START

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Vol. 1111 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

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DEPARTMENT
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Patent
and
Trademark
Office

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
February 6, 1990 Volume 1111 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.
THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 1, 1990, and was announced in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1140.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 18, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 3, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,639,944 through 4,641,378
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 1, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,370,754 through 4,371,982
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 19, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,300,367	06/219,569	11/17/81
4,300,496	06/218,359	11/17/81
4,300,943	06/222,219	11/17/81
4,301,160	06/216,957	11/17/81
4,553,270	06/462,894	11/19/85
4,553,274	06/661,426	11/19/85
4,553,276	06/473,587	11/19/85
4,553,277	06/556,373	11/19/85
4,553,278	06/603,490	11/19/85
4,553,279	06/542,266	11/19/85
4,553,288	06/614,724	11/19/85
4,553,291	06/644,357	11/19/85
4,553,298	06/634,357	11/19/85
4,553,300	06/614,808	11/19/85
4,553,301	06/607,059	11/19/85
4,553,304	06/499,398	11/19/85
4,553,305	06/554,570	11/19/85
4,553,306	06/548,942	11/19/85
4,553,325	06/612,575	11/19/85
4,553,333	06/640,637	11/19/85
4,553,341	06/638,961	11/19/85
4,553,347	06/624,052	11/19/85
4,553,349	06/528,180	11/19/85
4,553,355	06/580,194	11/19/85
4,553,363	06/421,826	11/19/85
4,553,365	06/537,523	11/19/85
4,553,382	06/532,986	11/19/85
4,553,383	06/561,546	11/19/85
4,553,385	06/553,083	11/19/85
4,553,394	06/485,486	11/19/85
4,553,395	06/499,201	11/19/85
4,553,396	06/606,529	11/19/85
4,553,418	06/589,758	11/19/85
4,553,419	06/363,172	11/19/85
4,553,420	06/537,681	11/19/85
4,553,433	06/494,598	11/19/85
4,553,440	06/323,193	11/19/85
4,553,453	06/616,122	11/19/85
4,553,466	06/516,255	11/19/85
4,553,467	06/544,694	11/19/85
4,553,468	06/532,710	11/19/85
4,553,479	06/483,916	11/19/85
4,553,480	06/519,839	11/19/85
4,553,481	06/599,093	11/19/85
4,553,483	06/398,347	11/19/85
4,553,484	06/429,062	11/19/85
4,553,490	06/648,658	11/19/85
4,553,492	06/648,927	11/19/85
4,553,494	06/578,747	11/19/85
4,553,503	06/525,126	11/19/85
4,553,509	06/630,698	11/19/85
4,553,524	06/529,498	11/19/85
4,553,528	06/336,886	11/19/85
4,553,544	06/660,391	11/19/85
4,553,557	06/498,650	11/19/85
4,553,560	06/504,219	11/19/85
4,553,575	06/561,213	11/19/85
4,553,576	06/634,045	11/19/85
4,553,577	06/609,865	11/19/85
4,553,581	06/483,792	11/19/85
4,553,582	06/661,251	11/19/85
4,553,584	06/558,932	11/19/85
4,553,589	06/630,122	11/19/85
4,553,590	06/575,844	11/19/85
4,553,592	06/578,453	11/19/85
4,553,610	06/588,947	11/19/85
4,553,612	06/549,876	11/19/85
4,553,618	06/522,435	11/19/85
4,553,635	06/727,106	11/19/85
4,553,636	06/596,351	11/19/85
4,553,637	06/594,788	11/19/85
4,553,645	06/575,619	11/19/85
4,553,658	06/491,240	11/19/85
4,553,664	06/567,147	11/19/85
4,553,665	06/537,383	11/19/85
4,553,667	06/560,048	11/19/85
4,553,671	06/529,155	11/19/85
4,553,678	06/623,033	11/19/85
4,553,683	06/635,409	11/19/85
4,553,684	06/677,072	11/19/85
4,553,686	06/611,473	11/19/85
4,553,687	06/431,682	11/19/85
4,553,691	06/639,625	11/19/85
4,553,695	06/568,057	11/19/85
4,553,719	06/717,644	11/19/85
4,553,724	06/555,597	11/19/85
4,553,735	06/339,092	11/19/85
4,553,737	06/707,684	11/19/85

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Patent Number	Serial Number	Issue Date
4,553,740	06/606,630	11/19/85
4,553,748	06/517,465	11/19/85
4,553,749	06/542,159	11/19/85
4,553,752	06/674,497	11/19/85
4,553,758	06/736,451	11/19/85
4,553,766	06/441,629	11/19/85
4,553,770	06/511,382	11/19/85
4,553,773	06/520,810	11/19/85
4,553,774	06/529,640	11/19/85
4,553,777	06/482,784	11/19/85
4,553,778	06/492,176	11/19/85
4,553,781	06/519,076	11/19/85
4,553,782	06/580,111	11/19/85
4,553,784	06/447,101	11/19/85
4,553,785	06/534,608	11/19/85
4,553,790	06/648,233	11/19/85
4,553,791	06/541,103	11/19/85
4,553,798	06/596,610	11/19/85
4,553,811	06/427,893	11/19/85
4,553,818	06/560,689	11/19/85
4,553,825	06/503,228	11/19/85
4,553,827	06/510,073	11/19/85
4,553,832	06/606,017	11/19/85
4,553,847	06/444,079	11/19/85
4,553,854	06/558,943	11/19/85
4,553,855	06/662,006	11/19/85
4,553,857	06/564,282	11/19/85
4,553,858	06/659,331	11/19/85
4,553,870	06/623,684	11/19/85
4,553,873	06/386,572	11/19/85
4,553,875	06/546,964	11/19/85
4,553,876	06/543,543	11/19/85
4,553,880	06/621,757	11/19/85
4,553,890	06/543,501	11/19/85
4,553,891	06/337,874	11/19/85
4,553,897	06/620,682	11/19/85
4,553,898	06/541,876	11/19/85
4,553,904	06/655,289	11/19/85
4,553,909	06/500,177	11/19/85
4,553,910	06/522,382	11/19/85
4,553,920	06/511,997	11/19/85
4,553,921	06/536,845	11/19/85
4,553,922	06/653,495	11/19/85
4,553,928	06/469,551	11/19/85
4,553,930	06/513,142	11/19/85
4,553,937	06/625,072	11/19/85
4,553,939	06/625,214	11/19/85
4,553,946	06/595,822	11/19/85
4,553,949	06/519,334	11/19/85
4,553,965	06/626,607	11/19/85
4,553,974	06/640,725	11/19/85
4,553,990	06/608,963	11/19/85
4,553,996	06/589,450	11/19/85
4,554,009	06/643,605	11/19/85
4,554,024	06/579,625	11/19/85
4,554,025	06/712,506	11/19/85
4,554,027	06/611,164	11/19/85
4,554,034	06/671,665	11/19/85
4,554,037	06/618,879	11/19/85
4,554,039	06/595,997	11/19/85
4,554,041	06/604,616	11/19/85
4,554,051	06/610,680	11/19/85
4,554,058	06/710,759	11/19/85
4,554,061	06/435,031	11/19/85
4,554,065	06/606,499	11/19/85
4,554,074	06/633,049	11/19/85
4,554,077	06/528,105	11/19/85
4,554,080	06/606,111	11/19/85
4,554,090	06/587,494	11/19/85
4,554,095	06/630,693	11/19/85
4,554,096	06/656,652	11/19/85
4,554,108	06/517,297	11/19/85
4,554,110	06/565,888	11/19/85
4,554,111	06/642,771	11/19/85
4,554,118	06/550,383	11/19/85
4,554,124	06/506,526	11/19/85
4,554,148	06/611,152	11/19/85
4,554,170	06/490,676	11/19/85
4,554,208	06/674,239	11/19/85
4,554,239	06/700,072	11/19/85
4,554,262	06/655,816	11/19/85
4,554,270	06/672,049	11/19/85
4,554,273	06/578,046	11/19/85
4,544,281	06/545,930	11/19/85
4,554,283	06/643,331	11/19/85
4,554,291	06/616,099	11/19/85
4,554,302	06/688,245	11/19/85
4,554,336	06/546,472	11/19/85
4,554,339	06/493,500	11/19/85
4,554,350	06/522,261	11/19/85
4,554,371	06/637,062	11/19/85
4,554,383	06/644,118	11/19/85
4,554,384	06/656,661	11/19/85
4,554,385	06/709,916	11/19/85
4,554,413	06/616,566	11/19/85
4,554,415	06/463,725	11/19/85
4,554,431	06/617,211	11/19/85
4,554,433	06/637,427	11/19/85
4,554,442	06/694,554	11/19/85
4,554,446	06/552,916	11/19/85
4,554,453	06/594,090	11/19/85
4,554,464	06/413,051	11/19/85
4,554,468	06/510,044	11/19/85
4,554,486	06/663,329	11/19/85
4,554,522	06/541,716	11/19/85
4,554,524	06/643,511	11/19/85
4,554,553	06/621,119	11/19/85
4,554,555	06/560,089	11/19/85
4,554,556	06/489,423	11/19/85
4,554,568	06/391,919	11/19/85
4,554,569	06/441,530	11/19/85
4,554,589	06/669,001	11/19/85
4,554,605	06/408,413	11/19/85
4,554,610	06/616,516	11/19/85
4,554,614	06/498,618	11/19/85
4,554,617	06/663,411	11/19/85
4,554,629	06/468,336	11/19/85
4,554,630	06/295,765	11/19/85
4,554,668	06/496,564	11/19/85

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U. S. C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U. S. C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U. S. C. 41(c)(10 and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,494,594	06/299,999	01/22/85	09/08/81	11/27/89
4,528,307	06/532,282	07/09/85	09/15/83	12/06/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,423,882, Reissue S. N. 07/451,458, Filed Dec. 15, 1989, Cl. 280/33.99B, SHOPPING CART WITH BABY SEAT, Don A. Stover, et al., Owner of Record: *UNR Industries, Inc., Chicago, Ill.*, Attorney or Agent: Allen J. Hoover, Ex. Gp.: 316

4,678,856, Reissue S. N. 07/420,364, Filed Oct. 12, 1989, Cl. 560/24, METHOD OF MANUFACTURING AROMATIC URETHANE AND INTERMEDIATE PRODUCT THEREOF, Takao Ikariya, Owner of Record: *Nippon Kikan Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Herbert Goodman, Ex. Gp.: 126

4,701,131, Reissue S. N. 07/423,189, Filed Oct. 18, 1989, Cl. 434/211, GEOMETRIC MODELING KIT AND METHOD OF MAKING SAME, Paul R. Hildebrandt et al., Owner of Record: *Inventor*, Attorney or Agent: John E. Reilly, Ex. Gp.: 334

4,704,220, Reissue S. N. 07/431,407, Filed Nov. 3, 1989, Cl. 252/75, OIL-IN-ALCOHOL MICROEMULSIONS IN ANTI-FREEZE, Errol D. Goddard Owner of Record: *First Brands Corp., Danbury, Conn.*, Attorney or Agent: Gary L. Wamer, Ex. Gp.: 115

4,710,230, Reissue S. N. 07/452,616, Filed Dec. 18, 1989, Cl. 106/308N, PIGMENT PASTE, Noboru Okoshi, et al., Owner of Record: *Dainippon Ink and Chemicals, Inc., Tokyo, Japan*, Attorney or Agent: Richard A. Steinberg, Ex. Gp.: 115

4,711,300, Reissue S. N. 07/451,519, Filed Dec. 6, 1989, Cl. 166/153, DOWNHOLE CEMENTING TOOL ASSEMBLY, Louis J. Wardlaw III, Owner of Record: *Inventor*, Attorney or Agent: *William C. Norvell* Jr., Ex. Gp.: 356

4,711,348, Reissue S. N. 07/447,047, Filed Dec. 7, 1989, Cl. 206/45.29, CONTAINER FOR PRODUCT SAMPLES, Allen Schluger, Owner of Record: *Inventor*, Attorney or Agent: Myron Amer, Ex. Gp : 241

4,712,232, Reissue S. N. 07/447,387, Filed Dec. 7, 1989, Cl. 379/329, MULTIPLE TELEPHONE JACK ASSEMBLY, E. Walter Rodgers, Owner of Record: *Wade Lup Rodgers, Grendale, Ariz.*, Attorney or Agent: Marvin A. Glazer, Ex. Gp.: 261

4,712,566, Reissue S. N. 07/451,982, Filed Dec. 15, 1989, Cl. 128/748, DEVICE FOR RECORDING PHYSIOLOGICAL PRESSURES. Bertil Hok, Owner of Record: *Radisensor Ab., Uppsala, Sweden*, Attorney or Agent: Arthur Schwartz, Ex. Gp.: 335

4,712,879, Reissue S. N. 07/450,740, Filed Dec. 14, 1989, Cl. 350/357, ELECTROCHROMIC DEVICE, Naill R. Lynam, Owner of Record: *Donnelly Corp., Holland, Mich.*, Attorney or Agent: James A. Mitchell, Ex. Gp.: 252

4,718,872, Reissue S. N. 07/452,559, Filed Dec. 18, 1989, Cl. 440/1, AUTOMATIC TRIM SYSTEM, Jeffrey A. Olson, et al., Owner of Record: *Inventor*, Attorney or Agent: David R. Price, Ex. Gp.: 315

4,719,523, Reissue S. N. 07/452,492, Filed Dec. 19, 1989, Cl. 360/51, SYCHRONIZING SIGNAL DETECTING CIRCUIT, Ken Kutaragi, Owner of Record: *Sony Corp., Tokyo, Japan*, Attorney or Agent: Jay H. Maioli, Ex. Gp.: 235

4,744,161, Reissue S. N. 07/449,539, Filed Dec. 12, 1989, Cl. 040/002.R, LABEL, David J. Instance, Owner of Record; *Inventor*, Attorney or Agent: Unknown, Ex. Gp.:357

4,770,242, Reissue S. N. 07/451,761, Filed Dec. 18, 1989, Cl. 165/185, COOLING DEVICE OF SEMICONDUCTOR CHIPS, Takahiro Daikoko, et al., Owner of Record: *Inventor*, Attorney or Agent: Stanley A. Wal, Ex. Gp.: 347

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,500,777, Reexam No. 90/001,911, Requested Dec. 21, 1989, Cl. 235/487, HIGH DATA CAPACITY SCRATCH AND DUST RESISTANT INFRARED, READ-WRITE DATA CARD FOR AUTOMATIC TELLER MACHINES, Jerome Drexler, Owner of Record: *Drexler Corp., Mountain View, Calif.*, Attorney or Agent: None, Ex. Gp.: 230, Requester: Optical Recording Corp., Toronto, Ontario, Canada

4,825,811, Reexam No. 90/001,912, Requested Dec. 14, 1989, Cl. 119/51.500, ANIMAL FEEDING DEVICE, Charles O'Kelley, Owner of Record: *Inventor*, Chicago, Ill., Attorney or Agent: Ralph R. Rath, Ex. Gp.: 330, Requester: Owner

REGISTRATION TO PRACTICE

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before February 28, 1990:

Ben-Oliel, Susan M. M., 110-1345 West 4th Ave., Vancouver, B.C., V6H 3Y8, Canada
Brigance, Gerald L., Route 1, Box 553F, Bumpass, Va. 23024
Callaghan, Thomas F., 7203 Countrywood Crt., Springfield, Va. 22151
Caress, Virginia B., 3906 Cherrywood La., Annandale, Va. 22003
Chi, James K., 1716 Arbor View Rd., Wheaton, Md. 20902
Jaudon, Henry S., 108 Forest Ave., Elberton, Ga. 30635
Jones, Herman O., 169 Chesapeake St., S. W. Washington, D. C. 20032
Lastova, MaryAnn S., 610 S. 21st St., Arlinton, Va. 22202
Moon, Charlie T., Route 1, Box 57D, Broad Run, Va. 22014
Nassif, Omar A., 172 Norton Ave., North York, Ont., M2N 4A9, Canada
Oechsle, Anton O., 2889 Sutton Oaks La., Vienna, Va. 22181
Powell, Everette A., Jr., P.O. Box 489, Culpeper, Va. 22701
Pinkham, Richard C., 5606 37th Ave., Hyattsville, Md. 20782
Prizant, James, 1900 S. Eads St., #1107, Arlington, Va. 22202
Rutledge, L. Dewayne, 109 Thorpes Parish, Williamsburg, Va. 23185
Swisher, Nancy A. B., 2001 S. Arlington Ridge Rd., Arlington, Va. 22202
Torchin, Norman G., 5225 Pooks Hill Rd., #218N, Bethesda, Md. 20814
Truluck, Dalton L., 2635 Childs La., Alexandria, Va. 22308

United States Patent and Trademark Office
Before the Commissioner of Patents and Trademarks

CAMERON WEIFFENBACH, Director, Office of Enrollment and Discipline

v.

WESLEY TURNER, Respondent.

Proceeding No. D89-6

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NOTICE BY PUBLICATION

Notice is hereby given to the above named respondent that proceedings under 35 U.S.C. § 32 have been instituted against him. A copy of the COMPLAINT AND NOTICE OF PROCEEDINGS UNDER 35 U.S.C. 32, including the charges against respondent, was twice mailed to respondent's residence address of record and business address of record. The COMPLAINT AND NOTICE was twice returned from respondent's residence and business addresses of record by the U.S. Postal Service.

Respondent may obtain a copy of the above-mentioned COMPLAINT AND NOTICE from:

John H. Raubitschek
Associate Solicitor
U.S. Patent and Trademark Office
Office of Enrollment and Discipline
P.O. Box 15667
Arlington, Va. 22215

This notice will appear in the *Official Gazette* for four (4) consecutive weeks beginning with the issue of January 30, 1990.

Respondent has thirty (30) days from the date of the last publication of this notice to file and answer to the charges against him. Failure to file an answer will be taken as an admission of the charges. 37 CFR § 10.136(d).

January 4, 1990

CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

Reclassification Alert Report

This report is a summary of classififcation changes which became effective by issuance of Classification Orders in September - December 1939. Information includes:

- subclasses established or abolished
- subclass title, indent, or position change
- classes where existing subclass definitions have changed

A Reclassification Alert Report may appear from time to time in the Official Gazette, and is intended to provide an interim notice of classififcation changes pending publication of the Manual of Classification and revisions thereto.

January 10, 1990

WILLIAM S. LAWSON
Administrator for Documentation

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
004			Defn Change	1314
008			Defn Change	1314
024			Defn Change	1314
030			Defn Change	1314
033	175	179	Abolish	1315
033	179.5		Abolish	1315
033	501.11	501.19	Establish	1315
033	501.45		Establish	1315
033	501.7	501.9	Establish	1315
033	514.1	514.2	Establish	1315
033	542.1		Position Change	1315
033	543.1		Establish	1315
033	544.1	544.6	Establish	1315
033	555.1	555.4	Establish	1315
033	561.1	561.3	Establish	1315
048	127.1		Establish	1317
048	127.3		Establish	1317
048	127.5		Establish	1317
048	127.7		Establish	1317
048	127.9		Establish	1317
048	196		Abolish	1317
048	198.1	198.3	Establish	1317
048	198.5	198.8	Establish	1317
112			Defn Change	1314
119			Defn Change	1314
123			Defn Change	1317
128			Defn Change	1315
128	092		Abolish	1314
128	303	361	Abolish	1314
175			Defn Change	1314
206			Defn Change	1314
209			Defn Change	1315
219			Defn Change	1314
223			Defn Change	1314
227	175	182	Establish	1314
227	901	902	Establish	1314
227	D001		Abolish	1314
250			Defn Change	1314
252			Defn Change	1317
294			Defn Change	1314
328			Defn Change	1314
362			Defn Change	1314
378			Defn Change	1314
407			Defn Change	1314
428			Defn Change	1314
433			Defn Change	1314
435	068	071	Abolish	1316
435	068.1		Establish	1316
435	069.1	069.5	Establish	1316
435	069.51	069.52	Establish	1316
435	070.1	070.2	Establish	1316
435	070.21		Establish	1316
435	070.3	070.5	Establish	1316
435	071.1	071.3	Establish	1316
530			Defn Change	1316
604			Defn Change	1314
606	001	236	Establish	1314
623			Defn Change	1314
935			Defn Change	1316

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PATENT NOTICES

Certificates of Correction For Week of February 6, 1990

D. 301,531	4,802,635	4,822,367	4,832,245
RE. 32,666	4,802,986	4,823,012	4,832,626
4,135,622	4,803,129	4,824,117	4,832,658
4,571,625	4,803,535	4,824,519	4,832,727
4,626,443	4,803,968	4,825,532	4,832,823
4,667,018	4,804,253	4,825,936	4,833,019
4,669,119	4,804,443	4,826,609	4,833,179
4,670,720	4,804,519	4,826,744	4,833,318
4,672,262	4,804,671	4,826,769	4,833,334
4,677,617	4,806,556	4,826,819	4,833,380
4,707,076	4,807,148	4,826,991	4,833,911
4,708,735	4,807,832	4,827,501	4,833,924
4,725,652	4,808,127	4,827,899	4,833,998
4,736,056	4,809,545	4,828,030	4,834,978
4,740,391	4,809,903	4,828,031	4,835,199
4,747,079	4,810,783	4,828,539	4,835,473
4,763,889	4,810,821	4,828,895	4,835,559
4,768,737	4,812,265	4,829,016	4,835,926
4,769,963	4,812,822	4,829,594	4,836,249
4,784,201	4,815,013	4,829,743	4,836,726
4,784,852	4,815,166	4,829,863	4,836,836
4,788,709	4,815,963	4,830,069	4,837,207
4,790,442	4,816,278	4,830,580	4,837,559
4,791,990	4,816,463	4,830,618	4,837,855
4,792,609	4,818,586	4,830,664	4,837,946
4,794,297	4,820,360	4,830,698	4,838,039
4,794,423	4,820,519	4,830,914	4,838,148
4,795,422	4,820,701	4,831,209	4,838,518
4,799,162	4,820,983	4,831,715	4,838,743
4,799,717	4,821,727	4,831,744	4,839,186
4,800,362	4,821,764	4,831,807	4,839,675
4,800,795	4,821,961	4,831,819	4,840,704
4,800,869	4,822,043	4,831,948	4,865,213

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Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF December 30, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-21-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	1-13-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M BLIX,Director	6-28-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	12-24-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
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MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during December 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,704,469 to 3,707,728 inclusive
Plant Patents ..... 3262 to 3280 inclusive

REEXAMINATIONS

FEBRUARY 6, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,956,327 (1202nd)

METHOD OF PREPARING 2,4-DIAMINO-5-BENZYL PYRIMIDINES

Ronald M. Cresswell, Scarsdale; John W. Mentha, Hartsdale, and Russell L. Seaman, Chappaqua, all of N.Y., assignors to Burroughs Wellcome Co., Triangle Park, N.C.

Reexamination Request No. 90/001,720, Feb. 23, 1989.
Reexamination Certificate for Patent No. 3,956,327, issued May 11, 1976, Ser. No. 482,144, Jun. 24, 1974.
Continuation of Ser. No. 258,804, Jun. 1, 1972, abandoned, which is a division of Ser. No. 16,606, Mar. 4, 1970, Pat. No. 3,697,512.
Claims priority, application United Kingdom, Mar. 6, 1969, 11908/69; Mar. 6, 1969, 11909/69; May 16, 1969, 25171/69; Jun. 13, 1969, 30247/69

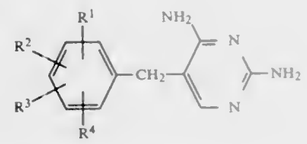
Int. Cl.[4] C07D *239/49*

U.S. Cl. 544—325

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

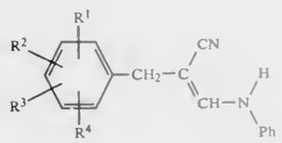
The patentability of claims 1–12 is confirmed.

1. A method of preparing a compound of formula I



(I)

which comprises the step of heating a mixture of a compound



and guanidine, where Ph is phenyl, naphthyl or phenyl substituted in one, two or three positions with lower alkyl, lower alkoxyl or halogen wherein lower alkyl and lower alkoxyl have 1 to 4 carbons and wherein R^1, R^2, R^3 and R^4 are the same or different, and each is hydrogen, halogen, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms or benzyloxy, or R^3 and R^4 taken together may be methylenedioxy when both R^1 and R^2 are hydrogen.

B1 4,575,826 (1204th)

REFRESH GENERATOR SYSTEM FOR A DYNAMIC MEMORY

Mark E. Dean, Boynton Beach, Fla., assignor to IBM Corp., Armonk, N.Y.

Reexamination Request No. 90/001,810, Jul. 17, 1989.
Reexamination Certificate for Patent No. 4,575,826, issued Mar. 11, 1986, Ser. No. 584,032, Feb. 27, 1984.

Int. Cl.[4] **G11C** *7/00*; **G06F** *13/00*

U.S. Cl. 365—222

AS A RESULT OF REEXAMINATION IT HAS BEEN DETERMINED THAT:

The patentability of claims 1 to 10 is confirmed.

New claims 11, 12 and 13 are added and determined to be patentable.

1. A refresh generator system for a dynamic random access memory in a data processing system which includes a processor of the type which, in response to a hold request signal, relinquishes control of its local bus and generates a hold acknowledge signal, said refresh generator system comprising first logic means responsive to a periodic signal from a refresh timer circuit to generate a hold request signal for the processor, second logic means responsive to a hold acknowledge signal from the processor to generate a refresh control signal, third logic means responsive to the refresh control signal to provide a refresh signal to control memory row access, a counter circuit coupled to be incremented by one in response to each refresh control signal, and a sequencer circuit responsive to each refresh control signal to generate a first gating signal to gate the current count in the counter circuit, representing a memory row address, to the memory and thereafter to generate a second gating signal to generate a memory read signal.

B1 4,728,471 (1205th)

TREATMENT OF EXPANSIBLE MATERIALS TO FORM LIGHTWEIGHT AGGREGATE

Robin A. Kyffin, Porthmadog, Wales; Peter A. Young, Harrogate, and Allon C. Day, Low Worsall, both of England, assignors to J. W. Greaves & Sons Limited, North Wales, United Kingdom

Reexamination Request No. 90/001,749, Apr. 11, 1989.
Reexamination Certificate for Patent No. 4,728,471, issued Mar. 1, 1988, Ser. No. 932,885, Nov. 20, 1986.

Claims priority, application United Kingdom, Nov. 23, 1985, 8528902

Int. Cl.[4] **E29C** *27/60*

U.S. Cl. 264—43

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 8 is cancelled.

Claim 1 is determined to be patentable as amended.

Claims 2–7, dependent on an amended claim, are determined to be patentable.

1. A method of heat-treating expansible particular materials to expand the same and produce a lightweight granular product comprising: precluding adherence of at least partially fused particles of said material to each other and the lining of a kiln

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by [,] providing a moving hearth within said kiln, feeding said material to said moving hearth at a charging zone so as to be distributed [over] *across substantially the entire radial extent of* said hearth and moving the hearth successively through a treatment zone of elevated temperature sufficient to at least partially fuse and expand said material [and], thereafter [,] *through* a discharge zone, at which the resultant expanded product is discharged from said hearth, *and finally through a pre-heating zone where said hearth is heated to said elevated temperature before receiving further material at said charging zone.*

STATUTORY INVENTION REGISTRATIONS

PUBLISHED FEBRUARY 6, 1990

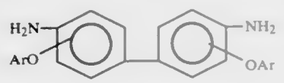
A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H728
ARYLOXY P-BENZIDINE COMPOUNDS

J. Shield Wallace, Albuquerque, N. Mex., and Fred E. Arnold, Centerville, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 26, 1988, Ser. No. 249,621
Int. Cl.[4] C07C *87/50*
U.S. Cl. 564—309 **6 Claims**

1. A substituted p-benzidine of the formula



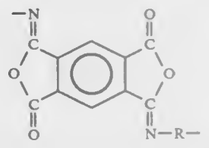
wherein Ar is phenyl or phenoxy phenyl.

H729
AROMATIC POLYISOIMIDES

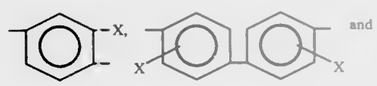
J. Shield Wallace, Albuquerque, N. Mex., and Fred E. Arnold, Centerville, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 26, 1988, Ser. No. 249,613
Int. Cl.[4] C08G *73/10*
U.S. Cl. 528—342 **8 Claims**

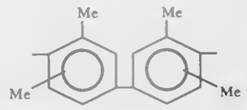
1. A polyisoimide having repeating units of the formula



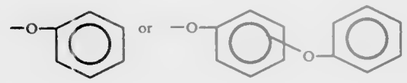
wherein R is selected from the group consisting of



and



wherein Me is $-CH_3$ and wherein X is



H730
HYDROXY-TERMINATED COPOLYFORMALS OF FLUORODIOLS WITH NITRODIOLS

Lori A. Nock, Baltimore, and Horst G. Adolph, Burtonsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1989, Ser. No. 389,211
Int. Cl.[4] C08G *2/18*
U.S. Cl. 528—244 **10 Claims**

1. A dihydroxy-terminated copolyformal formed from
A. formaldehyde and
B. a diol comonomer mixture of
(1) a fluorodiol selected from the group consisting of
$HOCH_2CF_2CF_2CF_2CH_2OH$,
$HOCH_2CF_2CF_2CF_2CF_2CH_2OH$,
$HOCH_2CF(CF_3)OCF_2CF_2CF_2CH_2OH$,
$HOCH_2CF_2OCF_2CF_2OCF_2CH_2OH$,
$HOCH_2CH_2(CF_2)_2CH_2CH_2OH$,
$HOCH_2CH_2(CF_2)_4CH_2CH_2OH$,
$HOCH_2CH_2(CF_2)_6CH_2CH_2OH$,
$HOCH_2CH_2(CF_2)_8CH_2CH_2OH$,
$HOCH_2CH_2(CF_2)_{10}CH_2CH_2OH$,
and mixtures thereof, and
(2) a nitrodiol selected from the group consisting of
$HOCH_2CH_2N(NO_2)CH_2CH_2N(NO_2)CH_2CH_2OH$,
$HOCH_2CH_2N(NO_2)CH_2C(NO_2)_2CH_2N(NO_2)CH_2CH_2OH$,
$HOCH_2C(NO_2)_2CH_2OCH_2OCH_2C(NO_2)_2CH_2OH$,
$HOCH_2CH_2N(NO_2CH_2C(NO_2)_2CH_2OCH_2OCH_2C(NO_2)_2CH_2N(NO_2)CH_2CH_2OH$, and
mixtures thereof,
wherein the fluorodiol comprises from about 10 to about 90 mole percent of the diol comonomer mixture with the nitrodiol being the remainder, and
wherein the terminal functional groups of the copolyformal are hydroxy groups.

H731
BLENDS OF THERMOPLASTIC POLYMERS AND MODIFIED BLOCK COPOLYMERS

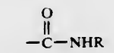
William P. Gergen, 11311 Hylander St., Houston, Tex. 77007; Robert G. Lutz, 632 Vista Grande Pl., Santa Rosa, Calif. 95401; Carl L. Willis, 15922 Red Willow, Houston, Tex. 77084, and Lorelle A. Pottick, 727 Bunker Hill Rd. #48, Houston, Tex. 77024

Continuation-in-part of Ser. No. 766,215, Aug. 16, 1985, Pat. No. 4,783,503, and a continuation-in-part of Ser. No. 766,216, Aug. 16, 1985, Pat. No. 4,797,447. This application Feb. 17, 1988, Ser. No. 157,353
Int. Cl.[4] C08L *53/00, 51/00*
U.S. Cl. 525—92 **26 Claims**

1. A multiphase polymer composition comprising:
(a) one phase containing at least be thermoplastic polymer containing a primary or secondary amine; and
(b) at least one other phase containing at least one composition to which has been grafted an effective amount of amide functional groups for toughening said multi-phase polymer compositions, said compositions comprising:
(1) a selectively hydrogenated block copolymer which comprises
(i) at least one polymer block A, said A block prior to hydrogenated being at least predominately a polymerized alkenyl arene block, and
(ii) at least one hydrogenated polymer block B, said B block prior to hydrogenation being at least predominately a polymerized conjugated diene block, and

(2) wherein substantially all of said amide functional groups are grafted to said block copolymer on said A blocks, and

(3) wherein said amide functional groups are represented by the general formula



wherein R is an alkyl, cycloalkyl, or aryl radical, and

(c) said one phase (a) being present in a weight ratio of about 99: to about 1:99 relative to said at least one other phase (b).

H732

POLYMER BLEND

Robert G. Lutz, Santa Rosa, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 20, 1988, Ser. No. 208,691

Int. Cl.[4] C08F *283/00*; C08G *14/00*

U.S. Cl. 525—471 **5 Claims**

1. A composition comprising a non-miscible blend of, as a major component, a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and, as a minor component as oligomer derived from spihalohydrin and a hydroxyphenylalkane.

H733

EDUCATIONAL DEVICE FOR DEMONSTRATING NONSTANDARD COUNTING PROCEDURES

Jan C. West, Alliance, Ohio, assignor to The United States of America as represented by the President of the United States, Washington, D.C.

Filed Jun. 3, 1988, Ser. No. 211,981

Int. Cl.[4] G09B *19/02*

U.S. Cl. 434—189 **7 Claims**



1. An educational device for extending sequences comprising;

a first platen accomodating a row of a plurality of first plates secured together and inscribed with a challenge numerical sequence;

a second platen accomodating a row of a plurality of second plates secured together and inscribed with a challenge numerical sub-sequence;

said first and second platens being secured together to function as a unit, with said second platen being offset to the right with respect to said first platen by one digit position of said sequence;

and a third plate positioned to the right of said second platen, said third plate serving as a means of preparing for the continuation of said challenge numerical sub-sequence.

H734

METHOD FOR INHIBITING ONSET OF OR TREATING MIGRAINE HEADACHES EMPLOYING AN ACE INHIBITOR

Abraham Sudilovsky, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 118,131, Nov. 9, 1987, abandoned. This application Mar. 7, 1988, Ser. No. 164,689

Int. Cl.[4] A61K *37/00, 31/44*

U.S. Cl. 514—19 **16 Claims**

1. A method for inhibiting onset or treating migraine headache in a mammalian specie, which comprises administering to a mammalian specie in need of such treatment an effective amount of an angiotensin converting enzyme inhibitor alone or in combination with a calcium channel blocker over a prolonged period of treatment to reduce frequency and/or severity of migraine headaches during such period of treatment.

H735

LEAD-203 AS A LABEL FOR RADIOIMAGING

Suresh C. Srivastava, Setauket, and George E. Meinken, Middle Island, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1988, Ser. No. 175,424

Int. Cl.[4] A61K *43/00*

U.S. Cl. 424—1.1 **7 Claims**

1. A conjugate of Pb-203 and an antibody or an antibody fragment useful in radioimaging.

H736

PROCESS FOR MAKING BORON NITRIDE USING SODIUM CYANIDE AND BORON

Carlos E. Bamberger, Oak Ridge, Tenn., assignor to The United Stated of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 27, 1987, Ser. No. 19,835

Int. Cl.[4] C01G *21/64*

U.S. Cl. 423—290 **6 Claims**

1. A process for making boron nitride comprising mixing sodium cyanide with boron phosphate and heating said mixture in a nonvacuum atmosphere of gas selected from the group nitrogen or an inert gas to a temperature and for a length of time suitable to cause reaction and subsequentialy extracting said by-products and unreacted starting material with water.

H737

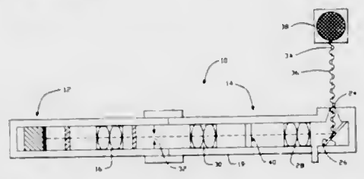
LIGHT INTENSITY COMPRESSOR

Michael C. Rushford, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 18, 1988, Ser. No. 241,231

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—347 E **15 Claims**



1. In a system in which a scene having a given light intensity profile is viewed, an assembly for compressing the light intensity range associated with that profile, comprising:

a light intensity compressor including,

a twisted nematic liquid crystal material,

means for applying an electric field having an intensity profile corresponding to the light intensity profile of said scene to a region of the liquid crystal material, and

a first and second polarizer, said polarizers being disposed on opposite sides of the liquid crystal material, the first and second polarizers and said liquid crystal material cooperating to compress the light intensity profile of the viewed scene;

means for forming an image of the scene being viewed on the light intensity compressor; and

means for viewing a compressed image of the scene.

H738

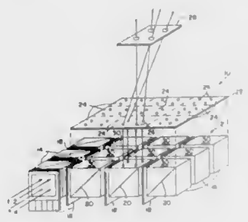
SWITCHED HOLOGRAMS FOR RECONFIGURABLE OPTICAL INTERCONNECT

J. Barry McManus, Arlington; Roger S. Putnam, Newton, both of Mass., and H. John Caulfield, Cornersville, Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 17, 1989, Ser. No. 381,543

Int. Cl.[4] G02B *5/32*; G02F *1/13*

U.S. Cl. 350—3.7 **3 Claims**



1. A Holoswitch comprising a switch array of a multiplicity of optical switches, said optical switches each including a liquid crystal cell and a polarizing beamsplitter, said switch array of said multiplicity of switches having said multiplicity of switches arranged for receiving a plurality of parallel optical beams and for directing the beams as a set toward a selected row of several rows formed by switches of said switch array, each switch of said several rows of said switch array having an output face through which said optical parallel beams can be projected to holographic spots of a hologram plate located adjacent said output face, and said optical face further projecting said beams from the holographic spots to detector means.

H739

AUXILIARY ANTENNA INTERFERENCE CANCELLER

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 13, 1989, Ser. No. 374,123

Int. Cl.[4] G01S *3/16*

U.S. Cl. 342—384 **10 Claims**

1. An interference cancelling system, comprising:

primary receiving antenna means including an output for providing a first output signal including a desired signal and all interfering signals;

steerable auxiliary receiving antenna means including means for simultaneously forming and scanning a plurality of relatively narrow receiving beams respectively directed to a predetermined number of individual sources of interfering signals for providing a respective number of second output signals; and

means connected to the output of said primary antenna means and said auxiliary antenna means for subtracting said second output signals from said first output signal.

H740

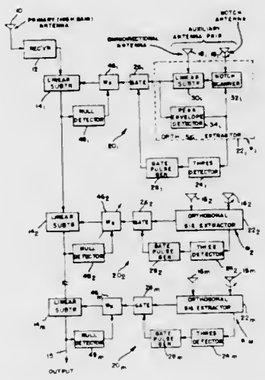
ANTENNA SIDELOBE INTERFERENCE CANCELLER

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 13, 1989, Ser. No. 374,124

Int. Cl.[4] G01S *3/16*

U.S. Cl. 342—384 **15 Claims**



1. An antenna sidelobe interference cancelling system, comprising:

primary receiving antenna means including an output for providing a first output signal including a desired signal and all of a plurality of interfering signals;

at least one auxiliary receiving antenna pair including omindirectional antenna means and steerable notch antenna means, said notch antenna means including a notch in the radiation pattern thereof directed to one of said interfering signals;

first circuit means connected to the respective outputs of said auxiliary antenna pair and differencing the output signals generated thereby to generate a second output signal corresponding to said one interfering signal; and

second circuit means connected to the output of said primary antenna means and said first circuit means for subtracting said second output signal from said first output signal and generating a control output signal.

H741

DISCRETE COMPLEX CORRELATION DEVICE FOR OBTAINING SUBPIXEL ACCURACY

Norman F. Powell, Ellicott City, Md., and Giora A. Bendor, Columbia, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 12, 1984, Ser. No. 643,904

Int. Cl.[4] G01S *13/90*

U.S. Cl. 342—25 **8 Claims**

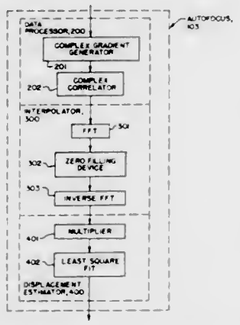
1. An autofocus device in combination with a synthetic aperture radar system to extract error phase from detected data, said autofocus device comprising:

a complex gradient generator receiving said detected data from said synthetic aperture radar system and generating a complex gradient from said detected data;

a complex correlator receiving said complex gradient from said complex gradient generator and outputting a line per line complex correlation;

an interpolator receiving said complex correlation from said

complex correlator and performing an interpolation to obtain a shift estimate; and



a displacement estimator receiving said shift estimate from said interpolator and converting said shift estimate into said error phase.

H742
TWO-LINE PHASE-MATCHED RAMAN AMPLIFIER

Bradley L. Bobbs, Granada Hills, and Jeffrey A. Goldstone, Newbury Park, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 14, 1988, Ser. No. 286,029
Int. Cl.[4] H01S *3/00*; H03F *7/00*
U.S. Cl. 330—4.3 **5 Claims**

1. A method for a Raman amplifier having a pump laser with two spectral lines used as input beams, and a Raman medium in which Raman gains of two lines in Stokes-shifted output are coupled together by a four-wave mixing process, said method comprising adjusting the angles between the input beams, so that the four-wave mixing phase mismatch due to medium dispersion is substantially eliminated;

whereby the Raman gains of the two Stokes shifted lines are coupled together so that the effective pump intensity for each is the total pump intensity: and since both lines convert in about the same amplifer length, independent of the relative power in each, the conversion efficiency is not limited by the inability to optimize the length for both lines simultaneously.

H743
LOW CURRENT VOLTAGE REFERENCE

Otto H. Bismark, Fords, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 13, 1989, Ser. No. 406,929
Int. Cl.[4] G05F *3/16*
U.S. Cl. 323—313 **12 Claims**

1. A voltage reference circuit comprising:

a voltage source;

a first circuit connected to the voltage source having a positive temperature coefficient, and including means for generating a reference voltage that is substantially independent of the voltage source over a predetermined voltage range; and

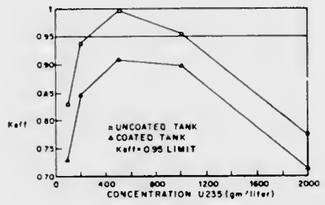


a negative temperature coefficient device connected in series with the first circuit.

H744
PORCELAIN ENAMEL NEUTRON ABSORBING MATERIAL

Daniel C. Iverson, Aiken, S.C., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 20, 1987, Ser. No. 123,462
Int. Cl.[4] C04B *35/68*; G21C *5/12*
U.S. Cl. 252—478 **7 Claims**



1. A neutron absorbing composite comprising a porcelain enamel coating adhered to a chemical reaction vessel containing a process stream of fissile material, said coating consisting essentially, by weight, of a major proportion of oxide of a cadmium compound and minor proportions of oxides of a boron compound, a lithium compound, and a silicon compound in the form of a porcelain enamel coating, said coating applied to said vessel in a thickness sufficient to prevent criticality.

H745
ION-SELECTIVE ELECTRODE FOR MEASURING CARBONATE CONCENTRATION

Kimiko Ishizaka, and Osamu Seshimoto, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1988, Ser. No. 169,288
Claims priority, application Japan, Mar. 17, 1987, 62-61889
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—418 **2 Claims**

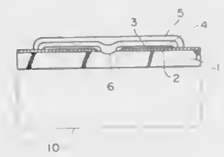
1. An ion-selective electrode for measuring carbonate concentration comprising layers in the following order:

an electrically insulating support;

a conductive metal layer on said support;

a metal halide of said same conductive metal on said metal layer;

a carbonate ion-selective layer containing an ion carrier; and

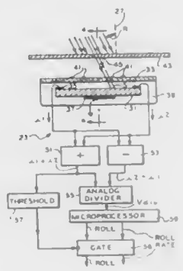


a buffer layer of a hydrophilic polymer binder containing a buffer.

H746
SOLAR REFERENCE FLIGHT ROLL POSITION SENSOR

Robert K. Leach, Minneapolis, Minn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 11, 1989, Ser. No. 393,174
Int. Cl.[4] G01C *21/00, 1/00*
U.S. Cl. 73—178 R **20 Claims**



1. A flight position sensor comprising:

a photodetector having means for generating first and second currents in response to the position of a beam of solar radiation illuminating a portion of a surface of the photodetector;

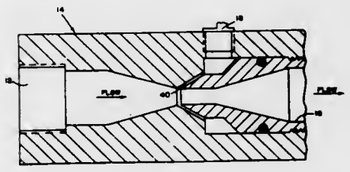
an opaque screen having an aperture therein superimposed above the surface of the photodetector such that a different portion of the surface is illuminated by solar radiation passing through the aperture for different positions of the sensor with respect to the sun; and

means for measuring the relative values of the first and second currents whereby the position of the sensor with respect to the sun is determined.

H747
ACTIVE CONTROL OF SOLID PROPELLANT GENERATORS USING THROAT MODULATION TECHNIQUES AND PROGRAMMABLE COMPENSATION

Paul L. Jacobs, Huntsville, and J. C. Dunaway, Falkville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 1, 1982, Ser. No. 383,403
Int. Cl.[4] F02K *1/18*
U.S. Cl. 60—242 **4 Claims**



1. A system for controlling the gas flow rate of a solid propellant comprising a solid propellant gas generator connected to a throat modulation device and thrust nozzle that has an exhaust outlet, a pressure sensor mounted on said solid propellant gas generator and being connected from said pressure sensor to a microprocessor controller for transmitting the chamber pressure of the solid propellant gas to the microprocessor controller, a temperature sensor mounted on said solid propellant gas generator and innerconnecting means connecting said temperature sensor to said microprocessor controller for transmitting said sensed temperatures of said solid propellant gas generator to said microprocessor controller, said microprocessor controller processing said sensed pressures and said sensed temperatures of said solid propellant gas generator and producing control signals, means interconnecting said microprocessor controller to a modulation control valve, said modulation control valve being connected to a source and said control signals being utilized to control said modulation control valve in such a manner to produce a modulated output from said modulation control valve that is communicated to said throat modulation device and thrust nozzle to cause the thrust produced at the outlet of said throat modulation device and thrust nozzle to be controlled in accordance with the sensed temperature and pressure of said solid propellant gas generator.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,158

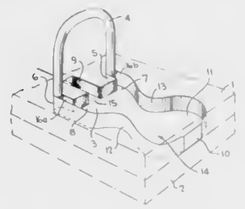
FLUIDIC OSCILLATOR WITH RESONANT INERTANCE AND DYNAMIC COMPLIANCE CIRCUIT

Ronald D. Stouffer, Silver Spring, and Peter Bauer, Germantown, both of Md., assignors to Bowles Fluidics Corporation, Columbia, Md.

Original No. 4,231,519, dated Nov. 4, 1980, Ser. No. 19,250, Mar. 9, 1979. Application for reissue Mar. 19, 1985, Ser. No. 713,716

Int. Cl.[4] **B05B** *1/08, 1/34;* **F15C** *1/22*

U.S. Cl. 239—589.1 **5 Claims**



1. A fluidic oscillator having a chamber, an inlet opening for issuing a jet of working fluid into said chamber, and an outlet opening for issuing working fluid from said chamber into the ambient environment, characterized by a fluid inertance flow conduit transferring working fluid between first and second locations on opposite sides of said jet and near said inlet opening in said chamber, and a dynamic compliance in the form of a vortex region defined between sidewalls of said chamber which generally converge towards said outlet opening and near said outlet opening such that working fluid in the jet forms in said vortex region a vortex which alternately flows in opposite directions, the vortex alternately aspirating fluid from and supplying fluid to said first and second locations in opposite phase and thereby through said inertance in alternately opposite directions.

Re. 33,159

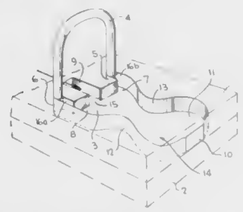
FLUIDIC OSCILLATOR WITH RESONANT INERTANCE AND DYNAMIC COMPLIANCE CIRCUIT

Peter Bauer, 13921 Esworthy Rd., Germantown, Md. 20767

Original No. 4,231,519, dated Nov. 4, 1980, Ser. No. 19,,250, Mar. 9, 1979. Application for reissue Jun. 10, 1983, Ser. No. 503,119

Int. Cl.[4] **B05B** *1/08, 1/34;* **F15C** *1/22*

U.S. Cl. 239—589.1 **37 Claims**



41. A fluidic spray device comprising:

a chamber having sidewalls forming an upstream end and a downstream end thereof;

fluid inlet means;

inlet means for issuing a jet of working fluid into aid chamber;

said sidewalls in the upstream end of said chamber converging toward said jet and substantially spaced therefrom;

said inertance means including an inertance flow conduit having an entry portion thereof entering directly into said upstream end of said chamber so that working fluid from said inertance means enters directly into said upstream end of said chamber at a location substantially spaced from said jet;

outlet means for issuing working fluid from said chamber in a flow pattern and direction determined by the static pressure and flow velocity of working fluid in said chamber;

dynamic compliance means including sidewalls which converge toward said outlet opening and near said outlet opening for establishing a vortical flow of the working flow issued into said chamber; and

fluid inertance means for cyclically reversing said vortical flow between first and second flow directions, said fluid inertance means interconnecting first and second locations in said chamber on opposite sides of said jet proximate said inlet means such that vortical flow in said first flow direction aspirates fluid from said fluid inertance means at said first location and feeds fluid into said fluid inertance means at said second location, and such that vortical flow in said second direction aspirates fluid from said fluid inertance means at said second locations and feeds fluid into said fluid inertance means at said first location, said fluid inertance means including means establishing a flow inertia for delaying changes in flow conditions through said fluid inertance means in response to differential pressure changes across said first and second locations.

Re. 33,160

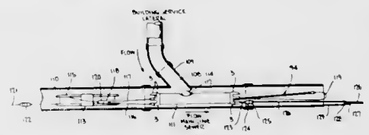
METHOD AND APPARATUS FOR INSPECTING LATERAL LINES

Kenneth R. Guthrie, Orlando, Fla., and James R. Martin, Orangevale, Calif., assignors to Cues, Inc., Orlando, Fla.

Original No. 4,651,558, dated Mar. 24, 1987, Ser. No. 776,163, Sep. 13, 1985. Application for reissue Nov. 25, 1987, Ser. No. 125,578

Int. Cl.[4] **H04N** *7/18*

U.S. Cl. 73—40.5 R **29 Claims**



21. Apparatus for inspecting a building service lateral sewer pipeline from a lateral opening in a main sewer pipeline at which the lateral and main pipelines intersect, said apparatus comprising:

a lateral television camera of sufficiently small size to fit in said lateral pipeline;

a lateral signal conduction cable connected to said lateral camera from a remote location for delivering electrical signals required to operate the lateral camera and sending a lateral video signal representing an image viewed by the lateral camera;

an elongated flexible push rod having a first end secured to said lateral camera and a second end, said push rod having suffi-

cient longitudinally compressive rigidity to push said lateral camera along said lateral pipeline when moved longitudinally into said lateral pipeline from said lateral opening, and sufficient transverse flexibility to follow bends in said lateral pipeline when moved longitudinally therein; and means for selectively extending said push rod and said lateral camera along with said lateral cable into, and retracting said lateral camera and said push rod along with said lateral cable from, said lateral pipeline via said lateral opening.

Re. 33,161

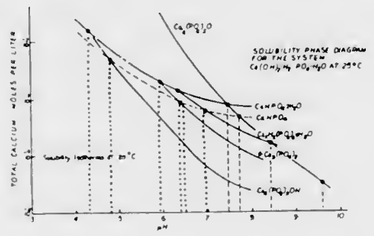
COMBINATIONS OF SPARINGLY SOLUBLE CALCIUM PHOSPHATES IN SLURRIES AND PASTES AS MINERALIZERS AND CEMENTS

Walter E. Brown, Rockville, and Laurence C. Chow, Potomac, both of Md., assignors to American Dental Association Health Foundation, Gaithersburg, Md.

Original No. 4,612,053, dated Sep. 16, 1986, Ser. No. 732,515, May 9, 1985. Continuation-in-part of Ser. No. 539,740, Oct. 6, 1983, Pat. No. 4,518,430, which is a continuation-in-part of Ser. No. 373,157, Apr. 29, 1982, abandoned. Application for reissue Mar. 2, 1988, Ser. No. 163,014

Int. Cl.[4] C01B *25/32*; A61K *6/00*

U.S. Cl. 423—308 **52 Claims**



1. A [dental restorative] slurry [comprising] *consisting essentially of* an aqueous mixture of $Ca_4(PO_4)_2O$ and at least one other calcium phosphate selected from the group consisting of $CaHPO_4.2H_2O$[,] *and* $CaHPO_4$, [$Ca_8H_2(PO_4)_6.5H_2O$, α—$Ca_3(PO_4)_2$, β—$Ca_3(PO_4)_2$, and modified $Ca_3(PO_4)_2$,] both calcium phosphates being present in the slurry in excess such that hydroxyapatite is substantially continuously precipitated from the slurry *at an ambient temperature.*

PLANT PATENTS

GRANTED FEBRUARY 6, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,136

ROSE PLANT — LAVGLO VARIETY

Keith Laver, Caledon East, Canada, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Nov. 28, 1988, Ser. No. 276,862

Int. Cl.[4] A01 *5/00*

U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of Miniature rose plant characterized by the following combination of characteristics:
(a) forms in abundance on a continuous basis attractive long lasting double yellow blossoms of good color stability,
(b) exhibits a low, compact and well-branched growth habit, and
(c) is well suited for pot forcing;
substantially as herein shown and described, together with the parts thereof.

7,137

ROSE PLANT — OLIJCHOU VARIETY

Huibert W. Olij, De Kwakel, Netherlands, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jan. 25, 1989, Ser. No. 301,109

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct variety of Intermediate rose plant characterized by the following combination of characteristics:
(a) forms in abundance attractive long lasting semi-double lemon yellow blossoms which are suffused with marigold orange on the edges,
(b) is well adapted for greenhouse forcing,
(c) exhibits vigorous vegetation, and
(d) is particularly suited for cut flower production;
substantially as herein shown and described.

7,138

ROSE PLANT — KEIROMO VARIETY

Seizo Suzuki, Tokyo, Japan, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jan. 23, 1989, Ser. No. 299,679

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:
(a) forms in abundance elegant long lasting blossoms which are scarlet pink on the inside and light carmine rose on the outside,
(b) is well adapted for forcing,
(c) exhibits vigorous glossy vegetation, and
(d) is particularly suited for cut flower production;
substantially as herein shown and described.

7,139

ROSE PLANT—KIBOH VARIETY

Seizo Suzuki, Tokyo, Japan, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jan. 23, 1989, Ser. No. 299,678

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of Floribunda rose plant characterized by the following combination of characteristics:
(a) forms attractive long lasting bipolar very double blossoms which are strawberry red with a lemon yellow base on the inside and are lemon yellow tinted with turkey red on the outside,
(b) is particularly well suited for the decoration of parks and gardens, and
(c) exhibits a vigorous bushy growth habit;
substantially as herein shown and described.

7,140

VARIETY OF TROPICAL MANGO NAMED MARTY

Neal P. Brooks, P.O. Drawer 9, 18400 SW. 256 St., Homestead, Fla. 33090

Filed Feb. 12, 1988, Ser. No. 155,479

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—33 **1 Claim**

1. A new and distinct variety of tropical mango substantially as described and illustrated having a fruit characterized by a dark purplish red skin color.

7,141

VARIETY OF TROPICAL MANGO NAMED ED MITCHELL

Edward F. Mitchell, 13950 SW. 67 Ave., Miami, Fla. 33158

Filed Feb. 12, 1988, Ser. No. 155,477

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—33 **1 Claim**

1. A new and distinct variety of tropical mango substantially as described and illustrated having a fruit characterized by a bright green underside with blended shades of yellow and peach on most of the surface of the fruit.

7,142

MALUS CORAL CASCADE

Henry A. Ross, 16711 Pearl Rd., Strongsville, Ohio 44136

Filed Dec. 30, 1988, Ser. No. 292,113

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinctive variety of flowering crabapple tree, as described and illustrated, a clone which is especially distinctive because of its wide-spreading, cascading habit of growth, especially when loaded with fruit in the Fall; an extremely profuse and striking annual display of persistant, small, glossy fruit of an unusual and uncommon coral-orange coloration; as well as being easily propagated vegetatively and coming true to the original selection, fairly rapid growing and apparently free from diseases which normally affect flowering crabapples.

7,143

AFRICAN VIOLET PLANT IMPROVED MONIQUE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,755

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. An new and distinct cultivar of African violet named Improved Monique, as described and illustrated, and particularly characterized by its single, occasionally semi-double, dark lilac flowers with darker center radiating into the two small petals; frilled edges, strong, upright flower stems that curve toward the center to form a compact bouquet above the leaves; medium green, serrated, oval leaves; profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and is long-lasting and non-dropping flowers.

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7,144
CARNATION NAMED HILSUCCES
Jan J. Hilverda, Aalsmeer, Netherlands, assignor to Hilverda b.v., Aalsmeer, Netherlands
Filed Jan. 23, 1989, Ser. No. 299,771
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 1 Claim

1. The new and distinct spray carnation cultivar, substantially as herein shown and described, characterized by its profuse production of relatively small flowers having a soft light pink coloration, borne singly on stems emitted in longitudinally-spaced relation on a long, flowering stem having an abundant production of foliage.

7,145
CARNATION NAMED KILLER
Antonio Di Giorgio, and Renato Di Giorgio, both of San Remo, Italy, assignors to Laboratoire de Physiologie Vegetale, La Londe-Le Maures, France
Filed Dec. 21, 1988, Ser. No. 294,517
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—73 1 Claim

1. The new and distinct carnation cultivar, substantially as herein shown and described, particularly distinguished by its profuse production of very large Turkish Red flowers borne singly on long, strong stems of a tall plant having a vigorous growth habit.

PATENTS

GRANTED FEB. 6, 1990

ERRATA

For CLASS	See PATENT NO.
074-594	4,898,063
074-594	4,898,064
475-179	4,898,065
081-483	4,898,068
073-118	4,898,084
606-114	4,898,155
606-072	4,898,156
606-147	4,898,157
606-105	4,898,161
606-042	4,898,169
606-236	4,898,171
606-062	4,898,186
440-001	4,898,563
528-323	4,898,896
313-594	4,899,092

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PATENTS

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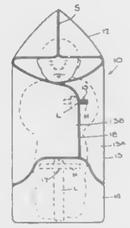
GENERAL AND MECHANICAL

4,897,885

ONE-PIECE INFANT BUNTING

Audrey T. Lint, 6371 Vermont Hill Rd., South Wales, N.Y. 14139

Filed Mar. 17, 1989, Ser. No. 324,753
Int. Cl.[4] A41B *13/06*
U.S. Cl. 2—69.5 7 Claims



1. An infant bunting formed from a single die-cut blank of ultrasonically sealable fabric material, the blank being contoured to define a rectangular main section having opposing sides and provided with a lower extension forming a closure section and an upper extension whose corners are folded in and ultrasonically seamed at their abutting edges to form a triangular hood section, the opposing sides of the main section being folded over the infant's body, arms and legs in overlapping relation to form a pouch which is held together by at least one Velcro fastener having hook and loop components which are ultrasonically welded to the respective sides, the closure section being foldable over the pouch to lock in the feet of the infant and being held to the pouch by a Velcro fastener, one of whose components is ultrasonically welded to the closure section, the other to one of said sides, said fabric material having multiple layers including a core layer formed of thermal insulation and a band ultrasonically welded across the upper extension to seal the core layer to the other layers of the material and to define a living neck hinge.

4,897,886

FIREFIGHTER'S GARMENTS HAVING MINIMUM WEIGHT AND EXCELLENT PROTECTIVE QUALITIES

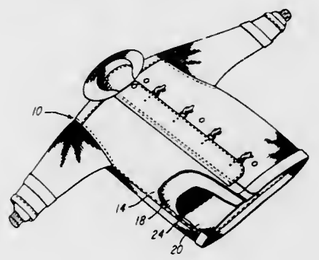
William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417

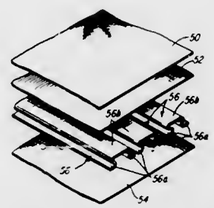
Filed Nov. 30, 1988, Ser. No. 278,553
Int. Cl.[4] A41D *1/02, 13/00*
U.S. Cl. 2—81 22 Claims

1. A firefighter's garment comprising an outer layer of flame resistant material, an intermediate layer of moisture resistant material, and an inner layer, spacer means positioned between the inner layer and the intermediate layer, the spacer means being enclosed between the inner layer and the intermediate layer whereby a dead air space is provided and circulation of air through the garment between the inner layer and the intermediate layer is prevented, the spacer means having a degree of rigidity, thereby maintaining a dead air space between the inner layer and the intermediate layer in all situations, including a situation in which localized external pressure is applied to the outer layer of the firefighter's garments, the air space thus consistently providing excellent thermal insulation while maintaining minimum weight.

13. A firefighter's garment comprising a plurality of layers of material, spacer means positioned between two of the layers of material and creating a dead air space between the two layers of material, the spacer means being enclosed between said two layers whereby circulation of air through the garment between the two layers is prevented, the spacer means comprising material having a degree of rigidity whereby the air space is maintained in all situations including situations in which localized external pressure is applied to the garment, the air space in the garment thus providing continuous and constant excellent thermal insulation qualities, and whereby the garment is light in weight.

20. The method of construction of a firefighter's garment comprising providing a plurality of layers of protective material, providing spacer means having a degree of rigidity, positioning the spacer means between two of the layers of material to provide dead air space between the two layers of material, enclosing the spacer-means between the two layers of material to prevent circulation of air through the garment and between the two layers of material, whereby the spacer means establishes and maintains air space between said two layers of materials even when localized external pressure is applied to the garment, the spacer means thus providing thermal insulation in the garment while permitting the garment to have minimum weight.





4,897,887

PREKNOTTED ADJUSTABLE NECKTIE

Jiann-Jong Chen, and Ching-Hwa Chen, both of 21, Alley 21, Lane 244, Sec. 5, Yen-Ping North Road, Taipei, Taiwan

Filed Aug. 31, 1988, Ser. No. 238,731
Int. Cl.[4] A41D *25/02, 25/08*
U.S. Cl. 2—150 8 Claims

1. A preknotted adjustable necktie comprising an inner tie member which comprises a loop portion to surround a users neck in use and a portion depending from said loop portion, the junction between said loop portion and said depending portion incorporating a zip fastener having an adjustment slider whereby the size of the loop portion may be adjusted, a knot former comprising an inner body and an outer body connected together, with the inner tie member passing between the inner body and the outer body and the slider of the zip fastener fixed to the knot former, and an outer tie member fastened to said knot former, arranged as a knot over the knot former and

depending therefrom, such that the position of the knot former on the inner tie member may be varied to tighten and to loosen the loop portion.

7. A knot former for use in an adjustable preknotted necktie comprising an inner body and an outer body connectable together to form the knot former, the inner body comprising a pair of oppositely laterally directed wing portions and a de-



pending tongue portion spaced forwardly of the wing portion, the outer body comprising a corresponding pair of oppositely laterally directed wing portions and a downwardly extending slot on the front face of the outer body for receiving said tongue when the inner body is arranged with its wing portions behind said outer body and with said tongue passed over to the front of said outer body.

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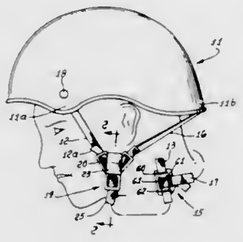
HELMET STRAP CLIP, AND ASSEMBLY

Lester V. Broersma, Bellflower, Calif., and Fritz W. Wurster, Waldstetten, Fed. Rep. of Germany, assignors to Bell Bicycles, Inc., Norwalk, Calif.

Filed Dec. 7, 1988, Ser. No. 280,821

Int. Cl.[4] A42B *3/00*

U.S. Cl. 2—421 **15 Claims**



1. For use with a helmet chin strap and forward and rearward straps connected to and depending from the helmet, a clip structure, comprising

(a) a first upright clip element having forward slot means connectible with the forward strap, and rearward slot means connectible with the rearward strap,

(b) a second upright clip element having lower slot means connectible with the chin strap,

(c) the two elements having upper and lower pairs of interconnectible tongue and groove means whereby they are connectible together and disconnectible from one another in response to finger pressure exertion thereon.

4,897,889

SHOWER-PARTITION WITH PIVOTED DOOR

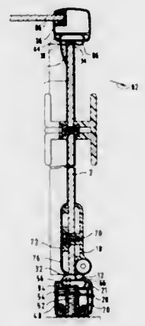
Heinz G. Baus, Hünibach-Thun, Switzerland, assignor to Altura Leiden Holding B.V., Maastricht, Netherlands

Filed Feb. 18, 1988, Ser. No. 156,737

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705433

Int. Cl.[4] E06B *1/30*; A47K *17/00*

U.S. Cl. 4—607 **20 Claims**



1. A shower-partition comprising:

a door having a hinge edge and a free edge,

a stationary profiled rail;

a profiled compensating rail arranged on said stationary rail, said compensating rail comprising a partition forming the base of a longitudinal undercut groove open toward said hinge edge of said door;

at least two hinges having substantially aligned axes of rotation, each hinge comprising at least one hinge-mount having a base portion received in said undercut groove and secured to said compensating rail, said hinges pivotably mounting said door on said compensating rail; and

means for horizontally and vertically adjusting the position of said compensating rail and pivotably mounted door relative to said stationary rail comprising at least two connecting elements mounted in longitudinally spaced positions on said stationary rail and at least two adjusting screws with heads axially secured in longitudinally elongated slots in said compensating rail and threaded portions each received in a threaded hole in a respective one of said connecting elements.

4,897,890

AIR CONTROL SYSTEM FOR AIR BED

Robert A. Walker, 8700 W. 36th St., Minneapolis, Minn. 55426

Continuation of Ser. No. 455,664, Jan. 5, 1983, abandoned. This application May 2, 1986, Ser. No. 859,866

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

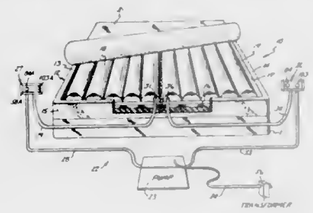
Int. Cl.[4] A47C *27/10*

U.S. Cl. 5—453 **20 Claims**

1. An apparatus for supplying air under pressure to an air mattress and regulating the pressure of the air in the air mattress comprising: pump means operable to supply air under pressure, electric powered means for operating the pump means, control means for controlling the electric power to the electric powered means and the flow of air from the pump means, hose means connecting the pump means with the control means and the control means with the air mattress for carrying air from the pump means to air mattress via the control means, said control means having first means operable to selectively allow air flow from the pump means through the control means to the air mattress and block the flow of air from the air mattress, switch means for connecting the electric

powered means to a source of electric power, said switch means being operated by the first means in response to movement of the first means to a position where the first means allows air to flow to the air mattress to connect the electric powered means to a source of electric power thereby operating the pump means, and second means separate from the first means operable to vent air from the air mattress thereby regulating the pressure of the air in the air mattress.

12. An apparatus for supplying fluid under pressure to means for accommodating fluid under pressure comprising: pump means operable to supply fluid under pressure, power means for operating the pump means, control means for controlling the power means and flow of fluid from the pump means to the



means for accommodating fluid under pressure, said control means having first means movable to a first position to allow flow of fluid from the pump means to the control means and then to the means for accommodating fluid under pressure and to a second position to block the flow of fluid from the means for accommodating fluid under pressure, and switch means operated by the first means when the first means is in the first position to connect the power means to a source of power thereby operating the pump means when the first means allows fluid to flow from the pump means to the means for accommodating fluid, and second means separate from the first means operable to allow fluid to flow from the means for accommodating fluid under pressure.

4,897,891

DUST RUFFLES FOR A BED WITH AN IMPROVED FASTENER SYSTEM

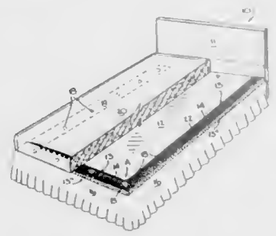
Robert A. Kallman, 14 Passaic Ave., Apt. 3B, Nutley, N.J. 07110, and Mark Henderson, 8 School Ave., Chatham, N.J. 07928

Continuation-in-part of Ser. No. 114,628, Oct. 28, 1987, Pat. No. 4,796,317. This application Oct. 21, 1988, Ser. No. 261,028

The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.

Int. Cl.[4] A47G *9/04*

U.S. Cl. 5—493 **15 Claims**



1. A valance for a bed, comprising:

a ruffled portion; and,

an unruffled portion attached to said ruffled portion, said unruffled portion comprising a flexible mesh material in combination with fastener means adapted to penetrate the apertures of said flexible mesh material to thereby fasten said valance to portions of said bed, said fastener means including:

a top surface layer of a substantially rigid material; and,

a head attached to said top surface layer, said head being capable of penetrating the apertures of said flexible mesh material to fasten said valance to portions of said bed.

4,897,892

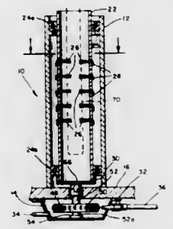
GOLF CLUB GRIP CLEANER

James K. Bublen, 2505 Elizabeth Dr., Helena, Ala. 35080

Filed Jan. 9, 1989, Ser. No. 294,653

Int. Cl.[4] A63B *57/00*; A46B *13/04*

U.S. Cl. 15—21 C **11 Claims**



1. A golf club grip cleaner comprising:

(a) a cleaning housing provided with a rotatably mounted cleaning tubular means sealed at its bottom end, said tubular means provided with a plurality of cleaning brushes mounted on the inside surface thereof;

(b) a power transducer housing provided with a water inlet means and a water outlet means and a waterwheel mounted on a shaft, said waterwheel activated by the flow of water introduced at said water inlet means;

(c) a support means for supporting said cleaning housing above said power transducer housing; and

(d) coupling means for connecting said waterwheel to said cleaning tubular means to rotate said cleaning tubular means.

4,897,893

PAINT ROLLER FRAME INCLUDING SNAP-ON COVER FOR OUTBOARD END CAP

Richard L. Barker, Apple Creek, Ohio, assignor to The Wooster Brush Company, Wooster, Ohio

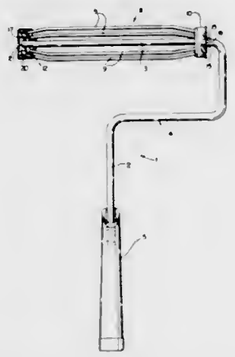
Filed Apr. 19, 1989, Ser. No. 340,432

Int. Cl.[4] B05C *17/02, 1/08*

U.S. Cl. 15—230.11 **23 Claims**

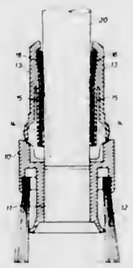
1. A paint roller frame comprising a handle portion, a shaft portion extending generally at a right angle to said handle portion, and a roller cage assembly rotatably mounted on said shaft portion for supporting a roller cover thereon, said roller cage assembly including an outboard end cap having a radial outer wall portion, an axial outer end wall, and an axially outwardly opening cavity, said cavity receiving a free end of said shaft portion, and fastening means in said cavity for preventing removal of said outboard end cap from said shaft portion, and a cover inserted over said outboard end cap, said cover having an end wall extending the full radial extent of said axial outer end wall of said outboard end cap, and an axial

skirt portion extending the full axial extent of said radial outer wall portion, and cooperating surface means on said radial



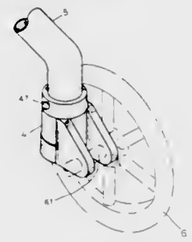
outer wall portion and skirt portion for retaining said cover on said outboard end cap.

4,897,894
VACUUM CLEANER NOZZLE
Stefan M. Fahlén, Bromma, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Sep. 17, 1987, Ser. No. 97,670
Claims priority, application Sweden, Oct. 3, 1986, 8604218
Int. Cl.[4] A47L *9/02*
U.S. Cl. 15—365 **3 Claims**



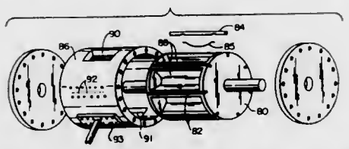
1. A nozzle for a vacuum cleaner being adapted to receive a suction conduit comprising a nozzle body provided with a suction passageway extending therethrough, both ends of said passageway being capable of alternately having attached thereto said suction conduit, a dust brush secured to and surrounding one end of said passageway, a pair of wing members each having outer and inner ends and being pivotally mounted at its inner end on the opposite end of said passageway and rotatable in opposite directions, each of said wing members having a resilient element mounted medially on the respective wing member and extending toward the inner end thereof, said resilient element having secured thereto a plush fiber picking material for cleaning textile materials said resilient element permitting the insertion of the suction conduit in said passageway to prevent damage to the plush picking material.

4,897,895
FRONT CASTER DEVICE FOR INFANT STROLLER
Kai-San Wang, Tainan Hsien, Taiwan, assignor to Sunshon Molding Co., Ltd., Tainan Hsien, Taiwan
Filed May 25, 1989, Ser. No. 356,553
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—20 **1 Claim**



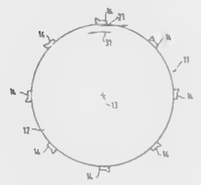
1. A front caster device for an infant stoller comprising:
a bracket for mounting an axle along an axis for rotatably mounting a ground supporting wheel thereto, having a tubular socket having an inner flange formed in an end away from an entrance of the socket on an inner periphery thereof said axle axis being transverse to a longitudinal axis of said tubular socket;
a bushing adapted to be rotatably fitted in said socket through the entrance thereof, having a flange provided with a pair of opposed holes adapted to correspond with a pair of opposed holes in a distal end of a front leg of an infant stroller and at least a flexible detent extending upwardly and outwardly from an outer periphery thereof, axially spaced from the flange and adapted to be engaged with the inner flange of the socket; and
a rivet for attaching the bushing to the distal end of the leg by insertion through said holes.

4,897,896
HARVESTING, SHUCKING AND EVISCERATING CLAMS AT SEA
William E. Gallant, Scarborough, Me., assignor to Borden, Inc., Columbus, Ohio
Division of Ser. No. 267,367, Nov. 4, 1988, which is a division of Ser. No. 122,014, Nov. 17, 1987. This application Jul. 12, 1989, Ser. No. 379,379
Int. Cl.[4] A22C *29/04*
U.S. Cl. 17—74 **4 Claims**



1. A steamer comprising an inlet valve, a cylindrical body configured to receive high pressure steam and an outlet valve,
said inlet valve including a first cylindrical casing, a core coaxially mounted to rotate within said casing, said casing being sealed about said core at each end to prevent fluid leakage,
said casing including inlet and outlet openings, said outlet opening being connected in fluid communication with an inlet aperture into the cylindrical body,
said core including a plurality of radially extending vanes, each vane engaging the interior surface of said cylindrical casing to form a plurality of pockets, said pockets being substantially sealed against any substantial fluid flow from one pocket to the other,
means for cooling the contents of each pocket as said core rotates said each pocket from fluid communication with the outlet opening to fluid communication with said inlet opening,
means for moving materials received through said inlet aperture along said cylindrical body to an outlet aperture,
said outlet aperture being in fluid communication with an inlet opening through a second cylindrical casing which comprises said outlet valve,
a second rotable core with radially extending vanes mounted coaxially with said second cylindrical casing to form pockets in said outlet valve,
means for cooling the contents of said pockets as said pockets rotate from fluid communication with the inlet opening of said outlet valve to an outlet opening through the second cylindrical casing.

4,897,897
CLOTHING FOR A CLEANING OR OPENING ROLLER
Paul Staheli, Wilen B. Wil, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Mar. 20, 1989, Ser. No. 325,655
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811682
Int. Cl.[4] D01G *15/84*
U.S. Cl. 19—114 **20 Claims**



1. A toothed strip for forming a clothing on a roller, said strip including
a plurality of teeth disposed along a front face of the strip in alternating relation with a plurality of troughs, each said tooth having an equilateral triangular shaped front face and an equilateral triangular shaped back, each said back having an apex at said front face of the strip; and
each said trough being inclined upwardly from said front face of the strip towards a rear thereof.

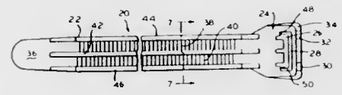
4,897,898
ADJUSTABLE TAPE MEASURE CLIP
David S. Chapin, Raleigh, N.C., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Aug. 24, 1988, Ser. No. 235,665
Int. Cl.[4] A45F *5/02*
U.S. Cl. 24—3 J **6 Claims**

1. A clip for mounting a tool onto the user's apparel, comprising:
a spring of a continuous length of metal including a first length for mounting said spring to the tool, a third length for gripping the user's apparel, and a second length between said first and third lengths for elastically attaching said first length to said third length; connecting said first and third lengths;
said first length being disposed opposite said third length by said second length;
said third length in contact with said first length and pressing upon said first length with a contact pressure; and



said first length further having an excitation means for applying a force to said second length to adjust said contact pressure.

4,897,899
CABLE TIE
William W. Shely, St. Charles, and Peter M. Wells, Elgin, both of Ill., assignors to All States Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 107,295, Oct. 9, 1987, Pat. No. 4,788,751. This application Jul. 26, 1988, Ser. No. 224,584
The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.
Int. Cl.[4] B65D *63/00*
U.S. Cl. 24—16 PB **8 Claims**



1. A cable tie comprising a unitary strap and head, said strap having a spaced parallel pair of racks of teeth extending along the length thereof, each of said teeth having a root and a crest with the crest of one tooth integrally joining the root of the next tooth with no break between them,
said teeth in one of said racks being juxtaposed in an aligned relationship with the teeth in the other of said racks whereby crests of said teeth in each of said racks are in contiguous alignment,
a pair of cantilevered positioned side-by-side with in said head to confront, to pivot, and to prop at a free end against individually associated ones of said racks of teeth,
said racks being separated by a medium strip having a substantially full strap thickness which at least equals the thickness of the strap at the crests of the teeth for adding plastic to said strap in the area where said free end of said cantilevered pawls prop against said teeth in said strap,
said pawls being separated from each other by a distance approximately equal to the width of said median strip so that each pawl is guided and directed by said median strap as it ratchets over its individually associated one of said rack of teeth to come to rest in a propping position against confronting teeth on said strap.

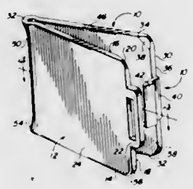
4,897,900
HOLDER FOR POCKET SQUARE
Rex A. Baggett, 3924 E. Yucca St., Phoenix, Ariz. 85028
Filed May 8, 1989, Ser. No. 348,875
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—543 **20 Claims**

1. Pocket square holder apparatus for holding a pocket square, comprising, in combination:
panel means for holding a pocket square, including

first panel means, including a first panel having a first side, a second side, a top edge and a bottom edge, for holding a pocket square,

second panel means, including a second panel having a first side, a second side, a top edge, and a bottom edge, for cooperating with the first panel of the first panel means for holding a pocket square between them,

hinge means for securing the first and second panels together, including a hinge secured to the first sides of the first and second panels,



relieved portions at the junctures of the top edges and the second sides of the first and second panels for spreading the pocket square, and

means for locking the first and second panels together at their second sides;

a stop opening between the top edges of the first and second panels through which a first portion of the pocket square extends; and

a bottom opening between the bottom edges of the first and second panels through which a second portion of the pocket square extends.

4,897,901

MACHINE FOR BRUSHING FABRICS, EQUIPPED WITH COUNTER-PILE WORKERS AND WITH TEAZLES

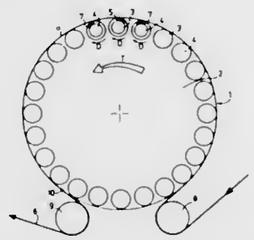
Michel Scholaert, Rue Verte, Allée Marie Antoinette No. 6, 59420 Mouvaux, France

Filed Dec. 12, 1988, Ser. No. 283,183

Claims priority, application France, Dec. 21, 1987, 87 18242; Dec. 21, 1987, 87 18241

Int. Cl.[4] D06C *11/00*

U.S. Cl. 26—33 **17 Claims**



1. A machine for brushing fabrics, of the type comprising in particular brushing rollers of the counter-pile type,

wherein it further comprises rollers of the teazle type, of small dimensions with respect to the width of the fabric, mounted to rotate freely, covered with a card clothing of which the teeth are directed parallel to their axis of rotation.

4,897,902

FABRICS AND TWISTED YARNS FORMED FROM ULTRAHIGH TENACITY AND MODULUS FIBERS, AND METHODS OF HEAT-SETTING

Sheldon Kavesh; Dusan C. Prevorsek, and Gary A. Harpell, all of Morris County, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 527,701, Sep. 1, 1983, Continuation-in-part of Ser. No. 429,942, Sep. 30, 1982, Pat. No. 4,819,458. This application Nov. 4, 1988, Ser. No. 267,423

Int. Cl.[4] D06C *7/00;* **D03D** *15/00*

U.S. Cl. 28—166 **11 Claims**

1. A method for preparing fabrics which comprises the steps:

(a) forming a fabric from stretched fibers of tenacity at least about 20 g/denier and tensile modulus at least about 600 g/denier containing polyethylene of weight average molecular weight at least about 500,000, and

(b) heating the fabric at a temperature between about 120° C. and about 155° C. sufficient and for a time sufficient for the fibers to shrink between about 1% and about 10% of their length in the fabric formed in step a.

4,897,903

METHOD OF PROVIDING AN INK JET PRINTING HEAD WITH PIEZO-CRYSTALS

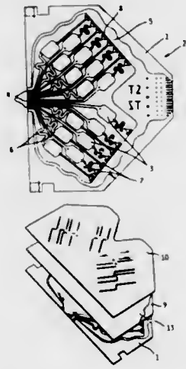
Fred Johannsen, Varel, Fed. Rep. of Germany, assignor to Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 309,082

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1988, 3804165

Int. Cl.[4] B41J *3/04;* **G01D** *15/18*

U.S. Cl. 29—25.35 **7 Claims**



1. A method of providing an ink jet printing head with piezo-crystals comprising the steps of:

(a) providing a plate-shaped basic printing head body including an ink supply reservoir, ink pressure chambers, ink exit openings, ink outlet channels which connect said pressure chambers with said ink exit openings, and ink inlet channels for connecting said pressure chambers with said ink supply chamber,

(b) providing a membrane plate,

(c) providing a piezo-ceramic plate,

(d) attaching said piezo-ceramic plate face-to face to said membrane place,

(e) attaching said membrane plate face-to-face to said basic body, and

(f) subsequent to step (d), entirely separating piezo-crystals from said piezo-ceramic plate by providing closed-course cuts through said piezo-ceramic plate such that a separate piezo-crystal is obtained in alignment with each said pressure chamber.

4,897,904

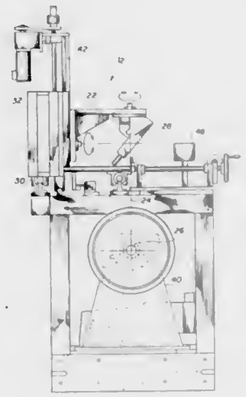
APPARATUS WHICH PROVIDES FOR THE PLACEMENT OF A BIT POINT OF A BIT AT A PREDETERMINED POSITION

Dennis Cowles, Broadview Heights, Ohio, assignor to Joy Technologies, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1988, Ser. No. 174,599

Int. Cl.[4] B21D *39/03*

U.S. Cl. 29—33 K **31 Claims**



1. An apparatus which provides for the placement of a bit point of a bit at a predetermined position with respect to a rotatable member comprising:

a holder for holding a bit;

means for burning into the holder a surface which corresponds to a portion of the surface of the member; and

means for aligning the holder on the member such that the surface burned into the holder is adjacent the portion of the surface of the member, and the bit point of the bit is capable of being held by the holder at the predetermined position.

4,897,905

CONTROLLED DEFLECTION ROLL USING INERT GASSES AND INDEPENDENT LUBRICATION SYSTEM

Charles C. Moschel, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Feb. 13, 1989, Ser. No. 308,921

Int. Cl.[4] B21B *27/06*

U.S. Cl. 29—116.2 **2 Claims**

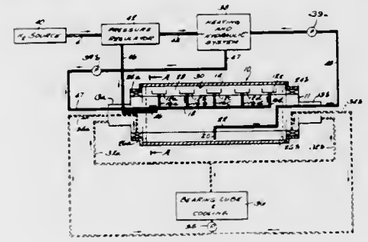
1. In a controlled deflection roll having a support shaft, a roll shell, bearings disposed about each end of the support shaft about which the roll shell is rotatably mounted, support element means mounted on the support shaft in a space between the support shaft and the inner surface of the roll shell in controlled supporting engagement therewith, the combination comprising:

seal means interposed between the bearings and the roll shell at each end of the support shaft to establish a fluid impermeable barrier between the interior space of the roll and the bearings;

bearing lubrication means in fluid communication with the bearings, said bearing lubrication means including a closed fluid loop and bearing pump means for conducting lubricant into and out of the bearings;

support element hydraulic means in fluid communication with the support element means, said support element hydraulic means including hydraulic pump means and a closed fluid loop for conducting hydraulic oil from outside the roll to the support element means and for conveying the hydraulic oil out of the interior of the roll;

heating means for heating the hydraulic oil in the closed fluid loop;



inert gas support means in fluid communication with (1) the interior space of the roll for supplying an inert gas to the interior of the roll between the seal means to establish and maintain an inert atmosphere within the roll, and (2) the means for heating the hydraulic oil;

the closed fluid loop of the bearing lubrication means and closed fluid loop of the support element hydraulic means are independent and separate from each other.

4,897,906

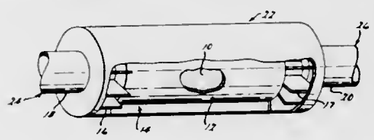
METHOD OF MAKING A FLUID PRESSURE SURGE DAMPER FOR A FLUID SYSTEM

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Mt. Clemens, Mich.

Division of Ser. No. 115,338, Nov. 2, 1987, Pat. No. 4,823,844. This application Apr. 24, 1989, Ser. No. 341,908

Int. Cl.[4] B21K *21/00;* **B21D** *53/00*

U.S. Cl. 29—890.9 **3 Claims**



1. A method for forming a dampener comprising the steps of;

(1) inserting an elastomeric element within an unsealed flexible membrane means,

(2) compressing said elastomeric element and said unsealed flexible membrane,

(3) sealing said unsealed flexible membrane means, and

(4) releasing said compressed elastomeric element thereby producing a subatmospheric condition within said flexible membrane means.

4,897,907

PROCESS FOR MANUFACTURING NOZZLE TIP

Lawrence J. Koplec, Unionville, and Franklin S. Smith, Newington, both of Conn., assignors to Stanadyne Automotive Corp., Windsor, Conn.

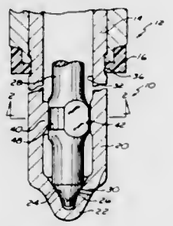
Filed Mar. 31, 1989, Ser. No. 331,437

Int. Cl.[4] B21D *53/06*

U.S. Cl. 29—888.4 **10 Claims**

1. A process for manufacturing a nozzle tip from a tubular workpiece defining an axial bore and having a distal end and an open proximal end and an exterior surface comprising:

(a) exteriorly forming a circumferentially extending indentation in said workpiece between said distal end and said proximal end to form a corresponding indented wall of substantially uniform thickness defining an interior surface having a reduced inside diameter; and



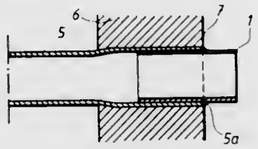
(b) removing material from said indented wall to form an integral collar defining a generally cylindrical guide surface having a substantially uniform diameter which is less than the diameter of non-indented portions of the axial bore.

4,897,908

METHOD OF ATTACHING TUBES IN A TUBE PLATE IN A HEAT EXCHANGER

Ragnar Hearikason, Linköping, Sweden, assignor to Asea Stal AB, Sweden

Filed Mar. 19, 1985, Ser. No. 713,704
Claims priority, application Sweden, Mar. 20, 1984, 8401533
Int. Cl.⁴ B23P *15/26*
U.S. Cl. 29—890.44 **11 Claims**



1. A method of attaching an end of a tube of a first material of high chemical corrosion resistance to a tube plate of a second material of lower chemical corrosion resistance, said second material being at best substantially not weldable to said first material, the tube plate having an inner surface, an outer surface and a hole therethrough and the end of said tube extending through the hole in said tube plate so as to extend from the inner surface thereof to the outer surface thereof, said method including the steps of

attaching a sleeve of at least substantially the same material as said first material to said end of the tube so that said sleeve extends away from the outer surface of said tube plate, said sleeve having a bore therethrough in fluid communication with the interior of said tube,

placing a cover plate of at least substantially the same material as said first material a distance away from the outer surface of said tube plate so as to leave a space between said cover plate and said tube plate, said cover plate having a hole therein which is aligned with the bore in said sleeve, and

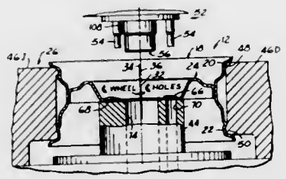
welding said sleeve to the cover plate to provide a fluid-tight joint therebetween.

4,897,909

METHOD FOR WHEEL MANUFACTURE BY PUNCH FORMING

Warren J. LaVoy, Morepeth, Canada, assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Dec. 29, 1988, Ser. No. 291,551
Int. Cl.⁴ B21H *1/02*
U.S. Cl. 29—894.325 **15 Claims**



1. A method of punch forming a through-opening in a pierceable metal blank having a stock thickness MT measured axially of said opening in a margin material which surrounds said opening after the same has been formed, said blank having first and second opposite faces and said opening extending therebetween, said opening having a predetermined finished inner peripheral dimension DS defined by inner peripheral wall surface means in said margin material extending circumferentially of said opening between said first and second blank faces, said method comprising the steps of:

(1) providing pierce punch means having a working end face transverse to the axis of said pierce punch means and shank surface means intersecting said pierce end face having an outer peripheral dimension DP smaller by a predetermined amount than DS,

(2) providing shave punch means having a working end face transverse to the axis of said shave punch means and shank surface means intersecting said shave end face and having an outer peripheral dimension DS and an inner peripheral dimension DP,

(3) operating said pierce punch means in a working stroke with its axis aligned coaxially with said opening axis to cause said pierce working end face to strike said first blank face and then move through said blank material past said second blank face,

(4) operating said shave punch means in a working stroke with its axis aligned coaxially with said opening axis to cause said shave working end face to strike said first blank face after said pierce end face has has traveled a predetermined distance SB from said first face toward said second face and to then move through said blank material past said second blank face in trailing relation to said pierce end face, and

(5) correlating the dimension DS, DP and SB with one another relative to dimension MT to cause said pierce and shave punch means to cojointly punch out a one-piece scrap slug to thereby form said opening with an inner peripheral wall surface having a generally smooth and generally cylindrical contour at said DS dimension.

4,897,910

METHOD FOR REMOVING SPRINKLER PIPE FROM A FIELD

William D. Miller; Omar L. Stiff, both of Brawley, and Benardo Mercurio, El Centro, all of Calif., assignors to William D. Miller, Inc., Brawley, Calif.

Continuation of Ser. No. 761,958, Sep. 6, 1985, abandoned, which is a division of Ser. No. 484,845, Apr. 14, 1983, Pat. No. 4,553,900. This application Apr. 27, 1987, Ser. No. 48,464
The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.
Int. Cl.⁴ B23P *19/00*
U.S. Cl. 29—426.3 **2 Claims**



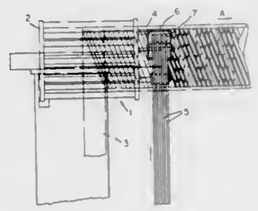
1. A method for removing sprinkler pipe from a field in which the sprinkler pipe is disposed in rows in the field with the sprinkle pipe in each row being formed of serially connected lengths of sprinkler pipe, comprising: engaging an attachment carried by a pulling means to a leading end of the sprinkler pipe, the attachment adapted to engage said leading end, and said pulling means with the attachment located on an elongate framework having ground engaging means; advancing the pulling means by use of a motive means that may be connected to and disconnected from the pulling means to withdraw at least one length of the serially connected lengths of pipe from the field without the elongate framework entering therein; carrying along the advancing pipe longitudinally of and onto the elongate framework, and centering the pipe on the framework; disconnecting a length of sprinkler pipe from the serially connected lengths of pipe; engaging said attachment to the leading end of the remaining serially connected lengths of pipe; and again advancing the pulling means to withdraw at least one additional length of the serially connected lengths of pipe from the field longitudinally of and onto the elongate framework without the elongate framework entering therein.

4,897,911

METHOD OF PLACING PLASTIC TUBES INTO EXISTING OPENINGS

Rachid Keldany, IM Aeglisten 3, CH-8124 Maur, and Keith J. Shaw, Rainstrasse 50, CH-8804 Pfäffikon, both of Switzerland

Filed Apr. 28, 1988, Ser. No. 187,266
Claims priority, application Switzerland, Apr. 28, 1987, 1605/87
Int. Cl.⁴ B21D *39/03;* **B23P** *11/00*
U.S. Cl. 29—429 **10 Claims**



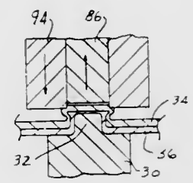
1. A method for increasing the stiffness of flexible plastic tubes after they are inserted into existing through-passages or into existing pipe lines, comprising the following steps: at an entrance to a through-passage, continuously forming a spirally wound tube from a band of plastic material with side edges of the band in abutting relationship, the wound tube being flexible and having an initial stiffness; simultaneously pushing the wound tube into the through-passage as it is being formed; applying a hardenable stiffening material onto the outer wall surface of the wound tube as it is being formed and thereafter, but before the setting of the stiffening material, positioning the wound tube with applied stiffening material at a desired position within said through-passage; and permitting the stiffening material to set to thereby impart to said wound tube after it is in its desired position in the through-passage a stiffness increase by the setting of the stiffening material when compared with its initial stiffness.

4,897,912

METHOD AND APPARATUS FOR FORMING JOINTS

Arthur L. Slasinski, Harper Woods, Mich., assignor to Weldex, Inc., Warren, Mich.

Division of Ser. No. 71,451, Jul. 8, 1987, Pat. No. 4,856,316.
This application Mar. 20, 1989, Ser. No. 326,160
Int. Cl.⁴ B23P *11/00*
U.S. Cl. 29—432.2 **4 Claims**



1. A method of forming a clinch joint between two sheets of material, comprising the steps of:

(A) relatively displacing a die and a punch during a first portion of a workstroke to form a cup in a section of said sheets;

(B) relatively displacing the die and an anvil during a second portion of a workstroke to laterally deform peripheral portions of the sheet section defining said cup, the relative displacement of the die and anvil being sufficient to allow said peripheral portions to be displaced laterally beyond said anvil so that part of said laterally deformed portions overlap said die; and

(C) relatively displacing the die and the anvil during a third portion of a workstroke to further deform said peripheral portions in the direction of displacement of said die.

4,897,913

METHOD OF USING A ROBOT FOR INSTALLING WEATHER STRIPPING IN A DOOR OR LIKE OPENING

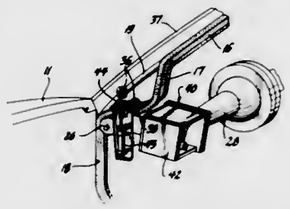
Stephen St. Angelo, Jr., Rochester Hills, Mich.; George C. Carver, Albany; David W. Patterson, Duluth, both of Ga., and Owen K. Fremont, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 161,500, Feb. 29, 1988, Pat. No. 4,839,958, which is a continuation-in-part of Ser. No. 888,238, Jul. 18, 1986. This application Apr. 17, 1989, Ser. No. 339,269
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.⁴ B23P *11/C2*
U.S. Cl. 29—450 **1 Claim**

1. A method of utilizing a robot having an arm and a pressure roller having a variable rotational velocity to install fixed lengths of weather stripping into a body opening including generally straight sections and corner sections, said method in combination comprising:

interacting and tracing said pressure roller along a straight

section of the opening at a first linear speed and at a first rotational speed and interacting and tracing said pressure roller along a corner section at a second linear speed differing from said first linear speed and at a second rotational speed differing from said first rotational speed, whereby said fixed length is guided and affixed with the



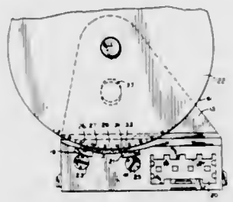
said sections as said fixed length is installed into said body opening and the relative velocity of a point on the periphery of said pressure roller relative to a point in said door opening in said corner section is such that said weather stripping is longitudinally compressed in said corner section.

4,897,914

METHOD OF MAKING A MAGNETIC-ENCODING DEVICE HAVING HALL EFFECT DEVICES

Robert J. Loubier, 5122 Chippewa Ct., Fort Wayne, Ind. 46804

Division of Ser. No. 652,867, Sep. 20, 1984, Pat. No. 4,829,248.
This application Dec. 16, 1988, Ser. No. 285,499
Int. Cl.[4] H01F *7/06*
U.S. Cl. 29—602.1 **3 Claims**



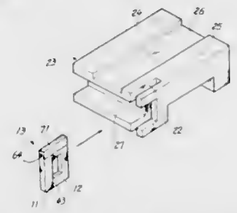
1. The method of fabricating a magnetic-encoding device having a Hall effect switch and a rotatable disc-shaped actuating magnet comprising the steps of forming an integral frame with at least two component-locating positions, one of said component-locating positions being sized to receive snugly a Hall effect switch, fitting such a switch onto said one position thereby locating said switch-relative to the second of said two positions, forming a disc-shaped permanent magnet with circumferentially alternating poles on its periphery and a predetermined outer diameter, mounting said magnet for rotation about its axis to said second position with its periphery adjacent to said Hall effect switch, said second portion serving to locate said magnet relative to said switch whereby said frame and said two component-locating positions serve to locate and position said switch and magnet relative to each other with a minimum of dimensional tolerance therebetween.

4,897,915

PROCESS FOR PRODUCING MAGNETIC HEAD OF FLOATING TYPE

Kiyotaka Ito, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jan. 6, 1989, Ser. No. 294,012
Claims priority, application Japan, Jan. 7, 1988, 63-1765; Oct. 6, 1988, 63-252385
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 **4 Claims**



1. A process for producing a magnetic core of the floating type by fitting a head core with a magnetic gap portion into a core accommodating groove in a slider having a face to be opposed to a magnetic recording medium, and securing the head core to the slider by a glass filled portion formed in a clearance within the groove around the head core, the process comprising the steps of:

(a) preparing a core chip comprising a pair of core segments butting on each other with a gap spacer formed therebetween to provide a magnetic gap portion, the core chip having a medium opposed portion of a small width extending over the pair of core segments, this step including forming a glass layer on the core chip covering the medium opposed portion,

(b) fitting the core chip prepared by the first step into a core accommodating groove formed in a slider chip,

(c) bonding the core chip to the slider chip by melting the glass layer formed on the core chip to fill the molten glass into a clearance within the core accommodating groove around the core chip, and

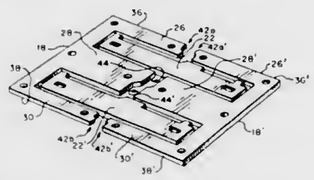
(d) machining the resulting assembly of slider chip and core chip to form the face to be opposed to the magnetic recording medium.

4,897,916

METHOD FOR MAKING A TRANFORMER CORE ASSEMBLY

Raymond L. Blackburn, Crystal Lake, Ill., assignor to Coils, Inc., Huntley, Ill.

Division of Ser. No. 237,056, Aug. 29, 1988, Pat. No. 4,827,237.
This application Jan. 17, 1989, Ser. No. 300,410
Int. Cl.[4] H01F *41/02*
U.S. Cl. 29—609 **7 Claims**



1. A method for forming a transformer core assembly with a mechanical interference fit between first and second lamination stacks forming the transformer core assembly, said method comprising the steps of:

providing two stacks of laminations;

providing identical coupling formations at two spaced apart locations on one side of one stack of laminations;

providing offset side surfaces connected by an inclined surface intermediate the two coupling formations;

providing one side of the other stack of laminations with a mating configuration;

providing a dimension, D, for each stack between a side edge of the stack and the inclined surface with the dimension D_2 of the second stack being greater than the dimension D_1 of the first stack; and

positioning the inclined surface on the mating configuration on the other stack at a location transversely offset from the location of the inclined surface on one side of the first stack so that when the two stacks are forced together an interference fit between the inclined surfaces will force the mating coupling formations to tightly engage each other and so forcing the mating coupling formations of the stacks together.

4,897,917

METHOD OF ASSEMBLING COMPONENTS OF AN ELECTROCHEMICAL GENERATOR USING THIN FILMS OF LITHIUM

Michel Gauthier, La Prairie-Quebec, and Andre Belanger, Sainte Julie, both of Canada, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France and Hydro-Quebec, Quebec, Canada

Filed Jul. 13, 1988, Ser. No. 218,243
Int. Cl.[4] H01M *6/18*
U.S. Cl. 29—623.3 **11 Claims**

1. A method for assembling the components of an electrochemical generator, wherein said components are in the form of thin films and comprise, as a first component, a lithium- or lithium alloy-based negative electrode and, as a second component, at least one thin film of a solid polymer electrolyte capable of conducting lithium ions, said method comprising:

(i) using a negative electrode precursor which consists of an intermediate assembly formed from a thin film of lithium or lithium alloy supported by an inert plastic film having controlled adhesion to the lithium such that the bond of the lithium-based film to said inert plastic film is sufficient to permit the handling of said intermediate assembly but is less than the bond of the lithium film to the solid polymer electrolyte of the component containing said electrolyte; and

(ii) applying the free metal surface of said intermediate assembly against said solid polymer electrolyte of the component containing said electrolyte by working these at a temperature and under a pressure sufficient to cause the lithium of said intermediate assembly to adhere to said solid polymer electrolyte.

4,897,918

METHOD OF MANUFACTURING AN INTERBOARD CONNECTION TERMINAL

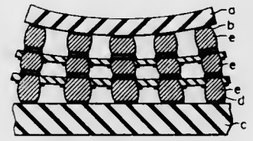
Takaaki Ooska; Norio Matsui, both of Tokyo; Shinichi Susaki, Iruma, and Yutaka Egawa, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone, Tokyo, Japan

Division of Ser. No. 23,552, Feb. 19, 1987, Pat. No. 4,783,722.
This application Mar. 25, 1988, Ser. No. 173,745
Claims priority, application Japan, Jul. 16, 1985, 60-156621; Jun. 13, 1986, 61-137961
Int. Cl.[4] H05K *1/11*
U.S. Cl. 29—830 **7 Claims**

1. A method of manufacturing an interboard connection terminal, comprising the steps of:

forming a metal interlayer of a three-layer structure by forming a through-hole in an unsolderable and insulating support board, forming a first metal layer by charging a solderable metal located into part of the through-hole, forming a second metal layer, stacked on the first metal layer, the second metal layer being a layer of unsolderable metal and serving to prevent diffusion of solder therethrough, and forming a third metal layer, stacked on the second metal layer, by charging a solderable metal into part of the through-hole, the third metal layer together with the first and second metal layers forming said three-layer structure; and

arranging on the support board a mask having a through-hole corresponding to and immediately above the through-hole of the support board, placing a first solder ball in the through-hole of the mask, and thermally fusing and thereafter cooling the first solder ball, thereby fixing



the first solder ball on the third metal layer, and arranging under the support board a mask having a through-hole corresponding to and immediately under the through-hole of the support board, placing a second solder ball in the through-hole of the mask, and thermally fusing and thereafter cooling the second solder ball, thereby fixing the second solder ball on the first metal layer, the step of forming a metal interlayer of the three-layer structure being also performed with the step of forming a unit basic structure.

4,897,919

METHOD FOR PRODUCING A STAMPED SUBSTRATE

Dale K. Wheeler, Fallston, Md., assignor to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 923,807, Oct. 27, 1986, abandoned.
This application Nov. 23, 1988, Ser. No. 277,471
Int. Cl.[4] H01R *9/14*
U.S. Cl. 89—845 **21 Claims**



1. A method for attaching a select portion of a planar member to a substrate, said planar member having first and second surfaces, said first surface comprising a plurality of lances projecting below said planar member substantially normal thereto, said selected portion having a first interengaging member comprising at least one of said lances, said substrate having a second interengaging member comprising an aperture, said method comprising the steps of:

locating said planar member proximate to said substrate such that said one lance is substantially perpendicular to said substrate and at a position above said aperture;

disposing a die between said first surface of said planar member and said substrate;

disposing a punch proximate to said second surface of said planar member; and

displacing said punch in a downward direction to separate said selected portion from said planar member, said step of displacing said punch in a downward direction operable to secure said selected portion to said substrate by inserting said lance into said aperture thereby causing mechani-

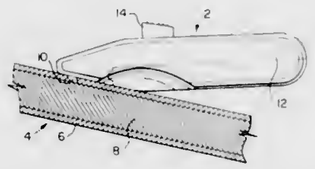
cal interference between said lance and said aperture, said step of displacing said punch in a downward direction operable to form said selected portion and secure said selected portion to said substrate in a single downward stroke of said punch.

4,897,920

SHEATH CUTTING TOOL

Donald W. Dunbar, 2945 Thomas St., Nanaimo, B.C., Canada V9T 2Y5

Filed Jun. 7, 1988, Ser. No. 204,159
Claims priority, application Canada, Jun. 19, 1987, 540152
Int. Cl.[4] B26B *27/00*
U.S. Cl. 30—90.4 **12 Claims**



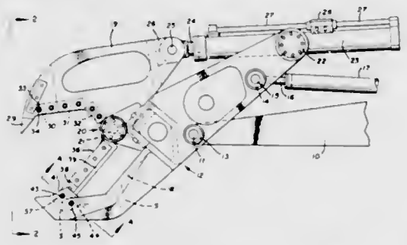
1. A cutting tool useful for cutting sheathing on a cable comprising:
(a) hand-grip holder having a general tapered shape for holding therein a cutting blade in a position retracted in the holder or in a position extending from the holder;
(b) a cutting blade having on one side an effective cutting surface along its exposed length when the cutting blade is in an extended position, the cutting surface of the cutting blade being angled in the direction of cut when in an extended position;
(c) blade moving means located on the exterior or the holder for enabling the cutting blade to be moved from a retracted position to an extended position from the narrow end of the holder and alternatively from an extended position to a retracted position;
(d) compression spring means located within the holder for urging the cutting blade into a retracted position when the cutting blade is in an extended position; and
(e) stop means located in the end of the holder for controlling the distance that the cutting blade extends from the holder when in an extended position.

4,897,921

METAL CUTTING SHEAR WITH CHANGEABLE MULTIPLE CUTTING EDGE PORTIONS

John R. Ramun, Youngstown, Ohio, assignor to Allied Gator Inc., Youngstown, Ohio

Filed Aug. 4, 1988, Ser. No. 228,104
Int. Cl.[4] B23P *19/00*
U.S. Cl. 30—134 **10 Claims**



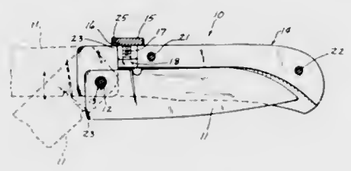
1. An improvement in a shear for a backhoe having a boom with a controlled piston and cylinder assembly connected thereto, said shear having an elongated fixed cutting blade having a raised cutting edge portions and means for attaching said fixed cutting blade to said boom, said fixed cutting blade having horizontally spaced vertically positioned parallel beam portions and horizontal sections therebetween, a movable cutting blade having a plurality of cutting edge portions, means inwardly of a first end of said fixed cutting blade pivotally mounting said movable cutting blade therebetween in pivotal relation to said fixed cutting blade from an open position to a closed work piece shearing position and means for keeping the plurality of cutting edge portions of said movable cutting blade in shearing relation to said raised cutting edge portion of said fixed cutting blade through the entire extent of the shearing movement of the blades with respect to each other, said means for keeping the cutting edge portions of said movable cutting blade in shearing relation to said raised cutting edge portion of said fixed cutting blade comprising a slot in one of said horizontal sections of said fixed cutting blade and inwardly of said first end thereof and defining an elongated guide path, said slot being positioned and sized to receive and maintain said movable cutting blade and said plurality of cutting edge portions thereon in shearing relation to a work piece disposed between said blades; the improvement comprising said plurality of cutting edge portions of said movable cutting blade being positioned to form a continuous cutting edge and being removably affixed to said movable cutting blade, at least one of said plurality of cutting edge portions including a plurality of sides and at least two sharp cutting edges on at least two of its sides and being mounted on said movable cutting blade to be changeably positioned on said movable cutting blade to be moved from a position having a sharp cutting edge of one side aligned with the sharp cutting edges of the remainder of the cutting edge portions to another position having a sharp cutting edge of another side in alignment with those cutting edges of the remainder of said plurality of cutting edge portions and wherein one of said cutting edge portions is directly adjacent said means pivotally mounting said movable blade.

4,897,922

FOLDING KNIFE

Dennis B. Brooker, Derby, Iowa, assignor to Ventura Forge, Inc., Ventura, Calif.

Filed Jul. 17, 1989, Ser. No. 381,751
Int. Cl.[4] B26B *3/06*
U.S. Cl. 30—166 **9 Claims**



1. A folding knife apparatus comprising:
an elongated handle having a slot formed therein; opposite to said working edge, said opposite edge having an abutment portion on one end thereof, said blade having a storage position wherein said working edge is disposed in said slot and a working position thereof approximately 180 degrees from said storage position thereof wherein said working edge extends out of said slot;
means for pivotally attaching one end of said knife blade to said handle along a first axis for permitting movement of said blade between the storage and working positions thereof;

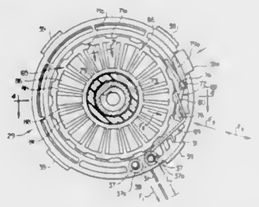
a lock member, said lock member having a locked position and a unlocked position;
means for rotatably attaching said lock member to said handle along a second axis between said locked and unlocked positions thereof;
said lock member being in engagement with said abutment portion of said opposite edge of the blade when said blade is in said working position and said lock member is in the locked position thereof; and said lock member being spaced from said blade abutment portion when the lock member is in the unlocked position thereof.

4,897,923

AUTOMATIC LINE FEED HEAD APPARATUS FOR A FLEXIBLE LINE TRIMMER OR THE LIKE

Imack L. Collins, Shreveport, La., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 908,214, Sep. 17, 1986, Pat. No. 4,835,867, which is a continuation-in-part of Ser. No. 631,000, Jul. 16, 1984, which is a continuation of Ser. No. 245,459, Mar. 19, 1981, abandoned, which is a continuation of Ser. No. 891,666, Mar. 30, 1978, abandoned. This application Dec. 20, 1988, Ser. No. 287,388
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30--276 **19 Claims**



11. A method of rotationally supporting in a bearing pocket structure an essentially straight central portion of a member having outwardly bent first and second opposite end portions, said method comprising the steps of:
providing a tubular coil spring member;
installing said coil spring member on said central portion by sequentially sliding said spring member onto said first end portion, bending said spring member around the juncture between said first end portion and said central portion, and pushing said spring member onto said central portion to position the opposite ends of said spring member between said outwardly bent first and second end portions; and
press-fitting the installed spring member into said bearing pocket structure.

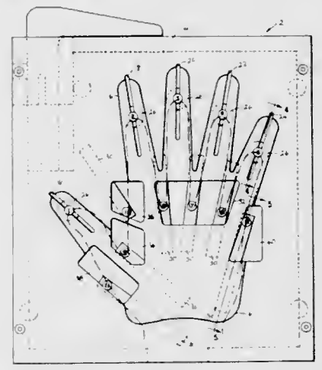
4,897,924

HAND MEASUREMENT APPARATUS

George T. Tepley, Chattanooga, Tenn., assignor to TGC Corporation, Chattanooga, Tenn.

Filed Aug. 19, 1988, Ser. No. 233,951
Int. Cl.[4] A41H *1/02*
U.S. Cl. 33—2 R **19 Claims**

1. Apparatus for measuring dimensions of a human hand having a back portion, a palm portion, fingers and a thumb, said apparatus comprising:
plate means for supporting an outstretched hand,
a plurality of movable locator means for measuring finger length, extending through the plate means,
a plurality of movable locator means for measuring the width of the base of at least one finger, extending through the plate means, and



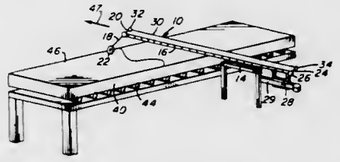
means on the locator means for recording the positions of said locator means on the surface of a sheet.

4,897,925

APPARATUS FOR DETERMINING SURFACE PROFILES OF METALLIC WORKPIECES

Robert H. Johns, Natrona Heights, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1987, Ser. No. 132,294
Int. Cl.[4] G01B *5/28*
U.S. Cl. 33—22 **10 Claims**



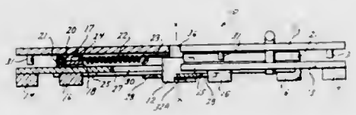
1. Apparatus for determining a surface profile of a metallic workpiece, said apparatus including:
a measuring arm means for engaging with a surface of the workpiece during translation across the width of the workpiece;
translating means including a support frame and a rail beam slidably positioned on the support frame, said rail beam having a pivotal connection at a first end portion thereof for pivotally connecting said measuring arm means to the rail beam, said translating means serving to translate the measuring arm means in a widthwise direction across the workpiece; and
recording means interconnected with the measuring arm means such that pivotal movement of the measuring arm means during translation across the width of the workpiece causes corresponding movement of the recording means to thereby record the surface profile of the metallic workpiece, said recording means including a recording arm pivotally connected to a second end portion of the rail beam, a tie rod for interconnecting the measuring arm and the recording arm such that deflection of the measuring arm during translation across the width of the workpiece causes deflection of the recording arm, an ink dispenser positioned at one end of the recording arm, and a paper tape positioned proximate to the ink dispenser for recording the deflection of the recording arm.

4,897,926

VEHICLE WHEEL TURNING ANGLE GAUGE

Paul J. Altaether, and Timothy A. Strege, both of St. Louis County, Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.

Filed Sep. 14, 1988, Ser. No. 244,040
Int. Cl.[4] G01B 11/275
U.S. Cl. 33—203.14 2 Claims



1. In a vehicle wheel turning angle gauge, the combination comprising:

(a) a stationary base plate and a superimposed vehicle wheel contact plate maintained in spaced relation by a bearing assembly permitting the contact plate to move in linear and angular directions relative to said stationary base plate;

(b) a tracking assembly movably positioned on said base plate, said base plate having a window opening to permit a view of the underside of said contact plate;

(c) an optical shaft encoder device operably movable with said wheel contact plate within said base plate window, a rotational responsive connection with said contact plate to follow the angular turning response imparted to said contact plate by a vehicle wheel in contact with said contact plate, said encoding device developing a signal output for determining the magnitude and the direction of rotation of said contact plate relative to said base plate;

(d) protective enclosure is mounted at the underside of said contact plate and is formed with an open bottom to receive said optical shaft encoder device; and a body of pliable material is applied to said protective enclosure for encapsulating and retaining said encoder device against rotation relative to said protective enclosure; and

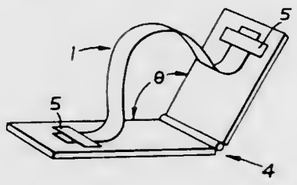
(e) signal processing means connected to said encoder device for displaying said magnitude and direction of rotation of said wheel contact plate.

4,897,927

ELECTRICAL ANGULAR DISPLACEMENT SENSOR

Alexander C. Nicol, Glasgow, Scotland, assignor to University of Strathclyde, Glasgow, Scotland

PCT No. PCT/GB85/00387, § 371 Date Dec. 1, 1986, § 102(e) Date Dec. 1, 1986, PCT Pub. No. WO86/01588, PCT Pub. Date Mar. 13, 1986
PCT Filed Aug. 30, 1985, Ser. No. 948,347
Claims priority, application United Kingdom, Sep. 1, 1984, 8422136
Int. Cl.[4] A61B 5/10
U.S. Cl. 33—534 9 Claims



1. An electrical sensor for use in providing a signal indicative of angular displacement between two spaced locations, comprising a generally planar flexible carrier of material capable of flexing when its ends are fixed to said locations and said locations undergo relative rotary movement within a predetermined angular range; and at least one electrically conductive element having a resistance which is a function of strain affixed to the carrier and extending therealong substantially the whole distance between said locations; wherein said electrically conductive element comprises a wire resistance strain gauge and the thickness of said carrier is selected such that the strain at the surface thereof does not exceed a predetermined limit when the carrier is flexed by relative rotary movement of said locations within said predetermined angular range, said limit being selected such that there is no permanent plastic deformation of the carrier or the strain gauge when the relative movement of said locations within said predetermined angular range causes maximum flexure of the carrier; and wherein the thickness of the carrier is determined according to the equation:

$$Y = \epsilon R;$$

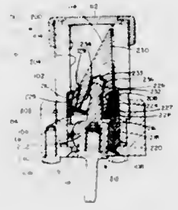
where Y is half the thickness of the carrier, ϵ is the maximum permissible strain at the surface thereof, and R is the minimum required radius of curvature of the carrier.

4,897,928

HOLE ANGULARITY GAUGE

David C. Maxville, Seattle; Kenneth R. Meade, Sr., Bothell, and David G. Beal, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 29, 1988, Ser. No. 212,914
Int. Cl.[4] G01B 5/24
U.S. Cl. 33—534 15 Claims



1. Apparatus for measuring the perpendicularity of a bore, comprising:

a hollow body having an inside wall, said body including a base receiving portion and an upper portion opposite said base receiving portion;

a base mountable to said base receiving portion of said body;

a clear scale window having a plurality of concentric circles printed thereon, each circle for indicating the angular offset of the bore centerline from an ideal centerline which is perpendicular to the plane of the surface of the bore;

a scale retaining cap mountable to said upper portion of said body to mount said scale window to said body;

first and second radial bearing assemblies each including a hollow bearing press fit into a bearing guide, said first radial bearing assembly being fixedly mounted within said body and said second radial bearing assembly being slidably mountable within said body and secured within said body by said base;

a cone-shaped pointer having a conical portion, a bearing engaging portion, an abutting edge intermediate said bearing engaging portion and said conical portion and an interior channel extending inward from said bearing engaging portion, said bearing engaging portion being fixed to said first radial bearing assembly such that said abutting edge engages said hollow bearing of said first radial bearing assembly to position said pointer therein whereby said pointer may undergo unrestricted radial movement within a predetermined range; and

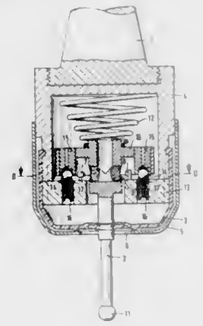
a lever having a bearing engaging base portion slidably mountable to said second radial bearing assembly, a retaining lip fixed to said bearing engaging base portion and engagable intermediate said base and said hollow bearing of said second radial bearing assembly to position said lever within said second radial bearing assembly, a shaft extending outward from said bearing engaging base portion and a tooling ball attached to said shaft, said second radial bearing assembly being slidable within said body such that said tooling ball extends inward of said interior channel of said pointer whereby said tooling ball contacts the walls of said interior channel, said lever also including a probe portion extending outward from said base portion in a direction opposite that of said shaft to engage the bore being measured.

4,897,929

MULTI-COORDINATE PROBE

Alfons Ernst, and Dieter Spark, both of Traunreut, Fed. Rep. of Germany, assignors to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Dec. 9, 1986, Ser. No. 939,899
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640160
Int. Cl.[4] G01B 7/28, 11/24
U.S. Cl. 33—559 5 Claims



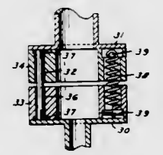
1. Multi-coordinate probe with at least one stylus having a longitudinal axis and being deflectable into several coordinate directions which is biased by a restoring force into a bearing arrangement determining its zero position, which bearing arrangement is constituted by the cooperation of surface regions of several bearing members with surface regions of a corresponding quantity of counterbearing support members, wherein the bearing members and the counterbearing support members assigned to them are arranged concentrically around the stylus axis, characterized in that the surface regions of the bearing members and of the counterbearing support members are circular, the probe includes mounting means for adjustably carrying the bearing members and the counterbearing support members so that the bearing members and the counterbearing support members are adjustable radially and axially with respect to each other in such a way that in the zero position of the stylus the contact regions of the respective surface regions of the bearing members and the surface regions of the associated counterbearing support members form respectively a circuit line, and that the entirety of the circular line thus generated lies in a plane perpendicular to the stylus axis, the counterbearing support members respectively having one conical bore at their front faces facing the bearing members, whose axis extends respectively parallel to the longitudinal axes of the counterbearing support members, and the counterbearing support members being seated eccentrically in rotatable receiving cylinders.

4,897,930

PRECISION PARALLEL MECHANICAL FLOAT

Robert F. Cusack, Grosse Pointe Park, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Continuation of Ser. No. 941,679, Dec. 15, 1986, Pat. No.
Int. Cl.[4] G01B 5/25
U.S. Cl. 33—644 1 Claim



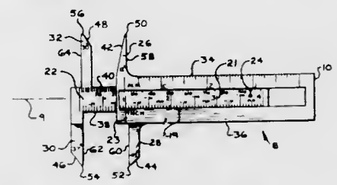
1. Precision parallel float mechanism comprising a base including three substantially equally spaced first registration surfaces in a fixed plane of reference, a relatively displaceable member having three directly opposed corresponding second registration surfaces, said directly opposed corresponding second registration surfaces being positioned in another plane of reference parallel to said fixed plane of reference whereby a pair of opposed registration surfaces are formed with each first registration surface and a respective directly opposed corresponding registration surface, three rigid columns each rigid column having a pair of peripheral contact surfaces engaging respectively a pair of said opposed registration surfaces, yieldable preloaded resilient means establishing normal compressive peripheral contact engagement with said first and second registration surfaces subject to each column tilting to opposite peripheral side edge contact with respective registration surfaces in response to a predetermined force couple imposed on the parallel planes of reference of said base and displaceable member, said mechanism including means for confining said peripheral contact surfaces against lateral displacement relative to said registration surfaces.

4,897,931

ANGLE INDICATING CALIPER

Stephen D. Goulette, Rives Junction, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Sep. 23, 1988, Ser. No. 248,141
Int. Cl.[4] G01B 5/14
U.S. Cl. 33—810 3 Claims



1. A slide caliper for measuring the characteristics of a hose fitting wherein the hose fitting includes a conical sealing surface having an angle of convergence and the caliper includes a body having a longitudinal axis, a slide mounted on the body for movement relative to the body in the direction of the axis, first and second measurement extensions mounted on the body and slide, respectively, extending in a transverse direction to the body axis for engaging the fitting to be measured and indicia defined on the body and slide to indicate the relative movement therebetween, each extension including a first edge perpendicular to the body axis and a second edge, the improvement comprising an angular surface defined on the second edge of each of the extensions having a predetermined angular

orientation to the body axis, the angular orientation of said angular surfaces being different and of an angle corresponding to a standard sealing surface angle whereby placing an angular surface against a fitting sealing surface permits the angle of the fitting surface to be determined.

4,897,932

MASTER OPTICAL DISK HEAT-DRYING APPARATUS

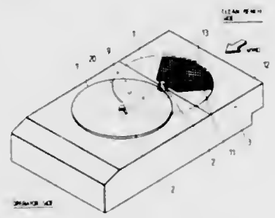
Kazumi Kuriyama, Yamanashi, Japan, assignor to Pioneer Electronic Corporation, Tokyo and Pioneer Video Corporation, Yamanashi, both of, Japan

Filed Mar. 14, 1989, Ser. No. 322,941

Claims priority, application Japan, Sep. 2, 1988, 63-219979; Sep. 2, 1988, 63-219980; Sep. 2, 1988, 63-219981; Sep. 2, 1988, 63-219982

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—52 **13 Claims**



2. An apparatus for heat-drying a master optical disk, said apparatus comprising:

heating means for radiation-heating said master optical disk;

carrying means for carrying said master optical disk above said heating means so as to be parallel with and opposite to said heating means; and

air blowing means for sending clean air at least between said heating means and said master optical disk.

4,897,933

TABLEWARE DRYING MACHINE

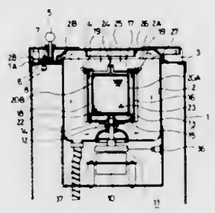
Junya Ito; Akihiko Chiba; Masuo Oku, all of Gunma, and Hitoshi Komada, Saitama, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 9, 1988, Ser. No. 243,069

Claims priority, application Japan, Sep. 17, 1987, 62-232918; May 19, 1988, 62-122344

Int. Cl.[4] F26B *17/30*

U.S. Cl. 34—58 **9 Claims**



1. A tableware drying machine, comprising:

a drying tank the top of which is open to the air,

a drying machine housing for accommodating the drying tank,

a tableware container, the surrounding walls of which have a plurality of holes therethrough for drying, said container being adapted for receiving tableware such as a spoon which has been washed,

a container receiving frame for receiving the tableware container, said receiving frame being mounted for rotation about an axis at high speed in the drying tank, said container rotating with said receiving frame when said container is received therein, at least a portion of the surfaces of said frame and container being oriented relative to said rotational axis to induce a flow of air when rotating,

motor means for rotating the container receiving frame and said container at said high speed,

a lid for opening and closing the drying tank top, air intake openings being provided in the lid for taking air into the drying tank when the lid is closed, said air intake being induced by means of said high speed rotation of the container receiving frame with the container therein, and

an outlet opening for discharging said air from said drying machine.

4,897,934

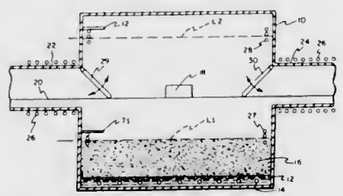
VAPOR PHASE PROCESSING SYSTEM

Douglas J. Peck, North Andover, Mass., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Aug. 13, 1987, Ser. No. 84,963

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—78 **3 Claims**



1. A vapor processing system comprising:

a vessel for containing a processing vapor,

means for heating an electronic liquid contained within said vessel to generate saturated vapor;

means for conveying work product through said vessel along a substantially horizontal path,

first condensing means for defining a lower level first defining means of said saturated vapor at a selected or adjustable level below said path,

second means for defining an upper level second defining means of said saturated vapor at a selected or adjustable level above said path; and

means for operating said second defining means for at least a portion of the time the work product is located within said vessel whereby the saturated vapor will envelop and process the work product; and

means for operating said first defining means for the remaining portion of the time whereby the saturated vapor will be maintained below the path thereby minimizing vapor loss along the path out of the vessel.

4,897,935

NON-SLIP MEANS AND THEIR USES ON SHOE SOLES

Jean-Louis Fel, 26 rue de Comblat - Belbex, 15000 Aurillac, France

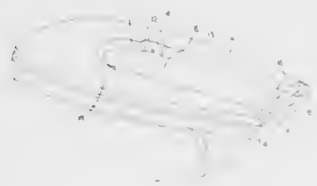
PCT No. PCT/FR87/00077, § 371 Date Jan. 4, 1988, § 102(e) Date Jan. 4, 1988, PCT Pub. No. WO87/05475, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 18, 1987, Ser. No. 133,047

Claims priority, application France, Aug. 19, 1986, 86 04306; Sep. 18, 1986, 86 13302

Int. Cl.[4] A43B *3/18*

U.S. Cl. 36—7.7 **9 Claims**



2. A non-slip device fastenable to a shoe by means of a strap the said device comprising a pad, wherein the pad has a shell shape and defines a recess in the form of the in[illegible] of a shoe, a non-slip surface carried by the pad, wh[illegible] non-slip surface is composed of at least one lay[illegible] cellular material with open cells and of low d[illegible] and a second layer of cellular material of high densit[illegible] ated between the pad and the open-cell layer.

4,897,936

SHOE SOLE CONSTRUCTION

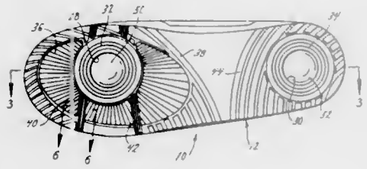
Rory W. Fuerst, Menlo Park, Calif., assignor to Kaepa, Inc., San Antonio, Tex.

Filed Feb. 16, 1988, Ser. No. 156,176

Int. Cl.[4] A43B *13/12, 13/04, 13/18, 5/00*

U.S. Cl. 36—30 A **14 Claims**





1. A shoe sole comprising:

(a) an insole,

(b) an outsole including a portion located at the ball of the foot and a portion located at the heel of the foot including an opening in at least one of said portions, said outsole having a ground-engaging surface,

(c) a midsole cushioning portion sandwiched between said insole and said outsole and including at least one cavity opening of a size greater than the outsole opening [illegible] being generally concentric with said outsole openi[illegible]

(d) an insert is disposed within the cavity op[illegible] the midsole portion, said insert having an [illegible]ortion of a size substantially the same as the size [illegible]idsole cavity opening, said insert having an in[illegible]ntral portion substantially the same size as, and [illegible]erally concentric with said outsole portion openin, and projecting into said opening but not beyond th[illegible]outsole ground-engaging surface and having an annul[illegible] portion overlapping said outsole opening operatively b[illegible]ring on the outsole.

4,897,93[illegible]

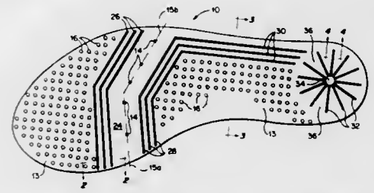
NON-SLIP INS[illegible]E BASE

Kenneth W. Misevich, Piscataway, and Thomas E. Mintel, Somerset, both of N.J., assig[illegible].o Colgate-Palmolive Company, Piscataway, N.J.

Filed Sep. [illegible]87, Ser. No. 100,062

Cl.[4] A43B *13/38*

U.S. Cl. 36—[illegible] **5 Claims**



1. An insole base to be positioned below a shoe insole to provide a non-slip surface for receiving said shoe insole in a shoe construction, comprising:

a show sole member having an upper surface in the shape of the bottom of a foot with a medial side and a lateral side, said upper surface having a smooth surface portion in the region proximate and adjacent to the location of the metatarsal heads of said foot, at least one raised ridge positioned in the upper surface of said sole member anterior to said smooth surface portion and at least one raised ridge positioned in the upper surface of said sole member posterior to said smooth surface portion, each raised ridge extending from the medial side of the sole member in a direction generally parallel to the transverse metatarsal axis which passes through the first and second metatarsal heads of the foot and with each said raised ridge then being angled so as to extend toward the lateral side of the sole member in a direction generally parallel to the oblique metatarsal axis which passes through the third, fourth and fifth metatarsal heads.

4,897,938

SHOE FREELY FITTING TO A FOOT AND A FOOT BED

Akira Otsuka, 13, Nanpeidai-Cho, Tokyo, Japan

PCT No. PCT/JP87/00287, § 371 Date Jan. 7, 1988, § 102(e) Date Jan. 7, 1988, PCT Pub. No. WO87/06804, PCT Pub. Date Nov. 19, 1987

PCT Filed May 9, 1987, Ser. No. 150,646

Claims priority, application Japan, May 9, 1986, 61-104858; Nov. 5, 1986, 61-261944

Int. Cl.[4] A43B *7/14, 3/26, 13/38*

U.S. Cl. 36—88 **6 Claims**

1. A combination of a shoe comprising a main body having a longitudinal length corresponding to one of several standardized lengths and an inner circumference which is larger than inner circumferences corresponding to said standardized length, and a plurality of foot supporting inserts detachably insertable within said shoe main body to complete said shoe, said inserts each having a shoe engaging surface and a foot engaging surface, said shoe engaging surface of each said insert

being nestable within and substantially identical in contour to a corresponding inner portion of said shoe, said foot engaging surface being prefabricated and preshaped and varying from



insert to insert so as to fit foot bottoms different in width and to conform generally to different contours of feet such that said shoe main body is fittable to different feet according to selection of one of said inserts.

4,897,939

FOOTWEAR REINFORCEMENT

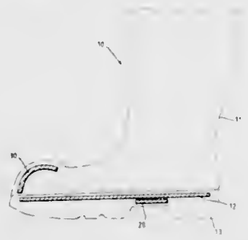
Robert Harrington, Bootle, England, assignor to Dunlop Limited a British Company, United Kingdom

Filed Oct. 6, 1988, Ser. No. 254,243

Claims priority, application United Kingdom, Oct. 13, 1987, 8723962

Int. Cl.[4] A43B *23/00*

U.S. Cl. 36—108 **7 Claims**



1. In a footwear article suitable for heavy duty outdoor use consisting of an upper attached to an outsole member and a flexible metal midsole member secured between said upper and said outsole member, the improvement which comprises securing an additional arch-reinforcement member within the sole between said flexible metal midsole member and said outsole member so as to strengthen the sole in the area contacted by a shovel when the wearer is using a shovel for digging.

4,897,940

SKI BOOT WITH HEEL SECURING DEVICE

Mariano Sartor, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

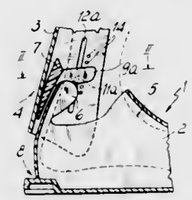
Filed Sep. 7, 1988, Ser. No. 240,909

Claims priority, application Italy, Sep. 15, 1987, 82586 A/87

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—119 **18 Claims**

1. Rear-entry ski boot with heel securing device, comprising a shell with which there is articulated at least one rear quarter, comprising at least one wedge-like element interposed, at the skier's heel region, between the rear inner surface of said rear quarter and the skier's foot, with said wedge-like element there being associated means, actuatable by the skier, for its translatory motion, wherein said means for the translatory motion of



said wedge-like element are constituted by a pair of elastically deformable wings, protruding laterally from said wedge-like element, said wings affecting the inner lateral surfaces of said rear quarter.

4,897,941

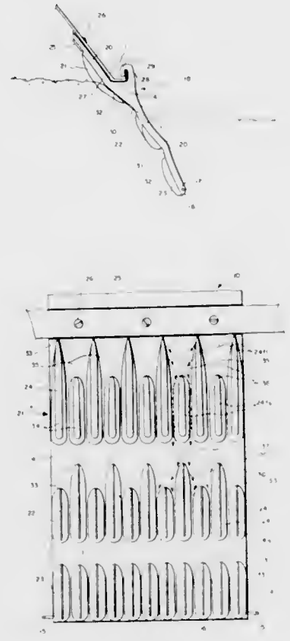
SNOW GROOMING COMB

William B. Sinykin, Logan, Utah, assignor to Logan Manufacturing Company, Logan, Utah

Filed Aug. 21, 1988, Ser. No. 396,925

Int. Cl.[4] E01H *4/00*

U.S. Cl. 37—222 **5 Claims**



1. A snow combing device adapted to be secured to the trailing edge of the skirt of a snow tilling device, said snow combing device comprising:

an elongate backing plate of resilient elastic material having provisions for securement to the trailing edge;

a laterally directed foremost row of alternately longer and shorter elongate combing teeth downstanding from the backing plate in the vicinity of said trailing edge, the shorter teeth being positioned between rearward portions of the longer teeth, each of the teeth having a rearmost elongate portion of generally triangular cross section and a foremost portion joining the rearmost portion and tapering therefrom laterally and upwardly to a point on the under surface of the backing plate; and

at least one additional laterally directed row of alternately shorter and longer combing teeth downstanding from the backing plate rearwardly of the foremost row, each longer and shorter tooth of each additional row being aligned respectively with a shorter and a longer tooth of the row immediately forward thereof, the shorter teeth of each additional row being positioned between rearward portions of the longer teeth of the row, and each additional tooth in each additional row having a rearmost elongate portion of generally triangular cross section and a foremost portion joining the rearmost portion and tapering therefrom laterally and upwardly to a point on the under surface of the backing plate.

4,897,942

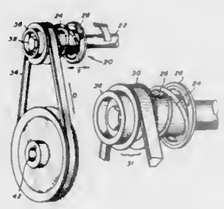
HIGH EFFICIENCY SNOWTHROWER

Kenneth H. Klas, Port Washington, and Richard R. Brown, Fredonia, both of Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Oct. 14, 1988, Ser. No. 257,798

Int. Cl.[4] E01H *5/09*

U.S. Cl. 37—244 **2 Claims**



1. A snow removal apparatus, comprising:

an engine,

means for engaging and displacing accumulated snow; and

means for coupling said engine to said engaging and displacing means so as to maintain a substantially constant load on said engine and while said engine operates at said constant load said coupling means transmits the power from said engine to said displacement means to achieve maximum snowthrowing distance for the engaged snow depending on the weight and depth of the accumulated snow encountered by said engaging and displacing means.

4,897,943

PHOTOGRAPHIC DISPLAY AND APPARATUS FOR MAKING ELEMENTAL PRINTS OF THE SAME

Katsumi Otake, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 18, 1988, Ser. No. 169,790

Claims priority, application Japan, Mar. 18, 1987, 62-39569[U]; Mar. 18, 1987, 62-63184; Apr. 6, 1987, 62-84275

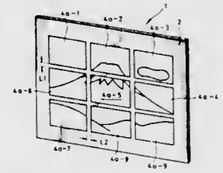
Int. Cl.[4] A47G *1/06*

U.S. Cl. 40—158.1 **18 Claims**

1. A picture display for displaying a large photographic picture, said large photographic picture representing an enlargement of an image recorded on an image frame of a film original, said display comprising:

a display panel; and

a roll of photographic paper containing a plurality of print portions which comprise enlarged images of a plurality of divisions into which said image frame is nominally divided, said print portions being formed consecutively on



said roll of said photographic paper, said roll of photographic paper being cut into said print portions after processing;

wherein said plurality of print portions are arranged in a predetermined fashion on said display panel so as to present substantially the same photographic picture as said large photographic picture.

4,897,944

PHOTOGRAPHIC PICTURE DISPLAY, APPARATUS AND METHOD OF MAKING ELEMENTAL PRINTS THEREOF

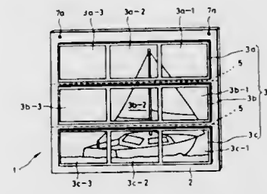
Katsumi Otake, Tokyo; Kiichiro Sakamoto, Kanagawa, and Mikio Kogane, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1988, Ser. No. 196,524

Claims priority, application Japan, May 20, 1987, 62-123053; Jun. 12, 1987, 62-146654; Jun. 17, 1987, 62-150810

Int. Cl.[4] A47G *1/06*

U.S. Cl. 40—159 **25 Claims**



2. A photographic picture display for displaying a large photographic picture corresponding to a smaller image frame, said display comprising:

a display panel;

a plurality of picture strips attached to said display panel to form a single picture;

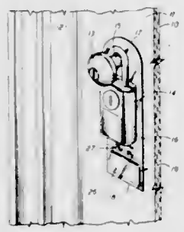
each said picture strip comprising consecutively positioned enlarged divisional images of corresponding adjacent divisions of said smaller image frame, said smaller image frame being notionally divided into a matrix of divisions, wherein said picture strip is formed with a row of enlarged divisional images with separation therebetween, corresponding to a row of divisions of said smaller image frame.

4,897,945

LOCK BOX DOOR PROTECTOR

Larry R. Webb, 2008 Stanley Rd., Cazenovia, N.Y. 13035

Filed Oct. 17, 1988, Ser. No. 258,660
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—331 **6 Claims**



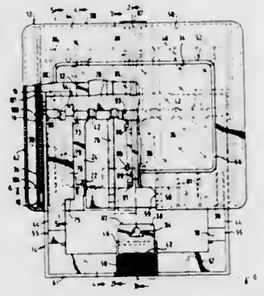
1. A lock box door protector for protecting the stile of a door from abrasion or damage when a realtor's key lock box is hung from a doorknob stem thereon, and which also proffers a supply of business cards, the door protector comprising an elongated strip of a resilient material having an upper end and a lower end, with an opening at said upper end to be placed over said doorknob and suspended from said stem, a pocket formed at the lower end of said strip to contain said supply of business cards, and said strip being of sufficient length so that said pocket is positioned below the base of a standard lock box suspended from the doorknob stem over said protector;
wherein said pocket includes means visibly displaying said cards while protecting them from the weather;
wherein the strip is of two layers at least at said lower end, with a clear plastic front layer and another layer behind to define said pocket; and
wherein said other layer has a slit therein for access to said business cards from behind the door protector.

4,897,946

DEVICE FOR THE CYCLIC REARRANGEMENT OF A PILE OF RECTANGULAR OR SQUARE SHEETS

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Continuation of Ser. No. 888,332, Jul. 11, 1986, Pat. No. 4,777,748. This application Jul. 29, 1988, Ser. No. 226,068
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441489
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[4] G09F *11/30*
U.S. Cl. 40—513 **43 Claims**



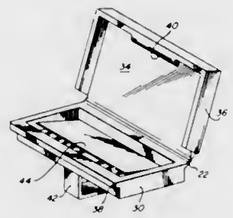
1. A device for cyclic rearrangement of a pile of substantially planar rectangular sheets, said pile having a principal plane parallel to the plane of said sheets, comprising first and second frame parts movable relative to each other in a predetermined direction parallel to said principal plane, and including means for removal of an individual sheet from one end of the pile leaving a remainder of said pile and for adding said individual sheet to the other end of the remainder of the pile upon reciprocal relative movement of the frame parts, said individual sheet having a first substantially planar face in contact with said remainder of said pile prior to removal, said means comprising:
separating means for separating said individual sheet from the pile,
means for feeding sheets to said separating means and for displacing said individual sheet relative to said remainder of said pile so as to expose said first planar face thereof,
first retaining means for holding said individual sheet in said first frame part and second retaining means for holding the remainder of the pile in said second frame part, and
means for guiding the individual sheet after separation for the purpose of returning it to the other end of the remainder of the pile, wherein said first retaining means comprises:
a roller element rotatably journalled to said second frame part and rolling on said first face of said individual sheet after separation, a counter element on one of said frame parts opposite to and cooperating with said roller element to clamp said individual sheet between said roller and counter elements so as to hold said individual sheet in said first frame part over a first predetermined portion of said relative movement of said frame parts, and means for urging said roller and counter elements toward one another.

4,897,947

IDENTIFICATION HOLDER FOR MOUNTING ON SHOES

Stephanie Kass-Pious, 157 Tremont St., Hartford, Conn. 06105

Filed Jan. 9, 1989, Ser. No. 294,217
Int. Cl.[4] A44C *3/00*
U.S. Cl. 40—636 **9 Claims**



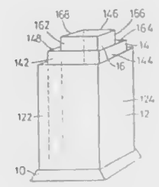
1. An identification member adapted to be secured to a shoe or the like having lacing or like elements extending transversely thereof, comprising:
(a) an integrally formed elongated carrier or synthetic resin having a base and cover hingedly connected along one side margin thereof, said base including a bottom wall and a sidewall extending about the periphery thereof to define an upwardly opening cavity, said sidewall of said base having outwardly extending flanges at its upper end along said one side margin and along the side margin opposite thereto, said base also having an elongated, generally U-shaped engagement loop depending from said bottom wall and providing a passage through which shoe laces or the like may be passed to secure the carrier to the top of the associated shoe, said engagement loop extending transversely of the elongated dimension, said cover having a top wall and a depending sidewall extending about the major portion of its periphery, said sidewalls of said base and cover being dimensioned and configured to interfit with said base extending into said cover, said cover being releasably engaged with said base to close said cavity, said cover having an inwardly projecting boss on the lower end of its sidewall opposite said one side margin and said boss snap fitting under said flange on said base, said hinged connection being provided along the outer edge of said flange on said base, said sidewall on said cover extending along said margin opposite that providing the hinged connection and along the adjacent side margins to provide a generally U-shaped sidewall which receives the base therebetween;
(b) an identification element removably seated within said carrier.

4,897,948

DISPLAY SYSTEMS

Gordon Owen, 48 Milton Dr., Ravenshead, Nottingham, England

Filed Sep. 18, 1987, Ser. No. 98,273
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—661 **15 Claims**



1. A display system for the display of information to a customer including a first hollow box section tube fixed to a base and including at least one further box section tube of smaller cross-section fitted within the first hollow box section tube to be readily removable therefrom and in which information relating to a customer's requirements is displayed on at least one face of each of the tubes, in which each tube is provided with means for retaining a card within the tube, in which the card is printed with information for the customer, each tube being transparent such that information on the card may be read through the tube, in which the card is replaceably retained within the tube and in which each tube is provided with means for retaining the card within close proximity to the inside surfaces of the tube.

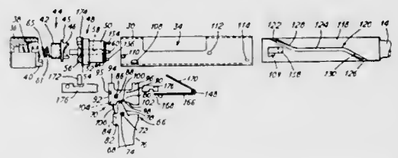
4,897,949

FIREARMS

Roland G. Whiteing, 45 Duncan Road, Glenferness, Midrand, South Africa

PCT No. PCT/GB86/00788, § 371 Date Jun. 23, 1988, § 102(e) Date Jun. 23, 1988, PCT Pub. No. WO87/03952, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 22, 1986, Ser. No. 216,718
Claims priority, application South Africa, Dec. 23, 1985, 85/9792
Int. Cl.[4] F41C *7/02*; F41D *5/02*
U.S. Cl. 42—10 **12 Claims**

1. A firearm comprising:
a. a main housing having
a.1 a main bore,
a.2 a loading passage through which a cartridge can be inserted into the main bore; and
a.3 an eject passage through which a cartridge case can be ejected from the main bore;
b. a breech at one end of the main bore;
c. a firing pin at the breech end of the main bore;
d. a sleeve rotatably fitting in the main bore and having
d.1 a port therein which corresponds in size and axial location to the loading passage;
e. a barrel having
e.1 a bore therethrogh which is shaped to inhibit the cartridge casing from passing along the barrel, and
e.2 a rear end that is telescopically received within the sleeve, the barrel being axially movable from a rear



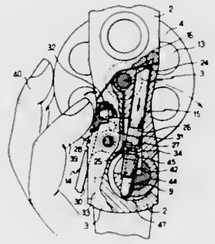
position in which it engaged the breech to a forward position; and
f. engaging cam means and cam follower means formed on the barrel and sleeve to cause rotation of the sleeve on axial movement of the barrel;
the arrangement being such that when the barrel is in the forward position, the port will be adjacent the loading passage; and when the barrel is intermediate the front and rear position the port will be adjacent the eject passage.

4,897,950

LOCKING DEVICE FOR THE CRANE OF A REVOLVER

Alain Lechelle, Mulhouse; Thierry Guidat, Brunstatt, and Serge Bruckert, Cernay, all of France, assignors to Matra Manurhin Defense, Velizy-Villacoublay, France

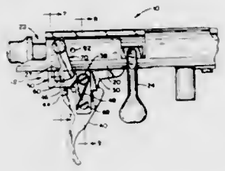
Filed Feb. 21, 1989, Ser. No. 313,380
Claims priority, application France, Feb. 26, 1988, 88 02399
Int. Cl.[4] F41C *1/02, 25/10*
U.S. Cl. 42—62 **10 Claims**



1. A revolver comprising: a locking device for locking a crane of a revolver, the crane supporting a cylinder and including a shaft pivotally mounted on a frame of the revolver for swinging parallel to the axis of a barrel of the revolver between a closed position in which the axis of the cylinder lies in the plane of symmetry of the revolver and an open position on one side of the revolver in which chambers of the cylinder are disengaged for loading or ejecting ammunition; the locking device being for holding the crane in position when the crane is in the closed position and further comprising a pushbutton and a sliding latch both mounted on the crane, the sliding latch having a locking end that is normally received, when the crane is in its closed position, in an associated notch in the frame of the revolver, the pushbutton being laterally accessible from a side of the revolver opposite to the one side from which the cylinder is swung out and co-operating directly with the sliding latch for retracting the locking end thereof, whereby the disposition of the pushbutton makes it possible to unlock the

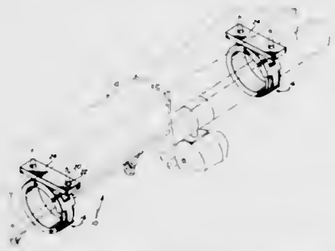
crane using the same hand as is used for pushing the cylinder into its swung-out position.

4,897,951
FIREARM SAFETY
William E. Osborne, Guilford, Conn., assignor to The Marlin Firearms Company, North Haven, Conn.
Filed Oct. 24, 1988, Ser. No. 261,621
Int. Cl.[4] F41C *17/02*
U.S. Cl. 42—70.06 20 Claims



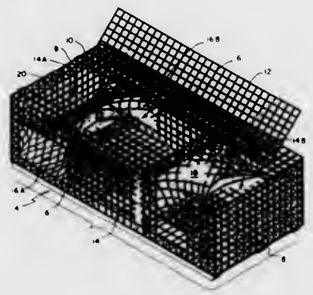
1. A safety for a firearm having a receiver and a trigger pivotally mounted at the underside of the receiver comprising:
bracket means pivotally mounted at the underside of the receiver for restricted pivotal movement, said bracket means defining first and second recesses;
biasing means for pivotally biasing said bracket means in a first pivotal direction;
operator arm means captured between said bracket means and receiver, said operator arm means having an engagement portion for pivotal engagement at the underside of said receiver and a generally opposing locking dog, said operator arm means comprising handle means for manually pivoting said operator arm means and detent means for pivotal engagement in said recesses; and
trigger catch means for engagement by said locking dog to prevent pivotal movement of the trigger;
so that when said operator arm means is in a safety pivotal position, the locking dog engages the trigger catch means and the detent means is retainably engaged in said first recess and said operator arm means is pivotally moveable to a fire pivotal position wherein said bracket means pivots to permit said detent means to rock into engagement into said second recess whereby said locking dog disengages said trigger catch means.

4,897,952
FISHING ROD HANGER
Robert L. Hawie, Stratford, Conn., assignor to The Hawie Manufacturing Co., Bridgeport, Conn.
Filed Jan. 28, 1988, Ser. No. 149,554
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 15 Claims



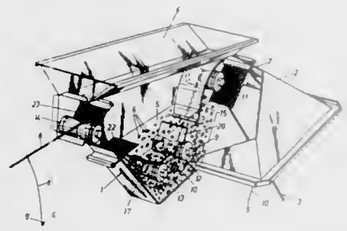
1. A fishing rod hanger comprising at least one cooperating bracket member adapted to support a fishing rod, said bracket member comprising:
a cylindrical channel surface adapted to receive a portion of the rod, said cylindrical channel surface being substantially circular in shape;
a channel passage formed in said channel surface comprising a section between the outer peripheral surface and the channel surface of said bracket member, said channel passage being defined by first and second transverse edges of said bracket member, each of said edges defining a portion of the bracket member extending from the outer peripheral surface to the cylindrical channel surface; and
latch means moveably connected to said bracket member for obstructing said channel passage whereby the portion of the rod received in the bracket member is confined within the channel surface; said latch means being pivotably hinged at one end to said first transverse edge, said latch means being selectively locked at a second end to said second transverse edge; and
said second transverse edge including an indentation extending from said outer peripheral surface, an inner peripheral surface of said indentation having a slot for receiving said second end of said latch means.

4,897,953
LOBSTER TRAP
Charles F. Bruce, R.F.D. 1, Box 1490, Rockland, Me. 04841
Filed Feb. 27, 1989, Ser. No. 316,236
Int. Cl.[4] A01K *71/00*
U.S. Cl. 43—102 5 Claims



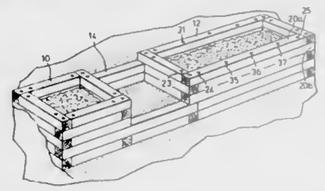
1. In a lobster trap comprising a lattice-work case an improved trap head comprising
means defining a pair of opposed openings in opposite sides of the case,
a funnel-like net within said case interconnecting said openings and providing a continuous lobster passage between said openings,
said net decreasing in diameter with distance from said openings and having its minimum diameter midway between said openings, and
means defining an opening from the minimum diameter portion of said net into the interior of said case.

4,897,954
APPARATUS FOR BAITING LONG LINES
Bert U. Gustavsson, Nävragöl, Sweden, assignor to Profish International AB, Solna, Sweden
PCT No. PCT/SE87/00137, § 371 Date Sep. 16, 1988, § 102(e) Date Sep. 16, 1988, PCT Pub. No. WO87/05465, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 18, 1987, Ser. No. 124,098
Claims priority, application Sweden, Mar. 19, 1986, 8601268
Int. Cl.[4] A01K *79/00*
U.S. Cl. 43—27.4 3 Claims



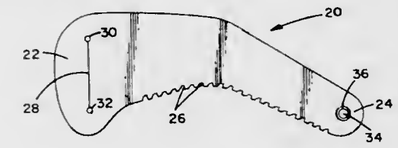
1. An apparatus for baiting long lines (3) comprising a reef line (8) and a number of hook leaders (10) depending therefrom at regular intervals, each supporting a hook (9) at its outer free end, said apparatus comprising a container (1) holding water (5) mixed with bait (6) and being equipped at its bottom with guide rollers (12, 13) serving to conduct a long line (3) introduced into the container (1) at the top thereof through said mixture of water (5) and bait (6), characterized therein that the container (1) is provided with a first baffle (17) which extends essentially in the direction of advancement of the reef line (8) and which is adjustable into various angular positions relative to the interior end wall (18) of the container so as to define together with said interior container wall a baiting zone (19) of varyable width through which the reef line (8) including its hook leaders (10) and hooks (9) are made to pass during the line advancement through the container (1).

4,897,955
WOODEN LANDSCAPING STRUCTURES
Gerald K. Winsor, 30 Cranberry Crescent, Kemptville, Ontario, Canada K0G 1J0
Continuation-in-part of Ser. No. 157,496, Feb. 12, 1988, abandoned. This application Dec. 19, 1988, Ser. No. 286,237
Claims priority, application Canada, Feb. 16, 1987, 529787
Int. Cl.[4] A01B *1/08*; E04B *1/00*
U.S. Cl. 47—33 10 Claims



7. A kit for constructing landscaping structures comprising:
a plurality of top and bottom timbers, each bottom timber having two spaced parallel blind corner holes provided transversely near a first end and one blind corner hole parallel to the other two blind corner holes provided near a second end, each top timber having two spaced parallel corner holes provided transversely through the top timber near a first end and one corner hole parallel to the other two corner holes provided transversely through the top timber near a second end, the corner holes of the top timbers being spaced to align with blind corner holes of bottom timbers at overlapping corners when a plurality of the top timbers are arranged to overlay a geometrically-arranged layer of a plurality of the bottom timbers, each timber having at least one intermediate joiner hole provided parallel to said corner holes and blind corner holes spaced from the first and second ends of the timber for alignment with said at least one joiner hole of an overlying timber when a plurality of the bottom timbers are arranged to overlay, with overlapping corners, a geometrically-arranged layer of a plurality of the top timbers; and
a plurality of hardwood dowels adapted to be snugly fitted through the aligned corner and blind corner holes, and into intermediate joiner holes of overlying timbers.

4,897,956
TREE BRACING APPARATUS
Robert M. McGuire, Rte. 1, Box 123B, Stacy, Minn. 55079
Filed Oct. 1, 1987, Ser. No. 103,844
Int. Cl.[4] A01G *17/04*
U.S. Cl. 47—43 8 Claims

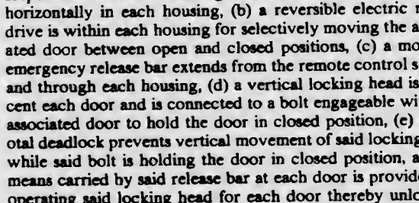


1. A three point tree bracing collar for bracing a tree, said collar formed of substantially planar, elongate plastic material and having first and second ends with said second end including a slot through which said first end can be passed in order to wrap the collar around a tree trunk, said first end including means for attaching a first anchoring line thereto, said collar providing a surface against and around which one or more other anchoring lines may be fastened when the collar is wrapped around said trunk whereby said first and one or more other anchoring lines can be anchored to the ground to provide three point bracing, said collar curved relative to its longitudinal axis so that said first end extends downwardly when said collar is wrapped around said trunk, the length of said collar engaging the tree trunk when it is wrapped thereabout having a width and rigidity sufficient to disperse the bracing forces of the anchoring line attached to said first end and the one or more other lines wrapped over said collar over an area of the tree trunk sufficient to avoid sawing of the collar into the tree trunk and girdling of the tree trunk.

4,897,957
PRECISION FLOWERING OF REGAL PELARGONIUMS (*PELARGONIUM XDOMESTICUM*)
J. Robert Oglevee, and Richard Craig, both of Connellsville, Pa., assignors to Oglevee, Ltd. and Research Corporation Technologies, Inc., a part interest
Filed Apr. 12, 1988, Ser. No. 180,471
Int. Cl.[4] A01H *3/02*
U.S. Cl. 47—58 13 Claims

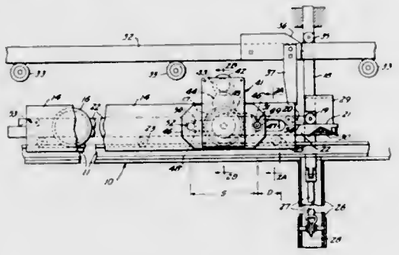
1. A method for the precisely timed production of a Regal Pelargonium plant in 13–16 weeks, comprising the steps of:
vegetative propagation;
floral initiation; and
finishing, wherein said floral initiation step further comprises controlling minimum total accumulated light exposure per plant to between 350 to 425 moles.

4,897,958
WINDOW-BOX AND SUPPORT
Ronald Brydges, 6 Faye Cresent, St. Catharines Ontario, Canada L2N 1N7
Filed Oct. 24, 1988, Ser. No. 261,722
Int. Cl.[4] A01G 9/02
U.S. Cl. 47—68 9 Claims



1. A window-box and mounting assembly for mounting on a window set in a wall comprising a rectangular plastic tray having an inner edge adjacent a window a lip formed on said inner edge to engaging a ridge on a ledge on a same side of the window as said tray and a pair of legs adjustably mounted on the bottom of said tray and engaging a wall below a ledge.

4,897,959
JAIL CELL LOCK MECHANISM
Donald A. Worden, Pompton Plains, N.J., assignor to Marotta Scientific Controls, Inc., Montville, N.J.
Filed Mar. 15, 1989, Ser. No. 324,408
Int. Cl.[4] E05B 47/06; E05F 15/00
U.S. Cl. 49—18 8 Claims



1. In a system for operating from a remote-control station one or more of a plurality of cell doors arranged substantially in horizontal alignment along a corridor or the like, wherein (a) a housing is located above each door and each door is roller suspended via its own carriage and rides a rail which extends horizontally in each housing, (b) a reversible electric motor drive is within each housing for selectively moving the associated door between open and closed positions, (c) a movable emergency release bar extends from the remote control station and through each housing, (d) a vertical locking head is adjacent each door and is connected to a bolt engageable with the associated door to hold the door in closed position, (e) a pivotal deadlock prevents vertical movement of said locking head while said bolt is holding the door in closed position, and (f) means carried by said release bar at each door is provided for operating said locking head for each door thereby unlocking all of said cell doors simultaneously; the improvement in which, at each cell-door location: (g) said deadlock means is pivotally mounted to a slide bar carried by said carriage and having limited horizontally guided lost-motion engagement to said carriage, said deadlock means at one limit of said lost-motion engagement having deadlock action to foreclose locking-head displacement from door-bolting position, and said deadlock means at the other limit of said lost-motion engagement having no deadlock relation with said locking head; (h) cam means on said slide bar coacts with said locking head for displacing the same out of door-bolting position, such coaction being in the course of slide-bar movement from said one to said other limit of said lost-motion engagement; and (i) said motor means is mounted to said slide bar and has an output shaft connected to drive at least one roller of said suspension; whereby, starting with a deadlocked bolted and closed condition of said door, and upon motor excitation in one direction, said one roller is driven to displace said slide bar from said one to said other limit of the lost-motion engagement, thereby unbolting said door so that, after reaching said other limit of the lost-motion engagement, continued motor drive in said one direction is operative to drive said carriage in any opening displacement of the door; and further whereby, starting with an open condition of said door, and upon motor excitation in the opposite direction, said roller may be first driven to displace said slide bar from said other to said one limit of the lost-motion engagement and continued motor drive in said opposite direction is operative to drive said carriage in a closing displacement of the door, with said cam means returning the locking head to door-bolting and dead-locked condition upon completion of the door-closing displacement.

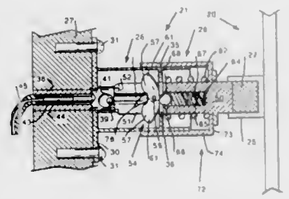
4,897,960
RAILROAD CROSSING GATE
Todd A. Barvicek, and James W. Jensen, both of Linn County, Iowa, assignors to General Signals, Inc., Evansville, Iowa
Filed Jan. 3, 1989, Ser. No. 292,928
Int. Cl.[4] E01F 13/00; E05D 15/52
U.S. Cl. 49—49 5 Claims



1. A crossing gate for selectively blocking vehicular traffic across a railroad grade crossing, said crossing gate comprising: means for mounting said crossing gate for movement in a generally vertical plane from an upright position not blocking the crossing to a lowered position blocking the crossing, an arm extending outwardly from the mounting means in a direction generally perpendicular to the direction of movement of the vehicular traffic, means combined with said arm and said mounting means and providing for swingable movement of said arm from a position blocking the crossing when force is applied to the arm and providing for return of the arm to its original position blocking the crossing when the force is removed, said arm having at least one translucent portion, means for providing light located inside of the arm behind the translucent portion, and a cushion support for the light providing means.

4,897,961
RELEASABLE MOUNT FOR WINDOW GRILLES
Jerry P. Shine, 10451 Isleworth Ave., San Diego, Calif. 92926
Filed Oct. 17, 1988, Ser. No. 258,600
Int. Cl.[4] E05B 65/10
U.S. Cl. 49—141 16 Claims

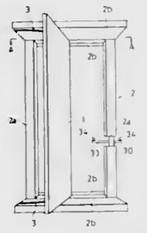
1. A releasable mount for mounting a window grille over a window, the mount comprising:
a fixed housing having a base end adapted for rigid attachment to a wall adjacent to the window, and an open end directed outwardly away from the wall,
a latch member mounted inside the fixed housing, the latch member having an opening therethrough,
a latch pin adapted to be rigidly connected to the window grille, and adapted to be received through the open end of the fixed housing and the opening in the latch member, to a latched position, the grille being in the desired mounted position over the window when the latch pin is in the latched position,
catch means mounted in a cavity inside the latch pin and being adapted for movement between a retracted position and an expanded position, for preventing the latch pin from being withdrawn from the latched position when in the expanded position, and for enabling the latch pin to be inserted and withdrawn from the fixed housing when in the retracted position,
a trigger pin mounted in the fixed housing with one end extending between the base end of the fixed housing and



the latch member, the trigger pin being adapted for movement between a cocked position, and a release position relatively further away from the latch member, and being biased by a biasing means in the cocked position, the trigger pin, when in the cocked position, being adapted to contact the catch means mounted on the latch pin when the latch pin is inserted into the fixed housing to the latched position, said contact causing the catch means to expand to the expanded position, and, the trigger pin, when in the release position, being adapted to enable the catch means to retract to the retracted position so that the latch pin may be withdrawn from the fixed housing, and
remote actuating means connected to the trigger pin for enabling a person inside the building to move the trigger pin from the cocked position to the release position, thereby enabling the latch pin to be withdrawn from the latched position.

4,897,962
DOOR APPARATUS
Mituru Itoh, No. 2-6, Inohana 3-chome, Chiba-shi, Chiba-ken, Japan
Filed Jun. 23, 1988, Ser. No. 210,693
Claims priority, application Japan, Oct. 2, 1988, 63-29735
Int. Cl.[4] E05D 15/56
U.S. Cl. 49—208 1 Claim

1. A door apparatus, comprising:
a frame having a rectangular main frame and sub-frames which expand along a vertical direction of said main frame and extends integrally from said main frame;
a door having a predetermined width, said door being fitted into said frame;
at least one door support shaft which vertically extends in at least one of an upper and lower center of said door in a transverse direction;
a main shaft means for rotatably supporting each door support shaft inside a vertical portion of said main frame;
at least one support arm being extended from at least one of an upper and a lower end portion of said main shaft;
each door support shaft being rotatably supported at a tip of each of said support arms;
at least one vertical support shaft being disposed at a position in said sub-frames where lines connecting axes of said vertical support shaft, said main shaft and said door support shaft substantially form a triangle;
at least one horizontal rocking rod having an elongated hole which extends from a tip of a substantially centered portion of said horizontal rocking rod within a longitudinal direction and into which said door support shaft slidably fits;
said horizonal rocking rod being rotatably supported in the horizontal direction at a base end portion by said vertical support shaft;
at least one rotation limit plate having a tip equipped with a notch groove extending along said elongated hole of said horizonftal rocking rod and having a predetermined width;
said door support shaft having a reduced portion which is fitted into said notch groove;
said rotation limit plate further includes a frame portion into which said horizontal rocking rod is fitted slidably;
a bias spring for urging said rotation limit plate in such a manner that the tip of said rotation limit plate is always in contact with said door support shaft;
at least one rotary shaft being disposed inside said sub-frame on an opposite side to said vertical support shaft;
at least one first small gear being fixed to said rotary shaft;
at least one disc means for rocking said support arm through a connecting rod, said disc means being fixed to said rotary shaft and having a predetermined diameter;
at least one first pin being implanted at an eccentric position of said disc means;



at least one second pin being implanted substantially at the center of said support arm in a longitudinal direction;
said connecting rod being fitted between said first pin and said second pin;
at least one second small gear being fitted to a second rotary shaft for meshing with said first small gear, said second small gear having a diameter substantially twice that of said first small gear;
at least one third pin being implanted to an eccentric position of said at least one second small gear;
at least one other rotary shaft having fixed thereto a third small gear having a diameter substantially equal to that of said first small gear and a second disc having a diameter substantially equal to that of said second small gear;
at least one fourth pin being implanted to an eccentric position of said second disc;
at least one other connecting rod being fitted between said third pin of said second small gear and said fourth pin; and
an operation shaft equipped at the upper and lower end portions thereof with at least one fourth small gear for meshing with said third small gear and having substantially the same diameter as that of said first small gear, and having a fitting hole at a substantially centered portion for fitting an operation rod;
said operation shaft being rotatably supported inside a vertical portion of said main frame on an opposite side of said main shaft;
said operation rod being equipped with knobs at both end

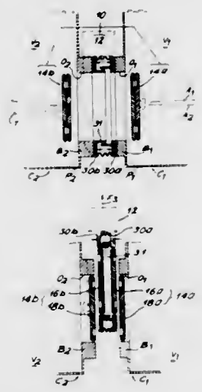
portions of said operation rod and slidably inserted through said fitting hole of said operation shaft.

4,897,963

CONNECTOR DEVICE FOR TWO REACTOR CONTAINMENTS

Michel Reboul, Laudun, and Charles Glachet, Vendome, both of France, assignors to Commissariat A L'Energie Atomique, Paris and Euritech, Vendome, both of, France

Filed Oct. 4, 1988, Ser. No. 252,923
Claims priority, application France, Oct. 15, 1987, 87 14250
Int. Cl.⁴ G21C *19/00*; G21F *7/00*
U.S. Cl. 49—507 **14 Claims**



1. A disconnectable device for connecting two reactor containments each having a connecting opening delimited by a flange, the connecting openings of the two containments being approximately aligned according to a common axis and the flanges being spaced at an approximate given distance, whereby this device comprises:

an assembly to place in communication the connecting openings of the containments in a sealed way with respect to the exterior of the containments, this assembly comprising a reference part provided with immobilization means with respect to the flanges of the cells, two linking parts cooperating with the reference part by means of rotary immobilization means around the axis of the connecting openings, these linking parts cooperating together in a sealed way so as to define an internal passage suitable for connecting the connecting openings, each of the linking parts bearing at least one sealing device suitable for coming to take sealed support on one of the flanges, said assembly finally comprising means to control a relative displacement between the linking parts parallel to said axis, and

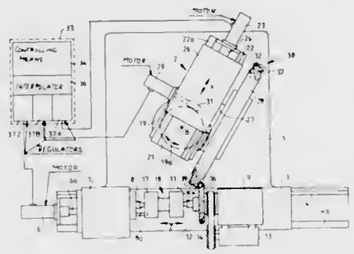
at least one double door each formed of two doors kept attached by magnetic devices authorizing a limited relative sliding between the doors, these two doors able to come and be nested in a sealed way respectively inside the connecting opening formed in the flange of one of the containments and the passage formed in the adjacent linking part when said assembly ensures a sealed communication between the containments.

4,897,964

GRINDING MACHINE WITH DRESSING APPARATUS AND METHOD OF DRESSING GRINDING WHEELS THEREIN

Ulrich Vetter, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 22, 1988, Ser. No. 275,122
Claims priority, applicatioo Fed. Rep. of Germany, Nov. 27, 1987, 3740199
Int. Cl.⁴ B24B *7/00*
U.S. Cl. 51—5 D **6 Claims**



1. A grinding machine comprising a wheelhead having at least one rotary grinding spindle and at least one grinding tool provided on said spindle and having a working surface; a dressing apparatus including a dressing tool; drive means for changing the positions of said spindle and said apparatus relative to each other in the direction of two axes which are inclined relative to each other; means for changing the orientation of said tools relative to each other while said dressing tool contacts and dresses said working surface, including means for changing the orientation of said spindle, said orientation changing means comprising means for turning said spindle about an axis which is remote from the point of contact between the working surface and said dressing tool; and means for controlling said drive means and said orientation changing means as a function of the profile of the working surface of said grinding tool, including means for compensating for deviations of movement of said tools in the directions of said two axes during dressing of said working surface as a result of changes of orientation of said spindle.

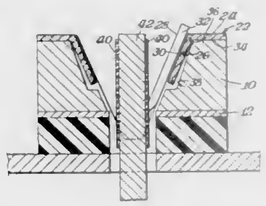
4,897,965

KNIFE SHARPENING APPARATUS

Daniel D. Friel, P.O. Box 4319, Greenville, Del. 19807

Continuation-in-part of Ser. No. 917,601, Oct. 6, 1986, Pat. No. 4,807,399, which is a continuation-in-part of Ser. No. 588,794, Mar. 12, 1984, Pat. No. 4,627,194, and Ser. No. 855,147, Apr. 23, 1986, Pat. No. 4,716,689, which is a continuation-in-part of Ser. No. 588,795, Mar. 12, 1984, abandoned. This application Jan. 31, 1989, Ser. No. 304,323
Int. Cl.⁴ B24B *3/54*
U.S. Cl. 51—128 **7 Claims**

1. In a knife sharpening apparatus for sharpening a knife having a face terminating at a cutting edge facet, comprising a sharpening member having a moving abrasive surface, said abrasive surface being in a plane, means to impart motion to said abrasive surface, magnetic knife quide means having a magnetic guide surface lying in a plane disposed at a predetermined angle to and intersecting said plane of said abrasive surface to form a line of intersection therewith, the improvement being in that said magnetic knife guide means is composed of a magnetized material having opposite polarity north and south magnetic pole faces with a first ferromagnetic member located substantially against one magnetic pole face and a second ferromagnetic member, said second ferromagnetic member having one portion which lies in one plane and a second portion which lies in an intersecting plane, said second ferromagnetic member being located in part against the other magnetic pole face where a portion of the second ferromagnetic member extends finitely in a direction parallel to the plane of the magnetic guide surface and essentially contiguous to the magnetized material, said second member being disposed



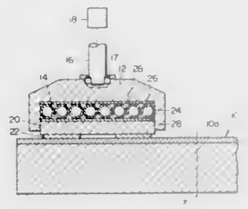
along a portion of said magnetic guide surface remote from said abrasive surface, and said first of said ferromagnetic members being located along a portion of said magnetic guide surface which is contiguous to said abrasive surface to create a magnetic field along said magnetic guide surface to hold the knife against said magnetic guide aurface and move the knife therealong into engagement with said moving abrasive surface.

4,897,966

POLISHING APPARATUS

Yutaka Takahashi, Noda, Japan, assignor to Japan Silicon Co., Ltd. and Mitsubishi Kinzoku Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 18, 1987, Ser. No. 87,167
Claims priority, application Japan, Aug. 19, 1986, 61-193781; Dec. 4, 1986, 61-289446
Int. Cl.⁴ B24B *37/04*
U.S. Cl. 51—131.3 **2 Claims**



1. An apparatus for polishing one of opposite faces of a slab member comprising:

(a) a surface plate having a flat upper surface and being rotatable about an axis perpendicular to said upper surface;

(b) a mounting member having an upper face and a lower face to which the other face of said slab member is fixedly secured, and said mounting member being disposed above said surface plate in such a manner that said one face of the slab member to be polished is held in contact with said upper surface of the surface plate;

(c) urging means operably connected to said mounting member for urging said mounting member toward said surface plate at a prescribed urging pressure to bring said one face of the slab member into pressure contact with said upper surface of said surface plate; and

(d) pressure transmitting means interposed between said mounting member and said urging means for causing the urging pressure of said urging means to be exerted on said upper face of said mounting member, said transmitting means comprising a mounting head connected to said urging means and having a recess formed in a lower face thereof, and a flexible container containing a fluid therein and housed in said recess of said mounting head with an upper surface thereof being held in contact with an inner surface of said recess while a lower surface of said container is held in contact with said upper face of said mounting member;

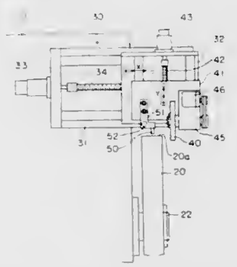
said flexible container comprising an elongated tube having upper and lower faces and being wound in a vortical form and having opposite closed ends, said upper and lower faces of said elongated tube being secured by top and bottom seats of resilient material, respectively.

4,897,967

APPARATUS FOR TRUING A GRINDING WHEEL

Toshio Maruyama; Yukio Oda, both of Kariya, and Syoji Yamaguchi, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 23, 1987, Ser. No. 6,162
Claims priority, application Japan, Jan. 23, 1986, 61-12800
Int. Cl.⁴ B24B *49/00*
U.S. Cl. 51—165.87 **5 Claims**



1. An apparatus for truing a rotatably supported grinding wheel having a grinding surface at its outer circumferential portion thereof, comprising:

a truing head movable relative to said grinding wheel in a first direction parallel to said grinding surface of said grinding wheel and in a second direction perpendicular to said first direction;

a truing tool supported on said truing head;

a contact detection member secured to said truing head and engageable with said grinding surface of said grinding wheel;

a contact detection device for generating a contact signal when said contact detection member is brought into contact with said grinding surface of said grinding wheel through relative movement between said truing head and said grinding wheel in said second direction;

gap memory means for storing a gap between edges close to said grinding wheel of said truing tool and said contact detection member in said second direction;

first and second feed means for effecting relative movement between said truing head and said grinding wheel in said first and second directions, respectively; and

a feed control device for controlling, in response to said contact signal from said contact detection device and based on said gap stored in said gap memory means, said first and second feed means in accordance with a predetermined cycle so as to true said grinding wheel, said feed control device including:

first feed control means operable when said edge of said truing tool is in alignment with said grinding surface of said grinding wheel upon completion of a previous truing operation, for moving said truing head relative to said

grinding wheel in said second direction until said contact signal is generated;

gap detection means for detecting a distance through which said truing head is moved relative to said grinding wheel under the control of said first feed control means; and

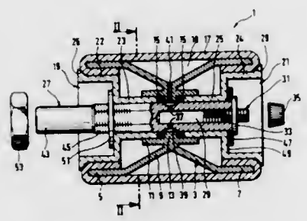
data setting means for storing said distance detected by said gap detection means in said gap memory means so as to renew said gap stored therein for use in positioning said truing tool relative to said grinding wheel in a subsequent truing operation.

4,897,968

INFLATABLE GRINDING ROLLER

Heinz Hutt, 472 Place Closse, Ile Bizard, Quebec, Canada H9C 1Y6

Filed Sep. 26, 1988, Ser. No. 249,493
Int. Cl.[4] B24D *9/02*
U.S. Cl. 51—373 **14 Claims**



1. An inflatable roller for use to mount a cylindrical abrasive element, said roller comprising:

a hollow cylindrical sleeve support having a concave center section including a bore section provided, intermediate its ends, with an inner radial shoulder dividing said bore section into two angular corners;

a packing ring in each of said corners;

an elastic sleeve fitted over said support; said sleeve having ends inturned over the ends of said support; said sleeve and said concave section defining together an inflatable air chamber;

a pair of cup-like compression members fitted into the ends of said support and constructed for pressing said sleeve inturned ends against said support; said members being formed, at their centers, with axial packing glands entering into said bore section and pressing said packing rings against said radial shoulder;

means for holding said compression members in a pressing position against the inturned ends of the sleeve and against the packing rings;

a mandrel extending through said packing glands, said packing rings and said radial shoulder; said mandrel having a blind bore opening at one end and an air inflation check-valve mounted at said one end, and

wherein said mandrel, said radial shoulder and said concave section are formed with communicating passages for joining together said blind bore and said air chamber.

4,897,969

METHOD AND MEANS FOR TEXTURIZING OBJECTS

Milo G. Balhorn, Waterloo, Iowa, assignor to Masonry Processes, Inc., Atlanta, Ga.

Filed May 2, 1988, Ser. No. 189,107
Int. Cl.[4] B24C *3/12*
U.S. Cl. 51—418 **15 Claims**

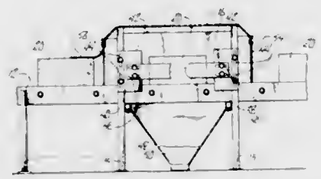
6. A sandblasting unit for texturizing a surface of an object comprising:

a frame;

a housing mounted on the frame;

a nozzle mounted within the housing and being operatively connected to a source of sandblasting particles, the nozzle being adapted to emit a spray of sandblasting particles, the spray having an area of coverage and being concentrated in a central locale within the coverage area;

means for moving the object through the housing and thereby exposing the surface of the object to the spray; and



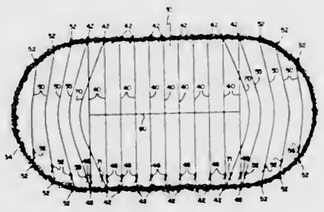
means located between the nozzle and the object for blocking the spray in the central locale so as to eliminate the concentration of spray therein allowing only a peripheral portion of the spray to reach the surface of said object and thereby produce uniform texturizing of the surface of the object said blocking means comprising an elongated member extending into said housing and having an imperforate exposed end and a longitudinal axis of symmetry which intersects the central locale.

4,897,970

METHOD OF COVERING AND SECURING MATERIAL

Paul B. Double; Frederick W. Orr, both of Winona, Minn., and Robert E. Dotterwick, Fountain City, Wis., assignors to Canamer International, Inc., Winona, Minn.

Filed Aug. 18, 1988, Ser. No. 234,016
Int. Cl.[4] E04D *1/34*
U.S. Cl. 52—4 **11 Claims**



1. A method of covering and securing to the ground a generally windrow-shaped stack of material which has a longitudinal crest having first and second ends, a base having a perimeter defined by a pair of generally parallel side edges and a pair of generally semi-circularly shaped end edges, longitudinal sides sloping downwardly and laterally outwardly from the crest toward the side edges of the base, and first and second ends sloping downwardly and radially outwardly from each respective end of the crest toward the end edges of the base, the method comprising the steps of:

(a) covering the entire surface of the stack with a flexible cover sheet having a rim portion;

(b) extending the rim portion of the cover sheet along the ground surface surrounding the stack of material;

(c) laying ballast material over substantially the entire length of the rim portion of the cover sheet to force the rim portion into generally abutting engagement with the ground to prevent the influx of wind and moisture;

(d) establishing a plurality of side anchors with respect to the ground, with the side anchors longitudinally spaced generally uniformly along the side edges of the base and aligned in opposed lateral pairs on opposite sides of the stack of material;

(e) laying a plurality of adjustable length, generally flat side straps laterally over the sides of the stack of material, in generally parallel relation and across the crest thereof;

(f) securing the ends of each flat side strap to the side anchors of a respective one of each of the opposed pairs of side anchors;

(g) shortening the length of each flat side strap to tighten the flat side strap down onto the cover sheet over the sides and crest of the stack of material;

(h) establishing a plurality of end anchors with respect to the ground with the end anchors longitudinally spaced generally uniformly along the end edges of the base and aligned in opposed lateral pairs on opposite sides of the ends of the stack of material;

(i) laying a plurality of adjustable length, generally flat first end straps generally laterally over the ends of the stack of material;

(j) securing the ends of each flat first end strap to the end anchors of a respective one of each of the opposed pairs of end anchors;

(k) shortening the length of each flat first end strap to tighten the flat first end strap down onto the cover sheet over the ends of the stack of material;

(l) laying at least one adjustable length, generally flat second end strap generally laterally over each end of the stack of material adjacent its respective end of the crest of the stack of material;

(m) securing the ends of each flat second end strap to the side anchors of the first opposed pair of side anchors along each side edge of the base; and

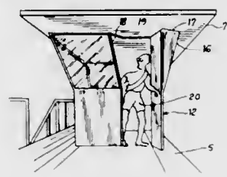
(n) shortening the length of each flat second end strap to tighten the flat second end strap down onto the cover sheet over the end of the stack of material adjacent its respective end of the crest of the stack of material.

4,897,972

OBSERVATION TOWER

David J. Stollery, 3203 Bern Ct., Laguna Beach, Calif. 92651

Filed May 22, 1989, Ser. No. 355,504
Int. Cl.[4] E04H *1/12*
U.S. Cl. 52—94 **14 Claims**



1. A tower-like enclosure having at least one nonvertical peripheral window with a substantially transparent pane, and at least one door and a generally quadrangular door jamb structure adjacent to one of said window panes, the improvement comprising:

a first door jamb section attached parallel and adjacent to a nonvertical edge of said one window pane;

an opposing generally vertical door jamb section attached to said enclosure.

a first door panel section generally in a vertical plane;

a second generally vertical door panel section attached to and angled away from the plane of said first door panel section and generally extending from said first door panel section to said first door jamb section when said door is closed; and

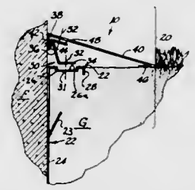
means for hingably attaching a vertical edge of said first door panel section to said opposing door jamb.

4,897,973

MODULAR SUN BLOCK SYSTEM

William A. Foster, Jr., Baltimore, Md., and Vincent S. Pedrick, 1637 Riverwood Rd., Baltimore, Md. 21221, assignors to Vincent S. Pedrick, Baltimore, Md.

Filed Feb. 16, 1988, Ser. No. 155,859
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—102 **6 Claims**



1. Structure for inhibiting vegetative growth on the ground adjacent a foundation comprising the combination of a plurality of angle pieces for anchoring the structure to the ground adjacent the foundation, each of said angle pieces having a short angle arm and a long angle arm with the short angle arm extending generally perpendicular to said long angle arm and having stiffening means located thereon, an elongated tread having a flange with a hook portion located thereon and means for detachably affixing the plurality of angle pieces to the elongated tread in spaced relation to each other on assembly, said means for detachably affixing the plurality of angle pieces to the elongated tread including a plurality of spring clips each having a portion thereof shaped to be located on one of said angle pieces and means for securing each spring clip to one of said angle pieces, each said spring clip having at least one hook thereon oriented and located for springing into engagement in

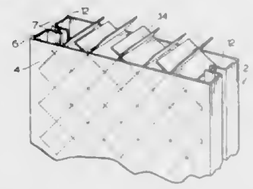
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4,897,971

WASHROOM PARTITION

Gordon G. Durston, Belmont, Canada, assignor to GSW Inc., Toronto, Canada

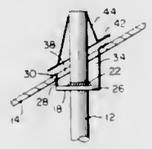
Filed Oct. 24, 1988, Ser. No. 261,313
Int. Cl.[4] E04C *2/40*
U.S. Cl. 52—35 **14 Claims**



1. A fabricated metal toilet stall panel comprising opposed metal panel sheets, each panel sheet has a flat face bordered by flanged edges which cooperate to define an essentially hollow core, said panels at said flanged edges including an inwardly directed sealing flange generally parallel to the respective flat face and in abutting opposed relation with the like sealing flange of the opposed panel sheet, said metal panels being secured to each other by an adhesive seal between said sealing flanges.

assembly with an adjacently located hook portion located on the flange of said elongated tread.

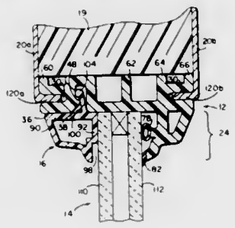
4,897,974
VENT PIPE ROOF MOUNT
Byron D. Lane, Hwy. 2, Box 257, Sawyer, N. Dak. 58781
Filed Jan. 4, 1989, Ser. No. 293,354
Int. Cl.[4] E04B 7/00
U.S. Cl. 52—199 7 Claims



1. A roof mount for supporting a vertically disposed tubular member from an inclined roof in which the tubular member extends through an opening in the roof that is larger than the tubular member and includes an upper edge and a lower edge, said roof mount comprising a substantially flat plate having a central opening through which the tubular member extends, said central opening including a plurality of inwardly extending tabs attached to the plate around the periphery of the opening and extending radially inwardly, said tabs being constructed of sheet material having substantial rigidity but sufficient flexibility and resiliency to be deflected by insertion of the tubular member through the opening for frictionally engaging and supporting the tubular member from the plate, and means at opposite edge portions of the plate to support the plate from the upper and lower edges of the opening through the roof with the plate being substantially horizontally disposed and the central opening in alignment with the opening in the roof thereby positioning the tubular member in the opening in the roof in spaced relatioo to the periphery of the opening in the roof, said means supporting the plate from the lower edge of the opening in the roof including an upwardly extending flange integral with the edge of the plate in alignment with the lower edge of the opening in the roof with the flange extending upwardly through the opening in contact with the lower edge of the opening and a laterally extending flange at the upper end of the upwardly extending flange with the laterally extending flange extending onto and engaging the top surface of the roof adjacent the lower edge of the opening and fastening means extending through the flange resting against the upper surface of the roof for securing the roof mount to the lower edge of the opening in the roof.

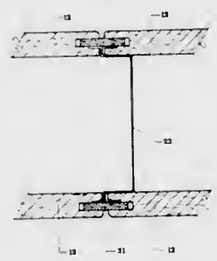
4,897,975
INTEGRAL DOOR LIGHT WITH GLAZING STOP
Kert E. Artwick, Holland; Steven R. Wilkening, Wyoming, both of Mich., and Leslie L. Pallin, Prescott, Wis., assignors to ODL, Incorporated, Zeeland, Mich.
Filed Oct. 23, 1987, Ser. No. 113,739
Int. Cl.[4] E06B 3/58
U.S. Cl. 52—208 13 Claims

1. A door light comprising:
a rectangular frame including a plurality of one piece extruded members each being generally identical in cross section, each of said frame members including a body portion having an interfit means for interfitting with portions of a door to support said frame within the door, said body portion including a channel having a bottom, said channel being at least as deep as it is wide, each of said frame members further including a resiliently flexible seal portion extruded with said body potion, said seal portion having a durometer hardness lower than the durometer hardness of said body portion;
a glazing panel abutting said seal portion to seal said glazing panel about substantially the entire periphery of said frame; and
a plurality of extruded glazing retainers snap-pressed within said frame, one glazing retainer being provided for each of said frame members, each of said glazing retainers including a body portion abutting said glazing panel to entrap said glazing panel in a position abutting said seal portion, each of said glazing retainers further including bias means



for biasing said glazing retainer against said glazing panel to bias said glazing panel against said frame seal portion, said bias means including a spring flange extending from said body portion into said channel and terminating in an edge, said spring flange being longer than it is thick, said channel being wider than said flange is thick whereby said flange can move laterally within said channel, said bias means including a retainer means at said flange edge for retaining said spring flange within said channel, said spring flange being pivotal about said retaining means, whereby said flange can move within said channel to move said retainer body toward said glazing panel.

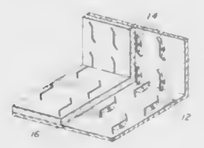
4,897,976
BUILDING ENCLOSURE ASSEMBLIES
Mark F. Williams, and Barbara L. Williams, both of 945 Tennis Ave., Maple Glen, Pa. 19002
Division of Ser. No. 206,885, Jun. 15, 1988, now Defensive Publication No. 4,833,849. This application Dec. 16, 1988, Ser. No. 285,724
Int. Cl.[4] E04B 2/00
U.S. Cl. 52—281 3 Claims



1. A hollow, floor-to-ceiling wall partition comprising two opposite and parallel walls constructed with a building enclosure assembly comprising, in combination,
(a) a plurality of gypsum-based floor, wall or ceiling panel members with a shouldered groove of stepped cross-sectional profile longitudinally rabbeted into at least one edge of said panel member, said shouldered groove comprising two distinct groove sections of distinct depths and widths,

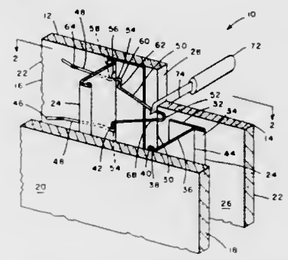
wherein a first groove section is of shallower depth and narrower width than a second groove section which is contiguous with the first groove section;
(b) a generally channel-shaped support means having a web portion and side portions with a substantially L-shaped flange member comprising a leg and a foot, extending by said leg from a side portion of said support means and terminating in the foot which is substantially perpendicularly disposed relative to the web portion of the support means; and
(c) a fire-resistant spline;
where adjacent pairs of said panel members are articulated by the inter-engagement of said L-shaped flange member and said spline with said shouldered grooves in the edges of adjacent panel members, the foot of said L-shaped flange member nesting into said first groove section and being retained therein by the nesting of a portion of the spline into said second groove section, whereby said spline completely spans over the foot of said L-shaped flange member, and a second panel member is articulated adjacent said first member by the nesting of the remaining portion of said spline into the second groove section in the edge of said second panel member wherein said walls are built upon a floor track within which is contained utility service wiring, comprising, in combination, spaced sections of substantially U-shaped, upwardly opened floor channel having a web portion and side portions with side flanges extending perpendicularly from said side portions, and support means having a substantially L-shaped flange member extending from each said portion of said support means, where said support means is nested into the upwardly opened floor channel sections and carried by the side flanges of the floor channel sections, whereby the feet of the L-shaped flange members of the support means project upwardly and perpendicular to the floor, and engage a first groove section formed in a bottom edge of a panel member.

4,897,977
S-BAR REFRACTORY ANCHORS WITH ELLIPTICAL TAB
Gary L. Page, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.
Filed Nov. 21, 1988, Ser. No. 274,513
Int. Cl.[4] E04B 1/24; E04C 2/04
U.S. Cl. 52—378 2 Claims



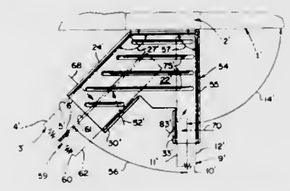
1. In a metal refractory anchor formed from a sheet of metal and having a bottom edge, a body section extending from said bottom edge to a top section, an arm extending from each end of said top section such that the top of each of said arms is the same height above the plane of said bottom edge as is the top edge of said top section, said extending arms being bent in opposite directions to the approximate shape of the letter S, and at least one projecting tab formed in the body section thereof, the improvement wherein:
said projecting tap is formed in a generally elliptical shape with two long sides and two ends wherein one of said long sides and both ends of said tab extend from said body section and a portion of the other of said long sides of said tab form a juncture of said tab and said body portion, whereby the portion of said tab connected to said body section has a length less than the end-to-end dimension of said tab.

4,897,978
PANEL EDGE ALIGNMENT CLIP
Robert J. Meschetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.
Filed Nov. 21, 1988, Ser. No. 273,524
Int. Cl.[4] E04F 13/04
U.S. Cl. 52—363 20 Claims



1. A panel edge alignment clip comprising a single length of relatively rigid wire formed to include two somewhat parallel legs engageable in holes in a rigid building framing element, which said framing element has a pair of spaced apart small holes of a size larger than said wire's size, and a head whereat said two legs are adjoined, each said leg having a foot end portion and a head end portion and therebetween an intermediate portion, said intermediate portions of said two legs all lying within a single general plane, at least one of said legs having an intermediate bend within said intermediate portion of sufficient magnitude to engage the periphery of one of said pair of holes when said legs are extended through said spaced apart small holes, and to thereby cause rotation of the clip head around said intermediate bend when said head is caused to move within said general plane of said clip.

4,897,979
MULTIPLE WOOD TRUSS CONNECTION
Karen W. Colonias, Lafayette, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.
Division of Ser. No. 227,727, Aug. 3, 1988. This application Jun. 30, 1989, Ser. No. 374,431
Int. Cl.[4] E04B 1/38
U.S. Cl. 52—643 3 Claims



1. In a multiple wood truss connection including:
a. a carrying wood truss girder having a vertical wood king post member;
b. a first carried wood hip truss having a wood bottom chord member having first and second sides and a bottom edge and said first carried wood hip truss is disposed at an angle to said carrying wood truss girder of less than 90°;
c. a second carried wood hip truss having a wood bottom chord member having first and second sides and a bottom edge and said second carried wood hip truss is disposed in side by side relation with said first carried wood hip truss;
d. a carried wood jack truss having a wood bottom chord member having first and second sides and a bottom edge

and said carried wood jack truss is disposed at an angle to said carrying wood truss girder of approximately 90°;

e. the improvement including a metal connector comprising:

(1) a common seat member;

(2) a hip seat member extending from said common seat member for receiving said bottom edges of said bottom chords of said first and second carried wood hip trusses;

(3) a hip sidewall connected to and disposed at an angle of generally 90° to said common seat member and said hip seat member for receiving said first side of said wood bottom chord of said first carried wood hip truss;

(4) a first back member connected to and disposed at an angle to said hip side wall along a first back bend line, and said first back member is formed with a plurality of fastener holes therethrough;

(5) a hip tab connected to and disposed at an angle of generally 90° to said hip seat member and laterally disposed from said hip sidewall for receiving said second side of said wood bottom chord of said second carried hip truss;

(6) a jack seat extending from said common seat member for receiving said bottom edge of said bottom chord of said carried wood jack truss;

(7) a jack tab connected to and disposed at an angle of generally 90° to said jack seat for receiving said first side of said bottom chord of said carried wood jack truss;

(8) a jack sidewall connected to and disposed at an angle of generally 90° to said common seat member and said jack seat member, and disposed at an angle of generally less than 90° to said hip sidewall, for receiving said second side of said wood bottom chord of said carried wood jack truss;

(9) a second back member connected to and disposed at an angle to said jack side wall along a second back bend line, and said second back member is formed with a plurality of fastener holes, at least one of which is in registration with one of said fastener holes in said first back member, and said second back member is disposed in overlapped registration with said first back member;

f. fastener means dimensioned for insertion through said fastener holes in said first and second back members and into said vertical wood king post member of said carrying wood truss girder;

g. hip sidewall fastener means joining said hip sidewall of said metal connector and said wood bottom chord of said first carried wood hip truss;

h. hip tab fastener means joining said hip tab to said wood bottom chord of said second carried wood hip truss;

i. jack tab fastener means joining said jack tab to said bottom wood chord of said carried wood jack truss; and

j. jack sidewall fastener means joining said jack sidewall to said wood bottom chord of said carried wood jack truss.

4,897,980

APPARATUS FOR FORMING A BULK PACKAGE

Joseph E. Geyser, Brentwood, and Nestor Kozbur, Antioch, both of Calif., assignors to James River Corporation, Oakland, Calif.

Filed Jun. 5, 1989, Ser. No. 360,484

Int. Cl.⁴ B65B *11/00, 35/50, 61/20*

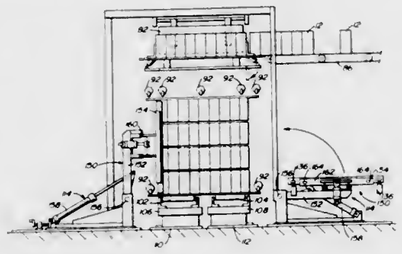
U.S. Cl. 53—128 **20 Claims**

1. Apparatus for forming a bulk package, said bulk package including objects stacked in layers with each layer comprising a plurality of said objects disposed in rows, a bottom tray disposed under the lower-most layer, a top cap disposed over the upper-most layer, and a plurality of elongated post members extending between the bottom tray and the top cap, said apparatus comprising, in combination:

bottom tray placement means for placing the bottom tray on a support;

stacking means for stacking said layers of objects on said bottom tray after placement of said bottom tray on said support;

top cap positioning means for positioning said top cap over the upper-most layer of objects after said stacking means has stacked said layers of objects; an



post member positioning means for positioning post members at preselected spaced locations between said bottom tray and top cap.

4,897,981

METHOD OF PACKAGING INTRAOCULAR LENSES AND CONTACT LENSES

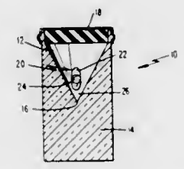
Robert E. Beck, Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Dec. 24, 1986, Ser. No. 946,346

The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.⁴ B65D *81/22*

U.S. Cl. 53—431 **5 Claims**



1. A method of packaging intraocular lenses and contact lenses, which comprises:

placing a lens and a physiologically acceptable fluid in a lens compartment of a container, said compartment having a conical configuration with its apex oriented downwardly towards the bottom of the container so that the lens assumes a substantially vertical position when placed therein, and sealing the container.

4,897,982

PLASTIC LINED PACKAGING

Victor S. Day, Spofford, N.H., and David A. Collette, Greenfield, Mass., assignors to Fulflex International Co., Limerick, Ireland

Filed Oct. 17, 1988, Ser. No. 258,563

Int. Cl.⁴ B65D *85/16;* **B65B** *1/04*

U.S. Cl. 53—449 **4 Claims**

1. A method for discharging elastic material from a container at high speed without tugging or trapping of the elastic material, the method comprising:

providing a container sized and shaped for the transport and discharge of elastic material;

placing a bag liner loosely within the container, the liner composed of a plastic material which reduces friction between the elastic material and the sidewalls while providing air pockets for even packing along the sidewalls;



filling the lined container with the elastic material; and, pulling the elastic material out of the lined container.

with said facing and securing said projecting area against a portion of said tubular-shaped member at said lower surface, said blank being free of cutouts, said facing being reopenable after said transverse seal.

4,897,984

COIN RECEIVING AND WRAPPING APPARATUS

Hideshi Sentoku, and Takayoshi Asaoka, both of Tokyo, Japan, assignors to Laurel Bank Machines Co. Ltd., Tokyo, Japan

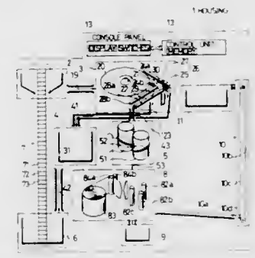
Filed Jun. 27, 1988, Ser. No. 211,577

Claims priority, application Japan, Jun. 30, 1987, 62-163460; Jul. 14, 1987, 62-175617

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.⁴ B65B *11/04, 57/20*

U.S. Cl. 53—501 **4 Claims**



1. A coin receiving and wrapping apparatus comprising:

a housing including

upper hopper means for receiving coins,

discriminating means for discriminating denominations and genuineness of coins received via said upper hopper means and counting the value of genuine received coins,

sorting means for sorting coins having a designated denomination for wrapping,

coin stacking means for receiving coins for wrapping from said sorting means and stacking the coins to make stacks of a predetermined number of coins,

coin wrapping means for receiving said stacks of coins from said coin stacking means and wrapping said stacks with a film material to make cylindrically-wrapped stacks of coins,

wrapped-coin storage means for storing wrapped stacks of coins,

temporary storage means detachably mounted on said housing for temporarily holding the coins sorted by said sorting means and determined to be coins other than those to be wrapped,

safe means for receiving coins from said temporary storage means and storing them therein, said safe means being disposed in said housing and being inaccessible from outside of said housing,

transfer means for transferring coins stored in said safe means to said upper hopper means, and

denomination setting means for setting said sorting means so as to designate a denomination of coins to be delivered to said coin stacking means for wrapping.

4,897,983

WRAPPER FOR TUBULAR PRODUCTS, ESPECIALLY CHOCOLATE BARS AND METHOD OF MANUFACTURING IT

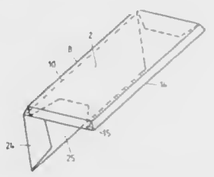
Wilhelm Hogeakamp, Hanover, and Gert Wostbrock, Garbsen, both of Fed. Rep. of Germany, assignors to Otto Hänsel GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,073

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719610

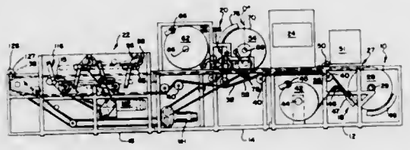
Int. Cl.⁴ B65B *7/08, 11/02*

U.S. Cl. 53—461 **6 Claims**



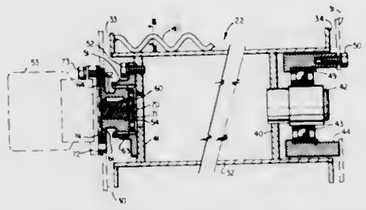
1. A method of manufacturing a wrapper for tabular products, particularly chocolate bars, comprising the steps: wrapping a one-piece rectangular-shaped blank asymmetrically around a bar to produce a facing and a tube-shaped member of wrapping material, forming a longitudinal sealing seam adjacent to one side of said bar and thereby forming an area of said blank projecting beyond said longitudinal sealing seam; wrapping said area against said lower surface of said bar and resting said area against said bar as part of said tube-shaped member; extending said tube-shaped member beyond the ends of said bar including said longitudinal forming bellows at said extended ends which encompass said longitudinal sealing seam as part of said tube-shaped member and forming inner flaps in said projecting area sealing seam; sealing tight said tube-shaped member at both said extended ends by a transverse seal extending over said projecting area and said bellows; opening said tube-shaped member after said sealing step by unfolding said projecting area from said lower surface and folding areas of said tube-shaped member that include said transverse seal and said bellows onto the lower surface of said bar; and refolding thereafter said projecting area back against said lower surface again in form of said facing to cover up areas of said bellows

4,897,985
CONTINUOUS MOTION PACKAGE FORMING MACHINE
Raymond G. Buchko, Appleton, and John A. Halgren, Neenah, both of Wis., assignors to Curwood, Inc., Appleton, Wis.
Filed Oct. 6, 1988, Ser. No. 254,412
Int. Cl.[4] B65B 9/02, 65/02
U.S. Cl. 53—559 10 Claims



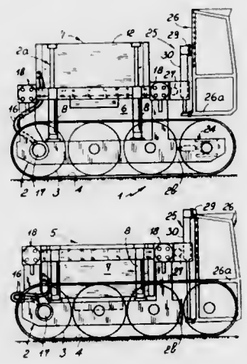
1. A continuous motion procesing machine comprising:
at least one tooling carriage;
drive linkage including a rotatable power input shaft, said linkage being connected to said carriage to move said carriage in a repetitive cyclic path;
processing tooling carried by said carriage adapted to perform processing steps in a processing zone during an increment of said cycle of carriage movement;
means for supplying at least one web to said processing zone at a constant rate of advancement including a first motor having a rotatable output shaft positionable in a plurality of positions during a predetermined distance of web advancement;
control means connected to said power input shaft to move said carriage through said repetitive cyclic path in a predetermined period of time;
said control means further including means to sense specific positions of said shaft of said first motor and to vary speed of rotation of said power input shaft during said predetermined time period in relation to the position of said shaft of said first motor during said predetermined distance of web advancement.

4,897,986
CANE HARVESTER FEED ROLL MOUNTING APPARATUS
Malcolm J. Baker; John G. Williams, and Graham G. Yates, all of Bundaberg, Australia, assignors to Austoft Industries, Ltd., Australia
Continuation of Ser. No. 765,214, Aug. 13, 1985, abandoned.
This application Mar. 23, 1988, Ser. No. 175,686
Claims priority, application Australia, Aug. 13, 1984, PG6527; Aug. 13, 1984, PG6526; Aug. 13, 1984, PG6528
Int. Cl.[4] A01D 45/10
U.S. Cl. 56—13.9 5 Claims



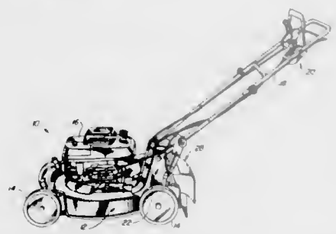
1. In a cane harvester, a feed roller rotatably mounted between two oppositely located frame sections of the harvester by opposed mounting connections, the improvement comprising at least one of the mounting connections comprising a splined adaptor plate mounted to one end of the feed roller about the longitudinal axes thereof and within the transverse width between said frame sections, a motor operable to power said feed roller, a shaft extending from the motor, a second adaptor plate having an opening therethrough and mounted on the outside of one of said frame sections of the harvester about the longitudinal axes of said feed roller with the motor being removably mounted to said second adaptor plate, and pinion means mounted on the shaft, said pinion means having a first end portion removably engaged with the splined adaptor plate and an opposite end portion closely received in the opening in the second adaptor plate, the pinion means being rotatable with the shaft relative to the second adaptor plate and selectively withdrawable through the opening in the second adaptor plate.

4,897,987
MULTIPURPOSE AND SELF-MOVING ARGICULTURAL MACHINE
Pier L. Spalla, Via Santa Maria, 29, 1-15032 Borgo San Martino (Alessandria), Italy
Filed Jun. 16, 1989, Ser. No. 367,089
Claims priority, application Italy, Jun. 17, 1988, 21002 A/88
Int. Cl.[4] A01C 23/00
U.S. Cl. 56—16.7 15 Claims



1. Multipurpose and self-moving agricultural machine, comprising:
mobile bearing members (3, 4), defining a direction of movement of said machine,
a frame (2) borne by said mobile bearing members (3, 4) and having a transversal direction, extending transversally to said direction of movement, and a longitudinal direction perpendicular to said transversal direction,
a main engine (7) borne by said frame (2) and acting at least on said mobile bearing members (3, 4),
a plurality of engaging means (31*a*, 31*b*) provided on that frame (2) and suitable to engage operative structures for agricultural works,
and an operation and driving place (26) borne by said frame (2);
characterized in that said frame (2) includes engagement means (2*a*) suitable to bear said main engine (7) alternatively in an upper position, said upper position being substantially above said frame (2), and in a lower position, said lower position being substantially beside said mobile bearing members (3, 4),
driving members (16) being provided between said main engine (7) and said mobile bearing members (3, 4), said driving members being adaptable for both said upper and lower positions of said main engine (7).

4,897,988
LAWN MOWER DISCHARGE OPENING COVER AND DEFLECTOR
Kenneth D. Schweitz, Oconomowoc, and Dean W. Benter, Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.
Filed Feb. 10, 1989, Ser. No. 310,807
Int. Cl.[4] A01D 34/63, 34/70
U.S. Cl. 56—202 21 Claims



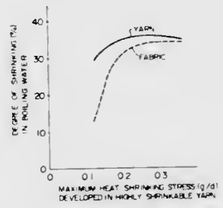
1. In a mower usable for cutting material such as grass, the mower having a housing and a material discharge duct opening in the rear of the mower housing, the improvement comprising:
a deflector carried on the mower, for receiving material exiting rearwardly from said duct and re-directing it to the side of the mower, the deflector adapted to move between
a first position spaced from said duct and
a second position covering said duct;
the deflector being comprised of adjoining first and second generally flat material directing surfaces
the first surface sloping downwardly and to the side
and the second surface sloping rearwardly and to the side.

4,897,989
METHOD TO PRODUCE THREE-PLY YARN AND FABRIC MADE THEREFROM
Coy J. Gray, Greenwood, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Division of Ser. No. 121,697, Nov. 16, 1987, Pat. No. 4,848,413.
This application Oct. 14, 1988, Ser. No. 257,610
Int. Cl.[4] D02G 1/20, 1/18, 3/04, 3/38
U.S. Cl. 57—239 2 Claims



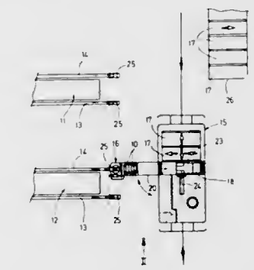
1. The method of producing a three-ply yarn comprising the steps of: supplying a pair of partially oriented synthetic filament yarns, drawing the pair of yarns, supplying the pair of drawn yarns along with a third false twist textured yarn into the air jet, supplying air under pressure into said air jet, commingling the pair of drawn yarns and the false twisted yarn in the air jet and taking up the commingled yarn.

4,897,990
HIGHLY SHRINKABLE SUBSTANTIALLY ACRYLIC FILAMENT YARN
Makoto Nishimura, 2219, Omori-5-chome, Moriyama-ku, Nagoya; Takashi Nonaka, 1012, Kanare-1-chome, Meito-ku, Nagoya; Isao Uenishi, Taun Ishiodai 122-7, 2, Ishiodai-1-chome, Kasugai-shi, and Tamotsu Goto, 4-1-607-103, Iwanaridai-8-chome, Kasugai-shi, all of Japan
Filed Aug. 22, 1988, Ser. No. 234,673
Claims priority, application Japan, Aug. 25, 1987, 62-210814
Int. Cl.[4] D02G 3/02
U.S. Cl. 57—247 8 Claims



1. A highly shrinkable substantially acrylic filament yarn which exhibits a degree of shrinking of at least 20% in boiling water, a maximum heat shrinking stress of at least 0.15 g/d in a dry heating atmosphere, and a Young's modulus of at least 280 Kg/mm^2 after free shrinking treatment in boiling water.

4,897,991
METHOD AND APPARATUS FOR AUTOMATIC ORDERLY REMOVAL AND COLLECTION OF FULLY-SPUN COPS FROM TEXTILE RING SPINNING MACHINES
Joachim Rohner, deceased, late of Mönchengladbach (by Jutta Rohner, heir); Manfred Langen, Mönchengladbach, and Gregor Gebald, Korschenbroich-Pesch, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH and Innovatex Unternehemensberatung GmbH, both of, Fed. Rep. of Germany
Filed Oct. 28, 1987, Ser. No. 114,874
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636654
Int. Cl.[4] D01H 9/18, 9/02
U.S. Cl. 57—281 12 Claims



1. A method for automatically removing and collecting in an orderly manner fully-spun cops from a plurality of textile ring spinning machines, each ring spinning machine being of the type wherein cops are conveyed after doffing by transport means longitudinally along the ring spinning machine to one longitudinal end thereof for collection, said method comprising the steps of providing a movable cart having at least one

removable container adapted for orderly arrangement interiorly therein of a plurality of fully-spun cops, automatically moving said cart to the transport means at the one longitudinal end of each ring spinning machine following a doffing operation thereon, receiving the doffed cops by said cart from said transport means, automatically delivering the received cops to a cop depositing location on said cart, automatically positioning said container in a cop receiving position with respect to said cop depositing location, and automatically depositing the cops at said cop depositing location in orderly arrangement in said container.

5. Apparatus for automatically receiving and collecting in an orderly manner fully-spun cops from a plurality of textile ring spinning machines, each ring spinning machine being of the type having transport means for conveying cops after doffing longitudinally along the ring spinning machine to one longitudinal end thereof for collection, said apparatus comprising a cart automatically movable to the transport means at the one longitudinal end of each ring spinning machine for receiving the doffed cops therefrom following a doffing operation thereon, said cart including: (a) at least one removable container adapted for orderly arrangement interiorly therein of a plurality of fully-spun cops, (b) associated means for automatically depositing cops into said container, (c) means for automatically positioning said container in a cop receiving position with respect to said cop depositing means, and (d) means for automatically receiving and delivering doffed cops from said transport means of said ring spinning machines to said cop depositing means.

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METHOD AND APPARATUS FOR TRANSPORTING ROVING BOBBINS IN A SPINNING FACTORY

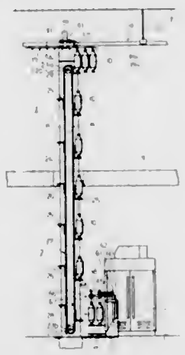
Takashi Kogiso, Mizunami, and Yoshio Kurachi, Aichi, both of Japan, assignors to Howa Machinery, Ltd., Aichi, Japan

Filed Aug. 26, 1988, Ser. No. 237,135

Claims priority, application Japan, Aug. 29, 1987, 62-216049

Int. Cl.⁴ D01H *9/18*

U.S. Cl. 57—281 **15 Claims**



1. A method for transporting a plurality of roving bobbins between a floor at which a plurality of roving frames are installed and places for carrying out a roving bobbin exchanging operation before ring spinning frames installed on another floor, said method being applied in a spinning factory wherein roving frames and ring spinning frames are installed on different floors respectively, and bobbin carriages provided with a plurality of bobbin hangers can be transported to said places for carrying out said roving bobbin exchanging operation by means of a guide rail system arranged on a ceiling of said floor on which said ring spinning frames are installed, comprising the steps of:

forming a transporting passage for transporting roving bobbins from specified positions on said floor on which said roving frames are installed to corresponding positions for transferring roving bobbins on said guide rail system,

transporting a plurality of full packaged roving bobbins doffed from roving frames from said transferring positions to said places for carrying out said roving bobbin exchanging operation by displacing said bobbin carriages along said guide rail system, after completion of an operation of transferring full packaged roving bobbins doffed from said roving frames, by displacing said full packaged roving bobbins through said transporting passage,

transporting a plurality of empty roving bobbins created by said roving bobbin exchanging operation from a place whereat said operation was carried out to a desired transferring position by displacing said bobbin carriages along said guide rail system, and then transferring said empty roving bobbins from said bobbin hangers of said bobbin carriages carried to said floor on which said roving frames are installed by transporting said empty roving bobbins taken from respective bobbin hangers of said bobbin carriages carried to said transfer position through said transporting passage,

said transportation of said full packaged roving bobbins through said transportation passage comprising sequential stepwise unit lifting operations of lifting a plurality of pairs of full packaged roving bobbins towards corresponding transfer positions on said guide rail system from corresponding specified positions, with a predetermined identical interval (a) between adjacent pairs of full packaged roving bobbins being longer than a length of said roving bobbin, while maintaining a constant axial distance between each pair of full packaged roving bobbins,

said transportation of empty roving bobbins through said transportation passage downwards comprising sequential stepwise unit operations of displacing said empty roving bobbins downwards, with an interval identical to said interval of said upward transportation of full package roving bobbins, with an axial interval of said pair of empty bobbins being identical to said axial interval of said pair of full packaged roving bobbins during said upward transportation of full packaged roving bobbins.

4,897,993

CLEANING DEVICE FOR OPEN END SPINNING ROTOR

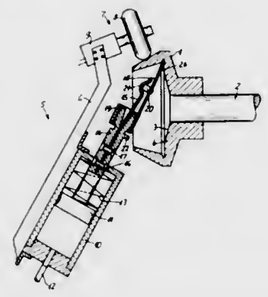
Hans Raasch, and Reinhard Böker, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,356

Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715934

Int. Cl.⁴ D01H *11/00*

U.S. Cl. 57—302 **5 Claims**



1. A cleaning device for removing debris from an open end spring rotor having a fiber collection groove, said cleaning device comprising a scraper component adapted for insertion into the fiber collection groove of the rotor, said scraper component having an end portion bent to extend oppositely to the direction of rotation of the rotor, said end portion presenting a forward edge inclined to the direction of rotation of the rotor, and a holder movable toward and away from the fiber collection groove of the rotor, said holder having a rounded end portion, said scraper component having a tubular foot portion for encircling mounting on said rounded end portion of said holder for movement of said scraper component with said holder toward and away from the fiber collection groove of the rotor and for pivotal movement of said scraper component relative to said holder.

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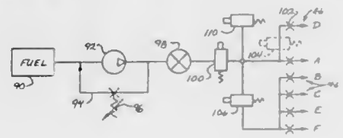
METHOD OF STARTING TURBINE ENGINES

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 124,073, Nov. 23, 1987. This application Oct. 3, 1988, Ser. No. 252,586

Int. Cl.⁴ F02C *7/22, 7/26*

U.S. Cl. 60—39.06 **3 Claims**



1. A method of starting a small turbine engine having a rotary turbine wheel, a rotary compressor coupled to the turbine wheel, an annular combustor provided with a plurality of angularly spaced fuel injectors and characterized by the absence of start injectors comprising the steps of:

(a) initiating rotation of said compressor and said turbine wheel by applying an external angular accelerating force thereto;

(b) at about 5–10% of rated engine speed, providing fuel to a minority of said injectors while continuing the application of said accelerating force;

(c) after ignition of the fuel introduced during step (b), and when the engine reaches 15–25% of rated speed, introducing fuel into said combustor through the remainder of said injectors while maintaining injection through said minority of injectors; and

(d) thereafter modulating fuel flow through all of said injectors to operate said engine in a desired fashion.

4,897,995

LIQUID TURBOJET ENGINE

Raafat H. Guirguis, 5516 Starboard Ct., Fairfax, Va. 22032

Filed Feb. 26, 1988, Ser. No. 161,156

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.⁴ B63H *11/00;* **F02C** *3/30*

U.S. Cl. 60—221 **21 Claims**

1. An engine, comprising:

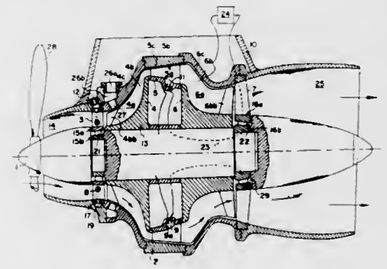
an elongated shaft extending along a longitudinal axis;

a housing mounted about said shaft, said shaft being rotatable relative to said housing about said longitudinal axis;

a conduit, within said housing and fixed to said shaft, having a compression section extending generally radially from said shaft, a combustion section extending generally axially and parallel relative to said shaft and from said compression section at a radial distance from said shaft and an expansion section extending from an end of said combustion section remote from said compression section;

inlet means, extending through said housing, for receiving relatively inert motive liquid from outside said housing and conveying said motive liquid to said conduit to fill said conduit with said relatively inert motive liquid; and

bubble means, adjacent an inlet end of said compression section, for inducing bubbles of combustible gas into said motive liquid in said compression section;



whereby the combustion gas bubbles are compressed during movement through said compression section, are ignited in said combustion section, and pass through said expansion section with said motive liquid.

4,8.. ,996

LOW-LOSS CYCLICALLY-OPERATING PRESSURE-RESPONSIVE BYPASS VALVE FOR FIXED DISPLACEMENT PUMP FLOW CONTROL

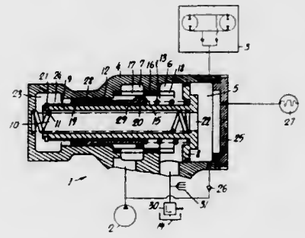
Faust Hagin, Munich, and Stefan Martini, Ulm, both of Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 78,518

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626187; Apr. 14, 1987, 3712716

Int. Cl.⁴ F15B *11/02, 13/02*

U.S. Cl. 60—468 **14 Claims**



1. A system for varying the output flow from a constant rate feed pump with low losses by chopping the output flow into one flow fraction supplied to the load as a power flow and into another flow fraction returned as a pressureless flow characterized in that the load is aperiodically supplied with proportionated amounts of fluid by chopping, the respective amounts of fluid and the chop frequency being inherently controlled in dependence on the instantaneous requirement of the load, said system comprising:

a housing provided with a number of pressure spaces arranged to be acted upon by different flows and with at least one pressureless space,

a piston arranged in a piston space, said piston space being a first of said pressure spaces, said piston including a piston rod secured thereto,

a compression spring arranged in a hole in said piston rod

and adapted to act against the sum of the hydraulic forces acting on the piston,

a spool having opposite end faces, a spring bearing on one end face of the piston and pressure means acting on the other end face of the spool, so as the constitute a system dependent on the relationship between the spring force and the hydraulic force, said piston space being connected on the one hand to a load and on the other hand to the constant rate pump via a check valve, a second pressure space being connected to an oil tank and a third pressure space being connected with the constant rate pump,

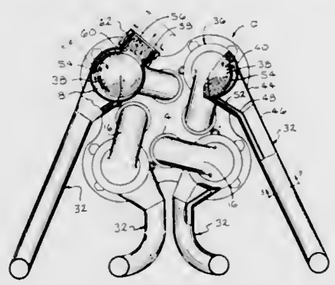
and means for alternately connecting the second and third pressure spaces together and for separating them on attainment of an upper or lower permissible pressure limit.

4,897,997

SHELL AND TUBE HEAT PIPE CONDENSER

Roelf J. Meijer, and Robert P. Verbey, both of Ann Arbor, Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Filed Aug. 19, 1988, Ser. No. 233,732
Int. Cl.[4] F02G *1/04*; F28D *15/02*
U.S. Cl. 60—517 **22 Claims**



1. A heat pipe working fluid conduit assembly for transferring vaporized working fluid from a heat pipe evaporator to a heat exchanger of a Stirling engine and for returning liquid working fluid from said heat exchanger to said evaporator comprising:

a conduit communicating with said evaporator and said heat exchanger for transferring said vaporized working fluid, said conduit having a flared shell joining said heat exchanger whereby the cross-sectional area of said conduit increases as said vaporized working fluid approaches said heat exchanger, and

a duct disposed inside said conduit extending into said flared shell and having an inlet within said flared shell for receiving said liquid working fluid from said heat exchanger and returning said liquid to said evaporator.

4,897,998

TURBO COMPOUND ENGINE

Shigeo Sekiyama; Shigeru Nibongi, and Sadatoshi Mogami, all of Kawasaki, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 264,298
Claims priority, application Japan, Oct. 28, 1987, 62-270327; Oct. 28, 1987, 62-270328
Int. Cl.[4] F02G *5/00*
U.S. Cl. 60—614 **22 Claims**

1. A turbo compound engine adapted for use with a vehicle and controlled by an operator, comprising:

an engine having an output shaft, an intake air passage and an exhaust gas passage;

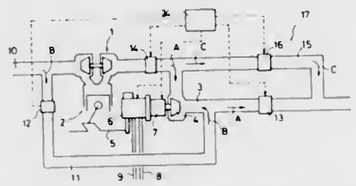
a governor and a control rack therefor;

a rotor disposed in the exhaust gas passage and rotatable in first and second directions, the first direction being the direction the engine output shaft rotates and the second direction being the direction opposite said first direction, the rotor being rotetable in a manner such that the rotor applies energy to the engine when it is rotated in said first direction by the exhaust gas from the engine whereas the rotor applies a brake force against the engine when it is rotated in said second direction by the intake air;

an intermediate member for connecting the rotor with the engine output shaft;

a first bypass line coupled with the intake air passage and joined with the exhaust gas passage downstream of the rotor for allowing the intake air to bypass the engine and reach the rotor;

a second bypass line coupled with the exhaust gas passage upstream of the rotor for allowing exhaust gas from the



engine to bypass the rotor when the rotor changes its direction of rotation from the second to the first direction of rotation and for allowing the intake air introduced through the first bypass line to flow therethrough when the rotor is rotating in the second direction of rotation thereof;

a selector switch operated by the vehicle operator for selecting between the first and second directions of rotations of the rotor;

reversing means for changing the rotation direction of the rotor when the operator operates the selector switch; and

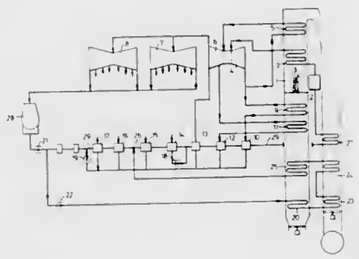
control means for closing the second bypass line for a predetermined period of time when the selector switch is operated to select the first direction of rotation of the rotor and the amount of movement of the control rack of the governor has exceeded a predetermined amount.

4,897,999

STEAM POWER PLANT

John W. Varney, P.O. Box 676, Cornwall, P. E. I., Canada C0A 1H0

Filed Feb. 3, 1989, Ser. No. 305,612
Int. Cl.[4] F01K *7/34*
U.S. Cl. 60—678 **5 Claims**



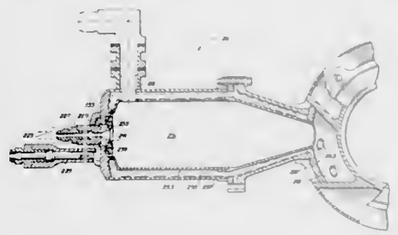
1. In a multi-stage steam power plant, a combustion chamber, a steam generator associated with said combustion chamber, a plurality of steam turbine stages including a first high pressure turbine and a last low pressure turbine, means to apply the steam from said steam generator to said steam turbine stages, steam bleeds from at least some of said stages and a condenser for receiving the steam output from said last low pressure turbine and having a water condensate output, a duct for providing combustion air to said combustion chamber and a flue for extracting combustion gases from said combustion chamber, a first steam to air heat exchanger in said duct for transferring a portion of the heat from the steam from at least one of said steam bleeds to the combustion air in said duct, a first water to gas heat exchanger in said duct upstream of said first steam to air heat exchanger for transferring a portion of the heat from said condensate output to the combustion air in said duct, a second water to gas heat exchanger in said flue for transferring a portion of the heat from said combustion gases to the condensate output from said first water to gas heat exchanger and a third water to gas heat exchanger in said duct downstream of said first water to gas heat exchanger for transferring a portion of the heat from the condensate output from said second water to gas heat exchanger to the combustion air in said duct.

4,898,000

EMERGENCY POWER UNIT

Francis K. Weigand, Torrance; Ronald J. Ness, Corona, and Michael S. Koerner, Harbor City, all of Calif., assignors to Allied-Signal Inc., Morris Townsh., N.J.

Division of Ser. No. 851,198, Apr. 14, 1986, Pat. No. 4,777,793.
This application Aug. 9, 1988, Ser. No. 230,214
Int. Cl.[4] F02C *3/14, 7/22*
U.S. Cl. 60—740 **5 Claims**



1. A combustor for an emergency power unit for aircraft, comprising:

a thermal liner defining a combustion chamber having openings at opposite ends thereof;

a pressure shell enclosing said thermal liner;

an insulator disposed between said thermal liner and said pressure shell, said insulator allowing said thermal liner to obtain a temperature approximating the combustion temperature, while inhibiting heat transfer to said pressure shell whereby said shell operates at a greatly reduced temperature;

means for initiating the combustion process within said combustion chamber; and

an injection head secured to said thermal liner in an arrangement sealing one of said openings of said combustion chamber, said injection head configured and arranged to deliver oxidant and fuel to said combustion chamber,

means for receiving pressurized air attached to said injection head;

means for receiving aviation fuel attached to said injection head;

first air plenum disposed radially around said means for receiving aviation fuel and in open communication with said means for receiving pressurized air such that said first air plenum distributes said pressurized air radially around said means for receiving aviation fuel;

a second air plenum disposed radially around said means for receiving aviation fuel in series with said first air plenum;

a plurality of air flow passages between said first air plenum and said second air plenum;

a second plurality of air flow passages extending through said injection head between said second air plenum and said combustion chamber; and

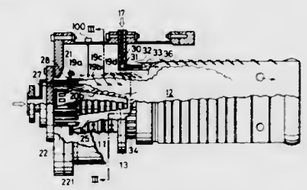
an aviation fuel passageway extending from said means for receiving aviation fuel to said combustion chamber.

4,898,001

GAS TURBINE COMBUSTOR

Michio Kuroda; Isao Sato; Yoji Ishibashi; Yoshihiro Uchiyama; Takashi Ohmori; Shigeyuki Akatsu, all of Hitachi; Fumio Kato, Toukai; Yorihide Segawa, and Nobuyuki Iizuka, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 752,680, Jul. 8, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,646
Claims priority, application Japan, Oct. 7, 1984, 59-143852; Oct. 7, 1984, 59-143851
Int. Cl.[4] F23R *3/34*
U.S. Cl. 60—733 **25 Claims**



1. A gas turbine combustor comprising:

a head combustion chamber disposed along a longitudinal axis for effecting ignition and maintaining flame;

a rear combustion chamber communicating with a downstream side of said head combustion chamber for admitting and combusting premixed fuel and air therein;

a tubular hollow member at an upstream side of said head combustion chamber along the longitudinal axis to define an annular combustion space;

means for producing diffusion combustion around said tubular member during operation of said combustor and vortex mixing between fuel and air, said means consisting of air inlet means at an upstream side of said annular combustion space for introducing air into said annular combustion space and a plurality of first nozzles projecting into said annular combustion apace a distance sufficient, on one hand, to inject fuel into said annular combustion space to produce the diffusion combustion and, on the other hand, to produce the vortex mixing upstream of a fuel injection part of one or more of said nozzles;

a plurality of premixing spaces for admitting fuel and air, said premixing spaces being disposed around the periphery of and at the upstream side of said rear combustion chamber so as to communicate with said rear combustion chamber; and

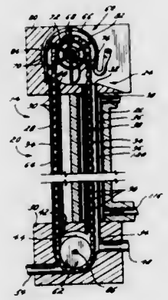
a plurality of second nozzles for injecting fuel into said premixing spaces.

4,898,002

ICE MACHINE

Richard S. Taylor, Joplin, Mo., assignor to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation-in-part of Ser. No. 150,617, Feb. 1, 1988, Pat. No. 4,845,955. This application Jun. 10, 1988, Ser. No. 205,232
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[4] F25C *5/04*
U.S. Cl. 62—71 **21 Claims**



1. In an ice machine including a refrigeration system operable to supply cold refrigerant to a selected location, the improvement comprising:

an upright, elongated, tubular body presenting an exterior surface and an upper end;

means for filling said body with water from a source thereof to a selected level;

an ice harvesting member comprising an endless loop of flexible material and presenting an elongated harvesting portion located within said tubular body and extending substantially along the length thereof;

means for selecting applying the cold refrigerant to said exterior surface of said tubular body in order to freeze the water contained therein to form a column of ice frozen to and thereby attached to said harvesting portion; and

an ice harvesting mechanism including means coupled with said harvesting member for withdrawing said harvesting portion and thereby said column of ice attached thereto through said upper end, said withdrawing means including pulley means rotatably mounted in the vicinity of said upper end coupled with said harvesting member for rotation of said member around the path defined by said loop for withdrawing said harvesting portion from said tubular body, and said pulley means presenting a peripheral surface including a plurality of outwardly extending prongs for breaking said column of ice, said pulley means being rotatable about an axis of rotation, each of said prongs including respective outwardly extending extension pieces coupled with the distal ends thereof, said extension pieces extending generally parallel to said axis of rotation.

4,898,003

AUTOMOBILE AIR CONDITIONER

Toru Ichikawa, Kusatsu; Shuichi Kodama; Noboo Kagoroku, both of Otsu; Shotaro Ito, Kurita, and Shuichi Honda, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

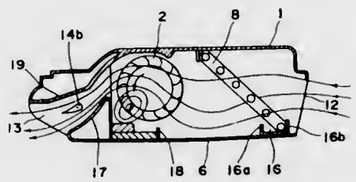
Filed Oct. 31, 1988, Ser. No. 264,884
Claims priority, application Japan, Oct. 30, 1987, 62-276104; Oct. 30, 1987, 62-276105; Dec. 24, 1987, 62-328543
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—244 **8 Claims**

6. An automobile air conditioner which comprises:

a generally elongated casing having air intake and outlet grilles defined along the longer opposite sides thereof;

a generally elongated evaporator supported in tilted fashion within the casing and so curved as to follow the curvature of the casing;

a pair of cross-flow fans accommodated within the casing in end-to-end fashion so as to extend generally parallel to the direction of elongation of the casing and positioned between the evaporator and the air outlet grille; and



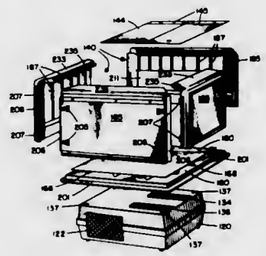
a drive motor for driving each of the cross-flow fans, said casing being shaped and curved so as to have a portion intermediate the length thereof raised to a levl higher than the level of the opposite ends of the casing and, at the same time, the evaporator supported within the casing being so shaped and so curved as to follow the curvature of the casing, said two drive motors being positioned intermediate the length of the casing and drivingly coupled with the cross-flow fans positioned laterally of the drive motors.

4,898,004

IN-STORE REFRIGERATED DISPLAY SYSTEM

James E. Richardson, 28 Ladder Hill Rd. South, Weston, Conn. 06883

Continuation-in-part of Ser. No. 181,921, Apr. 15, 1988, Pat. No. 4,845,957. This application Apr. 12, 1989, Ser. No. 336,747
Int. Cl.[4] A47F *3/04*
U.S. Cl. 62—255 **20 Claims**



17. A refrigerated display system for perishable items, comprising:

(a) a refrigeration unit comprising a cooling means for cooling fluid, a circulation means for causing said cooled fluid to be circulated through an insulated knock-down storage unit, and at least a first pair of openings in said refrigeration unit for permiting cooled fluid to flow out of said refrigeration unit through a first opening of said first pair and or permitting returning fluid to be received in said refrigeration unit via a second opening of said first pair; and

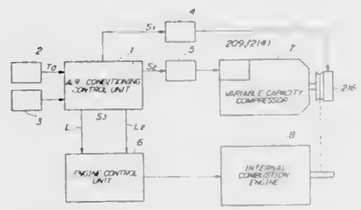
(b) at least a first, a second, and a third pair of insulated side walls, and a first and second plenum, said first plenum corresponding in size to the lengths of said first and second pairs of side walls, and said second plenum corresponding in size to the lengths of said first and third pair of side walls, said third pair of side walls being different in length than said second pair of side walls, said first and second pair of side walls having means for facilitating abutment one to another and together with said first plenum comprising a first said insulated knock-down storage unit, said third pair of side walls having similar said means for facilitating abutment to said second pair of side walls, and said first and third pair of side walls and said second plenum comprising a second said insulated knock-down storage unit, each said insulated knock-down storage unit arranged for being placed together with said refrigeration unit, and for storing said perishable items, and adapted for being knocked down and removed from said refrigeration unit, and replaced with the other of said knock-down insulated storage unit, each said knock-down insulated storage unit further comprising at least one opening through which at least one of said perishable items can be removed, at least a second pair of openings corresponding to said first pair of openings of said refrigeration unit, means for permitting said cooled fluid passing through a first opening of said second pair to circulate about said knock-down unit before passing through a corresponding second opening of said second pair and back to said refrigeration unit.

4,898,005

METHOD OF CONTROLLING IDLING ROTATIONAL SPEED OF INTERNAL COMBUSTION ENGINE FOR VEHICLES EQUIPPED WITH AIR CONDITIONING SYSTEMS

Yoshihiko Sakurai, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo and Mazda Motor Corporation, Hiroshima, both of, Japan

Filed May 24, 1989, Ser. No. 356,772
Claims priority, application Japan, Jun. 22, 1988, 63-154074
Int. Cl.[4] F02M *3/00*; F25B *1/00*
U.S. Cl. 62—115 **7 Claims**



1. A method of controlling the idling rotational speed of an internal combustion engine for an automotive vehicle equipped with an air conditioning system having a variable capacity compressor disposed to be driven by said engine and capable of being controlled by an external control signal, the method comprising the steps of:

(1) detecting a value of ambient temperature;

(2) calculating a value of a capacity control signal as said external control signal for controlling the capacity of said compressor;

(3) calculating a value of torque required for starting said compressor based upon the detected value of the ambient temperature and the calculated value of said capacity control signal; and

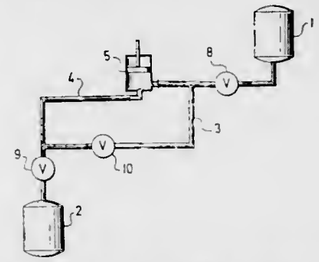
(4) increasing the idling rotational speed of said engine in accordance with the calculated value of the torque required for starting said compressor.

4,898,006

METHOD AND APPARATUS FOR DRAWING OFF LOW BOILING MEDIA FROM PRESSURE SYSTEMS

Zdenek Fencl; Frantisek Janda; Karel Kovarik, all of Prague; Jiri Sára, Revnice, and Antonin Tatoun, Prague, all of Czechoslovakia, assignors to Kovosluzba a odní podnik hlavního mesta Prahy, Prague, Czechoslovakia

Filed Oct. 12, 1988, Ser. No. 256,833
Int. Cl.[4] F17C *3/10*
U.S. Cl. 62—48.2 **6 Claims**



2. An arrangement for drawing off low boiling media from a pressure system into a storage vessel, comprising:

a pressure system;

a storage vessel;

a drawing off conduit, connecting said pressure system to said storage vessel, for drawing off the low boiling media from said storage vessel when the pressure in said pressure system is increased and the pressure in said storage vessel is reduced;

a return conduit connected between said pressure system and said storage vessel; and

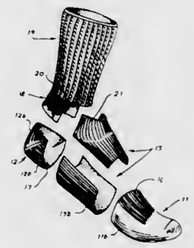
a compressor disposed in said return conduit.

4,898,007

MOISTURE MANAGEMENT SOCK

Ray E. Dahlgren, 56 Corto Rd., Arcadia, Calif. 91006

Filed Nov. 16, 1987, Ser. No. 121,156
Int. Cl.[4] A41B *11/02*; D04B *9/46*
U.S. Cl. 66—185 **8 Claims**



1. An improved moisture management sock including a foot comprising a toe portion, a heel portion, and an instep portion positioned between said toe and heel portions,

(a) said foot having the following yarn zones:

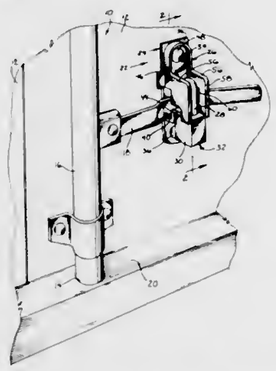
(i) a first zone comprising said toe portion, and wherein said first zone is knit predominately of hydrophilic yarn,

(ii) a second zone comprising said heel portion, and wherein said second zone is knit predominately of hydrophilic yarn, and

(iii) a third zone comprising said instep portion and being joined edgewise with said first and second zones, and wherein said third zone is knit predominately of hydrophobic yarn, and

(b) whereby moisture absorbed from the wearer's foot by the hydrophilic yarn in said first and second zones (toe and heel portions) is transferred by wicking action into the hydrophobic yarn in said third zone (instep portion) to be evaporated therefrom.

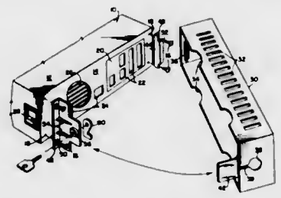
4,896,008
PADLOCK PROTECTOR
David S. Eberly, 5407 Touraine Dr., Tallahassee, Fla. 32808
Filed Jul. 15, 1988, Ser. No. 219,240
Int. Cl.[4] E05B *67/38*
U.S. Cl. 70—56 **1 Claim**



1. In combination, a swing-out closure member, a locking mechanism for said closure member, and a padlock protector, said locking mechanism including rod means shiftable between a locked position and an unlocked position, lever means pivotably connected to said rod means for shifting said rod means between its said locked and unlocked positions, a catch secured to said closure member, said catch including channel means for receiving and holding said lever means and having a bored flange, and a padlock having a housing and a retractable protruding shackle, said padlock protector including a block rotatably connected to one of said catch and closure member, said block including head part and a body, and continuous outer peripheral flanges extending outwardly of said body wherein the body is recessed between said flanges, said body having a bore therethrough for aligning with said channel part flange bore to house said padlock shackle, said flanges constituting means for partially surrounding said padlock shackle and housing to prevent unauthorized opening of said padlock and the closure member when in its locked position.

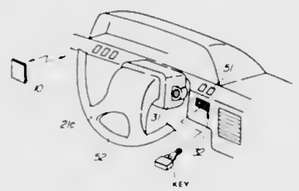
4,896,009
PROTECTIVE COVER FOR A PERSONAL COMPUTER
Robert P. Lakoski, Austin, Tex., and Jody L. Numbers, Tempe, Ariz., assignors to Lama Systems Inc., Austin, Tex.
Filed Mar. 22, 1989, Ser. No. 327,120
Int. Cl.[4] E05B *70/00*
U.S. Cl. 70—58 **10 Claims**

1. An access control device for the back of a personal computer having a base and back panel secured to the base with a plurality of peripheral attachment screws, comprising:
(a) enclosure means for enclosing at least a portion of the back panel, said enclosing means having a height selected to conform to the back panel, a depth sufficient to cover cable port connectors and a width dimensioned to correspond to selected attachment screws, cabling ports, a first element of a first cooperating mounting member, a first element of a second cooperating mounting member, and a plurality of venting slots,
(b) a second element of said first cooperating mounting member, said second element having securing means for attaching said second element to the computer with at least one peripheral screw, said first and second elements of said first cooperating mounting member being engagable to secure said enclosure means to the computer,
(c) a second element of said second cooperating mounting



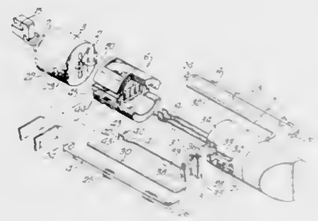
member having attachment means for securing to the computer with at least one peripheral screw, said first and second elements of said second cooperating mounting member being engagable to secure said enclosure means to the computer,
(d) locking means to lock said enclosure to the computer when said enclosure is secured to cover the back panel.

4,896,010
KEYLESS ENTRY SYSTEM FOR AUTOMOTIVE VEHICLES
Tohru Futami, and Mikio Takeuchi, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Oct. 25, 1988, Ser. No. 261,899
Claims priority, application Japan, Oct. 28, 1987, 62-272394; Oct. 28, 1987, 62-272395
Int. Cl.[4] E05B *49/00*
U.S. Cl. 70—278 **19 Claims**



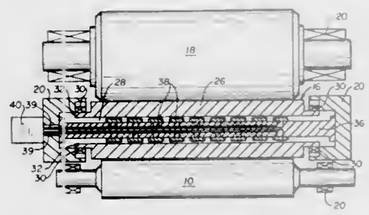
1. A keyless entry system for automobiles comprising:
input means for inputting a unique identification code signal;
control means having a code memory, said control means which, when said unique identification code signal matches with a preset identification code signal stored in said memory, outputs a coincidence signal;
locking key holder means disposed in the vehicular cabin for safely keeping a key, said locking key holder means which, only when receiving said coincidence signal from said control means, allows the key to be operated or to be removed.

4,898,011
LOCK
Walter J. Nugent, Melbourne, Australia, assignor to Walter Locks Pty Ltd., South Yarra, Australia
Filed Mar. 11, 1988, Ser. No. 166,644
Claims priority, application United Kingdom, Mar. 13, 1987, 8705948
Int. Cl.[4] E05B *17/04*
U.S. Cl. 70—379 R **23 Claims**



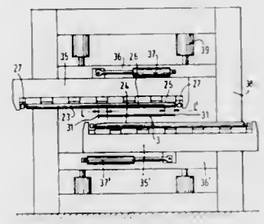
1. A lock, said lock comprising a drive member, means for moving said drive member, a plurality of elongate members movable in response to movement of the drive member, means for selectively positioning the ends of said elongate members relative to one another, and latch means comprising a plurality of latch elements, each associated with one of the elongate members, each defining at least one passage therethrough, and each being movable to a selected position in response to a key being inserted into the lock, the arrangement being such that when the correct key is inserted in the lock the latch elements are moved to such a position that the passage in each latch element is aligned with the free end of a respective elongate member so that the drive member can be moved, causing the elongate members to pass through the passages in the latch elements.

4,898,012
ROLL BITE GAUGE AND PROFILE MEASUREMENT SYSTEM FOR ROLLING MILLS
George B. Jones, and Edward A. Mills, both of Pittsburgh, Pa., assignors to United Engineering, Inc., Pittsburgh, Pa.
Filed Apr. 22, 1988, Ser. No. 184,830
Int. Cl.[4] B21B *37/00*
U.S. Cl. 72—11 **5 Claims**



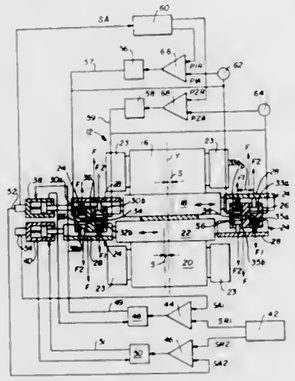
1. A rolling mill for processing strip material, said mill having at least two rolls, one of which is arranged to serve as either a work roll or a backup roll and subject to and deflected between its ends by the rolling force of the mill developed in rolling the material, said one roll also serving as a means for measuring certain characteristics of the material, such as gauge and profile, and comprising an outer cylindrical sleeve having an outer surface subject to the rolling force,
means for rotatively supporting said sleeve at its opposite ends, and
means arranged in the interior of said sleeve for supporting several sensor means axially along the length of said sleeve to measure said material characteristics of different points transversely of the material as the material contacts said outer surface of said sleeve and is subject to the rolling force.

4,898,013
INSTALLATION FOR LEVELLING A METAL STRIP
Francois Mazodier, Saint-Etienne, and René Paulhac, Sorbiers, both of France, assignors to Clecim, Courbevole, France
Filed Jul. 7, 1988, Ser. No. 215,973
Claims priority, application France, Jul. 8, 1987, 87 09715
Int. Cl.[4] B21D *1/02*
U.S. Cl. 72—165 **3 Claims**



1. An installation for levelling a metal strip (3) with production of elongations by traction-deflection, by advance of the strip (3) along a longitudinal axis (30) in a levelling stand (10) associated with means (11) (12) for tensioning the strip (3) and comprising, within a housing having two uprights (38),
(a) at least two active rolls (23, 24) and at least two deflector rolls (18) rotating around axes which are parallel to one another and perpendicular to a longitudinal axis of advance (30) of the strip, said active rolls (23, 24) being located on different levels on either side of the strip (3) for defining with said deflector rolls (18) an undulating path for the strip (3);
(b) said active rolls (23, 24) each having an asymmetrical profile comprising, at one end, a narrowed section (25) having a diameter which progressively decreases, the two narrowed sections (25) being provided at opposite ends of said asymmetrical active rolls (23, 24) respectively, on either side of the longitudinal axis (30);
(c) each of said asymmetrical active rolls (23, 24) resting on at least two carrying rolls (21) (22);
(d) said active rolls (23, 24) each associated with its carrying rolls (21) (22) respectively forming two levelling units (4) (5);
(e) said levelling units (4) (5) being resepectively mounted each in a frame forming a case (35) (35');
(f) said cases (35) (35') each being slidably mounted parallel to the axes of the rolls, respectively on an upper beam (36) and on a lower beam, (36') said upper and lower beams being mounted to slide vertically on the uprights (38) of said housing;
(g) height-adjusting means (39) (39') respectively associated with said upper beam (36) and lower beam (36') for adjusting the level of the corresponding active rolls (23) (24); and
(h) means for controlling the sliding of said levelling units (4) (5) in opposite direction each on the corresponding beam (36) (36') for adjusting the axial position of the narrowed section (25) of each active roll (23) (24) relative to the longitudinal axis (30) of the strip, said means consisting of jacks (37) (37') respectively resting on said upper and lower beams (36) (36') and on the corresponding cases (35) (35').

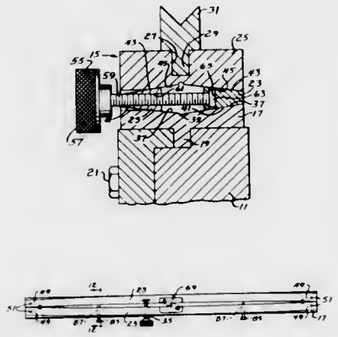
4,898,014
ROLL SHIFTING SYSTEM FOR ROLLING MILLS
Vladimir B. Ginzburg, Pittsburgh, and F. Ronald Vidil, McKeesport, both of Pa., assignors to United Engineering, Inc., Pittsburgh, Pa.
Filed Dec. 23, 1988, Ser. No. 289,187
Int. Cl.[4] B21B 31/18
U.S. Cl. 72—247 8 Claims



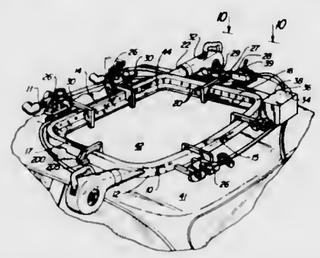
1. A rolling mill having a housing with a window formed therein for receiving at least two rolls together with chock assemblies therefore, which rolls generally define an axial direction, said window including immovable guide blocks for said chock assemblies and means for shifting the rolls in opposite axial directions, the improvement comprising:
separating means received in said blocks and operatively associated with said chock assemblies such that said chock assemblies move relative to said separating means in said axial direction, for imposing through said chock assemblies applied forces on the ends of each roll having the tendency to deflect the rolls in the plane of the major component of the rolling force generated by the rolls, whereby shifting at least one roll changes said applied forces; and
control means for controlling said applied forces in response to said shifting of at least one of the rolls, including
first determining means for determining the amount of roll shifting,
second determining means operatively associated with said first determining means for determining the amount of said change caused by said separating means, and
means responsive to said second determining means for effecting a change in said applied roll deflection forces to maintain the ultimate effect of said forces at a predetermined value.

4,898,015
PRESS BRAKE DEFLECTION COMPENSATING DEVICE
David L. Houston, P.O. Box 72757, Roselle, Ill. 60172
Filed Jul. 18, 1988, Ser. No. 220,505
Int. Cl.[4] B21D 5/02
U.S. Cl. 72—389 9 Claims

1. In a press brake having a bed for supporting a tool and a ram for supporting a mating tool, press brake bed and ram deformation compensation apparatus for placement between one of said tools and the press brake bed and ram, the compensation apparatus including an elongate base member, an elongate top member and a pair of elongate wedge members; the base and top members each having adjacent first and second planar surfaces which intersect to form a V-shaped longitudinal recess thereon, the respective V-shaped surfaces being oriented in opposed facing relationship; the wedge members each having upper and lower planar surfaces; the wedge members being oriented between the opposed V-shaped base and top member surfaces whereby the upper and lower planar surfaces of one wedge member slidably engage, respectively, the first surfaces of the V-shaped recesses in the base and top members and the upper and lower planar surfaces of the other wedge member slidably engage, respectively, the second surfaces of the V-shaped recesses in the base and top members; means for securing the wedge members to the base and top members at the opposed longitudinal ends thereof; means for applying lateral forces to the wedge members between the longitudinal ends thereof whereby the longitudinal center regions of the wedge members may be selectively spaced apart a predetermined distance thereby producing an deflection compensating deformation of the top member.

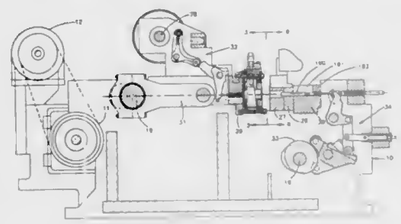


4,898,016
IN-ROOF FLANGING FIXTURE AND PROCESS
Jon D. Moeller, Farmington Hills, and Donald J. Old, Union Lake, both of Mich., assignors to ASC Incorporated, Southgate, Mich.
Filed Sep. 2, 1988, Ser. No. 240,009
Int. Cl.[4] B21D 11/18, 37/16
U.S. Cl. 72—342 17 Claims



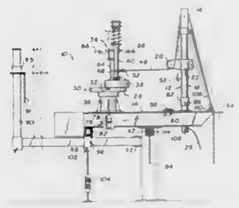
1. A flanging fixture for heating and offsetting a peripheral edge of a vehicle surface surrounding an aperture to form a downwardly extending ledge for receipt of a closure panel, comprising:
a frame removably mountable onto a vehicle surface;
means for locating the fixture on a vehicle surface about an aperture;
a means for heating the vehicle surface about the periphery of the aperture;
means for removably securing the frame on a vehicle surface, and;
means for forming a ledge about the periphery of the aperture, said means being removably connected to the frame.

4,898,017
QUICK-CHANGE TOOLING FOR PROGRESSIVE FORMERS AND THE LIKE
William H. Hite, and Gene E. Allebach, both of Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio
Filed Aug. 9, 1988, Ser. No. 230,327
Int. Cl.[4] B21J 13/08, 13/02
U.S. Cl. 72—405 18 Claims



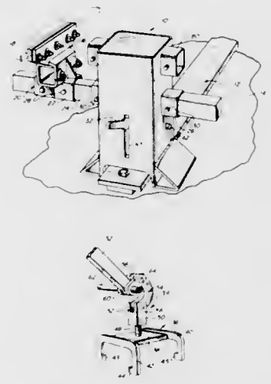
1. A progressive former comprising a die breast on said frame, a powered slide reciprocable on said frame toward and away from said die breast, tooling mounted on said slide and die breast cooperating to define a plurality of work stations for progressively forming workpieces, a transfer for progressively positioning workpieces at said work stations, and tooling support means removably mounted on said slide independent of said die breast for supporting said tooling on said slide, said tooling support means including adjustable means for positioning the tooling therein with respect to the associated tooling on said die breast in three directions perpendicular to each other, said tool support means along with said adjustable means being removable and reinstallable on said slide without disturbing the adjustment of said adjustable means.

4,898,018
STRUT STRAIGHTENING DEVICE
Ray Ventress, 10512 - 135A Street, Surrey, British Columbia V4A 4C8, Canada
Filed Jun. 21, 1988, Ser. No. 209,646
Claims priority, application Canada, Feb. 5, 1988, 565718
Int. Cl.[4] B21D 1/12
U.S. Cl. 72—457 18 Claims



1. An apparatus for straightening an unmounted automotive component comprising:
a pneumatic pull tower mounted at one end of a base and having a first pulley mounted on a movable ram sleeve in said tower and a second pulley movably mounted along said tower;
a driving cylinder housed in said pull tower for applying a force to move said ram sleeve;
component securing means mounted at a second end of said base and adapted to fixedly receive said component;
a pivotable spring compressing column adjacent said component securing means having means for unloading spring tension from a component;
a first chain for connecting at one end to said component and at another end to said base, said chain being led along said first and second pulleys such that when said driving cylinder is activated, said ram sleeve wil apply a force on said chain to straighten said component.

4,898,019
VEHICLE SUPPORT ASSEMBLY
John W. Rich, P.O. Box 810, Elburn, Ill. 60119
Filed Jan. 18, 1989, Ser. No. 299,548
Int. Cl.[4] B21D 1/12
U.S. Cl. 72—461 8 Claims

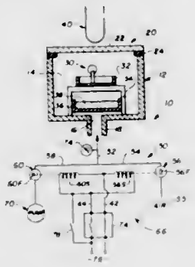


1. In combination with a system for body and frame straightening having at least a pair of tie down tracks which are fixedly secured in spaced apart relationship to a supporting surface, said tie down tracks each being generally T-shaped in cross-section with an upper track member and a lower track member, at least one vehicle support assembly, and a horizontally extending arm having on one end thereof a clamping device for clamping the bottom body flange of a vehicle body to maintain said vehicle body in a stationary position during body straightening operations, the improvement comprising an improved vehicle support assembly comprising a housing supporting said horizontally extending arm, a shaft extending through and supported by said housing, a clamping assembly disposed within said housing comprising a clamp member having a plurality of spaced-apart hooks which are disposed beneath the upper track member of said T-shaped tie down track, a lever pivotally supported at one end thereof by said shaft, a C-shaped cam coupled at one end thereof to said clamp member and coupled at the other end thereof to said one end of said lever, said lever upon being pivotally operated operating said C-shaped cam to raise said clamp member to thereby clamp said spaced-apart hooks beneath said upper track member of said T-shaped tie down track to clampingly secure said vehicle support assembly to said tie down track.

4,898,020
METHOD AND APPARATUS FOR DETECTING AND ELIMINATING ENTRAPPED GAS BUBBLES IN A THICK FILM COATING

Eastathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1987, Ser. No. 137,098
Int. Cl.[4] B01D *19/00*
U.S. Cl. 73—19 **28 Claims**



1. Apparatus for detecting the presence of entrapped gas in a coating of a thick film composition disposed on a member comprising:

a vessel having a chamber sized to receive a member having a thick film composition thereon, the chamber having a fluid therein having an initial ambient pressure,

observation means for viewing the member within the chamber;

means for varying the pressure of the fluid in the chamber a predetermined number of cycles between the initial pressure and a second pressure less than the initial pressure to cause any entrapped gas in the thick film composition to pulsate in a manner observable through the observation means,

wherein each cycle includes a first predetermined time period during which the pressure of the fluid in the chamber is at the initial pressure followed by a second predetermined of time during which the pressure of the fluid in the chamber is at the second pressure,

wherein, the first time period lies in the range from 0.1 to two seconds and wherein the second time period is in the range from 0.5 to ten (10) seconds, and

wherein the initial pressure of the fluid in the chamber is atmospheric pressure and wherein the second pressure is less than forty (40) torr.

4,898,021
QUANTITATIVE AIR INLEAKAGE DETECTION SYSTEM AND METHOD FOR TURBINE-CONDENSER SYSTEMS

Karen L. Weaver, and Michael Twerdochlib, both of Oviedo, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1988, Ser. No. 277,827
Int. Cl.[4] G01M *3/04*
U.S. Cl. 73—40.7 **1 Claim**

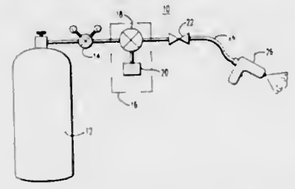
1. A method for determining size of air inleakage holes into a steam turbine system using a tracer gas detection system of the type including a source of tracer gas, at a regulated pressure, control means for discharging a preselected volume of tracer gas to a gas spray nozzle, pump means coupled to the turbine system for establishing an internal pressure less than ambient pressure and a gas detector for providing quantitative signals indicative of tracer gas in the turbine system, the method comprising the steps of:

delivering a predetermined quantity of tracer gas to the spray nozzle;

spraying the predetermined quantity of tracer gas at preslected inleakage sites about the turbine system;

determining the peak amplitude and time duration of detection of tracer gas at a preselected gas monitoring zone from signals from the gas detector;

integrating the gas detector signals to determine the quantity



of tracer gas entering the turbine system through the inleakage site;

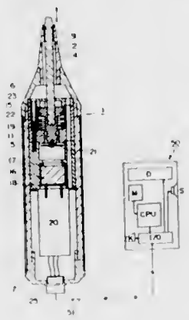
comparing the peak amplitude of the gas detector signals to the time duration of the signals to determine the relative distance from the inleakage site to the gas monitoring zone; and

establishing a relative size of the air inleakage holes from the determined quantity of tracer gas obtained from the step of integrating.

4,898,022
STEAM TRAP OPERATION DETECTOR

Hideaki Yumoto; Masao Yonemura; Mamoru Nagase; Yoshito Yamada; Yoshiyasu Fujiwara; Masakatsu Okamoto, and Yasutoshi Hosokawa, all of Kakogawa, Japan, assignors to TLV Co., Ltd., Japan

PCT No. PCT/JP88/00118, § 371 Date Nov. 28, 1988, § 102(e) Date Nov. 28, 1988, PCT Pub. No. WO88/05886, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 8, 1988, Ser. No. 261,830
Claims priority, application Japan, Feb. 9, 1987, 62-29164; Sep. 14, 1987, 62-230821; Jan. 12, 1988, 63-2758; Jan. 13, 1988, 63-3335[U]; Jan. 13, 1988, 63-3334[U]; Jan. 13, 1988, 63-3333[U]; Jan. 14, 1988, 63-6649; Jan. 14, 1988, 63-6648
Int. Cl.[4] G01M *3/08*
U.S. Cl. 73—46 **9 Claims**



1. A steam trap operation detector comprising a detecting section (1) and an arithmetic section (50);

said detection section (1) including:

a probe (2) arranged to be brought into contact with an object to be detected with a predetermined pressure given by an elastic member for detecting mechanical vibration owing to a steam current and a condensed-water current within said object to be detected;

diaphragm means (21) for generating ultrasonic vibration in response to said mechanical vibration detected by said probe (2);

a vibration sensor (16) provided in opposition to said diaphragm means (21) for converting said ultrasonic vibration into an electric signal;

a circuit board (20) containing an amplifying circuit for amplifying an output signal of said vibration sensor (16) so as to transmit the amplified output to the outside;

said arithmetic section (50) including;

a memory (M) for storing data corresponding to a variety of steam traps inclusive of said object to be detected;

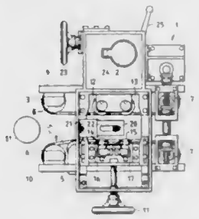
a central processing unit (CPU) for performing computation while executing comparison between the output signal transmitted from said detecting section (1) and predetermined data selectively obtained from said data stored in said memory (M); and

output units (D; S) for displaying the result of computation of said central processing unit (CPU) and/or for generating a sound output of an audible frequency.

4,898,023
APPARATUS FOR DETECTING INTERNAL PRESSURE OF A CAN

Morio Yamada, and Yoshihiko Kimura, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed May 9, 1988, Ser. No. 192,026
Claims priority, application Japan, May 18, 1987, 62-118884
Int. Cl.[4] G01M *3/36*
U.S. Cl. 73—52 **4 Claims**



1. An apparatus for detecting internal pressure of a cylindrical can, comprising:

a pair of first and second belt conveyors for feeding said cylindrical can without causing the rotation thereof by holding the cylindrical side thereof therebetween, said first and second belt conveyors being arranged in parallel to each other with a first clearance smaller than a diameter of said cylindrical can;

a first sensor means for detecting a reaction force of said cylindrical side, said first sensor means having a first fixed member and a first load cell arranged with a second clearance therebetween slightly smaller than said diameter of said can;

a second sensor means for detecting a reaction force of said cylindrical side, said second sensor means having a second fixed member and a second load cell arranged with a third clearance therebetween slightly smaller than said diameter of said can and different from said second clearance, said first and second sensor means being arranged in that sequence along said first clearance between said first and second belt conveyors and each of said first and second load cells having a can contact with an outer surface of an elliptic dome configuration which has a long diameter in a height direction of the can and a short diameter in a can moving direction;

a pair of support frames, one of said frames supporting one of said pair of first and second belt conveyors, and said first and second fixed members and the other frame supporting the other pair of said first and second belt conveyors, and said first and second load cells;

adjusting means for adjusting a distance between said pair of support frames;

a buckling sensor means for detecting a deflection of a cover of said can at a central point thereof, said buckling sensor means being adjustably positioned between said first and second belt conveyors;

a timing sensor means for operating said buckling sensor means when said central point of said can is positioned directly below said buckling sensor by detecting a foremost portion of said can;

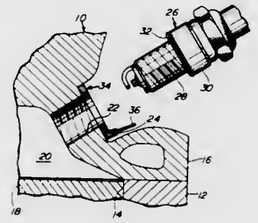
a calculation means for converting a difference between a maximum reaction force detecting by said first sensor means and a maximum reaction force detected by said second sensor means into an internal pressure of said can; and

a comparing means for comparing said deflection detected by said buckling sensor with a predetermined allowable value.

4,898,024
PIEZOELECTRIC PRESSURE MEASURING INSTRUMENT

Kiyoshi Takeuchi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 12, 1988, Ser. No. 192,944
Claims priority, application Japan, May 22, 1987, 62-76050[U]; May 29, 1987, 62-81045[U]; Jun. 2, 1987, 62-85521[U]
Int. Cl.[4] G01L *9/08;* **G01M** *15/00*
U.S. Cl. 73—115 **20 Claims**



1. A pressure measuring instrument for the measurement of combustion chamber pressure in the cylinder of an internal combustion engine, comprising:

a cylinder head formed with a spark plug insert bore having a female thread, said cylinder head including a first substantially flat wall extending radially outward from one axial end of said spark plug insert bore;

a spark plug including a portion having a male thread engaged with said female thread of said spark plug insert bore, and a second radially extending wall opposed to and spaced from said first wall of said cylinder head,

a piezoelectric preasure sensor surrounding said portion of said spark plug and disposed between said first and second walls;

said sensor comprising an annular disk-like electrode with an output terminal, a piezoelectric element in contact with said electrode, a pair of annular pressure acting members having interposed therebetween said electrode and said piezoelectric element, and a lead;

one of said pair of annular pressure acting members having an axially extending wall disposed inward of the inner periphery of the other of said pair of annular pressure acting members; and

a gasket disposed between said first and second radially

extending walls, radially outward of said axially extending wall and on the other of said pair of annular pressure acting members,

said axially extending wall being curved radially outward to form a terminal end portion holding said gasket on said the other of said pair of annular pressure acting members,

one of said pair of annular pressure acting members being in abutting engagement with one of said first and second walls with said terminal end portion being in abutting engagement with the other of said first and second walls.

4,898,025

METHOD FOR DETERMINING THE MEAN EFFECTIVE TORQUE OF AN INTERNAL COMBUSTION ENGINE

Matthias Weyland, Kallstadt, Fed. Rep. of Germany, assignor to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,703

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743066

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117.3 8 Claims

1. Method for determining the mean effective torque of an internal combustion engine connected through a connecting shaft to a load device, which comprises determining the torque of the shaft with a torque sensor connected to the shaft, scanning the angular velocity of the crankshaft of the engine at equidistant angular points on the crankshaft being spaced apart in time by a whole number multiple of the torque harmonic period, differentiating the crankshaft angular velocity with respect to time by forming the difference between sequential angular velocities and time measurement of a scanning period, forming a mean acceleration torque from the crankshaft angular acceleration determined by multiplication with the mass moment of inertia of the internal combustion engine, and adding the acceleration torque to the mean shaft torque to provide the mean effective torque.

4,898,026

PROCESS FOR TESTING DRIVING AXLES AND DEVICE FOR PERFORMING THE PROCESS

Joerg P. Damitz, Runkel, Fed. Rep. of Germany, assignor to Glyco Antriebstechnik GmbH, Wiesbaden, Fed. Rep. of Germany

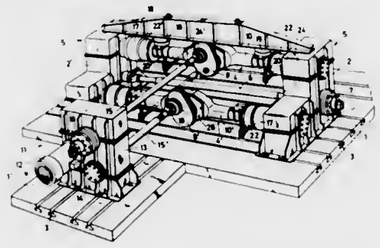
PCT No. PCT/DE87/00586, § 371 Date Sep. 29, 1988, § 102(e) Date Sep. 29, 1988, PCT Pub. No. WO88/04417, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 9, 1987, Ser. No. 273,858

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642717

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—118.1 18 Claims



1. A method of testing driving axles for motor vehicles, comprising the steps of:

mounting at least one driving axles in respective gear units at opposite ends in a test stand so that said axle has opposite axle shaft ends at said gear units and an axle housing extending between said units and supported on said stand;

connecting a drive motor to one of said ends through one of said units and a load to the other of said ends through another of said units for driving said axle while loading same; and

applying to said axle on said test stand a plurality of other forces independent of forces applied by said drive motor and load and sufficient to enable testing of total function of the axle under simultaneous drive and carrying conditions, the application of said other forces including application to said shaft ends of dynamic lateral forces corresponding to wheel-disk reaction forces applicable to the axle in use.

4,898,027

SYSTEM FOR MEASURING THE HEIGHT ABOVE GROUND LEVEL OF VEHICLES

Luigi Morra, Asti, Italy, assignor to Industrie Riunite SpA, Beinasco, Italy

Division of Ser. No. 797,020, Nov. 12, 1985, Pat. No. 4,674,768. This application Jan. 8, 1987, Ser. No. 1,527

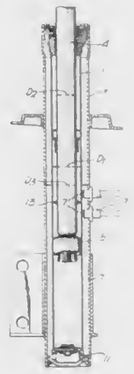
Claims priority, application Italy, Nov. 15, 1984, 23587 A/84

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—118.1 4 Claims

1. A system for measuring the height above ground level of vehicles comprising,

a Hall-effect position detector means mounted within a housing of a shock absorber including at least one ring-shaped magnet fixed to a piston rod mounted in a working cylinder of the shock absorber and at least one sensor means mounted on an outer face of said working cylinder, said working cylinder being non-magnetic and said sensor means generating a voltage signal modulated according to a distance between said magnet and said sensor means,



whereby the position of said piston rod relative to said working cylinder is sensed.

4,898,028

PISTON FOR A HIGH-ENTHALPY WIND TUNNEL

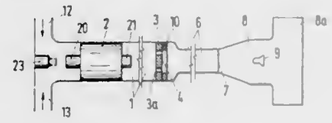
Lothar Brehm, Frankfurt, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 25, 1989, Ser. No. 301,777

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3804044

Int. Cl.[4] G01M *9/00*

U.S. Cl. 73—147 5 Claims



1. In a wind tunnel assembly having first and second passages, a test chamber and means for producing a pressure surge including a diaphragm at the end of the first passage, a thin sheet at the end of the second passage, the second passage is filled with a test gas, a piston, means mounting the piston for movement under the action of a gas pressure of at least 20 bars in the first passage from an initial position to a target surface so that the diaphragm disposed at the end of the first passage is torn under the compression produced by the approaching piston, and the resulting pressure surge is transmitted by the second passage, that is filled with the test gas, to the thin sheet to tear the sheet and effect the flow of the test gas as a supersonic shock wave into the test chamber, first locking means disposed at a rear portion of the piston and a stationary holder having second locking means cooperative with the first locking means when the piston is in its initial position.

4,898,029

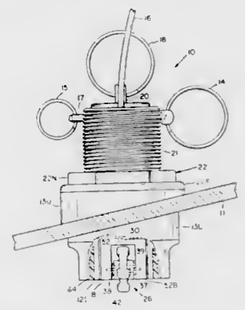
MARINE INSTRUMENT

Stephen G. Boucher, Amherst, N.H., assignor to Airmar Technology Corporation, Milford, N.H.

Continuation of Ser. No. 178,898, Mar. 31, 1988, Pat. No. 4,836,020, which is a continuation of Ser. No. 7,527, Jan. 28, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 310,859

Int. Cl.[4] G01C *21/10*

U.S. Cl. 73—187 18 Claims



1. A speed sensor for mounting to a marine vessel comprising:

a. a housing secured to said marine vessel;

b. a removable body disposed in said housing;

c. a paddlewheel cavity formed in said body;

d. a magnetized paddlewheel having a plurality of paddles extending from a central hub and adapted to be rotatably mounted on an axle extending across said cavity transverse the fore and aft direction of travel of the vessel; and wherein the ratio of the cross-section of the paddles in a plane transverse the direction of flow versus the available cross-sectional space within the cavity is in a range between about 0.25 to 0.5;

e. a magnetic sensor located adjacent said paddlewheel.

4,898,030

PROPELLANT REMAINING GAGING SYSTEM

Tso-ping Yeh, Fremont, Calif., assignor to Ford Aerospace Corporation, Newport Beach, Calif.

Filed Apr. 5, 1988, Ser. No. 177,701

Int. Cl.[4] G01F *17/00, 23/28;* B65D *85/00*

U.S. Cl. 73—290 V 17 Claims

1. Apparatus for gaging the amount of liquid propellant remaining in a tank on board a spacecraft, comprising:

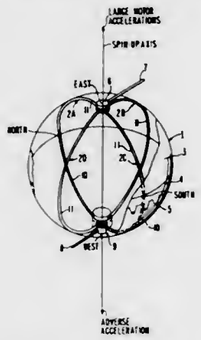
a hollow tank containing a liquid propellant and an ullage having a pressurant gas;

an outlet port, centered in a first half of the tank, for expelling from the tank liquid propellant but not pressurant gas, wherein relatively large operational accelerations of the spacecraft pass through the outlet port;

several elongated channels comprising relatively closed portions and relatively open portions, said channels communicating liquid propellant to the outlet port from regions within the tank, including a second half of the tank joined to the first half, wherein within the first half of the tank, at least one of the channels comprises solely relatively closed portions, and within the second half of the tank, at least one of the channels comprises solely relatively open portions;

at least one ultrasonic transducer mounted on an exterior surface of the tank, said transducer disposed to measure distance to a liquid/gas interface within an interior region of the tank; and:

coupled to each of said at least one transducer, means for determining the amount of liquid propellant remaining



within the tank and the expected remaining lifetime of the spacecraft.

4,898,031

VIBRATIONAL ANGULAR VELOCITY SENSOR

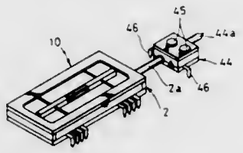
Takahiro Oikawa; Yoshiyuki Suzuki, and Tatsumi Ohtsuka, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Jul. 22, 1988, Ser. No. 222,751

Claims priority, application Japan, Jul. 24, 1987, 62-112723[U]; Jul. 24, 1987, 62-112724[U]; Jul. 24, 1987, 62-112726[U]; Jul. 24, 1987, 62-112728[U]; Jul. 24, 1987, 62-183741; Jul. 24, 1987, 62-183743

Int. Cl.⁴ G01P *15/08*

U.S. Cl. 73—505 **7 Claims**



1. A vibrational angular velocity sensor comprising:

(a) an angular velocity vibration element;

(b) a glass vacuum casing for housing said angular velocity vibration element in a vacuum, an inside surface of said glass vacuum casing being coated with a metallic film to exclude external radiant heat;

(c) at least one support pin, fixed to said glass vacuum casing by glass material within said glass vacuum casing, for supporting said angular velocity vibration element;

(d) a plurality of conductive lead pins extending from the inside to the outside of said glass vacuum casing, the inside ends of said conductive lead pins being connected to signal terminals of said angular velocity vibration element and the outside of said conductive lead pins being arranged with a constant length and connected to an outside printed circuit board for a velocity sensor signal processing circuit; and

(e) a plurality of casing fixing pins also extending from the inside to the outside of said glass vacuum casing, the outside ends of said casing fixing pins being arranged with a constant length and fixed to the outside printed circuit board.

4,898,032

RATE SENSOR

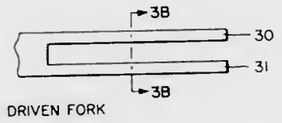
Roger Voles, London, England, assignor to Thorn EMI Electronics Limited, Hayes, England

Filed Jul. 6, 1988, Ser. No. 216,212

Claims priority, application United Kingdom, Jul. 8, 1987, 8716047

Int. Cl.⁴ G01P *15/00*

U.S. Cl. 73—505 **12 Claims**



1. An angular rate sensor comprises:

a pair of driven tines and excitation means, responsive to an applied drive signal, for exciting a vibration of the driven tines, a pair of output tines coupled mechanically to the driven tines; and detection means responsive to a vibration of the output tines for generating a detection signal related to angular rate; means for generating a feedback signal related to torsional imbalance of the driven tines, and feedback means, responsive to the feedback signal, for driving the driven tines towards a condition of torsional balance.

4,898,033

ACCELERATION SENSOR

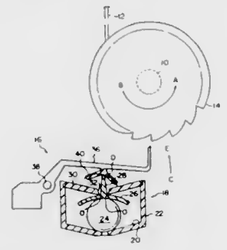
Toshimasa Yamamoto, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Aug. 26, 1988, Ser. No. 236,737

Claims priority, application Japan, Sep. 24, 1987, 62-145700[U]

Int. Cl.⁴ G01P *15/02*

U.S. Cl. 73—514 **20 Claims**



1. An acceleration sensor comprising:

a mass body which is held in a holding member and is movable relative to said holding member when an acceleration of a predetermined magnitude or greater acts on said holding member in a substantially horizontal direction;

a transmission member which is tiltingly disposed upon said mass body in such a manner that an upward movement of said transmission member is prevented and which is tilted when urged by a movement of said mass body; and

a lever which rests on said transmission member and which is swung when the tilting of said transmission member is transmitted thereto.

4,898,034

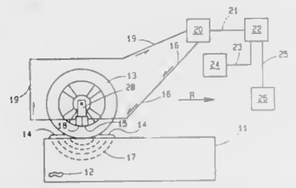
HIGH TEMPERATURE ULTRASONIC TESTING OF MATERIALS FOR INTERNAL FLAWS

David S. Kupperman, Oak Park, Ill., and Melvin Linzer, Silver Spring, Md., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 23, 1988, Ser. No. 235,078

Int. Cl.⁴ G01N *29/00, 29/04*

U.S. Cl. 73—644 **18 Claims**



1. Apparatus for nondestructive evaluation of defects in hot materials, such as metals and ceramics, by sonic signals, which comprises in combination:

(a) a buffer in contact with a hot material to be tested for defects, said hot material having a temperature in the range of from about 1700° F. to about 2200° F.;

(b) a liquid couplant consisting essentially of borax, in contact with said buffer and said hot material to be tested;

(c) transmitting means mounted on said buffer and spaced from said hot material to be tested, said transmitting means sending sonic signals through said buffer and said couplant, and into said hot material to be tested; and

(d) receiving means mounted on said buffer and spaced from said hot material to be tested, said receiving means receiving sonic signals reflected from within said hot material to be tested, through said couplant and said buffer.

4,898,035

PRESSURE SENSOR HAVING SEALING MEMBER FOR SEALING HOUSING INTERIOR WITH RESPECT TO EXTERNAL SPACE

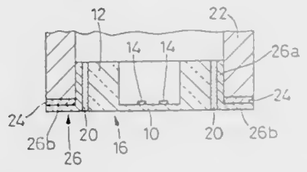
Yasuhito Yajima, and Yasushi Watanabe, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jan. 9, 1989, Ser. No. 294,412

Claims priority, application Japan, Jan. 16, 1988, 63-7124

Int. Cl.⁴ G01L *7/08, 9/06*

U.S. Cl. 73—727 **11 Claims**



1. A pressure sensor including a cylindrical metallic housing having an open end having an opening, a ceramic pressure sensing element having a ceramic diaphragm and fixedly accommodated within an open end portion of said metallic housing, and strain detecting means associated with said ceramic diaphragm, said ceramic diaphragm being exposed at one of opposite major surfaces thereof to an external space through said opening of the metallic housing and deformable in response to a pressure of a measurement fluid in said external space, an electrical output of said strain detecting means varying with an amount of deformation of said ceramic diaphragm, thereby representing said pressure of the measurement fluid, wherein an improvement comprising:

a metallic sealing member which is fluid-tightly bonded to a peripheral portion of said ceramic pessure sensing element with a bonding material, and which is fluid-tightly welded to said open end portion of said cylindrical metallic housing, so that said pressure sensing element is fluid-tightly secured to said metallic housing through said metallic sealing member, such that an interior of said metallic housing is sealed with respect to said external space.

4,898,036

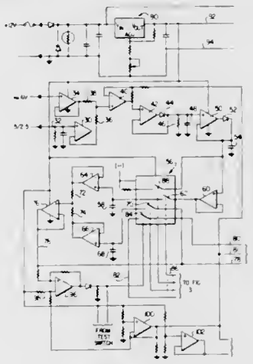
FLOW RESPONSIVE TRANSMITTER AND INDICATOR

Tommy L. Gray, Dallas, Tex., assignor to Span Instruments, Inc., Plano, Tex.

Filed Jan. 21, 1987, Ser. No. 5,830

Int. Cl.⁴ G01F *1/28*

U.S. Cl. 73—861.74 **14 Claims**



1. Apparatus for measurement and display indication of turbulent fluid flow, comprising:

means for generating a present rate of flow signal varying with an on-line measured turbulent flow;

means for generating an updated rate of flow display signal, said means including means for storing the present rate of flow signal, first means for receiving and storing a previously generated updated rate of flow display signal and second means for receiving and storing from the means for storing the present rate of flow signal and further including means connected to said first and second means for receiving for combining the previously generated updated rate of flow display signal with the present rate of flow signal to generate the updated rate of flow display signal;

a rate of flow display indicator; and

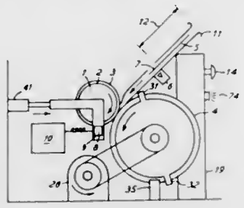
means for connecting in sequential order at timed intervals the previously generated updated rate of flow display signal to said first means for receiving, the present rate of flow signal to said second means for receiving, and the updated rate of flow display signal to said rate of flow display indicator.

4,898,037

METHOD AND APPARATUS FOR DETERMINING THE PROPENSITY OF A PAPER OR BOARD TO DUST

Roger A. Allen, Great Missenden, and Geoffrey Yoad, High Wycombe, both of United Kingdom, assignors to The Wiggins Teape Group Limited, Basingstoke, England

Filed Jul. 20, 1988, Ser. No. 221,551
Claims priority, application United Kingdom, Jul. 20, 1987, 87 17118
Int. Cl.[4] G01N *33/34*
U.S. Cl. 73—866 16 Claims



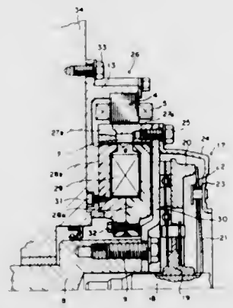
1. A method of testing the propensity of a paper or board to dust which comprises passing the paper or board through a nip formed between a reference surface and a feed system, supplementally pressing the reference surface to the surface to be tested at a predetermined pressure and measuring the dust adhering to the reference surface to obtain an indicative reading.

4,898,038

ENGINE STARTING AND CHARGING DEVICE

Yutaka Kitamura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00128, § 371 Date Oct. 6, 1988, § 102(e) Date Oct. 6, 1988, PCT Pub. No. WO88/06370, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 9, 1988, Ser. No. 294,639
Claims priority, application Japan, Feb. 10, 1987, 62-28629
Int. Cl.[4] F02N *17/00*
U.S. Cl. 74—6 7 Claims



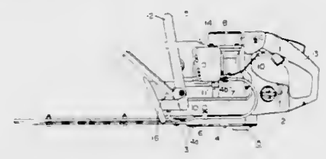
1. An engine starting and charging device having a starting and charging device body which comprises revolving field poles rotating with an engine crankshaft as a unit, field coils wound around field cores, and an armature coil wound around an armature core, characterized in that a clutch plate is mounted on said crankshaft, said revolving-field poles are fixed on said clutch plate, and a magnetic gap is provided between the outer peripheral section of a pair of field cores which hold said field coil therebetween and the inner peripheral section of said revolving-field poles.

4,898,039

THROTTLE LEVER HOLDING DEVICE

Fumihiko Aiyama, Musashimurayama, and Koji Hirayama, Ome, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Nov. 13, 1987, Ser. No. 119,927
Claims priority, application Japan, Nov. 14, 1986, 61-174888[U]
The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.
Int. Cl.[4] F02M *17/34*
U.S. Cl. 74—6 2 Claims



1. A throttle lever mechanism comprising:
first and second throttle levers;
a throttle valve opening/closing member for a carburetor;
a pivotable mounted link member having an elongated slot;
a connecting rod connected at one end to the second throttle lever and at another end to the link member through the elongated slot;
cable means having an inner wire cable and an outer tube covering the inner wire cable, a first end of the inner wire cable being connected to the first throttle lever, a second end of the inner wire cable being connected to the throttle valve opening/closing member, a first end of the outer tube being held in a stationary manner, and a second end of the outer tube being connected to said link member; and
an intermediate locking means provided for at least one of the first and second throttle levers for locking the at least one lever in a predetermined operational condition,
wherein when the at least one throttle lever is moved in an operational direction for a first time, the at least one lever is locked in the predetermined operational condition by the intermediate locking means and when the at least one throttle lever is moved in the operational direction a second time, the at least one throttle lever is released from the predetermined operation condition.

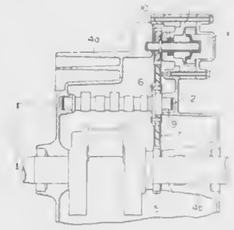
4,898,040

POWER TRANSMISSION APPARATUS

Shinichi Tamba, Kobe; Takeshi Miyazaki, Miki, and Akio Miguchi, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Oct. 19, 1988, Ser. No. 259,778
Claims priority, application Japan, Oct. 23, 1987, 62-162660[U]
Int. Cl.[4] F16H *37/06, 55/06*
U.S. Cl. 74—15.63 6 Claims

1. A power transmission apparatus comprising:
an aluminum housing;
a first shaft and a second shaft which are rotatably supported by said housing;
an iron gear which is mounted on said first shaft; and
a synthetic resin gear which is mounted on said second shaft and engages with said iron gear, said synthetic resin gear comprising a synthetic resin and aromatic polyamide fibers which are incorporated into the synthetic resin.

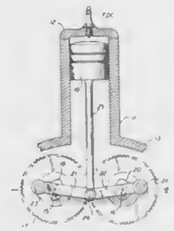


4,898,041

DRIVE LINKAGE FOR RECIPROCATING ENGINE

John J. Islas, R.D. 3, Box 498, Canastota, N.Y. 13032

Filed May 4, 1987, Ser. No. 45,539
Int. Cl.[4] F16H *21/38*
U.S. Cl. 74—44 9 Claims



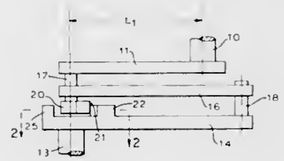
1. In a reciprocating engine of the type in which a piston travels in a cylinder between top dead center and bottom dead center positions, and in which a pair of parallel counter-rotating cranks having crank arms joined by respective connecting rods to said piston and have axes that define a crank plane, such that the rotary motion of the cranks for travel of the piston from the top dead center position to the bottom dead center position is significantly different from 180 degrees, and the rotary motion of the cranks for the travel of the piston from the bottom dead center position to the top dead center position is correspondingly different from 180 degrees in the complementary sense, and wherein the engine further comprises a piston rod that extends from said piston and between the crank axes and is pivotally coupled to said connecting rods such that the pivotal couplings of said piston rod to said connecting rods remains disposed at the side of said crank plane remote from said piston for all travel of said piston between said top dead center and bottom dead center positions; the improvement wherein the piston travel from top dead center to bottom dead center corresponds to crank motion significantly greater than 180 degrees and the piston travel from bottom dead center to top dead center corresponds to crank motion significantly greater that 180 degrees; and the crank arms, the connecting rods, and separation of the cranks are related such that for a given rotation angle of said cranks near top dead center, said piston descends from top dead center substantially at least twice as far as said piston ascends toward top dead center, whereby dwell time at top dead center is significantly reduced.

4,898,042

ROTARY DRIVES

Bryan N. V. Parsons, Stoney Stanton, England, assignor to Jaguar Cars Limited, United Kingdom

Filed Aug. 10, 1988, Ser. No. 230,786
Claims priority, application United Kingdom, Aug. 29, 1987, 8720494
Int. Cl.[4] F16H *21/12;* F01L *7/00*
U.S. Cl. 74—68 14 Claims



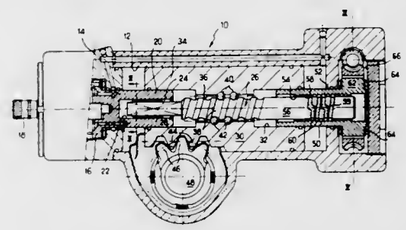
1. A rotary drive mechanism comprising an input shaft having a first crank, an output shaft mounted parallel to the input shaft but offset radially therefrom by a distance equal to the length of the first crank, said output shaft having a second crank the length of which is greater than the length of said first crank, the first and second cranks being pivotally connected to opposite ends of a link, the link being the same length as the second crank, and interlock means act between the first crank and at least one of the second crank and link, to prevent rotation of the second crank and link independently of the input shaft, when the second crank and link are parallel to one another.

4,898,043

VARIABLE RATIO STEERING MECHANISM

Juan S. Bacardit, Barcelona, Spain, assignor to Bendix Espana, Barcelona, Spain

Filed Oct. 4, 1988, Ser. No. 253,274
Claims priority, application European Pat. Off., Oct. 5, 1987, 87500064.8
Int. Cl.[4] B62D *5/00;* F16H *35/00*
U.S. Cl. 74—388 PS 8 Claims



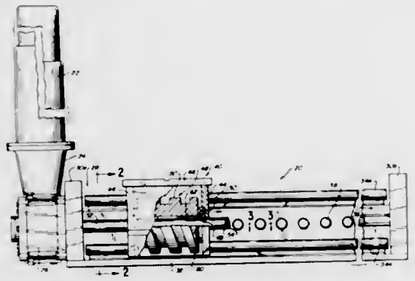
1. A variable ratio steering mechanism comprising a body in which is rotatably mounted an input shaft, a drive shaft having a longitudinal axis and coupled to the input shaft so as to be rotatable therewith, an output member slidably mounted in the body, screw means connecting the drive shaft and the output member so that rotation of the drive shaft produces a corresponding displacement of the output member in the body, characterized in that the drive shaft is axially slidable with respect to the input shaft, the mechanism further comprising means to selectively displace the drive shaft axially with respect to the input shaft, the displacement means comprising screw connection means between a drive member mounted in the body and the drive shaft.

4,898,044

CAM-DRIVEN LINEAR ACTUATOR APPARATUS

Peter E. Galloway, Wilton, Conn., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 26, 1988, Ser. No. 262,955
Int. Cl.[4] F16H *25/12, 25/22*
U.S. Cl. 74—424.6 **5 Claims**



1. A linear actuator apparatus comprising:
a drive motor assembly;
slide mechanism means driven by said drive motor assembly and operable to convert rotary motion into linear motion, said slide mechanism means comprising an elongated shaft means and a slide means, said slide means rotatably driven by said shaft means and linearly slidable therealong;
a drive cam member securably mounted to said slide means and operable to both rotate and linearly slide therewith;
a plurality of aligned cam follower members each positionally fixed and respectively engageable with said drive cam member; and
load carriage means journalled for sliding movement along a path parallel to said plurality of aligned cam follower members, said load carriage means also journalably supported relative to said drive cam member and said slide means, whereby rotation of said drive motor causes rotation of said drive cam member whereupon said engagement of said positionally fixed cam follower members with said drive cam member causes said drive cam member and said load carriage means to move linearly.

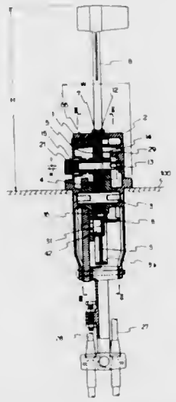
4,898,045

CONTROL DEVICE FOR BOAT ENGINE

Masanao Baba, Takarazuka, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Filed May 9, 1988, Ser. No. 192,032
Claims priority, application Japan, Nov. 20, 1987, 62-294808
Int. Cl.[4] B63H *21/24*
U.S. Cl. 74—471 R **3 Claims**

1. A control device for a boat engine comprising:
(a) a clutch arm, an operating disk, a throttle arm, and a single shaft for rotatably supporting said clutch arm, said operating disk and said throttle arm in that order;
(b) an operating lever extending radially and outwardly from a periphery of said operating disk for turning said operating disk;
(c) a gear mechanism installed between said operating disk and said clutch arm to change a first turn stage of said operating disk to a swing movement of said clutch arm; and
(d) a cam groove formed in a side surface of said operating disk facing to said throttle arm, a rack member having a cam-follower inserted in said cam groove, and a set of teeth formed on a boss of said throttle arm and engaging



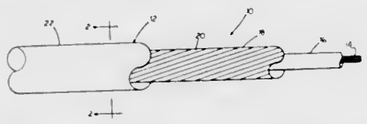
with said rack to change a latter turn stage of said operating disk to a swing movement of said throttle arm.

4,898,046

CONTROL CABLE

James M. Mancewicz, Kent City, and William R. Bosworth, Jr., Hudsonville, both of Mich., assignors to Grand Rapids Controls, Inc., Rockford, Mich.

Filed Dec. 3, 1987, Ser. No. 128,034
Int. Cl.[4] B32B *15/00;* **F16C** *1/10*
U.S. Cl. 74—502.5 **12 Claims**



1. In a control cable assembly wherein a core wire is slidably mounted in a conduit, an improved conduit comprising:
a tubular liner formed of a plastic resin surrounding the core wire;
a stranded wire reinforcement layer surrounding the liner, the reinforcement layer comprising a plurality of parallel lay wire strands formed of low carbon steel having a carbon content of SAE 1005–1040, the strands being wrapped substantially contiguously in a helical configuration around the liner, the wire strands being 0.008 to 0.020 inches in diameter, the helical configuration having a pitch of 0.5 to 3.0 inches, the carbon content, diameter, and pitch being interrelated in the following manner:

Wire SAE	Pitch for 0.008–0.015 Diameter Wire (inches)	Pitch for >0.015–0.020 Diameter Wire (inches)
1005–1020	0.5–1.5	0.5–2.0
>1020–1030	0.5–2.0	0.5–3.0
>1030–1040	0.5–3.0	0.5–3.0

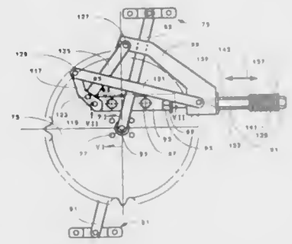
and
an abrasion resistant jacket surrounding the stranded wire layer.

4,898,047

CRANK AND SPROCKET DRIVE

Douglas A. Cropek, 6400 Oak Acorn Ct., Citrus Heights, Calif. 95621

Filed Sep. 14, 1987, Ser. No. 92,061
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—534.2 **6 Claims**



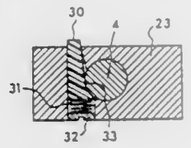
1. An apparatus for converting an applied driving force to rotary power comprising:
frame support means for supporting said apparatus;
a sprocket rotatably mounted to said frame support means;
a crank for driving said sprocket; and
resilient connecting means disposed between said crank and said sprocket such that application of force to said crank will deform said resilient connecting means and allow said crank to rotate relative to the rotation of said sprocket in said frame support means without increasing the throw of said crank;
said resilient connecting means comprising:
guide means fixedly attached to said sprocket;
a sliding member configured to engage said guide means and constrained thereby to move along said guide means, and further engaging said crank such that rotation of said crank relative to said sprocket will urge said sliding member along said guide means; and
spring means bearing on both said guide means and on said sliding member such that said spring means is deformed as said sliding member is urged along said guide means.

4,898,048

SELF CONTAINED BRAKING SYSTEM FOR BICYCLE PEDALS

Eric A. Sampson, Denver, Colo., assignor to Sampson Sports, Inc., Denver, Colo.

Division of Ser. No. 54,577, May 27, 1987, Pat. No. 4,819,504.
This application Jan. 9, 1989, Ser. No. 295,197
Int. Cl.[4] G05G *1/14;* **B62M** *3/08*
U.S. Cl. 74—594.4 **7 Claims**



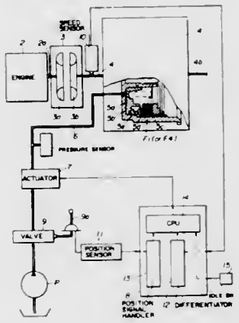
1. A bicycle pedal system comprising:
a bicycle pedal body and a horizontally disposed axle about which said body can rotate;
an elongated vertically movable member positioned within a cavity in said pedal body,
a top surface on an upper extremity of said member normally projecting above a top surface of said pedal body for receiving pressure applied by a shoe of a cyclist to said top surface of said pedal body,
vertically movable brake means on said member for engaging said axle to inhibit rotation of said pedal body about said axle when said pressure from said shoe is not applied to said top surface of said member, and
said vertically movable member being responsive when said pressure is applied by said shoe to disengage said brake means from said axle so that said pedal body can rotate freely about said axle and a spring entirely contained within said pedal body and positioned beneath said member for normally forcing said member upwards so that said braking surface is normally pressed upward against a side of said axle to inhibit said rotation of said pedal body about said axle.

4,898,049

ELECTRO-HYDRAULIC CONTROL FOR REDUCING ENGAGEMENT SHOCK IN AN AUTOMATIC TRANSMISSION

Yasuhiro Niikura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jul. 2, 1987, Ser. No. 69,201
Claims priority, application Japan, Jul. 7, 1986, 61-103836[U]
Int. Cl.[4] B60K *41/10*
U.S. Cl. 74—866 **5 Claims**



1. In an automatic transmission having an output member and an input member that is drivingly connected to a torque converter which in turn is drivingly connected to an engine,
a frictional element that may be engaged in response to the flow of a hydraulic fluid to establish a torque delivery path in the automatic transmission, said frictional element being driven through the input member;
means, including a transmission valve which may be selectively placed in any of a plurality of running range positions and in a neutral range position, for supplying hydraulic fluid toward said frictional element when said transmission valve is shifted from the neutral range position to one of the running range positions;
means for sensing the speed of the input member of the automatic transmission and for generating a speed signal indicative of the speed;
means for sensing the idling state of the engine and for generating an idling signal indicative of the idling state of the engine;
a control unit including means receiving the speed signal and the idling signal for generating, only when the engine is in an idling state, a derivative signal indicative of the derivative with respect to time of the speed signal, means for generating a target derivative signal indicative of a target value of the derivative signal, and means for generating an error signal indicative of the difference between the derivative signal and the target derivative signal, and means

responsive to the error signal for generating an output signal; and

means responsive to said output signal for controlling said hydraulic fluid supplying means to reduce said error signal toward zero.

4,898,050

SYSTEM FOR CONTROLLING THE PRESSURE OF OIL FOR A CONTINUOUSLY VARIABLE TRANSMISSION

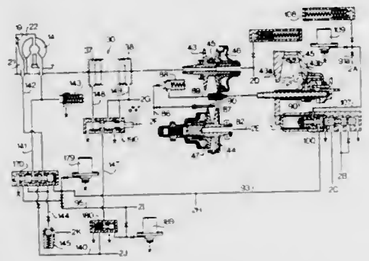
Yasuhito Sakai, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,430

Claims priority, application Japan, Apr. 28, 1987, 62-105653

Int. Cl.[4] B60K *41/12*

U.S. Cl. 74—867 **9 Claims**



1. In a system for controlling pressure of oil for a continuously variable transmission for transmitting power of an engine to wheels of a vehicle, the transmission having pulleys and a belt running thereon, hydraulic cylinders for changing running diameters of the pulleys, a torque converter with a lockup clutch, and a selector device for selecting forward and reverse drives, the system having a hydraulic circuit including a transmission ratio control valve and a line pressure control valve for controlling the hydraulic cylinders, and a lockup control valve for controlling said torque converter with said lockup clutch, the improvement in the system wherein:

each of said control valves has a shiftable spool;

a high pressure oil pump located adjacent the transmission for producing high pressure oil;

a low pressure oil pump located adjacent the torque converter for producing low pressure oil;

both of the oil pumps being operatively connected to the engine so as to be driven by the engine;

a first hydraulic circuit for supplying the high pressure oil to the hydraulic cylinders through the line pressure control valve and the transmission ratio control valve;

a second hydraulic circuit for supplying the low pressure oil to the lockup clutch through the lockup control valve;

a reducing valve supplied with the low pressure oil for producing constant control pressure oil;

a constant pressure circuit for supplying the constant control pressure oil to the transmission ratio control valve, said line pressure control valve and said lockup control valve, for shifting said spools of the respective control valves; and

solenoid operated valves communicated with the constant pressure circuit for producing control pressures for controlling the shifting of said spools of said respective control valves so as to control the supplying of the high pressure oil and the low pressure oil to said hydraulic cylinders and said lockup clutch, respectively.

4,898,051

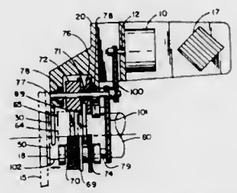
CONNECTOR MATE/DEMATE TOOL

David A. Easter, Westerville; William R. Dick, Columbus; Donald J. Hackman, Columbus, and Kathryn E. Alexander, Columbus, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Dec. 23, 1988, Ser. No. 289,055

Int. Cl.[4] B25B *17/00*

U.S. Cl. 81—57.2 **33 Claims**



1. A connector mate/demate tool for mating and demating a first section and a second section of a connector comprising:

a. a support frame;

b. a rotational drive means attached to said frame;

c. a means, attached to said frame, for aligning said frame with said second connector section; and

d. a rotary engagement means, attached to said frame and rotatably contacting said first connector section, for axially aligning said first connector section with said second connector section and driven by said rotational drive means for securing and unsecuring said first and second sections of said connector.

4,898,052

AUTOMATICALLY CONTROLLED SOCKET WRENCH

Byung K. Kang, 1516-5 Jung 2-Dong, Pusan Eunghang Apt. #101, Haeundae-Ku, Pusan, Rep. of Korea

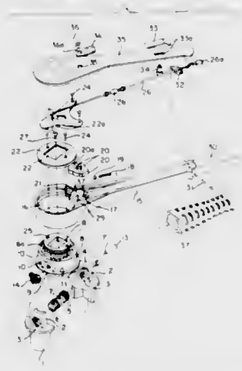
Filed Jun. 28, 1988, Ser. No. 212,692

Claims priority, application Rep. of Korea, Jan. 8, 1988, 12988[U]

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[4] B25B *13/00*

U.S. Cl. 81—57.43 **6 Claims**



1. An automatically controlled socket wrench which comprising:

a body member containing a handle,

a rotating, hollow gear member disposed within said body member, said rotating, hollow gear member containing a spring plate engaging aperture disposed thereon,

a pair of opposing jaw members slidably mounted within said rotating hollow gear member, said pair of opposing jaw members containing a supporter having a screwing aperture, respectively,

a double worm gear member with gears for engaging with said screwing apertures, said double worm gear member having a tubular shaft for receiving an axial pin,

a stopper member disposed in said body member, said stopper member being adapted to operatively engage said rotating gear member for restricting its rotation with said body member by operating a lever, and

a controlling wire rope connected to said double worm gear member at one end thereof and to switching means at the other end thereof through rollers, said rollers being disposed above the double worm gear member and disposed in said handle, whereby, upon the operation of the means for switching, the jaws are caused to open against the bias of the plate spring, and after the jaws are positioned around an object and after the operation of the lever and the suspending of the stopper member, the jaws are automatically and strongly closed by the spring plate around said object.

4,898,053

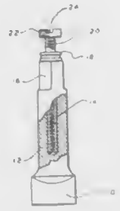
SOCKET WRENCH EXTENSION WITH EXTENSIBLE MAGNET

Anthony Russo, 18 Briar Hill Rd., Cedar Grove, N.J. 07009

Filed Oct. 1, 1987, Ser. No. 103,452

Int. Cl.[4] B25B *23/00*; B25G *3/02*

U.S. Cl. 81—125 **5 Claims**



1. A socket wrench extension for use with one of a plurality of removable sockets having different depths, comprising:

a threaded stem having a magnetic head; and

a shank having a driving and driven end, and a threaded axial bore extending into said driving end but falling short of said driven end, said driven end having a drive receiving portion, said shank having at said driving end a polygonal portion with a polygonal cross-section for engagement with an opening in a removable socket, said threaded stem being threaded partially into said bore to extend said magnetic head beyond said driving end, so that said magnetic head can be adjustably extended from said driving end to bring said magnetic head into a position consistent with the different depths of said removable sockets.

4,898,054

TOOL FOR CHIP REMOVING MACHINING

Olof L. Byström, Sandviken, and Sven-Erik V. Johansson, Gävle, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Continuation of Ser. No. 78,808, Jul. 28, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 251,014

Claims priority, application Sweden, Aug. 6, 1986, 8603325

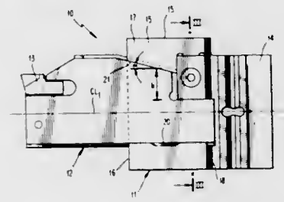
Int. Cl.[4] B23B *29/09*

U.S. Cl. 82—160 **20 Claims**

1. In a tool for chip removal machining comprising a holder and a planar blade removably secured in said holder, said blade including a front site for receiving a cutting insert, the improvement wherein:

said holder comprises an expandable securing part and a head attached thereto, said head including a recess extending in a front-to-rear longitudinal direction, said recess comprising an inner wall and blade-engaging edge means including front-to-rear extending upper and lower border edges converging away from said inner wall to define a dove-tail profile as viewed in a cross-section of said recess,

said blade being removably retained in said recess and comprising a one-piece plate extending in a front-to-rear longitudinal direction, said plate containing said insert-receiving site in the form of a pocket and comprising recess-engaging edge means including upper and lower abutment edges forming a dove-tail profile as viewed in a cross-section of said blade, said abutment edges contacting respective ones of said border edges to define therewith contact regions located adjacent front and rear ends of said border edges, said edge means of said blade and holder cooperating to define mutually engageable wedging surface means for applying against said blade:



first wedging forces in response to longitudinal rearward movement of said blade to positively limit said rearward movement of said blade,

second wedging forces in the plane of said blade in a direction perpendicular to said longitudinal direction to force said blade firmly against said lower border edge, and

third wedging forces in a direction perpendicular to the plane of said blade and perpendicular to said longitudinal direction to force said blade firmly against said inner wall of said recess,

said holder including a movable wedge member including a surface defining a portion of one of said border edges, and together with said upper abutment edge applying said second wedging forces, said wedge member being movable relative to said recess in a direction substantially perpendicular to the plane of said plate and substantially perpendicular to said longitudinal direction.

4,898,055

ADJUSTABLE MULTIPLE PAPER PUNCH

Hildaur L. Neilsen, 2 Juniper St., Metuchen, N.J. 08840

Filed Dec. 15, 1988, Ser. No. 285,108

Int. Cl.[4] B26F *1/04*

U.S. Cl. 83—571 **1 Claim**

1. A punching unit for use in a punch having a body and a punch-actuating lever pivoted thereto, said punching unit comprising a body defining a die hole, a punching element in the nature of a die reciprocably positioned in said punching unit body for cooperation with said die hole, and pivoted spacer means carried by said punching unit for movement into and out of overlying relationship with said punching element, whereby said spacer means adds to the length of said punching element when it is pivoted into over-lying relationship there-

with, said unit having a substantially square frame, said spacer element having a substantially planar body with spaced-apart





wings downwardly-extending from opposite sides of said body and a pivot pin connecting said wings within said body.

4,898,056

METHOD AND TOOL FOR PUNCHING PLASTER PLATES

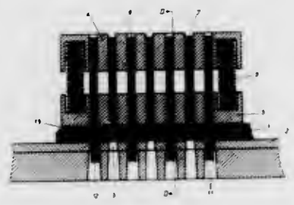
Finn Grobb; Kurt Hvalso, and Benni Madsen, all of Kalundborg, Denmark, assignors to Gyproc A/S, Kalundborg, Denmark

Continuation-in-part of Ser. No. 33,106, Feb. 19, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 228,809

Claims priority, application Denmark, Jul. 1, 1985, 2989/85; PCT Int'l Appl., Jun. 26, 1986, PCT/DK86/00077

Int. Cl.⁴ B26F *1/14*

U.S. Cl. 83—689 **14 Claims**



1. A tool for punching plaster boards manufactured from a hardened plaster comprising

punching tools,

a patrix having a main part for holding said punching tools, and a control plate, spring means interposed between said main part and said control plate for ensuring a control pressure of said tools on said plaster board, said control plate engaging closely with the plaster board to ensure a clean cut, and

a matrix for guiding said punching tools, said matrix having a wearing plate with a plurality of openings for receiving said punching tools and base plate having apertures coinciding with said openings of the wearing plate, said openings being adapted for expelling of a material punched out from said plaster board, each said punching tool having a blade positioned at an angle to a surface of the board, wherein during an operation said plaster board is positioned between an outside surface of said control plate and on outside surface of said wearing plate, whereby punching is first performed to form a number of first slits and thereafter form a number of second slits during a further movement to the patrix, said second slits being punched between said first slits.

4,898,057

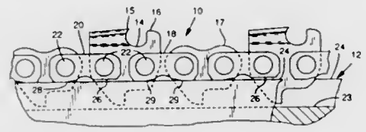
LOW VIBRATION CENTER DRIVE CUTTER CHAIN

Arvin A. Hille, Lake Oswego, Oreg., assignor to Blount, Inc.

Filed Jun. 13, 1989, Ser. No. 365,601

Int. Cl.⁴ B27B *33/14*

U.S. Cl. 83—831 **4 Claims**



1. A cutting chain for a chain saw including a cutter bar about which the chain circulates, said bar having a substantially straight portion along which the chain travels and a peripheral groove defined by a pair of opposite side rails, said cutting chain adapted to circulate around said bar in a predetermined direction and comprising:

a center cutter link having a tang adapted to ride within said groove and a cutting tooth formed in the link, the cutter link also having forward and rearward pivot openings;

a pair of oppositely disposed side links each having forward and rearward pivot openings and forward and rearward bar engaging undersides, the width of each of said links between its forward pivot opening and forward bar engaging underside being less than the width between its rearward pivot opening and rearward bar engaging underside; and

pin means extending through the rearward pivot opening of the cutter link and forward pivot openings of said side links for pivotally interconnecting the cutter and side links at said openings and extending through the rearward pivot openings of said side links for interconnecting said links to a following link and through the forward pivot opening of said cutter link for interconnecting said link to a preceding link,

whereby the forward bar engaging undersides of the side link are spaced from adjacent rails of said bar when the axes of the pivot means are substantially in a plane parallel to the surfaces of said rails.

4,898,058

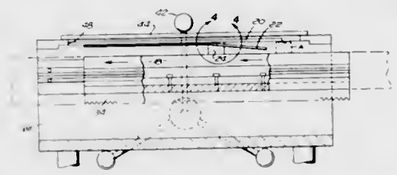
APPARATUS FOR REMOVING PELLICLES

Willis Seifert, Cupertino, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 24, 1987, Ser. No. 137,881

Int. Cl.⁴ B26D *3/28*

U.S. Cl. 83—870 **9 Claims**



9. A method for removing a pellicle of the type having a perimeter frame bonded to a first surface of a photomask with a layer of adhesive comprising the steps of:

(a) placing the photomask in a housing with the first surface of the photomask supported by an upper surface of said housing;

(b) securing the photomask in said housing so as to prevent lateral and longitudinal displacement of said photomask;

(c) positioning a blade rigidly in a movable carriage of said housing so that a cutting edge of said blade is positioned immediately below said upper surface of said housing so as to intercept the layer of adhesive between the perimeter frame and the first surface of the photomask; and

(d) moving said blade in a controlled manner such that said cutting edge is translated parallel to said upper surface along a path between the photomask and a portion of the perimeter frame of the pellicle;

whereby said pellicle is separated from said photomask.

4,898,059

ELECTRONIC MUSICAL INSTRUMENT WHICH COMPARES AMOUNT OF DATA RECORDED IN INTERNAL MEMORY DEVICE WITH STORAGE CAPACITY OF EXTERNAL MEMORY DEVICE AND SELECTIVELY TRANSFERS DATA THERETO

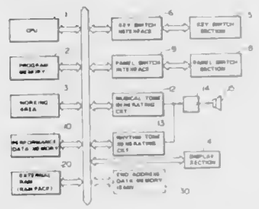
Akira Iizaka, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 8, 1988, Ser. No. 153,226

Claims priority, application Japan, Feb. 6, 1987, 62-25886; Feb. 6, 1987, 62-25887

Int. Cl.⁴ G09B *15/; G10H 1/00*

U.S. Cl. 84—601 **15 Claims**



12. An automatic performance data recording and reproducing apparatus for an electronic musical instrument comprising:

(a) first memory means for storing performance data;

(b) second memory means for recording performance data transferred from said first memory means; and

(c) transfer means for transferring said performance data stored in said first memory means to said second memory means based on a computed data quantity of said performance data stored in said first memory means and a detected storage capacity of said second memory means in a recording mode, wherein said transferred performance data are reproduced from said second memory means so that musical tones corresponding to the reproduced performance data are generated in a reproducing mode.

4,898,060

MUSICAL ADAPTER FOR NURSING BOTTLE

Ping K. To, 13/F., Flat A, No. 6, Centre Street, Hong Kong, Hong Kong

Filed Dec. 1, 1988, Ser. No. 278,365

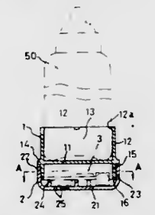
Int. Cl.⁴ G10F *1/06*

U.S. Cl. 84—95.2 **4 Claims**

1. An electronic musical adaptor for use with a nursing bottle, a cup, or a liquid container, said adaptor comprising:

a hard injection molded synthetic resin cup-shaped body having an upper portion and a lower portion, a substantially cylindrical wall defining a hollow cavity in said upper portion, means on said cylindrical wall for releasably retaining a liquid container in said hollow cavity, a downwardly open substantially cylindrical skirt on said lower portion of said cup-shaped body, means on said cylindrical skirt for frictionally detachably engaging said cup-shaped body with a bowl-shaped base member;

a bowl-shaped base member having an upwardly extending circumferential wall detachably engaged with said frictional engaging means of said cup-shaped body, said circumferential wall of said bowl-shaped base member jointly defining a space with said cylindrical skirt of said cup-shaped body, and a plurality of through sound holes defined in said bowl-shaped base member for causing sound produced within said space to be transmitted out of said bowl-shaped base member; and



an electronic musical IC device attached to said bowl-shaped base member and received within said space, switch means on said musical IC device for turning on said IC device for producing a sound responsive to tilting of said IC device when said electronic musical adaptor is picked up by a user.

4,898,061

BLOCK-TYPE PERCUSSION INSTRUMENT

Wayne E. Cohen, Emerson, and Donald M. Kralik, Elmwood, both of N.J., assignors to Latin Percussion, Inc., Garfield, N.J.

Continuation of Ser. No. 252,861, Sep. 30, 1988, abandoned. This application Jun. 22, 1989, Ser. No. 370,164

Int. Cl.⁴ G10D *13/06*

U.S. Cl. 84—402 **12 Claims**

1. A percussion instrument in the form of an oblong, plastic block comprising:

a generally rectangular block portion having front, top, and bottom faces and an elongated slot in the front face extending substantially the width and depth of the block portion;

a flange extending outwardly on either side and to the rear of said block portion, said flange including at least one mounting means; and

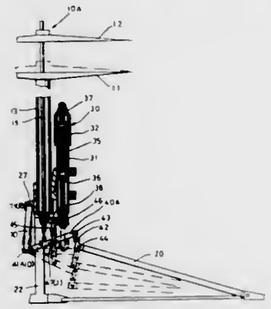
a raised striking ridge extending along the top face adjacent the front face.

4,898,062

HIGH HAT STAND WITH A ROTARY MEMBER

Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Apr. 4, 1989, Ser. No. 333,563
Claims priority, application Japan, Aug. 24, 1988, 63-209726
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422.3 14 Claims



1. A high hat stand for cymbals comprising:
a support for a stationary cymbal and a stationary cymbal carried on the support;
a movable cymbal and an operating rod on which the movable cymbal is supported, the operating rod being movable for moving the movable cymbal in a first, contacting direction to move the movable cymbal into engagement with the stationary cymbal and in a second, out of contact direction for moving the movable cymbal out of engagement with the stationary cymbal;
a pedal operable in one direction for moving the operating rod to move the movable cymbal in the first, contacting direction, and the pedal being movable in the opposite direction for permitting movement of the operating rod in the second, out of contact direction;
a rotary shaft having an axis that extends across the direction of movement of the operating rod in the first, contacting and second, out of contact directions;
a rotary member on the shaft, a first connecting point on the rotary member and spaced a first distance from the axis of the rotary shaft, first means connecting the first connecting point on the rotary member to the operating rod, such that the operating rod is acted upon by a force produced by a lever arm of the length from the axis of the rotary shaft to the first connecting point; a second connecting point on the rotary member and spaced a second distance from the axis of the rotary shaft, second means connecting the second connecting point to the pedal, such that movement of the pedal moves the second connecting point and rotates the rotary member around the shaft;
wherein the first effective radius of rotation between the shaft and the first connecting point is smaller than the second effective radius of rotation between the shaft and the second connecting point.

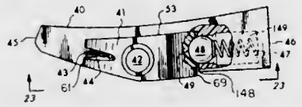
4,898,063

INTEGRATED BICYCLE PEDAL WITH SELF CENTERING AND LATERAL RELEASE CAPABILITIES

Eric A. Sampson, Denver, Colo., assignor to Sampson Sports, Inc., Denver, Colo.

Division of Ser. No. 16,277, Feb. 19, 1987, Pat. No. 4,815,333.
This application Nov. 29, 1988, Ser. No. 277,359
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.6 10 Claims

1. A bicycle pedal system comprising:
a shoe cleat adapted to be affixed to a shoe of a cyclist,
a pedal body adapted to be connected to a shaft on a bicycle crank arm,
an arcuate transverse channel having a first longitudinal radius on a front facing vertical surface of a front extremity of said pedal body, and
an arcuate protrusion on a rear facing vertical surface on a front portion of said cleat with said protrusion having a longitudinal radius equal to said radius of said body, said protrusion of said cleat being adapted to matingly engage in said channel of said pedal body,
a spring loaded detent in a heel portion of said cleat positioned in a horizontal plane below a horizontal plane comprising a top surface of said cleat,
a seating cavity in a rear facing vertical surface of a heel portion of said body and adapted to receive said detent,



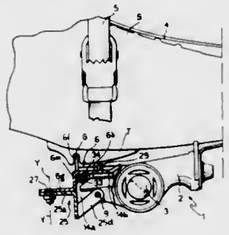
means including said detent and said cavity for matingly engaging said pedal body and said cleat in an interlocked manner with a downward motion of said heel portion of said cleat with respect to said heel portion of said pedal body whereby pedaling forces may be applied to said pedal body by said cleat in an upward, downward, forward and backward direction with respect to the longitudinal axis of said bicycle while minimizing motion of said cleat with respect to said pedal body, and
means including said detent and a front portion of said body and a front portion of said cleat for controllably disengaging said cleat from said pedal body in response to a torsional force on said shoe to which said cleat is affixed with said force being less than said upward pedaling force.

4,898,064

PEDAL WITH A SAFETY DEVICE, FOR RACE-BICYCLES

Antonio Romano, Padua, Italy, assignor to Campagnolo S.p.A., Vicenza, Italy

Filed Nov. 14, 1988, Ser. No. 270,592
Claims priority, application Italy, Nov. 12, 1987, 67965 A/87; Aug. 1, 1988, 67728 A/87; Sep. 22, 1988, 67842 A/88
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.6 10 Claims



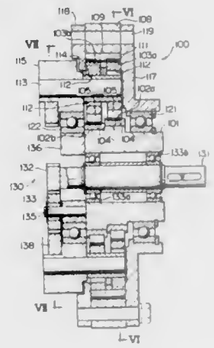
1. A pedal for racing bicycles, comprising a pedal body carrying a toe clip with a strap for retaining a cycling shoe at the front, a transverse stop in the form of a projecting plate movably mounted at the rear of said pedal for engagement in a recess formed in a cleat fitted to the sole of the cycling shoe, and adjustable resilient means engaging said transverse stop whereby said transverse top is movable relative to said pedal so as to enable its release from the cleat in use as a result of a force applied by the shoe above a threshold value to overcome said resilient means wherein an intermediate element is articulated to said pedal body about a main axis substantially parallel to said transverse stop, said transverse stop being connected to said pedal body with the interposition of said intermediate element and being rotatable relative thereto about an auxiliary axis substantially perpendicular to said main axis so as, in use, to allow said transverse stop to be release from the cleat as a result of a pivoting force applied by the shoe of a predetermined magnitude about a substantially vertical axis and subsequent backwards movement of the shoe itself.

4,898,065

PLANETARY REDUCTION GEAR

Seishiro Ogata, and Katsumi Taki, both of Ohbu, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00210, § 371 Date Oct. 26, 1988, § 102(e) Date Oct. 26, 1988, PCT Pub. No. WO88/06688, PCT Pub. Date Sep. 7, 1988
PCT Filed Feb. 26, 1988, Ser. No. 305,122
Claims priority, application Japan, Feb. 27, 1987, 62-46182; Feb. 27, 1987, 62-46183; Apr. 24, 1987, 62-99873; Apr. 27, 1987, 62-62581; Apr. 27, 1987, 62-62582
Int. Cl.[4] F16H *1/28*
U.S. Cl. 475—179 12 Claims



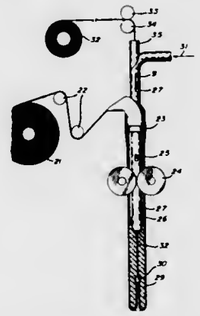
1. A planetary reduction gear having an inscribe type planetary gear mechanism comprising a ring-shaped internally-toothed gear (108; 602), externally-toothed gear means (103*a*, 103*b*; 601*a*, 601*b*) which inscribe in said internally-toothed gear, a plurality of pin-receiving bores (112; 604) provided in said externally-toothed gear means and spaced in the circumferential direction, inner pins (113; 606) loosely received in the pin-receiving bores, a flange (115, 608) supporting said inner pins, and rotatable eccentric means (102*a*, 102*b*; 613*a*, 613*b*) for causing eccentric rotation of said externally-toothed gear means in an orbiting manner,
characterized by comprising a planetary gear mechanism (130; 630) combined with said inscribe type planetary gear mechanism, said planetary gear mechanism (130; 630) including an input shaft (131; 631), an externally-toothed sun gear (132; 635) secured to said input shaft for rotation therewith, a plurality of planet gears (133; 636) arranged around said sun gear in meshing engagement therewith, an internally-toothed sun gear (138; 640) in which said planet gears inscribe, and a rotatable planet carrier (136; 638) rotatably carrying said planet gears and connected to said eccentric means so as to rotate said eccentric means;
wherein one of said internally-toothed gear and said flange serves as an output member while the other serve as a stationary member;
and wherein said internally-toothed sun gear being secured to said output member for rotation therewith;
whereby the rotation of said input shaft is transmitted to said planet carrier through said externally-toothed sun gear and said planet gears so as to cause said planet carrier to rotate in the same direction as the direction of rotation of said input shaft; and
the rotation of said planet carrier is transmitted to said output member through said eccentric means and said externally-toothed gear means so as to cause said output member to rotate in the direction counter to the direction of rotation of said planet carrier.

4,898,066

POLYMERIC FILM ENVELOPED EXPLOSIVE CARTRIDGES AND THEIR MANUFACTURE AND USE

Horst F. Marx, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Canada

Division of Ser. No. 150,979, Feb. 1, 1988, Pat. No. 4,872,408.
This application Jul. 25, 1989, Ser. No. 385,441
Claims priority, application Canada, Mar. 25, 1987, 532930
Int. Cl.[4] F42B *3/00*
U.S. Cl. 86—20.1 1 Claim



1. A method of manufacturing an improved flexible film-enveloped explosive cartridge comprising the steps of:
(a) positioning an open-ended tube of flexible film so that it describes upper and lower extremities;
(b) positioning centrally within the said tube a cord-like structure having upper and lower extremities;
(c) closing the lower extremity of said tube so as to firmly grip the lower extremity of the said cord-like structure;
(d) placing in the said tube a quantity of explosive; and
(e) closing the upper extremity of said tube so as to firmly grip the said upper extremity of the said cord-like structure so that the said cord-like structure is under longitudinal tension to provide a selected internal cartridge pressure.

4,898,067

COMBING APPARATUS FOR BRAIDING MACHINE

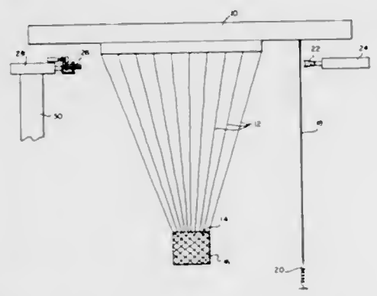
Clint H. Ashton, Warrenton, and Gerald A. Patterson, Manassas, both of Va., assignors to Atlantic Research Corporation, Alexandria, Va.

Filed Jul. 3, 1989, Ser. No. 374,988
Int. Cl.[4] D04C *1/06, 3/00, 3/48*
U.S. Cl. 87—8 12 Claims

1. Apparatus for combing fibers extending from a braiding machine to a braid point for the formation of a braided article, comprising:
a flexible line positioned on one side of the fibers and extending generally between the braiding machine and the braid point;
means for pushing the line into the fibers near the braiding machine; and
means for gripping the line when it is pushed into the fibers to pull the line through the fibers and toward the braid point, thereby separating and combing the fibers.
12. A method of combing fibers extending from a braiding

machine to a braid point for the formation of a braided article, comprising the steps of:

positioning on one side of the fibers a flexible line extending generally between the braiding machine and the braid point;



pushing the line into the fibers near the braiding machine; and

gripping the line pushed into the fibers and pulling it through the fibers toward the braid point to separate and comb the fibers.

4,898,068

TORQUE WRENCH

Klaus Neuhaus, Wuppertal, Fed. Rep. of Germany, assignor to Eduard Wille GmbH u. Co., Fed. Rep. of Germany

Filed Mar. 1, 1989, Ser. No. 317,674

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808120

Int. Cl.[4] B25B *23/142*

U.S. Cl. 81—483 **20 Claims**



1. A torque wrench, comprising an elongate outer housing; an elongate inner part extending rigidly within said housing from adjacent one end thereof to and beyond the opposite end thereof, that portion of said inner part extending beyond the said opposite end of the housing constituting a handle portion for the wrench, there being clearance between said inner part and said housing permitting transverse movement of one relative to the other; means adjacent to the said one end of the housing pivotally interconnecting said inner part and said housing; means for holding a work-engaging tool at and connected to the said one end of the housing; and spring-loaded, toggle lever mechanism operatively interconnecting said handle portion of the inner part and said outer housing for holding said inner part and said housing against transverse relative movement but arranged to release when a torque exerted on said tool by the wrench is excessive, thereby effecting sudden relative transverse movement between said inner part and said housing to alert the user of the wrench to the excessive torque.

4,898,069

APPARATUS FOR TRANSPORTING CARTRIDGES TO A FIRING WEAPON WITH AN ELEVATION CONTROL SYSTEM

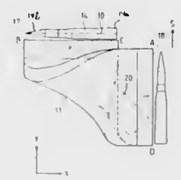
Samuel Schmid, Dietlikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zumi/u/ rich, Switzerland

Continuation-in-part of Ser. No. 864,773, May 19, 1986, abandoned. This application Mar. 11, 1988, Ser. No. 167,028

Claims priority, application Switzerland, Jun. 4, 1985, 02355/85

Int. Cl.[4] F41D *10/38*

U.S. Cl. 89—33.01 **13 Claims**



9. An apparatus for feeding cartridges from a stationary container to a firing weapon adjustable in elevation about an elevation axis, said apparatus comprising:

supply means for cartridges to be transported to a region at least in a neighborhood of the elevation axis of the firing weapon;

deflection means cooperating with the supply means for deflecting the cartridges according to a given elevation of the firing weapon and for infeeding the cartridges into the firing weapon;

said deflection means comprising a substantially helical non-flexible cartridge feed channel connected to the firing weapon;

said substantially helical non-flexible cartridge feed channel defining an infeed opening and an outfeed opening;

the cartridges being arranged substantially parallel to the elevation axis at said infeed opening of said substantially helical non-flexible cartridge feed channel;

said infeed opening of said substantially helical non-flexible cartridge feed channel being located at the region at least in the neighborhood of said elevation axis of the firing weapon and during adjustment of the elevation of the firing weapon remaining at the region at least in the neighborhood of the elevation axis;

said firing weapon containing a weapon barrel defining a weapon barrel axis;

the cartridges being arranged substantially parallel to said weapon barrel axis at said outfeed opening of said substantially helical non-flexible cartridge feed channel;

each cartridge of said cartridges possessing a center of gravity;

said cartridges being located within said substantially helical non-flexible cartridge feed channel such that said centers of gravity are positioned substantially along a helix; and

said substantially helical non-flexible cartridge feed channel is wound about an imaginary cylinder having a cylinder axis inclined through an angle of approximately 45° in relation to said elevation axis and with respect to said weapon barrel axis.

4,898,070

ON-BOARD AMMUNITION CONTAINER

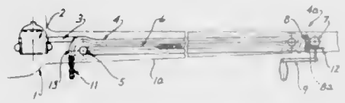
Bernhard Kramer, Markdorf, Fed. Rep. of Germany, assignor to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,809

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702119

Int. Cl.[4] F41D *10/36*

U.S. Cl. 89—34 **6 Claims**



1. An ammunition container for belted rounds to be used in conjunction with automatic guns in an aircraft comprising:

an ammunition belt;

rounds of ammunition having a length and a diameter;

means defining a longitudinally extending principal channel having a width which corresponds at least to the length of a single round and a height equal to at least one diameter of a round;

said channel having two ends, an ammunition feeding end and a belt introducing end; and

a loading device including a loading cable connected to the belt and a winch connected to the cable for pulling the cable, belt and rounds on the belt into the belt introducing end of the channel for reloading the container, the loading cable being unwound from the winch during ammunition feeding from the ammunition feeding end of the channel.

4,898,071

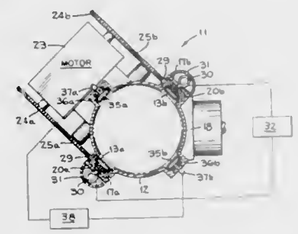
INFLATABLE AMMUNITION GRIPPING DEVICE

Dennis Borgwarth, Anoka, Minn., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 23, 1988, Ser. No. 248,055

Int. Cl.[4] E41F *9/08*

U.S. Cl. 89—45 **7 Claims**



1. An ammunition gripping device for handling a variety of soft and irregularly shaped ammunition while applying a considerable amount of force without damage to the ammunition, said gripping device being adapted for use with a pair of sources of pressure, said gripping device comprising:

an elongated transfer tube;

a plurality of inflatable elongated grippers;

means for movably mounting said elongated grippers inside said transfer tube with said elongated grippers extending lengthwise of said transfer tube and with said elongated grippers spaced apart in said transfer tube;

means for connecting said elongated grippers to a first source of pressure to selectively inflate said elongated grippers to grip ammunition inside said transfer tube;

a plurality of inflatable fixed grippers mounted lengthwise inside said transfer tube with said fixed grippers spaced between said elongated grippers and with said fixed grippers being fixed to said transfer tube;

means for connecting said fixed grippers to a second source of pressure to selectively inflate said fixed grippers to grip ammunition inside said transfer tube; and

means for selectively moving said elongated grippers along a length of the said transfer tube to selectively move said ammunition along the length of said transfer tube.

4,898,072

WEAPON AND AMMUNITION CARRIER FOR A GUN

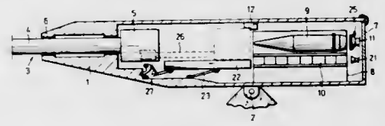
Heiko U. Gropp, Hamburg, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,972

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724867

Int. Cl.[4] F41F *9/06, 9/10*

U.S. Cl. 89—45 **6 Claims**



1. A weapon and ammunition carrier for a gun having a barrel, comprising:

a housing on which said gun is mounted, said gun being displaceable with respect to said housing from an initial firing position to a recoil position, said housing being pivotally mounted about an elevation axis to elevate said gun;

an ammunition magazine in said housing and positioned adjacent said recoil position of said gun, said magazine including an upper level for accommodating projectiles in such a manner that a projectile disposed at a middle position in said upper level is aligned with said gun barrel, and a lower level for accommodating propelling charges, said magazine having a projectile rammer which ejects said projectiles from said upper level of said magazine and rams said projectiles into said gun barrel, and a propelling charge rammer which ejects said propelling charges from said lower level of said magazine;

catching and holding means for catching and holding said gun barrel in the recoil position;

means responsive to said projectile rammer for releasing said catching and holding means;

recuperator means for axially advancing said gun from the recoil position to the firing position; and

loading tray means for transferring propelling charges from said magazine to said gun, said loading tray means including parallelogram suspension means for pivoting the loading tray means between a receiving position at the height of said lower level of said magazine and a charge loading position for said gun.

4,898,073

VACUUM BRAKE FORCE BOOSTER FOR USE WITH AUTOMOTIVE VEHICLES

Hermann Seip, Bad Vilbel; Wilfried Wagner, Huettenberg-Weidenhausen, and Ralf Jakobi, Liederbach, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Filed Nov. 29, 1988, Ser. No. 277,288

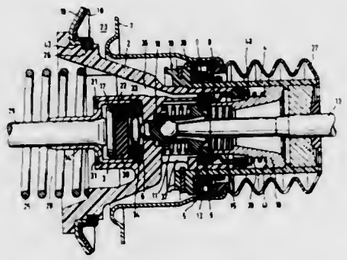
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740691

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369.2 **11 Claims**

1. A vacuum brake force booster for use with automotive

vehicles, comprising a vacuum housing sealingly subdivided by an axially movable wall into a vacuum chamber and a working chamber, a mechanically actuable control valve for connecting the working chamber to the vacuum chamber and to the atmosphere, respectively, with the axially movable control valve housing thereof being formed of thermoplastic material and accommodating, within an axial bore, a rubber-elastic reaction disc in abutment with a pressure plate of a



pushrod connected to an actuating piston of a master cylinder provided on a vacuum-side of the vacuum housing, the movable wall being in communication with the control valve housing and with a guiding sleeve adapted to axially guide the pushrods said guiding sleeve including a radial flange and an axial extension which, while accommodating the pressure plate and the reaction disc, is sealingly disposed in the axial bore of the control valve housing.

4,898,074

SERVO-VALVE ARRANGEMENT FOR POWER STEERING

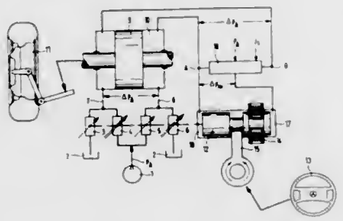
Arno Roehringer, Ditzingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,387

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 37218263

Int. Cl.[4] F18P *9/10*; B62D *00/00*

U.S. Cl. 91—371 **16 Claims**



1. A servo-valve arrangement, comprising high pressure and low pressure sides, two parallel throttle sections extending from the high pressure side to the low pressure side with series-arranged controllable throttling means on the high pressure and low pressure sides, two separate motor connections for the connection of inlet and outlet lines of a servo motor, said motor connections branching off from the throttle sections between the throttling means on the high pressure and low pressure side, displaceable control piston means simultaneously controlling the throttling means and operable to produce a controllable pressure difference between the motor connections upon displacement to increase the resistance of the throttling means on the high pressure side and to reduce the resistance of the throttling means on the low pressure side of one throttle section and at the same time to reduce at the other throttle section the resistance of the throttling means on the high pressure side and to increase the resistance of the throttling means on the low pressure side, two piston working spaces coordinated to separate working surfaces of the control piston means which upon actuation with different pressures enable the production of a force opposing an actuating force causing displacement of the piston means, and a third throttle section including a series arrangement of further throttling means with a further controllable throttling means, said series arrangement being, parallel to said servo-motor, one of the piston working spaces being connected to one side and the other piston working space being connected to the other side of one of the further throttling means, said other further controllable throttling means being controllable in dependence on external control magnitudes and in dependence of pressure differences occurring in the third throttle section to thereby change the actuating force for the displacement of the control piston means in dependence on said magnitudes and difference.

4,898,075

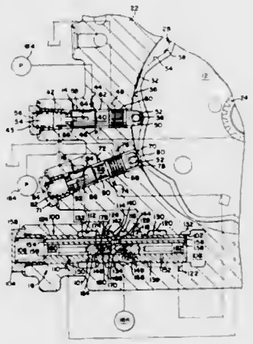
HYDRAULICALLY ACTUATED INDEXING MECHANISM

Joachim Horsch, Lombard, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Jun. 9, 1988, Ser. No. 204,575

Int. Cl.[4] F01B *1/00*

U.S. Cl. 91—477 **18 Claims**



1. An indexing mechanism comprising: a member adapted to be advanced a predetermined amount and along a predetermined path, said member defining a profile surface including a plurality of spaced tooth segments, each tooth segment having a crown section which is joined to an adjacent crown section by two oppositely directed ramps defining a fillet radius therebetween, each fillet radius being spaced from a crown section a predetermined distance;

a pair of spaced apart drivers which are urged against the profile surface of the member, the spacing between said drivers being such that when one driver is urged against a crown section the other driver acts against a fillet radius, and wherein each driver includes a valve spool reciprocally arranged in a ported valve body and a roller connected to said valve spool to act against said profile surface, with said valve spool and roller being resiliently urged toward said profile surface under the influence of a spring; and

means for supplying a driving force to each driver in an alternative manner such that a driver, after moving off said crown section, coacts with a ramp to impart a driving force to said member, said driving force being sufficient to move said member with a constant torque said predetermined amount.

4,898,076

MULTIPLE CYLINDER-CAPACITY PRESSURIZED FLUID (MOTOR OR PUMP) MECHANISM

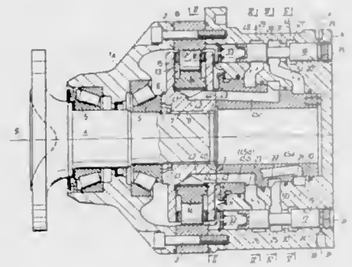
Louis Bigo, Compiegne, and Bernard Allart, Crepy-en-Valois, both of France, assignors to 501 Societe Anonyme: Poclain Huydraulics, B.P. 12, Verb Erie, France

Filed Feb. 12, 1988, Ser. No. 155,362

Claims priority, application France, Feb. 25, 1987, 87 02509

Int. Cl.[4] F01B *13/06*

U.S. Cl. 91—491 **14 Claims**



1. A pressurized fluid (motor or pump) mechanism, e.g. a hydraulic motor having at least two selectable distinct non-zero cylinder capacities, the mechanisms being constituted by:

at least one first external connector for connection to a source of fluid under pressure, and at least one second external connector for connection to a fluid exhaust;

at least one cam whose profile corresponds to a plurality of successive undulations, said undulations being divided at least into first and second distinct groups of undulations with each undulation comprising a first slope and a second slope;

a cylinder block mounted to rotate relative to said cam about an axis of rotation and which includes a plurality of cylinders disposed substantially radially relative to said axis of rotation;

each cylinder having at least one piston slidably mounted therein and suitable for bearing against the cam and delimiting, within said cylinder, a working chamber which is connected to a communication face of the cylinder block;

a plurality of cylinder ducts each connecting one of the working chambers to said communication face of the cylinder block;

a fluid distribution face constrained to rotate with the cam, said face permanently bearing against the communication face of the cylinder block and having first and second fluid distribution ducts opening out therein and corresponding to said first and second slopes of each of the undulations, said distribution ducts being suitable for being put into communication, during relative rotation of the cylinder block and the cam, with the cylinder ducts of the various cylinders;

a first cylinder-capacity selection slide valve disposed between said first and second external connectors and the first and/or second distribution ducts correspoeding to the undulations of the second group of undulations;

a second cylinder-capacity selection slide valve disposed between said first and second external connectors and the first and/or second distribution ducts corresponding to the undulations of the first group of undulations;

each of said first and second cylinder-capacity selection slide valves having two particular positions, which together correspond: (A) with the first cylinder-capacity selection slide valve and the second cylinder-capacity selection slide valve both being in their respective first positions, (a) to the first distribution ducts corresponding to the undulations of both groups of undulations being put into communication with the first external connector, and (b) to the second distribution ducts corresponding to the undulations in both groups of undulations being put into communication with the second external connector; (B) with the first cylinder-capacity selection slide valve being in its second position and the first cylinder-capacity selection slide valve being in its first position, (a) to the first distribution ducts corresponding to the undulations of the first group of undulations being put into communication with the first external connector, (b) to the second distribution ducts corresponding to the undulations of said first group of undulations being put into communication with the second external connector, and (c) to the first distribution ducts corresponding to the undulations of the second group of undulations being permanently isolated from the first external connector and/or to the second distribution ducts corresponding to the undulations of said second group of undulations being permanently isolated from the second external connector; (C) with the first cylinder-capacity selection slide valve in its first position and the second cylinder-capacity selection slide valve being in its second position; (a) to the first distribution ducts corresponding to the undulations of the second group of undulations being put into communication with the first external connector, (b) to the second distribution ducts corresponding to the undulations of the second group of undulations being put into communication with the second external connector, and (c) to the first distribution ducts corresponding to the undulations of the first group of undulations being permanently isolated from the first external connector and/or to the second distribution ducts corresponding to undulations of the first group of undulations being permanently isolated from the second external connector; and (D) with the first cylinder-capacity selection slide valve in its second position and the second cylinder-capacity selection slide valve being in its second position, to the first distribution ducts corresponding to undulations of the first group of undulations being permanently isolated from the first external connector and to the second distribution ducts corresponding to the undulations of the second group of undulations being permanently isolated from the second external connector and/or to the second distribution ducts corresponding to the undulations of the first group of undulations being permanently isolated from the second external connector and to the first distribution ducts corresponding to the undulations to the second group of undulations being permanently isolated from the first external connector, and/or to the first distribution ducts corresponding to the undulations of both groups of undulations being permanently isolated from the first external connector, and/or to the second distribution ducts corresponding to the undulations of both groups of undulations being permanently isolated from the second external connector.

4,898,077

SELF-BLEEDING HYDRAULIC PUMPING APPARATUS

James B. McBeth, N. Vancouver, Canada, assignor to Teleflex Incorporated, Limerick, Pa.

Filed Sep. 6, 1988, Ser. No. 241,079

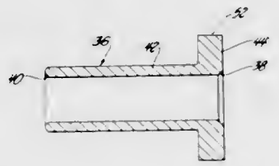
Int. Cl.[4] F01B *3/00, 13/04*

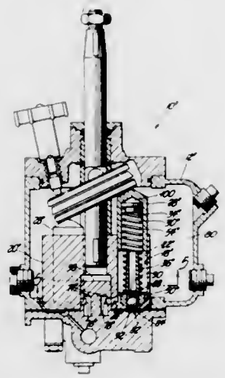
U.S. Cl. 91—505 **28 Claims**

1. A piston pump assembly (10) of the type for moving a liquid through a conduit system comprising: a housing (12); cylinder means (18) disposed in said housing (12) for receiving a volume of liquid from and expelling the same volume of liquid back into the conduit system, said cylinder means (18) including at least one liquid exhaust port (24); piston means (26) slideably disposed in said cylinder means (18) toward and away from a compressed position adjacent said exhaust port

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(24) for urging liquid through said exhaust port (24), said piston means (26) including a surface (34) in continuous contact with the liquid and spaced remotely of said exhaust portion (24) when said piston means (26) is adjacent said compressed position; said assembly (10) characterized by including bleed means (36) disposed in said cylinder means (18) having a first opening (38) in communication with said exhaust port (24) and a second





opening (40) closely spaced from said spaced surface (34) when said piston means (26) is adjacent said compressed position for exclusively expelling the liquid from said cylinder means (18) through both of said first (38) and second (40) openings as said piston means (26) moves toward said compressed position to force gas inclusions trapped in said cylinder means (18) adjacent said spaced surface (34) into said bleed means (36) and out of said cylinder means (18).

4,898,078

HYDRAULIC SYSTEM FOR A WORK VEHICLE

Douglas M. Gage, and Stuart L. Neagle, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

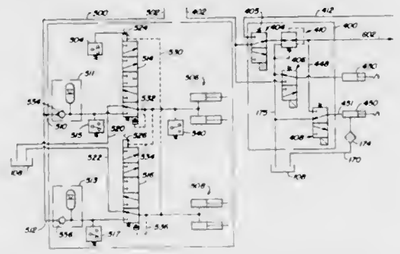
Division of Ser. No. 96,574, Sep. 11, 1987, Pat. No. 4,809,586.
This application Oct. 27, 1988, Ser. No. 263,742
Int. Cl.[4] F15B *11/00*
U.S. Cl. 91—524 8 Claims

1. A brake system for a work vehicle having a supporting structure and ground engaging means for propelling the vehicle, the brake system comprising:

a source of hydraulic fluid;

a first braking circuit which is fluidically coupled to the source of pressurized hydraulic fluid, the first braking circuit is provided with a first braking hydraulic actuator for braking the vehicle, a first regulating valve for controlling the flow of hydraulic fluid to the first braking actuator, a first outlet for directing hydraulic fluid from the first regulating valve to the first actuator, and a first pedal for shifting the first regulating valve and thereby controlling the flow of hydraulic fluid to the first actuator;

a second braking circuit which is fluidically coupled to the source of pressurized hydraulic fluid, the second braking circuit is provided with a second braking hydraulic actuator for braking the vehicle, a second regulating valve for controlling the flow of hydraulic fluid to the second braking actuator, a second outlet for directing hydraulic fluid from the second regulating valve to the second actuator, and a second pedal for shifting the second regulating valve and thereby controlling the flow of hydraulic fluid to the second actuator;



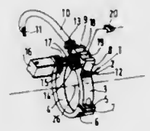
whereby the first regulating valve is hydraulically balanced between hydraulic fluid in the first outlet and the second outlet, and the second regulating valve is hydraulically balanced between hydraulic fluid in the second outlet and the first outlet, so that when the first regulating valve is shifted by the first pedal, the second regulating valve is hydraulically shifted, and when the second regulating valve is shifted by the second pedal, the first regulating valve is hydraulically shifted.

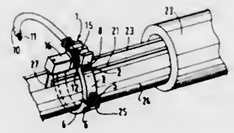
4,898,079

ELECTRIC OR ELECTRONIC POSITION SENSOR DEVICE

Marc Combette, Bel Air, France, assignor to Celduc S.A., Paris, France

Filed Sep. 14, 1988, Ser. No. 244,179
Claims priority, application France, Sep. 16, 1987, 87 12806
Int. Cl.[4] F01B *25/26, 31/12*
U.S. Cl. 92—5 R 5 Claims





1. An electrical sensing device for sensing the position of a piston or piston rod relative to a cylinder, the sensing device comprising:

(a) an annular clamping collar formed of a resilient electrically insulating material, having extensions which can be spaced apart to embrace the cylinder and tightened around the whole circumference of the cylinder by means of a tightening screw;

(b) a block integral with said collar and having at least one face thereof parallel to the median plane of the collar;

(c) a detector element carried by said block and supported in a cantilevered position with respect to the median plane of the collar so that the detector element has an axis of vision which is offset with respect to the median plane; and

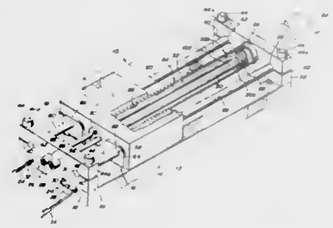
(d) a connection conductor protruding from the block for connecting the detector element to a monitoring system.

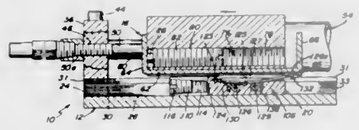
4,898,080

FLUID POWERED LINEAR SLIDE

Walter G. Lieberman, 19172 Biddle Dr., Irvine, Calif. 92715

Continuation-in-part of Ser. No. 84,285, Aug. 11, 1987, Pat. No. 4,829,880. This application Jul. 20, 1988, Ser. No. 221,738
The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.
Int. Cl.[4] F15B *15/22*
U.S. Cl. 92—14 10 Claims





1. A fluid powered linear slide including

a base,

a carriage member mounted to move reciprocably along a linear path between spaced apart terminals

manually adjustable, selectively actuated stop means mounted on the base to be moved to a plurality of different positions between said terminals, said stop means upon being actuated stopping movement of the carriage member,

a fluid power cylinder secured to the carriage member and movable therewith, with the longitudinal axis of the cylinder being parallel to said linear path,

a stationary piston disposed within the cylinder, said cylinder and piston coacting in response to pressurized fluid being introduced into the cylinder to move the carriage first in one direction along said linear path and then along said linear path in an opposite direction by applying said pressurized fluid to opposite sides of the piston,

a pair of stationary tubes extending into the cylinder, each tube having one end adapted to be connected to a source of the pressurized fluid and an opposed end connected to the piston, said ends connected to the pistons and each having port means thereat, with one port means being on one side of the piston and the other port means being on the opposite side of the piston, and

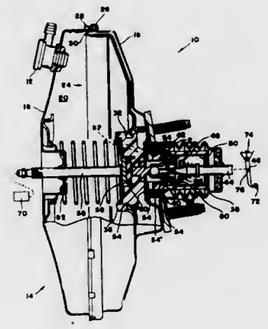
fluid powered means for selectively actuating the stop means.

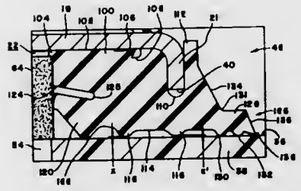
4,898,081

ONE PIECE REAR SEAL FOR SERVOMOTOR

Douglas A. Fecher, Granger, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Aug. 31, 1988, Ser. No. 238,950
Int. Cl.[4] F16J *15/18*
U.S. Cl. 92—165 R 5 Claims

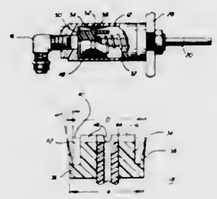




1. In a brake booster having a housing with an interior divided by a wall into a control chamber and an operational chamber, said wall having a projection that extends through an opening in said wall, said projection moving in said opening as the wall moves in the housing in response to a pressure differential between said control and operational chambers, the improvement in a seal which surrounds said projection to prevent communication of environmental air to said operational chamber along a flow path between the housing and projection that would effect said pressure differential, said seal comprising:

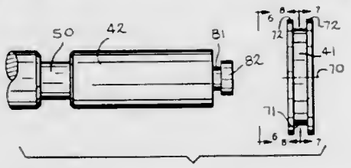
a resilient body having a first end and a second end, said resilient body having a peripheral surface that extends from said first end to said second end, said peripheral surface having a first groove separated from a second groove by a cylindrical surface, a first rib adjacent said first groove and a second rib adjacent said first end and a flange adjacent said second groove, said first rib engaging said housing to form a first static seal with said housing, said second rib engaging said housing to form a second static seal with said housing, said housing having a lip that extends into said second groove to fix the position of said resilient body with respect to said opening, said resilient body having first and second lands located between first and second dynamic seals, said first and second dynamic seals engaging said projection to prevent communication of environmental air into said control chamber, said first and second dynamic seals flexing to allow said projection limited radial movement into engagement with said first and second lands which maintains the projection in substantial axial alignment.

4,898,082
MOLDED PLASTIC AIR CYLINDER
Earl T. Pottorff, 2346 Taylor Rd., Savannah, N.Y. 13146
Filed Sep. 12, 1988, Ser. No. 242,528
Int. Cl.[4] F01B *31/00*
U.S. Cl. 92—132 **11 Claims**



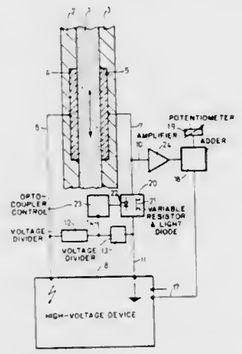
1. A plastic pneumatic cylinder device comprising a cylinder housing, a piston within said housing, and a rod on which the piston is mounted projecting axially from the housing; wherein said cylinder housing has a cylindrical bore of a predetermined diameter and a compressed air inlet at one end of the cylinder for admitting air pressure from a compressed air source into the bore to urge the piston and rod in one direction, with means in said cylinder housing to urge the piston and rod in the other direction when said air pressure is relieved; wherein said piston is a one-piece plastic piston molded entirely of a semi-rigid polymer, including a generally cylindrical body and a generally cylindrical sealing skirt surrounding and spaced radially from said body to seal slidably against said bore, said skirt being flared out to have an edge that is of a greater natural diameter than said borer; and wherein said cylinder housing is molded of said semi-rigid polymer including a molded closure of said semi-rigid polymer which fits onto said cylinder housing to contain said piston, said pneumatic cylinder device including means to ensure that said air pressure passes to said skirt to urge the same against said bore when the piston is urged against the inlet end of the bore.

4,898,083
PISTON HEAD AND ROD ASSEMBLY FOR A GEAR PUMP DRY VALVE
Ronald L. Jones, Corinth, Miss., assignor to Dana Corporation, Toledo, Ohio
Continuation of Ser. No. 20,063, Feb. 27, 1987, abandoned. This application Aug. 3, 1988, Ser. No. 229,739
Int. Cl.[4] F16J *1/12, 7/00*; F16B *3/00*
U.S. Cl. 92—255 **8 Claims**



4. A piston and rod assembly for an apparatus having a housing comprising:
a first bore formed in said housing having an internal dimension;
a second bore formed in said housing having an internal dimension;
a piston head disposed in said first bore, said piston head having an outer dimension which is slightly less than said first bore internal dimension so as to permit a seal therebetween, said piston head including an end surface defining a plane, an internal cavity formed within said piston head and extending through to said end surface so as to define an opening in said end surface, and a lip extending about a first portion of said opening to define a first dimension thereof and not extending about a second portion of said opening to define a second dimension thereof, said second dimension being greater than said first dimension; and
a piston rod disposed in said second bore, said piston rod having an outer dimension which is slightly less than said second bore internal dimension so as to permit a seal therebetween, said piston rod including a neck portion and a tail portion, said neck portion having an outer dimension which is less than said first dimension, said tail portion extending from said neck portion and having an outer dimension which is greater than said first dimension and less than said second dimension, said tail portion being disposed within said cavity and retained therein by said lip such that said piston head and piston rod are movable together along an axis extending perpendicular to said plane while permitting said piston rod to move laterally relative to said piston head, whereby said piston head and said piston rod are movable to one another while retained together to permit said piston head and said piston rod to seal respectively with said first and second bores.

4,898,084
SENSOR-CONTROLLED HYDRAULIC SYSTEM WITH ELECTROVISCOUS FLUIDS
Günter Oppermann, and Fritz Feld, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 172,669, Mar. 24, 1988, abandoned, which is a continuation of Ser. No. 19,894, Feb. 27, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 282,231
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609861
Int. Cl.[4] G01N *27/00*
U.S. Cl. 73—118.1 **9 Claims**



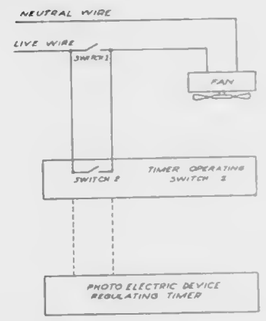
1. A hydraulic system comprising: means forming a fluid flow channel, an electroviscous fluid in the flow channel, a structural member relatively movable with respect to the fluid for imparting flow to the fluid relative to the flow channel, electrodes in contact with the fluid, means for applying an electrical voltage to the electrodes to vary the viscosity of the fluid, and circuit means connected to the means for applying a voltage to the electrodes for sensing the electrical current across the electrodes to produce a signal corresponding to the flow of the fluid and thereby corresponding to the relative movement of the structural member.

4,898,085
PUSH-IN FLEXIBLE COVER VENT
Frank R. Jarrot, Lantana, Fla., assignor to Airlette Manufacturing Corporation, Lantana, Fla.
Filed Nov. 23, 1988, Ser. No. 275,716
Int. Cl.[4] F24F *7/00*
U.S. Cl. 98—1 **15 Claims**



9. A flexible cover vent including superposed first and second stiff panel members incorporating corresponding first and second opposite marginal portions, said first marginal portions being secured together along an elongated zone extending longitudinally of said first marginal portions, said panel members being laterally bowed, substantially throughout, in the direction extending along said zone, said second marginal portions of said panel members being closely spaced apart and adapted to frictionally clampingly receive a flexible cover section margin therebetween extending along one free edge portion of said cover section defining one longitudinal margin of a narrow slit opening formed in said cover section and with said one free edge portion supported in bowed condition between said second marginal portions.

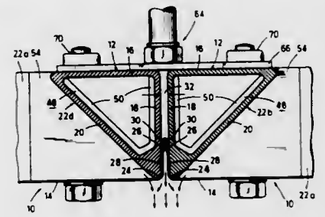
4,898,086
LIVING SPACE VENTILATION
Alan H. Norris, 120 Saddle Mountain Rd., Rome, Ga. 30161
Filed Jul. 5, 1988, Ser. No. 215,404
Int. Cl.[4] F24F *11/00*
U.S. Cl. 98—33.1 **5 Claims**



1. A method of ventilating living space with the coolest outside air obtainable in the 24 hour daily cycle by utilising a photoelectric device to provide a signal when the outside light is increasing at dawn, at which time the outside air is at its coolest, and using this signal to actuate electrical contacts which start operating an air moving device propelling air into or out of the living space so as to exchange inside air with outside air thus effecting ventilation of the

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4,898,087
LAMINARIZER
Klaus Fitzner, Betzdorf; Walter Betz, Siegen; Uwe Plitt, Kirchen, and Wolfgang Schmitt, Betzdorf, all of Fed. Rep. of Germany, assignors to Heinrich Nickel GmbH, Betzdorf, Fed. Rep. of Germany
Filed Mar. 17, 1989, Ser. No. 325,363
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827918
Int. Cl.[4] F24F *7/10*
U.S. Cl. 98—40.1 **26 Claims**

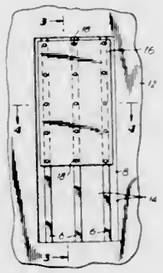


1. In a laminarizer for producing laminar flow for ceilings and walls of clean rooms formed of filter modules, the laminarizer being suspended or held spaced from a cover supporting mechanical filters, the laminarizer including rectangular frames with fabric sheets being stretched onto each rectangular frame, each rectangular frame defining a plane and having side members, each side member being a section of triangular cross-section, the side members each having a surface facing the room, an outer surface extending perpendicularly to the plane of the frame, and a rear surface extending in the plane of the rectangular frame, the fabric sheets resting against and being aligned by the surfaces of the side members facing the room, the improvement comprising the surfaces of the side members facing the room defining narrow alignment contact means for the fabric sheets, the fabric sheets being fastened to the side members at the outer surfaces of the side members.

4,898,088
TOTALLY FUSIBLE TUNNEL VENTILATION DAMPER SYSTEM
Norman Lesser, 11 The Bridge, Port Washington, N.Y. 11050, and Fred Horowitz, 997 Sheffield Rd., Teaneck, N.J. 07666
Filed Feb. 2, 1989, Ser. No. 305,189
Int. Cl.[4] F24F *11/04*
U.S. Cl. 98—49 **9 Claims**

1. A fusible tunnel ventilation system comprising:
(a) means defining at least one enlarged ventilation opening in the tunnel;
(b) support means transversing said opening;

(c) a sheet of fusible material covering only a portion of said opening and supported by said support means; and



(d) fastening means for fastening said sheet of fusible material to said support means over said portion of said opening.

4,898,089

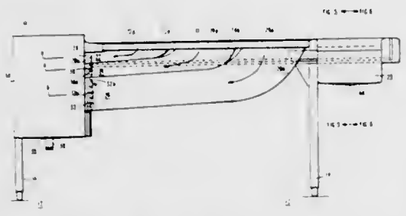
LAMINAR FLOW WORK TABLE WITH CONTROLLABLE VENTILATION OF A WORK SURFACE

George B. Roos, 22 Berkshire Dr., Berkeley Heights, N.J. 07922

Filed Apr. 28, 1988, Ser. No. 187,216

Int. Cl.[4] B05B *15/12*

U.S. Cl. 98—115.1 **18 Claims**



1. A substantially laminar flow work table, comprising:

a generally horizontal perforated work surface supported at a predetermined distance above a floor surface;

a first duct means situated below the perforated work surface and communicating with a predetermined first portion of the perforated work surface for permitting a fluid flow to be drawn through the first duct means and through the perforations in the predetermined first portion of the work surface, the first duct means having a predetermined cross sectional configuration and area transverse to the flow of fluid in the first duct means;

a first controllable baffle means situated in the first duct means for controlling the flow of fluid through the first duct means and the perforations in the predetermined first portion of the work surface, the first baffle means being continuously adjustable between two extreme positions defining minimum and maximum flow conditions, so that the flow of fluid through the first duct means and the perforations in the predetermined first portion of the work surface is adjustable to all flow conditions between the minimum and maximum flow conditions as a continuous function of the position of the first baffle means;

a second duct means situated below the first duct means and communicating with a predetermined second portion of the perforated work surface for permitting a fluid flow to be drawn through the second duct means and through the perforations in the predetermined second portion of the work surface, the second duct means having a predetermined cross sectional configuration and area transverse to the flow of fluid in the second duct means;

a second controllable baffle means situated in the second duct means for controlling the flow of fluid through the second duct means and the perforations in the predetermined second portion of the work surface, the second baffle means being continuously adjustable between two extreme positions defining minimum and maximum flow conditions, so that the flow of fluid through the second duct means and the perforations in the predetermined second portion of the work surface is adjustable to all flow conditions between the minimum and maximum flow conditions as a continuous function of the position of the second baffle means; and

a means for connecting the first and second duct means to a common exhaust manifold.

4,898,090

DEVICE FOR THE PRODUCTION OF AROMA EXTRACTS FROM COFFEE OR TEA

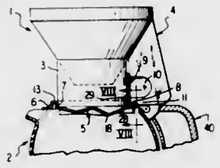
Kwan W. Chan, West Point, Hong Kong, assignor to Melitta-Werke Bentz & Sohn, Minden, Fed. Rep. of Germany

Filed Nov. 3, 1988, Ser. No. 266,589

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1987, 3737203

Int. Cl.[4] A47J *31/02*

U.S. Cl. 99—306 **12 Claims**



1. In a apparatus for the production of aroma extracts from coffee or tea including a filter vessel for receiving coffee or tea and a collecting container for receiving the filtrate from the filter vessel, said filter vessel and said collecting container having cooperating zones for removably supporting said filter vessel on said collecting container, the improvement comprising:

a plurality of detent means provided on said filter vessel in said zone,

detent recesses provided on said collecting container in said zone and arranged for receiving respective said detent means when the filter vessel is positioned on said collecting container for releasably locking said filter vessel to said collecting container by said detent means,

a centering ring mounted on the collecting container; and recesses being disposed in a region adjacent said centering ring;

a socket forming part of the filter vessel; said centering ring being adapted for receiving said socket; and

a lid being fixedly connected to the collecting container; said centering ring being a portion of said lid.

4,898,091

SELF VENTING FOOD FRYING APPARATUS

Alexander T. Rozak, #1, 722 - 5A St. N.W., Calgary, Alberta, Canada (T2N 1R4), and Gary G. Calderwood, 2008-31 Ave. S.W., Calgary, Alberta, Canada T2T 1T2

Filed Feb. 6, 1989, Ser. No. 306,920

Int. Cl.[4] A47J *37/12*

U.S. Cl. 99—336 **19 Claims**

1. Self venting food frying apparatus adapted for use in an enclosed space without connection to an outside exhaust system, said apparatus comprising:

a cabinet adapted to be supported at a suitable working height and having a top panel, side panels, a rear panel an upper front panel and a lower front panel at least one of said panels being configured to allow access to the interior of said cabinet;

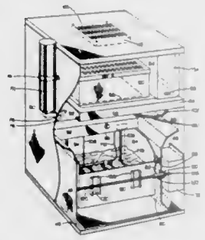
a container located in said cabinet for holding a supply of cooking oil;

means non-integral with said container for heating said container;

a spill tray system comprising an integral means to support said cooking oil container and said means non-integral with said container for heating said container;

means for supporting food products in the cooking oil during the cooking process, said means for supporting food products includes a handle means, and

means to hold said means for supporting food products while automatically lowering said means for supporting food products into said supply of cooking oil for a predetermined time and then raising said means for supporting said means for supporting food products out of said supply of cooking oil, said means for supporting food products



being held by said means to hold by using and resisting the force of gravity and rotation to said means to hold through said means or supporting food products without the requirements for releasable latching means, said means to hold comprising:

(a) means to engage said handle in a slidably fitting relationship while supporting same, said means to engage comprises at least one U-shaped channel device configured to be capable of supporting said handle means along three separate surfaces;

(b) rotatable means attached to said means to engage and capable of rotating in both directions within defined limits, said rotatable means further comprising integral stop means attached to a predetermined location of said U-shaped channel device to engage a fourth surface of said handle means;

(c) means to provide a rotatable force to said rotatable means, and

(d) means to control the means to provide a rotatable force such that the rotatable force is controlled in amount of time of application as well as direction.

4,898,092

FEED GRAIN CONDITIONING APPARATUS

David G. Greer, Anoka, Minn., assignor to AgriChem, Inc., Anoka, Minn.

Filed May 9, 1988, Ser. No. 191,378

Int. Cl.[4] A23N *17/00*

U.S. Cl. 99—487 **25 Claims**

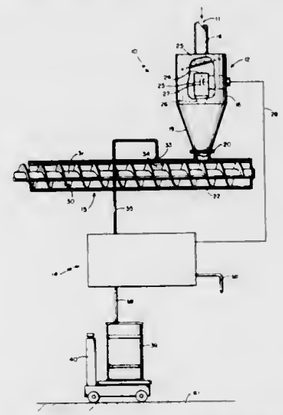
1. A feed grain conditioning apparatus for conditioning of feed grain to bring the moisture content to an approximate target moisture content through the addition of moisture derived at least in part from a water supply, as the feed grain moves in a downstream direction from a first location toward a second location, comprising;

grain conveying means for moving the grain in said downstream direction, having a sensing station and a wetting station located downstream of the sensing station;

a moisture sensor of the type to continuously monitor moisture content of grain and convert the measurement into an electronic signal, positioned at the sensing station located to intercept a sample of passing feed grain for substantially continuous measurement of the moisture content of the sample and translation of the measurement into an electronic signal;

liquid applicator means located at the wetting station positioned to disperse liquid derived at least in part from a water supply upon passing feed grain;

a liquid supply line connected to the liquid applicator means and for connection to the water supply;



an automatic valve connected in the liquid supply line having an electronically actuated valve control movable between relatively open and relatively closed positions to regulate the amount of liquid flow to the liquid applicator means for application to passing feed grain;

means connecting the moisture sensor to the valve control so that the valve control operates responsive to the electronic signal generated by the moisture sensor according to the difference between the moisture content of the grain sample as sensed by the moisture sensor and the target moisture content, said means including calibrated means connected between the moisture sensor and the automatic valve control for regulation of the valve control by the signal from the moisture sensor calibrated according to a known moisture content of the type of feed grain to be conditioned.

4,898,093

FRANKING MACHINE

Werner Haug, Langnau, Switzerland, assignor to Frama AG, Lauperswil, Switzerland

Continuation of Ser. No. 912,401, Sep. 25, 1986, abandoned. This application Oct. 6, 1988, Ser. No. 256,070

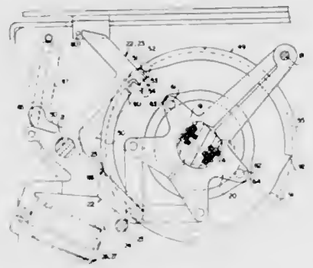
Claims priority, application Switzerland, Nov. 12, 1985, 04841/85

Int. Cl.[4] B41L *47/46;* **B41J** *1/34*

U.S. Cl. 101—91 **17 Claims**

1. A franking machine of the type having a control unit, said machine comprising: a franking head (2) fixed to one end of a main shaft (1) of said machine, franking value printing wheels (3) mounted in said head and which mesh with a meshing tooth system (28) of racks (4) guided in the main shaft (1) and which, in addition to the meshing tooth system (28), have a driving tooth system (29) and a position sensing tooth system (31), electromagnets (16, 17) being provided to move an associated

driving push rod (5, 6) into engagement with the driving tooth system 29 of one of said racks (4), retaining pawls (44, 44', 45, 45') provided to prevent the rearward movement of said racks and at least one position sensing pawl (19, 20) provided to sense, by engagement into the position sensing tooth system, the correct position thereof, wherein the position sensing pawl



(19, 20) is linked to an electromagnet (26) to be engaged and disengaged with respect to the position sensing tooth system in a position of the main shaft (1) in which the printing wheels (3) are adjusted, a sensor (80) indicating to the control unit the position of said position sensing pawl (19, 20) said engagement and disengagement of said position sensing pawl occuring while said main shaft is at rest.

4,898,094

APPARATUS AND METHOD FOR CONTROLLING A PLURALITY OF CONTINUOUS PAPER PRINTING MACHINES CONNECTED TO EACH OTHER

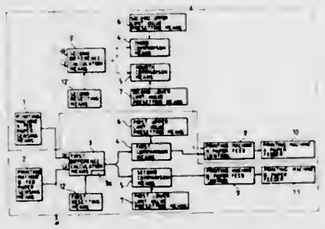
Hideki Doumoto, and Takashi Kimura, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Jan. 17, 1989, Ser. No. 297,285

Claims priority, application Japan, Jan. 15, 1988, 63-7297/88

Int. Cl.[4] B41F *1/34*; G06F *15/46*

U.S. Cl. 101—485 **8 Claims**



1. A method for controlling a plurality of paper printing machines connected in series for printing on a continuous paper web segmented linearly into frames, each of the printing machines having individual motive power sources, the method comprising the steps of:

generating a first signal every time one sheet of continuous paper is fed into a first one of said printing machines;

generating a second signal every time one sheet of said continuous paper is fed into a second one of said printing machines;

calculating a frame difference signal indicating the difference between the number of said first signals generated and the number of said second signals generated;

comparing said frame difference value with an upper limit value and a lower limit value;

controlling the feed of paper to the first printing machine to temporarily stop the feed of the paper to the first printing machine when said frame difference value is larger than the upper limit value; and

controlling the feed of paper to the second printing machine to temporarily stop the feed of the paper to the second printing machine when said frame difference value is smaller than the lower limit value.

4,898,095

LASER BEAM-DETONATABLE BLASTING CAP

Yoji Tasaki; Koichi Kurokawa; Katsuhide Hattori, all of Aichi; Mikio Takano, Tokyo; Toshikazu Miyajima, Yamato; Toshifumi Sato, Sagamihara, and Katsura Ogasawara, Kodaira, all of Japan, assignors to Nippon Oil and Fats Company, Limited and Kajima Corporation and Kajima Corporation, both of, Japan

Filed Apr. 13, 1988, Ser. No. 180,882

Claims priority, application Japan, Oct. 20, 1986, 61-247597; Apr. 30, 1987, 62-106745; Apr. 30, 1987, 62-106744

Int. Cl.[4] F42B *3/10*

U.S. Cl. 102—201 **9 Claims**



1. A laser beam-detonatable blasting cap, comprising:

a shell member;

a secondary explosive consisting of pentaerythritol tetranitrate charged in an upper portion of said shell member at a loading density of 0.8–1.4 g/cm^3, said secondary explosive containing a laser beam-absorbing black material;

an explosive charged in a lower portion of said shell member at a loading density of 1–1.7 g/cm^3;

a restraining wall arranged around said secondary explosive charged in the upper portion of said shell member; and

an optical fiber arranged in contact with said secondary explosive.

4,898,096

SAFETY DEVICE FOR FIRING CIRCUITS

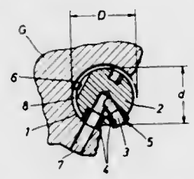
Klaus Ernert, Munich, and Horst Hütter, Tegernsee, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,705

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3823627

Int. Cl.[4] F42C *15/00, 15/18*

U.S. Cl. 102—221 **1 Claim**



1. A safety device for a firing apparatus having a housing with a circular bore having openings comprising:

shaft means rotatably supported in the circular bore, the shaft means having a smaller diameter than the diameter of the circular bore, the shaft means having a plurality of approximately curved firing channels, the channels aligning with the openings when the shaft is in the armed position, the channels having annular overextending boundaries having radially curved outside surfaces which rest against the inside wall of the circular bore.

4,898,097

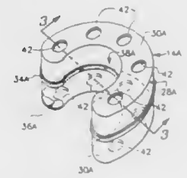
MODIFIED PROPELLANT INCREMENTS FOR SHORT RANGE TRAINING ROUND PROPULSION SYSTEM

Norman M. Jordan, Wayzata, Minn., and Donald McLaughlin, Joliet, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 2, 1989, Ser. No. 317,889

Int. Cl.[4] C06B *45/00*

U.S. Cl. 102—283 **16 Claims**



1. A modified propellant increment for an ammunition round, comprising:

(a) a body composed of a combustible propellant material and having a hollow interior, said body being semi-annular in shape defining a mounting cavity; and

(b) means defining a plurality of holes through said hollow body which communicate the exterior of said body with said hollow interior thereof for ensuring complete combustion of said body upon burning thereof.

4,898,098

DEVICE FOR THE RAPID GENERATION OF A SMOKE SCREEN AND A METHOD FOR PREPARING A SMOKE CHARGE

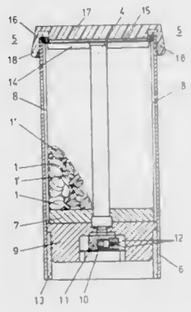
Yvonne Frey, Münsingen; Jörg Kutzli, Höfen; Walter Rauber, Gwatt; Hans Schmocker, Thun, and Markus Tobler, Seftigen, all of Switzerland, assignors to Schweizerische Eidgenossenschaft vertreten durch die Eidg. Munitionsfabrick Thun der Gruppe fÜr RÜstungsdienste, Thun, Switzerland

Filed Nov. 21, 1988, Ser. No. 274,244

Claims priority, application Switzerland, Dec. 24, 1987, 05058/87

Int. Cl.[4] F42B *13/44*

U.S. Cl. 102—334 **21 Claims**



1. A device for generation of a smoke screen in a given target area, wherein a plurality of briquetted smoke charges is accommodated in a container and is simultaneously ignitable and spreadable by a scattering charge, and wherein said smoke charges contain at least one metal oxide and at least one oxygen carrier and/or one halogen carrier, characterized in that the separate smoke charges are arranged randomly and are encapsulated on all sides in a hydrophobic ignition layer.

4,898,099

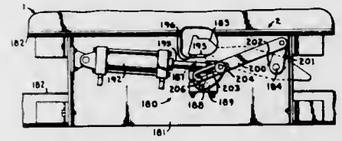
POSITIVE RETRACTION TROLLEY STOP FOR POWER AND FREE CONVEYORS

Gareth D. Summa, Riverside, Mo., assignor to Mid-West Conveyor Co., Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 926,672, Nov. 4, 1986, Pat. No. 4,790,247. This application Dec. 13, 1988, Ser. No. 283,584

Int. Cl.[4] B61B *13/00*; B61K *7/00*

U.S. Cl. 104—172.4 **21 Claims**



1. A trolley stop mechanism for use in a trolley system including a mobile trolley with movable means engageable by a drive dog of a trolley drive arrangement to move the trolley along a track, said mechanism comprising:

(a) a frame member;

(b) a stop arm connected to on said frame member and movable between a trolley disengaging position to cause a trolley to disengage from a drive dog of a trolley drive mechanism and a trolley engaged position;

(c) stop arm motor means mounted on said frame member, engaged with said stop arm, and movable between a first position and a second position, said motor means positively urging said stop arm to said trolley disengaging position upon said motor means moving from said first position to said second position and releasing said stop arm to move to said trolley disengaged position upon said motor means moving from said second position to said first position; and

(d) one way link means engaged between said stop arm and said stop arm motor means, said link means allowing movement of said stop arm to said trolley disengaging position without interference by said link means and causing positive positioning of said stop arm in said trolley engaged position when said motor means is moved from said second position to said first position.

4,898,100

AERIAL TRANSPORT INSTALLATION WITH TWO SUSPENSION-TRACTION CABLES AND PULLEYS DISPLACED VERTICALLY

Max Brochand, Noyarey, France, assignor to Pomagalski SA, Fontaine, France

Filed Mar. 10, 1988, Ser. No. 166,202

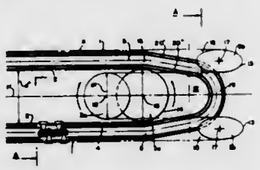
Claims priority, application France, Mar. 11, 1987, 87 03330

Int. Cl.[4] B61B *7/00*

U.S. Cl. 104—192 **19 Claims**

1. An aerial transport installation comprising two parallel, continuously moving suspension-traction cables forming respectively two endless loops, passing over end pulleys respectively located in embarking and disembarking stations; at least one car including disconnectable grippers for clamping the cables, said grippers when connected to the cable bearing on the top part of the cables; said cables cooperating to define a track of circulation for said car in the installation including a track portion of arrival of the car at a station and a track portion of departure of the car from a station, said cables further defining a "horizontal" track plane of arrival and a

"horizontal" track plane of departure, each containing both cables, said endless loops defined by each cable having loop portions which are located at the longitudinally furthest points on their paths of travel of the cables through the station, and said end pulleys including at least one return pulley associated with one of the cables which defines the end of its associated cable's loop and is spaced from said longitudinally furthest point on that cable's path of travel through the station and separates said arrival and departure track portions, means for disconnecting and connecting the grippers to the cables and means for supporting and guiding the car located in the embarking and disembarking stations, such that the car is engaged between, driven and conveyed by the cables and that in the embarking and disembarking stations the car is totally disengaged and dissociated from the cables whereby in at least one of the embarking and disembarking stations, for the track



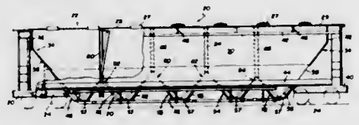
portion of arrival and for the track portion of departure defined by the cables, respective zones of cooperation of one of the cables with the end pulleys in the track portions of arrival and departure are displaced longitudinally in relation to the zones of cooperation of the other cable with the end pulleys such that a longitudinal free space is provided between the respective longitudinally farthest sections of the loops of the cables in relation to the station; at least one return pulley of at least one loop formed by a cable being recessed towards the inside of the track of circulation of the car, guiding means for causing the cable to make a half-turn upstream and downstream of the return pulley, and at least one of said return pulleys of at least one loop formed by a cable being substantially parallel to the track portions of arrival and of departure whilst being in a different plane from at least one of said track portions.

4,898,101

VEHICLE HOPPER BODY WITH INTERNAL REINFORCING MEMBERS

Lyan J. Harter, Atlanta, Ga., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Sep. 19, 1988, Ser. No. 245,572
Int. Cl.[4] B61D *3/00, 7/00*
U.S. Cl. 105—247 **5 Claims**



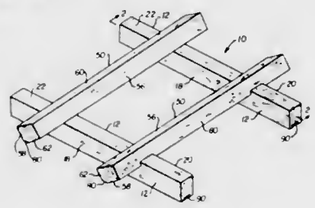
1. A hopper vehicle body comprising:
an elongated shell having a top and opposing side walls and having an arcuate lateral sectional profile in the general shape of a horseshoe with the side walls terminating in a lower horizontal edge;
each end of the elongated shell being closed by an end wall means;
the elongated shell having a plurality of spaced apart lateral crossridge means extending between the opposing side walls near but above the horizontal edges;
a plurality of discharge hoppers enclosing the vehicle body beneath and connected to the elongated shell;
each of the lateral crossridge means constituting a common top separating adjoining discharge hoppers;
a plurality of horseshoe-shaped reinforcement members located inside of the elongated shell;
each of the horseshoe-shaped reinforcements being positioned along a plane lateral to the elongated shell so as to intersect each crossridge means;
each horseshoe-shaped reinforcement having a hat shape in lateral section and comprising a top, a pair of opposing sides extending outward from the top side edges, and a rim parallel to the top extending outward from each side and terminating in an edge;
each rim of the hat-shaped reinforcement being joined to the elongated-shell; and
each horseshoe-shaped reinforcement member terminating in two lower opposing ends, with one of each of the two ends being joined to and of an adjoining crossridge means.

4,898,102

LOAD CARRYING SKID ASSEMBLY

Donald W. Thebeau, 12 Holly Hill Dr., Freedom, Pa. 15042

Filed Jul. 10, 1989, Ser. No. 377,557
Int. Cl.[4] B65D *19/31*
U.S. Cl. 108—56.1 **6 Claims**



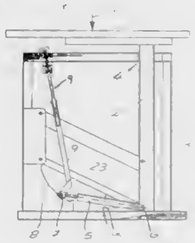
1. A load carrying skid assembly comprising:
at least a pair of spaced elongated base members, each having a generally rectangular transverse cross-section, and a longitudinal load bearing upper face and an opposite longitudinal surface engaging lower face, and longitudinal side faces; each base member defining oppositely disposed first and second notches inclined at obtuse angles toward each other and toward the transverse centerline of the base member, each notch extending through the side faces of the base member, each notch also extending from an open upper end at said upper face of said base member to a closed lower end intermediate said upper and lower faces of said base member, each notch having inner and outer walls connected at their bottom ends by said lower end; and
at least a pair of spaced elongated load engaging members each having a generally rectangular transverse cross-section removably interconnected with and extending laterally across said base members; each of said load engaging members having a longitudinal load engaging first side, an opposite second side, a longitudinal third side, and an opposite fourth side; said load engaging members mated in said first and second notches of said base members to dispose said load engaging first sides at obtuse angles extending away from each other and away from the transverse centerlines of said base members.

4,898,103

DESK CONSTRUCTION

Eskild Pontoppidan, Copenhagen, Denmark, and Willy Fleischer, Neukircher Mühle 26, D 4300 Essen, Fed. Rep. of Germany (16,BRD), assignors to Willy Fleischer, Bocum, Fed. Rep. of Germany and Metallwarenfabrik GmbH & Co. KG

Filed Jan. 15, 1988, Ser. No. 207,271
Claims priority, application Denmark, Jan. 16, 1987, 3058/87; Fed. Rep. of Germany, May 19, 1988, 3817102
Int. Cl.[4] A47B *9/00*
U.S. Cl. 108—144 **9 Claims**



1. A desk, particularly for work stations, comprising:
a desk top which is vertically adjustable between two end positions and has at least one vertical guide member; a desk frame including spaced-apart columns, each column having a vertical hollow bottom part and a top part telescopic therein;
a cross-member interconnecting said bottom parts;
height adjusting means connected to said cross-member for moving said top part with respect to said bottom part to move said desk vertically, said height adjusting means including a telescopic leg member having a first end pivotally connected with respect to said cross-member and a second end, a curved rail member pivotally mounted with respect to said cross-member, said second end of said telescopic leg member being propped against said curved rail, a spindle actuator means connected with a hand wheel for adjusting the position of the telescopic member second end relative to the rail, thereby pivoting the rail and pivoting the telescopic member, said curved rail defining a curve such that the position of the propped telescopic member and force components acting on the top support elements are essentially equal at each of the spaced-apart columns, a traction wheel mounted for rotation relative to said cross-member, a connection lever pivotally mounted to said curved rail member, said traction wheel being connected to a grooved reel member, said grooved reel member rotating with said traction wheel, a flexible traction wheel actuator element connected to said pivot and connected to said grooved reel, said flexible traction element rolling up and unrolling from said grooved reel to rotate said traction wheel upon movement of said pivot in response to said second end of said telescopic member being adjusted along said rail, rotation of said traction wheel causing said desk top to move vertically.

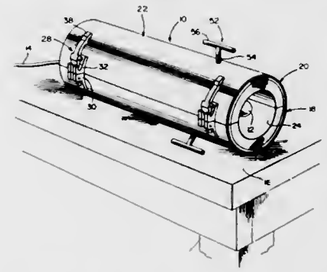
4,898,104

ARMING AND HANDLING SHIELD FOR OILFIELD AND OTHER EXPLOSIVE DEVICES

Thomas D. Savoy, 216 Malibou Blvd., and Herbert J. Wallace, 121 Royce St., both of Houma, La. 71040

Filed Oct. 18, 1988, Ser. No. 259,142
Int. Cl.[4] E05G *3/00*; E06B *9/00*
U.S. Cl. 109—1 R **9 Claims**

1. An arming and handling shield for explosive devices comprising an elongated rigid shell having a hollow interior and end openings and means extending into the interior of the shell for supporting and positioning an explosive device within the hollow interior of the shell, said shell being constructed of material resistant to forces generated when the explosive device is detonated and directing the forces from the end openings in the shell to protect adjacent personnel from injury, said shell being substantially cylindrical in configuration and formed by a pair of elongated semi-cylindrical shell sections which are hingedly connected along one longitudinal edge thereof and provided with releasable latch means along the other longitudinal edge thereof to enable the semi-cylindrical shell sections to be pivoted between open and closed positions to facilitate assembly of the explosive device in the shell and removal of the shell from the explosive device after the explosive device has been assembled, armed and placed in a position where no further danger exists for adjacent personnel, said shell including concentrically arranged inner and outer walls of metal which are spaced apart to define an internal cavity



between the inner and outer walls, a plurality of layers of concussion resistant material positioned between the inner and outer walls and filling the inner cavity to resist radial concussion forces and shrapnel and diverting such forces and shrapnel toward the end openings in the shell and away from adjacent personnel, said layers of concussion resistant material including multiple layers of aramid fiber cloth, said concussion resistant material includes approximately 40 layers of "Kevlar 29", the interior of said shell being cylindrical and the end openings being the same diameter as the interior of the shell, the inner wall of the shell being aluminum and approximately ¼" thick and the outer wall also being aluminum with the inner wall at least partially confining the initial concussion force in the event the explosive device is detonated and the layered concussion resistant material further dissipating the concussion forces with the outer wall completely stopping any remaining forces and debris which may have penetrated the layered concussion resistant material.

4,898,105

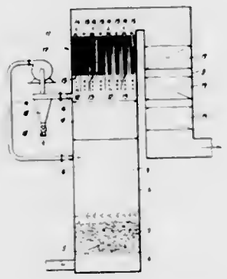
FILTER DEVICE

Louis M. Rappoldt, DV Ugchelen, and Peter H. DeHaan, PE Delft, both of Netherlands, assignors to Nederlandse Organisatie voor Toegepastnatuurwetenschappelijk Onderzoek TNO, The Hague, Netherlands

Filed Jan. 10, 1989, Ser. No. 295,345
Int. Cl.[4] F23G *5/00*
U.S. Cl. 110—245 **10 Claims**

1. Filter device for removing entrained fine solid particles from a gas stream, comprising a charging system for giving an electric charge to the particles and an electrified granular filter which is situated downstream of the charging system and which is formed by at least one layer of granules of a non electrically conducting material and means for forming an electrical field across the granules which comprise a polariza-

tion electrode at one side and an earthed electrode at the other side, in which the granule layer is formed by a self-supporting,



highly porous body, constructed of granules which are sintered together to form a sintered self-supporting granule layer.

4,898,106

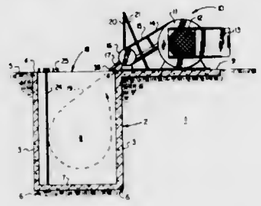
COMBUSTION METHOD AND APPARATUS

Roy G. Bellew, Thermopolis; Donald P. Dunn, Gillette, both of Wyn.; Charles T. Stilwell, Midland, Tex., and Johnny D. Wood, Moorcroft, Wyo., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 10, 1989, Ser. No. 378,340

Int. Cl.[4] F23G *00/00*; F23J *15/00*; F24F *9/00*

U.S. Cl. 110—346 **20 Claims**



1. In a method for burning a combustible material in a container having closed sides and bottom and an open top, which sides and bottom collectively define an interior burning chamber of finite volume and wherein during burning a sheet of oxygen containing gas is formed in an elongate opening and then forced into the interior of said chamber through said open top, said elongate opening having a center section and end sections on either side of said center section, said sheet of gas having by reason of said elongate opening a width which extends across a substantial portion of said open top, said elongate opening being angled with respect to said open top so that said sheet of gas impinges on at least one of said closed sides and thereafter circulates around the interior of said container before leaving same, the improvement comprising, when forming said sheet of gas in said elongate opening diverting a majority of said gas to said end sections while leaving a minority of said gas for said center section, and varying the interior volume of said burning chamber so that the combined effect of said gas sheet and adjusted interior volume in relation to the specific material being burned in said chamber yield an efficient combustion process as evidenced by minimal production of opaque smoke.

4,898,107

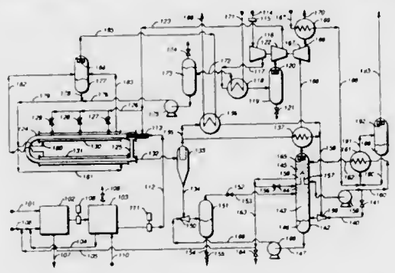
PRESSURIZED WET COMBUSTION OF WASTES IN THE VAPOR PHASE

Norman L. Dickinson, Monte Sereno, Calif., assignor to Dipac Associates, Monte Sereno, Calif.

Continuation-in-part of Ser. No. 100,531, Sep. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 813,486, Dec. 26, 1985, Pat. No. 4,714,032. This application Jan. 9, 1989, Ser. No. 294,424

Int. Cl.[4] F23G *7/04*

U.S. Cl. 110—346 **26 Claims**



1. A pressurized combustion process in which an aqueous waste is mixed with recycled combustion products and an oxygen-containing gas, and combustible constituents burned at supercritical temperature and subcritical pressure, with respect to water, net combustion products being cooled below their dewpoint at essentially combustion pressure, forming an aqueous slurry of non-combustible constituents and a wet flue gas.

4,898,108

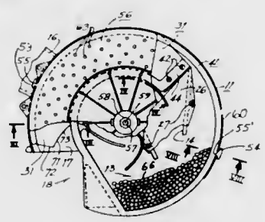
SEED SINGULATOR FOR AGRICULTURAL PLANTER

William C. McDermott, Kansas City, Mo., assignor to Deutz-Allis Corporation, Norcross, Ga.

Continuation-in-part of Ser. No. 245,727, Sep. 19, 1988, abandoned. This application Oct. 13, 1988, Ser. No. 257,183

Int. Cl.[4] A01C *7/04*; B23Q *7/02*

U.S. Cl. 111—185 **9 Claims**



1. An agricultural planter having an air-type seed singulator including a housing with a seed cavity to which bulk seed and pressurized air are supplied and a seed drop portion at the lower part of said housing and a vertical seed singulating disc mounted for rotation about a horizontal axis having a generally flat sealing face including an annular area presenting circumferentially spaced seed pockets defining a plurality of concentric circles greater than two coaxial with said horizontal axis, said pockets sequentially communicating with said seed cavity and said seed drop portion when said disc is rotated in a predetermined direction, characterized by

a first flat axially facing arcuate sealing surface extending in an arc in said predetermined direction about the outer periphery of said housing between the bottom of the seed cavity to said seed drop portion,

a second flat axially facing sealing surface on said housing extending from the circumferential end of said first sealing surface at the bottom of said seed cavity radially inward relative to said horizontal axis a predetermined distance and then curving in a direction opposite to said predetermined direction to present an arcuate portion in a generally concentric and radially inward spaced relation to a part of said first sealing surface near the other circumferential end of the latter, said portion of said second sealing surface and said part of said first sealing surface forming circumferentially lapped segments, said sealing surfaces at least partially circumscribing said cavity,

an arcuate trough in said housing disposed between said lapped segments,

a resilient sealing pad operatively disposed within said trough, said pad having a flat surface in sealing engagement with said annular area of said seed singulating disc, said sealing pad having an end at said seed drop portion disposed at right angles to said flat surface, said end having parts disposed in angular relation to one another whereby predetermined spacing of seeds is effected during rotation of said seed disc,

a generally flat wear ring secured to said housing and of a configuration to be in covering relation to said sealing surfaces, said wear ring being in axial sealing engagement with said flat sealing face of said disc and

a releasable fastening member releasably securing said pad and said wear ring to said housing.

4,898,109

DEVICE FOR SEWING A COLLAR ON TO A BODY OF AN ARTICLE OF CLOTHING

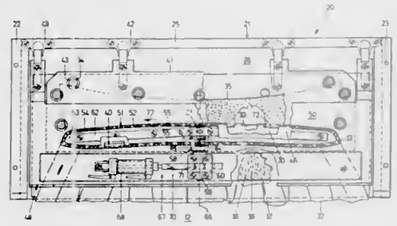
Hans Scholl, Oerlinghausen-Lipperreihe, Fed. Rep. of Germany, assignor to Kochs Adler Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 23, 1988, Ser. No. 235,291

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730405

Int. Cl.[4] D05B *3/00*

U.S. Cl. 112--121.14 **12 Claims**



1. Device for sewing a collar, formed by two lower collar parts (**30, 46**) on to a body (**37**) of an article of clothing, particularly a shirt or blouse, comprising a sewing head (**2**); and at least one workpiece holder (**20**) for receiving workpieces, the sewing head (**2**) and workpiece holder (**20**) being movable in a plane (x-y plane) relative to one another to produce a seam (**55**) for joining the workpieces; wherein the workpiece holder (**20**) has

a first nest (**29**) for receiving a first lower collar part (**30**) and having at least partially a form which is identical to the form of said first lower collar part; devices for receiving and positioning a body (**37**) of an article of clothing partially overlapping with the first nest (**29**) for the first lower collar part (**30**);

a second nest (**44**) for a second lower collar part (**46**), which nest has a form which is at least partially identical to the form of said second lower collar part (**46**) and is arranged above these devices and can be lowered towards then; and

a holding device which is arranged above the second nest (**44**) and can be lowered on to the second nest (**44**).

7. Device for sewing a collar, formed by two lower collar parts (**30, 46**) and an upper collar (**35**) on to a body (**37**) of an article of clothing, particularly a shirt or blouse, comprising a sewing head (**2**); at least one workpiece holder (**20**) for receiving workpieces, the sewing head (**2**) and workpiece holder (**20**) being movable in a plane (x-y plane) relative to one another to produce a seam (**55**) for joining the workpieces; wherein the workpiece holder (**20**) has

a first nest (**29**) for receiving a first lower collar part (**30**) and having at least partially a form which is identical to the form of said first lower collar part;

devices for receiving and positioning a body (**37**) of an article of clothing and of an upper collar (**35**) each partially overlapping with the first nest (**29**) for the first lower collar part (**30**);

a second nest (**44**) for a second lower collar part (**46**), which nest has a form which is at least partially identical to the form of said second lower collar part (**46**) and is arranged above these devices and can be lowered towards them; and

a holding device which is arranged above and can be lowered on to the second nest (**44**).

4,898,110

PATTERN-MATCHING SEWING MACHINE

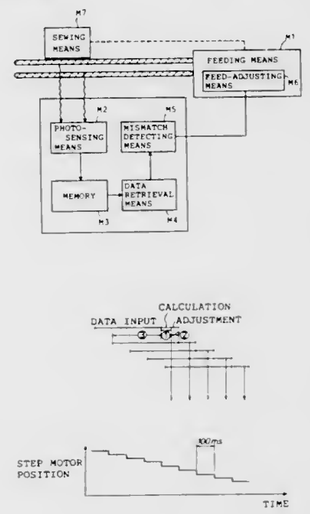
Etsuzo Nomura, Kasugai; Hirokazu Takeuchi; Shigeru Suzuki, both of Nagoya; Kazunori Irie, Ichinomiya, and Hiroumi Itoh, Nagoya, all of Japan, assignors to Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 27, 1989, Ser. No. 302,679

Claims priority, application Japan, Jan. 28, 1988, 63-17696

Int. Cl.[4] D05B *27/06, 27/08*

U.S. Cl. 112—314 **4 Claims**



1. A sewing machine for sewing two sheets having the same pattern comprising:

first and second feeding means each for intermittently feeding one of the sheets;

first and second photo-sensing means each for optically

sensing the pattern on one of the sheets during feeding and for generating photo-intensity data of a plurality of points on the sheet;

a memory for sequentially storing a plurality of the photo-intensity data;

a data retrieval means for retrieving a predetermined number of the newest photo-intensity data from the memory every preset cycle time, the predetermined number corresponding to a preset feeding distance of the sheets, and the preset cycle time being shorter than a feeding time for the preset feeding distance;

a mismatch detecting means for calculating a mismatch distance of the patterns on the two sheets using the predetermined number of retrieved data, the calculation being finished within the preset cycle time; and

a feed-adjusting means, based on the calculated mismatch distance, for adjusting one of the feeding means to match the patterns.

4,898,111

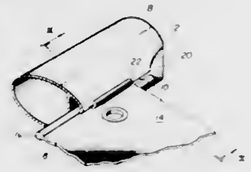
CATAMARAN SAILBOAT USER SUPPORT PLATFORMS AND PACKAGED ELEMENTS THEREFORE

John Hackney, 12420 Kelso Rd., Thonotosassa, Fla. 33592

Filed May 2, 1988, Ser. No. 188,844

Int. Cl.[4] B63B *1/00*

U.S. Cl. 114—61 **3 Claims**



1. In a catamaran sailboat equipped with a user support platform comprising a pair of parallel metal support tubes spaced apart approximately the beam of the sailboat, each said tube having a longitudinal slot on the inboard side thereof, and a trampoline stretched between said tubes by having beaded edges on the outboard sides thereof captured within said tube slots, the improvement for preventing the trampoline from disengaging from its support tubes that comprises a plurality of retainers spaced apart along said tube slots interposed between said tube slots and said beaded edges, said retainers being elongate web elements of substantially uniform web thickness and having a hook-like cross-section.

4,898,112

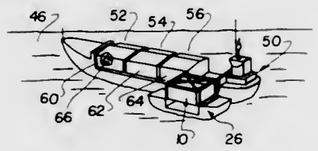
CARGO SHIP HAVING STOWAGE SPACE FOR FLOATABLE SELF-PROPELLED WAREHOUSES

John J. McGlew, and John J. McGlew, Jr., both of P.O. Box 823, Tuxedo Park, N.Y. 10987

Continuation of Ser. No. 400,938, Jul. 22, 1982, abandoned, which is a continuation of Ser. No. 896,050, Apr. 13, 1978, abandoned. This application Aug. 27, 1985, Ser. No. 770,357

Int. Cl.[4] B63B *35/42*

U.S. Cl. 114—255 **9 Claims**



1. A floatable cargo storage container comprises a block-like structure having an interior cargo storage space, at least one side wall having an opening therein through which the cargo may be loaded, means for closing said opening, said cargo storage container including a tank section defining a flotation chamber, means for ballasting and unballasting said flotation chamber for raising and lowering the container structure in the sea, and a plurality of tubular spaces in said storage container defining leg receiving recesses, a leg associated with each receiving space, means for extending and retracting said legs, said legs being of a length substantially equal to the height of said block-like structure and being extendable from the bottom of said structure by an amount substantially equal to the height of said structure so that they may support said structure on the sea bed, and propulsion means associated with said legs for moving the container through water and over land.

4,898,113

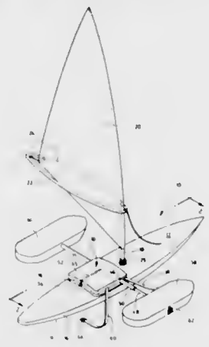
OUT-RIGGER ASSEMBLY

Robin R. Tapley, Dwight; James W. Hatkoski, Huntsville, and Richard J. Hatkoski, Dwight, all of Canada, assignors to Richard Hatkoski, Ontario, Canada

Filed Nov. 7, 1988, Ser. No. 268,294

Int. Cl.[4] B63B *43/04*

U.S. Cl. 114—283 **12 Claims**



1. An out-rigger assembly for use with a sail-board having a top surface and an undersurface and which assembly comprises:

an essentially planar central deck having an unencumbered top surface and adapted to be disposed on said top surface of said sail-board without significantly restricting standing and walking movement of an operator on said sail-board;

at least one releasable fastening strap adapted pass around said sail-board and removably to secure said central deck in position on said top surface of said sail-board;

first and second support means extending transversely outwardly from said centre deck from opposite side edges thereof; and

first and second pontoons releasably secured to respective ones of said first and second support means so as to be disposed in spaced apart and mutually parallel disposition relative to said sail-board on opposite transverse sides thereof when said central deck is secured in position on said sail-board.

4,898,114

FIN PAD OF SMALL MARINE CRAFT

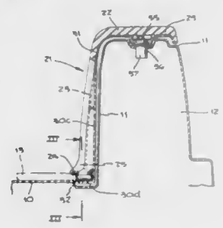
Yukio Asakura, Hyogo, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha dba Kawasaki Heavy Industries, Ltd., Kobe, Japan

Filed Feb. 23, 1989, Ser. No. 314,455

Claims priority, application Japan, Feb. 23, 1988, 63-23689[U]

Int. Cl.[4] B63B *29/00*

U.S. Cl. 114—343 **1 Claim**



1. A fin pad for covering one of the upstanding fins positioned on both sides of a deck floor and center line of a small watercraft, said floor being covered by a mat between said fins, said pad comprising:

a cushion having an inner lower edge, which curves toward a mat and generally toward a centerline of a small watercraft and overlies an adjacent edge of said mat, a back sheet covered by said cushion and adapted to be fixed to at least one of a pair of fins of said watercraft, and anchor means provided on an inner lower edge of said back sheet to engage a part of said floor.

4,898,115

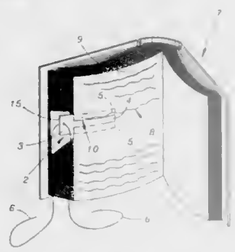
LINE IDENTIFYING BOOKMARK

Iris E. Bowlay-Williams, 6833 Sepulveda Blvd., #310, Van Nuys, Calif. 91405

Filed Mar. 14, 1989, Ser. No. 323,339

Int. Cl.[4] B42D *9/00*

U.S. Cl. 116—236 **5 Claims**



1. A bookmark identifying a particular line and page of a book comprising:

a generally rectangular member having a first portion extending from the page to be identified and a second portion fitting about the page to be identified;

said second portion having a first segment disposable on the page to be identified and formed to identify a particular line, and a second segment disposable on the rear of the page to be identified;

said first and second segments being cooperative to hold the bookmark in place on a particular line and page of the book; and

at least one tying member attached to said rectangular member, said tying member having sufficient length to extend around the outside of the book and hold the book in a closed configuration while the bookmark is held in place on the particular line and page of the book.

4,898,116

POWDER COATING BOOTH

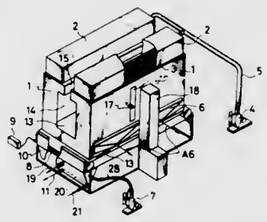
Katsutoshi Kozoe, Tokyo; Nobuo Furuya, Yokohama; Shinichi Kimura, Chiba; Yasunari Okamoto, Kawasaki; Mitsuyoshi Kumada, Yachiyo; Tatsuo Sugimoto, Chiba; Takehiko Ueno, Tokyo; Kenjiro Shimizu, Kohnosu, and Tsutomu Itoh, Tokyo, all of Japan, assignors to Onoda Cement Company, Ltd., Onoda, Japan

Filed Sep. 7, 1988, Ser. No. 241,343

Claims priority, application Japan, Sep. 14, 1987, 62-230499; Jan. 14, 1988, 63-006263

Int. Cl.[4] B05C *1/02, 5/00, 13/00*

U.S. Cl. 118—621 **12 Claims**



1. A powder coating booth comprising:

a sidewall formed from an insulating material or a semiconductor;

a ceiling having a function of downwardly supplying air;

a bottom opened over a conveyor belt;

means for forming an electric field extending to said conveyor;

a suction device for drawing powder paint, said suction device being provided in said sidewall near said bottom; and

a blowing-type static eliminator facing a portion of said conveyor belt positioned at a distance from said bottom.

4,898,117

SOLDER DEPOSITION SYSTEM

Peter G. Ledermann, Pleasantville, and Lua Thanh Nguyen, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1988, Ser. No. 181,775

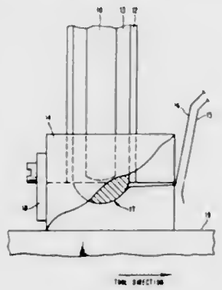
Int. Cl.[4] B05C *1/02*

U.S. Cl. 118—665 **10 Claims**

1. Apparatus for depositing solder on a series of separated conductive surfaces comprising:

a housing having means defining a reservoir for liquid solder and means defining an outlet for liquid solder in the form of a foot from said reservoir.

means for sensing the position of the liquid solder foot emerging from said outlet, and



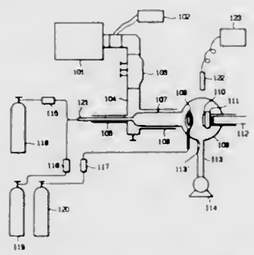
means for breaking a solder film existing between said liquid solder foot and one of said separated conductive surfaces.

4,898,118

APPARATUS FOR FORMING FUNCTIONAL DEPOSITED FILM BY MICROWAVE PLASMA CVD PROCESS

Tsutomu Murakami, Nagahama, and Masahiro Kanai, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,525
Claims priority, application Japan, Oct. 5, 1987, 62-249855
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—723 **2 Claims**



1. Apparatus for forming a deposited film by a microwave plasma CVD process comprising introducing a film-forming raw material gas into a reaction vessel capable of being vacuum sealed, and generating a microwave-excited plasma in the reaction vessel to deposit a film on a substrate for film deposition disposed in the reaction vessel, the apparatus comprising a rectangular waveguide for transmitting microwave energy, a pair of microwave cutoff cavities having different cutoff frequencies, the cavities being oppositely disposed on opposite sides of the waveguide, and a reaction vessel disposed to penetrate through the waveguide and the microwave cutoff cavities, wherein a raw material gas inlet is provided at one end of the reaction vessel, and a film deposition space is provided at the other end of the reaction vessel.

4,898,119

REMOTE CONTROL ANIMAL COLLAR

David M. Tsai, 124 Benedict La., Raleigh, N.C. 27614

Filed Aug. 11, 1988, Ser. No. 230,957
Int. Cl.[4] A01K *15/00*
U.S. Cl. 119—29 **10 Claims**



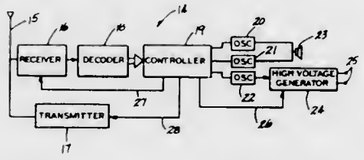
1. An adjustable animal training collar comprising in combination: a flexible strap at least a portion of which is adapted to encircle the neck of an animal, a radio receiver means for receiving a remotely broadcast radio signal and converting it to an on/off switching signal, an electric power source connected to an electric motor having a turning shaft which engages and turns a capstan connected to said strap such that turning of said capstan by said motor causes tightening of said strap around the neck of said animals, turning of said capstan being controlled by clutch means connected therewith and activated by switch means connected through said radio receiver to said power source to transmit power to said switch means on receipt of said on signal and to terminate said power on receipt of said off signal.

4,898,120

ANIMAL TRAINING AND RESTRAINING SYSTEM

Peter W. Brose, Harwinton, Conn., assignor to Torrington Product Ventures, Inc., New Hartford, Conn.

Filed Jun. 16, 1988, Ser. No. 207,541
Int. Cl.[4] A01K *15/02*
U.S. Cl. 119—29 **19 Claims**



4. An animal training system comprising a central logic unit including a radio transmitter and receiver, a unit for mounting on the animal which includes a transmitter and receiver, said central transmitter and receiver being effective to transmit signals to the animal unit and receive identification signals from the animal transmitter, means at said central logic unit for measuring the strength of a signal from the animal transmitter, means at said central logic unit for comparison of the measured strength of a signal from the animal transmitter with stored data relative to distance from the central logic unit, and means for initiating transmission of one a plurality of types of control signals to the animal.

4,898,121

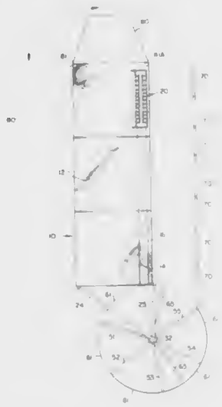
PORTABLE WORKING CHUTE SYSTEM

Charles E. Reynolds, P.O. Box 186, Moorcroft, Wyo. 82721

Filed Aug. 8, 1988, Ser. No. 229,652
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—98 **17 Claims**

1. Portable working chute system comprising:

(a) an elongated platform having first and second ends; said platform providing a working surface;
(b) wheels adapted to support said platform for transport;
(c) upright members attached to said platform and forming a passageway extending longitudinally over said platform;
(d) a tub pen attached to said second end of said platform, said tub pen comprising (i) a frame member, (ii) a plurality of upright support members attached to said frame member, (iii) a plurality of curved panel sections detachably secured to said support members and forming a tub pen having an inlet opening and an outlet opening, wherein said outlet opening communicates with said passageway;



and (iv) at least one gate pivotably attached to said frame member and being adapted to pivot within said tub pen; wherein said tub pen is adapted to be disassembled and carried on said platform for transport;
(e) leg members attached to said platform which are adapted to selectively raise and lower said first end of said platform; and
(f) a gooseneck hitch member pivotably attached to said first end of said platform; wherein said hitch member is pivotable between (i) a towing position in which said hitch member is longitudinally aligned with said platform, and (ii) a resting position in which said hitch member is pivoted to one side of said platform.

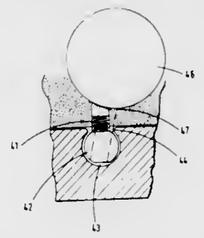
4,898,122

TILE MOUNTING SYSTEM

James Black, c/o The Manor House, Lawrence Street, York, Y01 3EF, England

Filed Jul. 6, 1988, Ser. No. 215,636
Claims priority, application United Kingdom, Jul. 6, 1987, 8715871
Int. Cl.[4] F22B *37/00*
U.S. Cl. 122—6 A **7 Claims**

1. A combination of ceramic tiles and locating elements for locating and supporting the ceramic tiles relative to a main support to which the locating elements are attached, the locating elements each having a elongate body, an enlarged head at one end and at the opposed end is attachable to the main support; the ceramic tiles each defining a recess in its rear surface, the recess having a substantially corresponding cross-section to that of the enlarged head of the elongate locating elements in the axial direction thereof, the diametric width of the recess being greater than the width of the opening to the recess and the width of the opening being substantially wider than the width of the elongate body of the locating member so that the locating member is rotatable within the recess in a direction transverse to the longitudinal axis of the locating member to



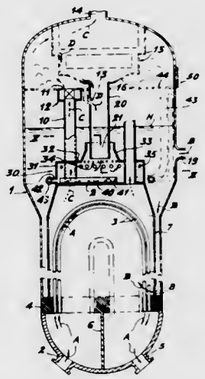
move the said elongate body between opposed sides of the recess opening.

4,898,123

WATER CLEANSING TANK FOR STEAM GENERATOR

Alain Holcblat, Issly les Moulineaux, France, assignor to Framatome, Courbevoie, France

Filed Jun. 20, 1988, Ser. No. 208,624
Claims priority, application France, Jun. 18, 1987, 87 08517
Int. Cl.[4] F22B *37/18, 37/48*
U.S. Cl. 122—379 **9 Claims**



1. A tank for the cleansing of water flowing in a steam generator, said water being separated from the steam by drying means and having flowed through a tube for the inlet of water into the tank, said tank comprising a casing consisting of a bottom, a side wall drilled with water-removal holes and a roof drilled with a central conduit into which the lower end of the tube penetrates.

4,898,124

SCALE AGITATOR

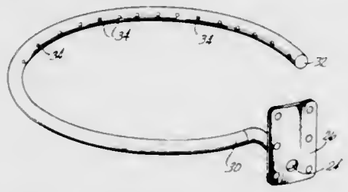
Dirk N. Granberg, Fenton, Mich.; Frank H. Suchomel, and Robert W. Ryno, both of El Paso, Tex., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jan. 11, 1989, Ser. No. 296,187
Int. Cl.[4] F22B *37/54, 37/18, 37/52*
U.S. Cl. 122—382 **17 Claims**

1. In a liquid heater having a tank in which the liquid is heated, a liquid inlet near the base of the tank, and a fitting at the liquid inlet, one side of which is in communication with incoming liquid, and the other side of which is in communica-

tion with the tank's interior, an inlet liquid distributor comprising:

a flexible elongated tube, one end of which is plugged and the other end of which is adapted to be mounted to the liquid inlet fitting so that the tube can be inserted into and withdrawn from the tank through the liquid inlet and held



in place by the fitting, the tube being longer than the diameter of the tank so that the tank's interior wall forces the tube to flex into a curve when the tube is inserted into the tank; and

a plurality of openings along the tube arranged for distributing the inlet liquid so that the inlet liquid is distributed in different directions by the different openings.

4,898,125

CYLINDER HEAD COVER WITH SUCTION PIPE ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE

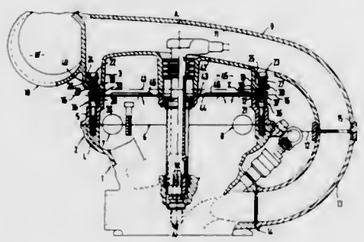
Herbert Ampferer, Sachsenheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 243,603

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1987, 3730817

Int. Cl.[4] F22B *9/08*

U.S. Cl. 123—52 MC **15 Claims**



1. A cylinder head cover with a suction pipe arrangement for an internal combustion engine of a four-cycle reciprocating-piston type construction which form a structural unit, comprising retaining means including seal means and threaded means for retaining the cylinder head cover at the cylinder head of the internal combustion engine, and threaded means having heads and extending substantially perpendicularly to a separating plane of the cylinder head cover and the cylinder head, elastic means arranged between the heads of the threaded means and support means of the structural unit extending substantially parallel to said separating plane for attaching the heads to the support means, wherein the cylinder head is of multi-partite configuration and the threaded means are screwed into head portions of coaxially arranged fastening bolts which retain the multi-partite cylinder head in position.

4,898,126

INTERNAL COMBUSTION ENGINE WITH CATALYTIC IGNITION

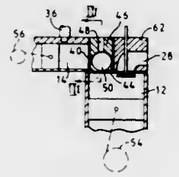
Dan Merritt, 139 Baginton Rd., Coventry, West Midlands, Great Britain

Continuation of Ser. No. 18,191, Feb. 24, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 303,019

Claims priority, application United Kingdom, Feb. 25, 1986, 8604635; Jul. 11, 1986, 8616982; Dec. 9, 1986, 8629304

Int. Cl.[4] F02B *19/16, 25/26;* **F02P** *23/02*

U.S. Cl. 123—53 A **23 Claims**



1. An internal combustion engine comprising at least one pair of first and second cylinders interconnected at their head ends by a combustion chamber, said first cylinder having a larger swept volume than said second cylinder;

means for delivering a charge of air to said first cylinder and means for delivering a charge of fuel to said second cylinder, said second cylinder being a fuel management cylinder;

substantially continuous ignition means in said combustion chamber;

respective first and second pistons movable in said cylinders towards and away from said combustion chamber;

means for restricting movement of fuel/air mixture from said fuel management cylinder into said combustion chamber until combustion is required;

and mixing means for delivering air with a vortex motion from the first cylinder to the combustion chamber for assisting rapid mixing in said combustion chamber of a fuel/air mixture from said fuel management cylinder with air from said first cylinder.

4,898,127

TWO-STROKE CYCLE ENGINE WITH VACUUM PULSE BALANCING SYSTEM

George E. Phillips, Oshkosh, and John M. Griffiths, Fond du Lac, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Mar. 20, 1989, Ser. No. 326,120

Int. Cl.[4] F02B *33/04*

U.S. Cl. 123—73 A **9 Claims**

1. A two-stroke cycle internal combustion engine, comprising:

a plurality of cylinders;

a reciprocable piston slidably mounted in each said cylinder, said piston creating a vacuum pulse during a portion of its reciprocation;

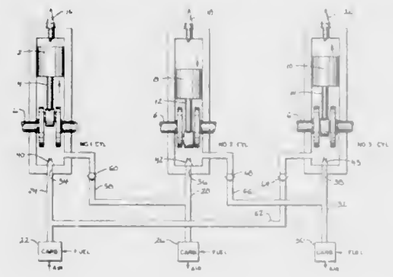
separate air-fuel mixture supply means associated with each said cylinder, said air-fuel mixture being drawn into said cylinder when said vacuum pulse is created by movement of said piston therein;

means communicating air-fuel mixture from each said separate air-fuel mixture supply means to the cylinder associated therewith; and

vacuum pulse balancing means, comprising:

a plurality of passages disposed downstream of each said separate air-fuel mixture supply means and placing each said cylinder in fluid communication with the air-fuel mixture supply means associated with one of the other cylinders; and

one-way valve means provided in each said passage for providing transfer of the vacuum pulses from said cylinders through said plurality of passages, so that the vacuum pulse from a first one of said cylinders is transferred to the air-fuel supply means associated with a second one of said cylinders so as to draw air-fuel mixture therefrom when a vacuum pulse is not being supplied by said first one of said cylinders.



4,898,128

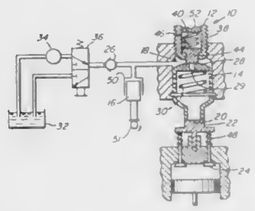
ANTI-LASH ADJUSTER

Vincent A. Meneely, 9837 McKinnon Crescent R.R. No. 10, Langley, B.C., Canada V3A 6X5

Filed Apr. 7, 1988, Ser. No. 179,034

Int. Cl.[4] F02D *9/06*

U.S. Cl. 123—90.12 **6 Claims**



1. A compression relief engine brake for internal-combustion engines, comprising:

an engine having an engine oil pump, exhaust valves, and means for actuating the exhaust valves;

a fluid cavity for accepting engine oil under normal pressure to the fluid cavity;

a slave piston having a predetermined surface area exposed to the fluid cavity, mounted for reciprocating motion within the fluid cavity, wherein the slave piston has a retracted position defining a maximum clearance between one end of the slave piston and the exhaust valve actuating mechanism and an extended position wherein the clearance between the end of the slave piston and the exhaust valve actuating mechanism, is reduced;

means for biasing the slave piston to the retracted position under a predetermined retracting force;

means for applying to the slave piston over a limited distance a net force exclusive of the retracting force and oil pressure which biases the slave piston towards the extended position and does not exceed the retracting force, wherein the resultant force due to the force imposed by oil pressure within the fluid cavity acting on the predetermined surface area of the slave piston and the net force exceeds the predetermined retracting force so that the slave piston is biased to the extended position over the limited distance through which the net force acts;

means for temporarily trapping the oil in the fluid cavity so that displacement of the slave piston in the direction of the extended position is maintained due to the incompressibility of the temporarily trapped oil; and

means for eliminating movement of the slave piston beyond said limited distance through which the supplemental force acts.

4,898,129

VALVE CONTROL OF INTERNAL COMBUSTION ENGINES BY MEANS OF A CAM-DRIVEN ROTARY PISTON PUMP

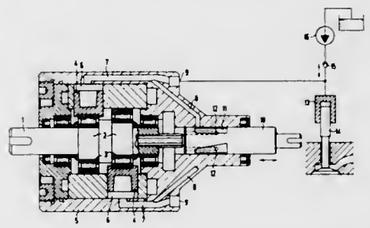
Ewald Junghans, Bergisch Gladbach, and Gabriel Tittizer, Roesrath, both of Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 237,227

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728511

Int. Cl.[4] F01L *9/02;* **F04B** *1/06*

U.S. Cl. 123—90.13 **8 Claims**



1. Rotary piston pump assembly, comprising a rotary piston pump having a pump housing and an interior, first outlets for leading fluid out of the interior of said pump, second outlets for leading fluid out of said pump housing, a closed loop of fluid passageways completely disposed within said housing for returning fluid into the interior of said pump through said first outlets, and means for closing said first outlets during a portion of the rotation of said pump.

4,898,130

VALVE MECHANISMS

Bryan N. V. Parsons, Stoney Stanton, United Kingdom, assignor to Jaguar Cars Limited, United Kingdom

Continuation of Ser. No. 252,168, Sep. 30, 1988, abandoned. This application May 5, 1989, Ser. No. 347,740

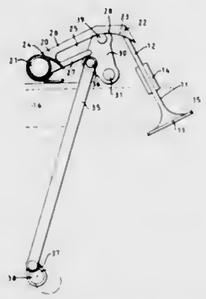
Claims priority, application United Kingdom, Oct. 3, 1987, 8723256

Int. Cl.[4] F01L *1/30*

U.S. Cl. 123—90.16 **21 Claims**

1. A valve mechanism comprising; a valve having a valve stem which is located for axial movement in a valve guide and a valve head adapted at one extreme of movement of the valve to locate against and close a valve seat; a valve lever pivotally mounted at one end and attached adjacent the other end to the end of the valve stem remote from the valve head; said valve lever defining a track; a drive pin permanently engaging said track and drive means to drive said drive pin in oscillatory manner; said track having a first portion which, when the valve is closed, is engaged by the drive pin and coincides with

the path of the drive pin and a second portion which diverges from the path of the drive pin, so that engagement of the



second portion by the drive pin will cause the valve lever to move to positively open and close the valve.

4,898,131

VALVE ACTUATING MECHANISM FOR INTERNAL COMBUSTION MECHANISM

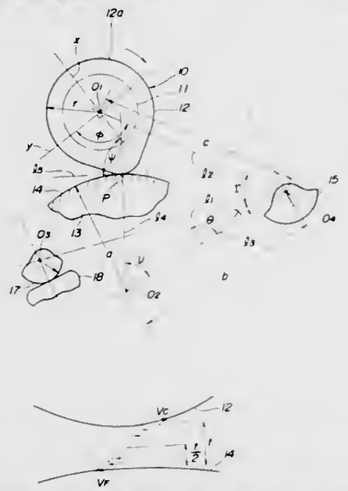
Makoto Sanada; Hiroshi Yamashita; Shinichiro Izawa, and Toshikazu Hamamoto, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 319,113

Claims priority, application Japan, Mar. 18, 1988, 63-65319; Mar. 18, 1988, 63-65325

Int. Cl.[4] F01L *1/08, 1/18*

U.S. Cl. 123—90.44 **3 Claims**



1. In a valve actuating mechanism for an internal combustion engine having at least one intake valve and at least one exhaust valve, including a rotatable cam having a camming surface, and a rocker arm having a cam slipper surface disposed in slidable contact with said camming surface, wherein said intake valve or said exhaust valve is opened and closed by rocking motion of said rocker arm caused by rotation of said rotatable cam,

the improvement wherein said rotatable cam and said rocker arm have dimensions, shapes, and relative positions so designed as to satisfy a condition of $V_C+V_F>0$ irrespective of the angles assumed by said rotatable cam, where V_C represents velocity of movement of a contact point on said camming surface of said rotatable cam at which said camming surface slides on said cam slipper surface, and V_F represents velocity of movement of the contact point on said cam slipper surface at which said cam slipper surface slides on said camming surface.

4,898,132

ENGINE STARTING APPARATUS FOR MARINE PROPULSION ENGINE

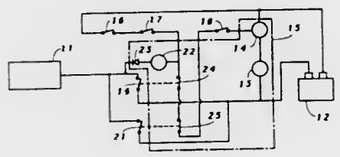
Isao Kanno, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 11, 1988, Ser. No. 167,307

Claims priority, application Japan, Mar. 13, 1987, 62-57982; Dec. 28, 1987, 62-333466

Int. Cl.[4] F02N *11/08*

U.S. Cl. 123—179 B **11 Claims**



1. In a starting system for an engine having an operator controlled kill switch selectively moveable between an opened position for permitting normal running of said engine and a closed position for disabling the running of the engine and a starting system for starting of the engine, means for providing a warning if the starting system is energized when the kill switch is closed.

4,898,133

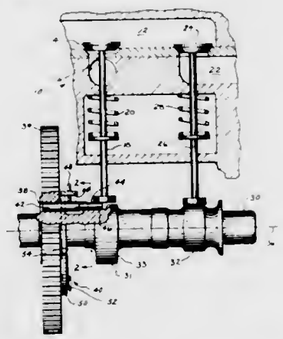
AUTOMATIC COMPRESSION RELEASE APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Mark S. Bader, Sheboygan Falls, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Dec. 7, 1988, Ser. No. 280,792

Int. Cl.[4] F01L *13/08*

U.S. Cl. 123—182 **14 Claims**



1. In an internal combustion engine having an exhaust valve, an exhaust valve lifter, a cam shaft with a cam surface which engages the valve lifter to open the valve at a first angular position of the cam shaft, and a mechanism for opening the valve at a second angular position of the cam shaft, the improvement in the mechanism comprising:

a cam pin located adjacent to the cam surface in a manner in which said cam pin can rotate on its longitudinal axis, and having a portion eccentric to the longitudinal axis which portion extends above the cam surface to engage the valve lifter and open the valve in a first rotational position and which portion in a second rotational position does not engage the valve lifter in a manner which opens the valve;

a drive pin attached to said cam pin and extending therefrom;

means, engaging said drive pin, for rotating said cam pin in response to engine speed; and

means against which said drive pin abuts when said cam pin is in the first or second rotational positions.

4,898,134

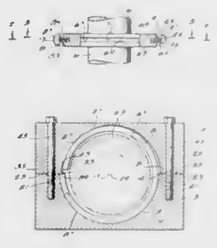
CRANKCASE SEAL ARRANGEMENT FOR TWO CYCLE ENGINE

Paul W. Breckenfeld, Winthrop Harbor, and George L. Broughton, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 27, 1989, Ser. No. 316,154

Int. Cl.[4] F16J *15/32;* **F16F** *15/00*

U.S. Cl. 123—195 R **8 Claims**



1. An internal combustion engine comprising an engine block comprising a first crankcase-defining member including a first semi-cylindrical surface extending about a first center, and also including a first shoulder extending from said first semi-cylindrical surface, a second crankcase-defining member fixedly connected to said first crankcase defining member and including a second semi-cylindrical surface located in generally co-planar facing relation to said first semi-cylindrical surface, and extending about a second center located in spaced relation to said first center, and also including a second shoulder extending from said second semi-cylindrical surface, a crankshaft supported by said engine block and including a crankcase-defining disc including a cylindrical surface in spaced and generally co-planar facing relation to said first and second semi-cylindrical surfaces and including therein an annular groove, a first seal member located in said annular groove and having an outer surface in sealing engagement with said semi-cylindrical surface of one of said first and second crankcase-defining members and an end surface engaging said shoulder on said other of said first and second crankcase-defining members, and a second seal member located in said annular groove and in sealing engagement with said first sealing member, and having an outer surface in sealing engagement with said semi-cylindrical surface of said other of said first and second crankcase-defining members, and an end surface engaging said shoulder on said one of said first and second crankcase-defining members.

4,898,135

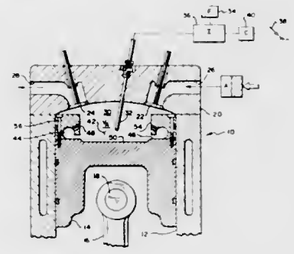
PISTON AND PROCESS FOR ACHIEVING CONTROLLED IGNITION AND COMBUSTION OF HYDROCARBON FUELS IN INTERNAL COMBUSTION ENGINES BY GENERATION AND MANAGEMENT OF FUEL RADICAL SPECIES

Charles C. Faillia, Annapolis; Andrew A. Pouring, Edgewater; Bruce Rankin, Annapolis, all of Md.; Carlo L. di Priolo, Milan, Italy; William McCowan, Grasonville, and Dennis Gosewisch, Severna Park, both of Md., assignors to Sonex Research, Inc., Annapolis, Md.

Filed Feb. 16, 1989, Ser. No. 311,289

Int. Cl.[4] F02F *3/28*

U.S. Cl. 123—263 **17 Claims**



1. In a piston for a reciprocating piston internal combustion engine in which a combustion cycle is carried out in a variable volume combustion chamber defined by the piston reciprocating in a close ended cylinder into which a fuel and air charge is periodically supplied, and which cycle includes intake, compression, combustion, expansion and exhaust portions, and wherein the piston crown is recessed and contains the majority of the charge when the combustion chamber is at minimum volume, the improvement comprising:

said piston including a generally toroidal shaped reaction chamber disposed in the piston crown area adjacent the periphery of the recess and extending at least part way around the recess periphery, and a continuous slot orifice providing communication between the recess and the reaction chamber, said reaction chamber and slot orifice being shaped and dimensioned such that during the compression part of each combustion cycle, a portion of the charge is admitted tangentially into the reaction chamber through the slot orifice with the flow of the gas portion of the charge being choked substantially during the entire compression event; the fluid admitted to the reaction chamber is radially vortically swirled in intimate contact with the sidewalls of the reaction chamber so as to effect heat transfer to the admitted charge and its partial oxidation reaction to create radical species of the fuel; any flame front approaching the reaction chamber from the combustion chamber is quenched; and outward flow of compressed gas with radicals from the reaction chamber into the combustion chamber during each combustion cycle through the slot orifice is choked during at least the expansion and exhaust portions of each combustion cycle; and so that radicals of the fuel are produced and retained temporarily in the reaction chamber during the combustion, expansion and exhaust portions of a combustion cycle and are discharged into the piston recess following the conclusion of said exhaust portion at least in advance of the compression portion of the next succeeding combustion cycle in sufficient quantity to condition the next succeeding charge in the combustion chamber for preselected ignition and combustion characteristics.

4,898,136

MIXTURE-COMPRESSING INTERNAL-COMBUSTION ENGINE WITH A MAIN COMBUSTION CHAMBER AND AN AUXILIARY COMBUSTION CHAMBER

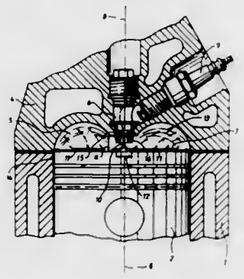
Wolfgang Latz, Stuttgart, and Robert Happel, Waiblingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Mar. 8, 1989, Ser. No. 320,523

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807841

Int. Cl.[4] F02B *17/00*

U.S. Cl. 123—269 **14 Claims**



1. Mixture-compressing spark-ignition internal-combustion engine with a cylinder head, which has a depression serving as a main combustion chamber and an auxiliary combustion chamber provided with a spark plug and connected to the main combustion chamber by an overflow bore, through which a part of the fuel/air mixture from the main combustion chamber is compressed by a piston and, after ignition has taken place, leaves at high pressure and velocity as an ignition jet with a jet direction aiming at a surface region of the piston crown, wherein the overflow bore is aligned concentrically with respect to the longitudinal center axis of the cylinder and the surface region of the piston crown is designed as a level impact area lying opposite the overflow bore and running orthogonally with respect to the jet direction of the ignition jet.

4,898,137

CONTROL DEVICE FOR VEHICLE

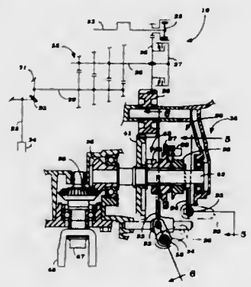
Minoru Fujita, Iwata, and Hirotaka Shibata, Hamamatsu, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 846,565, Mar. 31, 1986, Pat. No. 4,805,572. This application Jan. 13, 1989, Ser. No. 297,479

Int. Cl.[4] F02D *9/08, 29/00, 31/00*

U.S. Cl. 123—352 **20 Claims**

9. In an internal combustion engine having a first speed controlling element for controlling the speed of said engine, a second speed controlling element for controlling the speed of said engine, a manual operator for said first speed controlling element for manual engine speed control, an automatic operator for said second speed controlling element for automatic engine speed control, means for selectively controlling the engine speed from either said manual operator or said automatic operator, and means for precluding engine speed control



by the other of said operators upon selection of engine speed control by one of said operators.

4,898,138

ENGINE CONTROL APPARATUS

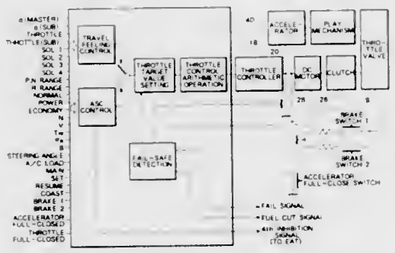
Eiji Nishimura; Kazutoshi Nobumoto, both of Hiroshima; Toshihiro Matsuoka; Toshiaki Tsuyama, both of Higashihiroshima, and Kaoru Sotoyama, Hatsukaichi, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 24, 1988, Ser. No. 261,971

Claims priority, application Japan, Oct. 26, 1987, 62-268307

Int. Cl.[4] F02D *11/10*

U.S. Cl. 123—399 **14 Claims**



1. An engine control apparatus comprising:

operation amount detection means for detecting an operation amount of an accelerator;

engine output adjusting means for adjusting an engine output;

arithmetic means for receiving the output from said operation amount detection means and calculating a control amount corresponding to the output operation amount of the accelerator in accordance with a predetermined characteristic, said control amount being one for controlling said engine output adjusting means;

drive means for receiving the output from said arithmetic means and driving said engine output adjusting means in accordance with said control amount calculated by said arithmetic means;

return detection means for detecting a return state of said accelerator; and

control means for, when said return detection means detects the return state of said accelerator, controlling said arithmetic means to output said control amount in accordance with a characteristic with which the engine output is decreased below that according to said predetermined characteristic.

4,898,139

ENGINE CONTROL APPARATUS

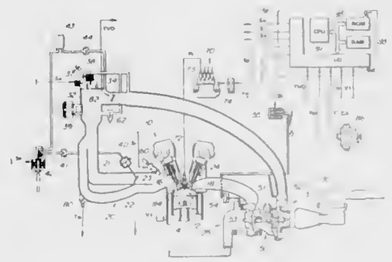
Tooru Kitayama, and Toshiya Ohtani, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 8, 1988, Ser. No. 241,876

Claims priority, application Japan, Sep. 9, 1987, 62-227227

Int. Cl.[4] F02D *41/04;* **F02P** *5/14*

U.S. Cl. 123—425 **4 Claims**



1. An apparatus for controlling an internal combusiton engine of the spark ignition type including spark-timing control means for controlling the timing of sparks supplied to the engine, comprising:

sensor means for sensing a condition of the engine;

a knock sensor for sensing engine knock;

a control unit including memory means having a first table describing a desired relationship between the sensed engine condition and the spark-timing control means for the engine being operating on first fuel having a first octane number and a second table describing a desired relationship between the sensed engine condition and the spark-timing control means for the engine being operating on second fuel having a second octane number greater than the first octane number, the control unit including means for providing a control signal having a first and second level, and means for calculating a first value corresponding to a setting of the spark-timing control means repetitively at uniform intervals from the first table in response to the first level of the control signal and from the second table in response to the second level of the control signal;

an electrical circuit coupled between the control unit and the spark-timing control means for converting the calculated first value into a setting of the spark-timing control means;

the control unit including means for performing advance control to advance the spark timing at a first predetermined rate when the sensed engine condition is within a specified range in the presence of the first level of the control signal, and means for changing the control signal from the first level to the second level when the spark timing is advanced over a first reference value during the advance control;

the control unit including means for performing knock control to retard the spark timing at a second predetermined rate in response to the sensed engine knock in the presence of the second level of the control signal, means for changing the control signal from the second level to the first level when the spark timing is retarded over a second reference value less than the first reference value during the knock control;

the control unit including means for storing a maximum value βmax to which the spark timing is advanced at maximum during the advance control, means for advancing the spark timing by the stored maximum value βmax before the spark timing is advanced at the first predetermined rate during the following advance control, and means for clearing the maximum value βmax to zero when the spark timing is advanced over the first reference value during the advance control.

4,898,140

DEVICES FOR ELIMINATING WATER FROM DIESEL OIL SUPPLYING A DIESEL ENGINE

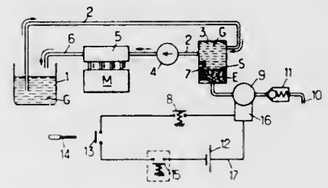
Jean Pages, Epinay sur Seine, France, assignor to Labinal, Montigny le Bretonneux, France

Filed Apr. 10, 1989, Ser. No. 335,502

Claims priority, application France, Apr. 11, 1988, 88 04760

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—510 **4 Claims**



1. Device for eliminating water present in diesel oil supplying a diesel engine of a vehicle, comprising a water separating member mounted in the diesel oil supply circuit of the engine, a container for the water separated from the diesel oil, means for detecting the passage of a predetermined warning threshold by the volume of separated water collected in said container, an electric drainage pump whose inlet is connected to the container and the outlet to an evacuation pipe equipped with a non-return valve and an electrical energizing circuit for this pump comprising an electric switch associated with the above detection means, which are arranged so as to close it automatically when the warning threshold is reached or passed by the volume of water collected in the container, characterized in that said electrical energizing circuit for the pump comprises a second electrical switch mounted in series with the first, arranged so as to be closed on the energization of the electrical circuit of the vehicle, and associated with means adapted to neutralize automatically its closure at the latest at the moment of starting up of the engine.

4,898,141

FUEL COOLING DEVICE

Christian Fiedler, Gernsbach, Fed. Rep. of Germany, assignor to Aeroquip GmbH, Baden-Baden, Fed. Rep. of Germany

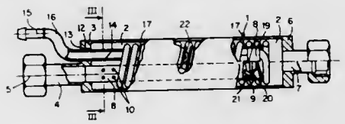
PCT No. PCT/EP87/00550, § 371 Date Apr. 8, 1988, § 102(e) Date Apr. 8, 1988, PCT Pub. No. WO88/02442, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 28, 1987, Ser. No. 221,782

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1986, 3633951

Int. Cl.[4] F02M *31/00, 31/20*

U.S. Cl. 123—541 **9 Claims**



1. A fuel cooling device comprising: a cylindrical housing; a refrigerant tube for carrying a refrigerant mounted in said housing; a spirally wound fuel tube surrounding said refrigerant tube; said refrigerant tube having connecting ends for the refrigerant and for fuel; said refrigerant tube having openings

for penetration of refrigerant into the interior of said housing; said spirally wound fuel tube comprising a continuous tube assembly located substantially in the interior of said housing; connecting ends on said tube assembly, said tube assembly exiting from said housing through said connecting ends; and adjustable throttle means located in an open end of said refrigerant tube.

4,898,142

COMBUSTION ENGINE WITH FUEL INJECTION SYSTEM, AND A SPRAY VALVE FOR SUCH AN ENGINE

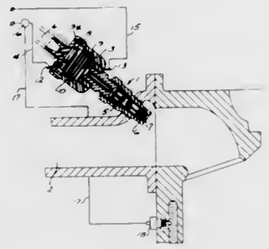
Guus Van Wechem, Katteshaarsweg; Gerrit Beunk, Liaztstraat; Frits Van Den Elst, Bornerbroeksestraat, and Arie Van Der Ploeg, Larixlaan, all of Netherlands, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 28, 1987, Ser. No. 55,481

Claims priority, application Netherlands, May 29, 1986, 8601384

Int. Cl.[4] F02M *31/00, 31/12*

U.S. Cl. 123—557 **4 Claims**



1. A combustion engine with a fuel system, said engine having at least one cylinder with an air inlet passage, into which passage opens a fuel spray valve which is connected to a fuel pipe with a pump, while disposed in a selected part of the fuel system is a fuel heating element with which the infed fuel can come into direct contact, characterized in that the fuel system comprises a fuel injection system having a fuel spray valve which is connected to the fuel pipe and the fuel heating element is provided in the form of a thermistor of material with a positive temperature coefficient associated with the fuel spray valve, said thermistor being connected to an electrical supply and discharge cable, a holder being disposed on the fuel spray valve and having therein the thermistor in the form of a PTC tablet which is connected to a heat sink for transfer of heat to the fuel, said heat sink being designed as a metal box to have good heat-conducting properties and low mass with at least one fuel passage for heat transfer from the box to fuel flowing in the passage.

4,898,143

EXHAUST GAS RECIRCULATION CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Sachito Fujimoto, and Takuya Sugino, both of Wako, Japan, assignors to Honda Giken Kogyo K. K. (Honda Motor Co., Ltd. in English), Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,824

Claims priority, application Japan, Mar. 22, 1988, 63-67563

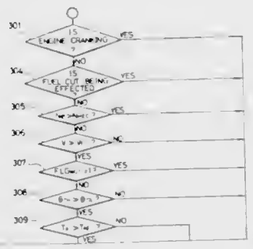
Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **7 Claims**

1. A method of controlling exhaust gas recirculation in an internal combustion engine having an exhaust passage, an intake passage, an exhaust gas recirculating passage extending between said exhaust passage and said intake passage, and an exhaust gas recirculating valve arranged across said exhaust gas recirculating passage, wherein the opening of said exhaust gas recirculating valve is controlled in response to operating conditions of said engine, the method comprising the steps of:

(1) detecting an amount of load on said engine;

(2) detecting a value of a temperature of said engine;



(3) setting a predetermined value of load on said engine in response to the detected value of the temperature of said engine; and

(4) inhibiting the exhaust gas recirculation when the detected amount of load of said engine exceeds said predetermined value.

4,898,144

INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINE

Manabu Kobayashi, Iwata; Kazutoshi Suzuki, Fukuroi, and Takeo Kondo, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

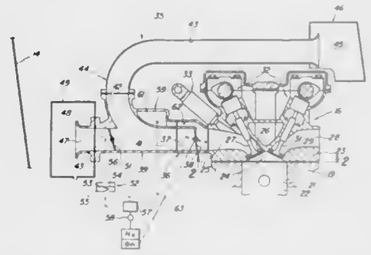
Continuation of Ser. No. 845,576, Mar. 28, 1986, abandoned. This application Apr. 3, 1989, Ser. No. 333,717

Claims priority, application Japan, Mar. 30, 1985, 60-67164

Int. Cl.[4] F02M *35/10*

U.S. Cl. 123—52 M **47 Claims**

1. An intake system for an internal combustion engine having a variable volume chamber an inlet port serving said chamber, a first intake passage having an air inlet at one end and an outlet end serving said inlet port, a second intake passage having an inlet end and an outlet end serving said inlet port, said second intake passage outlet end communicating with said first intake passage between its air inlet end and the outlet end of said first intake passage, said second intake passage having a substantially different length than said first intake passage, a first plenum chamber communicating with said inlet end of said first intake passage for serving first intake passage, means for supplying atmospheric air to said first plenum chamber, a second plenum chamber spaced from said first plenum chamber and serving said inlet end of said second intake passage, means for supplying atmospheric air to said second plenum chamber, and a throttle valve for selectively controlling a flow through only one of said intake passages.



4,898,145

ARROW REST AND HOLDER

Miroslav A. Simo, 370 N. Delaplaine, Riverside, Ill. 60546

Filed Aug. 1, 1983, Ser. No. 518,957

Int. Cl.[4] F41D *9/00*

U.S. Cl. 124—41 A **5 Claims**

1. An arrow rest holder comprising; a generally flat mounting plate, said mounting plate having securement means for rigid securement of one side adjacent to a bow and the other side of said mounting plate having a holding and positioning means detachably holding and positioning an arrow rest, said holding and positioning means comprising at least one extension holding means comprising a shaft portion and a larger head portion extending from said other side of said mounting plate adapted to securely engage an arrow rest mounting body.

4,898,146

HEATING APPLIANCE

Jan A. Stapensèa, Gasteren, Netherlands, assignor to Fasto B.V., Buinen, Netherlands

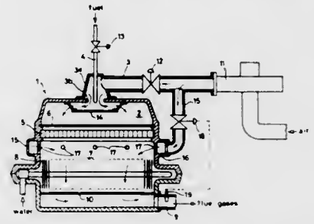
Filed Dec. 6, 1988, Ser. No. 280,383

Claims priority, application Netherlands, Dec. 10, 1987, 8702987

Int. Cl.[4] F24H *3/00*

U.S. Cl. 126—116 A **12 Claims**

1. A heating appliance, comprising a burner of the type having a full premixing and forced draught, and having a mixing chamber to which an air supply line and a fuel supply are connected, said mixing chamber having a burner plate which is provided with apertures and which adjoins a combustion chamber in which a heat exchanger is disposed some distance from the burner plate and is passed through by a medium to be heated, a flue being connected to said combustion chamber, and means in the heating appliance for varying the effective heat transfer of the flue gases to the heat exchanger to prevent cooling of the flue gases below their dew point under low load conditions of the heating appliance.



4,898,147

DOMESTIC OVEN OBSERVATION WINDOW HAVING A LOW TEMPERATURE EXTERNAL SURFACE

Fabrizio Doni, and Bruno Ferrario, both of Milan, Italy, assignors to SAES Getters SpA, Milan, Italy

Filed Nov. 2, 1988, Ser. No. 266,151

Claims priority, application Italy, Nov. 24, 1987, 22735

Int. Cl.[4] F23M *7/00*

U.S. Cl. 126—200 **14 Claims**

1. An observation window comprising:

A. an outer glass sheet having an outer facing surface and an inner facing surface, the inner facing surface covered by a layer of material reflecting infra-red radiation and transmitting visible light and;

B. an inner glass sheet having an outer facing surface and an inner facing surface and;

C. a distancing wall the edges of which are peripherally attached to both the outer glass sheet and the inner glass sheet thus defining an enclosed volume and;

D. a glass pumping tubulation attached to the distancing wall and;

E. a rare-gas contained within the enclosed volume at a pressure of between 10 and 1000 mbar at 25° C.

14. An oven comprising

I. An enclosure; and

II. A door providing access to the enclosure; and

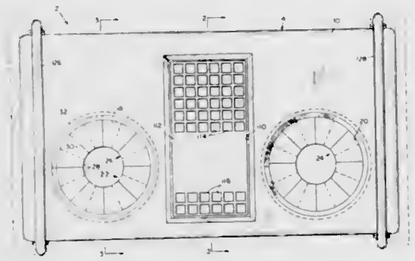
III. Means for heating the enclosure; and

IV. An observation window within the door; said window comprising:

A. an outer glass sheet having an outer facing surface and an inner facing surface, the inner facing surface covered by a layer of material reflecting infra-red radiation and transmitting visible light and;

B. an inner glass sheet having an outer facing surface and an inner facing surface and;
C. a distancing wall the edges of which are peripherally attached to both the outer glass sheet and the inner glass sheet thus defining an enclosed volume and;
D. a glass pumping tubulation attached to the distancing wall and;
E. a rare-gas contained within the enclosed volume at a pressure of between 10 and 1000 mbar at 25° C.

4,898,148
VERSATILE HEATER/COOLER
Charles L. Urso, 215 Newton St., Waltham, Mass.
Filed Jun. 28, 1988, Ser. No. 212,505
Int. Cl.[4] A61F 7/00
U.S. Cl. 126—204 **32 Claims**



1. A portable temperature conditioning apparatus comprising:
a container having a plurality of walls defining a hollow interior, the walls having insulating means for inhibiting the transfer of heat through the walls, the walls including a lid having a longitudinal axis and a portion having an edge defining a limb port of a size suitable for insertion of a user's limb through the port and into the interior of the container, the edge being substantially curved in order to comfortably surround the limb;
means for producing a temperature condition within the container;
a pair of U-shaped carrying handles, each handle having a pair of legs wherein each leg is pivotally connected to the container such that each handle is movable between an erect position and a lower position; and
means for retaining the handles in an erect position so that together the handles can support broad surfaced items above the container to aid the user.

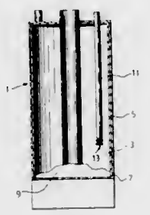
4,898,149
CORD-CONNECTED HOOD-BACKSPLASH
Martin B. Cohn, 25 Oxford Pl., Rockville Centre, N.Y. 11570
Filed Jun. 12, 1989, Ser. No. 364,972
Int. Cl.[4] F24C 15/20
U.S. Cl. 126—299 R **1 Claim**

1. A cord connected ductless range-hood, fan and backsplash comprising:
a bracket adapter to be mounted on a wall,
a range hood/backsplash adapted to be mounted on the bracket so that the hood is horizontal and the backsplash is hinged to the hood and vertical,
the hood being adapted to mount a light and a fan, internal wiring for the light and for passing from the hood through



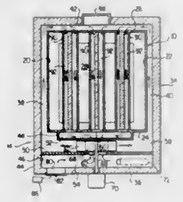
the bracket, and a line cord connected to the internal wiring exiting from behind the bottom of the backsplash.

4,898,150
PRESSURE BALANCING WATER HEATER DIP TUBE TURBULATOR ATTACHMENT
Brian Lewis, Guelph, Canada, assignor to GSW Inc., Toronto, Canada
Filed Mar. 10, 1989, Ser. No. 321,876
Int. Cl.[4] F24H 1/00
U.S. Cl. 126—361 **6 Claims**



1. A water heater comprising a tank having a bottom wall and a plastic water feed dip tube extending along a vertical axis downwardly into said tank towards and having a lower end terminating near said bottom wall, said lower end of said dip tube comprising a turbulator including an end plate with a flat upper surface at right angles to said vertical axis and a plurality of water flow openings immediately above said flat upper surface of said end plate, said water flow openings being positioned symmetrically at all sides around said dip tube such that water fed into said tank through said dip tube impinges on said flat upper surface of said end plate and is redirected as a balanced flow sideways in all directions out of said water flow openings to cause a swirling effect of the redirected water maintained near the bottom end of the tank and agitating any sediment settled thereon.

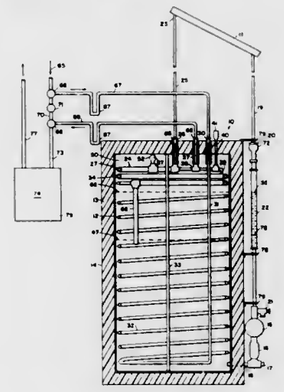
4,898,151
HIGH HEATING EFFICIENCY DEEP FAT COOKING FRYPOT
Clement J. Luebke, Burlington, Vt.; Frank A. Slade, Mountain Top, Pa.; Gerald W. Sank, Pasadena, Md.; James T. Grob; George M. Price, both of Shreveport, La., and Elbert M. Hubbard, Dallas, Tex., assignors to The Frymaster Corporation, Shreveport, La.
Continuation-in-part of Ser. No. 550,995, Nov. 14, 1983, Pat. No. 4,751,915, which is a continuation of Ser. No. 264,370, May 18, 1981, abandoned. This application Jun. 20, 1988, Ser. No. 209,280
Int. Cl.[4] A47J 27/00
U.S. Cl. 126—391 **9 Claims**



1. Deep fat cooking frypot apparatus comprising:
a frypot adapted to receive a quantity of cooking fluid;
wall means carried by said frypot for defining a recirculating flow passage thermally communicating with an oil-receiving interior portion of said frypot;
means for generating heated gas; and
fan means having an inlet and being operable to sequentially;
draw a first portion of the generated gas into said inlet,
discharge said first generated gas portion into and through said flow passage to transfer heat from said first generated gas portion to the cooking fluid,
return said first generated gas portion to said inlet at a reduced temperature,
mix the returned first generated gas portion with a second generated gas portion being initially drawn into said inlet to form from said first and second generated gas portions a gas mixture having a lower temperature than that of said second generated gas portion, and
discharge said gas mixture into and through said flow passage, and then back to said inlet.

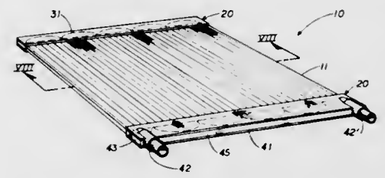
4,898,152
DUAL SEQUENCE SOLAR WATER HEATER
Karl H. Kahl, 8 Brian Rd., Chelmsford, Mass. 01824
Continuation of Ser. No. 683,210, Dec. 18, 1984, abandoned. This application Jul. 24, 1987, Ser. No. 77,601
Int. Cl.[4] F24J 3/02
U.S. Cl. 126—422 **10 Claims**

1. In a heat exchanger means for receiving the water for transferring to water, being conveyed from a water source to utilization means, heat from a transfer liquid heated in solar panel means, said heat exchanger means comprising:
A. closed tank means for storing the transfer liquid in lower and middle volumes thereof and including first and second ports for the transfer liquid, a third port for connection to the water source and a fourth port for connection to the utilization means;
B. circulating means for circulating the transfer liquid from said first port through the solar panel means to said second port;
C. multi-turn heat exchange coil means coextensive with said lower and middle tank volumes and having an outlet means in said upper tank volume and inlet means connected to said third port for receiving water from the water source to be heated by the transfer liquid in the tank;
D. multi-turn counterflow heat exchanger means with inner and outer liquid passage means located in the upper tank volume above the heat exchanger liquid level, said inner passage means being connected between said heat exchange coil outlet means and said fourth port thereby to complete a closed path between the water source and the utilization means and said outer passage means being connected to said second port to receive heated transfer liquid from the solar panels;



E. discharge means extending from said outer passage means to said lower tank volume for conveying all transfer liquid from said outer passage means to a point below the transfer liquid in said tank thereby to complete a closed-loop transfer liquid path;
F. vacuum breaker means connected to said outer passage means in said upper tank volume for breaking any vacuum in said closed transfer liquid path with air from said upper tank volume,
G. vent means for metering the transfer of air between said upper tank volume and the exterior of said tank.

4,898,153
SOLAR ENERGY PANEL
Daniel A. Sherwood, 3905 Orangewood Dr., Fair Oaks, Calif. 95628
Filed Apr. 3, 1989, Ser. No. 332,158
Int. Cl.[4] F24J 2/24
U.S. Cl. 126—448 **13 Claims**



1. A solar panel comprising a main body portion and a pair of caps in a mating arrangement at the opposite ends of the main body portion,
wherein the main body portion comprises an integrated sheet formed from a pair of spaced skins separated by a series of uniformly spaced parallel ribs running the full length of the two skins, each pair of spaced ribs defining a channel for the flow of fluid, said body portion being

disposed within said caps, and having a series of adjacent channels,

each cap comprising (a) a baffle member having a front wall an upper and a lower surface, and a series of adjacent arcuate recesses therein each of which recesses extends inwardly from the front wall thereof, and each of which recesses communicates with a defined plurality of said channels, the baffle member having a thickness equal to the thickness of the main body portion; and (b) a pair of skins overlaid on each of the upper and lower surfaces of the baffle member and extending inwardly beyond the recesses to form a slot transverse to said channels for the receipt of the main body portion,

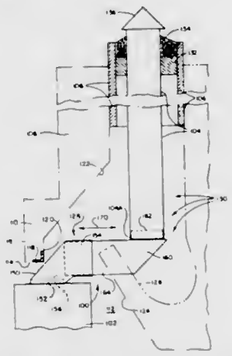
both of said caps having from zero to two ports therein one port being for the introduction and one port being for the removal of fluid from said panel, the total number of ports being two; each of said ports being in fluid communication with a number of channels of the main body portion, said number being equal to ½ of the number of channels in fluid communication with each recess.

4,898,154

ADJUSTABLE FITTING FOR FIREPLACE INSERT FLUE CONNECTION

David E. Richison, Kettering, Ohio, assignor to Richison Industries Incorporated, Kettering, Ohio

Filed Oct. 3, 1988, Ser. No. 252,121
Int. Cl.[4] F24B *7/00*; F23J *13/04*
U.S. Cl. 126—500 **7 Claims**



1. A horizontally adjustable fitting for connecting a wood burning insert for a masonry fireplace to a vent pipe positioned within the flue liner of the fireplace chimney, said masonry fireplace having a firebox recess including a rear wall which converges upwardly and forwardly toward a front wall, said horizontally adjustable fitting extending through a central portion of said rear wall and comprising;

an insert connector having first and second legs which are substantially perpendicular to one another, said first leg being vertically oriented when said horizontally adjustable fitting is in use and sized to engage a flue gas outlet of said wood burning insert; and

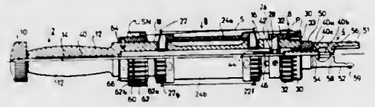
a vent pipe connector having first and second legs which are substantially perpendicular to one another, said first leg being vertically oriented when said horizontally adjustable fitting is in use and sized to engage a lowermost end of said vent pipe, the second legs of said insert connector and said vent pipe connector being formed such that they can be telescopically interfitted to one another to adjust the spacing between the first legs of said connectors to adapt said horizontally adjustable fitting to a large variety of inserts and fireplaces.

4,898,155

SUTURING IMPLEMENT PARTICULARLY USEFUL IN SURGICAL OPERATIONS FOR THE ATTACHMENT OF A PROSTHETIC VALVE

Yoel Ovil, Ramat Hasharon, and Morris Levy, Tel-Aviv, both of Israel, assignors to Galil (Naharia) Advanced Technologies Ltd., Ramat-Gan, Israel

Filed Sep. 25, 1985, Ser. No. 779,980
Claims priority, application Israel, Sep. 26, 1984, 73081
Int. Cl.[4] A61B *17/04, 17/06*
U.S. Cl. 606—144 **19 Claims**



1. A suturing implement particularly useful in surgical operations for suturing a member, such as a prosthetic valve, to tissue at the suture site by a plurality of sutures each including a needle attached to at least one end thereof, comprising:

a manually grippable handle;

pledget gripping means carried by said handle for gripping a plurality of pledgets each in a position to be pierced by a suture needle;

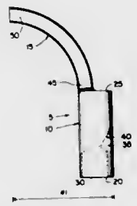
and releasing means carried by said handle for actuating said pledget gripping means to release said pledgets and the sutures applied thereto from said handle.

4,898,156

SUTURE ANCHOR

Roland F. Gatturna, Walpole; James E. Nicholson, Lincoln, and James O'Leary, Medford, all of Mass., assignors to Mitek Surgical Products, Inc., Norwood, Mass.

Filed May 18, 1987, Ser. No. 51,367
Int. Cl.[4] A61F *5/04*; A61B *17/04*; F61B *21/00*
U.S. Cl. 606—72 **23 Claims**



1. A suture anchor for anchoring one end of a suture in a hole formed in a piece of bone, said suture anchor comprising;

(a) a rigid coupling member; and

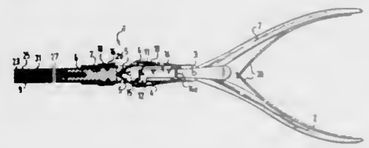
(b) barb means fixed to an end thereof to said coupling member for firmly engaging a first location on the sidewall of a hole in a piece of bone in which said suture anchor is disposed and for causing said coupling member to pivot in said hole so as to drive at least a portion of said coupling member into firm engagement with at least a second location on said sidewall of said hole so that the combined engagement of said barb means and said at least a portion of said coupling member with the sidewall of said hole substantially prevents said suture anchor from being withdrawn from said hole when an axial force is applied to a suture attached to one of said coupling member or said barb means.

4,898,157

INSTRUMENT FOR HOLDING SURGICAL NEEDLES

Hossein Messroghli, Gross-Gerau, and Manfred Boebel, Oetisheim, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Oct. 3, 1988, Ser. No. 251,750
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1987, 3733194
Int. Cl.[4] A61B *17/04*
U.S. Cl. 606—147 **9 Claims**



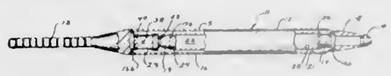
1. An instrument for holding surgical needles, said instrument having a distal end, a proximal end, and a longitudinal axis, the instrument comprising: an elongated member extending along said longitudinal axis, a pair of forceps having forceps jaws at said distal end including a fixed jaw on a distal end of said elongated member, a movable jaw pivotably mounted on said fixed jaw, a push and pull rod being connected to the movable jaw, a handle having a pair of hand grips being pivotably connected to the proximal end of said elongated member and extending obliquely outwardly of the instrument in the proximal direction thereof and being arranged in mirror image symmetry with respect to said longitudinal axis; the hand grips being actuatable by an actuating force exerted thereon transversly of said axis to move both hand grips toward the longitudinal axis to bring the forceps to said closed position with the forceps jaws lying in the direction of said longitudinal axis, connecting means connected to a distal end of said hand grips and a proximal end of said rod for converting the actuating force into a force directed longitudinally to the instrument to shift the rod to actuate the movable jaw, and means for releasably locking said movable jaw in its actuated position.

4,898,158

PENILE IMPLANT WITH IMPROVED PRESSURE RELIEF VALVE

Mark D. Daly, Milwaukee; James T. Maerzke, Kenosha; Jeffrey R. Gengler, Milwaukee, and Robert E. Trick, Racine, all of Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Division of Ser. No. 50,746, May 15, 1987, Pat. No. 4,823,779.
This application Dec. 12, 1988, Ser. No. 282,817
Int. Cl.[4] A61F *2/26*
U.S. Cl. 128—79 **1 Claim**



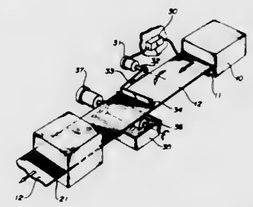
1. In an inflatable self-contained penile implant consisting of a cylindrical member having a pressure chamber, a reservoir for inflating fluid and a pump operatively connected to transfer fluid from the reservoir to the pressure chamber, the improvement which comprises an improved pressure relief valve operatively connected to the pressure chamber, said valve having a cylindrical housing with an inlet with a restricted opening at one end; a passage connecting said inlet to the reservoir; at least one outlet intermediate the length of said passage communicating with the reservoir; a close fitting piston mounted in said passage between the inlet and the outlet, said piston having a piston face, an integral raised annular knife edge seal on said piston face enclosing an area of the face of said piston; and, a precalibrated spring for maintaining said seal seated about said restricted opening, said area of the piston face within the seal being significantly smaller than the total area of the piston face so that once the seal is initially unseated by fluid pressure from its position about the restricted opening a substantially larger force is available to move the piston back to expose the outlet and quickly open the valve and release fluid back to the reservoir.

4,898,159

RAVEL-FREE ORTHOPAEDIC CASTING TAPES

George J. Buese, East Brunswick, and Hee K. Yoon, North Brunswick, both of N.J., assignors to Johnson & Johnson Orthopaedics, Inc., New Brunswick, N.J.

Division of Ser. No. 5,491, Jan. 20, 1987, Pat. No. 4,800,872.
This application Sep. 9, 1988, Ser. No. 242,381
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—90 **8 Claims**



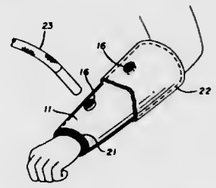
1. A method of forming a ravel resistant orthopedic casting tape comprising applying a soft flexible binder material to a fiberglass substrate, said binder being applied in an amount of from 2.5 to 90 grams per square meter of binder coated area, the binder having a type A hardness of less than 50, drying the binder to form a thin stretchable coating on said substrate, subsequently impregnating the substrate with water reactive hardenable resin, cutting the substrate to definitive lengths to form a length of casting tape and packaging the tape in a water impervious packaging material.

4,898,160

SURGICAL CAST VENTING DEVICE

Merrel Brownlee, Lowellville, Ohio, assignor to Alliance Group Inc., Youngstown, Ohio

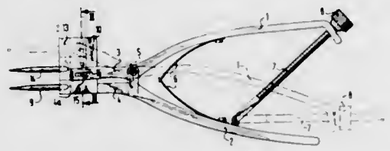
Filed Mar. 24, 1989, Ser. No. 328,283
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—91 R **2 Claims**



1. A surgical cast venting device for positioning on a layer of stockingnette on a patient's limb under a cast, said device comprising a flexible base portion, several parallel elongated channels in said base portion arranged in side by side relation in alternating upward and downward face directions, a flexible closure engaging said upward facing channels so as to form air passageways therein, an air supply opening in said closure communicating with said parallel elongated channels, apertures interconnecting said parallel elongated channels said channels having common side walls and said apertures being in

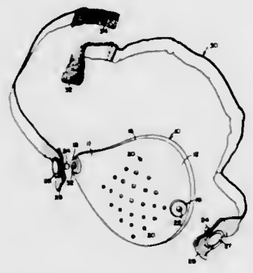
said common side walls, whereby air supplied said opening flows through said parallel elongated channels for delivery thereby to said layer of stockingnette on said patient's limb.

4,898,161
FORCEPS FOR PUSHING APART VERTEBRAE
Hans Grundei, Lübeck, Fed. Rep. of Germany, assignor to S+G Implants GmbH, Lubeck, Fed. Rep. of Germany
Filed Nov. 24, 1987, Ser. No. 124,917
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3641279; Mar. 3, 1987, 3707097
Int. Cl.[4] A61F 5/04; B25B 7/12, 7/04
U.S. Cl. 606—105 **2 Claims**



1. Forcepts for pushing apart adjacent vertebrae comprising a pair of axially parallel pins for insertion into bores in said vertebrae, a linearly sliding element guide system to enable said pins to be moved towards and away from one another while remaining mutually parallel, a pair of jaws on which said pins and said guide system are mounted, a pair of handles to actuate said jaws and effect said movement of the pins, a rod, a lateral arm, a bracket attached to one of said jaws, a first pin carrier attachable via said lateral arm to said bracket, said pin carrier provided with an aperture perpendicular to the extension of one of said pins, said aperture acting as a guide for said rod, said rod coupled at one end to the other of said jaws so as to be movable in an axial direction within said aperture, and coupled at the other end to a second pin carrier, both said pin carriers being replaceably connectable to said respective jaws.

4,898,162
CONVERTIBLE EYESHIELD
Theodore S. Worthrich, Long Beach, Calif., assignor to Surgin Surgical Instrumentation, Inc., Placentia, Calif.
Filed Sep. 22, 1988, Ser. No. 247,841
Int. Cl.[4] A61F 13/00
U.S. Cl. 128—155 **4 Claims**



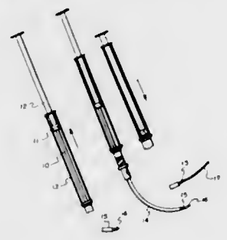
1. An eyeshield which can be taped over an eye-socket of a person by a health professional or a patient or alternatively, applied repeatedly without the use of tape by the patient himself, said eyeshield covering an eye and preventing any contact with the eye, thereby protecting the eye following an injury or surgery, comprising:

(a) a low friction, yieldable, light weight, high strength, self-supporting, eyeshield body having a first and a second surface, the first surface being a convex outer surface, the second surface being an inner concave surface, the eyeshield body having rounded edges and an outline fitting against the orbital bone structure of a face in fixed, non-contacting relation over the eye and including a periphery defining a generally circular portion and an extension therefrom;

(b) a pair of socket bosses not greater than one quarter inch in height integral with the convex surface of the eyeshield body adjacent the edge of the extension thereon on a first end and adjacent the edge of the circular portion on a second end, said bosses allowing the eyeshield to be taped onto the face of the person over the eyesocket; and

(c) releasable means for holding the eyeshield body over the eyesocket, said releasable means comprising an elastic band for encircling the head of the person over the eyebrow on one side of a face and under the ear lobe on the other side of the face, the band comprising a pair of sections having first and second interengaging fastening members on the ends opposite the snap fastener end, said interengaging fastening members comprising intercoupling hook and loop sections.

4,898,163
TRANSTRACHEAL AIRWAY AND PLACEMENT DEVICE
Gordon P. George, 1717 N. 1030 West, Orem, Utah 84057
Filed Feb. 27, 1989, Ser. No. 315,538
Int. Cl.[4] A61M 16/00
U.S. Cl. 128—200.26 **9 Claims**



1. An apparatus for performing transtracheal intubation via the cricothyroid membrane comprising, in combination:

a syringe means comprising at least one hollow barrel with a distal end adapted for attachment of integral apparatus means;

a plunger means slideably disposed within said hollow barrel of said syringe means;

a flexible stylet means slideably disposed within said barrel of said syringe means;

a hollow curvilinear needle means integrally attached to said distal end of said syringe means, said needle means having at its distal end a sharpened edge to serve as a cutting blade; and

a non-metal hollow tube airway means which is slideably disposed over said needle means.

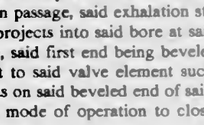
4,898,164
AIR SUPPLYING DEVICE, AND METHOD OF AIR SUPPLY
Iosif Baumberg, 69 Bay 29 St., Brooklyn, N.Y.
Filed Feb. 17, 1989, Ser. No. 311,046
Int. Cl.[4] A61M 16/20, 15/00; A62B 7/00, 7/12
U.S. Cl. 128—202.18 **9 Claims**

1. An air supply device to be used for ventilation in the vicinity of a subject's face while subject is sleeping on a pillow, comprising:

a plurality of normally inflated valve-chambers arranged to be located under respective sides of a pillow and formed so that when a subject's head rests on at least one of said valve-chambers, said at least one valve-chamber is deflated while another of said valve-chambers not supporting the subject's head remains inflated;

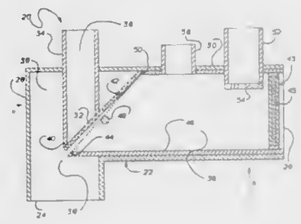
means for supplying air to said valve-chambers; and

a plurality of passages, at least one passage extending from each of said valve-chambers, each of said passages having an outlet, each outlet being at the opposte side of the



pillow from its associated valve-chamber, and being directed across the pillow towards the subject's face such that when the subject's head rests on at least one of said valve-chambers and the latter is deflated, the air supplied from said supplying means to said valve-chambers exits from at least one of said inflated valve-chambers, through its associated passage to its outlet, thereby directing air toward the face of the subject.

4,898,165
BREATHING APPARATUS
Lyle Warzeka, 2064 11th St., Wyandotte, Mich. 48192
Filed Dec. 8, 1988, Ser. No. 281,847
Int. Cl.[4] A61M 15/00
U.S. Cl. 128—204.18 **10 Claims**



1. A universal manual resuscitator valve, comprising:

a valve body having a bore therethrough which defines a passage;

an annular valve seat disposed in said bore;

a valve element attached at one portion to said valve body in said bore and adjacent said valve seat such that said valve element seats on said valve seat in a first mode of operation,

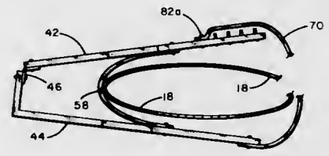
said valve element serving to partition said passage into a first portion and a second portion in said first mode of operation;

an exhalation stem disposed in said valve body and defining an exhalation passage, said exhalation stem having a first end which projects into said bore at said first portion of said passage, said first end being beveled and positioned with respect to said valve element such that said valve element seats on said beveled end of said exhalation stem in a second mode of operation to close said exhalation passage;

said valve body further having an inlet port disposed at said second portion of said passage;

a one-way valve disposed on said valve body in said passage in association with said inlet port.

4,898,166
RESUSCITATION BAG CONTROL APPARATUS
Robert J. Rose, Easton, N.H., and Larry A. Sundsrud, Park Rapids, Minn., assignors to Physician Engineered Products, Inc., Park Rapids, Minn.
Filed Apr. 14, 1988, Ser. No. 183,134
Int. Cl.[4] A62B 7/00
U.S. Cl. 128—205.13 **14 Claims**



1. An apparatus for removably securing and adjustably controlling the volume of fluid expelled from a self-recovering artificial resuscitation enclosure, the apparatus including:

first and second substantially rigid arms, and a connecting means mounted at a proximal end of each of said arms for pivotally connecting the arms for movement between closed and open positions;

a first substantially inextensible and pliable strap member fixed at an end thereof to a distal end portion of said first arm and a second substantially inextensible and pliable strap member fixed at its opposite ends to said first and second arms, and cooperating with said strap member and said arms to form a surrounding, contiguous engagement with said resuscitation enclosure, said second strap being on the opposite side of the resuscitation enclosure from said first strap and between said enclosure and said connecting means;

a fastening means for releasably coupling an opposite end of said first strap member at one of a plurality of discrete fastening locations along a distal end portion of said second arm, to releasably secure a self-recovering artificial resuscitation enclosure between said first and second arms, with said first and second arms and said first strap positioned in surrounding and contiguous relation to an outer surface of said resuscitation enclosure;

said arms movable into said closed position to elastically compress said enclosure to a minimum fluid volume, and returning to said open position responsive to an elastic recovery of said resuscitation enclosure to one of a plurality of predetermined expansion volumes, each of said expansion volumes corresponding to the coupling of said first strap at one of said discrete fastening locations.

4,898,167
AIDS PROTECTION VENTILATION SYSTEM
Richard S. Pierce, San Clemente, and Willem J. Van Leeuwen, Chino, both of Calif., assignors to Pakam Data Systems Inc., Wilmington, Del.
Filed May 13, 1988, Ser. No. 193,895
Int. Cl.[4] A62B 9/02; A61M 16/08, 16/20
U.S. Cl. 128—205.16 **14 Claims**

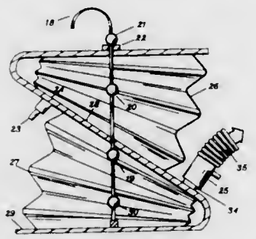
1. An Aids protection ventilation system comprising:

an adjustable spring loaded variable volume bellows, said bellows being usable to resuscitate a victim, and when used to resuscitate a victim, said bellows creating air pressure which forces air through;

an air delivery tube having a pressure relief valve and an oxygen inlet port that is connectable to an oxygen source;

an oxygen enrichment venturi valve that is used to input maximum oxygen into the air provided by said bellows, but, independent as to whether oxygen or said oxygen enrichment venturi valve is utilized the air from the bellows flows through the air delivery tube into;

a resuscitation airway valve having two ends and adapted to receive one of several optional inserts for improved performance, and a face mask, one end of said airway valve being connectable to said face mask, said face mask being placeable on a victim to supply air to the victim and another end of said airway valve being open to the atmosphere for exhausting the victim's exhaled air or fluid



wastes, said another open end of said airway valve being closable by the rescuer's hand when ventilation is needed, said bellows being compressed to force in fresh air from said bellows to the victim's lungs;

whereby said system in use enables the procedure to be performed without exposing the rescuer's mouth and lungs to the victim's mouth and fluids.

4,898,168

INFLATION INDICATORS FOR CUFFED TUBES

Bruce Yule, Hythe, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Jan. 9, 1989, Ser. No. 294,772

Claims priority, application United Kingdom, Jan. 9, 1988, 8800447

Int. Cl.[4] A61M *25/00*

U.S. Cl. 128—207.15 **9 Claims**



1. An inflation indicator of the kind for a cuffed medico-surgical tube formed from an envelope with two opposite walls of a flexible gas-impermeable material, the envelope having respective fluid inlets at opposite ends one of which communicates with the cuff on the medico-surgical tube such that the envelope is inflated by pressure in the cuff, the improvement wherein one of said walls has a surface formation extending along the length of the envelope on an inner surface of the wall to provide a continuous fluid passage between the walls between the two inlets when said walls contact one another on collapse of the envelope.

4,898,169

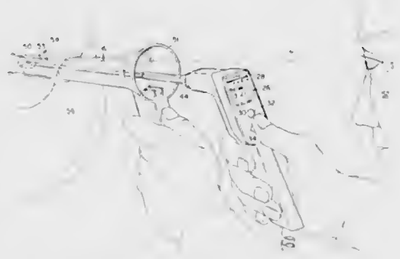
MEDICAL INSTRUMENT FOR THERAPY OF HEMORRHOIDAL LESIONS

Daniel A. Norman; Ronald R. Newton, both of Stateline, Nev.; Glenn V. Nicholas, Walnut Creek, Calif.; Steven Bellofatto, Closter, N.J., and Stephen K. Onody, Sberborn, Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Continuation-in-part of Ser. No. 47,698, May 8, 1987, abandoned, and a continuation-in-part of Ser. No. 47,712, May 8, 1987, and a continuation-in-part of Ser. No. 48,374, May 11, 1987, abandoned. This application Jun. 30, 1988, Ser. No. 213,597

Int. Cl.[4] A61B *17/36*

U.S. Cl. 606—42 **14 Claims**



1. An instrument for direct current electrical therapy of hemorrhoidal lesions or the like in a patient comprises a D.C. electric generator means, a grounding pad for the patient, a monopolar probe having a distal tip for penetration of the hemorrhoidal lesion to act as a negative electrode, and an instrument handpiece for support of the probe and control of the level of direct current,

said probe comprising a base and, extending therefrom, at least one elongated probe electrode terminating in said distal tip adapted for electricity-conducting engagement with a hemorrhoidal lesion,

said instrument handpiece comprising:

a lower handle portion sized and constructed to be gripped by a physician,

cooperative means for coupling said probe base to said handpiece in electricity-conducting engagement with the axis of said probe at an obtuse angle to the axis of said lower handle portion, arrangement of said probe and said lower handle portion at said obtuse angle allowing a physician to hold said instrument handpiece during treatment of a hemorrhoidal lesion without extended abnormal flexure of the wrist,

a therapy-monitoring an control upper handle portion disposed generally above said lower handle portion and having a front panel visible to the physician when the probe distal tip is penetrated into a hemorrhoidal lesion,

said front panel comprising

means for display of status of treatment conditions of said instrument, said means for display and the distal tip of said probe disposed generally in the same line of sight of a physician holding said lower handle portion with said distal probe tip penetrated into a hemorrhoidal lesion, and

means for control of the level of direct current disposed adjacent said lower handle portion in a manner to allow a physician to operate said means for control with digits of a hand gripping said lower handle portion,

whereby a physician may simultaneously view a treatment site and observe conditions of treatment appearing on said means for display, while gripping the instrument and operating said means for control with one hand, leaving the other hand free as he conducts therapy on a hemorrhoidal lesion.

4,898,170

SURGICAL KNIFE

Robert F. Hofmann, Littleton, and David B. Waldock, Brentwood, England, assignors to Duckworth & Kent Surgical Instruments Limited, Hertfordshire, United Kingdom and Medical Titanium Corporation, Clearwater, Fla.

Continuation of Ser. No. 891,721, Jul. 29, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 206,936

Claims priority, application United Kingdom, Aug. 1, 1985, 8519364

Int. Cl.[4] A61F *17/32*

U.S. Cl. 606—166 **7 Claims**



1. A surgical knife comprising a cutting blade, an elongated body, a head portion for receiving said cutting blade and adjustment means permitting adjustment of said blade within said head portion forwards and backwards lengthwise of the knife along a line extending at an angle of inclination to the longitudinal axis of the knife body, the head portion comprising a displaceable piston projecting into a chamber into which a blade holder for the blade is received, spring means acting to exert a biasing force on the piston, and a cranked member extending into the head portion of the knife body and having one arm bearing against the piston and another arm extending axially of the knife body.

4,898,171

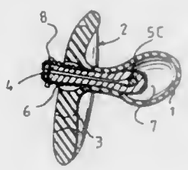
STAY-IN-PLACE PACIFIER

Ernest Moss, 200 River Court Pkwy., Atlanta, Ga. 30328

Filed Dec. 30, 1987, Ser. No. 139,460

Int. Cl.[4] A61J *17/00*

U.S. Cl. 606—236 **4 Claims**



1. A pacifier for babies and infants, comprising:

a shield protector with a hole therethrough;

a nipple attached to a side of said shield protector so that said nipple substantially covers the hole of said shield protector, said nipple having a hollow storage area which is accessible through the hole of said shield protector; and

a handle resiliently attached to said hollow storage area of said nipple, said handle being continually capable of resilient storage within the hollow storage area of said nipple and being continually capable of removal or extension therefrom, by passage of said handle through the hole of said shield protector.

4,898,172

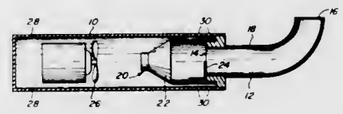
OPTICAL LIGHT PROBE

Richard J. Grable, 7400 SW. 13th St., Plantation, Fla. 33317

Filed Apr. 18, 1986, Ser. No. 853,394

Int. Cl.[4] A61F *7/00*

U.S. Cl. 128—397 **3 Claims**



1. A hand held light source probe for use with transillumination apparatus for tumor detection in human female breasts comprising:

a housing including a hollow heat insulating handle portions;

a pipe having proximal and distal ends extending longitudinally from one end of said housing, curing through substantially 90°, and terminating at its distal end in a plane surface;

a high intensity incandenscent reflectorized light source positioned in said housing to illuminate the proximal end of said light pipe;

a fixed opaque light shield of substantially less area than the proximal end of said light pipe so positioned in the projected light pahh of said bulb between said bulb and said pipe as to positively prevent the presence of a focal spot from said source on the distal end of said light pipe; and

means for positively circulating cooling air through said housing and over the outer surface of said bulb.

4,898,173

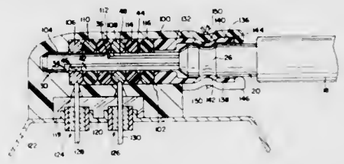
IN-LINE PACEMAKER CONNECTOR SYSTEM

Terry D. Daglow, Little Canada, and Richard D. Sandstrom, Scandia, both of Minn., assignors to Medtronic, Inc., Minn.

Division of Ser. No. 184,903, Apr. 22, 1988. This application Jun. 12, 1989, Ser. No. 364,300

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—419 P **5 Claims**



1. An electrical connector system for coupling a medical, electrical lead to a medical device, comprising:

a connector housing mounted to said medical device, said connector housing including a longitudinal lumen, open at its distal end;

at least one electrical conductor extending from said medical device into said longitudinal lumen;

a plurality of resilient non-metallic generally ring shaped members each having a central opening of a first diameter mounted adjacent one another in said longitudinal lumen of said connector housing, wherein at least one of said plurality of ring shaped members is conductive and wherein at least a second one of said plurality of ring shaped members is non-conductive, and wherein said at least one conductive ring shaped member is mounted in electrical contact with said conductor extending from said medical device; and

a connector pin, insertable within said longitudinal lumen of said connector block and coupled to said medical electri-

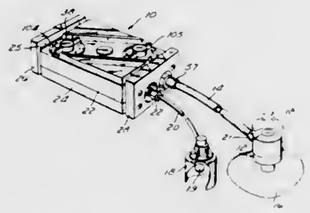
cal lead, said connector pin having a second, outer diameter larger than the inner diameter of said ring shaped members when located in said connector housing, whereby when said connector pin is inserted through said openings of said ring shaped members, said ring shaped members are compressed against said connector pin, said connector pin further comprising at least one conductive and at least one circumferential, non-conductive area arranged linearly along said connector pin such that when said connector pin is inserted into the lumen of said connector housing, said at least one conductive area on said connector pin contacts said at least one conductive ring shaped member and wherein said at least one non-conductive area of said connector pin contacts said at least one non-conductive ring shaped member.

4,898,174

AUTOMATIC VENTILATOR

Thomas F. Fangrow, Jr., Corona, Calif., assignor to Life Support Products, Inc., Irvine, Calif.

Filed May 3, 1988, Ser. No. 189,652
Int. Cl.[4] A62B 7/00; A61M 16/00
U.S. Cl. 128—204.24 **47 Claims**



1. An automatic ventilator system, comprising:
- a demand valve assembly for supplying gas to a patient which includes a supply gas inlet and an inlet valve which will open in response to the patient's inhaling breathing demands, said assembly further including an exhaust valve which will open in response to the patient's exhaling demands; and
- a pneumatic controller providing a control pressure to open said inlet valve for a predetermined period of time and at predetermined intervals to provide automatically a measured quantity of gas through the demand valve assembly to the patient at desired intervals, said control pressure being provided by said controller independently of said inhaling and exhaling demands, and said inlet valve being operable by patient inhaling demands independently of said control pressure.

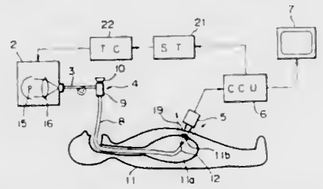
4,898,175

OUT-BODY OBSERVING APPARATUS

Toshiaki Noguchi, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 137,215
Claims priority, application Japan, Dec. 26, 1986, 61-313273
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—634 **30 Claims**

1. An out-body observing apparatus comprising:
- an endoscope having an elougated insertable part which can be inserted into a body cavity;
- a light source device which can feed said endoscope with an illuminating light capable of illuminating the body cavity interior with light radiated from said insertable part;
- an imaging means for detecting, outside the body, light from said illuminating light fed by said light source device, radiated from said insertable part onto a part to be observed and having passed through a living body tissue, and for producing, from said detected light, a projected image of the tissue;
- a signal processing means for processing a video signal from said projected image obtained by said imaging means; and



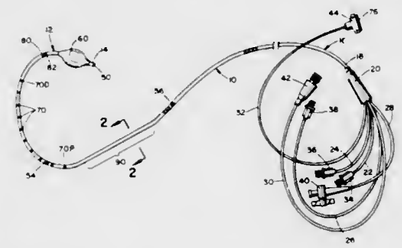
- a displaying means which can display on a picture surface a video image of the observed part with the video signal output from said signal processing means.

4,898,176

CONTINUOUS CARDIAC OUTPUT BY IMPEDANCE MEASUREMENTS IN THE HEART

John H. Petre, Cleveland Heights, Ohio, assignor to The Cleveland Clinic Foundation, Cleveland, Ohio

Filed Jun. 22, 1988, Ser. No. 210,095
Int. Cl.[4] A61B 5/04, 5/02
U.S. Cl. 128—642 **21 Claims**



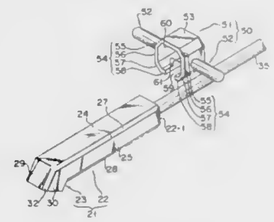
1. A diagnostic catheter for use in measuring cardiac output in the right ventricular chamber comprising:
- (a) an elongated, multi-lumen, flexible member having a distal end and a proximal end, a first lumen extending the entire length of said member and terminating in a distal port, a second port extending through the side wall of said member at a location immediately proximate of said distal end of said flexible member and a second lumen extending from said proximal end of said member to said second port;
- (b) an expandable sleeve surrounding said member and spanning said second port, said sleeve inflatable by a fluid introduced into the proximal end of said second lumen;
- (c) a plurality of ring electrodes secured to the outer surface of said member at predetermined axial spacing including a distal ring electrode located a first predetermined distance proximal of said distal end of said flexible member, a proximal ring electrode located a second predetermined distance greater than said first predetermined distance from said distal end of said flexible member and a further plurality of intermediate ring electrodes disposed between said distal ring electrode and said proximal ring electrode;
- (d) a plurality of electrical conductors extending longitudinally through a third lumen in said flexible member from said proximal end of said flexible member and individually connected to separate ones of said plurality of ring electrodes; and,
- (e) a first stiffening member disposed in a fourth lumen in said flexible member and extending from a third predetermined distance to a fourth predetermined distance proximal of said distal end of said flexible member, said third and fourth distances being greater than said second predetermined distance.

4,898,177

ULTRASONIC PROBE WITH FINGER GRIP ADAPTER

Masayuki Takano; Susumu Hiki, both of Ootawara, and Yuusiti Kikuti, Nasu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1988, Ser. No. 172,546
Claims priority, application Japan, Mar. 26, 1987, 62-45426[U]
Int. Cl.[4] A61B 8/00
U.S. Cl. 128—662.03 **9 Claims**



1. A probe assembly and a finger hook adapter attached thereto,

said probe assembly comprising:
- a pencil-type ultrasonic probe including an elongated body and a transducer element arranged at a distal end of the elongated body; and
- a cable including one end fixed to a proximal end of the elongated body and another end adapted to be connected to an ultrasonic diagnosis apparatus,

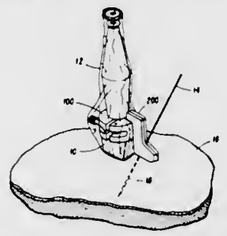
said finger hook adapter comprising:
- an elastically deformable member having inner surfaces defining a shape similar to an outer shape of said elongated body, said inner surfaces forming a through-hole in which the elongated member of said probe is adapted to be inserted, said member formed with a guide slit for guiding the cable into the through-hole, and an outer wall, said deformable member being elastically deformed when the cable is pressed against the guide slit, in a manner to widen a gap of the guide slit, and being elastically deformed when the proximal end of the elongated body is pressed against the inner surfaces forming the through-hole, in a manner to slightly widen the through-hole and to allow the elongated body to be inserted into the through-hole, whereby the elastically deformable member is elastically held by the elongated body; and
- a rod-shaped finger hook member extending from the outer wall of the ring-shaped member, said rod-shaped finger hook member adapted for allowing fingers of an operator to be hooked thereon, to keep said probe at a predetermined position with respect to the operator.

4,898,178

MONOLITHIC DISPOSABLE NEEDLE GUIDE FOR ULTRASOUND TRANSDUCERS

Victor J. Wedel, P.O. Box Q, Kaloma, Iowa 52247

Continuation of Ser. No. 42,387, Apr. 24, 1987, abandoned. This application Feb. 22, 1989, Ser. No. 314,291
Int. Cl.[4] A61B 8/00
U.S. Cl. 128—662.05 **5 Claims**



1. A needle guide for use with an ultrasound transducer in medical procedures, comprising in operative combination:
- (a) a monolithic member having at least one groove therein for receiving a needle;
- (b) a mounting bracket for attachment to the transducer and said mounting bracket having for receiving said monolithic member;
- (c) said monolithic member having a notch therein for cooperating with said bracket;
- (d) said monolithic member further having a first portion, a second portion, and a hinge connecting said first portion with said second portion;
- (e) said first portion having at least one groove therein for receiving a needle;
- (f) said first portion further having a notch therein for receiving said bracket; and
- (g) said second portion further having a notch therein for receiving said bracket.

4,898,179

DEVICE FOR DETECTING, MONITORING, DISPLAYING AND RECORDING OF MATERIAL AND FETAL VITAL SIGNS AND PERMITTING COMMUNICATION BETWEEN A WOMAN AND HER FETUS

Vladimir Sirota, 2111 Jefferson Davis Hwy., Apt. 803 South, Arlington, Va. 22202

Continuation-in-part of Ser. No. 60,812, Jun. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 745,684, Jun. 17, 1985, Pat. No. 4,672,975. This application Jul. 22, 1988, Ser. No. 223,011
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—670 **39 Claims**

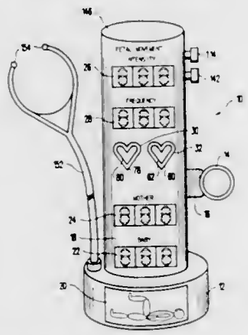
35. An obstetrical device for monitoring and displaying a representation of the heartbeats of a pregnant woman and her fetus, said device comprising:
- a housing;
- a first sensor circuit in said housing for detecting the heartbeat of the pregnant woman and generating a first electrical signal representative of that heartbeat;
- first display means in said housing connected to said first sensor circuit and responsive to the first electrical signal for providing a first visual signal representative of the pregnant woman's heartbeat;
- a second sensor circuit in said housing for detecting the heartbeat of the fetus and generating a second electrical signal representative of that heartbeat; and
- second display means in said housing connected to said second sensor circuit and responsive to the second electri-

cal signal for providing a second visual signal representative of the fetal heartbeat.

36. An obstetrical device for providing audio stimuli to a fetus and monitoring and displaying a representation of fetal response to said stimuli, comprising:

a housing;

a microphone connected to said housing;



a speaker, operably connected for transmitting audio stimuli from said microphone, disposed adjacent a lower portion of said housing adapted for abutment with a mother's abdomen; and

a sensor circuit in said housing for monitoring fetal response to said audio stimuli.

4,898,180

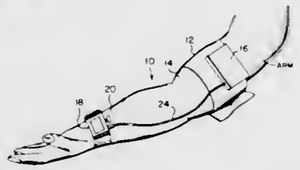
PERSONAL BLOOD PRESSURE MONITOR

Susan E. Farrelly, 150 East 69th St., New York, N.Y. 10021, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007

Filed Sep. 23, 1987, Ser. No. 100,299

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—681 **4 Claims**



1. A blood pressure monitoring device which comprises:

(a) a cuff inflatable to a desired pressure adapted to encircle an arm of a person;

(b) a housing on said cuff;

(c) a digital watch adapted to encircle the wrist of the person provided with means for controlling said pressure and for displaying pulse and blood pressure readings;

(d) a pressure regulating means extending from said digital watch to said housing for inflating said cuff, said pressure regulating means controlled from said digital watch by the first said means to inflate said cuff at predetermined time settings;

(e) a monitoring unit extending from said cuff and said housing to said digital watch, said monitoring unit being responsive to intensity of blood pressure pulses from the person coming through said cuff and heart beat pulses from the person coming through said housing into said digital watch; and

(f) means for recording blood pressure readings at preset time intervals wherein said readings can be displayed on said watch.

4,898,181

METHOD OF ILLUSTRATING ELECTROCARDIOGRAPHIC VALUES

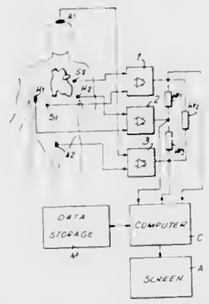
M. Kessler, Waldstrasse 6, D-8520 Erlangen, Fed. Rep. of Germany

Continuation of Ser. No. 919,751, Oct. 14, 1986, abandoned. This application Oct. 19, 1988, Ser. No. 262,107

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536658

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—699 **12 Claims**



1. A method of recording electrocardiographic values of an actual heart muscle, comprising the steps of applying scanning electrodes to predetermined locations of a patient's body, picking up electric signals delivered by said electrodes at time intervals which are small with respect to a total cycle of the heart muscle; amplifying the pick-up signals, and converting the same into digitalized vector data; feeding the vector data into a computer programmed for computing from the vector data coordinate values of discrete sectional planes SF1,SF2 . . .) of the heart muscle superimposed at distances; computed from the vector data during the heart muscle cycle; and graphically displaying at said time intervals changes of said superimposed planes to provide a live heart model (HM) showing the expansion processes of the heart muscle.

4,898,182

APPARATUS FOR EVALUATING HEART FITNESS

Brian Hawkins, 8 MacDonald Ave.; Jerald Greenberg, 34 Maple Ave.; Ofer Alon, 6 MacDonald Ave., all of Armonk, N.Y. 10504; Victor Martea, 144-45, 41 Ave., Apt. 3S, Flushing, N.Y. 11355; Edward Banyai, 133 Woodland Ave., New Rochelle, N.Y. 10805; Jennifer A. Edwards, 8 MacDonald Ave., Armonk, N.Y. 10504; David M. Banyai, 133 Woodland Ave., New Rochelle, N.Y. 10805; Juan C. Sanchez; Eran Sitnik, both of 137 Old Kisco Rd., Armonk, N.Y. 10504, and Joseph A. Yozzo, 17 Lawrence St., Mt. Kisco, N.Y. 10549

Filed Feb. 4, 1988, Ser. No. 152,113

Int. Cl.[4] A61B *5/04*

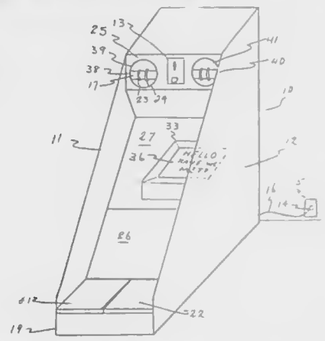
U.S. Cl. 128—707 **10 Claims**

1. Apparatus for evaluating the fitness of the heart of a person, said apparatus including:

(a) means, adapted to be operable by said person, for selecting sex data and age data, individual to said person, from a plurality of sex data and age data, for classifying said person among other persons on the basis of sex and age;

(b) means for instructing said person in a format of an exercise designed to increase a beat rate of said person's heart;

(c) exercise means for engagement by said person for changing said beat rate of said heart, said exercise means including exercise pace detecting means for monitoring the pace at which said person is performing said exercise while said person is engaged in said exercise and exercise pace control means for communicating to said person instructions for slow-up or slow-down or maintain constant the pace at which said exercise is being performed for maintaining said pace at a predetermined pace;



(d) means for monitoring said heart after said person performs said exercise for determining a recovery rate of said heart from an increased beat rate toward a slower beat rate; and

(e) means for comparing said recovery rate of said person's heart with heart beat recovery rates of persons in the same classification as said person for evaluating the fitness of said heart of said person.

4,898,183

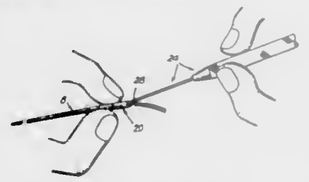
APPARATUS AND METHOD FOR INSERTION OF COCHLEAR ELECTRODE ASSEMBLY

Janusz Kuzma, Cherrybrook, Australia, assignor to Cochlear Pty. Limited, Lane Cove, Australia

Continuation of Ser. No. 77,445, Jul. 24, 1987, abandoned. This application Jun. 20, 1989, Ser. No. 368,979

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—784 **13 Claims**



1. A cochlear electrode lead assembly comprising a lead with a distal end and a proximal end including an array of electrodes on an external surface of said lead proximate said distal at one end and a resilient collar surrounding said lead and attached thereto at a region between said array and said proximal end, and means for permanently affixing a first circumferencial end of said collar to said lead only at said region.

4,898,184

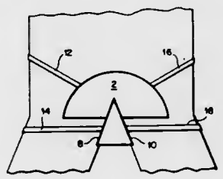
MALE AND FEMALE CONDOMS FOR THE PREVENTION OF THE TRANSMISSION OF AIDS AND OTHER VENEREAL DESEASES

Boris Skurkovich, 18 Blaisdell Ave., Pawtucket, R.I. 02860, and Simon Skurkovich, 802 Rollins Ave., Rockville, Md. 20852

Filed Oct. 23, 1987, Ser. No. 111,586

Int. Cl.[4] A61F *5/44*

U.S. Cl. 128—844 **12 Claims**



1. A genital receptacle consisting essentially of a resilient and flexible unitary body construction of rubber latex having an apron portion adapted to cover the pubic area of a human, thigh portions adapted to cover the perineum area of a human and a genitalia portion adapted to cover the surfaces of the genitalia of a human, a spermicide on the outside thereof and said spermicide containing antibodies to viruses and bacteria.

4,898,185

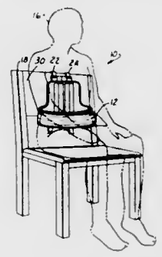
BACK TRACTION DEVICE FOR USE WITH CHAIRS

Ernest Fuller, Walled Lake, Mich., assignor to Life Support, Inc., Walled Lake, Mich.

Filed Feb. 24, 1989, Ser. No. 314,970

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—876 **11 Claims**



1. A method of relieving some of the pressure on the disc of the lower back of a person comprising the steps of:

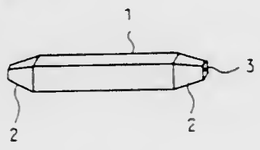
(A) securing a halter around the person's waist;

(B) securing a traction device to a chair having a seat; and

(C) adjustably attaching the halter to the traction device when the person is seated in the seat;

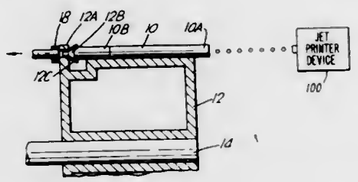
(D) said halter being formed with hook and loop fastener portions at its rear and the traction device being formed with mating hook and loop fastener portions that secures the halter to the traction device, the use of the hook and loop fastener portions allowing the traction device and the halter to be adjustably attached at any one of a variety of positions.

4,898,186
OSTEOSYNTHETIC PIN
Yoshito Ikada; Hyu H. Suong; Yoshihiko Shimizu, all of Uji; Satoshi Watanabe; Tatsuo Nakamura, both of Kyoto; Masakazu Suzuki, Ayabe, and Takeshi Shimamoto, Nagaokakyo, all of Japan, assignors to Gunze Limited, Ayabe, Japan
PCT No. PCT/JP87/00673, § 371 Date Apr. 29, 1988, § 102(e) Date Apr. 29, 1988, PCT Pub. No. WO88/01849, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 11, 1987, Ser. No. 199,412
Claims priority, application Japan, Sep. 11, 1986, 62-215077
Int. Cl.[4] A61F *5/04, 2/28*
U.S. Cl. 606—62 6 Claims



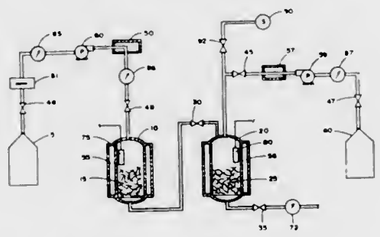
1. An osteosynthetic pin obtained by shaping a poly-L-lactic acid having a molecular weight of at least about 70,000 and axially drawing the shaped body about 2 to about 10 times at an elevated temperature of about 70° to about 120° C.

4,898,187
CIGARETTE MANUFACTURE
Dennis Hinchcliffe, London, England; Francis A. M. Labbe, Neuilly-sur-Seine, France; Desmond W. Molins, London, England, and Paul R. Wiese, London, England, assignors to Molins PLC, London, United Kingdom
Division of Ser. No. 909,234, Sep. 19, 1988, Pat. No. 4,785,831.
This application Sep. 20, 1988, Ser. No. 246,676
Claims priority, application United Kingdom, Aug. 22, 1984, 8421320
Int. Cl.[4] A24C *5/60*
U.S. Cl. 131—284 12 Claims



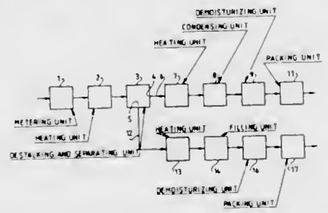
1. A method of treating cigarettes in which the cigarettes are conveyed sideways past nozzle means, spaced from the tobacco ends of the cigarettes and directed thereto, including the steps of supplying liquid adhesive to the nozzle means and operating the nozzle means while each successive cigarette is aligned therewith and spaced therefrom to project a measured quantity of adhesive onto the end of each cigarette from the nozzle means.

4,898,188
TOBACCO PROCESSING
Benjamin F. Nivea, Jr., Winston-Salem, and Charles D. Mays, Lewisville, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Continuation of Ser. No. 944,076, Dec. 22, 1986, Pat. No. 4,727,889. This application Feb. 24, 1988, Ser. No. 159,806
Int. Cl.[4] A24B *15/24, 15/26*
U.S. Cl. 131—296 26 Claims



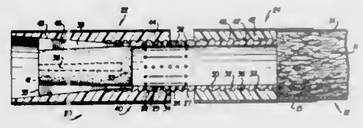
1. A process for extracting tobacco material, the process comprising:
(a) extracting tobacco components from a first tobacco material in cut filler form with a fluid under supercritical conditions thereby providing extracted tobacco components within the fluid; and then directly
(b) contacting the tobacco components extracted from the first tobacco material with a second tobacco material.

4,898,189
METHOD OF AND APPARATUS FOR TREATING UNCURED TOBACCO
Waldemar Wochnowski, Hamburg-Meiendorf, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany
Filed Jul. 7, 1988, Ser. No. 216,424
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1987, 3723040
Int. Cl.[4] A24B *15/00*
U.S. Cl. 131—299 56 Claims



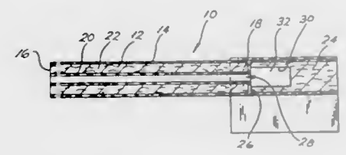
1. A method of treating uncured tobacco leaves which have a moisture content of less than 25 percent, normally between 13 and 17 percent, and contain ribs and stripe, comprising the steps of heating the leaves in an electric high-frequency heater to a temperature of 50°–100° C.; and thereupon subdividing the leaves into strips and ribs.

4,898,190
ADJUSTABLE AIR DILUTION CIGARETTE WITH PRESSURE DROP COMPENSATION
Philip A. Deal, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Mar. 1, 1989, Ser. No. 317,330
Int. Cl.[4] A24D *3/04, 3/18*
U.S. Cl. 131—336 12 Claims



1. A cigarette including a rod of smokable material and a filter element, said cigarette comprising filter assembly means for connecting the filter element to the smokable rod, said filter assembly means including air dilution means for admitting diluent air to the cigarette, means for adjusting the amount of diluent air admitted to the cigarette, and means for increasing the pressure drop of the cigarette as the amount of diluent air is increased, said means for increasing the pressure drop comprising means for supplying a compressive force to the filter element as the amount of diluent air admitted to the cigarette is increased.

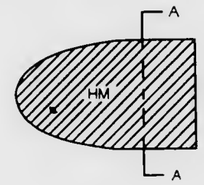
4,898,191
SMOKING DEVICE
Robert R. Johnson, and Tilford F. Riehl, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Filed Dec. 9, 1988, Ser. No. 281,584
Int. Cl.[4] A24B *15/00*
U.S. Cl. 131—359 10 Claims



1. A smoking device comprising:
a fuel column;
means defining a passage concentrically extending entirely through the fuel column having an impermeable wall;
a flavor releasing material filling the passageway;
a filter rod located at one end of the fuel column coaxial therewith, the filter rod being in flow communication only with the passage;
a pocket formed in the filter rod in coaxial alignment with the passage; and,
a flavor releasing material filling the pocket.

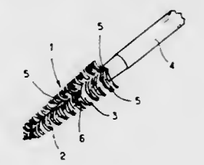
4,898,192
HOLOGRAPHIC FALSE NAILS
Allen L. Cohen, 10010 Walsham Ct., Richmond, Va. 23233
Filed Oct. 12, 1988, Ser. No. 256,582
Int. Cl.[4] A45D *29/00*
U.S. Cl. 132—73 7 Claims

1. An artificial fingernail which comprises:
(a) a carrier nail body with a top surface and a bottom surface, said carrier nail body contoured to fit onto a natural fingernail; and wherein
(b) the bottom surface has means for securing said artificial fingernail to the natural fingernail; and



(c) a hologram is affixed to and covering at least a part of the top surface of said carrier nail body, whereby said hologram functions to create an image that has three dimensional depth.

4,898,193
BRUSH FOR THE APPLICATION OF COSMETIC PRODUCTS
Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France
Filed Oct. 20, 1987, Ser. No. 110,526
Claims priority, application France, Oct. 24, 1986, 86 14774
Int. Cl.[4] A45D *40/26*
U.S. Cl. 132—218 10 Claims



1. A brush for the application of cosmetic products, comprising:
(a) an elongated core, and
(b) a plurality of bristles, wherein
said bristles are fixed around said core in a helical array with said bristles extending generally radially of said core and being shaped to form longitudinal rows of bristles arranged in sets, the bristles forming said rows having longer length than bristles immediately adjacent said rows, said bristles of one set of longitudinal rows having ends longer than those of another set of longitudinal rows of shorter length bristles, the ends of said bristles of longer length being milled to define ridges at the periphery of the brush having a thickness no greater than 1.5 mm, and wherein the ends of said bristles situated between adjacent ridges define a surface envelope having a concave profile.

4,898,194
HAIR TREATMENT DEVICE AND METHOD
Connie J. Einspahr, Rt. #1 Box #92, Roseland, Nebr. 68973
Filed Nov. 16, 1987, Ser. No. 120,965
Int. Cl.[4] A45D *6/00*
U.S. Cl. 132—251 8 Claims

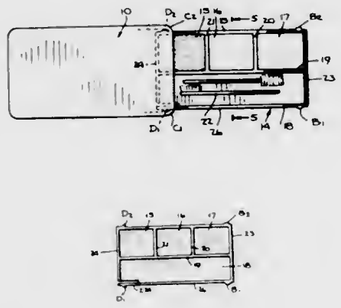
5. In combination with a conventional elongated permanent rod having an associated hair securement band, means for insertion between said securement band and hair of an individual wound around said permanent rod, said means for insertion comprising:
a thin flexible strip of plastic material;
said strip having a width of approximately one half inch, a

thickness of approximately one thirty seconds of an inch and a length between two and three and one half inches; said strip provided with a row of closely spaced circular apertures;



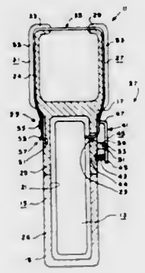
and
said strip having radiused ends.

4,898,195
SLIDING DRAWER COSMETIC COMPACT
Morris Sussman, Freeport, N.Y., assignor to Shore Plastics, Inc., Freeport, N.Y.
Filed Jan. 3, 1985, Ser. No. 740,477
Int. Cl.[4] A45D *40/00*
U.S. Cl. 132—317 **8 Claims**



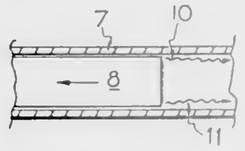
1. A travel cosmetic compact comprising:
A a molded plastic rectangular case having an open front end which is flanked by a pair of side catches;
B a molded plastic drawer slidable in said case and having at least one cell for containing a cosmetic supply, said drawer being provided with a bottom wall, front and rear walls and side walls, to define a rectangular frame, one of said side walls having a rear section which is detached from the bottom wall and the rear wall to define a flexible tine; and
C a pair of detents, one of which is formed on the free end of the tine, the other being formed at a corresponding position on the second side wall, said detents being adapted to engage the side catches of the case when the drawer is fully retracted to expose the cell and to prevent withdrawal of the drawer, said tine when the drawer is fully retracted at which position the tine is partially exposed being depressible to effect disengagement of the detent thereon from the side catch engaged thereby whereby the drawer may then be withdrawn from the case and replaced by another drawer.

4,898,196
FLOSSING DEVICE
W. Jeter Eason, 150 Goodwyn, Memphis, Tenn. 38111
Filed May 8, 1989, Ser. No. 348,964
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—327 **4 Claims**



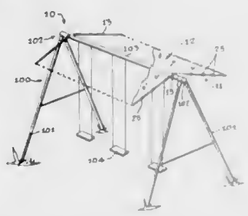
1. A flossing device for use by a user in combination with dental floss to floss teeth, said flossing device comprising:
(a) handle means for being held by the user, said handle means having a forward end, having a hollow interior for holding said dental floss and having an aperture extending from said hollow interior for allowing the distal end of said dental floss to extend outward from said hollow interior;
(b) a first arm member extending outward from said forward end of said handle means, said first arm member having an outer end positioned a spaced distance from said forward end of said handle means;
(c) a second arm member extending outward from said forward end of said handle means, said second arm member having an outer end positioned a spaced distance from said forward end of said handle means and from said outer end of said first arm member; and
(d) positioning means for positioning a portion of said distal end of said dental floss between said outer end of said first arm member and said outer end of said second arm member and for holding said portion of said distal end of said dental floss tight between said outer end of said first arm member and said outer end of said second arm member, said positioning means including first lock means for locking said dental floss relative to said first arm member, and second lock means for locking said dental floss relative to said second arm member; said first lock means including a grip member movable between a first position in which said dental floss is locked relative to said first arm member and a second position in which said dental floss is free relative to said first arm member, and spring means for urging said grip member to said first position; said grip member including a lever member having a first end, a second end, and a midportion; said grip member including pivot means for pivotally attaching said midportion of said lever member to said handle means; said spring means being associated with said lever member for normally urging said first end of said lever member toward said handle means to clamp said dental floss between said first end of said lever member and said handle means; said first end of said lever member moving away from said handle means and releasing said dental floss when the user applies pressure to said second end of said lever member against said spring means.

4,898,197
CLEANING OF TUBES USING PROJECTILES
Peter L. Barry, Blackburn, and Robert W. Vowles, Flemington, both of Australia, assignors to Lacress Nominees Pty. Ltd., Camberwell, Australia
Continuation-in-part of Ser. No. 858,859, Apr. 30, 1986, Pat. No. 4,724,007, which is a continuation of Ser. No. 648,882, Sep. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,269, Aug. 29, 1983, abandoned. This application Nov. 16, 1987, Ser. No. 120,942
Claims priority, application Australia, Mar. 11, 1983, 12433/83; PCT Int'l Appl., Aug. 17, 1984, PCT/AU84/00159
Int. Cl.[4] B08B *9/04*
U.S. Cl. 134—8 **11 Claims**



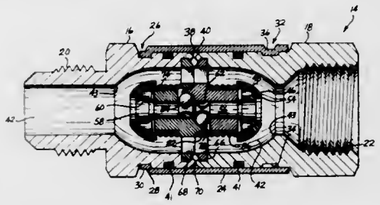
1. A method of cleaning tubes, using at least one solid substantially incompressible projectile having an outer diameter no greater than that which forms a loose sliding fit within a tube to be cleaned, wherein said projectile is propelled through said tube by a substantially instantaneous release of a flow of a pressurized cleaning liquid against one surface of said projectile, said projectile being propelled through said tube ahead of substantially all of the cleaning liquid at a speed of at least ten meters per second, such that cavitation-like turbulence is produced rearwardly of the projectile to effect cleaning of said tube as the projectile travels along said tube, and said projectile is propelled without substantial mechanical scraping contact with the inner walls of said tube.

4,898,198
CANOPY APPARATUS FOR CHILDREN'S SWINGS
Gerald E. Castlebury, Rte. 2, Box 144C, Ruther Glen, Va. 22546
Filed Feb. 1, 1989, Ser. No. 304,638
Int. Cl.[4] A63G *9/00*; E04H *15/58*
U.S. Cl. 135—90 **2 Claims**



1. A canopy apparatus in combination with a swing construction including a pair of vertically disposed A-frame support members operatively connected on their upper ends to a horizontal support bar wherein the canopy apparatus consists of:
a pair of support units wherein each support unit comprises: an elongated support arm having a pair of inboard apertures disposed on opposite sides of the midpoint of the support arm; a clamp member adapted to engage the bottom of the horizontal support bar; and a pair of elongated securing elements operatively engaged with the clamp member and dimensioned to project through the pair of inboard apertures in the support arm to captively engage a portion of the horizontal support bar; wherein, each of said support arms are provided with an inverted generally shallow V-shaped configuration; and,
a cover unit comprising a generally rectangular cover member fabricated from an opaque sheet of material; wherein, opposed sides of the cover member are provided with a plurality of spaced grommets and further provided with a plurality of tether elements which extend through said grommets and operatively attach said cover unit to said support units.

4,898,199
BREAKAWAY FLUID COUPLING
John M. Morris, Auburn; Zdenek Gabrlik, Seattle, and Charles J. Green, Vashon, all of Wash., assignors to GT Development Corporation, Tukwila, Wash.
Filed Feb. 7, 1989, Ser. No. 307,736
Int. Cl.[4] F16K *17/40*
U.S. Cl. 137—68.1 **24 Claims**

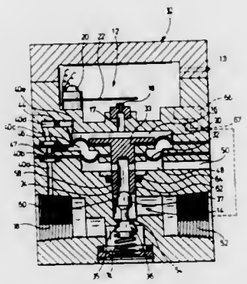


1. A breakaway fluid coupling comprising:
a first valve body, and a separate second valve body; said bodies defining a flow passage through the coupling;
a sleeve having a first end connected to said first body by a first joint that is detachable by bending forces of a first predetermined magnitude and resistant to tension forces of a second predetermined magnitude, and an opposite second end connected to said second body by a second joint that is detachable by tension forces of said second predetermined magnitude and resistant to bending forces of said first predetermined magnitude; and
a valve element positioned in each of said valve bodies to allow flow through said passage when said bodies are connected by the sleeve, and to close said passage when at least one of said joints is detached.

4,898,200
ELECTROPNEUMATIC TRANSDUCER
Katsuhiko Odajima, and Motoshige Ikehata, both of Sohka, Japan, assignors to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 729,188, May 1, 1985, abandoned. This application Apr. 21, 1989, Ser. No. 341,269
Claims priority, application Japan, May 1, 1984, 59-88178; Feb. 8, 1985, 60-23094
Int. Cl.[4] G05D *16/20*
U.S. Cl. 137—85 **3 Claims**

1. An electropneumatic transducer comprising:
(a) a body having supply and output ports;
(b) a nozzle flapper mechanism disposed in said body for varying a nozzle back pressure in response to the displacement of a nozzle flapper thereof;
(c) an inner valve disposed in a passage connecting said supply port and said output port for opening and closing said passage under the action of a diaphragm assembly operative in response to said nozzle back pressure;
(d) said nozzle flapper comprising an electrostrictive element displaceable dependent on a change in an electric signal applied thereto;
(e) said inner valve comprising a nonbleed-type pilot valve;

(f) said diaphragm assembly comprising two flexible diaphragms centrally coupled together by a joining member held in engagement with said inner valve, said nozzle flapper mechanism including a nozzle having a communication hole opening toward one of said diaphragms, the other diaphragm facing into an atmospheric-pressure chamber defined in said body and vented to atmosphere,



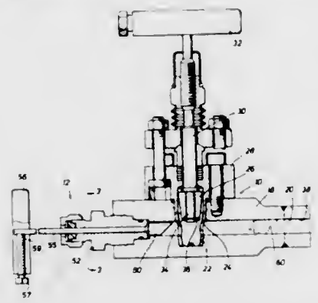
wherein said two diaphragms define a chamber therebetween held in communication with said supply port through a passage defined in said body so that a supply pressure is supplied from said supply port into said chamber, said one diaphragm having one surface subjected to the nozzle back pressure, said other diaphragm having one pressure subjected to the atmospheric pressure in said atmospheric-pressure chamber.

4,898,201

PORTABL TOOL FOR CLEANING VALVE BORES AND ASSOCIATED INLET PASSAGE

Jeff A. Conley, Sugar Land, and Jeffrey T. Lynch, Houston, both of Tex., assignors to Keystone International, Inc., Houston, Tex.

Filed Feb. 9, 1989, Ser. No. 308,000
Int. Cl.[4] B08B *1/00, 9/06;* **F16L** *55/00*
U.S. Cl. 137—245.5 **7 Claims**



7. For use with a valve having a valve body with a central bore therethrough defining a main bore portion, a valve member mounted for movement between open and closed positions relative to said central bore, said central bore defining an end opening including an intermediate diameter bore portion and a large diameter bore portion with an inner annular shoulder at the juncture of said main bore portion and said intermediate bore portion, and an outer annular shoulder at the juncture of the intermediate bore portion and the large diameter bore portion, said large diameter bore portion defining internal screw threads therein, said valve body adapted to receive the inner end of a flow line in abutting relation against said inner annular shoulder, and an externally threaded nut mounted about said flow line in threaded relation with said internally threaded bore portion for removably securing said flow line within said end opening;

the improvement of a portable cleaning tool for cleaning said valve bore adapted to be removably connected within said end opening upon removal of said flow line and associated nut; said portable cleaning tool comprising:

a tool connector having an elongate body with a central bore therethrough;

a rod extending through said bore having a handle on an outer end thereof and an enlarged diameter cleaning member on the inner end thereof, said cleaning member being generally cylindrical in shape with a trailing end surface to define an annular seat, and an inclined leading end surface to define a leading scraping edge;

said elongated body of said connector having means for engaging said annular seat of said cleaning member in a retracted position to prevent outward movement thereof, a main intermediate body portion of a generally uniform cross section, an externally threaded outer end portion, an inner end portion of a reduced diameter defining a tapered shoulder at its juncture with said intermediate portion, a first annular groove about said reduced diameter inner end portion, an O-ring received within said first annular groove, and a second annular groove about said intermediate body portion outwardly of said tapered shoulder;

a retainer ring received within said second annular groove and extending laterally over the adjacent outer end of said valve body;

a first internally threaded nut receiving said elongate body and retainer ring and threaded onto the external screw threads of said valve body adjacent the end of said body for compressing said retainer ring against the end of said valve body and holding said connector body within said end opening of said valve body;

a packing extending about said rod and received within the outer end of said connector body; and

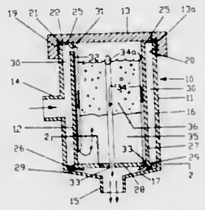
a second internally threaded nut threaded onto said outer end portion of said connector and compressing said packing for sealing about said rod.

4,898,202

FERTILIZER CONTAINER FOR SPRINKLER SYSTEM

James R. Craig, 2925 Cody St., Riverside, Calif. 92503

Continuation-in-part of Ser. No. 205,062, Jun. 10, 1988, which is a continuation-in-part of Ser. No. 78,165, Jul. 27, 1987, Pat. No. 4,750,512. This application May 16, 1989, Ser. No. 352,923
Int. Cl.[4] B01D *11/02*
U.S. Cl. 137—268 **4 Claims**



1. A fertilizer applicator for a sprinkler system, comprising:

A. a container for holding said solid fertilizer, including: integrally formed upper and lower end flange members, a continuous sidewall member and bottom member joined thereto, the bottom member providing at least one outlet bore and corresponding connecting upstanding drain pipes having upper entry ports for a solution of fertilizer to pass therethrough, the said sidewall providing an inlet bore, and connecting water line terminating near the bottom member for water to pass therethrough at a controlled rate and dissolve the said solid fertilizer, the lower flange member providing bores to permit water to drain therethrough;

B. an enclosure case for the container, including:

i. water inlet and outlet means, for water and diluted fertilizer solution, respectively;

ii. a sidewall portion for enclosing the sidewall member of the container;

iii. the container being removably secured by the upper flange member to the enclosure, thereby spacing the sidewall portion of the enclosure case and the sidewall member of the container; whereby:

i. water fed into the inlet will be pressured between the sidewalls and through the inlet bore of the sidewall member to dissolve the fertilizer, and form a solution of fertilizer which rises to the level of the entry ports of the drain pipes;

ii. water draining from the bores in the lower flange member will dilute the fertilizer solution draining from the drain pipes and connecting outlet bores to reduce fertilizer burning; and,

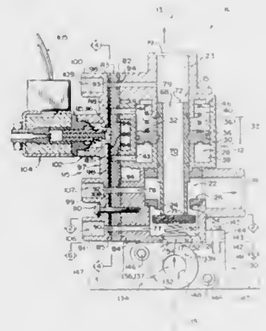
iii. when the fertilizer is dissolved, water is passed through the bores of the lower flange member and the outlet bores of the bottom member and outlet of the applicator, and then to the sprinkler system.

4,898,203

VALVE APPARATUS

Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada V6M 2W2

Filed Sep. 22, 1988, Ser. No. 247,725
Int. Cl.[4] F15B *13/043*
U.S. Cl. 137—269 **32 Claims**



1. A valve apparatus including:

(a) a valve body having: an axially disposed main chamber; an inlet port, and outlet port and an exhaust port communicating with the main chamber; a valve seat disposed between the main chamber and the inlet port; and axially disposed piston chamber, and first and second piston ports communicating with the piston chamber and being accessible at an outer surface of the body,

(b) a valve poppet member engageable with the valve seat to seal the main chamber from the inlet port,

(c) a piston dividing the piston chamber into first and second piston spaces, the piston being reciprocable within the piston chamber between first and second extreme positions within the piston chamber, the first and second piston spaces communicating with the first and second piston ports respectively,

(d) a valve actuator cooperating with the piston and the poppet valve member to actuate the valve member when required,

(e) piston biasing means for biasing the piston to apply force thereto, the piston biasing means being located within the first piston space to apply force to the piston in a first direction, the piston biasing means also being alternatively locatable within the second piston space to apply force to the piston in a second direction opposite to the first direction, so that direction of force of the biasing means is selectable to move the piston to an extreme position thereof in either direction,

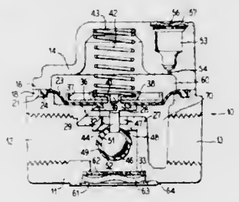
(f) fluid signal input means for receiving fluid signals and communicating with a fluid supply, the fluid signal input means being releasably secured to the valve body adjacent to both piston ports so as to communicate therewith, the fluid signal input means having inner and outer portions, the outer portion having an input signal connection to receive an input signal, and the inner portion having interchangeable conduit means for providing at least one interchangeable conduit for selectively communicating with a requisite piston port, the interchangeable conduit means communicating with the fluid supply and having an inlet conduit extending from the input signal connection to the second piston space to supply a fluid force to the piston in opposition to the piston biasing means, and an outlet conduit extending from the first piston space to exhaust fluid from the first piston space, the interchangeable conduit means having a periphery which encloses the two piston ports so that, if required, the interchangeable conduit means could alternatively provide a conduit from the input signal connection to the first piston space to supply a fluid force to the piston in opposition to force from the piston biasing means which can be alternatively located in the second piston space.

4,898,204

LOW PRESSURE GAS REGULATOR

Elmer E. Wallace, Fort Wayne, Ind., assignor to SCP, Inc., Auburn, Ind.

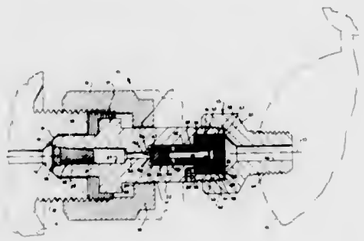
Filed Jan. 11, 1989, Ser. No. 295,501
Int. Cl.[4] G05D *16/06*
U.S. Cl. 137—505.41 **3 Claims**



1. A low pressure gas regulator comprising a body member, an inlet opening formed in said body member, an outlet opening formed in said body member, a partition in said body member which separates said inlet and outlet opening and formed with an opening which is surrounded with a valve seat, a moveable diaphragm mounted in said body member so as to have atmospheric pressure on one side thereof and the pressure of the outlet opening on the ohter side, a valve stem connected to said diaphragm and extending through said opening in said partition, a ball valve mounted on said valve stem in said inlet opening, and a relatively thick soft resilient cover mounted over said ball valve and engageable with said valve seat, and wherein said cover has a first thicker portion which engages said valve seat and a second portion which does not engage said valve seat which is thinner than said first portion.

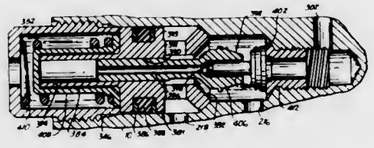
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4,898,205
STEM REGULATOR
Albert Ross, Elyria, Ohio, assignor to Western/Scott Fetzer Company, Westlake, Ohio
Filed Sep. 14, 1988, Ser. No. 244,827
Int. Cl.[4] F16K *31/122*
U.S. Cl. 137—505.12 5 Claims



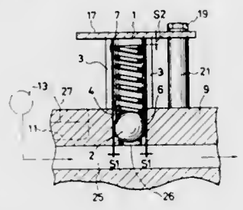
1. A stem pressure regulator for connection with the valve of a compressed gas cylinder, comprising a unitary inlet nipple having an inlet and an outlet and a central passage for conducting gases from the inlet to the outlet, the central passage including a circular bore, an annular seat formed in the body of the inlet nipple and surrounding said central passage at a plane transverse to the axis of the bore between the inlet and the outlet, piston means slidably disposed in the circular bore, the piston means having at a first end a seat area adapted to seal the annular seat, and at an opposite end having a face substantially larger than said annular seat, resilient spring means in said nipple urging said piston means away from said annular seat, second passage means for conducting fluid passing through said annular seat to said face, the piston means being arranged in a manner wherein the force of gas pressure on said face opposes the force of the spring means and closes said piston seat area against said annular seat when gas pressure on said face exceeds the gas pressure at the nipple inlet by a predetermined value, the nipple having a nose with a convex exterior surface at its inlet end, a generally circular exterior on a zone generally surrounding said annular seat and a shoulder downstream of said convex exterior surface and extending radially beyond said circular exterior, a coupling nut adapted to be assembled over said circular exterior, said nut having threads for coupling with a cylinder valve and a shoulder engageable with said nipple shoulder, the pitch diameter of the nut threads being greater than the diametral extent of the nipple shoulder, tightening of said nut threads on said cylinder valve causing abutment of said shoulders and sealing engagement of said nose with the cylinder valve, an adaptor on an outlet end of said nipple, said adaptor including means for coupling with separate compressed gas circuit components including a pressure regulator, said coupling means of the adaptor including coupling threads, the coupling means being of sufficient strength to support said pressure regulator in normal service and the nut including the threads thereof being of sufficient strength to support both said stem regulator and said pressure regulator in normal service.

4,898,206
COMPRESSION RELEASE RETARDER WITH VALVE MOTION MODIFIER
Zdenek S. Meistrick, Bloomfield, and Raymond N. Queaneville, Suffield, both of Conn., assignors to The Jacobs Manufacturing Company, Bloomfield, Conn.
Division of Ser. No. 120,825, Nov. 16, 1987, Pat. No. 4,838,516, which is a continuation-in-part of Ser. No. 872,494, Jun. 10, 1986, Pat. No. 4,706,624. This application Feb. 9, 1989, Ser. No. 308,837
Int. Cl.[4] F16K *15/06*
U.S. Cl. 137—512.3 10 Claims



1. A control check valve for use in an hydraulic circuit comprising a body having a first bore formed therein, first and second passageways communicating with said first bore, a bushing seated in said first bore, said bushing having a second bore formed therethrough, a valve actuating pin closely fitted for axial movement in said second bore, a first valve seat seated in said first bore between said first and second passageways and having a third bore formed therethrough, said third bore having a larger diameter than the diameter of said valve actuating pin, a bushing retaining cap threaded into said first bore, a drive collar communicating with said bushing, a compression spring seated between said bushing retaining cap and said drive collar to bias said drive collar and said valve- actuating pin in an axial direction, a first valve mounted for axial movement by said valve actuating pin and spring means adapted to bias said first valve toward said valve seat.

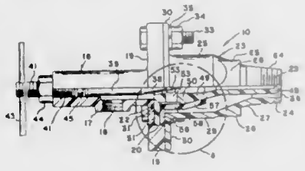
4,898,207
OIL RELIEF VALVE FOR LUBRICATION SYSTEMS FOR INTERNAL COMBUSTION ENGINES
Noriyuki Ueki, Kakogawa, and Shigeru Nishimura, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan
Filed Jan. 9, 1989, Ser. No. 294,671
Int. Cl.[4] F01M *1/00*
U.S. Cl. 137—539 3 Claims



1. An oil relief valve for a lubrication system for internal combustion engines, the system being of a type which has an oil line mounted in a bottom side of a crankcase, comprising a port bored in the bottom side of a valve chamber, a valve seat provided at an exit end of the port, said valve chamber extending upwardly from and connected to an upper end of the seat, the chamber having an inner circumferential surface, a vertically elongate sleeve member having a circular cross section and extending upwardly from the chamber, the sleeve member having an inner circumferential surface merged with the inner

surface of the chamber, vertical slits cut in the sleeve member, a valve plug mounted in the sleeve member and adapted to move along the inner circumferential surface of the sleeve member, and a coil spring mounted in a space defined in the sleeve member between the valve plug and a top portion of the sleeve, the spring having a free length smaller than the longitudinal distance of the space.

4,898,208
INJECTOR VALVE
George C. Nelson, York, Nebr., assignor to Cyclonaire Corporation, York, Nebr.
Continuation of Ser. No. 292,381, Dec. 30, 1988, abandoned. This application May 4, 1989, Ser. No. 347,418
Int. Cl.[4] F16K *15/14*
U.S. Cl. 137—614.2 23 Claims



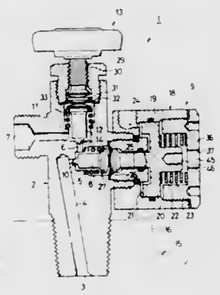
1. A valve assembly, for use as an injector valve in a pneumatic conveying system for particulate solids, the assembly being adapted to be connected to a source of pressurized fluid, the assembly comprising:
- a hollow inlet housing containing a chamber and having a first opening for receiving the shank of a valve spindle, said housing having a fluid inlet opening for introducing pressurized fluid into the inlet housing chamber;
- a hollow discharge housing secured to said inlet housing and containing a chamber, said discharge housing having a discharge opening for discharging fluid from the discharge housing chamber;
- a hollow valve seating element mounted in the chamber of said discharge housing, said seating element having at least one outlet opening passing from the hollow of said seating element to the outer surface of said seating element, said seating element having a hollow cylindrical inlet section containing a valve seat, and having a conical section forward of said hollow inlet section;
- isolating means about said seating element for isolating the chamber of said inlet housing from the chamber of said discharge housing;
- a valve spindle sealably contained within the chamber of said inlet housing, said spindle having a shank movably mounted in said first opening, and having a forward end proximate said valve seat and shaped to sealably mate with said valve seat;
- means for selectively moving said spindle to engage and withdraw said shaped forward end relative to said valve seat to selectively close and open the valve; and,
- a flexible elastomeric annular boot mounted on the outside surface of said valve seating element, said boot having a conical forward portion in contact with the outer surface of said seating element conical section, and having a cylindrical rearward portion in contact with the seating element cylindrical inlet section so that fluid entering the inlet housing when the valve is open passes through the valve seat, the hollow of the seating element, and the outlet opening of the seating element to stretch and flex the annular boot away from the outside surface of said seating element to allow flowing fluid to exit from the forward end of said conical forward portion of the boot and pass out of the valve assembly through the discharge opening

4,898,209
SLIDING RECONSTITUTION DEVICE WITH SEAL
Brian D. Zbed, Round Lake Park, Ill., assignor to Baxter International Inc., Deerfield, Ill.
Filed Sep. 27, 1988, Ser. No. 249,747
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614.04 32 Claims



1. A coupling device for establishing fluid communication between a first container and a second container comprising:
- a first sleeve member including at a first end thereof, means for connecting and securing said first sleeve member to a first container;
- a second sleeve member, so constructed and arranged that it receives a portion of the first sleeve, and operatively adapted for axial sliding engagement thereon, including means at one axial end thereof for releasably engaging and securing said second sleeve member to a second container;
- piercing means located within the first and second sleeves and secured to one of the sleeves for providing fluid flow from the first container to the second container; and
- a resilient seal means for sealing an end of the second sleeve member, located in said second sleeve member at said end adapted to be connected to said second container.

4,898,210
GAS-CYLINDER VALVE
Jiro Nitta, Hyogoken, Japan, assignor to Kabushiki Kaisha Neriki, Hyogoken, Japan
Filed Jan. 4, 1989, Ser. No. 293,430
Claims priority, application Japan, Jan. 12, 1988, 63-2829
Int. Cl.[4] F16K *51/00, 31/44*
U.S. Cl. 137—614.19 7 Claims



1. A gas-cylinder valve adapted for securely controlling gas flow from a gas cylinder, comprising:
- a one piece valve box having a gas inlet in communication with a gas outlet through a gas inlet passage, a gas supply valve chamber, a gas outlet passage and a metallic dia-

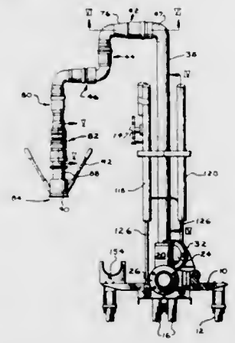
phragm sealing one end of said gas supply valve chamber within said valve box of said gas-cylinder valve;
a gas supply valve body movably supported in said gas supply valve chamber;
gas supply valve operation means for moving said gas supply valve body with respect to a first valve seat of the gas supply valve chamber to correspondingly open and close off said communication between said gas inlet and outlet passages;
said one piece valve box further including a protection valve chamber interposed downstream of said gas supply valve seat in said gas outlet passage within the valve box, said protection valve chamber being provided with a metallic diaphragm for sealing one end thereof and a movable protection valve body adapted to open and close off said gas outlet passage by controlled movement with respect to a second valve seat of the protection valve chamber;
spring means within each said gas supply valve chamber and said protection valve chamber for biasing said valve bodies in the direction of said metallic diaphragms; and
means to transmit valve operational forces to said diaphragms for opposing said biasing forces of said spring means and gas pressures acting on said diaphragms from within said valve chambers.

4,898,211

COUNTERBALANCED REFUELING ARM ASSEMBLY

Paul J. E. Fournier, Jackson, and Joseph F. Reinker, Jr., Parma, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Nov. 21, 1988, Ser. No. 273,600
Int. Cl.[4] F16L *3/00*
U.S. Cl. 137—615 **6 Claims**



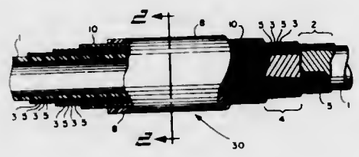
1. A counterbalanced refueling arm comprising, in combination, a supporting platform, wheels supporting said platform, an outboard caster assembly, said assembly including a caster wheel, a first swivel joint mounted on said outboard caster assembly having a substantially vertical axis of rotation, an inlet and an outlet defined on said joint, a fuel supply conduit communicating with said joint inlet, a second swivel joint mounted on said platform having a substantially horizontal axis of rotation, an inlet and an outlet, a rigid conduit interconnecting said first joint outlet with said second joint inlet establishing communication between said first and second joints, a substantially rigid arm conduit having an axis, an inner end affixed to and communicating with said second joint outlet and an outer end, said arm conduit being pivoted about said second joint axis within a substantially vertical plane, a first elbow swivel coupling having an inlet connected to said arm conduit outer end, an outlet and an axis of rotation transverse to said arm conduit axis, a second elbow swivel coupling having an inlet connected to said first coupling outlet, an outlet and an axis of rotation transverse to said first coupling axis, a third elbow swivel coupling having an inlet connected to said second coupling outlet, an outlet and an axis of rotation transverse to said coupling axis, and a nozzle connected to said third coupling outlet.

4,898,212

FATIGUE RESISTANT HOSE

Jerry R. Searfoss, Stow, and Bernard Keister, Aurora, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 1, 1984, Ser. No. 656,202
Int. Cl.[4] F16L *11/04*
U.S. Cl. 138—130 **8 Claims**



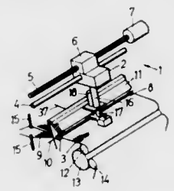
1. An improved flexible reinforced hose adapted for use in the conveyance of fluids under pressure, said hose comprising a core tube, at least one pair of oppositely helically wound inner and outer layers of reinforcing material disposed under tension about the core tube, and a protective jacket disposed about the reinforcement material, said reinforcement layers comprising a composite of synthetic fibers comprising a first synthetic fiber having a tenacity of from 12 to about 25 grams per denier with an elongation at break of about 2% to about 8% and a second synthetic fiber having a tenacity of from about 7 to 11 grams per denier and an elongation at break of from about 9% to about 17%, and said improvement characterized by said hose being provided with improved resistance to flexural fatigue as a result of said first and second fibers being disposed in alternating contiguous relationship to each other within each of said layers.

4,898,213

DEVICE FOR MENDING AND TRIMMING BROKEN WARP YARN

Yujiro Takegawa, Ishikawa, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

Filed Nov. 28, 1988, Ser. No. 276,857
Claims priority, application Japan, Nov. 26, 1987, 62-298805
Int. Cl.[4] D03D *49/00*
U.S. Cl. 139—1 R **4 Claims**



1. A device for mending and trimming broken warp yarn for a loom comprising:
a moving member supported above a woven cloth for movement widthwise along the woven cloth;
a yarn holding means mounted on the moving member to hold a free end of a mending yarn which has been tied to a broken warp yarn so that the free end of the mending yarn is extending substantially under tension;

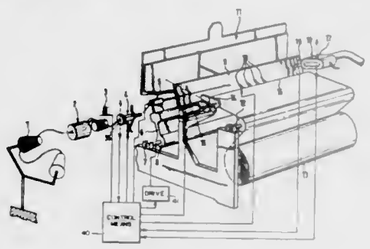
a signaling device which generates a signal upon the detection of arrival of the free end of the mending yarn at a predetermined position;
a cutter for cutting the free end of the mending yarn extending from the woven cloth so that a predetermined length of the mending yarn remains on the woven cloth; and
a controller for controlling the moving member, the yarn holding means and the cutter for operation according to a predetermined control program, the moving member, yarn holding means, and cutter being controlled so as to automatically cut off the free end of the mending yarn extending from the woven cloth by a predetermined length from the woven cloth.

4,898,214

METHOD AND APPARATUS FOR REMOVING AN IMPROPERLY INSERTED WEFT THREAD FROM AN AIR-JET LOOM

Dirk Lewyllie, Wervik; Jose Vangheluwe, Ypres; Bernard Pauwels, Roeselare, and Henry Shaw, Vleteren, all of Belgium, assignors to Picanol N. V., Ypres, Belgium

Filed Sep. 9, 1988, Ser. No. 242,123
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730480
Int. Cl.[4] D03J *1/04*
U.S. Cl. 139—116 A **24 Claims**



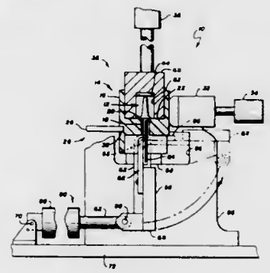
1. A method for removing a defectively inserted weft thread from a fabric fell in a fluid jet loom of the type wherein:
a length of weft thread normally is taken from a ready supply of weft thread and is inserted by being blown by a main jet nozzle into a first end of a shed formed from warp threads of the fabric,
the inserted weft thread is blown through the shed by auxiliary jet nozzles arranged along the shed,
the inserted weft thread is detected at a second end of the shed by a weft monitor located on the opposite side of the shed from the main nozzle, and
the inserted weft thread is beaten-up into the fabric fell and severed from the ready supply at a point adjacent the main nozzle, the method comprising the steps of:
preventing the severing of the weft thread when the weft thread is defectively inserted into the shed and not detected by the monitor;
stopping the operation of the loom in a position that forms the shed into which the weft thread is defectively inserted;
taking predetermined lengths of weft thread from the ready supply sequentially in several length segments, each segment being shorter than twice The width of the fabric, and blowing each segment through the shed together with the defectively inserted weft thread by using several sequential jet pulses from the main jet nozzle and the auxiliary jet nozzles.

4,898,215

ELECTRICAL CONTACT BENDER

Gerald M. Jones, Titusville, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 9, 1989, Ser. No. 308,073
Int. Cl.[4] B21F *1/00*
U.S. Cl. 140—105 **5 Claims**



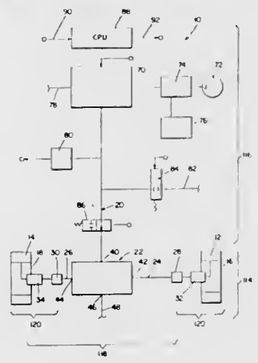
1. An apparatus for forming the contact leads of a connector block, said connector block comprising an electrically insulating body having a plurality of in-line apertures therein arrayed along an axis of said body and an electrical contact in each of said apertures, each of said contacts having a shoulder resting on a floor of said block and having a tail protruding therefrom, said apparatus comprising: means for engaging said block to hold said block firmly in a given position; means for engaging an upper portion of said contacts to apply pressure against said shoulder; tail engaging means for engaging said protruding tails of said contact; and means connected to said tail engaging means for causing said tail engaging means to pivot substantially away from the vertical a given amount and bend said tails substantially the same amount.

4,898,216

CTIS CONTROL SYSTEM AND METHOD FOR SENSING AND INDICATION OF INADEQUATE RATE OF CHANGE OF TIRE INFLATION PRESSURIZATION

Gary R. Schultz, and James A. Beverly, both of Kalamazoo, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 25, 1988, Ser. No. 198,412
Int. Cl.[4] B60C *29/00*; G01N *7/00*
U.S. Cl. 141—4 **12 Claims**



1. A method for controlling a CTIS including sensing and reacting to conditions indicative of system faults causing inade-

quate tire inflation pressurization responses to commanded changes in selected tire inflation pressurization settings, said CTIS of the type having a plurality of operator selectable tire pressurization settings which are automatically achieved and maintained by the system, said method characterized by:

sensing operator selection of a desired pressure setting to be achieved and maintained by the system;

determining the maximum acceptable period for achieving the selected pressure setting from the current pressure setting;

beginning the appropriate sequence of inflation/deflation operations to achieve the selected pressure, said appropriate inflation/deflation operations comprising repeated cycles of pressure measurement and tire inflation/deflation, said maximum period measured as a number of cycles of pressure measurement and tire inflation/deflation; and

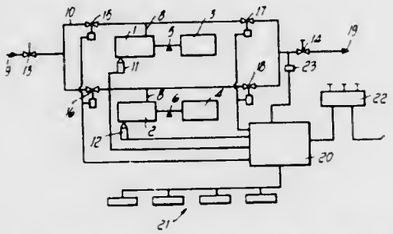
if the maximum acceptable period expires prior to achieving the selected pressure setting, discontinuing pressure measurement and adjustment operations, declaring a system fault and notifying the operator of said fault.

4,898,217

DEVICE FOR METERING THE MASS OF NATURAL GAS FOR FUELING MOTOR VEHICLES

Leonard Corbo, and Carlo Draghi, both of Via Savona 97, Milan 20144, Italy

Filed Apr. 4, 1988, Ser. No. 177,106
Int. Cl.[4] F17C *13/02*
U.S. Cl. 141—83 **2 Claims**



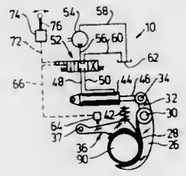
1. A gas mass metering device comprising a frame supporting at least two metering chambers, a counterweight associated to each of said at least two metering chambers, a yoke member disposed in between a respective one of said at least two chambers and said counterweight for balancing and supporting each respective one of said at least two metering chambers and counterweight, at least two load measuring cells, each of said at least two load measuring cells located underneath and supporting a respective chamber of said at least two chambers, a plurality of solenoid valves adapted to control the entrance and exit of gas in said at least two metering chambers, processor means for controlling said plurality of solenoid valves, each of said at least two metering chambers defining an enclosed volume with a single opening, and at least two flexible hoses each having two ends with the first end connected to said plurality of solenoid valves and the second end connected to said single opening in a respective one of said at least two metering chambers wherein said at least two flexible hoses are provided for filling gas in said at least two metering chambers and for removing gas therefrom wherein said chambers alternatively operate with a filling step in which one of said chambers is filled with gas and a fueling step in which the other of said chambers supplies gas contained therein.

4,898,218

DELIMBING DEVICE FOR A TREE

Stig Linderholm, Grangärde, Sweden, assignor to Grangärde Maskin AB, Grangärde, Sweden

Filed Jan. 2, 1989, Ser. No. 360,317
Claims priority, application Sweden, Jan. 6, 1988, 8802098
Int. Cl.[4] B27L *1/00*
U.S. Cl. 144—2 Z **4 Claims**



1. A delimbing device for a tree processing apparatus (10), comprising:

(a) a pair of curved gripping means (22,26) which are each provided with a limbing knife (24,28), for supporting and delimbing a peripheral section of a tree trunk movable in the longitudinal direction thereof relative to the gripping means;

(b) actuator means (44,46) operatively connected to said gripping means (22,26) and limbing knives (24,28) for adjusting the same relative to the tree trunk;

(c) an additional limbing knife (36) pivotally mounted on said device;

(d) means (42) for resiliently forcing said additional limbing knife (36) against the tree trunk for delimbing a remaining peripheral section thereof; and,

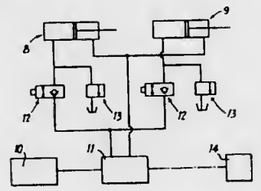
(e) a position sensor means (64) constructed and arranged to detect a displacement of a member (36,82), transverse to said longitudinal direction, following said remaining peripheral section of the tree trunk, and to emit a signal to make an adjustment of said actuator means (44,46) to change the amount of closing of said gripping means (22,26) and to thereby change the position of the tree trunk in the processing apparatus (10), each time a section of the trunk facing the additional limbing knife (36) has been displaced a predetermined distance in the direction of movement of the additional limbing knife (36).

4,898,219

WORKING HEAD FOR A TREE-SHAPING MACHINE

Jean-Pierre Pomies, Montargis, France, assignor to Association pour la Rationalisation et la Mecanisation de l'Exploitation Forestiere - A.R.M.E.F., Paris, France

Filed Dec. 29, 1988, Ser. No. 291,519
Claims priority, application France, Dec. 31, 1987, 87 18480
Int. Cl.[4] A01G *23/02*
U.S. Cl. 144—2 Z **8 Claims**



1. In a working head for a tree-shaping machine including at least one shaping unit having at least one movably mounted blade and an actuating cylinder for applying said movable blade to the surface of the work, and means for driving work through the shaping unit, the improvement comprising

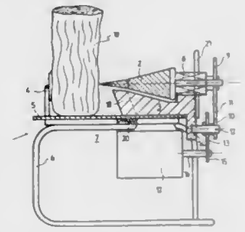
means for relieving the pressure in said cylinder during a starting phase of said driving means.

4,898,220

CONICAL SCREW AUGER MACHINE FOR SPLITTING A LOG OF WOOD

Gérard Maingueneau, Les Trois-Moutiers, France, assignor to Mecanique des 3 Moutiers, France

Continuation of Ser. No. 190,758, May 6, 1988, abandoned. This application Apr. 6, 1989, Ser. No. 334,782
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—194 **5 Claims**



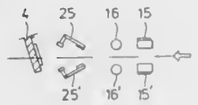
1. A wood splitting machine comprising a table having a metal surface for receiving a log which is to be split, a rotating threaded cone having a central axis of rotation which is parallel to the surface of said table, bearing means at the base of the cone for rotatably supporting said threaded cone, drive means for applying a rotational driving force through said bearing to turn said threaded cone, and a splitting wedge comprising a metal plate having a forward blade for penetrating and splitting a log, said plate having an elongation which lies along said axis of rotation, a bottom edge of said plate being fixed along its entire length to said surface of said table, a back portion of said plate being fixed to said bearing means for supporting said threaded cone, said back portion further having a member fixed to said drive means whereby said plate, and said table, said bearing means, and said drive means are integrated into a single mechanical unit which does not tend to separate or spring apart responsive to forces applied for splitting said log.

4,898,221

METHOD FOR LIMBING, BARKING AND CHIPPING, AND A DEVICE FOR UTILIZATION OF THE METHOD

Kjell-Anders Eriksson, Fiskgatan 10, Leksand, Sweden S-793 00

PCT No. PCT/SE87/00155, § 371 Date Sep. 27, 1988, § 102(e) Date Sep. 27, 1988, PCT Pub. No. WO87/05852, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 25, 1987, Ser. No. 252,370
Claims priority, application Sweden, Mar. 27, 1986, 8601448
Int. Cl.[4] B27L *3/00, 11/00, 1/00*
U.S. Cl. 144—340 **10 Claims**



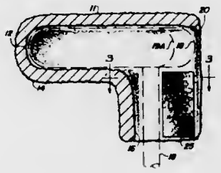
1. A method of barking, limbing and chipping a log which includes the steps of displacing a log linearly towards a chipper by means of feed rollers, shearing branches from the log by means of knife-like means pressed against a peripheral surface of the log at a location preceding the feed rollers and removing bark from the log at a location following the feed rollers by barking means having barking members pressed against the peripheral surface of the log by centrifical force to remove bark from the log by a cutting operation.

4,898,222

GOLF CLUB HEAD COVER

John H. Gaffney, 4429 E. Osborn, Phoenix, Ariz. 85018

Filed Jan. 12, 1989, Ser. No. 296,136
Int. Cl.[4] A63B *57/00*; B65D *65/02*
U.S. Cl. 150—160 **14 Claims**



1. A head cover for golf club irons or putters where the head is attached to the end of a shaft, said cover including in combination:

a first body portion made of flexible material and shaped to encase a golf club head having a toe and a heel, said first portion having a toe end and a heel end and being open on the heel end thereof;

a second body portion having first and second ends, with the first end thereof attached to said first body portion at the heel end thereof and at substantially right angles thereto for encasing at least a portion of the shaft of said golf club where it is attached to the head, said second portion being open on the second end and open on the side thereof adjacent the opening in said first portion to form a single continuous opening therewith in said cover; and

closing means comprising facing male and female fastener means located on on opposite sides of the inside of said second body portion adjacent the opening on the side thereof, for releasably closing the opening on the side of said second body portion to secure it around the shaft of a club, leaving the heel end of said first portion open when the head of such club is inserted into said first body portion, said shaft extending through the opening in the second end of said second body portion.

4,898,223

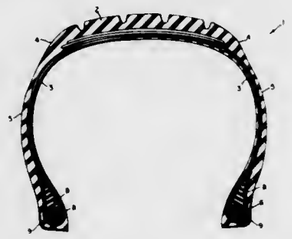
STIFF RUBBER COMPOSITION AND ARTICLES HAVING COMPONENTS THEREOF

Thomas J. Botzman, Stow, and Samuel P. Landers, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 30, 1989, Ser. No. 303,881
Int. Cl.[4] B60C *1/00, 15/00*; C08L *51/04*
U.S. Cl. 152—547 **14 Claims**

1. A rubber comprised of a sulfur cured blend of polyocte-

namer rubber, alkyl methacrylate grafted cis 1,4-polyisoprene rubber and at least one additional sulfur curable rubber se-



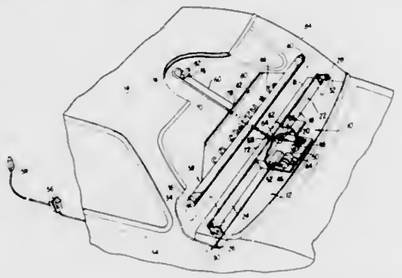
lected from natural rubber and synthetic rubber containing carbon-to-carbon double bond therein.

4,898,224

REAR WINDOW SHADE ASSEMBLY

Wesley L. Woodworth, 548 Wateroak Rd., Virginia Beach, Va. 23452

Filed Feb. 23, 1989, Ser. No. 314,521
Int. Cl.[4] E06B *9/20*
U.S. Cl. 160—310 **9 Claims**



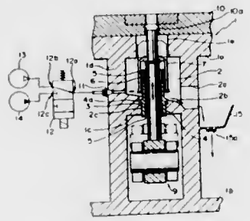
1. A rear-window shade assembly for an automobile comprising:
- a roll shade mechanism including a cylindrical drum with a thin shade wrapped thereabout, said drum having first and second support protrusions at opposite ends thereof, one of said support protrusions including a biasing means for returning said drum to a rolled up position when it is rotated away from the rolled-up position;
- a base having a length at least as long as said drum of said roll shade, said base including first and second shade brackets spaced from one another approximately the length of the drum, said first and second shade bracket being respectively engagable with said first and second support protrusions, said base having a relatively flat bottom and being shaped to be positioned at an elongated shelf behind a back seat of an automobile with the drum of said shade being aligned with said shelf;
- a crane arm extending upwardly from and being supported by, said base beside said shade mechanism, said crane arm including a guide means for guiding a cord extending from said base about an upper end portion of said crane arm back down to an outer end of said shade mounted on said shade drum while allowing said cord to move longitudinally, said crane arm including a means for allowing angular adjustment of the outer end thereof relative to said base so that said shade assembly can be mounted in a variety of car shops;
- a winch mounted on said base, said winch including a motor and a spool rotated by said motor, said spool having a cord wrapped thereabout, an outer end of said cord extending along said crane arm about its outer end portion and extending back to, and being attached to, said outer end of said shade;
- whereby, said motor assembly can be mounted in most cars and said motor can be driven to deploy and to retract said shade.

4,898,225

MOLD LUBRICANT EXHAUSTING APPARATUS FOR KNOCKING-OUT MECHANISM

Chieo Urata, Ishikawa, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP88/00329, § 371 Date Nov. 30, 1988, § 102(e) Date Nov. 30, 1988, PCT Pub. No. WO88/07420, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 31, 1988, Ser. No. 290,046
Claims priority, application Japan, Apr. 1, 1987, 62-49763[U]
Int. Cl.[4] B29C *33/44*
U.S. Cl. 164—158 **3 Claims**



1. A mold lubricant exhausting apparatus for a knockingout mechanism in which mold lubricant overflowed along a knock-out bar and accumulated in a bed is led into a reserving chamber formed around said knock-out bar to exhaust said mold lubricant through an exhaust port provided at said reserving chamber comprising:
- a nozzle disposed at an end thereof in said reserving chamber;
- an air pump connected to a base end of said nozzle for supplying air to said nozzle for forcibly exhausting said mold lubricant accumulated in said reserving chamber;
- a water pump for supplying water to said nozzle for cleaning the mold lubricant accumulated in said reserving chamber; and
- valve means for selectively connecting said water pump and said air pump to said nozzle.

4,898,226

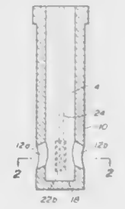
IMMERSION NOZZLE FOR CONTINUOUS CASTING OF STEEL

Toshio Teshima; Tooru Kitagawa; Mikio Sazaki; Toshi Masaoka; Takashi Mori, and Kazutaka Okimoto, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,018
Claims priority, application Japan, Jun. 1, 1987, 62-134941; Feb. 25, 1988, 63-042720
Int. Cl.[4] B22D *11/10*
U.S. Cl. 168—415 **6 Claims**

1. An immersion nozzle for continuous casting of steel, comprising:
- an immersion nozzle body having a bore for introducing molten steel supplied from a tundish into a continuous casting mold;

- two exit ports located symmetrically about the vertical center axis of said immersion nozzle body at a lower portion of said immersion nozzle body to introduce the molten steel into the continuous casting mold;
- gas blow-in inlets in an inwall of said immersion nozzle body, a center axis line of the gas blow-in inlets crossing, substantially at a right angle, a vertical plane passing through a line connecting the respective centers of the two exit ports;



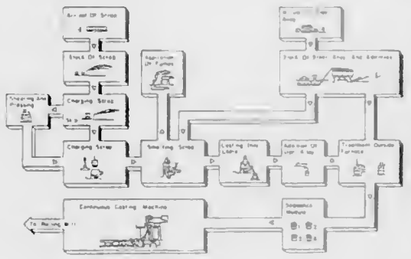
said gas blow-in inlets have a height substantially equal to a vertical diameter across said exit ports, the top of said gas blow-in inlets being from 0 to 100 mm above the upper end of said exit ports in an inwall of said immersion nozzle body; and
- gas blow conduits, each being connected respectively to one of said gas blow-in inlets.

4,898,227

PLANT TO CONVERT A METALLIC CHARGE INTO SEMIFINISHED PRODUCTS

Giampietro Benedetti, Campoformido, and Fulvio Fasano, Gorizia, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Division of Ser. No. 100,615, Sep. 24, 1987, Pat. No. 4,797,154. This application Oct. 24, 1988, Ser. No. 261,390
Claims priority, application Italy, Sep. 25, 1986, 83413 A/86
The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.
Int. Cl.[4] B22D *11/00, 11/14*
U.S. Cl. 164—417 **6 Claims**



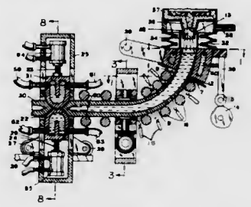
1. A system for the continuous conversion of metallic charge into semifinished products, comprising:
- an electric furnace for metling the metallic charge, having electrodes; and
- a preheating chamber for preheating the metallic charge, said chamber having first and second ends;
- a burner communicating with said chamber between its first and second ends;
- a terminal feed channel connected to said second end of said chamber, communicating with said furnace, for continuously feeding preheated charge materials into the furnace at a controlled and adjustable rate;
- a continuously functioning transformer communicating with said furnace to supply electrical power to the electrodes of said furnace;
- a tapping station, for tapping molten metal from said furnace;
- a casting station for the continuous casting of the molten charge, said casting station comprising a tundish and a continuous caster, said tundish being communicable with said continuous caster to feed molten metal, at a controlled rate, to the continuous caster;
- a refining station for refining molten metal, said refining station being positioned between said tapping and casting stations;
- first and second ladles for containing molten metal;
- a multi-functional manipulator for independently carrying the ladles between said tapping, refining and casting stations and for the simultaneous manipulation of said first and second ladles, comprising first and second rotatable arms, said arms being circumferentially and vertically traversable independently of each other, with said first arm carrying the first ladle and said second arm carrying the second ladle.

4,898,228

METHOD AND MEANS FOR SECTIONING CONTINUOUSLY CAST BILLET HAVING A MOLTEN CORE

Fred H. Wuetig, 7656 South Shore Dr., Chicago, Ill. 60649

Continuation of Ser. No. 425,335, Sep. 28, 1982, Pat. No. 4,815,520, which is a continuation of Ser. No. 200,936, Oct. 27, 1980, abandoned. This application Nov. 1, 1988, Ser. No. 265,564
Int. Cl.[4] B22D *11/126*
U.S. Cl. 164—460 **2 Claims**



2. The process of sectioning metal billet with a molten core comprising the steps of positioning a billet transversely extending across the path of travel of a ram having a blunt nosed configuration, and of closing said ram into contact with said billet and therethrough into contact with anvil means, thereby causing the walls of said billet to be pressed into contact and fused causing said billet to be sealed against leakage of said molten core as said walls are severed and said billet sectioned by said contact of said ram with said anvil means.

4,898,229

THERMOSTAT WITH INTEGRAL MEANS FOR DETECTING OUT-OF-PHASE CONNECTION OF A TWO-TRANSFORMER POWER SOURCE

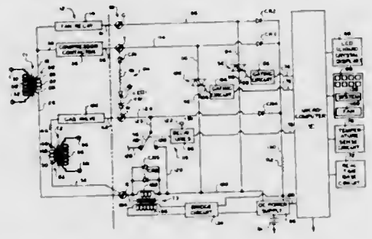
Bernard T. Brown, St. Louis, Mo.; Donald E. Donnelly, Glen Carbon, Ill., and Bartholomew L. Toth, Crestwood, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 22, 1988, Ser. No. 247,492
Int. Cl.[4] G05D *23/00*
U.S. Cl. 165—11.1 **8 Claims**

1. In a thermostat for controlling operation of heating and cooling apparatus, which apparatus includes a plurality of low-voltage operated devices and transformer means for energizing the low-voltage operated devices,
- a plurality of wiring terminals within said thermostat to

which the low-voltage operated devices and the transformer means are connected; and

circuit means connected between two of said terminals for detecting a voltage potential therebetween of approximately twice the normal operating voltage of said low voltage operated devices,



said detecting circuit means including a series connection of an LED and a voltage regulator, said voltage regulator being effective to break over and enable said LED to be illuminated when said voltage potential of approximately twice the normal operating voltage of said low-voltage operated devices exists.

4,898,230

AIR CONDITIONER WITH AN ENERGY SWITCH

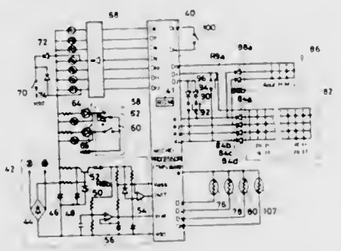
Yuji Tsuchiyama, and Masayuki Shimizu, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Continuation of Ser. No. 745,392, Jun. 14, 1985, abandoned. This application Nov. 17, 1987, Ser. No. 122,624

Claims priority, application Japan, Jun. 18, 1984, 59-125537; Jun. 18, 1984, 59-125539; Jun. 18, 1984, 59-91017[U]

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—12 **16 Claims**



1. An air conditioner with an energy saving switch, comprising:

a refrigerating system including compressor means, indoor heat exchanger means, expansion means and outdoor heat exchanger means connected in refrigerant flow relationship,

means for measuring a temperature of a room in which said indoor heat exchanger means is located to produce measured temperature data of the temperature of the room,

means for defining a temperature range from a first temperature to a second temperature which is higher than the first temperature so that a temperature to be produced by said refrigerating system can be set in said temperature range,

means for setting a temperature within said temperature range, which includes means generating set temperature data of the set temperature,

means for controlling an operation of said refrigerating system based on a comparison between the set temperature data generated by said means for generating temperature data and the measured temperature data produce by said temperature measuring means,

switch means,

means for changing said set temperature data in response to an operation of said switch means, said changing means including at least one of means for forcibly changing said set temperature data of the set temperature into temperature data corresponding to a third temperature only if the temperature set within said temperature range is within a first temperature subrange which exits between the third temperature and the second temperature when said refrigerating system is set in a heating mode and means for forcibly changing said temperature data of the set temperature into temperature data corresponding to a fourth temperature only if the temperature set within said temperature range is within a second temperature subrange which exists between the first temperature and the fourth temperature when said refrigerating system is set in a cooling mode,

said means for controlling including at least one of means for controlling an operation of said refrigerating system based on a comparison between said third temperature data and the measured temperature data produced by said temperature measuring means if the temperature set by said setting means is within said first temperature subrange in said heating mode and means for controlling an operation of said refrigerating system based on a comparison between said fourth temperature data and the measured temperature data produced by said temperature measuring means is the temperature set by said setting means is within said second temperature substrate in said cooling mode.

4,898,231

HEAT-PIPE SYSTEM AND METHOD OF AND APPARATUS FOR CONTROLLING A FLOW RATE OF A WORKING FLUID IN A LIQUID PIPE OF THE HEAT PIPE SYSTEM

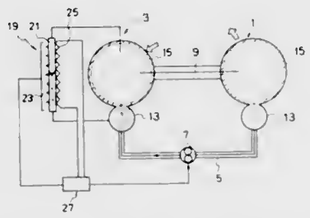
Yoshiro Miyazaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 913,389, Sep. 30, 1986, abandoned. This application Nov. 10, 1988, Ser. No. 285,311

Claims priority, application Japan, Sep. 30, 1985, 60-215140; Jun. 2, 1986, 61-125822

Int. Cl.[4] F28D *15/02*; F28F *27/00*

U.S. Cl. 165—13 **4 Claims**



1. A heat-pipe system which comprises:

an evaporator having a first capillary structure for evaporating a working fluid;

a condenser having a second capillary structure for condensing vapor evaporated in said evaporator into liquid condensate so as to return it to the evaporator through a liquid duct;

a vapor transport pipe communicating between vapor channels of said evaporator and said condenser for transporting the vapor evaporated in the evaporator;

a pump provided at the liquid duct for driving the working fluid therethrough;

sensor means for detecting the change in the amount of liquid in the capillary structure of the evaporator in accordance with the pressure difference between vapor pressure in the vapor channel and liquid pressure in the liquid channel of the evaporator; and

control unit means having a CPU, a ROM, and a RAM, connected between said pump and said sensor means for controlling the rotational speed of the pump in accordance with a detected signal from said sensor means so as to optimally control the amount of the liquid remaining in the capillary structure of the evaporator by controlling a flow rate of the liquid flowing through the liquid duct.

4,898,232

HEAT EXCHANGER AND PROCESS FOR PRODUCING THE SAME

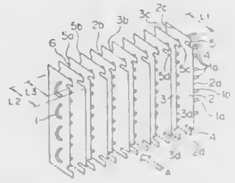
Izumi Ochiai; Masahiro Miyagi; Yoshio Nozawa, all of Tochigi, and Yukio Kitayama, deceased, late of Oyama, all of Japan (by Yuko Kitayama, Midori Kitayama, Takahisha Kitayama, successors), assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1988, Ser. No. 178,610

Claims priority, application Japan, Apr. 8, 1987, 62-84711

Int. Cl.[4] F28D *1/04*

U.S. Cl. 165—151 **10 Claims**



1. A heat exchanger comprising:

first and second types of fins stacked alternately with respect to each other;

each of first and second types of fins having notches in a direction perpendicular to a longitudinal direction of each said fin near longitudinal ends thereof;

widths of said first and second types of fins being equal at both longitudinal end portions of said first and second fins in outer areas defined by said notches thereof;

each of the first type of fins having a width at a portion between the notches greater than the width at the both longitudinal end portions thereof on the outer areas defined by said notches; and

at least one heat exchanger tube penetrating through the alternately stacked first and second types of fins.

4. A method of producing a heat exchanger comprising the steps of:

forming a plurality of rows of refrigerant-tube holes in a hoop;

forming lines of cutting which extend parallel to a direction of feed of said hoop at positions which are offset from the midpoint between adjacent rows of said holes, said lines of cutting having a length smaller than the longitudinal size of fins to be obtained;

forming slits or elongated holes in positions of said hoop to which the ends of said lines of cutting is to be extended, said slits or elongated holes having longitudinal axes extending in the direction crossing the direction of feed of said hoop;

cutting said hoop along a transverse line of cutting which extends in the direction crossing the direction of feed of said hoop past region between adjacent slits or elongated holes which oppose to each other in the direction of feed of said hoop, thus severing a group of fins having a plurality of fins of different types connected integrally;

stacking the successively severed groups of fins;

inserting refrigerant tubes into said holes in said fins and expanding said tubes so as to fix said tubes to said fins in the successive groups; and

cutting the stacked successive groups of fins at positions between adjacent rows of said holes and within the regions of said slits or said elongated holes.

4,898,233

HEAT EXCHANGE DEVICE USEFUL MORE PARTICULARLY FOR HEAT EXCHANGES BETWEEN GASES

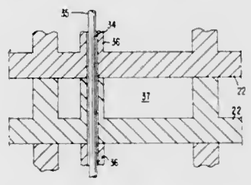
Alain Grehier, Paris, and Alexandre Rojey, Garches, both of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

Division of Ser. No. 855,034, Apr. 23, 1986, Pat. No. 4,771,826. This application Jul. 7, 1988, Ser. No. 216,466

Claims priority, application France, Apr. 23, 1985, 8506297

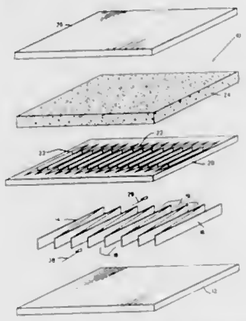
Int. Cl.[4] F28F *3/02, 3/08*

U.S. Cl. 165—166 **2 Claims**



1. A device for the exchange of heat between first and second fluids, one being relatively hot and other being relatively cold, comprising a heat exchange zone and intake and discharge means connected to sources of each of said fluids for letting fluid in and discharging fluid from the heat exchange zone, wherein said heat exchange zone comprises at least one block formed by juxtaposition of a plurality of solid, rectangular, heat exchange-block-forming plates extending parallel with one another with each plate having opposed faces and with one face of each plate being planar; at least some of the plates being provided on only one face with crenelated spacing elements extending parallel with respect to one another and in spaced relation with one another on the same plate and with other of the plates having continuously extending spacers on only one face thereof with all continuously extending spacers extending in parallel from one plate to an adjacent plate; said plates being formed and disposed so that for any two adjacent plates one of the faces on one plate is provided with said crenelated spacing elements and one of the faces on the other of said plates is provided with said continuously extending spacers; the crenelated spacing elements and continuously extending spacers, each having flat surfaces abutting the planar face on the adjacent plate; said exchange zone further comprising first end plates disposed perpendicularly to the exchange-block-forming plates and extending parallel to the direction of extent of the continuously extending spacers, the first end plates being provided with openings for intake and discharge of the first fluid into and out of flow spaces provided by the crenelated spacing elements and second end plates disposed perpendicularly to the exchange-block-forming plates and perpendicular with respect to the direction of extent of the continuously extending spacers, the second end plates being provided with openings for intake and discharge of the second fluid into and out of flow spaces provided by the continuously extending spacers, said juxtaposed plates forming the exchange block being held clamped between two flanges by tie-rods formed from rods threaded at their ends passing through the assembly of plates through openings provided with sleeves distributed in spaced relation over the whole surface of said plate.

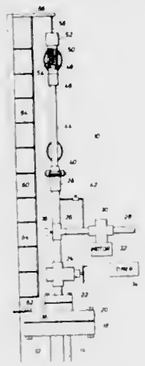
4,898,234
AIR HEAT EXCHANGER
Thomas McGovern, San Diego, Calif., and Robert B. Whitesides, Murrysville, Pa., assignors to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Aug. 19, 1988, Ser. No. 233,770
Int. Cl.[4] F28F 3/06, 3/12
U.S. Cl. 165—170 6 Claims



1. A heat exchange device providing a minimum pressure differential across the device and high heat transfer rates in the device, comprising:
- a plurality of inlet and outlet channels for receiving and exhausting respectively the flow of a heat exchange medium directed to the inlet channels,
- a plate-type structure located adjacent and in general parallel relation to the channels, said plate structure having a plurality of elongated orifices extending in the direction of and in registration with the inlet and outlet channels, each inlet and outlet channel having a corresponding orifice and,
- a heat exchange panel disposed adjacent the orifice structure and on the side thereof opposite that of the channels such that the medium entering the input channels travels through the inlet channels and through the orifices corresponding thereto to the heat exchange panel and then from the panel through the orifices corresponding to the outlet channels and then through the outlet channels.

4,898,235
WELLHEAD APPARATUS FOR USE WITH A PLUNGER PRODUCED GAS WELL HAVING A SHUT-IN TIMER, AND METHOD OF USE THEREOF
David J. Enright, Breaux Bridge, La., assignor to Vernon E. Faulconer, Inc., Breaux Bridge, La.
Filed Nov. 7, 1988, Ser. No. 267,992
Int. Cl.[4] E21B 43/00
U.S. Cl. 166—64 9 Claims

1. Wellhead apparatus for attachment to a gas well in which a reciprocating plunger has a large diameter dimension fitting in the tubing for repetitive travel along the production tubing string extending from the bottom of the tubing in the well to the wellhead, the apparatus comprising:
- (a) a transition tubing having an internal diameter size to fit about the plunger to contact the circumferential exterior of the plunger to guide the plunger for vertical movement therealong;
- (b) a tee serially connected with said transition tubing and having a side flow port for removing well production fluid flow therefrom;
- (c) a transverse shoulder above said tee;
- (d) a lubricator extension having a mating shoulder contacting said transverse shoulder and adapted to be joined thereto by a removable shoulder engaging connector; and wherein said tubing string, transition tubing tee, and lubricator extension define a plunger pathway;
- (e) an internally located and positioned plunger interceptor at the upper end of said lubricator extension;
- (f) first and second lateral gas flow lines, said second line connected above said first flow line to prevent pressure cushioning in said lubricator extension as the plunger enters thereinto;
- (g) a pivotal anchor suspending said lubricator extension above said shoulders and said anchor enables said lubricator extension to be moved to the side to open said tee and lubricator extension;



- (h) wellhead located support means above the tubing string and aligned with the tubing string to receive the plunger from the tubing string into said transition tubing;
- (i) a master valve serially connected above said transition tubing and having valve inlet and outlet means axially aligned and connected with said tee to enable the plunger to pass into said tee;
- (j) a union sub and a union nut for clamping said two shoulders together; and
- (k) resilient means mounting said interceptor for yielding in response to the plunger traveling through said lubricator extension in response to pressure drive moving the plunger upwardly against said interceptor.

4,898,236
DRILL STEM TESTING SYSTEM
David Sask, Calgary, Canada, assignor to Downhole Systems Technology Canada, Calgary, Canada
Filed Mar. 5, 1987, Ser. No. 22,128
Claims priority, application Canada, Mar. 7, 1986, 503613
Int. Cl.[4] E21B 49/08
U.S. Cl. 166—65.1 4 Claims

1. In a testing system for use in testing fluids in subsurface regions surrounding a wellbore, the testing system having an elongate housing insertable into the wellbore and a test flow channel formed in the housing for receiving test fluid from the test region and directing the test fluid through the interior of the housing, a test flow gating valve positioned in the test flow channel for regulating the flow of test fluid through the test flow channel, comprising:

means defining a test flow chamber in-line with the test flow channel;

a test flow valve member;

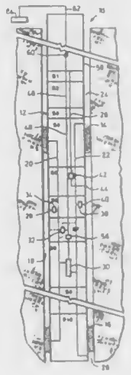
means mounting the test flow valve member in the test flow valve chamber for movement between an open position in which test fluids can flow through the test flow channel and a closed position in which test flow valve member obstructs the flow of fluids through the test flow channel;

biasing means for biasing the test flow valve member towards the closed position;

a fluid inlet channel formed in the housing and communicating with the exterior of the housing for receipt of wellbore fluid subject to ambient hydrostatic pressure and with the test flow valve member such that the ambient hydrostatic pressure can move the test flow valve member to the open position; and,

electrically-operable pressure gating valve means associated with the fluid inlet channel for regulating the application of the wellbore fluid under pressure to the test flow valve member, the pressure gating valve means comprising

a. means defining a pressure valve chamber, a high pressure port receiving the wellbore fluid subject to ambient hydrostatic pressure and communicating with the pressure valve chamber, a low pressure port communicating with the pressure valve chamber, and an outlet port for



placing the pressure valve chamber in communication with the test flow valve member;

b. a pressure valve member;

c. means mounting the pressure valve member in the chamber for movement between a high pressure position in which the pressure valve member obstructs the low pressure port and places the high pressure port in communication with the outlet port and a low pressure position in which the pressure valve member obstructs the high pressure port and places the low pressure port in communication with the outlet port;

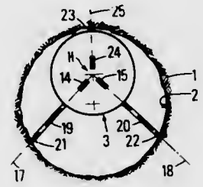
d. pressure valve biasing means for biasing the pressure gating valve member towards the low pressure position;

e. sink means for receiving wellbore fluid from the low pressure port; and,

f. electrically-operable pressure valve displacing means for displacing the pressure valve member from the low pressure position to the high pressure position.

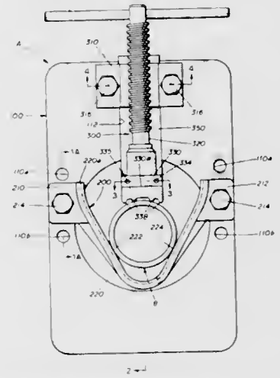
4,898,237
PROBE AND ITS MULTIDIRECTIONAL ANCHORING DEVICE IN A WELL
Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France
PCT No. PCT/FR87/00515, § 371 Date Aug. 24, 1988, § 102(e) Date Aug. 24, 1988, PCT Pub. No. WO88/05108, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 23, 1987, Ser. No. 257,309
Claims priority, application France, Dec. 24, 1986, 86 18258
Int. Cl.[4] E21B 47/00
U.S. Cl. 166—66 10 Claims

1. Device for anchoring a probe in a well, said probe having an axis disposed in parallel to an axis of the well and having a probe body means for supporting said device, the device includes at least two anchoring arms offset angularly with respect to each other relative to said axis of said probe and said arms disposed substantially at the same level as the probe, an outer wall portion of the probe body means next to a plane bisecting deployment planes of said anchoring arms, and being opposite the planes, is constructed so as to permit a firm direct



holding of said probe body means against walls of the well, and wherein said probe includes at least one direction-measuring element disposed in one of the deployment planes of said anchoring arms, said at least one measuring element being adapted to effect measurements in a direction of one of said deployment planes parallel to the probe axis and passing through one of the anchoring arms.

4,898,238
PIPE SUPPORTING DEVICE
Charles A. Grantom, 2712 Frank Rd., Houston, Tex. 77032
Filed Jun. 1, 1988, Ser. No. 201,488
Int. Cl.[4] E21B 19/10
U.S. Cl. 166—75.1 2 Claims



1. A device for vertically suspending a tube in a well bore, comprising:
- a base plate having a hole therethrough aligned with a well bore to allow the passage of a tube to be suspended in said well bore;
- a gripping jaw;
- a plurality of sets of jaw attachment means on said base plate spaced to enable selective placement of said jaw to accommodate a plurality of tubing diameters with at least one set of said attachment means on either side of said hole in said base plate;
- said jaw having an internal substantially V-shaped gripping surface which is sized to provide two points of contact with said tube and which is releasably attached to said base plate by means of said attachment means on said base

plate and is positioned to receive said tube in the interior of said gripping surface;

a gripping head slideably attached to said base plate which contacts said tube on the opposite side from said two points of contact between said gripping jaw and the tube to urge said tube into contact with said gripping jaw;

a threaded shaft pivotably connected at one end to said gripping head to apply force thereto in the direction toward said gripping jaw;

a threaded block on said base plate, having half threads which mesh with threads on said threaded shaft, through which said threaded shaft is screwed to apply force to said gripping head;

said half threads on said threaded block meshing with said threads on said threaded shaft around only about half of its circumference, allowing disengagement of said threads when said threaded shaft pivots about said end which is connected to said gripping head;

an alignment channel in said base plate the longitudinal axis of which is parallel to the central axis of said half threads; and

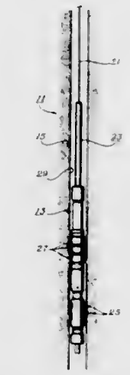
an alignment bar attached at one end to said gripping head, which slides in said alignment channel to restrict said gripping head to linear movement.

4,898,239

RETRIEVABLE BRIDGE PLUG

Wayne O. Rosenthal, Fort Worth, Tex., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 23, 1989, Ser. No. 314,388
Int. Cl.[4] E21B *33/129*
U.S. Cl. 166—133 **3 Claims**



1. A retrievable bridge plug apparatus for use in a well conduit, comprising:

(a) body means having first and second ends and an interior passage formed in said body means, said body means having first and second openings that allow communication between said interior passage and the exterior of said apparatus, said body means first end being adapted to receive setting means for setting said apparatus in said well conduit;

(b) gripping means for engaging and gripping said well conduit, said gripping means being disposed around said body means, said gripping means being extendable from a retracted position to an extended set position wherein said gripping means can engage said well conduit;

(c) first and second extending means for extending said gripping means, said first and second extending means being slidably disposed on said body means, said second extending means being located between said first extending means and said body means second end, said second extending means being prevented from moving toward said body means second end by a first locking means, said first locking means being retained in position relative to said body means by retaining means;

(d) packing means for engaging and providing a seal against said well conduit, said packing means being disposed around said body means and located between said first and second openings, said packing means being extendable from a retracted position to an extended set position wherein said packing means can engage said well conduit;

(e) first shoulder means located on one end of said packing means and second shoulder means located on the other end of said packing means, said first and second shoulder means being slidably disposed on said body means so as to move independently of each other, said second shoulder means being coupled to said first extending means;

(f) cover means for sealingly covering said first opening, said cover means being slidably disposed on said body means;

(g) said gripping means and said packing means being extended by moving said first shoulder means toward said body means second end such that said second shoulder means moves said first extending means closer to said second extending means and said first shoulder means moves closer to said second shoulder means;

(h) said first shoulder means being prevented from moving toward said body means first end by second locking means which is located between said first shoulder means and said body means;

(i) said cover means being movable toward said body means first end to uncover said first opening, wherein pressure can be equalized, said cover means then being movable toward said body means second end;

(j) tubular means located in said body means and being responsive to movement of said cover means toward said second end so as to engage said retaining means, wherein said retaining means is removed from said first locking means and said first locking means is released and said second extending means can move toward said body means second end;

(k) said cover means being movable back toward said body means first end, wherein said cover means moves said body means in the same direction as said cover means causing said first shoulder means, said second shoulder means, and said first extending means to move away from said second extending means allowing said packing means and said gripping means to retract.

4,898,240

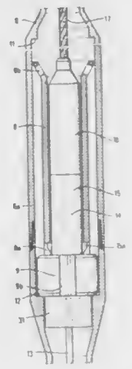
SYSTEM FOR MOVING A SET OF INSTRUMENTS AND A METHOD FOR MEASUREMENT AND/OR INTERVENTION IN A WELL

Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

PCT No. PCT/FR87/00520, § 371 Date Aug. 31, 1988, § 102(e) Date Aug. 31, 1988, PCT Pub. No. WO88/05109, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 30, 1987, Ser. No. 257,311
Claims priority, application France, Dec. 31, 1986, 86 18413
Int. Cl.[4] E21B *23/00, 47/00*
U.S. Cl. 166—250 **13 Claims**

1. A system for moving a set of measuring and/or intervention instruments in a well which is maneuverable remotely from the surface between a first position and a second position different from the first position, said system comprising a casing having one end located at the surface and another end located within the well and a body inside of which is placed support means for supporting said set of instruments, said body being connected to the another end of the casing and cooperating with said support means to provide movement of the support means relative to the body, said support means being limited in travel by means of two stops integral with said body and said support means being mechanically linked to said set of instruments by a connecting shaft; said system being devoid of reversible locking means between said support means and said body.

12. A method for effecting measurement and/or intervention in a well by remote control from the surface with a set of instruments wherein a system of movement having two positions is employed, said system being devoid of reversible locking means between a support means for the set and a body secured to a lower end of a casing, wherein said casing and said set is introduced into the well, said set being connected to a matching socket by an electrical connecting cable, said socket being integral with support means, a connection shaft equipped with an electrical connecting element being adapted to be



connected to the support means and to the matching socket being introduced into the well, said system being in a second position, said first position being located along the casing between the second position and said surface, said method being further characterized by exerting a pull on a suspension cable attached to said support means to bring the support means into the first position, said connecting shaft being under tension, then by immobilizing said set of instruments relative to a well of the wall while maintaining the pull on said suspension cable, then releasing the tension from the connection shaft and bringing said support means into second position before carrying out the measurement and/or intervention.

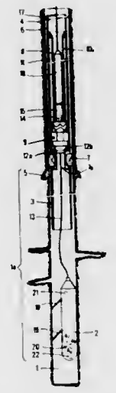
4,898,241

METHOD AND DEVICE FOR TAKING MEASUREMENTS AND/OR CARRYING OUT INTERVENTIONS IN A WELL SUBJECTED TO HYDRAULIC COMPRESSION

Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

PCT No. PCT/FR87/00521, § 371 Date Aug. 31, 1988, § 102(e) Date Aug. 31, 1988, PCT Pub. No. WO88/05110, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 30, 1987, Ser. No. 251,702
Claims priority, application France, Dec. 31, 1986, 86 18414; Dec. 31, 1986, 86 18417
Int. Cl.[4] E21B *34/14, 47/00*
U.S. Cl. 166—250 **13 Claims**

1. A method for carrying out measurements and/or interventions in a well having a first zone where hydraulic compression including hydraulic fracturing is effected and a second zone where the measurements and/or interventions are carried out, wherein a set on one or more measurement and/or intervention instruments is lowered into said well at the lower end of a casing, said compression zone being connected by the casing to hydraulic pressurization means, said set being connected to the surface by a cable located inside the casing and being mechanically isolated from the casing by an elastic link, characterized by controlling, at a point in the casing near said fracturing zone, any flow of fracturing fluid coming from or going to said fracturing zone, by means of a control element commanded at least partially by said cable from the surface,



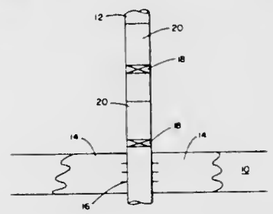
said control element being located at a level higher than said set and said fracturing fluid passing through said control element before reaching the fracturing zone.

4,898,242

METHOD FOR SUSPENDING WELLS

Alfred R. Jennings, Jr., Plano, Tex., and Paul Shu, Princeton Junction, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 890,679, Jul. 30, 1986, Pat. No. 4,817,719. This application Apr. 11, 1988, Ser. No. 179,728
Int. Cl.[4] E21B *33/13*
U.S. Cl. 166—285 **31 Claims**



1. A method for shutting in a well which minimizes formation damage comprising:

(a) placing into a formation a liquid solution sufficient to establish fluid flow into said formation which solution also minimizes fluid retention;

(b) pumping a solidifiable gel mixture into the productive interval of a formation via a wellbore where said mixture comprises

(i) water,

(ii) 0.2 to 5.0 wt. percent of a cross linkable polymer having at least one functional group selected from a member of the group consisting of an amine, an amide, a hydroxyl, or a thiol group, and

(iii) 0.02 to 50.0 wt. percent of a partially methylated aminoplast resin which cross links with said polymer;

(c) causing said gel mixture to become a solid thereby forming a gel plug within said wellbore and a formation gel within said formation sufficient to withstand environmen-

tal formation conditions and pressures which cause hydrocarbonaceous fluids to flow into said wellbore from the formation areas near said wellbore;

(d) placing in said wellbore on top of said plug an amount of cement sufficient to isolate said productive interval when said cement hardens while being supported by said plug; and

(e) allowing said cement to set which set cement in combination with said gel plug is competent to exclude production fluids from said wellbore.

4,898,243

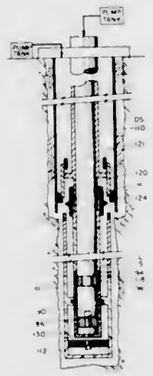
LINER AND DRILL PIPE ASSEMBLY

Hiram E. Lindsey, Midland, and Paul W. Cole, Odessa, both of Tex., assignors to Lindsey Completion Systems, Inc., Midland, Tex.

Filed Jan. 25, 1988, Ser. No. 147,533

Int. Cl.[4] E21B *23/00, 33/13*

U.S. Cl. 166—290 **7 Claims**



1. A method of cementing a liner in a well bore comprising the steps of:

making up sections of pipe to form a liner disposed in a well bore to a desired length of liner,

supporting the desired length of liner at the earth's surface while making up sections of drill pipe to form a desired string of drill pipe co-axially disposed within the desired length of liner where the desired string of drill pipe has a polished mandrel at its lower end and the desired length of liner has a sealing bore receptacle at its lower end which is disposed just above cementing equipment attached to the lower end of the desired length of liner,

when the polished mandrel is in position for sealing reception in the sealing bore receptacle, attaching a setting tool assembly to the desired string of drill pipe and attaching a liner hanger assembly with liner hanger slips to the desired length of liner, where the setting tool assembly and the liner hanger assembly are releasably interconnected while the polished mandrel is in the sealing bore receptacle, and where there is a hydraulically operated setting mechanism in the setting tool assembly for operating the liner hanger slips and a releasable pressure valve at the lower end of the desired string of drill pipe for use in developing hydraulic pressure for operating said hydraulically operated setting mechanism,

releasing the liner at the earth's surface and making up a supporting string of drill pipe attached to the setting tool assembly for lowering the co-axially disposed (telescoped) desired length of liner and desired string of drill pipe through the well bore to a desired liner location in the well bore,

hanging the liner in the well bore with liner hanger slips at a desired liner location in the well bore by applying hydraulic pressure to operate the setting tool and the step of applying an increased hydraulic pressure for releasing the pressure valve and opening the end of the drill pipe,

pumping a volume of cement slurry through the supporting string of drill pipe, the setting tool assembly and the desired string of drill pipe to a location below the sealing bore receptacle for injecting cement slurry into the annulus between the well bore and the desired length of liner, and

upon the trailing end of the volume of cement slurry reaching the lower end of the desired string of drill pipe, opening the interior of the desired string of drill pipe to the interior of the liner at a location above the sealing bore receptacle.

4,898,244

INSTALLATION OF DOWNHOLE PUMPS IN WELLS

John L. Schneider, Beech Wood Place, and Hugo M. Barcia, 18 Bremen Drive, both of West Hill, Skene, Aberdeenshire, United Kingdom

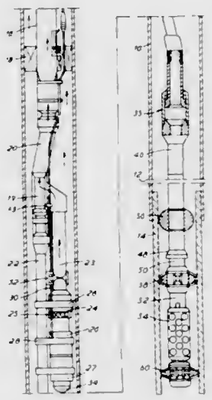
PCT No. PCT/GB87/00903, § 371 Date Aug. 12, 1988, § 102(e) Date Aug. 12, 1988, PCT Pub. No. WO88/04353, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 14, 1987, Ser. No. 235,891

Claims priority, application United Kingdom, Dec. 12, 1986, 8629746

Int. Cl.[4] E21B *43/116, 43/00*

U.S. Cl. 166—297 **20 Claims**



1. A method of installing a downhole pump in a well comprising the steps of running a tubing-conveyed perforator assembly, including a perforating gun, and a downhole pump down the well simultaneously by means of a tubing string, and firing the perforating gun in underbalanced conditions while absorbing transmission of resultant mechanical shock through the tubing string.

4,898,245

RETRIEVABLE WELL BORE TUBULAR MEMBER PACKER ARRANGEMENT AND METHOD

Britt O. Braddick, Houston, Tex., assignor to Texas Iron Works, Inc., Houston, Tex.

Continuation of Ser. No. 186,869, May 10, 1988, abandoned, which is a continuation-in-part of Ser. No. 7,786, Jan. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 912,320, Sep. 29, 1986, abandoned. This application Feb. 27, 1989, Ser. No. 314,158

Int. Cl.[4] E21B *23/08*

U.S. Cl. 166—387 **36 Claims**



1. A well bore tubular member retrievable packer arrangement for connection with either mechanically, hydraulically or wire line explosively actuated setting tool means retrievably supported on a setting string to sealably secure the packer arrangement with the well bore tubular member to communicate with a production string and which packer arrangement may be retrieved by a grapple tool supported on either coupled pipe, coiled pipe or a wireline comprising:

inner and outer tubular members;

said inner and outer tubular members each having an upper end;

connecting means adjacent the upper end of said inner tubular member for connecting said inner tubular member with the setting tool means;

said inner tubular member having a longitudinally extending, annular external surface adjacent its upper end;

adapter means supported by the retrievable setting tool means and surrounding said annular external surface on said inner tubular member;

securing means securing said inner and outer tubular members against relative movement as they are lowered into the well bore, said securing means releasable upon relative movement between said inner and outer tubular members;

packer means supported on aat least one of said tubular members and expandable into sealing engagement with the well bore tubular member upon relative longitudinal movement between said inner and outer tubular members;

slip means for engaging the well bore tubular member upon relative longitudinal movement between said inner and outer tubular members to secure the packer arrangement in expanded, sealed engagement with the well bore tubular member;

cooperating lock means on said inner and outer tubular members to lock said inner and outer tubular members in their longitudinally moved relationship to aid in maintaining said packer means secured in expanded, sealed engagement with the well bore tubular member;

disconnect means responsive to manipulation of the setting string for disconnecting the retrievable setting tool means and adapter from said inner tubular member whereby the setting tool means and said adapter may be withdrawn by the setting string to expose said external surface on said inner tubular member for sealably receiving the production string therearound; and

external grapple surface engaging means on the external surface of said outer tubular member for engagement by the grapple tool to retrieve the packer arrangement from the well bore tubular member.

7. A method of positioning a retrievable packer arrangement in a well bore tubular member by a setting string wherein the packer arrangement includes an inner tubular member connected with the setting string, an outer tubular member with external engageable release surface means adjacent its upper end and operable to release the set packer arrangement, packer means and slip means for sealably securing with the well bore tubular member, lock means to lock the packer arrangement in sealing relation with the well bore tubular member and which lock means can be unlocked by the external release surface means comprising the steps of:

releasably securing the inner and outer members against relative longitudinal movement;

manipulating the setting string to release the inner and outer members for relative longitudinal movement which moves the packer means and slip means into sealing and securing relationship with the well bore tubular member, positions the external engageable release surface means adjacent the upper end of the outer member for engagement and actuates the lock means to maintain the packer means and slip means in sealed and secured relationship with the well bore tubular member; and

releasing the setting atring from the inner member and removing the setting string from the inner member for retrieval from the well bore to position the external engageable surface means adjacent the outer member upper end for engagement .

4,898,246

QUICK RELEASE VALVE FOR SPRINKLER HEAD

Armin Riedle, Rathingen, and Horst Zientek, Kaarst, both of Fed. Rep. of Germany, assignors to Total Walther Feuerschutz GmbH, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 206,029

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1987, 3722233; Jul. 22, 1987, 3724215; Aug. 6, 1987, 3726120

Int. Cl.[4] A62C *37/14, 37/10, 37/08*

U.S. Cl. 169—38 **16 Claims**

16. A release element for thermal and/or electrical release of a fire-protection system, in particular a sprinkler system, where the release element formed from glass is filled to its bursting with a liquid, wherein the release element (1) comprises a cylindrical glass tube (2) with at thin wall thickness (3), which is closed at its upper end by means of a glass plug (4) and which is provided at its lower end with a plug (5) and a filler opening (6), which is hermetically closed by melting in its lower part (8) after the filling of the bursting liquid into the inner chamber (7),

wherein the plugs (4, 5) are respectively provided on the outer side with a tension element which solidly span around the plugs;

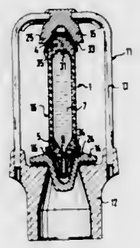
wherein the counter piece (15) and/or the closure piece (14) are formed as tension elements and where the counter piece (15) and/or the closure piece (14) respectively solidly surround the release element (1) with a collar (25);

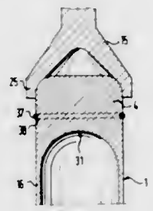
wherein the collars (25, 26) are extended up to the region of the cylindrical tube projection (10);

wherein the plugs (4, 5) are covered on their outer face with an elastic mass (35, 36), and where the pieces (4, 5) rest on the elastic mass (35, 36);

wherein the tension element is formed as a circular tension band (37) which is solidly clamped under tension in a groove (38) of the plug (4, 5);

wherein the tension band (37) is formed by an O-ring;
wherein the O-ring is comprised of a copper wire;





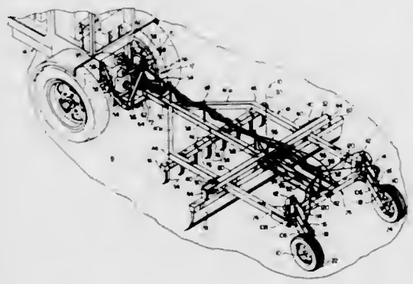
wherein the inner space (7) of the release element (1) exhibits at the upper end a semi-spherical shape (31) and at the lower end a funnel shape (32).

4,898,247

EARTH SCRAPER ATTACHMENT FOR A TRACTOR OR THE LIKE

Hendrix W. Springfield, Rte. #2, Box 250-1, Springtown, Tex. 76082

Filed Mar. 13, 1987, Ser. No. 25,730
Int. Cl.[4] E02F *3/76*
U.S. Cl. 172—799.5 **6 Claims**



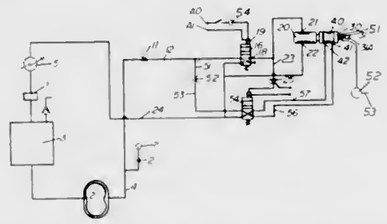
2. Earth scraping apparatus comprising:
a frame extending along an axis and having a forwardly disposed portion connectable to a vertically adjustable section of vehicle adapted to pull said frame, and a rearwardly disposed portion spaced apart along said axis from said forwardly disposed portion;
first and second frame support wheels;
connecting means for operatively connecting said frame support wheels to said rearwardly disposed portion of said frame on opposite sides of said axis;
wheel height adjustment means for selectively and independently adjusting the height of each of said frame support wheels relative to said frame;
earth scraping means, extending below said frame, for scraping the earth as said frame is moved by said vehicle; and
pivotal adjustment means for adjustably pivoting said earth scraping means relative to said frame about a generally vertically extending axis,
said earth scraping means including an elongated earth scraping blade disposed beneath said frame between said forwardly and rearwardly disposed portions thereof, and a blade support structure pivotally connected to said frame for rotation relative thereto about a generally vertically extending axis, said blade support structure being secured to said earth scraping blade,
said blade support structure being manually pivotable relative to said frame,
said pivotal adjustment means including locking means for manually locking said blade support structure in a selected manually pivoted position, and
said locking means including a chain secured to said frame, and a locking member carried by said blade support structure and insertable into a selected one of the links of said claim.

4,898,248

HYDRAULIC DEVICE

Owen R. Thompson, 1105 Colonel Anderson, Louisville, Ky. 40222

Filed Aug. 1, 1988, Ser. No. 197,520
Int. Cl.[4] B23Q *5/00*
U.S. Cl. 173—12 **1 Claim**



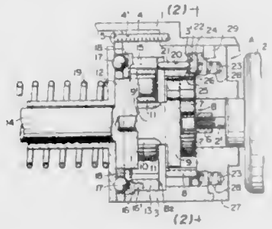
1. Apparatus for tightening rotatable fastener including: a source of pressurized fluid, to supply fluid at selected pressure, first multiple rotating actuator means adapted to rotate shaft means; socket means connected to said shaft means to receive said fastener element to be tightened; pressure switch means adapted to operate said first multiple rotating actuator means and rotate said shaft until fluid pressure provided by said source of pressurized fluid reaches a first pressure less than said selected pressure; switch means operable in response to the attainment of said first pressure, to supply said pressurized fluid to a second rotary actuator means and connect said second actuator means to said shaft means to rotate said shaft means through a portion of a full rotation at higher torque than provided by said first actuator means where said second rotary actuator means includes a tubular housing adapted to receive said shaft in generally central longitudinal alignment therein and vane means rotatable therein about said shaft between first and second limits in response to said pressurized fluid wherein ratchet means are provided to engage said vane and said shaft to rotate said shaft through a portion of a revolution when said vane is moved in a first direction and said vane is disengaged from said shaft when said vane is moved in a second direction; first and second pressurized fluid flow ports in said housing located so that admission of pressurized fluid to said first port and emission of said pressurized fluid from said second port rotate said vane in said first direction and admission of fluid through said second port and emission of pressurized fluid from said first port rotates said vane in said second direction; valve means operable in response to said pressure switch between first valve position to normally admit pressurized fluid to said second port and hold said vane at said first limit and second position to admit said pressurized fluid to said first port to move said shaft in said first direction.

4,898,249

ROTARY ELECTRIC TOOL

Toshitaka Ohmori, Saitama, Japan, assignor to Olympic Co., Ltd., Saitama, Japan

Filed Jul. 5, 1988, Ser. No. 215,553
Claims priority, application Japan, Aug. 5, 1987, 62-120940[U]
Int. Cl.[4] B23Q *5/12*; B25B *23/151*
U.S. Cl. 173—12 **19 Claims**



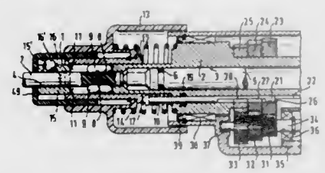
1. A rotary electric tool comprising a differential gear mechanism mounted within a gear case projections formed on the outer peripheral surface of an internal gear of a final planetary gear mechanism in the different gear mechanism, said projections being brought into engagement with a projection-formed surface of a torque adjusting cam, a spring for biasing said torque adjusting cam toward said internal gear by means of balls interposed between said spring and said torque adjusting cam, the internal gear and the torque adjusting cam being changed in relative position axially by a reaction force of the internal gear, the rotation of an output shaft being changed over between high and low speed conditions according to an axial displacement of the internal gear.

4,898,250

HAND-HELD TOOL WITH SWITCHING MEANS FOR VARIABLE OPERATION

Anton Neumaier, Sennerbergstr.; Uto Plank, Albert-Sigismund-Str., and Gerhard Rumpp, Schornstr., all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Dec. 17, 1987, Ser. No. 134,516
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3642776
Int. Cl.[4] E02D *7/02*
U.S. Cl. 173—48 **27 Claims**



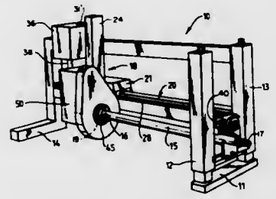
1. A hand-held tool comprises a housing having a front end through which a tool bit is inserted into an axially extending bore in a tool bit holder for receiving and holding different tool bits within said bore, and a probing means for determining the surface configuration of tool bits inserted into the holder for initiating a switching operation, wherein said probing means comprises at least one control element located within said housing in the region of said holder and being selectively displaceable transversely of the bore axis into the bore, a slide located within said housing coaxial with said bore, said slide arranged to abut against said control element in the axial direction of said bore when the control element is displaced laterally outwardly by a tool bit inserted into said holder and to extend axially over said control element when the control element extends radially inwardly of said slide into said bore, said probing means initiates the switching operation, one of mechanically, electrically or optically, said probing means comprises a switching member for selectively engaging one gear of a multi-stage gear train for the mechanically initiation of the switching operation.

4,898,251

EARTH BORING APPARATUS

Maxwell J. Clark, R.M.B. 7610, Reith Rd., Wangaratta, Victoria; Roy McMillan, and Frank J. Ogden, both of Wangaratta, all of Australia, assignors to Maxwell John Clark, Victoria, Australia

PCT No. PCT/AU87/00360, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988, PCT Pub. No. WO88/03221, PCT Pub. Date May 5, 1988
PCT Filed Oct. 23, 1987, Ser. No. 240,234
Claims priority, application Australia, Oct. 23, 1986, 64335/86
Int. Cl.[4] E21B *44/00, 3/02*
U.S. Cl. 175—27 **14 Claims**



1. An earth boring apparatus for driving a boring tool, the tool having a head for penetrating the earth and a longitudinally extending rotary drive shaft for advancing the head, the apparatus including a support frame, a carriage movably mounted to the support frame for movement therealong, said carriage being movable to advance the drive shaft and head relative to said frame to penetrate the earth and for retracting movement relative to the frame to enable a drive shaft extension to be fitted between the carriage and the drive shaft, a drive shaft engaging member associated with said frame and selectively operative to engage the drive shaft to inhibit rotation thereof thereby enabling the carriage to be retracted and the drive shaft extension to be fitted between the carriage and the drive shaft, said drive shaft engaging member including a roller for contacting the drive shaft, said roller having an axis of rotation extending generally transverse to the longitudinal direction of the drive shaft so that when said roller is engaged with said drive shaft rotational movement of the drive shaft is inhibited while longitudinal movement thereof is permitted.

9. An earth boring apparatus for driving a boring tool, the tool having a head for penetrating the earth and a longitudinally extending rotary drive shaft for advancing the head, the apparatus including a support frame, a carriage movably mounted to the support frame, said carriage supporting a drive shaft and a head attached thereto, said carriage being mounted

for advancing and retracting movement relative to the frame so as to enable a drive shaft to be driven and modified in length; advancing drive means for advancing the carriage and drive shaft, said advancing drive means including reaction means for sensing variations in earth resistance to penetration by the head, control means responsive to the penetration resistance sensed by said reaction means for controlling the operation of said advancing drive means to lessen the advancing force in response to increases in penetration resistance, said advancing drive means being mounted on the carriage and including a rotary drive bar for advancing the carriage, said reaction means including a mounting for said advancing drive means which is capable of limited pivoting movement relative to the carriage about an axis collinear with the rotational axis of the rotary drive bar in response to impeded movement of the carriage and continued operation of the advancing drive means, including rotary movement of the drive bar, said control means including a disabling switch operable in response to the limited pivoting movement of said reaction means to disable the advancing drive means.

4,898,252

CUTTING STRUCTURES FOR ROTARY DRILL BITS

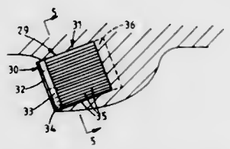
John D. Barr, Cheltenham, England, assignor to Reed Tool Company Limited, Gloucestershire, England

Filed Nov. 10, 1988, Ser. No. 269,780

Claims priority, application United Kingdom, Nov. 12, 1987, 8726541

Int. Cl.[4] **E21B** *10/56*

U.S. Cl. 175—379 **20 Claims**



1. A preform type cutting structure for a drag type rotary well drill bit, including a front layer formed of superhard material and having a rear surface and a front cutting face defining a cutting edge at one extremity of the layer of superhard material, and a backing structure formed of less hard material than said front layer, and at least a portion of the backing structure rearwardly of the cutting edge of the front layer being formed of a number of individual elements arranged one after another progressing crossways along the layer of superhard material, in a direction away from said cutting edge, and having means holding them in position such that, upon wear of the cutting edge and backing structure in use, the holding means of an element closest to the cutting edge and engaging the formation will eventually fail, causing detachment of that element from the backing structure, and thereby reducing the area of the backing structure in contact with the formation.

4,898,253

ELECTRONIC BALANCE FOR DOSING

Christian Oldenderf, Göttingen; Franz-Josef Melcher, Hardegsen, and Christoph Berg, Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 358,090

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1988, 3819075

Int. Cl.[4] **G01G** *19/62, 23/37*

U.S. Cl. 177—25.13 **2 Claims**

1. An electronic balance for dosing, with a measured value receiver (2), a digital signal processing unit (4,4'), a digital entry keyboard (13) for entering the theoretical value of a dosing, with a theoretical-weight memory (9) and with a digital display unit (5) with several positions after the decimal point, characterized in that switching means (8) are present which determine the highest-value decade in which a number

-28,0000
- 5,3102
- 0,2407
- 0,0083
- 0,0006

- 0,0002
- 0,0001
+ 0,0000
+ 0,0001
+ 0,0002

in the display (5) is not equal to zero and that these switching means (8) regulate the decoding (6) of the display in such a manner that all zeros to the left of this decade up to the units decade are represented as a small zero "o" whereas prezeros in the 10 decade, 100 decade, etc. are entirely suppressed in a known manner.

4,898,254

ELECTRONIC WEIGHING APPARATUS

Kensuke Fukui, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 19, 1989, Ser. No. 355,255

Claims priority, application Japan, Jul. 11, 1988, 63-172481; Jul. 13, 1988, 63-174616

Int. Cl.[4] **G01G** *3/14*

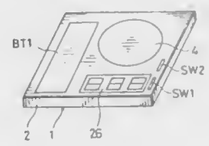
U.S. Cl. 177—210 C **29 Claims**

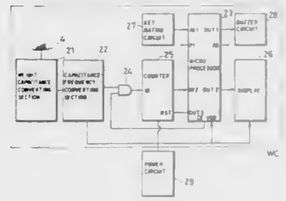
1. An electronic weighing apparatus for weighing a subject comprising:

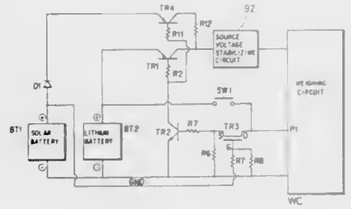
a weighing circuit which detects the weight of the subject by variation in capacitance, converts an oscillating output of an oscillating circuit corresponding to said variation into weight and displays the converted value on a display;

power supply means for supplying a driving current to said weighing circuit, said power supply means including a solar battery and a supplementary battery; and

switching means for effecting on-off control of electric current supply from said supplementary battery to said weighing circuit in accordance with the output voltage of said solar battery.







4,898,255

PLANAR LOAD CELL

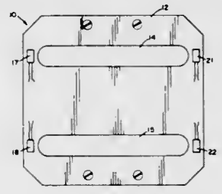
Ronald J. Gaines, Columbus, Ohio, assignor to Toledo Scale Corporation, Worthington, Ohio
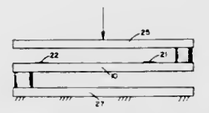
Filed Jan. 17, 1989, Ser. No. 297,176

Int. Cl.[4] **G01G** *3/14, 3/08;* **G01L** *1/22*

U.S. Cl. 177—211 **8 Claims**

1. Weighing apparatus comprising a plate having longitudinal and lateral axes and a lateral dimension providing a desired torsional stiffness, a pair of strain gauges mounted adjacent each lateral edge of the plate, the strain gauges of each pair being spaced apart and aligned longitudinally, and slots in the plate extending laterally between the strain gauges of each laterally opposite pair, said slots forming areas of stress concentration in the plate adjacent the strain gauges.





4,898,256

STAIR-CLIMBING WHEELCHAIR CARRIER WITH CRAWLERS

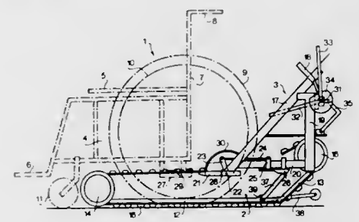
Max Lehner, Prambachkirchen, Austria, assignor to Sunwa Sharyo Manufacturing Co., Ltd., Tokyo, Japan

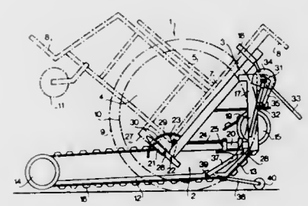
Filed Oct. 19, 1988, Ser. No. 259,651

Claims priority, application Austria, Oct. 20, 1987, 2764/87

Int. Cl.[4] **B62B** *5/02;* **B62D** *55/04*

U.S. Cl. 180—8.2 **23 Claims**





1. A crawler unit for coupling to a wheelchair and having a pair of power-driven tracks to be fitted between main wheels of the wheelchair, comprising:

a frame mounting said power-driven tracks;

an adapter for securing the wheelchair relative to said frame, said adapted including a coupling member for slidably mating with a complimentary coupling member on a wheelchair;

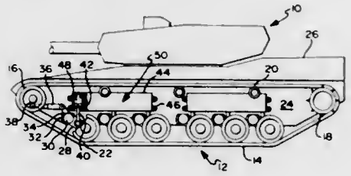
means mounting said adapter to said frame and permitting relative movement between said adapter and said frame;
lifting means connected to said frame and said adapter, and
actuating means connected to said lifting means for selective operation of said lifting means by an occupant of a wheelchair secured by said adapter to permit said occupant to selectively lift the wheelchair and adapter relative to said frame and to lift the frame and power-driven tracks relative to the wheelchair and adapter.

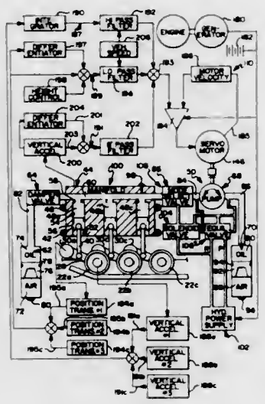
4,898,257

ACTIVE HYDROPNEUMATIC SUSPENSION SYSTEM

Jack M. Brandstadter, 1904 Cresthill Ave., Royal Oak, Mich. 48073

Filed Sep. 30, 1988, Ser. No. 251,676
Int. Cl.[4] B60G *17/04, 17/08;* B62D *55/112*
U.S. Cl. 180—9.1 **35 Claims**





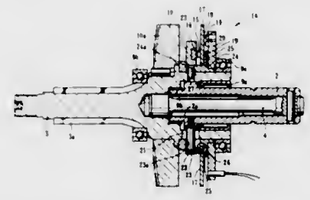
1. An active hydropneumatic suspension system for controlling the position of a mass having a first motion and supported relative to a movable reference having a second motion independent of the first motion and the mass being isolatable from the movable reference and subject to external force comprising:
support means including a series arranged hydropneumatic spring for producing a predetermined force to support the mass, servopump and hydropneumatic accumulator for receiving fluid from said hydropneumatic spring to isolate the mass from the movable reference;
said servopump having a fixed displacement and a variable velocity and the hydropneumatic accumulator varying in oil volume in accordance with the operation of said servopump for isolating and stabilizing the mass with respect to the movable reference;
a control system including detectors for sensing the first motion of the mass and the second motion of the movable reference and operative to control the velocity of the servopump to transfer fluid energy between the hydropneumatic spring and the hydropneumatic accumulator by transferring equal and opposite flow of energy from said hydropneumatic spring to said hydropneumatic accumulator substantially equal to the flow of energy caused by motion of said movable reference to adjust the force supporting the mass so as to maintain the predetermined force of the hydropneumatic spring and to transmit substantially zero dynamic force to the mass by the second motion of the movable reference thereby to increase the isolation of the mass from the action of the movable reference and to increase the stabilization of the mass when subject to external force.

4,898,258

ELECTRIC POWER STEERING APPARATUS

Takeshi Obe; Yoshiaki Taniguchi, and Hiroshi Nishikiori, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 314,180
Claims priority, application Japan, Feb. 29, 1988, 63-47110
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **11 Claims**



1. An electric power steering apparatus comprising:
a torsion bar;
an input shaft on a steering wheel side and an output shaft on a wheel side, said input and output shafts being coupled to each other by said torsion bar so as to be pivotally displaced in relation to each other;
an electric motor, coupled to said output shaft, for applying an auxiliary steering force thereto; and
detecting means for detecting a relative, pivotal displacement of said input and output shafts, wherein
main portions of said input and output shafts are coaxially arranged, one of said shafts is a cylindrical member having an outer end in which said torsion bar is housed, an inner end of said one shaft is pivotally inserted in an opening of a cylindrical inner end of the other shaft,
said detecting means is arranged on an outer surface of an outer shaft of said input and output shafts at an overlap portion thereof,
displacement transmitting means for transmitting a displacement of said one shaft to said detecting means is formed in the inner end of said one shaft so as to extend through said other shaft, and
said detecting means can obtain a relative, pivotal displacement of said input and output shafts from a displacement of said one shaft transmitted from said displacement transmitting means.

4,898,259

FOUR-WHEEL DRIVE APPARATUS FOR AUTOMOTIVE VEHICLES

Yuuki Fujitani, Toyota, and Kouji Kawakami, Ciryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 29, 1988, Ser. No. 174,817
Claims priority, application Japan, Mar. 31, 1987, 62-76401; Mar. 31, 1987, 62-76402; Mar. 31, 1987, 62-76403
Int. Cl.[4] B60K *17/352*
U.S. Cl. 180—250 **13 Claims**



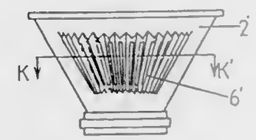
1. A four-wheel drive apparatus comprising a planetary gear unit for shifting, a shift changeover unit, a differential planetary gear unit and a transfer unit for transferring rotating power from one of a rear-wheel slide and a front-wheel side to the other,
wherein said shift changeover unit is arranged on a side of said planetary gear unit directed to an input shaft of the four-wheel drive apparatus, a carrier of said planetary gear unit is connected to a main output shaft, said differential planetary gear unit is arranged between said planetary gear unit and said transfer unit, the differential planetary gear unit includes a differential planetary ring gear coupled directly to said carrier of the planetary gear unit, a differential planetary carrier coupled directly to drive means of said transfer unit and e differential planetary sun gear coupled directly to an output shaft, and a rotating force outputted by said planetary gear unit is transferred to said rear-wheel side and said front-wheel side.

4,898,260

LOUDSPEAKER MOUNTING WITH INTEGRAL BACK WAVE FILTER AND WAVE MODULATING PLATE OF SAME DESIGN

Jimmy Fang, Monterey Park, Calif., assignor to Peter Tsung Hoes Fei, Costa Mesa, Calif.

Filed Feb. 11, 1988, Ser. No. 154,202
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—148 **15 Claims**



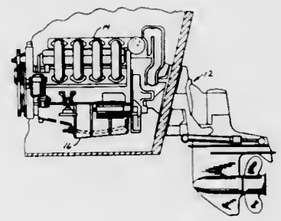
1. An improved loudspeaker located within a speaker cabinet, the loudspeaker comprising:
a speaker cone for generating sound waves; and
a filtering frame for reducing interference of said speaker cone from negative sound waves generated within said cabinet, said speaker cone being mounted on said filtering frame,
said filtering frame comprising:
a corrugated filter having a conically-shaped cross section with a plurality of apexes, said corrugated filter being substantially rigid and having a first and second side, and
a plurality of apertures located on said first side at corresponding apexes of said corrugated filter.

4,898,261

WATER COOLED PLASTIC OIL PAN

Arvid E. Winberg, Fond du Lac, and James N. Gavriles, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Apr. 10, 1989, Ser. No. 335,232
Int. Cl.[4] F01M *5/00*
U.S. Cl. 184—6.22 **13 Claims**



1. An oil pan for an internal combustion engine, said oil pan comprising a plastic member having an upper lip for mating with said engine in sealing relation, sidewalls depending downwardly below said lip, a bottom extending between said sidewalls below said lip to provide a closed-bottom receptacle for holding engine oil, a plurality of reinforcing walls integrally formed along said sidewalls and increasing the mechanical strength of same to enable said plastic oil pan to support said engine when the latter rests on said oil pan during installation or repair procedures,
wherein said reinforcing walls are external to said oil pan and formed along the exterior surface of respective said sidewalls and comprise a plurality of struts extending laterally outwardly from respective said sidewalls and extending from said upper lip downwardly along said sidewalls,
wherein said sidewalls extend downwardly below said bottom of said oil pan such that when said oil pan and engine rest on a given surface, said sidewalls support and space said bottom of said oil pan above said surface such that the weight of said engine is supported by said sidewalls of said oil pan, and wherein said struts extend along the exterior of said sidewalls to the bottom of said sidewalls and are tapered to have their narrowest width at the bottom of said sidewalls and their widest width at the top of said sidewalls at said upper lip.

4,898,262

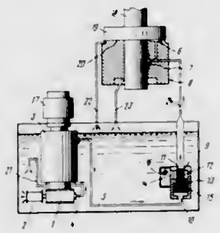
DECIVE FOR LUBRICATING HYDRODYNAMIC BEARINGS

Boris P. Gorodissky; Jury A. Lotts, and Lev N. Veretenov, all of Moscow, U.S.S.R., assignors to Moskovskoe Nauchno-Proizvod-stennoe Obiedinenie "Biophizpribor", Moscow, U.S.S.R.

PCT No. PCT/SU86/00114, § 371 Date Jun. 29, 1988, § 102(e) Date Jun. 29, 1988, PCT Pub. No. WO88/03612, PCT Pub. Date May 19, 1988
PCT Filed Nov. 10, 1986, Ser. No. 241,982
Int. Cl.[4] F01M *1/18, 11/10;* F16C *1/24*
U.S. Cl. 184—6.4 **3 Claims**

1. A device for lubricating hydrodynamic bearings, comprising a pump (1) for pumping oil from a tank (2) through a conduit (5) in communication with a delivery means which

supplies oil, with an operating or non-operating pump (1) to hydrodynamic bearings (8) on which a rotating shaft (18) is mounted, wherein the delivery means comprises a valve (9) having an inlet port (10), an outlet port (11), at least one auxiliary port (14) and a movable member (12) with an axial passage (13), through which the inlet port (10) is placed in communication with the outlet port (11) when the pump (1) is in operation, the valve (9) being mounted in the tank (2), so that at least the auxiliary port (14) is submerged in the oil, the movable member



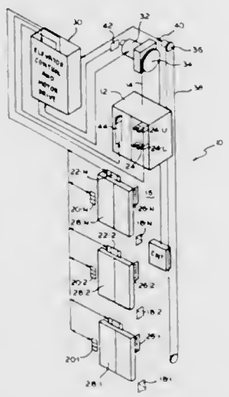
(12) with the pump (1) in operation is displaced to a first position, wherein the outlet port (11) is in communication with the inlet port (10) through the axial passage (13) through which oil is pumped into bearings (8) with the shaft (18) in rotation; and wherein the pump (1) is not in operation, the movable member (12) is shifted to a second position, wherein the outlet port (11) suction means at the bearings causes oil to be in communication with the auxiliary port (14) through which oil is sucked into the bearings (8) with the shaft (18) rotating.

4,898,263

ELEVATOR SELF-DIAGNOSTIC CONTROL SYSTEM

Bradley W. Manske, Moline, and John M. Weber, Milan, both of Ill., assignors to Montgomery Elevator Company, Moline, Ill.

Filed Sep. 12, 1988, Ser. No. 243,416
Int. Cl.[4] B66B *3/00*
U.S. Cl. 187—133 **13 Claims**



1. In an elevator control system operable to control movement of an elevator car in a hoistway, a diagnostic system comprising:

means for sensing the operative status of a plurality of preselected elevator operational characteristics, each said operational characteristics having a preselected error level;

means coupled to said sensing means for monitoring the operative status of such characteristics to determine if any of said operational characteristics are in a preselected error status; and

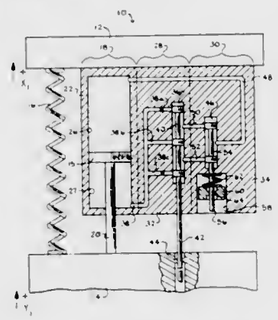
means responsive to said monitoring means for operating said control system to implement a desired action according to the error level of any operational characteristic which is in an error status as determined by said monitoring means.

4,898,264

SEMIACTIVE DAMPER WITH MOTION RESPONSIVE VALVE MEANS

Lane R. Miller, Fuquay-Varina, N.C., assignor to Lord Corporation, Erie, Pa.

Filed Apr. 3, 1989, Ser. No. 331,838
Int. Cl.[4] F16F *9/18*
U.S. Cl. 188—275 **16 Claims**



1. A system for attenuating the transmission of vibratory and shock forces between a supported member and a supporting member, comprising:

a semiactive damper assembly interconnecting said members, said damper assembly having variable volume chambers containing hydraulic fluid and being operable in accordance with a preselected control policy based in part upon the sign of the absolute velocity of said supported member;

fluid circuit means interconnecting said chambers of said damper assembly for at times dictated by said control policy permitting relatively free flow of said fluid between said chambers, and for at other times dictated by said policy significantly restricting the flow of said fluid between said chambers;

said circuit means including a flow-controlling valve assembly responsive to changes in said sign of said absolute velocity of said supported member;

said valve assembly including first and second cooperating and relatively movable valve members, said first one of said valve members being connected to and movable with one of said supported and supporting members;

a body having a large inertia;

resilient means connecting said body to said first one of said valve members such that said body remains substantially stationary during movement of said one of said valve members; and

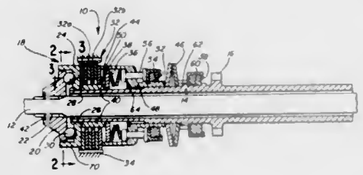
linkage means connecting said second one of said valve members to said body.

4,898,265

TORQUE LIMITER

Jeffrey D. Metcalf, Albion, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 27, 1988, Ser. No. 148,889
Int. Cl.[4] F16D *67/00, 43/20*
U.S. Cl. 192—8 R **14 Claims**



1. A torque limiter, comprising:

an input shaft;

an output shaft coaxial with the input shaft;

a ball ramp torque transmitting device concentrically disposed relative to said shafts and including a first cam plate splined to the input shaft for rotation therewith and a second cam plate splined to the output shaft for rotation therewith;

spring means axially of the ball ramp device for normally preloading the cam plates;

a friction brake assembly including brake components axially disposed between the ball ramp device and the spring means and operatively associated with the output shaft and the second cam plate in such a manner that in the event of jamming relative rotation of the input and output shafts will effect axial displacement of the second cam plate to actuate the friction brake assembly; and

pin means extending axially through the brake components of the friction brake assembly for transmitting preloading spring force to the second cam plate,

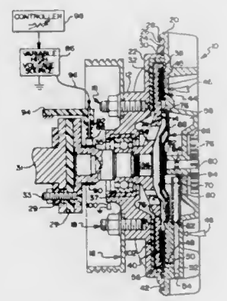
said pin transmitting means having at least a portion that radially overlaps with at least one of the brake components.

4,898,266

DOUBLE ELEMENT ELECTROVISCOUS FLUID CLUTCH

Wayne H. Garrett, Troy, and David A. Janson, Plymouth, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 27, 1989, Ser. No. 343,962
Int. Cl.[4] F16D *35/00, 43/25*
U.S. Cl. 192—21.5 **10 Claims**



1. An electroviscous fluid clutch comprising:

first and second members mounted for relative rotation about a common axis and defining cooperating shear surfaces forming an operating chamber therebetween;

means operative to circulate electroviscous fluid between said operating chamber and a storage chamber;

a passageway operative to interconnect said operating and storage chambers;

a source of high voltage potential; and

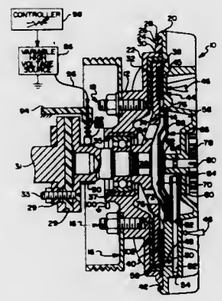
a plurality of electrodes in circuit with said source positioned to establish an electrostatic field within said passageway to selectively vary the characteristic viscosity of fluid flowing therethrough to modulate said circulating flow as a function of a sensed parametric input.

4,898,267

ELECTROVISCOUS FLUID CLUTCH

Wayne H. Garrett, Troy, and David A. Janson, Plymouth, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 27, 1989, Ser. No. 343,963
Int. Cl.[4] F16D *35/00, 43/25*
U.S. Cl. 192—21.5 **10 Claims**



1. An electroviscous fluid clutch comprising:

first and second members mounted for relative rotation about a common axis and defining cooperating shear surfaces forming an operating chamber therebetween;

means operative to circulate electroviscous fluid between said operating chamber and a storage chamber;

means operative to modulate said circulating flow as a function of a sensed parametric input;

a source of high voltage potential; and

a plurality of electrodes in circuit with said source positioned to establish an electrostatic field within said operating chamber to selectively vary the characteristic viscosity of fluid flowing therethrough.

4,898,268

PRINTER CIRCUIT BOARD POSITIONING APPARATUS

Yoshio Kamioka, Ota; Kazuhiro Hineno, Oizumi, and Tuneo Kanazawa, Oramachi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 3, 1987, Ser. No. 128,026
Claims priority, application Japan, Dec. 10, 1986, 61-190065[U]
Int. Cl.[4] B65G *21/20*
U.S. Cl. 198—345 **6 Claims**

1. A printed circuit board positioning apparatus comprising:

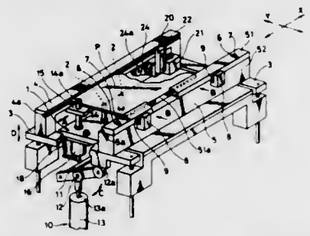
a table having a support member for supporting a printed circuit board;

guiding/transporting means on said table for guiding the printed circuit board as the circuit board moves in a flow direction over the support member and for transporting the circuit board onto the support member, said guiding/transporting means being formed for holding both end faces of the printed circuit board in a direction perpendicular to the flow direction;

first positioning means for positioning the printed circuit board in the direction perpendicular to the flow direction thereof by moving said guiding/transporting means;

a reference member; and

second positioning means for urging the printed circuit board towards the reference member in the flow direction of the circuit in response to a relative to approaching motion of the circuit board guiding/transporting means



toward said table before the printed circuit board is supported by said support member on said table, said first positioning means including an urging mechanism for moving said guiding/transporting means and which changes position in response to the circuit board urging in a direction perpendicular to the flow direction of the printed circuit board, said urging mechanism consisting of a plurality of rotary rollers, in each of which an eccentric position of a rotating shaft can be adjusted.

4,898,269

CLAMPING DEVICE FOR PALLETS

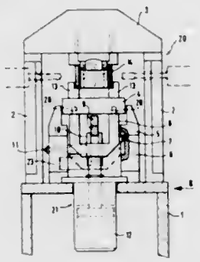
Helmut Hannig, Raisan-Buch, Fed. Rep. of Germany, assignor to Alfing Kessler Sondermaschinen GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 65,851, Jun. 24, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,877

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621604

Int. Cl.[4] B65G *47/00*

U.S. Cl. 198—346.1 **20 Claims**



1. An apparatus for positioning and clamping workpieces in a processing station, comprising:

(a) a processing station having a clamping device including alignment means for complimentarily engaging and aligning a workpiece to be processed in the processing station;

(b) a workpiece pallet for transporting a workpiece to said processing station, said workpiece pallet including a workpiece carrier for carrying the workpiece during transport to said processing station with the workpiece displaceably placed on the workpiece carrier so as to provide sufficient play to the workpiece being carried to enable the workpiece to engage and be aligned by said alignment means at the processing station;

(c) feed device means for conveying the pallet, workpiece carrier and workpiece to said processing station; and

(d) means at said processing station for lifting the pallet with the workpiece thereon so as to press the workpiece against and align the workpiece with the alignment means and thereby clamp the workpiece between the pallet workpiece carrier and the alignment means, for processing the workpiece in the processing station.

4,898,270

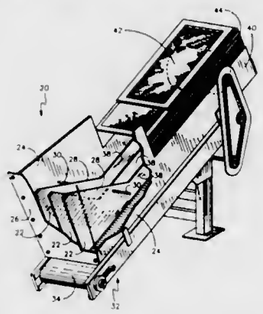
APPARATUS FOR ALIGNING AND TRANSPORTING CONTAINERS

Larry K. Hopkins, Lakewood; Gregory J. Fischer, and David G. Green, both of Wheatridge, all of Colo., assignors to Golden Aluminum Company, Lakewood, Colo.

Filed Sep. 18, 1987, Ser. No. 98,479

Int. Cl.[4] B65G *47/24*

U.S. Cl. 198—396 **19 Claims**



1. An apparatus for aligning and transporting containers, comprising:

(a) a hopper, said hopper having at least two substantially parallel stationary dividers forming hopper lanes for aligning containers about their longitudinal axes, said dividers having top surfaces, said top surfaces lying in substantially parallel vertical planes and declining from an end wall of said hopper, wherein each top surface has an angle of declination different from that of each adjacent top surface;

(b) conveyor means positioned under at least a portion of said dividers for transporting said aligned containers in a first direction to a first conveyor means end;

(c) movable deflector means spaced a first distance over said inclined conveyor means, said first distance equal to at least the width of said containers for deflecting any of said containers having at least a portion extending above said inclined conveyor means by more than said first distance, wherein said deflected containers are deflected down said inclined conveyor means; and

(d) wherein the center of said movable deflector means is approximately aligned with said first conveyor means end so that misaligned containers contacted and supported by adjacent leading aligned containers having a portion extending above said inclined conveyor means by slightly more than said first distance can be aligned as said aligned containers drop from said first conveyor means end prior to deflection of said misaligned containers by said movable deflector means.

4,898,271

METHOD AND DEVICE FOR SIGNALING OF A BACK-UP ON A CONTAINER CONVEYOR

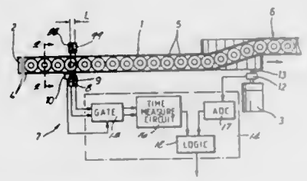
Hans Schleed, Pforzheim, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Oct. 10, 1985, Ser. No. 787,321

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 34383581

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—444 **6 Claims**



1. A device for detecting a back-up of bottles being transported on a conveyor, said device comprising:

means for projecting two beams from one to the other side of the path in which said bottles are transported on said conveyor through a measuring zone, said beams being directed at a level such that the beams are interrupted by a region in said bottles between the widest portion of the bottle and the mouth of the bottle,

detectors arranged on said other side of the conveyor in line with said beams, respectively, with a predetermined spacing between them, said detectors each producing a timing signal coincident with the leading edge of a moving bottle interrupting the beams consecutively,

signal processor means having input means for said signals and using the timing signals and spacing between beams to provide a signal representative of the transport speed of said bottles,

means for producing a signal representative of the speed of the conveyor and means supplying said signal to said processor means,

said processor means responding to existence of a predetermined relationship between said bottle speed and said conveyor speed signals by producing a signal indicative of a back-up.

4,898,272

CONVEYOR BELT SUPPORT MECHANISM

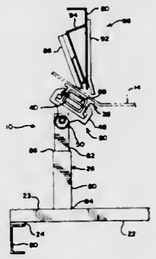
R. Todd Swinderman, Kewanee; Michael A. Bowman, Sheffield, both of Ill., and Larry J. Goldbeck, Camanche, Iowa, assignors to Martin Engineering Company, Neponset, Ill.

Filed Apr. 20, 1989, Ser. No. 340,870

Int. Cl.[4] B65G *15/60*

U.S. Cl. 198—841 **9 Claims**

1. A conveyor belt support mechanism comprising at least one vertical support disposed beneath said conveyor belt, at least one mounting member connected to said vertical support, at least one slider bar having a plurality of wear surfaces, each of which are adapted to be positioned in sliding supporting engagement under said conveyor belt, fastening means releasably securing said slider bar to said mounting member whereby said slider bar is readily removable and repositionable such that when one of said wear surfaces becomes worn beyond an acceptable limit said slider bar can be repositioned to place another wear surface in supporting engagement with said conveyor belt, and adjustment means associated with said mounting member and said vertical support for varying the position of said mounting member and said associated slider



bar with respect to said conveyor belt so as to compensate for wear to said wear surfaces.

4,898,273

PACKING FOR TRANSPORT OF PRODUCTS GIVING OFF MOISTURE

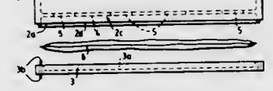
Cato Kristiansen, Rena, Norway, assignor to Renaco AS, Rena, Norway

Filed Jan. 21, 1986, Ser. No. 821,032

Claims priority, application Norway, Feb. 21, 1985, 850698

Int. Cl.[4] B65D *81/26*

U.S. Cl. 206—204 **5 Claims**



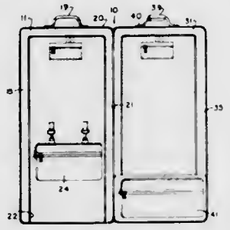
1. A packing assembly for storage and transport of fresh food products which give off moisture, such as fresh iced fish product and fresh meat products and the like comprising a box opening upwards and made from a liquid tight material with an upper lid, side and end walls, and a double bottom comprising an upper bottom member with drainage openings and a lower bottom member, and a moisture absorbent provided in a chamber between said bottom members where said absorbent is kept in place and is protected against mechanical strain, the upper bottom member of the box being raised in relation to lower edges of the side and end walls of the box to form said chamber having its opening facing fownward for insertion of a moisture absorbent, and the lower bottom member consisting of a chamber lid for closing said chamber with its content of absorbent, and said chamber lid being identically shaped with the upper lid for the box, and said side end end walls having lower and upper rims, and said lids being provided with an annular groove at one end face for engagement with the lower and upper rims of the box side and end walls.

4,898,274

DOUBLED HANGING GARMENT BAG

Darwin E. Stout; Robert C. Wilcox, and Charles A. Peloquin, all of Memphis, Tenn., assignors to The Trojan Luggage Company, Memphis, Tenn.

Filed Aug. 26, 1987, Ser. No. 91,399
Int. Cl.[4] A45C *5/12, 13/00, 13/10;* **B65D** *85/18*
U.S. Cl. 206—289 **8 Claims**



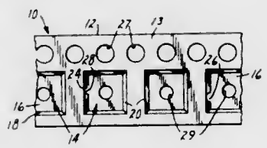
1. A foldable, doubled, hanging garment bag comprising:
an elongate, rectangular first garment bag formed by
a first outer side member having a predetermined generally rectangular configuration and top and bottom ends,
a first inner side member having a predetermined generally rectangular configuration congruent with that of said first outer side member,
a first peripheral gusset member joined with each of said first side members about the periphery thereof for defining with said first side members a contained volume for receiving garments,
first handle means secured to a face of said first outer side member opposite said first inner side member at a location approximately midway the height of said first outer side member for accommodating handling of said first garment bag in a folded condition, and
a first elongate row of closure teeth encircling the periphery of said first inner side member adjacent the junction of said first inner side member and said first gusset member; and
an elongate, rectangular second garment bag formed by
a second outer side member having a predetermined generally rectangular configuration congruent with that of said first outer side member and having top and bottom ends,
a second inner side member having a predetermined generally rectangular configuration congruent with that of said second outer side member,
a second peripheral gusset member joined with each of said second side members about the periphery thereof for defining with said second side members a contained volume for receiving garments,
second handle means secured to a face of said second outer side member opposite said second inner side member at a location approximately midway the height of said second outer side member for accommodating handling of said second garment bag in a folded condition, and
a second elongate row of closure teeth encircling the periphery of said second inner side member adjacent the junction of said second inner side member and said second gusset member,
said first and second elongate rows of closure teeth being sized and spaced for locking engagement thereof, and
slide means mounted on one of said first and second elongate rows of closure teeth for joining said teeth into a closed chain and thereby for joining said first and second garment bags together with said first and second inner side members adjoining and juxtaposed and said first and second handle means exposed on opposite faces of said joined garment bags,
whereby said first and second garment bags may be joined for handling as a single garment bag having two separate contained volumes for receiving garments.

4,898,275

NON NESTING COMPONENT CARRIER TAPE

Tom Skrtic, Eau Claire, Wis., and Timothy J. Justunen, Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Mich.

Filed May 25, 1989, Ser. No. 356,526
Int. Cl.[4] B65D *73/02, 85/30*
U.S. Cl. 206—330 **12 Claims**



1. A unitary flexible carrier tape comprising a strip like portion defining a top surface for said tape, and wall portions defining a multiplicity of similarly shaped pockets spaced along said tape and opening through said top surface, said wall portions comprising:
bottom wall portions,
side wall portions extending between said strip like portion and said bottom wall portions, said side wall portions including:
a majority of angled parts disposed at included angles of slightly greater than a right angle with respect to the top surface of said strip like portion so that said angled parts of said side wall portions converge toward the bottom wall portions, and
a minority of generally normal parts extending between said strip like portion and said bottom wall portions, said generally normal parts being disposed at included angles significantly closer to a right angle with respect to the top surface of said strip like portion than the included angles between said adjacent angled parts and said top surface to provide, with projecting parts of said bottom wall portions adjacent said generally normal parts, anti nesting shoulders for restricting entry of said side wall portions defining the pockets in one wrap of the carrier tape on a reel into the pockets in the wrap of carrier tape beneath it.

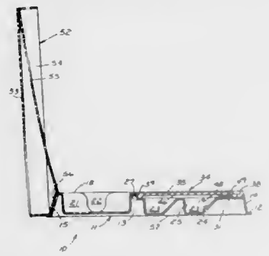
4,898,276

STORAGE AND DISPENSING BOX FOR SMALL COMPONENTS

Evangelos G. Georgakis, Downey, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Dec. 23, 1987, Ser. No. 137,812
Int. Cl.[4] B65D *83/10*
U.S. Cl. 206—369 **8 Claims**

1. A storage and dispensing box, comprising:
a base having generally parallel upper, intermediate and bottom surfaces joined by common spaced-apart sidewalls, the intermediate surface being positioned between the upper and bottom surfaces, being generally planar, and defining a plurality of open-top and downwardly closed cavities extending toward the bottom surface, said base having an elongated channel formed in at least one of said sidewalls, and
a closure panel having an elongated edge slidably engaged with the channel of the base to be movable into open and closed positions which respectively expose and cover the cavities, the closure panel having a bottom surface which rests on the base intermediate surface;
one of the base intermediate and panel bottom surfaces defining a projecting button, and the other of said surfaces defining a groove extending in the direction of elongation of said channel and said edge, and in the direction of panel



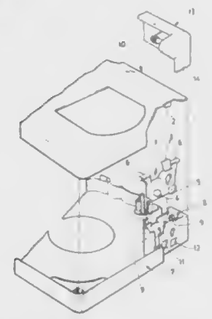
movement, said groove receiving the button, the groove having an end with a socket which receives the button when the panel is in the closed position, the groove having a shallowed portion adjacent said end and defining a detent whereby the panel is retained in the closed position and can be opened only by forcing the detent past the button.

4,898,277

COVER-LOCKING DEVICE FOR A VIDEO TAPE CASSETTE

Jae K. Ko, and Kyung H. Chung, both of Chungchongnam, Rep. of Korea, assignors to SKC Limited, Rep. of Korea

Filed Jan. 17, 1989, Ser. No. 298,344
Claims priority, application Rep. of Korea, Aug. 18, 1988, 88-13473
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 **1 Claim**



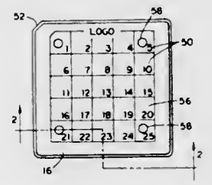
1. A cover-locking device for a video tape cassette including a half-down, a half-up, and a chamber formed at a front portion of said half-down at one end thereof, said cover-locking device comprising a cover-locking pin having a lock-releasing protrusion and an engaging protrusion, and a pair of shafts laterally protruding from opposite upper sides of said cover-locking pin for pivotably supporting said cover-locking pin on support members disposed in said chamber; said cover-locking device further comprising;
a push member integrally formed on an inner surface of said half-up of said tape cassette; and
an operating member formed on an upper portion of said cover-locking pin and protruding higher than said pair of shafts, said operating member being in contact with said push member when said cover-locking pin is supported on said support members.

4,898,278

STORAGE CONTAINER

Richard A. Leoncavallo, Pittsford; Linda J. Kover, Rochester, and Gregory R. Phillips, Penfield, all of N.Y., assignors to Nalge Company, Rochester, N.Y.

Continuation of Ser. No. 938,187, Dec. 5, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 212,269
Int. Cl.[4] B65D *85/20*
U.S. Cl. 206—443 **10 Claims**



1. A plastic container for holding an array of vials or other like articles comprising:
a base portion having a bottom wall, an upstanding peripheral wall extending from said bottom wall terminating at its upper end in a mating ridge portion;
a divider disposed within and secured to said base portion, said divider being spaced from said bottom wall of said base, said divider having a pluralityof openings each capable of receiving a vial or similar or other like articles, said divider having a retaining wall disposed around its periphery, said divider having on its upper surface indicia permanently affixed thereto and associated with each opening for identifying positions of each of said openings;
a top cover for placement on said base portion having a top wall, a peripheral outer wall extending downwardly from said top wall terminating at its lower end in a rim portion for mating with said ridge portion of said base portion and said outer retaining wall of said divider;
means for orienting said container so that said indicia on said divider is properly oriented for the user.

4,898,279

WARP-FREE PAPERBOARD SLAT

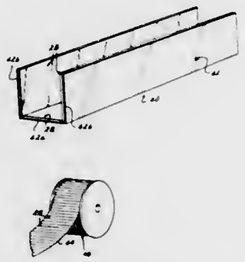
Kent A. Linnemann, Cincinnati, Ohio, assignor to Shippers Paper Products Company, Loveland, Ohio

Continuation-in-part of Ser. No. 946,858, Dec. 29, 1986, Pat. No. 4,771,885. This application Dec. 30, 1987, Ser. No. 139,472
Int. Cl.[4] B65D *65/02, 81/02*
U.S. Cl. 206—586 **2 Claims**

1. A structural channel for use in protecting the edge of a product to be packaged or shipped comprising a sheet of paperboard and a central and two side slats adhered thereto, said slats comprising a plurality of sheets of paperboard laminated to each other and the paper laminate being folded upon itself along a fold line with the facing sheets being adhered together and having a rounded edge along the fold line.

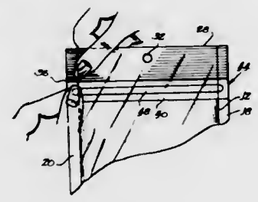
2. A wrapping material for use in protecting product to be packaged or shipped comprising a sheet of paperboard and a plurality of paperboard slats adhered thereto in substantially edge abutting relation, said slats comprising a plurality of sheets of paperboard laminated to each other and the paper laminate being folded upon itself along a fold line with the facing sheets being adhered together and substantially overlap-

ping one another to cause opposed planar faces along where it is laminated to itself, one of said opposed planar faces being



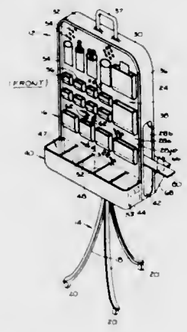
laminated to said sheet of paperboard, and said slat having a rounded edge along the fold line.

4,898,280
RECLOSABLE BAG
Heinz F. Runge, Niles, Ill., assignor to Kraft, Inc., Glenview, Ill.
Division of Ser. No. 186,886, Apr. 27, 1988. This application Mar. 1, 1989, Ser. No. 317,447
Int. Cl.[4] B65D *33/30*
U.S. Cl. 206—604 **2 Claims**



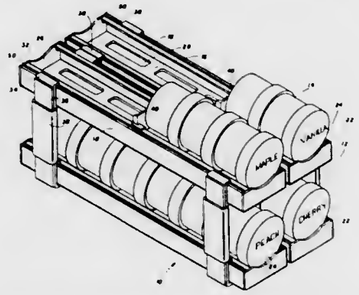
1. A reclosable bag comprising:
opposing walls having top and bottom edges extending between a pair of side edges;
a marginal seal of preselected width joining the top, bottom and side edges of said walls to form a product-receiving cavity therebetween, the marginal seal having an inner edge adjacent the cavity and an outer free edge;
a tear line along said walls between the side edges thereof, located adjacent the marginal seal of said top edge;
weakening means in the marginal seal of at least one side edge extending from a free edge of the marginal seal and formed along an edge of said tear line;
a metal strip segment on one side wall having a top edge spaced from the tear line and a pair of opposed ends adjacent each side edge terminating between the inner and outer edge of the marginal seal located thereat; and
a strip of sealing tape cooperating with said metal strip segment to encapsulate said metal strip segment, said sealing tape having a top edge adjacent said tear line so as to prevent migration of the tearing of said walls during opening of the reclosable bag into major portions of the walls; and
said opposing walls being flexible so as to be rollable about said metal strip segment, and said metal strip segment being bendable so as to reclose the opening in the bag formed by tearing the walls along said tear line, upon rolling the walls about the metal strip segment.

4,898,281
BEAUTICIAN'S CADDY
Sophia Cherry, 2539 W. 77th St., Chicago, Ill. 60652
Filed Dec. 27, 1988, Ser. No. 289,750
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—13 **12 Claims**



1. A beautician's caddy comprising,
a stand,
an upright panel unit having broad faces on opposite sides thereof, mounted on and carried by the stand, and positioned entirely thereabove,
the caddy being easily movable by a user, and
means detachably and demountably supporting beautician's articles on the panel in an arrangement distributed thereon in which each article is accessible to the user, independently of the others, by merely grasping and withdrawing it.

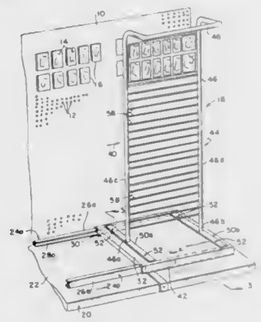
4,898,282
MERCHANDISE DISPLAY RACK
Rodney B. Hawkinson, 1919 Valencia St., Napa, Calif. 94558, and Julius A. Sarto, 383 N. Autumn St., San Jose, Calif. 95110
Filed Jul. 22, 1988, Ser. No. 223,101
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—49.1 **8 Claims**



1. A display rack for merchandise in containers comprising:
a slideway having a bottom panel, narrow upright side panels and inwardly directed side rails at the tops of said side panels;
said slideway having a front end and a rear end;
said side rails being spaced apart a distance to support a container;
a pair of pulleys at the front end of said slideway, each disposed adjacent one of said side panels;

an elongated, stretchable, thin, coiled tension spring secured at opposite ends thereof to the rear ends of said slideway;
said tension spring extending forwardly along one of said side panels, around both of said pulleys and back along the other of said side panels so that any extending and contracting movements of said tension spring are facilitated by said pulleys
a push plate,
a pair of outwardly disposed channel-like slide members carried on said push plate and slidably received on said side rails; and
mutually engageable stop means on said push plate and the front end of said slideway;
the portion of said tension spring between said pulleys extending slidably across the back of said push plate and free of attachment thereto.

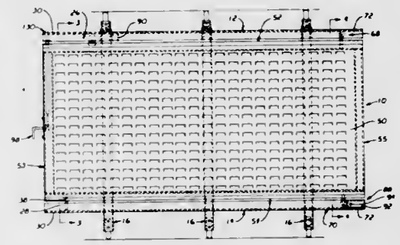
4,898,283
MOVEABLE DISPLAY RACK ASSEMBLY
Ted Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Filed Sep. 6, 1988, Ser. No. 241,161
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—57.1 **26 Claims**



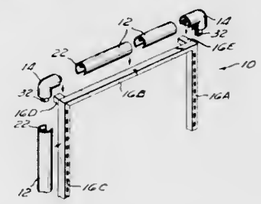
1. A movable pegboard display assembly for use with a fixed display wall and a stationary base positioned in front of and at a lower position with respect to the fixed display wall, said movable display assembly comprising:
upright rack means for supporting a plurality of articles thereon, said upright rack means including a lower end and an unsupported and unguided upper free end extending for a substantial height of said fixed display wall, said upright rack means including pegboard means for supporting the plurality of articles thereon;
trolley means for movably supporting said lower end on top of said stationary base; and
means for fixedly securing said lower end of said upright rack means on said trolley means.

4,898,284
STORAGE DEVICE
Richard F. Arens, 12110 Timberlake Rd., Riverview, Fla. 33569
Filed Jul. 8, 1988, Ser. No. 222,061
Int. Cl.[4] B60R *11/06*
U.S. Cl. 211—162 **15 Claims**

1. A storage device comprising a stationary support frame having a storage carriage slidably mounted thereon, said stationary support frame includes an upper and lower substantially horizontal support member each having a first and second support track formed thereon held in spaced relationship by a plurality of substantially vertical support members and an upper guide and a lower support element affixed to said upper and lower substantially horizontal support members respectively, said storage carriage includes a substantially vertical storage panel to support a plurality of storage containers thereon affixed between an upper and substantially horizontal carriage member having a first carriage track formed thereon and a lower substantially horizontal carriage member having a first and second carriage track formed thereon formed thereon and an upper and lower carriage element affixed to said upper and lower substantially horizontal carriage members respectively, said upper guide and lower support elements are disposed within said first carriage track of said upper and lower substantially horizontal carriage members respectively and said upper and lower carriage elements in offset relationship relative to each other in the vertical plane are disposed within said first and second support track of said upper and lower substantially horizontal support member respectively to limit lateral and rotational movement of said storage carriage as said storage carriage is moved between a retracted and extended position relative to said stationary support frame.



4,898,285
MERCHANDISE RACK COVERING SYSTEM
Frank P. Field, 854 Napoli Dr., Pacific Palisades, Calif. 90272
Filed Dec. 2, 1988, Ser. No. 279,207
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—183 **10 Claims**



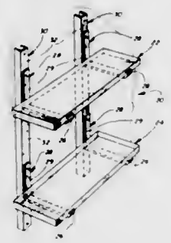
1. A covering system for a merchandise rack having a rack element comprising:
a cover element comprising an elongate tubular member having a first axial slot and a second axial slot extending along its length;
at least one corner element having a distal end in abutting relationship with said cover element and further comprising a generally L-shaped tubular member having an L-shaped slot extending along its length; and
spacer means extending within the interior of said cover element and said corner element, said first axial slot and said L-shaped slot frictionally engaging the rack element of the merchandise rack and said spacer means abutting said rack element when said cover element and said corner element are positioned upon said merchandise rack.

4,898,286

STORAGE SYSTEM AND CONNECTOR FOR THE SAME

Arthur A. Orlandi, 507 Shady La., North Barrington, Ill. 60010

Filed Feb. 19, 1988, Ser. No. 158,301
Int. Cl.[4] A47F 43/00
U.S. Cl. 211—187 **21 Claims**



1. In a system for storing various articles, a connector for supporting a shelf, or an upwardly extending article-supporting hook, in an elevated position, which connector comprises:

(a) an outwardly facing, generally vertical, support wall, said outwardly facing support wall defining a two-armed slot, said slot including first and second elongated arms extending away from each other from a common junction, said first elongated arm extending upward from said junction at a first predetermined acute angle to the horizontal, said second elongated slot arm extending downward from said junction at a second predetermined acute angle to the horizontal, the direction in which said second slot arm extends downward being a direction other than 180° to the direction in which said first elongated slot extends upward;

(b) a hanger having (i) a vertical arm connected to said outwardly facing support wall in the manner hereinafter described; and (ii) an outwardly extending member providing support for said articles to be stored, said hanger being positioned in front of and in contact with said support wall; and

(c) a downwardly extending hanger-supporting hook fixedly secured to said hanger, said hook having a generally horizontal shank and a free end portion, said hook free end portion extending downward from said shank in a direction that is substantially 180° to the direction in which said first elongated slot arm in said outwardly facing support wall extends upward, said hook free end portion being insertable in said first elongated slot arm, said hook shank extending from in front of said support wall, adjacent the end of said downwardly extending second slot arm that is remote from said slot junction, through said second elongated slot arm, said hook free end portion extending transverse to said second elongated slot arm to a position behind said support wall.

4,898,287

QUICK DISCONNECT BOOM MOUNT

John A. Blatt, 47 Willison, Grosse Pointe Shores, Mich. 48236

Filed Jul. 6, 1988, Ser. No. 215,743
Int. Cl.[4] B66C 23/70
U.S. Cl. 212—177 **4 Claims**

1. A quick disconnect boom mount comprising:

a first and a second block-like coupling member having respective end faces adapted to be seated in face-to-face engagement with each other when said coupling members are in a coupled position;

guide rods fixedly mounted in said first coupling member and projecting in spaced parallel relationship from said end face of said first coupling member;

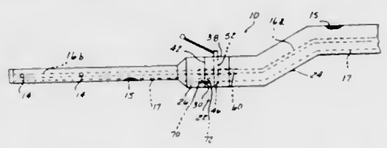
means defining guide rod receiving bores, corresponding in number to said guide rods, extending into said second coupling member from the end face of said second coupling member, along spaced parallel axes, said bores in said second coupling member being adapted to slidably receive said guide rods of said first coupling member, said guide rods and said receiving bores cooperating to guide said coupling members to and from said coupled position;

sealing means, disposed between said guide rods and said coupling members when said coupling members are in said coupled position;

means defining fluid passage bores extending longitudinally through said first and second coupling members and said guide rods in coaxial fluid communication with each other when said coupling members are in said coupled position;

electrical means extending longitudinally through said first and second coupling members;

connector means, disposed at said end faces of said coupling members, for connecting said electrical means in said first



and second coupling members when said coupling members are in said coupled position;

means defining a third bore in said second coupling member extending along a third axis normal to and offset from said parallel axes, said third bore intersecting one of said guide rod receiving bores;

a rotary locking member mounted within said third bore for rotation therein;

an eccentric cam portion on said locking member at the intersection of said third bore and said one of said guide rod receiving bores;

means defining a clearance recess in said locking member, diametrically opposed to said eccentric cam portion;

means defining a cam receiving recess in that guide rod receivable in said one of said guide rod receiving bores, said rotary member being rotatable within said third bore between a release position wherein said clearance recess is positioned to accommodate insertion or withdrawal of said guide rods into or from said guide rod receiving bores and a coupling position wherein said cam portion is engaged within said cam receiving recess to lock said coupling members in said coupled position.

4,898,288

SEMI-SUBMERSIBLE CRANE VESSEL

Robert J. Erdbrink, Leiden, Netherlands, assignor to Heerema Engineering Service BV, Leiden, Netherlands

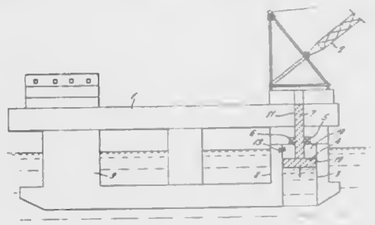
Filed Mar. 5, 1985, Ser. No. 708,441
Claims priority, application United Kingdom, Mar. 5, 1984, 8405689
Int. Cl.[4] B63B 39/03
U.S. Cl. 212—191 **7 Claims**

1. In a semi-submersible crane vessel having a heavy lift crane mounted on a working deck of the vessel, which working deck is supported by a plurality of columns which extend from a buoyant structure that is at least partly submerged, the combination of:

a chamber formed at least partly in two of said columns, each chamber having a longitudinal axis that extends vertically;

a vertically movable piston slidably arranged in each of said chambers, with each chamber being open to sea water below its respective piston;

independently controlled power-operated means on the vessel directly connected to each piston to effect vertical movement of the pistons in opposite directions within their respective chambers to alter the buoyancy of the



vessel and thereby rapidly compensate for variations of load carried by the crane whereby said vessel is maintained substantially level during operation of the crane; and

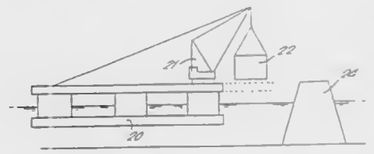
valve means that admit air into said chambers above said pistons.

4,898,289

METHOD OF HANDLING A LOAD WITH A CRANE VESSEL HAVING MOVABLE LOAD SUPPORTS

Wietse J. van de Wetering, The Hague, Netherlands, assignor to Heerema Engineering Service BV, Leiden, Netherlands

Filed Aug. 8, 1988, Ser. No. 229,315
Claims priority, application United Kingdom, Aug. 7, 1987, 8718768
Int. Cl.[4] B66C 23/52; B63B 27/00
U.S. Cl. 212—270 **1 Claim**



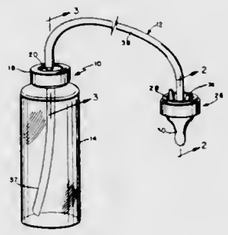
1. A method of using a crane vessel of the kind having at least one heavy lift crane operable in a working position to lift and lower loads clear of the vessel over a side or an end of the vessel, comprising the steps of picking up a load using the crane in its working position, positioning support means on the vessel in a load carrying position in which the support means is directly beneath the crane in its working position and is supported vertically at least partly by the vessel, lowering a load onto the support means, transporting the vessel to an installation site with the load on the support means, picking up the load from the support means at the installation site, removing the support means from its load carrying position, positioning the vessel adjacent the installation site and depositing the load at the installation site the load using the crane in its working position.

4,898,290

CONVERTIBLE BABY FEEDING BOTTLE

Prudente G. Cueto, 13617 Paseo Cardiel, San Diego, Calif. 92129

Filed Jul. 11, 1988, Ser. No. 216,510
Int. Cl.[4] A61J 9/00, 11/04
U.S. Cl. 215—11.1 **15 Claims**



1. A baby feeding bottle assembly, comprising:

a bottle having an open end, a first, interengageable formation on the open end of the bottle;

a cap having an opening, a second formation on the cap comprising means for releasable mating engagement with said first formation for releasably securing the cap to the bottle;

tubular fluid conducting means extending from the interior of the bottle through the cap opening for conveying fluid out of the bottle, the fluid conducting means including an external flexible tube extending from the cap member outside the bottle; and

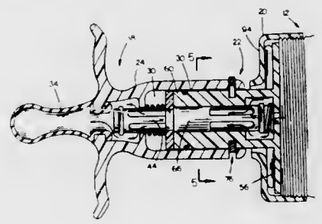
a nipple assembly for mounting at the free end of the external flexible tube, the assembly including an adapter member having connector means for securing the adapter member to the free end of the tube, a nipple, and a retainer ring for selectively securing the nipple to the adapter member or to the open end of the bottle, the retainer ring and adapter member having co-operable mating third and fourth formations, respectively, for releasable mating engagement to secure the nipple to the adapter member, the third formation being identical to the second formation on the cap and the fourth formation being identical to the first interengageable formation on the open end of the bottle to allow the retainer ring to be releasably secured to the adapter member or bottle, the adapter member having a through bore connecting the tube to the nipple.

4,898,291

NURSING BOTTLE WITH REMOVABLE PACIFIER

John C. Sailors, 3511 Pine St., Omaha, Nebr. 68105

Filed Mar. 29, 1989, Ser. No. 331,515
Int. Cl.[4] A61J 9/00
U.S. Cl. 215—11.4 **7 Claims**

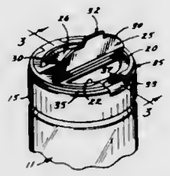


1. A nursing bottle, comprising:

a bottle portion having a lower end and an open upper end;

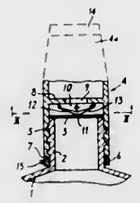
a cap removably mounted on the upper end of said bottle portion to retain fluid therein;
said cap having a removable pacifier portion thereon;
said cap having a first valve means therein operable between an open position, wherein fluid within the bottle is allowed to flow therethrough, and a closed position, wherein fluid within the bottle is sealed therein;
said first valve means including biasing means for biasing said first valve into the closed position when said cap is removed from said pacifier portion;
said pacifier portion including a body having a bore therethrough to allow the flow of liquid;
a resilient nipple mounted on the upper end of said body, in communication with said bore, to receive fluid therein;
said nipple having a feeding opening therein;
said pacifier portion having a second valve means operably mounted within said bore and operable between an open position, wherein fluid is prevented from flow therethrough, and a closed position, wherein fluid is prevented from flowing therethrough;
said pacifier being selectively releasably connected to said cap;
said first valve means being cooperable with said second valve means such that said valve means are in the open position when said pacifier portion and cap are connected, and such that said valve means are in the closed position when said pacifier portion and cap are disconnected.

4,898,292
CONTAINER CLOSURE WITH HINGED FLAP
Gordon E. VerWeyst, Rockford, Ill.; Charles E. Burk, Beloit, Wis., and Douglas E. Pherigo, Loves Park, Ill., assignors to J. L. Clark, Inc., Rockford, Ill.
Filed Jan. 17, 1989, Ser. No. 297,053
Int. Cl.[4] B65D *51/18*
U.S. Cl. 215—237 **11 Claims**



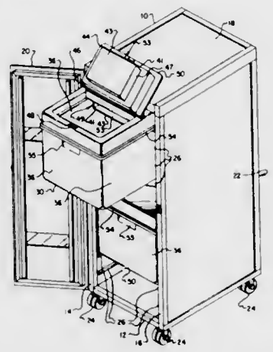
1. A one-piece container closure molded of resiliently yieldable plastic, said closure comprising a generally horizontal platform formed with a vertically extending dispensing opening, a closure flap, a hinge extending across said platform and supporting said flap to swing upwardly and downwardly between open and closed positions relative to said dispensing opening, said flap lying in face-to-face relation with said platform when in said closed position, said flap having a free edge extending around said flap from one end of said hinge to the other end thereof, a lift tab projecting outwardly from said free edge approximately midway along the length of said free edge to facilitate swinging of said flap to said open position, ribs upstanding from said platform and shielding the free edge of said flap when said flap is in said closed position, said ribs having adjacent ends which are spaced from one another to define a space between said ribs for said lift tab, said lift tab having side edges located adjacent the ends of said ribs, and means on the ends of said ribs and coacting with the side edges of said lift tab to hold said flap releasably in said closed position.

4,898,293
CLOSING DEVICE FOR CONTAINERS
Simone Morel, Montmirail, France, assignor to Societe de Conseils et D'Etudes Des Emballages S.C.E.E., Dammartin en Goele, France
Filed May 25, 1988, Ser. No. 202,572
Claims priority, application France, May 25, 1987, 8707347; Oct. 28, 1987, 8714953
Int. Cl.[4] B65D *41/50*
U.S. Cl. 215—250 **17 Claims**



1. A closing device for a container in which a cap is put in position on a neck of the container, said neck defining a mouth sealed by a membrane, said cap comprising a side wall surrounding said neck and engagement means for engaging the neck of said container and opening and closing said container, a perforation member mounted in the vicinity of said membrane and carried by a partition of the cap, said partition having at least one hole therethrough, said perforation member being provided for folding back said membrane toward an inner surface of said neck side wall, and control means for controlling the position of said perforation member so that said perforation member occupies a first position in which it cannot act on the membrane and at least a second postion in which said membrane is broken and folded back by said perforation member in order to provide free communication between said container and inside of said cap.

4,898,294
FROZEN FOOD CONTAINER FOR AIRCRAFT USAGE
Gary K. Jennings, 2428 Forest Brook La., Apt. 1104, Arlington, Tex. 76011
Filed Aug. 31, 1988, Ser. No. 238,397
Int. Cl.[4] A47J *41/00*
U.S. Cl. 220—3.1 **2 Claims**



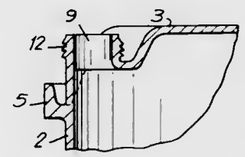
1. A frozen food container for use in conjunction with a wheeled cart of the type utilized in food service on a commercial aircraft and characterized by opposed side walls having opposed shoulders which support food and beverage trays and open containers within the interior of the cart, comprising:
thermal insulating material positioned between an interior and exterior shell forming a bottom wall, opposed end walls, opposed side walls and a top wall;
the top wall including an insulated lid pivotally supported on the top wall and including means for normally retaining the insulated lid in a closed condition; and
opposed shoulders extending outwardly from the exterior of the side walls of the container and adapted to engage the shoulders of the wheeled cart to support the container therein, whereby the container is transported along the aisles of the aircraft and is adapted for withdrawal from the cart to facilitate opening of the insulated lid of the top wall to provide access to frozen food items within the container for service to aircraft passengers.

4,898,295
SPIN WELDED, TAMPER-PROOF, RESEALABLE THERMOPLASTIC CONTAINER
Dae Sik Kim, 49 Floral Street, Newton, Mass. 02161
Filed May 3, 1988, Ser. No. 189,638
Int. Cl.[4] B65D *6/00*
U.S. Cl. 220—66 **12 Claims**



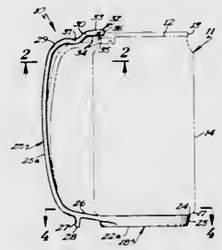
1. A tamper-proof, resealable container comprising:
an open-top cylindrical container including a circular opening proximate a first end of said container;
holding means, including three radially symmetrical legs, disposed on a second, closed end of said container for preventing rotation of said container about its central axis;
a cap having a circular base for forming a spin welded joint with the circular opening of said container;
said cap also including a predetermined part opposite the base of said cap which provides an opening upon removal and becomes a tight fitting resealable closure for said opening when reversed, said predetermined part comprising a cylindrical base having an outside dimension substantially identical to the outside dimension of the cap around said opening, and a cylindrical plug having an outside dimension substantially identical to the inside dimension of said opening;
means, located proximate the bse of said cap, for holding said cap from rotating about its central axis, said means for holding said cap from rotating including means for storing said predetermined part when removed from the dispenser cap; and
means for aiding removal of said predetermined part from said cap.

4,898,296
BUNGED VESSEL
Märten Burgdorf, Heimerzheim; Wilhelm Kühne, Wiesenbach, and Udo-Hermann Mans, Bammental, all of Fed. Rep. of Germany, assignors to Manser-Werker GmbH, Bruhl, Fed. Rep. of Germany
Filed Apr. 7, 1988, Ser. No. 178,678
Int. Cl.[4] B65D *1/20*
U.S. Cl. 220—72 **4 Claims**



1. In a bunged vessel of thermoplastic material having a shell, head and bottom ends and transport rings formed in one piece with the shell and arranged in the region of the head and bottom ends, the shell having a generally cylindrically shaped portion extending between the ends of the vessel and one of the transport rings being disposed at the juncture of the shell and head end and extending around the shell and having a first portion extending radially outwardly of the cylindrically shaped portion of the shell and a second vertically extending portion at the radial outer end of the first portion, and bungs disposed below the uppermost surface of the head end and defining bung holes disposed in the head end, the improvement characterized in that at least one of the bungs is disposed laterally outwardly of the head end with the interior and exterior wall surfaces thereof flush with the interior and exterior wall surfaces of the cylindrical portion of the shell of the vessel at the laterally outward end of a common diameter of the bung hole and cylindrical portion of the vessel and in that said at least one bung is threaded, and any wall surface of the cylindrical shell part of the vessel or extension thereof bounding the bung is also threaded.

4,898,297
DETACHABLE HANDLE AND COASTER FOR A BEVERAGE CONTAINER
Charles L. Wheeler, 1912 - 13th St. South, St. Cloud, Minn. 56301
Continuation-in-part of Ser. No. 168,460, Mar. 15, 1988, abandoned. This application Jan. 5, 1989, Ser. No. 293,803
Int. Cl.[4] B65D *25/28*
U.S. Cl. 220—85 H **1 Claim**



1. A single-piece coaster and handle device molded from a rigid plastic material for ready attachment to a cylindrical beverage can having an upper wall, an upper annular bead integral with the upper wall, and a lower wall, said coaster and handle device comprising:

a generally circular coaster structure including a flat central support wall of circular configuration having a central opening therein and being of a size for supporting the lower wall of a beverage can thereon, an annular depending wall integral with said flat central support wall and depending therefrom, an annular substantially flat bead-supporting wall integral with said depending annular wall and extending outwardly therefrom, said flat bead-supporting wall integral with said depending annular wall and extending outwardly therefrom, said flat bead-supporting wall having a flat upper surface and a flat lower surface, an annular outer wall integral with said bead-supporting wall and extending upwardly and outwardly therefrom and having an upper edge disposed in a horizontal plane located above the flat central support wall,

a generally C-shaped handle including a curved lower handle element integral with said coaster structure and extending outwardly and upwardly therefrom, a curved vertical handle element integral with said curved lower handle element and extending upwardly therefrom, a curved upper handle element integral with said vertical handle element and extending outwardly therefrom in substantially overlying relation with said curved lower handle element, said vertical handle element and said upper handle element being of uniform width, said upper handle element being shaped to define a thumb rest in the upper surface thereof to facilitate holding of said coaster and handle device by a user,

said upper handle element including a curved portion and a terminal portion, said terminal portion having a width dimension corresponding to the width dimension of the vertical handle element, said terminal portion having flat upper and lower surfaces and having a downwardly facing, transversely extending arcuate slot therein to define an outer lip and an arcuate gripping surface opposed to said outer lip, said outer lip comprising the outer end of said terminal portion, said arcuate gripping surface having a plurality of gripping elements integral therewith and projecting outwardly therefrom towards said outer lip for gripping the upper bead of a beverage can projecting into said slot, and

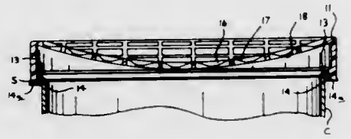
a flat rectangular-shaped support element integral with the curved lower handle element and extending transversely thereof, said support element being spaced outwardly of said coaster structure and having a width dimension corresponding to the width dimension of the vertical handle element and said upper handle element, said support element having a flat lower surface disposed in the same horizontal plane as the horizontal plane of the lower surface of said annular bead-supporting wall.

4,898,298

FLYING INSECT CONTAINER GUARD

Annie B. Norris, 1708 S. Scott, South Bend, Ind. 46613

Filed Mar. 29, 1989, Ser. No. 330,220
Int. Cl.[4] A47G *19/22*
U.S. Cl. 220—90.2 **1 Claim**



1. A flying insect container guard in combination with a container, said container formed of a cylindrical configuration including an outwardly extending edge seam at an upper terminal end of container, and wherein said guard comprises,

an annular skirt including engagement means for capturing said seam, and

a continuous mesh screen integrally secured to an upper continuous interior edge of said skirt, and

wherein said mesh screen is secured to an upper terminal edge of said skirt by an intermediate planar rim, and

wherein said mesh screen is of a concave downwardly depending configuration relative to said skirt, and extends downwardly relative to said skirt, and

wherein said engagement means includes a circular abutment flange means extending orthogonally interiorly of said skirt below said rim and above a lower terminal edge of said skirt to contact and abut an upper surface of said seam, and

wherein said engagement means further includes a circular seal secured within a circular groove underlying the flange and spaced below the flange a distance equal to the width of the seam to capture the seam between the flange and the seal, and

wherein said screen extends downwardly a distance equal to a length defined between the rim and an underlying surface of the flange to position the screen in an overlying contact to an upper surface of the container, and

wherein the screen includes a matrix of openings, and wherein each of the openings include a plurality of inwardly tapering walls to define an orifice aligned with and underlying the opening for metering of fluid through the orifices to the opening, and

further including a single downwardly depending leg aligned with the skirt in a first position and pivotal to a second position outwardly of the skirt to enable removal of the skirt from about the container, and

wherein the skirt and screen are formed of a flexible material.

4,898,299

PUSH AND DRINK LID

David H. Herbst, Ocean City, Md., and Chris E. Boes, LaRue, Ohio, assignors to Imperial Cup Corporation, Kenton, Ohio

Filed Mar. 3, 1988, Ser. No. 163,623
Int. Cl.[4] B65D *47/10*
U.S. Cl. 220—90.4 **20 Claims**



1. A detachable, drink-through lid for open-mouthed containers having a peripheral rim defining the open-mouth thereof comprising:

peripheral curl means defining a rim receiving cavity extending around a periphery of said lid, said cavity detachably receiving said rim of said container in order to retain said container lid on said container;

central web means extending across said container lid;

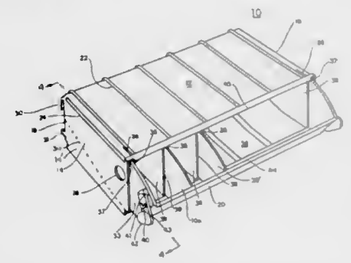
drink-through means comprising a well portion defined by said central web means and a raised element positioned within said well portion, said raised element having a plurality of corners and a top surface, said raised element including relatively frangible areas adjacent said corners, said well portion of said lid initially being sealed when said container lid is received on said container, whereafter a pressure exerted on said top surface of said raised element causes slits to be formed adjacent said corners in said relatively frangible areas while avoiding deformation of said peripheral curl means, said slits permitting contents within said container to be dispensed therethrough and ingested from said well portion, said well portion having a bottom which is positioned above a bottom of said central web means before said slits are formed.

4,898,300

MOLDED CLOSEABLE BIN HAVING A SHAPED HOPPER

Joel B. Cohen, Gwynedd, and Matthew Marhefka, Southampton, both of Pa., assignors to Shell Containers, Inc., Ambler, Pa.

Filed Jun. 6, 1988, Ser. No. 203,479
Int. Cl.[4] B65D *43/00, 45/00, 51/00*
U.S. Cl. 220—334 **18 Claims**



1. An improved bin having a bin compartment for storing objects, said pin providing access to said objects for removal from said bin compartment, comprising:

a bottom wall having a front edge;

first and second exterior side walls integrally formed with said bottom wall;

a top wall having a front edge, said top wall integrally formed with said first and second exterior side walls;

a back wall integrally formed with said first and second exterior side walls and said bottom wall; and

a hopper having a pair of hopper side walls and a protruding front with a lower edge and an upper edge, said lower edge of said hopper hangable attached to said front edge of said bottom wall, said hopper being movable between a closed position where said upper edge of said hopper mates with said front edge of said top wall to close said bin and said pair of hopper side walls are received by said protruding front defining a front wall for said bin in said closed position and providing an open position where objects may be removed from outside said bin;

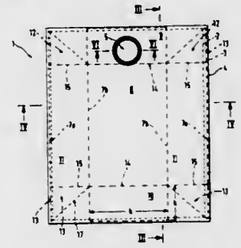
said protruding front of said hopper having first and second portions integrally joined at an angle, said first portion approximately aligned with said bottom wall when said hopper is in said open position, said second portion defining a front wall for said bin when said hopper is in said open position, said pair of hopper side walls defining an extension of said exterior side walls for said bin when said hopper is in said open position, wherein said upper edge of said hopper is formed along an edge of said second portion and said upper edge is spaced away from said front edge of said top wall when said hopper is in said open position.

4,898,301

COLLAPSIBLE CONTAINER FOR FLOWABLE MEDIA

Henning Schick, Poststrasse 11, D-7843 Heitersheim, Fed. Rep. of Germany

Filed Feb. 23, 1989, Ser. No. 315,459
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 8802437[U]; Apr. 12, 1988, 8804786[U]; Apr. 12, 1988, 8804787[U]; Apr. 26, 1988, 8805513[U]; European Pat. Off., Aug. 13, 1988, 88113182.5
Int. Cl.[4] B65D *5/00, 30/00*
U.S. Cl. 220—408 **33 Claims**



1. A container, particularly for flowable media, comprising an inner envelope including a deformable bag having a first opening for admission or evacuation of flowable media; an erectable and collapsible frame surrounding said bag and including, in the collapsed condition thereof, two overlapping sections and two parallel first fold lines hingedly connecting said sections to each other, each of said sections having a plurality of panels and second fold lines parallel to said first fold lines and hingedly connecting the panels to each other, at least one of said sections further comprising two flaps for at least one of said panels of said at least one section and two third fold lines normal to said first fold lines and hingedly connecting said flaps to said at least one panel, said sections being pivotable relative to each other along said first fold lines, the panels of each of said sections being pivotable relative to each other along the respective second fold lines and said flaps being pivotable relative to said at least one panel along the corresponding third fold lines for erection of said frame preparatory to admission of a flowable medium into said bag; and an outer envelope including a deformable sack surrounding said frame and having a second opening in register with said first opening; at least in erected condition of said frame.

4,898,302

APPARATUS FOR MELTING AND DISPENSING THERMOPLASTIC MATERIAL

David J. Byerly; Paul S. Frates, both of Lawrenceville, and Charles H. Scholl, Duluth, all of Ga., assignors to Nordson Corporation, Westlake, Ohio

Continuation of Ser. No. 2,173, Jan. 12, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 299,676
Int. Cl.[4] B67D *5/62*
U.S. Cl. 222—49 **15 Claims**

1. Apparatus for dispensing hot melt adhesive from a container having a neck formed with a discharge outlet, comprising:

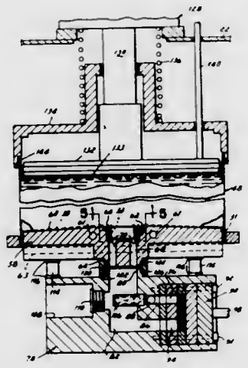
means for supporting the container;

a platen mounted in a position to contact the container, said platen having means for heating said platen to melt the hot melt adhesive within the container:

means for ejecting molten hot melt adhesive through the discharge outlet of the container;

heat transfer means carried by said platen and communicating with the discharge outlet of the container for transferring heat from said platen to the hot melt adhesive discharged through the outlet of the container, said heat

transfer means comprising a section of thermally conductive material formed with spaced passageways each having an elongated wall, said elongated walls each contacting a portion of the melted bot melt adhesive ejected from



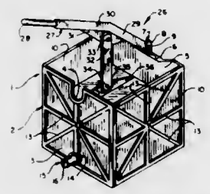
the container for transferring heat from said platen uniformly throughout the melted hot melt adhesive;
pump means communicating with said spaced passageways for pumping the melted hot melt adhesive to a dispenser.

4,898,303
CUP-TYPE DRINK MERCHANDISER WITH BAG-IN-BOX PRODUCT SUPPLY SYSTEM
Danny E. Large, Newark, and Mark S. Tschanen, Columbus, both of Ohio, assignors to Liqui-Box Corporation, Worthington, Ohio
Filed Oct. 27, 1988, Ser. No. 263,583
Int. Cl.[4] B67D *1/16*
U.S. Cl. 222—65 **7 Claims**



1. A liquid dispensing machine for dispensing successively a plurality of liquids having a cup support for receiving and supporting successively liquid-receiving cups and having dispensing nozzles over the cup support for receiving the plurality of liquids, means for feeding cups successively onto said support, means for supplying a selected liquid to a selected nozzle, said supply means being in the form of a closed airtight supply system comprising first and second bag-in-box packages for each of said liquids connected to a service line of a supply pump, and a switch over cut-off valve in the service line between the bags of the first and second packages which will automatically switch when the one bag is emptied and said pump draws a vacuum of eighteen inches of mercury on the empty bag to thereby permit removal and replacement of that empty bag while the pump still draws liquid from the other bag, said box of each bag-in-box package including a generally flat lower surface, said flat surface being inclined downwardly toward said service line connection at an angle of about 8° to provide a gravity assist in emptying said package, said machine having one or more drainage tubes for draining waste liquid from the machine, and means for collecting that waste liquid, said collecting means comprising a disposable flexible bag connected by a coupling to said tubes, said bag being disposed in a relatively rigid container, and a switch for stopping the machine when the bag is full which is operated by contact with the bag, said bag being disconnectable from said tubes and removable from said container for disposal as a closed bag.

4,898,304
VISCOUS LIQUID DISPENSER
Benjamin E. Bacon, Jr., 487 Ockley Dr., Shreveport, La. 71105
Filed Dec. 17, 1987, Ser. No. 134,858
Int. Cl.[4] B67B *7/24*
U.S. Cl. 222—82 **17 Claims**

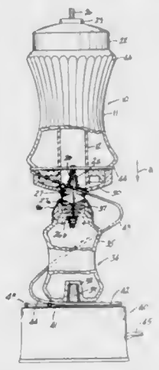


1. A dispenser for dispensing a viscous liquid comprising a container having an open top for receiving a quantity of the viscous liquid; a plunger plate shaped to substantially conform to the interior cross-section of said container and extending into said container in slidable relationship said plunger plate adapted to selectively exert pressure on said viscous liquid; a lever having one end pivotally attached to said container; an elongated connector bar having a plurality of angular slots provided therein in spaced relationship, with one end of said connector bar pivotally attached to said plunger plate and the opposite end of said connector bar slidably projecting through said lever; a slot pin extending through said lever, whereby said slot pin may be selectively and progressively inserted into selected ones of said angular slots responsive to lowering of the level of the viscous liquid in said container; and a discharge opening provided in said container near the bottom thereof, said discharge opening communicating with the interior of said container for discharging the viscous liquid from said container responsive to operation of said lever.

4,898,305
CONDIMENT CONTAINER AND DISPENSER
William Morris, 383 Ellsworth Ave., New Haven, Conn. 06511, assignor to William Morris, New Haven, Conn.
Filed Jul. 21, 1988, Ser. No. 222,023
Int. Cl.[4] A47G *19/12*
U.S. Cl. 222—142.5 **18 Claims**

1. A condiment container and dispenser comprising a container having means therein defining a central chamber with an opening at one end of said container and a second chamber about said defining means with an opening at the other end of said container a closure member closing each of said open ends, said closure members having openings therethrough, a spring member of conical shape defined by closely spaced helices of decreasing diameter normally closing each of said openings, a plunger member carried by each of said springs and

extending from said closure members, said plunger members being effective to extend an associated spring and permit mate-



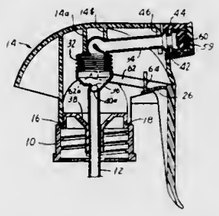
rial to be dispensed from either end of the container and dispenser by shaking or pouring.

4,898,306
COLLAPSIBLE CONTAINER FOR FLOWABLE SUBSTANCES
Greg Pardes, New York, N.Y., assignor to Reseal International Limited Partnership
Filed Jan. 13, 1988, Ser. No. 143,823
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—206 **7 Claims**



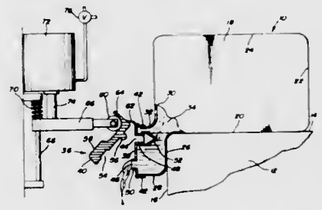
1. A container for dispensing flowable substances and being displaceable between an expanded condition and a collapsed condition comprising wall means forming an enclosed space for holding the flowable substance, said wall means including a pair of generally rigid walls having bordering edges, collapsible walls interconnecting a part of said bordering edges of said rigid walls, and a web connecting the remainder of said bordering edges of said rigid walls, in the expanded condition of said container said rigid walls being in gradually diverging relationship extending from said web in the expanded condition of said container and said web affording pivotable movement of said rigid walls for placing said container in the collapsed condition, said collapsible walls being displaceable between the expanded condition and the collapsed condition, and in the collapsed condition said rigid walls are disposed adjacent to one another around said bordering edges and said container being in a flattened shape, and a part of said collapsible walls forming a base for said container with said rigid walls and said web extending upwardly from the base.

4,898,307
SPRAY CAPS
Paolo M. B. Tiramani, New York, N.Y., assignor to Goody Products, Inc., Kearny, N.J.
Filed Aug. 25, 1988, Ser. No. 236,592
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—207 **20 Claims**



1. A manually operable spray cap including a main body having a closure for mounting the spray cap on a supply container of liquid to be dispensed, a nozzle having a discharge orifice, means forming a liquid passage from the supply container to the nozzle, including a bellows, a dip tube extending through the closure, and a discharge tube extending to the nozzle, said bellows having a movable end portion carrying the dip tube and a stationary end portion from which the discharge tube extends, said movable end portion and said stationary end portion constituting passage-constricting transitions between the bellows and the respective tubes, said bellows including said transitions and said discharge-passage tube and at least a portion of the dip tube extending from said movable end portion constituting a continuous-wall one-piece component formed of resilient plastic, said bellows having a corrugated lengthwise-compressible self-extending side wall, intake and discharge check valves for limiting the liquid to flow toward the nozzle, and a trigger carried by said main body for operating said movable end portion of the bellows and the dip tube therewith in bellows-compressing strokes.

4,898,308
REMOVABLE SYRUP PACKAGE
Arthur G. Rudick, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Aug. 17, 1988, Ser. No. 233,133
Int. Cl.[4] B65D *88/34*
U.S. Cl. 222—325 **20 Claims**



1. Apparatus for a beverage dispensing system comprising:
a removable package containing liquid to be dispensed and including a body portion and a liquid discharge portion having a discharge port therein from which said liquid may be dispensed;
an actuated closure assembly including a stationary facing member disposed over said discharge port and having an air inlet opening and a liquid outlet opening therein, and a cap member pivotally attached to said facing member and

having means for closing off said air inlet opening and said liquid outlet opening when in contact therewith during a closed operating state and exposing said openings when said cap member is pivoted away from said facing member during an open operating state; and

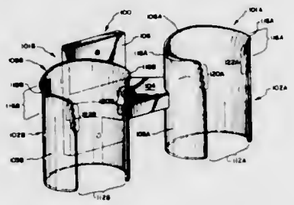
actuator means for pivoting said cap member between said closed and open operating state, said actuator means comprising a movably driven member in contact with said cap member and being movable between a first and a second position to effect said closed and open operating state.

4,898,309

APPARATUS USED TO FACILITATE THE DONNING OF ELASTIC GLOVES

Dan E. Fischer, Sandy, Utah, assignor to Ultradent Products, Inc., Salt Lake City, Utah

Filed Jan. 28, 1988, Ser. No. 149,352
Int. Cl.[4] A47G *25/90*
U.S. Cl. 223—111 **41 Claims**



1. An apparatus for installing a glove having an elastic cuff onto a hand, the apparatus comprising:

a fixed bracket holding means, mountable to said fixed bracket so as to become integrally attached to said bracket as a part thereof when so mounted, for receiving the elastic cuff of the glove and for holding the cuff in a stretched, stationary, open configuration when the elastic cuff of said glove is stretched over said holding means, such that the glove is thereby held stretched and open and is ready to receive the hand inserted therein; and

release means, formed on the holding means, for releasing the glove onto the hand after the hand is inserted therein and as the hand is moved downwardly and pulled forward so as to thereby pull the elastic cuff of said glove off of said holding means.

4,898,310

CENTER OF GRAVITY HOLSTER

Robert W. Remington, Kamiah, Id., assignor to Claude R. Wimer, Jr., Naples, Fla., a part interest

Filed Oct. 4, 1985, Ser. No. 784,492
Int. Cl.[4] F41C *33/02*
U.S. Cl. 224—238 **11 Claims**

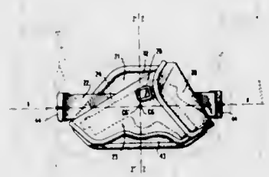
1. A pistol holster assembly comprising:

a united holster body and back pad, a waist-encircling belt carrying the united holster body and back pad and having releasable fastener means,

the united holster body and back pad during use being worn on the back of a wearer of the assembly with the center of balance of a pistol contained in the holster body located substantially on a horizontal axis substantially coinciding with the horizontal axis through the center of gravity of the body of a wearer of the assembly,

said back pad being arranged forwardly of the holster body relative to the back of a wearer and directly engaging and lying within the small of the back and being sufficiently large in area to span to a substantial degree the area of the small of the back and having a contoured marginal edge which approximately matches the natural contours of the small of the back thereby causing the back pad to be centered and stabilized while in contact with the small of the back,

the holster body being disposed with a pistol barrel receiving portion thereof at an acute negative angle to the horizontal, and



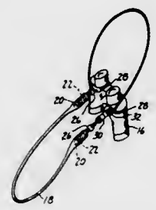
the holster body being of a size spanning a major portion of the area of the back pad both horizontally and vertically, the combined thicknesses of the united holster body and back pad being such that the assembly can lie substantially within a natural cavity defined by the small of the back.

4,898,311

BINOCULAR STABILIZER DEVICE

Robert Boyer, 216 Honeysuckle Ave., Paso Robles, Calif. 93446

Filed Apr. 18, 1988, Ser. No. 182,908
Int. Cl.[4] A45F *3/14*; A44B *11/20, 21/00*
U.S. Cl. 224—257 **4 Claims**



1. In connection with an article supported by the neck of its user and suspended about the user's body, a device for keeping the article secured to the user's body, comprising:

a length of elastic tubing;

means for interconnecting the elastic tubing at each end to the article including an elongated gripping piece having at least two ridges perpendicular to a longitudinal dimension of the gripping piece for gripping the elastic tubing when the gripping piece is installed within the elastic tubing; and means for securing each gripping piece to the article whereby;

the elastic tubing is adopted to be installed around the user and interconnected to the article.

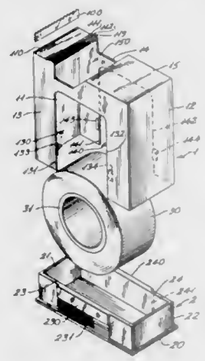
4,898,312

CASSETTE TAPE HOLDING BOX AND DISPENSER

Harrison Hwang, No. 23, Lin Tsuo Road, Shankang, Taichung Hsien, Taiwan

Filed Jul. 22, 1988, Ser. No. 222,927
Int. Cl.[4] B26F *3/02*; B65D *85/676*
U.S. Cl. 225—26 **4 Claims**

1. A portable holder and dispenser for adhesive or pressure sensitive tape comprising a receptacle having an open bottom portion for containing a roll of tape, the receptacle being formed of a pair of aligned parallel front and rear walls, a pair of aligned parallel side walls and first and second spaced apart top panels separated by an opening and running transversely between corresponding segments of the upper edges of the side walls, a hole extending from the lower edge of each of the side walls to the central part thereof respectively, securing means being provided on each of the inner side edges of the hole to engage a tape holding base, the first top panel having on the



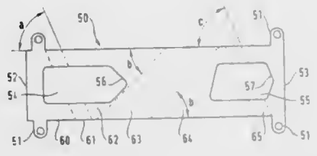
upper, front edge thereof a furrow and on the upper edge adjacent the opening serrations for engaging the adhesive or pressure sensitive surface of the tape, cutting means adapted for insertion into the furrow, the tape holding base being adapted for insertion into the open bottom portion of the receptacle and comprising a pair of side plates and a base plate linking the side plates, each of the side plates having an opening on the inner edge thereof for holding the tape roll, and means for engaging the securing means in the receptacle to retain the tape holding base within the open bottom portion of the receptacle.

4,898,313

TRANSPORT DEVICE FOR TRANSPORTING OBJECTS IN THE FORM OF STRIP SEGMENTS

Jean-Pierre Grégoire, Bagneux, France, assignor to SMH Alcatel, Paris, France

Filed May 24, 1988, Ser. No. 197,876
Claims priority, application France, May 25, 1987, 87 07318
Int. Cl.[4] B65H *23/32*
U.S. Cl. 226—197 **4 Claims**



1. A transport device for transporting objects in the form of strip segments along their axis while causing said strips to rotate through an angle of at least 90° about the axis, said device comprising two walls disposed parallel to each other, means for holding said walls spaced apart from each other in such a manner as to allow the objects to be transported to pass therebetween, said walls being twisted together about their longitudinal axes so that the slot between them at one of the ends of said walls is oriented in a direction rotated at least 90° relative to the direction of the slot at the other end of said walls, said walls being in the form of a twisted flat strip whose width is not less than the width of the objects to be transported, and wherein each of said walls comprises between one wall and in the other wall end, successive juxtaposed portions having the following shapes respectively:

a first rectangular trapezium;
a first end parallelogram;
a first common trapezium;
a middle parallelogram;
a second common trapezium;
a second end parallelogram; and
a second rectangular trapezium;

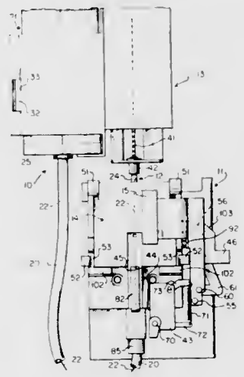
with the desired twist being obtained with the trapeziums being flat, with the end parallelograms being curved as portions of cylindrical surfaces and in the same direction about the original plane surface, and with the middle parallelogram being curved in the opposite direction to also form a portion of a cylindrical surface.

4,898,314

METHOD AND APPARATUS FOR STITCHER WIRE LOADING

Richard D. Stroh, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1988, Ser. No. 260,159
Int. Cl.[4] B42B *4/00*
U.S. Cl. 227—3 **23 Claims**



1. A wire dispensing supply item having a reel of wire that includes a wire end, said supply item being for use with a stitcher having wire cutting means, wire feeding means for feeding said wire end to said wire cutting means, and manually operable coupling means for releasably receiving a handle/-mounting member of said supply item, said handle/mounting member, when coupled to said coupling means, being operable to support said wire end in operative relation to said wire feeding means, said supply item comprising;

a reel of wire rotatably mounted in a substantially closed housing,

a flexible tube having one end connected to said housing, said tube operating to guide said wire end away from said reel of wire,

a handle/mounting member connected to said tube at the other end thereof, said handle/mounting member being constructed and arranged to releasably cooperate with the manually operable coupling means of said stitcher, and

releasably wire holding means contained within said handle/mounting member for releasably holding said wire end, the manually operable coupling means of said stitcher being

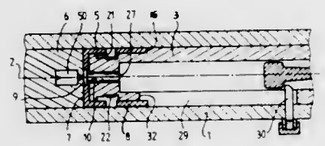
operable to couple said handle/mounting member with said wire end in operating relation to said wire feeding means, and in so doing, to release said releasable wire holding means.

4,898,315

EJECTOR SEALING APPARATUS

Jean-Claude Versurey, Bourg-Les-Valence, France, assignor to Societe de Prospection et D'Inventions Techniques (S.P.I.T.), Bourg-Les-Valence, France

Filed Apr. 7, 1988, Ser. No. 178,709
Int. Cl.[4] B25C *1/14*
U.S. Cl. 227—10 **8 Claims**



1. Apparatus for driving a fixing element or fastener into a receiving material, comprising:

a barrel holder (1);

a barrel (3) slideably disposed within said barrel holder (1) between a firing position and an open-ejection position;

means defining a housing bore (27) within said barrel (3);

inertia block means (4) movably disposed within said barrel (3) between a firing position and a fired position for driving said fixing element or fastener into said receiving material;

pawl means (30) projecting radially inwardly through a sidewall portion of said barrel holder (1) and said barrel (3) for engaging said inertia block means (4) when said inertia block means (4) is moved to said fired position so as to retain said inertia block means (4) within said barrel (3);

axially extending slit means (29) defined within said sidewall portion of said barrel (3) for housing said pawl means (30) so as to permit said barrel (3) to move axially relative to said barrel holder (1) and said pawl means (30) from said firing position to said open-ejection position;

a propulsive charge case (10), having a flanged rim portion (9), disposed within said housing bore (27) of said barrel (3) for generating propulsive gases for propelling said inertia block means (4) toward said fired position from said firing position;

breech means (6), and striker means (50) disposed within said breech means (6), for transmitting an impact force to said propulsive charge case (10) so as to cause said propulsive charge case (10) to generate said propulsive gases;

ejection ring means (5), comprising an end wall (7) within which said rim portion (9) of said propulsive charge case (10) is housed and a sleeve portion (8) mounted upon said barrel (3), movably mounted upon said barrel (3) between a first firing position and a second ejection position for ejecting said propulsive charge case (10) from said barrel (3) when said ejection ring means (5) and said barrel (3) are moved to said open-ejection position;

clip means (22,22') interconnecting said ejection ring means (5) and said barrel (3) together and movable with said ejection ring means (5) relative to said barrel (3) between said first firing position and said second ejection position; and

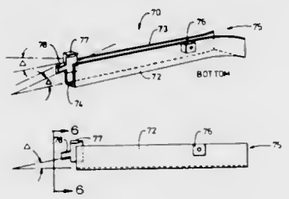
means (19,19') for increasing the resistance of said movement of said clip means (22,22') relative to said barrel (3) between said first firing position and said second ejection position.

4,898,316

FASTENER MAGAZINE AND GUIDE DEVICE

John E. McLaughlin, and Thomas A. McCardle, both of Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Mar. 15, 1989, Ser. No. 323,859
Int. Cl.[4] B25C *7/00*
U.S. Cl. 227—120 **17 Claims**



1. A fastener magazine and guide device for use with a moveable fastening tool attached to a magazine, comprising:

(a) a fastener magazine for containing a plurality of ordered fasteners in a coil and dispensing said fasteners tangentially from said coil for sequential insertion by said fastening tool;

(b) means for maintaining said fastener magazine substantially stationary and in substantially close proximity to said fastening tool; and

(c) guide means adapted to maintain said plurality of ordered fasteners substantially within a path from said fastener magazine to said fastener tool, said guide means coupled at its forward end to said fastener tool by an angled tongue adapted to fit within said fastener tool such that said guide means is mounted so as to move in concert with the movement of said fastener tool and sufficiently detached from said fastener magazine so as to prevent the transmission of substantial movement to said fastener magazine.

4,898,317

WELDING WIRE STRAIGHTENING DEVICE AND WELDING TORCH

Shigeo Ito, Nagoya; Toshihiko Imaeda, Niwa; Ryuhei Takagi, Owariasahi, and Ryutaro Sato, Obu, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

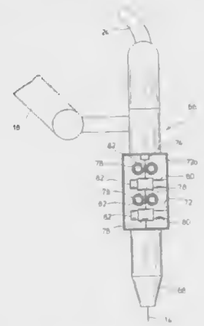
Continuation of Ser. No. 309,983, Feb. 9, 1989, abandoned, which is a continuation of Ser. No. 940,950, Dec. 12, 1986, abandoned. This application Jun. 26, 1989, Ser. No. 373,608
Claims priority, application Japan, Jul. 14, 1986, 61-107860[U]
Int. Cl.[4] B23K *9/28, 9/12*
U.S. Cl. 228—41 **5 Claims**

1. A device for straightening a welding wire comprising:

a frame having an inlet sleeve and an outlet sleeve on longitudinally opposite ends thereof, said inlet and outlet sleeves being coaxial to each other and said wire being fed through said inlet and outlet sleeves;

support pins provided at predetermined points in said frame, said support pins being freely movable in connection with said direction perpendicular to a wire feed path; and

three to five pairs of wire straightening rollers rotatably provided on said support pins and longitudinally spaced in the direction of said wire feed path, roller surfaces of each pair of said rollers being transversely spaced from each other and each of said pairs of rollers being provided at a phase angle of 60° to 90 ° from other pairs of rollers.

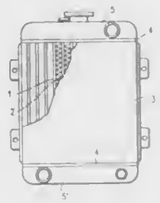


4,898,318

COPPER RADIATOR FOR MOTOR CARS EXCELLENT IN CORROSION RESISTANCE AND METHOD OF MANUFACTURING THE SAME

Syoji Shiga; Akira Matsuda; Nobuyuki Shibata, and Kiichi Akasaka, all of Nikko, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo and Nippondenso Co., Ltd., Kariya, both of, Japan

Division of Ser. No. 903,948, Sep. 5, 1986, Pat. No. 4,775,004. This application Apr. 4, 1988, Ser. No. 177,066
Int. Cl.[4] B23K *1/14*
U.S. Cl. 228—183 **7 Claims**



1. In a method of manufacturing a copper radiator for automobiles characterized by assembling said radiator by fitting fins to the outside of a plurality of tubes, through which the heat-exchanging medium flows, by bonding with solder to form a copper core and fitting seat plate(s) to one end or both ends of said core by bonding with solder to connect tank(s), the improvement which comprises carrying out the soldering for forming the core in a nonoxidative atmosphere and/or heating the core in a reductive atmosphere during assembling of the radiator after soldering so that the thickness of oxidized film on the surface of the fins is not more than 1200 Å.

4,898,319

AMBIENT AIR EXCLUSION SYSTEM FOR BRAZING OVENS

Robert T. Williams, Newfane, N.Y., assignor to Bruce T. Williams, Lockport, N.Y.

Filed Dec. 4, 1987, Ser. No. 128,933
Int. Cl.[4] F27D *7/00;* B23K *1/04, 35/38*
U.S. Cl. 228—219 **10 Claims**

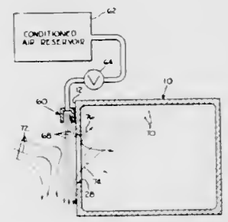
1. In a brazing oven including a housing defining an interior region in which materials to be brazed are placed, an opening in said housing to allow introduction and removal of the materials, a door operatively associated with said opening for closing said opening during brazing and for opening during introduction and removal of the materials, means for heating the materials in said region, and means for providing a vacuum in said region during brazing, the improvement comprising:

means operatively associated with said opening for providing a flow of gas along one direction in said opening when said door is opened to provide a single barrier to prevent gas rom exiting the oven interior and to prevent unconditioned ambient air from entering the oven interior when said door is opened, said barrier being provided exclusively by said flow of gas, said means for providing a flow of gas comprising:

(a) ported manifold means mounted in said housing interior adjacent the inside of said opening for providing a flow of gas across said opening; and

(b) reservoir means in fluid communication with said manifold means to supply gas to said manifold means;

(c) so that said manifold means also serves to introduce conditioned gas to said region after brazing.

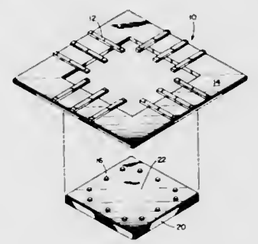


4,898,320

METHOD OF MANUFACTURING A HIGH-YIELD SOLDER BUMPED SEMICONDUCTOR WAFER

Thomas J. Dunaway, St. Louis Park; Richard K. Spielberger, Maple Grove, and Lori A. Dicks, New Hope, all of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Nov. 21, 1988, Ser. No. 274,207
Int. Cl.[4] B23K *31/02, 37/06*
U.S. Cl. 228—245 **17 Claims**



1. A method of manufacturing a high-yield fine pitch geometry solder bumped semiconductor wafer comprising the steps of:

(a) providing a nonsolderable transfer substrate having a transfer surface for receipt of solder material;

(b) depositing solder material onto the transfer surface to form solder bumps in a predetermined fine pitch geometry pattern;

(c) aligning solderable conductive elements of a semicon-

ductor wafer with the patterned solder bumps on the transfer surface; and

(d) reflowing the patterned solder bumps into wetted contact with the wafer conductive elements.

4,898,321

CASE AND PALLET SYSTEMS

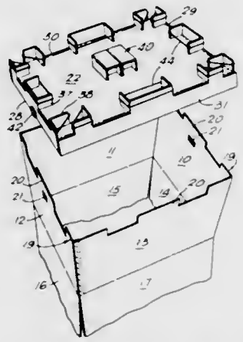
Paul N. Delany, 120 Maldon Road, Danbury, Essex, England

Filed Apr. 27, 1988, Ser. No. 185,117

Claims priority, application United Kingdom, Apr. 22, 1987, 8709464

Int. Cl.[4] B65D *90/12, 19/04*

U.S. Cl. 229—23 R **9 Claims**



1. A pallet base for a case, the pallet base comprising a flat rectangular central portion and a peripheral flange portion at at least two opposed edges of the central portion, each flange portion being foldable from a flat state to an erect state in which the flange portion defines both an upstanding portion above the level of the central portion and a depending skirt portion below the level of the central portion, the skirt portion of each flange portion having flaps which can be folded inwards to overlie the underside of the central portion thereby to maintain the flange portions in an erect position, and retaining means comprising elastic bands to hold each of said flaps turned inwards through at least 90°.

4,898,322

AUTOMATED MACHINE ENVELOPE

James B. Coffey, Dayton, Ohio, and Leslie B. Gwynn, Winston-Salem, N.C., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 18, 1988, Ser. No. 259,371

Int. Cl.[4] B65D *27/00*

U.S. Cl. 229—69 **20 Claims**

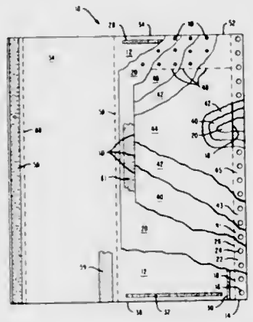
1. A multiple ply business form comprising a

back ply of one width having a control margin along one side thereof, an

intermediate ply of lesser width than said back ply and secured to said back ply by first securing means along at least two edges of the back ply and of the intermediate ply to form a pocket,

at least one additional ply secured by second securing means to said intermediate ply along one edge thereof to secure a first portion of the additional ply to the intermediate ply and including a line of weakening spaced from said one edge of said intermediate ply and adjacent said second securing means permitting removal of a second portion of the additional ply and leaving said first portion secured to the intermediate ply, the pocket formed by said back ply and said intermediate ply being of a size to accommodate the second portion of said additional ply in a flat, unfolded condition, and a

closure ply having a line of weakening connecting said closure ply and said back ply and foldable along said connecting line of weakening over the intermediate ply



for sealing the removed second portion of the additional ply which has been inserted in the pocket for record purposes.

4,898,323

MAILER FOR LASER PRINTER

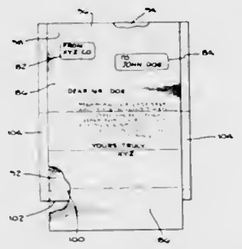
Tien-Tsung Chen, Claremont; C. Stefan Wegdell, Tustin, both of Calif.; Wayne L. Rutkowski, South Wales, N.Y., and Kim Y. Kao, Alhambra, Calif., assignors to Avery International Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 64,074, Jun. 17, 1987, Pat. No. 4,784,317. This application Nov. 14, 1988, Ser. No. 270,785

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[4] B65D *27/04, 27/14*

U.S. Cl. 229—92.3 **19 Claims**



1. A unitary mailer for use with laser type printers or copier machines, involving heating of the paper, comprising:

sheet paper means for receiving a printed message and for forming an envelope; said sheet paper means having an upper half and a lower half, and having substantially rectangular dimensions, both of which are greater than six inches, said sheet paper means being substantially uniform in thickness and continuous for its upper half;

said sheet paper means including two overlying sheets of paper permanently adhered together along one edge of each of the two sheets, with one of said sheets being a message sheet and the other of said sheets being an envelope sheet;

printed message and address information printed on one side only of said sheet paper means, with the message starting on the exposed upper half of said message sheet;

said sheet paper means including means for forming an envelope from said envelope sheet;

means for sealing said envelope including a stable adhesive which will not flow or become activated from the heat of a laser printer or a xerographic copier machine or from high humidity storage conditions;

the upper half of said message sheet having predetermined areas in which the names and addresses of the sender and the addressee are to be printed; and

the lower half of said envelope sheet including window means for exposing the names and addresses of the sender and the addressee of the mailer when said envelope sheet is folded;

whereby said sheet paper means may be fed through a laser printer or a copier machine without jamming or contamination, with a single pass providing both the message and addressing.

4,898,324

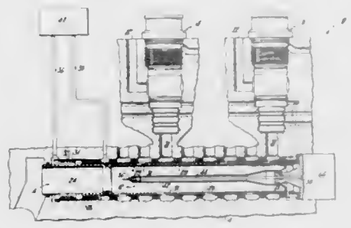
METERING VALVE TEMPERATURE COMPENSATION

Robert H. Perkinson, Somers, Conn.; Charles F. Stearns, East Longmeadow, and Rene F. Belanger, Holyoke, both of Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 30, 1989, Ser. No. 358,506

Int. Cl.[4] G05D *27/00*

U.S. Cl. 236—92 R **8 Claims**



1. Apparatus for metering a constant weight flow of fluid by compensating for temperature changes of said fluid, said apparatus comprising:

a temperature means for sensing a change in temperature, said temperature means changing a given percentage as said temperature of said fluid changes;

a valve means for metering said flow of fluid, said valve means having;

a window means having a cross sectional opening for controlling a flow of said fluid therethrough, and a spool means disposed about said temperature means for controlling an area of said opening so that said constant weight flow is maintained as temperature changes, and for cooperating with said temperature means such that as said temperature means changes a given percentage, a corresponding percentage cross-sectional area of flow through said window means is changed by said spool means so that said constant weight flow is maintained; and

a means for providing a constant pressure drop across said valve means.

4,898,325

AUTOMOBILE AIR CONDITIONER WITH SEPARATE FLOW ADJUSTMENT FOR CENTRAL AND SIDE VENTS

Museo Sakurada, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,278

Claims priority, application Japan, Apr. 28, 1987, 62-105658

Int. Cl.[4] B60H *1/02, 1/34*

U.S. Cl. 237—12.3 B **1 Claim**

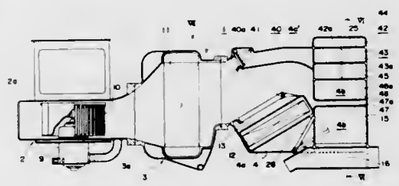
1. In an air conditioning system for an automotive vehicle having a compartment, the system having a central air outlet, and left and right air outlets respectively arranged at left and right sides of said central air outlet, said central air outlet and said left and right air outlets being provided at at least one of front and rear portions of said compartment, the improvement comprising;

central air passage means extending from a first diverging point and leading to said central air outlet;

side air passage means extending from said first diverging point in a manner separated from said central air passage means and leading to said left and right air outlets, said side air passage means having left and right air passages extending from a second diverging point which is located at a different position from said first diverging point and leading to said left and right outlets, respectively;

said first diverging point dividing air into a first part delivered into said central air passage means and a second part delivered into said side air passage means at a substantially fixed ratio;

a single flow rate ratio-adjusting means arranged at said second diverging point for adjusting the ratio between the respective flow rates of air delivered into said left and right air passages;



said second diverging point being located at a position downstream of said first diverging point in a direction in which air flows, said side air passage means having a common passage extending from said first diverging point to said second diverging point and being separated from said central air passage means;

heater means arranged upstream of said central air passage means and said side air passage means in a direction in which air flows;

mixed air-delivering means arranged between said heater means and said central air passage means and said side air passage means for delivering mixed air of cold air and warm air to the latter;

cold air-bypass passage means bypassing cold air flowing upstream of said heater means and said mixed air-delivering means around said heater means and said mixed air-delivering means, said cold air-bypass passage means having a first cold air-bypass passage leading to said central air passage means and a second cold air-bypass passage leading to said side air passage means;

a foot air outlet; and

passage means connecting between said foot air outlet and said mixed air-delivering means.

4,898,326

TRACK JOINING SYSTEM

Clarence K. Edwards, and Lawrence D. Edwards, both of Medford, Oreg., assignors to Kadee Metal Products Co., Medford, Oreg.

Continuation of Ser. No. 113,452, Oct. 28, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 302,127

Int. Cl.[4] E01B *23/00*

U.S. Cl. 238—10 E **5 Claims**
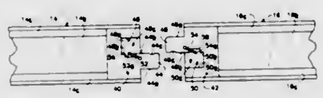
1. For a model railroad track comprising of a pair of elongate track sections disposed with one end of one track section opposite one end of the other track section, interconnecting

means detachably interconnecting the track sections comprising:

a one-piece, non-flexible socket and tongue element mounted on said one section and another one-piece, non-flexible socket and tongue element mounted on the other track section,

each of said elements including a socket portion having an outer open end disposed at the end of the track section mounting the element and the socket portion extending in an axial direction inwardly on the track section mounting the element to an inner end, and each element further including a rigid tongue portion disposed laterally of the socket portion extending in an axial direction outwardly of the track section mounting the element to a terminal end, the socket portion of each element having detachably lodged there within the tongue portion of the other element,

each socket portion and each tongue portion having opposed sides generally paralleling the axis of the track section and spaced from each other in a horizontal direction, and the socket portion sides including end expanses adjacent the inner end of the socket portion and disposed



on either side of and seating the terminal end of the tongue portion lodged within the socket portion, and the socket portion sides further including entering expanses adjacent the open end of the socket portion disposed on either side of and seating the tongue portion lodged within the socket portion, said end and entering expanses collectively inhibiting relative lateral skewing of the tongue portion within the socket portion,

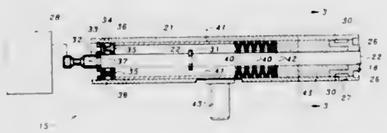
and a resilient locking spring detachably holding each tongue portion lodged within a socket portion, said spring being mounted on one of said sides of one of said portions and engageable with one of said sides of the other of the portions preventing relative axial displacement of the tongue portion relative to the socket portion, engagement with said one of said sides of the other of said portions being at a location disposed intermediate said end and said entering expanses of the socket portion, said spring being a leaf spring having an inner mounted end on said one portion and an outer free end, the leaf spring inclining extending from its inner end to its free end in the direction that said other portion moves relative to the one portion in lodging of the tongue portion within a socket portion.

4,898,327

INJECTION SYSTEM FOR FOAMABLE COMPOSITIONS

Lawrence B. Sperry, New York, N.Y., and Henry J. Ruddy, Newton, Conn., assignors to Sealed Air Corporation, Saddle Brook, N.J.

Filed Aug. 22, 1988, Ser. No. 235,064
Int. Cl.[4] B05B *15/02*
U.S. Cl. 239—1 **17 Claims**



1. An apparatus for cleaning foamable compositions from the outer exit portions of the injection nozzle of an injection system for foamable compositions, the apparatus comprising:

a tip assembly adjacent the outer portion of an injection nozzle from which foamable compositions may exit said injection nozzle, and wherein said tip assembly is porous to gases and certain liquids, but impermeable to other materials such as the foaming compositions which otherwise exit said injection nozzle; and

means for delivering a solvent in which foamable compositions are soluble into, then through, and then out of said porous tip assembly and adjacent said outer exit portions of said injection nozzle so that solvent which passes out of said tip assembly thereby cleans foamable compositions from said outer exit portions of injection nozzle.

4,898,328

EMANATOR FOR VOLATILE LIQUIDS

Rodney T. Fox, Cottingham, and Philip W. Goreham, Beverley, both of Great Britain, assignors to Reckitt & Colman Products Limited, London, Great Britain

Filed Sep. 11, 1987, Ser. No. 96,116
Claims priority, application United Kingdom, Sep. 12, 1986, 8622046
Int. Cl.[4] A61L *9/04*
U.S. Cl. 239—6 **39 Claims**



1. A device for containing a volatile liquid and dispensing said liquid as a vapour which comprises a closed container having walls impermeable to said liquid and vapour and at least one wall which includes a porous support provided with at least one crosslinked organopolysiloxane material which serves to close pores in the support to prevent passage of liquid therethrough while permitting the passage of vapour.

4,898,329

APPARATUS FOR A FUEL SYSTEM

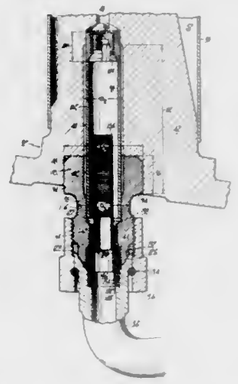
Franklin J. Davis, Glastonbury; Gilbert B. Wilcox, Somers, and Richard R. Wright, Willimantic, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 4, 1987, Ser. No. 117,117
Int. Cl.[4] B05B *1/24, 17/04*
U.S. Cl. 239—13 **11 Claims**

11. A method for shielding fuel flowing through a passage in a fuel nozzle assembly of a gas turbine engine, the passage having a longitudinal dimension, the engine having a fuel nozzle support which is attached to a casing of the engine and which has an inlet for said passage said inlet being at an upstreammost edge of said fuel nozzle support, which includes the steps of:

shielding the fuel stream with a longitudinally extending insulating gap outwardly of the passage; and,

shielding the passage with an internal insulating gap internally of the passage which longitudinally overlaps the



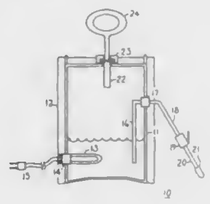
external gap and extends longitudinally to at least said upstreammost edge of the inlet to the passage.

4,898,330

PORTABLE DEICER SPRAYER

Jerry L. Betchan, 6515 Anderson Way, Nampa, Id. 83651

Filed Sep. 28, 1987, Ser. No. 102,014
Int. Cl.[4] B05B *1/24, 9/04*
U.S. Cl. 239—135 **1 Claim**



1. Portable sprayer means for deicing of airplane wings comprising:

deicer fluid container means for pressurized holding of deicer fluid prior to delivery to the airplane surface;

manually operated air pump means for pressurizing said container means operably detachable from the container means for refilling said container means with deicer fluid;

an electrical heater means for heating deicer fluid before delivery of fluid to airplane wing surface disposed within said container means;

thermostatic control means operably connected to the electric heater to maintain a preselected deicer fluid temperature;

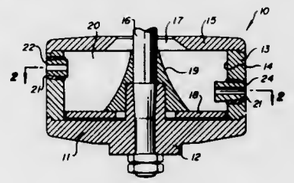
thermal insulation blanket means for removably enclosing said container.

4,898,331

ATOMIZER WHEEL WITH BUSHINGS OF DIFFERENT INWARDLY PROTRUDING LENGTHS

Ove E. Hansen, Columbia, and Christopher P. Healy, Ellicott City, both of Md., assignors to A/A Niro Atomizer, Soeborg, Denmark

Filed Dec. 22, 1988, Ser. No. 288,178
Int. Cl.[4] B05B *3/10*
U.S. Cl. 239—223 **26 Claims**



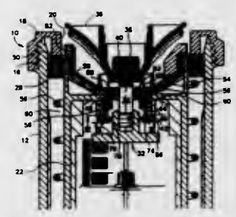
1. An atomizer wheel for atomization of slurries comprising a hub adapted for connection to a rotating drive shaft, a bottom, a substantially cylindrical side wall and a cover plate defining an annular bowl-shaped space concentric with said hub, said side wall being formed with a plurality of openings and a plurality of nozzles formed of a wear-resistant material, each of said nozzles being inserted in one of said openings with one end projecting into said bowl-shaped space a distance from said side wall and at least one of said nozzles having at least a portion of said one end projecting into said bowl-shaped space a greater distance from said side wall than at least a portion of said one end of other ones of said nozzles.

4,898,332

ADJUSTABLE ROTARY STREAM SPRINKLER UNIT

Edwin J. Hunter, 5551 Codorniz Rd., Rancho Sante Fe, Calif. 92067, and Loren W. Scott, Carlsbad, Calif., assignors to Edwin J. Hunter, Rancho Santa Fe, Calif.

Continuation-in-part of Ser. No. 121,400, Nov. 11, 1987, Pat. No. 4,842,201, which is a continuation-in-part of Ser. No. 878,591, Jun. 26, 1986, Pat. No. 4,869,379. This application Apr. 10, 1989, Ser. No. 335,848
Int. Cl.[4] B05B *3/04, 1/26*
U.S. Cl. 239—240 **22 Claims**



1. A rotating stream sprinkler unit comprising:

a tubular housing having a central axis, an inlet, an outlet, and a flow passage communicating therebetween for conducting a stream of water from said inlet to said outlet;

orifice means at said outlet for receiving and forming said stream of water into at least one substantially arcuate primary stream directed axially outward from said outlet; and

a rotating distributor head rotatably mounted at and spaced axially outward from said outlet having a plurality of flow channels therein for receiving and forming said primary stream into a plurality of streams and directing said plural-

ity of streams outward from said axis over a predetermined area; and

means for selectively blocking a portion of said flow passage for selectively adjusting the quantity of water in said stream of water communicated to said distributor head.

4,898,333

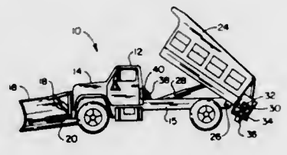
HYDRAULIC SYSTEM FOR USE WITH SNOW-ICE REMOVAL VEHICLES

James A. Kime, and Gregory R. McMenamin, both of Columbus, Ohio, assignors to H.Y.O., Inc., Columbus, Ohio

Filed Aug. 30, 1988, Ser. No. 238,630

Int. Cl.[4] E01C *19/20*; B60P *1/16*

U.S. Cl. 239—657 **18 Claims**



1. In a utility vehicle of the type having an internal combustion engine and hydraulically driven implements operated when selectively actuated, with pressurized hydraulic fluid derived from a pump driven by said engine, the improved hydraulic pump comprising:

a pump housing mounted upon said vehicle, and having a pump chamber;

first and second pump gears mounted for rotation within said housing pump chamber and defining a pump suction side and a pump pressure side connectable with said implements;

connector means for connecting said first pump gear in continuous driven relationship with said engine;

suction port means for coupling said pump suction side with a hydraulic fluid reservoir retained at substantially atmospheric pressure;

a poppet valve coupled intermediate said suction port means and said pump suction side and actuable to have a closed orientation substantially blocking passage of said hydraulic fluid into said suction side to derive a cavitation mode of pump operation and actuable to have an open orientation permitting the flow of hydraulic fluid from said reservoir into said pump suction side to derive a fluid pressurizing mode of operation, said poppet valve including a poppet slidably movable between open and closed orientations within a valve chamber;

vent means for venting said pump chamber substantially to atmospheric pressure to avoid ingress of air thereinto during said cavitation mode of pump operation; and

actuator means for selectively actuating said poppet valve into said open orientation by coupling one end of said valve chamber with said pump suction side, and into said closed orientation by terminating said coupling with said suction side to permit movement of said poppet to said closed orientation.

4,898,334

ARRANGEMENT FOR SECURING A CAP TO THE END OF A SUPPORTING BODY OF A HAMMER MILL ROTOR

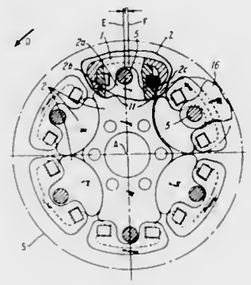
Helmut Manschwetus, Fuldabrück, Fed. Rep. of Germany, assignor to Thyssen Industrie AG Henschel, Essen, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,208

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727870

Int. Cl.[4] B02C *13/04*

U.S. Cl. 241—194 **2 Claims**



1. In a hammer mill, an arrangement for securing a cap to the end of a supporting body of a hammer rotor that has an axis of rotation and a plurality of supporting body ends disposed next to one another and staggered in the direction of rotation of said rotor, with hammer shafts being mounted in said supporting body ends and extending parallel to said axis of rotation of said rotor over the length of said rotor, and with respective hammers and shaft-protecting members being selectively mounted, in such a way that they can swing, between each two adjacent, spaced apart supporting body ends that are disposed parallel to one another, the improvement wherein:

each of said supporting body ends has, relative to said direction of rotation of said rotor, a forward end and a rearward end, with said forward end being provided with a first front projection that is an integral part of said supporting body end and extends parallel to said axis of rotation of said rotor, and with said rearward end being provided with a recessed portion; a filler member is received in said recessed portion of said rearward end, whereby said filler member forms a second rear projection and also extends parallel to said axis of rotation of said rotor; and

said cap, relative to said direction of rotation of said rotor, has a front wall and a rear wall, with said front and rear walls being provided with respective flanges that are directed toward one another, extend parallel to said axis of rotation of said rotor, and extend in a hook-like manner about said first front projection and said second rear projection; said cap also has two side walls and covers all sides of said supporting body end while leaving free spaces between said side walls and a hammer shaft; each of said side walls has two ends, each of which is provided with an opening through one of which said filler member is inserted into said recessed portion of said rearward end, and whereby to secure said filler member in said recessed portion, and to thereby secure said cap to said supporting body end, a resilient element is introduced into said filler member and also extends into a recessed provided in an inner surface of said rear wall of said cap.

4,898,335

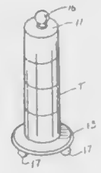
ROLL SUPPORT STAND

Ute Eysink, 2624 Rittiner Dr., Baton Rouge, La. 70806

Filed Feb. 16, 1989, Ser. No. 310,890

Int. Cl.[4] B65H *19/00*

U.S. Cl. 242--55.42 **4 Claims**



1. A roll support stand for storage of an aligned column of individual rolls of webbing formed with a hollow core of a predetermined diameter, said stand comprising,

a horizontal base including a continuous arcuate perimeter, and a counter-sunk blind bore formed medially of an upper surface of said base and extending downwardly from a top surface of said base,

and a vertical support post secured to said base orthogonally thereto and extending into said blind bore at a lowermost end of said support post,

and a securement member including a threaded shank extending through a bore directed into said blind bore wherein said threaded shank is received within a threaded bore formed in said lower end of said securement post,

and an abutment member selectively securable to an upper end of said support post of a further diameter greater than said predetermined diameter,

and wherein said support post is hollow and contains plural pairs of aligned windows diametrically opposed along said support post,

and wherein said support post further includes an adjustment rod extending medially of said support post wherein said adjustment rod is formed with a threaded lowermost end receivable within a plate, said plate extending orthogonally relative to said threaded lower end and formed with a threaded aperture threadedly receiving said threaded lower end to enable vertical repositioning of said adjustment rod relative to said hollow post.

4,898,336

APPARATUS FOR THE CONTINUOUS WINDING-UP OR WINDING-OFF OF SUBSTANTIALLY FLAT STRUCTURES INTO A PACKAGE AND FROM A PACKAGE, RESPECTIVELY

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Mar. 2, 1988, Ser. No. 163,346

Claims priority, application Switzerland, Mar. 6, 1987, 00860/87

Int. Cl.[4] B65H *75/00, 19/12*

U.S. Cl. 242—59 **15 Claims**

1. An apparatus for continuous winding-up or unwinding of substantially flat structures, especially printed products in imbricated formation, selectively into a product package or from a product package, comprising:

a driven and elevationally adjustable winding core member;

a supply spool member for a winding band which is to be selectively wound-up with the substantially flat structures from which there is formed the product package or unwound together with the substantially flat structures from the product package;

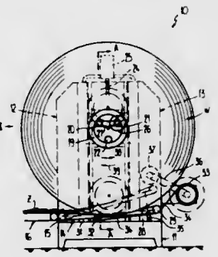
a conveyor device for the selective infeed of the substantially flat structures which are to be wound-up or the outfeed of the unwound substantially flat structures;

a conveyor band arrangement for the selective infeed of the substantially flat structures and the winding band which are to be wound-up to form the product package or for the outfeed of the substantially flat structures and the winding band which are unwound from the product package;

said conveyor band arrangement being arranged between said conveyor device and said winding core member;

said conveyor band arrangement containing at least one conveyor band trained around non-driven deflection means for entrainment in a freely revolving movement;

means for elevationally resiliently urging said conveyor band arrangement so as to contact in underfeed and from below the winding core member or the product package located upon said winding core member and thereby entrain said at least one conveyor band of said conveyor band arrangement in said freely revolving movement;



drive means for driving said winding core member;

said drive means comprising drive elements drivingly interconnecting said drive means and said winding core member;

an elevationally adjustable carriage member;

means for guiding said elevationally adjustable carriage member for movement in a substantially upright direction;

said drive means for driving said winding core member being mounted at said elevationally adjustable carriage member; and

elevational drive means for raising and lowering said elevationally adjustable carriage member and conjointly therewith said drive means and said winding core member and controllable as a function of the momentary elevational position of said conveyor band arrangement.

4,898,337

THREAD STORING AND SUPPLYING DEVICE FOR TEXTILE MACHINES, PARTICULARLY KNITTING MACHINES

Heinz Brunner, Albstadt-Ebingen, and Karl-Jürgen Sauter, Messstetten, both of Fed. Rep. of Germany, assignors to Sipra Patententwicklungs-Und Beteiligungsgesellschaft, Tailfingen, Fed. Rep. of Germany

Filed Sep. 14, 1988, Ser. No. 244,807

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733797

Int. Cl.[4] B65H *59/22, 51/20*

U.S. Cl. 242—151 **10 Claims**

1. A thread braking device for thread in textile machines especially knitting machines, comprising:

a housing;

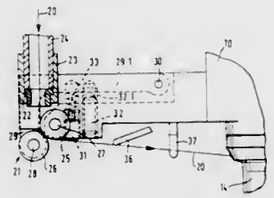
supporting means mounted in said housing so as to be movable relative to said housing;

a first roller rotatably mounted in said housing;

a second roller rotatably mounted in said supporting means parallel and spaced from said first roller and defining a gap for said thread;

a spring acting on said supporting means for urging with its spring force said second roller against said first roller;

a movable abutment associated with said supporting means and establishing a maximum value for said gap between



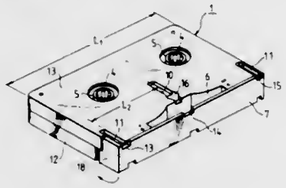
said rollers; and means for adjusting said spring force of said spring and said movable abutment independently of each other.

4,898,338

MAGNETIC TAPE CASSETTE

Kengo Oishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 21, 1988, Ser. No. 247,233
Claims priority, application Japan, Sep. 21, 1987, 62-143016[U]; Sep. 21, 1987, 62-143017[U]
Int. Cl.[4] G11B *23/04*
U.S. Cl. 242—198 **9 Claims**



1. A magnetic tape cassette comprising:
a pair of tape reels on which a tape is wound;
a case in which said tape reels are rotatably mounted;
an opening disposed in front of said cassette through which said tape can be pulled out for recording and playback;
a guard panel provided at a front of said cassette for opening and closing said opening; and
at least three guide grooves provided on a bottom of said case and extending in a front-to-rear direction of said cassette at a central portion and both ends of said cassette;
wherein said guide grooves are positioned to engage insertion guides of a recording/playback apparatus and are located away from areas of rotation of said reels in directions of length, width and thickness of said cassette; and
wherein one of said guide grooves disposed at said central portion of said cassette is wider than said guide grooves disposed at said ends of said cassette, and joins a photosensor insertion hole.

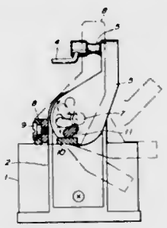
4,898,339

BAIL REVERSING STRUCTURE FOR FISHING SPINNING REELS

Shinji Takeuchi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,412
Claims priority, application Japan, Aug. 20, 1987, 62-126661
Int. Cl.[4] A01K *89/01, 89/04*
U.S. Cl. 242—231 **1 Claim**

1. A bail reversing structure for fishing spinning reels for moving a bail between a fishing line winding position and a fishing line releasing position, comprising:
an arm lever having a portion pivotally connected to a first end portion of the bail, said arm lever comprising a line roller, said arm lever having a substantially planar first surface and a second surface, said first surface being disposed further radially outwardly with respect to a rotor than said second surface;
an arm holder provided on a second end portion of the bail, said arm lever and said arm holder being mounted pivotally on bail mounting arms provided on both sides of the rotor;
an operating lever having a portion pivotally supported on a pivot axis on the bail mounting arm to which said arm lever is pivotally connected in such a manner that said operating lever can be drawn freely in a radial direction with respect to the rotor, the bail being moved between the fishing line winding position and the fishing line releasing position by turning said operating lever;



a locking projection formed on said first surface of said arm lever radially inwardly of said operating lever with respect to the rotor and extending radially outwardly from said first surface;
an arcuate engaging portion formed on a radially extending surface of said locking projection which substantially faces said pivotally connected portion of said arm lever; and
an operating projection provided on a rear side of a pivotally supported portion of said operating lever relative to the bail mounting arm, on the side of the operating lever nearest the rotor for directly engaging said engaging portion of said locking projection and extending radially inwardly of said operating lever with respect to the rotor, wherein said pivotally supported portion of said operating lever and said operating projection, in an unactuated state, are disposed on a rear side of said pivotally supported portion of said arm lever.

4,898,340

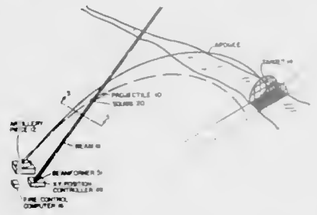
APPARATUS AND METHOD FOR CONTROLLING A CANNON-LAUNCHED PROJECTILE

Isaac E. Kliger, Lexington, and Richard A. Beckerleg, Boxford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 15, 1982, Ser. No. 339,535
Int. Cl.[4] F41G *7/00*
U.S. Cl. 244—3.11 **5 Claims**

1. In a system for controlling the flight of a cannon-launched projectile toward a selected target from an artillery piece, such system including a fire control computer for calculating the ideal ballistic trajectory of such projectile and a beam-forming arrangement for projecting a beam of infrared energy along the ideal ballistic trajectory from a point adjacent to the artillery piece, the improvement comprising:
(a) means for scanning the beam of infrared energy to form, in accordance with a predetermined program, a beam scan pattern and periodically to irradiate the cannon-launched projectile in flight toward the selected target;

(b) means on the cannon-launched projectile for detecting infrared energy in the beam to produce a first control signal whenever such projectile is irradiated;
(c) means on the cannon-launched projectile for reproducing the predetermined program synchronously with such program;



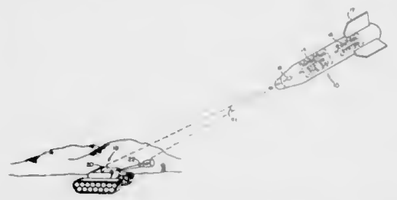
(d) means on the cannon-launched projectile, responsive to the first control signal and the reproduced predetermined program, for producing a second control signal indicative of the position of the cannon-launched projectile relative to the ideal ballistic trajectory; and
(e) means on the cannon-launched projectile for nulling the distance between the indicated position of such projectile and the ideal ballistic trajectory.

4,898,341

METHOD OF GUIDING MISSILES

John Terzian, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 12, 1988, Ser. No. 256,511
Int. Cl.[4] F41G *7/22*
U.S. Cl. 244—3.16 **7 Claims**



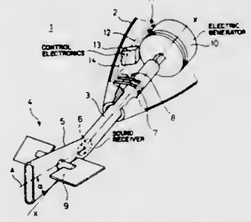
1. A method for deriving guidance signals in the terminal phase of an intercept of a target by a guided missile equipped with an imaging IR seeker, the target being of an extended area and being characterized by a thermal signature indicative of distribution of point sources of IR energy differing substantially from the distribution of point sources of IR energy in the background of the target and the imaging IR seeker being adapted, as the guided missile nears the target, sequentially to form at known intervals of time, a plurality of frames in each of which frames at least a portion of an image of the target appears, thereby providing a set of signals that creates a rectangular MxN pixel matrix of the frame, the changes from frame to frame of the rectangular MxN pixel matrix indicative of the guidance commands to be derived, the method comprising the steps of:
(a) generating, from the set of signals in the first formed one of the plurality of frames, the thermal signature of the target;
(b) selecting a first portion of the thermal signature to serve as a tracking point for the imaging IR seeker and a second portion removed from the first portion to serve as an aiming point for the guided missile;
(c) measuring a first angular displacement between the tracking point and the aiming point and storing a first signal representative of the first angular displacement;
(d) generating, using the set of signals and the stored first signal, guidance commands to maintain tracking of the tracking point by the imaging IR seeker and aiming of the guided missile at the aiming point;
(e) repeating steps (a), (b) and (c) using the set of signals in the next formed one of the plurality of frames to obtain a second signal representative of angular displacement, measured from the tracking point, between the tracking point and the aiming point at a later instant in time;
(f) comparing the first and the second signal to determine a third signal representative of the rate of growth of the angular displacement between the tracking point and the aiming point;
(g) modifying the guidance commands in accordance with the third signal to maintain tracking of the tracking point by the imaging IR seeker and aiming of the guided missile at the aiming point.

4,898,342

MISSILE WITH ADJUSTABLE FLYING CONTROLS

Walter Kranz, Taufkirchen, and Werner Schnäbele, Wolfratshausen both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 13, 1988, Ser. No. 283,628
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742836
Int. Cl.[4] F42B *15/02*
U.S. Cl. 244—3.21 **9 Claims**



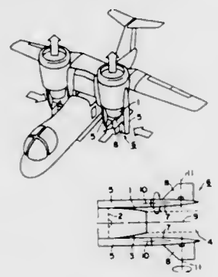
1. A missile with target sensor means comprising:
adjustable flight control means;
electric generator means having a rotor and a stator, the rotor and stator being mounted on two sections of the missile capable of rotary movement relative to one another, the rotor being mechanically coupled to the adjustable flight control means;
variable electric load means coupled to the electric generator means for providing variable electric resistance; and
control electronic means coupled to the target sensor means and the variable electric load means, the control electronic means receiving target location signals from the target sensor means and altering the variable electric load in response to the target location signals, the changes in electric load varying the rotational speed of the rotor which in turn varies the rotational rate of the adjustable flight control means, resulting in an altered flight path.

4,898,343

THRUST-DEFLECTING VANE DEVICE OF V/STOL AIRCRAFT

Keisuke Kamo, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 286,806
Claims priority, application Japan, Dec. 25, 1987, 62-328887
Int. Cl.[4] B64C *29/00*
U.S. Cl. 244—12.4 **5 Claims**

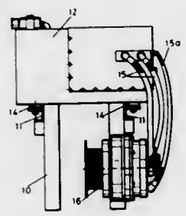


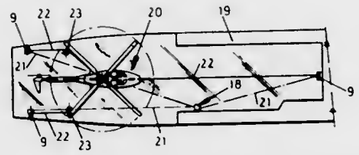
3. A thrust-deflecting vane device of a vertical/short take-off and landing (V/STOL) aircraft having an airframe and a jet engine which discharges an exhaust gas stream, comprising:

tail surfaces being provided at an aft part of said airframe; and

a tail surface deflecting device intercoupling said tail surfaces with said airframe and being operable to move said tail surfaces selectively between first positions on the outer lateral sides of said airframe and second positions in said exhaust gas stream, said tail surface deflecting device including a universal joint mechanism.

response thereto to said control unit; and means for transmitting an electrical signal from the control unit to the other





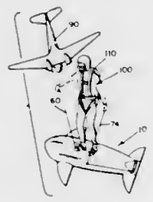
winch or winches in order to control the tension in their wires in relation to the wire tension of said one winch.

4,898,345

SKYBOARD

Dan Clayton, 8651 Foothill, No. 42, Rancho Cucamonga, Calif. 91730

Filed Oct. 24, 1988, Ser. No. 261,697
Int. Cl.[4] B64C *31/00*; B64D *17/78*
U.S. Cl. 244—4 A **17 Claims**



1. A skyboard, comprising:

a. a main body having an upper surface, a lower surface, a first lateral side, a second lateral side, a front nose and a transverse rear edge;

b. a pair of spaced apart generally parallel fins attached to the lower surface of the main body and extending for a portion of the length of the lower surface;

c. a first front wing attached to the first lateral side of said main body and extending transversely therefrom;

d. a first rear wing attached to the first lateral side of said main body and extending transversely therefrom;

e. a second front wing attached to the second lateral side of said main body and extending transversely therefrom;

f. a second rear wing attached to the second lateral side of said main body and extending transversely therefrom;

g. a pair of shoe bindings attached to the upper surface of said main body;

h. said main body further comprising a parachute compartment;

4,898,344

HYDRAULICALLY OPERATED WINCH UNITS

Thomas M. Craig, Loanhead, Scotland, assignor to MacTaggart, Scott (Holdings) Ltd., Loanhead, Scotland

Filed Jun. 6, 1988, Ser. No. 202,897
Claims priority, application United Kingdom, Jun. 9, 1987, 8713423
Int. Cl.[4] B64F *1/12*
U.S. Cl. 244—116 **9 Claims**

1. An aircraft handling system comprising a plurality of hydraulically operated winches, each winch having a wire for connection to the aircraft, and each winch having a dedicated hydraulic pumpset positioned in proximity thereto; an electrical control unit for effecting co-operating operation of the winches in order to effect the desired movement and control of the aircraft; means for detecting the tension in the wire of at least one of said winches and transmitting an electrical signal in

i. a closed parachute within said parachute compartment and attached to said main body; and

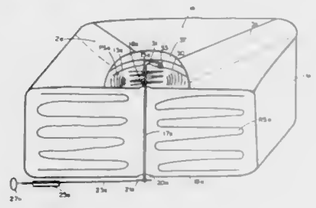
j. triggering means by which said parachute is released from said parachute compartment and caused to open.

4,898,346

RESERVE PARACHUTE PACK WITH PILOT CHUTE

Stefan Ertler, Letzenbergstrasse 50, D-6914 Malschenberg, Fed. Rep. of Germany

Filed Feb. 8, 1989, Ser. No. 307,715
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3805085
Int. Cl.[4] B64D *17/70*
U.S. Cl. 244—148 **20 Claims**



1. A parachute pack, comprising:

a reserve parachute folded into an undeployed condition;

a covering for said reserve parachute substantially enclosing said reserve parachute in its undeployed condition;

a pilot chute folded into an undeployed condition and overlying said folded reserve parachute;

means for deploying said pilot chute including a cover outside said covering for said reserve parachute, a compression spring located outside said covering and engageable with said cover, and an element attached to said cover and extending through said folded pilot chute, said folded reserve parachute and said covering, said element being secured to said cover substantially at its center and extending substantially centrally through said compression spring;

said deploying means further including means for releasably securing said element to the side of the reserve parachute's covering opposite said cover to maintain said compression spring in a compressed condition whereby, upon release of said securing means, said compression spring may extend to displace said cover and free said folded pilot chute for deployment.

4,898,347

METHOD FOR CLEANING SPACECRAFT CRITICAL SURFACES

Maurice P. Bianchi, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

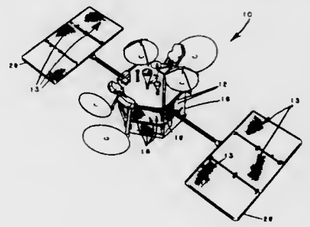
Division of Ser. No. 34,252, Apr. 6, 1987, Pat. No. 4,836,860. This application Oct. 17, 1988, Ser. No. 259,022
Int. Cl.[4] B64G *9/00*
U.S. Cl. 244—158 R **13 Claims**

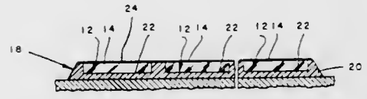
1. In combination

means having a pristine surface to be placed in an outer space environment,

a protective coating on said pristine surface which sublimes in said outer space environment, whereby contaminants which would otherwise deposit on and contaminate said surface deposit instead on said coating, and

wherein said protective coating and any contaminants thereon are eliminated from said surface in said outer space environment by sublimation of said coating, thereby





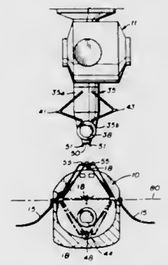
to expose said surface in its pristine state to said outer space environment.

4,898,348

DOCKING SYSTEM FOR SPACECRAFT

Jon B. Kahn, League City, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,121
Int. Cl.[4] B64G *1/64*
U.S. Cl. 244—161 **11 Claims**



1. A docking mechanism for the coupling and docking of a space vehicle with a space station which is provided with an egress hatch, said docking mechanism comprising:

a pressurizable tunnel structure attached at one end to said space station in sealing engagement therewith about said egress hatch, said tunnel structure providing a passageway of a size sufficient for accommodating the passage of personnel and equipment;

a passive docking ring affixed to said tunnel structure at a location thereon remote from said one end;

an active docking ring mounted on said space vehicle;

actuator means for moving said active docking ring between a stowed retracted position in the payload bay of the spaced vehicle to a fully deployed position outside said space vehicle wherein said active docking ring is disposed for coupling engagement with the passive docking ring in the space station when the space vehicle makes an aligned docking approach to the space station, said actuator means

being responsive to the docking impact of said space vehicle with the space station to attenuate the shock forces of said impact and after completing engagement retracting the docket and assembly;

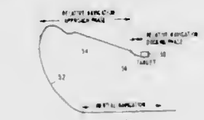
and means responsive to retraction of the active docking ring after coupling engagement of said docking rings for establishing a structural tie between said space vehicle and space station and sealing connection of said tunnel structure with said space vehicle for establishing a passageway for the passage of personnel and equipment between the space vehicle and space station.

4,898,349

SPACECRAFT APPROACH/SEPARATION BY USE OF ANGULAR MEASUREMENT

Paul A. Miller, East Windsor, N.J., assignor to General Electric Company, East Windsor, N.J.

Filed Dec. 9, 1988, Ser. No. 282,161
Int. Cl.[4] B64G *1/24*
U.S. Cl. 244—161 **11 Claims**





1. A spacecraft guidance and control system for approach-/separation relative to a target, both of which are in substantially mutually coplanar orbits about a heavenly body, said spacecraft comprising:

first attitude determining means for determining the direction of a radius from the center of gravity of said body to at least one of said spacecraft and said target;

second attitude determining means for determining a direction parallel with at least one of said coplanar orbits and normal to said direction of said radius;

sensing means coupled to said second attitude control means for sensing the angle in said plane between said direction and a line joining said target with said spacecraft; and

propulsion means coupled to said sensing means for generating propulsion tending to maintain said in-plane angle at a constant value.

5. A method for controlling the approach or separation of a spacecraft in a first orbit about a heavenly body relative to a target in a substantially coplanar second orbit, said method comprising at least the steps of:

determining the direction of a radius from the center of gravity of said body to at least one of said spacecraft and said target;

determining a second direction substantially parallel with one of said mutually coplanar orbits and normal to said direction of a radius;

observing the angle between said second direction and a line joining said target with said spacecraft; and

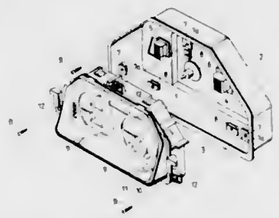
propelling to at least tend to maintain said angle constant.

4,898,350

VEHICLE-METER-HOUSING MOUNTING BRACKETS

Takahiro Masuda, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,798
Claims priority, application Japan, Oct. 12, 1987, 62-155732
Int. Cl.[4] G12B *9/00*
U.S. Cl. 248—27.1 **5 Claims**



1. A vehicle meter housing structure comprising:

an instrument panel having a front opening portion;

a meter housing inserted into said instrument panel through said front opening portion;

a pair of mounting brackets formed on a periphery of said meter housing; and

a pair of lugs, each of said lugs extending forwardly from one of said mounting brackets;

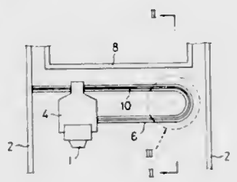
wherein each of said lugs has a small width portion which provides a gap large enough to receive human fingers between an inner edge of said instrument panel and said lug.

4,898,351

MECHANISM FOR SUPPORTING A LONG FLEXIBLE ELEMENT

Norio Suzuki, Tokyo, Japan, assignor to Juki Corporation, Chofu, Japan

Filed Dec. 22, 1988, Ser. No. 289,556
Claims priority, application Japan, Dec. 25, 1987, 62-329315
Int. Cl.[4] F16L *3/00*
U.S. Cl. 248—51 **16 Claims**



1. A mechanism for supporting a long flexible cable having at least one end which is attached to a movable member which travels substantially longitudinally and reciprocally, comprising:

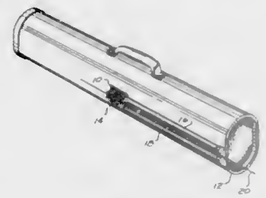
a long tape whose transverse section is curved outwardly or inwardly with constant curvature, said tape being placed along the length of said cable and in contact therewith in a manner supporting said cable and causing said cable to maintain a uniform angle of curvature at its point of turn back substantially throughout the travel of said member.

4,898,352

CONTAINER STAND

Ronald W. Hoffman, 10431 West Catalina, Phoenix, Ariz. 85039

Filed Feb. 13, 1989, Ser. No. 309,217
Int. Cl.[4] A63B *55/00*
U.S. Cl. 248—96 **7 Claims**



1. A supporting apparatus for attachment to an object to selectively position said object in an upright orientation, said supporting apparatus comprising:

(a) a bracket including

(i) a planar attachment plate attachable to said object, said attachment plate defining a weight supporting line, and

(ii) a planar attachment support perpendicularly and rigidly attached to said planar attachment plate;

(b) a rotating member pivotably attached to said attachment support, said rotating plate comprising

(i) a planar rotating support coplanar with said planar attachment support, and

(ii) a planar rotating plate perpendicularly and rigidly attached to said planar rotating support,

said rotating member being disposed for rotation from a first position in which said rotating plate is generally coplanar with said planar attachment plate to a second position in which said rotating plate forms an angle with said attachment plate;

(c) a first leg movably coupled to said rotating plate so that said first leg selectively resides in one of a first position generally parallel to said weight supporting line and a second position at an acute angle to said weight supporting line; and

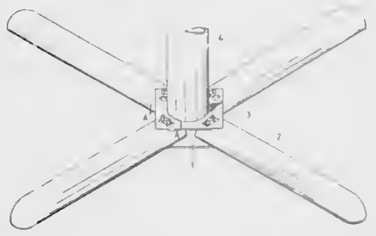
(d) a second leg movably coupled to said rotating plate so that said second leg selectively resides in one of a first position generally parallel to said weight-supporting line and a second position at an acute angle to said weight-supporting line, said second leg being at an angle with said first leg when said first and second legs are in said second positions.

4,898,353

BUILT-UP STAND

Ronald R. H. Jih, 26, Lane 378, Chung Shan Road, Lu Liao District, Sha Lu Chen, Taichung Shien, and Jing-Shuen Chi, 8, Lane 280, Jen Shing Road, Taichung City, both of Taiwan

Filed May 16, 1989, Ser. No. 352,298
Int. Cl.[4] A47B *91/00*
U.S. Cl. 248—188.7 **3 Claims**



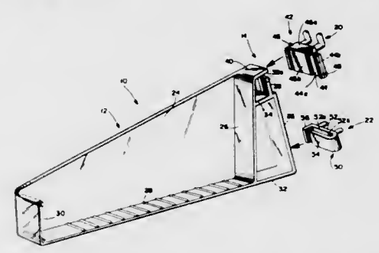
1. A built-up stand comprised of a bottom holder plate, a plurality of base elements and an upper holder plate, wherein the upper holder plate is comprising plurality of fastening holes made thereon with two retainer means integrally made at both sides of each of the fastening holes; the base elements each having a recessed front end to form into a plane which is including a fastening hole with two retainer holes set at both lateral sides, and also comprising a hollow stub set below its fastening hole; the bottom holder plate having a plurality of fastening holes made thereon to match with the fastening holes of the upper holder plate, with a locating plate respectively set at the left, right and inner side of each the fastening hole of the bottom holder plate to let the three locating plates which encircle the fastening hole of the bottom holder plate define a space just suitable for setting therein of the hollow stub of the base element, and wherein when the bottom holder plate, the base elements and the upper holder plate are attached together, the fastening holes of the bottom holder plate, the base elements and the upper holder plate are arranged to aim at one another, to allow a bolt screw means to screw thereinto and to further be fastened up with a wing nut.

4,898,354

PEG BOARD DISPLAY BRACKETS

Paul S. Whittington, Thornhill, and James Morison, Oshawa, both of Canada, assignors to Gorrie Advertising Management Limited, Mississauga, Canada

Continuation-in-part of Ser. No. 191,537, May 9, 1988, Pat. No. 4,817,900. This application Jan. 4, 1989, Ser. No. 293,421
Int. Cl.[4] F16B *5/06*
U.S. Cl. 248—225.1 **8 Claims**



1. A bracket for supporting a product on a display panel having a number of regularly spaced passages defined therein, said bracket comprising:

a body with a surface to carry said product, said body having a support assembly integrally formed therewith to support said surface in position against said display panel;

a first anchor portion for removable connection with said support assembly; said first anchor portion including a base, a pair of hook elements extending outwardly from said base and dimensioned to engage a corresponding pair of said passages; a hook mounting web extending outwardly form said base,

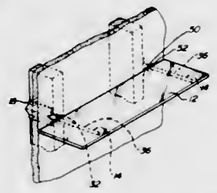
said support assembly including a first support flange and a second support flange extending outwardly from said body; said first support flange having an end which is spaced a distance from an adjacent end of said second support flange, said hook mounting web is dimensioned for a sliding engagement between said adjacent ends.

4,898,355

SHELF SUPPORT FOR GLASS SHELVING

Steven Steinway, 5582 Greenbriar Dr., West Bloomfield, Mich. 48322

Filed Jan. 17, 1989, Ser. No. 297,173
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—235 13 Claims



1. A mounting structure for supporting glass shelving comprising:

(a) an attachment bracket, the attachment bracket adapted to be mounted normal to a wall plane; the attachment bracket comprising a pair of legs, each leg having at least one mounting flange having at least one mounting hole formed therein, the legs being angularly inclined with respect to each other and terminating at an apex, the apex having an inner surface comprising an elongated hollow area;

(b) a supporting member, the support member being sized to be received and secured in the hollow area such that when secured the support member will extend therefrom normal to the wall plane and in a plane parallel to the attachment bracket; and,

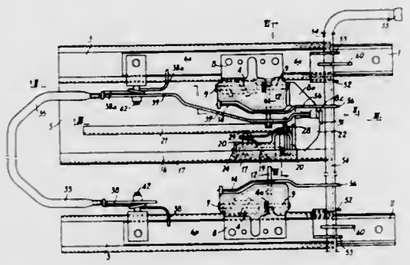
(c) fastening means for securing the bracket to a support surface, the fastening means being projectable through the mounting hole.

4,898,356

REVERSIBLE ENDLESS SCREW SLIDES AUTHORIZING A MICRO MILLIMETRIC CONTROLLED DISPLACEMENT AND INCLUDING A MEMORY FOR A VEHICLE SEAT

Yves Pipon, and Georges Droulon, both of Flers, France, assignors to A. & M. Cousin Etablissements Cousin Freres, Flers, France

Filed Nov. 18, 1988, Ser. No. 273,419
Claims priority, application France, Nov. 20, 1987, 87 16103
Int. Cl.[4] B60N *1/04*
U.S. Cl. 248—429 2 Claims



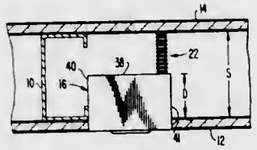
1. Reversible endless screw slides enabling a micro-millimetric displacement and including a memory for a vehicle seat in which two parallel slides (1,2), each constituted by a lower fixed element (3) and an upper mobile element (6), are fixed by their lower fixed elements (3) to the vehicle floor via a base plate (5), one (1) of the slides having on a lower vertical portion (3*a*) of the lower fixed element (3) a rack (3*b*) cooperating with a first reversible endless screw (4) freely mounted on a pin (9) fast with a box (8) fixed on an upper portion of the upper mobile element (6) for controlling a displacement of the slides (1, 2), locking means of the first endless screw (4) by a first shoe (11) being provided through action of a first lever (12), wherein the base plate (5) is mounted under at least one of the two slides and carries also, between the two slides (1, 2), a profile section (16) forming a second rack cooperating with a second reversible endless screw (19) and which can be locked by a second shoe (26), movement of the second shoe being controlled by a second lever (28), the first and second levers (12 and 28) being able to pivot against action of springs (14, 29) via a third lever (39) fast with an articulated control bow (35) placed between the two slides (1, 2) so as to free the first endless screw (4) locking the slides (1, 2) and the second endless screw (19) placed in a casing (20) and cooperating with the second rack for forming a slide mechanical memory; both the box (8) and the casing (20) carrying abutment parts (8*a*, 22, 8*c*, 31) so as to bring in coincidence a position of the box (8) controlling the displacement of the slides (1, 2) with the casing (20) constituting the slide mechanical memory, a fourth lever (56) being mounted on a shaft (54) controlling an unlocking of the first lever (12) and therefore of the first endless screw (4) and enabling to displace the upper mobile elements (6) of the slides without changing a position of the casing (20) constituting the slide mechanical memory.

4,898,357

ELECTRICAL BOX SUPPORT

Robert W. Jorgensen, Niles, Mich., and Kenneth R. Schnell, South Bend, Ind., assignors to Hubbell Incorporated, Orange, Conn.

Filed Dec. 15, 1988, Ser. No. 284,553
Int. Cl.[4] H02G *3/12*
U.S. Cl. 248—906 7 Claims



1. A support structure for an electrical box of the type having a back wall, first and second generally parallel side walls, an open front and means for mounting the box with the first side wall against a stud and with the back wall extending away from the stud between two generally parallel sheets of wall material, the depth of said box in the direction perpendicular to said sheets of wall material being significantly less than the distance between the inner surfaces of said sheets of wall material, the support structure comprising

means defining a hole of preselected size through said back wall significantly closer to said second side wall than said first side wall; and

a support member comprising

an elongated body of electrically nonconductive material having retainer means at one end dimensioned to be pushed into said hole in said back wall for holding said body on said box extending perpendicularly rearwardly therefrom,

a stop flange adjacent said retainer means for abutting an outer surface of said back wall of said box and establishing a depth to which said retainer means extends into said box, and

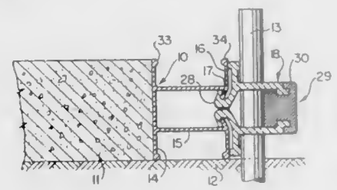
means defining a plurality of recesses substantially uniformly spaced along said body from the other end thereof to a location near said stop flange, said recesses forming weakened regions at which said body can be broken to remove a portion of said body of selected length and to thereby reduce the length of said support member to a length, measured between the remaining end thereof and said stop flange, which is substantially equal to the difference between the depth of the box and the distance between the inner surfaces of said sheets of wall material, thereby forming a support to restrict movement of said box between said sheets of wall material.

4,898,358

FORM-WORK FOR CONCRETE

John R. Sproaken, Suite 103, 1400 Kensington Road, N.W., Calgary, Alberta T2N 3P9, Canada

Filed Nov. 29, 1988, Ser. No. 277,253
Int. Cl.[4] E01C *7/00*
U.S. Cl. 249—7 9 Claims



1. Concrete form-work which comprises:

(a) an edge beam comprising an elongated edge plate having a front face and a rear face, a pair of web portions projecting outwardly from said rear face with a vertical space therebetween and a flange member joined to the free end of each web portion, each flange member including a plate portion extending outwardly relative to the vertical space between the web portion and substantially parallel to said edge plate and a lip portion extending inwardly into said vertical space,

(b) a pair of connector members each comprising a plate with a hole for receiving a stake, an off-set wedge-receiving flange at one edge of the plate and a connector flange at the opposite edge of the plate, each said connector flange including a J-shaped hook portion for hooking around each said edge beam flange lip and an abutment face for engaging a stake and

(c) a wedge member for engaging the off-set flanges of said pair of connector members to hold the connector members and force the connector member abutment faces into tight engagement with the stake.

4,898,359

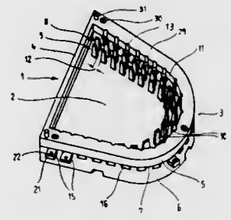
BASE FOR HOLDING A PLASTER OF PARIS MODEL OF A SET OF TEETH

Günter Gopon, Karlsruhe, Fed. Rep. of Germany, assignor to Karsten Baumann, Muhlacker, Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,009
Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716143
Int. Cl.[4] A61C *11/00*
U.S. Cl. 249—54 12 Claims

11. Casting apparatus for the production of dentures, comprising:

a base for holding a plaster of paris model of a set of teeth for the production of said dentures, the base including a bottom to which is attached an upright, circumferential U-shaped exterior wall having an interior surface and perpendicularly projecting guide elements for the plaster of paris model, wherein said guide elements include a first U-shaped curved row of spaced, juxtaposed, frustum configured pins extending parallel to the interior surface of said exterior wall, and



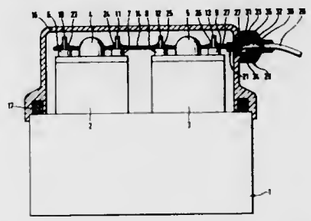
a casting box having a cover and a side wall depending from said cover, said side wall being configured for abutting said exterior wall.

4,898,360

VALVE BLOCK ASSEMBLY

Holger VonHayn, Bad Vilbel, and Joachim Maas, Griesheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 281,312
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742830
Int. Cl.[4] F16K *31/02*
U.S. Cl. 251—129.01 5 Claims



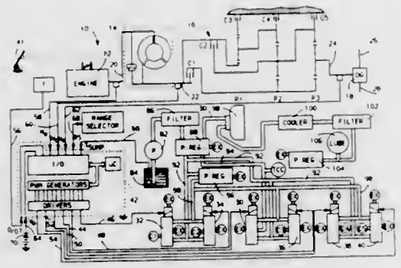
1. A valve block assembly comprising, in combination: a housing enclosing a portion of said valve block assembly, one or more electromagnetically actuable hydraulic valves, a value cap, a power supply means for applying electric power to the coils of the electromagnetic valves through a plurality of electrical contact points, wherein a printed circuit board is provided which is mountable on all of said electrical contact points of the coils as one component unit, and including electrical tracks to establish electrical connections between the coils and an outgoing cable of the valve block, wherein the printed circuit board includes a contact means for an output cable common to all tracks, which contact means is configured so that a removable plug contact of the connecting cable is directly plugged over an edge portion of the printed circuit board forming part of the contact means and a projection of said housing extending away from said edge portion and generally parallel to said printed circuit board for receiving and supporting said plug contact.

4,898,361

SUBMODULATION OF A PULSE-WIDTH-MODULATED SOLENOID CONTROL VALVE

James G. Beader, Carmel, Ind.; Lee F. Herron, Santa Barbara, Calif., and Keith D. Struthers, Carmel, Ind., assignors to General Motors Corporation, Detroit, Mich. and Delco Electronics Corporation, Kokomo, Ind.

Filed Apr. 28, 1989, Ser. No. 345,054
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.05 **3 Claims**



1. Fluid pressure control apparatus for generating a desired fluid pressure in a control chamber of a motor vehicle transmission, comprising:

a source of fluid pressure;

electrically energizable solenoid operated valve means adapted to alternately connect and disconnect said source and said control chamber in accordance with such energization;

a source of direct voltage including a storage battery, having a terminal voltage which varies depending on vehicle operation;

control means for (1) developing a relatively low frequency PWM valve energization signal having an on-time/off-time duty cycle which if applied to the valve would produce the desired pressure in said control chamber when the terminal voltage of said source is relatively low, and (2) submodulating the on-time of said energization signal in relation to the actual terminal voltage of said source so as to effectively reduce said on-time when the actual source voltage is greater than said relatively low source voltage; and

driver means for energizing the solenoid operated valve means with said source of direct voltage in accordance with the submodulated valve energization signal.

4,898,362

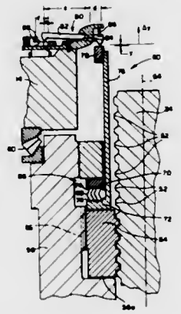
THRUST ACTUATED CONTROL FOR MOTOR OPERATED VALVE

Robert L. Leon, Roslyn, Pa., assignor to Liberty Technology Center, Inc., Conshohocken, Pa.

Filed Jan. 31, 1989, Ser. No. 304,983
Int. Cl.[4] F16K *31/04*
U.S. Cl. 251—129.12 **4 Claims**

1. In a motor operated valve, having a motor operator including motor drive means having a motor, a worm, a worm gear and a drive sleeve, a stem nut coupled to and surrounded by the drive sleeve for rotation about an axis and stem nut lock means coupled to the drive sleeve for preventing axial movement of the stem nut, the valve including a valve gate, a valve seat and a valve stem coupled to the valve gate, the valve stem threadingly engaging the stem nut for axial movement in a first direction upon rotation of the stem nut in a first direction to move the valve gate toward and into engagement with the valve seat and for axial movement in a second direction upon rotation of the stem nut in a second direction to move the valve gate out of engagement with and away from the valve seat, wherein the improvement comprises:

a thrust actuated control including thrust sensor means comprising a mechanical spring assembly positioned between the stem nut and the stem nut lock means for facilitating and sensing axial displacement of the stem nut in the second axial direction resulting from axial compressive thrust on the stem and for returning thrust from the stem



nut directly to the drive sleeve so that the force path beyond the drive sleeve is the same as it would have been without the thrust sensor means; and

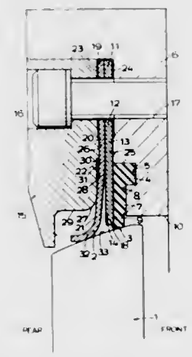
switch means operatively coupled with the thrust sensor means and with the motor for actuation to stop the operation of the motor to stop rotation of the drive sleeve and the stem nut when the axial displacement of the stem nut exceeds a predetermined limit proportional to a predetermined compressive thrust on the stem.

4,898,363

BUTTERFLY AND BALL VALVES

Philip J. Burton, Great Barr, England, assignor to Charles Winn (Valves) Limited, Birmingham, England

Filed Jun. 8, 1989, Ser. No. 363,542
Claims priority, application United Kingdom, Jun. 10, 1988, 8813832; Jul. 21, 1988, 8817411
Int. Cl.[4] F16K *1/22*
U.S. Cl. 251—173 **9 Claims**



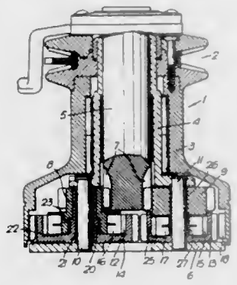
1. A fluid flow valve comprising a valve body provided with a fluid flow passage, a valve member pivotally mounted in said passage for rotation about an axis extending substantially transversely of said passage, an annular seal assembly carried by said body and encircling said fluid flow passage, an edge of said valve member presenting a seal engaging surface which sealingly engages with said seal assembly at least in the closed condition of said valve member to close said flow passage in that condition, said seal engaging surface tapering radially inwardly of the valve from a front to a rear of said valve member, said seal assembly comprising a polymeric sealing ring which is arranged normally to provide a first sealing engagement with said valve member, at least in the closed condition of said valve member, a substantially flat energiser ring which comprises a radially outer portion secured to said housing and a radially inner portion which abuts with said polymeric sealing ring, said energiser ring and polymeric sealing ring having dimensions chosen such that said energiser ring permanently exerts a force on said polymeric ring in a direction towards said front of said disc to urge said polymeric ring against a rearwardly facing abutment surface on said valve housing, said seal assembly further comprising a metal seat ring which provides a permanent resiliently biassed second sealing engagement with said valve member at a radially inner margin of said metal seat ring, and which comprises a radially outer metal seat ring portion which is sealingly held to said valve housing, the arrangement being such that the resilient loading exerted by said energiser ring on said polymeric seat is substantially independent of the resilient loading exerted on said valve member by said metal seat ring.

4,898,364

TWO-SPEED WINCH

Brian Shaker, Portsmouth, and Richard D. J. Huggett, Horndean, both of United Kingdom, assignors to Lewmar Marine Limited, Havant, England

Filed Oct. 6, 1983, Ser. No. 539,407
Claims priority, application United Kingdom, Oct. 8, 1982, 8228815; Dec. 30, 1982, 8237000
The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.
Int. Cl.[4] B66D *1/14*
U.S. Cl. 254—342 **8 Claims**



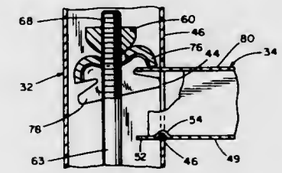
1. A manually powered winch having an input drive shaft and a winch drum, there being only two geared drive trains between the input drive shaft and the drum, an annular gear track on an inner wall of the drum, a unidirectional gear borne on an axle in the winch, the unidirectional gear comprising two parts, a first of said two parts comprising gear teeth engaging with the gear track and a hub joined to the gear teeth, the said first part being the final drive to the gear track from both said geared drive trains, the gear teeth of the first part being permanently engaged by teeth of a gear of one of the drive trains, and means being provided whereby the first part is also engageable by a second part of the said two parts of the unidirectional gear, the said second part being borne by a portion of the hub of the first part for rotation about that portion and the axle, and unidirectional drive means between the said first and second parts, the said second part having gear teeth being a member of the other of the said drive trains.

4,898,365

MODULAR BARRIER

John P. Conner, Grandville, and James R. Bouse, Belmont, both of Mich., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Aug. 20, 1987, Ser. No. 87,414
Int. Cl.[4] E04H *7/14*
U.S. Cl. 256—65 **17 Claims**



1. A modular barrier comprising:

a pair of spaced, vertical metallic tubular posts each having a facing vertical wall, each said vertical wall having an upper window and a lower window, each said vertical wall further including an upper tongue extending upwardly into said upper window and a dependent lower tongue extending into said lower window;

an upper tubular metallic rail extending between said posts;

a lower tubular metallic rail extending between said posts with said rails being parallel and having facing inside walls and outside walls, each said rail having a first end disposed inside one of said posts and a second end disposed inside the other of said posts, each of said facing inside walls having an indentation adjacent each said end receiving a corresponding one of the tongues, each of said windows being sized to receive its corresponding rail ends; and

holding means pushing said rails towards each other and disposed inside each of said posts, each of said holding means engaging said outside walls of said rails and pushing each of said rails toward the other of said rails whereby said tongues are held in their corresponding indentations to maintain said posts and said rails assembled, and the rails are moved toward each other by the holding means so that said rails are firmly secured, said rail ends extending less than halfway through said costs, each of said holding means being disposed entirely within its corresponding post.

4,898,366

APPARATUS FOR CHARGING A MELTING GASIFIER WITH GASIFICATION MEDIA AND SPONGE IRON

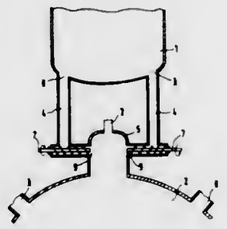
Bogdan Valetic, Duesseldorf, Fed. Rep. of Germany, assignor to Deutsche Voest-Alpine Industrieanlagenbau GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,729
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1987, 3723137
Int. Cl.[4] F27B *1/20*
U.S. Cl. 266—160 **4 Claims**

1. The combination of a direct reduction furnace, a melting gasifier and apparatus for charging the melting gasifier with sponge iron from the direct reduction shaft furnace arranged above the melting gasifier comprising:

a plurality of connecting means symmetrically arranged about a vertical longitudinal axis of the melting gasifier, each connecting means comprising a conduit having an inlet end connected to a lowermost end of the direct reduction shaft furnace, a substantially vertical portion of

the conduit connected to the inlet end and extending downwardly therefrom, a substantially horizontal portion of the conduit having a first end connected to a lowermost end of the vertical portion and a second end, and an outlet connecting the second end of the conduit to an upper portion of the melting gasifier;



a discharge means situated within each of the horizontal portions of the conduits for assisting in delivering sponge iron from the lower end of the vertical portion of the connecting means to the outlet; and

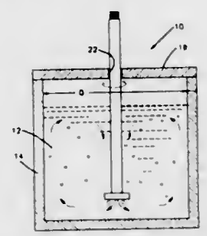
a gasification media inlet, situated on the longitudinal axis of the melting gasifier, adjacent to and centrally situated between the outlets of the plurality of connecting means.

4,898,367

DISPERSING GAS INTO MOLTEN METAL

Paul V. Cooper, Chesterland, Ohio, assignor to The Stemcor Corporation, Cleveland, Ohio

Filed Jul. 22, 1988, Ser. No. 222,934
Int. Cl.[4] C21C *7/00*
U.S. Cl. 266—216 **10 Claims**



1. Apparatus for dispersing gas into molten metal, comprising:

an impeller in the form of a rectangular prism having upper and lower faces, a width (A), a depth (B), and a height (C), with (A) being equal to (B), the impeller having a gas discharge outlet opening through the lower face of the prism;

an elongate, rotatable shaft rigidly connected to the impeller and projecting from the upper face of the impeller; and

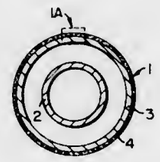
means for conveying gas to the gas discharge outlet, whereby gas to be dispersed into molten metal can be pumped along the lower face of the impeller.

4,898,368

WEAR RESISTANT METALLURGICAL TUYERE

Paul J. Schaffer, Peekskill, N.Y., and Robert C. Tucker, Jr., Brownsburg, Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 26, 1988, Ser. No. 236,788
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—222 **12 Claims**



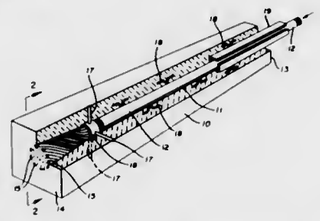
6. A metallurgical vessel comprising at least one refractory wall and having at least one coaxial tuyere passing through said wall for passage of fluid into the vessel, said tuyere comprising a central conduit and at least one conduit outer and coaxial thereto, each of said conduits having an outer surface and further comprising an oxide thermal barrier coating on the outer surface of the outermost coaxial conduit, said thermal barrier coating having a thermal conductivity less than that of said refractory.

4,898,369

LANCE WITH METERED CORE FOR TREATING MOLTEN METAL

Joseph A. Perri, Coraopolis, Pa., assignor to Insul Company, Inc., East Palestine, Ohio

Continuation-in-part of Ser. No. 190,019, May 4, 1989, abandoned. This application Apr. 26, 1989, Ser. No. 351,889
Int. Cl.[4] C21C *5/46*
U.S. Cl. 266—266 **9 Claims**



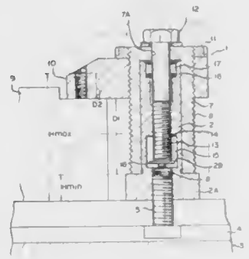
1. A lance for use in treating a bath of molten metal comprising an elongated refractory body having a central portion and first and second integral end portions all of a known width extending axially therefrom, a metal tube of a diameter less than or equal to one-fourth said known width of said elongated refractory body positioned axially in said central portion and said first end portion of said elongated refractory body so as to extend out of said first end portion and terminate inwardly of said second end portion, a plurality of smaller metal tubes arranged in a circular pattern communicating with said metal tube and positioned axially in said second end portion of said elongated refractory body and extending therefrom to the exterior end of said second end portion which defines the delivery end of said lance, means engaging said first mentioned metal tube and extending outwardly of said first end portion of said refractory body by which said lance may be supported, said plurality of smaller metal tubes being surrounded by said refractory body forming a coating thereover of a thickness greater than the diameter of said smaller metal tubes arranged in said circular pattern, a least a portion of each of said smaller metal tubes being formed to define a narrow slot whereby a controlled volume and flow of gas at a known pressure can be discharged thereby.

4,898,370

CLAMPING APPARATUS

Masayuki Saito, and Yasuo Kazama, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1988, Ser. No. 279,765
Claims priority, application Japan, Dec. 11, 1987, 62-188683
Int. Cl.[4] B25B *1/10*
U.S. Cl. 269—91 **3 Claims**



1. A clamping apparatus comprising:

a base block to be mounted on the top surface of the bed;

a cylindrical clamp base having a male screw on the outer peripheral surface thereof and mounted on the base block for up-and-down motion;

a clamp piece threadedly fitted on the male screw of t he clamp base and adapted to press an object of clamping on the bed; and

lift means for moving the clamp piece and the clamp base up and down, with respect to the base block,

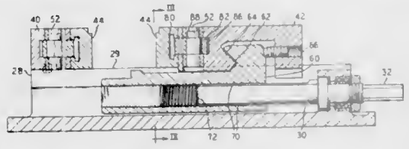
said clamp base having a through hole at a top portion thereof, and said lift means including a bolt threadedly fitted in a female screw of the base block through the through hole of the clamp base, spring means arranged between the base block and clamp base for urging the clamp base upward, and stopper means fixed to the tip end of said bolt for defining the upper motion limit of said clamp base.

4,898,371

QUICK-CHANGE VISE

Perry A. Mills, 18700 Bell Dr., Nevada City, Calif. 95959, and Joel DiMarco, 4288 Revere Pl., Culver City, Calif. 90230

Filed Mar. 17, 1988, Ser. No. 169,596
Int. Cl.[4] B23Q *3/02*
U.S. Cl. 269—136 **7 Claims**



1. A vise comprising:

an elongate base member having a longitudinal axis;

a pair of jaw members with opposing faces;

means for moving said jaw members toward and away from each other along said longitudinal axis on said base member for releasably grasping a workpiece therebetween;

a jaw blank for a jaw member having a front face and a back side; and

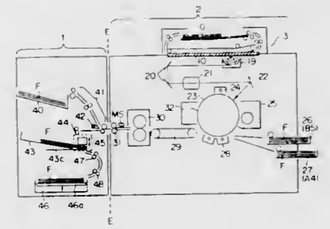
means for releasably securing a jaw blank to a jaw member including an channel located at the back side of said blank, retaining means for slidably engaging said channel, carrier means for carrying said retaining means, means for locating said carrier means with said jaw member, and means for moving said carrier means within said jaw member to a first extreme position wherein said jaw blank on said retaining means is spaced from said jaw member and to a second extreme position wherein said jaw blank on said retaining means is clamped against said jaw member, said means for moving including an opening located in said carrier means and a cam positioned within said opening, said cam operating against a wall of said opening.

4,898,372

COPY PAPER PROCESSING APPARATUS

Tsugio Hirabayashi, and Izumi Hamanaka, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed May 23, 1988, Ser. No. 197,588
Claims priority, application Japan, May 29, 1987, 62-131604
Int. Cl.[4] B42B *2/00*
U.S. Cl. 270—53 **17 Claims**



1. A copy paper processing apparatus for processing copy papers, comprising:

a stacker tray for receiving copy papers, said stacker tray including side plates for engaging opposing sides of the copy papers when the copy papers are received on the stacker tray;

blower means for blowing air through said stacker tray to reduce static friction between said stacker tray and said copy papers;

stopper means movable between a first position for engaging one edge of the copy papers and holding the copy papers in a desired position relative to the stacker tray when the copy papers are disposed on said stacker tray and a second position for permitting the copy papers to slide freely along the stacker tray;

punching means for punching holes in the copy papers held on said stacker tray in said desired position; and

stapling means for stapling together a plurality of copy papers held on said stacker tray in said desired position.

4,898,373

HIGH SPEED SIGNATURE MANIPULATING APPARATUS

John R. Newsome, R.R. #1, Box 58A, Shumway, Ill. 62461

Continuation-in-part of Ser. No. 882,073, Jul. 3, 1986, Pat. No. 4,747,817. This application Mar. 31, 1988, Ser. No. 176,364
Int. Cl.[4] B42B *1/02*
U.S. Cl. 270—58 **18 Claims**

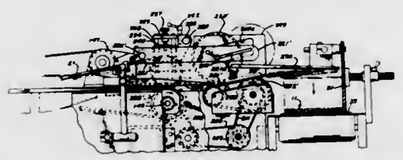
1. In apparatus for receiving a stream of documents traveling at a first velocity in spaced-apart serial relation and forming such documents into a running shingle traveling at a second

velocity which is lower than the first, the combination comprising

(a) means for imparting a lengthwise bow in each document as it is fed in to inhibit droop when the document is ejected with its leading portion unsupported,

(b) means for ejecting said documents for flyout from said means (a)

(c) means forming a moving throat with upper and lower surfaces moving, in their directly opposed regions, at said second velocity, the lower surface of said throat being closely spaced from the point of ejection, said means (c) being disposed with downstream spacing from and in relation to said means (b) such that the leading edge of an ejected document strikes said upper surface at a location upwardly displaced from the centerline of the throat, and is tucked down to ride with the setback on the preceding document which is traveling with and driven by gripping



between the directly opposed regions of said surfaces, the lower surface of said throat being the upper flight of an endless driven belt which is cross-sectionally shaped to make said lower surface upwardly convex to facilitate smooth downward drooping of the document wings laterally disposed on either side of said belt, the upper surface of said throat being the periphery of a non-driven wheel which turns idly due to contact with documents carried on said belt, said wheel being shaped to present a concave periphery so as to tend to urge said documents into a downwardly bowed configuration as a result of their leading edges striking said wheel, and

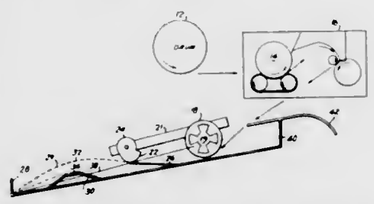
(d) a driven toothed wheel underlying said signatures at the point of ejection, the teeth of said toothed wheel catching the trailing edge of each ejected document and tucking it down to rest on the preceding document traveling with said lower surface.

4,898,374

INTERMITTENT DRIVE MECHANISM FOR COPY STACKING

David L. Vermaat, Port Crane, N.Y., assignor to Imagitek, Inc., Binghamton, N.Y.

Filed Jan. 27, 1988, Ser. No. 211,561
Int. Cl.[4] B65H 29/40
U.S. Cl. 271—178 3 Claims



1. A stacking apparatus for sheet media including an intermittent drive means comprising a drive wheel with a first circumferential portion at a proximal radius, and a second circumferential portion at a distal radius, said distal radius being greater than said proximal radius, said distal radius being chosen so as to form a nip with a guiding means thereby providing a driving period of the sheet media during rotation of said drive wheel, said proximal radius being chosen so as to not form a nip with said guiding means thereby providing a relaxation period for the sheet during rotation of said drive wheel;

a first lower recess in a path of the sheet media subsequent to said intermittent drive means to receive a trailing edge of a first sheet media of a first length thereby not obstructing the leading edge of subsequent sheet media;

nudging means in said path of the sheet media prior to said intermittent drive; and

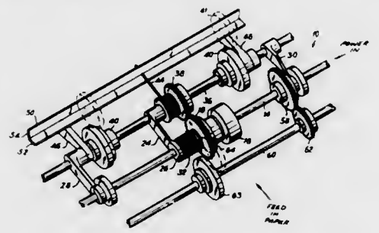
a second lower recess in said path of the sheet media prior to said nudging means to receive a trailing edge of the first sheet media of a second length, said second length being greater than said first length, thereby not obstructing the leading edge of a subsequent sheet media.

4,898,375

FEED DEVICE WITH AUTOMATIC SHEET ALIGNMENT

Bruce E. Heltje, Castle Creek, N.Y., assignor to Imagitek, Inc., Binghamton, N.Y.

Filed Feb. 2, 1988, Ser. No. 151,482
Int. Cl.[4] B65H 9/06
U.S. Cl. 271—246 12 Claims



1. An apparatus for aligning a sheet during a feeding process comprising:

a first power driven roller means;

a first idler means positioned so as to engage the sheet between said first roller means and said first idler means and feed the sheet in a given direction;

a second power driven roller means;

a second idler means;

a registration gate which is substantially perpendicular to said given direction and placed in relation to said first roller means and said first idler means so that a forward edge of the sheet may be abutted against the gate so as to block said given direction of travel of the sheet;

wherein said registration gate removing means includes a first wrap spring responsive to said second power driven roller means;

means for engaging the sheet between said second power driven roller means and said second idler means after said first power driven roller means has abutted the sheet against said registration gate;

said registration gate removing means operates substantially simultaneously with said engaging means; and

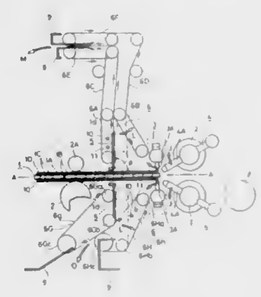
means for removing said registration gate from said direction of travel after said first roller means and said idler means have engaged the sheet for a preselected period.

4,898,376

FILM CONVEYING APPARATUS

Sigeo Sumi, Saitama, Japan, assignor to Somar Corporation, Tokyo, Japan

Division of Ser. No. 11,470, Feb. 5, 1987, abandoned. This application Aug. 11, 1988, Ser. No. 231,631
Claims priority, application Japan, Feb. 5, 1986, 61-23177
Int. Cl.[4] B65H 5/02
U.S. Cl. 271—272 8 Claims



1. In a device for removing a protective film from a board for forming a circuit thereon, the device including means for transporting the board along a path, and means for peeling the film from the board, a film conveying apparatus for conveying the peeled film away from the board and path, wherein the film conveying apparatus comprises:

a first conveyance means for conveying a film in a conveyance direction by contacting one side of the film, a plurality of said first conveyance means being disposed at predetermined intervals in a direction transverse to the conveyance direction, said first conveyance means comprising a plurality of conveyor rollers and a plurality of conveyor belts wound on corresponding ones of said conveyor rollers; and

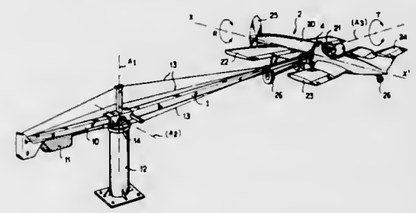
a second conveyance means for conveying the film by contacting the other side of the film, said second conveyance means comprising a plurality of conveyor rollers and a plurality of conveyor belts wound on corresponding ones of the conveyor rollers, and said conveyor rollers and corresponding ones of said conveyor belts of said second conveyance means being disposed between adjacent ones of said plurality of conveyor rollers and corresponding conveyor belts of said first conveyance means, wherein said device further comprises a plate disposed proximate to a position on the path at which the film is peeled by said means for peeling, said means for peeling including means for jetting fluid against the film to press it against one side of said plate and a third conveyance means for conveying the film which is pressed against said plate away from the plate, said third conveyance means comprising first conveyor belts extending in a direction substantially parallel to said plate and disposed on another side of said plate opposite the one side, and second conveyor belts disposed on the one side of the plate and movable between first and second positions, said second conveyor belts in said first position being disposed away from the first conveyor belts, the film and said plate, and in said second position said second conveyor belts extending in a direction substantially parallel to said plate and contacting the film, said plate being formed so as to allow said first conveyor belts to contact the film between said second conveyor belts in the second position and said plate, whereby said first and second conveyor belts are adapted for transporting the film therebetween away from said plate.

4,898,377

ROUNDABOUT WITH CLIMBING EFFECT FITTED WITH AN AIRPLANE

Jean J. Roche, 32, rue St Denis de Castines, 53500 Ernee, France

Filed Nov. 14, 1988, Ser. No. 270,915
Claims priority, application France, Nov. 12, 1987, 87 15819
Int. Cl.[4] A63G 4/00, 1/30
U.S. Cl. 272—36 14 Claims



1. A roundabout with climbing effect, of the type comprising an airplane mounted at one end of a pole which is movable in rotation about a vertical axis so as to describe a circular motion on said axis, said pole being also movable on a horizontal axis so as to enable a variation in altitude of the airplane during its circular motion, a counterweight being provided at the other end of the pole, opposite to the airplane with regard to the vertical axis, said counterweight substantially balancing the weight of the airplane and the pilot's weight, wherein the airplane is fixed to the pole by means of a gripping device which is adapted to hold a ring which is solidly joined to the airplane and surrounds a fuselage of said airplane, said ring being contained in a plane perpendicular to a longitudinal axis of the airplane and being centered on it, the gripping device supporting the ring and the plane at the end of the pole while at the same time enabling their free rotation on said longitudinal axis, wherein the center of gravity of the unit formed by the airplane and the pilot is located substantially in the plane containing the ring and, further, wherein the airplane is a biplane having two planes located on either side of the longitudinal axis of the pole, one in front of said pole and the other behind said pole, such that, during the circular motion of the roundabout, they generate two substantially equal and opposite lifting moments, thus preventing an untimely pitch effect.

4,898,378

SAFETY HARNESS ON/OFF SWITCH ASSEMBLY FOR TREADMILLS

Marysue Edwards, Grand Blanc, and Max M. Dubrinsky, West Bloomfield, both of Mich., assignors to Safe/Stress, Inc., Grand Blanc, Mich.

Division of Ser. No. 121,924, Nov. 18, 1987, Pat. No. 4,861,021. This application Jan. 9, 1989, Ser. No. 295,075
Int. Cl.[4] A63B 23/06, 1/00
U.S. Cl. 272—69 9 Claims

1. A safety harness on/off switch assembly for a motorized treadmill comprising a support means positioned over the treadmill;

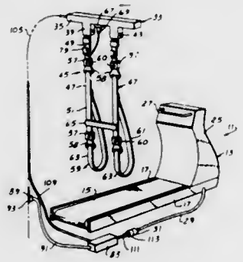
a safety harness including a pair of spaced laterally interconnected straps, at their upper ends flexibly and yieldably suspended from said support means and at their lower ends including a pair of loops to loosely receive portions of the body of a user upon the treadmill;

an electrical circuit connected to the treadmill and adapted to be connected to a power source;

a normally closed safety switch means mounted upon said support means and interconnected in said circuit and including a movable member;

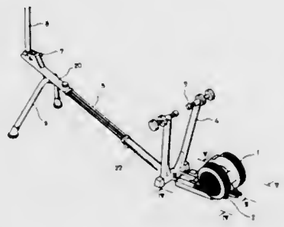
control means connected to at least one of the straps, on downward movement adapted to retract said movable

member whereby when a user falls, trips, faints or is injured the body of the user rests upon said loops extending said straps and retracting said movable member thereby opening said switch means and deactivating the treadmill;
said support means including a tubular support adapted for connection to a ceiling;
a pair of laterally spaced tubular extensions depending from said tubular support;



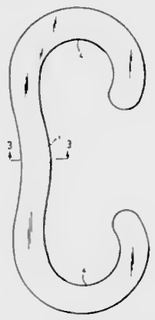
a transverse support bolt extending through each extension and connected thereto;
the upper ends of said straps extending into said extensions respectively; and
means nested within each extension flexibly interconnecting said straps with said support bolts;
said switch means being secured to and depending from said tubular support.

4,898,379
CYCLE TRAINER HAVING A LOAD APPLYING DEVICE
Kenzo Shiba, Settsu, Japan, assignor to Tsuyama Mfg. Co., Ltd., Osaka, Japan
Filed Dec. 19, 1988, Ser. No. 286,619
Int. Cl.[4] A63B *21/00, 21/24*
U.S. Cl. 272—73 **6 Claims**



1. A cycle trainer which rotatably supports a drive wheel (10) of a bicycle, constructed and arranged to be manually driven by said drive wheel through bicycle pedal movement, the cycle trainer comprising:
a rotatable roller (26),
energizing means (24, 28, 30, 31, 32, 34) for energizing said roller at a constant level of force toward a direction of said drive wheel to be in contact therewith,
movement blocking means (37, 38, 40) to be engaged with said energizing means, for blocking movement of said roller toward the direction of said drive wheel,
position adjusting means (2, 3, 4, 22, 46) for adjusting said roller to a predetermined position with respect to said drive wheel, while the movement of said roiler is blocked by said movement blocking means,
disengaging means (38) for disengaging said movement blocking means from said energizing means,
said disengaging means being operable to release said movement blocking means from said energizing means, causing said roller to be rotatably in contact with said drive wheel,
said energizing means comprising:
a roller shaft (24) inserted in said roller and used integrally therewith as a unitary body,
a pair of support frames for rotatably supporting said roller shaft,
a fixing shaft (28) attached to penetrate said pair of support frames,
a fixing plate (32) to which said fixing shaft is attached,
a transverse plate (31) provided on said pair of support frames,
a coil spring placed between said fixing plate and said transverse plate, and
said pair of support frames being rotatable about said fixing shaft.

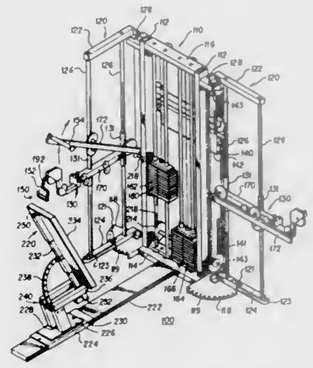
4,898,380
EXERCISING DEVICE
Hy Herman Kobrin, 6840 N.W. 10th Dr., Margate, Fla. 33063
Filed Oct. 5, 1988, Ser. No. 253,555
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—117 **14 Claims**



1. An exercise dvice comprising: a substantially planar weight of at least about three pounds having a shape generally corresponding to the shape of the letter "C", including two substantially identical turned in end portions and a central portion, between said end portions, having a reverse curvature;
each of said turned in end portions defining an unobstructed space with dimensions great enough to admit a hand and providing a hand-hold;
and said central portion defining an unobstructed space with dimensions great enough to admit a hand and providing yet another hand-hold for providing an exercise weight with a plurality of operating modes n a simple and economic structure, and in which the entire space enclosed between said turned in ends is free of other structures.

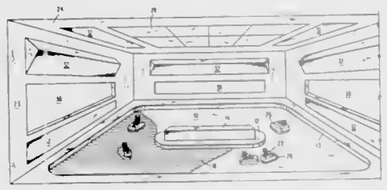
4,898,381
MULTI-EXERCISE SYSTEM
Joel D. Gordon, 3311 Woodvalley Dr., Baltimore, Md. 21208
Filed Nov. 23, 1988, Ser. No. 275,750
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **19 Claims**

1. A multi-exercise system for performing weight lifting exercises with a load resistance coupled to a cable, comprising:
a. a vertically extended stationary main frame;
b. a plurality of weights selectively coupled to one end of said cable for defining said load resistance disposed within said main frame;
c. at least one movable frame extension, said frame extension being pivotedly coupled to said main frame on one side thereof;
d. guide arm means vertically displaceable on said frame extension for directing an opposite end of said cable, said guide arm means includes (1) a first arm member slidingly coupled to said frame extension and extending longitudinally therefrom, and (2) first pulley means coupled to said first arm member for guiding said cable substantially parallel to said first arm member said first pulley means including at least a first and second pair of vertically opposing first pulley wheel members disposed on said first arm



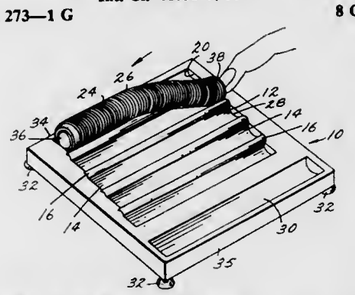
member for capturing said cable therebetween, (3) a second arm member pivotedly coupled at one end to a first end of said first arm member, and (4) second pulley means fixedly coupled to said second arm member for coupling said cable to said second arm member relative to said first arm member transmits an applied force to said load resistance;
e. counter weight means coupled to said guide arm means for (1) substantially counterbalancing said guide arm means, and (2) releasably locking said guide arm means in a selected vertical positional location; and
f. actuator means coupled to said opposing end of said cable and engageable by a portion of a user's body for applying a force thereto.

4,898,382
AMUSEMENT VEHICLE GAME
Egidio Lamanna, 122 Laurelcrest Avenue, Downview, Ontario M3H 2B3, Canada
Filed Jun. 16, 1989, Ser. No. 367,074
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—1 GC **19 Claims**



1. Game apparatus comprising:
a self-propelled vehicle capable of carrying and being steered by an operator;
said vehicle having a forward portion and a rearward portion;
forward bumper means mounted on said forward portion and rearward bumper means mounted on said rearward portion;
said bumper means being resiliently mounted on said vehicle and adapted for bumping contact with bumper means on other vehicles;
switch means on said vehicle adapted to be actuated by said bumper means;
counter means on said vehicle adapted to be actuated by said switch means to increment in one direction upon actuation by said forward bumper means and to decrement in another direction upon actuation by said rearward bumper means; and
display means on said vehicle and associated with said counter means for displaying the count thereof.

4,898,383
AMUSEMENT APPARATUS
Larry J. Buffington, 611 N. Summit Rd., Benton, Ark. 72015
Filed Jun. 12, 1989, Ser. No. 364,146
Int. Cl.[4] A63F *9/06*
U.S. Cl. 273—1 G **8 Claims**

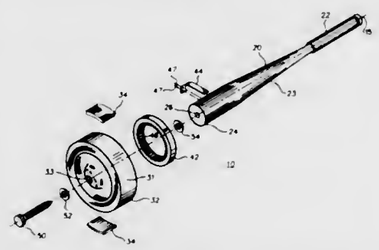


1. Amusement apparatus, comprising:
an undulant support surface defining a plurality of substantially parallel, alternating, rounded grooves and rounded ridges;
a first end wall defining a first end of each of said grooves and a second end wall defining a second end of each of said grooves, the distance between said first end wall and said second end wall within each of said grooves being substantially equal;
said surface defining an axis;
said first end walls located at progressively greater distances from said axis from a first one of said grooves to a last one of said grooves, and said second end walls located at progressively smaller distances from said axis from said first one of said grooves to said last one of said grooves; and
a plurality of substantially identical, round, saucer-shaped, nesting elements for positioning within said grooves and for manually manipulating among said grooves and over said ridges.

4,898,384
BATTING AID SYSTEM
G. Michael Beach, 7321 Morrison Dr., Greenbelt, Md. 20770
Filed Jun. 17, 1988, Ser. No. 208,099
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 R **19 Claims**

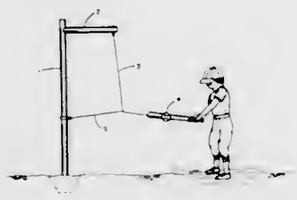
1. A batting aid system for training a baseball player to properly swing a baseball bat, comprising:
a longitudinally extended handle member defining a longitudinal axis having a gripping portion positionally located at a first end of said handle member; and,

audible feedback means pivotedly coupled to a second end of said handle member for indicating a proper baseball bat swing, said audible feedback means being responsive to rotative displacement of said handle member about said longitudinal axis during a swing of said system in simulation of a baseball bat swing, said audible feedback means having a central axis substantially coincident with said longitudinal axis and having a symmetrically located mass radially positioned about said central axis defining a



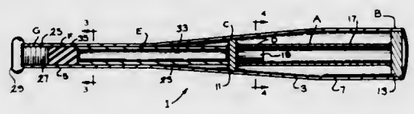
flywheel, said audible feedback means includes sound generating means coupled to both said flywheel and said second end of said handle member for providing said indication of said proper baseball bat swing, said sound generating means including driving means coupled to said second end of said handle member for initiating rotation of said flywheel responsive to rotation of said handle member about said longitudinal axis and generating an audible sound.

4,898,385
BATTING PRACTICE DEVICE
Carl D. Love, 4348 Baton Rouge Dr., Hermitage, Tenn. 37076
Filed Mar. 30, 1988, Ser. No. 175,344
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 E **3 Claims**



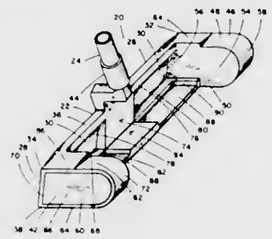
1. A batting practice device comprising:
a. a pole extending vertically from and secured to a practice surface;
b. an arm extending horizontally from the top of said pole;
c. a vertically extending tether means having its upper end attached to said arm;
d. a ball secured to the lower end of said vertical tether means;
e. a horizontal tether means with one end connected to said pole and the other end slidably connected to said vertical tether means at a point above said ball and intermediate said upper and lower end.

4,898,386
TRAINING BAT
Donald A. Anderson, 5367 Brandy La., Sylvania, Ohio 43560
Filed Feb. 10, 1989, Ser. No. 309,696
Int. Cl.[4] A63B *69/06*
U.S. Cl. 273—26 B **11 Claims**



1. A training bat comprising:
a hollow cylindrical bat having a handle end and a striking end;
a disk positioned in the interior of said bat, said disk being positioned substantially in the center of said bat;
a plate positioned in the interior of said bat at substantially the end of said striking end of said bat;
an object slideably positioned in the interior of said bat, said object being moveable between said disk and said plate;
a hollow chamber positioned in said handle end of said bat, said chamber disposed for receiving a weight;
a knob removably positioned on the end of said handle end of said bat, whereby said knob closes said end of said chamber.

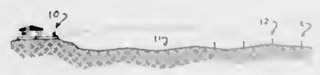
4,898,387
GOLF CLUBHEAD WITH A HIGH POLAR MOMENT OF INERTIA
Clifton D. Finney, 1057 Oak Hills Pkwy., Baton Rouge, La. 70810
Filed Dec. 27, 1988, Ser. No. 289,908
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—167 F **17 Claims**

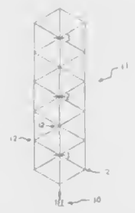


1. A golf clubhead comprising:
a. a toe and heel, a front and rear, and a top and sole with an elongated ball striking surface toward said front;
b. a fastening means to affix a shaft between said heel and said toe;
c. a geometric center of said striking face, and a vertical axis through said geometric center;
d. a toe section and a heel section;
e. a body casting of a material having a predetermined lower density, said body casting comprising in said toe section a portion of said elongated ball striking surface, and at least one toe cavity; and
f. said toe section of said head from a plane perpendicular to the length line of said head through said geometric center to the extreme of said toe comprising:
i. a toe weight means comprising at least one toe weight attached to said clubhead in said toe cavity, whereby each of said toe weights is of a material having some predetermined higher density greater than said predetermined lower density of said body casting;

ii. a mass distribution means to decrease the relative mass consisting of said body casting and said toe weight means in the region of said toe section near the center of mass of said clubhead and to position a most substantial portion of the mass of said toe weight means adjacent said toe behind said ball striking surface; and
iii. a characteristic feature of said most substantial portion of said toe weight means adjacent said toe comprising a relatively thin expanded surface whereby both the width and the height of said toe weight means are generally greater than the length of said relatively thin expanded surface to resist twisting forces when a golf ball is struck.

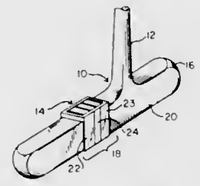
4,898,388
APPARATUS AND METHOD FOR DETERMINING PROJECTILE IMPACT LOCATIONS
Bryce P. Beard, III, 1617 Emerald St., Salisbury, N.C. 28144; James W. Klutta, 709 Arbor Rd., and Edgar P. Roberts, Jr., 761 Westover Ave., both of Winston-Salem, N.C. 27104
Filed Jun. 20, 1988, Ser. No. 208,673
Int. Cl.[4] A63B *69/36*; **F41J** *5/00*
U.S. Cl. 273--181 R **8 Claims**





8. An apparatus for assisting in the evaluation of targeting of an impacting golf ball and comprising:
an array of a plurality of vibration sensor means distributed in a predetermined regular geometric pattern which defines a target area which is a generally elongate, generally rectangular, generally horizontal surface area located remotely from a point from which a golf ball is dispatched toward the target area, each said sensor means for generating an electrical sensor signal indicative of the sensing of vibration,
electrical processor means electrically connected with said sensor means for receiving sensor signals generated thereby and for processing received sensor signals for determining a location of golf ball impact at any point within said target area spaced lengthwise or widthwise thereof relative to the locations of said sensor means in the target area and for generating an electrical location signal,
comparator means electrically connected with said sensor means and said processor means for receiving sensor signals generated by said sensors means and for making an ongoing comparison of signals to separate detection of a sharply rising signal from detection of a more slowly rising signal and discard the latter,
timing means electrically connected with said sensor means and said processor means for responding to a first sensor signal of impact by opening a window of time in which second and third sensor signal of impact will be sought in order that a discrimination of impact location may be performed
memory means electrically connected with said processor means for receiving and storing a plurality of location signals,
said processor means, comparator means, timing means and memory means cooperating for compiling and comparing sets of location signals indicative of the impacts of a succession of golf balls, and
display means electrically connected with said processor means for receiving said location signal and for displaying to an observer a representation of the locations of golf ball impact in the target area.

4,898,389
IMPACT INDICATING GOLF TRAINING DEVICE
Daniel J. Platt, 3543 Smuggler Way, Boulder, Colo. 80303
Filed Sep. 8, 1987, Ser. No. 93,994
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 A **12 Claims**



1. A self contained device for indicating the area of impact of the face of the head of a golf club with a ball, said face of said club having a predetermined impact center, the device comprising:
one or more impact sensitive transducer element which generates an electrical signal in response to an impact;
means responsive to an electrical signal generated by said one or more transducer elements, said responsive means linked to said one or more transducer elements, and;
means to signaling the area of impact of the face of the club with a ball, said signaling means being linked to and responsive to said means responsive to an electrical signal generated by said one or more transducer elements;
a single carrying unit, said impact sensitive transducer elements, said electrical signal responsive means, and said signaling means being carried by said single carrying unit; and
means for attachably and detachably locating said carrying unit carrying said one or more impact sensitive transducer elements, said signalling means, and said electrical signal responsive means on a golf club so that said one or more impact sensitive transducer elements, overlies the face of the club in a predetermined relationship to the impact center of the face of the club; whereby, when the face of the head of a golf club impacts with a golf ball, an electrical signal is generated by said one or more impact sensitive transducer element to cause said electric signal responsive means to signal the area of impact of the face of the club with a ball.

4,898,390

BOARD GAME

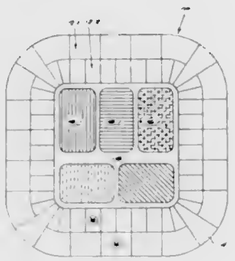
John L. De Villiers, 20 Bridgewater, 11th Avenue, Rivonia, Transvaal, South Africa

Filed Mar. 14, 1988, Ser. No. 167,970

Claims priority, application South Africa, Mar. 13, 1987, 87/1854

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—249 **4 Claims**



1. A board game comprising in combination:

first and second different types of remarks cards, each card of said first type containing a single remark selected from a group of character attributes, each card of said second type containing a single remark selected from a group of opinion statements,

a board including a playing surface demarcated with a plurality of graduated tracks and a display area for displaying at least one card of each of said first and second sets,

a plurality of assessment indicators each assessment indicator containing:

predetermined assessments pertaining to remarks on said first and second types of cards, and

means for indicating selected assessments pertaining to remarks on displayed cards of said first and second types, and

a plurality of markers each adapted for being positioned within graduations on at least one of said tracks.

4,898,391

TARGET SHOOTING GAME

Bryan M. Kelly; Jorge M. Fernandes; Matthew F. Kelly, all of Pleasanton, and Mark R. Kelly, Danville, all of Calif., assignors to Lazer-Tron Company, Pleasanton, Calif.

Filed Nov. 14, 1988, Ser. No. 270,262

Int. Cl.[4] F41J *5/02*

U.S. Cl. 273—310 **7 Claims**



1. A target shooting apparatus comprising

a plurality of rifles, each rifle comprising

means for generating a beam of light having a wavelength generally visible to the human eye,

means for frequency encoding said beam of light comprising

means for pulse modulating said beam of light using a combination of at least two different frequencies,

a plurality of targets, each target comprising

means for detecting said frequency encoded beam of light,

a target first light source adapted to illuminate said target,

a target second light source adapted to indicate when a frequency encoded beam of light has been detected by said means for detecting said frequency encoded beam of light,

a central controller comprising

means for activating said plurality of target first light sources,

means for activating said means for detecting said frequency encoded beam of light,

means for deactivating said target first light source, actuating said target second light source, decoding said frequency encoded beam of light to obtain a decoded signal, deactivating said means for detecting said frequency encoded beam of light, and allocating a score to the rifle represented by the decoded signal of said frequency encoded beam of light when said means for detecting said frequency encoded beam of light detects a frequency encoded beam of light.

4,898,392

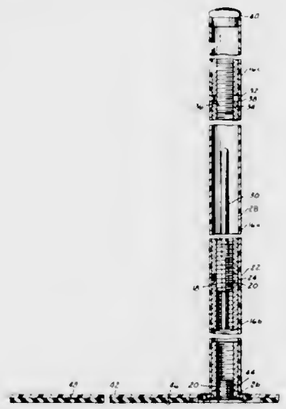
COMBINED RING TOSS AND BALL ROLL GAMES

Louis D. Goletz, 919 E. Lincoln, Royal Oak, Mich. 48067

Filed Aug. 8, 1989, Ser. No. 391,184

Int. Cl.[4] A63B *67/06, 71/00*

U.S. Cl. 273—336 **14 Claims**



1. A ring toss game playable on a surface, comprising:

a plurality of rings;

a pair of target standards, each target standard having an elongate cylindrical shape, each target standard being comprised of at least two segments, said at least two segments comprising:

a main segment having a first end and a second end, said main segment having an axial aperture adjacent said first end thereof;

a lower segment having a first end and a second end, either of said first end and said second end of said lower segment being removably connectable with said first end of said main segment;

first connection means connected with said first and second ends of said lower segment and said first end of said main segment for removably connecting said first end and said second end of said lower segment to said first end of said main segment; and

a staking rod connected with said first end of said lower segment, said staking rod being inserted into said axial aperture of said main segment when said first end of said lower segment is connected with said first end of said main segment;

a pair of bases, each base being structured for resting upon said surface each base selectively anchoring one target standard of said pair of target standards; and

second connection means connected with each said base for removably connecting said second end of one said lower segment to each said base;

whereby said staking rod anchors its respective target standard with respect to said surface by being penetrated thereinto when said second end of said lower segment is connected with said first end of said main segment.

4,898,393

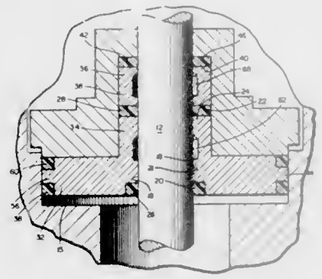
WEAR COMPENSATING STEM SEALING APPARATUS

Marvin J. Rollins, Muncie, Ind., assignor to Maxon Corporation, Muncie, Ind.

Filed Jun. 22, 1988, Ser. No. 210,372

Int. Cl.[4] F16J *15/16*

U.S. Cl. 277--27 **8 Claims**



1. An improved wear compensating stem sealing apparatus for maintaining and prolonging the effective life of the seal to prevent migration of a pressurized fluid upon a stem, said apparatus comprising:

an elongated stem having a longitudinally dimension;

an O-ring separator which is substantially annular shaped in transverse cross-section and having an opening at the inner diameter thereof for disposition of said stem therethrough and having a first O-ring contact surface thereon, and a second O-ring confinement means at an upper portion thereof;

a first O-ring disposed snugly about said stem and having a selected radial squeeze, and in contact with said first O-ring contact surface of said O-ring separator for initially sealing pressurized fluid from migrating upwardly upon said stem;

a second O-ring disposed snugly about said stem and having a selected radial squeeze and in contact with said second O-ring confinement means of said O-ring separator to provide subsequent sealing of said stem from such pressurized fluid migrating upwardly upon said stem;

said first O-ring over time providing less efficient sealing of the pressurized fluid than said second O-ring to subject said second O-ring within said second O-ring confinement means to compressive pressure from said pressurized fluid to provide an increased radial squeeze to said second O-ring upon said stem;

a stem ring disposed about said stem, above and in contact with said second O-ring at the lower radial portion of said stem ring surface and including a third O-ring compression surface thereon; and

a third O-ring disposed snugly about said stem and having a selected radial squeeze, and a third O-ring compression means, whereby when said first O-ring permits migration of such pressurized fluid upwardly from said stem to exert pressure upon said second O-ring, which pressure is transmitted upwardly against said stem ring which in turn is urged upwardly to further compress said third O-ring compression means.

4,898,394

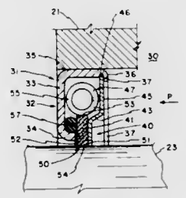
CREEP SEAL FOR ROTATING SHAFT

Robert M. Voltik, Lake Zurich, Ill., assignor to Falex Corporation, Aurora, Ill.

Filed Dec. 14, 1987, Ser. No. 132,156

Int. Cl.[4] F16J *15/00*

U.S. Cl. 277—35 **18 Claims**



1. Seal apparatus for a rotating shaft comprising: a thin annular seal member formed of a flexible fluid-impermeable material capable of low-stress creep so that it can undergo slow movement or change in size while under relatively low stress, said seal member having an inner surface adapted for sealing engagement with the outer surface of the associated shaft, bias means coupled to said seal member for placing it under relatively low stress sufficient to induce radial creep movement thereof by resiliently urging it radially inwardly around the entire circumference thereof, said bias means having a width axially of the associated shaft substantially greater than the axial thickness of said seal member, and retaining means discrete from said seal member, said retaining means including resilient means and being disposed in resilient clamping engagement with said seal member for inhibiting movement thereof axially and circumferentially of the associated shaft while accommodating creep movement thereof radially of the associated shaft under the urging of said bias means.

4,898,395

DEVICE FOR SEALING REFUELING OPENING

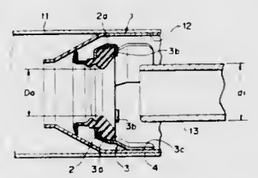
Ritsuo Kawase, Shizuoka, Japan, assignor to NOK Corporation, Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,733

Claims priority, application Japan, Nov. 12, 1987, 62-173105[U]

Int. Cl.[4] F16J *15/00*

U.S. Cl. 277—207 A **4 Claims**



1. A refueling opening sealing device for providing a seal between a tubular casing disposed in a refueling pipe and a refueling nozzle inserted into said casing, comprising:

a seal supporting member mounted in said casing through legs; and

an elastic sealing member supported by said seal supporting

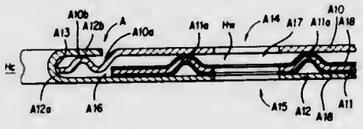
member, said elastic sealing member comprising a material containing liquid-oil-containing porous particles mixed therein so as to allow a liquid oil to exude to a surface of said elastic sealing member, said material being different than a material of said porous particles, and having a seal lip portion of a diameter smaller than an outside diameter of said refueling nozzle so as to contact an outer peripheral surface of said refueling nozzle to thereby provide a seal.

4,898,396

STEEL LAMINATE GASKET

Tsuneharu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 231,303
Int. Cl.[4] F16J *15/08*
U.S. Cl. 277—235 B **12 Claims**



1. A steel laminate gasket for an internal combustion engine having at least one cylinder hole and at least one through hole therein, comprising:

a first plate having at least one first hole corresponding to the cylinder hole of the engine, at least one second hole corresponding to the through hole of the engine, and first means for sealing around the first hole to securely seal around the same when the gasket is tightened,

a second plate situated under the first plate, said second plate having at least one third hole corresponding to the cylinder hole of the engine, and at least one fourth hole corresponding to the through hole of the engine,

at least one third plate situated between the first and second plates, said third plate including at least one fifth hole having the diameter larger than the diameter of the first means so that the first means is situate inside the fifth hole when the gasket is assembled, at least one sixth hole corresponding to the through hole of the engine, and sealing layers formed on both sides of the third plate,

second means for covering at least first means around the first hole to securely seal therearound, and

third means for sealing around the through hole of the engine, said third means being formed on at least one of the first, second and third plates to securely seal around the through hole when the gasket is tightened.

4,898,397

SEGMENTED DISK CLAMP

Robert S. Smith, 1263 Emery St., San Jose , Calif. 95126

Filed Mar. 29, 1988, Ser. No. 174,593
Int. Cl.[4] B23B *31/30*
U.S. Cl. 279—4 **7 Claims**

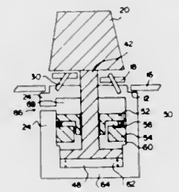
1. A clamp which comprises:

a housing comprising a wall which encloses a chamber and an entry port to admit pressurized fluid into said chamber;

a shoulder on said wall within said chamber;

a clamping piston located within said chamber;

a driving piston means within said chamber which comprises a nesting part having a nesting area and a nested part having a nested area and a space with a spring between said nested and nesting parts so that when said pressurized fluid is admitted into said chamber, said nested and nesting parts move so as to apply a first force to said clamping piston and when said nested part contacts said shoulder preventing said nested part from moving, said nesting part continues to move thereby compressing said spring and thereby applying a second force to said clamping piston which equals said first force multiplied by the ratio defined by the area of said nested and nesting areas divided by said nesting areas.

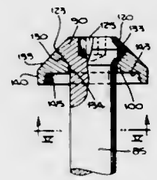


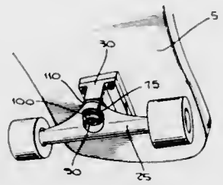
4,898,398

HIGH PERFORMANCE GRINDING KING PIN AND ASSOCIATED APPARATUS

Donald D. Cassel, 54 Rose Ave., #9, Venice, Calif. 90291

Filed Dec. 9, 1987, Ser. No. 130,685
Int. Cl.[4] A63C *17/02*
U.S. Cl. 280—87.042 **1 Claim**





1. Apparatus for attaching a skateboard truck having an opening therein to a skateboard base plate having an opening therein, the opening in the base plate including a pocket in which a threaded nut may be seated comprising:

a. an elongated member made of heat treated steel being threaded at one end thereof for insertion through the opening in the truck and the opening in the base plate and for screwable engagement with the threaded nut;

b. a head made of heat treated steel affixed to the other of said elongated member, including means embedded within it for receiving a torque-applying tool, said head protruding from the skateboard following installation such that there is no other structure which interfaces with the force of a grind on said head, and said head including a first outer surface substantially perpendicular to said elongated member, a second outer surface being connected to said first outer surface and frusto-conically shaped to bear the force of a grind over the entire length of a line tangent to said second outer surface and making an angle of between 20° and 60° with the plane perpendicular to the axis passing through said elongated member; and a tapered inner surface connected to said second outer surface and to said elongated member; and

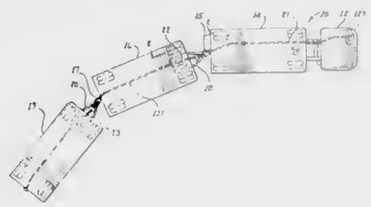
c. a washer made of heat treated steel through which said elongated member is inserted before insertion into the opening of the truck and base plate, said washer having a tapered outer surface which is frusto-conically shaped and which is substantially co-extensive with the outer surface of said head when said washer is mated with said head and a tapered inner surface connecteed to said outer surface which substantially mates with the inner surface of said head when said washer is mated with said head, said washer further having a portion which does not mate with said head when said washer is mated with said head, said portion having a portion formed therein.

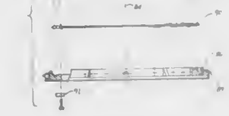
4,898,399

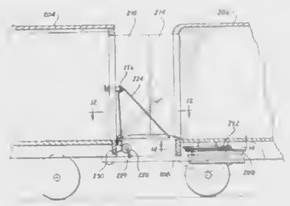
TRAILER ASSEMBLY AND METHOD

Charles R. Adams, El Paso, Tex., assignor to Aramar Inc., El Paso, Tex.

Filed Sep. 26, 1988, Ser. No. 248,626
Int. Cl.[4] B62D *53/00, 53/10;* **B60J** *5/12*
U.S. Cl. 280—408 **7 Claims**







1. A trailer assembly including a cab, and a plurality of trailer units pivotally interconnected in tandem using a plurality of dolly members, said assembly comprising:

thrust bearing assembly provided on each of said plurality of dolly members, said thrust bearing assembly having a bottom race member, a top race member, a top pivot plate member and a disc brake member,

said top pivot plate member being pivotally connected to said top race member and having a spring biased lock pin assembly and a grooved portion, said spring biased lock pin assembly and said grooved portion being used for mechanically communicating in an alignment relationship with a bed plate fixedly provided on each of said plurality of trailer units, said bed plate having a hole for receiving a locking pin member of said spring biased lock pin assembly and a hinge pin for being positioned within said grooved portion,

said top race member having an annular disc portion for providing a braking surface for said disc brake member and,

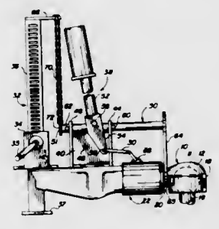
said cab having a unitary brake control means, including a metering valve for controlling actuation of said disc brake member on each of said thrust bearing assembly on each of said plurality of dolly members.

4,898,400

REMOTE OPERATED HITCH APPARATUS WITH SAFETY INTERLOCK

Johnny C. Elkins, P.O. Box 2599, San Angelo, Tex. 76900

Continuation-in-part of Ser. No. 147,196, Jan. 22, 1988, Pat. No. 4,804,204. This application Dec. 20, 1988, Ser. No. 286,707
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—427 **19 Claims**



1. A trailer hitch of the type having a main body, a ball receiving socket at one end of the main body and the other end of the main body being attachable to the end of a tongue, for example; a jack device adjacent the main body that is extensible to support the trailer near the tongue; a pivotal member, hinge means at the ball receiving socket end by which said main body and said pivotal member form hinged sections; said socket is formed jointly in said hinged sections; a collar reciprocatingly received about said main body and positioned to releasably receive the free marginal end of said pivotal member therein to thereby releasably latch the hinged sections together so that a ball can be captured therein; the improvement comprising:

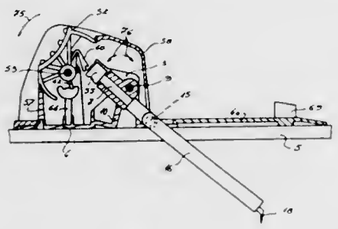
a remote actuator by which the hinged sections are forced together to enable the collar to be moved into the latched position; said actuator includes a control lever, means pivotally mounting said control lever for movement respective to the main body; actuator means connected to be moved in response to movement of said control lever, said actuator means being positioned for engaging and retracting the pivotal member into aligned position to enable said collar to be received about the marginal free end thereof; and an interlock by which said actuator means is moved against the pivotal member when the jack device is extended; whereby, the hitch can be positioned in aligned relationship respective to a ball therefor, the collar moved into a retracted position, the pivotal member engaged by said actuator means and thereby moved into a retracted position, whereupon the collar is released and captures the marginal end of the pivotal member with the hinged sections being retracted about a ball.

4,898,401

DEVICE FOR PREVENTING BACKWARD MOVEMENT FOR SKIS

Champagnac, Paul R., Unieux, France, assignor to Mecanique Generale J. DeVille Et Cie, Aurec-Sur-Loire, France

Filed May 13, 1988, Ser. No. 196,117
Claims priority, application France, May 15, 1987, 87 07099
Int. Cl.[4] A63C *7/10*
U.S. Cl. 280—605 **6 Claims**



1. A device for preventing backward movement for skis, comprising:
- a lug adapted to be solidly connected with the ski carrying a transverse first pin;
- a flap hinged on said first pin and having bores and a transverse nose projecting from a front end thereof;
- two bent and counterbent lateral arms disposed on the opposite side of said first pin from said nose and having ends forming pivot pins which are mounted in rotation in the bores of said flap so as to pivot around an axis of a longitudinal plane with respect to the ski;
- lock means spaced from said flap longitudinally along the ski and forming a cradle on the ski for receiving said arms therein and locking said arms above the ski in an inactive position; and
- movement means for bringing said arms from the inactive position to an active position in which said arms extend laterally and downwardly with respect to the ski,

said movement means comprising:
- a second horizontal transverse pin disposed in front of said first pin;
- a control rocker pivotally mounted on said second pin so as to pivot between a front position and a back position;
- an elastic pusher connected to said control rocker having a notched free end which covers and applies force against said nose of said flap when said control rocker is brought into the back position and which causes said flap to pivot so as to raise said arms relative to said lock means and allow said arms to escape from the cradle formed by said locking means; and
- spring means for separating said arm in the active position.

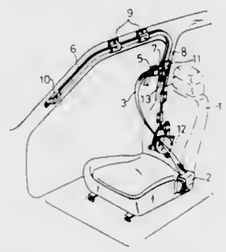
4,898,402

STRUCTURE FOR FIXING ANCHOR BASE ON STATIONARY BASE OF VEHICLE

Tomoharu Igarashi, Hiratsuka; Yoshinaro Yokote, Yokohama, and Kazuo Yamamoto, Sagamihara, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,136
Claims priority, application Japan, Feb. 27, 1987, 62-27326
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—804 **20 Claims**

1. In a structure for fixing an anchor base on a stationary base of a vehicle, said structure being suited for use in an automatic seat belt system of the type that a movable anchor travels along a guide member, the improvement wherein the anchor base has been formed from a plate-like member, has a closed transverse cross-section to surround transversely an occupant-restraining end of the guide member and extends in the direction of the length of the guide member; the anchor base is provided with a support portion to support the movable anchor on the anchor base; a side of said anchor base opposite said support portion being formed by overlapping both longitudinal edge portions of said plate-like member; an engaging portion is formed at one side of the anchor base, said one side facing the stationary base when the anchor base is fixed on the



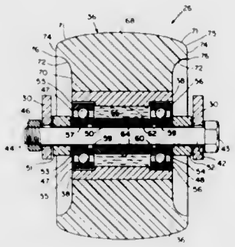
stationary base, and may hook on an engaged portion provided on a side of the stationary base to fix the anchor base on the stationary base; and the engaged portion is a projection having an expanded head portion and secured fixedly on the stationary base and the engaging portion of the anchor base is a notch for receiving the projection.

4,898,403

ROLLER SKI

Lennart B. Johnson, Federal Hill Rd., Milford, N.H. 03055

Filed Jan. 27, 1989, Ser. No. 302,818
Int. Cl.[4] A63C *17/04*
U.S. Cl. 280—842 **8 Claims**



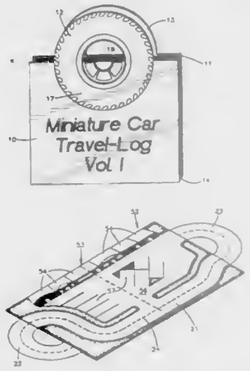
1. A roller ski comprising:
- an elongated base member and
- two wheels rotatably mounted at opposite ends of said base member by respective axles,
- one said wheel including a stationary member that is stationary with respect to said base member and a tire member that is mounted for rotation with respect to said stationary member, said tire member including a hub and an elastomeric tire mounted on said hub, said stationary member and said tire member having a respective stationary surface and a respective rotating surface that each partially define a chamber, said wheel including a liquid in said chamber to provide viscous damping to rotation of said tire member, said liquid being sufficiently viscous to provide resistance for retarding rotation of the wheel, the resistance increasing as a function of the rotational speed of the wheel, thereby acting to reduce the terminal velocity of the roller ski, wherein said stationary member includes an elongated spindle and said hub includes said rotating surface, said spindle having an outer substantially cylindrical surface forming said stationary surface and said hub having an inner substantially cylindrical surface forming said rotating surface, said outer cylindrical surface and said inner cylindrical surface facing each other and having a predetermined spacing therebetween.

4,898,404

CHILDREN'S BOOK PROVIDING A CONTINUOUS ROADWAY

Richard L. Babcock, 516 Birchwood Dr., Sandusky, Ohio 44870

Filed Feb. 9, 1989, Ser. No. 308,649
Int. Cl.[4] B42D *1/00*; **E01B** *23/00*; **A63H** *18/02*
U.S. Cl. 281—15.1 **13 Claims**



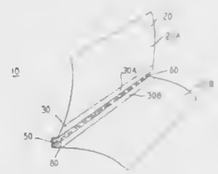
1. A book comprising front and back covers, a plurality of pages between said covers, hinge means connecting said covers and pages along one edge so that said covers can be opened and said pages can be turned, said covers providing extensions projecting beyond adjacent edges of said pages, indicia on said pages depicting a plurality of roadway landscapes, turning of said pages exposing selected roadway landscapes, indicia on said extension depicting roadway sections on which toy vehicles can rest while said pages are turned.

4,898,405

BINDABLE COVER FOLDERS

J. H. Pickering, Wayland; Sushil K. Bhatia, Framingham, both of Mass., and Roger Chevrette, Woonsocket, R.I., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Sep. 1, 1988, Ser. No. 239,455
Int. Cl.[4] B42D *3/00, 3/12*; **B42C** *9/00*; **B32B** *3/04*
U.S. Cl. 281—29 **2 Claims**



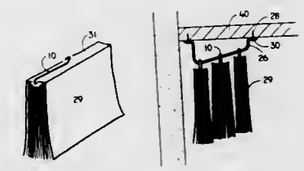
1. A folder for permanently binding a stack of paper sheets comprising,
- a binder spline comprising an elongated rigid member having a channel running along its length,
- said elongated member comprising a flat back panel and two oppositely facing coextensive panels emanating from said back panel, said back panel and oppositely facing panels defining said channel,
- a cover sheet affixed to the elongated rigid member,
- and a closed pouch containing a book binding adhesive therein, said pouch affixed to the elongated member and contained within and along the length of said channel,
- means for opening the pouch along its length to expose the adhesive contained therein,
- whereupon a stack of paper sheets can then be inserted into the channel so that an aligned edge of the stack of paper sheets is in direct contact with the adhesive and said stack of paper sheets thence becomes permanently bound to said binder spline.

4,898,406

METHOD FOR HANGING BOOKS AND BOOK-LIKE ITEMS

Jeffrey D. Willius, 2322 Como Ave., St. Paul, Minn. 55108

Filed May 13, 1988, Ser. No. 193,944
Int. Cl.[4] B42D *17/00*; **B42F** *15/00*
U.S. Cl. 281—43 **5 Claims**



1. A method for hanging a book having a spine of a certain length comprising the steps of:
- (a) providing a hanger comprising an elongate member having a substantially 180° turn therein to form a first span and a second span on either side of said turn with the end of said second span having book means formed therein, said second span having a length approximately one-half said certain length of the spine, said first span being straight and sized to slide in between the pages of the book and having a length sufficient to support the spine of the book when it is suspended using said hanger, said turn in said hanger providing that said first and second spans pinch the spine of the book to keep the hanger member engaged therewith when said hanger is inserted in the book;
- (b) inserting said hanger into the book so that said first span is inside the book on one side of the spine and said second span is on the outside of the book on the other side of the spine and so that said hook means is positioned approximately half-way between the ends of the spine;
- (c) providing receptacle means for receiving and coupling with said hook means;
- (d) securing said receptacle means to a support member such as a wall or a shelf; and
- (e) coupling said hook means of the inserted hanger to the mounted receptacle means so that the book hangs from the mounted receptacle means with the spine in a generally horizontal position.

4,898,407

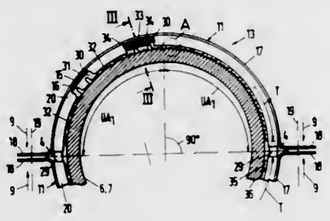
COUPLING FOR PIPES WITH PLAIN ENDS

Siegmund Zeidler, Hanau, Fed. Rep. of Germany, assignor to Rassmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,434
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737669
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—328 **13 Claims**

1. A pipe coupling, particularly for pipes with plain ends,

comprising a tubular housing arranged to be placed around the ends of pipes which are to be coupled to each other, said housing having at least one substantially axially extending slot; at least two annuli of teeth carried by and provided in the interior of said housing so that each of said annuli surrounds the end of one of the pipes which are to be coupled to each other, each of said annuli including a pair of portions which flank said at least one slot and each tooth of at least one portion



of each of said annuli having a longer flank nearer to and a shorter flank more distant from said at least one slot and so constructed and arranged that when said teeth penetrate into the ends of the pipes, material build up of the pipe ends in front of the teeth is substantially eliminated; and means for varying the width of said at least one slot so as to cause said teeth to penetrate into the ends of the respective pipes in response to a reduction of the width of said at least one slot.

4,898,408

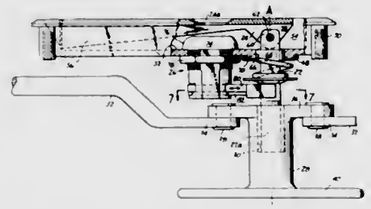
SAFE AND SECURE CAMPER SHELL DOOR LATCH

Peter Hauber, 9001 N. Glencoaks, Sun Valley, Calif. 91352

Continuation of Ser. No. 431,568, Sep. 30, 1982, abandoned. This application Aug. 30, 1988, Ser. No. 238,208

Int. Cl.[4] F05C *5/00;* **F05B** *5/02*

U.S. Cl. 292—7 **6 Claims**



1. Security latch for camper shell doors and the like, comprising a rotatable shaft adapted to extend through the door in an axial direction to be latched, an outside housing fixed to said door and defining an an axially extended outwardly open recess, an axially extendable outside handle for rotating said shaft, said handle being relatively sized with respect to said handle recess and pivotally mounted at one end to said shaft and located at one end of said recess to lie flush within said housing recess against snagging in a first condition and for extending axially from said housing recess in a second condition corresponding to the shaft operating condition of said handle, a lock assembly for selectively blocking shaft rotation, said lock assembly being partially located within said recess spaced from said handle in a manner that said handle in its said first condition overlies said lock assembly, spring means encircling said shaft for biasing said handle into its said first condition, an inside pull journaled on said shaft, and latch means carried by said pull for latching and unlatching said door upon rotation of said inside pull by said shaft.

4,898,409

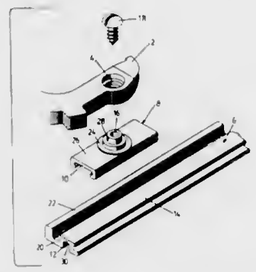
TANDEM ROD FOR CASEMENT WINDOWS

Gregory G. Carter, 68 Weber Street South, Apartment 20, Waterloo, Canada N2J 1Z7

Filed Feb. 23, 1988, Ser. No. 159,392

Int. Cl.[4] E05C *7/00*

U.S. Cl. 292—31 **15 Claims**



1. A tandem rod for use between locking ends of locking handles on a casement window or the like so that all of said handles move simultaneously with the movement of any one handle, said locking ends having suitable openings therein said tandem rod comprising an elongated bar having two ends with at least two brackets, being a first bracket and a second bracket, located thereon, there being a plurality of brackets for a plurality of locking handles for said window, said brackets and said bar having corresponding male and female shapes thereon so that the brackets can slide to any desirable location along the bar but cannot be removed therefrom except at said ends, a screw each bracket having a passageway being shaped to receive said screw, and in a final assembled state said screw passes through a suitable opening in the locking end of one of said locking handles, through said passageway and being fixedly and penetratingly secured in said bar at a location thereon, thereby interconnecting said locking handle, bracket and bar and affixing said bracket at a particular location on said bar, the bracket no longer being slidable relative to said bar, the locking handle being able to pivot about said screw, one bracket and one locking handle being affixed to said bar at each location of a locking handle, the location of the locking handle determining the location of the affixed bracket, there being no pre-existing openings in said bar to receive said screw prior to the penetration of a screw for a particular bracket, potential sites for affixing the first bracket to said bar being infinite before said final assembled state, potential sites for affixing the second bracket to said bar being infinite except for the location of said first bracket.

4,898,410

LATCHING ARRANGEMENT FOR A TOP

Constantin Brin, Stuttgart, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,670

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 3731068

Int. Cl.[4] B60J *7/185*

U.S. Cl. 292—241 **21 Claims**

1. A latching arrangement for a top at a windshield frame means of a motor vehicle, comprising pivot lever means attached on an edge of the top, mounting means attached at the windshield frame means, the pivot lever means which is rotatably supported about an approximately horizontally aligned longitudinal axis cooperating with an actuating means, the mounting means being formed by a rotatable roller means cooperating with a guide track means provided on the pivot lever means in such a manner that during the closing operation,

the guide track means is displaced from an unlatched position extending laterally adjacent the roller means into contact with the roller means about a lower area of the roller means, at intermediate positions into a latching position located underneath the roller means, rotation axes of the pivot lever means and of the roller means being arranged on a common, approximately vertically extending plane, and during the closing operation the rotation axis of the pivot lever means travels downwardly on the vertical plane as the guide track is displaced from its unlatched to its latched position and an area of the guide track means underneath the roller means extends tangential to the roller means in the latching position and substantially at a right angle to the vertical plane.

4,898,411

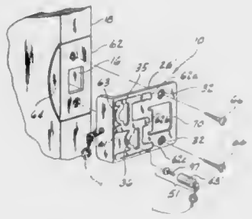
PORTABLE DOOR LOCK

Dennis M. Ocello, Affton, and Harry L. Taylor, St. Louis, both of Mo., assignors to Ocello Tool & Die Co., Fenton, Mo.

Filed Jul. 26, 1988, Ser. No. 224,462

Int. Cl.[4] E05C *17/36*

U.S. Cl. 292—292 **37 Claims**



1. A door locking apparatus for use with a door frame supporting a door, the frame having a latch recess for engaging a latch on an edge of the door, said apparatus comprising:

a planar member having a portion adapted to be disposed between the door frame and the edge of the door;

means for connecting the planar member to the door frame so that the planar member is located between the door frame and the edge of the door when said planar member is connected to the door frame;

the portion of said planar member having at least one slot therein having a first edge disposed substantially parallel to the edge of the door when said planar member is connected to the door frame;

a bolt having one end with a substantially, at least partially annular groove for engaging the first edge of the slot and adapted to be received in the slot whereby, when said planar member is located between the door frame and the edge of the door and the planar member is connected to the door frame by said means and the groove of the bolt engages the first edge of the slot, said bolt precludes opening of the door.

4,898,412

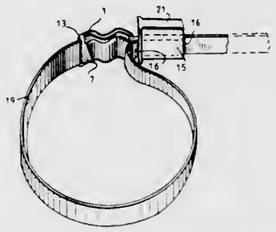
TAMPER-PROOF BAG SEAL AND METHOD FOR MANUFACTURING THE SAME

Joseph H. C. Weak, Huntington Bay, N.Y., assignor to American Casting & Manufacturing Corp., Plainview, N.Y.

Filed Jun. 1, 1988, Ser. No. 200,936

Int. Cl.[4] B05D *33/34*

U.S. Cl. 292—310 **5 Claims**



1. A bag seal for securing closure of a foldable bag comprising a tape with a secured end and a distal end and a bag engaging side and an outer side and a tape-gripping element having two tape gripping sections, a first tape-gripping section into which said secured end of the tape is fixedly connected

said first tape gripping section which comprises fold-over portions arranged to fold over said tape and be compressed thereagainst on said bag-engaging side, one of said foldover portions further comprises a projection adapted to be deflected outwardly from said fold-over portion in tape-engaging condition so that said projection is secured against a bag being secured by said seal; and a second tape-grinding section adapted to receive said distal end of said tape

said second tape-gripping passage being initially open for entry of said distal end of said tape, said second tape-gripping passage having a plurality of opposed inwardly pointing teeth in mating relationship for engagement with the surface of each side of said tape, and being deformable for compression against said tape.

4,898,413

MANUAL CONTROL DEVICE FOR OPENING A VEHICLE DOOR

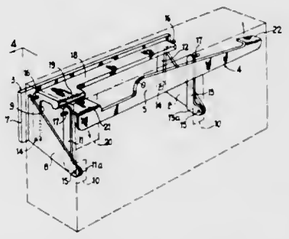
Carlo Bertolini, Les Bordes, France, assignor to Rockwell-CIM, France

Filed Jun. 14, 1988, Ser. No. 207,078

Claims priority, application France, Jun. 18, 1987, 87 08558

Int. Cl.[4] E05C *3/08*

U.S. Cl. 292—336.3 **3 Claims**



1. A manual control device for opening a vehicle door, comprising a case, a pivotable actuating lever of an associated latch, a knob capable of pivoting the actuating lever, the case being open toward the exterior and receiving the knob, two

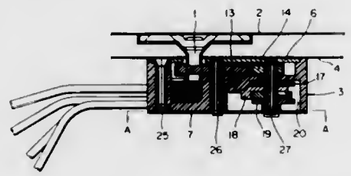
fixed pins fixed to the case and two movable pins integral with the knob associated with opposite sides of the knob, the knob being articulated on said opposite sides thereof to pivot about said two fixed pins and about said two movable pins, all of said pins being within the case, links respectively connecting, each fixed pin to a movable pin and all of said pins being so positioned that straight lines each passing through a fixed pin and a movable pin interconnected by the same link intersect outside the case.

4,898,414

WATER-TIGHT, NOISE-PROOF SEALED TYPE LOCKING APPARATUS FOR AUTOMOBILES

Shinjiro Yamada, Utsunomiya, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1988, Ser. No. 252,920
Claims priority, application Japan, Oct. 31, 1987, 62-276409
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—337 **2 Claims**



1. A water-tight, noise-proof sealed type locking apparatus comprising:
- a synthetic resin body;
- a partition wall formed medially of the synthetic resin body;
- a first recess formed in the body on the front side of the partition wall to accommodate a latch and a rachet; and
- a second recess formed in the body on the back side of the partition wall to accommodate rotation control members, the rotation control members including an open lever and a locking lever;
- whereby the first recess is covered by a cover plate, the second recess is covered by a back plate, and a connecting member for connecting the rotation control members to a handle on a door is fitted water-tightly to the synthetic resin body.

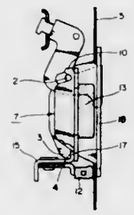
4,898,415

APPARATUS FOR MOUNTING AN OUTER DOOR HANDLE ASSEMBLY TO AN AUTOMOTIVE DOOR

Seiki Satoh, Utsunomiya, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,582
Claims priority, application Japan, Oct. 21, 1987, 62-265939
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—347 **4 Claims**

1. An apparatus for mounting an outer door handle assembly to the automotive door, comprising:
- an outer handle body consisting of an outer handle projecting therefrom, an engagement projection adapted to engage a mounting fitting, an engagement surface projecting from said body, and a flange extending at least partly about said body and being adapted to mount against the automobile door; and
- a said mounting fitting which has an engagement portion for engagement with the engagement projection, an engagement claw for engagement with the engagement surface, and a projection edge;
- whereby the outer handle body is inserted from outside into a mounting opening in an outer plate of the door and the mounting fitting is engaged from inside the door with the outer handle body, so that the outer plate of the door is



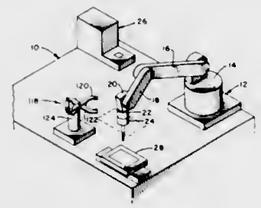
tightly clamped between the flange and the projection edge.

4,898,416

PICKUP DEVICE

Robert F. Hubbard, Buena Park, and Joseph M. Jacobs, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 5, 1988, Ser. No. 215,180
Int. Cl.[4] B25B *7/18*
U.S. Cl. 294—119.1 **17 Claims**



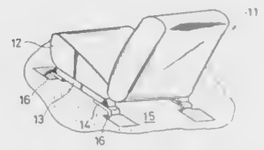
1. A pickup device comprising:
- a frame for attachment to a movable arm so that said pickup device can be moved to a desired location, said frame having guide means thereon wherein said frame has a brake thereon for selective engagement with an adjustment ring to that said adjustment ring can be held in position when not being adjusted;
- first and second carriages on said frame, said carriages being mounted on said guide means for guidance of said carriages;
- adjustment means on said frame for adjusting the space between said carriages;
- first and second arms respectively mounted on said first and second carriages so that by adjustment of said carriages along said guide means, the spacing between said arms can be adjusted wherein said means for adjusting said carriages along said guide means comprises said adjustment ring having first and second cam surfaces thereon, said first and second carriages being respectively engaged with said first and second cam surfaces so that rotation of said ring moves said carriages along said guide means:
- first and second pairs of fingers mounted so as to pivot on said arms so that said fingers can be moved with said frame; and
- means for opening and closing said fingers so that said pairs of fingers can grasp parts to be picked up, moved and positioned.

4,898,417

STRUCTURE FOR COVERING SEAT SLIDE LEGS

Hiroaki Kudo, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed May 26, 1988, Ser. No. 199,346
Claims priority, application Japan, May 28, 1987, 62-79863[U]; May 28, 1987, 62-79866[U]
Int. Cl.[4] B60N *3/04*
U.S. Cl. 296—97.23 **16 Claims**



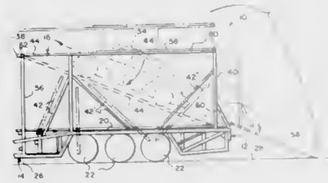
1. A structure for covering slide legs of seat slides attached to a floor panel through openings which are formed in a floor carpet placed on the floor panel, said structure comprising:
- portions of said floor carpet which correspond to the slide legs attached to the floor panel, said portions being swelled upward to form pentahedron-shaped cover portions, each cover portion having a space facing toward a respective seat slide, wherein said space of each cover portion is formed when an erected side of each cover portion facing the respective seat slide is cut off, two sides of the cover portion adjacent to said space are cut along bottom edges thereof to open said two sides, and said two sides are inserted under the floor carpet after the slide legs are attached to the floor panel.

4,898,418

TRI LEVEL REFRIGERATED TRAILER

Robert C. Lind, Sr., 118 Riverside Dr., San Antonio, Tex. 78210, and George Spector, New York, N.Y., assignors to Robert C. Lind, Sr., San Antonio, Tex.

Filed Mar. 2, 1988, Ser. No. 163,007
Int. Cl.[4] B60P *3/00, 3/08, 3/20*
U.S. Cl. 296—181 **4 Claims**



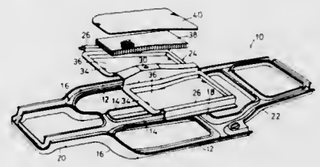
1. A tri-level refrigerated trailer which comprises:
- (a) A first support unit for supporting a first load, said first support unit including;
  - (i) a first frame member for receiving the first load; and
  - (ii) a tri-axle wheel assembly for rollably supporting said first frame member;
- (b) a second support unit extending longitudinally from said first support unit, said second support unit including:
  - (i) a refrigerator compartment for receiving a second load;
  - (ii) a second frame member for supporting said refrigerator compartment, said second frame member extending forwardly of said first frame member;
  - (iii) a nose with a low slung stinger fifth wheel extending forward of said second frame member having means to restrict rotation of said trailer relative to said truck for anti-skidding anti-jackknifing purposes;
- (c) a third support unit extending over said first and second support units for supporting a third load, said third load support unit including:
  - (i) a plurality of fixed box frame posts extending upwardly from said second frame member on either side of said refrigerator compartment;
  - (ii) a pair of parallel ramps fixed onto the tops of said box frame posts for receiving the weight of the third load;
  - (iii) a plurality of removable box frame posts extending upwardly from said first frame member;
  - (iv) a plurality of removable support braces, each extending generally diagonally from each of said removable box frame posts to said first frame member so as to stabilize said removable box frame posts; and
  - (v) a pair of removable adjustable parallel ramps keypinned on two of said removable box frame posts for supporting the third load when said third load is being moved on or off the trailer.

4,898,419

UNDERBODY STRUCTURE OF A MOTOR VEHICLE

Toshihisa Kenmochi, and Tatsunori Nakamura, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 169,902
Claims priority, application Japan, Mar. 20, 1987, 62-40073[U]; Mar. 13, 1987, 62-46669[U]; May 28, 1987, 62-79844[U]
Int. Cl.[4] B62D *21/00*
U.S. Cl. 296—204 **4 Claims**



1. An underbody of a motor vehicle having a plurality of strength members which give strength to a body of said vehicle and individually extend in a longitudinal direction of said body of said vehicle, and a floor panel disposed between said strength members, said floor panel comprising:
- a honeycomb sandwich structure having an upper plate, a lower plate, and a honeycomb core interposed between said upper plate and a recessed portion of said lower plate, wherein said recessed portion has a periphery for accommodating said upper plate, and wherein said lower plate is integrally formed with a panel for defining an upper surface of said strength members.

4,898,420

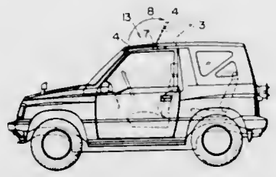
VEHICULAR OPENABLE ROOF HOOD

Yukiya Takada, Shizuoka, Japan, assignor to Suzuki Motor Company, Limited, Shizuoka, Japan

Filed Mar. 29, 1989, Ser. No. 330,127
Claims priority, application Japan, May 23, 1988, 63-67690[U]
Int. Cl.[4] B60J *7/00*
U.S. Cl. 296—219 **1 Claim**

1. A vehicular openable roof hood for covering an opening portion on the upper surface of a roof of an automotive vehicle, said hood comprising a pair of arms adapted to turn about a pair of pivotal shafts on said roof, a hood securing plate fixed to the distal ends of said arms to immovably hold the distal end of the hood, a hood cloth extending round the upper surface and the front edge of said hood securing plate to be secured to the latter from the bottom side thereof and position fixing means for immovably holding the hood at a position where it

is kept opened, wherein said hood cloth is provided with a plurality of engagement members each having a substantially U-shaped sectional configuration at the distal end thereof so as to allow it to be secured to the hood securing plate, the hood securing plate is formed with a plurality of key-shaped holes through which said engagement members are introduced so as to allow them to be held in an engaged state as well as an insert



hole through which position fixing means is inserted, each of said key-shaped holes comprising a wide part and a narrow part, and said position fixing means is secured to the ceiling portion of a vehicular body at one end thereof and includes a fixing portion for fixing a part of the position fixing means which has passed through said insert hole on the hood securing plate, the sectional shape of the position fixing means being defined in correspondence to the shape of the insert hole.

4,898,421

FOLDING FURNITURE

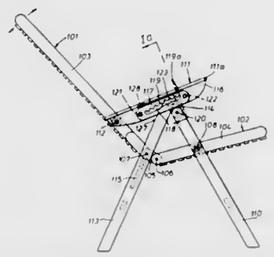
Oswald Brunn, Bunzlauer Platz 1, Munich, Fed. Rep. of Germany

Filed Feb. 20, 1987, Ser. No. 18,094

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607619; Mar. 7, 1986, 3607581

Int. Cl.[4] A47C *4/00*

U.S. Cl. 297—28 16 Claims



1. An adjustment mechanism for folding furniture including a back, a seat, at least one front leg, at least one rear leg, and an arm rest, the adjustment mechanism being adapted to be positioned at the arm rest for adjusting the relative position of the back and seat and for allowing the back, seat, front and rear legs and the arm rest to be folded flat against each other to assume a compact storage position, the front and rear legs having a connection means positioned therebetween for allowing the front and rear legs to be folded together, the adjustment mechanism comprising:

a support surface forming part of the arm rest, at least one projecting part extending downwardly from the support surface to define a space beneath the support surface and adjacent the projecting part, the space being sized for receiving the front and rear legs;

a catch plate mounted on the projecting part within the space for adjusting the relative inclinations of the back, seat and arm rest;

an element for extending through one of the front and rear legs and the connection means and being adapted to be received in the catch plate for positioning the back and seat and;

repositioning means for automatically repositioning the element when the front and rear legs are folded together for allowing the back, sea, front and rear legs and the arm rest to assume its compact storage position, said repositioning means including a stopper element positioned on the rear leg.

4,898,422

ARROWHEAD BICYCLE SADDLE

Robert V. West, III, 8480 Fredericksburg Rd., #339, San Antonio, Tex. 78229

Filed Sep. 15, 1988, Ser. No. 245,286

Int. Cl.[4] B62J *1/00*

U.S. Cl. 297—202 1 Claim



1. A bicycle seat having a narrow front portion which broadens from a forward edge rearwardly to a wider rear portion having a rear edge; characterized by a central cut-out having an arrow-head shape extending from a leading tip located near the forward edge of the seat to a wider mid-section, approximately halfway between the front and rear edges; said cut-out including a trailing edge portion which narrows in a rearward direction from the mid-section to a rear tip located intermediate the mid-section of the cut-out and the rear edge of the seat, and wherein the seat is relatively flat from the forward edge to the mid-section of the cut-out but which includes an elevated hump structure which borders the trailing edge and rear tip of the cut-out and which extends from the mid-section to the rear of the seat, whereas the hump structure will provide a rest for the superficial perineal space of an occupant while the cut-out provides a receptacle for the external genitalia.

4,898,423

DEVICE FOR CHANGING THE INCLINATION OF THE BACK-REST OF A VEHICLE SEAT

Erwin Kölle, Sindelfingen, and Josef Klink, Nagold, both of Fed. Rep. of Germany, assignors to Daimler Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Feb. 25, 1985, Ser. No. 705,349

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407159

Int. Cl.[4] A47C *3/02*

U.S. Cl. 297—362 7 Claims

1. An apparatus for changing the inclination of the back-rest of a vehicle seat, the apparatus comprising:

a first frame member,

a second frame member pivotably articulated to the first frame member, the back-rest being fixable to the first frame member,

a hand wheel mounted on the first frame member for rotation about an axis, the hand wheel being displaceable along said axis,

a driving gear coupled to the hand wheel for rotation and axial displacement therewith,

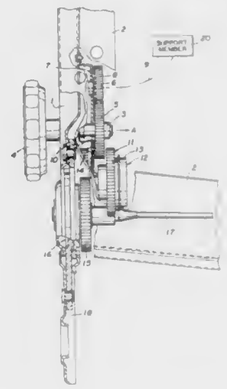
first transmission means for moving the first frame member, the first transmission means including one driven gear rotatably mounted on the second frame member, and intermediate gear stage means for interconnecting the driving gear and the one driven gear to impart rotary

motion to the driven gear in response to a rotation of the driving gear to effect pivoting of the first frame member with respect to the second frame member,

a support member drivingly engageable with the driving gear and movable in relation to the back-rest,

second transmission means for drivingly engaging the support member and moving the support member in relation to the back-rest, the second transmission means including another driven gear rotatably mounted on the first frame member,

the driving gear being selectively engageable with one of the intermediate gear stage means to move the first frame member and said another driven gear to move the support member,



first brake means operatively connected to said one driven gear for preventing rotation of said one driven gear in at least one direction when the intermediate gear stage means and the driving gear are disengaged, and

second brake means operatively connected to said another driven gear for preventing rotation of said another driven gear in at least one direction when said another driven gear and the driving gear are disengaged,

whereby the hand wheel is axially displaceable and rotatable by an operator to permit the operator to selectively activate one of the first transmission means to adjust the inclination of the back-rest and the second transmission means to adjust the position of the support member.

4,898,424

LINEAR SEAT RECLINER

Robert L. Bell, Rochester Hills, N.Y., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Filed Jul. 8, 1988, Ser. No. 216,618

Int. Cl.[4] A47C *1/024*

U.S. Cl. 297—367 38 Claims

1. In an adjustable seat structure, a back section pivoted to a seat section and a tilt-adjusting mechanism for controlling rotation of the back to a reclining position relative to the seat, said tilt-adjusting mechanism being responsive to manual pressure applied by an operator connected thereto and characterized by:

an elongated rod having first and second end portions with said first end having a length of teeth along its top surface, said second end portion being connectable to the back at a pivot point spaced from the axis of rotation, and

a latch mechanism receiving the first end portion of said rod and connected to said seat for latching the rod, said latch mechanism supporting said rod for reciprocating movement relative to said structure and including first bias means for biasing said rod into a first direction to direct the seat back into an upright position, a latch member, including a tooth complementary to and engageable with the teeth on said rod, for latching the rod when the back is at a desired tilt, a cam plate for camming the latch member between a latched and unlatched position, said

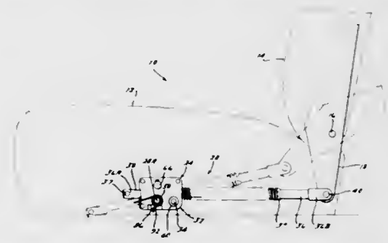


plate being rotatably mounted to the mechanism and driven in response to pressure applied by the operator, connection means for connecting the cam plate and the latch member, and second bias means for biasing the cam plate into the latched position with said rod.

4,898,425

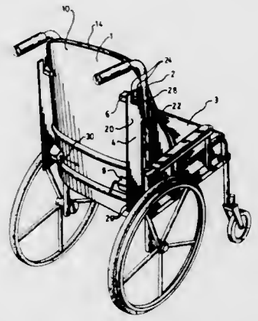
SEAT BELT KIT FOR WHEELCHAIRS

Philip C. Mundy, 47 Van Camp Avenue, Kitchener, Ontario, Canada N2M 1J1

Filed Jun. 28, 1989, Ser. No. 372,617

Int. Cl.[4] A47C *7/00*

U.S. Cl. 297—444 14 Claims



1. A seat back kit attachable to the back posts of a wheelchair, comprising:

a seat back defining shell having a generally upright back portion and two integral sides leading forward therefrom, the outside dimension between said sides being less than the clear distance between the back posts of a wheelchair;

attachment means for securing said shell with respect to said back posts at upper and lower seat back attachment points with the back of said shell positionable rearward of the plane of said back posts.

4,898,426

PASSENGER SEAT FOR AN AIRPLANE

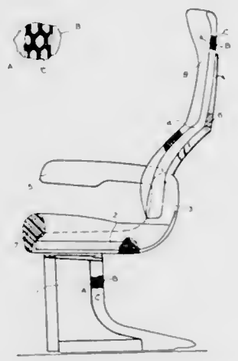
Thilo Schulz; Karl-Heinz Schmitz, and Thomas Schneider, all of Herborn, Fed. Rep. of Germany, assignors to Buderus-Sell GmbH, Herborn, Fed. Rep. of Germany

Filed Mar. 10, 1989, Ser. No. 321,991

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1988, 3811939

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—452 **6 Claims**



1. A passenger seat for an airplane, comprising:
a seat shell adapted to receive a seat cushion;
a pedestal supporting said seat shell;
a pair of supporting pieces flanking said seat shell;
respective armrests pivotally connected to said supporting pieces; and
a backrest connected to said seat shell and adapted to receive a backrest cushion, said seat shell, said pedestal, said supporting pieces, said armrests and said backrest each being constituted of at least two sandwich panels bonded together and each having a honeycomb core flanked by cover layers.

4,898,427

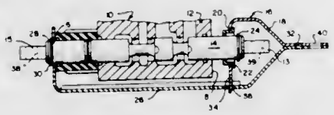
NEUTRAL STOP DEVICE

David W. Francis, Canfield, Ohio, assignor to Commercial Intertech Coporation, Youngstown, Ohio

Filed Nov. 30, 1988, Ser. No. 277,763

Int. Cl.[4] B60P *01/16*

U.S. Cl. 298—22 C **7 Claims**



1. A neutral stop device to prevent the accidental lowering of a truck bed for use on a hydraulic valve of the type having a spool whose opposite ends are both exposed outside the hydraulic valve housing during normal operation of the valve comprising:
(a) a first annular ring sized and positioned to permit a first end of the spool to pass therethrough and to prevent stop means provided on the first end from passing therethrough;
(b) a second annular ring sized and positioned to permit a second end of the spool to pass therethrough and to prevent stop means provided on the second end from passing therethrough;
(c) spacer means connected to and between the first annular ring and the second annular ring to maintain the first ring and the second ring a constant distance apart so that when the annular rings are fitted over the spool and each ring is positioned between a stop means and the valve housing the device will prevent the spool from being moved to a location which lowers the truck bed by any force acting on a pull-out cable connected to the device; and
(d) means for attaching the pull-out cable to one of the annular rings and the spacer means.

4,898,428

POWER SUPPLY SYSTEM FOR AN UNDERGROUND MINING MACHINE

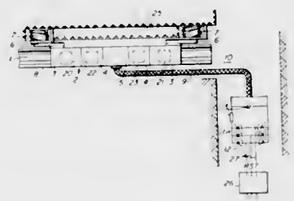
Karl-Heinz Weber, Witten-Heven, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik u. Eisengieberei mbH, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 229,255

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727800

Int. Cl.[4] E21C *29/00, 35/24*

U.S. Cl. 299—30 **9 Claims**



1. A drum-cutter loader for underground mining operations, the combination with said drum cutter-loader and a source of three phase electrical power including:
at least one cutting drum driven by a first asynchronous motor on the drum cutter-loader to release material from a mine face, and at least one winch driven by a second asynchronous motor on the drum cutter-loader for propelling the drum cutter-loader back and forth along the mine face,
rectifying means positioned remote from the drum cutter-loader coupled to receive three-phase power from a three-phase power source for converting the three-phase power to rectified direct current power;
cable means extending to the drum-cutter loader while coupled to said rectifying means for supplying said rectified direct current power; and
inverter means on the drum cutter-loader for converting the rectified direct current power supplied to said cable means to alternating current power to supply electrical power to said second asynchronous motor for driving the winch.

4,898,429

WHEEL NUT ASSEMBLY

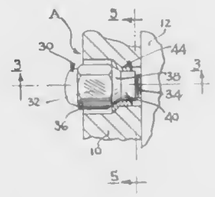
Mark J. Plumer, 10660 Wilshire Blvd. Apt. 1106, Los Angeles, Calif. 90024

Filed Jul. 25, 1988, Ser. No. 222,668

Int. Cl.[4] B60B *3/16*

U.S. Cl. 301—9 DN **20 Claims**

1. A wheel nut assembly for mounting a non-ferrous wheel to a wheel hub and securing the wheel to a plurality of outwardly extending studs through holes in the wheel and which holes, each have a conically shaped region and a connecting cylindrically shaped region and where the wheel hub has a hardness substantially greater than the wheel, said assembly comprising:
(a) a lug nut having a body with a plurality of peripherally extending tool engaging walls and with a bore extending therethrough,
(b) a conically shaped section on said body, said conically shaped section having an end proximate said body and an end distal to said body and a tapered outer wall which converges towards a reduced diameter at the end distal to said body,
(c) a skirt connected to the distal end of said conically shaped section and extending outwardly from said tool engaging walls axially with said bore, said skirt and conically shaped section having a bore communicating with the bore of the body and being sized to receive a mounting stud extending from said wheel hub, and
(d) an insert formed of a ferrous material and adapted to extend around said skirt, said insert having a hardness



similar to that of said hub and substantially greater than said wheel, said insert having a central opening sized and shaped to receive said conically shaped section on said body and said skirt, said insert also having a conically shaped inner wall bearing against the conically shaped section on said body and a conically shaped outer wall bearing against the conically shaped region of said wheel, said insert further having a cylindrically shaped section integral with the conically shaped section of the insert sized to receive the skirt on the nut and extending along and bearing against a substantial portion of the axial length of the skirt on said nut, the cylindrically shaped section of said insert also bearing against the cylindrically shaped region of said wheel, so that the nut may be tightened on the stud without crushing the wheel or damaging the stud and so that the nut and sleeve in combination grip a sufficient length of stud to preclude a vibrational unwinding from the stud and reducing flexing of the stud and damaging of stud receiving holes in the wheel.

4,898,430

TRACTION SLIP AND BRAKE SLIP-CONTROLLED BRAKE SYSTEM

Horst P. Becker-Endrigkeit, Frankfurt am Main, and Joachim Maas, Griesheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

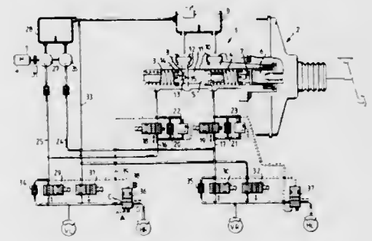
Filed Dec. 20, 1988, Ser. No. 287,310

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744071

Int. Cl.[4] B60T *8/34, 8/40;* **F16K** *31/12, 39/00*

U.S. Cl. 303—84.2 **8 Claims**

1. A traction slip and brake slip-controlled brake system for an automotive vehicle having a driven and non-driven axle and having vehicle wheels and wheel brakes coupled to each of the axles, comprising a brake pressure generator in communication with a brake conduit, further comprising a blocking valve provided in the brake conduit section immediately behind the brake pressure generator, a pump which below the blocking valve is in communication with the brake conduit, a follower inlet-valve and a relief conduit terminating below the inlet valve into the brake conduit and switched into which is an outlet valve, further comprising branch conduits to the wheel brakes of the driven and non-driven axles, provided with a separating valve in the branch conduit to the wheel brake of the non-driven axle, further comprising wheel sensors and electronic circuits for determining the wheel rotating pattern and for generating brake pressure control signals for the inlet and outlet valves, wherein the separating valve comprises two control connections which, through first and second control



are connected to the brake pressure generator and to a pump pressure conduit respectively, and wherein the separating valve includes a switch piston means and a valve closure member, said switch piston means being operable in a traction control mode to close said valve closure member in response to a pressure differential between the respective connections of said first and second control conduits, thereby separating the wheel brake of the non-driven axle from the wheel brake of the driven axle.

4,898,431

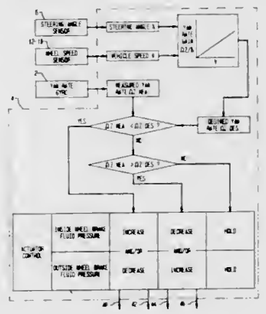
BRAKE CONTROLLING SYSTEM

Dean C. Karnopp, and Yoshiyuki Yasui, both of Davis, Calif., assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 15, 1988, Ser. No. 206,735

Int. Cl.[4] B60T *8/58*

U.S. Cl. 303—100 **14 Claims**



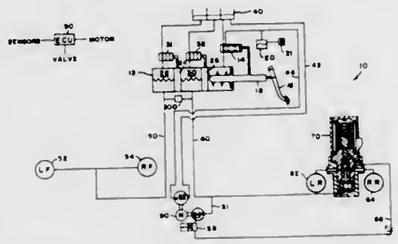
1. An apparatus for controlling a vehicle comprising:
means responsive to the influence of destabilizing forces on a vehicle for measuring an actual yaw rate of said vehicle;
means for determining a dynamically variable target yaw rate of said vehicle and for producing an output signal in response to a comparison of said target yaw rate and said actual yaw rate; and,
brake controlling means, responsive to said output signal, for maintaining stability of the vehicle when said vehicle is in motion.

4,898,432

ADAPTIVE BRAKING SYSTEM HAVING HYDRAULIC BOOSTER AND PUMP-BACK SYSTEM

Arthur K. Brown, Jr., South Bend, Ind., assignor to Allied-Signal, Inc., Morristown, N.J.

Filed Oct. 20, 1988, Ser. No. 260,531
Int. Cl.[4] B60T 8/44
U.S. Cl. 303—114 15 Claims



1. An adaptive braking system for a vehicle having a pair of axles with a pair of wheels and brakes on each axle, said system including a hydraulic brake booster for actuation by a vehicle operator, said hydraulic brake booster having first and second chambers in which hydraulic braking pressure is developed when a brake application is effected by the vehicle operator, a first braking circuit hydraulically communicating said first chamber with at least one brake controlling a wheel on one of said axles, a second braking circuit hydraulically communicating said second chamber with at least one brake controlling a wheel of the other axle, first electrically actuated valve means in said second braking circuit and for controlling hydraulic communication with the respective brake, control means responsive to rotation of the wheels and for controlling said one brake of the other axle by operating said electrically actuated valve means when an incipient skidding condition is detected, and pump means which supplies hydraulic pressure both to said booster for normal braking and to said one brake of the other axle when control of the one brake is effected by said control means in response to said incipient skidding conditions, hydraulic pressure being decayed away from the one brake and communicated directly to the pump means for return to the one brake during said incipient skidding condition, the direct communication to the pump means including communication with sump means that is separate from any reservoir means for said booster.

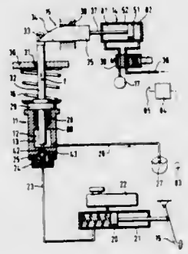
4,898,433

BRAKE PRESSURE MODULATOR FOR A BRAKE SKID-CONTROLLED BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Hans-Christof Klein, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 202,079
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718974
Int. Cl.[4] B60T 8/42
U.S. Cl. 303—115 10 Claims

1. A brake pressure modulator for a brake skid-controlled brake system for automotive vehicles, comprising at least one volume take-up means provided in a hydraulic conduit leading from a master cylinder to at least one wheel cylinder of said brake system, the volume take-up means including a plunger disposed in a cylindrical chamber, said cylindrical chamber in communication with the wheel cylinder hydraulic conduit, means for preloading the plunger into the cylindrical chamber, the plunger being closely guided out of the cylindrical chamber to the outside thereof and being connected with a vacuum-actuated driving mechanism means adapted to at leas partly retract the plunger from the cylindrical chamber upon occurrence of a brake skid signal to expand the volume of the cylindrical chamber and to thereby correspondingly decrease the brake pressure in said hydraulic conduit, variable transmission gear means provided between the driving mechanism means and the plunger, said variable transmission gear means adapted to vary its transmission ratio in response to the plunger position so that an actuating force applied by the driving mechanism



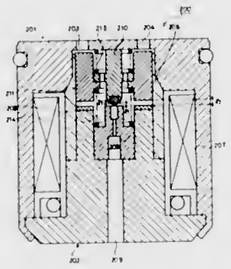
means to the plunger during an entire withdrawal operation of the plunger from said cylindrical chamber remains substantially constant, wherein the driving mechanism means is a piston/cylinder arrangement in communication with an atmospheric pressure and a vacuum source, and wherein connected to the atmospheric pressure and the vacuum source is a pneumatic blocking arrangement means for blocking movement of the plunger until a predetermined vacuum is available to apply a predetermined required pressure to the driving mechanism.

4,898,434

BRAKE PRESSURE CONTROL DEVICE FOR VEHICLES

Teruhisa Kohno; Koichi Hashida, and Koji Takata, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 115,450, Oct. 30, 1987, abandoned. This application Oct. 25, 1988, Ser. No. 264,442
Claims priority, application Japan, Oct. 31, 1986, 61-261075
Int. Cl.[4] B60T 8/02, 8/36
U.S. Cl. 303—119 6 Claims



1. An electromagnetic control valve, comprising housing means (201, 202) for enclosing said valve, a fluid flow passage in said housing means, first port means (203, 204) and second port means (205) in said housing means for permitting fluid flow through said fluid flow passage, a fixed valve seat (208) in said fluid flow passage in said housing means, a movable valve member (210) arranged in said fluid flow passage for cooperation with said fixed valve seat (208) for closing and opening said fluid flow passage, electromagnet means (207) including an armature (211) movable in said housing means in response to

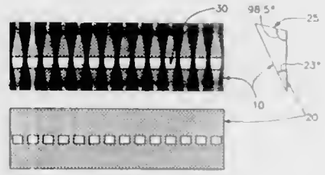
energizing and deenergizing said electromagnet means, said movable valve member being arranged inside said armature, first spring means (213) arranged for continuously urging said movable valve member in a direction toward said fixed valve seat (208), second spring means (214) arranged for continuously urging said armature (211) in a direction away from said fixed valve seat, said first spring means having a first spring force smaller than a second spring force of said second spring means, said movable valve member (210) in said armature (211), and said first and second spring means (213, 214) being so dimensioned and arranged that a displacement (l_2) of said armature is larger than a displacement (l_1) of said movable valve member so that a bidirectional fluid flow from said first port means to said second port means and vice versa is permitted when said electromagnet means are deenergized while permitting only a unidirectional fluid flow from said second port means (205) to said first port means (203, 204) when said electromagnet means are energized.

4,898,435

DARK MIRROR COATED PRISM

David L. Jungkman, Hudson, N.H.; David M. Comey, Concord; Ronald D. Stern, Newton, both of Mass., and Bruce L. Musicant, Concord, Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 24, 1988, Ser. No. 211,312
Int. Cl.[4] G02B 5/04; G01J 1/04, 5/06, 5/08
U.S. Cl. 350—1.1 3 Claims



1. In an infrared detection system including a detector array comprised of a plurality of detectors and sensitive to a radiation of interest in a predetermined wavelength band, an improved prism cold shield comprising a substrate having a top surface partially coated with a first coating layer arranged to define a plurality of bow-like stripes alternating with top surface openings which are covered by a second coating layer, and further having a bottom surface partially coated with a third coating layer in a pattern to define a line of windows on the bottom surface which are aligned with the top surface openings so as to define a field of view for the plurality of detectors, wherein the first and third coating layers are comprised of high absorption low reflectivity coatings in the wavelength band of the radiation of interest and the second coating layer is an anti-reflective coating.

4,898,436

SPATIAL LIGHT MODULATION IN COMPOUND SEMICONDUCTOR MATERIALS

Li-Jen Cheng, LaCrescenta; Gregory O. Ghess, Pasadena, and Afshin Partovi, Los Angeles, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 23, 1988, Ser. No. 172,007
Int. Cl.[4] G03H 1/12; G02F 1/35; G02B 27/28
U.S. Cl. 350—3.64 10 Claims

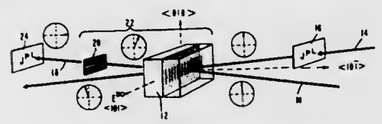
1. Apparatus for transferring information encoded on one beam of electromagnetic radiation to another beam of electromagnetic radiation comprising:

(a) a spatial light modulator comprising (1) a semi-insulating single crystal of a III-V or II-VI material, said single crystal cleaved to form a slab having a front-major surface and a rear major surface and (2) a polarizer adjacent said rear surface;

(b) means for forming a coherent input beam polarized in a given direction;

(c) means for directing said input beam onto said front major surface of said single crystal to cause diffraction of said beam, said beam passing through said polarizer to form an output beam;

(d) means for forming a coherent control beam which is



coherent with said input beam and polarized in a similar direction as said input beam;

(e) means for encoding said control beam with information; and

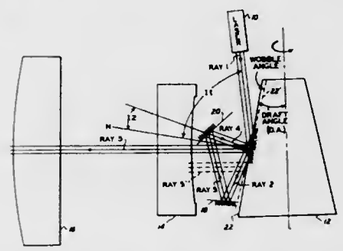
(f) means for directing said encoded control beam onto said front major surface of said single crystal to interact with said input beam within said single crystal to cause said input beam to be modulated in polarization across its wave front, whereby said information encoded on said control beam is transferred to said input beam and whereby said output beam from said polarizer is modulated in intensity.

4,898,437

WOBBLE CORRECTION BY TWO REFLECTIONS ON A FACET WITHOUT BOW

Harry P. Brueggemann, San Marino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 532,323, Sep. 15, 1983. This application Jan. 17, 1986, Ser. No. 876,648
Int. Cl.[4] G02B 26/10
U.S. Cl. 350—6.7 22 Claims



1. A system for correcting wobble errors in a mirror scanning system with minimal first and second bow effects, said first bow effects including at least first and second aspects thereof, comprising a scanning mirror having an axis of rotation, a light source for introducing a source of light toward said scanning mirror, said light being reflected by said scanning mirror, a plurality of fixed mirrors to reflect and direct the first reflected light from said scanning mirror, said fixed mirrors being placed in the path of said reflected light from said scanning mirror, and consecutively reflecting said light from each of said plurality of fixed mirrors back to the same surface of said scanning mirror, the second reflection from said scanning mirror being a scanning light beam of a range of arc, said range of arc being a result of the rotation through a predetermined range of arc of one revolution of said scanning mirror, said scanning mirror having a zero draft angle with respect to the

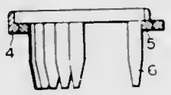
axis of rotation of said scanning mirror, the angles of incidence of said first and said second reflections from said scanning mirror being in a first predetermined selected angular relationship to each other, defining said first aspect, said plurality of fixed mirrors being in a second predetermined selected angular relationship to each other, defining said second aspect, so as to also satisfy said first predetermined selected angular relationship, and lens means for focussing said scanning light beam to a scanning point of light, the scanning beam having essentially no wobble effects as a result of the reflection back to the same surface of said scanning mirror, and no first bow effects as a result of said first and second predetermined selected angular relationships.

4,898,438

LIGHT RADIATION DEVICE FOR USE IN MEDICAL TREATMENT

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed May 12, 1989, Ser. No. 351,356
Claims priority, application Japan, Jul. 1, 1988, 63-164267
Int. Cl.[4] G02B *6/00*; A61B *17/36*
U.S. Cl. 350—96.10 **1 Claim**



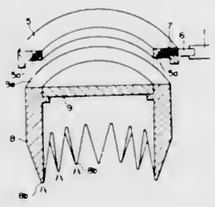
1. A light radiation device for use in medical treatment, comprising a fitted portion for engaging with a light source having a ring-shaped light-radiating end-surface, a cylindrical transparent base portion held in said fitted portion and having one end facing to the light-radiating end-surface of the light source portion and a light-radiating portion comprising of a large number of transparent tapered light-radiating elements arranged at the other end of the cylindrical transparent base portion, characterized in that said cylindrical base portion is covered with a light-reflecting layer or a clad layer at its outer and inner cylindrical surfaces.

4,898,439

LIGHT RADIATION DEVICE FOR USE IN MEDICAL TREATMENT

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,894
Claims priority, application Japan, Feb. 10, 1988, 63-30338; Jul. 1, 1988, 63-164266
Int. Cl.[4] G02B *6/00*; A61B *17/36*
U.S. Cl. 350—96.10 **4 Claims**



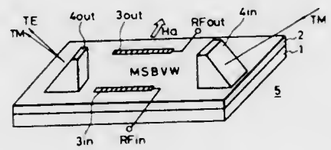
1. A light radiation device for use in medical treatment comprising a fiber optic cable, a ring-shaped light source portion and a cylindrical transparent light radiation portion, said ring-shaped light source portion including a connector for connecting said fiber optic cable thereto, an end surface, and a plurality of optical fibers each having one end connected to said connector and having another end terminating at said end surface of said ring-shaped light source portion so as to form a ring-shaped light-radiating surface thereon, said cylindrical light-radiating portion having a first end removably connected to the ring-shaped light-radiating surface of said light source portion and a second end having a plurality of tapered teeth thereon, and an enlarging lens removably secured within said cylindrical light radiation portion for observation of an object upon which light is being radiated by said cylindrical light radiation portion.

4,898,440

OPTICAL WAVEGUIDE DEVICE

Hitoshi Tamada; Masahiko Kaneko, and Tsutomu Okamoto, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 14, 1988, Ser. No. 244,164
Claims priority, application Japan, Sep. 29, 1987, 62-245020
Int. Cl.[4] G02F *1/09*
U.S. Cl. 350—96.13 **3 Claims**



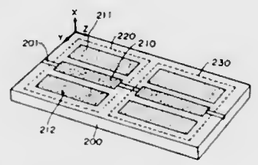
1. An optical waveguide device comprising:
(a) a layer of bismuth substituted magnetic garnet having a major surface;
(b) a pair of electrodes provided on said major surface applied with a microwave;
(c) means for applying a bias magnetic field in parallel to said major surface along a direction from one electrode to another electrode;
(d) optical input and output portions coupled to said layer to guide an optical wave therebetween, wherein said optical wave interacts with a magnetostatic backward volume wave generated by application of a microwave to said pair of electrodes with said bias magnetic field; and wherein said bismuth substituted magnetic garnet contains not less than 0.225 formula unit of Bi.

4,898,441

POLARIZATION CONTROLLER

Haruhito Shimizu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 2, 1988, Ser. No. 188,870
Claims priority, application Japan, May 1, 1987, 62-106264; May 29, 1987, 62-137268
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.14 **3 Claims**



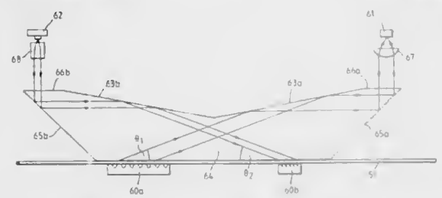
1. A polarization controller comprising,
an optical channel waveguide provided on an electrooptic substrate,
plural electrode groups provided in series in a light propagating direction on said electrooptic substrate, each of said plural electrode groups including a first electrode positioned on said optical channel waveguide, and second and third electrodes positioned on both sides of said optical channel waveguide, and means for applying predetermined voltages to said first to third electrodes in said each of said plural electrode groups,
wherein said predetermined voltages are applied to said first to third electrodes so that an electric field is produced in a predetermined direction on a plane orthogonal to said light propagating direction, thereby producing a birefringence in said optical channel waveguide in accordance with an electrooptic effect of said electrooptic substrate.

4,898,442

NON-INTRUSIVE FIBRE OPTIC TAP

Ian F. Scanlan, and Alan Robinson, both of Harlow, Great Britain, assignors to STC PLC, London, England

Filed Feb. 8, 1989, Ser. No. 308,115
Claims priority, application United Kingdom, Feb. 11, 1988, 8803159
Int. Cl.[4] G02B *6/26*; H01J *5/16*
U.S. Cl. 350—96.15 **12 Claims**



1. A coupling device for coupling light into or out of an optical fibre intermediate of its two ends, which device induces microbending of the optical fibre with a spatial periodicity to effect optical coupling between the fundamental bound mode of the fibre and a cladding mode by gripping the fibre between first and second surfaces respectively of a coupling element and a co-operating member, wherein said second surface is transversely ribbed and said first surface extends rectilinearly in the axial direction of the fibre and has no transverse ribbing and wherein said optical coupling element is provided with a reflective cylindrical or conical surface positioned such that light launched into the coupling element from said bound mode via said cladding mode and making a direct reflection in said surface is substantially collimated by making that reflection.

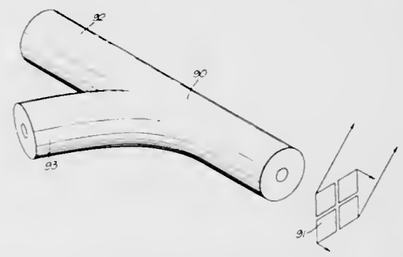
4,898,443

COHERENT MIXING OF OPTICAL SIGNALS

Richard E. Epworth, Bishop's Stortford; Stephen Wright, London, and Terry Bricheno, Great Sampford, all of England, assignors to STC PLC, London, England

Continuation of Ser. No. 69,115, Jul. 2, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 289,396
Claims priority, application United Kingdom, Aug. 5, 1986, 8619080
Int. Cl.[4] G02B *6/26, 6/42*
U.S. Cl. 350—96.15 **17 Claims**

1. An optical system including a multi-element photodetector and an optical mixing element for coherently mixing first and second optical input signals for detection at a photodetector, wherein the mixing element includes means to mix said first and second input signals for incidence upon the photodetector respectively in the form providing a zero order optical field distribution and in the form of a first order field distribution, which mixing element is constituted of an optical fiber directional coupler constructed from two optical fibre means to provide said coupler with first and second input ports and a first output port, and to provide said coupler with a coupling configuration that produces a coupling coefficient for zero order modes different from that for first order modes by an amount such that zero order mode light launched into said first input port emerges from the coupler substantially entirely from said first output port and first order mode light launched into said second input port emerges from the coupler substantially entirely from said first output port.

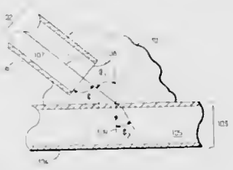


4,898,444

NON-INVASIVE OPTICAL COUPLER

Gary J. Grimes, Thornton; Lawrence J. Haas, Broomfield, and Jon R. Sauer, Aurora, all of Colo., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Nov. 30, 1988, Ser. No. 278,123
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **15 Claims**



1. An optical fiber coupler comprising:
a length of an optical fiber bus having a core and cladding and a straight region with cladding substantially similar to the cladding of the remainder of the optical fiber bus;
at least one tap optical fiber having a free end and a core-exposing face thereon, said free end of said tap optical fiber being adjacent to said optical fiber bus with the face of said free end facing said optical fiber bus region, the axes of said tap optical fiber and said optical fiber bus being positioned to permit light communication between said tap optical fiber and said optical fiber bus; and
a junction media encapsulating said tap optical fiber free end and said optical fiber bus region, said junction media having substantially the same refractive index as said cladding, thereby allowing efficient transmission of light from said tap optical fiber free end face into said optical fiber bus via said optical fiber bus cladding.

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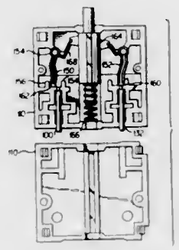
FIBER OPTIC SWITCHING SYSTEM

Edwin R. Newell, Wake Forest, and Terry E. Franks, Leicester, both of N.C., assignors to Square D Company, Palatine, Ill.

Filed Sep. 9, 1988, Ser. No. 243,055

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **3 Claims**



1. A snap-action switch for causing or preventing reflection of light at an end of each of at least two optical fibers, the switch comprising:

a housing;

a switch actuator moveably mounted within said housing;

a first support arm moveably mounted within said housing and having a first end positioned adjacent one of the optical fibers;

a first reflecting surface disposed near said first end of the first support arm;

a second support arm moveably mounted within said housing and having a first end positioned adjacent the other of the optical fibers;

a second reflecting surface disposed near said first end of said second support arm;

means connecting each of said first support arm and said second support arm to said switch actuator for permitting limited relative movement of each of said first and said second support arms between a first stable position and a second stable position, the first stable position being where said respective support arm reflecting surface reflects light at the end of its adjacent optical fiber and the second stable position being where said support arm reflecting surface reflects light at the end of its adjacent optical fiber.

4,898,446

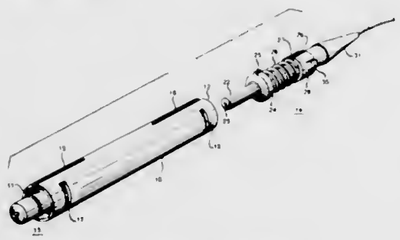
OPTICAL FIBER CONNECTOR

Roger L. Hinckley, Hackettstown, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 28, 1988, Ser. No. 263,744

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.20 **9 Claims**



1. An optical fiber connector comprising:

a barrel member having a forward section and rearward section;

a ferrule adapted for insertion of at least one optical fiber therein, said ferrule being mounted in the forward section of the barrel member;

a sleeve adapted to receive said ferrule therein at one end, the surface of said sleeve including at least one hole at said one end; and

a collar mounted over the rearward section of the barrel and including at least one locking tab adapted to engage said hole in the sleeve so that said ferrule is secured within the sleeve.

4,898,447

OPTOELECTRONIC COUPLING SYSTEM

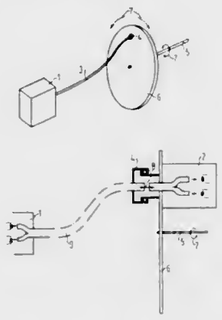
Werner Kuhlmann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 3, 1989, Ser. No. 319,398

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3810936

Int. Cl.[4] G02B *6/42*

U.S. Cl. 350—96.20 **11 Claims**



1. An optoelectronic coupling system including a light waveguide cable at each of whose ends are optically coupled to an optoelectronic conversion unit, the system characterized by the light waveguide cable being flexible yet torsionally-stable and being connected at its one end to one optoelectronic conversion unit, the light waveguide cable being separated at the other end into two axially opposing end members which are each fastened to one of two lateral portions of a pivot bearing, the pivot bearing having two lateral portions axially rotatable with respect to each other while the end members of the light waveguide cable are axially aligned and optically coupled end to end to each other, and the lateral portion of the pivot bearing associated with one end member of the light waveguide cable is rigidly connected with a carrier rotatable about an axis of rotation on which carrier the other optoelectronic conversion unit is fastened for optic coupling to one end member of the light waveguide cable.

4,898,448

FIBER DISTRIBUTION PANEL

David A. Cooper, Loganton, Pa., assignor to GTE Products Corporation, Stamford, Conn.

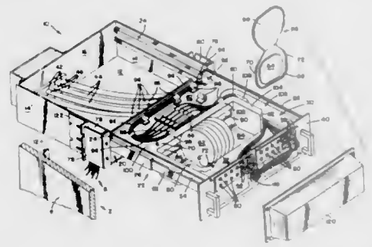
Filed May 2, 1988, Ser. No. 188,940

Int. Cl.[4] G02B *6/36, 7/26*

U.S. Cl. 350—96.20 **14 Claims**

1. Apparatus for interfacing optical fibers of external fiber optical cable with select optical fibers within equipment to which such optical fibers of such external fiber optical cable are to be coupled, comprising:

a housing comprising a base, first and second opposing side walls extending vertically from said base, a rear access panel extending vertically from said base and extending from said first opposing side wall to said second opposing side wall, a forward opening opposite said rear access panel, and means associated with said first and second side walls for slideably supporting a drawer within said housing so that said drawer can be slid relative to said rear access panel into said housing and out of said housing at said forward opening, said rear access panel including at least one opening through which one or more flexible fiber tubing extends through each of which one or more optical fibers can extend from outside of said housing to the inside of said housing, one end of each flexible fiber tubing being coupled to said rear access panel at said at least one opening and an opposite end of each flexible fiber tubing extending into said housing; and,



a drawer for so sliding upon said slideably supporting means, said drawer forming an enclosure including a bottom, first and second opposing side panels extending vertically from said bottom, a rear wall extending vertically from said bottom and extending from said first opposing side panel to said second opposing side panel, and a forward mounting panel opposite said rear wall and extending vertically from said bottom and extending from said first opposing side wall to said second opposing side wall, said forward mounting panel including a plurality of optical fiber connectors, said enclosure including an optical fiber splice cradle, said bottom being spaced from said base so that said one or more flexible fiber tubing can extend into a cavity formed between said drawer and said base when said drawer is slid into said housing, said drawer including an access opening through which optical fibers of said one or more of said external fiber optical cables can extend to said splice cradle, said enclosure further including a fiber optical cable storage unit.

4,898,449

CONNECTOR FOR THE DETACHABLE CONNECTION OF LIGHT CONDUCTING FIBRES

Laurentius C. J. Vroomen; Johannes Van Esdonk; Giok D. Khoe, and Antonius H. M. Swemmers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 81,197, Aug. 4, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 313,321

Int. Cl.[4] G02B *6/38*

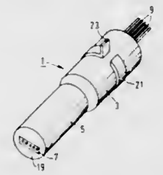
U.S. Cl. 350—96.21 **5 Claims**

1. A connector for the detachable connection of pairs of light conducting fibers comprising:

(a) first and second coupling elements, each of said coupling elements including a cylindrical reference surface and an end surface, means for mounting at least two light conducting fibers in a parallel relationship along a line, the longitudinal axis of said cylindrical reference surface being constructed and arranged to coincide with the axis of one of said light conducting fibers;

(b) an orientation element located on each of said first and second coupling elements, said orientation element being disposed in a predetermined relationship with said light conducting fibers; and

(c) a connector housing for joining said first and second coupling elements, said housing including first and second cylindrical cavities, said cylindrical cavities closely fitting said cylindrical reference surfaces and receiving said first and second coupling elements with said end surfaces of



said first and second coupling elements juxtaposed in proximate end to end relation, said connector having means for cooperative engagement with said orientation element on each of said coupling elements so as to dispose said coupling elements in the connector housing in such a manner so that the lines along which said light conducting fibers are disposed are mutually parallel.

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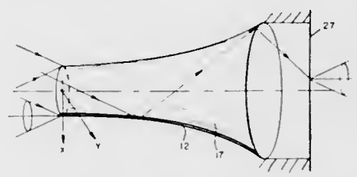
EXPANDED BEAM NON-IMAGING FIBER OPTIC CONNECTOR

Tommasz Jannson; Joanna Jannson, and Peter Yeung, all of Redondo Beach, Calif., assignors to Physical Optics Corporation, Torrance, Calif.

Filed Aug. 31, 1987, Ser. No. 91,520

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 **23 Claims**



4. A non-imaging expanded beam fiber optic connector for transmitting and coupling light energy from a first optical to a second optical fiber comprising:

a connector having two identical parts and a plane of symmetry lying equidistant between the two identical parts,

a first part for collimating and expanding a light beam propagated from a first input optical fiber to the plane of symmetry of the connector,

a second concentrating part for collecting and concentrating said light beam from said plane of symmetry to a second input optical fiber.

each of said parts having axial-rotational symmetry and containing an internally reflective side wall surface and a front refractive surface, and

in which both of said surfaces having optimized profiles, said optimized profile surfaces being designed so that the angular spectrum of light wave vectors projected onto said plane of symmetry has inverse symmetric properties when taking an angular spectrum of wave-vector projections for a given pencil of rays crossing a given plant of said plane of symmetry when making an inverse angular spectrum to said angular spectrum and calculating overlapping portions of these spectra and then calculating the remaining non-overlapping part within said angular spectrum and

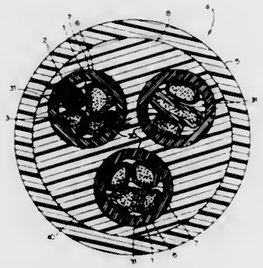
integrating said non-overlapping parts over all points of said plane of symmetry within the side wall boundary, and in which the obtained quantity is minimized by optimizing said side wall profile and said front surface profile.

4,898,451

WAX ENCASED FIBER OPTIC CABLE

Christopher A. Story, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Mar. 6, 1989, Ser. No. 307,470
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 7 Claims



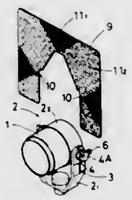
1. A fiber optic cable comprising:
(a) a plurality of free standing composites composed of an optical fiber circumscribed by a wax, each composite circumscribed by a tube-shaped member; and,
(b) a jacket, circumscribing said tube shaped members, delimiting a space in which said tube shaped members are disposed.

4,898,452

APPARATUS FOR MOUNTING TARGET PLATE ON REFLECTOR FOR ELECTRONIC DISTANCE METER

Hideya Kawachi, Yokohama, and Minoru Chiba, Isehara, both of Japan, assignors to Sokkisha Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 223,048
Claims priority, application Japan, Sep. 26, 1987, 62-239966
Int. Cl.[4] G02B 5/12; G01L 15/02
U.S. Cl. 350—97 6 Claims



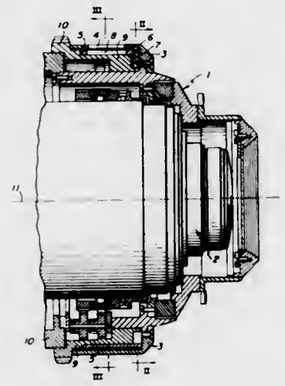
1. An for mounting a target plate on a reflector for an electronic distance meter, the reflector including a reflector body having a built-in prismatic reflection type optical member that reflects light emitted from an electronic distance meter, said apparatus comprising a support unit supporting the reflector body, the target plate being an inverted U-shape, means for engaging guide grooves extending vertically at opposing locations on both left and right sides of said support unit, the inverted U-shaped target plate being slid in and engaged with the guide grooves, and at least one locking screw provided with a knob portion and a fall-off check mechanism screwed into the support unit so that the target plate may be pressed by a forward end of the locking screw and thus locked onto the support unit.

4,898,453

MACROLENS ASSEMBLY HAVING A DISTANCE ADJUSTMENT OF MORE THAN 360 DEGREES

Harald Hohenecker, Vienna, Austria, assignor to Aari Cine & Video Gerate Gesellschaft M.b.H., Vienna, Austria

Filed Aug. 12, 1988, Ser. No. 231,483
Claims priority, application Austria, Mar. 16, 1988, 706/88
Int. Cl.[4] G02B 7/02
U.S. Cl. 350—255 15 Claims



1. A lens system using a radially adjustable distance finder comprising:
a lens mount having inner surfaces defining an inwardly protruding first projection;
first distance setting means which is rotatable to set a distance, located inside said lens mount;
second distance setting means located inside said first distance setting means, formed with an outer surface defining an outwardly projecting second projection;
means for setting a distance by rotating said second distance setting means;
projection mating means rigidly coupled to said first distance setting means, for preventing said first distance setting means from passing either said first or second projection, and
maintaining means for maintaining said projection mating means in a first location until said projection mating means contacts one of said projections, and for automatically releasing said first location in response to a force produced by said mating means.

4,898,454

OPTICAL LIGHT SWITCH OR MODULATOR DEVICE WITH A LIQUID CRYSTALLINE COMPOSITE OPTICAL COMPONENT

Alan Buckley, Berkeley Heights; Tessie M. Che, Westfield; Thomas M. Leslie, Clinton Township, / County; James B. Stamatoff, Westfield; Dagobert E. Stuetz, Watchung, all of N.J., and Donald R. Ulrich, Alexandria, Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 15,757, Apr. 10, 1987, Pat. No. 4,814,211.
This application Aug. 24, 1988, Ser. No. 235,514
Int. Cl.[4] G02F 1/13; C09K 19/00, 19/52
U.S. Cl. 350—350 R 3 Claims

1. In an optical light switch or light modulator device the improvement which comprises an optical medium component which is a composite composition consisting of an inorganic

oxide glass monolith with a microporous structure containing an encapsulated liquid crystalline component; wherein the glass monolith microporous structure has an average pore diameter in the range between about 50–300 angstroms, and substantially all of the pore diameters are within about a 100 angstrom diameter variation range.

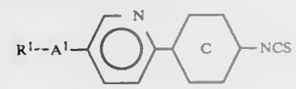
4,898,455

PYRIDINE LIQUID CRYSTALLINE COMPOUNDS

Richard Buchecker; Alfred Germann, both of Basel; Stephen Kelly, Kaiseraugst, and Martin Schadt, Seltisberg, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 16, 1987, Ser. No. 39,143
Claims priority, application Switzerland, Apr. 22, 1986, 1638/86; Feb. 2, 1987, 356/87
Int. Cl.[4] C09K 19/34; G02F 1/13; C07D 213/26
U.S. Cl. 350--350 R 9 Claims

1. A compound of the formula:



Ia

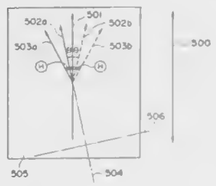
wherein R^1 is alkyl, alkoxy, alkenyl or alkenyloxy; A^1 is a single covalent bond, trans-1,4-cyclohexylene or 1,4-phenylene; and ring C is 1,4-phenylene.

4,898,456

LIQUID CRYSTAL OPTICAL DEVICE

Shinjiro Okada; Osamu Taniguchi, both of Kawasaki; Akira Tsuboyama, Tokyo, and Masahiko Enari, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 854,583, Apr. 22, 1986, abandoned.
This application May 5, 1989, Ser. No. 348,138
Claims priority, application Japan, Apr. 23, 1985, 60-087084; Apr. 24, 1985, 60-087828; Apr. 24, 1985, 60-087829; Apr. 24, 1985, 60-087830
Int. Cl.[4] G02F 1/13
U.S. Cl. 350--350 S 23 Claims



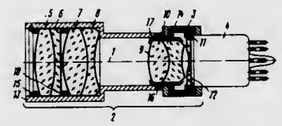
1. A liquid crystal optical apparatus comprising:
(a) as liquid crystal cell comprising a pair of electrodes and a ferroelectric smectic liquid crystal having a negative dielectric anisotropy disposed between the electrodes capable of being oriented to a first stable orientation state on one side and a second stable orientation state on the other side of the absence of an electric field, said orientation states forming an angle 2Θ between the average molecular axes of said first and second stable orientation states;
(b) means for applying between said electrodes a voltage signal sufficient to respectively transform the ferroelectric smectic liquid crystal oriented from the first or second orientation state to the second or first orientation state;
(c) means for applying between said electrodes in a non-selecting; period an alternating voltage which is insufficient to transform the ferroelectric smectic liquid crystal from one to the other of the first and second orientation states but which is sufficient to provide a third stable orientation state and a fourth stable orientation state which form a large angle than said angle 2Θ; and
(d) means for detecting an optical difference between light rays having passed through the ferroelectric smectic liquid crystal oriented to said third stable orientation state and light rays having passed through the ferroelectric smectic liquid crystal oriented to said fourth stable orientation state.

4,898,457

OPTICAL SYSTEM OF TELEVISION CAMERA

Viktor N. Alexeev, prospekt, 12, korpus 2, kv. 32, Leningrad, Tikhoretsky; Irina L. Astiropova, prospekt, 128, kv. 10, Leningrad, Nevsky, and Artemy L. Lisenko, Dimitrova, 24, korpus 2, kv. 87, Leningrad, ulitsa, all of U.S.S.R.

PCT No. PCT/SU84/00074, § 371 Date Jul. 28, 1986, § 102(e) Date Jul. 28, 1986, PCT Pub. No. WO86/03917, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 20, 1984, Ser. No. 902,410
Int. Cl.[4] G02B 9/00, 9/34, 9/62, 13/16
U.S. Cl. 350—463 15 Claims



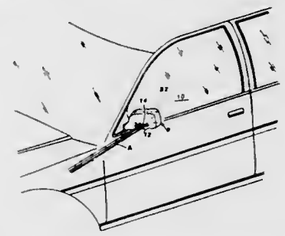
1. An optical system of a television camera, comprising, arranged successively in the direction of the light flux on one optical axis, an objective composed of n elements and a faceplate of a television tube, a light-sensitive layer being located on a last, in the direction of the light flux, surface of said faceplate, and the last, in the direction of the light flux, element of the objective having an optical power other than zero and being used as the faceplate of the television tube, wherein the last element of the objective is a concave-flat lens having its concavity facing the object.

4,898,458

LAMINAR AIR FLOW EXTERIOR ADJUSTABLE REARVIEW MIRROR

William H. McDonald, P.O. Box 445, Londonderry, N.H. 03053-9998

Filed Jan. 1, 1989, Ser. No. 304,577
Int. Cl.[4] B60S 1/56; B60R 1/06; G02B 7/18
U.S. Cl. 350—584 7 Claims



1. A laminar air flow exterior adjustable rearview mirror for motor vehicles, comprising:
(a) a rearview mirror housing structure constructed of rigid material circumscribing an adjustable rearview mirror situated therein, attached to the exterior portion of a motor vehicle;
(b) said structure surrounding the rearview mirror compris-

ing of an air intake aperture located on the forwardly portion of the structure, with respect to the forward motion of the vehicle exposed to the flow of air resulting from said motion of the vehicle, communicating with a vertically oriented curvilinear shaped air compression chamber integral to the mirror housing structure, and situated and integral to a semi-spherical moisture sump depression formed within the bottom of said chamber, and a moisture weep duct integrated and connecting the moisture sump depression with an oblong formed moisture weep orifice opening situated on the lowest elevation of the rearview mirror housing structure through which moisture present in said depression may pass, and a rearview mirror situated within the cavity of the mirror housing structure, attached to an adjustable movement mechanism providing infinite angular movements to said mirror, and an oblong formed air exhaust aperture situated adjacent to the rearwardly side of the rearview mirror housing structure, positioned vertically over the rearview mirror, and communicating with the verically oriented curvilinear shaped air compression chamber in combination,

(c) a means depleting moisture from the flow of air entering into the invention, through the air intake aperture, as the vehicle with invention attached thereto travel in a forward direction and,

(d) a means creating increased atmospheric air pressure within the portion of the invention, subject to encountered inflow of air through the air intake aperture, as the vehicle with invention attached thereto travel in a forward direction and,

(e) a means increasing the velocity and momentum of the exhaust air flow, which permeates the air exhaust aperture, relative to intake air flow, as the vehicle with invention attached thereto travel in a forward direction and,

(f) a means directing the exhaust air flow, which permeates the air exhaust aperture, vertically over the viewing surface of an exterior infinitely adjustable rearview mirror situated within the rearview mirror housing structure, as the vehicle with invention attached thereto travel in a forward direction and,

(g) a means creating an air flow momentum, in proportion with the vehicle speed, onto the viewing surface of the adjustable rearview mirror, and any vapor or particulate matter thereon, as the vehicle with invention attached thereto travel in a forward direction.

4,898,459

READING SPECTACLES

Carl E. Eriksson, Djursholm, Sweden, assignor to Iris Optics Ltd., London, England

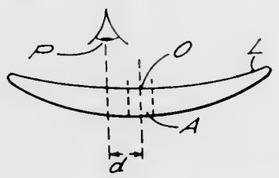
PCT No. PCT/GB86/00735, § 371 Date Oct. 1, 1987, § 102(e) Date Oct. 1, 1987, PCT Pub. No. WO87/03382, PCT Pub. Date Jun. 4, 1987

PCT Filed Dec. 2, 1986, Ser. No. 113,819

Claims priority, application United Kingdom, Dec. 2, 1985, 8529595

Int. Cl.[4] G02C *7/16*

U.S. Cl. 351—46 **7 Claims**



1. A method of preparing a pair of reading spectacles for testing by a user, wherein a mask is applied to each lens of the spectacles, the mask having therein a window whose centre corresponds substantially to the optical centre of the lens, the size of the window being determined in accordance with an inverse relationship to the strength of the lens.

4,898,460

SPECTACLES HAVING A FRAME FORMED BY AN ELONGATED CYLINDRICAL ELEMENT COMPRISING DEFORMABLE BELLOWS

Michel Magninat, and Eric Charden, both of Paris, France, assignors to Bronton Limited, France

Filed Jun. 29, 1988, Ser. No. 213,017

Claims priority, application France, Jul. 1, 1987, 87 09293

Int. Cl.[4] G02C *5/14, 5/22*

U.S. Cl. 351—114 **8 Claims**



1. Spectacles comprising a frame, a set of lenses separate from and connected to the frame,

said frame made from an elongated continuous cylindrical element which forms the front frame part to which the set of lenses are connected as well as the side branches which are to be positioned to the sides of the wearer's head, said continuous cylindrical element being capable of being initially rectilinear and bent, at least at certain locations, into a desired shape by the wearer, said certain locations being located at least at the junctions of said side branches with the front part and said certain locations comprising a semi-rigid deformable bellows, such that the frame can be bent at said bellows, by the wearer, into a shape which, because of the semi-rigid deformable characteristic, retains its bent shape while being capable of being subsequently deformed.

4,898,461

MULTIFOCAL OPHTHALMIC LENS

Valdemar Portney, 7 Alassio, Irvine, Calif. 92720

Continuation of Ser. No. 56,050, Jun. 1, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 366,319

Int. Cl.[4] G02C *7/04, 7/06*

U.S. Cl. 351—169 **44 Claims**



19. A multifocal ophthalmic lens for providing variable vision correction power, said lens having first and second zones with the second zone lying radially outwardly of the first zone, each of said zones having a first region with near vision correction power, a second region with far vision correction power and an intermediate vision region between the first and second regions, the intermediate vision region including progressive intermediate vision correction powers which are intermediate the near vision correction power and the far vision correction power and which provide vision correction for intermediate distances.

4,898,462

DEVICE FOR DETECTING A TRANSMISSIVITY OF A SUBSTANCE

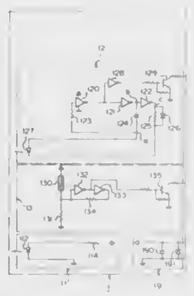
Koji Numata, Fumio Asakura, both of Toyohashi; Yoshiyuki Kago, Nishio; Masaei Nozawa, Okazaki; Takahiro Shibakawa, Kariya; Hajime Akado, Anjyo, and Hideharu Kato, Nakata, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Feb. 25, 1988, Ser. No. 160,302

Claims priority, application Japan, Feb. 26, 1987, 62-43967; Mar. 5, 1987, 62-51153

Int. Cl.[4] G01N *33/28, 21/59*

U.S. Cl. 356—70 **13 Claims**



1. A device formed in a housing portion for detecting a transmissivity of a substance, comprising:

light emitting means including a light emitting element; and

photodetecting means including a photodetecting element, said photodetecting means being spaced from said light emitting means by a predetermined distance, said photodetecting means for detecting a transmitted light value of a substance passing through a space between said light emitting means and said photodetecting means as an amount of light transmitted through said substance, said photodetecting means comprising a photooscillator circuit including said photodetecting element as one component element thereof for outputting a signal having characteristics selected from a cycle and a frequency corresponding to said transmitted light value, said photodetecting means being incorporated with said photodetecting element as a unit which is fixedly provided inside a housing portion of said device.

4,898,463

OPTICAL TIME DOMAIN REFLECTOMETER WITH AUTOMATIC MEASURING FUNCTION OF OPTICAL FIBER DEFECTS

Takashi Sakamoto, and Kazumaro Kitagawa, both of Atsugi, Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Nov. 23, 1988, Ser. No. 276,231

Claims priority, application Japan, Nov. 27, 1987, 62-297803

Int. Cl.[4] G01N *21/88*

U.S. Cl. 356—73.1 **15 Claims**

1. An optical time domain reflectometer comprising:

light emitting means for supplying an optical pulse to a target optical fiber;

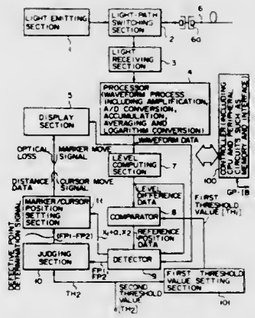
light receiving means for producing an electric signal corresponding to reflection light from said target optical fiber;

processing means for performing digital processing on said electric signal from said light receiving means, to thereby produce waveform data;

level computing means for computing level difference data for a predetermined unit interval of said waveform data from said processing means;

comparing means for comparing said level difference data computed by said level computing means with a first threshold value and producing reference position data indicating a position where said level difference data exceeds said first threshold value;

detecting means for retrieving from said comparing means that level difference data from said level computing means which is located within a predetermined range preceding and succeeding said reference position data, to thereby



detect first and second position data indicating preceding and succeeding constant-value start points, and detect first level data included in said waveform data from said processing means, which corresponds to a point attained by adding said predetermined unit interval to said first position data, and second level data of said waveform data which corresponds to said second position data; and

judging means for acquiring difference data indicating a difference in level between said first and second level data detected by said detecting means and determining a defective point in said target optical fiber by comparing said difference data with a second threshold value.

4,898,464

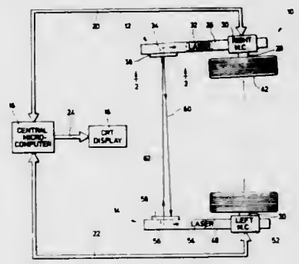
METHOD AND APPARATUS FOR DETERMINING THE POSITION OF AN OBJECT

Glenn A. Thorne; Robert D. Joy, and Jeff A. Simpson, all of Cedar Rapids, Iowa, assignors to Bce Line Company, Bettendorf, Iowa

Filed Aug. 31, 1987, Ser. No. 91,601

Int. Cl.[4] G01B *11/26;* **G01C** *21/06*

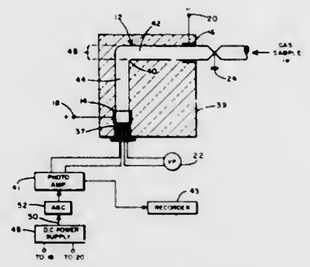
U.S. Cl. 356—152 **15 Claims**



1. An apparatus for determining the position of an object, comprising:

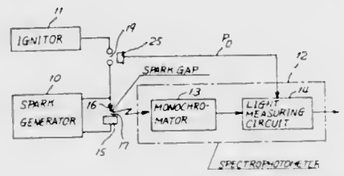
a source of an electromagnetic radiation beam;
an array of spaced, electromagnetic radiation beam detectors for said beam, each detector including detector signal producing means associated therewith for producing a variable magnitude detector signal in response to the intensity of electromagnetic radiation impinging thereon, said detector signal being subject to a signal bias due to the effects of ambient light, detector bias, or the like;
means mounting one of said source and array in a fixed relationship relative to said object;
structure for locating the other of said source and array in a fixedly spaced relationship relative to said object and in an orientation for impingement of said beam on said array;
altering means for selectively altering the intensity of said source-derived electromagnetic radiation impinging on said array between relatively lower and higher intensities whereby each of said detector signal-producing means associated with said detectors produces respective corresponding first and second detector signals;
digital converting means coupled with said detector signal producing means for receiving said first and second signals and for converting said signals into respective, corresponding, first and second digital signals; and
digital signal processing means coupled with said converting means and including digital memory means for receiving said first and second digital signals and for storing respective first and second data sets representative thereof in said memory means,
said processing means including means for retrieving and comparing said data sets to one another for producing an output data set representative of the difference therebetween and thereby representative of respective detector signals without said signal bias and for producing an output signal indicative of the location of said beam relative to said array wherein said location is indicative of the position of said object relative to one of said source and array.

4,898,465
GAS ANALYZER APPARATUS
A. Gerrit Crawford, White Bear Lake, and Douglas C. Morrison, Shoreview, both of Minn., assignors to Medical Graphics Corporation, St. Paul, Minn.
Filed Jan. 30, 1989, Ser. No. 302,919
Int. Cl.[4] G01N *21/66*
U.S. Cl. 356—311 **7 Claims**



1. In a gas analyzer of the type incorporating a tubular glow-discharge path having a cathode electrode at a first end of said path and an anode electrode at the other end, with means for introducing an unknown gas mixture into the interior of said tubular path while maintaining a predetermined negative pressure therein, and photodetector means positioned to intercept light emanating from said tubular path for producing a signal indicative of the concentration of a particular gas constituent of said mixture, the improvement comprising: a bend formed in said tubular path such that said anode electrode and said cathode electrode are non-colinear, said photodetector means being disposed in coaxial alignment with said tubular path proximate said anode electrode.

4,898,466
METHOD AND APPARATUS FOR EMISSION SPECTROSCOPIC ANALYSIS
Isao Fukui, Uji; Shuzo Hayashi, Kyoto, and Takao Miyama, Muko, all of Japan, assignors to Shimadzu Corporation, Japan
Filed Nov. 21, 1988, Ser. No. 274,332
Claims priority, application Japan, Nov. 30, 1987, 62-303988; Apr. 26, 1988, 63-103167
Int. Cl.[4] G01N *21/63, 21/67*
U.S. Cl. 356—313 **19 Claims**

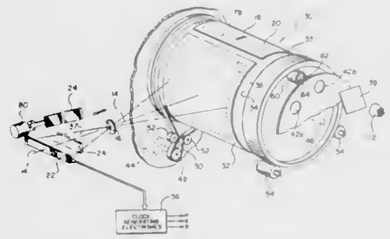


1. A method of emission spectroscopic analysis of a sample containing elements to be analyzed, comprising:
providing energy in the form of a cyclic pulses each having a waveform which comprises a relatively high energy portion and a relatively low energy portion continuing from said relatively high energy portion, said relatively high energy portion providing a sufficient amount of energy to vaporize said elements contained in said sample and said relatively low energy portion providing a sufficient amount of energy to cause said vaporized elements to emit light;
concentrating the energy of each of said pulses on said sample; and
spectroscopically measuring said light emitted by said vaporized elements.

5. The method of claim 1, wherein said relatively high energy portion of each of said pulses include a first relatively high peak while said relatively low energy portion includes a second peak which is lower and less steep than said first peak.

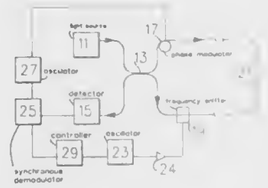
4,898,467
SPECTROMETER APPARATUS FOR SELF-CALIBRATING COLOR IMAGING APPARATUS
James R. Milch, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 7, 1988, Ser. No. 267,596
Int. Cl.[4] G01J *3/28*; H04N *1/46*
U.S. Cl. 356—328 **11 Claims**

1. Spectrometer apparatus for measuring the spectral characteristics of color imaging apparatus of the type including a solid state image sensor having multiple pixels, and optical apparatus for projecting light, transmitted via a color image, along an optical axis for illuminating pixels of said image sensor, said spectrometer apparatus comprising:
(a) a light source;
(b) a member, defining an optical slit, positionable on the optical axis between said light source and the optical apparatus in a plane occupied by a color image when it is illuminated; and
(c) a diffraction grating positionable on the optical axis between the optical apparatus and the image sensor to disperse light, projected by the optical apparatus, onto the image sensor, the magnitude and the location of the light impinging upon the image sensor varying as a function of optical characteristics of the color imaging apparatus including the spectral content of said light source and the



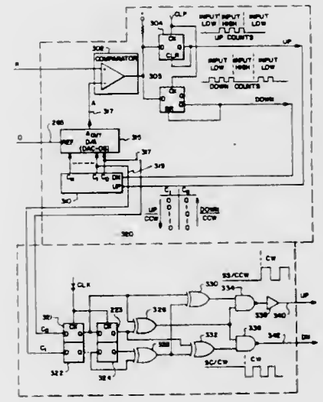
spectral transmissivity characteristics of the optical apparatus and the image sensor.

4,898,468
SAGNAC DISTRIBUTED SENSOR
Eric Udd, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Jun. 20, 1988, Ser. No. 208,982
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—345 **52 Claims**



1. A distributed optic sensor, comprising:
light source means for producing a first beam of light;
beam splitting means, optically connected to said light source means, for receiving said first beam of light from said light source means, splitting said beam of light into a second and a third beam of light, and recombining said second and said third beams into a fourth beam of light;
optical path means in optical connection with said beam splitting means for directing said second and third beams in counterpropagating directions.
phase modulating means, optically connected to said optical path means, for impressing a demodulation frequency change on one of said second and third beams of light as it enters said optical path means, and for impressing a demodulation frequency change on the other of said second and third beams of light as it leaves said optical path means;
frequency shifting switch means, optically connected to said optical path means, for switching and controlling the frequency difference between said second and third counterpropagating light beams; and,
detection means, optically connected to said optical path means, for detecting momentary and steady state phase shifts of said second and said third beams of light from said fourth light beam including electrical circuitry means for measuring the environmental disturbances along said optical path means.

4,898,469
DITHER SIGNAL REMOVER FOR A DITHERED RING LASER ANGULAR RATE SENSOR
Wesley C. Sewell, 2171 Paddock Cir., Dunedin, Fla. 33528, and Stephen P. Callaghan, 3532 Skycroft Dr., St. Anthony, Minn. 55418
Division of Ser. No. 737,978, May 24, 1985. This application Oct. 4, 1988, Ser. No. 254,002
Int. Cl.[4] G01C *19/64*
U.S. Cl. 356—350 **1 Claim**



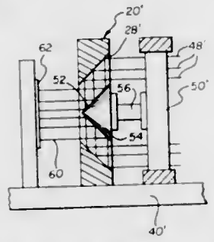
1. A digital dither reference signal for a dithered ring laser angular rate sensor comprising:
a clock signal generator for providing clock pulses;
means responsive to dithering of said sensor for providing an analog output signal indicative thereof;
means for comparing said analog output signal and a first analog reference signal, said comparator providing an output signal having at least first and second values indicative of the aign of said comparison;
first gate means for providing a pulse on a first signal line for each clock pulse during those times that said comparator output is at said first state;
second gate means for providing a pulse on a second signal line for each clock pulse during those times that said comparator output is at said second state;
counter means for counting in one direction for each pulse on said first signal line, and counting in the opposite direction for each pulse on said second signal line, said counter having a binary output representative of said count;
analog to digital converter for converting the digital representation of the count of said counter to said first analog reference signal; and
means responsive to the state of at least the two least significant bits of said binary count output for generating a pulse on either of third and fourth signal lines for each clock pulse, said third signal line having a pulse when the binary value of said least two significant bits advances, and on said fourth signal line when the binary value of said two least significant bits decreases, such that the difference between the number of pulses on said third and fourth signal lines is representative of said dithering.

4,898,470

APPARATUS AND METHOD FOR TESTING CIRCULAR CYLINDRICAL OR CONICAL SURFACES

Edwin E. Cleveland, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 12, 1988, Ser. No. 218,756
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—359 **8 Claims**



1. Apparatus for use with a Fizeau interferometer for testing the trueness of a circular cylindrical or conical specularly reflective surface of a piece to be tested, said surface having an axis, the interferometer being adapted to project a beam of collimated light, said apparatus including:

a member having a conical specularly reflective surface having an axis;

tested piece mounting means for mounting the piece to be tested with the axis of the surface of the piece to be tested coincidental with the axis of the conical specularly reflective surface of said member;

means for mounting said member and said piece to be tested with the axis of said conical specularly reflective surface of said member parallel to the beam of collimated light projected by the Fizeau interferometer, whereby the projected light is incident on said conical specularly reflective surface of said member;

said conical specularly reflective surface of said member having a cone angle such that light reflected by said conical specularly reflective surface of said member is incident on the surface of the piece to be tested and is directly or indirectly reflected thereby onto the conical specularly reflective surface of said member and is reflected by said surface of said member axially of the conical specularly reflective surface of said member towards the interferometer, whereby the light projected by the Fizeau interferometer and the light reflected by the conical specularly reflective surface of said member towards the interferometer interfere and the interference pattern created may be inspected with the Fizeau interferometer.

4,898,471

PARTICLE DETECTION ON PATTERNED WAFERS AND THE LIKE

John L. Vaught; Armand P. Neukermans, both of Palo Alto; Herman F. Kelderman, Berkeley, and Franklin R. Koenig, Palo Alto, all of Calif., assignors to Tencor Instruments, Mountain View, Calif.

Continuation of Ser. No. 64,319, Jun. 18, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 248,369
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—394 **21 Claims**

1. A method of particle detection on a patterned surface comprising,

(a) scanning a substantially flat surface with a single laser beam, said beam scanning said surface in a sequence of paths,

(b) collecting approximately constant solid angles of acceptance of light scattered from a plurality of points on said surface with an optical collection system,

(c) detecting said collected light and producing an electrical signal corresponding to the intensity of light collected,

(d) producing electrical waveform templates from said electrical signal, said surface having a periodic pattern representing a plurality of die formed thereon, each of said waveform templates representing a portion of a scan path corresponding to one of said die, one of said waveform templates corresponding to a die being designated as a reference waveform template,

(e) comparing the waveform template corresponding to another die with said reference waveform template, differences between the waveform templates representing particles on the surface in said scan path, and

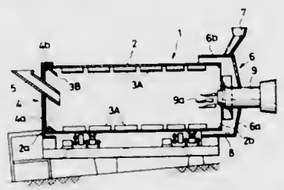
(f) repeating steps (a)–(e) until at least a predetermined number of said die have been scanned.

4,898,472

PLANT OF BATCH SYSTEM FOR PRODUCING A COMPOSITE PAVING MATERIAL BY USING A BITUMINOUS WASTE PAVEMENT MATERIAL

Hideo Sasaki, Ageo, Japan, assignor to Taisei Road Construction Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 40,886, Apr. 21, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 281,952
Claims priority, application Japan, Apr. 25, 1986, 61-96168
Int. Cl.[4] B28C *5/20, 5/46, 7/04*
U.S. Cl. 366—18 **1 Claim**



1. A batch system plant for producing a composite paving material by using a bituminous waste pavement material, comprising:

a heating means which includes a rotary cylindrical body in a lengthwise configuration, inclined in a vertical direction, having a top and bottom and mounted, on its inner top and bottom surfaces, with agitating blades, said heating means having an elevated opening section over which there is loosely fitted an elevated wall member equipped with a new aggregate material introduction chute, and a lowered opening section over which there is loosely fitted a lowered wall member equipped with a bituminous waste material introduction chute separate from said rotary cylindrical body and also equipped, at its central part, with a burner which heats the new aggregate material;

a new-aggregate material supply passageway which is connected to said new aggregate material introduction chute and which supplies said new aggregate material from a new aggregate feeder to said new aggregate material introduction chute through a first arrangement of conveyors, said arrangement of conveyors including, among them, a new aggregate material conveyor scale equipped with an amount-of-new-aggregate-material indicating device;

a reproduction material supply passageway which is connected to said bituminous waste material introduction chute and which supplies a bituminous waste pavement material from a bituminous waste material feeder having an inverter which adjusts the flow rate of said waste material, to said bituminous waste material introduction chute through a second arrangement of conveyors, said second arrangement of conveyors including, at a terminal end of its arrangement, a bituminous waste material conveyor scale equipped with an amount-of-reproduction-material indicating device, said new aggregate material and said bituminous waste material being mixed together and then heated to form said composite paving material; and

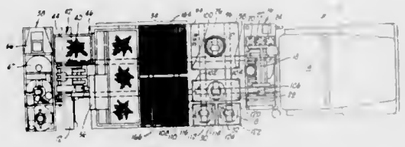
a ratio control section which is connected between said inverter and said amount-of-new-aggregate-material indicating device having an automatic interlocking operation which can be changed to a manual independent operation and vice versa, and which makes a comparison between respective indicated supplying values of said new aggregate material and waste reproduction material and thereby proportionally controlling the value of the waste material relative to the value of the new material so that both said values may bear a predetermined ratio, to generate a command control signal to said inverter for controlling the supply and ratio of said heated new-aggregate and unheated bituminous waste material.

4,898,473

BLENDED SYSTEM WITH CONCENTRATOR

Calvin L. Stegemoeller, and Lonnie R. Walker, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 199,560, May 27, 1988. This application May 2, 1989, Ser. No. 345,933
Int. Cl.[4] B01F *15/02*
U.S. Cl. 366—132 **11 Claims**



1. A blender system, comprising:

a blender tub means for blending a solid particulate material in a liquid, said tub means having a tub outlet defined therein,

a pump means having a pump suction inlet and a pump discharge;

suction conduit means for conducting a tub outlet stream from said tub outlet and an initially separate liquid supply stream from a liquid supply to said pump suction inlet; and

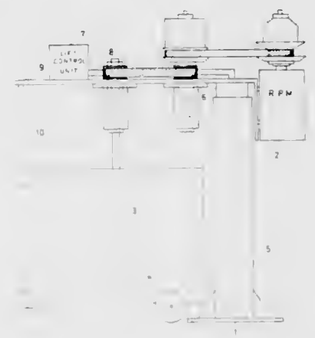
a solids concentrator means for separating a pump discharge stream from said pump discharge into a lower density recirculating stream and a higher density concentrator discharge stream, said concentrator means having a concentrator inlet means for receiving said pump discharge stream, a low density outlet means for directing said recirculating stream back to said tub, and a high density outlet means for discharging said concentrator discharge stream.

4,898,474

SELF-CONTAINED, ADJUSTABLE DISPERSER AND MIXER

Benjamin Lipson, Apt B 403, Cedarbrook Hill Apts., Wyncote, Pa. 19095

Filed Oct. 21, 1987, Ser. No. 110,840
Int. Cl.[4] B01F *7/18, 15/00*
U.S. Cl. 366—286 **2 Claims**



1. A mixing device for agitating and mixing a liquid, said device comprising,

(a) a motor connecting a shaft and an impeller to do the mixing,

(b) a support structure to which the motor is attached,

(c) a cylinder attached to a base and containing a slidably and rotatably movable piston attached to said support structure,

(d) a control unit with actuating means to operate said piston in said cylinder by means of a control fluid to raise and lower said support structure,

wherein said control unit is mounted on said support structure and said control unit actuating means is connected to said support structure to be in easy reach of an operator, such that the operator may operate said actuating means while simultaneously keeping in view said liquid being mixed, and wherein said piston is a solid body containing a passageway for transfer of control fluid through said piston from an entrance at the top of said piston to an exit at the bottom of said piston, to allow said fluid to move between said piston and said cylinder through said passageway.

4,898,475

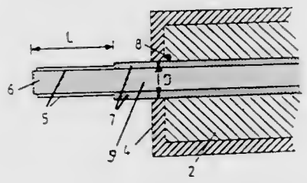
APPARATUS AND METHOD FOR THE MEASURING OF DEW POINTS

Petr Horn, Samstagern, Switzerland, assignor to Novasina AG, Pfaffikon, Switzerland

Filed Mar. 14, 1988, Ser. No. 167,975
Claims priority, application Switzerland, Mar. 16, 1987, 1058/87
Int. Cl.[4] G01N *25/68*
U.S. Cl. 374—28 **6 Claims**

1. An apparatus for the measuring of dew points, including a first sensor intended to measure a temperature, a chiller block intended for the chilling of a bedewable surface having an area and at least one connecting piece arranged as heat transfer means between said chiller block and said bedewable surface, in which said connecting piece comprises a two ended member made of thermoconductive material, said member being at one end in thermal contact with said chiller block and at the other end in thermal contact with said bedewable surface, and comprising a cross-sectional area for heat transfer between the two ends of said connecting piece, said cross-sectional area being at

least three times less than the total area of the bedewable surface, and in which said first sensor is provided at or adjacent to said bedewable surface, whereas a second sensor intended



for measuring the temperature of the chiller block is provided at said chiller block, whereby the temperature gradient along said member between said bedewable surface and said chiller block can be controlled.

4,898,476

ARRANGEMENT FOR MEASURING THE WATER VAPOR DEW POINT IN GASES

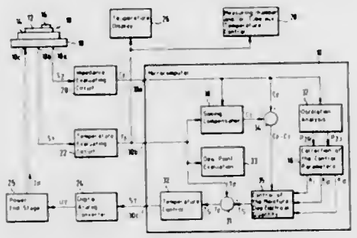
Rainer Herrmann, Steinen, and Dieter Funken, Lörrach, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,667

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740719

Int. Cl.[4] G01N *25/68*

U.S. Cl. 374—28 **16 Claims**



1. Method for measuring the water vapour dew point in gases in which a moisture-dependent electrical quantity used for indicating the formation of dew droplets on a sensor surface is held by controlling the temperature of the sensor surface at a desired value associated with a stable dew mass and the temperature of the sensor surface is measured, characterized in that for setting the desired value the temperature of the sensor surface is lowered from a value lying above the dew point temperature and a periodic time temperature variation is superimposed on the lowering, and that on simultaneous occurrence of periodic time variations of the moisture-dependent electrical quantity the value of the moisture-dependent electrical quantity measured on the change of the periodic time variations to a monotonic variation is used as the desired value.

14. Arrangement for measuring the water vapour dew point in gases including a dew point sensor comprising an electrical sensor element which comprises a sensor surface and which furnishes an electrical signal dependent on the moisture-dependent electrical quantity, an electrical heating and cooling means influencing the temperature of the sensor surface and an electrical temperature sensor furnishing an electrical signal dependent on the temperature of the sensor surface, and a control arrangement which is connected to the dew point sensor and receives the moisture-dependent electrical quantity as controlled variable and supplies to the electrical heating and cooling means a correcting variable by which the moisture-dependent electrical signal is held at a desired value, characterized in that the control arrangement includes a master controller and a follow-up controller which are arranged in cascade, that the master controller receives the moisture-dependent electrical signal as controlled variable and the desired value of the moisture-dependent electrical signal as command variable and emits a temperature desired value signal and that the follow-up controller receives the temperature desired value signal furnished by the master controller as command variable and the temperature-dependent signal furnished by the temperature sensor as controlled variable and supplies the correcting variable to the electrical heating and cooling means.

4,898,477

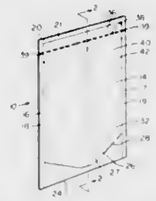
SELF-EXPANDING FLEXIBLE POUCH

William A. Cox; James B. Camden, both of Cincinnati, and George L. Roseberry, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 18, 1988, Ser. No. 259,380

Int. Cl.[4] B65D *33/00*

U.S. Cl. 383—33 **27 Claims**



1. A sealed, self-expanding, flexible pouch having a top portion and a throat area subjacent said top portion, said pouch comprising:

(a) front and back sidewall panels superimposed over one another and sealed together along their top, side, and bottom peripheral edges, said panels having an inner surface; and

(b) an extensible stay attached to said inner surface of said front and back sidewall panels and located in said throat area of said pouch, said extensible stay having a relaxed, expanded configuration and a stressed, collapsed configuration, said stay initially being held in its said stressed, collapsed configuration by said top portion of said pouch, whereby said stay expands to its said relaxed, expanded configuration when said top portion of said pouch is removed, thereby expanding said throat area of said pouch.

4,898,478

LINEAR GUIDE APPARATUS

Nobuyuki Osawa, Takasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

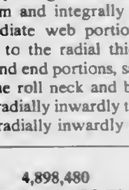
Filed Jun. 9, 1989, Ser. No. 364,653

Claims priority, application Japan, Jun. 17, 1988, 63-80229

Int. Cl.[4] F16C *29/06*

U.S. Cl. 384—45 **3 Claims**

1. In a linear guide apparatus including an elongated guide rail having axial ball rolling grooves formed in both side surfaces in parallel to one another, a slider main body mounted on said guide rail for movement in an axial direction and having ball rolling grooves formed in an inner surface respectively opposing the ball rolling grooves of said guide rail, said slider main body also having ball return paths formed in side walls thereof in parallel to the ball rolling grooves in the inner surface of the slider main body, end caps respectively joined to opposite ends of said slider main body, each of said end caps having curved paths of a half circular shape for bringing the ball return paths into communication with the ball rolling grooves, and a plurality of balls rollably inserted into the opposing ball rolling grooves, the ball return paths, and the curved paths, the improvement comprising:



a boundary ridge portion formed in each of the ball rolling grooves of said guide rail and said slider main body between a groove flank face and a land face, the boundary ridge portion being formed in a circular arc shape continuously connecting the groove flank face and the land face.

4,898,479

ROLL NECK BEARING ASSEMBLY AND INNER BEARING COMPONENT THEREFOR

Thomas E. Simmons, Westford, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Division of Ser. No. 31,416, Mar. 30, 1987, Pat. No. 4,790,673.

This application Jun. 24, 1988, Ser. No. 211,242

The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.

Int. Cl.[4] F16C *33/74*

U.S. Cl. 384—130 **5 Claims**

1. An inner bearing component for a rolling mill roll neck bearing assembly, said inner bearing component being adapted to be axially received on the roll neck and comprising: a body portion adapted to coact with other components of the bearing assembly in radially supporting the roll neck, and an end portion spaced axially from and integrally joined to said body portion by an intermediate web portion of reduced radial thickness as compared to the radial thicknesses of adjacent segments of said body and end portions, said end portion being spaced radially from the roll neck and being configured and dimensioned to deflect radially inwardly towards said roll neck under the influence of radially inwardly applied forces.

4,898,480

COMPACT FERROFLUIDIC ELECTRICALLY CONDUCTING SEALED BEARING

Kuldip Raj, Merrimack; Hanumaiah L. Gowda, Hudson, and Ronald Moskowitz, Hollis, all of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Division of Ser. No. 12,193, Feb. 9, 1987, Pat. No. 4,797,013.

This application Oct. 27, 1988, Ser. No. 263,539

Int. Cl.[4] F16C *33/82*

U.S. Cl. 384—446 **18 Claims**

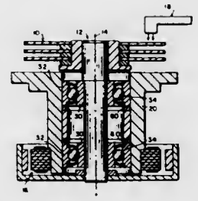
1. A sealed rolling element bearing for supporting a shaft of magnetic or nonmagnetic material and for permitting rotation of the shaft relative to a housing, comprising:

an inner race attachable to the shaft, said inner race having an annular outer surface;

an outer race concentric with said inner race and attachable to the housing, said outer race having an annular inner surface;

a plurality of rolling elements located in an annular region between said inner race and said outer race;

a pair of shields attached to the outer surface of said inner race and extending outwardly from the outer surface of said inner race toward the inner surface of said outer race on opposite sides of said rolling elements so as to substantially enclose said annular region, each of said shields having a closely-spaced, noncontacting relationship with the inner surface of said outer race thereby defining a gap between each of said shields and the inner surface of said outer race,



said inner race, said outer race, said rolling elements and said shields being of magnetically permeable material;

magnetic means for producing a magnetic field in said gaps and in regions where said rolling elements contact said inner race and said outer race; and

a ferrofluid retained by said magnetic field in the gaps between said shields and said outer race and in the regions where said rolling elements contact said races, said ferrofluid permitting relative rotary movement of said housing and said shaft while sealing opposite ends of said bearing and lubricating said rolling elements and creating a reservoir to replenish any fluid loss, wherein at least a portion of each of said shields is angled toward said rolling elements, and said inner and outer races have equal axial dimensions.

4,898,481

BEARING ASSEMBLY

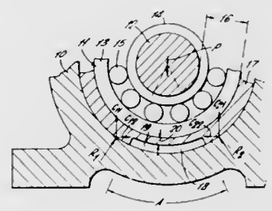
Ronald F. Hamblin, Luton, United Kingdom, assignor to SKF (UK) Limited, United Kingdom

Filed Apr. 12, 1988, Ser. No. 180,391

Claims priority, application United Kingdom, Apr. 13, 1987, 8798772

Int. Cl.[4] F16C *27/04*

U.S. Cl. 384—581 **9 Claims**



1. A bearing assembly comprising a housing having a bore, a bearing which is disposed in the bore and a shaft which is supported by the bearing for rotation with respect to the hous-

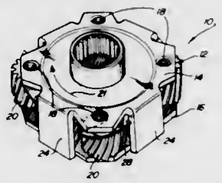
ing, wherein the bearing is supported substantially over its complete circumference by at least two portions of differing stiffness, which are circumferentially adjacent to each other and extend longitudinally of the bearing, each less stiff portion being arcuate and centered on the bearing axis, such that the reaction to a load acting along a radius of the bearing includes substantial components to each side of that radius which are opposed to each other.

4,898,482

REPLACEABLE SHIM

Matthew M. Stewart, 26468 Hickory Blvd., Bonita Beach, Fla. 33923

Continuation-in-part of Ser. No. 57,328, Jun. 4, 1987, Pat. No. 4,775,250. This application Oct. 3, 1988, Ser. No. 252,785
The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.
Int. Cl.[4] F16C *33/00*; F16H *35/08*; F16B *43/00*
U.S. Cl. 384—626 **5 Claims**



1. For use in conjunction with a member rotatably mounted to a shaft, said shaft being secured to a frame, said shaft normally moving in a predetermined transverse direction, a shim comprising:

a flat body having a recess with an open end, said body being insertable between said frame and said rotary member so that said shaft is positioned within said recess, and

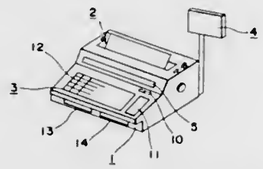
means for locking said body to said frame so that said open end of said recess faces in said predetermined transverse direction, and so that said shaft remains in said recess comprising a surface on said body adapted to abut against a surface on said frame, said body surface being spaced from and facing substantially away from said recess; wherein said body and said locking means are of one-piece construction.

4,898,483

ELECTRONIC TYPEWRITER EQUIPPED WITH A PERSONAL COMPUTER

Taiji Iizuka, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 7, 1988, Ser. No. 141,514
Claims priority, application Japan, Jan. 9, 1987, 62-3808
Int. Cl.[4] B41J *5/40*
U.S. Cl. 400—61 **6 Claims**



1. An electronic typewriter equipped with a personal computer comprising:

a first processing unit including,

processing means for controlling operations of said first processing unit,

storing means for storing a user application program, and

display means for displaying data processed according to user application program;

interface means, operatively connected to said first processing unit, for transferring data to and from said first processing unit;

a second processing unit, coupled to said first processing unit through said interface, for controlling a printer according to data transferred from said interface;

keyboard means, including character input keys and function keys, for inputting data to a selected one of said first processing unit or said second processing unit, exclusive of the other;

selection switch means, operatively connected to said first processing unit and said second processing unit, for selecting one of two modes, said modes causing only one of said first processing unit or said second processing unit to operate and receive said inputted data; and

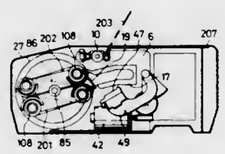
distribution means, operatively connected to said keyboard means, for distributing data outputted from said keyboard means to either said first processing unit or said second processing unit according to the mode selected by said selection switch means, said data being processed by either said first processing unit or said second processing unit according to the mode selected.

4,898,484

THERMAL TRANSFER PRINTER

Yuuji Aoyagi; Syouji Yokoyama, and Tomohiko Yanagita, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 832,130, Feb. 24, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 248,287
Claims priority, application Japan, Feb. 27, 1985, 60-38161
Int. Cl.[4] B41J *35/22*
U.S. Cl. 400—120 **15 Claims**



1. A thermal transfer printer comprising:

a case; side plates respectively provided at opposite sides of said case; a platen mounted between said side plates; a roller mounted between said side plates in pressure contact with said platen; a plurality of interchangeable rolls of ink film ribbon, each with an ink layer wound around a supply roll and arranged to be taken up around a take-up roll in an ink film take-up direction by a force transmitted from said platen; recording paper disposed in opposition to the ink layer on one of said ink film ribbons which is fed to a predetermined recording position by said platen; a thermal head including an array of heating elements disposed along an axial direction of said platen, said heating elements being pressed against said platen through said one ink film ribbon and said recording paper; means operatively disposed in said case for feeding said recording paper; means operatively disposed in said case for feeding said one ink film ribbon; means rotatably mounted in said case between said side plates for supporting said thermal head, said thermal head being operatively arranged to be brought against said one ink film ribbon heated in accordance with recording information and transferring an ink image onto a surface of said recording paper; said plurality of interchangeable rolls of ink film ribbon being accommodated in said case and each being contained in ink ribbon-containing cassettes; driving means operatively provided in said case for driving said thermal head supporting means and for setting a clearance between said platen and said thermal head by rotation of said thermal head supporting means, said driving means being operable to open the clearance between said platen and said thermal head in response to an interchange of said rolls of ink film ribbon, with the clearance having a width not less than a maximum diameter of one roll of said ink film ribbon, to allow a first roll of said rolls of ink film ribbon to be moved in a direction substantially perpendicular to a longitudinal axis of said platen without translation along said longitudinal axis and parallel to the ink film take-up direction to the predetermined recording position from a storing position and to be retracted from the predetermined recording position to the storing position, and a second roll of said rolls of ink film ribbon to be interchanged with the first roll by being moved from the storing position to the predetermined recording position while said recording paper remains stationary during the interchange to assure a smooth subsequent printing operation;

an electric controller for controlling said driving means and for effecting the interchange of said rolls of ink film ribbon; and

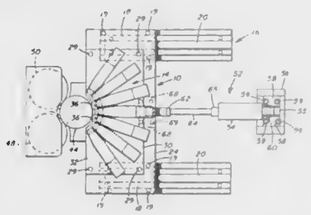
means provided in said case for guiding and positioning said ink film ribbon in relation to the predetermined recording position.

4,898,485

METHOD AND APPARATUS FOR MARKING ON AN ARCUATE SURFACE

Edwin W. Spelcher, Pittsburgh, Pa., assignor to M. E. Cunningham Company, Ingomar, Pa.

Continuation of Ser. No. 157,920, Feb. 19, 1988, which is a continuation of Ser. No. 930,660, Nov. 13, 1986, abandoned. This application Mar. 3, 1989, Ser. No. 320,292
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[4] B41J *3/10*
U.S. Cl. 400--121 **11 Claims**



1. Apparatus for marking on an arcuate surface comprising,

marking means for marking the circumference of an object having an arcuate surface with a plurality of characters of preselected height, said marking means including a plurality of marking head assemblies spaced from each other by a preselected angular distance to form a generally fan-shaped array,

said plurality of marking head assemblies angularly spaced from a circumference of said object by a preselected degree to control said height of said characters,

mounting means for supporting said marking means,

object support means for supporting said object having said arcuate surface, said object support means positioned to provide that a longitudinal axis of said object is substantially perpendicular to said plurality of marking head assemblies,

positioning means for positioning said arcuate object on said object support means, and

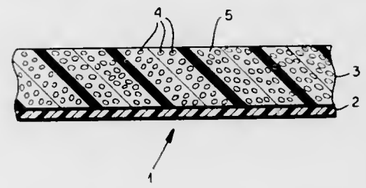
means to actuate said plurality of marking head assemblies to selectively imprint a plurality of marks in the circumference of said arcuate object and form said plurality of characters.

4,898,486

THERMAL TRANSFER RIBBON, ESPECIALLY FOR IMPRESSIONS ON ROUGH PAPER

Norbert Mecke, Hannover, and Heinrich Krauter, Neustadt, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 109,489, Oct. 15, 1987. This application Feb. 10, 1988, Ser. No. 154,651
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635141
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[4] B41J *31/00*
U.S. Cl. 400—241.2 **10 Claims**



1. A thermal-transfer ribbon, comprising:

a support strip; and

a thermally transferable image-transfer layer on said support strip comprising a solid continuous phase in which a coloring agent is dispersed, a coloring-agent-containing discontinuous phase consisting of solid beads of a polymer meltable during the thermal-transfer process and distributed in said continuous phase, said solid continuous phase being formed by at least in part.

4,898,487

PRINT HEAD CARRIAGE FOR MATRIX PRINTER

Robert A. Brull, Dryden; James R. Del Signore, II, Trumansburg, and Alan H. Walker, Barton, all of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 8, 1988, Ser. No. 282,226
Int. Cl.[4] B41J *11/22*
U.S. Cl. 400—354 **4 Claims**



1. A printer for serial printing of indicia on record media, comprising a

printer frame, a

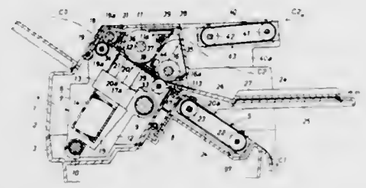
print head carriage, a
print head secured to said carriage, and
shaft means secured to said printer frame and supporting said print head carriage for transverse movement along said shaft means in printing operations, said print head carriage including bearing means and said carriage being made of a conductive material comprising polycarbonate with polytetrafluoroethylene and carbon material wherein said print head is bonded through said bearing means and through said shaft means to the ground potential of said printer.

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PRINTER WITH MULTI-FUNCTION PAPER FEEDING MECHANISM

Takeshi Yokoi, Kagamigahara; Shigeo Nakamura, and Hiroshi Yamanaka, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Aug. 21, 1987, Ser. No. 87,827
Claims priority, application Japan, Aug. 22, 1986, 61-197916; Mar. 28, 1987, 62-74980; Apr. 7, 1987, 62-86125
Int. Cl.[4] B41J *13/30, 11/22*
U.S. Cl. 400—642 **3 Claims**



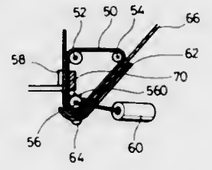
1. A printer comprising a platen, a print head which faces said platen so as to print out on a sheet of printing paper at a printing position on said platen, a paper guide path for guiding the printing paper through said printing position, and a guide means having a guide plane for inserting a sheet of printing paper in said guide path;
wherein said paper guide path comprises a paper inlet portion at one end thereof for inserting the printing paper thereto and a paper discharge portion at the other end thereof for discharging the printing paper therefrom,
wherein said paper guide path is a substantially flat path extending from said paper inlet portion to said paper discharge portion, said path slanting upward to the paper feed direction so that said paper inlet portion is located lower than said paper discharge portion, said paper guide path being formed between a guide member and a paper path member, said guide member being disposed on the upper side of a tangent line of the printing position on said platen and said paper path member being disposed on the lower side of the tangent line thereof,
wherein said guide plane of said guide means is connected with said paper inlet portion of said paper guide path and meets said paper guide path at an obtuse angle, a resilient film attached to an edge of said guide means and projecting toward said paper guide path and a free edge of the film being disposed adjacent to said paper path member, and pin tractor means located below said guide means for feeding a continuous web, said web having pin feed holes along outer edges engageable with said pin tractor means, into said paper guide path through a space between said resilient film and said paper path member, and
said guide means and said pin tractor being located adjacent the paper inlet portion.

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PAPER SUPPORT MECHANISM IN A PRINTER

Junichiro Matsumoto; Mitsuhiro Shimada, and Yoichi Yamamoto, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 23, 1984, Ser. No. 643,470
Claims priority, application Japan, Aug. 26, 1983, 58-156749
Int. Cl.[4] B41J *11/08*
U.S. Cl. 400—656 **8 Claims**



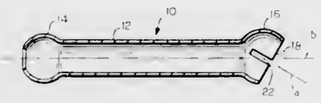
1. A paper feed/support mechanism for a printer which has a thermal print head adapted to travel in a horizontal plane, said print head containing a plurality of heating elements which are aligned in a direction extending substantially perpendicular to the direction of travel of the print head which comprises:
an endless elastic sheet member having a width extending over a printing zone of said printer;
at least two roller members forming a conveying surface for extending said endless sheet member in front of said print head, said at least two roller members including a pair of rollers which form, in combination, a flat conveying surface in front of said print head, said flat surface having a height, measured in the direction perpendicular to the direction of travel of the print head, greater than the height of the heating elements of said print head; and
a drive mechanism connected to at least one of said at least two roller members so as to rotate said endless sheet member around said at least two roller members in a plane substantially perpendicular to the traveling direction of the print head.

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STRUCTURE FORMED FROM BALL JOINTED LINKS

Alfred F. Herbermann, Ann Arbor, and Robert M. Carabbio, Saline, both of Mich., assignors to Syron Engineering and Manufacturing Corporation, Saline, Mich.

Filed Feb. 19, 1988, Ser. No. 158,305
Int. Cl.[4] F16C *11/06*
U.S. Cl. 403—56 **10 Claims**



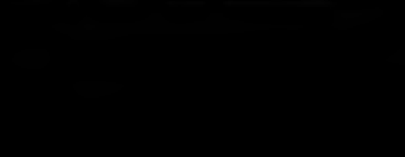
1. A structure which is adapted to support a load, said structure comprising:
a first link, said first link having;
an elongate metallic central portion extending along a central axis; and
a ball portion having a part-spherical outer surface, said ball portion being attached to said central portion of said first link at an end of said central portion of said first link; and
a second link, said second link having;
a socket portion having a part-spherical inner surface and an opening at an extremity of said socket portion, said socket portion being attached to said central portion of said second link at an end of said central portion of said second link;
said ball portion of said first link being engaged in said socket portion of said second link with said elongate central portion of said first link extending through said opening in said socket portion of said second link;
said first link initially being capable of limited universal movement with respect to said second link when said ball portion of said first link is engaged in said socket portion of said second link;
securing means securing said ball portion of said first link to said socket portion of said second link in a predetermined, load bearing position of said second link with respect to said first link; and
said extremity of said socket portion defining an end face at a first plane, a second plane being defined perpendicular to said central axis of said elongate central portion, said first plane and said second plane intersecting at an acute angle.

4,898,491

LOCKING PIVOT ASSEMBLY WITH BOTH PIVOT AND TILT AXES

Kip Van Steenburg, Sudbury, Mass., assignor to Amatech Corporation, Acton, Mass.

Continuation-in-part of Ser. No. 710,050, Mar. 11, 1985, Pat. No. 4,698,837. This application Oct. 5, 1987, Ser. No. 104,839
Int. Cl.[4] F16C *11/04*
U.S. Cl. 403--96 **20 Claims**



1. A pivot assembly comprising:
a rotating member for supporting a load;
a mounting member for supporting said rotating member;
means for pivotably interconnecting said rotating member and said mounting member to enable rotation about a pivot axis, and for inhibiting translation of said rotating member relative to said mounting member along said pivot axis;
means for enabling tilting of said rotating member about a tilt axis transverse to said pivot axis;
said rotating member and said mounting member overlapping to define at least one pair of adjacent sections; and
means for providing releasable gripping between said adjacent sections, responsive to the loading and tilting of said rotating member, to inhibit relative rotation about said pivot axis, by increasing grip between said adjacent sections when said rotating member supports a load and is torqued about said tilt axis in a first direction, and to permit relative rotation about said pivot axis by releasing grip when said rotating member is tilted about said tilt axis in a second and opposite direction, releasing said torque.

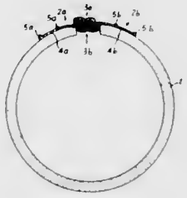
4,898,492

PRESSURE CLOSING DEVICE FOR JOINING THE EDGES OF PLASTIC SHEETS

Valery Janowski, Paris, France, assignor to Gefrem, Avallon, France

Filed Mar. 17, 1987, Ser. No. 26,919
Claims priority, application France, Mar. 17, 1986, 86 03759
Int. Cl.[4] F16D *1/00;* **B65D** *33/24*
U.S. Cl. 403--340 **3 Claims**

1. In a pressure closing strip for joining two edges of cellular sheet material, wherein said strip comprises longitudinally extending hook means for interconnection with like hook means of a complementary pressure closing strip and a longitudinally extending flap having one face adapted to be welded to the sheet material along an edge thereof, and wherein said flap has a first lateral edge attached to said hook means and a second lateral edge opposite the first, the improvement com-



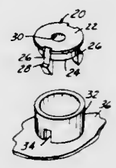
prising a first longitudinal rib, discrete from said hook means, protruding from only one face of said flap intermediate said first and second edges to reinforce the flap against wrinkling, and further comprising a second rib extending along said second edge parallel to said first rib and protruding from only one face of said flap.

4,898,493

METHOD AND APPARATUS FOR ASSEMBLING PARTS

Karl Blankenburg, 42050 Executive Dr., Mt. Clemens, Mich. 48045-3488

Filed Mar. 16, 1989, Ser. No. 324,452
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—407.1 **8 Claims**



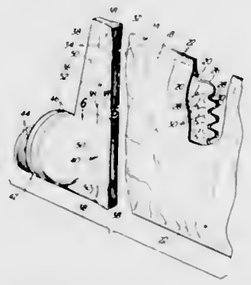
1. A system for joining parts together in spaced relationship such as opposed panels which comprises:
(a) a plurality of carrier elements,
(b) a plurality of receiver elements,
(c) means on said elements to interlock in engagement when said elements are moved axially into a juxtaposed position,
(d) a first part fastened to one or more carrier elements by conventional fastening means,
(e) a second part fastened to one or more receiver elements by conventional fastening means,
(f) said parts being joined together when said carrier element and receiver element are moved together,
(g) said carrier elements comprising a hollow cylindrical body portion having a perforate top to receive bolt fasteners and resilient, dependent leg portions, a lateral latch projection on each of said leg portions, and
(h) said receiver elements comprising a hollow cylindrical body portion dimensioned to have a sliding fit with said carrier element, and apertures formed in the wall of said receiver elements to receive said latch portions in an interlock engagement when said elements are telescoped together.

4,898,494

SUBSURFACE WATER DRAINAGE SYSTEM

Doan Ellis, 3624 Chevron Dr., Highland, Mich. 48031

Continuation-in-part of Ser. No. 49,856, May 13, 1987, Pat. No. 4,793,728. This application Aug. 23, 1988, Ser. No. 235,196
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[4] E01C *11/22*
U.S. Cl. 404—002 **14 Claims**



1. A drainage system outlet member comprising facing resiliently deformable platelike side members, said side members being joined along opposite pairs of upper and lower edges of each by ridges and being spaced from each other between said ridges, said side members having paired flared portions extending laterally of said ridges and providing flared openings in said outlet member,

stops projecting inwardly of said side members at spaced locations thereof with the stops of one side member facing the stops of the other side member and serving to limit inward movement of one of said side members relative to the other,

a series of vertically extending projections extending inwardly of each of said platelike side members intermediate said flared portions and said stops and forming means for retaining by impingment material inserted into said outlet member beyond said projections,

one of said side members having a drain opening formed therein adjacent the lower of said ridges and inwardly of said flared ends,

a drain connector in said drain opening for connection to a drainage means for draining fluid away from said outlet member.

4,898,495

METHOD AND APPARATUS TO CONTROL A BEACH AT AN INLET AND TO MAINTAIN THE BEACH

Newman K. Lin, 22648 SW. 54th Ave., Boca Raton, Fla. 33433

Filed Nov. 17, 1988, Ser. No. 272,392
Int. Cl.[4] E02B *3/02*
U.S. Cl. 405—73 **66 Claims**



1. For beach erosion control and maintenance control at an inlet, a method for bypassing the littoral drift of a body of water from the upstream beach of an inlet having an entrance to the downstream beach of the inlet, wherein the downstream beach is of porous media comprising the steps of:

during flood tides, trapping the sediment carried by a littoral drift, with an inflow into a sediment trapping means anchored on the bottom of a body of water, around the entrance of said inlet, said trapping means comprising at least one assembled diffuser frame, trapping pipeline means and reversible pump means to vacuum water out of said sediment trapping means, said sediment trapping means having an outflow path,

re-suspending the trapped sediment of the outflow path discharged of said sediment trapping means into said body of water, to form a regenerated littoral drift, when an ebb tidal current is weak, said outflow path resulting from water flowed into said sediment trapping means by said reversible pump means, and

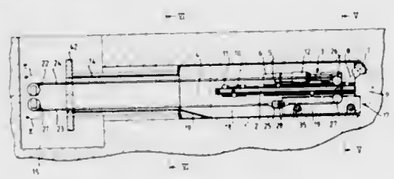
generating a water flow by a diffuser means installed on the floor of the water body between the downstream beach and said inlet, to direct said regenerated littoral drift toward the downstream beach, said diffuser means comprising a diffuser with flow deflector means and pipe means including check valve means on the pipe means, said pipe means interconnecting said diffuser means and said trapping means, and accepting fluid flow from said trapping means.

4,898,496

APPARATUS FOR UNDERGROUND TUNNELING

Ludwig Pfeiffer, Kassel, and Wilfried Werner, Zierenberg, both of Fed. Rep. of Germany, assignors to MTS Minitunnelsysteme GmbH, Kassel, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 241,005
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729561
Int. Cl.[4] E21D *9/08*
U.S. Cl. 405—141 **10 Claims**



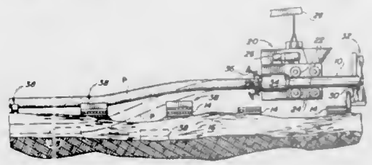
1. Apparatus for underground tunneling, especially for tunnels of unwalkable cross section, containing: a working tube (1) having an axis (4), which can be urged forward in the direction of the tunnel in formation, a digging unit (3) which is mounted in the working tube and can be pushed past the front end of the working tube, and which is movable radially of its axis and bears a partial-face cutter for loosening the dirt in front of the working tube and can be set for a substantially smaller outside cross section in comparison to the inside cross section of the working tube, and a carrier system for the removal of the dirt loosened in the driving of the tunnel, the carrier system containing a scoop (19) which is movable underneath the digging unit substantially parallel to the working tube axis and contains a transport system (21–24) coupled to the scoop; the scoop being mounted on the floor of the working tube (1) such that it can be pushed forward partially past its front end and withdrawn again fully into the working tube, and has at its front end a mouth (20) of shovel-like configuration for the loading of the loosened dirt; and wherein the transport system contains a reversible drive mechanism for moving the scoop back and forth when loading, for withdrawing the scoop (19) rearwardly from the working tube (1) for the removal of the dirt, and for returning the scoop (19) into the working tube (1) after it has been emptied.

4,898,497

METHOD FOR CEMENTITIOUS COATING OF PIPE AND FORMS FOR USE THEREWITH

Keith R. Behr, 8201 W. Montebello, Glendale, Ariz. 85303

Filed Jan. 28, 1988, Ser. No. 149,524
Int. Cl.[4] F16L *1/02, 9/04*
U.S. Cl. 405—154 **10 Claims**



1. A method of coating pipe with a layer of cementitious material at a job site, comprising the steps of:

(a) providing a plurality of pipe sections;

(b) connecting the pipe sections at the job site to form a length of pipe;

(c) progressively coating the length of pipe with the cementitious material;

(d) supporting the uncured coating of cementitious material about the length of pipe on support forms having a concave support surface; and

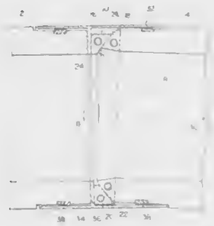
(e) curing the cementitious material.

4,898,498

THRUST TRANSMITTING DEVICE

Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,853
Claims priority, application Japan, Dec. 7, 1987, 62-307687
Int. Cl.[4] F16L *1/00*
U.S. Cl. 405—184 **5 Claims**



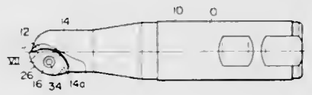
1. A thrust transmitting device disposed between a pair of adjacent pipes for transmitting a thrust from one of the pipes to the other, comprising a first ring provided on one side with a spherical concave surface and a second ring provided on one side with a spherical convex surface adapted to abut relatively slidably against said concave surface of said first ring, at least one of said rings being slidably mounted for movement in the radial direction of said rings with respect to both pipes and the other ring whereby said at least one of said rings can move in the radial direction when the pipes are thrust along a curved path.

4,898,499

BALL END MILL

Osamu Tsujimura, Kawasaki; Tatsuo Arai, Kitamoto; Masaaki Nakayama, Tokyo, and Masayuki Okawa, Kawasaki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,442
Claims priority, application Japan, Mar. 4, 1987, 62-31257[U]; Mar. 19, 1987, 62-40257[U]; Jul. 13, 1987, 62-107229[U]; Jul. 13, 1987, 62-107230[U]; Aug. 5, 1987, 62-120179[U]; Nov. 25, 1987, 62-179344[U]; Nov. 25, 1987, 62-179343[U]; Jan. 26, 1988, 63-8710[U]
Int. Cl.[4] B23C *5/14, 5/02*
U.S. Cl. 407—42 **13 Claims**



3. A ball mill end comprising:

an end mill body having an axis of rotation therethrough and having forward and rearward end portions; and

an indexable first cutter insert releasably attached to said forward end portion of said body, said insert comprising a plate defined by a front face, a rear face and a plurality of pairs of first and second side faces disposed alternately and lying between said front face and said rear face, each of said first side faces cooperating with said front face to define a main cutting edge which is generally arcuately shaped when viewed in a direction perpendicular to said front face, each of said second side faces cooperating with said front face to define a secondary cutting edge, said secondary cutting edges being shorter than said main cutting edges, each of said main cutting edges having a leading end portion which intersects one of said secondary cutting edges at an obtuse angle and a trailing end portion which intersects the another of the secondary cutting edges, said front face serving as a rake surface for said main and secondary cutting edges and having a pair of marginal surface portions each disposed between the leading end portion of one of said main cutting edges and the trailing end portion of the other main cutting edge, said marginal surface portion being convexly curved so as to slope toward said rear face toward said secondary cutting edge;

the arrangement of said first insert with respect to said body being such that said leading end portion of said main cutting edge is disposed adjacent to said axis of said body, and that said secondary cutting edge extends from said leading end portion beyond said axis of said body toward said rearward end portion of said body when viewed in a direction generally perpendicular to said front face so that said secondary cutting edge lies substantially opposite said axis from said main cutting edge.

4,898,500

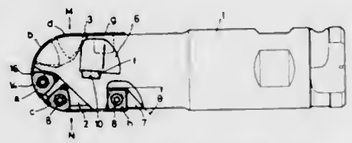
BALL END MILL WITH THROW AWAY INSERT

Naohiro Nakamura; Yoshikatsu Mori, and Keiji Honda, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 16, 1988, Ser. No. 245,178
Claims priority, application Japan, Sep. 17, 1987, 62-143290[U]
Int. Cl.[4] B23C *5/12*
U.S. Cl. 407—62 **5 Claims**

1. A ball end mill with throw away inserts, comprising a body formed in its hemispherical front end at diametrically opposite positions with two first insert mounting pockets, said pockets being formed each with a plurality of insert mounting

seats, and first throw away inserts having an arcuate cutting edge and mounted in said respective insert mounting seats so that when said mill is rotated, the locuses of said cutting edges will generate a hemisphere and overlap by more than a quarter of the length of each cutting edge, the inserts closer to the front end of said body having an axial rake of 0–5 degrees and the inserts at the rear having an axial rake of 4–8 degrees, the latter inserts having a larger axial rake than the former, the latter insert in each pocket having the leading end of its cutting edge



located on the extension line of the cutting edge of the former insert mounted in the same pocket, whereby said cutting edges form substantially an S-shaped line as viewed from the front of the body, said first inserts being of a substantially regular polygonal shape and of a positive type having their cutting edge arcuately convexed with a radius which is equal to one another and larger than that of the imaginary circle which circumscribes said each insert at the noses thereof, said inserts being formed on each side face thereof with a flat surface having a larger relief angle than that of the side face.

4,898,501

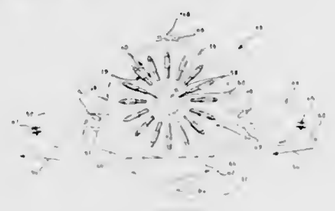
IN LINE ROTARY DRILLING MACHINE FOR PRODUCING UNIFORM OPENINGS IN CONTINUOUS STRIP MATERIAL

Larry R. Palmer, Harriman, Tenn., assignor to Tennessee Tool and Engineering, Inc., Oak Ridge, Tenn.

Filed Jun. 14, 1989, Ser. No. 366,758

Int. Cl.⁴ B23B *39/20, 41/00*

U.S. Cl. 408—32 **20 Claims**



1. A machine for the drilling of holes of selected uniform size and selected uniform spacing in a moving continuous strip base material, which comprises:

a frame means;

a rotatable drum means adjustably mounted on said frame means, said drum means provided with a substantially circular periphery for carrying said strip base material on a selected portion thereof, said drum means provided with radial openings at positions along said periphery corresponding to said spacing of said holes, said drum means further provided with radial slots directed toward said openings;

means for rotating said drum means at a selected angular speed around an axis to produce a selected linear speed of said periphery;

means for holding a surface of said strip base material against said selected portion of said periphery of said drum means;

a plurality of drill units mounted on said drum means, said drill units each associated with one of said slots in said drum means, said drill units including a drill bit for said selected size hole oriented with selected of said radial openings;

means associated with each said drill units for rotating said drill bits; and

means for moving said drill units in a selected sequence in a radial direction related to said axis whereby selected ones of said drill bits engage said strip base material against said selected portion of said periphery to drill said holes, and whereby other selected ones of said drill bits are withdrawn from said strip base material to permit withdrawal of said strip base material from said periphery.

4,898,502

MECHANICAL DRILLING AID

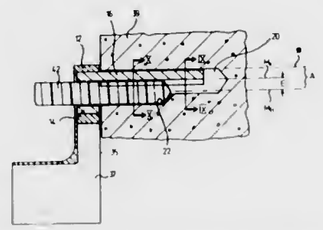
Reinhard Becher, Engelbergstrasse 42, D-7000 Stuttgart 31, Fed. Rep. of Germany

Filed Dec. 19, 1988, Ser. No. 286,627

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3833040

Int. Cl.⁴ B23B *49/02*

U.S. Cl. 408—72 B **15 Claims**



1. Mechanical drilling aid for guiding a drilling tool when drilling a correct bore into an object, in particular into a wall, said correct bore to be drilled being disposed eccentrically to an existing faulty bore, wherein the cross-sections of said faulty bore and said correct bore to be drilled intersect each other or extend immediately adjacent to each other, comprising:

a guide element provided with an opening therein having a cylindrical wall serving for guiding said drilling tool, said cylindrical wall defining a circle at least as large as the circumferential circle of said drilling tool and having a longitudinal center axis coaxial with the axis of the drilling tool, and

a rod-shaped part projecting from said guide element, said rod-shaped part being introducible into said faulty bore and abutting against an inner wall of said faulty bore, at least along an outer edge of said rod-shaped part, said rod-shaped part being detachable from said guide element so that it can be left in said object, thereby filling a space between said correct bore and said faulty bore,

wherein the distance between said outer edge of said rod-shaped part and said longitudinal center axis of said cylindrical wall in said guide element is equal to the sum of the amount of eccentricity between said faulty and said correct bore, and the radius of said faulty bore, wherein said distance is measured across a center point of said cross-section of said faulty bore.

4,898,503

TWIST DRILL

Herman B. Barish, Woodland Hills, Calif., assignor to Lockheed Corporation, Calif.

Filed Jul. 5, 1988, Ser. No. 215,175

Int. Cl.⁴ B23B *51/02*

U.S. Cl. 408—230 **8 Claims**

1. A split-point, two-fluted twist drill having:

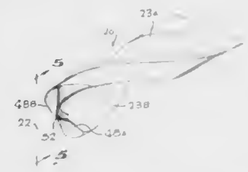
a helix angle of the flutes of between 28 and 32 degrees;

a web thickness at the point prior to splitting of between 23 and 27 percent of the drill diameter;

a point angle of between 132 and 138 degrees;

a web taper from said point to flute run out of 0.015 to 0.020 inches per inch;

a chisel-edge angle of between 115 and 121 degrees;



a splitting angle of between 127 and 137 degrees;

a primary cutting edge rake angle of between 10 to 14 degrees positive; and

a flat at the corner of the cutting edge rake of between 10 and 12 percent of the drill diameter.

4,898,504

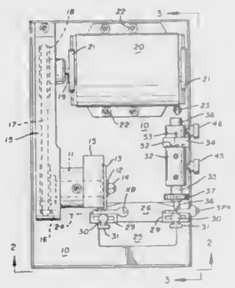
KEY CUTTING MACHINE

Frank P. Agius, and Darrell E. Sims, both of 909 Washington St., Alpina, Mich. 49707

Filed Nov. 30, 1988, Ser. No. 277,778

Int. Cl.⁴ B23C *01/16*

U.S. Cl. 409—81 **5 Claims**



1. In a key cutting machine of the type having a base, a rotary cutter, a yoke movably supported on the base having a pair of clamps thereon for holding a spacing key and a key blank, an improved guiding apparatus, the improved guiding apparatus comprising: a body member having a transverse opening, said body member being on said base and having two spaced apart bores, with both bores being in spaced parallel relation to a plane containing said rotary cutter, a guide disc having a plurality of different depth cut-outs in an annular pattern on one side thereof, means for rotatably removably positioning said guide disc in said transverse opening in said body opening, a movable guide axially movable in one bore of said two spaced apart bores and having a spahed end protruding from said one bore for engagement with said spacing key, an adjustment ring adjustably positioned on said movable guide for movement axially of said movable guide, and a depth guide pin in the other bore of said two spaced apart bores in said body member having one end engaging said depth cut-outs in said disc and an opposite end engaging said adjustment ring, a resilient biasing means on said depth guide pin and located in said other bore and engaging said body member adjacent to said other bore for biasing said depth guide pin into engagement with said adjustment ring whereby said key blank may be guided toward said rotary cutter so as to cut said key blank in longitudinally spaced areas corresponding with said spacing key and to depths matching the depths of said cut-outs in said disc.

4,898,505

EXPANSION DOWEL ASSEMBLY WITH AN EXPANSION CONE DISPLACEABLE INTO AN EXPANSION SLEEVE

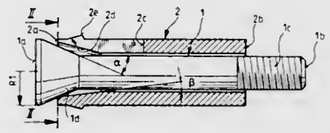
Peter Froehlich, Neuried, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Liechtenstein

Filed Nov. 18, 1988, Ser. No. 273,409

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 3739608

Int. Cl.⁴ F16B *13/06*

U.S. Cl. 411—55 **5 Claims**



1. An expansion dowel assembly for insertion into a borehole in a receiving material and having a leading end and a trailing end relative to the insertion direction of the dowel assembly into the borehole, the dowel assembly including an axially extending expansion sleeve with a leading end and a trailing end and a bore extending axially therethrough, said sleeve having a cylindrically shaped outer surface, said expansion sleeve having an axially extending expansion region adjacent the leading end thereof with the bore in said expansion region widening toward the leading end, said expansion sleeve having circumferentially spaced axially extending slots extending from the leading end toward the trailing end thereof and extending at least for the axial extent of the expansion region, and an axially extending anchor bolt having a leading end and a trailing end and extending through said bore in said expansion sleeve with the leading end of said anchor bolt having an expansion cone widening in the insertion direction and arranged to be drawn into the leading end of said expansion sleeve toward the trailing end thereof for expanding said expansion sleeve, wherein the improvement comprises that:

(a) said expansion cone has a cone angle and said expansion region has a cone angle and the cone angle of said expansion cone is larger than the cone angle of said expansion region;

(b) said expansion sleeve in said expansion region has a variable wall thickness in the circumferential direction with the wall thickness diminishing in the direction toward said slots, the radius of said outer surface of said expansion sleeve being centered on the axis thereof, said expansion sleeve having an inner surface eccentrically arranged relative to the axis thereof; and

(c) the outer surface of said expansion region has a circumferentially extending annular bear projecting outwardly from the outer surface of said expansion sleeve.

4,898,506

METHOD AND APPARATUS FOR MAKING A BOOK-BINDING

Peter Lázár, Tannenstr. 11, D-4040 Neuss 21, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 176,338

Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716112

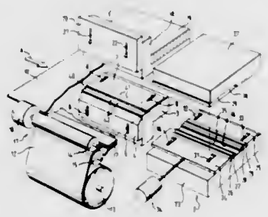
Int. Cl.⁴ B42C *11/04, 7/00, 9/00*

U.S. Cl. 412—8 **20 Claims**

7. Apparatus for manufacturing a book cover, comprising:

(a) support means;

(b) feed means operably associated with said support means for supporting a board;
(c) feed means operably associated with said support means for causing a length of hot-melt strip material to be moved relative to the board and for being positioned below the board;
(d) said support means includes a plate defining a recess and having an upper surface for supporting the board and an edge portion engageable with an advancing edge of the strip material for causing the strip material to be stopped and thereby oriented relative to the overlying board and a base portion upon which the strip material is supported;



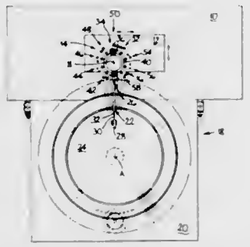
(e) punch means overlies said support means and are displaceable relative thereto for selectively engaging and pressing the board against the underlying strip material and thereby causing the board to be secured to the strip material; and,
(f) cutter means operably associated with said support means, underlying said recess and cooperating with said punch means for severing the strip material from said feed means as said punch means presses the board against the strip material.

4,898,507

APPARATUS FOR HANDLING ELECTRICAL OR ELECTRONIC COMPONENTS

Victor T. Hawkswell, Witham, England, assignor to Dynapert, Inc., Beverly, Mass.

Filed Jan. 29, 1988, Ser. No. 150,101
Claims priority, application United Kingdom, Feb. 5, 1987, 8702617
Int. Cl.[4] B65H *5/08*
U.S. Cl. 414—225 **12 Claims**



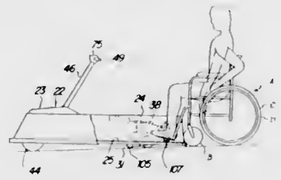
1. Apparatus for handling electrical or electronic components comprising
a pick-up head having a pick-up tool,
a support on which the pick-up head is mounted, the support being mounted for movement, in the operation of the apparatus, to move said pick-up head between a pick-up station at which a component is picked up and a placement station at which the component is placed at a desired position,
means for displacing the support to move said pick-up head through one or more orientation stations intermediate the pick-up and placement stations,
orienting means, mounted at at least one orientation station, arranged to engage a pick-up head at that orientation station and rotate the tool about an axis of the head to a desired orientation,
said pick-up head including clutch means which normally retains the tool locked against rotation but which is released, to permit rotation of the tool, by relative axial movement of the orienting means and pick-up head into engagement with one another and which is re-engaged to prevent rotation of the tool when the orienting means and pick-up head are moved out of engagement, and
said orienting means at each orientation station including a drive member mounted coaxially with the axis of a pick-up head at that station for movement along the axis into and out of axial driving engagement with the tool of the pick-up head to displace said pick-up head between selected upper and lower positions and for rotation of the tool about the axis to change the orientation of the tool.

4,898,508

LOW SLUNG SMALL VEHICLE

Osamu Hayata, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 30, 1987, Ser. No. 68,231
Claims priority, application Japan, Jun. 30, 1986, 61-151424
Int. Cl.[4] B62K *15/00*
U.S. Cl. 414—476 **17 Claims**



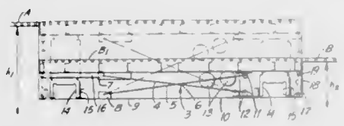
1. A vehicle having a load carrying floor suspended from at least a pair of rear wheels and at lease one dirigible front wheel, a body comprising front walls and side walls, said front walls and said side walls each having a generally inverted box shape and defining said floor and open at the rear edge of said vehicle, said front wheel being supported relative to said body for steering movement about a steering axis and for rotation about a rotational axis, power means fixed relative to said body comprising an engine contained within said front wall and driving transmission means comprising a differential position within said front wall and a pair of chains each driven by an output shaft of said differential and extending through a respective one of said side walls for driving a respective one of said rear wheels for propulsion of said vehicle, and means for suspending said floor for pivotal movement about said rotational axis of said front wheel and for movement relative to said rear wheels from a lowered position wherein said floor is angularly disposed relative to the ground and said front wheel rotational axis of the rear edge of said floor is lowered to a ground engaging position and a raised position wherein said floor extends substantially horizontally and the rear edge thereof is above the ground.

4,898,509

CARGO TRANSPORTER, PARTICULARLY OF THE TRAILER TYPE HAVING A FRONT ELEVATED LOADING FLOOR

Kees W. Thunnissen, Boslaan, Netherlands, assignor to Talson Transport Engineering, B.V., Heeze, Netherlands

Filed Mar. 31, 1987, Ser. No. 33,016
Int. Cl.[4] B60P *1/44*
U.S. Cl. 414—495 **9 Claims**



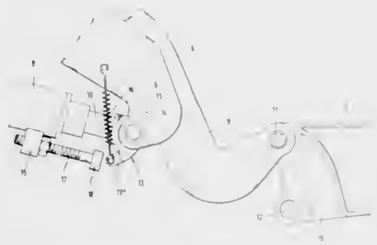
1. Cargo-transporter, particularly of the trailer type, comprising a loading floor including at a front thereof a first portion which is elevated, and a second portion situated directly behind the elevated first portion, said second portion including a section formed as a lifting platform having a lifting height corresponding to a difference in levels between said first and second portions, an apparatus for guiding and lifting said platform accommodated in a space below said platform, said transporter being self-supporting, said lifting platform being vertically movably guided and having a length substantially corresponding to the length of the elevated first loading floor portion, said guiding and lifting apparatus being accommodated in a cup-shaped housing secured against a bottom of the vehicle and having a height corresponding to the lifting height of the platform, said guiding and lifting apparatus comprising two linkage systems interconnected by transverse torsion means and adapted to lift said lifting platform so that said lifting platform is moved upward vertically without simultaneously moving in a forward direction, the lifting platform being provided at an end edge thereof remote from the elevated loading floor portion with a downwardly extending skirt which extends in a lowered position of the lifting platform up to a bottom of said housing.

4,898,510

LIFTING AND SWIVELING DEVICE FOR A LOADING TAILGATE OF A TRUCK

Günter Weber, Hauptplatz 23, Gattendorf (Burgenland, Österreich), Austria

Filed Jul. 26, 1988, Ser. No. 226,859
Int. Cl.[4] B60P *1/48*
U.S. Cl. 414—557 **6 Claims**



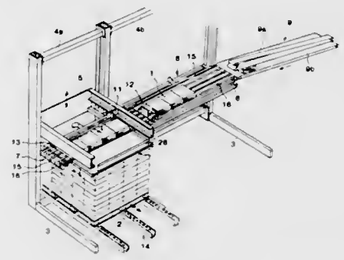
1. A lifting and swivelling device for a tailgate of a truck, comprising:
(a) a structural support member, transversely attached to said truck, and having upper, middle and lower pivot points;
(b) a lifting arm with first and second ends, its first end being pivoted about said upper pivot point, and having a second pivot point in its second end;
(c) a pressure-means lifting cylinder with a first end pivoted about said lower pivot point, and a second end pivoted about said second pivot point at said second end of said lifting arm;
(d) an angled swivel arm having a first end and a bent second end, said angled swivel arm being pivoted at its first end about a third pivot point located on the half of said lifting arm nearest said upper pivot point, said angled swivel arm bearing on said lifting arm during a lifting process and being swivelable away from said lifting arm by said tailgate's weight when said tailgate is set on the ground, said angled swivel arm having a swivel arm pivot point at its bent second end;
(e) said tailgate having a top pivot point attached to said swivel arm pivot point, and having a bottom pivot point;
(f) a parallelogram connecting rod attached between said middle pivot point on said structural support member and said bottom pivot point on said tailgate, so that said upper, middle, bottom and top pivots points form the vertices of a parallelogram;
(g) a catch pivoted about said second pivot point at said second end of said lifting arm, said catch adapted to engage a projection on said angled swivel arm;
(h) resilient means attached between said catch and said lifting arm urging said catch to engage said projection; and
(i) an adjustment member on said pressure-means lifting cylinder, adapted to disengage said catch from said projection when said pressure-means lifting cylinder is fully retracted.

4,898,511

APPARATUS FOR STACKING PRODUCTS THAT ARE HIGHLY SUSCEPTIBLE TO DAMAGE, PARTICULARLY BOOKS

Manfred Rossig, Beckum, and Rolf Budde, Lohne, both of Fed. Rep. of Germany, assignors to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany

PCT No. PCT/DE87/00180, § 371 Date Dec. 7, 1987, § 102(e) Date Dec. 7, 1987, PCT Pub. No. WO87/06565, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 23, 1987, Ser. No. 141,310
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614256
Int. Cl.[4] B65G *57/11*
U.S. Cl. 414—792.6 **17 Claims**



1. Apparatus for stacking fragile products comprising:
feed system means, said feed system means comprising first support means for serially receiving the products to be stacked, said feed system means further comprising first stop means which cooperates with said first support means for arresting the movement of the products in a first direction, said first support means including transport means

and a first supporting surface, said transport means being movable relative to said first supporting surface to convey the products over said first supporting surface along a first path in said first direction to said first stop means whereby a row of the products extending from said first stop means may be formed, said first supporting surface being fluid permeable;

a sliding platform, said platform being positioned adjacent to said feed system means first support means and being reciprocally movable beneath said first supporting surface along a second path which is generally transverse to said first path, said sliding platform also being vertically movable relative to said first support means, said sliding platform having a second product supporting surface which is fluid permeable, said sliding platform further including second stop means for arresting movement of the products along said second path in said second direction;

means for pushing the products off said feed system means first supporting surface onto said sliding platform second supporting surface, said pushing means including a push-off element which is movable relative to said first and second supporting surfaces to urge the products into contact with said second stop means; and

means for delivering pressurized air to a region immediately below each of said first and second supporting surfaces whereby an air cushion for reducing friction between the products and the supporting surfaces is formed between said supporting surfaces and the products;

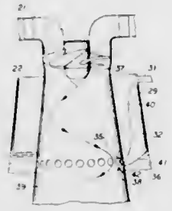
the permeability of the material comprising said supporting surfaces being chosen to be such that the pressure drop in an unladen portion thereof is at least equal to the pressure drop in a portion that is laden with the products.

4,898,512

APPARATUS AND METHOD FOR REDUCING EFFECTS OF DRAFT TUBE PRESSURE FLUCTUATIONS

Geffs, John J., 8841 Britland Way, Fair Oaks, Calif. 95628

Filed Mar. 27, 1989, Ser. No. 328,578
Int. Cl.[4] F03B *11/04, 3/10*
U.S. Cl. 415—1 **12 Claims**



1. Apparatus for reducing the effects of pressure fluctuations acting within a tube wherein a vortex has formed naturally during fluid flow through the tube comprising:

a closed surge suppression chamber having a bottom wall and a top wall mounted about the exterior of the tube having an opening leading into the upper end thereof adjacent the top wall;

a plurality of spaced apertures formed about the exterior of said tube fluidly communicating the interior of said tube with the interior of the surge suppression chamber adjacent to the bottom wall of said chamber; and

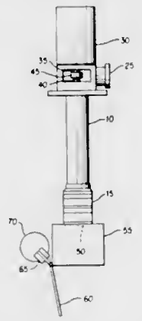
air injection means communicating with said opening for selectively injecting air therein from any angle.

4,898,513

CIRCULATING WATER SYSTEM AND SUMP PUMP STRAINER APPARATUS

Clarence C. Hou, Cherry Hill, N.J., assignor to Mobil Oil Corp., New York, N.Y.

Filed Jun. 5, 1989, Ser. No. 361,463
Int. Cl.[4] F04D *29/70*
U.S. Cl. 415—121.2 **12 Claims**



1. A centrifugal sump pump for withdrawing liquid from a reservoir comprising:

(a) a pump housing having motor mount means at an upper end;

(b) a pump intake conduit affixed to a lower end of said pump housing, said intake conduit having a fluid intake opening;

(c) a first perforate strainer covering said fluid intake opening;

(d) a second perforate strainer encasing said first perforate strainer, said second perforate strainer having finer perforations than said first perforate strainer and having open area at least equal to that of said first perforate strainer;

(e) a perforate door in said second perforate strainer hingeable attached to said second perforate strainer, said perforate door including means for retaining said perforate door closed during normal pump operation;

(f) lifting means attached to said perforate door for remotely opening said perforate door.

4,898,514

TURBINE BALANCE ARRANGEMENT WITH INTEGRAL AIR PASSAGE

James R. McCracken, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 27, 1987, Ser. No. 112,857
Int. Cl.[4] F01D *5/10, 5/18*
U.S. Cl. 416—95 **10 Claims**

1. An apparatus for balancing a gas turbine rotor having a rotating disk and a plurality of air cooled blades extending from said disk and a supply of cooling air located on a first side of said disk comprising:

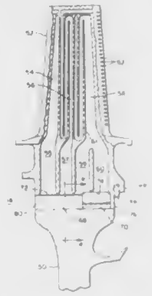
a plurality of axially extending dovetail slots through the outer edge of said disk;

a mating dovetail on each of said blades, said dovetail shorter than the depth of said dovetail slots, thereby providing an axial opening through said dovetail slot;

said axial opening open at a first side of said disk in direct fluid communication with said supply of cooling air;

blocking means at a second side of said disk extending to the full depth of said dovetail slot whereby said axial opening is closed at the second side;

each blade having at least one cooling flow path therethrough including a radial inlet in fluid communication with said axial opening; and a balance weight located in at least one of said axial openings filling less than all of said axial opening leaving a portion of the opening in fluid communication with said radial inlet.

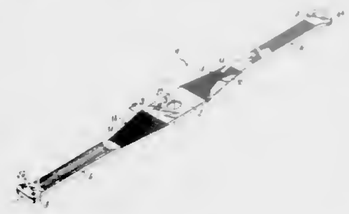


4,898,515

EXTERNAL WRAP OF COMPOSITE FLEXBEAM

Edward A. Beno, Stratford, and William L. Noehren, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 23, 1986, Ser. No. 888,611
Int. Cl.[4] B64C *27/38*
U.S. Cl. 416—134 A **8 Claims**



1. A flexbeam (10) having a hub portion (12), a flap flexure portion (14) outboard of the hub portion, a lag-torsion flexure portion (16) outboard of the flap flexure portion, and a blade attachment portion (18) outboard of the lag-torsion portion, and having core fibers (32) of composite material extending longitudinally along the length of the flexbeam, characterized by:

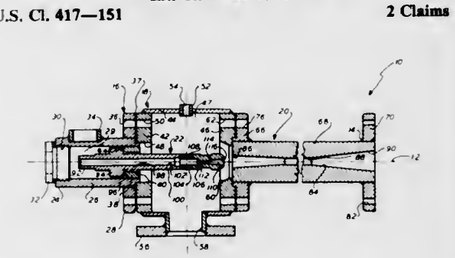
an external wrap (34) made up of composite fibers (36) having an angular orientation with respect to the longitudinal flexbeam core fibers (32) and disposed about the flap flexure portion.

4,898,516

PROTECTIVE FAN SHIELD

Debra S. Hendricks, 666 E. Findlay St., Carey, Ohio 43316

Filed Feb. 16, 1989, Ser. No. 310,945
Int. Cl.[4] B63H *1/00*
U.S. Cl. 416—247 R **1 Claim**



1. A protective fan shield in combination with a rotary fan including rotating blades, said fan including a cage arranged about the blades and formed of coaxially spaced ribs, said shield comprising,

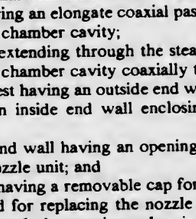
a flexible net member removably mounted about the cage, and

stiffening means secured to the net for preventing intrusion of said net between the ribs of a shield, and

wherein the stiffening means include a plurality of elongate flexible struts, and

wherein the stiffening means further include a plurality of pockets secured to an exterior surface of the net for receiving the struts selectively therewithin, and

wherein the shield is of a hemispherical configuration and formed with a continuous conduit about the perimeter



thereof with a continuous elastomeric band secured within the conduit, and

wherein the net is formed of woven fiberglass to define a mesh of 17 squares per square inch, and

wherein the pockets are arcuate in configuration and are arranged orthogonally relative to the ribs of the cage when shield is secured about the cage.

4,898,517

STEAM/AIR EJECTOR FOR GENERATING A VACUUM

Olof A. Eriksen, 1 Saddle Rd., Cedar Knolls, N.J. 07927

Filed Oct. 21, 1988, Ser. No. 260,791
Int. Cl.[4] F04F *5/00*
U.S. Cl. 417—151 **2 Claims**

1. An ejector comprising:

a steam chest having an axis and having a coaxial steam chest cavity with an inlet opening;

a suction chamber connecting coaxially to the steam chest and having a coaxial suction chamber cavity with an inlet opening;

a diffuser coaxial with the steam chest and the suction chamber and having an elongate coaxial passage for exhausting the suction chamber cavity;

a nozzle unit extending through the steam chest cavity and the suction chamber cavity coaxially therewith;

said steam chest having an outside end wall and a peripheral wall and an inside end wall enclosing the steam chest cavity;

said outside end wall having an opening disposed coaxially with the nozzle unit; and

said opening having a removable cap for removing the nozzle unit and for replacing the nozzle unit or a duplicate thereof through the opening, wherein the nozzle unit has an enlarged portion having a bearing surface for engaging a bearing surface in the steam chest, and wherein the nozzle unit has an externally threaded portion for receival in an internally threaded hole in the steam chest, and wherein the nozzle unit has an elongate passage intercon-

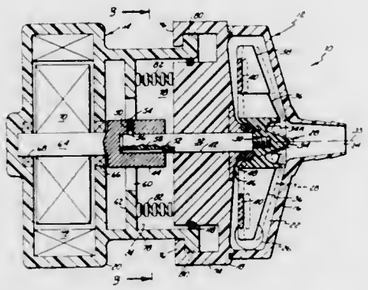
necting the steam chest cavity with the suction chest cavity with the suction chamber cavity, and wherein the nozzle unit has an end portion with an opening, and wherein the nozzle unit has a nozzle insert received in the end portion opening, said nozzle insert having a passage portion, said passage portion having an inlet portion and a necked down portion and an outlet portion, and wherein said steam chest inside wall and an adjacent end wall of the suction chamber have plurality of matching holes of the same angular spacing and overall diameter for a plurality of bolts and wherein said diffuser and said suction chamber have bare adjacent respective wall portions having plurality of matching holes of the same angular spacing and overall diameter for a plurality of bolts for facilitating joining of said steam chest inlet opening and suction chamber inlet opening to outside piping connections.

4,898,518

SHAFT DRIVEN DISPOSABLE CENTRIFUGAL PUMP

Lloyd C. Hubbard, Deephaven, and Earl W. Clausen, Eden Prarie, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1988, Ser. No. 239,526
Int. Cl.[4] F04D *29/08, 29/60*
U.S. Cl. 417—360 **17 Claims**



1. In a centrifugal pump for pumping biological fluids of the type having a pumping portion and a separable drive portion with a rotatable drive shaft, the pumping portion having an impeller housing with a fluid pumping chamber therein, an impeller shaft extending rotatably through the impeller housing, an impeller mounted on the impeller shaft for rotation therewith in the pumping chamber and first seal means for providing a fluid-tight seal about the impeller shaft as it passes through the impeller housing, the improvement which comprises:

the impeller shaft being positioned and adapted to be mechanically engaged with the drive shaft of the drive portion for coupled rotation therewith when the pump and drive portions of the centrifugal pump are assembled; and

means for creating a fluid-tight sealed shaft chamber surrounding those portions of the impeller shaft outside the pumping chamber when the pump and drive portions of the centrifugal pump are assembled.

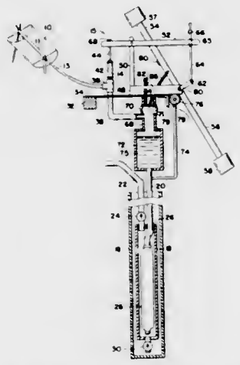
4,898,519

DEEP WELL SOLAR PUMP

Jaroslav Vanek, 414 Triphammer Rd., Ithaca, N.Y. 14850

Filed May 18, 1989, Ser. No. 354,465
Int. Cl.[4] F04B *17/00, 47/08*
U.S. Cl. 417—379 **9 Claims**

1. In a pump having a source of gas under pressure, and a gas operated pump, a mechanism periodically injecting gas from said source of gas into said gas operated pump, said mechanism comprising, in combination, a long period pendulum turning towards a first position by gravity, an injection valve connected between said source of gas under pressure and said gas operated pump, a linkage between said pendulum and said injection valve, said linkage opening said injection valve when said pendulum is in said first position, an impulse tube connected between said injection valve and said gas operated



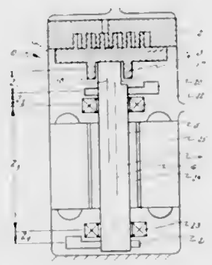
pump, a member having a surface adjacent to the first position of said pendulum, and an elastic impulse bladder connected to said impulse tube adjacent to said surface so that inflation of said impulse bladder on the opening of said injection valve forces said impulse bladder against said pendulum urging said pendulum against the force of gravity toward a second position.

4,898,520

METHOD OF AND ARRANGEMENT FOR REDUCING BEARING LOADS IN SCROLL COMPRESSORS

Jeffrey J. Nieter, Coventry, and Raymond L. DeBlois, Tolland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 18, 1988, Ser. No. 220,719
Int. Cl.[4] F04C *18/04, 29/00*
U.S. Cl. 418—1 **5 Claims**



1. A scroll compressor comprising

a support:

a drive shaft having a main portion centered on an axis and an eccentric crank portion transversely offset from said axis; bearing means for supporting said main portion of said shaft on said support for rotation about said axis;

a fixed scroll element mounted on said support so as to be stationary relative thereto at least as far as rotation about said axis is concerned;

an orbiting scroll element mounted for orbiting motion relative to said fixed scroll element, bounding therewith at least one compression space, and acted upon by said crank portion of said drive shaft;

means for admitting a medium to be compressed into and for discharging said medium from said compression space;

means rotating said drive shaft about said axis for said crank portion to cause said orbiting scroll element to conduct said orbiting motion with said medium being compressed in said compression space prior to its discharge with attendant exertion of a resultant pressure force by said medium on said orbiting scroll element and transmission of such force to said crank portion of said drive shaft, and application to said drive shaft of inertial forces resulting from rotation around said axis of eccentric masses of said drive shaft and said orbiting scroll element; and

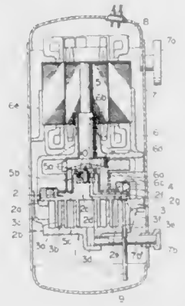
balancing means including at least two counterweights mounted on said drive shaft at mutually opposite sides of said bearing means for joint rotation with said drive shaft about said axis, each of said counterweights having such a mass and angular position about said axis that the counteracting inertial force exerted thereby on said drive shaft takes into account not only all of the inertial forces acting on said drive shaft but also pressure force for said counterweights to substantially compensate for the combined effect of all other eccentric masses and of said resultant pressure force on said bearing means at least when said drive shaft rotates at a predetermined speed.

4,898,521

OIL FEEDING SYSTEM FOR SCROLL COMPRESSOR

Kazuo Sakurai, Shizuoka, and Takahiro Tamura, Shimizu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,648
Claims priority, application Japan, Aug. 10, 1987, 62-198083
Int. Cl.[4] F04C *18/04, 29/02*
U.S. Cl. 418—55 **8 Claims**



1. An oil feeding system for a scroll compressor comprising:

a scroll compressor section having a gyratory scroll and a stationary scroll each having a base and a spiral wrap provided normally on said base, said wraps being intertwined in such a manner that, when said gyratory scroll is caused to gyrate, a space defined by said wraps and said bases is reduced and said space moves toward a center so as to perform compression; a motor disposed at an upper position and said scroll compressor section being disposed at a lower position; a drive shaft means for connecting said motor to said compressor section; a frame provided with bearings for supporting said drive shaft means and disposed between said scroll compressor section and said motor so as to link and fix the compressor section and the motor in place; an enclosed vessel means for accomodating said scroll compressor section and said motor; a suction pipe opening into an interior of said enclosed vessel means; a suction port formed in an outer periphery of said stationary scroll and communicating with the interior of said enclosed vessel means; and a discharge port formed in said stationary scroll and communicating with a discharge pipe extending in such a manner so as to open to an exterior of said enclosed vessel means, the interior of said enclosed vessel means being adapted to maintain a low-pressure atmosphere,

said oil feeding system comprising:

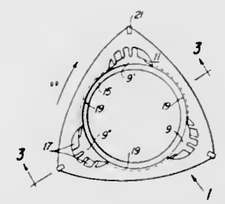
a gyratory shaft projecting from a side of said base of said gyratory scroll opposite a side on which said wrap is provided; an eccentric hole including cavities formed in an end of said drive shaft means, said gyratory shaft being fitted into said eccentric hole for driving said gyratory scroll; a pump chamber means concentrically formed at an end of said gyratory shaft; a pump case having a circular-arc suction port formed on one side of said pump case and a circular-arc discharge-side oil sump formed on the other side of said pump case; a trochoid pump disposed within said pump chamber means together with said pump case; a cover disposed in such a manner so as to cover an upper portion of said pump chamber means and provided with a discharge port formed therethrough; an oil line means; and an oil reservoir provided at a bottom of said enclosed vessel means, wherein said circular-arc suction portion of said pump case communicates with said oil reservoir through said oil line means said circular-arc oil sump communicates with said trochoid pump, and said discharge port of said cover communicates with various parts to be lubricated through said cavities.

4,898,522

SYSTEM FOR COOLING THE ROTARY ENGINE ROTOR

Thomas C. Edelmayer, Mobile, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Apr. 7, 1988, Ser. No. 179,028
Int. Cl.[4] F01C *1/22, 21/06*
U.S. Cl. 418—61.2 **16 Claims**



1. A polygonal rotor for rotary engines comprising:

a generally equilateral, triangularly-shaped rotor body;

means for supporting a rotor bearing in said rotor body;

said rotor body having a central annular open portion of generally circular shape and off-axis semi-circular annular open portions provided substantially through each apex of said rotor body to act as a coolant passage;

said means for supporting a rotor bearing being fittable within said central annular open portion of said rotor;

said rotor being further provided with one or more coolant channels fluidly interconnecting said coolant passages to thereby allow the through passage of coolant therebetween;

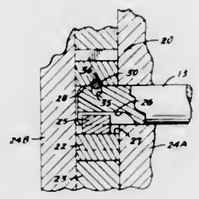
said coolant channels being defined between said means for supporting a rotor bearing and said central annular open portion of said rotor whereby coolant directly contacts said means for supporting a rotor bearing.

4,898,523

GEAR PUMP WITH RING-TYPE SHAFT RETAINER

Frank L. Harwath, Rockford, Ill., assignor to Suntec Industries Incorporated, Rockford, Ill.

Filed Dec. 27, 1988, Ser. No. 289,741
Int. Cl.[4] F01L *1/10;* **F16D** *1/06*
U.S. Cl. 418—70 4 Claims



1. A gear pump comprising a body, an elongated cylindrical shaft rotatably supported by said body and having an axially facing free end, a spur gear having a cylindrical hole receiving the free end portion of said shaft, radially opening keyways located in the free end portion of said shaft and in the wall of said hole, at least one of said keyways also opening axially, a key located in said keyways and preventing relative rotation between said shaft and said gear, and means for preventing relative axial movement between said shaft and said gear, said means comprising a first groove extending circumferentially around at least a portion of said shaft, a second groove extending circumferentially around at least a portion of the wall of said hole and alined axially with the groove in said shaft, and a ring-like retainer made of resiliently yieldable material, said retainer having an inner peripheral portion located in the groove in said shaft and having an outer peripheral portion located in the groove in the wall of said hole, said retainer being made of round wire having a predetermined cross-sectional diameter, the depth of the groove in said shaft being at least as great as the cross-sectional diameter of said wire whereby the retainer may be contracted resiliently and hoopwise into the groove in the shaft without the outer peripheral portion of the retainer projecting radially beyond the cylindrical surface of the shaft, the effective depth of the groove in the wall of said hole being less than the cross-sectional diameter of said wire whereby the latter groove captivates the inner peripheral portion of said retainer in the groove in said shaft when the retainer is expanded hoopwise, said retainer being radially split and having circumferentially facing ends which straddle said key, the transverse distance between the ends of said retainer being just slightly greater than the transverse width of said key when said retainer is fully contracted into the groove in said shaft.

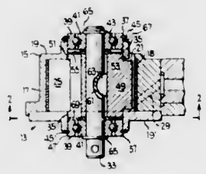
4,898,524

FLUID DRIVEN ROTARY MOTOR

James K. Butzen, Grayslake, Ill., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jan. 27, 1989, Ser. No. 302,431
Int. Cl.[4] F01C *1/344, 19/08*
U.S. Cl. 418—136 13 Claims

1. In a fluid driven rotary motor of the type comprising:
a rotor housing which includes a rotor cover disposed between a pair of end plates;
the end plates each having a bore formed therein;
a rotor having a relatively large diameter, cylindrical working portion disposed between a pair of relatively small diameter, cylindrical end portions, the working portion defining a pair of axial faces,
a drive shaft which defines opposite ends and which is coaxial with the rotor and torsionally affixed thereto;
the rotor having a plurality of radially extending slots formed therein;
a plurality of vanes respectively slidably received in the slots;
two bearings each having an inner race and an outer race and being respectively mounted in the end plate bores so as to be radially supported therein;
the rotor and the drive shaft being rotatably mounted in the housing, the rotor end portions and the drive shaft ends being journaled in the end plate bores and the inner bearing races, respectively; and
the housing, the end plates, the rotor and the vanes cooperating with one another to define an plurality of variable, working volumes, whereby the introduction of a compressed fluid into the working volumes, its expansion therein and subsequent exhaust therefrom causes rotation of the rotor and the drive shaft;
the improvement comprising:
means for axially fixing the opposite ends of the drive shaft to the inner races;



the rotor being axially slidable with respect to the drive shaft;
an abutting ring having a hole formed therein and being intermediate one of said rotor end portions and the inner race of the bearing associated therewith so that said drive shaft is received in said hole;
said abutting ring abutting the inner race of the bearing associated therewith, and not contacting the outer race thereof;
axial compression spring means disposed between the other rotor end portion and the inner race of the bearing association therewith;
said axial compression spring means abutting the other rotor end portion and the inner race of the bearing associated therewith, and not contacting the outer race thereof; and
axial displacement of the rotor, with respect to the housing, being limited by said abutting ring and said axial compression spring means cooperating with the rotor end portions and the inner races of the bearings associated therewith, respectively, so that contact between on the working rotor portion and the end plates is avoided.

4,898,525

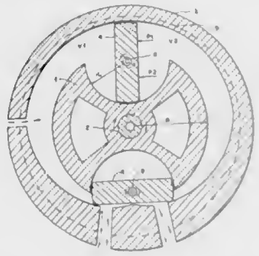
MOTOR, PUMP AND FLOW METER WITH A PLANETARY SYSTEM

Exarchou Hippocrates, Iroon Polytechniou I, Larisa, Greece

Filed Aug. 1, 1988, Ser. No. 227,005
Claims priority, application Greece, Apr. 27, 1988, 880100274
Int. Cl.[4] F01C *1/26*
U.S. Cl. 418—227 8 Claims

1. A planetary system (P.S) that can be used as pump, fluid flow meter and motor, comprising, in combination, a housing (3): a cylindrical core (1): means rotatably mounting said core in said housing, said core having at least one peripheral portion engaging one arcuate surface portion of the inner surface of said housing: the inner surface of said housing and a peripheral surface of said core conjointly defining inlet and outlet chambers extending in opposite angular directions from the arcuate surface portion: two discs (9) mounted on the two basements of the core: one or more planets (4) mounted on the two discs: means (as example four gears 11, 12, 13, 14 per planet) inter-

connecting said cylindrical core and said planets for rotation of said planets on said core, as the latter rotates about its axis, at an angular velocity which is half of the angular velocity of said core and direction of movement of said planets opposite to that of said core: the inner surface of said housing being formed as



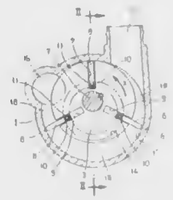
the loci generated by arbitary points on the circumferences of said planets during rotation of said core: the peripheral contours of said planets having a configuration contact with the inner surface of said housing during rotation of said core: a fluid inlet port in communication with said inlet chamber: and a fluid outlet port in communication with said outlet chamber.

4,898,526

VANE PUMP WITH AXIAL INLET AND PERIPHERAL TANGENTIAL OUTLET

Hiroshi Saksmaki; Yukio Horikoshi, and Takeshi Jinnouchi, all of Sakado, Japan, assignors to Eagle Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 78,422, Jul. 27, 1987, abandoned. This application Feb. 22, 1989, Ser. No. 314,296
Claims priority, application Japan, Aug. 12, 1986, 61-122850[U]
Int. Cl.[4] F04C *2/344*
U.S. Cl. 418—257 2 Claims



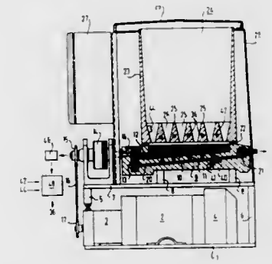
1. A vane pump comprising a pump housing means, said housing means having an internal cylindrical working chamber, a rotor means rotatably mounted in said working chamber, said working chamber having an inner peripheral wall and a cylindrical axis, said rotor means having an axis of rotation which is spaced from said cylindrical axis such that said rotor means is eccentrically mounted in said cylindrical working chamber, said housing means having two end sections and an intermediate section, said end sections being disposed at the longitudinal ends of said cylindrical working chamber, said intermediate section connecting said two end sections and being disposed radially outwardly of said working chamber, said end sections having bearing means for rotatably supporting said rotor means, said rotor means having a plurality of generally radial slots, vane elements slidably mounted in said slots such that as said rotor means rotates, said vane elements slide in and out of said slots to provide variable volume chambers between said vane elements which effect a pumping action, said variable volume chambers having an outer periphery defined by said inner peripheral wall of said cylindrical working chamber, said variable volume chambers having longitudinal ends defined by said two housing end sections, one of said housing end sections and said intermediate housing section having an axial inlet means which extends in an axial direction parallel to said cylindrical axis and which opens onto said working chambers, said axial inlet means extending the axial length of said intermediate housing section from said one housing end section to the other housing end section, said axial inlet means being spaced radially outwardly of the axis of rotation of said rotor means, said intermediate housing section having an outlet means which opens up onto said outer periphery of said working chambers such that the fluid being pumped is discharged through the outer periphery of the working chambers into said outlet means, said outlet means having an outlet passage which is tangentially disposed relative to said cylindrical chamber such that the fluid being pumped flows from said variable volume chambers tangentially into said tangential passage coincident with the inertia imparted to the fluid by the pump as said fluid exits said variable volume chambers.

4,898,527

APPARATUS FOR LIQUEFYING A THERMOPLASTIC HIGH POLYMER MATERIAL

Henning J. Claassen, Industriegebiet Hafen, 2120 Lüneburg, Bundesrepublik Deutschland, Fed. Rep. of Germany

Filed Nov. 1, 1988, Ser. No. 265,438
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738191
Int. Cl.[4] B29C *47/92*
U.S. Cl. 425—143 5 Claims



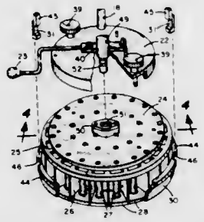
1. An apparatus for liquefying a thermoplastic high-polymer material, comprising:
(a) a supply container for the thermoplastic material;
(b) heating means for heating the thermoplastic material in the supply container;
(c) a base part arranged beneath the supply container and containing a collecting trough for the liquefied thermoplastic material;
(d) a sensor means for detecting the amount of liquefied thermoplastic high-polymer material conveyed out of the collecting trough and for supplying a corresponding signal as an actual value; and
(e) control means for controlling the heating means for the supply container relative to a result of a comparison between a given desired value of the amount of liquefied thermoplastic high-polymer material conveyed out of the collecting trough and an actual value detected by the sensor means.

4,898,528

DIVIDING AND ROUNDING MACHINE

Mark L. Willard, Saginaw; David E. Beatty, Wrenshall, both of Minn., and Jeffery A. Nyquist, Superior, Wis., assignors to Dutchess Bakers' Machinery Company, Inc., Superior, Wis.

Filed Jul. 12, 1988, Ser. No. 217,657
Int. Cl.[4] A21C *3/10, 5/08*
U.S. Cl. 425—185 **1 Claim**



1. In a machine for dividing material such as dough or the like wherein the dough or the like is placed on a pallet supported by a crank plate which is movably mounted on a machine frame, and the machine frame includes an upstanding yoke section with an overhead support spaced above the crank plate, and a vertically movable rack connected to the overhead support, the rack having a lower yoke section attached thereto with said lower yoke section having downwardly extending arms, and a dividing assembly removably connected to said rack and downwardly extending arms, the improvement in rack, downwardly extending arms and dividing assembly comprising:

(a) said rack having a lower end formed into a cross key;

(b) said downwardly extending arms each having a ring groove proximate a lower end;

(c) said dividing assembly having an upper plate with a locking groove complementary sized to accept said cross key in one position and to engage and lock said cross key in another position of said dividing assembly;

(d) said dividing assembly further comprising an outer ring, said outer ring having a pair of ring slots which are alignable with said downwardly extending arms ring grooves, whereby said ring may be engaged and removed from said downwardly extending arms by aligning said ring slots and said ring grooves, and said ring may be attached to said downwardly extending arms by rotating said ring relative to said arms; and

(e) a trip plate attached to said lower yoke section above said dividing assembly, said trip plate having means for removably fastening to said dividing assembly, and having a pivotable lever engageable to said rack, said rack having a trip groove sized to receive said lever.

4,898,529

APPARATUS FOR MOLDING MAGNETO-OPTIC SUBSTRATES

Boris J. Muchnik, Boulder, Colo., and Bernd F. Fischer, Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

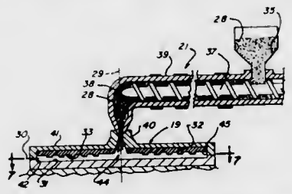
Division of Ser. No. 84,273, Aug. 11, 1987. This application Dec. 29, 1988, Ser. No. 291,839
Int. Cl.[4] B29C *45/74;* **B29D** *17/00*
U.S. Cl. 425—542 **1 Claim**

1. In an injection molding apparatus for manufacturing a magneto-optic recording substrate; said substrate being planar, circularly symmetrical relative to an axis of symmetry, and having relatively uniform birefringence with respect to azimuthal position around said axis of symmetry; the improvement comprising:

a two-piece mold having a cavity therein for forming said substrate, said cavity being planar and having a center corresponding to said axis of symmetry, said cavity being continuous from said center to an outer circular perimeter;

support means for positioning said mold with the plane defined thereby horizontal and with said cavity closed for receiving hot fluid plastic material; and

a horizontally directed, heated barrel having rightangle



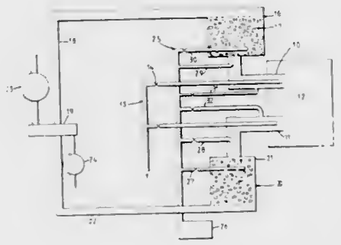
bend means for vertically injecting said hot fluid plastic material into said center of said mold so that said fluid plastic moves substantially horizontally, radially, relatively independent of the force of gravity, and uniformly through said mold so as to minimize birefringence variations of the substrate with respect to azimuthal position around said axis of symmetry.

4,898,530

METHOD OF OPERATING A PAIR OF BURNERS AND APPARATUS FOR USE IN THE METHOD

Brian Wills, Kinver, and Gary Johns, Wolverhampton, both of United Kingdom, assignors to Stordy Combustion Engineering Limited, Wolverhampton, United Kingdom

PCT No. PCT/GB87/00212, § 371 Date Jan. 14, 1988, § 102(e) Date Jan. 14, 1988, PCT Pub. No. WO87/05988, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 27, 1987, Ser. No. 127,666
Claims priority, application United Kingdom, Mar. 27, 1986, 8607810
Int. Cl.[4] F23L *15/04*
U.S. Cl. 431—11 **3 Claims**



1. A method of operating a pair of burners cyclically wherein, during a first part of each cycle, air is passed through a first heat store to a first of the burners, fuel is discharged from the first burner with the air and burns in a combustion space, hot products of combustion are passed from the combustion space through a second heat store associated with the second burner and heat is transferred from the products of combustion to the second heat store, wherein during a second part of each cycle, air is passed through the second heat store, is heated therein, is discharged from the second burner with fuel into the combustion space to burn therein and the hot products of

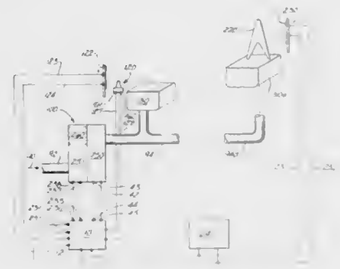
combustion flow from the combustion space through the first burner and then through the first heat store to impart heat to the latter, wherein a reducing agent is introduced into the products of combustion at said first burner and wherein, before the products of combustion leave the first heat store, the reducing agent reduces oxides of nitrogen present in the products of combustion.

4,898,531

PHOTOSENSITIVE CONTROL OF ELECTRICALLY POWERED EMISSIVE IGNITION DEVICES

Mark K. Goldstein, La Jolla, and Earl M. Dolnick, Encinitas, both of Calif., assignors to Quantum Group, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 101,038, Jul. 3, 1984, Pat. No. 4,263,791, Ser. No. 659,074, Oct. 5, 1984, abandoned, Ser. No. 517,699, Jul. 25, 1983, abandoned, Ser. No. 693,869, Jan. 22, 1985, abandoned, Ser. No. 937,609, Dec. 3, 1986, abandoned, Ser. No. 701,269, Feb. 13, 1985, abandoned, and Ser. No. 48,961, May 11, 1987, Pat. No. 4,793,799. This application Aug. 1, 1988, Ser. No. 227,083
Int. Cl.[4] F23N *5/08*
U.S. Cl. 431--12 **19 Claims**



1. A method for controlling a gas burning appliance comprising the steps of:

passing current through an emissive igniter;

generating a current and voltage from a photovoltaic device viewing the igniter; and

opening a gas valve to a burner when the current and/or voltage from the photovoltaic detector exceed a threshold sufficient for opening the valve with no other source of electric power;

heating an emissive element with a flame from the burner; and

generating sufficient current and voltage from a second photovoltaic device viewing the emissive element for maintaining the valve open with no other source of electric power.

4,898,532

RETRACTABLE LIGHTER APPARATUS

David P. Bercik, 516 Elmira St., Monongahela, Pa. 15063

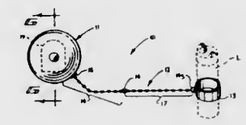
Filed May 22, 1989, Ser. No. 355,324
Int. Cl.[4] F23Q *2/32*
U.S. Cl. 431—253 **9 Claims**

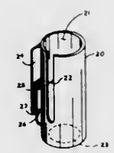
1. A retractable lighter apparatus comprising, in combination,

a retraction member including a first tether line secured interiorly of the retraction member and biased interiorly of the retraction member in a first position and extensible exteriorly of the retraction member to a second extended position, and

a second tether line secured to said first tether line and including an abutment means for maintaining said second tether line exteriorly of said housing in said first and second positions, and

a clip member integrally secured to a terminal free end of





said second tether line to clampingly secure a lighter assembly therewithin, and

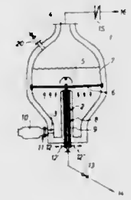
a pouch means for securement of said clip means and said lighter assembly in said first position.

4,898,533

FLUIDIZED-BED ACTIVATION FURNACE FOR ACTIVATED CARBON

Tsuneo Okamoto, and Yasuo Sakaguchi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1988, Ser. No. 274,168
Claims priority, application Japan, Nov. 25, 1987, 62-296660
Int. Cl.[4] F27B *15/00*
U.S. Cl. 432—58 **3 Claims**



1. A fluidized-bed activation furnace comprising:

a central hollow pillar vertically extending from a bottom portion of said fluidized-bed activation furnace to a central portion of said furnace and having an outlet for discharging activated carbon granules at an upper portion thereof;

a bowl-shaped cap covering a top portion of said central hollow pillar;

a perforated plate located under said bowl-shaped cap and fixed to an outer periphery of said central hollow pillar below said outlet for discharging activated carbon granules so as to divide said fluidized-bed activation furnace into two portions of an upper portion and a lower portion;

a steam jacket covering the outer periphery of said central hollow pillar and a fire resistant and heat insulating material covering the outer periphery of said steam jacket;

a cooling steam introducing system for introducing cooling steam, into said steam jacket; and

a high temperature activating gas introducing system which is provided at the lower portion of said furnace; and wherein

(a) said bowl-shaped cap has an inner diameter 1.2 to 3.0

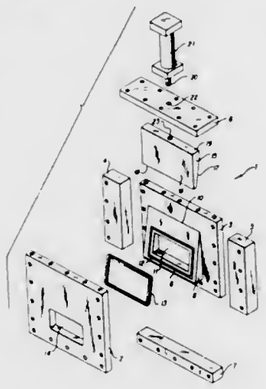
times as large as an outer diameter of said central hollow pillar;
(b) a gap between a lower edge of said bowl-shaped cap and said perforated plate is 5 to 50 mm;
(c) said perforated plate is so designed that an opening ratio of an annular zone of said perforated plate between said central hollow pillar and an outer periphery of a circle which is concentric with a circular cross section of said central hollow pillar and has a diameter 1.2 to 1.5 times as large as the inner diameter of said bowl-shaped cap, is 1.2 to 3 times as large as an opening ratio of a zone of said perforated plate which is outside of said annular zone; and
(d) said perforated plate is fixed to the outer periphery of said central hollow pillar in such a manner as to have a downward inclination of 2° to 10° toward a fixed portion of said perforated plate.

4,898,534

APPARATUS AND PROCESS FOR FIRING CERAMICS

Robert L. Huntt, Germantown, Md., assignor to Alpha Industries, Woburn, Mass.

Division of Ser. No. 149,174, Jan. 27, 1988, Pat. No. 4,833,302. This application Jan. 31, 1989, Ser. No. 304,292
Int. Cl.⁴ F27D *1/18*; H05E *3/66*
U.S. Cl. 432—250 **3 Claims**



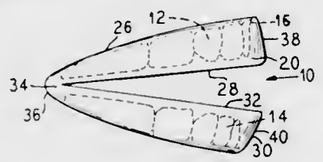
1. A door assembly for a high temperature oven or kiln, said door assembly including a door frame and a door vertically movable therein from an open position to a shut position and vice versa,
said door frame including a front plate, a back plate, side plates and top and bottom plates, said plates defining a cavity thereinbetween, one of said front and back plates extending in said cavity at least in part at an angle of at least 2° to the vertical, and the other plate being substantially vertical so that said cavity is at least in part wedge-shaped thereinbetween, aligned apertures in said front and rear plates defining an opening through which material can pass into or out of the high temperature oven or kiln, said cavity being wedge-shaped in the area surrounding at least one of said apertures, a resilient seal surrounding the aperture in the plate extending at said angle,
said door located generally within said cavity and having a front surface and a back surface, said surfaces being generally at the same angles respectively as said front plate and said back plate, said door movable vertically from an open position wherein the door is out of contact with said resilient seal and displaced from the area between the apertures to provide unimpeded passage therethrough, to a closed position wherein the wedge shape of the door and of the cavity cooperate to firmly seal the door against the resilient seal so that gases cannot substantially escape through the closed door.

4,898,535

SELF-OPENING PREFORMED ACTIVATOR AND POSITIONER

Earl O. Bergersen, 950 Green Bay Rd., Winnetka, Ill. 60093

Filed Apr. 11, 1988, Ser. No. 180,178
Int. Cl.⁴ A61C *7/00*
U.S. Cl. 433—6 **12 Claims**



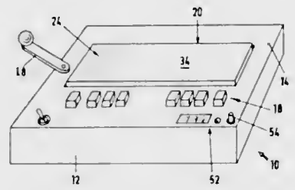
1. An orthodontic appliance for use in the positioning of teeth which includes a first tooth receiving trough in an upper portion for positioning an upper row of teeth and a second tooth receiving trough in a lower portion for positioning a lower row of teeth, said troughs being defined by lingual and labial-buccal flanges and including an isthmus interconnecting said flanges, said upper portion isthmus and said lower portion isthmus being separated at an anterior end of said appliance, but connected at a posterior end of said appliance to form a hinge connection between said two portions.

4,898,536

DEVICE FOR DISPLAYING GRAPHIC INFORMATION

Rainer Hoffarth, Bellnhauser Muhle 1, D-3555 Fronhausen, Fed. Rep. of Germany

Continuation of Ser. No. 936,431, Dec. 1, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 204,259
Claims priority, application European Pat. Off., Dec. 11, 1985, 85115789
Int. Cl.⁴ G09B *21/02*; B41J *3/32*
U.S. Cl. 434—114 **9 Claims**



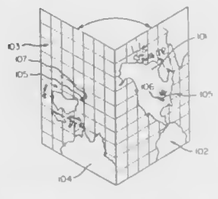
1. A device (10) for tactually and visually displaying graphic information, such as braille texts, which device is composed of
(a) a flat display having a top face (34) that is formed by the tops of a plurality of profiles (30) arranged in side-by-side parallel relationship to each other, each of said profiles having at least one elongated row of spaced apart vertical bores (32),
(b) a pin (22) with a rounded upper tip (24) positioned within each of said bores (32), said bores (32) serving as guides for the vertical movement of said pins (22) in a direction perpendicular to top face (34),
(c) spring means (28) associated with the lower end of each pin (22) which bias each pin (22) to its lowermost position so that the rounded tip (24) does not extend above the top of its surrounding bore (32),
(d) stroke releasers (60) associated with each pin (22) which are electrically actuatable to allow each pin (22) to rise from its lower spring biased position to a upper position where the rounded tip (24) of the pin (22) projects above said top face (34),
(e) locking means (26) to lock each pin (22) in said upper position,
(f) eraser means (36) for returning each pin (22) from its said upper position to its spring-biased lower position, and
(g) said locking means (26) and said eraser means for each elongated row of pins (22) comprising strip (34) that is mounted between said profiles (30) and beneath said top face (34) so as to be able to both engage and disengage the pins (22) in each elongated row of pins, each said strip (34) being movable with respect to its associated adjacent profile (30) in a direction parallel to said top face (34) and transverse to the longitudinal axes of said pins (22).

4,898,537

LOCATING SYSTEM FOR MAPS AND OTHER DIAGRAMS AND DISPLAYS

Paul L. Pryer, 10 Lonsdale Ave., Dayton, Ohio 45419

Filed Dec. 12, 1988, Ser. No. 283,100
Int. Cl.⁴ G09B *19/00*
U.S. Cl. 434—130 **11 Claims**



1. In an instructional device for relating information on one surface to information on another surface, the improvement comprising:
means defining a pair of positionally related surfaces, said surfaces defining a first side, said first side having spatially related information thereon,
means defining a second side, said second side having information thereon spatially arranged to relate to specific portions of the information on said first side, and
marking means for engagement with locations on said first side corresponding to locations of said specific portions of information thereon for producing a mark on said second side at a location which is antipodal to the information on said first side.

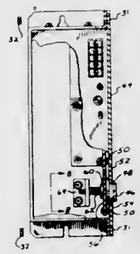
4,898,538

SELF ALIGNING CONNECTOR

Michael F. Tratar, Mentor; Edwin L. Bremenour, Euclid, and Dale R. Terdan, Mentor, all of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Feb. 16, 1989, Ser. No. 310,951
Int. Cl.⁴ H01R *13/629*
U.S. Cl. 439—76 **8 Claims**

1. A self aligning connector assembly comprising:
a first enclosure;
a first connector mounted to the first enclosure;
a guide plate including an alignment guide means affixed thereto and means which adjustably fasten the guide plate to the first enclosure so that the guide plate has a predetermined orientation with respect to the first connector;
a second enclosure including a receptacle for receiving the alignment guide means, and means for attaching the second enclosure to the guide plate; and
a second connector mounted to the second enclosure and engaging the first connector;



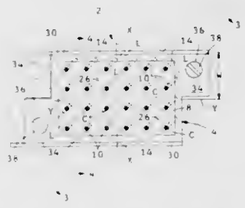
whereby the first and second connectors are aligned with each other by means of the guide plate.

4,898,539

SURFACE MOUNT HDI CONTACT

Douglas W. Glover, Harrisburg, and Donald R. Harner, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 22, 1989, Ser. No. 314,331
Int. Cl.⁴ H01R *9/09, 13/24*
U.S. Cl. 439—81 **14 Claims**



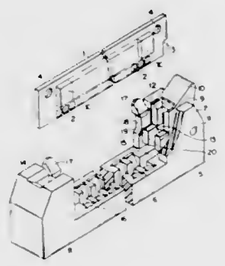
1. A pin header electrical connector comprising;
an insulating housing having a flat interface surface and a mating face opposite thereto, said housing defining a multiplicity of contact element receiving, through cavities, each of which opens both into said interface surface and into said mating face; and
a one-piece electrical contact element retained in each of said cavities and having an elongate contact spring proximate to said interface surface, said contact spring having a longitudinal axis extending substantially parallel to that surface, a contact nose on said contact spring projecting from said interface surface and a contact pin projecting from said mating face, said contact noses being arranged in a gird array having X and Y axes extending normally of each other and intersecting said interface surface, said longitudinal axes of said contact springs, all extending parallel to each other but being angled with respect to both of said X and Y axes, and each contact pin presenting opposed, flat contact surfaces which are parallel to one of said X and Y axes and extend at right angles to the other of those axes.

4,898,540

CONNECTOR FOR A PRINTED CIRCUIT BOARD

Masaaki Saito, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,299
Claims priority, application Japan, Dec. 28, 1987, 62-336265
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—153 **1 Claim**



1. A connector for a printed circuit board of the type having an inserting end, first and second corners at opposite sides of the inserting end, a cut-out portion at a first one of the first and second corners of the inserting end, a retaining hole at each of the first and second corners, and a plurality of contact points or conductor strips juxtaposed along a marginal portion of the inserting end, said connector comprising:

a connector body having first and second end portions, said connector body having a groove through which a printed circuit board is inserted and withdrawn;

a plurality of contacts disposed in said groove, said plurality of contacts being arranged for resiliently contacting a plurality of contact points or conductor strips on a printed circuit board received in said groove;

a resilient locking member attached to said connector body, said resilient locking member releasably engaging a first retaining hole at a first corner portion at the inserting end of a printed circut board when a printed circuit board is received in said groove in said connector body;

a single push-up lever pivotably attached to said connector body at said first end portion thereof, means on said single push-up lever for pushing up only one corner of a printed circuit board received in said groove in said connector body when said single push-up lever is pivoted, said means for pushing up only one corner of a printed circuit board including a push-up portion defined on said single push-up lever for engaging a cut-out portion at the first one of the first and second corners of the inserting end of a printed circuit board, and said single push-up lever further including disengaging means for simultaneously disengaging said locking member from a first retaining hole of a printed circuit board as said means for pushing up only one corner of a printed circuit board pushes up the one corner of the printed circuit board when said singel push-up lever is pivoted for releasing a printed circuit board received in said groove in said connector body; and

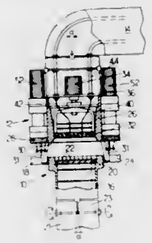
wherein, when said push-up lever is pivoted for releasing a printed circuit board, the printed circuit board is pivoted about the second corner thereof by the pushing up of only one corner of the printed circuit board by the single push-up lever.

4,898,541

MULTIPLE CONNECTION DEVICE

Christian Lhuillier, Clamart, France, assignor to Framatome, Courbevoie, France

Filed Sep. 30, 1988, Ser. No. 251,490
Claims priority, application France, Sep. 30, 1987, 87 13502
Int. Cl.[4] H01R *13/631*
U.S. Cl. 439—248 **8 Claims**



1. A self-alignment multiple connection device having two assemblies, one of which is movable in a direction towards and away from the other, wherein:

one of the assemblies has a first mechanical connection plate and a first connection element provided with contacts and fixed to the mechanical connection plate;

the other assembly includes a second mechanical connection plate and a second connection element provided with contacts arranged and distributed for operatively engaging the contacts of the first connection element upon movement of the latter along said direction toward the first plate, said second connection element being movable with respect to said second mechanical connection plate, along said direction; and

said second mechanical connection plate carries members arranged to engage the first plate and to achieve mutual centering of the two plates upon closing movement thereof along said direction, remotely controlled means for locking the plates one on the other in aligned and mutually abutting condition and drive means for moving said second connection element along said direction with respect to said second plate between a rear position in which the contacts of the first and second elements are separated from each other even when the plates are in abutting condition and a forward position in which the contacts of the two elements are in mutual engagement when the plates are in abutting condition.

4,898,542

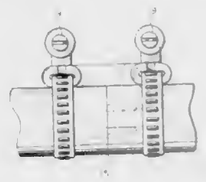
ANTI-SEPARATION COAXIAL CONNECTOR TIE-STRAPS

Frank A. Jones, Jr., Temple Hills, Md., assignor to Jerome J. Norris, Rockville, Md.

Filed Nov. 4, 1987, Ser. No. 116,359
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—371 **4 Claims**

1. A flexible tie-strap for securing a transporting structure joined together by coaxial connectors from separating comprising: dual elongated body portions having holding eyelets with apertures extending transversely therethrough at one end and strap portions having a flat side and a convex side at opposite ends, said convex side including a pair of spaced, parallel narrow ribs along a major portion of its length and said flat side including spaced parallel projections extending transversely thereof to provide a gripping surface, wherein said apertures are provided with rectangular slots aligned in communication therewith whereby the strap portions are passed through said holding eyelets apertures, and end portions of said strap free of the aperture are in registry with said slots after locking means

comprising a detent in the form of V-tooth rachets hold said straps in the holding eyelet against reverse movement; said



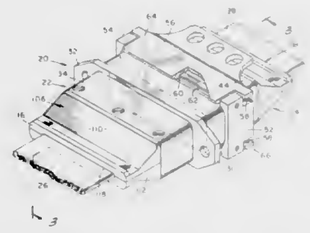
straps having a bridging member connecting side portions of the upper areas of the elongated bodies and the eyelet projections.

4,898,543

SELF-ALIGNING ELECTRICAL CONNECTOR

Everett L. Benze, Inglewood, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Filed Apr. 3, 1989, Ser. No. 332,035
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—374 **4 Claims**



1. An electrical connector having plug and receptacle parts which can be mated or unmated by force application directed along lines within a substantial angular range, comprising:

an open-ended hollow metal receptacle shell of generally rectangular cross-section with sidewalls forming the width being longer than those forming the height, and an inner edge portion surface being tapered;

a first insulative insert received within the receptacle shell having at least one slotlike opening therein, the plane of which is parallel to the sidewalls forming the receptacle shell width;

a first thin generally flat platelike contact received within the insert opening and extending parallel to the shell sidewalls forming the shell width;

an open-ended hollow metal plug shell of generally rectangular cross-section with sidewalls forming the width being longer than those forming the height, the cross-section dimensions of one end portion of said plug shell being capable of sliding receipt within an open end of the receptacle shell, an open end outer surface of said plug shell being positively radiused and provided with a groove spaced slightly from the radiused end that completely encircles the plug shell;

a second insulative insert received within the plug shell and having at least one slotlike opening therein with its plane parallel to the plug shell sidewalls forming the plug shell width; and

a second thin generally flat platelike contact complementary with the first contact, located within the plug insert opening and extending parallel to the plug shell sidewalls forming the plug shell width,

wherein when the first and second contacts are fully mated they lie in the same place.

4,898,544

FLAT CABLE SUPPORT COMB

Thomas Callahan, Wakefield, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Filed Mar. 23, 1988, Ser. No. 172,143
Int. Cl.[4] H01R *9/07*
U.S. Cl. 439—498 **6 Claims**



1. A printed circuit board interconnect system comprising:

a ribbon cable and terminal connectors for interconnecting first and second printed circuit boards located in separated racks and in substantially the same or parallel planes and having connectors at ends thereof with the same pin orientation;

said cable folded in a manner to interconnect said first and second printed circuit boards through the respective cable and board connectors with correct pin orientation with said cable as folded lying in substantially one plane;

the folded cable having first and second right angle folds adjacent the cable connectors and a central pair of right angle folds separated by a 180 degree fold in a central region of the cable, and said cable having a further 180 degree fold adjacent each right angle fold in the central region; and

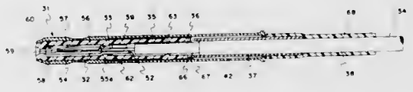
means for positioning said cable in said central region.

4,898,545

THIN-TYPE COAXIAL CONNECTOR AND RECEPTACLE FOR MATING WITH THE COAXIAL CONNECTORS

Hiroshi Endo; Takao Suzuki; Mitsuo Komoto; Kouzou Uekido, and Tetsuro Tokaichi, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry, Limited and NEC Corporation, both of, Japan

Filed Sep. 6, 1988, Ser. No. 240,943
Claims priority, application Japan, Sep. 9, 1987, 62-138727[U]; Oct. 9, 1987, 62-154828[U]; May 20, 1988, 63-65895[U]
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—578 **5 Claims**



1. A thin-type coaxial connector for use in an electrical and mechanical connection of an end of a coaxial cable which comprises a central conductor insulated from an outer conductor by an inner insulator, and an outer insulator jacket; said outer jacket and said inner insulator being cut away at said cable end to expose said central conductor, said inner insulator and said outer conductor as an exposed central conductor, an exposed inner insulator, and an exposed outer conductor, respectively; said coaxial connector comprising a central female

contact for making electrical and mechanical connections to said exposed central conductor, an insulator holder for holding said central female contact together with said exposed inner insulator; a ferrule for mounting on said outer jacket; said insulator holder and said ferrule being arranged adjacent to one another in an axial direction to have facing axial ends and being engaged with one another at the facing axial ends in order to prevent a relative rotation thereof; and an outer conductor sleeve fitted onto said insulator holder and said ferrule, said ferrule and said outer sleeve tightly clamping said exposed outer conductor therebetween, wherein:

said central female contact comprising a connecting portion shaped to be press-deformed to mechanically and electrically couple with said exposed central conductor and a contact portion connected to each other by a coupling portion, said contact portion comprising a cylindrical supporting portion connected said coupling portion; a receiving contact portion axially extending from said cylindrical supporting portion to a first extending end, said receiving contact portion having a generally arcuate lateral section and a V-shaped section at a position which is short of said first extending end, said V-shaped section providing an inner contact surface, a spring contact portion extending along said receiving contact portion from said cylindrical supporting portion with a gradually reducing gap therebetween and having a second extending end short of said first extending end, a ring-like member supported at said first extending end and defining an opening for receiving a pin contact, and an axial guide portion axially extending from said ring-like member along said receiving contact portion toward but short of said second extending end for guiding said pin contact inserted through said opening into said gap between said receiving and spring contact portions;

said insulator holder being formed in a discrete sleeve body and having radially inwardly projecting inner projections which come into a press contact with said central female contact and said exposed inner insulator, respectively;

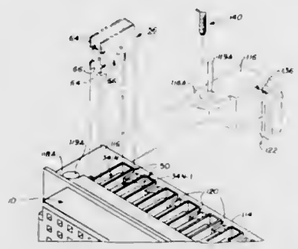
said outer conductive sleeve having a deforming portion for tightly clamping said exposed outer conductor with said ferrule after being press-deformed.

4,898,546

GROUND PLANE SHIELD DEVICE FOR RIGHT ANGLE CONNECTORS

Richard A. Elco, Mechanicsburg, and David F. Fusselman, Middletown, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1988, Ser. No. 285,461
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—608 **44 Claims**



1. A ground plane shield device for use with a connector mounted to a generally planar substrate, the connector being of the type having a housing from which a plurality of terminal tails emanate, the tails being arranged in at least one column, the tails each having a first portion generally perpendicular to the housing, a second portion generally perpendicular to the substrate, and an intermediate portion connecting the first and the second portions, the shield comprising:

a conducting member formed to define a first and a second panel arranged in generally confrontational spaced relationship with respect to each other, the panels defining a space therebetween, each panel having at least a first, connector, edge and a second, substrate, edge;

a first and second clip disposed on each panel in corresponding locations along the connector and the substrate edges, respectively,

the clip along the connector edge of each of the panels and the clip along the substrate edge of each of the panels extending toward the corresponding clip on the other of the panels thereby to place the corresponding clips into predetermined close proximity to each other,

each of the clips being arranged to receive and to grasp a predetermined portion of a predetermined one of the tails in the column of tails thereby to support the device above a substrate and to connect electrically the tails to the panel,

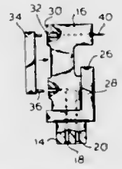
such that, in use, with the cutouts in the clips along the connector edges of the panels grasping the first portion of the predetermined one of the tails in the column and with the cutouts in the clips along the substrate edges of the panels grasping the substrate portion of the same predetermined tail the intermediate portion of all of the tails in the column is received in the space between the panels.

4,898,547

HYBRID INTERFACE ADAPTER

Stanley Bottoms, Largo, and James L. Korzik, Palm Harbor, both of Fla., assignors to Paradyne Corp., Largo, Fla.

Filed Jul. 30, 1985, Ser. No. 760,485
Int. Cl.[4] H01R *25/00*
U.S. Cl. 439—652 **4 Claims**



1. A hybrid interface adapter for coupling circuit lines carrying circuit signals of a first level to a bus having lines for carrying bus signals at a second level different from said first level comprising:

a body having a surface with first and second groups of holes;

a first port integrally secured to said body and having a third group of holes and a plurality of conductive elements for connecting each of said third group of holes to one of said second group of holes whereby said second group of holes may be coupled through said third group of holes to a bus by normal connection means;

a second port integrally secured to said body and having means for connecting the adapter to a PC board, said connecting means being electrically connected to said first group of holes; and

a signal level translating means removably connected to said first and second groups of holes, said signal level translating means being capable of being mounted in substantial abutment to said first and second groups of holes, said signal level translating means functioning to translate said circuit signals of a first level to said bus signals of a second level wherein said connecting means comprises a plurality of pins and wherein said plurality of pins are arranged perpendicularly to said third group of holes and wherein said third group of holes is arranged in two parallel rows,

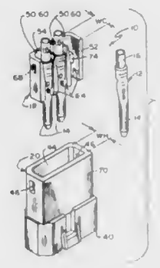
the holes of one row being staggered with respect to the holes of the other row.

4,898,548

CONNECTOR ASSEMBLY

Arnold A. Case, West Chicago, and Robert DeRoss, Naperville, both of Ill., assignors to Molex Incorporated

Continuation of Ser. No. 778,476, Sep. 20, 1985. This application Jun. 17, 1987, Ser. No. 65,675
Int. Cl.[4] H01R *13/00*
U.S. Cl. 439—686 **2 Claims**



1. In a connector arrangement including a housing having a forward mating end with an opening and an opposed conductor receiving end with an opening having an insert receiving cavity extending therebetween, an insert telescopically received in said cavity, said insert including at least one channel adapted to receive a terminated wire lead, said channel cooperating with said housing to define a terminal-receiving passageway, a terminal received within said passageway including a forward mating end and a rear end, a conductor crimped in said rear end to form a terminated wire lead having a predetermined cross-sectional crimp height; mounting means for retaining said terminated lead in the channel; and means for releasably locking said insert within the housing;

the improvement comprising:

said insert including an upstanding projecting platform in said channel disposed intermediate the length of the channel having an upper surface adapted to support the rear end of the terminal, said platform cooperating with said housing to define a constricted region between the upper surface of the platform and the interior of the cavity, the cross section of said constricted region defining a maximum crimp height whereby only those terminated leads having a crimp height less than said maximum crimp height are receivable into the passageway.

4,898,549

CONNECTOR BUILT FROM ONE OR MORE SINGLE ROWED HOUSINGS, WITH LONG LASTING LOCKING MECHANISM

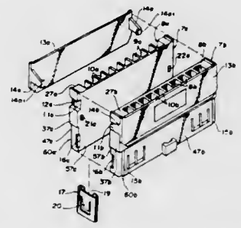
Katsuhiko Nakama, Nagaokakyo; Hiroshi Ninomiya, Uji; Toru Michishige, Nagaokakyo, and Fumiaki Itsuki, Ibaraki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 101,024, Sep. 24, 1987, abandoned, which is a division of Ser. No. 823,329, Jan. 28, 1986, Pat. No. 4,709,976. This application Feb. 28, 1989, Ser. No. 318,443
Int. Cl.[4] H01R *13/514*
U.S. Cl. 439—701 **4 Claims**

1. An electrical connector for coupling a plurality of wires to male terminals, comprising:

a first housing formed at one end thereof with a first single row of holes for receiving a plurality of male terminals and at another end and on a front surface thereof with a first single row of wire insertion depressions, each hole of said first single row of holes being in communication with a respective depression of said first single row of wire insertion depressions, said first housing including a first positioning means disposed on a rear surface thereof; and

a second housing identical to said first housing formed at one end thereof with a second single row of holes for respectively receiving a plurality of male terminals and at another end and on a front surface thereof with a second single row of wire insertion depressions, each hole of said second single row of holes being in communication with a



respective depression of said second single row of wire insertion depressions, said second housing including a second positioning means disposed on a rear surface thereof, wherein said said rear surfaces abut one another and are joined together through said first and second positioning means; and,

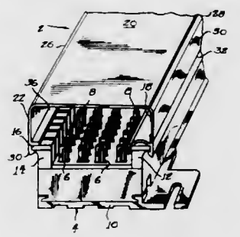
at least one coupling member separate from said housings for coupling said first and second housings together to form an integrated connector.

4,898,550

EXTRUDED PLASTIC HINGE COVER FOR TERMINAL BLOCKS

George E. Ayer, Naperville, Ill., assignor to Reliance Comm/Tec Corporation, Franklin Park, Ill.

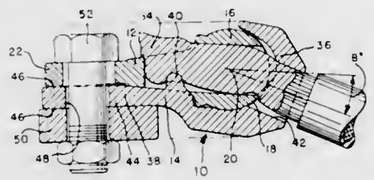
Continuation of Ser. No. 139,001, Dec. 29, 1987, abandoned. This application Jul. 17, 1989, Ser. No. 382,003
Int. Cl.[4] H01R *9/00*
U.S. Cl. 439—718 **11 Claims**



1. A snap-on hinge cover for a communications terminal block comprising a plastic body having first, second, and third longitudinally extending sections, the second section being laterally intermediate the first and third sections, and joined thereto along boundary regions, said first and third sections having marginal regions spaced from said boundary regions, means at said marginal regions for snap-fitting and releasably locking said body onto opposed longitudinally spaced fanning strips of a communications terminal block, longitudinally extending hinge means along one side of said second section connecting adjacent marginal and boundary regions, said hinge means being formed as an extruded strip along with the extrusion of adjacent components of plastic of said body and with said body being of a predetermined rigidity, said components

having spaced adjacent edges forming a gap and said hinge-forming extruded strip spanning said gap and having a resiliency which is high as compared to the resiliency of said first, second, and third sections and constituting a memory which biases the hinge portion of the cover to an open position upon release of the snap-fitting engagement of the marginal region and fanning strip remote from the hinge means and with maintenance of the snap-fitting engagement of the remote marginal region and fanning strip under spring pressure of the hinge means with the cover in closed position.

4,898,551
CABLE CLAMP
Paul A. Cornell, Knockamore, Ireland, assignor to Pan Electric Corporation, Carson City, Nebr.
Filed Apr. 11, 1989, Ser. No. 336,106
Int. Cl.[4] H01R *4/40*
U.S. Cl. 439—789 **22 Claims**



1. A cable clamp for terminating a cable, said connector comprising:

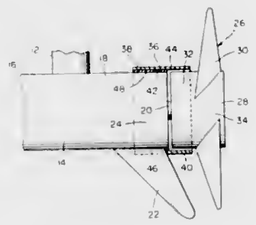
a male member having a generally cylindrical head and a first tail extending away from the head, said head defining a first cable receiving opening extending out of a cylindrical surface of the head, said first tail having two opposed first surfaces adjacent to a free end thereof;

a female member having a head receiving portion and a second tail, said head receiving portion receiving the head and shaped to permit rotation of the head, said head receiving portion defining a second cable receiving opening positioned to align with the first cable receiving opening when the male member is rotated to an open position with respect to the female member, said second tail having two opposed second surfaces at a free end thereof, one of said second surfaces acting as a mounting surface for the female member, the other of the second surfaces positioned to abut the adjacent one of the first surfaces;

said mounting surface defining a mounting plane, at least the majority of the male member situated above the mounting plane, a portion of the head receiving portion situated below the mounting plane to reduce the height of the female member above the mounting plane, said head receiving portion extending above the mounting plane by a distance greater than that by which it extends below the mounting plane;

said first and second surfaces defining aligned apertures therethrough to receive a mounting fastener that clamps the first tail adjacent to the second ail and secures the mounting surface of the second tail against a support element.

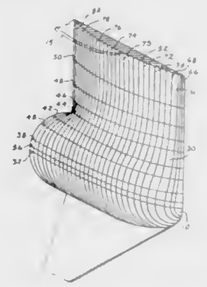
4,898,552
OUTDRIVE LOWER UNIT HOUSING-TO-PROPELLER HUB BRIDGING SLEEVE
Ivan L. Cochran, Immokalee, Fla., assignor to Edward R. Olesky, Immokalee and Fred Tittle, Tavernier, both of, Fla., a part interest to each
Filed Oct. 20, 1988, Ser. No. 260,271
Int. Cl.[4] B63H *5/16*
U.S. Cl. 440—71 **4 Claims**



1. In combination with an outdrive lower unit including a horizontally elongated front-to-rear extending housing portion including remote first and second ends, one end of a propeller shaft journalled from said housing portion projecting endwise outwardly from said first end, a propeller including a hub portion having opposite axial ends, said hub portion being removably mounted on said one end of said propeller shaft closely adjacent said first end, said first end and the adjacent axial end of said hub portion being at least substantially cylindrical and of substantially the same outside diameter, a protective sleeve having a substantially constant inside diameter slightly greater than the outside diameters of said first end and said adjacent end of said hub and including first and second end portions, said first end portion being mounted on said first end of said housing portion with said second end portion projecting outwardly of said housing portion first end and closely and loosely telescoped over said adjacent axial end of said hub portion, spanning and enclosing the axial spacing between said housing portion first end and said adjacent axial end of said propeller hub portion and closely rotatably receiving said propeller hub portion adjacent axial end therein said sleeve first end portion being mounted on said housing portion first end solely through the use of an adhesive band layer at least substantially occupying the radial spacing between the inner surface of said sleeve first end portion and said housing portion first end.

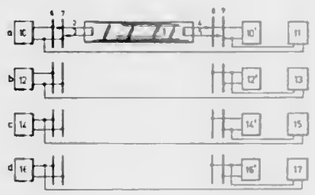
4,898,553
MARINE DRIVE UNIT WITH REDUCED DRAG
Herbert A. Bankstahl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Apr. 11, 1988, Ser. No. 180,045
Int. Cl.[4] B63H *21/10*
U.S. Cl. 440—76 **8 Claims**

1. A marine drive comprising a lower drive unit near the transom of a boat and having a vertical depending strut portion with at least one vertical drive shaft and having a lower horizontal torpedo portion with at least one horizontal propeller shaft carrying at least one rear propeller, said strut portion and said torpedo portion having outer profiles which are blended along a blended portion such that vertical cross-sections through said strut portion, said blended portion and said torpedo portion have outer profiles defining an upper zone of substantially straight vertical outer surface elements, a central zone of concave outer surface profiles, and a lower zone of convex outer surface profiles, all as taken along said vertical cross-sections, and wherein the degree of concave curvature of said outer surface profiles of said central zone continually increases from the front of said blended portion to at least the maximum width thereof such that the outer surface profiles along said vertical cross-sections of said blended portion are



substantially less concavely curved at the front than at the maximum width thereof.

4,898,554
METHOD OF AND EQUIPMENT FOR AGEING A LOW-PRESSURE HOT-CATHODE DISCHARGE LIGHT SOURCE, PARTICULARLY A FLUORESCENT LAMP
Kálmán Antal; Béla Rimay, and Ferenc Halász, all of Budapest, Hungary, assignors to Tungsram Részvénytársaság, Budapest, Hungary
Filed Mar. 21, 1989, Ser. No. 326,802
Claims priority, application Hungary, Apr. 22, 1988, 2039/88
Int. Cl.[4] H01J *9/44*
U.S. Cl. 445—6 **14 Claims**



1. In a method of ageing a low-pressure hot-cathode gas discharge light source comprising the steps of

preheating two electrodes of a sealed gas discharge light source by connecting their input terminals to a supply unit forwarding electric preheating current,

generating a discharge arc between said preheated electrodes by applying voltage equal with or exceeding the burning voltage rating of said light source connected to said input terminals,

maintaining said discharge arc for a time selected to be in a predetermined period and

breaking said discharge arc after passing said time selected,

said generating, maintaining and breaking steps forming a cycle of operations,

repeating at least once said cycle and

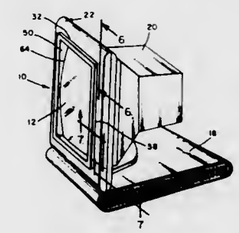
checking selected operating parameters, the improvement of

applying in generating step increased alternating voltage being at least 8 times and at most 16 times higher than said burning voltage rating of said gas discharge light source,

maintaining said discharge arc for a short time and

changing the connecting arrangement of said input terminals to said source of said increased alternating voltage each time before carrying out said repeating step, for accelerating the process of ageing.

4,898,555
DISPLAY SCREEN BEZEL AND ASSEMBLY METHOD
Craig F. Sampson, Palo Alto, Calif., assignor to Bell & Howell Publication Systems Company, Skokie, Ill.
Filed Mar. 23, 1989, Ser. No. 327,741
Int. Cl.[4] H04N *7/14, 5/64*; G08C *21/00*
U.S. Cl. 445—22 **42 Claims**



33. A method for assemblying a bezel to a display screen of a display device, comprising the steps of:

providing a display device having a display screen;

providing a chassis for mounting said display device thereto;

mounting said display device to said chassis;

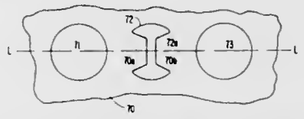
providing a first bezel for the display screen, said first bezel having inner edges describing an opening in said first bezel;

providing a second bezel for being fitted within said first bezel opening, said second bezel having an inner lip with an edge describing an opening in said bezel, said inner lip edge conforming to the contour of said display screen for engaging said display screen, said second bezel including spring means carried thereby;

fitting said second bezel within said first bezel opening for being retained by said first bezel and with said spring means ,directed for resiliently engaging said first bezel; and

mounting said first bezel to said chassis with said second bezel fitted within said first bezel opening, and said second bezel's inner lip edge engaging said display screen and said spring means engaging said first bezel.

4,898,556
ELECTRON GUN INTEGRAL BEAM CORRECTORS AND METHOD
James C. Day, Owensboro, Ky., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.
Continuation of Ser. No. 732,951, May 13, 1985, abandoned, which is a division of Ser. No. 518,507, Jul. 29, 1983, Pat. No. 4,584,500. This application Nov. 14, 1988, Ser. No. 274,694
Int. Cl.[4] H01J *29/02, 9/14*
U.S. Cl. 445—36 **3 Claims**



1. A method for producing an in-line electron gun electrode structure for a color cathode ray tube, such lensing structure having a planar surface normal to the in-line plane, and three in-line apertures having axes of symmetry lying in the in-line plane, each aperture having an opening in the planar surface, a terminal opening, a sidewall extending from the planar surface to define the terminal opening, and at least one pair of electron beam correctors extending from and integral with the sidewall

defining at least one of the terminal openings, the method comprising:

(a) producing three in-line holes in a workpiece of formable electrode material, at least one of the holes having a constricted central portion with substantially parallel sides; and

(b) forming the workpiece into a three-dimensional electrode structure in which predetermined portions of the material surrounding the holes is formed into aperture sidewalls whereby the aperture sidewall associated with the hole having the constricted central portion has integral extensions therefrom, which extensions function as beam correctors.

4,898,557

PROCESS FOR PREPARING EXTRACTION GRIDS

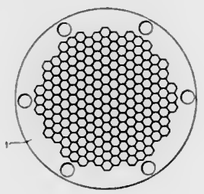
Jürgen Engemann, Wuppertal, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

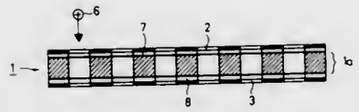
Continuation of Ser. No. 881,634, Jul. 3, 1986, abandoned. This application May 6, 1988, Ser. No. 193,149

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1986, 3601632

Int. Cl.[4] H01J *09/24, 09/00*

U.S. Cl. 445—49 **11 Claims**





1. A process for producing extraction grids for ion sources comprising:

providing a mounting plate of a thermostable material selected from the group consisting of mineral insulating and semiconducting materials, on both sides with a continuous metal coating, and producing an essentially congruent pattern of holes symmetrical in size and shape extending through the mounting plate and the metal coatings, the step of producing an essentially congruent pattern of holes in the mounting plate and the metal coatings comprising providing the mounting plate with a pattern of holes having links therebetween while leaving the links unchanged, and subsequently providing the links on both sides with continuous metal coatings while keeping the holes open, the area of the coating covering substantially the entire area of the pattern the metal coatings coinciding on both sides of the mounting plate with the mounting plate extending fully to the edges of the metal coatings at the holes and with the holes of the mounting plate being free of overhang by either of the metal coatings.

4,898,558

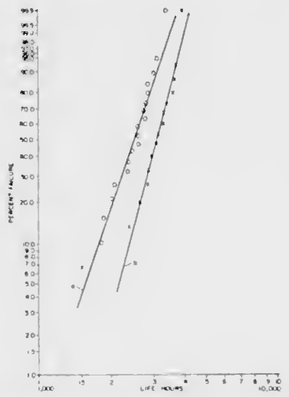
GETTER FOR INCANDESCENT LAMPS

John W. Shaffer, Montoursville, Pa., assignor to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 287,574, Dec. 16, 1988, abandoned, which is a continuation of Ser. No. 153,863, Feb. 9, 1988, abandoned. This application May 26, 1989, Ser. No. 358,520

Int. Cl.[4] H01J *9/38*

U.S. Cl. 445—53 **9 Claims**



1. A method of gettering an incandescent lamp comprising the steps of:

introducing a fill gas and a getter compound selected from the group consisting of silane compounds of the formula:

$$Si_aH_{(2a+2)}$$

wherein "a" is an integer greater than zero, a partially halogenated derivative thereof and mixtures thereof, into an unsealed lamp envelope; sealing the lamp envelope; and heating the sealed envelope, for a sufficient period of time, and at a sufficient temperature, to activate the getter before the decomposition of the getter.

4,898,559

MACHINES FOR THE IMPLANTATION OF CATHODES IN CATHODE-RAY TUBE GUNS

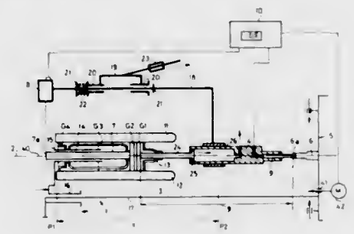
Daniel Cote, Ampuis Coudrieu, France, assignor to Videocolor, Montrouge, France

Filed Jan. 10, 1989, Ser. No. 295,388

Claims priority, application France, Jan. 13, 1988, 88 00295

Int. Cl.[4] H01J *9/06*

U.S. Cl. 445—64 **8 Claims**



1. A machine for the implanting of a cathode in a caathode-ray tube gun eyelet, of a type comprising a device to support the gun, movable along the axis of the gun, a cathode-supporting device positioning the cathode in the axis of the gun and a sensor with a retractable rod, working together with a first detector giving the position of the cathode when the rod is supported on the grid G1, said sensor being movable perpendicularly to the axis of the gun, said machine further comprising a gauge rod, with a calibrated length, which rests on the grid G2 and opens out on the side opposite to the eyelet, with a second detector recording the position of the gauge rod and a control device, determining the shift of the gun-supporting device through the measurements made by the two detectors.

4,898,560

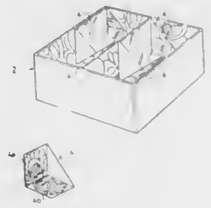
MIRROR PATTERN FORMING AMUSEMENT DEVICE

Ivan Moscovich, 19 Elkachi Street, Afeka, Ramat Aviv, Israel

Filed Feb. 9, 1989, Ser. No. 308,155

Int. Cl.[4] A63H *33/04, 33/22*

U.S. Cl. 446—85 **16 Claims**



1. An amusement device comprising:

a plurality of mirror blocks of the same size and configuration, each of the blocks having a flat face for permitting the block to rest on a flat horizontal surface, and a mirror face a to face upwardly when the block is supported on said flat horizontal supporting surface;

and a plurality of pattern-bearing elements each bearing a partial section of an overall pattern and selectively positionable with respect to the mirror faces of said blocks to reconstruct the overall pattern by reflections from the mirror faces of the mirror blocks.

4,898,561

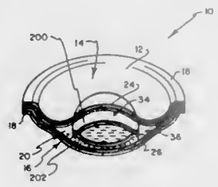
SELF-INFLATING TOY

John R. Nottingham, 60 Stonewood Dr., and John Spirk, 50 Stonewood Dr., both of Moreland Hills, Ohio 44022

Continuation of Ser. No. 103,025, Sep. 30, 1987, abandoned, which is a continuation of Ser. No. 879,915, Jun. 27, 1986, abandoned. This application Mar. 27, 1989, Ser. No. 331,081

Int. Cl.[4] A63H *33/00*

U.S. Cl. 446—220 **10 Claims**



1. A hollow self-inflatable amusement device comprising,

a sealed hollow structure for flexible material which when inflated defines a substantially ball-like configuration,

said structure being formed from a pair of superposed sheets of said flexible material, said sheets being free of apertures or access openings over the surfaces thereof,

said sheets having a peripheral bonded seam joining the sheets together, with each sheet having excess material lying in non-planar relation within the seam periphery when said structure is in a non-inflated and generally collapsed state,

said excess material of said superposed bonded sheets in said non-inflates state including opposed outwardly convex generally part-spherical surfaces within the perimeter of said peripheral seam, thereby together with said peripheral seam defining a configuration which is substantially self-sustaining for ready handling and manipulation prior to impact and inflation,

normally inactive gas-generating means including a rupturable container containing a gas-generating chemical received within said hollow structure between said sheets,

said gas-generating means being responsive to impact pressure forces against the surfaces of said sheets to rupture said container and cause generation of a gas by said gas-generating means within said hollow structure to inflate the same,

said sheets and said gas-generating means cooperating to preclude rupture of said sheets under said impact forces thereby to maintain the integrity of said sealed hollow structure,

said gas-generating means controllably generating said gas following impact over a period from about 15 seconds to 2 minutes, thereby slowly inflating said hollow structure from the initial configuration thereof including said excess material inwardly of the sheet periphery to a final inflated form of generally ball-like appearance with a taut, generally smooth and unfolded surface, thereby permitting protracted observation thereof during inflation for amusement and interest, and,

said flexible material being substantially impervious to rapid leakage transmission of said gas therethrough, thereby to maintain the inflated configuration for a substantial period of time for observation, handling and enjoyment.

4,898,562

DIRECTION-COVERTING DEVICE FOR A REMOTE-CONTROLLED TOY

Zenichi Ishimoto, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,467

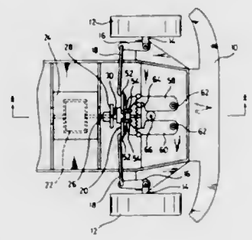
Claims priority, application Japan, Sep. 12, 1987, 62-227559

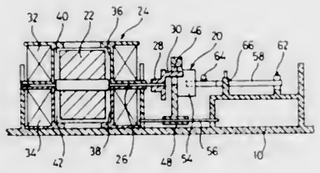
Int. Cl.[4] A63H *17/385*

U.S. Cl. 446—460 **3 Claims**

1. A direction-shifting device for a remote-controlled toy, said device comprising a rotor shaft supported between opposite contact faces of opposing coil bobbins of an equally-divided electromagnetic coil, each said bobbin comprising a coil wound in multiple turns parallel to said rotor shaft, said rotor shaft supporting a rotor magnet, each said bobbin including a hollow interior within which is located a portion of said rotor magnet, an end of said rotor shaft being connected to a crank having an eccentric shaft, and direction-shifting means engaged with said eccentric shaft of said crank, said direction-shifting means being pivotably supported and displaceable by

said eccentric shaft in a lateral direction and connected at lateral portions thereof with opposing steering rods to accomplish a desired shift in direction upon displacement of said direction-shifting means.



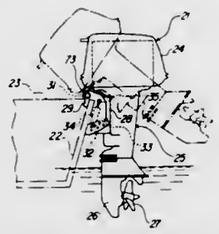


4,898,563

TRIM APPARATUS FOR MARINE PROPULSION UNIT

Katsumi Torigai, and Masanori Takahashi, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 5, 1987, Ser. No. 58,908
Claims priority, application Japan, Jun. 6, 1986, 61-130045
Int. Cl.⁴ B63H *21/26*
U.S. Cl. 440—1 **6 Claims**



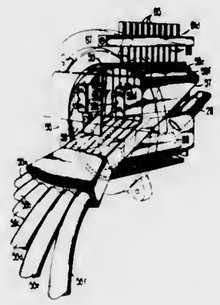
1. In a marine propulsion unit comprising an outboard drive adapted to be supported by a transom of a watercraft for movement between a plurality of trim adjusted positions, power means for moving said outboard drive between said positions, a throttle control for controlling a running speed of said watercraft, and means for operating said power means upon movement of said throttle control to a predetermined position for adjusting the trim of said outboard drive.

4,898,564

APPARATUS FOR COIN SORTING AND COUNTING

William L. Gunn, Atlanta; William D. Heath, Jr., Bremen, and John C. Mantovani, Lilburn, all of Ga., assignors to Brink's Incorporated, Darien, Conn.

Division of Ser. No. 232,898, Aug. 16, 1988. This application Jan. 30, 1989, Ser. No. 374,187
Int. Cl.⁴ G07D *3/00*
U.S. Cl. 453—3 **6 Claims**



1. In a coin handling apparatus of the type including a rotating cylindrical drum characterized by an axis of rotation and having a plurality of counterbores disposed in a plurality of channels lying in planes perpendicular to said axis of rotation, each of said counterbores having a hole therein, a cylindrical housing surrounding said rotating cylindrical drum to form a plenum between the inner surface of said rotating cylindrical drum and said cylindrical housing, means for creating a partial vacuum with said plenum such that the air pressure within said rotating cylinder is higher than the air pressure at the outer surface of said rotating cylinder, means for rotating said cylindrical drum within said cylindrical housing in a predetermined direction of rotation; the improvement comprising in combination:

an array of coin sensors disposed on said cylindrical housing such that at least one of said coin sensors is located over each one of said channels;

a plurality of elongated coin receiving stations located within said cylindrical drum each of said elongated coin receiving stations having a substantially rectangular opening at the top thereof extending lengthwise across said plurality of channels along lines parallel to said axis of rotation;

an array of selectively operable air valves disposed on said cylindrical housing such that at least one of said air valves is located substantially over said rectangular opening in each of said coin receiving stations for each of said channels;

coin identification means connected to said array of coin sensors for providing a particular coin identification signal from a plurality of coin identification signals in response to each occurrence of a metallic object lodged in one of said counterbores of a particular one of said channels passing the one of said coin sensors located over said particular one of said channels; and

a controller connected to said array of air valves and said coin identification means for providing an activation signal to a particular one of said air valves located over said particular one of said channels in response to said particular coin identification signal to cause said metallic object to be ejected into a corresponding particular one of said coin receiving stations.

4,898,565

DIRECTION SENSING APPARATUS FOR DATA TRANSMISSION CABLE CONNECTIONS

Steve W. Braun, San Diego, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 428,009, Sep. 29, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 668,679
Int. Cl.⁴ H04B *9/00*
U.S. Cl. 455—612 **10 Claims**



1. A data transmission apparatus including:

a data cable comprising a plurality of segments terminated with universal connectors,

a master station having a mating connector for connection to a connector of a first of said cable segments, and

a plurality of data stations, each having two data station universal connectors, each of said connectors being suitable for mating with one of said cable segment connectors for respectively connecting said data stations along said data cable,

direction sensing apparatus, comprising

a light source included in the connector of said master station,

a light source and a light detector included in each of said two data station connectors of each of said data stations,

fiberoptic means included in each of said cable segments to provide a light path for light from said master station light source to a light detector of a first data station connector and subsequent light paths to subsequent sequentially remote data stations from said first data station,

said light detector in a first of said data station connectors of said first data station connected to said fiberoptic means to detect light from said master station light source, said first data station including logic means operated by said light detector in said first of said data station connectors for establishing separate paths for control and data signals, respectively, through said first data station and for enabling a light source in the second of said data station connectors of said first data station, said path for said control signals being between said light detector in said first of said data station connectors and said light source in said second of said data station connectors, and said path for said data signals being between said light detector in said second of said data station connectors and said light source in said first of said data station connectors,

said light detector in the first of said data station connectors in each sequentially subsequent data station connected to said fiberoptic means to detect light sources from respectively preceding data stations, each of said subsequent data stations including logic means operated by said light detector in said respective subsequent data station, for detecting a light source from respectively preceding data stations for establishing separate paths for control and data signals, respectively, through each of said subsequent data stations and enabling said light sources in the second of said data station connectors of each of said respective subsequent data stations and

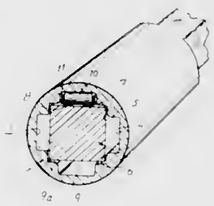
wherein said separate paths through each of said data stations are set concurrently and; the simultaneous, bidirectional transmission of said control and said data signals through each of said data stations can occur.

4,898,566

OVERLOAD-PROTECTED TORQUE TRANSMITTING TELESCOPIC SHAFT

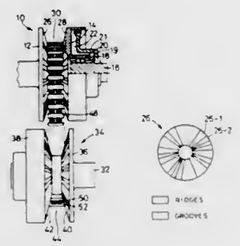
Olle Hakansson, Eskilstuna, Sweden, assignor to FFV Autotech Aktiebolag, Eskilstuna, Sweden

Filed Jan. 20, 1988, Ser. No. 146,207
Claims priority, application Sweden, Mar. 12, 1987, 8701041
Int. Cl.⁴ F16C *3/03*
U.S. Cl. 464—167 **9 Claims**



1. A torque transmitting apparatus comprising a first element (2) and a second element (1) telescopically connected to rotate in common and axially translate relative to each other for play-free axial translation and torque transmission therebetween, said first element (2) including a bore having a polygonal cross-section defined by inner surfaces, said second member (1) having a polygonal cross-section defined by outer surfaces, each of said outer surfaces and an associated one of said inner surfaces forming a pair of cooperating surfaces, one of said cooperating surfaces of each pair having at least three sections including a central section defining a groove (4) narrower than the other of the cooperating surfaces and outer sections (5, 6) which cooperate with matching outer sections (9*a*) of said other of said cooperating surfaces (9), and rolling element means for supporting said second element (1) within said bore defined by said first element (2) for play-free axial movement relative to said first element (2) and play-free transmission of torque of predetermined magnitude between said first element (2) and said second element (1) and including a plurality of rolling element assemblies, each rolling element assembly being disposed between an associated pair of cooperating surfaces and partially disposed within said groove (4) associated therewith, said rolling element assembly including at least one bed (7), means (12) for restraining said bed (7) against axial movement relative to one of said elements comprising said first element (2) and said second element (1), a plurality of rolling elements (10 or 13) disposed between and in rolling contact with said one bed (7) and one of said cooperating surfaces of said associated pair, and spring biasing means (8) acting between the other of said cooperating surfaces of said associated pair and said bed (7) for biasing said bed (7) toward said one cooperating surface of said associated pair, said spring biasing means (8) having a spring force calculated to transmit torque up to a predetermined magnitude through said rolling element assembly from one of said elements comprising said first and second elements (2, 1) to the other of said elements comprising said first and second elements (2, 1) said outer sections (5, 6) being forced into direct contact with said matching outer sections (9*a*) by torque applied between said elements in excess of said perdetermined magnitude whereby said rolling element assemblies are protected from overloading.

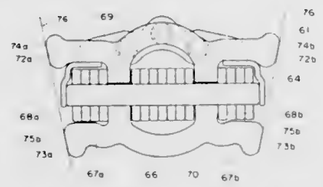
4,898,567
PULLEYS FOR BELT-AND-PULLEY TYPE CONTINUOUSLY VARIABLE TRANSMISSION
Yudai Tatara, Susono; Kiyoomi Sato, Toyota; Susumu Okawa, Aichi, and Yasunobu Jufuku, Gotenba, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Oct. 24, 1988, Ser. No. 261,319
Claims priority, application Japan, Oct. 26, 1987, 62-268059; Sep. 13, 1988, 63-229187
Int. Cl.[4] F16G *1/22*
U.S. Cl. 474—174 13 Claims



1. A pair of pulleys for a belt-and-pulley type continuously variable transmission wherein the pulleys are connected by a transmission belt having multiplicity of contact members such that the contact members of the belt are in contact with contact surfaces of the pulleys, wherein an improvement comprises:

at least one of said pair of pulleys has a contact surface which has a plurality of raised and recessed portions that are spaced apart from each other at irregular angular intervals in a circumferential direction of said at least one pulley such that said contact members of said belt abut on said contact surface of said at least one pulley at varying circumferential positions of said contact surface, so that a pitched noise due to abutting contact between said contact members and said contact surface is reduced.

4,898,568
ENDLESS TRANSMISSION BELT
Shiro Sakakibara, Aichi; Yoshiaki Kano, Gifu, and Yoshinori Miyaishi, Aichi, all of Japan, assignors to Aisin Aw Kabushiki Kaisha, Japan
Filed Dec. 21, 1988, Ser. No. 287,323
Claims priority, application Japan, Dec. 29, 1987, 62-335988
Int. Cl.[4] F16G *1/24*
U.S. Cl. 474—245 3 Claims



1. An endless transmission belt including blocks and pins spaced along its length, link plates arranged in sets of parallel members, each of said link plates having a single opening formed therein, plural sets of said link plates being interconnected by said pins in an endless manner, each of said link plates comprising:

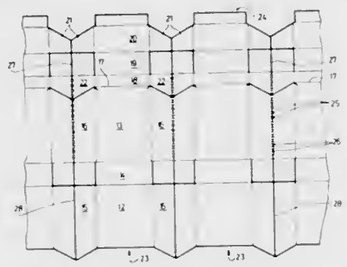
(a) upper and lower horizontal portions and side end faces defining a central opening, said horizontal portions joining said side end faces via rounded portions for contacting said pins;

(b) a first notch formed in the upper horizontal portion and partially defining said opening; and

(c) a second notch formed in the lower horizontal portion and partially defining said opening,

whereby stress received by said rounded portions at the top and the bottom of the side end faces is dispersed.

4,898,569
PROCESS, WEB OF MATERIAL AND APPARATUS FOR PRODUCING PACKAGING BLANKS
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Fed. Rep. of Germany
Filed Apr. 21, 1988, Ser. No. 184,640
Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716897
Int. Cl.[4] B31B *1/18, 1/04*
U.S. Cl. 493—361 6 Claims



1. Process for producing, from thin cardboard, packaging blanks for the manufacture of hinge-lid packs and for delivering the blanks to a packaging machine, the blanks being formed as a result of punching of the cardboard, said process comprising the steps of:

forming in a continuous longitudinal cardboard web (24) a succession of blanks (23) connected to one another along their longitudinal edges which extend transverse to the longitudinal dimension of the web;

completely severing the connected blanks from one another along only a first edge region of the longitudinal edges;

punching in the web residual connections (25), in the form of perforations, in only a remaining edge region (29) of the longitudinal edges which is located in a middle region of the web of material

selecting the remaining edge region as a folding tab edge region which, after separation of a blank from the web, is concealed within a finished hinge-lid pack; and

then, delivering the thin cardboard web, having the residual connections between successive blanks, to a packaging machine where said separation occurs.

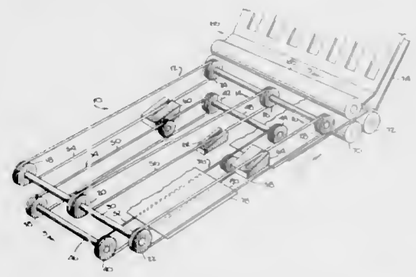
4,898,570
METHOD AND APPARATUS FOR HALF FOLDING PAPER SHEETS
Harry E. Luperti, Bethel; Robert Irvine, Riverside, and Anthony Luvara, Stamford, all of, assignors to Pitney Bowes, Stamford, Conn.
Continuation of Ser. No. 95,695, Sep. 19, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 309,022
Int. Cl.[4] B65H *45/14, 45/24*
U.S. Cl. 493—420 8 Claims

1. Apparatus for half folding sequentially and nesting a plurality of paper sheets, comprising:

a buckle chute folder having a pair of feed rollers rotating at a given velocity, said rollers forming an entrance nip to said buckle chute folder;

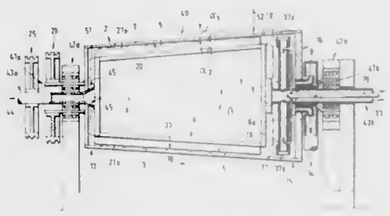
means for feeding said plurality of paper sheets seriatim along a path toward said feed rollers at a second velocity greater than said given velocity; and

means situated within said path for causing a succeeding



paper sheet of said plurality to become shingled relative to a preceding paper sheet of said plurality prior to said succeeding paper sheet entering the nip of said feed rollers, thereby forming a shingled stream entering said entrance nip to said buckle chute folder, whereby any desired number of said sheets may be folded in half and nested one inside the other sequentially.

4,898,571
SOLID BOWL CENTRIFUGE
Wolfgang Epper, Bergheim-Kenten, and Hans-H. Gildemeister, Overath, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany
Filed Nov. 30, 1988, Ser. No. 277,978
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744093
Int. Cl.[4] B04B *3/02, 11/08*
U.S. Cl. 494—26 15 Claims



1. A solid bowl centrifuge for separating mixtures including different densities into a lighter phase and a heavier phase comprising in combination:

a rotary drum providing a cylindrical settling sump therein and having an inlet for a mixture to be separated and having end walls;

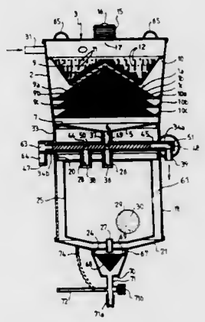
a displacement member rotationally located within the drum having end walls and forming the settling sump between the displacement member and the drum;

means defining a discharge element for lighter phase material in an end wall of the drum;

means defining a discharge element for heavier phase material leading from the settling sump at the deepest location at the outer circumference of the drum;

and a hollow shaft on the displacement member connected to said heavier discharge element for the removal of heavier phase material.

4,898,572
AUTOTRANSFUSER
Evelyne Surugue nee Lasnier; Hubert Lasnier, both of Creteil, and Phillipe Perovitch, Merignac, all of France, assignors to Futur-Quotidien S.A., Merignac, France
Filed Dec. 1, 1987, Ser. No. 127,053
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—4 17 Claims



1. A device for recovering and re-injecting blood into a patient comprising:

(a) suction means for recovering the blood;

(b) a first chamber forming a filtering chamber connected to said suction means;

(c) a plurality of filtering beds inside said filtering chamber;

(d) a source of negative pressure and a source of positive pressure; (e) a first source of anticoagulant products connected to said filtering chamber;

(f) a second chamber forming a blood collecting chamber, located beneath the filtering chamber to receive the blood by gravity from the filtering chamber;

(g) a second source of anti-coagulant products inside said collecting chamber;

(h) second filtration means at the base of said collecting chamber;

(i) means for back-transfusion of blood into the patient's circulatory system from said collecting chamber,

wherein said device further comprises:

(A) a bag of supple plastic material forming said collecting chamber;

(B) a rigid lower vessel to contain the said bag, wherein the space between the said bag and the walls of said vessel form an air jacket;

(C) a multi-way valve comprising a means defining a plurality of passages connected to said positive pressure source, to said negative pressure source, to said filtering chamber, to said supple plastic bag and to said air jacket, said multi-way valve having a first position whereby the source of negative pressure is connected to said supple bag and said supple bag is connected to the filtering chamber thereby drawing blood from the suction means to the filtering chamber and from there to the supple bag, said valve having a second position whereby the source of positive pressure is connected to the air jacket, and at the same time the supple bag is isolated and closed, whereby the pressure in the air jacket is transmitted to the supple bag causing the blood to be delivered to the back-transfusion means.

4,898,573

BLOOD COMPONENTS COLLECTOR UNIT

Yoshinori Takenaka, Oita; Hirokazu Fukami, Fuchu, and Sadayoshi Sekiguchi, Sapporo, all of Japan, assignors to Asahi Medical Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1987, Ser. No. 114,020

Claims priority, application Japan, Oct. 29, 1986, 61-255922; Sep. 1, 1987, 62-216517

Int. Cl.⁴ A61M *1/34*

U.S. Cl. 604—6 **10 Claims**



1. A blood components collector unit comprising:
a cannula,
a blood collection bag connected to said cannula through a first tube, said blood collecting bag containing an anticoagulant,
a membrane type blood components separator having a plasma outlet and a blood cell outlet, which separator is connected to said blood collection bag on its side remote from said cannula through a second tube,
said membrane type blood components separator having a membrane moistened with a physiologically isotonic solution which is employed in an amount of A/100 g or less wherein A is a surface area of said membrane expressed in terms of cm^2,
valve means positioned intermediate the length of and within said second tube, which is in the closed state and has opening means for opening said valve means,
said opening means being adapted to permit the opening of the valve means by manual manipulation from outside of said second tube,
a plasma collection reservoir for collecting plasma, and
a blood cell collection reservoir for collecting blood cell-enriched blood,
said plasma collection reservoir and said blood cell collection reservoir being connected to said blood components separator at said plasma outlet through a third tube and at said blood cell outlet through a fourth tube, respectively,
wherein each connection through each tube at both ends thereof is in a fixed fashion, thereby providing unified connection,
and wherein said collector unit is packed in a container in a sterile state,
thereby enabling the blood components collector unit to be stored aseptically for a prolonged period of time and to be readily used for collecting blood from a donor without rinsing the blood components collectors unit with a rinsing solution, leading to elimination of the danger of dilution of the blood components, and wherein said blood collection bag and said value means provide means for decreasing the burden on the donor by allowing the unit to be separated from a donor immediately after completion of the collection of blood from the donor to bag, while allowing continued separation of blood into blood components.

4,898,574

LITHOTOMIC APPARATUS

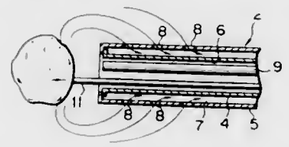
Naoki Uchiyama, Tokyo; Yoshio Shishido, Sagamihara, and Yasuhiro Ueda, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 45,127, Apr. 30, 1987, abandoned. This application Feb. 1, 1989, Ser. No. 306,267

Claims priority, application Japan, May 8, 1986, 61-105292; May 8, 1986, 61-105295; May 8, 1986, 61-105296; Jul. 24, 1986, 61-174318

Int. Cl.⁴ A61B *17/22*

U.S. Cl. 604—22 **7 Claims**



7. A lithotomic apparatus for treating a calculus produced in a body cavity, comprising:
an elongated suction probe, that can be inserted into the body cavity, including a distal channel having a distal end open to the distal end of the probe, an outer tube located around the inner tube with a gap therebetween, a suction channel defined between the inner and outer tubes and having an annular cross section, and a plurality of suction holes formed in the circumferences of the outer tube to communicate with the suction channel and located near the distal end of the probe;
suction means for sucking gas from the suction holes through the suction channel;
an elongated viewing probe, that can be inserted into the instrument channel, for viewing a region near the distal end of the suction probe;
an elongated treating probe, having a nozzle portion at a distal end thereof, that can be inserted into the instrument channel so that the nozzle portion projects from the distal end of the suction probe;
means for supplying a high-pressure fluid, and
a drive means for feeding the high-pressure fluid to the treating probe and pulsatively ejecting the fluid from the nozzle portion.

4,898,575

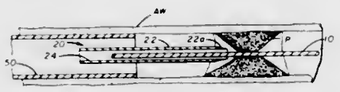
GUIDE WIRE FOLLOWING TUNNELING CATHETER SYSTEM AND METHOD FOR TRANSLUMINAL ARTERIAL ATHERECTOMY

Robert E. Fischell, Silver Spring, Md., and Tim A. Fischell, Palo Alto, Calif., assignors to MedInnovations, Inc., Dayton, Md.

Continuation of Ser. No. 91,311, Aug. 31, 1987, abandoned, which is a continuation of Ser. No. 874,140, Jun. 13, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 205,541

Int. Cl.⁴ A61B *17/32*

U.S. Cl. 604—22 **36 Claims**



9. A guide wire following catheter system for percutaneous transluminal atherectomy, comprising:
a guide wire with distal and proximal ends, and adapted to be advanced within a patient's arterial system and to penetrate through an arterial stenosis, said guide wire being essentially flexible throughout its length that lies within the stenotic artery and being free of any substantial protuberance at its said distal end; and
a tunneling catheter with distal and proximal ends and having for most of its length a single, thin wall tube having an outer cylindrical surface and an inner cylindrical surface, said inner cylindrical surface forming an interior lumen and being adapted to fit around said guide wire so that said tunneling catheter can be advanced along said guide wire to said arterial stenosis; and,
a cutting means located at the distal portion of said tunneling catheter for cutting through said arterial stenosis as said tunneling catheter is advanced along said guide wire, said cutting means having at least one cutting edge and having at least one opening into which the cut plaque enters as said cutting means is advanced through the stenotic plaque, and wherein none of said cutting edges extends outward from said outer cylindrical surface of said tunneling catheter and wherein said cutting means is precluded from cutting through said guide wire during rotation of said tunneling catheter as a result of said inner cylindrical surface of said tunneling catheter being a smooth cylindrical surface and being free of a cutting edge which could cut through said guide wire and wherein the inner diameter of said distal end of said tunneling catheter is only slightly larger than the outside diameter of said guide wire so that said distal end of said tunneling catheter is substantially centered about said guide wire; and wherein said tunneling catheter has a passageway formed between said inner cylindrical surface of said tunneling catheter and the outer surface of said guide wire, said passageway being in fluid communication between said distal and proximal ends of said tunneling catheter and being a means for collecting and removing cut plaque as said cutting means is advanced over said guide wire so as to cut the stenotic plaque

4,898,576

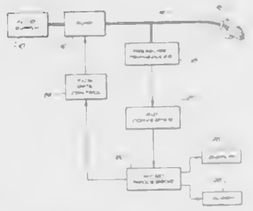
INTRAVENOUS FLUID FLOW MONITOR

James H. Philip, 75 Francis St., Boston, Mass. 02115

Continuation of Ser. No. 81,613, Jul. 31, 1987, abandoned, which is a continuation of Ser. No. 872,199, Jun. 6, 1986, abandoned. This application Aug. 22, 1988, Ser. No. 236,341

Int. Cl.⁴ A61M *5/14*

U.S. Cl. 604—50 **23 Claims**



1. A system for monitoring the flow of fluid through a fluid delivery system to a patient comprising:
(a) means for monitoring fluid pressure in the fluid delivery system supplying fluid to a patient;
(b) means for controlling the fluid flow through the fluid delivery system at sequentially different flow rates in a predetermined manner;
(c) means responsive to the sensed pressures and the sequentially different fluid flow rates, for determining resistance to fluid flow in the fluid delivery system; and
(d) means for comparing the determined resistance with predetermined limits and for generating output signals responsive thereto.

4,898,577

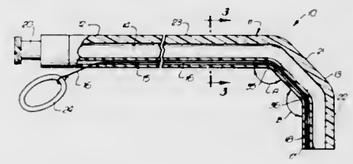
GUIDING CATHETHER WITH CONTROLLABLE DISTAL TIP

Rodney S. Badger, Morago; Lawrence D. Wasicek, Sunnyvale, and Bruce H. Wand, San Jose, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Sep. 28, 1988, Ser. No. 250,709

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 604—53 **12 Claims**



1. A guiding catheter comprising:
(a) a tubular member having a proximal portion, a main portion, and a distal portion, the distal portion having at least one section which is performed at an angle with respect to the main portion;
(b) a first lumen of relatively large diameter disposed within the tubular member which extends along the length thereof and which is adapted to receive catheters or guidewires therethrough;
(c) a second lumen of relatively small diameter disposed within the tubular member, extending along the length thereof;
(d) a control line which is disposed within the second lumen and which is secured at the disposed tip thereof to the distal portion of the tubular member; and
(e) means at the proximal end of the control line to axially move the control line within the second lumen to thereby change the preformed angle between a section of the distal portion of the catheter and the main portion thereof.

4,898,578

DRUG INFUSION SYSTEM WITH CALCULATOR

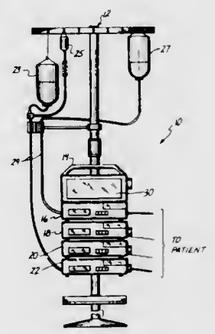
Bernardino Rubalcaba, Jr., Laguna Beach, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Filed Jan. 26, 1988, Ser. No. 148,554

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.⁴ A61M *5/16*

U.S. Cl. 604—66 **25 Claims**



1. A drug infusion system, comprising:
a plurality of infusion pump modules and a central management unit interconnected with the infusion pump modules

to provide centralized control, the central management unit including means for communicating with a user that includes:

(a) means for enabling the user to initiate the display of a menu of infusion-rate-related parameters;

(b) means for enabling the user to selectively assign values for any of the parameters in the menu; and

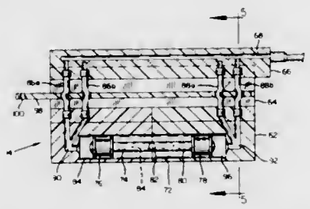
(c) means for automatically calculating an infusion rate value according to the values so assigned for purposes of controlling the infusion pump modules accordingly.

4,898,579

INFUSION PUMP

Leroy E. Groshong, Portland; Judson C. Groshong, Beaverton, both of Oreg., and R. James Brawn, deceased, late of Portland, Oreg. (by Stanley C. Fisher, administrator), assignors to Pump Controller Corporation, Portland, Oreg.

Division of Ser. No. 67,700, Jun. 26, 1987, Pat. No. 4,838,860.
This application Jun. 3, 1988, Ser. No. 201,951
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—67 **10 Claims**



1. An infusion pump for administering fluid from a fluid source through an outlet to a patient at a controlled average volumetric flow rate comprising:

(a) pump means for pumping fluid from said fluid source through said outlet at an average volumetric flow rate proportional to the average rate of movement of said pump means;

(b) electric motor means for moving said pump means; and

(c) control means for controlling the average rate at which said electric motor means moves said pump means, said control means comprising time-based means for repeatedly initiating motor-driving electric energy at a predetermined time rate, and position-based means for repeatedly terminating said energy in response to the advancement of said motor means beyond respective predetermined positions after respective initiations of said energy, said respective predetermined positions being separated by identical increments of movement of said motor means;

(d) said electric motor means comprising a rotary brushless permanent magnet motor, having a rotor with permanent magnet poles and magnetic field sensor means for sensing the magnetic fields of said poles and thereby indicating the angular position of said rotor, said position-based means being responsive to the position of said rotor as indicated by said magnetic field sensor means.

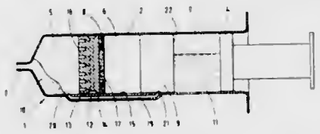
4,898,580

SYRINGE FOR A LIQUID PHARMACEUTICAL COMPOSITION

Patrick J. Crowley, Epsom, England, assignor to Beecham Group p.l.c., Middlesex, England

Filed Oct. 4, 1988, Ser. No. 253,677
Claims priority, application United Kingdom, Oct. 6, 1987, 8723454
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—90 **7 Claims**

1. A syringe for dispensing a liquid pharmaceutical composition, comprising a first chamber, adjacent the syringe outlet, for holding a first moisture sensitive component of the composition, a second chamber, adjacent the first chamber, containing moisture sequestering material, the second chamber being separated from the first chamber by a first barrier member movable within the syringe in response to fluid pressure, a third chamber, separated from the second chamber by a further movable barrier member, for holding a second, liquid component of the composition and being closed by a syringe plunger, and a liquid by pass around and outside the second chamber, for connecting the liquid component in the third chamber when the further movable barrier member reaches a predetermined position in the syringe in response to a compressive force from the plunger.

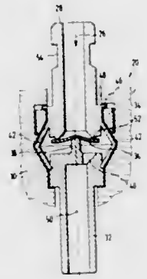


4,898,581

DEVICE FOR ADMINISTERING LIQUID

Peter Iwatschenko, Neunkirchen, Fed. Rep. of Germany, assignor to Pfrimmer-Viggo GmbH & Co. KG, Erlangen, Fed. Rep. of Germany

Continuation of Ser. No. 157,917, Feb. 19, 1988, abandoned.
This application Jun. 5, 1989, Ser. No. 364,546
Claims priority, applicatioo Fed. Rep. of Germany, Feh. 19, 1987, 3705357; European Pat. Off., Oct. 29, 1987, 87115896
Int. Cl.[4] A61M *5/00*; E16K *5/14*
U.S. Cl. 604—122 **8 Claims**



1. A check valve for a device for parenteral administration of a liquid, which comprises:

a tube segment connector having an annular valve seat at one end and a central axis;

a tube connector piece adjacent to the tube segment connector, the tube connector piece having a central axis and a peg centrally located on one end, wherein the annular valve seat is located adjacent to the peg and the central axes of the tube connector piece and the tube segment connector are aligned to form a central axis of the check valve;

an elastic membrane suspended perpendicular to the central axis of the check valve between the annular valve seat and the peg and biased against the annular valve seat by the peg, the peg being displaceable along the central axis of the check valve by a bellows surrounding the annular valve seat; and

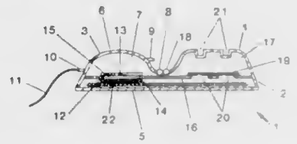
a selectively positionable locking means for variably compressing the bellows and displacing he peg so as to adjust the bias of the membrane against the annular valve seat thereby adjusting the opening pressure of the check valve.

4,898,582

PORTABLE INFUSION DEVICE ASSEMBLY

Rolf A. Faste, Stanford, Calif., assignor to Pharmetrix Corporation, Menlo Park, Calif.

Filed Aug. 9, 1988, Ser. No. 230,620
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—141 **8 Claims**



1. A portable infusion device assembly, comprising;

(a) a housing, defining first and second compartments disposed in side-by side relationship to one another,

(b) an osmotic pump, disposed within said first compartment,

(c) a driving liquid for said pump disposed within said second compartment,

(d) wick means, disposed within said housing, in liquid transferring relationship between said first and second compartments,

(e) a barrier disposed between said wick means and said driving liquid, and separating said driving liquid from said wick, and

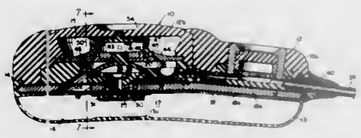
(f) means integral with said housing or said barrier for rupturing said barrier so that upon rupture of said barrier, said driving liquid will be transferred by said wick from said second compartment to said first compartment.

4,898,583

IMPLANTABLE PATIENT-ACTIVATED FLUID DELIVERY DEVICE AND OUTLET VALVE THEREFOR

Alexander S. Borsanyi, Newport Beach, and Russell J. Redmond, Goleta, both of Calif., assignors to Baxter Healthcare Corporation, Deerfield, Ill.

Filed May 18, 1988, Ser. No. 195,770
Int. Cl.[4] A61N *1/00*
U.S. Cl. 604—153 **5 Claims**



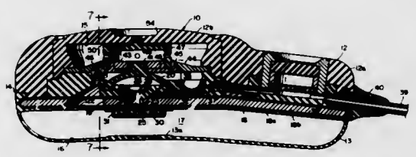
1. An implantable patient-activated device for dispensing metered amounts of fluid to such a patient, comprising a casing formed of soft, deformable polymeric material having a top wall and a bottom wall defining a fluid reservoir with an outlet port; pumping means within said casing including a compressible pump housing having a pumping chamber; first passage-providing means defining an inlet passage extending between said reservoir and said chamber; inlet valve means restricting flow through said inlet passage from said chamber to said reservoir; second passage providing means defining an outlet passage extending between said chamber and said outlet port; outlet valve means along said outlet passage for controlling flow therethrough; said outlet valve means including an annular valve seat of elastomeric material providing a valve opening and a cup-shaped valve member formed of elastomeric material having an outer surface normally sealingly engaging said valve seat; said top wall of said casing having a target zone operatively connected to said pump housing and deformable by finger pressure to compass said pump housing; said valve seat and valve member being deformable together, when said target zone is depressed to compass said pump housing and displace fluid from said chamber, until said seat reaches a limit of deformation and said valve member breaks away from said seat to allow fluid to surge through said outlet passage, said breakway and surge providing tactile feedback to signal a user applying finger pressure to said target zone that a metered amount of fluid has been discharged from said device; said body portion of said valve member including a base having a truncated stem portion; said truncated stem portion having an outer surface sealingly engageable with said deformable annular valve seat.

4,898,584

IMPLANTABLE PATIENT-ACTIVATED FLUID DELIVERY DEVICE

Alexander S. Borsanyi, Newport Beach; Russell J. Redmond, Goleta; Claude A. Vidal, Santa Barbara, and Edmund E. Spaeth, Orange, all of Calif., assignors to Baxter Healthcare Corporation, Deerfield, Ill.

Filed May 18, 1988, Ser. No. 195,702
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—153 **15 Claims**



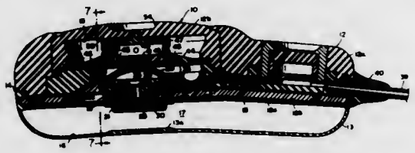
1. An implantable, patient-activated device for dispensing metered amounts of fluid to a patient, comprising a casing formed of soft, deformable polymeric material having a top wall and a bottom wall defining a fluid reservoir with an outlet port; a rigid support plate within said casing dividing said reservoir into upper and lower chambers and having an opening therethrough placing said chambers in communication with each other; pumping means mounted upon said plate within said upper chamber and comprising a compressible pump housing defining a pump cavity; first passage-providing means defining an inlet passage extending from said lower chamber to said cavity; inlet check valve means along said inlet passage; second passage-providing means defining an outlet passing extending from said cavity to said outlet port; outlet check valve means along said outlet passage; said top wall having a flexible pump-actuating zone; and connecting means within said upper chamber connecting said pump-actuating zone and said pump housing so that when said pump-actuating zone is depressed said pump housing is compressed to discharge from said outlet port an amount of fluid substantially equal to the volume of said pump cavity; said pump-actuating zone of said top wall being piercable by an injection needle and said pump-actuating zone also functioning as a target zone for the injection of fluid into said reservoir; and barrier means within said upper chamber for shielding said pump housing against contact by an injection needle inserted through said target zone; said barrier means including a rigid, needle-impenetrable disc connected to and extending over said pump housing.

4,898,585

IMPLANTABLE PATIENT-ACTIVATED FLUID DELIVERY DEVICE WITH BOLUS INJECTION PORT

Alexander S. Bermanyi, Newport Beach, and Michael L. Jones, Huntington Beach, both of Calif., assignors to Baxter Healthcare Corporation, Deerfield, Ill.

Filed May 18, 1988, Ser. No. 195,769
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—153 **2 Claims**



1. An implantable, finger-pressure-activated device for dispensing metered amounts of fluid to a patient, comprising a casing formed of soft deformable polymeric material having a top wall and a bottom wall defining a fluid reservoir with an outlet port; pumping means within said casing comprising a compressible pump housing having a pumping chamber; said casing including an enlarged body portion and a reduced lateral portion; said top wall of said body portion having a central target zone for finger pressure activation of said pump when said target zone is depressed; and said reduced lateral portion having a bolus injection chamber communicating with said outlet port; said top wall of said reduced lateral portion having a bolus injection port adjacent said bolus injection chamber with said bolus injection port separated from said chamber by a needle-piercable self-sealing elastomeric membrane; first passage-providing providing means being provided within said casing and defining an inlet passage extending from said reservoir to said pump chamber an annular valve seat at one end of said inlet passage facing said pump housing within said pump chamber; an elastomeric inlet valve member mounted within said pump chamber and normally engaging said valve seat to close said inlet passage; second passage-providing means defining an outlet passage extending from said pump chamber to said outlet port; said bolus-receiving chamber communicating with said outlet passage; whereby, medicament injected into said outlet passage through said bolus injection port is prevented from entering said inlet passage and said reservoir by said inlet valve member; and a grid member being mounted in said inlet valve passage; said grid member having a flow passages extending longitudinally therethrough and an end portion surrounded by said valve seat for engaging and bracing said elastomeric inlet valve member when back pressure develops in said pump chamber.

4,898,586

SUCTION CATHETER AND STORAGE HOLDER AND PACKAGE

Suellen McDonough, Durham, N.H., assignor to The Academy of Applied Science, N.H.

Filed Nov. 19, 1987, Ser. No. 122,374
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—171 **6 Claims**

1. A sterile suction catheter and sheath package in which the sheath serves also as a storage holder having, in combination, a flexible catheter tube open at one end and connected at the other end in an outlet stem of a valve T-stem section connector having inlet and outlet stems, the inlet stem of which is connectable to a suction hose; a packaging-and-storage sheath of tubing, in which the catheter is originally sterilely packaged end at least of the length of the catheter tube, open at one end and closed at the other end and of cross-section larger than that of the catheter tube for receiving the same therein and therealong; the said outlet stem having an enlarged region of cross dimension sufficient rigidly to seal within and against the said one end of the sheath when the catheter is fully inserted within the sheath and removable from said one end of the sheath to



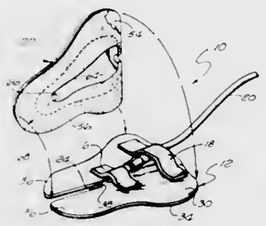
permit withdrawal of the catheter from the sheath, and then reinsertable within the sheath to re-seal within and against said one end of the sheath for repeated storage usage.

4,898,587

INTRAVENOUS LINE STABILIZING DEVICE

Csaba L. Mera, 1025 E. Ocean Ave., Suite B, Lompoc, Calif. 93436

Filed Nov. 15, 1988, Ser. No. 271,618
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—174 **22 Claims**



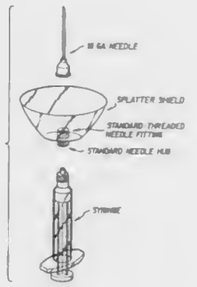
1. An intravenous line stabilizing device, comprising:
base means for adhering the stabilizing device to a part of a body, the base means including an upper surface, a lower surface, and a plurality of limbs, wherein two adjacent limbs adjoin one another at a crotch;
means for securing an intravenous line to the upper surface of the base means; and
cover means for overlying at least portions of the base means and the intravenous line, the cover means being adhered to the upper surface of the base means in a manner providing a continuous bridging surface between the two adjacent limbs, wherein the cover means includes cushion means for shielding the covered portion of the intravenous line from externally applied impact forces.

4,898,588

HYPODERMIC SYRINGE SPLATTER SHIELD

Christopher W. Roberts, P.O. Box 445, Derby Line, Vt. 05830

Filed Oct. 17, 1988, Ser. No. 258,790
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—187 **6 Claims**



1. A splatter shield for use with a hypodermic syringe during wound lavage, comprising a sheet of stiff material and a central tube which is attached to the sheet as it passes through the center thereof, said tube projecting on at least one side of said sheet and having one end adapted to receive a standard syringe fitting and the other end adapted to receive a standard hypodermic needle, wherein the shape of the sheet is a cone or a conic frustum of about 60° to 180° with the concavity of the cone being on the side of the sheet having the needle-receiving central tube end, and wherein the size and degree of concavity of the sheet is such as to allow the hypodermic needle, in use, to project below the base of the cone to the extent of about 10% to about 50% of the needle's length.

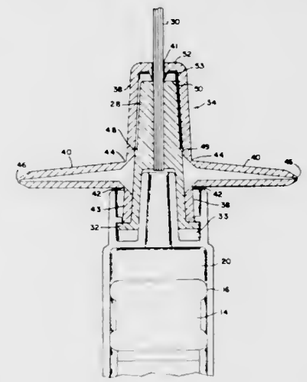
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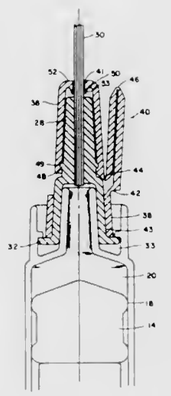
FLUID PASSING APPARATUS WITH MEANS FOR COVERING THE SAME

Stuart M. Dolgin, 95 Belvedere Dr., Syosset, N.Y. 11791, and Philip Torbet, Brookville, N.Y., assignors to Stuart M. Dolgin, Syosset, N.Y.

Continuation-in-part of Ser. No. 166,046, Mar. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 135,581, Dec. 21, 1987, abandoned. This application Sep. 7, 1988, Ser. No. 241,352
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—198 **16 Claims**

1. Apparatus for passing a fluid into or out of a warm-blooded animal or tissue thereof comprising:
(a) a body adapted to contain said fluid;
(b) a needle assembly in flow communication with said body and adapted to penetrate the warm blooded animal or tissue thereof comprising;
(i) a base having a pair of opposed ends,
(ii) needle means affixed to one end of the base, and
(iii) means for releasably securing the other end of the base to the body;
(c) means for mounting the needle assembly on the exterior surface of the body;
(d) means for urging said fluid out of or into said body through said needle assembly; and
(e) cover means comprising;
(i) a body having a top end including an opening for passage of the needle means,
(ii) a bottom end adapted to be secured to the base of the needle assembly,
(iii) at least one pair of arms hingedly attached to each other, one of said arms hingedly attached to the top end of the cover body and the other of said arms hingedly attached to the bottom end of the cover body, whereby the cover body moves from a retracted position wherein the needle means extends through the opening in the top end of the cover body and is in the operable position for passing fluid into or out of said warm-blooded animal, to an extended position wherein the





cover body moves upwardly and above the needle means thereby encasing the needle means within the cover body, and
(iv) means operatively interconnecting the cover body to the needle assembly for releasably retaining the cover body in the retracted position.

4,898,590

SYRINGE HAVING PROTECTIVE SLEEVE

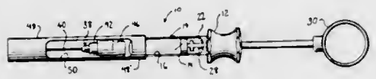
Leonard Andors, Brookhaven, N.Y., assignor to Research Foundation of the State University of N.Y., Albany, N.Y.

Filed Jun. 24, 1988, Ser. No. 211,476
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—198 **13 Claims**

1. A syringe comprising:
a barrel including longitudinal walls defining an elongate chamber therein for receiving a cartridge;
a first, elongate opening defined within said longitudinal walls through which a cartridge may be inserted into said chamber;

a second opening defined within said longitudinal walls of said barrel, said second opening in opposing relation to said first, elongate opening;

a sleeve slidably mounted to said barrel, said sleeve including a first, elongate opening and a second opening, said



second sleeve opening being in opposing relation to said first, elongate sleeve opening, said sleeve being movable to a position with respect to said barrel such that said first and second sleeve openings are substantially in register with said first and second barrel openings; and

means for retaining said sleeve upon said barrel.

4,898,591

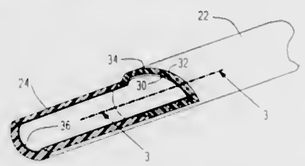
NYLON-PEBA COPOLYMER CATHETER

Yue-Teh Jang, Houston; Vern L. Liebmann, Sugar Land; Glenda S. Villman, Freeport, all of Tex., and Surendra A. Amin, Lake Charles, La., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Aug. 9, 1988, Ser. No. 229,991

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—282 18 Claims



1. An intravascular catheter comprising

a tubular body formed with inner and outer polymer layers with a reinforcing braid layer formed between the inner and outer layers, and

a soft flexible tubular tip formed from a polymer and having one end bonded to an end of the tubular body,

said polymers of said inner and outer layers and said tip including a blend of nylon and a copolymer of ester linked polyethylene and polyamide.

4,898,592

MEANS FOR THE APPLICATION OF TRANSDERMALLY ABSORBABLE ACTIVE SUBSTANCES

Arno W. Latzke; Ralf Latzke, and Gert Latzke, all of Mühltobel 946, CH-9429 Zelg/Wolfhalden, Switzerland

Continuation of Ser. No. 42,344, Apr. 24, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,923

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628688; Aug. 30, 1986, 3629565; European Pat. Off., Feb. 18, 1987, 87102306.5

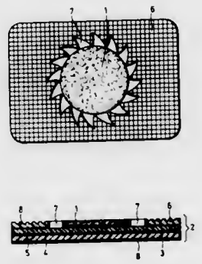
Int. Cl.[4] A61F *13/02*

U.S. Cl. 604—307 22 Claims

1. A device for application of a heated transdermally absorbable active substance to skin, comprising at least one replaceable carrier impregnated with a transdermally absorbable active substance, and a laminate support housing the carrier comprising:

(a) a first closed-cell polyethylene foam layer having a thickness of 2 to 6 mm, said first foam layer including a foil-facing area and a laminate-contacting area defined on a first surface, and an opposite surface,

(b) a second closed-cell polyethylene foam layer having a thickness of 2 to 5 mm, said second foam layer including



a laminate-contacting surface bonded to said laminate-contacting area of the first foam layer and an opposite, skin-contacting surface, wherein at least one portion of said second foam layer has been removed to define pink-shaped side walls housing the carrier, and

(c) a flexible heat-conductive metal foil, said metal foil including a first surface facing said foil-contacting surface of the first foam layer and an opposite surface facing said carrier.

4,898,593

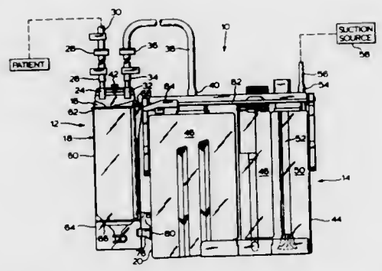
AUTOTRANSFUSION BAG HOLDER

David R. Swisher, St. Louis, and F. Thane DeWeese, Ladue, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Aug. 29, 1988, Ser. No. 238,366

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—319 9 Claims



1. An attachment device for attaching a collection bag to a drainage unit comprising

a collection bag holder having top and bottom ends and including an upper arm near said top end and a lower projection spaced below said upper arm near said bottom end,

a drainage unit having top and side surfaces and including an upper bracket with a vertically extending arm rigidly attached adjacent said top surface and a lower first fastener surface on said side surface,

the upper arm further including an extension for releasably engaging an opening in said bracket of said drainage unit to form a first attachment means,

said lower projection further including a second fastener surface for releasably engaging the first fastener surface on said side surface of said drainage unit to form a second attachment means, and

wherein said first and second attachment means limit the horizontal and vertical movement of the collection bag holder about the drainage unit and wherein said second attachment means prevents rotation about the first attachment means.

4,898,594

INCONTINENCE APPAREL FOR FEMALES

Alan M. Cottenden, Brickhill, Bedfordshire, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 937,027, Jan. 5, 1987, abandoned. This application Aug. 11, 1988, Ser. No. 231,649

Claims priority, application United Kingdom, Mar. 15, 1985, 8506790

Int. Cl.[4] A61F *13/16*

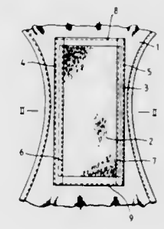
U.S. Cl. 604—397 9 Claims

1. A garment for use by an incontinent subject, having inner and outer surfaces respectively for location, in use, nearer to and further from said subject, and comprising:

an absorbent pad located over an area of said garment inner surface;

a sheet of liquid impermeable material having greater transverse dimensions than said area of said garment, with a central potion of said sheet being interposed between said area of said garment and said pad and with further portions of said sheet being conformed to pass over the sides of said pad and slightly across the surface of said pad remote from said area so that said sheet has a trough-like shape around said pad, remaining peripheral portions of said sheet being turned in folds to pass back across said remote surface of said pad and into engagement with said garment beyond said area;

first stitching formed through said sheet folds and said pad to interconnect the same without penetrating said area of



said garment and without penetrating the portion of said sheet which is interposed between said area and said pad; and

second stitching formed through said sheet peripheral portions and said garment to interconnect the same without penetrating said area of said garment and without penetrating the portion of said sheet interposed between said area and said pad.

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4,898,595

COLORING KERATINOUS MATERIAL

Petrina F. Fridd, and Rosemary M. Taylor, both of Wales, United Kingdom, assignors to Dow Corning Limited, Barry, Wales

Filed Feb. 17, 1987, Ser. No. 15,185

Claims priority, application United Kingdom, Feb. 26, 1986, 8604705; Jan. 12, 1987, 8700620

Int. Cl.[4] A61K *7/06, 7/13*

U.S. Cl. 8—405 **12 Claims**

1. In a method of coloring keratinous material by means of a hair colorant system, wherein the improvement comprises applying to said keratinous material a polysiloxane comprising from 0.1 to 100% of the total number of siloxane units, siloxane units having the general formula

$$R_a(HO)SiO_{(3-a)/2} \quad (i)$$

wherein R represents a monovalent hydrocarbon group having 1 to 12 inclusive carbon atoms, or an alkoxy or alkoxyalkoxy group, in which each alkoxy group has up to 7 carbon atoms and a is 1 or 2,

the balance of the siloxane units of the polysiloxane having the general formula

$$Z_cSiO_{(4-c)/2} \quad (ii)$$

wherein Z represents a monovalent hydrocarbon group having 1 to 12 inclusive carbon atoms, or an alkoxy or alkoxyalkoxy group in which each alkoxy group has up to 7 carbon atoms and c is 0, 1, 2 or 3,

the resulting polysiloxane having a degree of polymerization in the range of from 600 to 1700.

4,898,596

EXHAUST PROCESS FOR SIMULTANEOUSLY DYEING AND IMPROVING THE FLAME RESISTANCE OF ARAMID FIBERS

Phillip H. Riggins, and Peter J. Hauser, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 139,761, Dec. 30, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 295,001

Int. Cl.[4] D06P *5/00*

U.S. Cl. 8—490 **16 Claims**

1. A process of dyeing poly(m-phenyleneisophthalamide) fabric comprising:

(1) dyeing the fabric at about 120° C. to about 150° C. and at elevated pressure in a fiber-dyeing solution containing a tinctorial amount of at least one dye and a dye diffusion promoting amount of N-cyclohexyl-2-pyrrolidone, then

(2) heating the fabric while in contact with the solution until the desired degree of dyeing is attained.

4,898,597

FRIT BONDED ABRASIVE WHEEL

John Hay, Shrewsbury; Carole J. Markhoff-Matheny, Leicester, and Brian E. Swanson, Northboro, all of Mass., assignors to Norton Company, Worcester, Mass.

Filed Aug. 25, 1988, Ser. No. 236,586

Int. Cl.[4] C09K *3/14*

U.S. Cl. 51—298 **9 Claims**

1. A grinding wheel comprised of abrasive grain and a vitrified bond therefor, said abrasive grain consisting essentially of from 10% to 100% by weight of a polycrystalline sintered aluminous abrasive and from 0% to 90% by weight of a second type of abrasive, and wherein said vitrified bond contains at least 40% by weight of frit.

4,898,598

COMPOUND AND METHOD FOR POLISHING STONE

Manuel Zapata, Dallas, Tex., assignor to Superior Granite & Marble Restoration, Dallas, Tex.

Filed Oct. 27, 1988, Ser. No. 263,350

Int. Cl.[4] B24D *3/02*

U.S. Cl. 51—309 **9 Claims**

1. A compound for polishing stone comprising a mixture of aluminum and stannous metallic oxides, a natural resin wax and a pre-prepared gel.

4,898,599

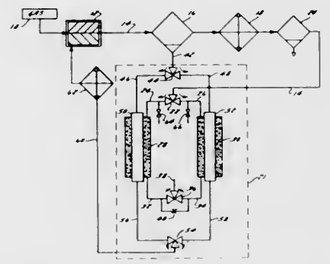
DESICCANT GAS DRYING SYSTEM

Bernard W. Settlemyer, Ocala, Fla., assignor to Pneumatic Products Corporation, Ocala, Fla.

Filed May 12, 1989, Ser. No. 352,373

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—28 **9 Claims**



1. A method for producing a dried, compressed gas, which comprises:

compressing a moist gas in the presence of an oil to produce a hot, compressed, moisture-laden, oily gas;

separating hot oil from said compressed gas; and

alternately contacting said gas with an adsorbent which adsorbs moisture from said gas and transferring heat from said hot oil to said adsorbent to intermittently desorb moisture from said absorbent.

2. An apparatus for compressing and drying a gas, comprising:

a gas compressor having means for producing a hot, compressed, moisture-laden, oily gas and means for separating hot oil from said compressed gas;

a dryer connected to said compressor for receiving said compressed gas from said compressor, said dryer having an adsorbent capable of alternately assuming a moisture adsorbing condition and a regenerating, moisture desorbing condition, and conduit means for circulating said compressed gas through said adsorbent to dry said compressed gas; and

means connected to said compressor and said dryer for intermittently transferring heat from said hot oil to said adsorbent to cause said adsorbent to assume said regenerating condition.

4,898,600

APPARATUS FOR RECOVERING HIGH TEMPERATURE BLAST FURNACE GAS

Genichi Ishibashi; Hideyuki Kamano, and Masahiko Seki, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Japan

Filed Jul. 26, 1988, Ser. No. 224,487

Claims priority, application Japan, Jul. 31, 1987, 62-116599

Int. Cl.[4] B01D *53/14*

U.S. Cl. 55—222 **30 Claims**

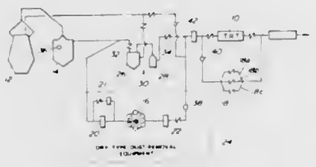
1. A blast furnace gas circulation system comprising:

a turbine driven by blast furnace gas for generating an elec-

tric power, said turbine having a turbine blade having a first heat resisting temperature;

a gas flow passage connecting top of a blast furnace to said turbine;

a dry type dust removing equipment disposed in said gas flow passage and designed for removing dust in said blast furnace gas, said equipment having a filter element having a second heat resisting temperature which is higher than said first heat resisting temperature;



a first cooling equipment provided upstream of said dry type dust removing equipment for cooling said blast furnace gas to a temperature lower than said second heat resisting temperature; and

a second cooling equipment provided downstream of said dry type dust removing equipment and upstream of said turbine, said second cooling equipment being responsive to said blast furnace gas temperature at upstream thereof higher than said first heat resisting temperature for cooling said blast furnace gas to the temperature lower than said first heat resisting temperature.

4,898,601

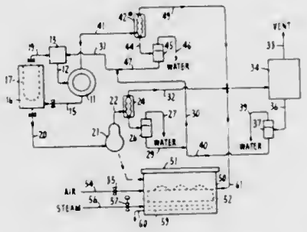
DRYCLEANING RESIDUE AFTERCOOKER

Michael E. Casey, 655 Palo Alto Ave., Mountain View, Calif. 94041

Continuation of Ser. No. 215,076, Jul. 5, 1988, abandoned, which is a continuation of Ser. No. 800,506, Nov. 21, 1985, abandoned. This application Jun. 1, 1989, Ser. No. 361,742

Int. Cl.[4] B01D *46/02, 53/04*

U.S. Cl. 55—341 R **8 Claims**



1. A dry cleaning solvent recovery system for separating contaminant-laden halohydrocarbon dry cleaning fluid into reusable clean dry cleaning solvent and solvent free solid residue comprising

a dry cleaning machine employing halohydrocarbon dry cleaning fluid and capable of generating a spent liquid comprising solid soil and filter aid in said halohydrocarbon dry cleaning fluid, said machine having a vent and a vent scrubber capable of removing and recovering dry cleaning solvent vapors from said vent,

means for recovering clean dry cleaning solvent from said spent liquid and generating a high solvent content residue phase comprising a mixture of soil and filter aid together with dry cleaning solvent, means for transferring said residue phase to a dry cleaning residue aftercooker device comprising a vapor-sealed enclosure having a vapor sealable opening adapted for receiving into said enclosure the high solvent-content dry cleaning residue phase, means for controlling the temperature within said enclosure to within the range of 65° F. to 175° F. means for admitting a flow of air into said enclosure into contact with said dry cleaning residue, and means for withdrawing a flow of solvent-vapor-enriched air from said enclosure and conducting said solvent-vapor-enriched air to said vent scrubber system present in said dry cleaning machine.

4,898,602

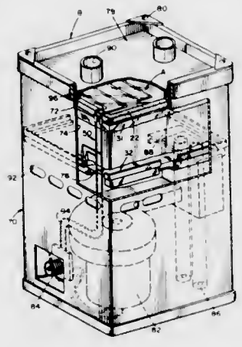
SELECTIVELY OPENABLE FILTERING ASSEMBLY

Thomas J. Gruber, 6805 Mayfield Rd., Bldg. B, Ste. 1114, Mayfield Heights, Ohio 44124

Filed Mar. 28, 1988, Ser. No. 174,100

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—359 **22 Claims**



18. A remotely openable assembly comprising:

a container having contents;

a cover means for sealing said container contents against communication with the surrounding environment, said cover means comprising a layer of a thermoplastic material; and,

a remotely activated means for opening said cover means for allowing said container contents to communicate with the surrounding environment, wherein said remotely activated means comprises a means for generating heat to sever said layer of thermoplastic material, after which said material shrivels up in order to expose said container contents to the surrounding environment.

4,898,603

METHOD FOR MANUFACTURING HALIDE GLASS OPTICAL FIBER

Joseph J. Hutta, Groton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 25, 1988, Ser. No. 223,185

Int. Cl.[4] C03B *15/16, 37/018*

U.S. Cl. 65—3.13 **3 Claims**

1. A process of manufacturing a clad optical halide glass fiber, said process comprising the steps of:

(a) providing a heavy metal fluoride core-glass melt, said melt being within a desired temperature range;

(b) providing a clad-glass melt, said clad-glass melt being within a desired temperature range;

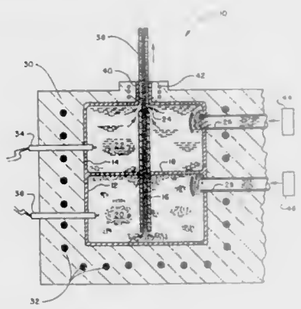
(c) causing said core-glass melt to flow through a core conduit;

(d) causing said clad-glass melt to flow through an orifice;

(e) positioning an output end of said core conduit centrally near said orifice such that said core-melt is cylindrically enclosed by said clad-glass melt whereby a HMFG optical fiber is formed in a molten condition;

(f) maintaining the molten optical fiber flowing through a die nozzle within a desired temperature range;

(g) extruding said molten optical fiber from said die nozzle in a vertical direction;



(h) drawing said molten optical fiber in a vertical direction counter gravity; and

(i) allowing said molten optical fiber to cool to form a solid optical fiber.

4,898,604

METHOD OF MANUFACTURING A BLANK FOR A LIGHT-WEIGHT MIRROR WITH A SUPPORTING STRUCTURE

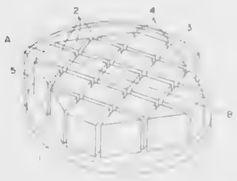
Paul Sauerwein, Rodenbach, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 841,915, Mar. 20, 1986, abandoned. This application Mar. 1, 1988, Ser. No. 165,447

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510414

Int. Cl.[4] C03B *23/207*

U.S. Cl. 65—18.1 **8 Claims**



1. A method of manufacturing a light-weight mirror with a supporting structure having means defining cells and that is fastened securely to a mirror plate, wherein the materials selected for the supporting structure and for the mirror plate have practically the same coefficient of thermal expansion and wherein the method comprises manufacturing the supporting structure by positioning mutually separated graphite molding bodies directly on a base in the form of a plate, said plate being a mirror plate, surrounding the molding bodies with a wall of graphite, filing the interstices between the individual molding bodies and between the molding bodies and the wall with a granulate of crystalline or amorphous quartz to create part of the supporting structure, placing the resultant overall assembly in a furnace where the assembly is heated in a non-oxidizing atmosphere for 2 to 6 hours under a pressure of 2×10^{-2} to 2 mbars at a temperature of 1710° C., to 1780° C. cooling the resulting bonded assembly within the furnace, and removing the graphite molding bodies once the assembly has cooled.

4,898,605

GLASS VESSEL IN PARTICULAR, AN AMPOULE AND A METHOD FOR TREATING THE GLASS VESSEL

Reinhard Mannl, Mitterteich, Fed. Rep. of Germany, assignor to Schott Ruhrglas GmbH, Postfach, Fed. Rep. of Germany

Continuation of Ser. No. 46,383, May 6, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 370,053

Claims priority, application Fed. Rep. of Germany, May 6, 1986, 3615287

Int. Cl.[4] C03B *33/09*

U.S. Cl. 65—113 **9 Claims**



1. A method of forming a pre-stressed strip in a glass vessel such as an ampoule to facilitate the opening of the vessel along the strip, said method comprising forming in a portion of said vessel designated for placement of the pre-stressed strip, a tensile stress zone solely by heating said zone, and after said zone has cooled forming in said zone a short compressive stress zone solely by heating a short section of said tensile stress zone.

5. A method of forming a pre-stressed strip in a glass vessel such as an ampoule to facilitate the opening of the vessel along the strip, said method comprising forming in a portion of said vessel designated for placement of the pre-stressed strip, an annular tensile stress zone solely by thermal treatment of said zone, and thereafter forming in said tensile stress zone a short compressive stress zone solely by thermal treatment of a short section of said tensile stress zone.

4,898,606

PHOSPHORYLAMINOPHENYLTRIAZOLINONE HERBICIDES

George Theodoridis, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 258,292, Oct. 14, 1988, abandoned. This application Mar. 7, 1989, Ser. No. 319,842

Int. Cl.[4] A01N *57/32;* **C07F** *9/65*

U.S. Cl. 71—86 **21 Claims**

1. A compound of the formula

in which

X and Y are independently F, Cl, or Br;

R is lower alkyl or lower haloalkyl;

R^1 is selected from lower alkyl, lower haloalkyl, cycloalkyl of 3 to 7 ring carbon atoms, lower alkenyl, lower haloalkenyl, lower alkynyl, lower haloalkynyl, and benzyl which is unsubstituted or substituted on the phenyl ring with one or more substituents selected from halogen, lower alkyl, lower alkoxy, lower alkoxycarbonyl, cyano, and nitro;

R^2 is independently selected from among —OR^1 or is hydroxy, amino, lower alkylamino, or lower dialkylamino;

R^3 is H, lower alkyl, or lower alkenyl; or a base addition salt of the compound as defined above in which R^2 is hydroxy.

20. A herbicidal composition comprising an herbicidally effective amount of the compound of claim 1 in admixture with a suitable carrier.

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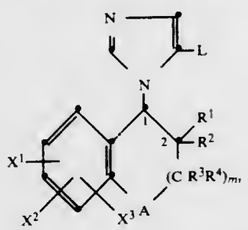
HERBICIDAL IMIDAZOLE DERIVATIVES

Henry Szczepanski, Wallbach, Switzerland, and Lourens Wals, Turnhout, Belgium, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 18, 1988, Ser. No. 234,240
Claims priority, application Switzerland, Aug. 25, 1987, 3242/87
Int. Cl.[4] A01N *43/50*; C07D *233/90*
U.S. Cl. 71—92 22 Claims

1. A 1,5-substituted imidazole derivative of formula I

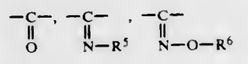
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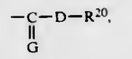
or a stereochemically isomeric form thereof, or a salt thereof, in which

m is 0 or 1,

A is a group



L is



X^1 is hydrogen, C_1–C_5alkyl, C_1–C_5alkoxy, halogen, C_2–C_5alkenyl, nitro, amino, C_1–C_5alkylcarbonylamino, trifluoromethyl or difluoromethoxy,

X^2 is hydrogen, C_1–C_5alkyl, halogen or C_1–C_5alkoxy,

X^3 is hydrogen or halogen, each of R^1 and R^2, independently of the other, is hydrogen, C_1–C_5alkyl or C_2–C_5alkenyl, or

R^1 and R^2 together with the carbon atom carrying them form a spirocyclic C_3–C_7cycloalkane ring,

R^3 is hydrogen, C_1–C_5alkyl, halogen, C_1–C_5alkoxy or hydroxy,

R^4 is hydrogen, C_1–C_5alkyl, halogen or C_1–C_5alkoxy, or

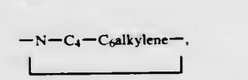
R^3 and R^4 together with the carbon atom carrying them form a carbonyl group, or

R^2 and R^3 are a C_2–C_5alkylene bridge; each of R^5 and R^6 is hydrogen, C_1–C_5alkyl, —CH_2—C_2—C_5alkenyl, benzyl or phenyl,

each of R^{14} and R^{15}, independently of the other, is hydrogen or C_1–C_5alkyl,

G is oxygen or sulfur

D is oxygen or sulfur and R^{20} is hydrogen, C_1–C_5alkyl, —CH_2—C_2—C_5alkenyl, —CH_2—C_2—C_6alkynyl, C_3–C_7-cycloalkyl, or C_1–C_5alkyl substituted by C_3–C_7cycloalkyl, C_3–C_7cycloalkoxy, phenyl, C_1–C_5alkoxy, hydroxy, cyano,



carboxy or by C_1–C_5alkoxycarbonyl.

18. A method of controlling weeds, which comprises treating the weeds or the locus thereof with a herbicidally effective amount of a compound of formula 1, according to claim 1.

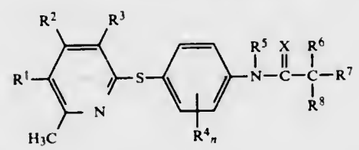
4,898,608

PYRIDYLTHIO-ACYLANILIDE HERBICIDES

Klaus Sasse, Bergisch-Gladbach; Reiner Fischer, Monheim; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 15, 1987, Ser. No. 38,700
Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614846
Int. Cl.[4] C07D *213/57, 213/64*; A01N *43/40*
U.S. Cl. 71—94 9 Claims

1. A pyridylthio-acetanilide of the formula



in which

R^1, R^2 and R^3, independently of one another, represent hydrogen, fluorine, chlorine, bromine, cyano or trifluoromethyl, or alkyl, alkoxy or alkylthio having 1 to 4 carbon atoms in each case,

R^4 represents fluorine, chlorine, bromine, methyl or methoxy,

n represents a number 0, 1 or 2,

R^5 represents hydrogen, or alkyl having 1 to 4 carbon atoms, or alkenyl or alkinyl having 2 to 6 carbon atoms in each case,

R^6 represents hydrogen, fluorine, chlorine, bromine, cyano, alkyl, having 1 to 4 carbon atoms, which is optionally mono- or polysubstituted identically or differently by fluorine, chlorine or bromine, alkenyl having 2 to 4 carbon atoms, phenyl or benzyl which are in each case optionally mono- to pentasubstituted identically or differently by fluorine, chlorine, bromine, trifluoromethyl, methyl and methoxy, or represent the —OR^{12} or —$S(O)_m$—R^{12} radicals, where

R^{12} represents alkyl having 1 to 4 carbon atoms which is optionally mono- or polysubstituted identically or differently by fluorine, chlorine, bromine, methoxy or ethoxy, or represent phenyl which is optionally mono- to pentasubstituted identically or differently by fluorine, chlorine, bromine or C_1–C_4alkyl,

m represents a number 0, 1 or 2,

R^7 ad R^8, independently of one another, represent fluorine, chlorine, bromine or alkyl having 1 to 4 carbon atoms which is optionally mono- or polysubstituted identically or differently by fluorine, chlorine or bromine,

X represents oxygen or sulphur.

8. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim 1.

4,898,609

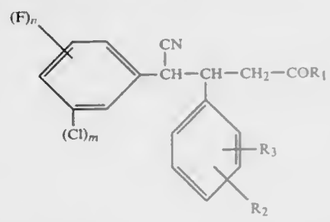
4-CYANO-4-(FLUOROPHENYL)-3-(SUBSTITUTED PHENYL) BUTYRIC ACIDS, ESTERS AND DERIVATIVES THEREOF, AND A METHOD OF SELECTIVELY CONTROLLING UNDESIRABLE VEGETATION IN RICE THEREWITH

Stephen S. Szucs, Trenton, N.J.; Laura S. Quakenbush, Yardley, Pa., and Pierre A. Marc, Willingboro, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 928,077, Nov. 6, 1986, abandoned. This application Oct. 9, 1987, Ser. No. 104,901
Int. Cl.[4] A01N *43/08, 37/34*; C07D *307/46*; C07C *121/66*
U.S. Cl. 71—105 38 Claims

21. A method for selectively controlling undesirable vegetation in transplanted rice comprising applying to flood water or soil as a preemergence post-transplant or pre-plant incorporated treatment, a herbicidally effective amount of an erythro/threo mixture of a compound of formula I

(I)



wherein R_1 is OH, OR_4 or OM, benzyloxy C_1–C_3 alkyl; R_2 is hydrogen, o-fluorine, m-fluorine, m-chlorine, m-bromine or m-OCH_3; R_3 is hydrogen, p-fluorine, p-OCH_3 or p-CH_3; provided that R_2 and R_3 are not both hydrogen; n is an integer of one or two; m is zero or one; R_4 is C_1–C_3 alkyl, C_1–C_4 alkoxy C_1–C_2 alkyl, furfuryl or benzyl; M is an alkali metal, C_1–C_3 mono or dialkylammonium and the stereoisomers thereof.

4,898,610

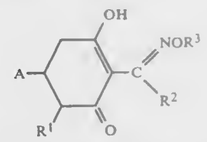
CYCLOHEXANE-1,3-DIONE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Michael Keil, Freinsheim; Dieter Jahn, Edingen-Neckarhausen; Rainer Becker, Bad Duerkheim; Wolfgang Rohr, Wachenheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 639,473, Aug. 10, 1984, abandoned. This application Jan. 5, 1987, Ser. No. 4,217
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329017
Int. Cl.[4] A01N *33/04*
U.S. Cl. 71—121 10 Claims

1. A cyclohexane-1,3-dione derivative of the formula

(I)



where A is phenyl monosubstituted in the para-position by trifluoromethyl, by fluorine-substituted C_1–C_3-alkoxy or by C_3–C_5-alkynyloxy, R^1 is hydrogen, methoxycarbonyl, ethoxycarbonyl, methyl or cyano, R^2 is C_1–C_4-alkyl, and R^3 is C_1–C_3-alkyl, C_3- or C_4-alkenyl, C_3- or C_4-haloalkenyl having 1, 2 or 3 halogen substituents, or propargyl, or a salt thereof.

6. A herbicide containing inert additives and a herbicidally effective amount of a cyclohexane-1,3-dione derivative of the formula I, or a salt thereof, as defined in claim 1.

4,898,611

POLYMERIC ORE AGGLOMERATION AIDS

Anthony E. Gross, St. Charles, Ill., assignor to 501 Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 176,128, Mar. 31, 1988, abandoned. This application Dec. 16, 1988, Ser. No. 285,408
Int. Cl.[4] C27B *1/14*
U.S. Cl. 75—3 3 Claims



1. An improved process for heap leaching precious metal ores containing gold and silver wherein the ore fines are first agglomerated with an agglomeration agent, formed into a heap and then leached by percolating through the heap a cyanide solution which extracts the gold and silver from the agglomerated ore for subsequent recovery, the improvement in which the agglomerating agent comprises an anionic water-soluble vinyl addition polymer having a molecular weight of at least 1,000,000, selected from the group consisting of: polyacrylamide; a copolymer of acrylamide and sodium acrylate; polyacrylamide containing sulfonate groups; and a polymer of acrylamide and sodium acrylate copolymer containing sulfonate groups with 5 to 20 pounds per ton of cement, based on the weight of the ore.

4,898,612

FRICTION-ACTUATED EXTRUSION OF RAPIDLY SOLIDIFIED HIGH TEMPERATURE AL-BASE ALLOYS AND PRODUCT

Paul S. Gilman, Suffern, N.Y., and Michael S. Zedalis, Randolph, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 31, 1988, Ser. No. 238,790
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—249 14 Claims



1. A friction-actuated extrusion process in which a continuous friction-actuated extruder has, as in-feed, a particulate that has not been outgassed, said particulate having been comminuted from rapidly solidified aluminum alloy ribbon.

4,898,613

RARE EARTH ALLOY POWDER USED IN PRODUCTION OF PERMANENT MAGNETS

Naoyuki Ishigaki, Otsu; Takaki Hamada, Takatsuki, and Setsuo Fujimura, Kyoto, all of Japan, assignors to Sumitomo Special Metals Co. Ltd., Osaka, Japan

Division of Ser. No. 832,890, Feb. 26, 1985, Pat. No. 4,769,063. This application Jan. 20, 1988, Ser. No. 145,982

Int. Cl.[4] B22F 1/00

U.S. Cl. 75—251 9 Claims

1. A rare earth alloy powder having a particle size in the range of 20 μm to 1 mm and produced by a reduction-diffusion treatment with calcium, consisting essentially of:

25–40 atomic % R_1,

35–83 atomic % Fe, and

2–15 atomic % B,

wherein R_1 represents at least one rare earth element selected from the group consisting of Tb, Dy, Ho, Er, Tm and Yb; and wherein oxygen is at most 7000 ppm, carbon is at most 1000 ppm and calcium is present in an amount not greater than 2000 ppm.

4,898,614

WATER SHEETING ZWITTERIONOMERIC AMINOFUNCTIONAL SILOXANES

Daniel J. Halloran, Midland; Kenneth A. Kasprzak, Saginaw Township, Saginaw County, both of Mich.; Stefano G. Savastano, Somerset, N.J., and Terence J. Swihart, Essexville, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 5, 1989, Ser. No. 293,842

Int. Cl.[4] C08G 77/04; C07F 7/04

U.S. Cl. 106—3 20 Claims

1. In a polish formulation containing as components thereof at least one member selected from the group consisting of waxes, solvents, surfactants, thickening agents, abrasives, dyes, odorants, and other ingredients normally used in making polishes, the improvement comprising incorporating therein a composition which is a zwitterion and the reaction product of an acid anhydride and an aminofunctional siloxane selected from the group consisting of (A) a combination of a hydroxyl endblocked polydimethylsiloxane having a viscosity in the range of about 10 to 15,000 cs at twenty-five degrees centigrade, and a silane selected from the group consisting of those having the general formulae $R''_n(R'O)_{3-n}Si(CH_2)_3NHR'''$ and $R''_n(R'O)_{3-n}SiRNHCH_2CH_2NH_2$ wherein R''' is a hydrogen atom or a methyl radical, R'' is a monovalent hydrocarbon radical free of aliphatic unsaturation and contains from one to six carbon atoms, n has a value of from zero to two, R' is an alkyl radical containing from one to four carbon atoms, and R is a divalent hydrocarbon radical free of aliphatic unsaturation and contains three to four carbon atoms, (B) a combination of a hydroxyl endblocked polydimethylsiloxane having a viscosity in the range of about 10 to 15,000 cs at twenty-five degrees centigrade, a silane selected from the group consisting of those having the general formulae $(R_1O)_3—SiR_2NHR_3$ and $(R_1O)_3—SiR_2NHCH_2CH_2NH_2$ wherein R_1 is an alkyl radical containing from one to four carbon atoms, R_2 is a divalent hydrocarbon radical free of aliphatic unsaturation and contains from three to four carbon atoms, and R_3 is selected from the group consisting of the hydrogen atom and the methyl radical, and a silane having the general formula X_3SiZ wherein X is selected from the group consisting of alkoxy and acyloxy radicals containing from one to four carbon atoms, and Z is a nonhydrolyzable radical selected from the group consisting of hydrocarbon radicals, halogenated hydrocarbon radicals, and radicals composed of carbon, hydrogen, and oxygen atoms, wherein the oxygen atoms are present in hydroxyl groups, ester groups, or ether linkages, there being from one to ten carbon atoms in the Z radical, and (C) a combination of a polydimethylsiloxane having a viscosity in the range of about one to 15,000 cs at twenty-five degrees centigrade, and a silane selected from the group consisting of those having the general formulae $R''_n(R'O)_{3-n}Si(CH_2)_3NHR'''$ and $R''_n(R'O)_{3-n}SiRNHCH_2CH_2NH_2$ wherein R''' is a hydrogen atom or a methyl radical, R'' is a monovalent hydrocarbon radical free of aliphatic unsaturation and contains from one to six carbon atoms, n has a value of from zero to two, R' is an alkyl radical containing from one to four carbon atoms, and R is a divalent hydrocarbon radical free of aliphatic unsaturation and contains three to four carbon atoms.

4,898,615

METHOD OF MANUFACTURING CEMENT

Fernando Trivino Vazquez, Madrid, Spain, and Roger J. Clenin, Puplinge, Switzerland, assignors to Catrel S.A. Societe D'Etudes et D'Applications Industrielle, Geneva, Switzerland

Filed Dec. 28, 1987, Ser. No. 138,160

Claims priority, application Switzerland, Mar. 12, 1987, 933/87

Int. Cl.[4] C04B 7/04, 7/06

U.S. Cl. 106—103 13 Claims

1. A method for manufacturing cement, comprising the steps of:

(a) preparing a homogenous powder mixture from (i) crushed refuse being substantially free of metal constituents, containing water and containing a significant percentage of combustible materials, and (ii) at least one first mineral material containing calcium oxide in the free or combined state, wherein said powder mixture comprises greater than 50% by weight refuse and less than 50% by weight of said first mineral material;

(b) granulating the powder mixture under pressure, whereby granules are produced;

(c) heat treating the granules at a temperature between about 130° and 230° C. for a length of time sufficient to bring the water content of the granules to between about 0.1 and 1.0% by weight, whereby a heat-treated refuse product is produced;

(d) mixing the heat-treated refuse product with a components selected from the group consisting of a mixture of limestone and clay and a mixture of silica, lime, alumina and iron oxides, and firing the resulting mixture in a kiln, whereby a clinker is produced; and

(e) adding gypsum to said clinker and crushing the resulting mixture, whereby cement is produced.

4,898,616

AQUEOUS ADDITIVE SYSTEMS, METHODS AND POLYMERIC PARTICLES

Kenneth W. Hyche, and William C. Gose, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 701,888, Feb. 15, 1985, abandoned. This application Feb. 7, 1986, Ser. No. 827,042

Int. Cl.[4] C08L 91/06; C09D 3/393

U.S. Cl. 106—271 4 Claims

1. Aqueous application system for applying additives to polymeric particles, the system being characterized by freedom from in situ formation of color producing complexes, said system comprising about 2 to about 10 percent by weight of a surfactant, about 5 to about 20 percent by weight of an emulsified wax, about 0.2 to about 1.0 percent by weight of a base with a pH in the range of greater than 7 to equal to or less than 10.5, about 20 to about 60 percent by weight of at least one additive capable of forming color producing complexes, and about 40 to about 60 percent by weight of water.

4,898,617

WORKING MATERIAL FOR CONSTRUCTION OR REPAIR

Masatoshi Motomura, Ichihara; Ichiro Muramatsu, Chiba; Noboru Okoshi, Sodegaura; Yoshitami Araki, Kisai; Kenichiro Noisura, Sette; Takehisa Kozai, Kodaira, and Hiroshi Mita, Hiroshima, all of Japan, assignors to Dainippon Ink & Chemicals, Inc. and Taisei Road Construction Co., Ltd., both of Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,162

Claims priority, application Japan, Sep. 28, 1987, 62-240885

Int. Cl.[4] C08L 95/00

U.S. Cl. 106—281.1 16 Claims

1. A working material for construction or repair comprising (A) a mixture of 0.5 to 30% by weight of (a-1) a hydroxide of a divalent or higher basic metal, 10 to 99% by weight of (a-2) an aggregate and 0.5 to 70% of (a-3) a bituminous substance, the total amount of these materials (a-1), (a-2) and (a-3) being 100% by weight, and covering the mixture (A), (C) oxidized rosin whereby a chelating reaction between the metal hydroxide (a-1) in mixture (A) and the oxidized rosin (C) is effectively inhibited.

4,898,618

PAINTABLE COMPOSITION FOR PROTECTING METALS AND CERAMICS DURING THERMAL TREATMENT

Cressie E. Holcombe, Jr., Knox County, and Lloyd R. Chapman, Anderson County, both of Tenn., assignors to ZTP Coatings, Oak Ridge, Tenn.

Filed Jun. 10, 1988, Ser. No. 205,090

Int. Cl.[4] C09K 15/02

U.S. Cl. 106—287.34 16 Claims

1. A paintable composition for producing, when dry, a coating for metal and ceramic substrates to inhibit oxidation, decarburization and similar deleterious reactions when said substrates are exposed to elevated temperatures, said composition consisting essentially of:

about 12–83 wt % aqueous-silica-containing liquid having about 27±9 wt % silica;

about 6–57 wt % R_2O aqueous solution, where R is selected from Na, K, Li and mixtures thereof; and

about 8.0–53.5 wt % of at least one transition metal component selected from the oxides and precursors of oxides of cobalt, chromium, iron, manganese, nickel, titanium, zinc and zirconium, based on the total weight of the composition.

4,898,619

PIGMENT COMPOSITIONS

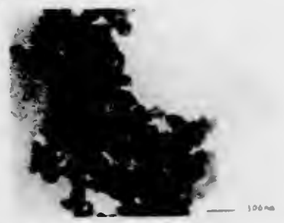
John F. Clifford, Buckinghamshire, and Fiona C. R. Morrison, Cheshire, both of United Kingdom, assignors to Cookson Group PLC, United Kingdom

Filed Dec. 19, 1988, Ser. No. 286,142

Claims priority, application United Kingdom, Dec. 21, 1987, 8729729

Int. Cl.[4] C09C 1/22

U.S. Cl. 106—459 19 Claims



7. A pigment which consists essentially of crystallites of iron oxide having an average particle size of less than 100 nanometers doped with from 10% to 80% by weight of aluminium as $A)^{3+}$ based on the weight of iron, having the general formula $(Al_xFe_{2-x})O_3$, where x=0.34 to 1.24 and having an orange colour with the following colour measurements:

L (Lightness) >45°

C (Strength) >40°

H (Hue) 50° to 60°

4,898,620

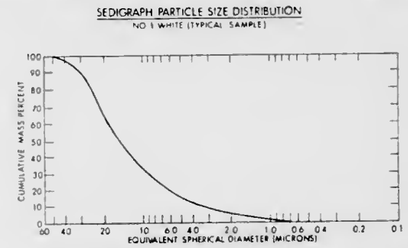
DRY GROUND/WET GROUND CALCIUM CARBONATE FILLER COMPOSITIONS

Jerry W. Rayfield, Sylacauga, Ala.; Robert Baker, Marietta, Ga., and Kenneth E. Weber, Pacific Palisades, Calif., assignors to ECCA Calcium Products, Inc., Atlanta, Ga.

Division of Ser. No. 231,391, Aug. 12, 1988, Pat. No. 4,835,195. This application May 16, 1989, Ser. No. 352,726

Int. Cl.[4] C08K 7/00

U.S. Cl. 106—464 10 Claims



1. A finely-divided particulate composition comprising a mixture of:

A. Dry-ground calcium carbonate wherein the particles present range in median particle size from about 5 μm to about 30 μm in equivalent spherical diameter and whose particle size distribution is such that:

(a) no more than about 10 weight percent of the particles present are greater than about 80 μm in equivalent spherical diameter;

(b) at least about 10 weight percent of the particles present are less than about 10 μm in equivalent spherical diameter;

(c) at least about 5 weight percent of the particles present are less than about 5 μm in equivalent spherical diameter; admixed with

B. wet-ground calcium carbonate having the following characteristics:

(a) the size of the mineral particles at the 50% point on a SediGraph particle size distribution curve representing the wet ground material is from about 0.6 μm to about 2.0 μm in equivalent spherical diameter;

(b) the size of the mineral particles at the 80% point on said distribution curve divided by the size of the mineral particles at the 50% point on said distribution curve gives a number of from about 1.3 to about 2.8;

(c) the size of the mineral particles at the 20% point on said distribution curve is from about 0.2 μm to about 1.5 μm in equivalent spherical diameter; and the overall sizes of mineral particles present are such that:

no more than about 2 weight percent of the particles present are larger than about 10 μm in equivalent spherical diameter;

at least about 97 weight percent of the particles present are less than about ∂μm in equivalent spherical diameter;

at least about 90 weight percent of the particles present are less than about 5.5 μm in equivalent spherical diameter;

at least about 70 weight percent of the particles present are less than about 3 μm in equivalent spherical diameter;

at least about 20 weight percent of the particles present are less than about 1.5 μm in equivalent spherical diameter; and

no more than about 40 weight percent of the particles present are less than about 0.4 μm in equivalent spherical diameter.

4,898,621

USE OF HYDROXYALKYL POLYETHYLENE GLYCOL ETHERS AS SURFACTANTS IN RINSE AIDS FOR DISHWASHING MACHINES

Horst Pruehs; Gilbert Schenker, Erkrath; Theodor Altenschoepfer, Duesseldorf, and Robert Piorr, Ratingen-Hoesel, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 220,142

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723873

Int. Cl.[4] C11D *1/72, 3/20*

U.S. Cl. 134—25.2 **10 Claims**

1. The process of rinsing dishes and glassware in a dishwashing machine comprising adding thereto a rinse aid composition containing a hydroxyalkyl polyethylene glycol ether corresponding to the following formula

$$R^1-CH(OH)-CH(R^3)-(OCH_2-CH_2)_n-OR^2 \quad (I)$$

in which

R^1 is hydrogen or a linear C_1–C_{16} alkyl radical,

R^2 is a linear or branched C_4–C_8 alkyl radical,

R^3 is hydrogen or a C_1–C_{16} alkyl radical and

n is a number of from about 7 to about 30,

with the proviso that the total number of carbon atoms in R^1 and R^3 is from about 6 to about 16, and mixtures of said ether.

4,898,622

ORNAMENTAL ALLOY MATERIAL AND METHOD

Takashi Kuze, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 214,336, Mar. 11, 1981, abandoned. This application May 5, 1983, Ser. No. 490,982

Claims priority, application Japan, Dec. 14, 1979, 54-161432

Int. Cl.[4] C22F *1/10*

U.S. Cl. 148—2 **9 Claims**



1. A process for preparing a nickel-chromium alloy including silver comprising the steps of preparing an ingot of the alloy mixture, consisting essentially of about 5 to about 20 weight percent chromium, about 0.3 to about 10 weight percent silver and the remainder is nickel, warm rolling the ingot at a temperature ranging from about 300 degrees to about 400 degrees Centigrade to form a billet where the cross-sectional reduction per pass is not greater than 20% and thereafter cold rolling the billet into a bar having a diameter ranging from about 2 to about 4 mm with the cross-sectional reduction being in excess of 80%.

4,898,623

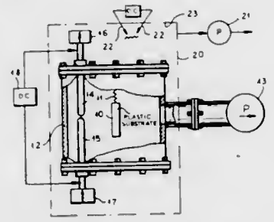
METHOD OF SHAPING HARD DIFFICULT-TO-ROLL ALLOYS

Eduard Pinkhasov, Eastchester, N.Y., assignor to Vapor Technologies Inc., Mt. Vernon, N.Y.

Filed Dec. 9, 1988, Ser. No. 282,609

Int. Cl.[4] B22D *23/00*; C22F *1/18*

U.S. Cl. 148—3 **18 Claims**



1. A method of making objects from difficult-to-roll alloys, comprising the steps of:

(a) depositing upon a synthetic resin substrate having a shape complementary to a shape to be imparted to a difficult-to-roll alloy, a layer of said alloy of approximately a final thickness of an object of said shape to be fabricated from said alloy, by striking an arc between electrodes at least one of which is constituted of at least one metal of said alloy in an evacuated space to form a vapor of the composition of said alloy and depositing said layer from said vapor on said substrate, whereby the composition of said layer is substantially true to the composition of said vapor;

(b) removing said layer from said substrate; and

(c) heat-treating the layer removed from said substrate to increase the density of said layer.

4,898,624

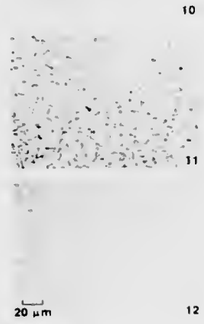
HIGH PERFORMANCE TI-6A1-4V FORGINGS

Amiya K. Chakrabarti, Monroeville, Pa.; George W. Kuhlman, Jr., Pepper Pike, and Stanley R. Seagle, Warren, both of Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 7, 1988, Ser. No. 203,691

Int. Cl.[4] C22F *01/18*

U.S. Cl. 148—11.5 F **11 Claims**



1. An alloy comprising:

5.5 to 6.75% Al,

3.5 to 4.5% V,

0.1 to 0.2% O,

0.02 to 0.05% N,

≦0.3% Fe,

0 to ≦0.08% C,

0 to ≦0.0125% H,

0 to ≦0.005 Y,

residual elements each 0 to ≦0.1%

total 0 to ≦0.4%, and the remainder Ti wherein the microstructure comprises nearly equiaxed primary alpha particles with platelets of secondary alpha in an aged beta matrix and wherein the fracture toughness (K_{Ic}) is at least about 45 ksi-(in)$^{\frac{1}{2}}$.

4,898,625

METHOD FOR PRODUCING A RARE EARTH METAL-IRON-BORON PERMANENT MAGNET BY USE OF A RAPIDLY-QUENCHED ALLOY POWDER

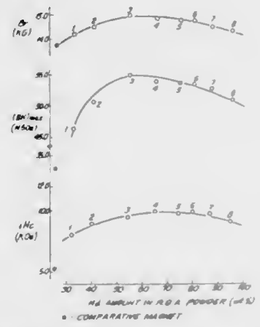
Tsutomu Otsuka, and Etsuo Otsuki, both of Miyagi, Japan, assignors to Tokin Corporation, Miyagi, Japan

Division of Ser. No. 97,656, Sep. 16, 1987. This application Apr. 11, 1989, Ser. No. 336,207

Claims priority, application Japan, Sep. 16, 1986, 61-217629; Jan. 30, 1987, 62-18707; Apr. 9, 1987, 62-85676; Apr. 11, 1987, 62-87917; May 18, 1987, 62-120826

Int. Cl.[4] H01F *1/02*

U.S. Cl. 148—101 **22 Claims**



1. A method for producing a transition metal-rare earth metal-boron permanent magnetic body with a high energy product and a reduced oxygen content, said permanent magnet body comprising a solid solution phase and magnetic crystalline particles dispersed within said solid solution phase, which comprises steps of:

preparing an ingot of R—T—B magnetic alloy comprising a magnetic intermetallic compound represented by a chemical formula of $R_2T_{14}B$, where R is at least one element selected from the group consisting of yttrium (Y) and rare earth metals, T is at least one transition metal comprising 50–100 at % iron on the basis of the total transition metal;

pulverizing and milling said ingot to thereby prepare a magnetic alloy powder;

preparing a rapidly quenched alloy body by rapidly quenching a melt comprising at least one metal element (R) selected from the group consisting of yttrium (Y) and rare earth metals and at least one of boron (B) and a transition metal (T);

pulverizing and milling said rapidly quenched alloy body to thereby produce a rapidly-quenched alloy powder;

mixing said rapidly-quenched alloy powder with said magnetic alloy powder to provide a mixed powder containing said rapidly quenched alloy powder in an amount of 70% or less by volume;

compacting said mixed powder into a compact body of a desired shape; and

liquid sintering said compact body at an elevated liquid sintering temperature to produce the permanent magnetic body wherein said rapidly-quenched alloy powder melts to a liquidus phase which cements the magnetic alloy powder and a part of the liquidus phase substantially generates the magnetic crystalline particles and the remaining portion of the liquidus phase generates the solid solution phase upon cooling from the liquid sintering temperature.

4,898,626

ULTRA-RAPID HEAT TREATMENT OF GRAIN ORIENTED ELECTRICAL STEEL

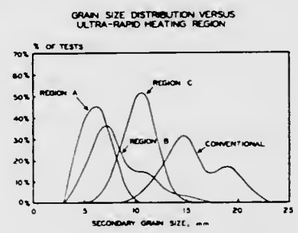
Jerry W. Shoen, and David E. Margerum, both of Middletown, Ohio, assignors to Armco Advanced Materials Corporation, Lyndora, Pa.

Filed Mar. 25, 1988, Ser. No. 173,698

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—111 **8 Claims**



1. A process for controlling secondary grain growth and improving the magnetic properties of grain oriented electrical steel strip containing less than 6.5% silicon, said process comprising the steps of subjecting said strip of final gauge to an ultra-rapid annealing treatment at a heating rate above 100° C. per second (180° F. per second) to a temperature above 675° C. (1250° F.), decarburizing and subjecting said strip to a final high temperature anneal for secondary growth, whereby said strip has secondary grains of reduced size a degree of texturing above 90% in the (110)[001] direction and improved core loss, which improvement will survive a stress relief annealing without any significant change in magnetic properties.

4,898,627

ULTRA-RAPID ANNEALING OF NONORIENTED ELECTRICAL STEEL

Jerry W. Schoen, Middletown, Ohio, assignor to Armco Advanced Materials Corporation, Lyndora, Pa.

Filed Mar. 25, 1988, Ser. No. 173,695

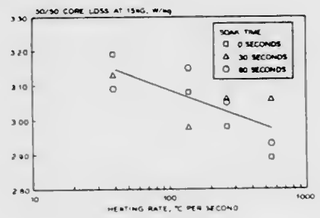
Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—111 **13 Claims**

1. A method for annealing nonoriented electrical steel strip which comprises:

a. heating said strip at a rate above 133° C. per second.

b. heating said strip to a peak temperature of from 750° C. to 1150° C., and



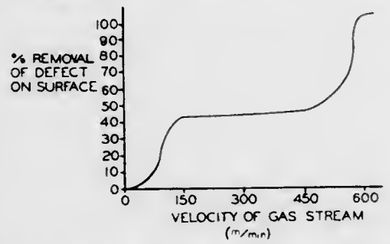
c. soaking said strip for a period less than five minutes within said peak temperature range.

4,898,628

HOT WORKING METHOD FOR PRODUCING GRAIN ORIENTED SILICON STEEL WITH IMPROVED GLASS FILM FORMATION

Wayne F. Block, Waukesha, Wis.; Wade S. Wright, Fairfield, Ohio, and Chris G. Klapheke, Gibsonia, Pa., assignors to Armco Advanced Materials Corporation, Lyndora, Pa.

Filed Jan. 19, 1989, Ser. No. 299,714
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—111 **16 Claims**



11. A method of improving the surface of cold rolled oriented silicon steel for improved adherence of an insulative coating comprising the steps of:

(a) heating a slab of oriented silicon steel in a hearth furnace to a temperature of 1260° to 1400° C.,

(b) subjecting said slab to an oxidizing treatment after exiting said furnace with a gas having at least 30% oxygen and a velocity of at least 460 meters/minute for at least one second,

(c) removing the scale formed during said oxidizing treatment,

(d) hot rolling said slab to form a hot rolled strip,

(e) annealing said hot rolled strip,

(f) cold rolling in one or more stages said annealed strip,

(g) decarburizing said cold rolled strip and providing a continuous surface of fayalite,

(h) applying an annealing separator and

(i) providing a final high temperature anneal to develop the magnetic properties of the oriented silicon steel and form a continuous glassy coating.

4,898,629

METHOD OF PRODUCING HOT ROLLED STEEL STRIP

Cestmir Lang, Oberhausen, and Lutz Meyer, Voerde, both of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 209,256
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721641
Int. Cl.[4] C21D *8/02*
U.S. Cl. 148—12 B **9 Claims**

1. A method of producing a hot rolled strip having a tensile strength of Rm=500 to 780 N/mm^2 from an unalloyed or low-alloy steel having 0.3 to 0.9% C, comprising austenizing a steel slab, hot rolling the slab into a hot rolled strip, cooling the strip on a run-out table and winding the strip into a coil, wherein the hot rolling and cooling of the hot rolled strip on the run-out table are controlled such that the austenite/ferrite transformation in the hot rolled strip starts only in the coil and is finished in the coil.

4,898,630

THERMOSETTING HIGHLY FOAMING SEALER AND METHOD OF USING IT

Osamu Kitoh, Nagoya, and Masahiko Ohashi, Inazawa, both of Japan, assignors to Toyota Jidosha Kabushiki and Iida Industry Co., Ltd., Japan

Filed Nov. 17, 1988, Ser. No. 272,285
Claims priority, application Japan, Nov. 18, 1987, 62-291550; Dec. 25, 1987, 62-331714
Int. Cl.[4] B32B *31/26, 31/30, 5/20*
U.S. Cl. 156—79 **21 Claims**



20. A process for filling a gap formed between two parallel planes comprising the steps of:

a first step of providing a thermosetting highly foaming sealer containing an unvulcanized rubber, a vulcanizing agent, a softener and an inorganic filler and comprising a first sealing member bonded on one of two parallel planes before heating and a second sealing member laminated on said first sealing member; and

a second step of vulcanizing, foaming and expanding said first sealing member from 1 to 2 times of original volume thereof and said second sealing member 6 times or more of original volume thereof by heating, thereby filling said gap with said thermosetting highly foaming sealer.

4,898,631

METHOD FOR FABRICATING CERAMIC FILAMENTS AND HIGH DENSITY TAPE CASTING METHOD

Earl R. Collins, Jr., La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jan. 15, 1988, Ser. No. 144,407
Int. Cl.[4] B28B *1/20*; B29B *9/06*
U.S. Cl. 156—89 **21 Claims**

1. A method of forming a mat of overlying sinuous filaments having a predetermined thickness comprising:

(a) blending a mixture comprising

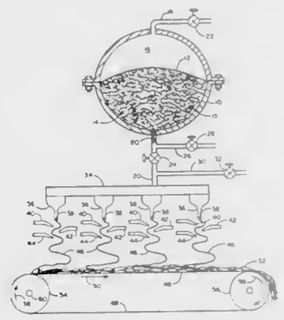
(i) finely divided solid particles,

(ii) a binder operable for bonding said solid particles together, and

(iii) a solvent for said binder, into an uniformly dispersed slurry,

(b) transforming said slurry into a plurality of downwardly falling filaments;

(c) deflecting said plurality of downwardly falling filaments with a plurality of impinging gas streams operative for deflecting and bending said filaments into a plurality of



downwardly falling sinuous filaments while simultaneously removing said solvent therefrom by evaporation; and

(d) collecting said plurality of sinuous filaments on a moving surface in such a manner that said plurality of sinuous filaments overlap each other a predetermined amount thereby forming a mat of overlying sinuous filaments having a predetermined thickness.

4,898,632

METHOD OF MANUFACTURING A SAFETY GLASS PANE COMPRISED OF A SHEET OF GLASS AND A SHEET OF FLEXIBLE PLASTIC MATERIAL

Mario Roth: Vordem Esche, both of Aachen, and Heinz Scholl, Eschweiler, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Jul. 30, 1984, Ser. No. 635,526
Claims priority, application France, Jul. 28, 1983, 83 12460
Int. Cl.[4] B32B *17/00*
U.S. Cl. 156—99 **10 Claims**

1. A method of manufacturing a laminated glass pane comprised of the following constituent parts: (i) a sheet of glass and, (ii) a sheet or film of flexible plastic material, wherein said sheet or film comprises at least one layer of flexible plastic material, said method comprising:

(i) stacking the constituent parts of at least two curved panes such that a face of each glass sheet which face is not covered by its corresponding plastic sheet or film serves as a counter-mold for the adjoining pane, and whereby a separating means is inserted between each pane;

(ii) applying a final counter-mold over the exposed plastic sheet of said stack;

(iii) subjecting the stacked panes and counter mold to conditions of elevated temperature and pressure.

4,898,633

ARTICLE CONTAINING MICROENCAPSULATED MATERIALS

Richard H. Doree, St. Paul, and Josef V. Ugro, Jr., Mahtomedi, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 880,050, Jun. 30, 1986, Pat. No. 4,774,133, which is a continuation of Ser. No. 699,660, Feb. 8, 1985, Pat. No. 4,654,256. This application Jul. 15, 1988, Ser. No. 219,180
Int. Cl.[4] A63B *39/00*
U.S. Cl. 156—145 **3 Claims**



1. Method of applying an article to a porous object, said article comprising:

(A) a thermoplastic polymeric substrate,

(B) on at least one surface of said substrate a layer comprising rupturable microcapsules carrying a liquid therein and a binder resin adhering the microcapsules to the substrate,

the surface of said substrate bearing said microcapsules being capable of softening sufficiently when exposed to heat to allow said microcapsules to become partially embedded in said surface by means of applied pressure, said microcapsules being sufficiently strong to avoid rupture when exposed to the heat and pressure required to soften said substrate and embed said microcapsules, said substrate further being capable of softening sufficiently so that the thermoplastic material of the polymeric substrate can flow sufficiently to allow the substrate to become bonded to porous objects, said method comprising the steps of:

(1) placing said article ono said porous object,

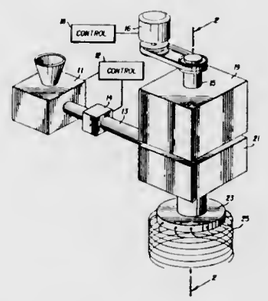
(2) subjecting said article to sufficient heat and pressure to partially embed said microcapsules in said substrate and adhere said substrate to said porous object.

4,898,634

METHOD FOR PROVIDING CENTRIFUGAL FIBER SPINNING COUPLED WITH PRESSURE EXTRUSION

Herbert W. Keuchel, Tallmadge, Ohio, assignor to John E. Benoit, Annandale, Va.

Division of Ser. No. 632,733, Jul. 20, 1984, Pat. No. 4,790,736. This application Jul. 5, 1988, Ser. No. 215,475
Int. Cl.[4] D01D *5/18*
U.S. Cl. 156—167 **17 Claims**



1. A process for forming fibers comprising

supplying a source of molten polymer fiber-forming material;

pumping said fiber-forming material from said source to at

least one spinneret on a rotatable die, said fiber-forming material being pumped under pressure through a substantially leak-proof closed channel connecting said source to said at least one spinneret on said rotatable die;

controlling the extrusion rate of said material through said spinneret by controlling the volumetric quantity of said fiber-forming material being pumped to said at least one spinneret through said channel; and

rotating said die during extrusion of said fiber-forming material;

whereby said molten polymer fiber-forming material is expelled from said spinnerets so as to produce fibers.

4,898,635

METHOD AND APPARATUS FOR BONDING PARTS OF DISAPPEARING MODEL USED FOR CASTING

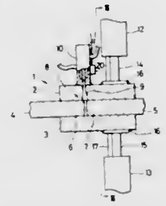
Toshiaki Kobari, Nagano, Japan, assignor to Morikawa Sangyo Kabushiki Kaisha, Nagano, Japan

Filed Oct. 12, 1988, Ser. No. 256,485

Claims priority, application Japan, Oct. 31, 1987, 62-276854

Int. Cl.⁴ B29C *45/14*; B32B *31/14*

U.S. Cl. 156—245 **3 Claims**



1. A method of bonding parts of a disappearing model used for casting comprising placing a plurality of parts of a foamable synthetic resin for making a disappearing model in adjacent relationship to each other to form an assembly to be bonded together; surrounding said assembly of parts with an injection mold frame which has been previously formed and has an internal shape that accords with the external shape of said assembly of parts to be bonded; said mold having an injection opening formed therein to allow an adhesive to be injected; by means of an injection nozzle injecting through said injection opening an adhesive between said portions to be adhered by means of an apparatus for injecting said adhesive so as to bond together said portions to be adhered; said external surfaces of said assembly being seated against the internal surfaces of said mold in such a manner that the adhesive is entirely confined to the space between the parts whereby the surfaces of the assembled and bonded parts are smooth; and removing said injection mold frame from said portion after bonding.

4,898,636

MULTILAYER PRINTED WIRING REGISTRATION METHOD AND APPARATUS

Walter S. Rigling, 113 Bridgeview Court, Longwood, Fla. 32779

Filed May 4, 1989, Ser. No. 347,290

Int. Cl.⁴ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—626 **7 Claims**

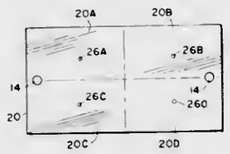
1. A method of registering terminal areas of the substrates of a laminated printed wiring panel; wherein the centers of the terminal areas have shifted from known design locations, for drilling holes therethrough prior to plating of electrical interconnections through the holes comprising the steps of:

(a) drilling, at a point of known design coordinates, a target pilot hole through an interior substrate board of the panel, prior to etching of a printed wiring pattern thereon and prior to lamination of the substrate board in the panel, said pilot hole having a diameter smaller than a terminal area;

(b) inserting a disc of detectable material into the drilled target hole;

(c) etching a printed wiring pattern on the drilled substrate board;

(d) fabricating the laminated multilayer panel with the drilled substrate board and undrilled substrate boards;



(e) detecting the location on the panel of a center of the detectable disc; and

(f) measuring the shift of the center of the pilot hole from the known design coordinates thereof, which shift occurs during etching and fabrication.

4,898,637

PROCESS FOR THE MANUFACTURE OF A TUBULAR SEMIMANUFACTURED ARTICLE MADE FROM PLASTIC FOR THE FABRICATION OF CONTAINER SACKS

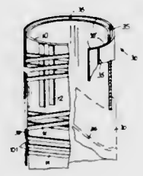
Franz X. Starlinger-Huemer, Sonnenuhrgasse 4, 1060 Vienna, Austria

Filed Nov. 10, 1987, Ser. No. 119,464

Claims priority, application Switzerland, Nov. 11, 1986, 04500/86

Int. Cl.⁴ B28B *21/52*

U.S. Cl. 156—172 **1 Claim**



1. A process for the maufacture of a sack, comprising the steps of:

extruding a tubular extrudate composed of a thermoplastic film;

laying longitudinal reinforcement strands in spaced apart relationship along said tubular extrudate;

laying at least two reinforcement strands onto said tubular extrudate and said longitudinal reinforcement strands in helical patterns in spaced-apart turns in opposite senses to form a reinforcement layer thereon extending along and around said tubular extrudate, so that gaps between said turns register with gaps between said longitudinal strands and are throughgoing through said reinforcement layer;

continuously delivering at least one thermoplastic film web from a roll to and winding said at least one film web around said reinforcement layer so that successive web turns have adjoining edges and bonding said adjoining edges together by heating to a soft and warm condition in the vicinity of a heated inner caibrating ring so that said turns from a continuous jacket around said reinforcement layer, said film and said film web being composed of thermoplastic material having melting temperatures below the melting temperatures of said strands;

thermally bonding said jacket through said throughgoing gaps directly to said tubular extrudate without bonding said jacket to said reinforcement layer to form a tube; and

forming a sack from said tube.

4,898,638

METHOD OF MANUFACTURING FLEXIBLE GASKETS WHICH WITHSTAND CHEMICAL AGENTS

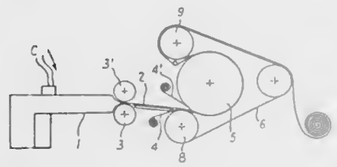
Pierre Lugez, Le Neubourg, France, assignor to Valois S.A., Le Neubourg, France

Filed Nov. 28, 1988, Ser. No. 276,740

Claims priority, application France, Nov. 26, 1987, 87 16427

Int. Cl.⁴ B29C *47/06*; B32B *25/08, 31/04, 31/28*

U.S. Cl. 156—272.6 **5 Claims**



1. A method of manufacturing a flexible gasket which withstands chemical attack from fluid substances, said method consisting in applying at least one film of PTFE (polytetrafluoroethylene) directly onto a sheet of raw rubber and in subjecting said sheet of rubber together with said film of PTFE to heating and to pressure suitable for causing said rubber to vulcanize, wherein said film of PTFE is previously treated by a corona effect which comprises bombarding said film with a corona discharge on that one of its two faces which comes into contact with said sheet of rubber.

4,898,639

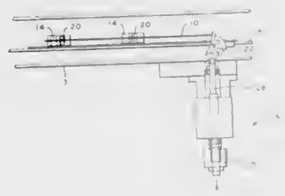
WAFER RETENTION DEVICE

Rolf Moe, Alameda; David J. Correia, Hayward, and Michael Downs, San Jose, all of Calif., assignors to Bjorne Enterprises, Inc., Fremont, Calif.

Filed Apr. 14, 1989, Ser. No. 338,056

Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—345 **9 Claims**



1. An apparatus for stripping materials from a wafer, the apparatus comprising a housing, an actuator means and a turret rotatably coupled to the housing for rotation about a selected axis, the turret being formed with a plurality of pockets, each pocket being shaped to hold a wafer, the flat surface of a wafer within the pocket defining a wafer surface plane and wherein each pocket includes:

support means disposed about the periphery of the pocket for supporting the retained wafer; and

a latching member pivotally coupled to the turret for rotation about an axis that is substantially parallel to the wafer surface plane at a pivot point spaced apart from the wafer surface plane substantially adjacent the edge of the wafer, the latching member including a cam follower portion for engaging the actuating means, a wafer engaging portion for pressing against the side of a wafer carried by the associated pocket, and biasing means for urging the cam follower towards the engagement position; and

wherein the actuator means is arranged to independently pivot the latching member from an engagement position suitable for contacting a wafer carried by the pocket to a disengaged position free from contacting the wafer.

4,898,640

CABLE SHIELDING TAPE AND CABLES INCORPORATING SUCH TAPE

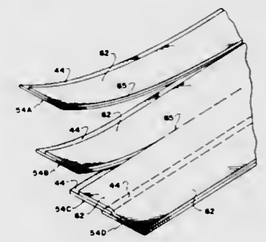
Lawrence J. O'Connor, Winnipeg, Canada, assignor to KT Technologies Inc., Bridgetown, Barbados

Filed Mar. 23, 1988, Ser. No. 172,425

Claims priority, application United Kingdom, Mar. 26, 1987, 8707219

Int. Cl.⁴ B65H *18/28*

U.S. Cl. 156—204 **18 Claims**



1. A method of manufacturing tape comprising forwarding a plurality of separate tapes each comprising a layer of an insulating material, laying the tapes as they are forwarded in a pattern each relative to the next so that an edge portion of each tape less than the width of the tape lies over an edge portion of a next adjacent tape, while the tapes remain in the pattern, laminating onto the tapes a layer of a conducting material of a width sufficient to cover more than one of the tapes, separating each of the insulating material tapes from the other insulating material tapes each with a portion of the conducting material laminated thereto covering a surface thereof except for said edge portion which is free from said layer of conducting material, and winding each of the tapes into a cylindrical package.

4,898,641

SINGLE CRYSTAL WAFER OF LITHIUM TANTALATE

Masahiro Ogihara; Shinji Makikawa, and Masaaki Iguchi, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

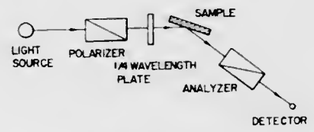
Continuation of Ser. No. 22,591, Mar. 4, 1987, Pat. No. 4,776,917, which is a division of Ser. No. 810,748, Dec. 19, 1985, abandoned. This application Jul. 19, 1988, Ser. No. 221,325

Claims priority, application Japan, Dec. 24, 1984, 59-280820

The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.

Int. Cl.⁴ C30B *29/30, 33/00*; H01L *41/01*; H03H *9/00*

U.S. Cl. 156—601 **1 Claim**



1. A method of preparing an SAW device having a deviation

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in the sound velocity of less than ±0.15% which comprises the steps of: (a) providing the surface of a single crystal wafer of lithium tantalate having a double refraction value of $4.5\times10^{-3}\pm6\times10^{-4}$ and in which the value of the variation of the double refraction value does not exceed $\pm6\times10^{-4}$ measured at a wavelength of 632.8 nm and at a temperature of 20° C.; and (b) forming two patterned electrodes on the surface of the single crystal wafer in a parallel alignment with each other in such an orientation that the direction of propagation of SAW is in parallel.

4,898,642

TWISTED, CHEMICALLY STIFFENED CELLULOSIC FIBERS AND ABSORBENT STRUCTURES MADE THEREFROM

Danny R. Moore, Germantown; James W. Owens, and Howard L. Schoggen, both of Memphis, all of Tenn., assignors to The Procter & Gamble Cellulose Company, Memphis, Tenn.

Continuation of Ser. No. 21,953, Mar. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 879,671, Jun. 27, 1986, abandoned. This application Feb. 1, 1989, Ser. No. 304,925
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.⁴ D21H *5/12;* **D06M** *1/00*
U.S. Cl. 162—157.6 **28 Claims**

1. Cellosic fibrous material comprising individualized, chemically stiffened, curled cellulosic fibers and a crosslinking agent, wherein said crosslinking agent is selected from the group consisting of C_2–C_8 dialdehydes, C_2–C_8 dialdehyde acid analoques having at least one aldehyde group, and oligomers of said dialdehydes and dialdehyde acid analogues, said fibers chemically stiffened by reaction with from about 0.75 mole % to about 2.0 mole % of said crosslinking agent, calculated on a cellulose anhydroglucose molar basis, said fibers having:

a. an average dry fiber twist count of at least about 4.5 twist nodes per millimeter;

b. an average wet fiber twist count of at least about 3.0 twist nodes per millimeter and at least about 0.5 twist nodes per millimeter less than said dry fiber twist count;

c. an average isopropyl alcohol retention value of less than about 30%; and

d. an average water retention value of between about 28% and about 50%.

4,898,643

HEADBOX CONTROL APPARATUS FOR A PAPERMAKING MACHINE

Elmer Weisshuhn, Vogt; Alfred Bubik, Ravensburg; Hans Dahl, Ravensburg; Herbert Holik, Ravensburg; Rüdiger Kurtz, Immenstaad; Anton Zembrot, Aulendorf; Wolf-Gunter Stotz, Ravensburg; Werner Selder, Ravensburg, and Robert Tröndle, Ravensburg, all of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss GmbH, Fed. Rep. of Germany

Filed May 19, 1986, Ser. No. 873,196
Claims priority, application Switzerland, Sep. 19, 1984, 04489/84; Feb. 28, 1985, 00915/85
Int. Cl.⁴ D21F *1/06*
U.S. Cl. 162—259 **30 Claims**

1. A headbox apparatus for a papermaking machine defining a predetermined machine direction and a predetermined web width and for producing a paper web from an infed fiber stock suspension passed through the headbox apparatus, said headbox apparatus comprising:

a distribution box for distributing an infed fiber stock suspension across the predetermined web width;

a diffusor system following said distribution box and receiving the infed fiber stock suspension from said distribution box;

said diffusor system possessing a plurality of diffusor channels for throughpassing the infed fiber stock suspension through said diffusor system;

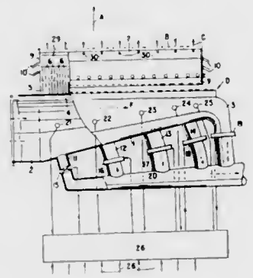
a nozzle chamber following and flow communicating with said diffusor system;

said nozzle chamber receiving said infed fiber stock suspension from said diffusor system;

said nozzle chamber containing a delivery slice defining an adjustable opening width for outfeeding the infed fiber stock suspension;

said nozzle chamber having a predetermined length between said diffusor system and said delivery slice and a predetermined width;

adjusting means for adjusting a predeterminate opening width profile of said adjustable opening width of the



delivery slice of said nozzle chamber and thereby a predeterminate weight per unit area distribution across said predetermined web width; and

control means operatively connected with said adjusting means and for controlling, as a function of the adjustment of said adjusting means, the throughflow of the infed fiber stock suspension through said nozzle chamber in order to substantially equalize said throughflow in terms of flow rate and pressure at least at preselected locations along the predetermined length and across said predetermined width of said nozzle chamber and thereby substantially eliminate transverse flows of the infed fiber stock suspension within the nozzle chamber.

4,898,644

REMOVAL OF VOLATILE ACIDS FROM AQUEOUS SOLUTIONS

Wendell E. Van Horn, Chicago, Ill., assignor to QO Chemicals, Inc., West Lafayette, Ind.

Filed May 2, 1988, Ser. No. 189,228
Int. Cl.⁴ B01D *3/34, 3/38;* **C07C** *51/44*
U.S. Cl. 203—15 **6 Claims**

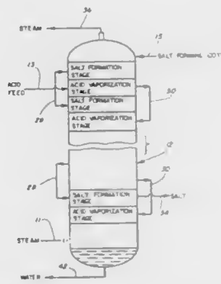
1. A process for removing a volatile acid from an aqueous solution thereof which comprises:

flowing steam upwardly within a distillation column having a plurality of alternately superimposed and separate salt formation zones and acid vaporization zones,

flowing an aqueous solution of a volatile acid downwardly within said distillation column through a plurality of said acid vaporization zones wherein it contacts upwardly flowing steam to effect at least partial vaporization of the acid,

passing said vaporized acid from each of said acid vaporization zones upwardly into a superimposed salt formation zone within said distillation column wherein it contacts a liquid containing an acid reactive cation flowing downwardly within said salt formation zone to form an acid salt, and

removing from said distillation column an acid salt.



4,898,645

PROCESS FOR THE PRODUCTION OF PURE TETRAFLUOROETHYLENE

Hartmut Voigt, Winhöring, and Reinhold Freudenreich, Burgkirchen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 30, 1988, Ser. No. 238,546
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729106
Int. Cl.⁴ B01D *3/34;* **C07C** *17/38*
U.S. Cl. 203—67 **8 Claims**

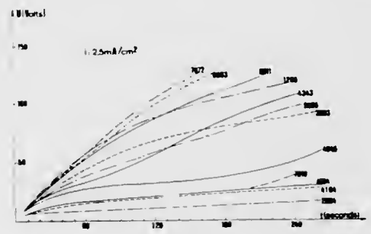
1. In a process for the production of pure tetrafluoroethylene from the gaseous pyrolysis products of a pyrolyzable C_1 to C_4 fluorocarbon which is pyrolyzable to form tetrafluoroethylene, said gaseous pyrolysis products comprising 20 to 70 percent by weight of tetrafluoroethylene and being essentially dry and essentially freed of any hydrogen chloride or hydrogen fluoride, condensing said pyrolysis gas to obtain a liquefied portion of the gas, introducing this liquefied portion of the gas into a first distillation column and separating by distillation at the top end of this column as a top product of the first column components boiling at a lower temperature than does tetrafluoroethylene, thereby forming a bottom product of the first distillation column and introducing this bottom product through an inlet into a second distillation column, distilling off pure tetrafluoroethylene as a top product of the second distillation column and discharging at the bottom of said column components boiling at a higher temperature than does tetrafluoroethylene, the improvement which comprises introducing into the second distillation column above the inlet for the bottom product of the first distillation column 0.6 to 2 kg of difluoromonochloromethane per 1 kg of tetrafluoroethylene discharged from the top of the second distillation column above the inlet for the bottom product of the first distillation column 0.6 to 2 kg of difluoromonochloromethane per 1 kg of tetrafluoroethylene discharged from the top of the second distillation column.

4,898,646

PROCESS FOR IDENTIFYING AL ALLOYS BY ELECTROCHEMICAL MEANS

Christophe Bommier, Moirans; Philippe Gimenez, Grenoble; Jean-Claude Kucza, St. Etienne de Crossey, and Jacques Rabiet, Goncelin, all of France, assignors to Pechiney, Paris, France

Filed May 2, 1989, Ser. No. 346,532
Claims priority, application France, May 3, 1988, 88 06431
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 204—1 T **12 Claims**



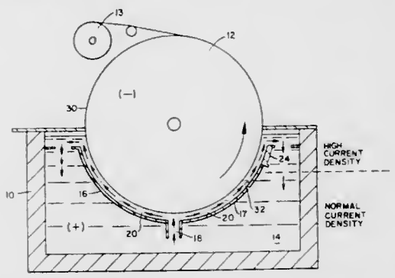
1. Method of determining the nature of Al alloys of unknown designation comprising the steps of: subjecting a sample of an Al alloy to anodization to determine the shape and relative position of the curve U=f(t) during intensiostatic operation, U being the voltage at the terminals of an electrolyzer and t the time, of which the analyzed sample constitutes the anode, the cathode being of 3003 or 1199; and making a comparison of the determined curve with a curve U=f(t) derived from an Al alloy of known designation to generally establish coincidence of the two curves.

4,898,647

PROCESS AND APPARATUS FOR ELECTROPLATING COPPER FOIL

Betty M. Luce, and Betty L. Berdan, both of Willowick, Ohio, assignors to Gould, Inc., Eastlake, Ohio

Continuation-in-part of Ser. No. 813,097, Dec. 24, 1985. This application Dec. 22, 1988, Ser. No. 288,472
Int. Cl.⁴ C25O *1/04*
U.S. Cl. 204—13 **31 Claims**



1. A process for producing surface treated metal foil, said process comprising:

providing an electrolytic cell having an electrolyte and a cathodic surface immersed in said electrolyte, said electrolyte containing a concentration of metal ions;

applying a first current density in a first zone for plating a relatively smooth metal foil deposit on said cathodic surface; and,

applying a continuous series of pulses of a second current density having a magnitude greater than the limiting cur-

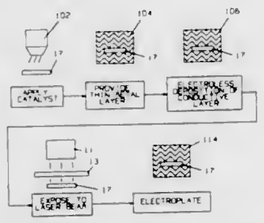
rent density in a second zone, said second current density forming a plurality of nodules on said metal deposit.

4,898,648

METHOD FOR PROVIDING A STRENGTHENED CONDUCTIVE CIRCUIT PATTERN

Dominic A. Cusano, Schenectady, N.Y., assignor to Pacific Bell, San Francisco, Calif.

Filed Nov. 15, 1988, Ser. No. 271,898
Int. Cl.[4] C25D *5/02;* **B05D** *3/06, 3/10, 5/12*
U.S. Cl. 204—15 **5 Claims**



1. A method for providing a patterned metallic layer on a surface of an insulating substrate comprising the steps of:
(a) providing a catalytic layer on said surface of said substrate for facilitating the deposition of metallic layers on said substrate;
(b) plating a first metallic layer of a predetermined thickness on said catalytic layer; and
(c) exposing first predetermined regions of said first metallic layer to an ablative laser beam so as to remove said first metallic layer in said first predetermined regions and to retain said first metallic layer in second predetermined regions.

4,898,649

METHOD FOR MANUFACTURING ELECTROLYTICALLY CHROMATED STEEL SHEET

Hiroki Iwasa; Toyofumi Watanabe, and Hirohide Furuya, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Feb. 10, 1989, Ser. No. 309,774
Claims priority, application Japan, Feb. 27, 1988, 63-45421
Int. Cl.[4] C25D *9/10*
U.S. Cl. 204—28 **2 Claims**

1. In an improved method for manufacturing an electrolytically chromated steel sheet, comprising the steps of:
subjecting a steel sheet intermittently to a plurality of runs of cathodic electrolytic chromate treatment in an acidic electrolytic chromating solution, to form on at least one surface of said steel sheet a chromating film comprising a metallic chromium layer as a lower layer and a hydrated chromium oxide layer as an upper layer formed on said metallic chromium layer;
the improvement comprising
at least one of said plurality of runs of cathodic electrolytic chromate treatment is carried out at an electric current density within the range of from 90 to 200 A/dm^2, to form numerous granular projections over the entire surface of said metallic chromium layer of said chromating film.

4,898,650

LASER CLEANING OF METAL STOCK

Jeff C. Wu, Clemmons; George B. Cvijanovich, and Richard T. Williams, both of Winston-Salem, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 10, 1988, Ser. No. 197,773
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[4] C25D *5/34;* **B05D** *3/06*
U.S. Cl. 204—29 **4 Claims**

1. A method of cleaning the nickel plated surface of an electrically conductive metal by removing surface contaminants therefrom, by the application of an excimer laser light, where said contaminants strongly absorb the laser light and said nickel plated metal is capable of absorbing laser wavelengths between 193 and 351 nm by at least 10%, comprising the step of subjecting said nickel plated metal to at least a single pulse of a laser emitting at a wavelength between 193 and 351 nm for a controlled length of pulse width of from 3 to 100 nsec. and sufficient energy density to vaporize said contaminants.

4,898,651

ANODIC COATINGS ON ALUMINUM FOR CIRCUIT PACKAGING

Issa S. Mahmoud, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 145,805, Jan. 15, 1988. This application Aug. 25, 1989, Ser. No. 398,680
Int. Cl.[4] C25D *11/08*
U.S. Cl. 204—29 **6 Claims**

1. A method of preparing aluminum alloy substrates for use in electrical packaging applications comprising the sequential steps of:
(a) cleaning aluminum alloy workpieces;
(b) polishing the aluminum alloy workpieces;
(c) rinsing the polished aluminum alloy workpieces;
(d) anodizing the aluminum alloy workpieces in an electrochemical cell in which the aluminum alloy workpieces are made positive and the cell solution comprises:
deionized water, sulfuric acid, a complexing agent, urea and ammoniated colloidal silica;
at a temperature of about 5 to about 15 degrees centigrade
at a current density initially of about 30 to about 50 amps per square foot
for a time determined as a function of the desired thickness in accordance with thickness=15 Angstroms per second times seconds;
(e) rinsing the anodized aluminum alloy workpieces in flowing deionized water; and
(f) drying the anodized aluminum workpieces in forced air.

4,898,652

POLYOXALKYLATED POLYHYDROXY COMPOUNDS AS ADDITIVES IN ZINC ALLOY ELECTROLYTES

Brian D. Bammel, Canton; Walter J. Wleczerniak, Utica, and Kenneth D. Snell, Rochester, all of Mich., assignors to OMI International Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 835,489, Mar. 3, 1986, abandoned. This application Nov. 2, 1988, Ser. No. 265,962
Int. Cl.[4] C25D *3/56*
U.S. Cl. 204—44.2 **55 Claims**

1. An aqueous acidic electrolyte suitable for electrodepositing zinc alloys on a conductive substrate comprising an effective amount of an additive agent comprising a bath soluble polyhydroxy compound having three or more hydroxyl groups at least one of which is substituted with an oxyalkylene group present in an amount effective to provide grain refinement of the zinc alloy electrodeposit, wherein said additive agent is substantially free of fatty acids or fatty acid moieties; zinc ions present in an amount of about 10 g/l to saturation; and an additional metal ion selected from the group consisting of iron ions present in an amount of about 5 to about 140 g/l,

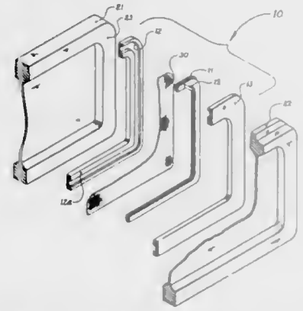
nickel ions present in an amount of about 0.5 to about 120 g/l, cobalt ions present in an amount of about 0.5 to about 120 g/l, and mixtures thereof.

4,898,653

COMBINATION ELECTROLYSIS CELL SEAL MEMBER AND MEMBRANE TENTERING MEANS

Gregory J. F. Morris, Milan, Italy, assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 26, 1988, Ser. No. 249,639
Int. Cl.[4] C25B *1/24, 9/00, 13/00*
U.S. Cl. 204—128 **11 Claims**



7. A method of operating an electrolytic cell comprising
(a) providing a seal/tentering member comprising an inflatable gasket member interposed between a first and second insulator members, said insulator members having a recess defining; a compartment adapted for receiving the inflatable gasket member, said insulator members interposed between a pair of cell frame flanges;
(b) fastening a sheet-like separator against at least one of the insulator members of the seal/tentering member;
(c) interposing the seal/tentering member with separator between at least a first frame member and a second frame member, the separator spacing apart an anode and a cathode compartments defined by the first and second frame members and the separator; and
(d) compressing the seal/tentering member with separator and the first and second frame members together;
(e) feeding an aqueous alkali metal halide solution to the electrolytic cell; and
(f) passing an electrical current from the anode to the cathode such that a halide is evolved at the anode.

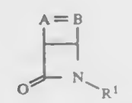
4,898,654

METHOD OF PRODUCING OPTICALLY ACTIVE β-LACTAM DERIVATIVES

Fumio Toda, Ehime; Kouichi Tanaka, Matsuyama; Masatoshi Taniguchi, Saita, and Michio Sasaoka, Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

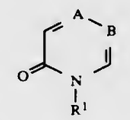
Filed May 26, 1989, Ser. No. 357,840
Claims priority, application Japan, May 27, 1988, 62-131263
Int. Cl.[4] B01J *19/08*
U.S. Cl. 204—157.71 **6 Claims**

1. A method of producing an optically active β-lactam derivative of the general formula



(II)

wherein A and B are the same or different and each is N, CH or C—R^2 in which R^2 is a lower alkyl group, a phenoxy group, a phenoxy group having 1 to 3 lower alkoxy groups as the substituent or a protected hydroxy group, and R^1 is a hydrogen atom, a lower alkyl group, a phenyl group, a phenyl group having 1 to 3 lower alkoxy groups as the substituent, a benzyl group or a benzyl group substituted with 1 to 3 lower alkoxy groups on the benzene ring, which comprises irradiating with light, in solid phase, an inclusion complex of a nitrogen-containing compound of the general formula



(I)

wherein A, B and R^1 are as defined above with an optically active host compound.

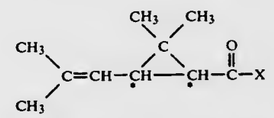
4,898,655

METHOD FOR RACEMIZATION OF OPTICALLY ACTIVE CHRYSANTHEMIC ACID OR ITS DERIVATIVES

Gohfu Suzukamo, Osaka, Japan; Yoji Sakito, Montreal, Canada; Masami Fukao, Shiga, Japan, and Koji Hagiya, Osaka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Jul. 15, 1988, Ser. No. 219,761
Claims priority, application Japan, Jul. 17, 1987, 62-179727; Sep. 28, 1987, 62-245656; Sep. 30, 1987, 62-248281; Mar. 31, 1988, 63-82040; Apr. 12, 1988, 63-89559; Apr. 21, 1988, 63-99962
Int. Cl.[4] B01J *19/08*
U.S. Cl. 204—157.87 **28 Claims**

1. A process for racemization of optically active chrysanthemic acid or its derivatives which comprises allowing optically active chrysanthemic acid or its derivatives of the formula



wherein X represents a hydroxyl group, a halogen atom, a C_{1-20} alkoxy group or a 2,2-dimethyl-3-isobutenylcyclopropane carboxyl group and * mark shows asymmetric carbon atoms, to react, in the presence of ultra violet light, with at least one bromine compound selected from the group consisting of hydrogen bromide, phosphorus bromide compounds, boron bromide compounds, aluminum bromide compounds, carboxylic acid bromides, tert.carbon-bromine compounds, N-bromine compounds, Si-bromine compounds, S-bromine compounds, and halo-bromine compounds or SH-compounds.

4,898,656

ELECTRODEPOSITION COATING PROCESS OF PHOTORESIST FOR PRINTED CIRCUIT BOARD

Masahiro Hoshino, Kobe; Isao Kobayashi, Takarazuka; Kenji Seko, Yokosuka; Naozumi Iwasawa; Yuu Akaki, both of Hiratsuka, and Toshio Kondo, Fujisawa, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 28, 1989, Ser. No. 329,636

Claims priority, application Japan, Mar. 28, 1988, 63-72083; Apr. 22, 1988, 63-98400; May 2, 1988, 63-109482; Jul. 28, 1988, 63-187031

Int. Cl.[4] C25D *13/04*

U.S. Cl. 204—181.1 16 Claims

1. An electrodeposition coating process of a photoresist for printed circuit board which comprises electrodeposition coating on a conductive surface a photosensitive electrodeposition coating composition (A), and thereafter further electrodeposition coating on the resultant coated plate an electrodeposition coating composition (B) composed chiefly of water-soluble or water-dispersible resin having a glass transition temperature (Tg) not lower than 20° C.

4,898,657

ELECTROPLATING APPARATUS FOR PLATE-SHAPED WORKPIECES

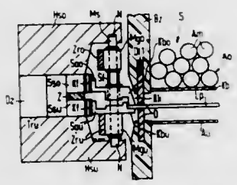
Daniel Hosten, Handzame, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 26, 1989, Ser. No. 371,634

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1988, 3823071

Int. Cl.[4] C25D *17/00*

U.S. Cl. 204—198 12 Claims



1. In an electroplating apparatus for plate-shaped workpieces which are being transported in a horizontal path through an electroplating cell of the apparatus, said apparatus comprising a plurality of contact clamps arranged at a distance from one another and laterally displaced outside of the cell for gripping an edge of the workpiece for cathodic contacting of the workpiece, a cathode current being supplied to the contact clamps by at least one live rail and by contact springs on the basis of a wiping contact, the improvements comprising said live rail comprising a core composed of a material having electrical conductivity and being provided with an envelope composed of a material having a high resistance to corrosion, each contact spring being composed of a material having a high resistance to corrosion, and said contact springs being connected to the live rail mechanically in an electrically conductive fashion.

4,898,658

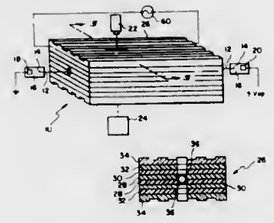
INTEGRATED TEMPERATURE CONTROL/ALIGNMENT SYSTEM FOR HIGH PERFORMANCE CAPILLARY ELECTROPHORETIC APPARATUS

Barry L. Karger, Newton; Aran Paulus, Boston; Aharon S. Cohen, Brookline, and Robert J. Nelson, Boston, all of Mass., assignors to Northeastern University, Boston, Mass.

Filed Nov. 25, 1987, Ser. No. 125,539

Int. Cl.[4] G01N *27/26*

U.S. Cl. 204—299 R 19 Claims



1. An integrated temperature control/alignment system disposed in an ambient environment for use with a high performance electrophoretic apparatus including a capillary column and an externally prepositioned on-column detection device, comprising:

means for thermoelectrically regulating heat transfer between the capillary column and the ambient environment to maintain the capillary column at a predetermined electrophoretic operating temperature, said thermoelectric regulating means including

means for mounting the capillary column as part of the electrophoretic apparatus, said mounting means being formed from an electrical insulating material having a coefficient of thermal conductivity to provide efficient heat transfer between the capillary column and said mounting means sufficient to maintain the capillary column at said predetermined electrophoretic operating temperature, said mounting means including

means for aligning the capillary column in a predetermined position to the externally prepositioned on-column detection device within said integrated temperature control/alignment system as part of the electrophoretic apparatus for on-column detection, and

means for physically engaging the capillary column to lock the capillary column in said predetermined position within said integrated temperature control/alignment system.

4,898,659

MULTI-POINT COLD SOLVENT INJECTION IN SCRAPED SURFACE DEWAXING CHILLERS

Thomas E. Broadhurst, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 21, 1988, Ser. No. 171,675

Int. Cl.[4] C10G *43/08*

U.S. Cl. 208—33 3 Claims

1. In the solvent dewaxing of waxy hydrocarbon oils using indirectly cooled scraped surface chillers the improvement comprising injecting cold dewaxing solvent into the scraped surface chillers at multiple points to form a wax/oil/solvent slurry and controlling the ΔT occurring at each injection point within each chiller bank across the entire chiller train, so that the ΔT at each injection point attributable only to cold solvent injection is equal.

4,898,660

CATALYTIC USES OF CRYSTALLINE METALLOPHOSPHATE COMPOSITIONS

Stephen T. Wilson, Shrub Oak; Brent M. Lok, New York, and Edith M. Flanigen, White Plains, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 472,135, Mar. 4, 1983, abandoned, which is a division of Ser. No. 315,055, Oct. 26, 1981, Pat. No. 4,385,994, which is a division of Ser. No. 166,333, Jul. 7, 1980, Pat. No. 4,310,440. This application Oct. 20, 1983, Ser. No. 544,080

Int. Cl.[4] C10G *11/02*

U.S. Cl. 208—114 10 Claims

1. Process for converting a hydrocarbon which comprises contacting said hydrocarbon under hydrocarbon converting conditions with an aluminophosphate having a framework structure whose chemical composition expressed in terms of mole ratios of oxides is:

$$Al_2O_3:1.0\pm0.2\ P_2O_5$$

said framework structure being microporus in which the pores are uniform and have nominal diameters within the range of about 3 to about 10 Angstroms, an intracrystalline adsorption capacity for water at 4.6 torr and 24° C. of at least 3.5 weight percent, the adsorption and desorption of water being completely reversible while retaining the same essential framework toplogy in both the hydrated and dehydrated state.

4,898,661

METHOD FOR DEWAXING HYDROCARBON OIL EMPLOYING CRYSTALLINE ALUMINOSILICATES PROMOTED WITH A SOLID FLUORINE COMPOUND

Masaru Uaho, Yokohama, and Hajime Okazaki, Kawasaki, both of Japan, assignors to Nippon Oil Co., Ltd., Japan

Continuation-in-part of Ser. No. 788,242, Oct. 17, 1985, abandoned. This application Jul. 29, 1987, Ser. No. 79,233

Claims priority, application Japan, Oct. 18, 1984, 59-218847

Int. Cl.[4] C10G *35/08, 11/08*

U.S. Cl. 208—117 18 Claims

1. A method for dewaxing hydrocarbon oil which is characterized by bringing said hydrocarbon oil into contact with a catalyst which is prepared by mixing a crystalline aluminosilicate having an SiO_2/Al_2O_3 molar ratio between 12 and less than 70 with at least one solid fluorine compound selected from aluminum fluoride, ammonium fluoride, zinc fluoride, cadmium fluoride, manganese fluoride, chromium fluoride, tin fluoride, copper fluoride and silver fluoride; molding the resulting mixture; and calcining the molded mixture at a temperature of 100° to 700° C. for a time of 0.5 hour or more; said crystalline aluminosilicate being obtained by exposing a gelled reaction mixture consisting of a silica source, an alumina source, an alkali source, water and an organic compound in the molar composition ratio

$SiO_2/Al_2O_3 = 10$ to 100

$H_2O/SiO_2 = 5$ to 100

$OH^-/SiO_2 = 0.01$ to 1.0

$R/Al_2O_3 \geqq 0.05$

wherein R is said organic compound, to hydrothermal synthetic conditions of a reaction temperature of 50° to 300° C. for a reaction time of 3 hours to 1 month.

4,898,662

CATALYTIC CRACKING PROCESS USING HIGH EQUILIBRIUM ACTIVITY ADDITIVE CATALYST

Pochen Chu, West Deptford, and Sadi Mizrahi, Cherry Hill, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Division of Ser. No. 130,491, Dec. 9, 1987, Pat. No. 4,818,738. This application Oct. 31, 1988, Ser. No. 264,577

Int. Cl.[4] C10G *11/05*

U.S. Cl. 208—120 15 Claims

1. A process for the catalytic cracking of a hydrocarbon feedstock under cracking conversion conditions in the presence of a mixture of catalysts comprising:

(i) a cracking catalyst, and

(ii) an additive catalyst comprising a crystalline zeolite having a Constraint Index of from about 1 to about 12 and having at least 10% of the exchangeable cation sites occupied by cations, said cations selected such that the cationic form of said zeolite is thermodynamically favored at cation loading conditions and the hydrogen form of said zeolite is thermodynamically favored under catalytic cracking unit regenerator steaming conditions, said zeolite bound in a matrix chosen such that the matrix component forms a thermodynamically favored compound with said cations under catalytic cracking unit regenerator steaming conditions wherein the maintenance of the activity of the additive zeolite is enhanced.

4,898,663

METHOD FOR CONTROLLING SEDIMENTATION IN AN EBULLATED BED PROCESS

Scott M. Sayles; William B. Livingston, and Michael P. Bellinger, all of Baton Rouge, La., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 25, 1988, Ser. No. 275,831

Int. Cl.[4] C10G *17/00, 45/20*

U.S. Cl. 208—178 3 Claims

1. In a continuous process for treating a fluid hydrocarbon feedstock with a hydrogen-containing gas at elevated catalytic reaction temperatures and pressures in the presence of a bed of particulate solid catalyst, said process comprising introducing the hydrogen-containing gas and feedstock into the lower end of a generally vertical catalyst containing reaction vessel wherein the catalyst is placed in random motion within the fluid hydrocarbon whereby the catalyst bed is expanded to a volume greater than its static volume, wherein the mixture of feedstock, gas and catalyst constitutes a turbulent zone from which zone aged catalyst is removed and fresh catalyst is added, the upper portion of which turbulent zone is defined by an interface with a substantially catalyst depleted zone from which zone hydrocracked product is removed, and wherein said fluid hydrocarbon feedstock is changed from a first, sediment yielding feedstock F_1 to a second feedstock of different sediment yield wherein the improvement comprises:

a. setting the flow rate of the first feedstock F1 at a first flow rate F1(1),

b. initiating flow of said second feedstock F2 at a first flow rate F2(1),

c. increasing the flow rate of the second feedstock to a second flow rate F2(2) at which a selected concentration of sediment in the hydrocracked product is reached, and then increasing the flow rate of the second feedstock until a selected steady state flow rate F2(SS) is reached,

d. maintaining said steady state flow rate F2(SS) until the concentration of sediment drops below the selected concentration,

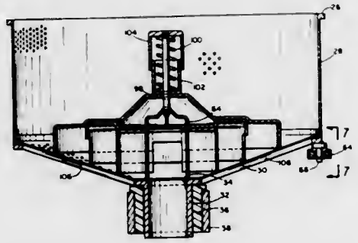
e. reducing the flow rate of the first feedstock F1 at a rate such that the selected concentration of sediment is not exceeded.

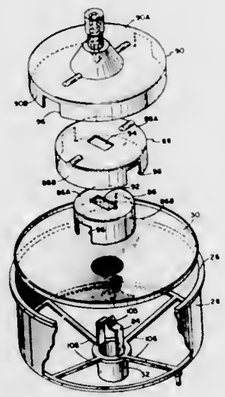
4,898,664

SIFTER FOR USE IN SEPARATING DOUGH BALLS FROM BREADING

Vernon E. Reece, 1936 W. 47th Pl., Tulsa, Okla. 74125

Division of Ser. No. 226,223, Jul. 29, 1988, Pat. No. 4,862,824.
This application Apr. 17, 1989, Ser. No. 339,382
Int. Cl.[4] B07B *1/00*
U.S. Cl. 209—235 5 Claims





1. A sifter for use in separating dough balls from breading comprising:

a sifter basket having a foraminous portion through which breading but not dough balls can pass and having a bottom with a central opening therein of a size which permits the passage of dough balls therethrough;

a plurality of inverted cup shaped members each having an enclosing top wall portion and a circumferential downwardly extending side wall and each side wall having at least one notched opening therein, the inverted cup-shaped members being of different diameters and concentrically arranged upon one another in a stacked array with the top wall portions of adjacent cup-shaped members being in abutting engagement and the smallest diameter cup-shaped member on the bottom and the largest diameter cup-shaped member on top;

means to removeably retain said inverted cup-shaped members in the stacked array adjacent said sifter basket bottom thereby providing a labyrinth path between an outermost surface of the side wall of the largest diameter cup-shaped member and the interior of the smallest diameter inverted cup shaped member through which dough balls pass to reach said central opening; and

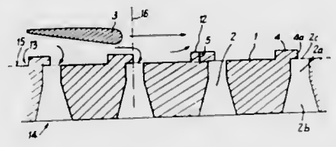
means to vibrate said basket to cause breading to be sifted therefrom.

4,898,665

SCREENS FOR PAPER PULP PURIFIERS

Jean-Pierre Lamort, Vitry Le Francois, France, assignor to E & M Lamort, Vitry Le Francois, France

Filed Apr. 4, 1988, Ser. No. 177,502
Claims priority, application France, Apr. 6, 1987, 87 04833
Int. Cl.[4] B07B *1/04*
U.S. Cl. 209—273 13 Claims



1. A screening device, comprising:

a screening element with a perforated surface and a plurality of perforations each passing through said screening element, each of said perforations having an inlet at said perforated surface and an outlet spaced from said perforated surface;

means for producing turbulence in a flow of fluid passing through said perforations and for directing the flow directly into said perforations, said producing and directing means including a plurality of obstacles, each of said obstacles extending from an area on said perforated surface that is upstream of a respective one of said inlets and further extending into an area that is over at least a portion of said respective one of said inlets so as to constitute an entry baffle; and

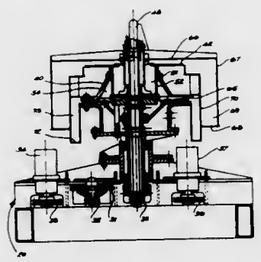
a hydrodynamic profiled blade for preventing said perforations from clogging, said blade being arranged upstream of said perforations and obstacles and being rotatable for creating pulsations of flow into said perforations with each pass.

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ROTATING CENTRIFUGAL JIG WITH PULSATOR

Christopher G. Kelsey, Sydney, Australia, assignor to Lowan (Management) Pty. Limited, East Glenelg, Australia

PCT No. PCT/AU86/00016, § 371 Date Sep. 22, 1986, § 102(e) Date Sep. 22, 1986, PCT Pub. No. WO86/04269, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 24, 1986, Ser. No. 939,520
Claims priority, application Australia, Jan. 25, 1985, PH9037; Apr. 12, 1985, PG0122
Int. Cl.[4] B03B *5/12*
U.S. Cl. 209—425 15 Claims



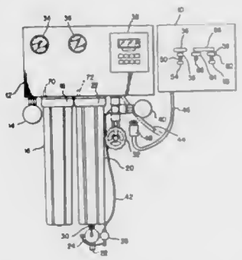
1. A centrifugal jig comprising a container mounted for rotation about its longitudinal axis, the container comprising an axial region and a peripheral region, ragging separating said regions, means for rotating said container, means for introducing feed material to the axial region, means for supplying fluid to said peripheral region, and means for pulsating the fluid in said peripheral region while the container rotates, said pulsating means comprising interface means communicating with said peripheral region, said interface means being located substantially wholly outside the volume defined by the free surface of the feed material and the projection of that free surface to its intersection with said longitudinal axis.

4,898,667

POINT-OF-USE MEMBRANE FILTRATION SYSTEM

Charles Dimun, Billerica; David Marcus, Newton; Philip Mitchell, East Walpole, and Samuel B. Sachs, Brookline, all of Mass., assignors to The Kendall Company, Boston, Mass.

Filed Mar. 14, 1988, Ser. No. 167,658
Int. Cl.[4] B01D *21/30, 27/00*
U.S. Cl. 210—138 16 Claims



1. A filtration system for producing depyrogenated water comprising:

a filter cartridge,

said filter cartridge having an inlet conduit means for charging liquid into said cartridge,

said inlet means having a drain valve, whereby liquid may be drained therefrom when said drain valve is in the open position,

said inlet means having a reject valve, whereby liquid may be drained therefrom when said reject valve is in the open position,

said filter cartridge having an outlet means,

said outlet means having a product dispensing valve,

said outlet means having a rinsing valve,

means for maintaining said water to be dispensed in a depyrogenated condition between periods of non-use of the said system consisting essentially of,

means for opening said reject valve in response to the opening of said product dispensing valve,

means for automatically periodically opening said drain valve for a preselected period of time,

means for opening said rinsing valve for a preselected period of time.

4,898,668

FUEL FILTER WITH HEATER

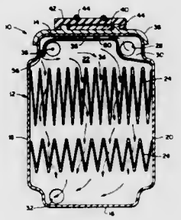
David H. Hodgkins, Granby, and Alex Shinkevich, West Suffield, Conn., assignors to Stanadyne Automotive Corp., Windsor, Conn.

Filed Sep. 30, 1988, Ser. No. 251,907
Int. Cl.[4] B01D *35/8*
U.S. Cl. 210—180 20 Claims

10. A fuel conditioner comprising:

a housing having a fuel inlet port, a fuel outlet port, and an inner defining a location for containing at least one filter element;

a baffle plate situated within the housing between the inlet port and said location, the baffle plate conforming in shape with and being in adjacent closely spaced relation to a selected portion of the housing thereby defining a flow passage between the plate and the housing portion through which fuel makes a single pass from the inlet port to said location;



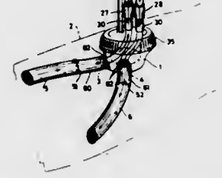
heater means situated on the exterior of said portion of the housing, and having a heating surface in contact with and conforming to said exterior of said selected housing portion for controlling the temperature of the fuel passing through the flow passage by the transfer of heat through the housing portion to the fuel in the flow passage.

4,898,669

VASCULAR ACCESS DEVICE, IN PARTICULAR FOR PURIFICATION TREATMENTS OF THE BLOOD

Franco Tesio, Pordenone, Italy, assignor to Claber S.p.A., Italy

Filed Jun. 13, 1988, Ser. No. 206,105
Claims priority, application Italy, Jun. 16, 1987, 20908 A/87
Int. Cl.[4] B01D *13/00;* A61M *5/00*
U.S. Cl. 210—232 6 Claims



1. A vascular access device, comprising:

a case designed to be grafted permanently in living tissue and having a pair of connections for blood vessels, the connections being structured to couple with respective ends of at least one cut blood vessel, the case having an outer surface covered with a first layer of damping material on which is arranged a second layer of biocompatible material weldable to the living tissue;

a two-position valve removably housed in said case and a pair of access ports for removal means and admission means for blood, the valve being a rotary valve having two independent passages wherein, in a first rotational angular position of the valve the passages establish connection between a first of the connections and a first of the access ports and between a second of the connections and a second of the access ports, respectively, and in a second rotational angular position of the valve the passages establish connection between said first and second connections and between said first and second access ports, respectively, said access ports being formed in a retaining element for said valve and being connected to the passages by unions formed in the case, the retaining element being

removably locked by a ringnut screwed onto the case; and,

a plate having two portions, each of the portions having an upper sleeve and a lower sleeve, said upper sleeves being structured to receive said removal means and said admission means for the blood and said lower sleeves being structured to penetrate said access ports, the plate being lockable on the vascular access device by a shaped ring threadable onto the case.

4,898,670

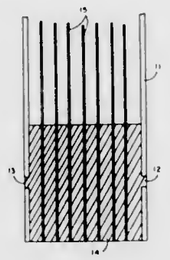
CARTRIDGE BONDING

Arye Z. Gollan, Needham, Mass., assignor to A/G Technology Corporation, Needham, Mass.

Continuation of Ser. No. 745,783, Jun. 17, 1985, abandoned. This application Jun. 8, 1987, Ser. No. 59,583

Int. Cl.[4] B01C *13/00*

U.S. Cl. 210—232 **3 Claims**



3. In an assembly of a housing with a wall of substantially uniform inside diameter for a structure sealed with a potting compound engaging the inside of said wall inside said housing, the improvement comprising,

mechanical locking means for mechanically locking said potting compound to said housing and extending into a region coextensive with the housing wall,

said housing having an end edge perpendicular to the axis of said housing adjacent to said regional formed with a plurality of openings in said wall with said mechanical locking means comprising at least one of a portion of said potting compound extending over and contacting said end edge, and a portion of said potting compound extending into said openings,

said structure comprising a hollow fiber membrane potted to said housing by said potting compound and extending through the axial length of said potting compound.

4,898,671

FILTERING DEVICE FOR THE SEPARATION OF LIQUIDS AND SOLIDS

Kamil Fux, Schiebel, Schmerikon, and Ludwig Gresa, Bohlstrasse 6, Uznach, both of Switzerland

Division of Ser. No. 448,982, Nov. 24, 1982, Pat. No. 4,702,847. This application Oct. 13, 1987, Ser. No. 112,377

Claims priority, application Switzerland, Mar. 25, 1981, 2005/81

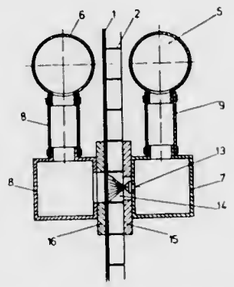
Int. Cl.[4] B01D *23/24, 29/38*

U.S. Cl. 210—333.01 **8 Claims**

1. A filter apparatus for separating a liquid slurry into a solids fraction and a liquid fraction, comprising:

a generally flat filter consisting essentially of a single support grid and a filter material located on one side of said support grid, said filter having an inflow side and an outflow side, said inflow side carrying said filter material and having solids deposited thereon and said outflow side being supported by said single grid, said grid subdividing said outflow side into a plurality of separate injection chambers and defining a plurality of separate small regions of said filter, said grid being only located on said outflow side;

jet means for directing a stream of liquid through one of said injection chambers and against one of said small regions of said filter defined by said one injection chamber, said jet means including a cover plate directly contacting and engaging said grid to close said one injection chamber opposite said filter material;



sludge removing means, directly contacting and engaging said inflow side of said filter and aligned with said jet means, for receiving solids dislodged from said filter by said stream of liquid; and

moving means, coupled to said jet means and said sludge removing means, for simultaneously moving and maintaining alignment of said jet means and said sludge removing means to that said jet means and said sludge removing means close selectively each of said injection chambers to direct a stream of liquid therethrough.

4,898,672

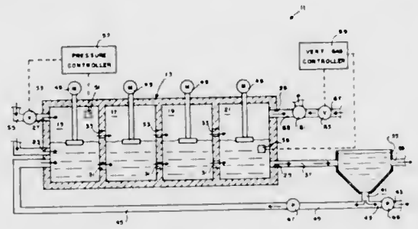
OXYGEN CONTROLLING WASTEWATER TREATMENT METHOD

Ricky C. Clifft, 21 Meriweather Dr., Paragould, Ark. 72450, and Melrose T. Garrett, 5237 Chesapeake Way, Houston, Tex. 77056

Division of Ser. No. 96,004, Sep. 14, 1987, Pat. No. 4,846,965. This application Apr. 10, 1989, Ser. No. 335,580

Int. Cl.[4] C02F *3/26*

U.S. Cl. 210—614 **4 Claims**



1. A method of treating wastewater using an aeration tank of the type having an interior divided into at least a first chamber and a last chamber with each of said chambers having a lower portion and an upper portion and having liquid passageways in said lower portions of each of said chambers and gas passageways in said upper portions of each of said chambers for allowing liquid and gas to pass sequentially through each of said chambers from said first chamber to said last chamber, having an effluent outlet associated with said last chamber of said aeration tank for allowing treated water to exit said aeration tank; and having agitator means to enhance oxygen transfer from said upper portion to said lower portion of said aeration tank; said method comprising the steps of:

(a) adding wastewater and return sludge to said lower portion of said first chamber of said aeration tank at least until said wastewater and return sludge flows from said first chamber to said last chamber of said aeration tank through said liquid passageways in said lower portion of each of said chambers of said aeration tank;

(b) introducing high-purity oxygen into said first chamber of said aeration tank;

(c) maintaining the pressure in said upper portion of said first chamber of said aeration tank to at or slightly below existing atmospheric pressure; and

(d) maintaining the dissolved oxygen in the effluent from said last chamber by removing gas by vacuum from said last chamber of said aeration tank.

4,898,673

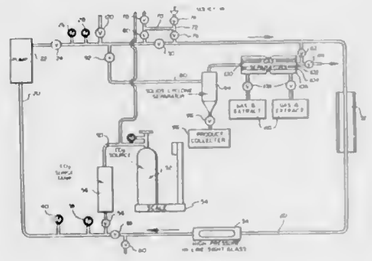
DYNAMIC SUPERCRITICAL FLUID EXTRACTION SYSTEM

Wayne K. Rice, Wanatah, Ind., and Laxman Singh, South Holland, Ill., assignors to Vitamins, Inc., Chicago, Ill.

Filed Jul. 11, 1987, Ser. No. 61,787

Int. Cl.[4] B01D *11/00*

U.S. Cl. 210—634 **15 Claims**



1. A method of carrying out a dynamic extraction comprising:

charging a closed-loop first stage of a dynamic system with extracting solvent under pressure;

pumping said solvent to cause flow in said closed-loop first stage;

injecting material to be extracted under pressure into said flowing solvent in said closed-loop first stage to form a co-currently flowing mixture with said solvent;

removing said mixture from said system;

separating a liquid comprising extract dissolved in solvent from said removed mixture; and

separating said extract from said solvent and recovering extract.

4,898,674

SOLVENT DEWAXING PROCESS

Mordechai Pasternak, Spring Valley, and Tansukhlal G. Dorawala, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 24, 1988, Ser. No. 172,663

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—638 **12 Claims**

1. A process for treating a charge solution containing an organic oxygen-containing wax antisolvent and an aromatic hydrocarbon oil solvent in a charge ratio of organic oxygen-containing wax antisolvent to aromatic hydrocarbon oil solvent which comprises

passing a charge solution containing an organic oxygen-containing wax antisolvent and an aromatic hydrocarbon oil solvent in a charge ratio of organic oxygen-containing wax antisolvent to aromatic hydrocarbon oil solvent into contact with, as non-porous pervaporation membrane, a high molecular weight ion exchange resin in membrane form having carbon atoms in the backbone bearing a pendant acid group which membrane has been contacted with as counter ion, a potassium salt or with a quaternary phosphonium salt containing hydrocarbyl groups;

maintaining a pressure drop across said pervaporation membrane thereby forming (i) a retentate containing decreased content of oxygen-containing wax antisolvent; and

recovering said retentate containing decreased content of oxygen-containing wax antisolvent and said permeate containing increased content of oxygen-containing wax antisolvent.

4,898,675

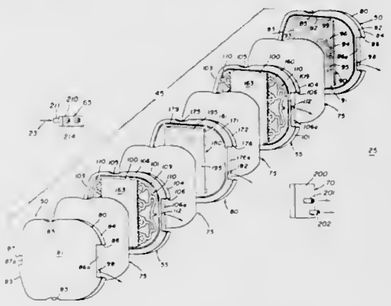
SYSTEM AND METHOD FOR CONTINUOUSLY FRACTIONATING BLOOD IN SITU

Ardis R. Lavender, 15 Deerfield Rd., Chappaqua, N.Y. 10514

Continuation-in-part of Ser. No. 523,007, Aug. 15, 1983. This application Dec. 16, 1985, Ser. No. 809,923

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—651 **48 Claims**



1. A method of collecting plasma from a living donor thereof, comprising: ascertaining the donor's initial plasma volume, extracting blood from the donor, and separating plasma from the extracted blood until a predetermined percentage of the donor's initial plasma volume has been separated.

4,898,676

BACTERIOSTATIC ACTIVATED CARBON FILTER

Carl Horowitz, Brooklyn; Mohan Sanduja, Flushing, and Michael Dichter, deceased, late of Brooklyn, all of N.Y. (by Anna Dichter, heir), assignors to Puro Corporation of America, Maspeth, N.Y.

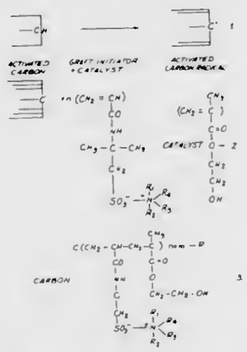
Filed Sep. 14, 1988, Ser. No. 244,502

Int. Cl.[4] C02F *1/28*

U.S. Cl. 210—668 **4 Claims**

1. Method for the purification of water by activated carbon while preventing bacterial growth on and around the activated

carbon, said method comprising passing water to be purified across activated carbon which has chemically grafted thereto



a polymerized salt of a polymerizable anionic monomer and a cationic germicide.

4,898,677

PROCESS FOR INHIBITING SCALE FORMATION AND MODIFYING THE CRYSTAL STRUCTURE OF BARIUM SULFATE AND OTHER INORGANIC SALTS

Ingrid E. Brase, E. Windsor, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Nov. 10, 1986, Ser. No. 929,127
Int. Cl.[4] C02F *5/10*
U.S. Cl. 210—701 **4 Claims**



1. A method of inhibiting the deposition of barium sulfate scale in a downhole aqueous system containing at least 50 ppm of barium sulfate, which consists of adding an effective scale-inhibiting amount of a water-soluble copolymer having a weight ratio of 70–95% acrylic acid and 5–30% of an alkali metal vinyl sulfonate, the copolymer having a weight average molecular weight of below about 90,000, wherein the solubility and/or the dispersibility of the barium sulfate is enhanced and the crystal structure of the barium sulfate is modified to produce fibers.

4,898,678

HEAVY-METAL SEPARATOR FOR DRINKING WATER

Charles G. Johnson, 19150 Saddle La., Apple Valley, Calif. 92308, and Candido O. Sanchez, 953 Arbor St., Costa Mesa, Calif. 92627

Filed Dec. 12, 1988, Ser. No. 282,685
Int. Cl.[4] B01D *21/02*
U.S. Cl. 210—741 **13 Claims**

8. A method of separating lead particles from drinking water obtained from a main water-supply source, comprising the steps of:

supplying lead-contaminated water from an incoming water-supply source to a first separator tank;

allowing the lead particles to precipitate to the bottom of said first separator tank;

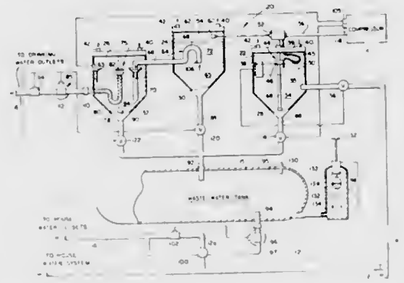
transferring the upper selective surface portion of water from said first separator tank to a second separator tank by means of a first transfer means;

allowing the lead particles in said second separator tank to precipitate to the bottom thereof;

siphoning the upper surface portion of water from said second separator tank by a second water transfer means so as to deposit said water into a third separator tank;

allowing the remaining lead particles to precipitate to the bottom of the third separator; and

pumping lead-free water from said third separator tank;



discharging lead-contaminated water from the bottoms of said first, second and third separator tanks into a waste-water tank;

draining said lead-contaminated water from said waste-water tank into a drain conduit;

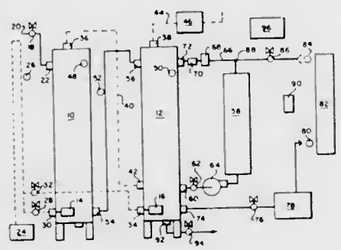
said draining being controlled by a valve means located in said drain conduit, said valve means operated by a switch control means operated by the level of waste water in said waste-water tank; and by a pressure-regulated pump means in said drain conduit between said waste-water tank and said valve means, said pump means operated by pressure-sensing means positioned downstream from said valve means.

4,898,679

METHOD AND APPARATUS FOR OBTAINING OZONE SATURATED WATER

Seymour Siegel, Feeks La., Mill Neck, N.Y. 11765, and Louis Maggio, 20 Woodoak Dr., Westbury, N.Y. 11590

Filed Feb. 1, 1989, Ser. No. 305,440
Int. Cl.[4] C02F *1/78*
U.S. Cl. 210—752 **18 Claims**



1. A method for obtaining ozone saturated water comprising introducing water into a first zone, bubbling ozone into the water in said first zone for a time sufficient to kill substantially all bacteria present in said water and form ozone demand-free water, passing the ozone demand-free water from said first zone to a second zone, bubbling ozone into said ozone demand-free water in said second zone while passing said ozone demand-free water from said second zone into a chilling zone, chilling said ozone demand-free water in said chilling zone, returning the chilled ozone demand-free water to said second zone while continuously adding ozone thereto in said second zone and increasing the ozone in said chilled ozone demand-free water to a specific excess amount until said chilled ozone reaches a temperature of between 32 to 38 degrees Farenheit.

4,898,680

DETERGENT COMPATIBLE, DRYER RELEASED FABRIC SOFTENING/ANTISTATIC AGENTS

Allen D. Clauss; Gayle E. Culver; David M. Piatt, and Thomas J. Wiereriga, all of Cincinnati, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 58,449, Jun. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 933,824, Nov. 24, 1986, Pat. No. 4,828,746. This application Nov. 7, 1988, Ser. No. 270,402
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[4] C11D *3/30;* **D06M** *13/46*
U.S. Cl. 252—8.8 **11 Claims**

1. A through-the-wash detergent and fabric softening composition comprising:

(A) from about 1% to about 50% of detersive surfactant;

(B) from about 15% to about 60% of detergency builder;

(C) from about 0.5% to about 10% of detergent-compatible, dryer activated fabric softener composition in particulate form, the said particles comprising:

(a) an inner core of fabric softener composition consisting essentially of at least about 10% of a cationic fabric softener, the said softener composition having a melting point of from about 50° C. to about 80° C. and the remainder of said inner core being materials which can be applied to fabrics along with said cationic fabric softener in a laundry dryer; and

(b) a coating surrounding said core, said coating being a substantially water-insoluble material having a melting point above about 35° C. and a penetration value of about 0.6 mm or less as measured by ASTM Test D-1321, modified by using a 100 gram weight, said water-insoluble material being selected from the group consisting of: cellulose ethers, cellulose esters, and mixtures thereof;

the said coating comprising from about 3% to about 30% of said particle, the said inner core comprising from about 97% to about 70% of said particle, and the said particles having a size of from about 5 to about 1,000 microns.

4,898,681

HYPOCHLORITE DISTINFECTANT STABILIZED WITH CALCIUM CHELANT

Charles D. Burton, 3807 Chestnut Hill Dr., Midland, Mich. 48640

Filed Aug. 31, 1988, Ser. No. 238,466
Int. Cl.[4] D06L *3/08;* **C11D** *3/395;* **A61L** *2/16;* **A01N** *33/04*
U.S. Cl. 252—102 **8 Claims**

1. A dilute aqueous sodium hypochlorite solution stabilized against decomposition during storage consisting essentially of dilute aqueous sodium hypochlorite and a small but effectively stabilizing proportion of the calcium chelate of disodium ethylenediaminetetraacetic acid.

4,898,682

CORROSION INHIBITED SYNTHETIC LUBRICANTS

Takateru Dekura, No. 1-3, Sasame-cho, Kamakura-shi, Kanagawa-ken, Japan

Filed Oct. 3, 1988, Ser. No. 252,104
Claims priority, application Japan, Aug. 11, 1988, 63-201749
Int. Cl.[4] C10M *105/70*
U.S. Cl. 252—47.5 **1 Claim**

1. Anti-corrosion synthetic lubricants of the formula Rf—N-H—Z or 2(Rf—NH)Z, wherein Rf has a molecular weight of from 200 to 15,000 and is a member selected from the group consisting of:

$X(C_3F_6O)_\overline{l}CFYCO$,

$X(C_3F_6O)_\overline{l}(CF_2O)_\overline{m}CFYCO$,

$X(C_2F_4O)_\overline{l}(CF_2O)_\overline{m}CFYCO$,

$X(CF_2)_\overline{l-1}CO$,

$X(CF_2)_\overline{l-1}CH_2CO$, and

$X(CF_2)_\overline{l-1}CH_2CH_2CO$,

wherein l is an integer from 3 to 150, m is an integer from 1 to 50, X is H—, F—, CF_3—, C_2F_5—, C_3F_7—, CF_3O—, C_2F_5O—, or C_3F_7O—, and Y is F—, CF_3—, or C_2F_5—; and Z is a heterocyclic group selected from the group consisting of triazole, tetrazole, thiazole and thiadiazole groups.

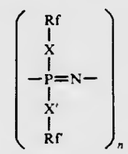
4,898,683

SYNTHETIC LUBRICANTS

Takateru Dekura, No. 1-3, Sasame-cho, Kamakura-shi, Kanagawa-ken, Japan

Filed Dec. 6, 1988, Ser. No. 280,357
Claims priority, application Japan, Aug. 23, 1988, 62-209774
Int. Cl.[4] C10M *137/16*
U.S. Cl. 252—51 **3 Claims**

1. Synthetic lubricant obtained by amidation of phosphonitrilic acid by way of nucleophilic substitution, said synthetic lubricant having the formula:



wherein, n is from 3 to 10; X and X' are each NH or NH_2, with the proviso that X and X' are not both NH_2; Rf and Rf' are each a member selected from the group consisting of $Y(C_3F_6O)_lCFZCO$, $Y(C_3F_6O)_l(CF_2O)_mCFZCO$, $Y(C_2F_4O)_l(CF_2O)_mCFZCO$, $Y(CF_2)_{l-1}CO$, $Y(CF_2)_{l-1}CH_2CO$, and $Y(CF_2)_{l-1}CH_2CH_2CO$, wherein $l<m$, l is an integer from 3 to 150, m is an integer from 1 to 50, Y is H—, CF_3—, or C_2F_5—; and wherein CF_3O—, C_2F_5O—, or C_3F_7O—, and Z is F—, is F—, CF_3—, or C_2F_5—; and wherein when X or X' is NH_2, Rf or Rf' respectively, is absent.

4,898,684

NOVEL AMINE-CONTAINING COPOLYMERS AND THEIR USE

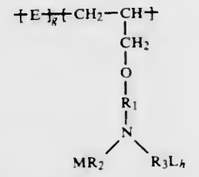
Fu Chen, Newtown, and William S. Carey, Ridley Park, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 214,989, Jul. 5, 1988, Pat. No. 4,868,263, which is a continuation-in-part of Ser. No. 37,484, Apr. 13, 1987, Pat. No. 4,759,851, Continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Jul. 17, 1989, Ser. No. 380,847

Int. Cl.[4] C02F *5/10*

U.S. Cl. 252—181 **3 Claims**

I. A composition comprising a water soluble polymer, having the structure:



wherein E in the above formula is the repeat unit remaining after polymerization of a polymerizable monomer, containing pendant carboxylic acid or water-soluble salts thereof, carboxylic amide, lower alkyl (C_1-C_6) ester, or lower (C_1-C_6) alkyl hydroxylated ester of such carboxylic acids and wherein R1 in the above formula comprises a C_1-C_6 linear or branched alkylene or substituted alkylene, R_2 and R_3 independently represent hydrogen, C_1-C_5 lower alkylene or substituted lower alkylene, and M and L, independently represent hydrogen or a water-soluble cation further comprising polyvalent metal salts.

4,898,685

SURFACE ACTIVE COMPOUND

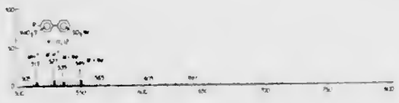
Takazumi Kanekiyo; Yukitoshi Akimoto; Miho Kubota; Koichi Fujita, and Yasunori Koizumi, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1989, Ser. No. 367,318

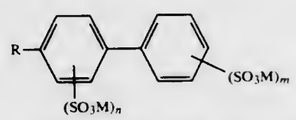
Claims priority, application Japan, Jul. 11, 1988, 62-172177

Int. Cl.[4] B01F *17/12;* **C07C** *143/24*

U.S. Cl. 252—353 **9 Claims**



1. An alkylbiphenyldisulfonate represented by formula:



wherein R represents an alkyl group having from 10 to 15 carbon atoms; M represents an alkali metal atom; and m and n each represents 0, 1 or 2, and m+n=2.

4,898,686

ZINC STABILIZATION WITH MODIFIED ACRYLAMIDE BASED POLYMERS AND CORROSION INHIBITION DERIVED THEREFROM

Donald A. Johnson; John E. Hoots; Dodd W. Fong, all of Naperville, and Guy A. Crucil, Bloomingdale, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 27, 1987, Ser. No. 42,927

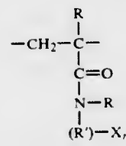
Int. Cl.[4] C23F *11/18, 11/16*

U.S. Cl. 252—389.2 **9 Claims**

I. A corrosion inhibitor composition comprising:

(a) a water soluble zinc salt; and

(b) a zinc-stabilizing water soluble vinylic terpolymer having a molecular weight ranging between about 2500 to about 85,000, which polymer contains at least five mole percent of a repeating mer unit represented by the formula:



wherein R is chosen individually, at each occurrence, from the group consisting of hydrogen, methyl and ethyl groups;

R' is a multicovalent hydrocarbonaceous bridging group containing from 1-12 carbon atoms and which be linear alkyl, aryl, cyclic and mixtures thereof; and

X is chosen from the group consisting of —SO_3M, —COOM, and mixtures thereof; and

n ranges from 1-10; and

M is chosen from the group consisting of hydrogen, metallic cations, protonated amines, quaternary amines and mixtures thereof; and which polymer also contains at least ten mole percent of a mer unit chosen from the group consisting of acrylic acid, methacrylic acid, maleic anhydride, maleic acid and mixtures thereof; and further, which polymer also contains at least ten mole percent, of a mer unit chosen from the group consisting of acrylamide, methacrylamide, methyl vinyl ether, ethyl vinyl ether, maleimide, and mixtures thereof; and wherein the ratio of zinc salt(a) to zinc stabilizing polymer(b) ranges between about a:b between about 100:1 and, wherein (a) and (b) are combined with (c) an orthophosphate or orthophosphate source, such that the ratio of a:b:c: ranges between about 10:1:1 to about 1:10:100.

4,898,687

CORROSION INHIBITOR

David C. Parker, Macclesfield, and Brian G. Clubley, Wilmslow, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 9, 1988, Ser. No. 269,085

Claims priority, application United Kingdom, Nov. 21, 1987, 8727323

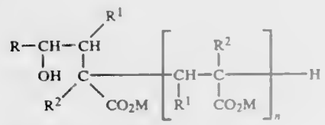
Int. Cl.[4] C09K *15/06*

U.S. Cl. 252—389.61 **19 Claims**

1. A composition, in contact with a corrodable metal surface, which composition comprises:

(A) an aqueous-based or oil-based system; and

(B) as inhibitor for protecting the metal surface against corrosion, a mixture comprising at least one compound of formula I and at least one compound of formula II:



I

$$R^3[O(CH_2)_m]_pO(CH_2)_{m-1}CO_2M, \qquad II$$

wherein

R is a monoalkylglycol ether group of formula III

$$R^3[O(CH_2)_m]_pO(CH_2)_{m-1}— \qquad III$$

R^1 is H, CO_2M or C_1-C_4 straight or branched chain alkyl residue;

R^2 is H, C_1-C_4 straight or branched chain alkyl residue, —CH_2CO_2M or —$CH_2CH_2CO_2M$;

R^3 is C_4-C_{20} straight or branched chain alkyl residue, C_6-C_{10}aryl residue, C_6-C_{10}aryl residue substituted by C_1-C_{15}alkyl residues, C_5-C_{12}cycloalkyl residue, a C_7-C_{12}aralkyl group, or a C_7-C_{12}aralkyl group substituted by C_1-C_{15}alkyl residues;

n is a number from 0 to 20;

m is a number from 2 to 4;

p is a number from 0 to 20; and

M is a metal ion, hydrogen, an ammonium ion or a substituted ammonium ion.

4,898,688

POLY(2,2,6-TETRAMETHYL PIPERIDYL AMINO)-1,3,5-TRIAZINES AS STABILIZERS FOR SYNTHETIC POLYMER COMPOSITIONS

Yutaka Nakahara, Okegawa, and Etsuo Tobita, Urawa, both of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

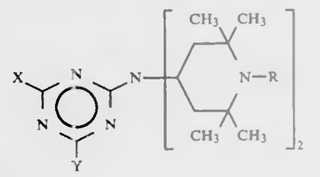
Division of Ser. No. 884,146, Jul. 10, 1986, abandoned. This application Dec. 30, 1987, Ser. No. 139,525

Claims priority, application Japan, Jul. 17, 1985, 60-157727

Int. Cl.[4] C09K *15/18*

U.S. Cl. 252—400.24 **5 Claims**

1. A stabilizer composition for enhancing the resistance of synthetic polymers to deterioration upon exposure to light and heat comprising a poly(2,2,6,6-tetramethyl piperidyl amino)-1,3,5-triazine having the formula:

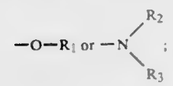


I

in which:

R is selected from the group consisting of hydrogen; alkyl, alkenyl, cycloalkyl, hydroxyalkyl and alkoxy having from one to about twelve carbon atoms; acyl having from about one to about twelve carbon atoms; and oxyl;

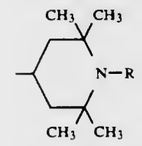
X and Y are each selected from the group consisting of



wherein:

R_1 is selected from the group consisting of alkyl, hydroxyalkyl and alkylenealkoxy having from one to about twelve carbon atoms; cycloalkyl having from three to about twelve carbon atoms; and aryl having from six to about eighteen carbon atoms;

R_2 and R_3 are selected from the group consisting of hydrogen; alkyl having from one to about twelve carbon atoms; cycloalkyl having from three to about twelve carbon atoms; and aryl having from six to about eighteen carbon atoms; and R_2 and R_3 taken together as alkylene in a five to six member ring including the nitrogen atom in the ring; and



and at least one synthetic polymer heat stabilizer selected from the group consisting of phenolic antioxidants, organic phosphites, polyvalent metal salts and thiodipropionic acid esters.

4,898,689

ELECTROCONDUCTIVE SILICONE RUBBER PARTICLES

Mitsuo Hamada, Kisarazu; Koji Shimizu, Ichihara, and Haruki Wakita, Chiba, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,394

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—510 **8 Claims**

1. An electroconductive silicone rubber particulate consisting essentially of from 0.5 to 280 parts by weight of an electrically conductive material per 100 parts by weight of silicone rubber and having a particle diameter of from 0.1 to 1000 micrometers.

6. A composition comprising 100 parts by weight of a matrix of silicone rubber in which there is dispersed from 25 to 125 parts by weight of an electroconductive silicone rubber particulate consisting essentially of from 0.5 to 280 parts by weight of an electrically conductive material per 100 parts by weight of the silicone rubber in the particle and has a particle diameter of from 0.1 to 1000 micrometers.

4,898,690

BUBBLE-BATH CONCENTRATE GEL

Ingrid Bitter; Wolfhard Scholz, both of Krefeld, and Werner Schneider, Krefeld-Bockum, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,108

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714455

Int. Cl.[4] C11D *1/14, 1/12*

U.S. Cl. 252—554 **10 Claims**

1. A bubble-bath concentrate gel composition consisting essentially of:

(A) about 35 to 45% by weight of one or more alkyl ether surfactants of the formula R^1-$O(C_2H_4O)_n$-SO_3Na, in which R^1 is a C_{12-16} alkyl and n is 1 to 6;

(B) about 5 to 15% by weight of one or more nonionic polyglycol ether surfactants of the formula R^2-A-$(C_2H_4O)_x$-H, in which R^2 is a C_{12-18} alkyl, alkenyl or acyl, A is oxygen or -NH-, and x is 3 to 9;

(C) about 1 to 5% by weight of one or more amphoteric or zwitterionic surfactants;

(D) about 1 to 5% by weight of one or more glycerol polyglycol ether monofatty acid esters or of fatty acid monoacid or diglyceride polyglycol ethers based on a C_{12-18}

fatty acid containing 5 to 20 glycol ether moieties in either case;
(E) about 2 to 10% by weight of a water-insoluble perfume oil;
(F) water q.s. to 100% by weight; and
(G) 0 to about 5% by weight of standard auxiliaries, additives and mixtures thereof for bubble bath concentrates; all percentages based upon the concentrate as a whole.

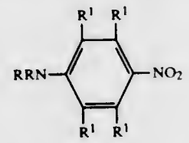
4,898,691

ORGANIC NONLINEAR OPTICAL MEDIA

Marie Borzo, Basking Ridge, and Dagobert E. Stuetz, Watchung, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed May 16, 1988, Ser. No. 194,478
Int. Cl.[4] F21V 9/04; G02B 5/22
U.S. Cl. 252—589 **14 Claims**

1. A nonlinear optical medium consisting of a solid solution of components comprising (1) a thermoplastic acrylate or methacrylate polymer or copolymer; (2) a first organic compound exhibiting nonlinear optical response which corresponds to the formula:



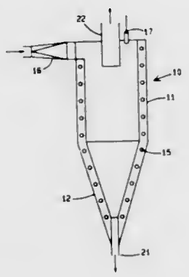
where R is hydrogen or a C_1–C_{20} alkyl substituent, and R^1 is hydrogen or a C_1–C_4 alkyl substituent; and (3) a second organic compound which complexes with and enhances the nonlinear optical response of the first organic compound.

4,898,692

PROCESS FOR DIRECT CONVERSION OF REACTIVE METALS TO GLASS

John B. Rajan; Romesh Kumar, and Donald R. Vissers, all of Naperville, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 16, 1988, Ser. No. 271,967
Int. Cl.[4] G21F 9/16
U.S. Cl. 252—629 **17 Claims**



1. A one-step process for converting radioactive metal waste into a product suitable for storage, comprising providing a cyclone reactor having means for heating the side walls thereof and an exhaust gas outlet and a glass product outlet, establishing an inlet stream of aspirated radioactive metal waste, establishing an inlet stream of air and silica, mixing the two inlet streams in the cyclone reactor to produce a glass and an off gas, maintaining the side walls of the reactor at a temperature sufficient to permit the glass formed in the reactor to flow along the side walls to the liquid glass outlet, and continuously venting off gas through the exhaust gas outlet.

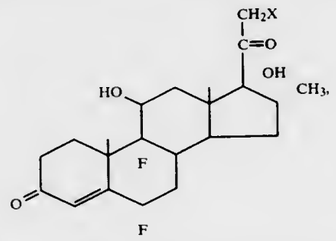
4,898,693

PROCESS FOR PRODUCTION OF 6α,9α-DIFLUORO-11β,17α-DIHYDROXY-16α-METHYL-4-PREGNENE-3,20-DIONE AND ITS DERIVATIVES

Gerhard Hempel, Werne; Mario Kennecke, Berlin; Bernhard Krieger, Unna; Rainer Phillippson, Bergkamen-Mitte; Hermann Triem, Hamm, and Alfred Weber, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,098
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640709
Int. Cl.[4] C07J 9/00
U.S. Cl. 260—397.4 **10 Claims**

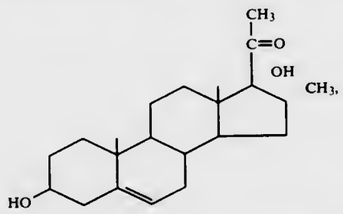
1. A process for the production of 6α,9α-difluoro-11β,17α-dihydroxy-16α-methyl-4-pregnene-3,20-diones of general formula I



(I)

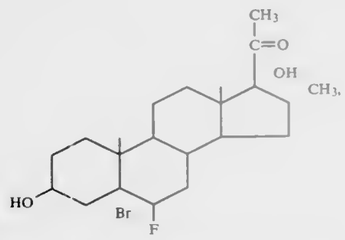
F

wherein
symbolizes a single bond or a double bond, and
X is H, Br, I or alkanoyloxy with 1–8 carbon atoms,
comprising: reacting 3β,17α-dihydroxy-16α-methyl-5-pregnen-20-one of formula II



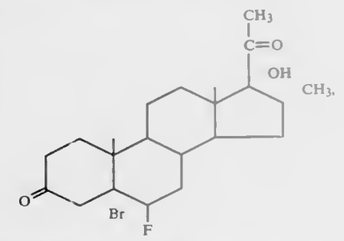
(II)

with an N-bromoacylamide and hydrogen fluoride in the presence of urea,
oxidizing the resultant 5α-bromo-6β-fluoro-3β,17α-dihydroxy-16α-methyl-pregnan-20-one of formula III



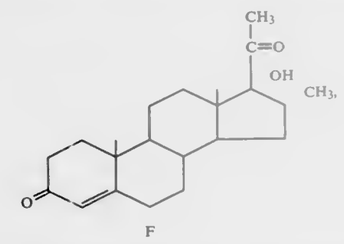
(III)

dehydrobrominating the formed 5α-bromo-6β-fluoro-17β-hydroxy-16α-methyl-pregnane-3,20-dione of formula IV while simultaneously isomerizing the 6-position



(IV)

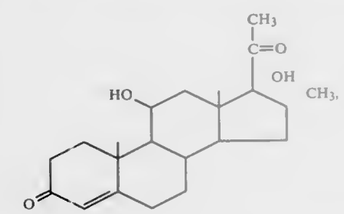
hydroxylating the resultant 6α-fluoro-17α-hydroxy-16α-methyl-4-pregnane-3,20-dione of formula V at the II-position



(V)

F

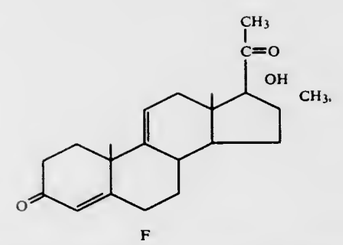
with a live culture of an effective species of the Curvularia type,
dehydrating the thus-produced 6α-fluoro-11β,17α-dihydroxy-16α-methyl-4-pregnene-3,20-dione of formula VI



(VI)

F

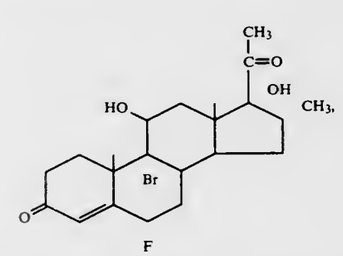
adding BrOH to the resultant 6α-fluoro-17α-hydroxy-16α-methyl-4,9, (11)-pregnadiene-3,20-dione of formula VII



(VII)

F

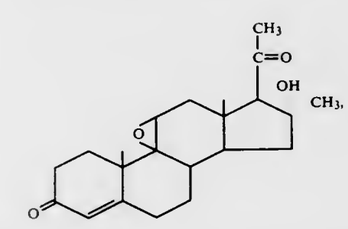
dehydrobrominating the resultant 9α-bromo-6α-fluoro-11β,17α-dihydroxy-16α-methyl-4-pregnene-3,20-dione of formula VIII



(VIII)

F

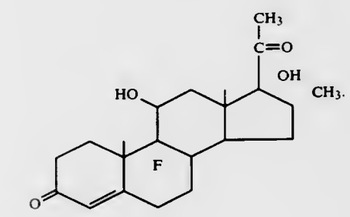
and
opening the epoxide ring of the thus-produced 9,11β-epoxy-6α-fluoro-17α-hydroxy-16α-methyl-4-pregnene-3,20-dione of formula IX



(IX)

F

with hydrogen fluoride to form 6α,9α-difluoro-11β,17α-dihydroxy-16α-methyl-4-pregnene-3,20-dione of formula Ia



(Ia)

F

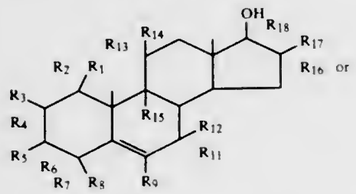
4,898,694

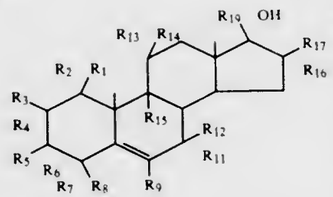
17-HYDROXY-STEROIDS

Arthur G. Schwartz, 220 Locust St., Philadelphia, Pa. 19106, and Marvin L. Lewbart, 546 E. Saint Andrews Dr., Media, Pa. 19063

Filed Nov. 25, 1987, Ser. No. 126,369
Int. Cl.[4] C07J 9/00
U.S. Cl. 260—397.5 **101 Claims**

1. Compounds of the formulae:





wherein

R_1, R_2, R_3, R_4, R_7, R_8, R_{11}, R_{12}, R_{13}, R_{14}, R_{15}, and R_{17} are each independently hydrogen, lower alkyl, halogen, or lower alkoxy; R_5 and R_6 are independently hydrogen, lower alkyl or lower alkoxy;

R_{16} is lower alkyl, halogen, or lower alkoxy;

R_9 is hydrogen, lower alkyl or halogen; and

R_{18} and R_{19} are each independently hydrogen, lower alkyl, lower alkenyl, lower alkynyl, formyl, lower alkanoyl or epoxy.

4,898,695

METHOD FOR TINTING HYDROPHILIC PLASTIC ARTICLES

Praful Doshi, Poway, Calif., assignor to Pilkington Visioncare Holdings, Inc., Menlo Park, Calif.

Filed Nov. 1, 1988, Ser. No. 265,523
Int. Cl.[4] B29D 11/00
U.S. Cl. 264—2.6 **11 Claims**

1. A method for producing a tinted, hyrated contact lens wherein a tinting step is carried out as an in-line step during the process of converting a monomeric, lens forming material to a packaged, fully hydrated contact lens, comprising the steps of:
1. converting the monomeric material to an intermediate contact lens article in the xerogel state;
2. generating at least one optical surface on said article;
3. tinting said article by impregnating the pores of said article with a dispersion of a solubilized vat dye as a precursor at a temperature in the range 35° to 85° degrees Centigrade, rinsing said article, precipitating the vat dye in a water insoluble form in the pores of said article and rinsing said article a second time;
4. drying said article to substantially its former xerogel state;
5. converting said xerogel article to a packaged, fully hydrated contact lens.

4,898,696

CONTINUOUS PREPARATION OF MICROCAPSULES WITH MELAMINE-FORMALDEHYDE CONDENSATE WALLS IN AQUEOUS DISPERSION

Wolfgang Sliwka, Weinheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 902,589, Sep. 2, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 185,265
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532878
Int. Cl.[4] B01J 13/02
U.S. Cl. 264—4.7 **13 Claims**

1. A continuous process for preparing microcapsules encapsulating a hydrophobic material, said microcapsules having melamine-formaldehyde condensate capsule walls, which process comprises condensing a water-soluble melamine-formaldehyde precondensate which is water-miscible in all proportions without turbidity from an initial aqueous solution, comprising said precondensate, said hydrophobic material and 1-5.5%, by weight, based on the aqueous phase, water soluble high polymers containing strongly acid groups,

continuing said condensation of said precondensate until said aqueous solution starts to become turbid,

dispersing the hydrophobic material to be encapsulated in the aqueous dispersion resulting from said initial condensation step, and subsequently completing condensation of said melamine-formaldehyde condensate to form the wall material of the resulting microcapsules,

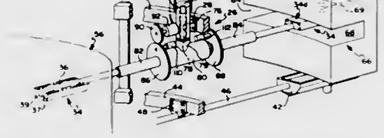
wherein the microcapsules are prepared in a pH 3-6.5 and 15°-100° C.

4,898,697

ROTATIONAL SLUSH MOLDING METHOD

Roger L. Horton, Somersworth, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Dec. 23, 1988, Ser. No. 289,024
Int. Cl.[4] B29C 41/18; B28B 5/06
U.S. Cl. 264—37 **4 Claims**



1. A method for forming cured plastisol parts in a process in which a heated mold is initially filled with an excess of plastisol material to form a gel layer thereon and the excess plastisol is returned to a plastisol supply followed by a fusion step wherein the gel material is cured in a curing oven comprising:

providing conveyor means having a plurality of spaced reversing arm assemblies, each arm assembly having opposite ends carrying mold means thereon;

providing first and second conveyor paths for the mold means on the opposite ends of each arm assembly and locating one of the first and second conveyor paths inside the outer perimeter of the other of the first and second conveyor paths;

preheating mold means on one of the arm assemblies on the first conveyor path and filling the preheated mold means with an excess charge of plastisol into the preheated mold means to form a gel layer thereon while on the first conveyor path and thereafter dumping plastisol from the preheated mold means for return to a supply source of plastisol;

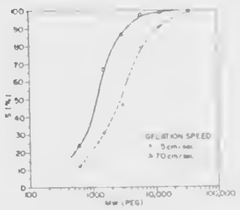
simultaneously curing a gel layer on mold means on another of the arm assemblies by directing the mold means through the second conveyor path as the preheated mold means on the other end of the arm assembly is being filled and dumped whereby the movement of an arm assembly produces simultaneous filling and curing of mold means on one of the arm assemblies and simultaneous dumping and curing of mold means on another of the arm assemblies.

4,898,698

METHOD OF CASTING A POROUS MEMBRANE OF POLYMERIC MATERIAL

Thomas A. Tweedle, Orleans; Oleh Kutowy, North Gower, and André Tremblay, Vanier, all of Canada, assignors to National Research Concil of Canada, Ottawa, Canada

Filed Dec. 7, 1988, Ser. No. 281,021
Claims priority, application Canada, Dec. 9, 1987, 553861
Int. Cl.[4] B29C 39/42, 67/20
U.S. Cl. 264—41 **4 Claims**



1. A method of casting a porous membrane of polymeric material, comprising:

(a) casting a layer of a casting solution on to a support to provide a cast layer of the casting solution thereon with an exposed skin, the casting solution comprising

(i) a polymeric material capable of gelation from the casting solution by a gelation liquid to form a porous membrane, and

(ii) an aprotic solvent for the polymeric material, which will be slowly diffused from the casting solution by the gelation liquid, the aprotic solvent having a relatively high exothermic heat of mixing with the gelation liquid and being selected from the group consisting of N-Methyl Pyrrolidinone, Dimethyl Acetamide, Dimethyl Sulfoxide, Dimethyl Formamide and Butyrolactone,

(b) progressively submerging the cast layer in a gelation liquid water at a relative surface velocity between the cast layer and the gelation liquid of at least 15 cm/second, whereby the exposed skin is gently scrubbed with gelation liquid to continuously remove outwardly diffusing solvent therefrom and dissipate exothermic heat evolved by mixing of the diffusing solvent and the gelation liquid,

(c) maintaining the cast layer submerged in the gelation liquid until gelation of substantially the whole cast layer has occurred,

(d) so that rapid entry of the gelation liquid into the cast layer occurs without solvent build-up recurring at the exposed surface, thus causing gelation of at least a stable, coherent active skin layer on the exposed surface of the cast layer, with build-up of a solvent diffusing layer between the exposed surface of the cast layer and the gelation liquid being minimized, whereby a membrane is formed having at least one of the following:

(i) a more homogeneous active skin layer with a lower molecular weight cut off point,

(ii) a more homogeneous active skin layer with a sharper molecular weight cut off,

(iii) a relatively thinner active skin layer with a relatively greater flux for a given separation of a substance from a solution thereof, and

(iv) relatively fewer imperfections throughout an active skin layer.

4,898,699

METHOD FOR BONDING A POROUS METAL LAYER TO A CERMET SURFACE

Hans Hofmann, Muehlheim, and Hartmut Wendt, Dieburg, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,509
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721753
Int. Cl.[4] B29C 67/20; C04B 35/00, 35/64, 41/81
U.S. Cl. 264—43 **21 Claims**

1. A method for bonding a porous metal layer to a cermet surface of a cermet blank to form a cell or bi-polar plate in which the cermet acts as an electrically non-conducting diaphragm and the porous metal layer acts as an electrode, comprising the following steps:

(a) preparing a ceramic component and a metal component for the formation of said cermet blank, said ceramic component being selected as a calcined, milled component from the group consisting of alkaline earth metal oxides, alkaline metal oxides, rare earth metal oxides, amphoteric oxides of Sub-Groups III, IV, V, and VI of the periodic table and any mixture of the just listed group, said metal component being selected in the form of a first reducible metal oxide powder from the group consisting of Sub-Groups I, II and VIII of the period table,

(b) mixing said ceramic component and said first reducible metal oxide powder to form a cermet mixture, wherein said first reducible metal oxide powder is so proportioned that a resulting metal proportion in said cermet blank corresponds to about 5% by weight to about 40% by weight of said cermet blank,

(c) preparing from said cermet mixture a green cermet blank without any supporting metal netting in said green cermet blank,

(d) applying a coating of a second reducible metal oxide including an activating metal to at least one surface of said green cermet blank, and

(e) subjecting said green cermet blank and said coating to a reducing sintering for forming from said first reducible metal oxide powder said metal component of said cermet blank having improved bonding capabilities, and for forming simultaneously from said second metal oxide said porous metal layer effectively bonded to said cermet surface thereby providing said cermet blank with said metal layer bonded thereon, said bonded cermet having high mechanical stability and sufficient flexibility to act as said diaphragm and electrode of said bi-polar plate.

4,898,700

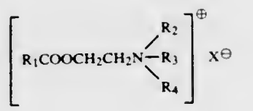
PROCESS FOR PRODUCING PREOXIDIZED FIBERS FROM ACRYLIC FIBERS

Osamu Yoshinari; Yoshifumi Kawakatsu; Hayashi Takahashi, and Hideaki Fukuizumi, all of Shizuoka, Japan, assignors to Toho Rayon Co., Ltd., Tokyo, Japan

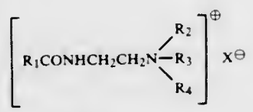
Continuation-in-part of Ser. No. 883,399, Jul. 8, 1986, abandoned, which is a division of Ser. No. 610,080, May 14, 1984, abandoned. This application Sep. 30, 1988, Ser. No. 252,074
Claims priority, application Japan, May 14, 1983, 58-83483
Int. Cl.[4] D01F 9/22, 11/08
U.S. Cl. 264—83 **27 Claims**

1. A process for producing preoxidized fibers with substantially no fiber coalescence, which comprises preoxidizing acrylic fibers having a fluorine-containing surface active agent and at least one phosphoric surface active agent selected from the group consisting of compounds represented by the follow-

ing formulae (I), (II) and (III), and preoxidizing the acrylic fibers thus-obtained:



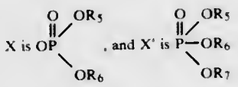
(I)



(II)

$$[R_1CON(CH_2CH_2OH)_2]X' \quad \text{(III)}$$

wherein R_1 represents an aliphatic hydrocarbon group having 1 to 17 carbon atoms, R_2, R_3 and R_4, which may be the same or different, and each represents a hydrogen atom, a lower alkyl group, a hydroxyethyl group or a hydroxyisopropyl group,



wherein R_5, R_6 and R_7, which may the same or different, each represents a hydrogen atom or a hydroxyethyl group, wherein the total amount of the fluorine-containing surface active agent and the phosphoric surface active agent is up to 0.5% by weight based on the total weight of the acrylic fibers and the surface active agents, and wherein the amount of the phosphoric surface active agent is from 30 to 95% by weight based on the total amount of surface active agent.

4,898,701

MANUFACTURE OF SHAPED ARTICLES FROM REFRACTORY POWDER

Alan W. Atkinson, and David N. Smith, both of Rugby, United Kingdom, assignors to T&N Materials Research Limited, Manchester, England

Filed Dec. 30, 1987, Ser. No. 139,762

Claims priority, application United Kingdom, Jan. 23, 1987, 8701538

Int. Cl.⁴ C08B *33/13*

U.S. Cl. 264—109 **9 Claims**

1. A method of making phosphate-bonded refractory material in sheet form, comprising the steps of:

(a) mixing a refractory powder of particle size below 200 μm with an aqueous acidic phosphate solution in a proportion such as to form a damp crumbly mass, said mass being free from combustible binder and containing a plasticity-improving clay in an amount up to about 10% by weight of the mass;

(b) subjecting said crumbly mass to high shear by repeatedly passing it through the nip of a twin-roll mill until a cohesive plastic mass adhering to a roll of said mill is formed; and

(c) removing said cohesive plastic mass from the roll as a coherent sheet and hardening said sheet at a temperature below the sintering temperature of the refractory powder and not greater than about 600° C.

4,898,702

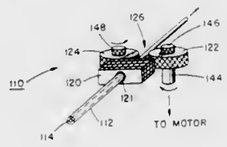
METHOD AND APPARATUS FOR REMOVAL OF A WIRE MANDREL FROM A CATHETER

Jeffrey M. Elkins, Miami Lakes, and Russell F. Collins, Hialeah, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Apr. 4, 1988, Ser. No. 177,062

Int. Cl.⁴ B29C *41/42*

U.S. Cl. 264—145 **7 Claims**



1. A method for fabricating a catheter comprising the steps of: extruding a plastic tubular layer over a wire mandrel to a desired thickness to form a catheter; exposing a portion of the mandrel at one end; pushing the exposed portion of the mandrel through a passageway in a body, said passageway having a diameter wide enough to receive the mandrel but not the extrusion;

pushing the exposed end of the mandrel into a nip between two contact wheels; and

turning the wheels, whereby the mandrel is withdrawn from the catheter.

3. An apparatus for removing a wire mandrel from a plastic tubular extrusion to form an elongated catheter, an exposed portion of said mandrel extending beyond one end of the plastic tubular extrusion, comprising:

a body having a throughpassage with a diameter greater than that of the wire mandrel but less than that of the plastic extrusion; and

gripping means for gripping the exposed portion of the mandrel and pulling the mandrel through the body while the body restrains the motion of the plastic tubular extrusion;

said gripping means comprising a pair of rotatably mounted rollers spaced near the throughpassage in the body to form a nip for grasping the exposed end of the mandrel as the mandrel is pushed through the body and pulling the mandrel from the tubular extrusion.

4,898,703

UTILIZATION OF POLYESTER IN PLACE OF LEAD FOR USE AS A SHEATHING MATERIAL FOR CURING LONG LENGTH HOSE

Hoyt M. Wells, Akron, Ohio; William J. Determan, Pierce; Vernon V. Vanis, Norfolk, both of Nebr.; John E. Hrivnak, Clinton; Donald E. Richeson, North Canton, both of Ohio, and Timothy P. Saupe, Madison, Wis., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 7, 1989, Ser. No. 334,500

Int. Cl.⁴ B29C *63/18, 35/06*

U.S. Cl. 264—166 **5 Claims**

1. A process for vulcanizing a tubular article comprising the sequential steps of:

(a) extruding about said article a sheath of unoriented polyethylene terephthalate;

(b) quenching such sheath at such a rate as to preclude crystallization;

(c) subjecting said sheath article to a vulcanization temperature sufficient to transform said sheath from an amorphous state to a crystalline state and to vulcanize said article; and

(d) removing said sheath from said article.

4,898,704

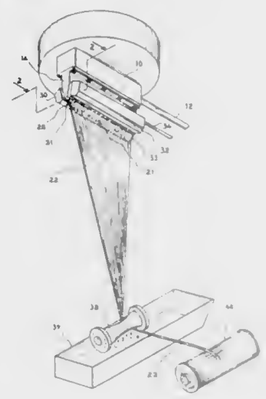
COAGULATING PROCESS FOR FILAMENTS

David W. Luckey, Richmond, Va., assignor to E. I. Du Pont De Nemours & Co., Wilmington, Del.

Filed Aug. 30, 1988, Ser. No. 238,109

Int. Cl.⁴ D01D *5/06*

U.S. Cl. 264—180 **6 Claims**



1. A process for preparing filaments from a solution of polymer by extruding the solution through linearly arranged apertures in a spinneret to form a vertical warp of filaments traveling at a first velocity downwardly through an gap, jetting opposed sheets of coagulating liquid at a second velocity from each side of said warp at an angle with said warp to meet at a common line across the width of the warp below the face of the spinneret, each of said sheets of liquid being wider than said warp at said common line, said second velocity having a vertically downward component that is from about 20% to about 99% of said first velocity.

4,898,705

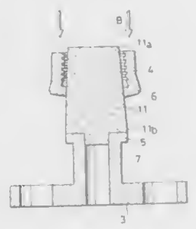
METHOD FOR PRODUCING SYNTHETIC RESIN UNION JOINT

Junsuke Kyomen; Masayuki Sakaguchi, both of Sakai, and Hiroto Fujii, Kawachinagano, all of Japan, assignors to Kubotatekko Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 803,051, Nov. 15, 1985, abandoned. This application May 16, 1988, Ser. No. 194,529

Int. Cl.⁴ B29C *55/24, 57/06*

U.S. Cl. 264—242 **2 Claims**



1. A method for producing a synthetic resin union joint, which method comprises:

forming a union nut having a flange part and a screw portion and forming a union sleeve, said union sleeve having a union swivel end and a connecting end;

heating a length portion of said union nut at least equal to a thickness dimension of said flange part but not extending to said screw portion so as to elastically soften said length of said union nut;

abutting one end of a truncated cone-shaped expansion guide with an end face of said union swivel end such that an outer diameter of said guide substantially corresponds with an outer diameter of said union swivel end;

shifting and enlarging said length of said union nut along said expansion guide so as to pass over said union swivel end and so that said union nut passes over said guide; and

returning said length of said union nut to its original configuration due to a restoring force of an elastically softenable state so as to be positioned between said union swivel end and said connecting end; and

removing said expansion guide from engagement with said union swivel end.

4,898,706

PROCESS FOR PRODUCING MOLDED ARTICLES WITH UNEVEN PATTERN

Seizo Yabe, Tokyo, and Kunio Yamazaki, Osaka, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 253,638

Claims priority, application Japan, Oct. 7, 1987, 62-251650

Int. Cl.⁴ B29C *45/14*

U.S. Cl. 264—266 **3 Claims**



1. A process for producing a synthetic resin molded article having a pattern formed on its uneven surface, which comprises fitting a patterned film or sheet to a mold and injecting a thermoplastic resin, wherein said mold has engraved therein a sharp unevenness such that said patterned film or sheet undergoes extension of from 5 to 120% upon resin injection, said patterned film or sheet is a polycarbonate film or sheet having a thickness of from 0.3 to 1 mm, and said polycarbonate film or sheet has formed a pattern on its side to be in contact with the engraved side of the mold so that the pattern does not directly contact the injected resin.

4,898,707

METHOD AND APPARATUS FOR GUSSETED PARISON DRAPING

George F. Arp, Rochester, N.Y., assignor to John D. Brush & Co., Inc., Rochester, N.Y.

Filed Dec. 23, 1988, Ser. No. 289,318

Int. Cl.⁴ B29C *49/04, 49/30, 49/50*

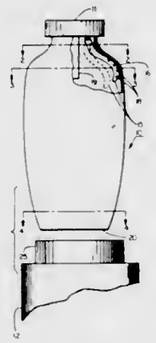
U.S. Cl. 264—515 **10 Claims**

1. A method of draping a generally cylindrical parison around a generally rectangular mold core arranged within a generally rectangular mold cavity as said parison lowers from an extrusion head, so that said parison can be blown against surfaces of said cavity and said core, said draping method comprising:

a. preforming said parison into a generally rectangular shape having opposed side and end walls, said preforming being accomplished by passing said parison over a spreader arranged under and proximate to said extrusion head to form said parison internally into corner regions of said

generally rectangular shape as said parison descends from said extrusion head;

b. as an open bottom end of said generally rectangular parison descends into proximity with an open mold clamp arranged on said rectangular mold core, directing a jet of air downwardly through said open bottom end to draw said side and end walls of said generally rectangular parison inward relative to said corner regions in a bottom region of said parison;



c. clamping said inwardly drawn side and end walls of said bottom region of said parison by closing said clamp against said bottom region of said parison to form a pleat in each of said end walls as said bottom region is folded to extend along said clamp;

d. further lowering said clamped parison so that said parison drapes around said rectangular core mold and said pleats unfold into gussets and extend toward corners of said rectangular mold core; and

e. closing said cavity and blowing said parison against said core and said cavity.

4,898,708

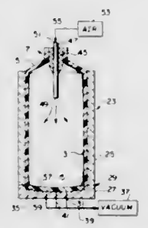
METHOD FOR SHAPING CLOSED BOTTOM OF TUBULAR CONTAINER

George H. Holoubek; John J. Rhoades, both of Muscatine, Iowa, and George P. Whitaker, Triadelphia, W. Va., assignors to Wheeling Stamping Company, Wheeling, W. Va.

Continuation of Ser. No. 859,475, May 2, 1986, abandoned. This application Jul. 21, 1988, Ser. No. 222,387

Int. Cl.[4] B29C *49/22, 49/04*

U.S. Cl. 264—515 **23 Claims**



1. A method for producing a tubular thermoplastic container having an open neck at one end and a sealed bottom wall at the other end comprising:

forming an extruded tubular wall section of a substantially uniform wall thickness;

forming a narrow open neck section at one end thereof;

applying a thermoplastic disc at the other end thereof, said thermoplastic disc welded at its peripheral edge to the circumferential wall at said other end of the tubular wall section to close said other end, with said thermoplastic disc being in a moldable state; then,

placing said closed end, and at least a major portion of the tubular wall section, into a mold sleeve having a closed bottom cavity with said at least major portion of said tubular wall section in close proximity to said mold sleeve and said disc adjacent said closed bottom cavity; and

forming said thermoplastic disc, while the same is still in a moldable state, to cause the disc to conform in shape to said closed bottom cavity to form said sealed bottom wall, while maintaining said substantially uniform wall thickness and said extruded shape of said tubular wall portion in close proximity to said mold sleeve, said forming of said thermoplastic disc occurring by application of vacuum to the exterior surface of said disc, or by application of fluid pressure to the interior confines of the tubular wall section and closed bottom, or by a combination of both exterior vacuum and internal fluid pressure has been inserted after "sleeve".

4,898,709

ORE IRRADIATOR

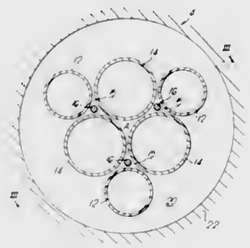
Colin G. Clayton, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 678,565, Oct. 26, 1984, abandoned. This application Jul. 20, 1987, Ser. No. 75,213

Claims priority, application United Kingdom, Apr. 22, 1983, 8310991

Int. Cl.[4] G21G *1/06*

U.S. Cl. 376—159 **15 Claims**



1. An irradiator for irradiating lumps of ore for detecting the presence of a selected substance in the lumps, the irradiator comprising a plurality of cylindrical ducts **(12, 14)** through which, in operation, lumps of ore are caused to pass, and means for rotating each duct about its longitudinal axis, characterised in that the ducts are arranged in a close-packed array so as to define roughly triangular spaces **(15)** between the ducts, each said space being defined by walls of three adjacent ducts, with clearance between neighboring ducts sufficient to allow rotation of the ducts, and that a plurality of neutron sources **(16)** for irradiating the ducts are provided, at least some of the roughly triangular spaces between the ducts having a said neutron source therein so that each duct is adjacent to at least one source, some of the ducts being adjacent to, and so in use irradiated by, more than one neutron source, the other ducts being adjacent to one source, the former ducts being of greater cross-sectional area than the latter, each source comprising a target, and means to generate a high energy particle beam incident onto the target in a direction substantially parallel to the longitudinal axes of the ducts, and of such an energy that in operation neutrons bring about excitation of atoms of the selected substance in the lumps.

4,898,710

MACHINE FOR REMOVING THE SPACING WIRE OF NUCLEAR FUEL RODS

Jean Colas, Bagnols sur Ceze, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 30, 1988, Ser. No. 278,023

Claims priority, application France, Dec. 7, 1987, 87 16979

Int. Cl.[4] G21C *19/33, 19/36*

U.S. Cl. 376—261 **15 Claims**



1. Machine for removing the spacing wire (28) of a nuclear fuel rod **(26)**, the wire **(28)** being helically wound around the rod **(26)** and the latter being substantially cylindrical, characterized in that the machine comprises:

a first and a second rotary parts **(10, 12)** rotatable about the same axis and having in each case:

a front face **(11,15)**,

a rear face **(13, 17)**, the front face of the second rotary part **(12)** being substantially in contact with the rear face of the first **(10)**,

a central passage **(72, 74)** along which it is possible for said rod **(26)** to pass, said passage **(72, 74)** having an inlet on the front face and an outlet on the rear face and having a substantially cylindrical shape, whose axis coincides with the said rotation axis and

a series of holes **(32, 34)** through each of which the wire **(28)** can pass, said holes **(32, 34)** being further than the central passage **(72, 74)** from the rotation axis and having an inlet on the front face and an outlet on the rear face, the arrangement being such that the outlet of one hole **(32)** of the first rotary part **(10)** can coincide at least partly with the inlet of a hole **(34)** of the second rotary part **(12)**,

means for rotating the first rotary part **(10)**,

means for rotating the second rotary part **(12)**, and

means **(44)** for the displacement in translation of the rod **(26)** along its axis to make it pass through the central passages **(72, 74)** of the rotary parts **(10, 12)**.

4,898,711

POWDER METAL MIRROR

Donald W. Burt, Manhattan Beach, and Gerald A. Hans, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 25, 1988, Ser. No. 223,982

Int. Cl.[4] B22F *3/26*

U.S. Cl. 419—27 **16 Claims**

1. A process for preparing, from metallurgical powders, a mirror having at least one mirror face with an optical quality reflective surface thereon, comprising the steps of:

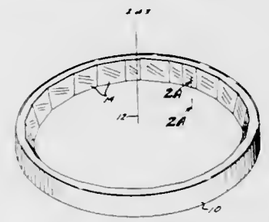
forming from metallurgical powders a first precursor of a final mirror, the first precursor being powder in a form having the general shape of the final mirror but being larger in size than the final mirror;

pressing the first precursor with a tool to consolidate the powder material and to define the mirror face, thereby forming a first intermediate precursor of the mirror;

sintering the first intermediate precursor to form a second intermediate precursor;

repressing the second intermediate precursor to form a third intermediate precursor, in a first repressing step, with a tool having an optical quality tool face contacting the mirror face, the tool face that contacts the mirror face moving at an acute angle relative to the mirror face;

annealing the third intermediate precursor;



repressing the annealed third intermediate precursor, in a second repressing step, with a tool having an optical quality tool face contacting the mirror face, the tool face moving at an acute angle relative to the mirror face; and

coating the mirror face of the repressed third intermediate precursor with a metallic coating.

4,898,712

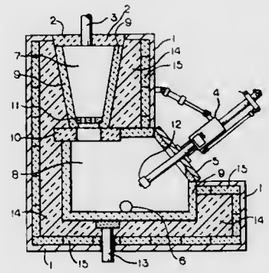
TWO-STAGE FERROSILICON SMELTING PROCESS

Vishu D. Dosaj; James B. May, both of Midland, Mich., and Robert D. Jeffress, Palo Alto, Calif., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 20, 1989, Ser. No. 325,850

Int. Cl.[4] C22C *33/00*

U.S. Cl. 420—578 **28 Claims**



1. A process for preparing ferrosilicon in a closed two-stage furnace, the first stage of the furnace containing an energy source and the second stage being attached to the first stage by a means suitable for retaining solid particles in the second stage and allowing gases from the first stage to pass through the contained particles, said process comprising:

a. combining into the first stage of the furnace a feed mixture consisting essentially of a source of iron, a source of carbon, and silicon dioxide;

b. loading the second stage of the furnace with particles containing higher oxides of iron;

c. applying energy to the first stage sufficient to effect conversion of the feed mixture to molten silicon and iron and to gaseous carbon monoxide; the gaseous carbon monoxide contacting the particles contained in the second stage and reducing the higher oxides of iron;

d. recovering the molten silicon and iron from the first stage as a ferrosilicon alloy;

e. loading the reduced higher oxides of iron formed in the second stage, along with silicon dioxide and a source of carbon to the first stage;

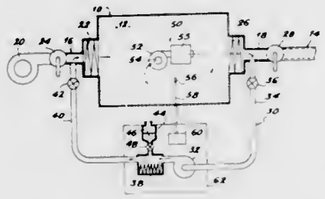
f. loading the second stage of the furnace with particles containing higher oxides of iron;
g. repeating steps c through f.

4,898,713

PROCESS FOR STERILIZING A TIGHT ENCLOSURE AND INSTALLATION FOR PERFORMING THIS PROCESS

Claude Picard, Nanterre, France, assignor to Societe Nouvelle d'Exploitation La Calhene, Velizy-Villa coublay, France

Filed Mar. 10, 1988, Ser. No. 166,366
Claims priority, application France, Mar. 30, 1987, 87 04393
Int. Cl.⁴ A61L *2/20, 2/24*
U.S. Cl. 422—3 **7 Claims**



1. Process for the sterilization of a tight enclosure having a closed volume and equipped with a ventilation and filtration circuit, which circuit has a supply pipe with a supply filter and a discharge pipe with a discharge filter, the supply pipe and the discharge pipe each connected to the tight enclosure defining the closed volume, the steps of the process comprising in order:
(a) closing the ventilation and filtration circuit upstream of the supply filter and downstream of the discharge filter;
(b) while the ventilation and filtration circuit remains closed:
I. drying the closed volume defined by the tight enclosure until a given lower relative humidity is obtained;
II. introducing a sterilizing agent into the closed volume until a given higher relative humidity is obtained, the sterilizing agent being introduced by using a closed circuit connected to the supply pipe upstream of the supply filter and to the discharge pipe downstream of the discharge filter;
III. sterilizing the closed volume by maintaining the sterilizing agent in the closed volume for given contact time; and
(c) scavenging the closed volume by opening and using the ventilation and filtration circuit, and wherein the drying of the closed volume is accomplished by circulating the atmosphere within said volume through a drying means which is located within the closed volume.

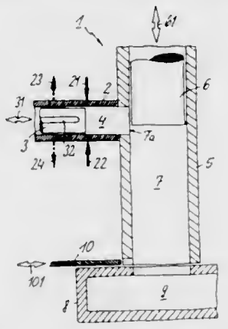
4,898,714

MIXING APPARATUS

Franz Urban, Rohrdorf/Thansau, and Adolf Bauer, Olching, both of Fed. Rep. of Germany, assignors to Krauss-Maffei AG, Münich, Fed. Rep. of Germany

Filed Aug. 10, 1987, Ser. No. 83,338
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626990
Int. Cl.⁴ B01F *5/02, 15/02;* **B29B** *7/76*
U.S. Cl. 422—133 **8 Claims**

1. An impingement mixing device comprising:
a mixing chamber housing;
a control piston axially displaceable within said mixing chamber housing between an extended position and a retracted position;
a mixing chamber within said housing defined by an end face of said control piston when in the retracted position and a mixing chamber discharge outlet coextensive with an end face of said control piston when in the extended position;
means to feed a first component to said mixing chamber;



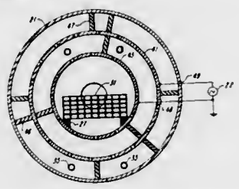
means to feed a second component to said mixing chamber in opposing relationship to said first component; and
a discharge tube housing defining a quieting chamber communicating with said mixing chamber and having an opening at a discharge end, means for at least partially closing said opening of said quieting chamber at said discharge end.

4,898,715

PROCESS AND APPARATUS FOR DRY STERILIZATION OF MEDICAL DEVICES AND MATERIALS

Adir Jacob, 23 Juniper La., Framingham, Mass. 01701

Division of Ser. No. 19,134, Feb. 25, 1987, Pat. No. 4,801,427. This application Nov. 22, 1988, Ser. No. 275,324
Int. Cl.⁴ B01J *19/08, 19/12*
U.S. Cl. 422—186.29 **2 Claims**



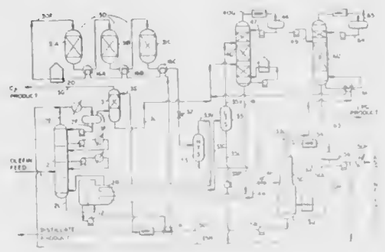
1. Apparatus for sterilization of medical devices and materials in a gas plasma comprising,
a gas confining chamber formed with a generally cylindrical metallic wall,
a perforated metallic cylinder positioned within said chamber generally concentric with said generally cylindrical chamber wall,
means for electrically connecting said chamber wall to a point of potential reference,
means for applying an RF voltage between said perforated cylinder and said point of potential reference,
means for evacuating said gas-confining chamber, and
means for flowing gas through said chamber.

4,898,716

OLEFIN FRACTIONATION AND CATALYTIC CONVERSION SYSTEM

Chung H. Hsia, Matawan; Hartley Owen, Belle Mead, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 616,376, Jun. 1, 1984, Pat. No. 4,504,691, which is a continuation-in-part of Ser. No. 508,959, Jun. 29, 1983, Pat. No. 4,497,147, and a continuation-in-part of Ser. No. 508,907, Jun. 29, 1983, Pat. No. 4,450,311. This application Jan. 14, 1985, Ser. No. 691,304
Int. Cl.⁴ B01D *3/14;* **B01J** *8/04*
U.S. Cl. 422—190 **9 Claims**



1. A system for converting lower olefins to heavier hydrocarbons from olefinic feedstock comprising a mix comprising:
prefractionation means for recovering light feedgas from the olefinic feedstock including a stripper tower operatively connected to strip said light feed gas from heavier hydrocarbons selectively;
means for recovering a liquid stripper bottoms stream from the prefractionator;
reactor means containing oligomerization catalyst for converting lower olefins contained in the stripper bottoms stream to higher molecular weight hydrocarbons comprising intermediate and heavy hydrocarbons;
means for flashing at least a portion of the reactor effluent stream between the reactor means and a phase separator by reducing pressure of the effluent stream, thereby producing a first liquid effluent stream rich in heavy hydrocarbons and a first effluent vapor stream rich in light hydrocarbons;
means for recovering a liquid recycle stream rich in intermediate hydrocarbons from at least one of said separated effluent streams;
means for recycling substantially all of the liquid recycle stream as a liquid sorbent stream to the prefractionation means.

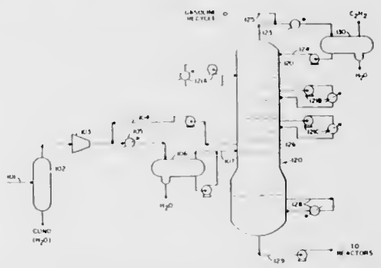
4,898,717

MULTISTAGE PROCESS FOR CONVERTING OXYGENATES TO DISTILLATE HYDROCARBONS WITH INTERSTAGE ETHENE RECOVERY

Chung H. Hsia, Matawan; Hartley Owen, Belle Mead, and Bernard S. Wright, East Windson, all of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Division of Ser. No. 568,152, Jan. 4, 1984, Pat. No. 4,506,106. This application Jan. 7, 1985, Ser. No. 689,638
Int. Cl.⁴ B01D *3/14;* **B01J** *8/04*
U.S. Cl. 422—190 **7 Claims**

1. A continuous multi-stage catalytic system for converting oxygenated feedstock to liquid hydrocarbons comprising primary stage catalytic dehydration means containing catalyst for converting oxygenate to light olefinic vapor and normally liquid C_5^+ hydrocarbons;
interstage separation means for recovering water and hydrocarbons from the primary stage effluent stream;
first fractionation means for recovering ethene from the primary stage olefinic vapor including a sorption tower operatively connected to selectively sorb C_3+ hydrocarbons from the olefinic vapor in a liquid sorption stream;
means for pressurizing and heating the liquid sorption stream containing C_3+ sorbate;
secondary stage catalytic oligomerization reactor means containing medium pore shape selective zeolite oligomerization catalyst for converting olefinic hydrocarbons in



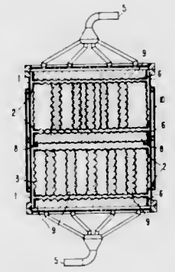
the sorption stream to liquid hydrocarbons comprising a major amount of distillate;
second fractionation means for separating secondary stage effluent into a light hydrocarbon stream rich in C_3–C_4 aliphatic hydrocarbons, a C_5+ gasoline stream and distillate range stream; and
means for recycling at least a portion of the C_5+ gasoline stream to the first fractionation means as a lean sorbent stream.

4,898,718

BIOCATALYTIC REACTORS FOR GEL-LIKE AND OTHER TYPES OF IMMOBILIZED BIOCATALYSTS

Joaquim P. Cardoso, Sacavem, Portugal, assignor to Cipan-Companhia Industrial Produtora De Antibioticos, S. A., Lisbon, Portugal

Filed Mar. 2, 1987, Ser. No. 20,772
Claims priority, application Portugal, Mar. 19, 1986, 82225
Int. Cl.⁴ B01J *8/02*
U.S. Cl. 422—211 **13 Claims**



1. A biocatalytic reactor for contacting a liquid with a particulate catalyst comprising:
(a) a column having an inlet and an outlet for said liquid, and
(b) at least one catalyst containing box inside said column between said inlet and said outlet and extending across the interior of said column, said box having a top end and a bottom end and defined by a wire mesh covering suitable to prevent the catalyst from escaping the box and allowing the free passage of the liquid through it, means defining a plurality of separate voids each free of catalyst material

and extending from the bottom end to the top end of said box and defined by wire mesh on their lateral area and top and bottom cross sectional areas.

4,898,719

LIQUID EXTRACTION PROCEDURE FOR THE RECOVERY OF SCANDIUM

William J. Rourke, Worcester; Wen-Chao Lai, Westboro, and Samuel Natansohn, Sharon, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 41,815, Apr. 23, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 321,603

Int. Cl.[4] C01F *17/00*

U.S. Cl. 423—21.5 **7 Claims**

1. A method for recovering scandium comprising the following steps:

Step 1—dissolving scandium from a solid comprising iron, manganese, and scandium to form an aqueous solution comprising an amount of said scandium, and said iron, said amount of said iron in said aqueous solution being greater than said amount of said scandium in said solution;

Step 2—reducing any ferric iron in said aqueous solution containing said scandium;

Step 3—adjusting the product from step 2 containing said scandium to an acidic pH from about 1.8 to about 2.0 to form an acidic solution;

Step 4—selectively extracting said scandium with respect to iron from said acidic solution by contacting said acidic solution with an organic mixture forming an organic mixture containing said scandium, said organic mixture comprising an organic extractant and an organic solvent, said organic extractant comprising thenoyltrifluoroacetone;

Step 5—contacting said organic mixture containing said scandium with an aqueous stripping solution to transfer said scandium contained in said organic mixture to said aqueous stripping solution, said stripping solution comprising a mineral acid;

Step 6—precipitating said scandium contained in said aqueous stripping solution; and

Step 7—separating said precipitated scandium from said aqueous stripping solution.

4,898,720

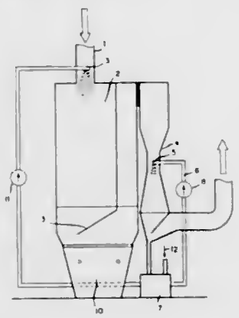
METHOD FOR GASCLEANING AND A DEVICE FOR THE ACCOMPLISHMENT OF THE METHOD

Per Glindsjö, Nygatan 136, SE-602, 31 Norrköping, Sweden

Filed Apr. 18, 1988, Ser. No. 182,451

Int. Cl.[4] B01D *47/00*

U.S. Cl. 423—210 **13 Claims**



11. A method for gascleaning comprising the steps of feeding dirty gas into an inlet of a gas reactor;

flowing the dirty gas around an edge of a deflection plate mounted at a bottom of a wall inside the gas reactor;

feeding the dirty gas from the deflection sheet to a venturi pipe;

spraying water into the venturi pipe at a constriction;

collecting the water from the venturi pipe in a tank;

pumping the water in the tank with a pump to the nozzle in the venturi pipe;

pumping water from the tank with a second pump to a second nozzle disposed at the top of the gas reactor.

4,898,721

HALOGEN ABSORBTION USING VEGETABLE OILS AND SURFACTANTS

Robert M. Alway, 2830 Radcliffe, Portage, Mich. 49081

Filed Apr. 4, 1989, Ser. No. 332,972

Int. Cl.[4] B01D *53/34;* **B08B** *3/04*

U.S. Cl. 423—240 **5 Claims**

1. A process of absorbing halogens comprising; contacting a mixture containing vegetable oil and surfactant with halogen, pure or mixed with other material.

4,898,722

SYNTHESIS OF CRYSTALLINE SAPO-37

Eric G. Derouane, Namur, Belgium, and Roland von Ballmoos, Pennington, N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,785

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 **7 Claims**

1. A method for synthsizing crystalline material comprising silicon, phosphorus and aluminum and exhibiting a characteristic X-ray diffraction pattern as shown in Table 1 of the specification which comprises:

(1) providing a reaction mixture comprising water, sources of the said oxide, silicon oxide, and phosphorus oxide, one of the said oxide sources being unstable in the water, an organic directing agent A, wherein said organic directing agent A is a mixture of tetrapropylammonium and tetramethylammonium, inorganic cations M and anions N, and a substantially water-immiscible organic solvent for the said oxide source unstable in the water, the components of said reaction mixture having the following relationship:

$$(A)_a:(M_2O)_b:(Al_2O_3)_c:(SiO_2)_d(P_2O_5)_e:(Solvent)_f:N_g:(H_2O)_h$$

wherein a, b, c, d, e, f, g, and h are numbers satisfying the following relationship:

a/(c+d+e) is less than 4,

b/(c+d+e) is less than 2

d/(c+e) is less than 2,

f/(c+d+e) is from 0.1 to 15,

g/(c+d+e) is less than 2, and

h/(c+d+e) is from 3 to 150,

wherein upon initial provision of said reaction mixture the said oxide source unstable in the water is dispersed or dissolved in the water-immioscible organic solvent;

(2) heating said reaction mixture at a rate of from 5° C. to 200° C. per hour to a temperature of from 80° C. to 200° C.;

(3) agitating said reaction mixture in a manner sufficient to intimately admix the water-immiscible organic solvent and the water with each other thereby progressively hydrolyzing the oxide source unstable in water;

(4) when nucleation of said crystalline material occurs, heating said agitated reaction mixture at a rate of from 5° C. to 200° C. per hour to a temperature of from 100° C. to 300° C.;

(5) maintaining said agitated reaction mixture at a temperature of from 100° C. to 300° C. and a pH of from 2 to 9 until crystals of said crystalline material are formed; and

(6) recovering from said reaction mixture said crystalline material characterized by a composition, in the anhydrous state, as follows:

$$A_{y'}:M_{x/m}{}^{m+}:(AlO_2)_{1-y}{}^{-}:(PO_2)_{1-x}{}^{+}:(SiO_2)_{x+y}:N_{y'/n}{}^{n-}$$

wherein A' represents the total of organic directing agent A plus water-immiscible organic solvent, v is the number of moles of A', m is the valence of cation M, n is the valence of anion N, and x and y are numbers of from greater than −1 to less than +1 which satisfy the relationship:

(1) if x is 0, then y is not 0,

(2) if y is 0, then x is not 0,

(3) the sum of x+y is greater than 0 and less than 1,

said crystalline material having an ion exchange capacity of at least about 0.05 meq/g.

4,898,723

METHOD FOR PRODUCING HIGH STRENGTH, HIGH MODULUS MESOPHASE-PITCH BASED CARBON FIBERS

Yoshinori Suto; Toshiyuki Ito; Hideyuki Nakajima; Kelichiro Okamura; Shin-ichi Nayuki, all of Kamisumachi; Hiroyasu Ogawa, and Harumitsu Enomoto, both of Shizuokaken, all of Japan, assignors to Petoca Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 202,851

Claims priority, application Japan, Jun. 5, 1987, 62-139979

Int. Cl.[4] D01F *9/12*

U.S. Cl. 423—447.4 **1 Claim**

1. A method for producing mesophase pitch based carbon fibers which comprises carbonizing infusiblized fibers, obtained by treating mesophase-pitch-fibers, in an inert atmosphere under no tension or under a tension of 1 mg/denier or less in a first stage until an interlayer spacing d 002 of 0.3460–0.3490 nm and a crystallite thickness L_c(002) of 1.6–2.2 nm are attained and then carbonizing under a tension of 50–300 mg/denier at the temperature of 2600° C. or more in the second stage.

4,898,724

ORGANIS AMINE PHOSPHONIC ACID COMPLEXES FOR THE TREATMENT OF CALCIFIC TUMORS

Jaime Simon, Angleton; David A. Wilson, Richwood, both of Tex.; Wynn A. Volkert; David E. Troutner, both of Columbia, Mo., and William F. Goeckeler, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 803,376, Dec. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 738,010, May 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 616,985, Jun. 4, 1984, abandoned. This application May 14, 1987, Ser. No. 50,263

Int. Cl.[4] A61K *43/00, 49/02;* **A61N** *5/10;* **C07F** *11/00*

U.S. Cl. 424—1.1 **26 Claims**

1. A composition comprising (1) a complex which comprises Sm-153 and at least one of an aminophosphonic acid or a physiologically acceptable salt thereof wherein the aminophosphonic acid is selected from the group consisting of ethylenediaminetetramethylenephosphonic acid, diethylenetriaminepentamethylenephosphonic acid, hydroxyethylethylenediaminetrimethylenephosphonic acid, tris(2-aminoethyl)aminehexamethylenephosphonic acid, bis(aminoethyl)-piperazinetetramethylenephosphonic acid, and (1-carboxy)ethylenediaminetetramethylenephosphonic acid and (2) at least one of the above aminophosphonic acids, or a physiologically acceptable salt thereof, in excess of that required to make the complex, and wherein the resulting composition is therapeutically effective.

4,898,725

PREPARATIONS FOR WASHING OR RINSING HAIR CONTAINING DI- OR TRI- CARBOXYLIC ACIDS

Horst Hoeffkes, Duesseldorf-Hellerhof; Kurt Seidel, Duesseldorf; Karl Giede; Alfred Struve, both of Hilden, and Bert Gruber, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 822,368, Jan. 24, 1986, abandoned. This application Sep. 20, 1988, Ser. No. 248,344

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3503618

Int. Cl.[4] A61K *7/075, 7/080;* **C11D** *3/20*

U.S. Cl. 424—70 **12 Claims**

1. An aqueous or aqueous-alcoholic composition for washing or rinsing hair, comprising

A. from about 0.1 to about 5.0% by weight of at least one water soluble ionic polymer, and

B. from about 0.1 to about 20% by weight of a water-soluble salt of a saturated or unsaturated aliphatic, alicyclic or aromatic di- or tri-carboxylic acid containing from 6 to 44 carbon atoms wherein two of its carboxyl groups are separated from one another by at least 3 carbon atoms.

4,898,726

INITIATED HAIR STRAIGHTENING COMPOSITION AND SYSTEM

Marion D. Beste, Arlington Heights, Ill., assignor to Johnson Products Co., Inc., Chicago, Ill.

Filed Aug. 24, 1988, Ser. No. 236,054

Int. Cl.[4] A61K *7/09;* **A45D** *7/04*

U.S. Cl. 424—72 **42 Claims**

1. An initiated, aqueous, no-base type hair-straightening composition having a pH of between 12 and about 14 comprising a mixture of a strong alkali as a hair-straightening agent and a water-soluble initiating agent that is a mercapto dicarboxylic acid hair keratin-disulfide reducing agent selected from the group consisting of aliphatic dicarboxylic acids having about 4 to about 6 carbon atoms and a sulfhydryl functional group on a carbon atom alpha to one or both of the carboxy acid groups, salts thereof and derivatives thereof.

4,898,727

DEODORANT AND FILTER USING SAME, AS WELL AS METHOD OF PRODUCING THE DEODORANT

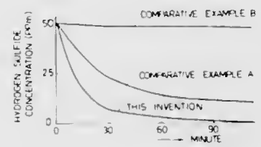
Koji Osada, Yawata; Haruyuki Date, Sakai; Yasuhiro Saihara, Kadoma; Toshiyuki Yamauchi, Ibaragi, and Shiro Koike, Shijonawate, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 25, 1986, Ser. No. 878,324

Claims priority, application Japan, Oct. 15, 1985, 60-230424

Int. Cl.[4] A61L *9/01;* **C07H** *1/08*

U.S. Cl. 424—76.1 **12 Claims**



1. A deodorant consisting essentially of deodorizing ingredients extracted by hydrophilic organic solvents, water, or mixtures thereof from at least one plant selected from the group consisting of Osmanthus, Forsythia, Paulownia, Syringa, Diospyros, Quercus, Fartugium, Petasites, Pinus, Tsuga, Ginkgo, Nandina, Loropetalum, Houttuynia, and Oxalis, and a carrier impregnated with said deodorizing ingredients.

4,898,728

PROCESS FOR PRODUCTION OF COMPOSITION CONTAINING LECITHIN AND POLYVINYLPYRROLIDONE

Robert R. Vartan, Bristol, Tenn., assignor to Beecham Group p.l.c., England

Filed Apr. 7, 1988, Ser. No. 178,487
Int. Cl.[4] A61K *31/79, 31/74, 31/43*
U.S. Cl. 424—80 10 Claims

1. In a process for the production of a sterile composition containing lecithin and polyvinyl pyrrolidone the improvement comprising admixing the lecithin and polyvinyl pyrrolidone, in a solvent comprising about 75% to 90% methyl isobutyl ketone and about 10% to 25% isopropyl alcohol, and passing the solution through a millipore filter whereby the ingredients are rendered sterile.

4,898,729

TREATMENT OF HYPERTENSION, COMPOUNDS AND COMPOSITIONS FOR ANTIHYPERTENSION AND DIURESIS

Ronald B. Miller, Harpenden, England; Alfred Halpern, Great Neck, N.Y.; Stewart Leslie, Cambridge, England, and Peter Hofer, Liestal, Switzerland, assignors to Euroceltique, S.A., Luxembourg, Luxembourg

Filed Dec. 9, 1983, Ser. No. 559,755
Int. Cl.[4] A61K *31/79*
U.S. Cl. 424—80 30 Claims

1. Method of effecting antihypertensive action without diureses which comprises administering to a patient requiring antihypertensive effect but in whom diureses is not desired a pharmaceutically acceptable thiazide diuretic having a predetermined diuretic effective dose, the amount of said thiazide diuretic administered being sufficient to achieve antihypertension while being insufficient to achieve effective diuresis.

4,898,730

METHOD TO STIMULATE THE IMMUNE RESPONSE TO SPECIFIC ANTIGENS

Julia G. Levy, Vancouver; J. Kevin Steele, Victoria, and Anthea T. Stammers, Port Coquitlan, all of Canada, assignors to The University of British Columbia, Vancouver, Canada

Filed Mar. 13, 1987, Ser. No. 25,463
Int. Cl.[4] A61K *39/00, 45/02, 37/02*
U.S. Cl. 424—88 5 Claims

1. A method to enhance the immune response to a specified antigen which comprises administering to a mammal in need of such treatment at a time prior to exposure to said antigen effective to enhance immune response upon exposure to said antigen, an amount of an idiotypic factor secreted by Ts1 cells (TsF1) immunoreactive with the antigen effective to enhance said immune response.

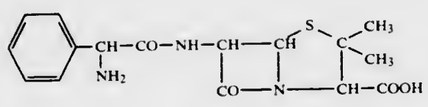
4,898,731

ANTIBIOTIC COMBINATIONS OF PENICILLINS

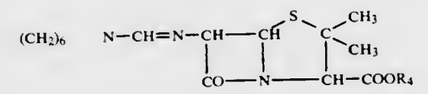
Peter Bamberg, Zurich, Switzerland; Bertil A. Ekström, Södertälje, Sweden; Ulf E. Forsgren, Södertälje, Sweden, and Berndt O. H. Sjöberg, Södertälje, Sweden, assignors to Astra Lakemedel Aktiebolag and Astra Pharmaceutical Products, Inc., both of, Sweden

Division of Ser. No. 464,157, Apr. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 302,423, Oct. 31, 1972, abandoned. This application Jun. 24, 1985, Ser. No. 748,268
Claims priority, application United Kingdom, Nov. 1, 1971, 50675/71
Int. Cl.[4] A61K *31/43*
U.S. Cl. 424—114 2 Claims

1. A method of treating bacterial infections in a body which comprises forming an antibacterially effective 1:1 mixture of:



and



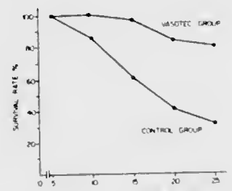
in the body.

4,898,732

INHIBITING OF TUMOR GROWTH WITH AN ANTAGONIST OF THE RENIN-ANGIOTEN-SIN SYSTEM

Leonardo A. Fernandez, Guilford, Conn., assignor to The Clinipad Corporation, Guilford, Conn.

Filed May 4, 1988, Ser. No. 190,158
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—422 7 Claims



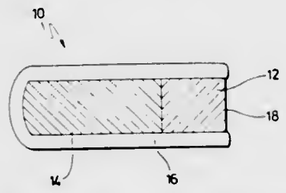
1. The method of implanting in a patient a controlled-release member, said member containing and releasing in controlled manner an effective dose a member selected from the group consisting of enalapril maleate, catapril and seralasin acetate, of a pharmaceutical antagonist of the renin-angiotensin system of said patient, whereby the growth of vascularization in said patient at least in an area adjacent said implanted controlled-release member is inhibited.

4,898,733

LAYERED, COMPRESSION MOLDED DEVICE FOR THE SUSTAINED RELEASE OF A BENEFICIAL AGENT

Randolph B. DePrince, and Ravi Viswanathan, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Nov. 4, 1985, Ser. No. 794,530
Int. Cl.[4] A61F *2/00*
U.S. Cl. 424—425 24 Claims



1. A partially coated device for the continuous administration of a beneficial agent in the body of a living being at a substantially steady rate which comprises:

(a) a body fluid-contacting layer which comprises a dispersion of an agent which is substantially soluble in body fluid and a solid matrix material, said matrix material comprising a polymer which is substantially insoluble in said body fluid, and

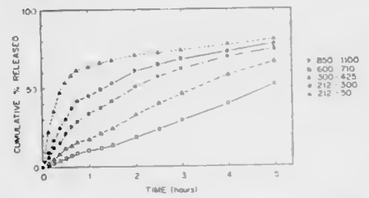
(b) a non-body fluid-contacting layer which comprises a reservoir of said beneficial agent, wherein said body fluid-contacting layer is compression molded to said non-body fluid-contacting layer to form a tablet or pellet.

4,898,734

POLYMER COMPOSITE FOR CONTROLLED RELEASE OR MEMBRANE FORMATION

Edith Mathiowitz, Brookline; Robert S. Langer, Somerville, both of Mass.; Abraham Warshawsky, Rehovot, Israel, and Elazar Edelman, Brookline, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 29, 1988, Ser. No. 162,161
Int. Cl.[4] A61F *2/00*
U.S. Cl. 424—426 16 Claims



1. A method for making a composite polymeric device comprising:

providing a compound to be released,

incorporating the compound to be released into polymer spheres,

mixing the polymer spheres into a liquified polymer matrix, and

solidifying the polymer matrix.

4,898,735

LIPOSOME/DOXORUBICIN COMPOSITION AND METHOD

Yechezkel Barenholz, Jerusalem, Israel, and Alberto Gabizon, San Francisco, Calif., assignors to Yissum Research and Development Company of the Hebrew University of Jerusalem and Hadassah Medical Organization, both of, Israel

Continuation-in-part of Ser. No. 806,084, Dec. 6, 1985, Pat. No. 4,797,285. This application Oct. 12, 1988, Ser. No. 256,844
Int. Cl.[4] A01N *25/00*; A61K *31/65*
U.S. Cl. 424—450 2 Claims

1. A method of treating human neoplasms of the liver, with at least the same extent of therapeutic effectiveness, but substantially reduced incidence of alopecia and nausea with respect to that produced treatment with doxorubicin in free form, comprising

preparing, for parenteral administration, an aqueous suspension of liposomes (i) whose lipid bilayer region contains at least about 2.5 mole percent doxorubicin or a pharmacologically acceptable salt thereof, and (ii) which are in the size range of 0.05 to 0.5 microns in diameter, allowing for sterilization by membrane, and which suspension contains less than about 10% doxorubicin in free-drug form; and

parenterally administering a pharmacologically acceptable amount of the suspension to the patient.

2. The method of claim 1, wherein the liposomes are about 0.2 microns in diameter.

4,898,736

METHOD FOR TABLET PREPARATION

Ashok V. Katdare, Norristown, Pa., assignor to Merck & Co., Inc., Rayway, N.J.

Filed Mar. 9, 1988, Ser. No. 166,078
Int. Cl.[4] A61K *9/20*
U.S. Cl. 424—465 2 Claims

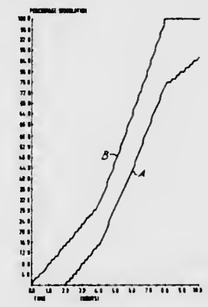
1. A process for the preparation of low dose (2S,12bS)-1',3'-dimethylspiro(1,3,4,6,7,12b-hexahydro-benzo-[2,3-a]quinolizin)-2,4'-(5',6'-dihydro-1'H-pyrimidine-2'(3'H)-one) tablets comprising the steps: dissolving (2S,12bS)-1',3'-dimethylspiro(1,3,4,6,7,12b-hexahydrobenzo]2,3-a]quinolizin)-2,4'-(5',6'-dihydro-1'H-pyrimidine-2'(3'H)-one) in a suitable easily evaporated solvent; mixing the solution with a directly compressible powder tableting vehicle; evaporating the solvent; adding a lubricant and other excipients if desired; and compressing the mixture into tablets.

4,898,737

CONTROLLED ABSORPTION PHARMACEUTICAL COMPOSITION

Donald E. Panoz, and Edward J. Geoghegan, both of Athlone, Ireland, assignors to Elan Corporation plc, Athlone, Ireland

Continuation of Ser. No. 32,996, Mar. 30, 1987, abandoned, which is a continuation of Ser. No. 598,191, Apr. 9, 1984, abandoned. This application Apr. 27, 1988, Ser. No. 188,090
Claims priority, application Ireland, Apr. 21, 1983, 915/83
Int. Cl.[4] A61K *9/16, 9/52*
U.S. Cl. 424—468 16 Claims



1. A controlled absorption propranolol containing pellet for oral administration, said pellet comprising:

(A) a core of

(i) a powder mixture comprising propranolol or a pharmaceutically acceptable salt thereof and an organic acid selected from the group consisting of citric acid, tartaric acid, succinic acid, malic acid, ascorbic acid and fumaric acid or a mixture thereof, and

(ii) a polymeric material comprising a major proportion of a pharmaceutically acceptable water-soluble polymer and a minor proportion of a pharmaceutically acceptable water-insoluble polymer,

said core comprising layers of said powder mixture and said polymeric material superimposed one upon the other wherein said polymeric material is present in an amount sufficient to ensure that all of said powder mixture is coated into said core; and

(B) a multi-layer membrane surrounding said core and containing a major proportion of a pharmaceutically acceptable film forming, water-insoluble polymer and a minor proportion of a pharmaceuticaly acceptable film forming, water-soluble polymer,

the number of layers in said membrane and the ratio of said water-insoluble polymer to said water-soluble polymer being effective to permit release of said propranolol

from said pellet at a rate allowing controlled absorption thereof over a twenty four hour period following oral administration, said rate being measured in vitro as a dissolution rate of said pellet in a buffer solution at pH 7.5 which, when measured in a basket assembly according to U.S. Pharmacopoeia XX at 37° C. and 75 r.p.m., substantially corresponds to the following dissolution pattern:

(a) from 0 to 15% of the total propranolol is released after 2 hours of measurement in said assembly;
(b) from 15 to 30% of the total propranolol is released after 4 hours of measurement in said assembly;
(c) from 43 to 63% of the total propranolol is released after 6 hours of measurement in said assembly;
(d) from 75 to 100% of the total propranolol is released after 8 hours of measurement in said assembly;
(e) from 85 to 100% of the total propranolol is released after 10 hours of measurement in said assembly.

4,898,738

PROCESS FOR PRODUCING VINEGAR FROM NON-COOKED ALCOHOL MOROMI

Takehiko Yamamoto, Izumi; Terumasa Kubota, Toyohashi; Isao Itoh, Kashihara; Hiroyuki Kato, Isoki; Terumi Kikuchi, Toride; Hiroko Kawasaki; Misako Mashimoto, both of Sakai, and Yuji Oki, Higashi-Osaka, all of Japan, assignors to Tamanoi Vinegar Corporation Limited, Osaka, Japan

Continuation of Ser. No. 111,798, Oct. 22, 1987, abandoned. This application May 4, 1989, Ser. No. 348,085
Claims priority, application Japan, Dec. 22, 1986, 61-305858
Int. Cl.[4] C12J *1/00, 1/04*
U.S. Cl. 426—17 **3 Claims**

1. A process for producing vinegar from non-cooked alcohol MOROMI derived from corn, which comprises:
pulverizing corn which has not undergone heat denaturation,
adding water in an amount from 2.0 to 7.0 times by volume to the pulverized corn, then adding a glucoamylase preparation containing from 8 to 15 units of glucoamylase activity per 1 gram of starch in the pulverized corn and from 0 to 35 units of protease activity per 1 gram of starch in the pulverized corn and yeast to the pulverized corn,
conducting alcoholic fermentation of raw starch material in the pulverized corn,
separating the resultant solid content from the resultant liquid solution containing alcohol, and
conducting acetic acid fermentation of the separated liquid solution by means of acetic acid bacteria,
wherein said process is conducted in the absence of malt.

4,898,739

PROCESS FOR PREPARING "NON-BITTER" ENZYME MODIFIED CHEESE FLAVORING MATERIAL AND SPRAY DRIED PRODUCT

Anandaraman Subramaniam, Syracuse; Robert M. Ozogar, Mattydale, and Carlton K. Bergsbaken, Syracuse, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Division of Ser. No. 43,317, Apr. 28, 1987, Pat. No. 4,853,232. This application Apr. 11, 1989, Ser. No. 336,502
Int. Cl.[4] A23C *9/12, 19/086*
U.S. Cl. 426—35 **8 Claims**

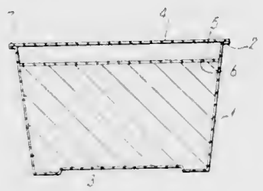
1. A process for preparing a non-bitter flavoring material that can be eaten as is or added to foodstuff to impart a cheese flavor to the foodstuff comprising
(a) digesting at a pH between 4.5 and 4.9 a mixture of softened cheese "having at least 60% by weight solids" and purified microbial coagulase until said mixture thins;
(b) inactivating said coagulase; and
(c) homogenizing.

4,898,740

PACKAGE CONTAINING A WATER-IN-OIL FAT DISPERSION

Alfred G. Havenstein, Schenefeld; Werner Kahle, Pinneberg, and Dagmar Schnell, Hamburg, all of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

PCT No. PCT/EP87/00188, § 371 Date Dec. 1, 1987, § 102(e) Date Dec. 1, 1987, PCT Pub. No. WO87/05886, PCT Pub. Date Oct. 8, 1987
PCT Filed Apr. 3, 1987, Ser. No. 130,384
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611276
Int. Cl.[4] A23D *3/04, 5/04*
U.S. Cl. 426—106 **6 Claims**



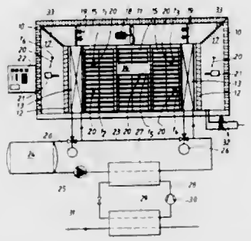
1. A package having walls containing a plastified water-in-oil dispersion, at least a surface of which that is not in contact with the walls of the package, said package comprising a thin coating that is a closed, substantially pore-free, edible fat layer not containing a discontinuous aqueous phase, a greater part of the fat layer having a fat of melting point below 37° C., which layer is generally imperceptible and said layer has a non-aqueous, physiologically acceptable filling agent dispersed therein in an amount of 8 to 20%, said filling agent being a gas selected from the group consisting of nitrogen, inert nitrogen oxides, carbon dioxide and mixtures thereof.

4,898,741

METHOD FOR THAWING OF FOOD ARTICLES

Jan B. Heide, Kristiansund, Norway, assignor to Skärhamn International AB, Göteborg, Sweden

Filed Jun. 21, 1988, Ser. No. 209,383
Claims priority, application Sweden, Jun. 30, 1987, 8702696
Int. Cl.[4] A23B *4/06*
U.S. Cl. 426—231 **4 Claims**



1. A method for thawing of articles of food which have been frozen and stored at a temperature of about −38° C., comprising placing the articles in a room having means for maintaining a controlled humid climate and a maximum air flow of about 5 m/sec, and automatically regulating the thawing process via temperature detector means within the core of the articles and humidity detector means within the humid climate.

4,898,742

PROCESS FOR THE DECHARACTERIZATION OF BASE WINE

Anil J. Shrikhande, Farmington, Conn., and Joseph A. Alioto, Madera, Calif., assignors to Heublein, Inc., Farmington, Conn.

Filed Mar. 2, 1987, Ser. No. 21,050
Int. Cl.[4] C12G *3/08*
U.S. Cl. 426—271 **4 Claims**

1. A process for treating wine which comprises:
(a) decharacterizing the wine by subjecting the wine to the effects of a non-ionic absorbent selected from the group consisting of phenolic resins and polyaromatic resins;
(b) fortifying the decharacterized wine to contain between 18 and 24 percent of alcohol by volume; and
(c) neutralizing the fortified wine by subjecting the fortified wine to the effects of activated carbon.

4,898,743

METHOD OF COOKING LOBSTER

Richard E. Ross, and Shelley D. Ross, both of 5240 Westside Rd., Redding, Calif. 96001

Filed Aug. 31, 1988, Ser. No. 239,529
Int. Cl.[4] A23L *1/33*
U.S. Cl. 426—523 **3 Claims**



1. A method of cooking lobster, comprising:
cutting a lobster shell having lobster meat therein to facilitate removal of said lobster meat therefrom;
removing said lobster meat from said lobster shell;
positioning said lobster meat atop said lobster shell;
placing said lobster shell and said lobster meat into a cooking pan having a bottom and sides extending upward from said bottom, said bottom and sides being shaped, positioned and oriented such that when said lobster shell is positioned against said bottom of said cooking pan and said lobster meat is positioned atop said lobster shell, said lobster meat is positioned in close proximity to all of said sides of said cooking pan, and
heating said cooking pan to cause reradiation of heat from said sides of said cooking pan toward said lobster meat whereby said lobster meat is substantially evenly cooked.

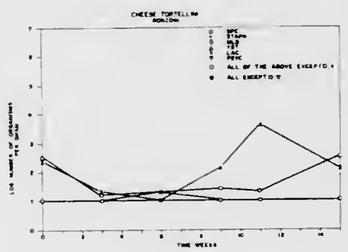
4,898,744

METHOD FOR PREPARING AND PRESERVING FILLED PASTA PRODUCTS

Louis Liggett, Brooklyn; Michael McGuire, Elmhurst; Marcia Paimer, Nanuet, and Ralph DeGiacomo, Palisades, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 22, 1987, Ser. No. 136,891
Int. Cl.[4] D21D *2/08;* **A23L** *3/00, 1/162*
U.S. Cl. 426—557 **10 Claims**

1. A method for preparing and preserving filled dough product in the form of a filled fresh pasta shell which maintains the freshness for up to 120 days without lowering the moisture to levels which prohibit growth of organisms which cause deterioration comprising the steps of:
(a) preparing a uniform blend comprising flour, water and whole eggs having a moisture content of up to 33%;
(b) conditioning the uniform blend by compacting same to form a sheet of dough having a thickness of at least 0.04 inches;
(c) forming and filling the sheeted dough with a filling composition having a pH ranging from 4.5 to 6.0 selected depending on the end product desired;
(d) contacting the filled dough with steam in a single steam treatment for a time and at a temperature sufficient to pasteurize said filled dough;



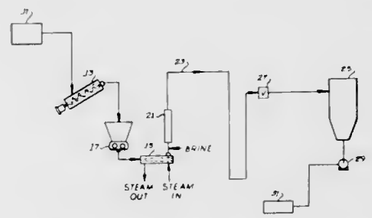
(e) cooling the pasteurized filled dough shell to temperatures between about 30° F. and 50° F.;
(f) packaging the cooled pasteurized filled dough in a modified atmosphere environment; and
(g) storing the packaged product for extended periods of time at temperatures ranging from about 40° F. to about 50° F.

4,898,745

METHOD FOR MANUFACTURING OF PASTA FILATA CHEESE WITH EXTENDED SHELF LIFE

William H. Zamzow, Glenview, and Anthony M. Miller, Northbrook, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed May 25, 1989, Ser. No. 357,057
Int. Cl.[4] A23C *19/06*
U.S. Cl. 426—582 **11 Claims**



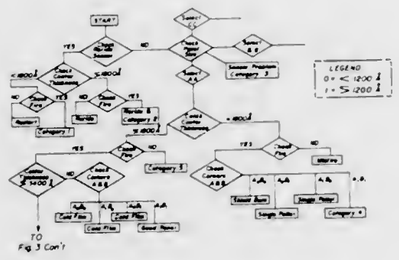
1. A method for making Pasta Filata cheese comprising providing a Pasta Filata curd, dividing said curd into pieces, delivering said curd pieces to an auger conveyor, heating and working said curd to a plastic consistency as it passes through said conveyor, transporting said plastic curd through a steam injection heating zone and a static mixing zone to provide a homogeneous molten curd, transferring said molten curd from said mixer through a holding conduit into a vacuum chamber so as to flash cool said molten curd, said holding conduit having a diameter and length sufficient to hold said molten curd for a time at the temperature of said molten curd which is sufficient to pasteurize said curd and said conduit having an inner wall surface formed of a material with enhanced lubricity as compared to stainless steel.

4,898,746

MATERIAL DEPOSITION PROCESS ANALYSIS SYSTEM

Stephen T. Opresko, Lancaster, Pa., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Jun. 28, 1988, Ser. No. 213,214
Int. Cl.[4] D05D *5/06*
U.S. Cl. 427—10 **2 Claims**



1. A method for depositing an aluminum coating on a phosphor screen of a CRT faceplate panel, comprising the steps of:
   a. loading said panel onto an identified exhaust cart having an evacuation chamber with an apparatus therein for controlling the distribution of aluminum from at least one source on said apparatus;
   b. evacuating said chamber to a pressure sufficient to deposit aluminum;
   c. providing aluminum from said source and depositing aluminum as a coating on said phosphor screen of said panel;
   d. sensing the providing of said aluminum from said source;
   e. generating a plurality of electrical signals representative of the relative thickness of said aluminum coating at the center and the edges on said panel; and
   f. converting said signals into data values to indicate whether said aluminum coating achieves a predetermined thickness profile and utilizing said data values to provide an indication of the performance of said identified exhaust cart and of the categories of defects for said panel not meeting said predetermined thickness profile.

4,898,747

ELECTROSTATIC COATING OF RUBBER-TO-METAL ADHESIVES ON METAL PARTS

Kenneth L. Robertson, Ottawa Hills, Ohio, assignor to Ken-Kost, Inc., Delta, Ohio

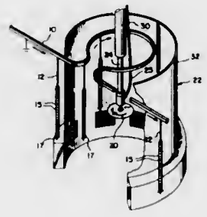
Continuation of Ser. No. 178,804, Mar. 29, 1988, Pat. No. 4,810,521, which is a continuation of Ser. No. 885,623, Jul. 15, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 274,118
Int. Cl.[4] B05D *1/04, 1/06, 3/02, 5/00*
U.S. Cl. 427—31 **7 Claims**

1. The process of treating metal parts for bonding of rubber thereto by the application of a rubber-to-metal adhesive thereon, comprising the steps of

providing a plurality of metal parts,

conveying said parts through a disc-type electrostatic applicator while applying a first rubber-to-metal adhesive coating having a low solids content of less than about 40 wt. % solids thereon, said coating being diluted with a petroleum diluent adapted to increase the polarity of said adhesive and having a relatively slow evaporation rate so that the adhesive is applied in a liquid form,

conveying said parts to a drying oven for curing,



conveying said parts from said oven to a second disc-type electrostatic applicator,

applying a second rubber-to-metal adhesive having a low solids content of less than about 40 wt. % solids by said second applicator, said second adhesive being diluted by a petroleum diluent adapted to increase the polarity of said second adhesive and having a relatively slow evaporation rate so that said second adhesive is applied in a liquid form to said parts, and

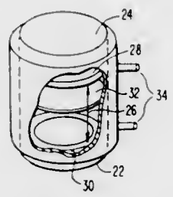
reconveying said parts to said drying oven for drying said second adhesive.

4,898,748

METHOD FOR ENHANCING CHEMICAL REACTIVITY IN THERMAL PLASMA PROCESSES

Charles H. Kruger, Jr., Stanford, Calif., assignor to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Aug. 31, 1988, Ser. No. 239,122
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 **16 Claims**



1. A method for enhancing a chemical reaction during which a multiatomic reactant dissociates, comprising:

providing a plasma having an initial gas temperature and an initial electron temperature in a reaction zone, the initial gas temperature and the initial electron temperature being the same or within less than about 1,000° Kelvin of each other, the plasma including at least one multiatomic species; and,

elevating the electron temperature of the plasma in the reaction zone by at least about 1,000° Kelvin above the initial electron temperature and the initial gas temperature to increase the dissociation of the multiatomic species or to inhibit recombination of the multiatomic species when dissociated.

4,898,749

METHOD FOR PRODUCING ALUMINUM OXIDE COATED COBALT POWDER

Joseph E. Ritsko, Towanda, Pa.; Walter A. Johnson, Houghton, Mich., and Nelson E. Kopatz, Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 3, 1989, Ser. No. 292,715
Int. Cl.[4] B05D *7/00*
U.S. Cl. 427—216 **6 Claims**

1. A method for producing aluminum oxide coated cobalt powder, said method comprising:
   (a) contacting cobalt powder of fine particle size with a liquid aluminum compound wherein the aluminum is hydrolyzable and adding water to said compound and said cobalt powder to form a slurry;
   (b) removing essentially all of the liquid from said slurry to produce cobalt powder with a coating of hydrolyzed aluminum oxide; and
   (c) firing said cobalt powder with said hydrolyzed aluminum oxide coating in a non-oxidizing atmosphere to produce cobalt powder with a coating of aluminum oxide.

4,898,750

PROCESSES FOR FORMING AND USING PARTICLES COATED WITH A RESIN WHICH IS RESISTANT TO HIGH TEMPERATURE AND HIGH PH AQUEOUS ENVIRONMENTS

Robert H. Friedman, and Billy W. Surles, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,066
Int. Cl.[4] B05D *7/00*
U.S. Cl. 427—221 **22 Claims**

1. A process for preparing particulate matter coated with a cured, alkaline fluid resistant resin comprising:
   (a) contacting particulate matter with a mixture of effective amounts of urea formaldehyde resin and a furfural oligomer resin;
   (b) mixing the particulate matter and resins sufficiently to coat the particulate matter uniformly with a resin;
   (c) contacting the resin-coated particulate matter with an aqueous solution of surfactant and an acid catalyst for the resin;
   (d) mixing the resin-coated particulate matter and aqueous solution of acid and surfactant at a speed sufficient to form a foam; and
   (e) allowing the mixture of resin coated particulate matter and the foaming aqueous acid and surfactant fluid to stand for a period of time sufficient to cause polymerization of the resin on the resin coated particulate matter.
   (f) cleaning the residual acid and surfactant fluid from the surface of the particulate matter; and
   (g) heating the resin coated particulate matter to a temperature of from 300°0 F. to 350° F. for a period of time sufficient to cure the resin to a state at which the particulate matter will not stick together.

4,898,751

COMPOSITION AND METHOD FOR PREVENTION OF ADHESION OF PARTICULATE MATTER TO CONTAINERS

Shailesh G. Dwivedy, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 371,874, Apr. 26, 1982, abandoned. This application Apr. 14, 1986, Ser. No. 851,647
Int. Cl.[4] B05D *7/22;* **C08L** *91/06*
U.S. Cl. 427—230 **4 Claims**

1. A composition useful in coating surfaces to inhibit or prevent solid particulates from adhering to such surfaces which comprises a polymeric poly-α-olefin wax and a resin in a hydrocarbon solvent, the weight ratio of poly-α-olefin wax to resin being from about 1:2 to about 2:1.

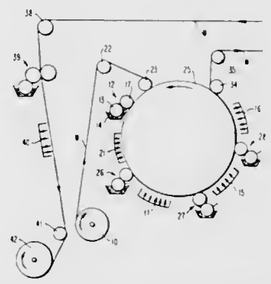
3. A method of inhibiting or preventing solid particulates from adhering to surfaces which comprises coating such surfaces with a composition comprising a polymeric poly-α-olefin wax and a resin in a hydrocarbon solvent, the weight ratio of poly-α-olefin wax to resin being from about 1:2 to about 2:1.

4,898,752

METHOD FOR MAKING COATED AND PRINTED PACKAGING MATERIAL ON A PRINTING PRESS

Giancarlo A. Cavagna, Silver Spring, Md.; Ernest J. Groome, Charleston, S.C.; Joseph M. Murphy, Springfield, Mass., and Domenick L. Raschella, Midlothian, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Mar. 30, 1988, Ser. No. 175,249
Int. Cl.[4] B05D *3/02, 3/12, 5/00, 7/00*
U.S. Cl. 427—265 **7 Claims**



1. The process of manufacturing outer packaging material on a web fed printing press having a plurality of printing stations comprising the steps of:
   (a) selecting a web of unbleached paper board having surfaces that are smooth, well sealed and strong;
   (b) feeding said web to a printing press having a plurality of printing stations;
   (c) applying a coating formulation comprising temperature insensitive binders selected from the group consisting of polyvinylacetate, styrene butadiene and acrylics, and mixtures thereof, and pigments selected from the group consisting of clay, titanium dioxide and calcium carbonate, and mixtures thereof, having a binder-to-pigment ratio of from about 20–25 parts binder to 100 parts pigment, a viscosity of from about 7–11 seconds measured by a No. 3 Zahn cup, and a solids content of between about 50–60% to at least one surface of said web at selected printing stations on said press in increments of about 1–1.5 lbs./1000 square feed to achieve a total coat weight of at least about 2 lbs./1000 square feet;
   (d) drying said coated surface after each coating application; and
   (e) printing high quality graphics on the coated surface of said web at subsequent printing stations on said printing press.

4,898,753
PROCESS FOR THE PREPARATION OF AROMATIC POLYIMIDE FILM
Hiroshi Inoue; Tadao Muramatsu; Yasuji Narahara, and Tetsuji Hirano, all of Hirakata, Japan, assignors to UBE Industries, Ltd., Ube, Japan
Filed May 26, 1988, Ser. No. 199,330
Claims priority, application Japan, May 29, 1987, 62-136365
Int. Cl.[4] B05D 3/02, 5/00
U.S. Cl. 427—276 25 Claims

1. A process for the preparation of an aromatic polyimide film having a surface provided with protrusions having an average diameter of 40 to 2,000 angstroms, the number of protrusions being in the range of 1×10^4 to 1×10^9/mm^2, which comprises the steps of coating an aromatic polyamic acid solution containing inorganic particles having an average diameter of not larger than 1,000 angstroms on at least one surface of an aromatic polyimide gel film containing a volatile material in an amount of 10 to 90 wt. %, said aromatic polyimide gel film having been obtained by ring closure and imidation of an aromatic polyamic acid in an organic polar solvent containing a dehydrating agent and a catalyst at a temperature of not higher than 200° C. to form a composite of said gel film having a coated surface containing said inorganic particles; drying said film composite at a temperature of 50° to 200° C.; and heat treating the dried film composite at a temperature of not lower than 300° C. to form said polyimide film having said surface protrusions.

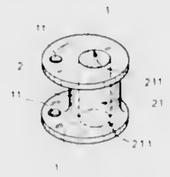
4,898,754
POLY(AMIDE-IMIDE) PREPREG AND COMPOSITE PROCESSING
Stephen Christensen, Woodinville, Wash.; Jay O. Rakel, Warrenville, Ill., and Dale E. Hartz, Kent, Wash., assignors to The Boeing Company, Seattle, Wash.
Continuation of Ser. No. 913,287, Sep. 30, 1986, abandoned. This application May 5, 1988, Ser. No. 190,531
Int. Cl.[4] B29D 9/00
U.S. Cl. 427—369 10 Claims

1. A method of making and treating a pre-impregnated fiber reinforced poly(amide-imide) material, comprising the steps of:
impregnating a fibrous reinforcing material with a poly(amide-imide) resin dissolved in an organic solvent to form a prepreg, said poly(amide-imide) resin being heat fusible at an elevated temperature that is above the boiling point of said solvent;
drying the prepreg at a temperature of less than 550°–650° F. until approximately 4%, by weight, of the solvent remains;
elevating the temperature of said prepreg to an elevated temperature in the range of about 550°–650° F., said elevated temperature being substantially above the boiling point of the solvent and being approximately equal to the temperature where said resin begins to advance in molecular weight;
maintaining said elevated temperature for approximately 1 to 5 minutes such that said solvent substantially completely evaporates from said prepreg; and
reducing the temperature of said prepreg before the resin advances in molecular weight sufficiently to cause a substantial adverse effect on consolidatability,
wherein after the step of reducing the temperature of the prepreg, the prepreg has a substantially reduced solvent content, and is heat fusible to form a composite article having a glass transition temperature that is about that of the pure poly(amide-imide) resin.

4,898,755
INORGANIC-ORGANIC COMPOSITE COMPOSITIONS EXHIBITING NONLINEAR OPTICAL RESPONSE
Tessie M. Che, Westfield; Dagobert E. Stuetz, Watchung; Alan Buckley, Berkeley Heights, all of N.J., and Donald R. Ulrich, Alexandria, Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.
Division of Ser. No. 15,759, Apr. 17, 1987, Pat. No. 4,814,211.
This application Oct. 24, 1988, Ser. No. 261,583
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—389.7 6 Claims

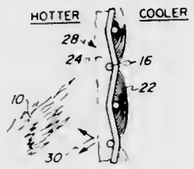
1. A process for producing a composite composition comprising a homogeneous inorganic oxide glass monolith with a microporous structure containing an organic component which exhibits nonlinear optical response, which comprises hydrolyzing tetraalkoxysilane under acidic or basic pH conditions in a sol-gel reaction medium comprising water, a water-miscible organic solvent and an organic component which exhibits nonlinear optical response, until gellation of the reaction medium is completed, and removing the solvent medium to provide a porous glass monolith with incorporated organic component.

4,898,756
INSERT FOR A SANDWICH STRUCTURE
Walter Oefner, Otterfing, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany
Filed Aug. 4, 1988, Ser. No. 228,284
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725974
Int. Cl.[4] F16B 19/04
U.S. Cl. 428—34.1 21 Claims



1. An insert for use in sandwich structures comprising a circular shank with a concentric bore, at least one circular head fixed eccentrically to the shank, the bore of the shank being continued through the head, the bore being eccentric to the head.

4,898,757
CONVERTIBLE TEXTILE FIRE BLOCK MATERIAL
Anton Maix, P.O. Box 21306, Ft. Lauderdale, Fla. 33335
Filed Jul. 22, 1985, Ser. No. 757,478
Int. Cl.[4] B32B 3/02
U.S. Cl. 428—97 24 Claims



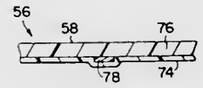
1. A single textile material fabric having at least a portion thereof convertible by flux of heat into a fire barrier material, comprising:
a woven wool textile material means for forming a portion of said single fabric, said material means including a front face in a normal, first state, said material means also having a rear face, at least a portion of said front face being convertible by heat or flame into a fire retardant barrier with a fire retardant barrier face in a fired, second state to protect said rear face; and
a carrier means connected to said material means forming an under construction for said single fabric, said carrier means for supporting said material means in said normal, first state for use as a textile fabric and for supporting said fire retardant barrier and said textile material means in said fired, second state for use as a fire retardant barrier, said carrier means connected to said material means in said normal, first state and said fired, second state, whereby said single fabric is usable alone as a fire retardant barrier for matter situated rearward of said rear face.

4,898,758
PAINT MASK
Ronald B. Lipson, 6085 Pickwood Dr., West Bloomfield, Mich. 48033
Filed Sep. 6, 1988, Ser. No. 240,607
Int. Cl.[4] B05C 11/16
U.S. Cl. 427—99 2 Claims



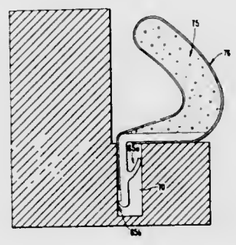
1. A combination paint mask and insignia plate for protecting the exposed surfaces of a three-dimensional vehicle insignia plate mounted on and projecting outwardly from the surface of a vehicle body, the insignia plate having an outer perimeter and a flat under surface,
the mask including an integral molded thin hollow part of plastic material wherein the inner surface of said part is in obverse form to the insignia plate for abutting engagement therewith, and wherein the outer surface of said part is a slightly enlarged replica of the outer surface of the insignia plate, and wherein the peripheral edge portion of said part defining the opening of the hollow part seals the insignia plate immediately adjacent the vehicle body and immediately adjacent said outer and inner perimeters;
and a plurality of spaced flexible coplanar anchor flanges upon said peripheral portion extending radially inward, underlying and retainingly engaging said under surface and peripheral portions of said insignia;
said flanges being spaced around said peripheral portion;
said insignia plate having a layer of adhesive material connected to and underlying said insignia plate for anchoring said insignia plate to said body, said adhesive material spacing peripheral portions of said insignia plate from said body,
said flanges being deflectable and of such shape and dimension as to be self-securing under and around said insignia plate in the space between said peripheral portions and said body formed by said adhesive material;
whereby the insignia plate is protected from paint sprayed on said body immediately adjacent said plastic part.

4,898,759
MOLDED PRINTED CIRCUIT BOARD FOR USE WITH A BRUSHLESS ELECTRIC MOTOR
John W. Hoover, Huntington, and Charles R. Marracino, Torrington, both of Conn., assignors to Nidec Corporation, Torrington, Conn.
Filed Jul. 27, 1988, Ser. No. 225,090
Int. Cl.[4] B32B 3/00
U.S. Cl. 428—99 11 Claims



1. A molded one piece printed circuit board for use in a motor having a stator having a plurality of attachment means spaced thereabout and a rotor rotating about an axis, said printed circuit board comprising:
a first layer with openings therein for providing electrical insulation;
a plurality of conductors, selected ones of which register with corresponding ones of said openings; and
a second layer of molded plastic construction having an inner surface configured to receive said first layer and said conductors, said second layer having a plurality of openings registered with certain ones of said conductors and said first layer openings, and further having an opposed outer surface with a plurality of integrally formed projections therefrom spaced thereabout, said projections configured to be in registration with and adapted to be received by said stator attachment means, said second layer projections configured to affix the printed circuit board to said stator in a preferred alignment and preclude relative movement therebetween.

4,898,760
PROCESS AND APPARATUS FOR EXTRUDING A LOW DENSITY ELASTOMERIC THERMOPLASTIC FOAM
Louis Halberstadt, Andover; Peter E. Mertinooke, Amesbury, both of Mass.; Joseph V. Perry, Chester, N.H., and Dan C. Muessel, Danvers, Mass., assignors to Amesbury Industries, Inc., Chester, N.H.
Filed Nov. 17, 1987, Ser. No. 121,805
Int. Cl.[4] E06B 7/16
U.S. Cl. 428—122 14 Claims



1. A weatherseal comprising:
a soft, low density elastomeric thermoplastic foam profile having a density less than 20 lbs/ft^3 and foamed from a thermoplastic elastomer having a durometer reading of less than 65;
a means for attaching said weatherseal to a structure, said means for attaching being bonded along the length of said foam profile; and

a thin, low friction skin bonded to at least part of the surface of said foam profile.

4,898,761

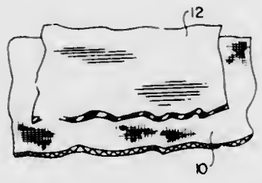
BARRIER FABRIC AND METHOD

Jerry A. Dunaway, Old Hickory; Leon H. Zimmerman, Nashville, and Nancy T. LaToudress, Mt. Juliet, all of Tenn., assignors to Reemay, Inc., Old Hickory, Tenn.

Continuation-in-part of Ser. No. 96,048, Sep. 11, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 281,104

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—137 **12 Claims**



1. Method of producing a barrier fabric which is permeable to liquid vapors and impermeable to liquids, said method comprising the steps of first laminating a vapor impermeable polymer film to a reinforcing porous fibrous web to provide a composite web and then needling the film of the composite web with tapered needles to provide a plurality of micropores through said film, said micropores being sufficiently small to prevent substantial transmission of liquids and sufficiently large to permit transmission of vapors.

4,898,762

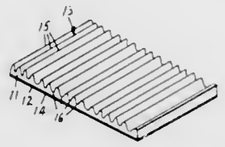
EASY TEAR STERILIZATION INDICATOR TAPE

Josephine S. Brown, and Alan J. Sipinen, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 1, 1988, Ser. No. 212,661

Int. Cl.[4] D06N *7/04*

U.S. Cl. 428—152 **26 Claims**



1. An elongate strip of normally tacky and pressure-sensitive adhesive tape wound convolutely upon itself about a core to form a roll, said tape having particular utility for use as a finger-tearable sterilization indicator tape, comprising in combination a predominantly crystalline isotactic polypropylene film backing having an overall thickness on the order of 75–115 micrometers with one smooth side and one rough side, a layer of normally tacky and pressure-sensitive adhesive, and an indicator means for determination that said tape has been exposed to a sterilization procedure, said rough side having closely spaced randomly disposed valleys extended substantially at right angles to the lateral edges of said tape, said valleys separated by ridges and having a depth greater than one-half the overall thickness, so that the tape has the general appearance of creped paper sterilization indicator tape but differs in that it is consistently readily finger-tearable in a straight line at right angles to its lateral edges, said tape, when subjected to a stretching force parallel to its length, differing from sterilization indicator tape having a smooth-surfaced polypropylene film backing in that it elongates throughout its length without reducing significantly in width.

4,898,763

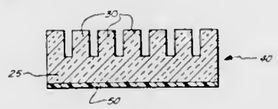
CURED POLYIMIDE FOAM STRUCTURES AND THEIR PRODUCTION

Gregory A. Ferro, Hoffman Estates, Ill., assignor to Imi-Tech Corporation, Elk Grove Village, Ill.

Continuation of Ser. No. 261,114, Oct. 24, 1988, abandoned. This application May 26, 1989, Ser. No. 357,549

Int. Cl.[4] B32B *3/26, 27/34*

U.S. Cl. 428—159 **39 Claims**



28. An integral body of cured polyimide foam having a plurality of spaced-apart laterally-proximate individual portions integral with and extending from a continuous portion thereof.

4,898,764

MOLDING OF FOAM RESIN HAVING A HOLLOW MEMBER

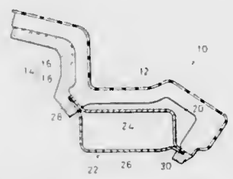
Junichi Kurihara, and Masanori Hara, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1989, Ser. No. 378,675

Claims priority, application Japan, Jul. 12, 1988, 63-91483[U]

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—188 **6 Claims**



1. A molding of foam resin, comprising;
a substrate constituted by a plurality of resin layers at least one of which is formed of foam resin; and
a hollow member having outwardly extending flanges;
said flanges of said hollow member being buried in said layer of foam resin.

4,898,765

IMPREGNATION-PRINTED MOLDED ARTICLE

Taunenobu Sato, Kokubunji, and Kiitiro Fukui, Fuji, both of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Oct. 8, 1987, Ser. No. 106,734

Claims priority, application Japan, Oct. 15, 1986, 61-245005

Int. Cl.[4] B32B *3/00;* **C08F** *8/00;* **C08L** *67/02*

U.S. Cl. 428—195 **3 Claims**

1. A molded article comprising at least one surface which bears an impregnation-printed character and/or symbol consisting essentially of a sublimative dye which is impregnated within and fixed to said at least one surface, wherein said at least one surface consists essentially of a blend of resin components (A) and (B), wherein resin component (A) is a thermoplastic polyester in an amount between 80–40 weight percent,

and resin component (B) is at least one thermoplastic resin in an amount between 20–60 weight percent selected from the group consisting of acrylonitrile-butadiene-styrene, acrylonitrile-styrene, methylmethacrylate-butadiene-styrene,ethylene-ethylacrylate, acrylonitrile-EPDM-styrene, acrylonitrile-styrene-special acrylic rubber, polymethyl methacrylate, butadiene rubber and acrylonitrile rubber.

4,898,766

POLYMER FILM WITH CONDUCTIVE PATTERN AND METHOD OF MANUFACTURING THE SAME

Toshiaki Tamamura; Katsuta; Osamu Niwa, Mito; Makoto Hikita, Mito, and Akio Sugita, Mito, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Continuation of Ser. No. 875,148, Jun. 17, 1986, abandoned, which is a division of Ser. No. 736,491, May 21, 1985, Pat. No. 4,608,129. This application Sep. 8, 1988, Ser. No. 243,242

Claims priority, application Japan, May 22, 1984, 59-101676; Jun. 4, 1984, 59-113095; Jul. 27, 1984, 59-155605; Dec. 7, 1984, 59-257395

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—195 **6 Claims**



1. A polymer film with a conductive pattern comprising an electrically insulative polymer film with an electrically conductive pattern containing an electrically conductive polymer of an aromatic compound or a heterocyclic compound selected from the group consisting of thiophene, pyrrole, furan, selenophene, tellurophene, carbazole and their derivatives, the conductive pattern being formed on at least one major surface of said insulative film and including an internal portion extending inwardly into said film from said at least one major surface.

4,898,767

COPPER-EXUDING BOROALUMINOSILICATE GLASSES

Gerald D. Pong, Beaver Dams, and Sheryl L. Hultman, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 105,262, Oct. 7, 1987. This application Jun. 28, 1988, Ser. No. 212,478

Int. Cl.[4] H05K *1/03*

U.S. Cl. 428—210 **4 Claims**

1. An electronic device comprising a silicon element and a substrate for the element formed from a low dielectric, copper-exuding, boroaluminosilicate glass consisting essentially of, in percent by weight on the oxide basis, 56–64% SiO_2, 18–25% B_2O_3, 3–11% Al_2O_3, 0–2% CaO, 0–2% Li_2O, 0–1% K_2O, the total Li_2O+K_2O+CaO being 1.5–3%, and 1–20% CuO, and having a coefficient of thermal expansion of $30-35\times10^{-7}$ at 300° C., a dielectric constant not over 5.0 at 100 KHz, and a loss tangent not over 0.003 at 100 KHz.

4,898,768

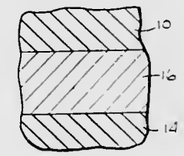
LAYERED STRUCTURE FOR ADHERING GOLD TO A SUBSTRATE AND METHOD OF FORMING SUCH

Harbhajan S. Randhawa, Boulder, Colo., assignor to Vac-Fec Systems, Inc., Boulder, Colo.

Filed Feb. 17, 1989, Ser. No. 312,622

Int. Cl.[4] B32B *7/02, 15/04*

U.S. Cl. 428—216 **10 Claims**



1. A layered structure for adhering gold or an alloy thereof to a substrate, said layered structure comprising:
a first layer overlying a substrate, said first layer including a member selected from the group consisting of metal nitrites, metal carbides and metal carbonitrides wherein said metal is selected from the group consisting of titanium, zirconium and hafnium; and
a transparent layer of refractory metal overlying said first layer and underlying gold or an alloy thereof, said transparent layer having a thickness greater than about 25 angstroms and less than about 100 angstroms.

4. A layered structure as claimed in claim 1 wherein said first layer has a thickness greater than about 0.1 microns and less than about 5 microns.

4,898,769

FIBRE REINFORCED COMPOSITE MATERIAL

Philip Laflin, Manchester, and Ian Molyneux, Warrington, both of United Kingdom, assignors to Teamat Ltd., Manchester, England

Filed May 12, 1989, Ser. No. 350,797

Claims priority, application United Kingdom, Jun. 1, 1988, 8812923

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—283 **8 Claims**

1. Composite material comprising a water-soluble aluminous cement matrix to which are bonded superimposed layers of glass fibre fabric enclosed within it as reinforcement, wherein said fabric is a mechanically bonded chopped strand glass mat of mass/unit area not greater than 850 g/m^2.

4,898,770

PROCESS FOR PRODUCING PREFORMABLE CONTINUOUS STRAND MATS USING A MIXTURE OF THERMOSETTING AND THERMOPLASTIC RESIN

Sidney G. Dunbar, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 7, 1987, Ser. No. 35,523

Int. Cl.[4] B32B *5/02*

U.S. Cl. 428—283 **4 Claims**

1. A process for forming a continuous strand preformable mat having strand intersections and glass inclusions which consists of combining a thermosetting polyester binder material and a thermoplastic polyester binder material to form a binder matrix material; wherein the matrix material is present in a ratio of approximately 90% to 50%, by weight of the matrix material, thermoplastic polyester binder material to approximately 10% to 50%, by weight of the matrix material, thermosetting polyester binder material;
applying the binder matrix material to a continuous strand mat;
heating the continuous strand mat to a temperature in excess of 200° F. by placing the mat in a mold and then closing

the mold to form and solidify the mat such that the thermosetting binder material cures and hardens while the thermoplastic binder material softens and flows around strand intersections of the continuous strand mat;

thereafter cooling the continuous strand mat in order to solidify the thermoplastic polyester material of the binder matrix material to form a cooled mat; and,

passing the cooled mat through a set of compaction rollers set at a gap wide enough so as not to compact the mat but narrow enough to crush any glass inclusions present in the continuous strand mat.

4. The continuous strand mat formed according to the process of claim 1, wherein the thermoplastic polyester binder material is present in a ratio of approximately 80 wt. % to approximately 20 wt. % of the thermosetting polyester binder material.

4,898,771

AGENT FOR IMPARTING ANTISTATIC CHARACTERISTICS TO A THERMOPLASTIC POLYMER AND A THERMOPLASTIC POLYMER COMPOSITION CONTAINING THE AGENT

Marvin R. Havens, Greer, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Division of Ser. No. 918,754, Oct. 14, 1986, Pat. No. 4,800,115. This application Sep. 21, 1988, Ser. No. 247,215

Int. Cl.[4] B05D *3/02*

U.S. Cl. 428—316 **7 Claims**

1. A method for protecting packaged static sensitive devices from electrostatic charges comprising:

(a) providing a package comprising an antistatic film having one or more layers, wherein at least one layer comprises a composition of a thermoplastic polymer in admixture with an antistatic agent wherein the polymer is polyethylene and the antistatic agent is a mixture of both fatty acid ester of polyhydroxy alcohol and polyalkoxylated compound, and wherein said film will, after 12 days at 160° F. (71° C.), still exhibit antistatic characteristics of a static decay time less than about 2000 milliseconds at low humidity less than about 15% relative humidity; and

(b) conforming said film about a selected device.

4,898,772

ABHESIVE COATING PREPARATION AND METHOD OF ABHESIVELY COATING UTENSILS

Manfred Priesch, Recklinghausen; Harald Rau, and Christian Weitemeyer, both of Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,246

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728414

Int. Cl.[4] B32B *9/04, 15/08*

U.S. Cl. 428—332 **12 Claims**

1. A utensil, such as a baking tin, baking mold, frying pan, metal pot and the like having a surface which is adapted to be subjected to high heat, wherein said surface has an abhesive surface coating baked onto said surface, said coating comprising in heat-cured

(a) a heat curable polysiloxane, modified with polyol, and

(b) 0.05 to 4% by weight, calculated on the polysiloxane (a), of a linear siloxane which is reactive with the polysiloxane (a),

said modified polysiloxane (a) being the reaction product of a polysiloxane of the general formula

$$R^2{}_aSi(OR^1)_b\,O_{\frac{4-(a+b)}{2}}$$

wherein

OR^1 is alkoxy derived from a primary or secondary alcohol with 1 to 4 carbon atoms,

R^2 is selected from the group consisting of alkyl and phenyl,

a = 1 to 1.5, and

b = 0.1 to 0.8, and

an ester group-containing polyol of the general formula

$$R^6{-}O{-}\overset{\overset{O}{\|}}{C}{-}R^7{-}\overset{\overset{O}{\|}}{C}{-}O{-}R^6$$

wherein R^6 is selected from the group consisting of

$$\overset{OH}{\overset{|}{HO(CH_2)_2-}},\ \overset{OH}{\overset{|}{CH_3{-}CH{-}CH_2-}},\ HO(CH_2)_3-,$$

$$HO{-}CH_2{-}\overset{CH_3}{\overset{|}{C}}{-}CH_2{-}\overset{CH_3}{\overset{|}{C}}{-}CH_2{-}O{-}CH_2{-}\overset{CH_2OH}{\overset{|}{C}}{-}CH_2{-}O{-}CH_2{-}\overset{CH_2OH}{\overset{|}{C}}{-}CH_2{-}O{-}CH_2{-}\overset{CH_2OH}{\overset{|}{C}}{-}CH_2{-}OH,$$

$$HO{-}CH_2{-}\overset{OH}{\overset{|}{CH}}{-}CH_2{-}\text{ and }C_2H_5{-}\overset{CH_2OH}{\overset{|}{C}}{-}CH_2{-}O{-}CH_2{-}\overset{CH_2OH}{\overset{|}{C}}{-}CH_2{-}OH$$

R^7 is alkylene, cycloalkylene or phenylene, and the polyol containing the ester groups has at least three hydroxyl groups,

the reaction being carried out in such a molar ratio, that one $SiOR^1$ group corresponds approximately to one COH group and the reaction being term-inated after a 25 to 90% conversion; said reactive linear polysiloxane (b) corresponding to the general formula

$$R^5{-}Si(R^5)_2{-}O{-}\left[\begin{array}{c}R^3\\|\\Si{-}O\\|\\R^4\end{array}\right]_x{-}Si(R^5)_2{-}R^5$$

wherein

R^3, R^4 are the same or different and represent methyl or phenyl, with the proviso that at least 80 mole percent of R^3 and R^4 are methyl,

R^5 is selected from the group consisting of alkyl with 1 to 4 carbon atoms, phenyl and groups capable of reacting with the $SiOR^1$ or COH groups of the modified polysiloxane (a) with the proviso that at least one R^5 group is such a reactive group, and

$x \geqq 0$.

2. The utensil of claim 1, wherein said coating has a thickness of about between 10 to 40 mm.

4,898,773

PHOTOGRAPHIC PAPER SUPPORT WITH A WATER RESISTANT COATING OF POLYETHYLENE

Ralf-Burkhard Dethlefs, Bissendorf; Bernd Scholz, Osnabrück, and Wolfram Wysk, Belm, all of Fed. Rep. of Germany, assignors to Felix Schoeller jr GmbH & Co. KG, Osnabrück, Fed. Rep. of Germany

Filed Jul. 24, 1987, Ser. No. 77,491

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627859

Int. Cl.[4] B32B *27/08, 27/32;* **G03C** *1/76*

U.S. Cl. 428—332 **17 Claims**

1. A coated paper support material for photographic layers comprising

a photographic paper base having two sides;

a water resistant coating of a polyolefin disposed on each of the two sides of the photographic paper base, where one of the two water resistant coatings includes a high pressure polyethylene having a density of from about 0.930 to 0.936 gram per cubic centimeter and containing from about 5 to 12 methyl groups for each 1000 carbon atoms.

4,898,774

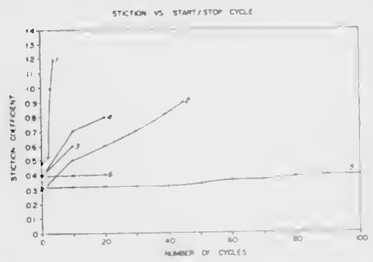
CORROSION AND WEAR RESISTANT MAGNETIC DISK

Tsutomu T. Yamashita; Ching-Cheng Shir, both of San Jose; Tu Chen, Saratoga, and Ga-Lane Chen, Fremont, all of Calif., assignors to Komag, Inc., Milpitas, Calif.

Continuation-in-part of Ser. No. 847,990, Apr. 3, 1986. This application Dec. 17, 1986, Ser. No. 943,333

Int. Cl.[4] G11B *5/64*

U.S. Cl. 428—336 **27 Claims**



1. Structure comprising:

a film of magnetic recording media on a substrate; and

a second layer formed above said film, said second layer comprising sputtered ZrO_2, a stabilizer and Al_2O_3, said structure being constructed for the recording of data in said film of magnetic recording media by magnetic induction recording, said second layer being the uppermost vacuum-deposited layer on said structure.

4,898,775

PAINT COATED METAL SHEETS

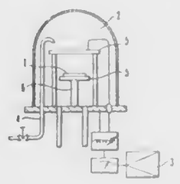
Joji Oka, and Ryoji Nishioka, both of Kanagawa, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 141,955, Jan. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 120,776, Nov. 16, 1987, abandoned, which is a continuation of Ser. No. 856,160, Apr. 25, 1986, abandoned. This application May 8, 1989, Ser. No. 349,934

Claims priority, application Japan, Apr. 27, 1985, 60-89933; Australia, Apr. 22, 1986, 56486/86; Canada, Apr. 25, 1986, 507657

Int. Cl.[4] B32B *15/08, 27/06*

U.S. Cl. 428—336 **3 Claims**



1. A paint coated metal sheet comprising a metal substrate and a paint film applied thereon, the uppermost surface part of said paint film containing fluorine atoms introduced thereinto as perfluoroalkyl groups including methyl fluoride and ethyl fluoride said perfluoroalkyl groups being introduced into said surface up to a depth of 1–5000 Å by a plasma treatment, with the remaining part of said paint film being non-fluorinated by said plasma treatment.

4,898,776

ISOCYANATE/SURFACTANT-MODIFIED POLYOL BINDER FOR MANUFACTURE OF LIGNOCELLULOSIC COMPOSITES

Michael G. Israel, Clearwater; George A. Grozdits, St. Petersburg, and Kenneth G. Trout, Tampa, all of Fla., assignors to Jim Walter Reasearch Corp., St. Petersburg, Fla.

Continuation-in-part of Ser. No. 912,889, Sep. 29, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 273,681

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—336 **10 Claims**

1. A synthetic board comprising lignocellulosic material bonded together with a binder comprising an organic polyisocyanate having at least two active isocyanate groups per molecule and a polyester polyol, the binder including a surfactant which adjusts the surface tension of the binder to a value about equal to or lower than the critical surface tension of the lignocellulosic material and helps to compatibilize the binder components, the amount of the surfactant being from about 0.01 to 5 percent by weight, based on the weight of the polyester polyol, with the proviso that the polyol does not contain any fatty acid material.

4. The synthetic board of claim 1 wherein the lignocellulosic material is bonded together to form a member selected from the group consisting of a particleboard, a waferboard, an oriented waferboard and an oriented strand board.

4,898,777

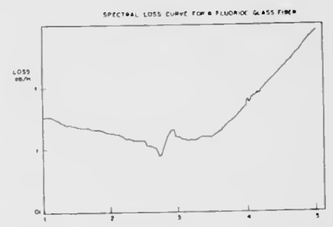
HIGH-STRENGTH FLUORIDE GLASS FIBERS AND PROCESS OF MAKING

Edwin A. Kindler, Takoma Park, and Danh C. Tran, Bethesda, both of Md., assignors to Infrared Fiber Systems, Silver Spring, Md.

Filed Jan. 24, 1989, Ser. No. 300,852

Int. Cl.[4] C03C *15/00*

U.S. Cl. 428—364 **12 Claims**



9. A method of producing a fluoride glass fiber having increased stength, comprising the steps of:

immersing a fluoride glass preform in a solution of H_3BO_3 dissolved in hydrochloric or nitric acid until a desired degree of surface etching is obtained;

removing said preform from said solution;

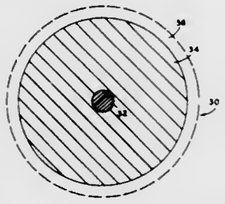
rinsing said preform with water or hydrochloric or nitric acid;

drying said preform with a volatile solvent; and then

drawing said etched preform into a fiber.

11. A fluoride glass fiber produced according to claim 9.

4,898,778
SILICON CARBIDE MONOFILAMENTS FOR IMPROVED COMPOSITE PROPERTIES AND METHOD
Raymond C. Lozzewski, Windham, N.H., assignor to AVCO Corporation, Providence, R.I.
Filed Nov. 28, 1988, Ser. No. 276,797
Int. Cl.[4] B32B *9/00*; D02G *3/00*
U.S. Cl. 428—368 **11 Claims**



1. A high strength silicon carbide monofilament comprising:
a core; and
a stoichiometric bulk layer of silicon carbide deposited on the core, said bulk layer being further defined by a fine grain structure where the grain size continuously varies across the cross section and where the average grain size increases from the interface of the core and the bulk layer through a single peak of maximum average grain size intermediate the interface and the exterior surface of the bulk layer and then decreases to a second average grain size at the exterior surface of the bulk layer, the maximum grain size being less than 200 nanometers and the over all average grain size is between 90 and 100 nanometers.

4,898,779
POWDERS OF TETRAFLUOROETHYLENE COPOLYMER AND PROCESS FOR PREPARING THE SAME
Tatsuhiro Yoshimura; Nobuyuki Tomihashi, both of Takatsuki, and Shuhei Simosaki, Itami, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan
Filed Dec. 21, 1987, Ser. No. 135,217
Claims priority, application Japan, Dec. 22, 1986, 61-307131
Int. Cl.[4] B32B *5/16*; C08L *27/12*
U.S. Cl. 428—402 **1 Claim**

1. Powders of tetrafluoroethylene copolymer consisting essentially of particles of a copolymer selected from the group consisting of a tetrafluoroethylene/hexafluoropropylene copolymer and a tetrafluoroethylene/fluoro (vinyl ether) copolymer, said particles having a non-spherical shape which is characterized by a sectional profile which comprises at least one linear section, wherein the frictional packing ratio is in the range of 20 to 100%, the average particle size (μ) is in the range of 100 to 500 μm, and the average particle size (μ) and the bulk density (ρ_1) of the powders satisfy the following equation:

$$\log \mu < 2.45\ \rho_1 + 0.75.$$

4,898,780
PRODUCTION OF MICROCAPSULES
Michael E. A. Seitz, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio
Continuation-in-part of Ser. No. 866,224, Mar. 22, 1986, Pat. No. 4,729,792, which is a continuation-in-part of Ser. No. 796,196, Nov. 2, 1985, abandoned. This application Jan. 7, 1988, Ser. No. 141,633
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[4] B01J *13/02*
U.S. Cl. 428—402.21 **10 Claims**

1. A process for the production of microcapsules containing an oily solution, comprising:
dispersing an oily solution including a crosslinking agent into an aqueous solution;
forming a polysalt in said aqueous solution, said polysalt including a high molecular weight polyanion and a polycationic polyamine having a molecular weight of less than 1200 and having a functionality of at least three, whereby a hard, thick layer is formed around droplets of oily solution and microcapsules are produced.
10. The product produced by the process of claim 1.

4,898,781
WATER-SOLUBLE MICROCAPSULES
Takashi Onouchi, Tokyo; Hironori Sugai, Yokohama; Kazuo Sekiguchi, Nagareyama; Yoshikazu Hosoda, Fujisawa, and Eiichi Yoshida, Tokyo, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan
Filed Nov. 9, 1987, Ser. No. 118,004
Claims priority, application Japan, Nov. 7, 1986, 61-263842
Int. Cl.[4] A61K *37/48*; B01J *13/02*; C12N *11/08*
U.S. Cl. 428—402.22 **3 Claims**

1. Water-soluble microcapsules comprising:
a core material of hydrophilic substance which comprises an enzyme and a water-containing polyhydroxy compound in an amount of 2 to 50 times that of said enzyme by weight and having a water content of 5 to 40% by weight, said enzyme being dissolved or dispersed in said water-containing polyhydroxy compound; and
a coating material of polyvinyl alcohol having an average degree of polymerization in the range of 200 to 3,000 and a saponification ratio of not less than 90%.

4,898,782
LATEX COATING COMPOSITION OF MULTILAYERED COPOLYMER PARTICLES OF VINYLIDENE CHLORIDE AND ACRYLIC COMONOMERS
Taeik Min, Pittsford, and Robert E. Touhsaent, Fairport, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Apr. 27, 1989, Ser. No. 343,660
Int. Cl.[4] C08L *27/08*
U.S. Cl. 428—407 **8 Claims**

1. A thermoplastic film coated with a dried latex composition containing a multi-layered particle for suspending in an aqueous solution, said multi-layered particle including:
(a) an acrylic seed layer;
(b) an intermediate layer of a vinylidene chloride monomer, an acrylic ester monomer, and an acrylic acid monomer, forming a terpolymer having a high vinylidene chloride concentration; and,
(c) an outer skin layer of a vinylidene chloride monomer, acrylic ester monomer, and an acrylic acid monomer, forming a terpolymer having a low vinylidene chloride concentration.

4,898,783
SOUND AND THERMAL INSULATION
Francis P. McCullough, Jr., Lake Jackson; Robert L. Hotchkiss, Midland; R. Vernon Snelgrove, Freeport, all of Tex.; David M. Hall, Auburn, Ala., and Jacqueline R. McCullough, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 918,738, Oct. 14, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 108,255
The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.
Int. Cl.[4] B32B *9/00*, *5/02*; B64C *1/40*
U.S. Cl. 428—408 **26 Claims**

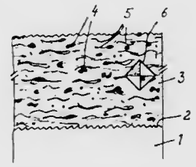


1. A thermal insulating and/or sound absorbing structure comprising a batting of resilient elongatable, non-linear, non-flammable, carbonaceous fibers, said fibers having a reversible deflection ratio of greater than 1.2:1, an aspect ratio greater than 10:1 and a limited oxygen index value greater than 40.

4,898,784
TIE LAYER COMPOSITION AND LAMINATED STRUCTURES CONTAINING SAME
Andrea Sanders, Katy, and Glenn R. Himes, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Dec. 30, 1987, Ser. No. 139,549
Int. Cl.[4] B32B *27/36*, *27/08*; C08L *53/02*
U.S. Cl. 428—412 **11 Claims**

1. A laminated structure comprising a plurality of polymeric layers, at least one of said layers containing a polar group which is reactive with a carboxyl radical, said at least one layer being selected from the group consisting of copolymers of one or more olefins and one or more other monomers selected from the group consisting of unsaturated esters, unsaturated acids, unsaturated alcohols and unsaturated ionomers, at least one olefin polymer layer and at least one other polymeric layer being a tie layer between said at least one layer containing a polar group and said at least one olefin polymer layer comprising at least one carboxylated, selectively hydrogenated block copolymer, said carboxylated, selectively hydrogenated block copolymer comprising at least one polymeric block containing predominantly monoalkenyl aromatic hydrocarbon monomer units and at least one polymeric block containing predominantly hydrogenated conjugated diolefin monomer units, and at least one uncarboxylated, selectively hydrogenated block copolymer, comprising at least one polymeric block containing predominantly monoalkenyl aromatic hydrocarbon monomer units and at least one polymeric block containing predominantly hydrogenated conjugated diolefin monomer units, and at least one uncarboxylated, selectively hydrogenated block copolymer, comprising at least one polymeric block containing predominantly conjugated diolefin monomer units and at least one polymeric block containing hydrogenated conjugated diolefin monomer units, wherein said tie layer comprises, on average, from about 0.01 to about 10 carboxyl radicals per polymer chain contained in said tie layer, said laminated structure having been prepared by bringing the separate layers together while said separate layers are in the molten phase and while said separate layers are in motion.

4,898,785
CR_2O_3-PROTECTIVE COATING AND PROCESS FOR ITS MANUFACTURE
Heiko Gruner, Beinwil am See, Switzerland, assignor to Plasmainvent AG, Zug, Switzerland
Continuation of Ser. No. 942,843, Jan. 15, 1987, abandoned. This application May 22, 1989, Ser. No. 356,615
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513892
Int. Cl.[4] B05D *1/08*
U.S. Cl. 428—472 **8 Claims**



1. An article comprising, in combination, a protective layer of Cr_2O_3 on a metal support applied by a vacuum plasma spray process, said support having a surface pre-treated by a transferred electric arc immediately prior to the application of said protective layer and wherein the Cr_2O_3 is conveyed in said spray process in a plasma flame having a reducing atmosphere, said protective layer having a density almost corresponding to the density of chromium oxide as a solid material, a residual porosity of less than 2%, a Vickers hardness of more than 2000 kp/mm^2 (HV), and being substantially free of imbedded metallic phases.

4,898,786
POLYESTER FILM PRIMED WITH AN AMINOFUNCTIONAL SILANE, AND FILM LAMINATES THEREOF
Howard W. Swofford, Taylors, S.C., assignor to Hoechst Celanese Coproration, Somerville, N.J.
Filed Jun. 15, 1988, Ser. No. 207,069
Int. Cl.[4] B32B *27/06*, *27/36*, *9/04*, *13/12*
U.S. Cl. 428—480 **14 Claims**

1. An oriented self-supporting high modulus polyester film having a continuous primer coating composition on one or both sides thereof, said coating composition comprising the dried residue of a hydrolyzed aminosilane compound having the formula in the unhydrolyzed state:

$$XSi(R^2)_a(R^3)_b$$

wherein X is a radical selected from the group consisting of $H_2NR^1HNR^1$—and $H_2NR^1HNR^1HNR^1$—; the R^1's are the same of different groups selected from the group consisting of C_1 to C_8 alkyl or phenyl; R^2 is a hydrolyzeable group selected from the group consisting of C_1 to C_8 alkoxy, an acetoxy group or a halide; R^3 is a nonreactive, nonhydrolyzeable group selected from the group consisting of C_1 to C_3 alkyl or phenyl; (a) is an integer ranging from 1 to 3; (b) is an integer ranging from 0 to 2, with the sum of (a) and (b) being 3, said primer coating composition being present at a weight effective to improve the adhesion of other polymers to said film.

4,898,787

EMULSION POLYMERIZED COHESIVE POLYMER LATEX USEFUL AS COLD SEAL COATING AND IMPROVED SEALABLE ARTICLES TREATED WITH THE SAME

Taeik Min, Pittsford, and Robert E. Touhsaent, Fairport, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 69,049, Jul. 2, 1987, abandoned. This application Apr. 28, 1988, Ser. No. 187,303

Int. Cl.[4] B32B *27/06*

U.S. Cl. 428—480 **16 Claims**

1. A coated or impregnated substrate which includes a cold sealable, emulsion polymerized cohesive terpolymer composition for coating or impregnating said substrate, said terpolymer consisting of:

(a) from about 40 to about 75 percent by weight of a first monomer comprising ethyl acrylate;

(b) from about 15 to about 50 percent by weight of a second monomer comprising vinyl acetate; and,

(c) from about 0.1 to about 10 percent by weight of a third monomer comprising methacrylic acid,

whereby said terpolymer coated or impregnated substrate having low tack characteristics, high crimp strength and is cohesive only to substrates which are coated or impregnated with said terpolymer when cold sealed under pressure.

4,898,788

DECORATIVE LAMINATED SHEET AND DECORATIVE OVERLAID PLYWOOD FACED WITH THERMOSETTING RESIN

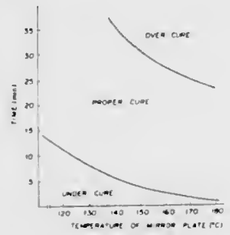
Kenji Minami, Suita; Hidetaka Yatagai, Nishinomiya, and Yoshinori Sano, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jul. 19, 1988, Ser. No. 221,208

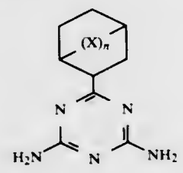
Claims priority, application Japan, Jul. 21, 1987, 62-179953

Int. Cl.[4] B32B *27/10, 27/36*

U.S. Cl. 428—481 **22 Claims**



1. A thermosetting resin decorative laminated sheet faced with a resin-impregnated sheet layer obtained by impregnating a sheetlike material with a resin composition containing an amino resin (I) produced by the reaction of formaldehyde with an amino compound (A) containing as an essential component thereof at least one carboguanamine (a) represented by the formula I:



(I)

wherein X is CH_2 and n is 0 or 1, and curing the impregnated sheetlike material, said amino resin (I) having a degree of methanol miscibility, M_1, in the range of 1 to 200, and a degree of methanol miscibility, M_2, in the range of 90 to 200.

4,898,789

LOW EMISSIVITY FILM FOR AUTOMOTIVE HEAT LOAD REDUCTION

James J. Finley, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 4, 1988, Ser. No. 176,979

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[4] B21D *39/00*

U.S. Cl. 428—623 **11 Claims**

1. A high transmittance, low emissivity article comprising:

a. a transparent nonmetallic substrate;

b. a first transparent antireflective metal oxide film deposited on a surface of said substrate;

c. a first transparent infrared reflective metallic film deposited on said antireflective metal oxide film;

d. a transparent metal-containing primer film deposited on said infrared reflective metallic film;

e. a second transparent antireflective metal oxide film deposited on said primer film;

f. a second transparent infrared reflective metallic film deposited on said second transparent antireflective metal oxide film;

g. a second transparent metal-containing primer film deposited on said second infrared reflective metallic film; and

h. a third transparent antireflective metal oxide film deposited on said second primer film.

4,898,790

LOW EMISSIVITY FILM FOR HIGH TEMPERATURE PROCESSING

James J. Finley, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 947,799, Dec. 29, 1986, Pat. No. 4,806,220. This application Apr. 1, 1988, Ser. No. 176,511

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[4] B21D *39/00*

U.S. Cl. 428—623 **12 Claims**

1. A high transmittance, low emissivity article comprising:

a. a transparent nonmetallic substrate;

b. a first transparent antireflective metal oxide film deposited on a surface of said substrate;

c. a transparent infrared reflective metallic film;

d. a transparent metal-containing primer film deposited on said infrared reflective metallic film comprising a first layer of metal and a second layer of metal oxide; and

e. a second transparent antireflective metal oxide film deposited on said primer film wherein said primer film comprises a different metal oxide from said second antireflective metal oxide film.

4,898,791

SOLDERABLE LAYER SYSTEM

Dieter Schurig, Wallrabenstein, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 5, 1988, Ser. No. 152,620

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705258

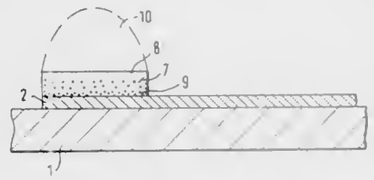
Int. Cl.[4] B32B *15/04*

U.S. Cl. 428—629 **6 Claims**

1. In a solderable layer system in which a conductor layer, which is partially covered by a layer of solder, is applied to a support, the improvement wherein:

said conductive layer is disposed between and contiguous said support and layer of solder, said conductive layer being formed of a material which includes an oxide of tin; said system includes a reducing agent; and

the solder layer comprises an alloy, brass, which includes said reducing agent, said reducing agent being operative



with said oxide to free the tin for improved adherence between the solder layer and the conductive layer.

4,898,792

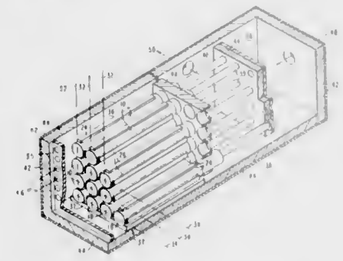
ELECTROCHEMICAL GENERATOR APPARATUS CONTAINING MODIFIED HIGH TEMPERATURE INSULATION AND COATED SURFACES FOR USE WITH HYDROCARBON FUELS

Prabhakar Singh, Export; Roswell J. Ruka, Churchill, and Raymond A. George, Forest Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1988, Ser. No. 280,915

Int. Cl.[4] H01M *8/06*

U.S. Cl. 429—19 **23 Claims**



1. An electrochemical generator apparatus, containing an electrochemical cell assembly comprising a plurality of electrochemical cells and insulation materials in the form of at least one of porous partition boards between cell bundles, porous generator insulation, porous cell support boards, porous fuel entry distribution boards, and porous fuel conditioner boards, where a gaseous fuel containing hydrocarbons will contact the insulation materials, the improvement characterized in that at least one of the insulation materials is impregnated with metal atom containing material, where the metal is selected from the group consisting of (A) metals selected from the group consisting of Mg, Ca-Al, Sr-Al, Ce, Ba, and mixtures thereof, and, (A) metals plus Ni.

4,898,793

FUEL CELL DEVICE

Mitsuie Matsumura; Toshihide Tanaka; Hiroaki Urushibata, and Kazunao Sato, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 1, 1988, Ser. No. 265,815

Claims priority, application Japan, Nov. 4, 1987, 62-277496; Nov. 20, 1987, 62-291870

Int. Cl.[4] H01M *8/04, 8/14*

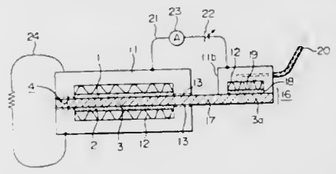
U.S. Cl. 429—38 **25 Claims**

1. A fuel cell device comprising:

a fuel cell including an oxidant gas side electrode and a fuel gas side electrode which are disposed away from each other, and an electrolyte layer sandwiched therebetween;

a half cell including an electrolyte layer, a single electrode and a gas chamber;

a connecting electrolyte layer for connecting, in an ion conductive manner, said electrolyte layer of said fuel cell and said electrolyte layer of said half cell; and



an electrochemical circuit which is formed by a single electrode of said half cell and either of said electrodes of said fuel cell, and which electrochemically transfers the electrolyte between said fuel cell and said half cell, whereby the quantity or the composition of the electrolyte contained in said fuel cell is performed by the transference of the electrolyte.

4,898,794

HYDROGEN ABSORBING NI,ZR-BASED ALLOY AND RECHARGEABLE ALKALINE BATTERY

Hidekazu Doi, Omiya, and Ritsue Yabuki, Iwatsuki, both of Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Jul. 17, 1989, Ser. No. 380,608

Claims priority, application Japan, Dec. 27, 1988, 63-330423; Dec. 27, 1988, 63-330424

Int. Cl.[4] H07M *4/36; C22C 19/03, 30/00*

U.S. Cl. 429—59 **14 Claims**

8. A sealed Ni-hydrogen rechargeable battery comprising a negative electrode provided with a hydrogen absorbing alloy as an active material, an Ni positive electrode, a separator and an alkaline electrolytic solution, wherein the hydrogen absorbing alloy is composed of a hydrogen absorbing Ni,Zr-based alloy comprising 5 to 20% by weight of titanium (Ti), 10 to 37% by weight of zirconium (Zr), 5 to 30% by weight of manganese (Mn), 0.01 to 15% by weight of tungsten (W), 6 to 30% by weight of iron (Fe), and balance unavoidable impurities.

4,898,795

LID FOR LEAD-ACID ACCUMULATORS WITH ELASTIC AND DEFORMABLE POLE SEATS

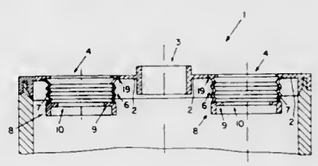
Olimpio Stocchiero, 5 Via Kennedy, 36050 Montorso Vicentino, Italy

Filed Oct. 4, 1988, Ser. No. 253,033

Claims priority, application Italy, Oct. 9, 1987, 85615 A/87

Int. Cl.[4] H01M *4/00*

U.S. Cl. 429—66 **6 Claims**



1. A lead-acid accumulator lid made of a plastic material and having a substantially planar body with an upper and lower

surface, said body having and edge portion suited to be permanently attached to an accumulator case;

a central opening for the filling and refilling of the electrolyte contained in the accumulator;

a pair of openings provided in the lid for the passage of electric poles which extend from the accumulator, said openings having substantially circular edges;

an expandable elastic, flexible, substantially tubular member extending from each of said edges into said lid for providing a sealing connection with said poles, said tubular member extending axially to said openings, wherein said expandable elastic flexible tubular members are formed integrally with said lid and are shaped to be compressible, co-axially to said openings, said tubular members projecting from said opening edges inwardly of the accumulator case, so that the upper surface of the lid is substantially planar and free of projections in correspondence with said openings, whereby the axial sliding of the poles relative to the lid is effected thereby insulating the lid from stress.

4,898,796

LEAD-ACID STORAGE BATTERY

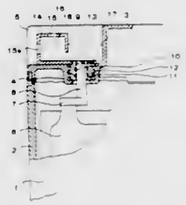
Hiroshi Furukawa; Sachio Uemichi; Toshihiro Isoi, and Kenzo Kawakita, all of Takatsuki, Japan, assignors to Yuasa Battery Co., Ltd., Takatsuki, Japan

Filed Nov. 8, 1988, Ser. No. 268,448

Claims priority, application Japan, Nov. 9, 1987, 62-282787

Int. Cl.[4] H01M 2/02

U.S. Cl. 429—178 **3 Claims**



1. A lead-acid storage battery including a connecting terminal assembly which comprises;

a bushing made from lead or lead alloy, buried in a cover of said battery in the same process as when said cover is molded, and including a hole into which a pole is fitted; and

a connecting terminal made by press working a sheet of metal, except for lead or lead alloy, having good electrical conductivity, having at least one bolt-insertion hole and a space for accommodating a nut, fixed to the upper portion of said bushing, and having a strength resistive to a torque of 40 kg-cm or more caused by a bolt being inserted into said bolt-insertion hole.

4,898,797

MULTIPLE XEROPRINTED COPIES FROM A SINGLE EXPOSURE USING PHOTOSENSITIVE FILM BUFFER ELEMENT

William T. Gruenbaum; William Mey, both of Rochester, and Kelly S. Robinson, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,867

Int. Cl.[4] G03G 13/24

U.S. Cl. 430—51 **8 Claims**

1. In a process for making multiple copies from a single imagewise exposure of an electrostatographic element having an insulating layer between a conductive layer and a photoconductive layer, where said element is simultaneously charged and imagewise exposed, then exposed with uniform light to drive the charges down from the surface of the electrostatographic element to the surface of the insulating layer, the improvement wherein said uniform light is absorbed by said photoconductive layer and does not penetrate through said photoconductive layer to said insulating layer.

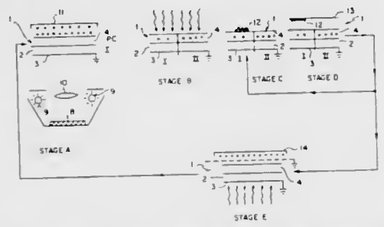
6. A method of making multiple electrostatographic copies comprising

(A) simultaneously charging and imagewise exposing an electrostatographic element which comprises, in order,

(1) a conductive layer;

(2) an insulating layer; and

(3) a photoconductive layer;



(B) uniformly exposing said element with uniform light applied directly to the surface of said photoconductive layer such that said uniform light is absorbed by said photoconductive layer and does not penetrate through said photoconductive layer to said insulating layer, thereby forming a latent electrostatic image on said insulating layer;

(C) developing said latent electrostatic image and transferring said developed image to a receiver; and

(D) repeating step (C) without additional imagewise exposures of said element.

4,898,798

PHOTOSENSITIVE MEMBER HAVING A LIGHT RECEIVING LAYER COMPRISING A CARBONIC FILM FOR USE IN ELECTROPHOTOGRAPHY

Masao Sugata, Yokohama; Tohru Den, Atsugi; Susumu Ito; Keiji Hirabayashi, both of Tokyo; Keiko Ikoma, Yokohama; Noriko Kurihara, Kawasaki; Kuniji Osabe, Tama; Tatsuo Takeuchi, Kawasaki; Hiroshi Satomura, Hatogaya; Yoshihiro Oguchi, Yokohama; Akio Maruyama, Tokyo, and Keishi Saito, Nabari, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 101,948

Claims priority, application Japan, Sep. 26, 1986, 61-227302; Sep. 26, 1986, 61-227303; Sep. 26, 1986, 61-227304; Sep. 26, 1986, 61-227305; Sep. 26, 1986, 61-227306; Sep. 26, 1986, 61-227310; Sep. 26, 1986, 61-227311; Sep. 4, 1987, 62-220491

Int. Cl.[4] G03G 5/10

U.S. Cl. 430—58 **19 Claims**

1. A photosensitive member for use in electrophotography comprising a substrate and a divided-functional light receiving layer having a charge carrier transportation layer and a charge carrier generation layer in this order from the side of said substrate, wherein said charge carrier transportation layer has a thickness of 1 to 100 μm and comprises a film containing (i) carbon atoms in an amount of at least 65 atomic percent, (ii) hydrogen atoms in an amount 30 atomic percent or less and (iii) at least one element selected from the group consisting of boron, aluminum, gallium, indium, thallium, nitrogen, phosphorus, arsenic, antimony and bismuth in an amount of 5 atomic ppm to 5 atomic percent; the matrix of said film being said carbon atoms; said film having a value of 0.18 to 5.9 for the ratio of $1_D/1_G$ between the peak intensity (1_D) of 1333 cm^{-1} and the peak intensity (1_G) of 1850 cm^{-1} in Raman spectra; and wherein said film contains a diamond phase in volume ratio of 50 to 90 percent, a graphite phase in a volume ratio of 20 percent or less and an amorphous carbon phase for the balance.

4,898,799

PHOTORECEPTOR

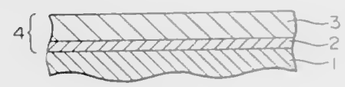
Yoshihide Fujimaki, Hachioji, and Shigeki Takenouchi, Chofu, both of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,052

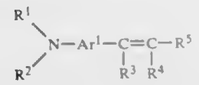
Claims priority, application Japan, Jul. 10, 1987, 62-173640; Sep. 25, 1987, 62-241983

Int. Cl.[4] G03G 5/14, 5/06

U.S. Cl. 430—59 **4 Claims**



3. A photoreceptor for electrophotography comprising an electroconductive support and, provided thereon, a photosensitive layer containing a titanyl phthalocyanine compound which has major peaks in terms of Bragg's 2θ angle to the CuKα characteristic X-ray wavelength at 1.541 Å at least at 9.5±0.2 degrees, 11.7 ±0.2 degrees, 15.0±0.2 degrees, 23.5±0.2 degrees, 24.1±0.2 degrees and 27.3±0.2 degrees as a carrier generating substance, and a compound having formula I as a carrier transporting substance;



I

(wherein, R^1 and R^2 independently is an alkyl group or an aryl group either of which may have a substituent; R^3 and R^4 independently is a hydrogen atom, a halogen atom, or an alkyl group, an aryl group, an alkoxy group or an amino group, provided that each group may have a substituent; R^5 is an aryl group or a heterocyclic group, either of which groups may have a substituent; and Ar^1 represents a substituted or unsubstituted aryl group.

4,898,800

AMINOBIPHENYL CHARGE TRANSPORTING MATERIALS AND ELECTROPHOTOGRAPHIC PHOTOCONDUCTORS USING THE SAME

Tomoyuki Shimada, Numazu; Masaomi Sasaki, Susono; Mitsuru Hashimoto, and Tamotsu Aruga, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

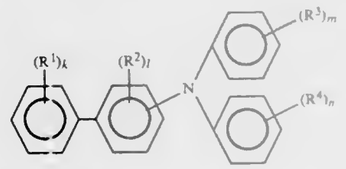
Filed Oct. 20, 1988, Ser. No. 260,063

Claims priority, application Japan, Oct. 20, 1987, 62-265662; Jan. 19, 1988, 63-010330; Feb. 19, 1988, 63-037234; Apr. 19, 1988, 63-097464

Int. Cl.[4] G03G 5/14

U.S. Cl. 430—59 **17 Claims**

1. An electrophotographic photoconductor, comprising an electroconductive support and a photoconductive layer formed thereon comprising at least one aminobiphenyl compound having the formula:



(I)

wherein R^1 represents hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a thioalkoxy group, an aryloxy group, a methylenedioxy group, an aralkyl group, a nitro group, or an unsubstituted or substituted aryl group; R^2 represents hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, halogen; and R^3 and R^4 each represent hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, halogen, a dialkylamino group, an amino group, a thioalkoxy group, an aryloxy group, a methylenedioxy group, an aralkyl group, or an unsubstituted or substituted aryl group, k, m and n each represent an integer of 0 to 5, and l represents an integer of 0 to 4, provided that R^1, R^2, R^3 and R^4 cannot be hydrogen at the same time.

4,898,801

MAGNETIC CARRIER OF DEVELOPER FOR ELECTROPHOTOGRAPHIC COPYING MACHINES COMPOSED OF FERRITE AND A SELECTED METAL OXIDE

Hidekiyo Tachibana; Akihiko Noda; Kazuo Terao, all of Kanagawa; Toshio Honjou, Chiba; Yukio Seki, Chiba; Hiroshi Endo, Chiba, and Toshio Yokobari, Chiba, all of Japan, assignors to Fujl Xerox Co., Ltd., Tokyo and Nippon Iron Powder Co., Ltd., Chiba, both of, Japan

Continuation-in-part of Ser. No. 871,171, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 663,980, Oct. 23, 1984, abandoned. This application Oct. 19, 1987, Ser. No. 111,137

Claims priority, application Japan, Oct. 24, 1983, 58-197500

Int. Cl.[4] G03G 9/10

U.S. Cl. 430—106.6 **5 Claims**

1. A carrier for a developer composed of a composition represented by the formula $(CuO)_a(ZnO)_b(Fe_2O_3)_c$, wherein a(mol)+b(mol)+c(mol)=1, $0.17 \leqq a+b/c < 0.42$, a is in the range from 0.1 to 0.3, b in the range from 0.05 to 0.15, and c in the range from 0.7 to 0.8, said composition having a bulk density of 1.8–3.4 g/cm^3 and a magnetization of 10–30 emu/g in a magnetic field of 450–500 Oe(oerested).

4,898,802

TONER COMPOSITIONS WITH ORGANO BORON NEGATIVE CHARGE ENHANCING ADDITIVES

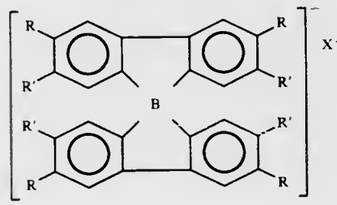
Bing R. Hsieh, Webster; Robert J. Gruber, and John L. Haack, both of Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 22, 1989, Ser. No. 354,181

Int. Cl.[4] G03G 9/08

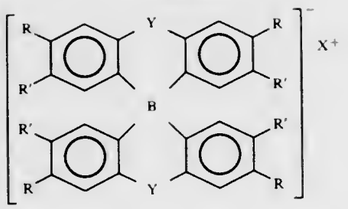
U.S. Cl. 430—110 **26 Claims**

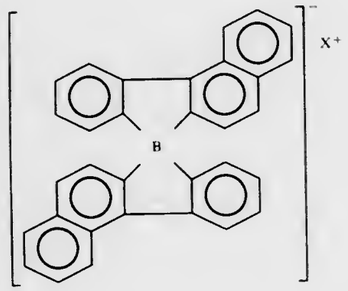
1. A negatively charged toner composition comprised of resin particles, pigment particles, and as a charge enhancing additive the salts of 5,5'-spirobi(5H-dibenzoborole) of the following Formulas I, II, III, IV, or V:

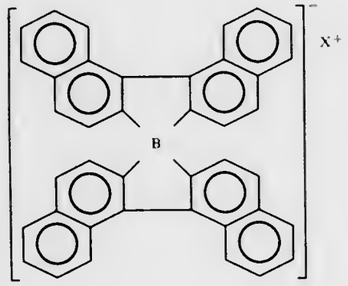


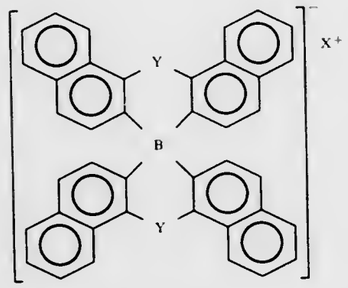
I

-continued









wherein R, and R' are independently selected from the group consisting of hydrogen, an aliphatic group, and halide; Y is alkylene or hetroatoms; and X is a cation.

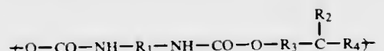
4,898,803

LIGHT-SENSITIVE O-QUINONE DIAZIDE COMPOSITION WITH ACIDIC POLYURETHANE RESIN

Toshiaki Aoai; Keitaro Aoshima, and Akira Nagashima, all of Shizuoka, Japan, assignors to Fujl Photo Film Co., Ltd., Minami-Ashigara, Japan

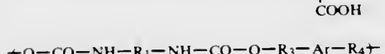
Filed Nov. 12, 1987, Ser. No. 119,578
Claims priority, applicatioa Japan, Nov. 14, 1986, 61-271554
Int. Cl.[4] G03C *1/60, 1/54, 1/495*
U.S. Cl. 430—191 **14 Claims**

II 1. A light-sensitive composition comprising at least one polyurethane resin having at least one repeating unit represented by at least one of formula (I) and formula (II) and which is insoluble in water and soluble in an aqueous alkaline solution; and at least one positive-working light-sensitive o-quinonediazide compound:



(I)

III



(II)

in the above general formula, R_1 represents a bivalent aliphatic or aromatic hydrocarbon group which may have a substituent; R_2 represents a hydrogen atom or an alkyl, an aralkyl, an aryl, an alkoxy or an aryloxy group which may be substituted with a substituent; R_3, R_4 and R_5 may be the same or different and represent a single bond or a bivalent aliphatic or aromatic hydrocarbon group which may be substituted with a substituent; and Ar represents a trivalent aromatic hydrocarbon group

IV which may be substituted with a substituent,

wherein the amount of the o-quinonediazide compound is in the range of from 10 to 50% by weight of the composition.

the amount of the polyurethane resin in the light-sensitive composition falls within the range of from about 5 to 90% by weight of the composition.

the polyurethane resin has an acid value of 1.5 to 4.0 meq/g, and

the polyurethane resin and the o-quinonediazide compound are together in admixture.

V

4,898,804

SELF-ALIGNED, HIGH RESOLUTION RESONANT DIELECTRIC LITHOGRAPHY

Kurt Rauschenbach, Marlborough, Mass., and Charles A. Lee, Ithaca, N.Y., assignors to Cornell Research Foundation, Ithaca, N.Y.

Filed Mar. 31, 1988, Ser. No. 176,274
Int. Cl.[4] G03C *5/16*
U.S. Cl. 430—311 **20 Claims**

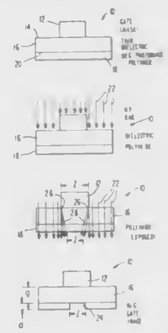
1. A method for multi-surface lithography, comprising:

forming a thin-film of a semiconductor material having a resonant dielectric characteristic wherein a resonant dielectric increase occurs when said thin film material is exposed to light of a predetermined frequency;

forming a mask adjacent a top surface of said thin film;

forming a photoimageable layer on a bottom surface of said thin film beneath said mask, said photoimageable material being sensitive to light of said predetermined frequency;

directing light of said predetermined frequency from a collimated source toward said top surface of said thin film, past said mask and through said thin film to expose, and to



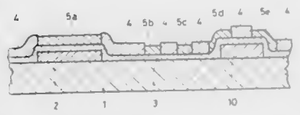
produce an image in, said photoimageable layer which corresponds to the shape of said mask.

4,898,805

METHOD FOR FABRICATING HYBRID INTEGRATED CIRCUIT

Mitsuyuki Takada; Hayato Takasago, and Yolchiro Onishi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 224,175
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—315 **11 Claims**



1. A method for fabricating a hybrid IC substrate comprising the steps of:

preparing an insulating ceramic substrate having a major surface,

baking one or more conductors of a first group on the major surface,

forming an insulating porous active layer including a glass component and a small amount of a metal component having a catalytic action for electroless plating to cause said active layer to cover said major surface and said conductors of the first group, and

forming one or more conductors of the second group by electroless plating on said active layer,

whereby a portions of said active layer sandwiched between said conductors of the first and the second groups is rendered conductive and a portions of said active layer in direct contact with said insulating substrate is maintained as an insulator.

4,898,806

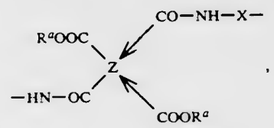
COATED MATERIAL AND USE THEREOF

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

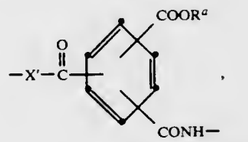
Continuation of Ser. No. 105,515, Oct. 2, 1987, abandoned, which is a continuation of Ser. No. 845,891, Mar. 28, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 302,076
Claims priority, application Switzerland, Apr. 11, 1985, 1551/85
Int. Cl.[4] G03C *5/16;* **B05D** *3/06*
U.S. Cl. 430—325 **50 Claims**

26. A process for producing a relief image which comprises

(a) coating a substrate with a layer of a polyamic acid, which polymer contains 50 to 100 mol %, based on said polymer, of at least one structural unit of formula I or II

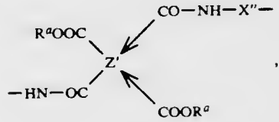


(I)

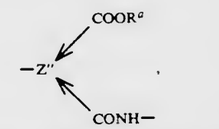


(II)

or of a mixture thereof, and 0 to 50 mol. % of a structural unit of formula III or IV



(III)

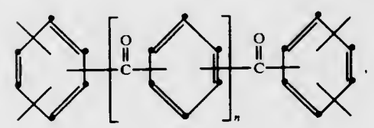


(IV)

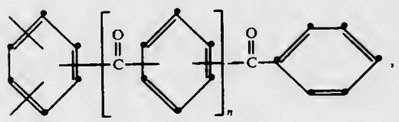
or of a mixture thereof, wherein the arrows denote position isomerism and

R^a is a hydrogen atom,

Z is a tetravalent aromatic radical which contains a benzophenone structural unit and to which one —CONH and one —$COOR^a$ group is attached to one or two different phenyl radicals in ortho- or peri-position to each other, and where Z is a radical of formula V, VI, VII or XI

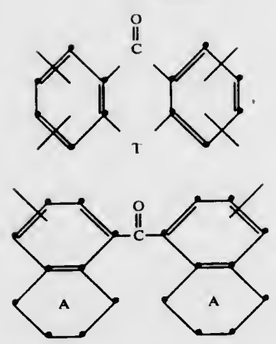


(V)



(VI)

-continued



(XI)

wherein n is 0 or 1, T is a direct bond, $—CH_2—$, —O—, —S—, —SO—, $—SO_2—$, —CO—, $—NR^b—$ or $—CR^b$-$R^c—$, wherein R^b is a hydrogen atom, C_1–C_{10}alkyl, naphthyl or benzyl, and Rc has the meaning of R^b but is not hydrogen, the rings A in formula XI are saturated or aromatic, and a pair of free bonds is ortho to each other,

Z' is a tetravalent aromatic radical which differs from Z and to which one ester group and one amide group are attached in ortho- or peri-position to each other,

Z' is a trivalent aromatic radical which differs from the radical in the structural unit of formula II and to which one ester and one amide group are attached in ortho- or peri-position to each other,

X is the radical of an aromatic diamine which is substituted in both ortho-positions to at least one N-atom by alkyl, cycloalkyl, alkoxy, alkoxyalkyl or aralkyl, or two adjacent carbon atoms of the aromatic radical are substituted by alkylene,

X' is a divalent aromatic radical which is substituted by at least one group as defined for X, and

X'' has the same meaning as X or is a divalent radical of an organic diamine which differs from the radical X,

(b) irradiating the coated material through a photomask,

(c) developing the image by treating the material with a solvent to remove the uncrosslinked polymer from the areas not exposed to irradiation, and

(d) heating the crosslinked image to convert said image to the corresponding polyimide form.

4,898,807

METHOD FOR FORMING DIRECT POSITIVE COLOR IMAGE USING AN N-HYDROXY ALKYL-SUBSTITUTED-P-PHENYLDIAMINE DERIVATIVE AT ELEVATED TEMPERATURES FOR A SHORT PERIOD OF TIME

Kazuhiro Kobayashi; Shigeharu Koboshi, and Kazuyoshi Miyaoka, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 68,719, Jun. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 868,288, May 28, 1986, abandoned. This application May 1, 1989, Ser. No. 348,095

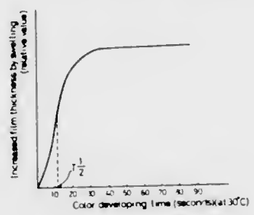
Claims priority, application Japan, May 31, 1985, 60-118443; Jun. 18, 1985, 60-132649; Jul. 12, 1985, 60-153699

Int. Cl.[4] G03C *7/16*

U.S. Cl. 430—378 **22 Claims**

1. A method for forming a direct positive color image by subjecting an inner latent image type light-sensitive silver halide color photographic material for formation of a direct positive color image, having at least one light-sensitive emulsion layer containing inner latent image type silver halide grains which have not been previously fogged on the grain surfaces to color developing processing after image exposure, which comprises developing, an inner latent image type light-sensitive silver halide color photographic material for formation of a direct positive color image in which a silver halide emulsion, in at least one light-sensitive emulsion layer consists substantially of a silver chlorobromide emulsion by contact

(VII)



with a color developing solution having a pH of 7 to 13 and containing a N-hydroxyalkyl-substituted-p-phenylenediamine derivative as a color developing agent in an amount of 1 to 100 g/l of said color developing solution at 30° C. to 50° C. for from 5 to 150 seconds.

4,898,808

ANTISTATIC SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Noriki Tachibana; Masato Nishizeki, and Nobuaki Kagawa, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 17, 1989, Ser. No. 298,188

Claims priority, application Japan, Oct. 27, 1988, 63-271672

Int. Cl.[4] G03C *1/82;* **C08G** *75/00;* **C07D** *211/00*

U.S. Cl. 430—510 **76 Claims**

1. An antistatic silver halide photographic light-sensitive material having a support, provided thereon, at least one light-sensitive layer and at least one non-light-sensitive layer, wherein said at least one non-light-sensitive layer comprises a polymer compound consisting essentially of a repeated structural unit represented by Formula [I];

Formula [I]



$X_1^{\ominus}$, $X_2^{\ominus}$

wherein Z_1 and Z_2 represent the group of the atoms necessary to form a six-membered ring with $—N^{\oplus}—$; R represents a divalent group; R_1 and R_2 represent independently one selected from the group consisting of an alkyl group and an aryl group; R_3 represents a hydrocarbon group; $X_1^{\ominus}$ and $X_2^{\ominus}$ represent an anion; a and 1 represent an integer of 0 and 1.

4,898,809

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Takeshi Sampei, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,754

Claims priority, application Japan, Aug. 11, 1987, 62-201125; Aug. 11, 1987, 62-201126

Int. Cl.[4] G03C *1/84*

U.S. Cl. 430—523 **9 Claims**

1. A silver halide photographic light-sensitive material comprising a support bearing thereon photographic component layers including

at least one silver halide emulsion layer containing a silver halide emulsion sensitized so as to have a maximum spectral sensitivity on the side of a wavelength shorter than 600 nm; and

at least one non-light-sensitive hydrophilic colloid layer arranged to the side of said silver halide emulsion layer opposite to said support,

wherein at least one of said hydrophilic colloid layers contains a water-soluble dye having a maximum light-absorption within the wavelength region of not less than 700 nm.

4,898,810

LAYERS FOR PHOTOGRAPHIC MATERIALS

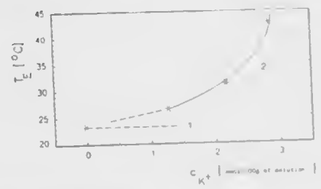
Ute Eggert, Fribourg; Andreas Engel, Binningen, and Ekkehard Kramp, Marly, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 143,054, Jan. 12, 1988, abandoned. This application May 1, 1988, Ser. No. 346,294

Claims priority, application Switzerland, Jan. 13, 1987, 00097/87-7

Int. Cl.[4] G03C *5/26, 1/00;* **A23L** *1/04*

U.S. Cl. 430—523 **26 Claims**



1. A photographic material, which contains, on a support, at least one light-sensitive layer with gellan gum, which with mono-, di- and/or trivalent metal ions, forms gels having a solidification temperature between 24° and 45° C.

4,898,811

COLOR PHOTOGRAPHIC SILVER HALIDE MATERIAL WITH SULFONYLPHENOL OIL FORMER

Erich Wolff, Solingen; Dieter Lowski, Bergheim, and Harry Elias, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 2, 1988, Ser. No. 279,415

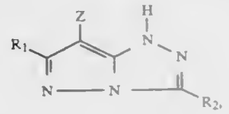
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743006

Int. Cl.[4] G03C *7/38*

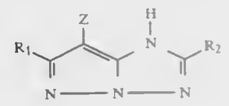
U.S. Cl. 430—546 **5 Claims**

1. A color photographic silver halide material which, in at least one silver halide emulsion layer, contains a magenta coupler corresponding to formula (I) or (II)

(I)



(II)



in which

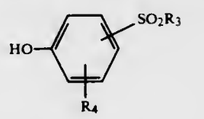
R_1 represents alkyl, aryl or a ballast group,

R_2 is a ballast group, alkyl or aryl,

Z is hydrogen or a group releasable on reaction with the developer oxidation product,

and a compound corresponding to formula (III)

(III)



in which

R_3 represents alkyl, alkoxy, aryl, optionally substituted amino or the residue of a heterocycle,

R_4 represents COR_5, NHR_6, $S(O)_nR_7$

R_5 represents OR_8, NHR_8, alkyl, aryl or a heterocycle,

R_6 represents SO_2R_8, COR_8 or $CONHR_8$,

R_7 represents alkyl, aryl or NHR_8,

R_8 represents alkyl or aryl and

n is 0, 1 or 2,

with the exception of compounds in which R_3 represents a carboxymethoxyphenyl, carboxymethoxy, alkoxycarbonylmethoxy or alkoxycarbonylmethoxyphenyl radical substituted at the methylene group.

4,898,812

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL WITH A SILVER HALIDE EMULSION LAYER CONTAINING A CYAN COUPLER AND A COLOR DEVELOPMENT ACCELERATOR

Kozo Aoki, and Nobuo Furutachi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 7, 1987, Ser. No. 82,461

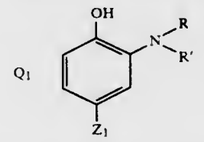
Claims priority, application Japan, Aug. 7, 1986, 61-184329

Int. Cl.[4] G03C *7/34*

U.S. Cl. 430—548 **10 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer, said emulsion layer containing at least one cyan dye forming coupler represented by the general formula (I):

(I)



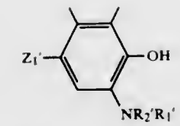
wherein,

Z_1 represents a hydrogen atom or a group that can be released in a coupling reaction with the oxidation product of a color developing agent;

R represents an acyl group or a sulfonyl group; and wherein

R' represents a hydrogen atom or an aliphatic group having 1 to 8 carbon atoms which may be substituted with one or more substituents;

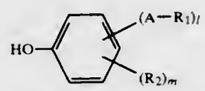
Q_1 represents a 5- to 8-membered ring comprising $—NR'$-$_3CO—Q'_1$, wherein the nitrogen atom of the group $—NR'_3CO—Q'_1$ is bonded to the carbon atom at the 5-position of the phenol ring portion of formula (I), wherein Q'_1 represents at least one divalent group selected from the group consisting of a divalent amino group, an ether linkage, a thioether linkage, an alkylene group, an ethylene linkage, an imino linkage, a sulfonyl group, a carbonyl group, an allylene group, a divalent heterocyclic ring group and a group represented by



wherein Z'_1 and R'_2 have the same meaning as Z_1 and R', respectively, as defined above; R'_1 represents a group represented by $—COX_1—R'_4$ or a group represented by $—SO_2—X_1R'_4$ wherein X_1 represents a group —O—, a group —NR'$_5$— or a chemical bond wherein R'_5 represents a hydrogen atom or a substituted or unsubstituted aliphatic group having 1 to 8 carbon atoms, and R'_4 represents a substituted or unsubstituted aliphatic group; Z'_1, R'_1 and R_2 may be the same or different, and Q'_1 may be substituted or unsubstituted; R'_3 represents a hydrogen atom or a group represented by $—X_2R'_6$ that can be attached as a substituent to the nitrogen atom, wherein X_2 represents a chemical bond or one or more divalent linking groups that may have a substituent selected from the group consisting of a divalent amino group, an ether linkage, a thioether linkage, an alkylene group, an imino linkage, a sulfonyl group, a sulfoxy group, and a carbonyl group; and R'_6 has the same meaning as R'_4; and

a dimer coupler or a polymer coupler may be formed through R, R', Z_1, or Q_1;

and at least one color development accelerator represented by the formulae (II) or (V):



(II)

Q

$$R_5—NHSO_2—R_6 \quad (V)$$

wherein,

A represents a divalent electron accepting group;

R_1 represents a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a substituted or unsubstituted alkylamino group, a substituted or unsubstituted anilino group, or a substituted or unsubstituted heterocyclic group;

l is 1 or 2;

R_2 represents a substituted or unsubstituted aliphatic group, a substituted or unsubstituted alkoxy group, a hydroxyl group or a halogen atom;

m is an integer of from 0 to 4;

Q, which may or may not be present, represents a benzene ring or a heterocyclic ring that may be condensed with the phenol ring;

R_5 represents a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkylsulfonyl or phenysulfonyl group or a substituted or unsubstituted acyl group; and

R_6 represents a substituted or unsubstituted aliphatic group or a substituted or unsubstituted aryl group; or

R_5 and R_6 may combine to form a 5- to 7-membered ring, which ring may be independent or may be part of a fused ring system.

4,898,813

CATALYTIC TEST COMPOSITION INTENDED TO PRODUCE A RANGE OF COLORS

James P. Albarella, 25845 Meadow Oak La.; Steven C. Charlton, 1533 Strong Ave.; James W. Reinsch, 3421 Whitfield Ct.-D, all of Elkhart, Ind. 46514, and Mary E. Warchal, 10272 Jefferson Rd., Osceola, Ind. 46561

Filed Apr. 4, 1986, Ser. No. 848,691

Int. Cl.[4] C12Q *1/00, 1/26, 1/54, 1/60*

U.S. Cl. 435—4 **19 Claims**

1. Process for determining the concentration of an analyte in a fluid sample, which process comprises:

contacting a common substrate generating system capable of generating a common substrate by reaction with an analyte of interest, with (a) an analyte, (b) a first catalytic system capable of generating a change in hue of a first indicator component by reaction with the common substrate, and (c) a second catalytic system capable of generating a change in hue of a second indicator component by reaction with the common substrate,

wherein the generation of the change in hues of the first and second indicator components occurs substantially simultaneously and provides different hues at different analyte concentrations, the final hue depending on the concentration of the analyte.

4. The test composition for the determination of the concentration of an analyte in a fluid sample, comprising:

(a) a common substrate generating system which in the presence of an analyte in a fluid sample will generate a common substrate selected from the group consisting of adenosine triphosphate, reduced flavin adenine dinucleotide, hydrogen peroxide, glycerol and glucose;

(b) a first catalytic system capable of generating a change in hue in a first indicator upon reaction with the common substrate; and

(c) a second catalytic system capable of generating a change in hue in a second indicator by reaction with the common substrate,

wherein the generation of the change in hues of the first and second indicators occurs substantially simultaneously and provides different hues at different analyte concentrations, the final hue produced by the test composition depending on the concentration of the analyte present in the fluid sample.

4,898,814

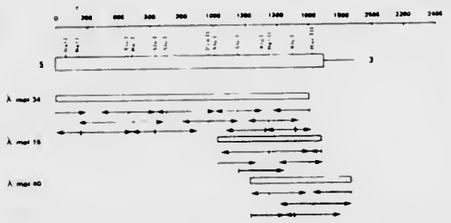
A CDNA CLONE FOR HUMAN TYROSINASE

Byoung S. Kwon, Vestal, N.Y., assignor to Donald Guthrie Foundation for Medical Research, Inc., Sayre, Pa.

Filed Oct. 6, 1986, Ser. No. 915,753

Int. Cl.[4] C12Q *1/68;* **C12N** *9/02, 15/00;* **C07H** *15/12*

U.S. Cl. 435—6 **6 Claims**



4. A method of making human tyrosinase comprising the steps of:

a. fusing the lambda mel 34 cDNA encoding human tyrosinase to an expression vector wherein said cDNA is under the functional control of a promoter sequence;

b. expressing tyrosinase in *E. coli;*

c. purifying the resulting tyrosinase.

6. A method of using the cDNA gene for human tyrosinase recovered from the λ mel 34 cDNA as deposited at the A.T.C.C. Collection under No. 40265 as a probe for genetic analysis of human albinism comprising the steps:

(a) labeling said cDNA;

(b) hybridizing said labeled cDNA with albino human genomic DNA; and

(c) detecting the patterns of hybridization.

(d) repeating steps (a), (b) and (c) a plurality of times to produce said fermentation product.

4,898,815

NOVEL SYNTHETIC PEPTIDE, PROCESS FOR ITS PREPARATION AND MEDICAMENTS CONTAINING IT

Andre Dodin, Milly La Foret; Odile Siffert, Versailles; Georgette Le Thuillier, Morangis, and Patrice Allard, Paris, all of France, assignors to Institut Pasteur, Paris, France

Division of Ser. No. 643,955, Aug. 24, 1984, Pat. No. 4,686,281. This application Jan. 20, 1987, Ser. No. 4,416

Claims priority, application France, Aug. 29, 1983, 83 13828

Int. Cl.[4] G01N *33/569;* **A61K** *39/40*

U.S. Cl. 435—7 **6 Claims**

1. Diagnostic agent for the presence of *V. cholerae* and/or toxinogenic *Escherichia coli,* said agent being essentially constituted by a serum taken from rabbits previously treated with injections of the synthetic peptide Gln-Ser-Leu-Gly-Val-Lys-Phe-Leu-Asp-Glu-Tyr-Gln-Ser-Lys-Val.

4,898,816

MEDIATORS FOR BIOELECTROCHEMICAL CELLS TO TEST FOR MICROBIOLOGICAL ACTIVITY

Anthony P. F. Turner; Ann Swain; Graham Ramsay; Marco Cardosi, and Bernard H. Schnelder, all of Cranfield, England, assignors to Paul de la Pena Limited, Worcestershire, United Kingdom

Filed Mar. 19, 1987, Ser. No. 27,979

Claims priority, application United Kingdom, Mar. 19, 1986, 8606831; Nov. 25, 1986, 8628166

Int. Cl.[4] C12Q *1/04*

U.S. Cl. 435—34 **11 Claims**

1. In a bioelectrochemical cell for use in measuring microbiological activity in a liquid sample suspected of containing microorganisms, wherein microbiological activity results in a mediator transfer of electrons between liquid and electrode in the cell and a consequent electrical signal is detected and measured, the improvement which comprises incorporating in the cell an amount of a ferricyanide and a 1,4-benzoquinone effective for said mediation of electron transfer.

4,898,817

MICROORGANISM IMMOBILIZATION

Hiroshi Yamazaki, 22 Alderbrook Drive, Nepean, Ontario K2H 5W5, and Sushama Joshi, 37 Sheldrake Drive, Kanata Ontario K2L 1S5, both of Canada

Filed Jun. 16, 1986, Ser. No. 874,388

Claims priority, application Canada, Nov. 6, 1985, 494718

Int. Cl.[4] C12P *35/06, 17/18, 7/14;* **C12N** *11/02*

U.S. Cl. 435—49 **13 Claims**

1. A repetitive batch fermentation process for producing a fermentation product comprising the steps of:

(a) freely suspending and stirring small segments of support cloth bearing a fixed film of live and reproductive microorganisms immobilized thereon within a fermenter containing suitable nutrient liquor to carry out a fermentation process, whereby said microorganisms produce a fermented liquor;

(b) withdrawing said fermented liquor from said fermenter while retaining said small segments of support cloth bearing said fixed film of live and reproductive microorganisms immobilized thereon within said fermenter;

(c) adding fresh nutrient to said fermenter containing said small segments of support cloth bearing said fixed film of live and reproductive microorganisms immobilized thereon; and

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4,898,818

ANTITUMOR ACTIVE SUBSTANCE, PROCESS FOR PREPARING THE SAME, DRUG CONTAINING THE SUBSTANCE, GENE CODING FOR THE SUBSTANCE, VECTOR CONTAINING THE GENE AND RECOMBINANT MICROORGANISM

Satoru Nakai; Mayumi Kaneta; Yoshikazu Kikumoto, all of Tokushima; Yeong-Man Hong; Kazuyoshi Kawai, both of Naruto; Setsuko Takegata, Tokushima; Kiyoshi Ishii, Tokushima; Yasuo Yanagihara, Tokushima, and Yoshikatsu Hirai, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1985, Ser. No. 810,776

Claims priority, application Japan, Dec. 21, 1984, 59-271207; Jun. 24, 1985, 60-138280; Jun. 24, 1985, 60-138281; Oct. 3, 1985, 60-220882

Int. Cl.[4] C12P *21/00;* **C12N** *15/00;* **C07K** *13/00*

U.S. Cl. 435—69.1 **2 Claims**

1. A process for preparing an antitumor active substance GIF comprising the steps of causing an antitumor substance inducing substance to act on an immunologically competent cell derived from a human and collecting the GIF substance by sequential chromatography comprising gel-filtration chromatography, reverse-phase chromatography and chromatofocusing or ion-exchange chromatography, and the GIF substance is substantially a homogeneous protein, contains as its component protein, polypeptide A, having the following primary structure, and has a molecular weight of 18,000 and an isoelectric point of 6.88 to 7.02

Ala	Pro	Val	Arg	Ser	Leu	Asn	Cys	Thr	Leu	Arg	Asp	Ser
Gln	Gln	Lys	Ser	Leu	Val	Met	Ser	Gly	Pro	Tyr	Glu	Leu
Lys	Ala	Leu	His	Leu	Gln	Gly	Gln	Asp	Met	Glu	Gln	Gln
Val	Val	Phe	Ser	Met	Ser	Phe	Val	Gln	Gly	Glu	Glu	Ser
Asn	Asp	Lys	Ile	Pro	Val	Ala	Leu	Gly	Leu	Lys	Glu	Lys
Asn	Leu	Tyr	Leu	Ser	Cys	Val	Leu	Lys	Asp	Asp	Lys	Pro
Thr	Leu	Gln	Leu	Glu	Ser	Val	Asp	Pro	Lys	Asn	Tyr	Pro
Lys	Lys	Lys	Met	Glu	Lys	Arg	Phe	Val	Phe	Asn	Lys	Ile
Glu	Ile	Asn	Asn	Lys	Leu	Glu	Phe	Glu	Ser	Ala	Gln	Phe
Pro	Asn	Trp	Tyr	Ile	Ser	Thr	Ser	Gln	Ala	Glu	Asn	Met
Pro	Val	Phe	Leu	Gly	Gly	Thr	Lys	Gly	Gly	Gln	Asp	Ile
Thr	Asp	Phe	Thr	Met	Gln	Phe	Val	Ser	Ser	OH.		

4,898,819

HETEROPOLYSACCHARIDE SOLUTIONS STABILIZED AGAINST VISCOSITY LOSS OVER TEMPERATURE AND TIME

Jean-Louis Linossier, Lyons, France, assignor to Rhone-Poulenc Specialities Chimiques, Courbevoie, France

Filed Dec. 5, 1985, Ser. No. 804,862

Claims priority, application France, Dec. 5, 1984, 84 18506

Int. Cl.[4] C12P *19/04*

U.S. Cl. 435—93 **9 Claims**

1. A process for stabilizing the viscosity of an aqueous saline solution of a heteropolysaccharide over temperature and time, comprising purging dissolved oxygen from such aqueous saline solution by degassing same with carbon dioxide, the ionic strength of which saline solution being such that said heteropolysaccharide exists therein in ordered form, and thence adding to said degassed solution an effective amount of a reducing/deoxidizing agent as to maintain the pH thereof at a value ranging from 5 to 7, said carbon dioxide and reducing agent preventing precipitation of insoluble materials.

4,898,820

PROCESS FOR PRODUCTION OF ISOMALTULOSE

Akio Hiteshio; Hisao Takamatsu, and Reiko Hattori, all of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,611

Claims priority, application Japan, Jul. 27, 1987, 62-185594; Jul. 22, 1988, 63-181695

Int. Cl.[4] C12P *19/12*

U.S. Cl. 435—95 **4 Claims**

1. A process for production of isomaltulose characterized by reacting glucose and fructose to form isomaltulose in the presence of an enzyme which hydrolyzes a polysaccharide or oligosaccharide at the α-1, 4- and/or α-1,6-glucoside linkage thereof by an exo-type cleavage.

4,898,821

ANTIBIOTIC COMPOUNDS AND THEIR PREPARATION

John B. Ward, Rushey; Hazel M. Noble, Burnham; Neil Porter, Pinner; Richard A. Fletton, Ruislip, and David Noble, Burnham, all of England, assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 775,737, Sep. 13, 1985, abandoned. This application Mar. 25, 1987, Ser. No. 29,885

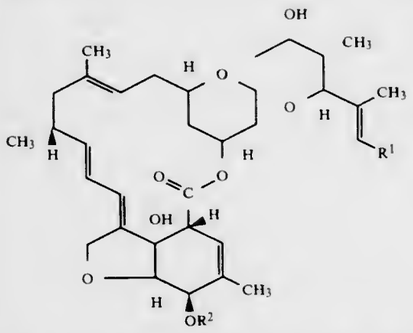
Claims priority, application United Kingdom, Sep. 14, 1984, 8423278; Dec. 21, 1984, 8432519

Int. Cl.[4] C12P *17/18*

U.S. Cl. 435—119 **13 Claims**

1. A process for the preparation of a compound having a formula (III)

(III)



or mixtures thereof, in which R^1 is a methyl, ethyl or isopropyl group and R^2 is hydrogen or a methyl group; which comprises the step of cultivating a microorganism which is *Streptomyces thermoarchaensis* NCIB 12015, 12111, 12112, 12113 or 12114.

4,898,822

PROCESS FOR PREPARING OPTICALLY ACTIVE INDOLINE-2-CARBOXYLIC ACID

Masanori Asada, Takasago; Shigeki Hamaguchi; Hidetoshi Katsuki, both of Kobe; Yoshio Nakamura, Takasago; Hideyuki Takahashi, Kakogawa, all of Japan; Kenji Takahara, Bronx, N.Y.; Yoshio Shimada, Kakogawa, Japan; Takehisa Ohashi, Kobe, Japan, and Kiyoshi Watanabe, Akashi, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 31, 1986, Ser. No. 846,436

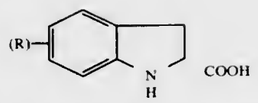
Claims priority, application Japan, Apr. 1, 1985, 60-69769; May 20, 1985, 60-109160; Jun. 8, 1985, 60-124879

Int. Cl.[4] C12P *17/10, 1/04;* **C12N** *9/18;* **C07P** *41/00*

U.S. Cl. 435—121 **9 Claims**

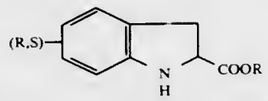
1. A process for preparing an (R)-indoline-2-carboxylic acid having the formula [(R)-II]:

[(R)-II]



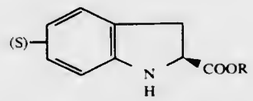
which comprises subjecting a racemic ester of an (R,S)-indoline-2-carboxylic acid having the formula [(R,S)-I)]:

[(R,S)-I]



wherein R is an alkyl or alkenyl group having 1 to 10 carbon atoms; an alkyl or alkenyl group having 1 to 10 carbon atoms substituted with either hydroxyl group or a halogen atom, or simultaneously substituted with both hydroxyl group and a halogen atom; or a substituted or unsubstituted aromatic hydrocarbon group, to the action of an enzyme selected from the group consisting of Protease Amano P, Bioplase AL 15, Actinase E, Pancreatic digesting enzyme TA, Steapsin and Lipase L 3216, or a microorganism selected from the group consisting of *Aspergillus melleus* IFO 4420, *Bacillus subtilis* IFO 3018, *Streptomyces griseus* IFO 8358, *Saccharomyces cerevisiae* HUT 7018, *Trichosporon cutaneum* IFO 1200, *Aeromonas hydrophila* IFO 3820, *Arthrobacter paraffineus* ATCC 21317, *Arthrobacter nicotianae* IFO 14234, *Acidiphilium cryptum* IFO 14242, *Brevibacterium protophormiae* IFO 12128, *Corynebacterium pourometabolum* IFO 12160 and *Pseudomonas oxalacticus* IFO 13593, or a stereoselective esterase from any of these microorganisms, to asymmetrically hydrolyze the racemic ester [(R,S)-I] into optically active (R)-indoline-2-carboxylic acid [(R)-II] and an ester of (S-indoline-2-carboxylic acid having the formula [(S)-I]

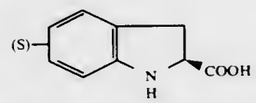
[(S)-I]



wherein R is as above, and then isolating the optically active (R)-indoline-2-carboxylic acid [(R)-II].

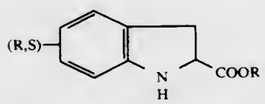
3. A process for preparing an (S)-indoline-2-carboxylic acid having the formula [(S)-II]:

[(S)-II]



which comprises subjecting a racemic ester of an (R,S)-indoline-2-carboxylic acid having the formula [(R,S)-I]:

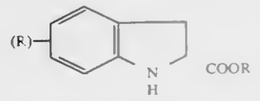
[(R,S)-I]



wherein R is an alkyl or alkenyl group having 1 to 10 carbon atoms; an alkyl or alkenyl group having 1 to 10 carbon atoms substituted with either hydroxyl group or a halogen atom, or simultaneously substituted with both hydroxyl group and a

halogen atom, or a substituted or unsubstituted aromatic hydrocarbon group, to the action of an enzyme selected from the group consisting of Lipoprotein lipase and Lipase AP 6, or a microorganism selected from the group consisting of *Pseudomonas aeruginosa* IFO 3080, *Aspergillus niger* IFO 4407, *Arthrinium phaeospermum* IFO 5703, *Aspergillus ficuum* IFO 4280, *Cephalosporium mycophilum* IFO 8580, *Echinopodospora jamaicensis* IFO 30406, *Emericellopsis glabra* IFO 9031, *Hypocrea lactea* IFO 8434, *Isaria atypicola* IFO 9205, *Lepista nuda* IFO 8304, *Nectria flammea* IFO 30306, *Pestalotiopsis distincta* IFO 9981, *Phialophora fastigiasta* IFO 6850, *Podospora carbonaria* IFO 30924, *Botryoascus synnaedendrus* IFO 1604, *Candida diversa* IFO 1090, *Citeromyces matritensis* IFO 0651, *Debaryomyces hansenii* IFO 0015, *Hormoascus platypodis* IFO 1471, *Maniliella tomentosa* CBS 22032, *Kluyveromyces frogilis* IFO 0288, *Nadsonia elongata* IFO 0665, *Rhodotarula glutinis* IAM 4642, *Schizosaccharomyces pombe* IFO 0347, *Torulopsis gropengiesseri* IFO 0659, *Wickerhamia fluorescens* IFO 1116, *Alcaligenes faecalis* IFO 12669, *Arthrobacter crystallopoietes* IFO 14235, *Brevibacterium flavum* ATCC 21269, *Protaminobacter alboflavus* IFO 3707 and *Pseudomonas acidovorans* IFO 13582, or a stereoselective esterase from any of these microorganisms, to asymmetric hydrolyze the racemic ester [(R,S)-I] into optically active (S)-indoline-2-carboxylic acid [(S)-II] and an ester of (R)-indoline-2-carboxylic acid having the formula [(R)-I]:

[(R)-I]



wherein R is as above, and then isolating the optically active (S)-indoline-2-carboxylic acid [(S)-II].

4,898,823

DNA SEQUENCE

Alan J. Kingsman, and Susan M. Kingsman, both of Islip, England, assignors to Celltech Limited, Sough, England

PCT No. PCT/GB84/00189, § 371 Date Jan. 30, 1985, § 102(e) Date Jan. 30, 1985, PCT Pub. No. WO84/04757, PCT Pub. Date Dec. 6, 1984

Continuation of Ser. No. 697,584, Jan. 30, 1985, abandoned. This PCT application May 31, 1984, Ser. No. 165,388

Claims priority, application United Kingdom, May 31, 1983, 8314961

Int. Cl.[4] C12N *15/00, 1/20, 5/00*

U.S. Cl. 435—172.3 **5 Claims**

1. An isolated upstream activator sequence (UAS) derived from the Saccharomyces phosphoglycerate kinase (PGK) gene which is contained in the 5' region of the PGK gene between nucleotides -324 and -456, which UAS when inserted upstream of a yeast promotor is capable of potentiating the efficiency thereof.

4,898,824

CROSSLINKED POLYACRYLAMIDE-SULFHYDRYL POLYMER FOR IMMOBILIZATION OF BIOLOGICALLY ACTIVE SUBSTANCES

Kin-Fai Yip, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

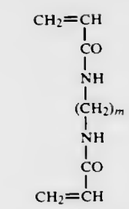
Filed Dec. 9, 1986, Ser. No. 939,904

Int. Cl.[4] C12N *11/08, 11/06*

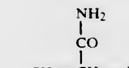
U.S. Cl. 435—180 **12 Claims**

1. A method for preparing a water-insoluble crosslinked polyacrylamide polymer and immobilizing a biologically active substance thereon which comprises copolymerizing a mixture comprising monomers of the formulae:

(a)

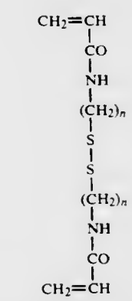


(b)



and

(c)



wherein m and n are, independently, integers from 1 through 6, and, isolating the resulting crosslinked polyacrylamide polymer, reducing said crosslinked polymer with a reducing agent to cleave the disulfide bond in the crosslinkages of monomer (c) to result in a crosslinked polymer free of residual amino and carboxylic acid groups and to form chemically active sulfhydryl groups, and reacting the reduced crosslinked polymer with a biologically active substance to couple said biologically active substance to said chemically active sulfhydryl group.

4,898,825

METHODS FOR PURIFICATION OF SINGLE-CHAIN AND DOUBLE-CHAIN TISSUE PLASMINOGEN ACTIVATOR

Mitsuyoshi Morii; Masaharu Ohoka, both of Yokohama; Toshihiko Suzuki, Tokyo; Katsuyuki Suzuki, Hiroshima; Nobuhiro Kawashima, Sagamihara; Noriko Morii, and Kunizo Mori, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Apr. 29, 1987, Ser. No. 43,746

Claims priority, application Japan, May 7, 1986, 61-103200; Aug. 11, 1986, 61-186850

Int. Cl.[4] C12N *9/48, 9/64*

U.S. Cl. 435—212 **18 Claims**

1. A method for separately purifying and separating single-chain tissue plasminogen activator (tPA) and double-chain tPA from a mixture containing both, which method comprises the steps of:

(a) bringing a mixture containing single-chain tPAs and double chain tPAs into close contact with a column carrying an immobilized Erythrina trypsin inhibitor as an affinity agent to adsorb said tPAs onto said column;

(b) treating said column with an eluent having a pH ranging from 4.5 to 6.0 to selectively elute single-chain tPA; and

(c) treating said column with an eluent having a pH lower than 4.5 to selectively elute double-chain tPA.

4,898,826
METHOD TO SOLUBILIZE TISSUE PLASMINOGEN ACTIVATOR

Stephen A. Duffy, Florissant; Christopher P. Prior, Ballwin, both of Mo., and Randal W. Scott, Sunnyvale, Calif., assignors to Invitron Corporation, St. Louis, Mo.

Filed Dec. 10, 1987, Ser. No. 130,901
Int. Cl.[4] C12N *9/64, 9/48, 9/50*; A61K *37/547*
U.S. Cl. 435—226 **8 Claims**

1. A method to enhance the solubility of tissue plasminogen activator (tPA) in aqueous medium, which method comprises dissolving said tPA in an aqueous medium containing a basic amino acid at a concentration of 0.02–0.2 M and a citric acid moiety at a concentration of 0.02–0.08 M, at a pH of 5–8.

4,898,827
METAL RECOVERY

James A. Brierley; Corale L. Brierley, both of Wheat Ridge, Colo.; Raymond F. Decker, Houghton, Mich., and George M. Goyak, Harmony, Pa., assignors to Advanced Mineral Technologies, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 777,061, Sep. 20, 1985, Pat. No. 4,690,894, which is a continuation-in-part of Ser. No. 661,917, Oct. 17, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,763
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] C12N *1/38, 1/14, 1/06*; C02F *3/00*
U.S. Cl. 435—244 **30 Claims**

1. A process for enhancing the metal uptake properties of *Bacillus subtilis* from aqueous solutions containing metal cations, which comprises:
treating cells of said *Bacillus subtilis* characterized by cell walls with an amount of caustic solution maintained at an elevated temperature above ambient and ranging up to boiling at a pH in excess of 9 sufficient to form a caustic-ized biomass reaction product consisting essentially of material derived from the cell walls thereof having enhanced metal uptake properties,
and thereafter recovering, washing to remove excess caustic and drying said treated biomass to form a relatively solid, stable product thereof,
immobilizing said biomass reaction product in the particulate state in an insoluble organic binder said immobilized biomass reaction product in said particulate state being characterized by substantially enhanced metal uptake as compared to the metal uptake of the *Bacillus subtilis* in the untreated state.

4,898,828
ULTRAHIGH COPY NUMBER STREPTOMYCETES PLASMIDS

Charles L. Hershberger, New Palestine; Jeffrey L. Larson, and Patricia A. Reynolds, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 763,172, Aug. 7, 1985, abandoned. This application Mar. 20, 1986, Ser. No. 841,920
Int. Cl.[4] C12N *1/20, 15/00*; C07H *21/04*
U.S. Cl. 435—252.3 **30 Claims**

1. A recombinant DNA Streptomyces vector comprising:
(a) a DNA sequence conferring a pleiotropic copy number phenotype and having at least the SCP2* minimal replicon of the approximately 1.4 kb BclI-Sau3A origin of replication-containing restriction fragment of the SCP2* replicon but no more than the approximately 2.2 kb origin of replication-containing BamHI restriction fragment of the SCP2* replicon, and
(b) one or more DNA segments that convey resistance to at least one antibiotic when transformed into a sensitive, restrictionless host cell.

4,898,829
APPARATUS FOR THE DETECTION OF BIODEGRADABLE AND TOXIC SUBSTANCES IN AQUEOUS SOLUTIONS

Friedrich W. Siepmann, Frankfurter Str. 10, D-6100 Darmstadt, and Michael Teutscher, Heinrichstr. 5, D-6111 Otzberg 4, both of Fed. Rep. of Germany

Division of Ser. No. 693,836, Jan. 23, 1985, Pat. No. 4,748,127, which is a continuation of Ser. No. 387,873, Jun. 10, 1982, abandoned. This application Dec. 14, 1987, Ser. No. 132,267
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038305; PCT Int'l Appl., Oct. 10, 1981, PCT/EP81/00162
Int. Cl.[4] C12M *1/36, 1/34*
U.S. Cl. 435—289 **42 Claims**

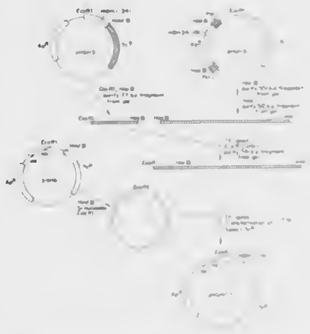


1. Apparatus for measuring the degree of pollution of an aqueous liquid resulting from biodegradable components contained in the aqueous liquid, said apparatus comprising:
first means for providing a sample stream of the aqueous liquid;
second means for providing biologically neutral water to the sample stream to provide a diluted sample stream;
means for obtaining oxygenation of the diluted sample stream to provide an oxygenated, diluted sample stream;
a reaction vessel having an inlet and an outlet, said inlet receiving the oxygenated, diluted sample stream, said reaction vessel containing a biological bath having an essentially constant microbiological living mass for which the biodegradable components of the aqueous liquid act as nutrients and in which oxygen is consumed in biodegrading the biodegradable components;
means for determining the oxygen consumption in said reaction vessel and means coupled to said first and second means for regulating, via said first and second means, the amount of dilution of the sample stream to maintain essentially constant oxygen consumption in said reaction vessel while providing a constant volumetric flow rate of the oxygenated diluted sample stream through the reacion vessel; and
means for indicating the degree of pollution of the aqueous liquid in accordance with the amount of dilution of the sample stream.

4,898,830
HUMAN GROWTH HORMONE DNA

David V. Goeddel, and Herbert L. Heyneker, both of Burlingame, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 654,340, Sep. 25, 1984, Pat. No. 4,658,021, Division of Ser. No. 356,564, Mar. 9, 1982, Pat. No. 4,601,980, Division of Ser. No. 55,126, Jul. 5, 1979, Pat. No. 4,342,832. This application Apr. 13, 1987, Ser. No. 37,319
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] C12N *1/00, 15/00*
U.S. Cl. 435—320 **5 Claims**

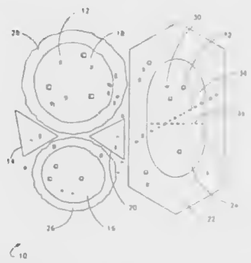


1. A DNA molecule consisting of DNA encoding amino acids 1–191 of human growth hormone.

4,898,831
METHOD AND APPARATUS FOR ANALYZING FLUID INCLUSIONS

Michael P. Smith, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed May 18, 1987, Ser. No. 51,555
Int. Cl.[4] G01N *33/24*
U.S. Cl. 436—32 **23 Claims**

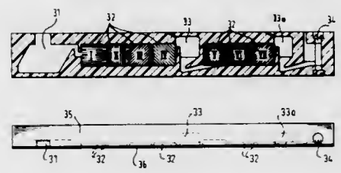


1. A method for deriving information relating to geologic processes which form naturally-occurring mineral useful in the exploration of oil and gas, said method comprising the steps of:
providing a sample comprising a cut polished section of sedimentary rock containing a plurality of microscopic fluid inclusions of less than 50 microns in diameter, the fluid inclusions being of interest in the exploration for oil and gas;
characterizing a class of said microscopic fluid inclusions of less than 50 microns in diameter which are formed in such sample;
identifying and selecting in the sample a single microscopic fluid inclusion within said characterized class;
mechanically rupturing in the sample essentially only the identified and selected microscopic fluid inclusion; and
analyzing gases released from said fluid inclusion.

4,898,832
PROCESS FOR CARRYING OUT ANALYTICAL DETERMINATIONS AND MEANS FOR CARRYING OUT THIS PROCESS

Sigmar Klose, Berg, and Fritz Stähler, Tutzing, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 413,012, Aug. 30, 1982, abandoned. This application Jan. 25, 1988, Ser. No. 147,610
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1981, 3134611
Int. Cl.[4] G01N *21/07*
U.S. Cl. 436—45 **5 Claims**



1. Process for analyzing a liquid sample, comprising:
(a) transporting a fluid sample from a sample application point to a soluble dry reagent containing zone on a transport path;
(b) mixing and incubating said fluid sample with said dry reagent to form a reaction-mixture; and
(c) transporting said reaction mixture to a reaction-mixture measurement point on said transport path at which point a parameter of said reaction mixture is measured, wherein transport of said fluid sample and said reaction mixture takes place on at least a part of said transport path by interaction of a first, surface force between said fluid sample or said reaction-mixture and said transport path and a second, controllably variable centrifugal force, said second controllably variable centrifugal force being less than said surface force on said at least part of said transport path so as to cause said fluid sample or reaction-mixture to move in a direction opposite the direction of said controllably variable centrifugal force during transport of the fluid sample from the application point to the dry reagent zone and the reaction mixture from the dry reagent zone to the point of measurement.

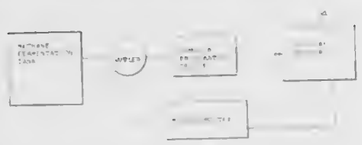
4,898,833
METHOD FOR MEASURING CELL COUNTS AND/OR METHANE PRODUCING ACTIVITY OF METHANOGENS

Satoshi Ueyama, and Satoru Isoda, Hyogo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1987, Ser. No. 62,579
Int. Cl.[4] G01N *33/48*
U.S. Cl. 436—63 **32 Claims**

24. A method for measuring viability of Methanogens which comprises a first treatment, which comprises conducting a first extraction, applying heat to a first Methanogens-containing fraction of a sample to be analyzed thereby extracting out of said Methanogens a particular fluorescent substance inherent to and contained in said Methanogens to obtain an extracted liquid, a first separation of applying a solid-liquid separating procedure for removing solid particles greater than a predetermined particle size containing Methanogens from said ex-

tracted liquid containing said particlular fluorescent substance thereby obtaining an extracted and separated liquid containing said particular fluorescent substance, a first measurement of irradiating an excitation light in a first particular wavelength region to said extracted and separated liquid thereby measuring fluoresence intensity in a second particular wavelength region emitted from extracted and separated liquid, thereby obtaining a first measured value, and a second treatment, comprising a second separation of applying said solid-liquid separating procedure for removing solid particles greater than said predetermined particle size, to a second fraction of the Methanogens-containing sample, thereby obtaining a solid-liquid separated liquid, a second extraction by applying heat to said



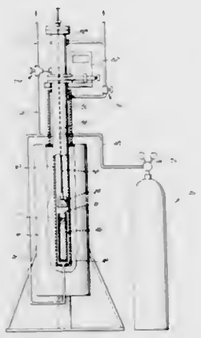
solid-liquid separated liquid thereby obtaining a separated and extracted liquid, a second measurement of irradiating an excitation light in said first particular wavelength region to said separated and extracted liquid, a second measurement of irradiating an excitation light in said first particular wavelength region to said separated and extracted liquid, thereby measuring fluorescence intensity in said second particular wavelength region radiated from said separated and extracted liquid, thereby obtaining a second measured value, and performing a predetermined data processing based on the first and the second measured values thereby obtaining a calculated value for the viability of Methanogens in said Methanogens-containing sample.

4,898,834

OPEN-TUBE, BENIGN-ENVIRONMENT ANNEALING METHOD FOR COMPOUND SEMICONDUCTORS

Arthur H. Lockwood, Goleta, and Adela Gonzales, Santa Barbara, both of Calif., assignors to Amber Engineering, Inc., Goleta, Calif.

Filed Jun. 27, 1938, Ser. No. 211,839
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—22 **13 Claims**



1. A method for annealing ion implanted junctions in indium antimonide wafers, employing a furnace having resealable means for accessing said furnace, comprising the steps of:

maintaining said furnace at a predetermined annealing temperature;

providing an indium-antimony atmosphere within said furnace, said indium and antimony being provided at their equilibrium vapor pressure at said annealing temperature;

inserting said wafer into said furnace and into contact with said atmosphere through said resealable means for accessing said furnace;

maintain said wafer in said furnace for a predetermined annealing time; and

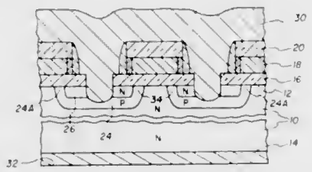
removing said wafer from said furnace and said atmosphere through said resealable means for accessing at the end of said predetermined time while maintaining said indium-antimony atmosphere within said furnace.

4,898,835

SINGLE MASK TOTALLY SELF-ALIGNED POWER MOSFET CELL FABRICATION PROCESS

Billy G. Cawlfield, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Oct. 12, 1988, Ser. No. 256,505
Int. Cl.[4] H01L *21/40*
U.S. Cl. 437—29 **5 Claims**



1. A process for making a multicell power MOSFET comprising the steps of

preparing a monocrystalline silicon wafer whose bulk is of one conductivity type,

forming in turn over one surface of the wafer a thermally-grown oxide layer and a polysilicon layer,

oxidizing the top surface portion of the polysilicon layer to form of it a polyoxide layer,

forming openings at least through the polyoxide and polysilicon layers for defining localized portions of the wafer,

introducing donor and acceptor ions into the silicon wafer by way of said openings for forming an enclosed surface zone of the one conductivity type, adjacent each of said openings and a separate zone of the opposite conductivity enclosing each of said surface zones, each of the enclosing zones including a surface region essentially all of which underlies the polysilicon layer so that, when inverted, it can serve as a conductive channel between the enclosed surface zone of the one conductivity type and the bulk of the wafer of the one conductivity type,

forming an insulating layer over the edges of the polysilicon layer exposed in each opening,

depositing a conductive layer over the polyoxide layer and in the openings for penetrating the thermally-grown oxide layer in the openings and making low resistance electrical

connection at least to each of the surface regions of the one conductivity type,

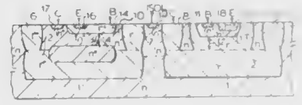
and providing a separate low resistance electrical connection to the bulk of the wafer.

4,898,836

PROCESS FOR FORMING AN INTEGRATED CIRCUIT ON AN N TYPE SUBSTRATE COMPRISING PNP AND NPN TRANSISTORS PLACED VERTICALLY AND INSULATED ONE FROM ANOTHER

Raffaele Zambrano, Mercato San Severino, and Salvatore Musumeci, Riposto, both of Italy, assignors to SGS-Thomson Microelectronics S.R.L., Agrate Brianza, Italy

Filed Apr. 21, 1989, Ser. No. 341,540
Claims priority, application Italy, Apr. 28, 1988, 20357 A/88
Int. Cl.[4] H01L *27/02*
U.S. Cl. 437—31 **2 Claims**



1. Process for forming an integrated circuit on a substrate of N type semiconductor material, comprising PNP and NPN transistors with vertical current flow, insulated from each other, in which:

P^+ type regions are diffused on the N type substrate, said regions constituting the horizontal isolation region (2) of the NPN transistors and the low-resistivity collector region (3) of the PNP transistors,

within the isolation region (2) a high-concentration N^+ type zone (4) is diffused, said zone acting as a low-resistivity collector region for the NPN transistor,

an N type epitaxial layer (5) is then grown all over the surface of the device,

P^+ type regions (6) and (7) are then diffused until they join with region (2), so as inside to define a region (10), and P^+ type regions (8) and (9) are diffused until they join with region (3), so as inside to define a region (11), regions (6), (2) and (7) all together acting as an isolation region for the NPN transistor, regions (3), (8) and (9) all together acting as a collector region for the PNP transistor,

within the N type region (11), a P type region (12) is diffused to act as a low-concentration collector region for the PNP transistor,

within the P type region (12), an N type region (13) is diffused to act as the base of the PNP transistor,

within the N type regions (10) and (13), P type regions (14) and respectively (15) are diffused to act as the base of the NPN transistor and respectively as the emitter of the PNP transistor,

within the P type region (14), an N type region (16) is diffused to act as the emitter of the NPN transistor,

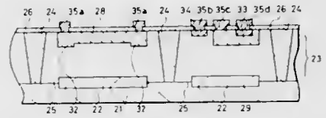
said diffusions of regions (2) and (4) being made to give the region (2) a surface concentration lower than that of the region (4), characterized in that said region 14 is realized in such a way to ensure that the low-concentration collector thickness (s1) of transistor NPN be practically equal to the low-concentration collector thickness (s2) of transistor PNP.

4,898,837

METHOD OF FABRICATING A SEMICONDUCTOR INTEGRATED CIRCUIT

Kazuo Takeda; Nobuyuki Sekikawa; Katsuhiro Hayasaka; Chikao Fujunuma; Nobuo Itoh, and Tetsuya Kubota, all of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 15, 1988, Ser. No. 271,748
Claims priority, application Japan, Nov. 19, 1987, 62-292415; Nov. 19, 1987, 62-292416; Nov. 19, 1987, 62-292420; Dec. 17, 1987, 62-320337; Dec. 25, 1987, 62-331176
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—31 **13 Claims**



1. A method of fabricating a semiconductor integrated circuit comprising the steps of:

preparing a semiconductor substrate of a first conductivity type,

forming buried layers of a second conductivity type opposite to the first conductivity type in predetermined regions of said semiconductor substrate,

forming an epitaxial layer of the second conductivity type covering said substrate and said buried layers,

forming isolation regions of the first conductivity type dividing said epitaxial layer into a plurality of islands,

selectively implanting ions to form a base region of the first conductivity type of a vertical bipolar transistor in a surface layer of one island and simultaneously to form a resistor region in a surface layer of another island, said selectively implanting including effecting a first ion implantation and a second ion implantation,

selectively doping impurities of the first conductivity type during the first ion implantation into not only the resistor region but also the base region of the vertical bipolar transistor thereby determining impurity concentration in said resistor region,

further selectively doping impurities of the first conductivity type during the second ion implantation into said base region thereby determining an impurity concentration in said base region,

causing the impurities doped during the first and second ion implantation to be diffused to a prescribed depth in said base region, and

selectively diffusing impurities of the second conductivity type into a surface layer of said base region, to form an emitter region of the vertical bipolar transistor.

4,898,838

METHOD FOR FABRICATING A POLY EMITTER LOGIC ARRAY

Francis J. Morris, Plano, and Stephen A. Evans, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 16, 1985, Ser. No. 787,872
Int. Cl.[4] H01L *21/20, 21/265, 29/56, 29/64*
U.S. Cl. 437—31 **11 Claims**

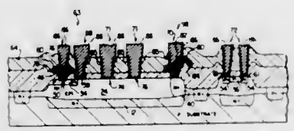
1. A method of fabricating a Schottky transistor, comprising:

providing a semiconductor substrate having a collector region of a first conductivity type;

forming a semiconductor layer of the first conductivity type on the collector region, the semiconductor layer having an exterior surface and a base region within the collector region and near the exterior surface;

forming a first insulating layer on the semiconductor layer;

doping the base region to be of a second conductivity type;
heavily doping a collector contact region to be of the first conductivity type, the collector contact region being a portion to the semiconductor layer and extending from the collector region to the first insulating layer, the collector contact region being spaced from the base region;
opening first and second orifices from the exterior through the first insulating layer to the semiconductor layer, the first orifice exposing a first area formed on the base region, the second orifice exposing a second area formed on the collector contact region;
forming first and second polysilicon bodies, the first body extending into the first orifice and contacting the first area, the second body extending into the second orifice and contacting the second area, the exterior surface area of the first and second bodies being greater than the respective first and second areas;
heavily doping the polysilicon bodies with a dopant to be of the first conductivity type;
annealing the first polysilicon body and the base region such that dopant diffuses into the first area from the first polysilicon body, the diffusion creating an emitter region of a first conductivity type within the base region;





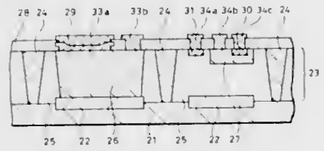
doping a second base region to be of the second conductivity type with a doping concentration that is greater than that of said base region, the second base region being a portion of the semiconductor layer adjacent to the base region and the first insulating layer and spaced from the collector and collector contact regions;
opening a third orifice in the first insulating layer to expose a third area of the semiconductor layer, the third area adjoining a portion of the second base region and a Schottky diode region adjacent to the second base region, the Schottky diode region comprising a portion of the semiconductor layer of the first conductivity type, the third area being spaced from the base and collector contact regions;
forming separate conductive layers on the polysilicon bodies and across the third area, the conductive layers having edges and central areas;
forming a second passivating and insulating layer on the conductive layers and adjacent areas of the first insulating layer and to fill the third orifice;
opening vias in the second insulating layer to the central areas of the conductive layers, the edges of the conductive layers not being exposed; and
forming conductive leads in the vias to provide base, emitter, collector and Schottky diode connections.

4,898,839

SEMICONDUCTOR INTEGRATED CIRCUIT AND MANUFACTURING METHOD THEREFOR

Chikao Fujinuma; Nobuyuki Sekikawa; Teruo Tabata; Tadayoshi Takada; Yoshiaki Sano, and Toshimasa Sadakata, all of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 15, 1988, Ser. No. 271,746
Int. Cl.[4] H01L *27/04*
U.S. Cl. 437—33 **8 Claims**



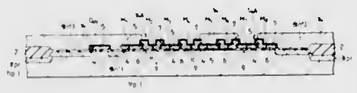
1. A method for manufacturing a semiconductor integrated circuit comprising the steps of:
preparing a semiconductor substrate of a first conductivity type;
forming buried layers of a second conductivity type on prescribed regions of the substrate;
forming an epitaxial layer of the second conductivity type covering said substrate and said buried layers;
forming isolation regions of the first conductivity type dividing said epitaxial layer into a plurality of islands and simultaneously forming a lower electrode region of a MIS type capacitor in one of said islands;
forming a base region of a vertical bipolar transistor by selectively introducing impurities of the first conductivity type into another island;
covering said epitaxial layer with an oxide layer;
exposing a portion of said lower electrode region by patterning said oxide layer and depositing thereon a dielectric layer of the MIS type capacitor;
further patterning said oxide layer and forming an emitter region of the vertical bipolar transistor by selectively diffusing impurities of the second conductivity type; and
forming an upper electrode of the MIS type capacitor on said dielectric layer and forming electrodes which make ohmic contacts through contact holes provided at desired regions in said oxide layer.

4,898,840

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND A METHOD OF PRODUCING THE SAME

Kousuke Okuyama, Kawagoe, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,702
Claims priority, application Japan, Nov. 13, 1987, 62-285318
Int. Cl.[4] H01L *21/00, 21/02, 21/265;* **B01J** *17/00*
U.S. Cl. 437—41 **12 Claims**



1. A method of producing semiconductor integrated circuit devices, comprising:
(a) a step for introducing impurities into the surface of a semiconductor material having a first type of conductivity, said impurities having a second type of conductivity that is opposite to said first type of conductivity;

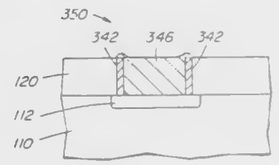
(b) a step for forming a plurality of first conductive layers maintaining an equal distance on the surface of said semiconductor material;
(c) a step for forming a plurality of second conductive layers among said plurality of first conductive layers on the surface of said semiconductor material, in such a manner that said second conductive layers are partly overlapped on said first conductive layers;
(d) a step for forming a masking layer having openings at positions corresponding to particular ones of said plurality of first conductive layers or said plurality of second conductive layers; and
(e) a step for selectively introducing impurities of the first conductivity type into the openings utilizing said masking layer;
wherein said first and second conductive layers constitute gate electrodes of MISFET's that are connected in series.

4,898,841

METHOD OF FILLING CONTACT HOLES FOR SEMICONDUCTOR DEVICES AND CONTACT STRUCTURES MADE BY THAT METHOD

Vu Q. Ho, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 16, 1988, Ser. No. 207,568
Int. Cl.[4] H01L *21/285*
U.S. Cl. 437—200 **4 Claims**



1. A method of filling a contact hole of a semiconductor device, said contact hole extending through a dielectric isolation layer of the semiconductor device to expose a contact region of the semiconductor device, the exposed contact region defining a bottom of the contact hole and the dielectric isolation layer defining side walls of the contact hole, the method comprising:
forming a layer of metal silicide on the side walls of the contact hole, said metal silicide being a silicide of a metal alloy, the alloy comprising a refractory metal and at least one noble metal; and
selectively depositing metal on the bottom of the contact hole and on the layer of metal silicide on the side walls of the contact hole to substantially fill the contact hole.

4,898,842

ORGANOMETALLIC-DERIVED CORDIERITE AND OTHER COMPOUNDS COMPRISING OXIDES OF SILICON

Lawrence D. David, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 835,498, Mar. 3, 1986, abandoned. This application Sep. 14, 1987, Ser. No. 97,397
Int. Cl.[4] C03C *10/08*
U.S. Cl. 501—9 **33 Claims**

1. A method of producing amorphous powders comprising cordierite-forming glasses, wherein the method comprises: (a) forming an aqueous or organic solution having an aqueous or organic solvent, respectively, and containing at least two precursors of said amorphous powders comprising cordierite, wherein said precursors are β-diketonates of magnesium and aluminum or chelating hydroxycarboxylates of aluminum and magnesium; (b) adding to said solution a silane; (c) adding to said solution a reagent capable of hydrolyzing at least said silane wherein said precursor components, said silane, and said hydrolyzing reagent undergo a polymerization reaction; (d) stripping from said aqueous or organic solution the aqueous or organic solvent, leaving a residue; (e) pyrolyzing said residue to produce a fine, amorphous powder comprised of amorphous cordierite-forming glass.

4,898,843

TITANATE POWDER AND PROCESS FOR PRODUCING THE SAME

Fumio Matushita; Kageyasu Akashi, both of Kawasaki, and Satoshi Sekine, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 659,704, Oct. 11, 1984, abandoned. This application Feb. 9, 1988, Ser. No. 157,093
Claims priority, application Japan, Oct. 12, 1983, 58-189249; Oct. 26, 1983, 58-199173
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—136 **12 Claims**



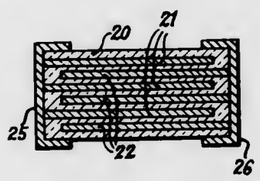
1. A powder consisting of barium titanate powder, strontium titanate powder or a solid solution thereof, wherein (a) the average particle diameter is 0.07 to 0.5μ, (b) the specific surface area measured is 20 m^2/g or less and does not exceed 2.5 times the specific surface area calculated from the average particle diameter on the assumption that the powder particles be spherical, (c) the crystallite size calculated from the half-width of the peak of the X-ray diffraction pattern for the powder is 0.05μ or more, and (d) the particle shape is substantially spherical.

4,898,844

PROCESS FOR MANUFACTURING A CERAMIC BODY HAVING MULTIPLE BARIUM-TITANATE PHASES

Galeb H. Maher, North Adams, and Susan E. Stefanik, Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jul. 14, 1986, Ser. No. 885,509
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—138 **8 Claims**



1. A method for making a dielectric ceramic body comprising:
(a) forming a start mixture by mixing a first barium titanate

powder A having a Curie temperature greater than 120° C., a second barium titanate powder B having a Curie temperature less than 0° C., from 1 to 4 weight percent of a glass borate powder C and greater than zero but less than 2½ weight percent of a powdered sintering-inhibitor agent D, said barium titanate A being present in a quantity by weight percent that is about twice that of said barium titanate B;

(b) forming a body of said start mixture; and

(c) sintering said body to produce a dense dielectric ceramic body.

4,898,845

CATALYST DISPERSED IN SUPPORTED MOLTEN SALT

Ravindra Datta, and Darrell P. Eyman, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Dec. 12, 1988, Ser. No. 283,402
Int. Cl.[4] B01J *23/42, 23/74*
U.S. Cl. 502—3 **12 Claims**

1. A catalytically active composition, comprising:

a porous substrate having a large internal surface area;

a molten salt disposed to coat said surface area with a thin film; and

microcrystallites of a catalytically active metal heterogeneously dispersed in said molten salt.

4,898,846

CRACKING CATALYSTS WITH OCTANE ENHANCEMENT

Grant C. Edwards, Silver Spring, and Alan W. Peters, Rockville, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Mar. 21, 1986, Ser. No. 842,519
Int. Cl.[4] B01J *29/28, 29/08*
U.S. Cl. 502—67 **10 Claims**

1. A catalytic cracking catalyst comprising a primary, large pore high silica zeolite exchanged to a low soda level which is mixed in a matrix, said primary large pore zeolite being present in a catalytically effective amount for catalytic cracking and in an amount up to 80% by weight of the total mixture and where said primary large pore zeolite is not a Y-faujasite nor an X-faujasite.

3. A cracking catalyst according to claim 1, wherein the primary, large pore zeolite is zeolite Beta, ZSM-20, or mixtures thereof.

7. A cracking catalyst according to claim 1, wherein the catalyst further comprises a secondary zeolite in an amount of 1-30% by weight of the catalyst selected from the group consisting of X-faujasite, Y-faujasite, ferrierite, mordenite and mixtures thereof and wherein the amount of the primary, large pore zeolite is equal to or greater than the amount of the secondary zeolite.

4,898,847

CATALYST AND METHOD FOR PRODUCTION OF POLYMERS AND COPOLYMERS OF 1-ALKENES

Zdenek Salajka; Odlrich Hamrik; Jan Kratochvíla; Mihnea Gheorghiu; Josef Krívánek, all of Brno; Pavel Sindelár, Prostejov; Petr Zaloudík, Brno; Vasil Legeza, Litvínov, and Ladislav Jansa, Teplice, all of Czechoslovakia, assignors to Vyzkumny Ustav Makromolekularni Chemie, Brno, Czechoslovakia

Continuation-in-part of Ser. No. 38,820, Apr. 15, 1987, abandoned. This application Jul. 1, 1987, Ser. No. 68,998
Claims priority, application Czechoslovakia, Jul. 3, 1986, 5072-86; Aug. 22, 1986, 7089-86; Dec. 23, 1986, 9837-86
Int. Cl.[4] C08F *4/64*
U.S. Cl. 522—110 **13 Claims**

1. A supported one-phase catalyst for polymerizing ethylene and for copolymerizing ethylene with 1-alkenes containing from 3 to 10 carbon atoms prepared by the process comprising the combination of the following steps conducted in the recited order:

(I) first depositing under an inert atmosphere and fixing on a particulate support containing OH groups and formed of an oxide selected from the group consisting of silica and alumina, said support having a surface area in the range of 50 to 500 m^2/g, an inner porosity in the range of 0.5 to 3.0 ml/g and particulate dimensions in the range of 1 to 200 microns; at least one organoaluminum compound having the empirical formula I:

$$R_mAlX_{3-m} \quad (I)$$

wherein m is an integer ranging from 1 to 3;

(II) then depositing at least one transition metal compound (I) of the group of titanium compounds having empirical formula IIa:

$$R_nTiX_{4-n} \quad (IIa)$$

wherein n is an integer ranging from 0 to 4; or vandium having the emprical formula IIb:

$$R_pVX_{5-p} \text{ or } R_qVX_{4-q} \quad (IIb)$$

wherein p is an integer ranging from 0 to 5 and q is an integer ranging from 0 to 4; and, finally depositing on the thus coated substrate at least one organometallic compound having the empirical formula IIIa wherein said compounds are organoaluminum compounds of formula I or organomagnesium compounds of formula IIIb:

$$R_rMgX_{2-r} \quad (IIIb)$$

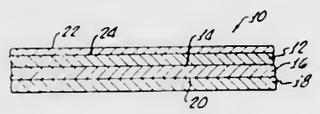
wherein r is an integer ranging from 1 to 2, with the proviso that all said compounds of formulas I, II and III have substituents R being selected from those groups of substituents consisting of alkyl, aryl and alkoxide having from 1 to 20 carbon atoms; with X being halogen except that in compounds of formula II, X_2 can be oxygen and substituents R and X in compounds of formulas I, II, and III can be the same or different; said catalyst not requiring additional activation.

4,898,848

THERMAL LABEL WITH REMOISTENABLE ADHESIVE

Tomoo Shibata, Irvine, Calif., assignor to Ricoh Electronics, Inc., Irvine, Calif.

Continuation of Ser. No. 929,342, Nov. 12, 1986, abandoned. This application Jun. 20, 1988, Ser. No. 208,669
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—200 **8 Claims**



1. A thermosensitive label comprising:

a substrate;

thermosensitive color-forming layer means, disposed on one side of said substrate, for creating a display of images when the temperature of selected portions of the thermosensitive color-forming layer means are heated above an activation temperature; and

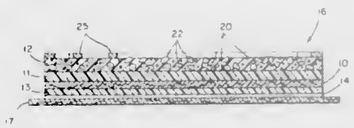
a remoistenable adhesive disposed on an opposite side of said substrate, said remoistenable adhesive being disposed on said substrate in a viscous form and dried on the substrate without heating the thermosensitive color-forming layer above the activation temperature, said remoistenable adhesive comprising components not causing color formation or fading of images created in the thermosensitive color-forming layer, said remoistenable adhesive comprising a water-soluble or water dispersible casein-vinyl acetate having a solids content of at least about 70 percent by weight when applied to the opposite side of the substrate.

4,898,849

COATED THERMALLY PRINTABLE MATERIAL AND METHOD OF PRODUCING THE SAME

Ming-Huang J. Kang, Nashua, N.H., assignor to Nashua Corporation, Nashua, N.H.

Filed Dec. 29, 1987, Ser. No. 139,186
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—214 **11 Claims**



1. A heat-sensitive recording material comprising:

A. a substrate;

B. a thermal imagewise imprintable color-producing layer affixed to a first surface of said substrate comprising a leuco dye developable upon exposure to an acidic developer, an acidic developer, and a binder material for said dye and developer; and

C. a protective layer overlying said color-producing layer, wherein said protective layer comprises;

an organic water soluble resin cross-linked durit its formation in situ atop said color-producing layer and containing dispersed friction reducing polymer particles and a fluorocarbon surfactant,

said material being characterized by decreased surface friction and resistance to background discoloration and image fading induced by exposure to solvents.

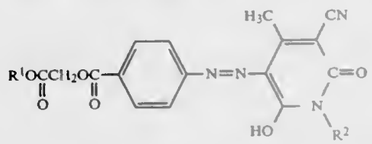
4,898,850

PYRIDONE DYESTUFF FOR THERMAL TRANSFER RECORDING AND PRINTING SHEETS AND METHODS EMPLOYING SAME

Akitosi Igata, and Tamio Mikoda, both of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 278,857
Claims priority, application Japan, Dec. 3, 1987, 62-304601; Oct. 18, 1988, 63-260653
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 **25 Claims**

1. In a gas phase thermal transfer printing method in which a volatilizable dyestuff in the form of a heat-releasable coating on a surface of a transfer substrate is pressed against a face of a printable substrate, while the transfer substrate is heated to the volatilization temperature of the dyestuff, thereby transferring the pattern of the dyestuff from the transfer substrate to the printable substrate, the improvement wherein the dyestuff is a yellow pyridone of the formula



wherein R^1 is lower alkyl and R^2 is lower alkyl, lower alkoxy-lower alkyl, carbocyclic aryl-lower alkyl, cyclo-lower alkyl, lower alkenyl or lower alkoxycarbonyl-methyl

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4,898,851

PROCESS FOR MAKING 90 K SUPERCONDUCTORS USING A SPRAY DRIED OXALATE PRECURSOR

John B. Michel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 22, 1987, Ser. No. 64,951
Int. Cl.[4] C01F *17/00;* **C01G** *3/02;* **C04B** *35/64;* **H01L** *39/12*
U.S. Cl. 505—1 **12 Claims**

1. An improved process for preparing a superconducting composition having the formula $MBa_2Cu_3O_x$ wherein

M is selected from the group consisting of Y, Nd, Sm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu;

x is from about 6.5 to about 7.0;

said composition having a superconducting transition temperature of about 90K;

said process consisting essentially of heating a precursor powder in an oxygen-containing atmosphere at a temperature from about 875° C. to about 950° C. for a time sufficient to form $MBa_2Cu_3O_y$, where y is from about 6.0 to about 6.4; and maintaining the $MBa_2Cu_3O_y$ in an oxygen-containing atmosphere while cooling for a time sufficient to obtain the desired product;

said precursor powder being prepared by

(a) forming an aqueous solution of $M(NO_3)_3$, $Ba(NO_3)_2$ and $Cu(NO_3)_2$ in an atomic ratio of M:Ba:Cu of about 1:2:3, (b) adding the resulting solution to sufficient oxalic acid to precipitate the metals present as salts, and (c) spray drying the resulting slurry to obtain the precursor powder.

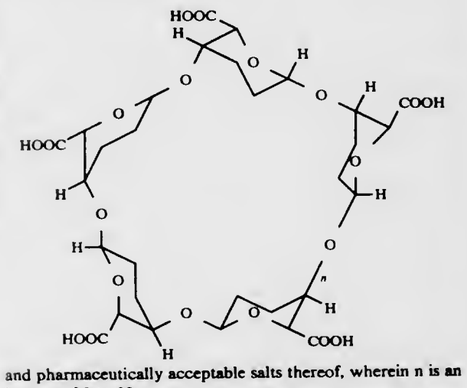
4,898,852

CYCLOPOLGALCTURONIC ACID COMPOSITION AND TREATMENT

William E. Walsh, 990 Lydia Dr., Roseville, Minn. 55113

Filed Jun. 2, 1987, Ser. No. 57,166
Int. Cl.[4] A61K *7/00*
U.S. Cl. 514—54 **15 Claims**

1. A substantially pure cyclopoly-beta-D+-galacturonic acid compound of the formula:



and pharmaceutically acceptable salts thereof, wherein n is an integer of 1 to 10.

2. A viscous liquid topical application comprising a major proportion of a pharmaceutically acceptable liquid base and about 0.1 to 10 wt-% of the cyclogalacturonic acid compound of claim 1.

4,898,853

ACETYLENIC ESTERS

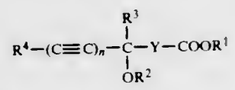
James V. Heck, Scotch Plains, and Michael D. Lewis, Rahway, both of N.J., assignors to Merck & Co. Inc., Rahway, N.J.

Continuation of Ser. No. 156,106, Feb. 16, 1988, abandoned. This application Aug. 1, 1989, Ser. No. 388,717

Int. Cl.[4] A61K *31/695;* **C07F** *7/18*

U.S. Cl. 514—63 **11 Claims**

1. A compound of the formula:



wherein R^1 is:
(a) hydrogen:
(b) C_1–C_6 alkyl;
(c) C_7–C_{14} aralkyl;
(d) tris (C_1–C_6 alkyl)silyl; or
(e) a pharmaceutically acceptable cation;
R^2 is:
(a) hydrogen;
(b) C_1–C_6 alkyl;
(c) C_7–C_{14} aralkyl ;
(d) tris (C_1–C_6 alkyl)silyl;
(e) C_2–C_6 alkanoyl;
(f) C_2–C_7 alkoxycarbonyl; or
R^3 is:
(a) hydrogen; or
(b) C_1–C_6 alkyl;
R^4 is
tris(C_1–C_6 alkyl)silyl;
Y is:
C_4–C_{10} alkylene or C_4–C_{10} alkylene substituted with one or more substituents selected from the group comprising:
(i) hydroxy;
(ii) C_2–C_6 alkanoyloxy; and
(iii) C_2–C_7 alkoxycarbonyloxy; and
n is an integer of from about 1 to 4.

4,898,854

CERTAIN 2-CARBOXYPIPERIDYL-(ALKYLENE OR ALKENYLENE)-PHOSPHONIC ACIDS AND ESTERS THEREOF USEFUL FOR THE TREATMENT OF DISORDERS RESPONSIVE TO N-METHYL-D-ASPARTATE RECEPTOR BLOCKADE

Alan J. Hutchison, Verona; Kenneth R. Shaw, and Josef A. Schneider, both of Millburn, all of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

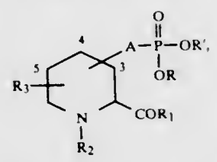
Continuation of Ser. No. 933,702, Nov. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 867,114, May 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 738,102, May 24, 1985, abandoned. This application Jul. 11, 1988, Ser. No. 217,120

Int. Cl.[4] C07F *9/65;* **A61K** *33/42*

U.S. Cl. 514—89 **26 Claims**

1. A compound of the formula

(II)



in which the phosphono bearing chain is attached at the 3, 4, or 5-position of the piperidinyl ring and wherein R and R' represent hydrogen, lower alkyl, benzyl, benzyl substituted on phenyl by halogen, lower alkyl or lower alkoxy, lower alkanoyloxymethyl or lower alkanoyloxymethyl substituted on oxymethyl by lower alkyl, cyclohexy or cyclopentyl; R_2 represents hydrogen, lower alkyl or acyl; R_3 represents hydrogen, lower alkyl or aryl-lower alkyl; COR_1 represents carboxy or carboxy derivatives in the form of a pharmaceutically acceptable prodrug ester; A represents lower alkenylene or lower alkylene; acyl in the above definitions represents lower alkanoyl, aryl-lower alkanoyl, aroyl, lower alkoxycarbonyl, aryl-lower alkoxycarbonyl; or alpha-amino lower alkanoyl aryl represents phenyl or phenyl substituted by one to three substituents selected from lower alkyl, lower alkoxy, trifluoromethyl and halogen; aroyl represents benzoyl or benzoyl substituted by one to three substituents selected from lower alkyl, lower alkoxy, trifluoromethyl and halogen; or a pharmaceutically acceptable salt of a said compound having an acidic or basic salt forming group.

16. A method of blocking the N-methyl-D-aspartate excitatory amino acid receptor in a mammal comprising the administration to a mammal in need thereof of an effective N-methyl-D-aspartate blocking amount of a compound of claim 1 in combination with one or more pharmaceutically acceptable carriers.

4,898,855

DEUTERATED ANALOGS OF 1,25-DIHYDROXYCHOLECALCIFEROL

Enrico G. Baggiolini, North Caldwell; Bernard M. Hennessy, Nutley, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

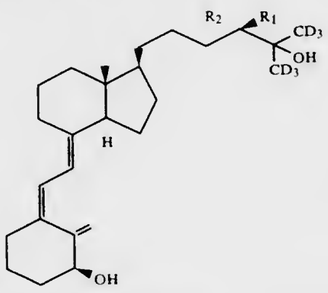
Filed Sep. 14, 1987, Ser. No. 96,981

Int. Cl.[4] A61K *31/59;* **C07J** *9/00*

U.S. Cl. 514—167 **16 Claims**

1. A compound of the formula

I



wherein R_1 and R_2 are deuterium.

4,898,856

METHOD FOR TREATING CENTRAL NERVOUS SYSTEM DISEASES

Chaovanee Aroonsakul, 6907 S. Constance, Chicago, Ill. 60649

Continuation-in-part of Ser. No. 666,254, Oct. 29, 1984, Pat. No. 4,791,099, and a continuation-in-part of Ser. No. 852,645, Apr. 16, 1986, Pat. No. 4,727,041. This application Feb. 16, 1988, Ser. No. 156,242

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—171 **2 Claims**

1. A method for treating central nervous system diseases in human beings, said diseases are selected from Senile Dementia, Parkinson's disease, cerebral atrophy, Alzheimer's disease, cerebellar atrophy, senile tremor, and essential tremor, multiple schlerosis, cerebrovasculart accidents, said method comprising:

inducing into the blood stream of the human being suffering from one of said diseases, an effective amount of human growth hormone.

4,898,857

TREATING CONTROL NERVOUS SYSTEM DISEASES

Chaovanee Aroonsakul, 6907 S. Constance, Chicago, Ill. 60649

Continuation of Ser. No. 156,242, Feb. 16, 1988, which is a continuation-in-part of Ser. No. 666,254, Oct. 29, 1984, Pat. No. 4,791,099, and Ser. No. 852,645, Apr. 16, 1986, Pat. No. 4,727,041. This application Feb. 3, 1989, Ser. No. 293,132

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—171 **3 Claims**

1. A method for treating central nervous system diseases in human beings, which diseases are selected from Senile Dementia, Parkinson's disease, cerebral atrophy, Alzheimer's disease, cerebellar atrophy, senile tremor, and essential tremor, comprising:

inducing into the blood stream of of a human being suffering from the disease an effective dosage of a group consisting of: androgens.

4,898,858

CEPHALOSPORIN DERIVATIVES AND ANTIBIOTICS CONTAINING THE SAME

Seiji Shibahara, Tokyo; Tsuneo Okonogi, Kanagawa; Yasushi Murai, Kanagawa; Toshiaki Kudo, Kanagawa; Takashi Yoshida, Tokyo; Ken Nishihata, Kanagawa, and Shinichi Kondo, Kanagawa, all of Japan, assignors to Meiji Seika Kaisha Ltd. and Susumu Mitsuhashi, both of Tokyo, Japan

Filed Nov. 10, 1986, Ser. No. 928,955

Claims priority, application Japan, Nov. 27, 1985, 60-267984

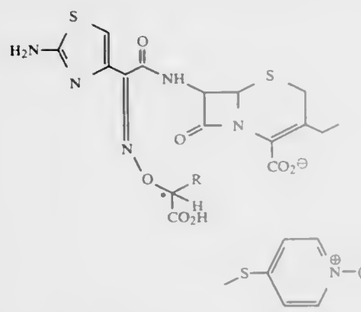
The portion of the term of this patent subsequent to Mar. 7, 2006, has beeo disclaimed.

Int. Cl.[4] C07D *501/136;* **A61K** *31/545*

U.S. Cl. 514—206 **14 Claims**

1. Cephalosporin derivatives of a general formula (I) and non-toxic salts and non-toxic esters thereof:

(I)



(wherein R represents an acyclic or cyclic lower alkyl group having up to 6 carbon atoms, which may optionally be substituted by a halogen atom; the steric configuration as asterisked (*) includes an optical-active (R)-form or (S)-form or an optical-inactive (RS)-form; n is 0 or 1, n^1 is 0 to 3, n^2 is 0 to 3; and when n^1 is 0, n^2 is 3; when n^1 is 1, n^2 is 2; when n^1 is 2, n^2 is 1: when n^1 is 3, n^2 is 0).

4,898,859

2-OXA-ISOCEPHEM COMPOUNDS AND COMPOSITIONS CONTAINING SAME

Setsuro Fujii, Kyoto; Hiroshi Ishikawa; Koichi Yasumura, both of Otsu; Koichiro Jitsukawa, Ashiya; Sachio Toyama, Otsu; Hidetsugu Tsubouchi, Otsu; Kimio Sudo, Otsu, and Kouichi Tsuji, Otsu, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 165,942

Claims priority, application Japan, Mar. 9, 1987, 62-53870; Jul. 14, 1987, 62-175045; Sep. 3, 1987, 62-221043; Jan. 28, 1988, 63-18350

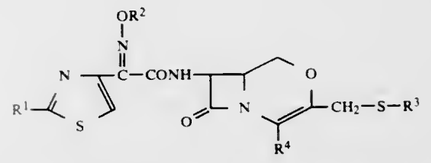
The portion of the term of this patent subsequent to May 26, 2006, has been disclaimed.

Int. Cl.[4] A61K *31/535;* **C07D** *498/04*

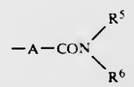
U.S. Cl. 514—210 **29 Claims**

1. A 2-oxa-isocephem compound of the formula (1):

(1)



wherein R^1 is an amino group, a lower alkanoylamino group, a halogen-substituted lower alkanoylamino group, a phenylsubstituted lower alkylamino group having 1 to 3 phenyl groups, a phenyl-lower alkoxycarbonylamino group or a lower alkoxycarbonylamino group; R^2 is a lower alkyl group, a cycloalkyl group, a cyano-lower alkyl group, a carboxy-lower alkyl group or a carbamoyl-lower alkyl group; R^3 is a pyridyl group or a pyridinio group, in which the pyridinio group is substituted with a lower alkyl group, a cycloalkyl-lower alkyl group, a lower alkoxy-lower alkyl group, a lower alkanoyl-lower alkyl group, a benzoyl-lower alkyl group, a halogen-substituted lower alkyl group, a lower alkyl group substituted with a halogen-substituted lower alkanoyl group, a carboxycarbonyl-lower alkyl group, a lower alkyl group substituted with a lower alkoxyimino group, or a group of the formula:



in which A is a lower alkylene group, R^5 is a hydrogen atom or a lower alkyl group, R^6 is a lower alkyl group or a hydroxy group, and R^5 and R^6 together with the adjacent nitrogen atom may form a saturated 5- or 6-membered heterocyclic group which may contain further an oxygen atom, a nitrogen atom and/or a sulfur atom, and further said heterocyclic group may be substituted with a hydroxy group or a lower alkyl group; and R^4 is a carboxy group, a carboxylate group or an esterified carboxy group, provided that R^2 is a carbamoyl-lower alkyl group, when R^3 is a pyridyl group, or a pyridinio group substituted with a lower alkyl group, or its pharmaceutically acceptable salt.

29. An antimicrobial composition comprising an antimicrobially effective amount of 2-oxa-isocephem compound of the formula (1) as defined in claim 1 or its pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier.

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4,898,860

ANTICONVULSANT COMPOSITION AND METHOD

Jose M. Musacchio, New York, N.Y., and Frank C. Tortella, Columbia, Md., assignors to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 897,410, Aug. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 766,838, Aug. 16, 1985, Pat. No. 4,694,010. This application Mar. 28, 1988, Ser. No. 174,175

Int. Cl.[4] A61K *31/44, 31/55, 31/415*

U.S. Cl. 514—215 **15 Claims**

10. A method for controlling seizures in a mammal in need of such treatment comprising administering to said mammal an amount of

(a) an anti-epileptic hydantoin; and

(b) an anti-epileptic hydantoin-potentiating amount of a compound selected from the group consisting of benztropine and opipramol; said amounts in combination being effective for controlling seizures in said mammal.

4,898,861

METHOD FOR INHIBITING THE PROLIFERATION OF TUMOR CELLS

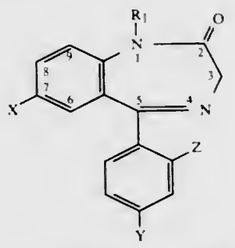
James I. Morgan, Upper Montclair; Sydney Spector, Livingston, both of N.J., and James K. T. Wang, New York City, N.Y., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 30,932, Mar. 26, 1987, abandoned, which is a continuation of Ser. No. 655,653, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 524,169, Aug. 17, 1983, abandoned. This application Aug. 29, 1988, Ser. No. 237,649

Int. Cl.[4] A61K *31/55*

U.S. Cl. 514—221 **8 Claims**

1. A method for treating a patient afflicted with tumor cells having specific, saturable peripheral binding sites which comprises orally administering to the patient a benzodiazepine having a selective affinity to bind to the peripheral binding sites on the tumor cells, which cells are sensitive to treatment with the benzodiazepine, said benzodiazepine having the formula



wherein R_1 is C_1 to C_3 alkyl, C_2 to C_3 alkenyl or C_2 to C_3 alkynyl; Y is halogen, hydroxy or lower alkoxy; X is halogen and Z is halogen or hydrogen, in a daily dose between about 10 mg/kg of body weight of the patient and about 50 mg/kg of body weight of the patient which is effective for inhibiting the proliferation of said tumors cells.

4,898,862

1,2,4-TRIAZINONE DERIVATIVES, THEIR PREPARATION AND USE

Yasuhiro Morisawa; Mitsuru Kataoka; Mitsuo Sugiyama; Fujio Saito; Hiroyuki Koike; Takeshi Oshima; Yasuo Simoji, and Hitoshi Nagahori, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

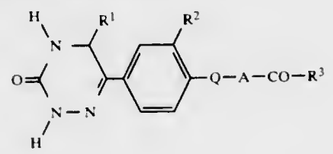
Filed Mar. 16, 1987, Ser. No. 26,290

Claims priority, application Japan, Mar. 20, 1986, 61-62593; Apr. 2, 1986, 61-75996; Apr. 14, 1986, 61-85255

Int. Cl.[4] C07D *253/06, 401/12, 403/12;* **A61K** *31/53*

U.S. Cl. 514—236.2 **23 Claims**

1. A compound of formula (I):



(I)

wherein:

R^1 represents a hydrogen atom or a C_1–C_6 alkyl group; R^2 represents a hydrogen atom, a halogen atom, a C_1–C_6 alkyl group, a substituted C_1–C_6 alkyl group having at least one halogen atom, a nitro group, an amino group, a protected amino group, an alkylamino group in which the alkyl part is C_1–C_6, a dialkylamino group in which each alkyl part is C_1–C_6, a cyano group, a carbamoyl group, an alkylcarbamoyl group in which the alkyl part is C_1–C_6, a dialkylcarbamoyl group in which each alkyl part is C_1–C_6, a ureido group, an alkylureido group in which the alkyl part is C_1–C_6, a dialkylureido group in which each alkyl part is C_1–C_6, a carboxy group or a protected carboxyl group;

Q represents an oxygen atom or a sulfur atom;

A represents a C_1–C_6 alkylene group;

R^3 represents a hydroxy group, a C_1–C_6 alkoxy group, an aryloxy group, an aralkyloxy group in which the alkyl part has from 1 to 6 carbon atoms or a group of formula $-(NH)_n-NR^5R^6$, wherein

n is 0 or 1; and

R^5 and R^6 are independently selected from the group consisting of hydrogen atoms; C_1–C_{10} alkyl groups; C_2–C_6 alkenyl groups; C_3–C_7 cycloalkyl groups; aryl groups; heterocyclic groups, and substituted C_1–C_{10} alkyl groups having at least one substituent selected from the group consisting of substituent (a) defined below; or R^5 and R^6, together with the nitrogen atom to which they are attached, form a heterocyclic group as defined below;

substituents (a):

halogen atoms, hydroxy groups, C_1–C_6 alkoxy groups, aryloxy groups, aralkyloxy groups in which the alkyl part has from 1 to 6 carbon atoms, carboxy groups, protected carboxy groups, carbamoyl groups, alkylcarbamoyl groups in which the alkyl part is C_1–C_6 dialkylcarbamoyl groups in which each alkyl part is C_1–C_6, C_3–C_7 cycloalkyl groups, aryl groups, heterocyclic groups, amino groups, protected amino groups and substituted amino groups having one or two substituents selected from the group consisting of C_1–C_6 alkyl groups, aryl groups and heterocyclic groups;

said protected amino group is an amino group protected with a group selected from the group consisting of C_1–C_7 aliphatic carboxylic acyl groups; substituted C_1–C_7 aliphatic carboxyl acyl groups having at least halogen or C_1–C_4 alkoxy groups; arylcarbonyl groups; aralkyloxy carbonyl groups in which the alkyl part is C_1–C_6; and aralkyl groups in which the alkyl part is C_1–C_6;

said protected carboxy group is a carboxy group protected with a group selected from the group consisting of C_1–C_6 alkyl groups, aralkyl groups in which the alkyl part is a C_1–C_6 alkyl, C_2–C_5 aliphatic acyloxymethyl groups, 1-(C_2–C_7 alkoxycarbonyloxy)ethyl groups, phthalidyl group (2-oxo-5-methyl-1,3-dioxolen-4-yl)methyl group, (2-oxo-5-phenyl-1,3-dioxolen-4-yl)methyl group, C_1–C_6 alkoxymethyl groups and halogenated C_1–C_6 alkyl groups;

said aryl groups and aryl parts of groups containing an aryl are phenyl or naphthyl groups which are unsubstituted or have at least one substituent selected from the group consisting of halogen atoms, hydroxy group, C_1–C_6 alkoxy groups, C_1–C_6 alkyl groups, halogenated C_1–C_6 alkyl groups, nitro groups, sulfamoyl groups and C_1–C_6 alkylsulfamoyl groups;

said heterocyclic groups and heterocyclic parts of groups containing a heterocyclic group are groups selected from the group consisting of tetrahydrofuryl, tetrahydropyranyl, tetrahydrothienyl, tetrahydrothiopyranyl, aziridinyl, azetidinyl, pyrrolidinyl, piperidyl, hexahydroazepinyl, imidazolidinyl, oxazolidinyl, thiazolidinyl, morpholinyl, thiomorpholinyl, piperazinyl, homopiperazinyl, furyl, thienyl, pyrrolyl, pyridyl, oxazolyl, thiazolyl and pyrimidinyl groups which are unsubstituted or have at least one substituent selected from the group consisting of substituent (b):

substituent (b): phenyl groups; naphthyl groups; substituted phenyl or naphthyl groups having at least one substituent selected from the group consisting of halogen atoms, C_1–C_4 ethyl groups, C_1–C_4 alkoxy groups and trifluoromethyl groups; C_1–C_4 alkyl groups; substituted C_1–C_4 alkyl groups having at least one substituent selected from the group consisting of hydroxyl groups, phenyl groups and substituted phenyl groups having at least one substituent selected from the group consisting of halogen atoms, C_1–C_4 alkyl groups, C_1–C_4 alkoxy groups and trifluoromethyl groups; C_1–C_7 alkanoyl groups; substituted C_2–C_7 alkanoyl groups having at least one substituent selected from the group consisting of furyl groups, thienyl groups, pyridyl groups, C_3–C_7 cycloalkyl groups, halogen atoms, C_1–C_4 alkoxy groups and phenyl groups; C_2–C_5 Alkoxycarbonyl groups; aralkyloxycarbonyl groups wherein the alkyl part is C_1–C_4 and the aryl part is phenyl or naphthyl groups or substituted phenyl or naphthyl groups having at least one substituent selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy and trifluoromethyl groups; benzoyl groups; naphthoyl groups; substituted benzoyl or naphthoyl groups having at least one substituent selected from the group consisting of halogen atoms, sulfamoyl groups, C_1–C_4 alkyl groups and C_1–C_4 alkoxy groups; furyl carbonyl groups; thienyl carbonyl groups; pyridylcarbonyl groups; C_1–C_4 alkylsulfonyl groups; arylsulfonyl groups, wherein the aryl part is phenyl or naphthyl groups, or substituted phenyl or naphthyl groups having at least one substituent selected from the group consisting of halogen atoms, C_1–C_4 alkyl groups, C_1–C_4 alkoxy groups and trifluoromethyl groups; the carbamoyl group; mono- and di- alkylcarbamoyl groups wherein the alkyl part is C_1–C_4; furyl groups; thienyl groups; pyridyl groups and oxygen atoms;

or a pharmaceutically acceptable acid addition salt thereof; and providing that:

when R^2 represents said hydrogen atom or said nitro, amino or cyano group, then R^3 represents a group of formula $-(NH)_n-NHR^6$, where n is 0 or 1 and R^6 represents said C_1–C_6 alkyl group having at least one heterocyclic substituent.

20. A method of treating cardiac disorders in an animal comprising administering to said animal, a cardiotonically effective amount of the compound of claim 1.

4,898,863

HETEROCYCLIC CARBOXAMIDES

Frederick J. Brown, Newark, Del., and Ying K. Yee, Kennett Square, Pa., assignors to ICI Americas Inc., Wilmington, Del.

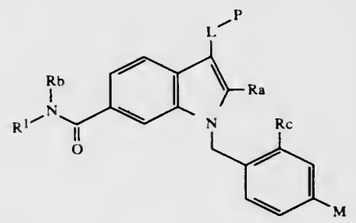
Filed Apr. 15, 1987, Ser. No. 38,842

Claims priority, application United Kingdom, Apr. 15, 1986, 8609175

Int. Cl.[4] A61K *31/535, 31/405;* **C07D** *211/06, 209/14*

U.S. Cl. 514—235.2 **14 Claims**

1. A compound of formula Ia



Ia

wherein

Ra is hydrogen or (1–4C)alkyl;

Rb is hydrogen or methyl;

R^1 is (2–10C)alkyl which may contain 1 or more fluorine substituents; or R^1 is phenyl-(1–6C)alkyl in which the (1–6C)alkyl moiety may bear a fluoro or (1–4C)alkoxy substituent and in which the phenyl moiety may bear a substituent selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl; or R^1 is (3–8C)cycloalkyl or (3–8C)cycloalkyl-(1–6C)alkyl, the cyclic moiety of any of which may contain one unstruated linkage and may bear 1 or 2 (1–4C)alkyl substituents;

L is a (1–10C)alkylene link, which may contain one double or triple bond;

P is a polar group selected from a group consisting of cyano, 1H-tetrazol-5-yl, carbamoyl of formula $CONR^2R^3$, ureido of formula $NR^4CONR^2R^3$, carbamoyloxy of formula $OCONR^2R^3$, a carbamate of formula NR^4COOR^5, acylamino of formula NR^4COR^5, acyloxy of a formula $OCOR^5$, and a thio group (which may be oxidized) of formula $S(O)_nR^5$ in which

R^2 is selected from a group consisting of hydrogen, (1–6C)alkyl, and phenyl, the phenyl moiety of which may bear 1 or 2 substituents selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl, and

R^3 and R^4 are independently selected from a group consisting of hydrogen and (1–6C)alkyl;

or R^2 and R^3 together with the adjacent nitrogen form a pyrrole, pyrrolidine, piperidine, morpholine, piperazine or N-(1–6C)alkylpiperazine ring, and R^4 is hydrogen or (1–6C)alkyl;

R^5 is chosen from a group consisting of (1–4C)alkyl and phenyl, the phenyl moiety of which may bear 1 or 2 substituents selected form a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl; and

n is the integer 0, 1 or 2;

Rc is selected from a group consisting of hydrogen and (1–4C)alkoxy; and

M is an acidic group selected from a group consisting of carboxy, an acylsulphonamide residue of formula $-CO.NH.SO_2R^6$ and 1H-tetrazol-5-yl in which

R^6 is selected from a group consisting of (1–6C)alkyl, (3–8C-)cycloalkyl, (6–12C)aryl, heteroaryl selected from a group consisting of furyl, thienyl and pyridyl, and (6–12C)aryl(-1–4C)alkyl, in which any of the aromatic or heteroaromatic moieties may bear 1 or 2 substituents selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy, and trifluoromethyl;

or a pharmaceutically acceptable salt thereof.

11. A pharmaceutical composition comprising a leukotriene antagonizing amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable diluent or carrier.

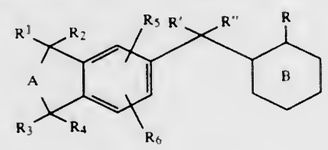
4,898,864

BICYCLIC AROMATIC COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN COSMETICS AND HUMAN AND VETERINARY MEDICINE

Jean Maignan, Tremblay les Gonesse; Gerard Lang, Saint Gratien; Gérard Malle, Villiers sur Morin, and Philippe Vingler, Gif-sur-Yvette, all of France, assignors to L'Oreal, Paris, France

Filed Oct. 27, 1987, Ser. No. 112,860
Claims priority, application France, Oct. 27, 1986, 86 14901
Int. Cl.[4] C07C *59/76*
U.S. Cl. 514—237.5 **15 Claims**

1. A bicyclic aromatic compound having the formula



(R)

wherein

R_1, R_2, R_3 and R_4 each independently represent hydrogen or lower alkyl, at least two of the R_1–R_4 radicals being other than hydrogen,

A represents methylene or dimethylene, substituted or not by lower alkyl; when A represents dimethylene, R_1 and R_3 together can form a methylene or dimethylene radical,

R_5 and R_6 represent hydrogen, halogen, lower alkyl, lower alkoxy or hydroxy,

R' and R" together form an oxo radical,

B represents cyclohexyl, cyclohexenyl, cyclohexadienyl or phenyl, substituted or not,

R represents $—CH_2OH$ or $—COR_7$,

R_7 represents hydrogen, $—OR_8$ or



R_8 represents hydrogen, alkyl having 1–20 carbon atoms, monohydroxyalkyl, polyhydroxyalkyl or aryl or aralkyl,

r' and r" represent hydrogen, lower alkyl, monohydroxyalkyl optionally interrupted by a heteroatom polyhydroxyalkyl, aryl or benzyl or the residue of amino acid, or r' and r" taken together form a heterocycle, and

the salts of said compounds of formula I, their optical isomers and the tautomeric forms of the compound of formula I with the exception of 2-((5,8-methano-5,6,7,8-tetrahydro-2-naphthyl) carbonyl) benzoic acid.

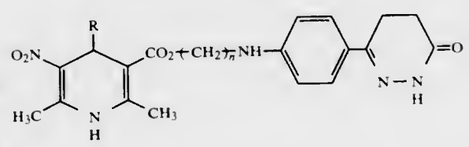
4,898,865

[4-(6-OXO-1,4,5,6-TETRAHYDRO-3-PYRIDAZINYL) ANILINO HEXYL 1,4-DIHYDRO-2,6 DI METHYL 5 NITRO 4 ARYL PYRIDINE 3-CARBOXYLATES

Gerhard Franckowiak; Martin Bechem, both of Wuppertal; Michael Kayser, Leverkusen; Rainer Gross, Wuppertal; Matthias Schramm, Cologne; Friedel Seuter; Elisabeth Perzborn, both of Wuppertal, all of Fed. Rep. of Germany, and Günther Thomas, Arese, Italy, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,759
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724909
Int. Cl.[4] A61K *31/495*; C07D *403/14*
U.S. Cl. 514—252 **10 Claims**

1. A nitrodihydropyridine of the formula



in which

R represents phenyl or naphthyl, each of which can be substituted up to 3 times, identically or differently, by fluorine, chlorine, bromine, nitro, cyano, alkyl, alkoxy, alkylthio, each having up to 4 carbon atoms, trifluoromethyl, trifluoromethoxy or trifluoromethylthio, or benzyloxy or benzylthio, each of which is optionally substituted by nitro, fluorine, chlorine, bromine, trifluoromethyl, methyl or methoxy, or represents a heterocycle which is optionally substituted by methyl, fluorine, chlorine, bromine or phenyl and is from the group consisting of thienyl, furyl, pyridyl, pyrimidyl, quinolyl, benzoxadiazolyl or thiochromenyl, and

n represents a number from 1 to 10,

or a physiologically acceptable salt thereof.

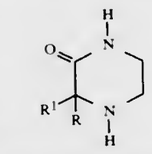
4,898,866

THIENYLPIPERAZINONES, THEIR PREPARATION AND THEIR USE

Karl Schönafinger, Alzenau; Rudi Beyerle, Frankfurt, and Ursula Schindler, Mörfelden-Walldorf, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 9, 1989, Ser. No. 349,540
Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817198
Int. Cl.[4] A61K *31/495*; C07D *403/04*
U.S. Cl. 514—252 **10 Claims**

1. 3-(Thien-2-yl)-piperazin-2-ones, substituted in the 3-position, of the general formula



(I)

wherein R denotes phenyl; phenyl which is monosubstituted, disubstituted or trisubstituted by $(C_1–C_6)$-alkyl, $(C_1–C_6)$-alkoxy and/or $(C_1–C_6)$-alkoxy-$(C_1–C_6)$-alkyl; $(C_1–C_6)$-alkyl; phenyl-$(C_1–C_6)$-alkyl; naphthyl-$(C_1–C_6)$-alkyl; $(C_1–C_6)$-alkoxy-$(C_1–C_6)$-alkyl; or di-$(C_1–C_6)$-alkylamino-$(C_1–C_6)$-alkyl and R^1 denotes 2-thienyl, and pharmacologically tolerable acid addition compounds thereof.

9. Method for improving the human brain function and/or for reducing the consequences of cerebral aging process in humans which comprises administering to a patient in need of such action an effective amount of a compound of claim 1.

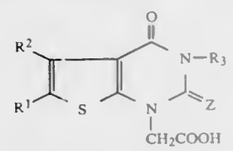
4,898,867

THIENOPYRIMIDINE DERIVATIES AS ALDOSE-REDUCTASE INHIBITORS

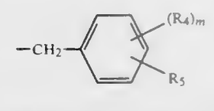
Ogawa Kazuo, Tokushima; Yamawaki Ichiro; Matsushita Yoichi, both of Tokushima; Nomura Naruo, Naruto, and Okazaki Issei, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

PCT No. PCT/JP88/00935, § 371 Date May 4, 1989, § 102(e) Date May 4, 1989, PCT Pub. No. WO89/02432, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 16, 1988, Ser. No. 377,862
Claims priority, application Japan, Sep. 16, 1987, 62-231425
Int. Cl.[4] A61K *31/505*; C07D *239/00, 491/00*
U.S. Cl. 514—258 **5 Claims**

1. A thienopyrimidine derivative of the formula

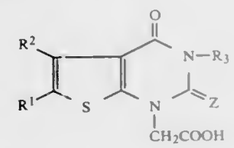


wherein R_1 and R_2 are the same or different and each represent hydrogen, halogen, lower alkyl, cycloalkyl or pheny, R_1 and R_2 taken together may form a ring with an alkylene chain, R_3 represents lower alkyl or a group of the formula

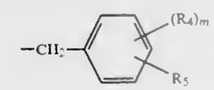


(in which R_4 is lower alkyl, lower alkoxy or halogen, m is 0, 1 or 2, and R_5 is hydrogen or halogen) and Z is oxygen or sulfur, or a pharmaceutically acceptable salt thereof.

5. An aldose-reductase inhibitor comprising an effective amount of at least one thienopyrimidine derivative of the formula



wherein R_1 or R_2 are the same or different and each represent hydrogen, halogen, lower alkyl, cycloalkyl or pheny, R_1 and R_2 taken together may form a ring with an alkylene chain, R_3 represents lower alkyl or a group of the formula



(in which R_4 is lower alkyl, lower alkoxy or halogen, m is 0, 1 or 2, and R_5 is hydrogen or halogen) and Z is oxygen or sulfur, or pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier or excipient therefor.

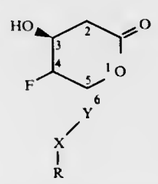
4,898,868

3-DEMETHYL-4-FLUOROMEVALONIC ACID DERIVATIVES, A PROCESS FOR THE PREPARATION THEREOF, PHARMACEUTICAL PRODUCTS BASED ON THESE COMPOUNDS, THE USE THEREOF, AND INTERMEDIATES

Andreas Bergmann, Frankfurt am Main; Wilhelm Bartmann, Bad Soden am Taunus; Gerhard Beck, Frankfurt am Main, and Hans-Hermann Lau, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

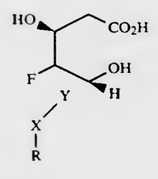
Filed Jul. 8, 1988, Ser. No. 216,752
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722809
Int. Cl.[4] A61K *31/44*; C07D *213/35, 405/06*
U.S. Cl. 514—277 **3 Claims**

1. A 3-demethyl-4-fluoromevalonic acid derivative of the formula I



(I)

and the corresponding free dihydroxy carboxylic acid of the formula II



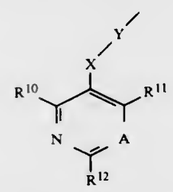
II

in which

Y-X-R denotes

R^8 and R^9 denote hydrogen, halogen, trifluoromethyl, or alkyl or alkoxy, each having 1 to 6 carbon atoms,

the group of the formula V



V

in which

X-Y is equal to CH=CH or $CH_2—CH_2$

A is equal to CH and

R^{10} denotes H, straight-chain C_1–C_4-alkyl, branched C_3–C_6-alkyl, trifluoromethyl or perfluoroisopropyl,

R^{11} denotes H, straight-chain C_1–C_4-alkyl, branched C_3–C_6-alkyl, cycloalkyl having 5–8 ring carbon atoms, phenyl which can be substituted 1 or 2 times by straight-chain C_1–C_3-alkyl, C_1–C_3-alkoxy, halogen or by trifluoromethyl;

R^{12} denotes H, straight-chain C_1–C_4-alkyl, branched C_3–C_6-alkyl, cycloalkyl having 5–8 ring carbon atoms, phenyl which can in turn be substituted 1 or 2 times by straight-chain C_1–C_3-alkyl, trifluoromethyl, hydroxyl or by halogen.

2. A pharmaceutical product containing an effective amount of a compound as claimed in claim 1 in combination with a pharmaceutically acceptable carrier.

4,898,869

REDUCTION OF STROKE DAMAGE

Justin A. Zivin, 31 Camp St., Paxton, Mass. 01612

Continuation of Ser. No. 20,558, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 746,042, Jun. 18, 1985, abandoned, which is a division of Ser. No. 651,501, Jun. 18, 1984, Pat. No. 4,524,072. This application Jul. 7, 1988, Ser. No. 216,084

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—280 **8 Claims**

1. A method of reducing stroke-induced neurological damage in a human patient comprising administering to the patient an effective amount of a pharmaceutically acceptable neurological-damage-reducing serotonin antagonist.

4,898,870

PYRROLOQUINOLINE QUINONE COMPOUNDS USEFUL AS AN ENZYME INHIBITOR

Yuji Narutomi, Kanagawa; Masabu Katsumata, Tokyo; Yasuko Osawa, and Saburo Uchikuga, both of Kanagawa, all of Japan, assignors to Sogo Pharmaceutical Company Limited, Tokyo, Japan

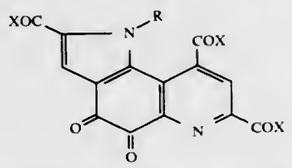
Continuation-in-part of Ser. No. 81,407, Jul. 31, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 299,024

Claims priority, application Japan, Aug. 7, 1986, 61-184127; Aug. 14, 1986, 61-189542; Mar. 3, 1987, 62-046771; Jul. 27, 1987, 62-185365

Int. Cl.[4] A61K *31/47*

U.S. Cl. 514—292 **1 Claim**

1. A method for the therapy of preventing and treating diabetic complications by inhibiting aldose reductase, comprising administering to a patient in need of said therapy an amount sufficient for preventing or treating diabetic complications of a compound of the formula (I):



(I)

wherein R is hydrogen, X is OR′ or NR″R‴, and R′, R″ and R‴ are each selected from the group consisting of hydrogen and lower alkyl.

4,898,871

PYRROLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS WHICH CONTAIN THEM AS HYPNOTICS AND ANTICONVULSANTS

Jean-Dominique Bourzat, Paris; Marc Capet, Thiais; Claude Cotrel, Paris; Richard Labaudiniere, Vitry S/Seine; Philippe Pitchen, Marolles-enBrie, and Gerard Roussel, Soisy S/Seine, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

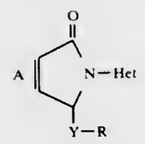
Filed Nov. 30, 1987, Ser. No. 126,352

Claims priority, application France, Dec. 2, 1986, 86 16794

Int. Cl.[4] A61K *31/435*; C07D *471/02. 211/00*

U.S. Cl. 514—300 **11 Claims**

1. A pyrrole derivative of the formula:



(I)

in which A forms with the pyrrole ring an isoindoline ring-system, Y denotes an oxygen or sulphur atom or an imino radical, Het denotes a naphthyridinyl which is unsubstituted or substituted by halogen, (1 to 4 C) alkyl, (1 to 4 C) alkyloxy, (1 to 4 C) alkylthio, cyano or trifluoromethyl and R denotes straight- or branched-chain alkenyl of 3 to 10 carbon atoms or alkyl which is unsubstituted or substituted by alkyloxy, alkylthio, cycloalkyl, alkylcarbonyl, cycloalkylcarbonyl, in which the cycloalkyl has 3 to 6 carbon atoms, cycloalkylcarbamoyl in which the cycloalkyl portion has 3 to 6 carbon atoms, amino, alkylamino, dialkylamino, alkylcarbonylamino, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, aminoalkylcarbamoyl, alkylaminoalkylcarbamoyl, dialkylaminoalkylcarbamoyl, alkyloxyalkylcarbamoyl, or phenyl, the aforesaid alkyl radicals being straight- or branched-chain radicals and containing, except where specifically stated, 1 to 10 carbon atoms each, and, when they exist, its pharmaceutically acceptable salt and optical isomers.

11. A method of producing an anxiolytic, hypnotic, anticonvulsant, antiepileptic or muscle relaxant therapeutic effect in a subject in whom such therapy is desired which comprises administering to such a subject an effective amount of a pyrrole derivative as claimed in claim 1.

4,898,872

IMIDAZO[4,5-B]PYRIDYL QUINOLONE CARDIAC STIMULANTS

Simon F. Campbell, Grey Friars; David S. Morris, Westgate-on-Sea, and David A. Roberts, Congleton, all of England, assignors to Pfizer Inc., New York, N.Y.

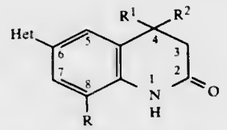
Filed Apr. 21, 1988, Ser. No. 184,462

Claims priority, application United Kingdom, Apr. 21, 1987, 8709448

Int. Cl.[4] A61K *31/47*; C07D *471/04*

U.S. Cl. 514—303 **10 Claims**

1. A heterobicyclic-substituted 2-(1H)-quinolone compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein

Het is a 1(H)-imidazo(4,5-b)pyridin-6-yl group, said heterobicyclic-substituted 2-(1H)-quinolone compound being optionally substituted on the available ring carbon atoms in one or both of the rings of Het with up to three C_1–C_4 alkyl groups and being additionally optionally substituted on the sole available ring carbon atom in the imidazo portion of Het with one oxo group;

R is hydrogen or C_1–C_4 alkyl; and

R^1 and R^2 are each independently hydrogen or C_1–C_4 alkyl; and the dashed line between the 3- and 4-positions represents an optional bond in which case R^2 is absent.

4,898,873

α,α-DIARYL-4-ARYL-4-HYDROXYL-1-PIPERIDINEBUTANAMIDE, N-OXIDES AND PHARMACEUTICAL USE

Loureas Wals, Turnhout, and Ludwig P. Cooymans, Beerse, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 888,606, Jul. 23, 1986, Pat. No. 4,824,853, and a continuation-in-part of Ser. No. 786,566, Oct. 11, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 294,541

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[4] A61K *31/445*; C07D *211/94*

U.S. Cl. 514—327 **3 Claims**

1. The compound 4-[4-chloro-3-(trifluoromethyl)phenyl]-4-hydroxy-N,N-dimethyl-α,α-diphenyl-1-piperidinebutaneamide, N-oxide.

3. A method of treating warm-blooded animals suffering from diarrhea, which method comprises the systemic administration to warm-blooded animals of an effective anti-diarrheal amount of the compound 4-[4-chloro-3-(trifluoromethyl)-phenyl]-4-hydroxy-N,N-dimethyl-α,α-diphenyl-1-piperidinebutaneamide, N-oxide.

4,898,874

ACETIC ACID DERIVATIVES OF 3-ARYL-2,1-BENZISOXAZOLE AND ESTERS AND AMIDES THEREOF

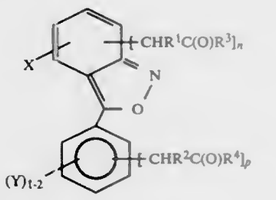
David A. Walsh, Richmond, and Ibrahim M. Uwaydah, Chesterfield, both of Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Sep. 15, 1986, Ser. No. 906,965

Int. Cl.[4] A61K *31/42*; C07D *261/20*

U.S. Cl. 514—379 **66 Claims**

1. A compound selected from the group having the formula:



wherein;

R^1 and R^2 are hydrogen or methyl;

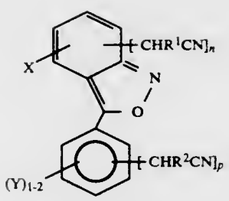
R^3 and R^4 are selected from —OH, loweralkoxy, Am or —OM wherein Am is selected from —NH_2, —NH-loweralkyl, or —N(loweralkyl)$_2$ and M is a pharmaceutically acceptable cation;

X is selected from hydrogen, halogen, loweralkyl, or nitro;

n and p are zero or one with the proviso that either n or p must be one or both n and p are one; and

Y is selected from hydrogen, halogen, loweralkyl, loweralkoxy, nitro or trifluoromethyl with the further proviso that X and/or Y can be loweralkyl when only the 7-position of the benzisoxazole ring is substituted by a —$CHR^1C(O)R^3$ radical and the phenyl radical carries only a Y radical.

51. A compound selected from the group having the formula:



wherein;

R^1 and R^2 are hydrogen or methyl;

X is hydrogen, halogen, loweralkyl or nitro;

n and p are zero or one with the proviso that either n or p must be one or both n and p are one; and

Y is hydrogen, halogen, loweralkyl, loweralkoxy, nitro or trifluoromethyl with the further proviso that X and/or Y can be loweralkyl when only the 7-position of the benzisoxazole ring is substituted by a



radical and the phenyl radical carries only a Y radical.

4,898,875

MERCAPTO-SUBSTITUTED HYDROXYETHYL-(TRIAZOL-L-YL) DERIVATIVES

Karl H. Büchel, Burscheid; Graham Holmwood, Wuppertal; Udo Kraatz, Leverkusen; Wolfgang Krämer, Burscheid; Paul Reinecke, Leverkusen; Wilhelm Brandes, Leichlingen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,557

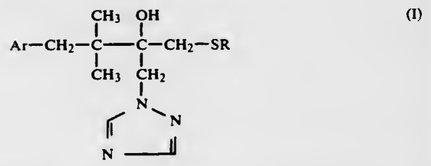
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1986, 3630129

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[4] A01N *43/653*; C07D *249/12*

U.S. Cl. 514—383 **10 Claims**

1. A mercapto-substituted hydroxyethyl-(triazol-1-yl) compound of the formula



(I)

in which

Ar represents phenyl which can be monosubstituted, disubstituted or trisubstituted by identical or different substituents from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, halogenoalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms, halogenoalkoxy with 1 or 2 carbon atoms and 1 to 5 halogen atoms, halogenoalkylthio with 1 or 2 carbon atoms and 1 to 5 halogen atoms and phenyl.

R represents hydrogen, straight-chain or branched alkyl with 1 to 12 carbon atoms, alkenyl with 2 to 12 carbon atoms, cycloalkyl which has 3 to 6 carbon atoms, cycloalkylalkyl which has 3 to 6 carbon atoms, in the cycloalkyl part and 1 or 2 carbon atoms in the alkyl part and is optionally monosubstituted or disubstituted by halogen, or

represents aralkyl which has 6 to 10 carbon atoms, in the aryl part and 1 to 4 carbon atoms in the alkyl part, it being possible for the aryl part to be substituted by halogen, or R represents phenyl which is mono-, di- or tri-substituted by halogen and/or alkyl with 1 to 4 carbon atoms.

4,898,876

BENZOYLPIPERAZINE ESTERS AND A PROCESS FOR THEIR PRODUCTION

Setsuro Fujii, Toyonaka; Eizou Hattori, Sakado; Mitsuteru Hirata, Tokorozawa; Koichiro Watanabe, Higashi-Murayama; Kazuhiro Onogi, Iruma, and Masahiko Nagakura, Sayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

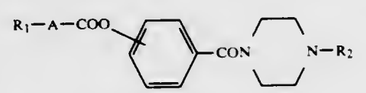
Filed Nov. 12, 1985, Ser. No. 796,525

Claims priority, application Japan, Jun. 25, 1982, 57-109192; Apr. 28, 1983, 58-75868

Int. Cl.[4] C07D *241/04*

U.S. Cl. 544—391 **14 Claims**

1. A benzoylpiperazine ester represented by the formula:

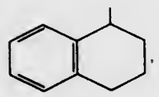


wherein

A represents a single bond or a C_1–C_2 alkylene group, vinylene group, —O—alkylene group or methine group;

R_1 represents a (C_9–C_{11}) bicyclic carbon ring which may be substituted with a lower alkyl group, lower alkoxy group, oxy group, nitro group or a halogen atom, or may be partially saturated; a fluorene group which may contain an oxo group; a fluorenylidene group; an anthracene group; a phenanthrene group which may be substituted with a lower alkyl group, or may be partially saturated; a benzofuran or thianaphthene group which may be substituted with a lower alkyl group or lower alkoxy group; a benzopyran or benzoazine group which may be substituted with an oxo group or phenyl group or may be partially saturated; a attached through an n atom; a benzodiazine group; an isooxazole which may be substituted with a lower alkyl group or phenyl group; an alkylene dioxybenzene or xanthene group; and

R_2 represents an alkyl group, C_6 cycloalkyl group, C_6 cycloalkyl(C_1)alkyl group or benzyl group, excepting the case where A is a single bond, R_1 is



and R_2 is a methyl group.

4,898,877

CIRCULATION-ACTIVE CYCLOHEXENECARBOXYLATES

Horst Meyer, West Haven, Conn.; Eckhard Schwenner; Martin Bechem, both of Wuppertal, Fed. Rep. of Germany; Rainer Gross, Wuppertal, Fed. Rep. of Germany; Matthias Schramm, Cologne, Fed. Rep. of Germany; Michael Kayser, Hagen, Fed. Rep. of Germany, and Siegbert Hebisch, Oberhausen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

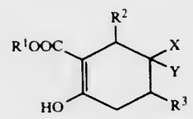
Filed Feb. 18, 1988, Ser. No. 157,678

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706877

Int. Cl.[4] A61K *31/275, 31/215;* **C07C** *121/48, 121/75*

U.S. Cl. 514—521 **12 Claims**

1. A cyclohexenecarboxylate of the formula



(I)

in which

R^1 represents a straight-chain or branched saturated or unsaturated hydrocarbon radical with up to 20 carbon atoms, which is optionally interrupted by an oxygen atom or a sulphur atom in the chain, or a cyclic hydrocarbon radical with up to 20 carbon atoms, which straight-chain or branched or cyclic hydrocarbon is optionally substituted by halogen, cyano, hydroxyl, acetyloxy, nitro, nitrooxy or by a phenyl, phenoxy, phenylthio or phenylsulphonyl group which is optionally substituted by halogen, cyano, dialkylamino with in each case 1 to 2 carbon atoms to each alkyl group, alkoxy with 1 to 4 carbon atoms, alkyl with 1 to 4 carbon atoms, trifluoromethyl or nitro, or by an amino group, where this amino group carries 2 identical or different substituents from the group alkyl with up to 4 carbon atoms, alkoxyalkyl with up to 4 carbon atoms, phenyl or C_7–C_{14}-aralkyl, or an N-phenyl or N-alkyl grouping, where this alkyl group is 1 to 3 carbon atoms,

R^2 represents C_6–C_{12}-aryl, which can be mono-, di- or trisubstituted by halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_6-alkylthio, C_1–C_6-alkylsulphonyl, trifluoromethyl, trifluoromethoxy, difluoromethoxy, trifluoromethylthio, nitro, cyano, C_1–C_4-alkoxycarbonyl, di-C_1–C_6-alkylamino, dimethylaminosulphonyl or dimethylcarbamoyl, the substituents being identical or different,

R^3 represents C_1–C_6-alkyl or represents C_6–C_{12}-aryl, which can be mono- or disubstituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, cyano, trifluoromethyl or trifluoromethoxy, the substituents being identical or different,

and

X and Y are identical or different and represent a group of the formula —CN, —COR^4, —SO_2R^4, —$COOR^5$, —$CONR^6R^7$ or —$SO_2NR^6R^7$,

wherein

R^4 denotes C_1–C_8-alkyl, C_6–C_{12}-aryl or C7C14-aralkyl,

R^5 denotes C_1–C_8-alkyl or C_6–C_{12}-aryl,

and

R^6 and R^7 are identical or different and denote C_1–C_6-alkyl, C_6–C_{12}-aryl or C_7–C_{14}-aralkyl,

with the proviso that at least one of X and Y is —CN or —$COOR^5$.

12. A method of normalizing the circulation of a patient in need thereof which comprises administering to such patient an amount effective therefor of a compound according to claim 1.

4,898,878

ANTIOXIDANT THIOHISTIDINE COMPOUNDS

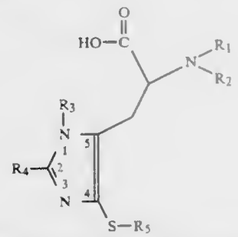
Bennett M. Shapiro; Eric E. Turner; Paul B. Hopkins; Rachel E. Klevit; Tod P. Holler, and Andreas Spaltenstein, all of Seattle, Wash., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Filed Oct. 2, 1987, Ser. No. 104,736

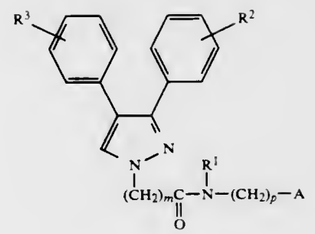
Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—386 **4 Claims**

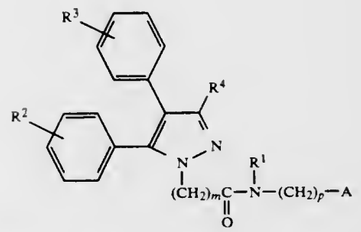
1. A method of regulating oxidative stress in an animal host, comprising the step of administering to said host an antioxidatively effective amount of a 4-thiohistidine compound of the formula:



wherein R_1, R_2, R_3 and R_4 are individually selected from hydrogen and methyl, and R_5 is hydrogen or a 4-thiohistidine.



or



or acid-addition salt thereof wherein R^1 is hydrogen or lower-alkyl; R^2 and R^3 are independently hydrogen, hydroxy, lower-alkyl, lower-alkoxy, lower-alkylamino, lower-alkylamido, lower-alkylsufonamido, nitro, amino, cyano, or halo; R^4 is hydrogen or hydroxy; m is one or two; p is one, two, or three; and A is a five-or six membered heterocycle containing carbon, hydrogen and nitrogen and attached to $(CH_2)_p$ at a carbon, or A is a five-or six-membered heterocycle, substituted with a lower-alkyl group, containing carbon, hydrogen and nitrogen and attached to $(CH_2)_p$ at a carbon.

9. A composition for treating cardiac arrhythmias comprising an amount of a compound according to claim 1 effective to treat cardiac arrhythmias together with one or more pharmaceutically acceptable excipients or diluents.

4,898,879

NURTITIONAL COMPOSITION FOR MANAGEMENT OF HEPATIC FAILURE

David C. Madsen, Libertyville, and Hugh N. Tucker, Chicago, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 935,887, Mar. 9, 1987, abandoned, which is a continuation of Ser. No. 805,394, Dec. 3, 1985, abandoned, which is a continuation of Ser. No. 479,104, Mar. 28, 1983, abandoned, which is a continuation of Ser. No. 278,914, Jun. 29, 1981, abandoned. This application Jun. 17, 1988, Ser. No. 208,805

Int. Cl.[4] A61K *31/195, 31/415*

U.S. Cl. 514—400 **22 Claims**

1. A composition for administration to a patient having liver disease, comprising a cysteine free mixture of nonessential and essential amino, having from 8 to 16 total mole % of the composition consisting of L-serine, L-histidine, L-threonine, L-tryptophan, L-glutamine and glycine taken together; said L-theronine contributing from about 2.3 to 3.9% of the total mole % of said composition.

4,898,880

N-(HETEROCYCLE)ALKYL)-1H-PYRAZOLE-1-ALKANAMIDES AS ANTIARRHYTHMIC AGENTS, COMPOSITIONS AND USE

Denis M. Bailey, East Greenbush; George Y. Lesher, Schodack, and Thomas E. D'Ambra, North Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 22, 1989, Ser. No. 327,218

Int. Cl.[4] A61K *31/415;* **C07D** *403/12*

U.S. Cl. 514—406 **16 Claims**

1. A compound of formula

4,898,881

DRY MICROBIOCIDAL COMPOSITION CONTAINING AN ETHYLENE BIS-DITHIOCARBAMATE SALT

Girish K. Patel, Hixson, and James H. Belcher, Chattanooga, both of Tenn., assignors to Alco Chemical Corporation, Tenn.

Filed Apr. 14, 1988, Ser. No. 181,415

Int. Cl.[4] A61K *31/27;* **A01N** *47/10*

U.S. Cl. 514—481 **12 Claims**

1. A dry water soluble composition for use as a microbiocide comprising a mixture of a sodium or potassium salt of ethylene bis-dithiocarbamate and a sodium or potassium salt of dimethyldithiocarbamate in a weight ratio of between about 4:1 and about 1:4, said composition being free of water of solution and of a substantial amount of water of crystalization and having a temperature of combustion over 170° C.

4,898,882

RESISTANCE IMPARTING AGENT FOR COLD SYNDROME OF LOW PULMONARY FUNCTION PATIENTS

Fumio Nagahama, Sapporo; Norihiro Kakimoto, Machida, and Kohei Miyao, Tokyo, all of Japan, assignors to Asai Germanium Research Institute, Tokyo, Japan

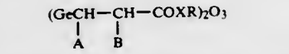
Continuation of Ser. No. 869,698, Jun. 2, 1986, abandoned. This application Dec. 12, 1988, Ser. No. 284,848

Int. Cl.[4] A61K *31/28*

U.S. Cl. 514—492 **9 Claims**

1. A method for treating or imparting resistance to a cold

syndrome in a patient having low pulmonary function, said method comprising administering an effective amount to treat a cold syndrome of an organogermanium compound having the formula:



(I)

wherein A and B independently represent a hydrogen atom or a lower alkyl group, R represents a combination of one or two atoms or groups as identified above by A and B, and X represents an oxygen or nitrogen atom and a pharmaceutically acceptable carrier.

4,898,883

1-SUBSTITUTED DERIVATIVES OF 4-METHOXY-2,3,6-TRIMETHYLBENZENE, PROCESS FOR THEIR PREPARATION AND MEDICINAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Gerard Lang, Saint Gratien; Serge Forestier, Claye-Souilly; Alain Lagrange, Chatou, and Braham Shroot, Antibes, all of France, assignors to L'Oreal, Paris, France

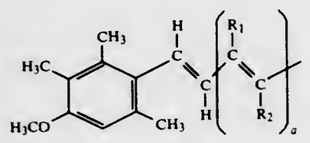
Continuation of Ser. No. 765,150, Aug. 13, 1985, abandoned. This application Jul. 21, 1987, Ser. No. 75,890

Claims priority, application Luxembourg, Aug. 13, 1984, 85502

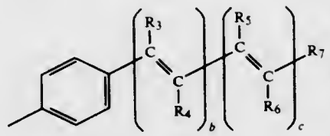
Int. Cl.[4] A61K *31/19, 31/21;* C07C *65/28*

U.S. Cl. 514—544 **18 Claims**

1. A compound having the formula



(II)

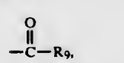


wherein

a is 1 and b and c, each independently, are 0 or 1;

R_1, R_2, R_3, R_4, R_5 and R_6, each independently, are selected from the group consisting of hydrogen and C_1–C_6 alkyl;

R_7 is selected from the group consisting of (i) $—CH_2OR_8$ wherein R_8 is selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_2–C_6 monohydroxyalkyl, C_2–C_6 polyhydroxyalkyl, cyclopentyl and cyclohexyl and (ii) a group of the formula



wherein R_9 is hydrogen $—OR_{10}$ wherein R_{10} is selected from the group consisting of hydrogen, C_1–C_{18} alkyl, C_2–C_6 monohydroxyalkyl and C_2–C_6 polyhydroxyalkyl, or an isomer or salt thereof.

4. A pharmaceutical composition comprising in a pharmaceutically acceptable carrier at least one compound of formula II of claim 1 in an amount effective to treat dermatologic complaints.

15. A cosmetic composition comprising in a cosmetically acceptable carrier, at least one compound of formula II of claim 1 in an amount effective for use in body hygiene and hair care, for the treatment of acne, seborrhea and hair loss, for regrowth of hair and for protection against damage by sunlight.

4,898,884

METHOD AND COMPOSITION FOR TREATING ARTHRITIS

W. Keith R. Watson, P.O. Box 1537, Rancho Santa Fe, Calif. 92067, assignor to Kenneth R. Watson and William W. Haefliger, Pasadena, Calif., a part interest

Continuation of Ser. No. 656,751, Oct. 1, 1984, abandoned, which is a continuation of Ser. No. 426,868, Sep. 29, 1982, abandoned. This application Feb. 16, 1986, Ser. No. 828,941

Int. Cl.[4] A61K *31/110, 31/185, 31/195*

U.S. Cl. 514—553 **5 Claims**

1. A method for producing a solution useful for treating a human or animal patient afflicted with arthritis to alleviate inflammation, pain and swelling caused by calcium phosphates in bone or joint tissue, by topically applying an effective amount of said solution to the patient's skin surface overlying the inflammed, painful and swollen area of the patient for a period of time sufficient to alleviate said inflammation, pain and swelling, which method comprises:

(a) forming said solution consisting essentially of a mixture of dimethyl sulfoxide and citric acid or citric acid monohydrate by combining between about 20 to 50 weight percent of said citric acid or citric acid monohydrate and between about 80 to 50 weight percent dimethyl sulfoxide,

(b) and heating and mixing said citric acid or citric acid monohydrate and dimethyl sulfoxide during the formation of said solution.

4,898,885

PHARMACEUTICA AND DIETARY COMPOSITIONS

David F. Horrobin, Surrey, England, assignor to Efamol Limited, Surrey, England

Continuation of Ser. No. 833,286, Feb. 27, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 232,515

Claims priority, application United Kingdom, Mar. 8, 1985, 8506027

Int. Cl.[4] A61K *31/20*

U.S. Cl. 514—560 **4 Claims**

1. A method of treatment of benign prostatic hypertrophy wherein gamma-linolenic acid or dihomo-gamma-linolenic acid or both, as such or in the form of an acceptable and physiologically equivalent derivative, is administered to a person suffering from the same in an amount of 0.1 mg to 10 g of the or each acid, or molar equivalent amounts, of said derivatives, daily.

4,898,886

UREA AGAINST ADENOCARCINOMA

Joaquin Amat-Larraz, Paseo De La Liberacion 132, Benicarlo/-Castellon, Spain

Continuation of Ser. No. 717,084, Mar. 28, 1985, abandoned. This application Jun. 22, 1988, Ser. No. 211,156

Claims priority, application Switzerland, Mar. 28, 1984, 1563/84

Int. Cl.[4] A61K *31/17, 31/34*

U.S. Cl. 514—588 **6 Claims**

1. A method of treating animals with adenocarcinoma cancer comprising administering by injection to the affected animal an effective amount of composition comprising about 45% by weight urea, about 8% to about 9% by weight ascorbic acid, about 1% to about 2% by weight sodium bicarbonate and about 45% by weight physiological NaCl solution.

4,898,887

COMPOUNDS AND COMPOSITIONS HAVING ANTI-INFLAMMATORY AND ANALGESIC ACTIVITY

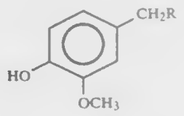
John M. Janusz, Fairfield; Maurice E. Loomans, Cincinnati, both of Ohio; Thomas R. LaHann, Pullman, Wash., and Gerald B. Kasting, Wyoming, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 805,481, Dec. 4, 1985, abandoned, which is a continuation of Ser. No. 684,427, Dec. 20, 1984, abandoned. This application Aug. 22, 1986, Ser. No. 899,459

Int. Cl.[4] A61K *31/16;* C07C *103/60*

U.S. Cl. 514—617 **21 Claims**

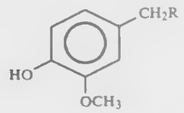
1. N-vanillylamide compounds, and pharmaceutically-acceptable salts thereof, of the formula:



wherein R is a straight or branched chain tri-unsaturated or tetra-unsaturated fatty acid amide having from 14 to 24 carbon atoms.

16. A method for reducing inflammation and producing analgesia in humans or lower animals, which comprises administering to said human or lower animal a safe and effective amount of a composition comprising:

(a) a safe and effective amount of a N-vanillylamide compound of the formula



wherein R is a straight or branched chain tri-unsaturated or tetra-unsaturated fatty acid amide having from 14 to 24 carbon atoms, or a pharmaceutically-acceptable salt thereof, or mixtures thereof; and

(b) a pharmaceutically-acceptable carrier.

4,898,888

TREATMENT OF VIRUS INFECTIONS WITH GANGLIONIC BLOCKING AGENTS

Joseph A. Baldone, 1211 Royal St., New Orleans, La. 70116

Continuation of Ser. No. 19,116, Feb. 26, 1987, abandoned, which is a continuation of Ser. No. 756,653, Jul. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 743,889, Jun. 12, 1985, abandoned, which is a continuation of Ser. No. 631,645, Jul. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 456,732, Jan. 10, 1983, abandoned. This application Oct. 5, 1988, Ser. No. 214,881

Int. Cl.[4] A61U *31/14*

U.S. Cl. 514—642 **10 Claims**

1. A method for treating infection or disease in a mammal caused by herpes simplex virus type-1 or herpes simplex virus type-2 comprising the step of administering to the mammal a ganglionic blocking agent selected from the group consisting of tetraethylammonium ion, hexamethonium ion, pentalinium ion, chlorisondamine ion, trimethidinium ion, trimethaphan ion, mecamylamine, pempidine, and homologs thereof in an effective dosage.

4,898,889

METHODS FOR THE TREATMENT OF HYPERTENSION

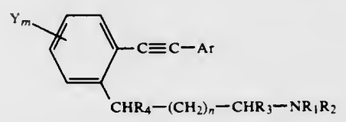
John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Spring House, Pa.

Continuation of Ser. No. 820,825, Jan. 21, 1986, abandoned, which is a continuation of Ser. No. 553,725, Nov. 21, 1983, abandoned. This application Mar. 27, 1989, Ser. No. 329,178

Int. Cl.[4] A61K *31/135, 31/40, 31/445, 31/535*

U.S. Cl. 514—654 **9 Claims**

1. A method for controlling hypertension in an animal which comprises administering to the animal a therapeutically effective antihypertensive amount of an acetylene of the following formula (I):



(I)

wherein

Y is independently alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoyloxy, alkanoylamino, amino, monoalkylamino, dialkylamino, hydroxy, halogen or cyano or methylenedioxy or ethylenedioxy at adjacent ring carbons;

m is 0, 1, 2 or 3;

Ar is phenyl or a 5- or 6-membered heterocyclic aromatic ring attached via a ring carbon to the acetylene moiety, which rings may be substituted independently by one or more of alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, carboxamido, halogen, fluoroalkyl or cyano;

R_1 and R_2 are independently hydrogen, alkyl, cycloalkyl or cycloalkylalkyl or R_1 and R_2 are alkyl and are joined to form a 5- to 7-membered saturated ring which ring may contain an oxygen or sulphur atom or an NR_5 moiety wherein R_5 is hydrogen or alkyl;

R_3 is hydrogen, alkyl or alkoxyalkyl;

R_4 is hydrogen or alkyl; and

n is 0, 1 or 2,

and the pharmaceutically acceptable acid addition salts and the quaternary ammonium compounds thereof.

4,898,890

MEDICINES FOR USE IN THE THERAPY AND PREVENTION OF KIDNEY AND LIVER DISEASES

Toshio Sato; Hitoshi Matsumoto, and Hisao Kakegawa, all of Tokushima, Japan, assignors to Dainippon Ink and Chemicals, Inc. and Nippon Hypox Laboratories Incorporated, both of Tokyo, Japan

PCT No. PCT/JP87/00409, § 371 Date Dec. 23, 1987, § 102(e) Date Dec. 23, 1987, PCT Pub. No. WO87/07835, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 22, 1987, Ser. No. 157,509

Claims priority, application Japan, Jun. 21, 1986, 61-145829; Sep. 2, 1986, 61-205118

Int. Cl.[4] C07O *311/60*

U.S. Cl. 514—685 **52 Claims**

1. A method for the therapy and prevention of kidney diseases or liver diseases, comprising administering to a mammal a medicine containing a therapeutically or prophylactically effective amount for the therapy and prevention of kidney diseases, or liver diseases of isoliquiritigenin as an active ingredient.

4,898,891

ANTIVIRAL COMPOSITIONS

David Lavie; Michel Revel; Dalia Rotman, all of Rehovot, Israel, and Vincent V. Velde, Brussels, Belgium, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed Aug. 7, 1987, Ser. No. 82,700
Int. Cl.[4] A61K *31/05, 31/045*
U.S. Cl. 514—732 **16 Claims**

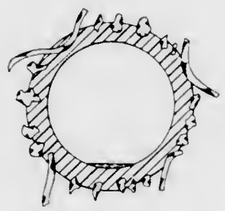
9. A method of treating vial infections in a mammal afflicted with a viral infection, comprising administering to said mammal an effective antiviral amount of a substantially pure compound selected from the group consisting of hypericin, pseudohypericin, a pharmaceutically acceptable salt of hypericin or pseudohypericin, and mixtures thereof in any desired ratio.

4,898,892

METHODS FOR PREPARING OPAQUE COATINGS AND APPLYING THE SAME

George E. Melber, Depew, and Leon Wolinski, Checktowago, both of N.Y., assignors to Pierce & Stevens Corporation, Buffalo, N.Y.

Division of Ser. No. 225,755, Jul. 29, 1988, which is a continuation-in-part of Ser. No. 28,119, Mar. 19, 1987, Pat. No. 4,722,943, and a continuation-in-part of Ser. No. 103,203, Oct. 1, 1987, and a continuation-in-part of Ser. No. 103,204, Oct. 1, 1987, said Ser. No. 28,119, is a division of Ser. No. 103,203, , which is a division of Ser. No. 103,204,. This application Jun. 6, 1989, Ser. No. 362,316
Int. Cl.[4] C08J *9/22, 9/32*
U.S. Cl. 521—54 **13 Claims**



1. The method of making an opaque coating comprising combining a film forming coating binder and a composite opacifier, said composite opacifier comprising dry expanded thermoplastic resin microspheres having an inorganic opacifying constituent adhered to and embedded the surface thereof, said opacifying constituent having a refractive index of greater than about 1.6, and said composite opacifier having a hiding power substantially equivalent to that of said opacifying constituent having a refractive interface with air.

4,898,893

BLOWING AGENTS FOR ISOCYANURATE FOAMS AND METHOD FOR PRODUCING THE SAME

Kaneyoshi Ashida, Farmington Hills, Mich., assignor to Harry A. Fischer, Canada

Filed Sep. 20, 1988, Ser. No. 246,877
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—131 **29 Claims**

1. A blowing agent for a resinous material; the blowing agent consisting essentially of a blend of:
(a) a flammable liquid hydrocarbon; and
(b) a halogenated aliphatic hydrocarbon; and wherein the blowing agent has a boiling point of between about 30° C. to 100° C.

4,898,894

FILM FORMING BINDERS CONTAINING LOW DENSITY COMPOSITE OPACIFIERS

George E. Melber, Depew, and Leon Wolinski, Checktowago, both of N.Y., assignors to Pierce & Stevens Corporation, Buffalo, N.Y.

Division of Ser. No. 225,755, Jul. 29, 1988, which is a continuation-in-part of Ser. No. 28,119, Mar. 19, 1987, Pat. No. 4,722,943, and a continuation-in-part of Ser. No. 103,203, Oct. 1, 1987, and a continuation-in-part of Ser. No. 103,204, Oct. 1, 1987, said Ser. No. 28,119, is a division of Ser. No. 103,203, Oct. 1, 1987, and Ser. No. 103,204, Oct. 1, 1987. This application Jun. 6, 1989, Ser. No. 362,315
Int. Cl.[4] C08J *9/22, 9/32*
U.S. Cl. 521—54 **7 Claims**



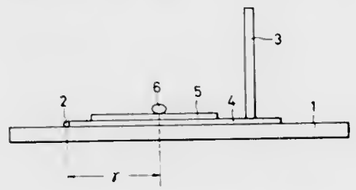
1. A composition for use in the making of paints and coatings comprising a film-forming coating binder and an opacifier, said opacifier comprising expanded thermoplastic resin microspheres having an inorganic opacifying constituent adhered to an embedded in the surface thereof.

4,898,895

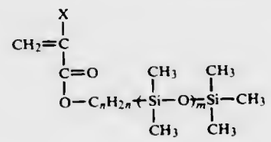
ANTIFOULING PAIN HAVING A POLYACRYLATE COMPONENT WITH PENDENT SILYL OR SILOXANE GROUPS

Shigeru Masuoka; Hiroshi Doi, both of Hyogo, and Yoshihiro Honda, Osaka, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,541
Claims priority, application Japan, Dec. 30, 1986, 61-311221; Jun. 28, 1987, 62-160089
Int. Cl.[4] C08F *30/08;* **C08L** *31/00, 31/02;* **C09D** *5/14*
U.S. Cl. 523—122 **6 Claims**



1. An antifouling paint comprising an antifoulant and a polymer formed from a monomer represented by formula (I):



(I)

wherein X is a hydrogen atom or a methyl group; n is an integer of 2 to 4; and m signifies the average degree of polymerization and is zero or a positive integer.

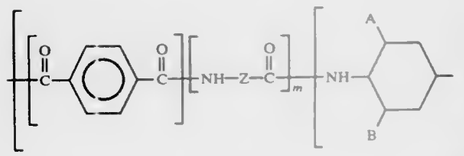
4,898,896

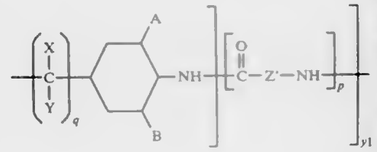
TRANSPARENT COPOLYAMIDE FROM OLIGOMERIC AMIDE AND CYCLOALIPHATIC DIAMINE AND PROCESS FOR THE PRODUCTION THEREOF

Philippe Maj; Philippe Blondel, both of Bernay, and Daniel Cuzin, Port Marly, all of France, assignors to Atochem, France

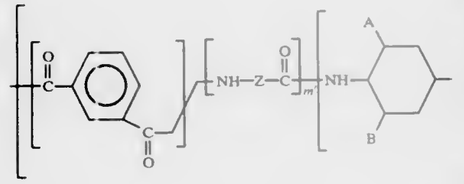
Filed Sep. 26, 1988, Ser. No. 249,376
Claims priority, application France, Oct. 21, 1987, 87 14542
Int. Cl.[4] C08G *69/14, 69/26, 69/08*
U.S. Cl. 528—323 **7 Claims**

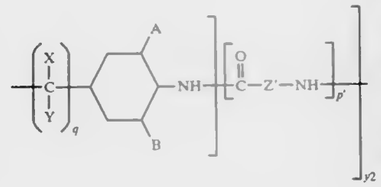
1. A transparent polyamide containing terephthalic acid radicals or radicals of the mixture of terephthalic and isophthalic acids and a cycloaliphatic diamine radical and having the chain formations:





and





in which:
y_1+y_2 is between 10 and 200 with $y_1/(y_1+y_2)>0.5$;
m, p, m' and p' are whole numbers equal to or greater than zero, such that:

is between 0.5 and 10, taken statistically over the macromolecule;
Z and Z' are the same or different and are either a polymethylene segment $-(CH_2)-_n$ where n is a whole number equal to or greater than 6 or a sequence containing an amide resulting from condensation of an aliphatic diamine containing at least 6 carbon atoms between the amine functions and an aliphatic dicarboxylic acid containing at least 4 carbon atoms between the acid functions;
A and B are the same or different and represent hydrogen or a methyl, ethyl, or isopropyl radical;
X and Y are the same or different and represent hydrogen or a methyl radical; and
q is a whole number between 0 and 6.

4,898,897

PROCESS FOR PRODUCING POLYESTER RESIN COMPOSITION

Kazuto Kiyohara; Toshiaki Yamazaki; Ichiya Harada; Takanori Nakadate, all of Hino; Kentaro Noguchi, Hofu; Michiteru Nakano, Hofu; Shigeru Sakae, Hofu, and Kazuhiro Okuma, Hofu, all of Japan, assignors to Konica Corporation and Kanebo Ltd., both of, Japan

Filed Apr. 21, 1988, Ser. No. 184,389
Claims priority, application Japan, Apr. 24, 1987, 62-101310; Apr. 25, 1987, 62-102810
Int. Cl.[4] C08K *3/36, 3/34, 3/30, 3/26*
U.S. Cl. 523—343 **17 Claims**

1. A process for producing a polyester resin composition containing at least 10 wt % of a white inorganic pigment dispersed in a polyester resin, which comprises kneading the polyester resin with the white inorganic pigment and thereafter subjecting the blend to a polycondensation reaction at a temperature ranging from the melting point of the polyester up to 300° C. and at a reduced pressure of not higher than 5 Torr.

9. A process for producing a polyester resin composition containing at least 10 wt % of a white inorganic pigment dispersed in a polyester resin, which comprises kneading and dispersing said white inorganic pigment in at least part of a molten polyester resin withdrawn from a continuous polycondensation apparatus, mixing the blend with a polyester resin also withdrawn from a continuous polycondensation apparatus but which has not been kneaded with the white inorganic pigment, and subjecting the resin mixture to a polycondensation reaction at a temperature ranging from the melting point of the polyester up to 300° C. and at a pressure not higher than 5 Torr.

4,898,898

POLYMER-DENSIFIED FILLERS

Thomas H. Fitzgerald, Guilderland; John S. Razzano, Cohoes, and Todd R. Stegman, Troy, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 915,939, Oct. 6, 1986, abandoned, which is a continuation of Ser. No. 539,587, Oct. 6, 1983, abandoned. This application May 19, 1989, Ser. No. 355,106
Int. Cl.[4] C08K *3/34;* **C08J** *3/20*
U.S. Cl. 523—351 **25 Claims**

1. A method for providing polymer-densified fillers, consisting essentially of:
(A) adding to a suitable mixing vessel;
(i) 100 parts by weight of a silicone polymer or mixture of silicone polymers having a viscosity ranging from about 1000 to about 200,000,000 centipoise at 25° C.; and
(ii) an amount of filler comprising:
(a) 50 to 500 parts by weight of reinforcing filler per 100 parts by weight of said silicone polymer; and
(b) 900 to 5000 parts by weight of extending filler per 100 parts by weight of said silicone polymer; and
(B) mixing said silicone polymer and said filler for an amount of time effective for providing a free-flowing particulate mixture having a density at least 100 percent higher than

when the silicone polymer and filler first became free-flowing particles.

4,898,899

ADHESIVE COMPOSITION

Yasuji Isobe, Seto, Japan, assignor to Toagosei Chemical Industry Co., Tokyo, Japan

Filed Dec. 5, 1988, Ser. No. 280,174

Claims priority, application Japan, Dec. 25, 1987, 62-327294; Jul. 11, 1988, 63-170977; Sep. 19, 1988, 63-232568; Sep. 19, 1988, 63-232569

Int. Cl.[4] C09K *5/34*

U.S. Cl. 524—90 **40 Claims**

1. An anaerobic adhesive composition which comprises a polymerizable methacrylate monomer, a peroxide polymerization initiator, and at least one compound selected from the group consisting of chlorophyll, metal-substituted chlorophyll, chlorophyllin salt and pthalocyanine complex unsubstituted or substituted on a benzene nucleus thereof.

4,898,900

3,3-OXY-BIS{[2,2'-DI(BROMOMETHYL)]}PROPANOIC ACID DERIVATIVES

Michael Peled, Beer-Sheva, Israel, assignor to Bromine Compounds Ltd., Beer-Sheva, Israel

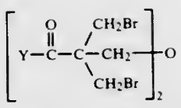
Filed Dec. 27, 1988, Ser. No. 290,154

Claims priority, application Israel, Dec. 28, 1987, 84953

Int. Cl.[4] C07C *103/727, 103/147, 59/315, 69/708;* **C08K** *5/20, 5/11, 5/09*

U.S. Cl. 524—220 **17 Claims**

1. 3,3'-Oxy-bis{[2,2'-di(bromomethyl)]propanoic acid} derivatives of formula (I)



(I)

in which Y represents OR, chlorine or NH—R and wherein R represents hydrogen or an alkyl, aralkyl or aryl group, wherein the alkyl, aryl and aralkyl groups are unsubstituted or substituted with 1 to 5 bromine atoms.

12. A flame-retardant composition comprising a synthetic resin and a compound of Formula I according to claim 1, alone or in admixture with conventional flame-retardant synergistic materials additives or mixtures thereof.

4,898,901

LONG CHAIN N-ALKYL-ALPHA-ALKYL NITRONES AND POLYOLEFIN COMPOSITIONS STABILIZED THEREWITH

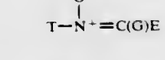
Ramanathan Ravichandran, Yonkers, N.Y.; Stephen D. Pastor, Basel, Switzerland; Raymond Seltzer, New City, N.Y., and Ambelal R. Patel, Ardsley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 105,417, Oct. 7, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 330,986

Int. Cl.[4] C07C *135/00;* **C08K** *5/32*

U.S. Cl. 524—237 **28 Claims**

1. A long chain N-alkyl-alpha-alkyl nitrone compound of the formula



wherein

T is a straight or branched chain alkyl of 16 to 18 carbon atoms,

G is hydrogen, methyl or ethyl,

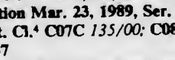
E is a straight or branched chain alkyl of 13 to 17 carbon atoms, and

where the sum of the carbon atoms in G plus E is equal to 15 to 17.

10. A stabilized composition which comprises

(a) a saturated polyolefin or mixture thereof, and

(b) a stabilizing amount of a long chain N-alkyl-alpha-alkyl nitrone of the formula



wherein

T is a straight or branched chain alkyl of 16 to 18 carbon atoms,

G is hydrogen, methyl or ethyl,

E is a straight or branched chain alkyl of 13 to 17 carbon atoms, and

where the sum of the carbon atoms in G plus E is equal to 15 to 17.

4,898,902

BINDER COMPOSITION FOR INJECTION MOLDING

Tomoaki Nagai; Hideyuki Yamanashi, and Hideo Hachimori, all of Tokyo, Japan, assignors to Adeka Fine Chemical Co., Ltd. and Asahi Denka Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 211,756

Claims priority, application Japan, Jul. 3, 1987, 62-166297; May 31, 1988, 63-133864

Int. Cl.[4] C08L *71/02;* **C08K** *5/10*

U.S. Cl. 524—275 **17 Claims**

1. A binder composition for injection molding of at least one of metal powder and ceramic powder which comprises polyoxyethylene/polyoxypropylene condensation polyether as the main component together with from 10 to 100 parts by weight of at least one auxiliary component selected from the group consisting of natural waxes, synthetic waxes, fatty acids and esters per 100 parts of said polyoxyethylene/polyoxypropylene condensation polyether.

4,898,903

THERMALLY STABLE FLUORINATED ORGANOSILOXANE GEL COMPOSITION

Diane M. Rasch, Alameda, Calif., and Lawrence D. Fiedler, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 14, 1989, Ser. No. 322,865

Int. Cl.[4] C08K *5/04*

U.S. Cl. 524—398 **7 Claims**

1. In an organosiloxane composition curable to a clear, thermally stable fluorosilicone gel, said composition comprising

A. a liquid diorganovinylsiloxy terminated polydiorganosiloxane wherein at least 25 percent of the silicon atoms are bonded to a fluorine containing hydrocarbon radical;

B. a compatible liquid fluorine-containing organohydrogensiloxane having an average of more than two silicon bonded hydrogen atoms per molecule in an amount sufficient to provide a molar ratio of silicon bonded hydrogen atoms to vinyl radicals in said composition of from 0.5 to about 1.0; and

C. an amount sufficient to promote curing of said composition of a platinum-containing catalyst, p1 the improvement comprising the presence in said composition of up to 0.1 percent, based on the weight of said composition, of copper acetylacetonate to minimize hardening and surface deformation of the cured gel at temperatures above 100° C.

4,898,904

METHOD TO MODIFY POLY(ARYLE SULFIDE) RESINS

Michael C. Yu; Lacey E. Scoggins, and Jerry O. Reed, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 933,518, Nov. 21, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 177,255

Int. Cl.[4] C08K *5/09, 5/13, 3/22*

U.S. Cl. 524—399 **10 Claims**

1. A process comprising mixing poly(arylene sulfide) resin with an effective amount of a melt flow rate additive at a temperature above the melting temperature of the poly(arylene sulfide) resin to produce a final resin product having reduced melt flow rate and reduced melt crystallization temperature compared to said poly(arylene sulfide) resin alone and before treatment, wherein the melt flow rate additive is selected from among the group consisting of cadmium acetate, mercury acetate and zinc propionate and is present in an amount of from about 0.1 to about 2 weight percent based on the total composition.

4,898,905

SLIDING MATERIAL

Shinya Kawakami, and Masahara Kikuchi, both of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Toyoto, Japan

Filed Jul. 11, 1988, Ser. No. 217,522

Claims priority, application Japan, Jul. 13, 1987, 62-172955

Int. Cl.[4] C08K *3/38, 3/36, 3/34, 3/04*

U.S. Cl. 524—404 **7 Claims**

1. A sliding material for use under boundary lubricating condition or mixed lubricating condition, consisting essentially of from more than 30 to 60% by weight of graphite, from 1 to less than 30% by weight of at least one lubricant selected from the group consisting of polytetrafluoroethylene, MoS_2, Pb, and BN, and from 10 to less than 60% by weight of a polyimide and a polyamide-imide.

4,898,906

COMPOSITIONS BASED ON VINYLIDENE FLUORIDE POLYMERS WHICH HAVE A REDUCED SMOKE-GENERATING CAPACITY

Etienne Hannecart, Tervueren, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 539,063, Oct. 4, 1983, abandoned. This application Aug. 28, 1987, Ser. No. 91,309

Claims priority, application France, Oct. 11, 1982, 82 17123

Int. Cl.[4] C08K *3/24*

U.S. Cl. 524—406 **6 Claims**

1. Vinylidene fluoride polymer composition, comprising:

at least 85 mole percent monomeric units derived from vinylidene fluoride and an effective amount of a smoke reducer consisting of a molybdate of calcium, zinc, or aluminum.

4,898,907

COMPOSITIONS OF PLATINUM AND RHODIUM CATALYST IN COMBINATION WITH HYDROGEN SILSESQUIOXANE RESIN

Loren A. Haluska; Keith W. Michael, both of Midland, and Leo Tarhay, Sanford, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 937,273, Dec. 3, 1986, Pat. No. 4,822,697. This application Oct. 27, 1988, Ser. No. 263,206

Int. Cl.[4] C08K *5/01*

U.S. Cl. 524—490 **9 Claims**

1. A composition of matter comprising a solvent solution of a mixture of

(a) hydrogen silsesquioxane resin, and

(b) a metal catalyst selected from the group consisting of platinum catalysts and rhodium catalysts.

4,898,908

ANIONIC POLYMER HYDROGELS AND A PROCESS FOR MAKING THE SAME

Shawqui Lahalih, and George Hovakeemian, both of Safat, Kuwait, assignors to Kuwait Institute for Scientific Research, Safat, Kuwait

Filed Jan. 26, 1989, Ser. No. 301,948

Int. Cl.[4] C08J *61/00;* **C08K** *00/00*

U.S. Cl. 524—593 **12 Claims**

1. An anionic polymeric hydrogel consisting essentially of sulfonated aminoformaldehyde resin having a capability to absorb at least three (3) times its own weight of deionized water.

4,898,909

AQUEOUS POLYACRYLATE DISPERSIONS AND THEIR USE FOR THE PRODUCTION OF SELF-ADHESIVE STRUCTURES HAVING GOOD LOW TEMPERATURE ADHESION

Juergen Vietmeier, Wachenheim; Peter Pfoehler, Speyer; Gundo Brauch, Wachenheim; Wolfgang Druschke, Dirmstein, and Albrecht Zosel, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 30, 1987, Ser. No. 139,822

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 3700248

Int. Cl.[4] C08L *33/00*

U.S. Cl. 524—820 **2 Claims**

1. A 40–70% strength aqueous dispersion of a copolymer having a glass transition temperature of not more than −45? C. and a K value greater than 80 and consisting of

(a) from 90 to 95% by weight of one or more nontertiary acrylates of alkanols of 8 to 12 carbon atoms,

(b) from 0 to 18% by weight of at least one of acrylates or methacrylates of alkanols of 1 to 4 carbon atoms, vinyl esters of carboxylic acids of 2 to 4 carbon atoms, (meth)acrylonitrile or styrene,

(c) from 0.1 to 4% by weight of at least one of α,β-monoolefinically unsaturated mono- or dicarboxylic acids of 3 to 5 carbon atoms or their amides, which are unsubstituted or substituted at the nitrogen atoms by alkyl of 1 to 4 carbon atoms or carboxyl, or hydroxylalkyl acrylates where alkyl is of 2 to 5 carbon atoms, and

(d) from 0.01 to 3% by weight of α- methylstyrene.

4,898,910

MODULUS CONTROL IN SILICONE SEALANT

Russell P. Kamis, County of Bay; Jerome M. Klosowski, Bay City, and Loren D. Lower, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 26, 1988, Ser. No. 249,731

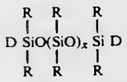
Int. Cl.[4] C08L *83/04*

U.S. Cl. 524—860 **4 Claims**

1. A silicone sealant, containing polydiorganosiloxane having alkoxy endblocking, alkoxy functional crosslinker and/or chain extender, and titanium catalyst, produced by a method comprising

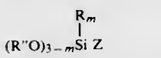
(A) mixing in the absence of moisture

(1) 100 parts by weight of a polymer mixture of the average formula



where each R is free of aliphatic unsaturation and is at least one selected from the group consisting of monovalent hydrocarbon, monovalent halohydrocarbon, and monovalent cyanoalkyl radicals of 1 to 18 inclusive

carbon atoms, each D is selected from the group consisting of the vinyl radical and radicals of the formula



where each R'' is at least one selected from the group consisting of methyl, ethyl, propyl, and butyl, Z is a divalent hydrocarbon radical or combination of divalent hydrocarbon radicals and siloxane radicals, m is 0 or 1, and x is of a value such that the polymer has a viscosity of from 0.5 to 3000 Pa.s at 25° C., from 3 to 40 percent of the total of endblocking radicals D in the polymer mixture being vinyl radicals,

(2) from 0.1 to 14 parts by weight of an alkoxysilane of the formula



where R' is at least one selected from the group consisting of methyl, ethyl, propyl, phenyl, and vinyl, R'' is as defined above and a is 0, 1, or 2 and

(3) from 0.2 to 6 parts by weight of titanium catalyst, and

(4) optional filler,

(B) storing the mixture in the absence of moisture,

to give a sealant which is stable in the absence of moisture and has a modulus which is at a desired level after cure of the sealant.

4,898,911

RESIN COMPOSITION

Shunitsu Miyashita, and Kenji Mogami, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki, Osaka, Japan

Continuation-in-part of Ser. No. 122,738, Nov. 19, 1987. This application Dec. 24, 1987, Ser. No. 137,698

Claims priority, application Japan, Nov. 20, 1986, 61-276927; Dec. 26, 1986, 61-314245; May 30, 1987, 62-135805

Int. Cl.[4] C08L *37/00, 33/02*

U.S. Cl. 525—74 **6 Claims**

1. A melt-blended resin composition consisting essentially of:

(a) 5 to 95% by weight of a resin containing at least one epoxy group per molecule and having a modulus of elasticity in bending measured according to ASTM D790 of at most 10^4 kg/cm^2 at room temperature, and

(b) 95 to 5% by weight of a copolymer of an α- olefin and an α,β-unsaturated carboxylic acid wherein at least 5% by mole of the carboxyl groups are neutralized with an alkali metal and which has a modulus of elasticity in bending measured according to ASTM D790 of at most 10^4 kg/cm^2 at room temperature.

4,898,912

COMPATIBLE POLYMER BLENDS

Werner Siol, Darmstadt, and Ulrich Terbrack, Reinheim, both of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Sep. 15, 1987, Ser. No. 96,472

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632369

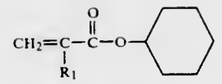
Int. Cl.[4] C08L *27/12, 35/00, 45/00*

U.S. Cl. 525—199 **25 Claims**

I. A miscible polymer blend, consisting essentially of:

(i) 0.1-99.9 wt.% of a first polymer comprising at least 90 wt.% and up to 100 wt.% of styrene monomer units; and

(ii) 99.9-0.1 wt.% of a second polymer comprising at least 10 wt.% and up to 100 wt.% of of monomer units of the formula (I)



(I)

wherein R_1 is hydrogen or methyl.

4,898,913

METHOD OF MAKING HYDROPHOBIC COPOLYMERS HYDROPHILIC

Maris J. Ziemelis, and William R. R. Park, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 7, 1989, Ser. No. 334,501

Int. Cl.[4] C08F *267/02, 265/02*

U.S. Cl. 525—301 **11 Claims**

1. A method for altering a macroporous highly cross-linked hydrophobic copolymer, produced by precipitation polymerization in a solvent of at least one monounsaturated ester monomer and at least one polyunsaturated ester monomer soluble therein, in order to render the hydrophobic copolymer hydrophilic, comprising polymerizing an acrylate monomer on the surface of the hydrophobic copolymer in order to form carboxylic acid sites on the surface of the hydrophobic copolymer.

4,898,914

MODIFIED BLOCK COPOLYMERS FUNCTIONALIZED IN THE MONOALKENYL AROMATIC OR VINYLARENE BLOCK

William P. Gergen, Houston, and Robert G. Lutz, Spring, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 766,217, Aug. 16, 1985. This application May 16, 1988, Ser. No. 194,670

Int. Cl.[4] C08L *53/02*

U.S. Cl. 525—314 **12 Claims**

1. A functionalized selectively hydrogenated block copolymer of the formula $B_n(AB)_oA_p$ where n=0 or 1, o=1 to 50, p=0 or 1, each A is predominantly a polymerized monoalkenyl aromatic or vinylarene hydrocarbon block and each B prior to hydrogenation is predominantly a polymerized conjugated diene hydrocarbon block, to which has been grafted at least one ethylene oxide molecule, wherein substantially all of the grafted molecules are grafted to the block copolymer in the monoalkenyl aromatic or vinylarene block.

4,898,915

ALTERNATING COPOLYMERIZATION OF DONOR MONOMERS HAVING PROTECTED AMINE GROUPS WITH ACCEPTOR MONOMERS

H. James Harwood, Stow; Ramendra N. Majumdar, Akron, both of Ohio, and Shih-Liang Yang, Pamona, Calif., assignors to University of Akron, Akron, Ohio

Filed Aug. 24, 1983, Ser. No. 525,953

Int. Cl.[4] C08F *18/22, 20/52*

U.S. Cl. 525—326.7 **5 Claims**

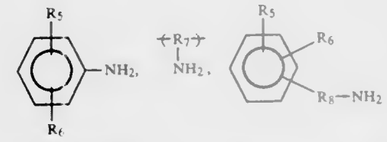
1. An alternating copolymer, consisting of:

substantially alternating units having the formula



and units that are selected from the amine group containing units consisting of

-continued



and combinations thereof, some of said amine groups containing protected amine groups thereon,

where R_1, R_2 and R_3 can be the same or different and are selected from the group consisting of hydrogen, a halogen, an alkyl having from 1 to 6 carbon atoms, an aryl having from 6 to 15 carbon atoms, and alkyl substituted aryl having from 7 to 15 carbon atoms, and an acid or ester of the formula



where R' is hydrogen, or an alkyl having from 1 to 20 carbon atoms;

where A is a nitrile group, or

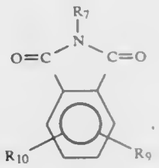


where R_4 is hydrogen, an alkyl having from 1 to 20 carbon atoms, an aryl having from 6 to 19 carbon atoms, an alkyl substituted aryl having from 6 to 20 carbon atoms, a halogen substituted phenyl having from 1 to 5 halogens thereon, a substituted aryl having from 6 to 20 carbon atoms with said substituted group being alkoxy, aryloxy, nitrilo, nitro, carboxyl, or a carboxylic acid ester group,

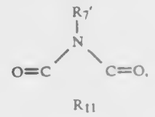
where R_5 and R_7 each represents a substituted ethylene group having from 2 to 6 carbon atoms,

where R_6 is hydrogen, an alkyl having from 1 to 10 carbon atoms, a halogen, an alkoxy having from 1 to 10 carbon atoms or an aryloxy having from 6 to 20 carbon atoms, and

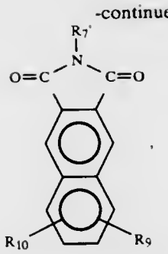
where R_8 is an alkylene having from 2 to 6 carbon atoms or an alkylene arylene having from 7 to 15 carbon atoms, said alternating unit contains protected amino groups therein being made from a compound having the formula selected from



Formula XI(a)



Formula XI(b)



Formula XI(c)

where R_9 and R_{10} each represents a hydrogen, an alkyl having from 1 to 8 carbon atoms, an aryl having from 6 to 20 carbon atoms, an alkoxy having from 1 to 8 carbon atoms, an aryloxy having from 6 to 20 carbon atoms, or a halogen; and

wherein said R_{11} is a hydrogencarbon having from 1 to 18 carbon atoms using one specie thereof which has been reacted with a basic compound.

4,898,916

PROCESS FOR THE PREPARATION OF POLY(VINYLPHENOL) FROM POLY(ACETOXYSTYRENE) BY ACID CATALYZED TRANSESTERIFICATION

Balaram B. G. Gupta, North Plainfield, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 22,186, Mar. 5, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 231,582

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.[4] C08F *8/12*

U.S. Cl. 525—344 **11 Claims**

1. A process for converting polymers of 4-acetoxystyrene to polymers of 4-vinylphenol which comprises:

a. forming a slurry of the polymer of 4-acetoxystyrene in an alcohol;

b. adding an acid to the slurry;

c. holding the slurry at a temperature of about 20° C. to about 65° C. until the polymer dissolves in the alcohol, indicating complete conversion of the acetoxy groups to phenolic groups;

d. adding a base in an amount sufficient to raise the pH to about 5 to about 7; and

e. recovering the 4-vinylphenol polymer.

4,898,917

N-SUBSTITUTED POLYBENZIMIDAZOLE POLYMER

Michael J. Sansone, Berkeley Heights, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 99,431, Sep. 11, 1987, abandoned. This application Sep. 21, 1988, Ser. No. 247,132

Int. Cl.[4] C08G *73/18*

U.S. Cl. 525—420 **23 Claims**

1. A process for the production of substituted polybenzimidazole polymers which comprises the following steps:

a. preparing a polybenzimidazole polymer solvent solution;

b. forming a polybenzimidazole anion from the polybenzimidazole polymer in solution; and

c. reacting the polybenzimidazole anion with a substituted methyl halide having the general formula of R—CH_2X, wherein R is selected from the group consisting of hydrogen, unsubstituted and substituted alkyl, unsubstituted and substituted alkenyl, and unsubstituted and substituted aryl groups wherein the substituents are selected from methyl, ethyl, pyridyl, halo, cyano, or nitro and wherein X is a halide substituent selected from the group consisting of

chloro, bromo, and iodo, to produce an N-substituted polybenzimidazole polymer.

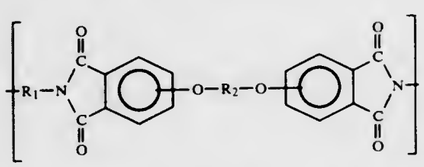
4,898,918

THERMOPLASTIC RESIN COMPOSITION

Naoki Yamamoto; Hiroshi Mori, both of Hiroshima; Akira Nakata, Otake, and Misayo Suehiro, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

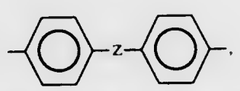
Filed Sep. 30, 1988, Ser. No. 251,464
Claims priority, application Japan, Oct. 1, 1987, 62-245921
Int. Cl.[4] C08F *283/04*
U.S. Cl. 525—425 **11 Claims**

1. A thermoplastic resin composition, comprising:
(A) a polyether imide resin, consisting of recurring units having the formula (1)

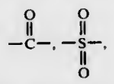


(1)

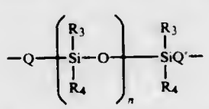
wherein R_1 and R_2 are, independently, a substituted or unsubstituted phenylene group, or a group having the formula



wherein Z is an oxygen atom, a sulfur atom,

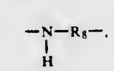


or an alkylene group having 5 or less carbon atoms; and
(B) an aromatic polyester-polyorganosiloxane block copolymer, containing at least one polymer segment, comprising, as its main constituent, at least one segment selected from the group consisting of: (i) an aromatic polyester comprising monomer units derived from at least one aromatic dicarboxylic acid and at least one dihydric phenol; (ii) an aromatic polyester comprising monomer units derived from at least one aromatic dicarboxylic acid and at least one diol selected from lower aliphatic diols and alicyclic diols; and (iii) an aromatic polyester comprising monomer units derived from an aromatic hydroxycarboxylic acid; and polyorganosiloxane segments having the formula (2)



(2)

wherein R_3 and R_4 are, independently, methyl or phenyl groups, Q is an oxygen atom,



or —O—R_9— in which each of R_8 and R_9 is a lower alkylene group or a lower alkylene ether group; and Q' is an oxygen atom,

or —R_9—O—, wherein R_8 and R_9 are as defined above, and n is an integer of 10 or more, and wherein the weight ratio of (A) to (B) is 1/9 to 9/1.

4,898,919

POLYURETHANE ADHESIVE

Ryuichi Ueda, Ikeda; Masahito Mori, and Kohske Torii, both of Takatsuki, all of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Osaka, Japan

Filed Jul. 22, 1988, Ser. No. 223,106
Claims priority, application Japan, Jul. 28, 1987, 62-189860; Jul. 31, 1987, 62-193127
Int. Cl.[4] C08L *75/06*
U.S. Cl. 525—440 **5 Claims**

1. A polyurethane adhesive which comprises
(a) a block polyurethane polyol produced by reacting a hydrogenated polybutadiene glycol, a polyol having two or more hydroxy groups in the molecule and a polyisocyanate,
(b) a thermoplastic polyester urethane rubber, and
(c) a polyisocyanate compound as a crosslinking agent.

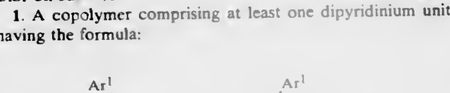
4,898,920

ADHESIVE COMPOSITIONS, CONTROLLED RELEASE COMPOSITIONS AND TRANSDERMAL DELIVERY DEVICE

Chi-Long Lee, Midland, and Katherine L. Ulman, Sanford, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 15, 1987, Ser. No. 109,157
Int. Cl.[4] C08F *77/04*
U.S. Cl. 525—477 **24 Claims**

1. An adhesive composition consisting essentially of a blend of
(A) about 10 to 99 wt. % of said composition of a random graft copolymer having the average formula



wherein x/y is in the range of 0.01 to 100, inclusive; x+y is in the range of 10 to 1000, inclusive; z is a number less than or equal to 15; R is selected from the group consisting of alkyl radicals having 1 to 8 carbon atoms, aryl radicals and haloalkyl radicals; all R groups can be the same or different; M is H, —COCH=CH_2, or —CO—NH(CH_2-)$_2$—O—CO—C(CH_3)=CH_2; G is a divalent radical selected from —$CH_2CH_2CH_2O$—, —CH_2CH_2O—, or urethane groups; and
(B) correspondingly I to 90 wt. % of a random resinous copolymer consisting essentially of structural units having the formulae $R_3^3SiO_{0.5}$ and SiO_2 wherein R^3 is a monovalent hydrocarbon radical, said resinous copolymer having an SiOH functionality of at least about 0.5 wt. %.

4,898,921

CONDUCTING POLYMER FILMS, METHOD OF MANUFACTURE AND APPLICATIONS THEREFOR

Brian D. Humphrey, Cedar Grove; Marc L. Kasner, Kinnelon, and John L. Isidor, Upper Montclair, all of N.J., assignors to Montclair State College, Montclair, N.J.

Filed Jun. 3, 1987, Ser. No. 57,602
Int. Cl.[4] C08G *81/00, 83/00*
U.S. Cl. 527--300 **30 Claims**

1. A conducting polymer film comprising a polysaccharide matrix with intercalated, bonded conducting polymers selected from the group consisting of polypyrrole, polythiophene, polyaniline and their derivatives.

4,898,922

URETHANE RESINS

Hiroyuki Shiraki, Kobe, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 5, 1988, Ser. No. 253,863
Claims priority, application Japan, Oct. 12, 1987, 62-256886
Int. Cl.[4] C08G *18/32*
U.S. Cl. 528—60 **5 Claims**

1. A urethane resin having mercapto groups in a ratio of about 0.01 to 1 milli-equivalent/g which is prepared by reacting a polyhydroxy component with a polyisocyanate, the polyhydroxy component being a mixture which comprises
(1) a long chain diol having a molecular weight ranging from about 500 to 3000,
(2) a short chain glycol having a molecular weight ranging from about 60 to 400, and
(3) 3-mercapto-1,2-propane diol.

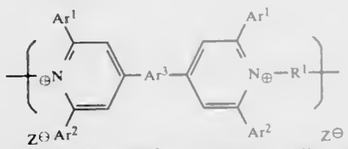
4,898,923

POLYPYRIDINIUM COPOLYMER

Alan R. Katritzky, Gainesville, Fla.; Larry R. Krepski, White Bear Lake, Minn.; Jerald K. Rasmussen, Stillwater, Minn.; Steven M. Heilmann, Afton, Minn., and Richard D. Tarr, Toledo, Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 126,590, Nov. 30, 1987, Pat. No. 4,841,021.
This application Mar. 1, 1989, Ser. No. 317,650
Int. Cl.[4] C08G *33/02*
U.S. Cl. 528—73 **11 Claims**

1. A copolymer comprising at least one dipyridinium unit having the formula:



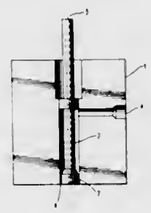
wherein Ar^1, Ar^2, and Ar^3 are the same or different aromatic or heteroaromatic group each of which contains one ring or two fused or catenated rings having 5 to 12 ring carbon or heteroatoms, R^1 is any divalent organic bridging group, and $Z^\ominus$ is a counterion, said copolymer further comprising copolymeric units derived from amine-reactive difunctional comonomers.

4,898,924

PROCESS FOR THE PRODUCTION OF BIAXIALLY ORIENTED RIGID ROD HETEROCYCLIC LIQUID CRYSTALLINE POLYMER FILMS

Edward C. Chenevey, North Plainfield, and Edward R. Kafchinski, Winfield, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jan. 11, 1989, Ser. No. 295,689
Int. Cl.[4] B29C *55/12, 55/28;* C08G *73/22, 75/32*
U.S. Cl. 528—183 **26 Claims**



1. A process for preparing a biaxially oriented film of a rigid rod heterocyclic liquid crystalline polymer comprising,
(i) providing a dope from a polymerization mixture of a rigid rod heterocyclic liquid crystalline polymer and a solvent;
(ii) extruding the dope to form a film;
(iii) imparting biaxial orientation to the film to increase the transverse strength thereof;
(iv) solidifying the biaxially oriented film; and
(v) washing the solidified film to remove the solvent.

4,898,925

ELASTOMERIC ACETAL POLYMERS

George L. Collins, Maplewood; Kurt F. Wissbrun, Short Hills, and Hongkyu Kim, Madison, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 12, 1988, Ser. No. 243,381
Int. Cl.[4] C08G *2/10*
U.S. Cl. 528—230 **5 Claims**

1. An elastomeric copolymer of about 15 to 45 mol % of trioxane and about 55 to 85 mol % of 1,3-dioxolane based on the total of trioxane and 1,3-dioxolane, and about 0.005 to 0.15 wt.% of 1,4-butanediol diglycidyl ether or butadiene diepoxide as a bifunctional monome, based on the total weight of copolymer, said copolymer being substantially non-crystalline in the unstretched state at room temperature.

4,898,926

BIOELASTOMER CONTAINING TETRA/PENTA-PEPTIDE UNITS

Dan W. Urry, Birmingham, Ala., assignor to The University of Alabama at Birmingham/Research Foundation, Birmingham, Ala.

Filed Jun. 15, 1987, Ser. No. 62,557
Int. Cl.[4] C08G *69/10*
U.S. Cl. 528—328 **4 Claims**

1. A bioelastomer containing repeating units comprising elastomeric pentapeptide units or a mixture of tetrapeptide and pentapeptide units, wherein said repeating units comprise amino acid residues selected from the group consisting of hydrophobic amino acid residues and glycine residues, wherein said repeating units exist in β-turn which comprises a polypentapeptide unit of the formula:

—αPρΩG—

wherein
P is a peptide-forming residue of L-proline;
G is a peptide-forming residue of glycine;
α is a peptide-forming residue of L-valine, L-leucine, L-

isoleucine, L-phenylalanine or an ionizable peptide-forming residue selected from the group consisting of residues of L-Glu, L-Asp, L-His, L-Lys and L-Tyr and other ionizable pep-tide-forming L-amino acid residues.

Ω is a peptide-forming residue of L-valine, L-leucine, L-isoleucine, L-phenylalanine or an ionizable peptide-forming residue selected from the group consisting of residues of L-Glu, L-Asp, L-His, L-Lys, and L-Tyr and other ionizable peptide-forming L-amino acid residues; and

ρ is a peptide-forming residue of glycine or a peptide-forming residue of D-Glu, D-Asp, D-His, D-Lys and D-Tyr and other ionizable peptide-forming L-amino acid residues; and wherein n is an integer of from 1 to 5,000; with the proviso that in at least one repeating pentapeptide unit of said bicelastomer, at least one of said α or Ω is a peptide-forming residue selected from the group and L-Tyr and other ionizable peptide-forming L-amino acid residues, or ρ is a peptide-forming residue of glycine or a peptide-forming residue of D-Glu, D-Asp, D-His, D-Lys and D-Tyr and other ionizable peptide-forming L-amino acid residues.

4,898,927

NON-FUSIBLE POLYMER INSOLUBLE IN ORGANIC SOLVENTS FROM 1,3,5,7-TETRATHIA-S-INDACENE-2,6-DITHIONE

Max Hunziker, Düdingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 14, 1988, Ser. No. 218,768

Claims priority, application Switzerland, Jul. 24, 1987, 2825/87; Jul. 30, 1987, 2915/87

Int. Cl.⁴ C08G *75/00*

U.S. Cl. 528—377 **10 Claims**

1. A non-fusible polymer which is insoluble in organic solvents and essentially is of the formula I

(1)



in which n is 2 or a number greater than 2 and each radical R_1 independently is —H, C_1–C_{20}alkyl, C_1–C_{20}alkoxy, aryl or aryloxy with up to 12 C atoms, aralkyl with up to 20 C atoms, alkaryl with up to 20 C atoms, —CN, —$OCOR_2$, —OH or —SR_3, in which R_2 and R_3 independently of one another are each C_1–C_{20}alkyl or aryl with up to 12 C atoms.

4,898,928

POLYACETAL AND POLYKETAL HYDROGELS FORMED FROM ACETALS OR KETALS AND POLYOLS

Jorge Heller, Woodside; Donald W. H. Penhale, Menlo Park, and Steve Y. Ng, San Francisco, all of Calif., assignors to Sandoz Pharmaceuticals Corp., E. Hanover, N.J.

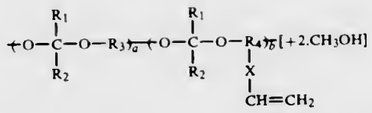
Filed Mar. 7, 1988, Ser. No. 164,604

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

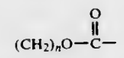
Int. Cl.⁴ C08G *18/30*

U.S. Cl. 528—392 **17 Claims**

1. Water-soluble polyacetal or polyketal having the formula



wherein R_1, and R_2 are aliphatic, cycloaliphatic or aromatic groups, for ketals; R_1 is hydrogen and R_2 is aliphatic, cycloaliphatic, or aromatic groups for acetals; R_3 and R_4 are also aliphatic, alkoxy, cycloaliphatic or aromatic groups X represents groups as $(CH_2)_n$, $O(CH_2)_nO$ or



that connect the pendant unsaturation to the aliphatic, cycloaliphatic or aromatic R^4 groups, the ratio of a to b is 0.5 to 10, and n is 10–100.

4,898,929

ALKENYL PHENOXY POLYFLUOROALKOXYPHOSPHAZENE

W. Dirk Klobucar; Charles H. Kolich, and Jeffrey T. Books, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 2, 1988, Ser. No. 265,991

Int. Cl.⁴ C08G *79/02;* **C08F** *6/02*

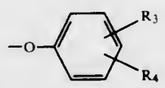
U.S. Cl. 528—399 **21 Claims**

1. A Substantially linear organophosphazene polymer containing randomly distributed repeating units represented by the formulas:

wherein R_1 is a fluoroalkoxy group having the structure:

$$F_3C—(CF_2)_m—CH_2O—$$

wherein m is 0 or an integer from 1 to 20 and wherein at least 3 of the R_1 units are different from each other and R_2 represents a group with some alkenyl group unsaturation which enhances the curability of said polymers and represented by the formula:



wherein R_3 is an alkenyl monovalent group and R_4 is selected from the group consisting of H, alkyl and alkoxy, the total number of said units ranging from 3 to about 100,000 and the R_2 groups being present in an amount sufficient to enable the cure of said polymers and in the range of about 0.01–50 mole percent of the total number of R_1 and R_2 groups.

4,898,930

PEPTIDE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Evzen Kasafirek; Mirosiav Rybák; Ivan Krejcí; Antonín Sturc; Alena Roubalová, all of Prague; Jirí Vanzura, Hradec Králové; Evzen Krepela, Brno, and Michal Bartík, Kosice, all of Czechoslovakia, assignors to Spofa, spojene podniky pro, Prague, Czechosiovakia

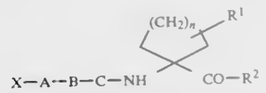
Filed Jun. 12, 1987, Ser. No. 62,300

Claims priority, application Czechoslovakia, Jun. 12, 1986, 4332-86

Int. Cl.⁴ C07K *7/54*

U.S. Cl. 530—332 **15 Claims**

1. Peptide derivatives of the general formula I,



in which

X is H, a C_2 to C_5 alkanecarbonyl, a C_3 to C_6 carboxyalkanecarbonyl or a p-toluenesulfonyl,

A is a glycine, alanine, leucine, phenylalanine, tyrosine, lysine or arginine residue,

B is a glutamine, proline, arginine or lysine residue or a direct chemical bond,

n is an integer of from 1 to 3, R^1 is H or a C_1 to C_3 alkyl and R^2 is a C_1 to C_3 alkoxyl or an amino group selected from the group consisting of glycine, alanine, leucine, phenylalanine and serine when C is a glycine, alanine, leucine, phenylalanine, glutamine or serine residue or

R^2 is a glycine, alanine, leucine, phenylalanine or serine methyl ester, ethyl ester or amide residue when C is a direct chemical bond, and pharmaceutically acceptable acid addition salts thereof.

4,898,931

NOVEL HUMAN INTERFERON-γ POLYPEPTIDE DERIVATIVE

Seiga Itoh, Sagamihara; Yasutoshi Takeichi, and Moriyuki Sato, both of Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 751,205

Claims priority, application Japan, Jul. 11, 1984, 59-143950

Int. Cl.⁴ C07K *13/00, 15/26;* **A61K** *45/02*

U.S. Cl. 530—351 **1 Claim**

1. A derivative of human interferon-γ polypeptide comprising an amino acid sequence in which nine amino acid residues have been removed from the carboxy terminus thereof, the methionine residue at position 137 has been replaced with a cysteine and the amino acid at positions 1 and 3 may be serine or cysteine and which is encoded by a recombinant plasmid selected from the group consisting of pGVT137, pGNC5 and pGNB4.

4,898,932

MONOCLONAL ANTIBODIES REACTIVE WITH ACTIVATED AND ONCOGENIC RAS P21 PROTEINS

Walter P. Carney, Brighton, Mass., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 913,905, Oct. 1, 1986, abandoned, and a continuation-in-part of Ser. No. 696,197, Jan. 19, 1985, abandoned. This application Oct. 22, 1987, Ser. No. 111,315

Int. Cl.⁴ C07K *15/00;* **C12N** *5/00*

U.S. Cl. 530—387 **13 Claims**

1. A monoclonal antibody which binds specifically to an epitope of an activated ras protein containing valine at position 12 and does not bind to an epitope of normal nononcogenic ras protein containing glycine at position 12, wherein said epitope of the activated ras protein also is bound by a monoclonal antibody produced by hybridoma cell line having ATCC Accession No. HB 8698.

4,898,933

WATER-SOLUBLE FIBER-REACTIVE AMINOTRIAZINE AND VINYLSULFONE CONTAINING AZO DYESTUFFS HAVING CARBOXY- OR CARBAMOYL PYRIDINIUM GROUPS

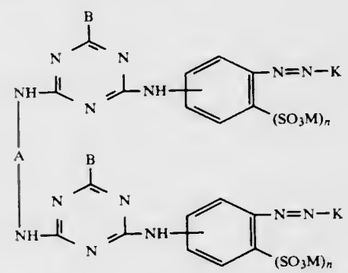
Ludwig Schläfer, Kelkheim; Hartmut Springer, and Reinhard Hähnle, both of Königstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 115,435, Oct. 30, 1987, Pat. No. 4,861,344. This application May 5, 1989, Ser. No. 348,276

Int. Cl.⁴ C09B *62/453, 62/09, 62/513;* **D06P** *1/38*

U.S. Cl. 534—605 **4 Claims**

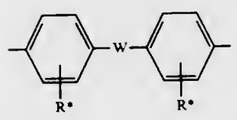
1. A water-soluble azo compound which conforms to the formula



in which

A is phenylene unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, chlorine, sulfo and carboxy, or

A is a group of the formula



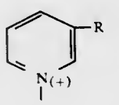
in which

W is a direct bond or a vinylidene group of the formula —CH=CH— or a group of the formula —NH—CO—NH— and

R• is hydrogen or nitro, sulfo, carboxy, methyl, ethyl, methoxy or ethoxy;

B is a pyridinium group of the formula

(3)



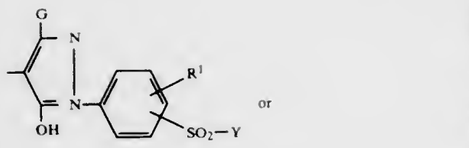
in which

R is carboxy or carbamoyl;

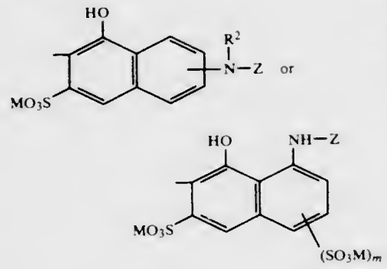
n is zero or 1;

M is hydrogen or an alkali metal;

K is a group of the formula

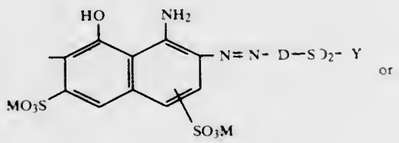


or

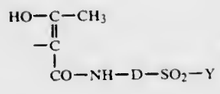


the one —SO_3M group being bonded in the meta- or para-position relative to the —NH—Z group

or is



or



in which

D is phenylene unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, bromine, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carboxy and sulfo, or is naphthylene unsubstituted or substituted by 1 or 2 sulfos;

R^1 is hydrogen, chlorine, alkyl group of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R^2 is hydrogen or alkyl of 1 to 4 carbon atoms;

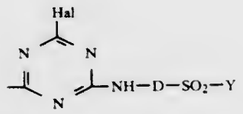
G is carboxy, methyl or carbalkoxy of 2 to 5 carbon atoms;

Y is a vinyl, β-sulfatoethyl or β-chloroethyl;

M has the abovementioned meaning;

m is zero or 1;

Z is α- or β-bromoacryloyl or is β-chloropropionyl, β-chloroethylsulfonylbenzoyl or (β-chloroethylsulfonylmethyl)-benzoyl or a group of the formula



in which D and Y have the abovementioned meanings and Hal is chlorine or fluorine;

one of the sulfo, sulfato and carboxy groups forms an anion equivalent to the pyridinium cation.

4,898,934

PROCESS FOR MANUFACTURING LIGHT-COLORED ALKYLOLIGOGYCOSIDES AND ALKYLGLYCOSIDES

Harald Lueders, Recklinghausen, and Peter Hofmann, Marl, both of Fed. Rep. of Germany, assignors to Hnels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 240,594

Claims priority, applicatioo Fed. Rep. of Germany, Sep. 5, 1987, 3729843

Int. Cl.[4] C07G *3/00, 17/00, 11/00;* **C07H** *15/04*

U.S. Cl. 536—18.6 **12 Claims**

1. A process for manufacturing light-colored alkyloligoglycosides and alkylglycosides having C_{8-24} alkyl groups from saccharides and alcohols, comprising the steps of:

(i) reacting at least one saccharide with a C_{1-6} alcohol to prepare a C_{1-6} alkylglycoside or alkyloligoglycoside;

(ii) reacting said C_{1-6} alkylglycoside or alkyloligoglycoside with a C_{8-24} alcohol at an elevated temperature of 80° to 140° C. and in the presence of an acid catalyst, wherein a complex-forming agent selected from the group consisting of alkali salts of phosphoric acid, polyphosphoric acid, hydrofluoric acid, and hydrocyanic acid and polybasic saturated carboxylic acids, an alkali salt thereof of a methyl or ethyl ester thereof is present during one or both of steps (i) and (ii), to produce a product solution containing said C_{8-24} alkyloligoglycoside or alkylglycoside;

(iii) separating said C_{8-24} alkyloligoglycoside or alkylglycoside from said product solution; and

(iv) bleaching said C_{8-24} alkyloligoglycoside or alkylglycoside with a peroxide compound.

4,898,935

METHOD OF PRODUCING SUCROSE FATTY ACID ESTER GRANULES

Shingo Nakamura, Kyoto, and Hiroshi Nagahara, Osaka, both of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jan. 17, 1989, Ser. No. 297,806

Claims priority, application Japan, Jan. 22, 1988, 63-6313247

Int. Cl.[4] C07H *13/02, 11/00*

U.S. Cl. 536—119 **1 Claim**

1. A method of producing sucrose fatty acid ester granules by the fluidized bed granulation and drying technique which comprises forming a fluidized bed comprising a sucrose fatty acid ester powder at a temperature not exceeding 60° C., spraying the fluidized bed with an aqueous sucrose fatty acid ester solution having a concentration of 3–20% by weight, as a binder, and then drying the sprayed fluidized bed, to thereby cause granulation.

4,898,936

2-DEOXYURIDINES AND RIBOSIDE PRECURSORS

James E. Ollmann, and Ralph J. DePasquale, both of Jacksonville, Fla., assignors to PCR, Inc., Gainesville, Fla.

Continuation-in-part of Ser. No. 653,451, Sep. 24, 1984, abandoned. This application Sep. 19, 1985, Ser. No. 777,701

Int. Cl.[4] C07H *19/073, 11/00, 23/00*

U.S. Cl. 536—17.1 **5 Claims**

2. Methyl 3-O-benzyl-5-O-(t-butyldimethylsilyl)-2-deoxy-ribofuranoside.

5. The alpha-3'-O-benzyl-2'-deoxy-5-trifluoromethyl-uridine.

4,898,937

α-CRYSTALS OF CEFAZOLIN SODIUM

Toshinobu Uemura, Kishiwada; Keiji Kai, Osaka; Masateru Kodani, Ikeda; Fumiyo Yoshida, Osaka, and Matsuhiko Aratani, Daito, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 2, 1989, Ser. No. 305,167

Claims priority, application Japan, Feb. 5, 1988, 63-26337

Int. Cl.[4] C07D *501/56;* **A61K** *31/545*

U.S. Cl. 540—227 **2 Claims**

1. α-Crystals of cefazolin sodium with a water content in the range of 13.0 to 15.8 percent.

4,898,938

METHOD FOR PREPARING CRYSTALLINE CEFADROXIL MONOHYDRATE

Leonardo Marsili, Segrate, Italy, assignor to Rifar S.r.L., Milan, Italy

Filed Aug. 3, 1987, Ser. No. 80,999

Int. Cl.[4] C07D *501/22;* **A61K** *31/545*

U.S. Cl. 540—230 **2 Claims**

1. A method for preparing crystalline cefadroxil monohydrate which comprises slurrying a cefadroxil solvate with isopropyl alcohol containing from about 6% to about 18% of water, at a temperature in the range of about +45° C. to +55° C. for a time of about 1 to 2 hours, and isolating the crystalline cefadroxil monohydrate by filtration.

4,898,939

PROCESS FOR PREPARING 2β-SUBSTITUTED-METHYLPENICILLIN DERIVATIVES

Sigeru Torii; Hideo Tanaka; Motoaki Tanaka, all of Okayama; Shozo Yamada, Honjyo, and Akira Nakai, Okayama, all of Japan, assignors to Taibo Pharmaceutical Co., Ltd., Tokyo and Otsuka Kagaku Kabushiki Kaisha, Osaka, both of, Japan

Filed Feb. 28, 1989, Ser. No. 316,632

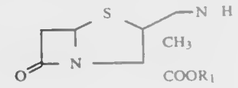
Claims priority, application Japan, Mar. 1, 1988, 63-49038

Int. Cl.[4] C07D *499/00*

U.S. Cl. 540—310 **9 Claims**

1. A process for preparing a 2β-substituted-methylpenicillin derivative represented by the formula

(I)

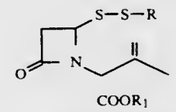


wherein

is pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, tetrazolyl, benzotriazolyl, benzopyrazolyl or benzimidazolyl each of which may have 1 to 3 substituents selected from the class consisting of C_1–C_6 straight- or branched-chain alkyl group, C_1–C_6 straight- or branched-chain alkoxy group, C_2–C_6 acyl group, carbamoyl group, C_1–C_6 alkyl-substituted carbamoyl group, halogen atom, hydroxy group, trifluoromethyl group, nitro group, amino group, formyl group, C_1–C_6 alkoxy-C_1–C_6 alkyl group, C_2–C_7 alkoxycarbonyl group, C_3–C_7 alkenyloxycarbonyl group, benzyloxycarbonyl group which may optionally have 1–3 substituents selected from the group consisting of C_1–C_6 alkyl group, a halogen atom and nitro group on the benzene ring, phenyl group which may optionally have 1–3 substituents selected from the group consisting of C_1–C_6 alkyl group, C_1–C_6 alkoxy group and halogen atom on the benzene ring, C_1–C_6 alkyl groups substituted with 1–3 phenyl groups, C_1–C_6 alkylthio group, C_1–C_6 alkylsulfinyl group and C_1–C_6 alkylsulfonyl group, and R_1 is a penicillin carboxyl protecting group selected from the group consisting of methyl, ethyl, propyl, butyl, tert-butyl, 1,1-dimethylpropyl, 1-cyclopropylmethyl, 2-cyano-1,1-dimethylethyl, bromobenzoylmethyl, p-nitrobenzoylmethyl, dimethylaminomethyl, methylthiomethyl, phenylthiomethyl, succinimidomethyl, trichloroethyl, tribromoethyl, 1,1-dimethyl-2-propenyl, 1,3-dimethyl-3-butenyl, benzyl, diphenylmethyl, trityl, p-nitrobenzyl, p-methoxybenzyl, di(p-methoxyphenyl)methyl, acetoxymethyl, acetoxyethyl, propionyloxyethyl, pivaloyloxymethyl, pivalolyloxyethyl, pivaloyloxypropyl, benzoyloxymethyl, benzoyloxyethyl, benzylcarbonyloxymethyl, cyclohexylcarbonyloxymethyl, methoxymethyl, ethoxymethyl, benzyloxymethyl, 3-phthalidyl, crotonolacton-4-yl, tetrahydropyranyl, dimethylchlorosilyl, trichlorosilyl, pyridine-1-oxide-2-methyl and quinoline-1-oxide-2-methyl, which comprises

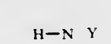
reacting an azetidinonedisulfide compound of the formula

(III)



wherein R_1 is as defined above, and R is a 5- or 6-membered heterocyclic group, which contains 1 to 4 nitrogen atoms and may further contain one oxygen or sulfur atom as the heteroatom in the ring structure, and which may optionally be fused with a benzene ring, and which may optionally have 1 to 3 substituents, selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy halogen atom, nitro, phenyl, tolyl, xylyl, benzyl, phenethyl and trityl, with a nitrogen-containing heterocyclic compound of the formula

(IV)



wherein

is as defined above, in a solvent and in the presence of a metal compound which is an organic carboxylic acid salt, carbonate or oxide of silver, mercury, cerium, copper, lead or thallium, wherein the metal compound is used in an amount of about 1.5 to 5 moles per mole of the compound of the formula (III), the compound of the formula (IV) is used in an amount of about 2 to 20 moles per mole of the compound of the formula (III), and the reaction is carried out at a temperature of about 20° to 100° C.

4,898,940

PEPTIDE ANTIBIOTICS

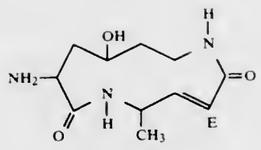
Masataka Konishi, Kawasaki; Koji Tomita, Setagaya; Masahisa Oka, Yokohama, and Ken-ichi Numata, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 51,433, May 19, 1987, Pat. No. 4,833,076, which is a continuation-in-part of Ser. No. 771,090, Aug. 30, 1985, abandoned. This application Feb. 13, 1989, Ser. No. 309,527

Int. Cl.[4] C07D *241/02*

U.S. Cl. 540—460 **1 Claim**

1. A compound of the formula

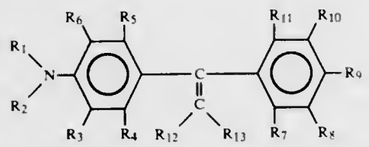


4,898,941
PROCESS FOR PREPARING DIPHENYLALKENE DERIVATIVES

Nobuo Kanda, Hirakata; Haruo Omura, Osaka; Yukihiro Abe, Nishinomiya, and Mitsuru Kondo, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

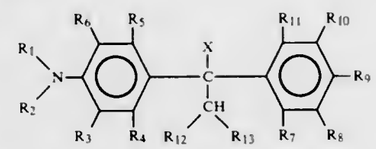
Filed Aug. 11, 1987, Ser. No. 83,815
Claims priority, application Japan, Aug. 22, 1986, 61-197622; Dec. 12, 1986, 61-297276
Int. Cl.[4] C07D *471/06, 223/04, 209/44;* **C07C** *85/24*
U.S. Cl. 540—596 **11 Claims**

1. A process for preparing a diphenylalkene derivative of formula (II)



(II)

which comprises oxidizing a diphenylalkanoic acid derivative of formula (I)



(I)

wherein

each of R_1 and R_2 is selected independently from the group consisting of C_{1-8} alkyl; C_{2-4} alkyl substituted with C_{1-4} alkoxyl; C_{2-4} alkyl substituted with halogen atom; C_{3-9} alkenyl; C_{3-9} alkynyl; C_{5-12} cycloalkyl; phenyl-C_{1-4} alkyl unsubstituted or substituted with halogen atom, C_{1-4} alkyl or C_{1-4} alkoxyl; phenyl unsubstituted or substituted with halogen atom, C_{1-4} alkyl or C_{1-4} alkoxyl; or R_1 and R_2 form together with the nitrogen atom to which R_1 and R_2 are attached, or together with said nitrogen atom and the phenyl ring to which said nitrogen atom is attached, a heteroring selected from the group consisting of pyrrolidine, piperidine, morpholine, hexamethyleneimine, isoindoline, tetrahydroquinoline, indoline and julolidine,

each of R_3 to R_{11} is independently selected from the group consisting of hydrogen atom; halogen atom; C_{1-4} alkyl; C_{1-4} alkoxyl; phenoxy unsubstituted or substituted with halogen atom, C_{1-4} alkyl or C_{1-4} alkoxyl; and the amino group $—N(R_{17})(R_{18})$ wherein each of R_{17} and R_{18} is independently selected from the group consisting of hydrogen atom; C_{1-8} alkyl; C_{2-4} alkyl substituted with C_{1-4} alkoxyl; C_{2-4} alkyl substituted with halogen atom; C_{3-9} alkenyl; C_{3-9} alkynyl; C_{5-12} cycloalkyl; C_{1-4} acyl; phenyl-C_{1-4} alkyl unsubstituted or substituted with halogen atom, C_{1-4} alkyl or C_{1-4} alkoxyl; and phenyl unsubstituted or substituted with halogen atom, C_{1-4} alkyl or C_{1-4} alkoxyl, provided that R_{17} and R_{18} are not hydrogen atoms simultaneously, and R_{17} and R_{18} may form together with the nitrogen atom to which R_{17} and R_{18} are attached, or together with said nitrogen atom and the phenyl ring to which said nitrogen atom is attached, a heteroring selected from the group consisting of pyrrolidine, piperidine, morpholine, hexamethyleneimine, isoindoline, tetrahydroquinoline, indoline and julolidine,

each of R_{12} and R_{13} is independently hydrogen atom or C_{1-4} alkyl,

X is carboxyl, or an amide, ester or halide thereof,

said oxidation being conducted at a temperature in the range of from −5° C. to 150° C., in a solvent which is at least one member selected from the group consisting of water and an inert organic solvent, and in the presence of an oxidizing agent selected from the group consisting of lead dioxide, lead tetraacetate, ferric chloride, potassium persulfate, sodium persulfate, ammonium persulfate and hydrogen peroxide.

4,898,942
PROCESS FOR MANUFACTURING DIAZINON

David Ovadia, Omer, and Ernestine Mandler, Beer-Sheva, both of Israel, assignors to Makhteshim Chemical Works, Ltd., Beer Sheva, Israel

Continuation of Ser. No. 917,195, Oct. 19, 1986, abandoned.
This application Aug. 30, 1988, Ser. No. 239,341
Claims priority, application Israel, Oct. 14, 1985, 76705
Int. Cl.[4] C07F *9/65*
U.S. Cl. 544—243 **11 Claims**

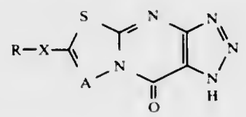
1. An improved process for preparing diazinon by reacting the sodium or potassium salt of 2-isopropyl-4-methyl-6-hydroxypyrimidine with diethylthiophosphoryl chloride the improvement which comprises mixing 2-isopropyl-4-methyl-6-hydroxypyrimidine with solid sodium or potassium hydroxide in a ketone or ether solvent at a temperature of about 50°-60° C. until a homogeneous mixture is formed, adding diethylthiophosphoryl chloride to this homogeneous mixture, keeping the mixture at a temperature of 55°-80° C. until the reaction is complete, and separating the diazinon formed.

4,898,943
TRICYCLIC TRIAZOLOPYRIMIDINE DERIVATIVES

Sumiro Isoda; Shunzo Aibara; Tamotsu Miwa; Hiroyuki Fujiwara; Sbuichi Yokobama, and Hiroo Matsumoto, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,677
Claims priority, application Japan, Feb. 6, 1987, 62-25853; Mar. 30, 1987, 62-77344
Int. Cl.[4] C07D *513/14;* **A61K** *31/52*
U.S. Cl. 544—251 **15 Claims**

1. A compound represented by formula (I)



(I)

where A represents



or =N—; A' represents a hydrogen atom, an alkyl group or a halogen-substituted alkyl group having 1 to 6 carbon atoms; R represents a cycloalkyl group having 4 to 14 carbon atoms which may be substituted with one or more alkyl groups, having 1 to 6 carbon atoms; and X represents a single bond, or

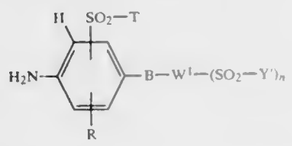
an alkylene group having 1 to 10 carbon atoms or an alkenylene group having 2 to 10 carbon atoms, each of which may be substituted with one or more substituents selected from the group consisting of an alkoxy group having 1 to 6 carbon atoms and a halogen atom, and physiologically acceptable salts thereof.

4,898,944
PRECURSORS FOR THE PREPARATION OF WATER-SOLUBLE TRIPHENDIOXAZINE DYESTUFFS

Günther Schwaiger, Frankfurt am Main; Hartmut Springer, Königstein/Taunus, and Walter Helmling, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 909,010, Sep. 18, 1986, Pat. No. 4,786,728.
This application Oct. 27, 1988, Ser. No. 263,613
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 3533411; Jul. 26, 1987, 3625347
Int. Cl.[4] C07C *147/103, 147/107, 147/12*
U.S. Cl. 544—337 **10 Claims**

1. A compound of the formula (4)



(4)

in which:

Y' is vinyl, β-hydroxyethyl or an ethyl group which contains, in the β-position, a substituent which is eliminated by an alkali;

R is a hydrogen atom or alkyl with 1 to 6 carbon atoms, alkoxy with 1 to 5 carbon atoms, halogen, carboxy, or sulfo;

n is the number 1 or 2;

T is alkyl of 1 to 6 carbon atoms with may be interrupted by 1 or 2 hetero groups selected from the group consisting of —O—, —S—, —NH—, and —N(R')—, the alkyl group T is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, but with the exclusion of substituents which conform to said group Y', or

T is phenyl or naphthyl, or is phenyl or naphthyl both of which are substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, carbamoyl unsubstituted or monosubstituted or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, sulfamoyl unsubstituted or monosubstituted or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, trifluoromethyl, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, nitro and amino unsubstituted or monosubstituted or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms;

B is an oxygen or sulfur atom or an amino group of the formula —NH— or —N((R')—, and

R' of formula —N(R')— in said definition of T and B is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo;

W^1 is alkylene of 1 to 6 carbon atoms which may be interrupted by 1 or 2 hetero groups which are selected from groups of the formulae 'O—, —S—, $—SO_2—$, —CO—, 1,4-piperidino, —NH— and $—N(R^o)—$ in which R^o has one of the meanings of R' or is alkanoyl of 2 to 5 carbon atoms, and the alkylene W^1 is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, or

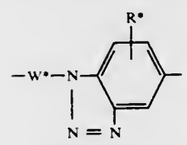
W^1 is an alkylene-phenylene, phenylene-alkylene, phenylene-alkylene-phenylene or alkylene-phenylene-alkylene group, the alkylene moieties of which are of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, and interrupted or non-interrupted by 1 or 2 hetero groups selected from those mentioned above, and the phenylene moieties of which are unsubstituted or substituted by 1 or 2 substituents selected from the group of substituents consisting of sulfo, carboxy, sulfamonyl carbamoyl, methyl, ethyl, methoxy, ethoxy, nitro, chlorine, amino and amino substituted by alkyl of 1 to 4 carbon atoms, phenyl and/or phenylalkyl with an alkyl of 1 to 4 carbon atoms, or

W^1 is phenylene or naphthylene, or phenylene or naphthylene both of which are substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, sulfamoyl, carbamoyl, carbamoyl which is mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, sulfamoyl which is mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, trifluoromethyl, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, nitro, amino and amino mono- or di-substituted by alkyl of 1 to 4 carbon atoms phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, or

W^1 is one of the above-mentioned alkylene and arylene moieties which are connected with one another by one of the above-mentioned hetero groups, or

W^1 is a cycloalkylene of 5 to 10 carbon atoms unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, or is an alkylene-cycloalkylene or cycloalkylene-alkylene or alkylene-cycloalkylene-alkylene the alkylene moieties of which are of 1 to 4 carbon atoms and the cycloalkylene moities of which are of 5 to 8 carbon atoms and may be substituted by alkyl of 1 to 4 carbon atoms, or

W^1 is a group of the formula



in which

R^* is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, carboxy or sulfo, and

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W* is alkylene of 1 to 6 carbon atoms which may be interrupted by 1 or 2 hetero groups which are selected from groups of the formulae —O—, —S—, $—SO_2$, —CO—, 1,4-piperidino, —NH— and —N(R°)— in which R° has one of the meanings of R' —CO—, or is alkanoyl of 2 to 5 carbon atoms, and the alkylene W* is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, or

W* is an alkylene-phenylene, phenylene-alkylene, phenylene-alkylene-phenylene or alkylene-phenylene-alkylene group, the alkylene moieties of which are of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, and interrupted or non-interrupted by 1 or 2 hetero groups selected from those mentioned above, and the phenylene moieties of which are unsubstituted or substituted by 1 or 2 substituents selected from the group of substituents consisting of sulfo, carboxy, sulfamoyl, carbamoyl, methyl, ethyl, methoxy, ethoxy, nitro, chlorine, amino and amino substituted by alkyl of 1 to 4 carbon atoms, phenyl and/or phenylalkyl with an alkyl of 1 to 4 carbon atoms, or

W* is phenylene or naphthylene, or phenylene or naphthylene both of which are substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, sulfamoyl, carbamoyl, carbamoyl which is mono- or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, sulfamoyl which is mono- or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, trifluoromethyl, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, nitro, amino and amino mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbn atoms, and/or cycloalkyl of 5 to 8 carbon atoms, or

W* is one of the above-mentioned alkylene and arylene moieties which are connected with one another by one of the above-mentioned hetero groups, or

W* is a cycloalkylene of 5 to 10 carbon atoms unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, or is an alkylene-cycloalkylene or cycloalkylene-alkylene or alkylene-cycloalkylene-alkylene the alkylene moieties of which are of 1 to 4 carbon atoms and the cycloalkylene moieties of which are of 5 to 8 carbon atoms and may be substituted by alkyl of 1 to 4 carbon atoms;

at least one of the sulfo and sulfato groups which may be present in the molecule as mentioned above being necessarily present in the molecule.

4,898,945

PROCESS FOR 6,7-DIHYDRO-5,8-DIMETHYL-9-FLUORO-1-OXO-1H,5H-BENZO[I,J]QUINOLIZINE-2-CARBOXYLIC ACID

Bruce E. Williams, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 821,048, Jan. 11, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 268,608

Int. Cl.⁴ C07D *455/06, 215/12*

U.S. Cl. 546—95 **7 Claims**

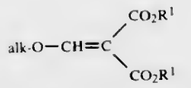
1. A process for the preparation of 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid comprising the steps of:

(1) reacting bromine with 6-fluoro-2-methylquinoline to give 5-bromo-6-fluoro-2-methylquinoline, and

(2) reacting 5-bromo-6-fluoro-2-methylquinoline with a methyl Grignard reagent in the presence of dichloro[1,3-bis(diphenylphosphino)propane] nickel (II) to provide 2,5-dimethyl-6-fluoroquinoline, and

(3) reducing said 2,5-dimethyl-6-fluoroquinoline to provide the corresponding 2,5-dimethyl-6-fluoro-1,2,3,4-tetrahydroquinoline, and

(4) condensing said 2,5-dimethyl-6-fluoro-1,2,3,4-tetrahydroquinoline with a diester of an alkoxymethylenemalonic acid of the formula



wherein alk is an alkyl group containing 1 to about 4 carbon atoms and each R^1 is independently an alkyl group containing 1 to about 4 carbon atoms or the R's together form an isopropyl radical to provide a diester of 2-(N-tetrahydroquinolinyl)methylenemalonic acid, and

(5) ring closing said diester of 2-(N-tetrahydroquinolinyl)-methylenemalonic acid to provide an ester of 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid, and

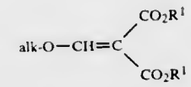
(6) hydrolyzing the ester to give a 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid.

5. A process for the preparation of an ester of 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid comprising the steps of:

(1) reacting 5-bromo-6-fluoro-2-methylquinoline with a methyl Grignard reagent in the presence of dichloro[1,3-bis(diphenylphosphino)propane] nickel (II) to provide 2,5-dimethyl-6-fluoroquinoline, and

(2) reducing said 2,5-dimethyl-6-fluoroquinoline to provide the corresponding 2,5-dimethyl-6-fluoro-1,2,3,4-tetrahydroquinoline, and

(3) condensing said 2,5-dimethyl-6-fluoro-1,2,3,4-tetrahydroquinoline with a diester of an alkoxymethylenemalonic acid of the formula



wherein alk is an alkyl group containing 1 to about 4 carbon atoms and each R^1 is independently an alkyl group containing 1 to about 4 carbon atoms or the two R' moieties together form an isopropyl radical to provide a diester of 2-(N-tetrahydroquinolinyl)methylenemalonic acid, and

(4) ring closing said diester of 2-(N-tetrahydroquinolinyl)-methylenemalonic acid to provide an ester of 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid.

4,898,946

PROCESS FOR THE PREPARATION OF N-ALLYL-PIPERIDINE DERIVATIVES

Silvestro Costanzi, San Giuliano Milanese; Damiano Gussoni, Milan, and Luciano Pallini, Fornovo di Taro, all of Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy

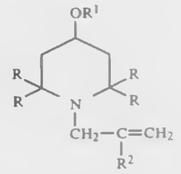
Filed Jun. 3, 1987, Ser. No. 56,880

Claims priority, application Italy, Jun. 11, 1986, 20756 A/86

Int. Cl.⁴ C07D *211/40*

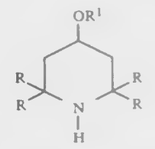
U.S. Cl. 546—216 **11 Claims**

1. A process for preparing a 2,2,6,6-tetraalkyl-piperidine derivative of general formula I



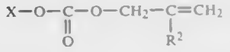
I

wherein R is (C_1-C_4)alkyl, R^1 is hydrogen, straight or branched (C_1-C_{20})alkyl, straight or branched (C_3-C_{20})alkenyl or phenyl-(C_1-C_6)alkyl and R^2 is hydrogen or methyl, which comprises reacting a 2,2,6,6-tetraalkyl-piperidine derivative of formula II



II

wherein R and R^1 are as defined above with an allylic carbonate of formula III



III

wherein X is a $—CH_2—C(R^2)=CH_2$, (C_1-C_4)alkyl or aryl-(C_1-C_4)alkyl group, and R^2 is as defined above, in the presence of a palladium catalyst.

4,898,947

PYRIDINE AND THIAZOLIDINEDIONE DERIVATIVES

Kanji Meguro, Nishinomiya; Takeshi Fujita, Takarazuka; Chitoshi Hatanaka, Nagaokakyo, and Satoru Ooi, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

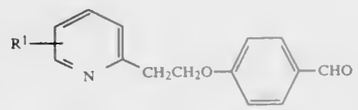
Division of Ser. No. 73,695, Jul. 19, 1987, Pat. No. 4,812,570. This application Dec. 29, 1988, Ser. No. 291,782

Claims priority, application Japan, Jul. 24, 1986, 61-174278

Int. Cl.⁴ C07D *213/46, 413/12*

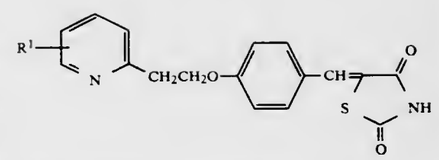
U.S. Cl. 546—280 **2 Claims**

1. A compound of the formula:



wherein R^1 is hydrogen or a lower alkyl.

2. A compound of the formula:



wherein R^1 is hydrogen or a lower alkyl.

4,898,948

BENZOTHIAZOLYLAZOLIDINES, AND THEIR PRODUCTION AND USE

Toru Haga, Takarazuka; Eiki Nagano, Nishinomiya; Kouichi Morita, and Ryo Sato, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 194,904, May 17, 1988, Pat. No. 4,828,605, which is a division of Ser. No. 750, Jan. 6, 1987, Pat. No. 4,786,310. This application Feb. 21, 1989, Ser. No. 312,754

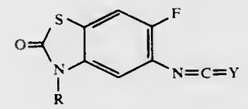
Claims priority, application Japan, Jan. 6, 1986, 61-001172; Mar. 17, 1986, 61-059035

Int. Cl.⁴ C07D *277/68*

U.S. Cl. 548—171 **8 Claims**

1. A compound of the formula:

(III)



wherein R is a C_1-C_5 alkyl group, a C_3-C_5 alkenyl group, a C_3-C_5 alkynyl group or a C_1-C_3 alkoxy (C_1-C_3)alkyl group and Y is a sulfur atom or an oxygen atom.

4,898,949

INTERMEDIATES FOR THE PREPARATION OF ANTIHYPERCHOLESTEROLEMIC TETRAZOLE COMPOUNDS

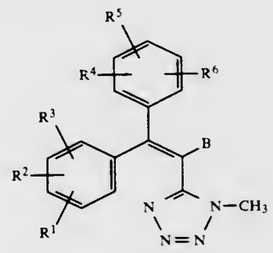
John J. Wright, Middletown; Sing-Yuen Sit, Meriden; Neelakantan Balasubramanian, Bristol, and Peter J. Brown, Cromwell, all of Conn., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 18,558, Feb. 25, 1987. This application Feb. 18, 1988, Ser. No. 151,512

Int. Cl.⁴ C07D *257/04*

U.S. Cl. 548—253 **24 Claims**

1. A compound of the formula



wherein

R^1 and R^4 each are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy or trifluoromethyl;

R^2, R^3, R^5 and R^6 each are independently hydrogen, halogen, C_{1-4} alkyl or C_{1-4} alkoxy;
B is hydrogen, C_{1-6} alkoxycarbonyl or CH_2Y;
Y is hydrogen, hydroxyl or X; and
X is bromo, chloro or iodo.

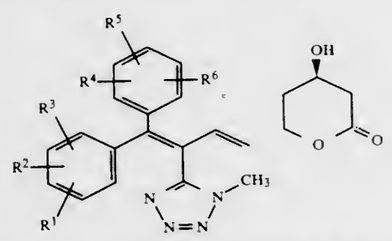
4,898,950

PREPARATION OF ANTIHYPERCHOLESTEROLEMIC TETRAZOLE COMPOUNDS

William T. Han, Cheshire, and John J. Wright, Middletown, both of Conn., assignors to Bristol-Myers Company, New York, N.Y.

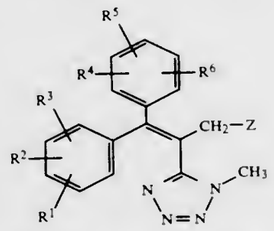
Division of Ser. No. 156,865, Feb. 18, 1988, Pat. No. 4,824,959. This application Feb. 6, 1989, Ser. No. 306,118
Int. Cl.[4] C07D *405/06*
U.S. Cl. 548—253 **6 Claims**

1. A process for preparing a compound of the formula

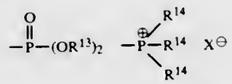


in substantially the trans-(4R,6S) form wherein R^1 and R^4 each are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, or trifluoromethyl; and R^2, R^3, R^5 and R^6 each are independently hydrogen, halogen, C_{1-4} alkyl or C_{1-4} alkoxy, comprising the steps of

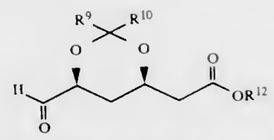
(a) reacting a compound of the formula



wherein R^1, R^2, R^3, R^4, R^5, and R^6 are as defined above and Z is

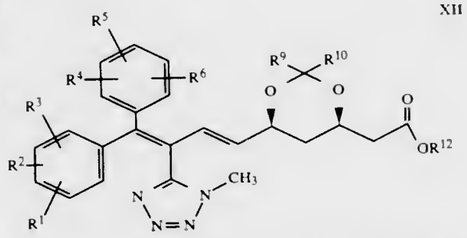


wherein R^{13} is C_{1-4} alkyl; R^{14} is phenyl which is unsubstituted or substituted by one or two C_{1-4} alkyl or chloro substituents; and X is bromo, chloro or iodo with a compound of the formula



IIIb

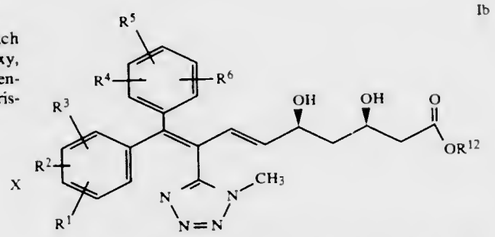
in substantially the cis-(4R,6S) form wherein R^9 and R^{10} each are C_{1-4} alkyl or R^9 and R^{10}, taken together with the carbon atom to which they are attached, is cyclopentyl, cyclohexyl or cycloheptyl; and R^{12} is hydrogen, C_{1-4} alkyl or a metal cation, to produce a compound of the formula



XII

in substantially the cis-(4R,6S) form wherein R^1, R^2, R^3, R^4, R^5, R^6, R^9, R^{10} and R^{12} are as defined above;

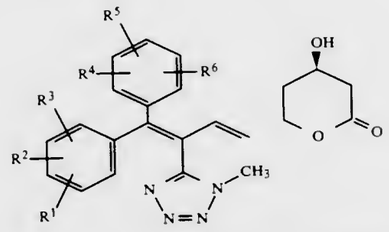
(b) reacting a compound of Formula XII with acid to produce a compound of the formula



Ib

wherein R^1, R^2, R^3, R^4, R^5, R^6 and R^{12} are as defined above; and

(c) cyclizing a compound of Formula Ib wherein R^{12} is hydrogen, to produce a compound of formula



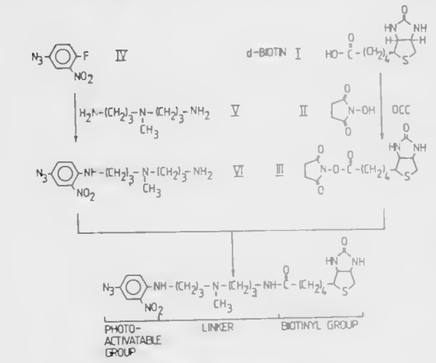
in substantially the trans-(4R,6S) form wherein R^1, R^2, R^3, R^4, R^5, and R^6 are as defined above.

4,898,951

COMPOUNDS USED AS INTERMEDIATES IN THE PREPARATIONS OF NON-RADIOACTIVE BIOLOGICAL PROBES

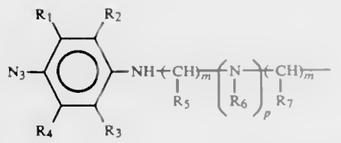
Robert H. Symons, Adelaide, Australia, assignor to Bresatac Limited, Adelaide, Australia

Continuation of Ser. No. 712,705, Mar. 15, 1985, abandoned. This application May 4, 1988, Ser. No. 191,811
Claims priority, application Australia, Mar. 22, 1984, PG4200; Oct. 4, 1984, PG7500
Int. Cl.[4] C07D *495/04*; C07C *117/00*
U.S. Cl. 548—303 **8 Claims**

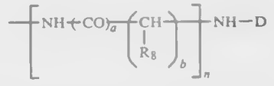


PHOTOBIOTIN, VII

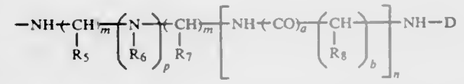
1. A compound of the Formula I



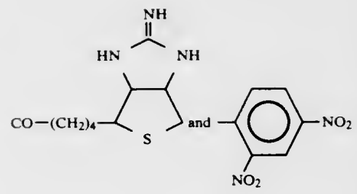
I



wherein
R_1 to R_4, which may be the same or different, are selected from the group consisting of H, alkyl of 1 to 5 carbon atoms, NO_2, halogen, --COOH, and $—NH_2$;
wherein R_5, R_6, R_7, R_8 which may be the same or different are selected from the group consisting of H, alkyl of 1 to 5 carbon atoms and halogen; wherein
n is an integer of 0 to 5
m is an integer of 1 to 10
p is an integer of 0 to 1
a is an integer of 0 to 1
b is an integer of 1 to 10
wherein if a is 1 then b is 1, and
wherein the moiety



includes at least 5 carbon atoms and wherein D is selected from the group consisting of



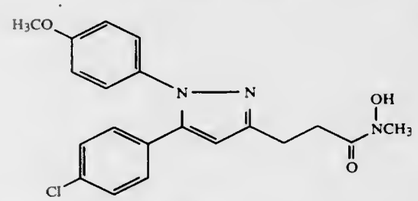
4,898,952

REGIOSELECTIVE SYNTHESIS OF A 1,5-DISUBSTITUTED PYRAZOLE

William V. Murray, Belle Mead, and Michael P. Wachter, Bloomsbury, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation of Ser. No. 55,807, May 29, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,140
Int. Cl.[4] C07D *231/12*
U.S. Cl. 548—378 **1 Claim**

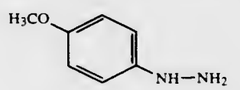
1. A process for the preparation of 3-[5-(4-chlorophenyl)-1-(4-methoxyphenyl)-3-pyrazolyl]-N-hydroxy-N-methyl-propanamide of the following formula (IX):



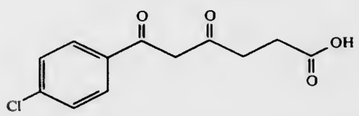
(IX)

which comprises the steps of

(i) reacting a hydrazine of the following formula (X) with a diketoacid of the following formula (XI):

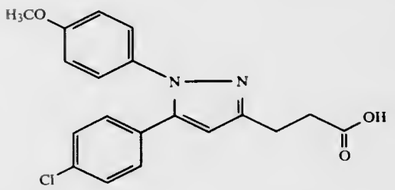


(X)



(XI)

at a temperature of about 0°–100° C., to form a pyrazole acid of the following (XII):



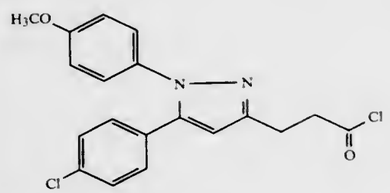
(XII)

followed by

(ii) chlorinating the pyrazole acid (XII) oxalyl chloride to

yield the pyrazole acid chloride of the following formula (XIII):

(XIII)



followed by

(iii) reacting the pyrazole acid chloride (XIII) with methylhydroxylamine hydrochloride to yield the methylpropanamide of formula (IX).

4,898,953

NATURAL VITAMIN E INTERMEDIATE

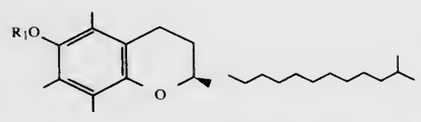
Ka-kong Chan, Hopatcong, N.J., and Gabriel G. Saucy, Vero Beach, Fla., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 135,128, Dec. 18, 1987, Pat. No. 4,831,185. This application Jan. 30, 1989, Ser. No. 303,507

Int. Cl.[4] C07D *311/72*

U.S. Cl. 549—408 **3 Claims**

1. An optically active compound of the formula:



wherein R_1 taken together with its attached oxygen atom forms a hydrolyzable ether hydroxy protecting group.

4,898,954

PROCESS FOR THE PREPARATION OF OXIRANES

Karl H. Mohrmann; Wolf Reiser, both of Wuppertal, Fed. Rep. of Germany; Siegfried W. Linke, Seoul, Rep. of Korea, and Rudolf Zerbes, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

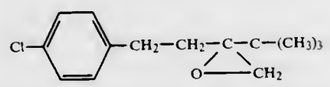
Continuation of Ser. No. 603,527, Apr. 25, 1984, abandoned. This application Sep. 3, 1985, Ser. No. 772,066

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315681

Int. Cl.[4] C07D *301/02*

U.S. Cl. 549—519 **8 Claims**

1. A process for the preparation of an oxirane of the formula



which comprises contacting dimethyl sulphide with dimethyl sulphate in the presence of tert.-butanol thereby to form trimethylsulphonium methyl sulphate of the formula

$$(CH_3)_3S^{\oplus}\ CH_3SO_4^{\ominus}$$

and thereafter, without isolating said trimethylsulphonium methyl sulphate, contacting the same with 1-(4-chlorophenyl)-4,4-dimethyl-3-pentanone in the presence of potassium tert.-butylate and in the presence of tert.-butanol at temperatures between 0° and 60° C.

4,898,955

META-CONTAINING ENOLATE COMPOUNDS

Gerard Van Koten, Den Dolder; Frederick H. Van Der Steen, Utrecht, and Johann T. B. H. Jastrzebski, De Bilt, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Division of Ser. No. 151,816, Feb. 3, 1988. This application Dec. 12, 1988, Ser. No. 283,194

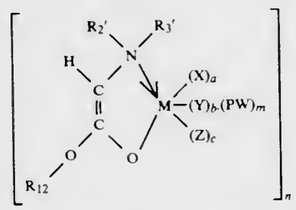
Claims priority, application European Pat. Off., Feb. 6, 1987, 87-200185.4

Int. Cl.[4] C07F *3/06, 5/06, 7/10, 5/02*

U.S. Cl. 556—12 **3 Claims**

1. A compound of the formula

II

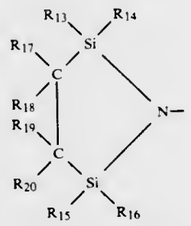


wherein R_{12} is selected from the group consisting of alkyl, aryl and aralkyl, each unsubstituted or substituted with alkyl, aryl or aralkyl, M is selected from the group consisting of zinc, aluminum, zirconium, boron, tin and titanium, P is alkali metal, X, Y and Z are individually selected from the group consisting of alkyl, aryl and alkoxide, W is selected from the group consisting of thiolate, and triflate, and a,b,c and m are 0 or 1 with at least one being 1, n = 1-6, all being integers, R_2' and R_3' are individually selected from the group consisting of hydrogen, alkyl, aryl and aralkyl, each unsubstituted or substituted with alkyl, aryl, or aralkyl or



wherein R_6, R_7 and R_8 are individually selected from the group consisting of alkyl, aryl and aralkyl, R_2' and R_3' together with the nitrogen atom to which they are attached form a ring of formula III

III



wherein R_{13}, R_{14}, R_{15}, R_{16}, R_{17}, R_{18}, R_{19} and R_{20} are individually selected from the group consisting of alkyl, aryl and aralkyl.

4,898,956

METHOD TO PREPARE THERMO-OXIDATIVELY STABLE PHENYLMETHYLSILOXANE FLUIDS

Terrence K. Hilty, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

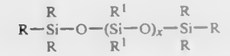
Filed Jun. 27, 1989, Ser. No. 372,495

Int. Cl.[4] C07F *7/08, 7/18*

U.S. Cl. 556—401 **21 Claims**

1. A polysiloxane fluid consisting essentially of

(i) a polysiloxane of the formula



where each R is independently selected from an alkyl group having 1 to 6 carbons and an aryl group having 5 to 10 carbons; each R^1 is independently selected from phenyl and methyl groups, with the proviso that they are not all methyl; and x equals 3 to 100 and,

(ii) an organozirconium compound.

4,898,957

ORGANOSILICON DIAMINE ANTIMICROBIAL COMPOUND

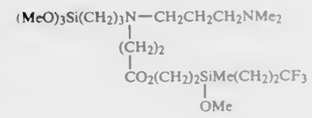
Edwin P. Plueddemann, Midland, and Anthony Revis, Freeland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 182,698, Apr. 18, 1988, Pat. No. 4,866,192. This application Jun. 7, 1989, Ser. No. 362,987

Int. Cl.[4] C07F *7/04*

U.S. Cl. 556—418 **1 Claim**

1. A compound of the formula



wherein Me is methyl.

4,898,958

ORGANOSILICON COMPOUND

Hirofumi Kishita, Annaka; Koichi Yamaguchi, Takasaki, and Akira Yoshida, Tokyo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,173

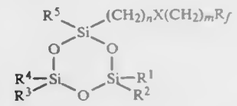
Claims priority, application Japan, Sep. 11, 1987, 62-227909

Int. Cl.[4] C07F *7/08*

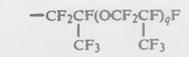
U.S. Cl. 556—448 **2 Claims**

1. An organosilicon compound represented by general formula (I):

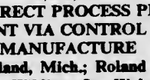
(I)



wherein R^1, R^2, R^3, R^4 and R^5 may be the same or different and each represent an alkyl group having 1 to 4 carbon atoms; R_f represents



where q represents an integer of 1 to 5, or



where q is as defined above; and X represents —O— or $—CH_2—$; provided that n is 3 and m is an integer of 0 to 2 when X represents —O—, and n is 0 and m is 1 when X represents $—CH_2—$.

4,898,959

METHOD FOR THE PREPARATION OF BETA-SUBSTITUTED ALLYLSILANE

Makoto Yoshitake; Shinichiro Yamane, and Akihiko Shirahata, all of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,411

Claims priority, application Japan, Dec. 24, 1987, 62-327628

Int. Cl.[4] C07F *7/08*

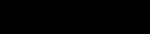
U.S. Cl. 556—466 **5 Claims**

1. A method for the preparation of betasubstituted allylsilane with the general formula (IV)

(IV)

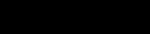
said method comprising reacting, in an organic solvent, a Grignard reagent with the general formula (III)

(III)



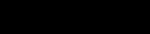
with a substrate compound selected from the group consisting of an acid anhydride with the general formula (II)

(II)



and a carboxylic acid ester with the general formula (I)

(I)



where, in the preceding formulae (I), (II), (III), and (IV), R^1 is a hydrogen atom or a hydrocarbon group having 1 to 20 carbon atoms, R^2 is a hydrocarbon group having 1 to 4 carbon atoms, R^3, R^4, and R^5 are independently selected from the group consisting of hydrocarbon groups having 1 to 3 carbon atoms or alkoxy groups, at least one of R^3, R^4, and R^5 being an alkoxy group having at least 3 carbon atoms, and X is a halogen atom.

4,898,960

METHOD OF DIRECT PROCESS PERFORMANCE IMPROVEMENT VIA CONTROL OF SILICON MANUFACTURE

Vishu D. Dosaj, Midland, Mich.; Roland L. Halm, Madison, Ind., and Oliver K. Wilding, Jr., Wales, United Kingdom, assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 22, 1986, Ser. No. 945,128

Int. Cl.[4] C07F *7/08, 7/16*

U.S. Cl. 556—472 **32 Claims**

1. A method of improving the performance of a process for the manufacture of alkylhalosilane, said process comprising, contacting an alkylhalide with silicon at a temperature of 250° to 350° C. in the presence of tin or tin compounds, and copper or copper compounds, wherein there is at least also present 25 to 2500 parts per million, based upon the silicon in a reaction mass, of a phosphorous promoter, which method further comprises controlling the level of the phosphorous promoter in the silicon by incorporating and controlling the level of phosphorous in the mass of the silicon by controlling the amount of phosphorous that is introduced into a silicon smelter during the manufacture of silicon.

4,898,961

METHOD FOR PREPARING ALKENYLSILANES

Gnaneshwar R. Baile, Midland; Donald E. McVannel, Hemlock, both of Mich.; Kirsten L. Reading, North Royalton, Ohio, and Ginger L. Hall, Barry, Wales, assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 17, 1989, Ser. No. 380,929
Int. Cl.[4] C07F 7/08
U.S. Cl. 556—479 **6 Claims**

1. In a method for preparing an alkenylsilane by the reaction of an acetylenic hydrocarbon with a silane containing a silicon-bonded hydrogen atom, where the reaction is conducted in the presence of a liquid medium comprising said alkenylsilane and a solubilized hydrosilylation catalyst, the improvement comprising

a. a conducting said reaction under a pressure below the critical decomposition temperature of said acetylenic hydrocarbon by introducing a homogeneous gaseous mixture consisting essentially of said acetylenic hydrocarbon and said silane into a reactor wherein said mixture is directed into contact with the surface of at least one moving layer of a liquid medium comprising said alkenylsilane and said catalyst, where said medium is an effective solvent for said acetylenic hydrocarbon,

b. maintaining the relative concentrations of acetylenic hydrocarbon and gaseous silane in said mixture equivalent to a molar ratio of hydrocarbon to silane of greater than 1, and

c. adjusting the flow rates of said homogeneous mixture and said liquid medium to maintain the temperature within said reactor at a level favoring formation of said alkenysilane and which is not conducive to further reaction of said alkenylsilane and decomposition of said acetylenic hydrocarbon.

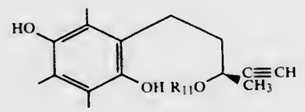
4,898,962

NATURAL VITAMIN E INTERMEDIATE

Ka-kong Chan, Hopatcong, N.J., and Gabriel G. Saucy, Vero Beach, Fla., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 135,128, Dec. 18, 1987, Pat. No. 4,831,185. This application Jan. 30, 1989, Ser. No. 303,705
Int. Cl.[4] C07C 67/02
U.S. Cl. 558—58 **1 Claim**

1. A compound of the formula



wherein R_{11} is mesyl, tosyl or lower alkanoyl.

4,898,963

PROCESS FOR THE RECOVERY OF ACID ORGANOPHOSPHORUS COMPOUNDS AND/OR ORGANOPHOSPHATE IONS PRESENT IN AN AQUEOUS SOLUTION

André Chesne, le Vesinet; Sylvie Chevalier, Paris; Michel Germain, Marcoussis, and Dominique Pareau, Verrieres le Buisson, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 29, 1987, Ser. No. 114,622
Claims priority, application France, Oct. 30, 1986, 86 15127
Int. Cl.[4] C07C 9/08
U.S. Cl. 558—146 **10 Claims**

1. Process for the recovery of acid organophosphorus compounds, organophosphate ions and mixtures thereof present in an aqueous solution, comprising contacting the aqueous solution with an organic solution comprising at least one organic amino compound which is not very soluble in water and which is dissolved or diluted in an organic solvent, said organic solvent selected from the group consisting of aromatic and paraffinic hydrocarbons, organochloro compounds, ethers, esters, alcohols, ketones and mixtures thereof, wherein said organic amino compounds have at least one amine function selected from the group consisting of cyclic amines; primary, secondary and tertiary amines; acid salts of these amino compounds, quaternary ammonium salts, and mixtures thereof, and recovering, in the organic solution, the complex formed by the reaction of the acid organophosphorus compounds, organophosphate ions and mixtures thereof with one or more of the organic amino compounds.

4,898,964

ADDITIVES FOR SYNTHETIC RESINS

Mitsuo Kinoshita, Aichi; Shigeru Imamura, Toyokawa, and Hirokazu Matsueda, Toyohashi, all of Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 943,046, Dec. 18, 1986, abandoned. This application Jul. 6, 1989, Ser. No. 376,142
Claims priority, application Japan, Feb. 21, 1986, 61-37718
Int. Cl.[4] C07C 122/00, 69/80, 69/40, 69/60
U.S. Cl. 558—416 **10 Claims**

1. An additive for synthetic resins containing a block copolymer of the form $X—Y)_n$ where

X is polybutadiene block, hydrogenated polybutadiene block, polyisoprene block or hydrogenated polyisoprene block with molecular weight of 1000–50000, occupying 10–95 weight % of said block copolymer,

Y is polyester block having connected ester linkage one or more types of organic dicarboxylic anhydride and one or more types of 1,2-epoxide selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide,

X and Y are connected by ester linkage,

n is an integer between 1 and 10, and

$X—Y)_n$ is obtained by starting with carboxyl group or hydroxyl group in polybutadiene, hydrogenated polybutadiene, polyisoprene or hydrogenated polyisoprene and by alternate condensation of said organic dicarboxylic anhydride and said 1,2-epoxide therewith in the presence of a catalyst.

3. The additive of claim 1 wherein at least one of said polyester blocks has a reactive group selected from the group consisting of vinyl group, isocyanate group and carboxylic acid group.

4,898,965

ADDITIVES FOR SYNTHETIC RESINS

Mitsuo Kinoshita; Shigeru Imamura, and Hirokazu Matsueda, all of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 117,797, Nov. 5, 1987, abandoned. This application Jul. 6, 1989, Ser. No. 376,141
Claims priority, application Japan, Nov. 7, 1986, 61-266435
Int. Cl.[4] C07C 122/00, 69/80, 69/40, 69/60
U.S. Cl. 558—416 **14 Claims**

1. An additive for synthetic resins including a block copolymer of the form $X—Y_n$ where

X is polybutadiene block, hydrogenated polybutadiene block, polyisoprene block or hydrogenated polyisoprene block with molecular weight 1000–50,000,

Y is polyester block obtained by ring-opening polymerization of ε-aliphatic lactone, at least one of said polyester blocks having a reactive group selected from the group consisting of vinykl group, isocyanate group and carboxylic acid group,

X and Y are connected by ester linkage,

n is an integer between 1 and 10, and

$X—Y_n$ is obtained by starting with carboxyl group or hydroxyl group in polybutadiene, hydrogenated polybutadiene, polyisoprene or hydrogenated polyisoprene and by ring-opening polymerization of said ε-aliphatic lactone in the presence of a catalyst, said polyester block or blocks and said reactive group or groups comprising 10–60 weight % of said block copolymer.

4,898,966

PROCESS FOR THE PREPARATION OF PHENYLALANINE N-PROPYL ESTER HYDROCHLORIDE

Heinz Erpenbach, Cologne; Klaus Gehrmann; Peter Hörstermann, both of Erftstadt; Erhard Jägers, Bornheim, and Georg Kohl, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 256,052
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3736078
Int. Cl.[4] C07C 101/10
U.S. Cl. 560—38 **4 Claims**

1. A process for the preparation of phenylalanine n-propyl ester hydrochloride, which comprises reacting phenylalanine hydrochloride with n-propanol in a molar ratio 1:(5 to 20) at temperatures from 80° to 110° C. and pressures from 0.1 to 1.5 bar in the presence of 0.1 to 0.75 mole of HCl/mole of phenylalanine hydrochloride and in the presence of an entrainer selected from the group consisting of toluene and 1,2-dichloroethane, a concentration of said entrainer of 20 to 50% by weight being maintained in the reaction mixture, and said entrainer being removed by distillation during the reaction as an azeotrope with water at a reflux rate of 3 to 10, the organic phase being fed back, at least partly, into the reaction mixture after the phases have been separated.

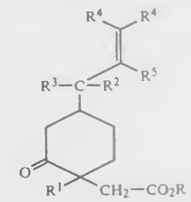
4,898,967

PROCESS FOR THE PRODUCTION OF SUBSTITUTED 2-OXOCYCLOHEXANEACETIC ACID ESTERS

Philip F. Hughes, Hopewell; Dominick Mobilio, Plainsboro, and Leslie G. Humber, North Brunswick, all of N.J., assignors to American Home Products Corp., New York, N.Y.

Division of Ser. No. 131,698, Dec. 11, 1987, which is a division of Ser. No. 20,426, Mar. 2, 1987, Pat. No. 4,748,266, which is a continuation-in-part of Ser. No. 868,230, May 28, 1986, abandoned. This application Feb. 13, 1989, Ser. No. 310,264
Int. Cl.[4] C07C 69/76, 69/74
U.S. Cl. 560—051 **5 Claims**

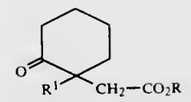
1. The process for producing compounds of formula (V)



(V)

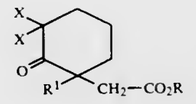
wherein R and R^1 are lower alkyl; R^2, R^3, and R^5 are hydrogen, or lower alkyl wherein lower alkyl contains 1 to 6 carbon atoms; each R^4 is independently selected from the group consisting of hydrogen, and lower alkyl wherein lower alkyl contains 1 to 6 carbon atoms, or R^3 is joined to the R^4 which is cis to the carbon bearing R^3 to form $—CH_2—_m$ wherein m is 2 to 3 which comprises

(a) dihalogenating the compound of formula (I)



(I)

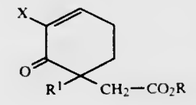
wherein R and R^1 are as defined above with a halogenating agent in a suitable solvent to produce the compound (II)



(II)

wherein R and R^1 are as defined above; and X is chlorine, or bromine;

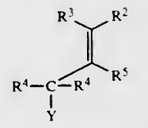
(b) dehydrohalogenating the compound (II) in the presence of a base and optionally in the presence of added salts in a suitable solvent to produce the compound (III)



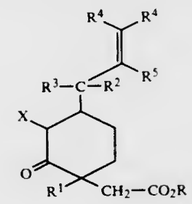
(III)

wherein R, R^1, and X are as defined above;

(c) reacting the compound (III) with



wherein R^2, R^3, and R^5 are hydrogen, or lower alkyl wherein lower alkyl contains 1 to 6 carbon atoms; each R^4 is independently selected from the group consisting of hydrogen, or lower alkyl wherein lower alkyl contains 1 to 6 carbon atoms, or R^3 is joined to one of the R^4 substituents to form $—CH_2—_m$ wherein m is 2 to 3; Y is selected from the group consisting of $SiR^6R^7R^8$ and $SnR^6R^7R^8$ wherein R^6, R^7, and R^8 are independently selected from the group consisting of hydrogen, straight chain or branched lower alkyl containing 1 to 6 carbon atoms, cycloalkyl, aryl, arylalkykl, halogen, or alkoxy in the presence of a Lewis acid to produce the compound (IV)



(IV)

wherein R, R^1, R^2, R^3, R^4, R^5, and X are as defined above;

(d) dehalogenating the compound (IV) with a reducing agent to produce the desired compound (V).

4,898,968

CYCLOPROPANE DERIVATIVES

Edward McDonald, Marlow, and Roger Salmon, Bracknell, both of England, assignors to Imperial Chemical Industries PLC, London, England

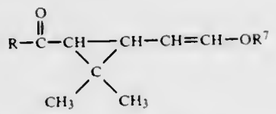
Division of Ser. No. 928,461, Nov. 10, 1986, Pat. No. 4,760,443, which is a division of Ser. No. 712,252, Mar. 15, 1985, Pat. No. 4,661,488. This application May 2, 1988, Ser. No. 188,850

Claims priority, application United Kingdom, Mar. 26, 1984, 8407810; Jul. 20, 1984, 8418612; Feb. 4, 1985, 8502778

Int. Cl.[4] C07C *69/743*

U.S. Cl. 560—124 **2 Claims**

1. A compound of formula:



wherein R is alkoxy of up to 6 carbon atoms and R^7 is alkyl of up to 6 carbon atoms.

4,898,969

TRANSESTERIFICATION OF ALKOXYESTERS

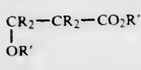
Glenn C. Jones, and William D. Nottingham, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,167

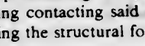
Int. Cl.[4] C07C *69/66*

U.S. Cl. 560—187 **11 Claims**

1. A method for the transesterification of alkoxyesters having the structural formula:

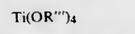


wherein each R is independently selected from the group consisting of H and C_1–C_{10} alkyl moieties, with the provision that the total number of carbon atoms for all R groups does not exceed 10, and each R' is independently selected from the group consisting of C_1–C_{10} alkyl moieties; said method comprising contacting said alkoxyester with at least one alcohol having the structural formula:



wherein each R'' is selected from the group consisting of C_1–C_{20} alkyl or cycloalkyl moieties, optionally substituted with one or more hydroxy- or alkoxy-moiety in the presence of a catalyst selected from the group consisting of:

(i) a titanium alkoxide catalyst having the formula:



wherein each R''' is independently selected from the group consisting of C_1–C_{10} alkyl moieties, and

(ii) a tin compound selected from the group consisting of:

dibutyltin diacetate,

dibutyltin oxide, and

dibutyltin dilaurate,

wherein said contacting is carried out for a time and at a temperature sufficient to produce the desired transesterification product having the structural formula:



4,898,970

PROCESS FOR PRODUCING FLUORINATED ESTERS

Eiji Ogura; Kunihiro Mito, and Shoji Arai, all of Shinnanyo, Japan, assignors to Onoda Cement Co., Ltd., Onoda and Tosoh Corporation, Shinnanyo, both of, Japan

Filed Feb. 1, 1983, Ser. No. 463,020

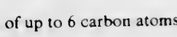
Claims priority, application Japan, Feb. 5, 1982, 57-17128

Int. Cl.[4] C07C *67/11, 69/003, 69/14*

U.S. Cl. 560—236 **5 Claims**

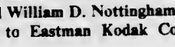
1. A process for producing a fluorinated ester containing a trifluoromethyl group, which comprises:

subjecting a 1,1,1-trifluoro-2-halogenated ethane of the formula



wherein X is Cl or Br, in γ-butyrolactone used as a solvent, to an esterification reaction with at least one carboxylic acid selected from the group consisting of

(1) a carboxylic acid salt of the formula

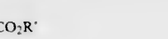


wherein

R is an alkyl group having a carbon number of not more than 19 or a phenyl group, and

M is Na, K, or Mg;

(2) a dicarboxylic acid salt represented by the general formula

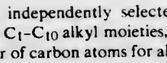


wherein

R is C_0–C_8 alkylene group or a phenylene group, and

M and M' are Na, K or Mg, which may be the same or different; and

(3) a dicarboxylic acid salt having an ether-bond in molecule, of the formula



wherein

R and R' are C_1 to C_{10} alkylene groups which may be the same or different, and

M and M' are the same or different and are Na, K or Mg.

4,898,971

LIQUID ISOCYANATE PREPOLYMERS

William E. Slack, Moundsville, W. Va., assignor to Mobay Corporation, Pittsburgh, Pa.

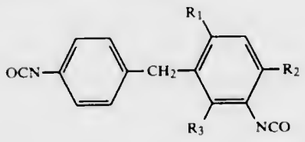
Filed Jan. 23, 1989, Ser. No. 300,868

Int. Cl.[4] C07C *118/00*; C08G *18/00*

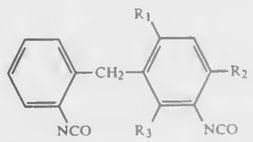
U.S. Cl. 560—359 **3 Claims**

1. A liquid, storage-stable isocyanate prepolymer having an isocyanate group content of from 3 to 30% by weight, prepared by reacting

(i) a diisocyanate corresponding to the formula

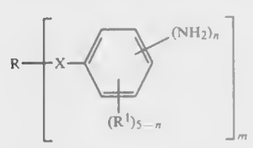


which may be present in admixture with 0 to 40% by weight, based on the total mixture, of diisocyanates corresponding to the formula



and optionally with 0 to 30% by weight, based on the total mixture, of other diisocyanatodiphenylmethane isomers which may be substituted; wherein two of the radicals R_1, R_2 and R_3 represent hydrogen and one of the radicals R_1, R_2 and R_3 represents a methyl group; with

(ii) a polyamine of the structure



where R represents an m-valent residue obtained by the removal of m-functional groups from a compound having m-functional groups and having a molecular weight of from 76 to about 10,000,

X represents —O—,



R^1 represents hydrogen or an inert substituent,

R^2 represents hydrogen, a C_1 to C_5 alkyl group or a phenyl group,

n is 1 or 2, and

m is an integer of from 2 to 8.

4,898,972

PROCESS FOR PRODUCING N-PHOSPHONOMETHYLGLYCINE

Donald L. Fields, Jr., Manchester; Raymond C. Grabiak, Maryland Heights, and Dennis P. Riley, Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 26, 1988, Ser. No. 248,663

Int. Cl.[4] C07F *9/38*

U.S. Cl. 562—17 **17 Claims**

1. A process for the production of N-phosphonomethylglycine which comprises contacting N-phosphonomethyliminodiacetic acid with a molecular oxygen-containing gas in the presence of an effective amount of a catalyst selected from the group consisting of the salts and salt complexes of manganese and cobalt, and an effective amount of bromide ion.

4,898,973

TRISUBSTITUTED BENZOIC ACID INTERMEDIATES

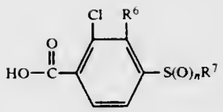
David L. Lee, Martinez, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Filed Mar. 7, 1985, Ser. No. 709,006

Int. Cl.[4] C07C *149/40*

U.S. Cl. 562—429 **8 Claims**

1. Compounds having the strucutral formula



wherein R^6 is C_2–C_4 alkoxy or C_1–C_2 alkylthio; n is 0 or 2; and R^7 is C_1–C_3 alkyl.

4,898,974

PRODUCTION OF 3,3-DIMETHYL-2-OXO-BUTYRIC ACID SALT

Karlfried Dickoré, Leverkusen; Hans D. Engels, Solingen; Hans Krätzer, Wuppertal, and Walter Merz, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 227,552, Jan. 22, 1981, which is a continuation of Ser. No. 788,867, Apr. 19, 1977, which is a division of Ser. No. 650,651, Jan. 20, 1976, Pat. No. 4,052,460. This application Apr. 23, 1985, Ser. No. 726,218

Int Cl.[4] C07C *51/09*

U.S. Cl. 562—577 **4 Claims**

1. A process for the preparation of a salt of 3,3-dimethyl-2-oxo-butyric acid which comprises contacting a solution containing a salt of 3,3-dimethyl-2-hydroxy-butyric acid in at least about 95% purity at a pH of about 9 to 12 with approximately the stoichiometric amount of a permanganate, and separating the readily filterable coarsely crystalline MnO_2 which is formed from the substantially pure dissolved salt of 3,3-dimethyl-2-oxo-butyric acid.

4,898,975

WATER SOLUBLE ORGANIC AMMONIUM PER HALIDES

Nicolai A. Favstritsky, Lafayette, Ind., assignor to Great Lakes Chemical Corporation, Wast Lafayette, Ind.

Division of Ser. No. 211,362, Jun. 24, 1988. This application Jul. 19, 1989, Ser. No. 382,833

Int. Cl.[4] C07C *76/06*

U.S. Cl. 564—2 **3 Claims**

1. A stabilized, aqueous perhalide composition comprising:

a water solution of an ammonium hydrohalide of the formula:



where R_1 and R_2 are independently hydrogen, hydroxyethyl, alkyl, cycloalkyl, alkyl ether, polyoxyalkylene, and halogenated alkyl; X is chlorine, bromine or iodine; and only one of R_1 and R_2 may be hydrogen; and

bromine, wherein the molar ratio of hydrohalide to bromine is in the range of about 2–4:1.

4,898,976

METHOD OF MAKING THE ETHANOLAMINE SALT OF N-NITROSOPHENYLHYDROXYLAMINE

John W. Varwig, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Continuation of Ser. No. 189,251, May 2, 1988, which is a division of Ser. No. 708,313, Mar. 5, 1985, Pat. No. 4,772,740. This application Apr. 17, 1989, Ser. No. 339,450

Int. Cl.[4] C07C *76/00*

U.S. Cl. 564—112 **11 Claims**

1. The method of preparing the ethanolamine salt of N-nitrosophenylhydroxylamine comprising the step of reacting

ethanolamine and cupferron in the presence of a polar organic solvent.

4,898,977

PROCESSES FOR THE PREPARATION OF 5-AMINO-4-HYDROXYVALERIC ACID DERIVATIVES

Peter Herold, Basel, Switzerland, and Christof Angst, Summit, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

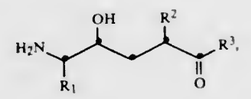
Filed Aug. 13, 1987, Ser. No. 85,437

Claims priority, application Switzerland, Aug. 13, 1986, 3248/86

Int. Cl.[4] C07C *103/19*

U.S. Cl. 564—191 **6 Claims**

1. A process for the preparation of a compound of the formula



(I)

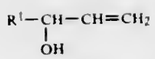
in which

R^1 represents hydrogen, alkyl, hydroxyalkyl, etherified hydroxyalkyl, esterified hydroxyalkyl, haloalkyl, carboxyalkyl, esterified carboxyalkyl, amidated carboxyalkyl, cyanoalkyl, aminoalkyl, mono- or di-lower alkylaminoalkyl, pyrrolidinoalkyl, piperidinoalkyl, morpholinoalkyl, oxoalkyl, cycloalkyl, cycloalkyl-lower alkyl, aryl, aryl-lower alkyl, 2-methylthioethyl, mercaptomethyl, 3-indolylmethyl, 4-imidazolylmethyl or 3-guanidinopropyl;

R^2 represents hydrogen, alkyl, hydroxyalkyl, etherified hydroxyalkyl, esterified hydroxyalkyl, haloalkyl, carboxyalkyl, esterified carboxyalkyl, amidated carboxyalkyl, cyanoalkyl, aminoalkyl, mono- or di-lower alkylaminoalkyl, pyrrolidinoalkyl, piperidinoalkyl, morpholinoalkyl, oxoalkyl, cycloalkyl, cycloalkyl-lower alkyl, aryl, aryl-lower alkyl, amino, mono- or di-lower alkylamino, aryl-lower alkylamino, lower alkanoylamino, lower alkoxycarbonylamino, aryl-lower alkoxycarbonylamino, pyrrolidino, piperidino, morpholino, hydroxy, lower alkoxy, lower alkanoyloxy-lower alkoxy, lower alkoxycarbonyloxy-lower alkoxy, aryloxy, aryl-lower alkoxy, lower alkanoyloxy, cycloalkylcarbonyloxy, arylcarbonyloxy, tri-lower alkylsilyloxy, mercapto, lower alkylthio, hydroxy-lower alkylthio, arylthio, aryl-lower alkylthio, lower alkanoylthio, lower alkylsulfinyl, hydroxy-lower alkylsufinyl, arylsulfinyl, aryl-lower alkylsulfinyl, lower alkylsulfonyl, hydroxy-lower alkylsulfonyl, arylsulfonyl, aryl-lower alkylsulfonyl, 2-methylthioethyl, mercaptomethyl, 3-indolylmethyl, 4-imidazolylmethyl or 3-guanidinopropyl; and

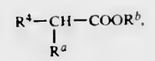
R^3 represents hydroxy, amino, substituted oxy or mono- or disubstituted amino wherein the substituent is alkyl, hydroxyalkyl, etherified hydroxyalkyl, esterified hydroxyalkyl, haloalkyl, carboxyalkyl, esterified carboxyalkyl, amidated carboxyalkyl, cyanoalkyl, aminoalkyl, mono- or di-lower alkylaminoalkyl, pyrrolidinoalkyl, piperidinoalkyl, morpholinoalkyl, oxoalkyl, cycloalkyl, cycloalkyl-lower alkyl, alkenyl, carboxyalkenyl, alkynyl, aryl, aryl-lower alkyl, heteroaryl or heteroaryl-lower alkyl, wherein heteroaryl contains one or two nitrogen atoms, an oxygen atom, a sulfur atom, one or two nitrogen atoms and an oxygen atom, or one or two nitrogen atoms and a sulfur atom, and wherein heteroaryl may be partially saturated, or R^3 represents cyclic alkyleneamino, oxaalkyleneamino, thiaalkyleneamino or azaalkyleneamino wherein the aza nitrogen atom is unsubstituted or substituted by lower alkyl, phenyl, phenyl-lower alkyl, lower alkanoyl, lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, and of salts of such a compound, comprising the steps of:

esterifying an allyl alcohol of the formula



(II)

in the presence of a catalyst with an acid or ester of the formula

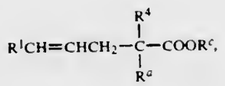


(III)

in which R^a represents hydrogen or a group $COOR^b$ and R^b represents hydrogen, lower alkyl, aryl-lower alkyl or tri-substituted silyl wherein the substituents are lower alkyl, cycloalkyl, aryl or aryl-lower alkyl, and R^4 has the meanings of R^2 or is halogen, or with a derivative of the compound of formula III wherein the group $COOR^b$ is replaced by a radical $C(OR^b)_3$ and R^b represents lower alkyl, or wherein the group $CH—COOR^b$ is replaced by a radical $C{=}C(OR^b)_2$ and R^b represents lower alkyl, or wherein one radical OR^b in $COOR^b$, $C(OR^b)_3$ or $C{=}C(OR^b)_2$ is replaced by $NR_2{}^b$;

arranging the resulting compound in situ by heating or by treatment with a base and a silylating agent followed by heating;

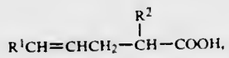
hydrolyzing the resulting compound of the formula



(IV)

in which R^c represents hydrogen, lower alkyl, aryl-lower alkyl or tri-substituted silyl wherein the substituents are lower alkyl, cycloalkyl, aryl or aryl-lower alkyl, if R^c is other than hydrogen or R^a represents a group $COOR^b$ and R^b is other than hydrogen, and decarboxylating if R^a is a group $COOR^b$, and, if R^4 represents halogen, treating with a reagent which exchanges halogen for a radical R^2 as defined above;

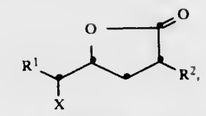
haloactonizing the resulting compound of the formula



(V)

a carboxamide or a hydroxamic acid ester thereof, with a halogenating agent;

treating the resulting compound of the formula



(VI)

in which X represents halogen, with a reagent which exchanges halogen for azido, isocyanato, readily cleavable secondary or tertiary amino or imido, hydrazino, cynamino or guanidino;

and, in the resulting compound, opening the lactone ring with a compound that introduces a radical R^3, and converting the nitrogen-containing radical X into an amino group.

4,898,978

PROCESS FOR THE PREPARATION OF N,N'-DISUBSTITUTED GUANIDINES

Manfred Bergfeld, Erlenbach-Mechenhard; Ludwig Eisenhuth, Obernburg, and Hans Zengel, Kleinwallstadt, all of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

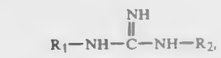
Filed Jan. 17, 1986, Ser. No. 819,881

Claims priority, applicatioo Fed. Rep. of Germany, Jan. 17, 1985, 3501383

Int. Cl.[4] C07C *128/00*

U.S. Cl. 564—231 **11 Claims**

1. A process for the preparation of an N,N'-disubstituted guanidine having the formula:



wherein R_1 and R_2 may be the same or different and represent an unsubstituted or a mono- or polysubstituted aromatic group, said process comprising reacting a corresponding N,N'-disubstituted thiourea with ammonia and oxygen or an oxygen-containing gas, in the presence of a solvent and at least one catalyst selected from the group consisting of elements with atomic numbers 21 through 30 in the Periodic Table, lanthanides, and salts, oxides, and complexes thereof.

4,898,979

PROCESS FOR PREPARING 1,3,5-TRIAZINETRIONES

Bernd Gallenkamp, Wuppertal; Andreas Günther, Cologne; Karl-Heinrich Mohrmann, Bergisch-Gladbach, and Thomas Schmidt, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

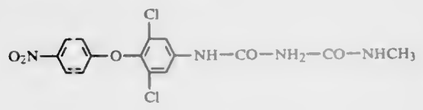
Division of Ser. No. 858,407, May 1, 1987, abandoned. This application Sep. 8, 1987, Ser. No. 94,195

Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516732

Int. Cl.[4] A61K *31/165; C07C 102/06*

U.S. Cl. 564—418 **6 Claims**

1. The biuret of the formula



4,898,980

PROCESS FOR PREPARING DITHIOBISPHENOLS

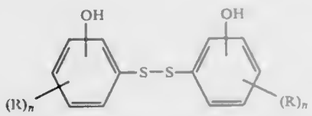
Linda A. Benjamin, Horsham, Pa.; Stephen D. Pastor, Basel, Switzerland, and John J. Luzzi, Carmel, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 29, 1988, Ser. No. 212,852

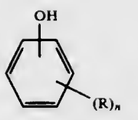
Int. Cl.[4] C07C *148/02*

U.S. Cl. 568—23 **6 Claims**

1. A process of preparing compounds of the formula



wherein R is C_{1-C8} alkyl, C_5–C_{12} cycloalkyl, C_7–C_9 aralkyl or C_7–C_9 aralkyl substituted by C_1–C_{12} alkyl and n is 1–3, which comprises reacting a phenol of the formula



wherein R and n are as previously defined with sulfur monochloride in the presence of equimolar amounts ±10% and greater than 30 weight %, relative to the phenol, of an aliphatic or heterocyclic amine.

4,898,981

HETEROATOM CONTAINING PERFLUOROALKYL TERMINATED NEOPENTYL GLYCOLS AND COMPOSITIONS THEREFROM

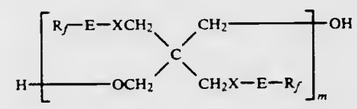
Robert A. Falk, New City, N.Y.; Kirtland P. Clark, Bethel, Conn., and Athanasios Karydas, Brooklyn, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,743

Int. Cl.[4] C07C *147/00*

U.S. Cl. 568—28 **12 Claims**

1. A compound of formula I



(I)

wherein

R_f is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms,

E is branched or straight chain alkylene of 1 to 10 carbon atoms or said alkylene interrupted by one to three groups selected from the group consisting of —NR—, —O—, —S—, $—SO_2—$, —COO—, —OOC—, —CONR— and $—SO_2NR—$,

X is —S— or $—SO_2—$, and

where R is independently hydrogen, alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 1 to 6 carbon atoms, and

m is 1 to 3.

4,898,982

PREPARATION OF DIARYL ETHERS AND DIARYL SULFIDES

Gregory P. Hussmann, Batavia, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Nov. 16, 1987, Ser. No. 121,151

Int. Cl.[4] C07C *148/00, 43/275*

U.S. Cl. 568—58 **14 Claims**

1. A method for the formation of a diaryl ether or a diaryl sulfide comprising heating a phenol, a thiophenol, a β-hydroxy-substituted fused aromatic ring-system compound, or a β-thio-substituted fused aromatic ring-system compound in the gas phase at a temperature in the range of from about 300° C. to about 600° C. in the presence of a bed of catalyst particles comprising thorium oxide deposited on a support selected from the group consisting of pure silica, pure zirconia, carbon, asbestos and quartz.

4,898,983

PREPARATION OF ARYL CARBONYL COMPOUNDS

Ian D. H. Towle, Cirencester, England, assignor to Raychem Limited, London, England

Continuation of Ser. No. 96,416, Sep. 11, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 270,401

Claims priority, application United Kingdom, Sep. 30, 1986, 8623510

Int. Cl.[4] C07C *45/46*

U.S. Cl. 568—322 17 Claims

1. A method of preparing an aryl carbonyl compound which comprises reacting phosgene or a mono-, di-, or polyfunctional organic carboxylic acid, acid halide, alkyl ester or anhydride together with an aromatic comonomer containing at least one activated hydrogen atom in a reaction medium comprising:

(A) a Lewis acid;

(B) a controlling agent comprising:

(i) $R(OX)_a$ which must be present in the reaction medium together with the Lewis acid before any reactant containing acid halide groups is added,

(ii) $R(COOX)_a$, or

(iii) $(RO)_bY$, which, if the Y—O linkage(s) are reactive to acid halide groups, must be present in the reaction medium together with the Lewis acid before any reactant containing acid halide groups is added,

where R is a monovalent or polyvalent organic group compatible with the reactant(s) and the other components of the reaction medium,

each X independently is a hydrogen atom or a monovalent metal atom,

each a independently is 1 or 2,

Y is a multivalent metal atom, and

b is an integer equal to the valency of Y; and

(C) optionally a non-protic diluent;

the various component being present in such proportions and the reaction being conducted under such conditions that a para substituted carbonyl compound substantially free of by-products resulting from alkylation and/or ortho substitution is obtained.

4,898,984

PROCESS FOR PREPARING 3,5,5,-TRIMETHYL-4-HYDROXY-2-CYCLOHEXEN-1-ONE

Hans Bellut, Duelmen, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 278,232

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806835

Int. Cl.[4] C07C *45/28*

U.S. Cl. 568—342 9 Claims

1. A process for preparing 3,5,5-trimethyl-4-hydroxy-2-cyclohexen-1-one, comprising:

oxidizing beta-isophorone in the presence of aqueous hydrogen peroxide and formic acid at a temperature in the range of 0°–100° C., wherein said hydrogen peroxide and said acid are present in a molar ratio of about 1:1 to about 5:1.

4,898,985

PROCESS FOR PREPARING 3,5,5-TRIMETHYLCYCLOHEXA-2-EN-1,4-DIONE

Nobuhiko Ito; Kimio Kinoshita; Kiyonori Suzuki, and Takeaki Eto, all of Chiba, Japan, assignors to Soda Aromatic Company, Limited, Japan

Filed Oct. 6, 1988, Ser. No. 254,212

Claims priority, application Japan, Oct. 6, 1987, 62-250625

Int. Cl.[4] C07C *45/34*

U.S. Cl. 568—344 10 Claims

1. A process for preparing 3,5,5-trimethylcyclohexa-2-en-1,4-dione comprising oxidizing 3,5,5-trimethylcyclohexa-3-en-one with molecular oxygen or a molecular oxygen-containing gas in the presence of an alkylamine and an organometallic complex catalyst selected from the group consisting of a porphyrin complex of manganese, cobalt, iron or copper, a substituted porphyrin complex of manganese, cobalt, iron or copper, a phthalocyanine complex of manganese, cobalt, iron or copper and a substituted phthalocyanine complex of manganese, cobalt, iron or copper.

4,898,986

INOSOSE DERIVATIVES, PRODUCTION AND USE THEREOF

Satoshi Horii, and Hiroshi Fukase, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

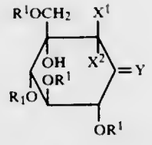
Filed Aug. 31, 1987, Ser. No. 90,974

Claims priority, application Japan, Sep. 9, 1986, 61-212952; Nov. 5, 1986, 61-263462; Jan. 6, 1987, 62-779

Int. Cl.[4] C07C *49/497*

U.S. Cl. 568—376 2 Claims

1. A compound of the formula:



wherein X^1 and X^2 are both halogen; X^1 is hydrogen and X^2 is halogen; or X^1 is $-SQ^1$ and X^2 is $-SQ^2$, wherein each of Q^1 and Q^2 is lower alkyl or Q^1 and Q^2 can form lower alkylene R^1 is a protective group for hydroxyl and Y is =O, =N—Z, wherein Z is a hydroxyl, hydroxyl protected group, or



wherein A is hydrogen or a C_{1-7} acyclic or cyclic hydrocarbon, which can include at least one substituent selected from the group consisting of hydroxyl, hydroxyl protected and phenyl.

4,898,987

METHOD FOR PRODUCTION OF PHENOL/ACETONE FROM CUMENE HYDROPEROXIDE

John F. Kniftoo, Austin, Tex., assignor to Texaco Chemical Company, White Plains, N.Y.

Filed Mar. 17, 1989, Ser. No. 324,118

Int. Cl.[4] C07C *45/53*

U.S. Cl. 568—385 22 Claims

1. In a method for cosynthesis of phenol and acetone by acid-catalyzed decomposition over a catalyst, the improvement comprising reacting cumene hydroperoxide over an acidic montmorillonite clay catalyst which has been modified by the use of a material from the group consisting of heteropoly acids, titanium, zirconium or aluminum at a temperature of about 20° C. to 150° C. and a pressure of from zero to 1000 psig.

4,898,988

PROCESS FOR THE PREPARATION OF β-HYDROXYKETONES

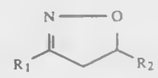
You-Jyh Lin, Columbia, and Harold Kloczewski, Pasadena, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Mar. 13, 1989, Ser. No. 322,259

Int. Cl.[4] C07C *45/56*

U.S. Cl. 568—386 9 Claims

1. A process for the preparation of β-hydroxyketones comprising: the catalytic hydrogenolysis of an aqueous solution of isoxazolines having the formula



together with a stream of hydrogen in a fixed-bed reactor containing a transition metal catalyst at a temperature from about 20° to 150° C. and a pressure from about 0 to 150 psig; wherein R_1 and R_2 are independently selected from hydrogen, alkyl, cycloalkyl or aromatic group; and wherein the aqueous solution of isoxazolines is substantially free of acids or buffers.

4,898,989

ALKANE OXIDATION PROCESS

Paul E. Ellis, Jr., Downingtown, and James E. Lyons, Wallingford, both of Pa., assignors to San Refining and Marketing Company, Philadelphia, Pa.

Filed Oct. 7, 1988, Ser. No. 254,750

Int. Cl.[4] C07C *45/33*

U.S. Cl. 568--399 14 Claims

1. In an oxidation process in which an alkane is contacted with air or oxygen at about 50°–350° C. and in the presence of a catalytically effective amount of a heteropolyacid having the formula (I) $H_c(X_kM_nO_y)^{-e}$, where X is a group IIIA–VIA atom, M is molybdenum, tungsten, vanadium, or combinations thereof, k is 1–5, n is 5–20, and y is 18–62, or polyoxoanions thereof, the improvement which comprises replacing three atoms of M with three different metal atoms, M′, to yield a catalyst having the formula (II) $H_c(X_kM_nM'_3O_y)^{-e}$ where X, k, and M are as above, n is 5–17, y is 18–59, M′ is zinc or a transition metal, and wherein M′ is free of double-bonded oxygen atoms and each M′ atom is bonded through oxygen to another M′ atom; or polyoxoanions thereof.

4,898,990

PROCESS FOR THE EXTRACTION OF VANILLIN

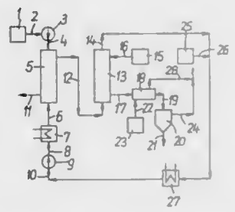
Hubert Coesen, Essen, and Reinhard Konrad, Bochum, both of Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 57,895, Jul. 16, 1987. This application Dec. 27, 1988, Ser. No. 289,516

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1985, 3533562

Int. Cl.[4] C07C *45/90*

U.S. Cl. 568—438 7 Claims



1. Process for the extraction of vanillin by means of extraction from a vanillin-containing, water-containing, liquid mixture of substances with carbon dioxide at a temperature of 0 to 110? C. as well as a pressure of 30 to 400 bar and subsequent separation of the vanillin from the vanillin-containing carbon dioxide, comprising: passing the vanillin-containing carbon dioxide at the extraction temperature and the extraction pressure through an aqueous $NaHSO_3$, $KHSO_3$, Na_2SO_3, or K_2SO_3 solution to separate the vanillin from the carbon dioxide and form a vanillin-containing aqueous $NaHSO_3$, $KHSO_3$, Na_2SO_3 or K_2SO_3 solution and a vanillin-free carbon dioxide, subsequently acidifying the vanillin-containing $NaHSO_3$, $KHSO_3$, Na_2SO_3 or K_2SO_3 solution with sulfuric acid to a pH value of 2 to 4, and feeding the vanillin-free carbon dioxide back into the extraction stage.

4,898,991

NEW PERFLUOROPOLYETHERS

Hsu-Nan Huang, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1989, Ser. No. 303,151

Int. Cl.[4] C07C *43/12*

U.S. Cl. 568—615 8 Claims

1. Perfluoropolyether compounds of the formula:

$$F(CF_2)_aO[(CF_2)_bCFCF_2O]_cCF_2CF_2O(CF_2)_dF$$
$$\quad\quad\quad

(b) a catalytic system comprising a mixture of from about 1.0% to about 5% copper hydroxycarbonate, and from about 2% to about 10% sodium sulphite based upon the weight of said 4-bromo-2-tert-butylphenol.

4,898,994

PROCESS FOR MAKING 3,5-DIALKYL-4-HYDROXYBENZYL-SUBSTITUTED AROMATICS

Glen L. Livingston, Church Hill, Tenn.; John Borges, and George L. Mina, both of Orangeburg, S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 14, 1988, Ser. No. 257,981
Int. Cl.[4] C07C *37/11, 39/12*
U.S. Cl. 568—720 **11 Claims**

1. A two-stage process for making a 3,5-di-C_{1-20}alkyl-4-hydroxybenzyl-substituted alkylbenzene compound, said process comprising a first stage of forming a mixture of said alkylbenzene compound and a 2,6-di-C_{1-20}-alkyl-4-methoxymethylphenol in an inert solvent, the amount of said 2,6-di-C_{1-20}-alkyl-4-methoxymethylphenol being about 30–60 weight percent of the total 2,6-di-C_{1-20}-alkyl-4-methoxymethylphenol used in the process and feeding sulfuric acid to said mixture at a temperature of about −10° to 25° C. to form a first stage reaction mixture and a second co-feed stage of co-feeding (i) the remaining 40–70 weight percent of the 2,6-di-C_{1-20}-alkyl-4-methoxymethylphenol and (ii) sulfuric acid to form a final reaction mixture and recovering said 3,5-di-C_{1-20}-alkyl-4-hydroxybenzyl-substituted alkylbenzene compound from said final reaction mixture.

4,898,995

METHOD FOR PRODUCTION OF PHENOL/ACETONE FROM CUMENE HYDROPEROXIDE

John F. Knifton, Austin, and John R. Sanderson, Leander, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,817
Int. Cl.[4] C07C *37/08, 45/53*
U.S. Cl. 568—798 **15 Claims**

1. In a method for cosynthesis of phenol and acetone by acid-catalyzed decomposition over a catalyst, the improvement comprising reacting cumene hydroperoxide over a heterogeneous catalyst consisting essentially of a heteropoly acid on an inert support at a temperature of about 20° to 150° C. and a pressure of from zero to 1000 psig.

4,898,996

PROCESS FOR PRODUCING 3-CHLORO-4-FLUORONITROBENZENE

Tsukasa Ishikura, Ageo, and Tatuharu Fukushima, Yono, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00283, § 371 Date Jun. 23, 1988, § 102(e) Date Jun. 23, 1988, PCT Pub. No. WO88/07519, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 18, 1988, Ser. No. 229,175
Claims priority, application Japan, Mar. 25, 1987, 62-68792; Apr. 14, 1987, 62-89751
Int. Cl.[4] C07C *79/12, 17/12*
U.S. Cl. 568—938 **3 Claims**

1. A process for producing 3-chloro-4-fluoronitrobenzene comprising chlorinating 4-fluoronitrobenzene in the presence of:

(1) iodine or an iodide in combination with iron or an iron compound or

(2) iodine or an iodide in combination with antimony or an antimony compound.

4,898,997

HALOPHENYLETHYLENES

Raymond V. H. Jones, Linlithgow, and Ian G. C. Fleming, Kirkliston, both of Scotland, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 862,656, May 13, 1986, abandoned, which is a continuation of Ser. No. 675,469, Nov. 28, 1984, abandoned, which is a continuation of Ser. No. 370,813, Apr. 22, 1982, abandoned. This application Dec. 20, 1988, Ser. No. 287,628
Claims priority, application United Kingdom, May 12, 1981, 8114395
Int. Cl.[4] C07C *17/24, 21/18, 33/24*
U.S. Cl. 570—128 **3 Claims**

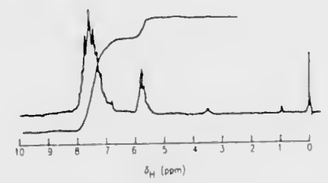
1. 1-(2-chlorophenyl)-1-(4-fluorophenyl)ethane.
2. 1-(2-fluorophenyl)-1-(4-fluorophenyl)ethane.
3. 1-(2,4-dichlorophenyl)-1-(4-fluorophenyl)ethane.

4,898,998

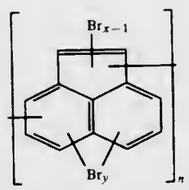
PROCESS FOR PRODUCING BROMINATED ACENAPHTHYLENE CONDENSATES

Masashige Kubo; Hideo Sakka, and Yukihiro Tsutsumi, all of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed May 31, 1984, Ser. No. 615,541
Claims priority, application Japan, Jun. 1, 1983, 58-95830; Oct. 28, 1983, 58-201119; Oct. 29, 1983, 58-201920; Nov. 15, 1983, 58-213326; Dec. 27, 1983, 58-244796; Feb. 23, 1984, 59-31451
Int. Cl.[4] C07C *17/00*
U.S. Cl. 570—204 **13 Claims**



1. A process for producing brominated acenaphthylene condensates of the formula:



wherein x is 1 or 2, y is an integer from 1 to 6 and n is 2 or more, comprising:

(A) brominating the side chain of the acenaphthene with 0.2 to 2.0 times as many moles of bromine as acenaphthene, said bromination initiated by ultraviolet radiation or by a radical initiator in a halogenated hydrocarbon solvent;

(B) adding a Lewis acid catalyst to the reaction solution in step (A) to promote the condensation of the brominated acenaphthene product of step (A);

(C) adding to the reaction solution of step (B) an equimolar or more amount of bromine relative to the amount of acenaphthene starting material, to further brominate and simultaneously condense the brominated acenaphthene and/or brominated acenaphthene condensates; and

(D) dehydrobrominating the brominated acenaphthene condensates.

4,898,999

PROCESS FOR HALOGENATING CYCLOBUTENOARENES

Larry S. Corley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 3, 1988, Ser. No. 201,818
Int. Cl.[4] C07C *17/12, 17/04*
U.S. Cl. 570—207 **18 Claims**

1. A process for preparing a cyclobutenohaloarene comprising the steps of:

(a) providing a reaction mixture comprising an organic phase and an aqueous phase, the organic phase comprising a cyclobutenoarene;

(b) contacting in the organic phase the cyclobutenoarene and a halogen source, said halogen source selected from sources of chlorine and bromine, under reaction conditions effective for producing a reaction product comprising the cyclobutenohaloarene and hydrogen halide and for permitting migration of the halogen halide into the aqueous phase; and

(c) recovering the cyclobutenohaloarene from the organic phase.

4,899,000

PRODUCTION OF ALLYL CHLORIDE

John E. Stauffer, 6 Pecksland Rd., Greenwich, Conn. 06831

Filed Jan. 27, 1989, Ser. No. 303,498
Int. Cl.[4] C07C *17/02, 17/34, 17/15*
U.S. Cl. 570—222 **11 Claims**

1. A process for the production of allyl chloride using hydrogen chloride as a source of chlorine, said process including reaction steps operated in tandem;

first subjecting perchloroethylene to oxychlorination with hydrogen chloride and oxygen in the presence of an oxychlorination catalyst to give reaction products consisting essentially of hexachloroethane and water;

second, isolating and reacting said hexachloroethane with a hydrocarbon containing three carbon atoms and optionally added chlorine, in the vapor phase to produce a product stream comprising predominantly allyl chloride, perchloroethylene and hydrogen chloride; and

third, isolating said products of the second step and repeating the first step using as starting materials the perchloroethylene and hydrogen chloride thus isolated whereby chlorination using regenerated hexachloroethane is accomplished, the process being operated with total utilization of hydrogen chloride and net production of hydrogen chloride and hexachloroethane is avoided.

4,899,001

PROCESS FOR THE SIMULTANEOUS HYDROCONVERSION OF A FIRST FEEDSTOCK COMPRISING UNSATURATED, HALOGENATED ORGANIC COMPOUNDS AND A SECOND FEEDSTOCK COMPRISING SATURATED, HALOGENATED ORGANIC COMPOUNDS

Tom N. Kalnes, La Grange, and Robert B. James, Jr., Northbrook, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 21, 1988, Ser. No. 274,225
Int. Cl.[4] C10C *1/00*
U.S. Cl. 585—310 **12 Claims**

1. A process for the simultaneous hydrodehalogenation of a first feedstock comprising unsaturated, halogenated organic compounds and a second feedstock comprising saturated, halogenated organic compounds which process comprises:

(a) reacting said first feedstock comprising unsaturated, halogenated organic compounds with hydrogen in a first hydrogenation reaction zone operated at hydrogenation conditions selected to minimize the polymerization of unsaturated organic compounds and to produce a first hydrogenated stream comprising hydrocarbonaceous compounds;

(b) reacting at least a portion of said first hydrogenated stream comprising hydrocarbonaceous compounds and said second feedstock comprising saturated, halogenated organic compounds with hydrogen in a second hydrogenation reaction zone operated at hydrogenation conditions selected to produce a second hydrogenated stream comprising hydrocarbonaceous compounds and to generate at least one water-soluble inorganic halide compound;

(c) contacting the resulting effluent from said second hydrogenation zone containing hydrogenated hydrocarbonaceous compounds and at least one water-soluble inorganic halide compound with a halide-lean aqueous scrubbing solution; and

(d) introducing a resulting admixture of said effluent from said second hydrogenation zone and said halide-lean aqueous scrubbing solution into a separation zone to provide a hydrogen-rich gaseous stream, a third hydrogen-ated stream comprising hydrocarbonaceous compounds and a halide-rich aqueous scrubbing solution containing at least a portion of said water-soluble inorganic halide compound.

4,899,002

INTEGRATED STAGED CONVERSION OF METHANOL TO GASOLINE AND DISTILLATE

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,657
Int. Cl.[4] C07C *1/24, 2/12*
U.S. Cl. 585—312 **9 Claims**

1. An integrated fluidized bed process for the conversion of C_1–C_5 oxygenate feedstock to olefinic gasoline range hydrocarbons and heavier distillate range hydrocarbons comprising the steps of:

(a) contacting said C_1–C_5 oxygenate feedstock with shape selective medium pore metallosilicate catalyst in an oxygenate to light olefins conversion zone under oxygenate to light olefins conversion conditions whereby an effluent stream comprising C_2+ olefins is produced;

(b) cooling said effluent stream and passing said effluent stream to an olefins to gasoline conversion zone in contact with shape selective medium pore metallosilicate catalyst under olefins to gasoline conversion conditions whereby C_2+ olefins are converted to gasoline comprising C_5+ olefinic hydrocarbons;

(c) introducing said C_5+ hydrocarbons into an olefins to gasoline and heavier distillate range hydrocarbons conversion zone at increased pressure under olefins to gasoline and heavier distillate range hydrocarbon conversion conditions in contact with shape selective medium pore metallosilicate catalyst whereby olefinic gasoline and heavier distillate range hydrocarbons are produced without recycling C_3–C_4 hydrocarbons to said olefins to gasoline and heavier distillate range hydrocarbons conversion zone.

4,899,003

PROCESS FOR OXYDEHYDROGENATION OF ETHANE TO ETHYLENE

Robert M. Manyik, St. Albans; Jonathan L. Brockwell, South Charleston, and John E. Kendall, Charleston, all of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Jul. 11, 1985, Ser. No. 753,975
Int. Cl.[4] C07C *5/333*
U.S. Cl. 585—313 **20 Claims**

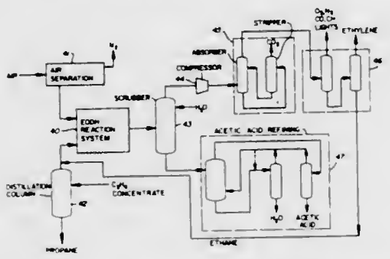
1. A process for converting ethane to ethylene, in a reaction system comprising:

at least two stages connected in open continuous series relationship with each other;

each stage comprising an oxydehydrogenating catalyst system maintained at conditions for catalytically converting an input gaseous stream comprising ethane and oxygen to an output gaseous stream having a temperature greater than 250° C. and comprising ethylene, acetic acid, water, ethane, and oxygen;

comprising the steps of:

cooling the output gaseous stream of each stage other than the output gaseous stream of the last stage to a temperature of less than about 250° C. for the introduction of oxygen;



changing the total water and acetic acid content in the input gaseous stream of at least one stage with respect to the total water and acetic acid content in the output gaseous stream immediately preceding that stage; and

supplying oxygen to the input gaseous stream of each stage when the input gaseous stream is at a temperature of less than about 250° C. and in an amount such that the total oxygen content of the input gaseous stream of each stage is less than about 6 mole percent with respect to the total input gaseous stream of that stage.

4,899,004

PROCESS FOR PRODUCING TRIMETHYLBENZENE

Joe D. Allison, and Richard M. Tillman, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Sep. 9, 1988, Ser. No. 242,110

Int. Cl.[4] C07C *2/00, 2/08*

U.S. Cl. 585—321 **22 Claims**

1. A process for selectively producing trimethylbenzene which comprises:

(a) contacting a C_1 to C_4 alkane with magnesium at a temperature of from about 450° C. to about 650° C., a pressure of from about atmospheric pressure to about 100 psig and a contact time of from about 0.01 to about 10 ml of alkane per minute per gram of magnesium;

(b) contacting the reaction product or a fraction thereof produced in step (a) with water or alcohol to promote a protonolysis reaction; and

(c) contacting the reaction mixture or fraction thereof produced in step (b) with a Y zeolite catalyst containing a metal selected from a Group VIB metal or a Group VIII metal and mixtures thereof at a temperature of from about 50° C. to about 250° C., a pressure of from about atmospheric pressure to about 50 psig and a contact time of from 0.01 to about 10 ml of reaction mixture or fraction thereof per minute per gram of Y zeolite catalyst.

4,899,005

METHOD FOR PREPARING CYCLOOLEFIN COPOLYMERS WITH IMPROVED HEAT STABILITY

Parley C. Lane, Cuyahoga Falls; Linwood P. Tenney, Hudson; George M. Benedikt, Macedonia, and Paul T. Stricharczuk, Mayfield Heights, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 19, 1987, Ser. No. 122,849

Int. Cl.[4] C07C *2/76, 13/28*

U.S. Cl. 585—360 **19 Claims**

1. A method for increasing the molecular weight and number of ring structures of one or more cycloolefin monomers comprising:

providing a volume of one or more cycloolefin monomers of sufficient purity to provide a degree of conversion to cycloolefin monomers greater than 95% upon polymerization with a metathesis catalyst system, said cycloolefin monomers having at least one norbornene group and

heating said volume of one or more cycloolefin monomers to a temperature in the range of 130° C. to 200° C. for a period of at least 0.25 hours to dissociate a portion of said cycloolefin monomers and react the dissociation products with components of said volume of cycloolefin monomers;

wherein said volume of one or more cycloolefin monomers is maintained substantially free of a polymerization catalyst and co-catalyst system during heating and the heated volume of one or cycloolefin monomers is of sufficient purity to provide a degree of monomer conversion greater than 95% upon polymerization with a methathesis catalyst system, wherein the degree of monomer conversion to polymer is determined by thermal gravimetric analysis of weight loss upon heating a polymerized sample up to about 400° C.

4,899,006

PRODUCTION OF AROMATICS FROM ETHANE AND/OR ETHYLENE

Dilip Davé , London, and Antony H. P. Hall, Cobham, both of England, assignors to The British Petroleum Company PLC, London, England

Filed Oct. 7, 1981, Ser. No. 309,440

Claims priority, application United Kingdom, Oct. 11, 1980, 8032910

Int. Cl.[4] C07C *12/02, 12/42*

U.S. Cl. 585—415 **11 Claims**

1. A process for producing aromatic compounds which comprises contacting under conversion conditions, a gaseous paraffinic hydrocarbon feed containing ethane, with a catalyst comprising gallium and a crystalline zeolite characterized by a constraint index within the approximate range of 2 to 8.7 and a silica to alumina ratio of at least 5, the weight of gallium in said catalyst being between about 0.05 to about 10 percent based on the total weight of catalyst whereby ethane present in said gaseous feed is converted to aromatic compounds, and recovering said aromatic compounds as liquids.

4,899,007

AROMATIC CONVERSION REACTIONS WITH ZEOLITIC CATALYST COMPOSITION OF IMPROVED SHAPE SELECTIVITY

Pochen Chu, West Deptford, N.J.; Francis G. Dwyer, West Chester, and Albert B. Schwartz, Philadelphia, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 533,893, Sep. 21, 1983, abandoned, which is a continuation of Ser. No. 454,302, Dec. 29, 1982, abandoned, which is a continuation of Ser. No. 7,871, Jan. 31, 1979, abandoned. This application Dec. 10, 1984, Ser. No. 679,673

Int. Cl.[4] C07C *2/68*

U.S. Cl. 585—467 **17 Claims**

1. A conversion process for the alkylation of a monoalkyl aromatic with an olefin to produce a dialkyl aromatic in which the para-isomer is in excess of its normal equilibrium concentration which comprises contacting said monoalkyl aromatic and said olefin under conditions effective for accomplishing said alkylation in the presence of a zeolite which has been calcined at an elevated temperature of at least 649° C., said zeolite being characterized by a silica/alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12.

4,899,008

DIRECT CATALYTIC ALKYLATION OF MONONUCLEAR AROMATICS WITH LOWER ALKANES

Rene B. LaPierre, Medford, and Roger A. Morrison, Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 205,563, Jun. 7, 1988, abandoned, which is a continuation of Ser. No. 64,630, Jun. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 879,786, Jun. 27, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 324,483

Int. Cl.[4] C07C *2/68*

U.S. Cl. 585—467 **20 Claims**

1. A process for producing alkylaromatics which comprises reacting a mononuclear aromatic compound and a C_2–C_4 paraffin in the presence of an acidic, intermediate pore size zeolite catalyst under substantially non-cracking conditions for the paraffin to produce C_{7+} alkylaromatic products with a selectivity of at least 60 weight percent.

4,899,009

METHOD FOR PRODUCING M-BENZYLTOLUNE

Shigenobu Kawakami, Ichikawa; Keiji Endo, Yokosuka; Hideyuki Dohi, Yokohama, and Atsushi Sato, Tokyo, all of Japan, assignors to Nippon Petrochemicals Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 289,416, Dec. 21, 1988, abandoned, which is a continuation of Ser. No. 159,102, Feb. 23, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 364,490

Claims priority, application Japan, Sep. 9, 1987, 62-226214; Dec. 29, 1987, 62-332856

Int. Cl.[4] C07C *5/22*

U.S. Cl. 585—471 **5 Claims**

1. A method for producing m-benzyltoluene which is characterized in that toluene and diphenylmethane are allowed to react at a reaction temperature in the range of 170 to 400° C. in the presence of a crystalline synthetic zeolite catalyst in which the molar ratio of SiO_2/Al_2O_3 is 20 or higher and the openings of main pores are formed by ten-membered oxygen rings.

4,899,010

PROCESS FOR ISOMERIZATION OF UNEXTRACTED, ETHYLBENZENE-CONTAINING XYLENE FEEDS

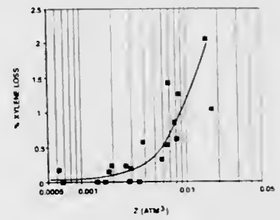
Jeffrey A. Amelse, Batavia, and Mark G. Reichmann, Oak Park, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 29, 1988, Ser. No. 250,933

Int. Cl.[4] C07C *5/22*

U.S. Cl. 585—480 **11 Claims**

1. In a vapor-phase process to isomerize, in the presence of hydrogen, a stream containing a major amount of one or more xylenes and a minor amount of ethylbenzene and primarily C_9 paraffins and naphthenes to a mixture rich in paraxylene, the improvement comprising isomerizing said feed over a catalyst composition that is a supported, crystalline, silicate molecular sieve having pores defined by rings containing ten oxygen atoms and containing a heteroatom selected from the group consisting of boron, aluminum, iron and gallium, said heteroatom present in a ratio of about one heteroatom for each twelve to five hundred silicon atoms, which catalyst composition is impregnated with about 0.02 to about 5 weight percent platinum, calculated as the metal, at a temperature T between about 700 and about 1000° F., a total pressure P between ambient and about 100 psig, and a hydrogen/hydrocarbon mol ratio H/HC between about 0.25 and about 5, such that T, P, and



H/HC are chosen so that Z, a function of T, P and H/HC, is less than about 0.01.

4,899,011

XYLENE ISOMERIZATION PROCESS TO EXHAUSTIVELY CONVERT ETHYLBENZENE AND NON-AROMATICS

Yung F. Chu, Cherry Hill, N.J.; Charles T. Kresge, Ellicott City, Md., and Rene B. LaPierre, Medford, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 15, 1986, Ser. No. 819,072

Int. Cl.[4] C07C *5/27*

U.S. Cl. 585—481 **30 Claims**

1. A process for isomerizing a feed which contains 0–20 weight percent paraffins and an aromatic C_8 mixture of ethylbenzene and xylene in which the para-xylene is less than that at thermal equilibrium which process comprises contacting the feed, under isomerization conditions, with a two component catalyst system including component (1) and component (2) wherein

component (1) comprises a zeolite of a constraint index of about 1 to about 12 and of an ortho-xylene sorption time of greater than 50 minutes based on its capacity to sorb 30% of the equilibrium capacity of ortho xylene at 120° C. and at an ortho xylene partial pressure of 4.5±0.8 mm of mercury and 0.05 to 10 wt % of a hydrogenation component and is effective, under said isomerization conditions, to deethylate benzene; and

component (2) comprises a zeolite, having a constraint index within the approximate range of 1 to 12 and characterized by a xylene sorption capacity greater than 1 gram/100 grams of zeolite and an ortho-xylene absorption time for 30 percent of said capacity of less than 10 minutes, where the sorption capacity and sorption times are measured at 120° C. and a xylene pressure of 4.5±0.8 mm of mercury; and comprises 0.05 to 10 weight percent of a hydrogenative component wherein the amount of component (2) in the catalyst system is at least 50 percent by volume of the catalyst system wherein isomerization conditions include a temperature of from about 400° to 1000° F., a pressure of from about 0 to 1000 psig, a WHSV of between 0.5 and 100 and a H_2/HC molar ratio of between about 0.5 and 10; and

whereby the ethylbenzene content of the feed is exhaustively converted,

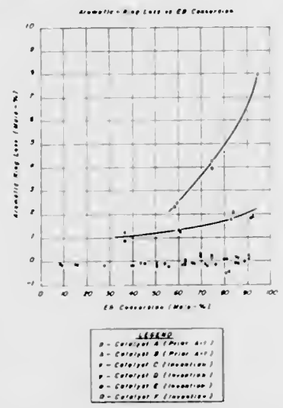
wherein exhaustively converted is deethylation of at least half the ethylbenzene and includes hydrocracking of at least one-third of said 0–20 weight percent of paraffins.

4,899,012

CATALYST FOR THE ISOMERIZATION OF AROMATICS

J. W. Adriaan Sachtler, Des Plaines, and R. Joe Lawson, Palatine, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Oct. 17, 1988, Ser. No. 259,086
Int. Cl.[4] C07C 5/22
U.S. Cl. 585—482 2 Claims



1. A process for the isomerization of a feedstock containing a non-equilibrium mixture of xylenes and ethylbenzene which comprises contacting such non-equilibrium mixture with a catalyst comprising a combination of a Group VII metal component and a lead component with a carrier material containing about 1 to about 20 mass % of a pentasil zeolite and an inorganic oxide binder, wherein the atomic ratio of lead to Group VIII metal is about 2 to about 10 and wherein about 80% to about 100% of the Group VIII metal component and about 60% to about 100% of the lead component are combined with the inorganic oxide binder, at conditions selected to isomerize xylenes and selectively dealkylate ethylbenzene.

4,899,013

VISCOUS POLYMERS OF ISOBUTYLENE AND DIENES

Kelley R. Lane, Winfield, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 20, 1988, Ser. No. 260,253
Int. Cl.[4] C07C 2/02
U.S. Cl. 585—506 6 Claims

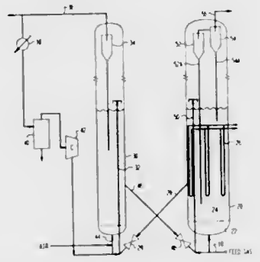
1. A process for preparation of viscous copolymer of dienes and isobutylene wherein said copolymer has a degree of unsaturation greater than 100% and an average molecular weight range of from 400 to 10,000 wherein said process comprises reacting a feed comprising isobutylene with a C_4 to C_8 diene in the presence of a catalyst comprising a Lewis acid-type catalyst wherein the volume ratio of C_4 to C_8 diene to said isobutylene is from 1:3 to about 1:20, at a temperature within the range of from about 0° C. to about 40° C., wherein weight ratio of said catalyst to said feed is from 0.02 wt % to about 0.20 wt %.

4,899,014

UPGRADING PROPENE-ETHENE MIXTURES IN A TURBULENT FLUIDIZED CATALYST BED REACTOR

Amos A. Avidan, 2120 Stackhouse Dr., Yardley, Pa. 19067; David L. Johnson, 181 Concord Meeting Rd., Glen Mills, Pa. 19342, and Jorge L. Soto, S-545 Inverness Apts., Westville, N.J. 08093

Continuation-in-part of Ser. No. 6,407, Jan. 23, 1987, Pat. No. 4,746,762. This application May 23, 1988, Ser. No. 197,546
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] C07C 2/12
U.S. Cl. 585—533 16 Claims



1. A fluidized bed catalytic process for conversion of propene-rich light olefinic gas feedstock comprising at least 2 mol % ethene and having a C_3:C_2 olefin molar ratio of at least about 2:1 to produce hydrocarbons rich in C_4+aliphatics and aromatics, comprising the steps of: maintaining a turbulent fluidized bed in a reactor operating at a pressure in the range from about 400 to 2500 kPa, and temperature of about 315 to 510° C., said catalyst being a particulate zeolite having a silica:alumina molar ratio in the range from about 20:1 to about 200:1, an apparent particle density of about 0.9 to 1.6 g/cm^3, a size range of about 1 to 150 microns, and average catalyst particle size of about 20 to 100 microns containing about 10 to 25 weight percent of fine particles having a particle size less than 32 microns;

passing hot light olefinic gas feedstock upwardly through the fluidized catalyst bed in a single pass under turbulent flow conditions which provide reaction severity conditions sufficient to convert at least about 70% of feedstock ethene and propene;

maintaining turbulent fluidized bed conditions at a superficial feedstock velocity of about 0.3 to 2 meters per second through the reactor bed; and

recovering hydrocarbon product containing a major amount of C_4+hydrocarbons, at least 6% isobutane, and containing propane and propene in a ratio in the range from about 0.1:1 to 5:1.

4,899,015

PROCESS FOR OLEFINS TO GASOLINE CONVERSION

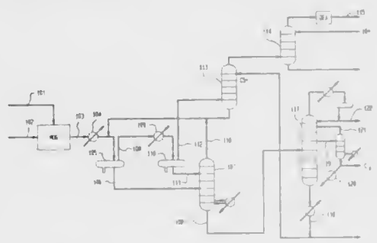
Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,432
Int. Cl.[4] C07C 2/02
U.S. Cl. 585—533 9 Claims

1. An improved process for the conversion of lower olefinic hydrocarbon feedstock to C_5+ gasoline range hydrocarbons comprising:

a. contacting a hydrocarbon stream containing C_3− and/or C_4− olefinic hydrocarbons with a medium pore shape selective solid catalyst in an oligomerization zone under oligomerization conditions to produce an effluent stream rich in C_5+ gasoline range hydrocarbons;

b. separating said effluent stream to provide a C_3− hydrocarbon stream and a C_3+ hydrocarbon stream;



c. fractionating said C_3+ hydrocarbon stream to produce a C_5+ gasoline range hydrocarbon stream, a stream rich in C_4 hydrocarbons and a stream rich in C_3 hydrocarbons.

4,899,016

PURIFICATION PROCESS FOR ORGANIC FEEDSTOCKS

Keith R. Clark, and Philip Richman, both of Houston, Tex., assignors to UOP, Des Plaines, Ill.

Filed Feb. 11, 1988, Ser. No. 155,125
Int. Cl.[4] C07C 7/12; C10G 17/00
U.S. Cl. 585—826 6 Claims

1. Process for purifying an organic feedstock which comprises the steps of:

(a) passing the impure organic feedstock in the liquid phase through a fixed bed containing a molecular sieve adsorbent capable of selectively absorbing the impurity constituent to be removed, and terminating such passage prior to the time of breakthrough of an undesirable concentration of the impurity constituent;

(b) draining the bed of its void space held liquid, by displacing said liquid with vapor containing constituents of the purified product;

(c) countercurrently to the direction of flow into the bed in step (a). introducing a substantially non-sorbable purge gas into the bed at a rate which displaces the void space vapor from the bed without significant intermixing of the two gas phases and without desorbing the adsorbed impurity and collecting the displaced vapor as product;

(d) continuing the flow of the non-sorbable purge gas through the bed to desorb the adsorbed impurity and flush same from the bed and out of the adsorption-purification system;

(e) displacing the non-sorbable purge gas remaining in the bed at the termination of step (d) by the cocurrent flow, with respect to the direction of flow in step (d), thereinto of vapor phase stream comprising one or more constituents of the purified product of step (a); and

(f) countercurrently with respect to the direction of flow in step (e) displacing the void space vapor remaining in the bed in step (e) by introducing in the liquid phase a portion of the purified product from step (a) in an amount sufficient to fill the bed void space and cool the bed to the desired temperature for introducing additional impure feedstock to begin a new purification and regeneration cycle.

4,899,017

PROCESS FOR THE SELECTIVE SEPARATION OF PARA-XYLENE FROM C8 AROMATIC MIXTURES

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 27, 1987, Ser. No. 78,440
Int. Cl.[4] C07C 7/12
U.S. Cl. 585—828 13 Claims

1. A process for removing p-xylene from a mixture including p-xylene and at least one other C_8 aromatic compound selected from the group consisting of m-xylene, o-xylene and ethylene benzene, comprising

contacting said mixture with a bed comprising a zeolite having a SiO_2:Al_2O_3 molar ratio of at least 200 selected from the group consisting of ZSM-5, ZSM-11 and zeolite beta, at a temperature up to about 100° C. (atmospheric pressure), whereby p-xylene is adsorbed by said zeolite and said at least one other C_8 aromatic compound passes through the bed;

passing through said bed containing the zeolite and adsorbed p-xylene, a desorbent, while maintaining the temperature the same as that used during said contacting and thereby maintaining the desorbent in the liquid state; whereby desorbent leaving the bed contains p-xylene.

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4,899,018

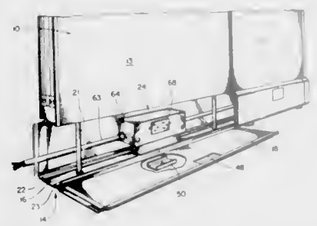
UTILITY ROUTING SYSTEM FOR MODULAR PANELS

Donald J. Sireci, 9 Oxford Dr., Deerfield, Ill. 60015

Continuation-in-part of Ser. No. 11,289, Feb. 5, 1987, Pat. No. 4,808,768. This application Dec. 2, 1988, Ser. No. 278,849

Int. Cl.[4] H02G *3/28*

U.S. Cl. 174—48 **11 Claims**



1. A utility routing system for interconnected modular wall panels having a base assembly consisting of a bottom plate and a top plate interconnected by struts where the bottom plate has a pair of spaced parallel linearly extending ribs, comprising: a baseline box adapted to receive at least one receptacle, projection means on the baseline boxes sized to slidably engage the bottom plate ribs so they define a track for the box, and means for clamping the baseline box to the bottom plate in any desired position.

4,899,019

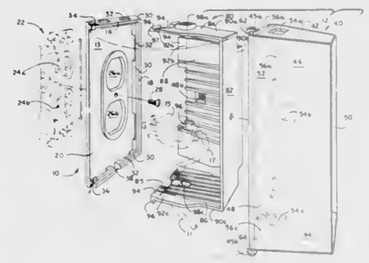
SAFETY COVER FOR ELECTRICAL RECEPTACLES

Robert G. Riceman, Roswell, Ga., assignor to Donald J. Scheer, Atlanta, Ga.

Filed Mar. 9, 1987, Ser. No. 23,685

Int. Cl.[4] H01R *13/447*

U.S. Cl. 174—67 **10 Claims**



1. A safety cover for an electrical receptacle comprising:
(a) a receiving plate capable of being affixed to an electrical receptacle for lockingly receiving a cover assembly;
(b) a cover assembly having at least one pair of opposite walls for covering said receptacle, said cover assembly comprised of an outer housing member and an inner housing member having a plurality of locking means extending outwardly beyond said outer housing member toward said receiving plate and located within and affixed to said outer housing member; and
(c) a plurality of individually operated locking means for locking said cover assembly to said receiving plate and unlocking said cover assembly from said receiving plate, said locking means positioned on said cover assembly in such a manner as to be incapable of simultaneous operation by a hand below a predetermined size and each said locking means comprised of:
(i) a depressable locking flange extending from said cover assembly;
(ii) a locking flange receiving means located on said receiving plate for receiving and holding said locking flange; and
(iii) means for depressing said locking flange into and out of locked position with said receiving means.

4,899,020

PRINTED WIRING UNIT FOR HORN SWITCH

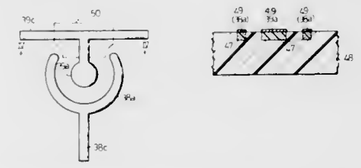
Satoshi Ohno, Inazawa, and Tetsusbi Hiramitsu, Ichinomiya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Aug. 25, 1988, Ser. No. 236,182

Claims priority, application Japan, Oct. 19, 1987, 62-159837[U]; Dec. 26, 1987, 62-330986

Int. Cl.[4] H05K *1/00*

U.S. Cl. 174—68.5 **4 Claims**



1. A printed wiring unit comprising:
an insulative base made of resin strong in corrosion resistance against an etching reqgent to be used in pre-treatment for plating,
a printed wiring pattern disposed on said insulative base
said base defining recesses for said wiring pattern disposed therein,
a pattern base being shaped substantially the same as said printed wiring pattern, molded so as to inlay within said recesses of said insulative base, and being made of resin weak in corrosion resistance against said etching reagent used in pre-treatment for plating, and
a conductive plating layer formed on said pattern base.

4,899,021

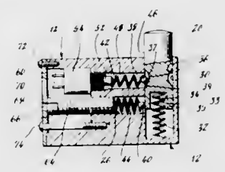
LATCHING SWITCH

Thomas M. Daniel, 167 N. Taylor Ave., Norwalk, Conn. 06854

Filed Apr. 22, 1988, Ser. No. 185,069

Int. Cl.[4] H01H *13/62*

U.S. Cl. 200—43.13 **12 Claims**



1. An improved latching switch, comprising:
(a) A portable switch body having an aperture formed therein and a first elongated cavity extending into said body from said aperture for receiving a switch actuating member therein;
(b) a switch actuating member positioned in said cavity and adapted for movement along a length of said cavity;
(c) a biasing means positioned in said cavity for causing said actuating member to extend through said aperture and from said body;

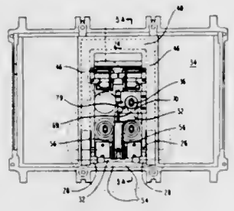
(d) a second elongated cavity formed in said body, said second cavity communicating with said first cavity and extending transversely thereto;
(e) a third elongated cavity formed in said body, said third cavity communicating with said first cavity and extending transversely thereto;
(f) a first latch means movably positioned in said second cavity for engaging and restraining said actuating member at a first location of said actuating member at which location said actuating member extends partly from said switch body;
(g) a second latch means movably positioned in said third cavity for engaging and restraining said actuating member at a second location of said actuating member at which location said actuating member is substantially recessed within said first cavity;
(h) an electrical switching means positioned in said switch body and responsive to movement of said first latch means in said second cavity for providing a first switching state when said switch actuating member is positioned at said first location and a second switching state when said switch actuating member is moved from said first location and is positioned at said second location; and,
(i) a key means for engaging and actuating said second latch means for releasing said latched actuating member from its second location whereby said biasing means causes said actuating member to advance to said first location in said first cavity at which it extends partly from said body.

4,899,022

STORED ENERGY OPERATING MECHANISM CHARGING HANDLE AND COVER ASSEMBLY

David A. Leone; G. Lawrence Moody, both of Lawrenceville; William D. Holland, Stone Mountain; Mark E. Bell, Atlanta, and W. Dale Robbins, Sneliville, all of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Oct. 11, 1988, Ser. No. 256,356
Int. Cl.[4] H01H *9/20, 5/00*
U.S. Cl. 200—50 A **6 Claims**



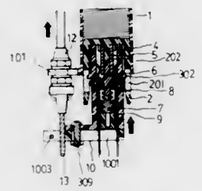
1. A circuit breaker comprising:
at least one pair of primary contacts;
means for storing energy, wherein the energy is used to close the primary contacts;
a circuit breaker case including a cover, wherein the contacts and means for storing energy are positioned within the case;
a handle pivotally mounted to the cover including means for transferring energy to the means for storing energy, wherein energy is transferred to the means for storing energy when the handle is pivoted from a first position;
means for initiating being activatable such that the closing of the primary contacts is initiated, the means for initiating being mounted to the cover; and
means for interlocking the means for initiating with the handle such that the means for initiating is restricted from being activated when the handle is pivoted from the first position.

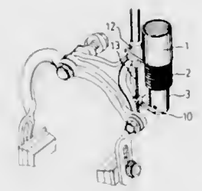
4,899,023

BICYCLE BRAKE LIGHT CONTROL SWITCH ASSEMBLY

Lee Shu-Hwa, 7F, 16, Alley 3, Lane 227, Nung-An St., Taipei, Taiwan

Filed Feb. 14, 1989, Ser. No. 310,786
Int. Cl.[4] H01H *3/16*
U.S. Cl. 200—61.12 **7 Claims**





2. A bicycle brake light switch control assembly, said assembly comprising:
a housing;
means for securing said housing to a brake cable;
a socket housed in said housing, said socket having first elongated slots;
a sliding sleeve with a first inner hole therethrough, said sliding sleeve having locating holes and means for attaching said sliding sleeve to a brake cable;
conductive means;
insulating means;
a power jacket, said jacket having retainer noses engageable with said locating holes, said jacket also having notches;
conductive plate springs with a first end and a second end, said first ends disposed on said notches;
springing means disposed between said power jacket and said insulating means, so that when said springing means is in an equilibrium state, said second end of said conductive plate springs is contiguous to said insulating means and an electric circuit is not completed, but when the bicycle brake is activated, the brake cable urges said sliding sleeve to displace which in turn causes power jacket to push said second end of said conductive plate springs onto said conductive means and completing the electric circuit.

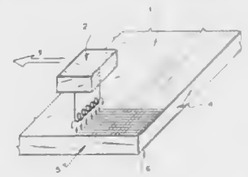
4,899,024

METHOD FOR TREATING LARGE CAST IRON DIES, PARTICULARLY FOR VEHICLE-SHEET METAL PRESSING

Luciano Puozzo, and Maurizio Manzin, both of Turin, Italy, assignors to 501 Fiat Auto S.P.A., Turin, Italy

Filed Dec. 21, 1987, Ser. No. 135,306
Claims priority, application Italy, Dec. 19, 1986, 67946 A/86
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.41 **4 Claims**

1. A method for localized induction hardening of adjacent regions of a cast iron piece, in particular the piece forming at least a part of a die for pressing metal sheets, to produce, in each said region, a localized martensitic transformation, said adjacent regions having a portion in common, wherein the hardening of said common portion is obtained by two successive hardening operations performed along directions at sub-



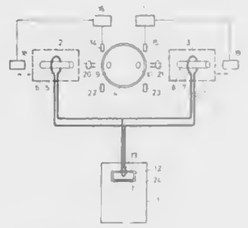
stantially right angles to each other and in such a manner as to obtain in said adjacent regions a depth of the martensitic transformation of 1 to 3 mm and a surface hardness exceeding 400 HB.

4,899,025

HEATING APPARATUS COMPRISING AT LEAST TWO INDEPENDENT INDUCTORS

Ronald P. T. Kamp, and Johannes P. De Meij, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1988, Ser. No. 278,706
Claims priority, application Netherlands, Dec. 16, 1987, 8703043
Int. Cl.[4] H05B *6/08*
U.S. Cl. 219--10.57 **7 Claims**



1. A heating apparatus comprising: a high-frequency generator, at least two heating inductors connected to the high-frequency generator for inductively heating workpieces in which each inductor includes an induction coil coupled to the high-frequency generator and a high-permeability coil core, means for displacing said coil cores within respective induction coils mutually independently, and at least one detector for detecting at least one process parameter in the induction heating process, said process parameter being determined exclusively by the workpiece, and wherein the displacing means independently displace the coil cores in response to detection signals received from the at least one detector in order to individually switch the transfer of energy on and off between said high-frequency generator and said workpieces.

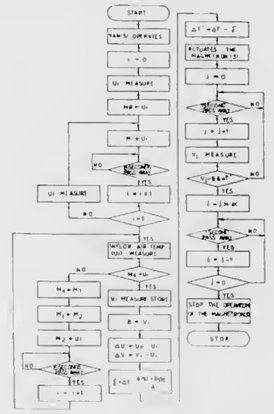
4,899,026

AUTOMATIC COOKING CONTROL SYSTEM FOR A MICROWAVE OVEN

Ki Tae Oh, Kyungsangnam, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 21, 1988, Ser. No. 287,020
Claims priority, application Rep. of Korea, Dec. 22, 1987, 14744/1987
Int. Cl.[4] H05B *6/68*
U.S. Cl. 219—10.55 M **16 Claims**

1. A method of automatically cooking food in a microwave oven having a heating chamber and a magnetron, comprising the steps of:
(a) measuring an initial temperature of air flowing into the heating chamber;
(b) storing the initial temperature as a first reference value and a first temperature;
(c) delaying eight seconds;
(d) measuring and storing a temperature of the air flowing into the heating chamber;
(e) repeating said steps (c) and (d) until a second and third temperature is measured and stored;
(f) measuring a fourth temperature of the air flowing into the heating chamber;
(g) determining if the fourth temperature is equal to the first temperature;
(h) measuring and storing a temperature of air flowing out of



the heating chamber as a second reference value when said step (g) has determined that the fourth temperature is equal to the first temperature;
(i) calculating a temperature increment value by using the first reference value, fourth temperature, and the temperature of the air flowing out of the heating chamber;
(j) actuating the magnetron for a first time period;
(k) measuring the temperature of the air flowing out of the heating chamber;
(l) determining if a difference between the temperature measured in said step (k) and the second reference value is greater than or equal to the temperature increment value; and
(m) actuating the magnetron for a second time period when said step (l) has determined that the difference is greater than or equal to the temperature increment value, thereby automatically cooking food.

4,899,027

DOUBLE-EFFECT TABLE WITH HEATING AND COOLING PURPOSES

Jackson Wong, No. 14, Li-Chih New Village, Tso-Ying District, Kaohsiung City, Taiwan

Filed May 22, 1989, Ser. No. 355,340
Int. Cl.[4] H05B *6/12*
U.S. Cl. 219—10.493 **1 Claim**

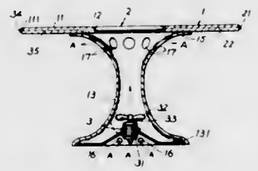
1. A double-effect table comprising:
an upper table plate having an electromagnetic oven capable of producing electromagnetic waves for heating or cooking purpose embedded in the upper table plate, coplanar to an upper surface of said upper table plate;
a hollow foot stand positioned under said upper table plate having an upper portion of said foot stand enlarged up-

wardly for connecting and supporting said upper table plate and having a lower portion of said foot stand enlarged downwardly for standing said foot stand and said table on a floor; and

a cooling fan provided in said foot stand operatively driven for discharging air radially outwardly from said foot stand,

the improvement which comprises:

said hollow foot stand having said lower portion formed with a plurality of air inlet holes, and having said upper portion of said stand formed with a plurality of air



discharge holes radially disposed and transversely formed through said upper portion of said hollow foot stand,

said driving motor and said cooling fan mounted in said lower portion of said foot stand,

whereby upon a running of the driving motor and cooling fan, a cooling air is sucked from the lower portion of said foot stand, and directed through said hollow foot stand to be discharged from the upper portion of said foot stand for evenly cooling people sitting around said table.

4,899,028

SUCTION AND EXHAUST SYSTEM OF A HEAT COOKING APPARATUS

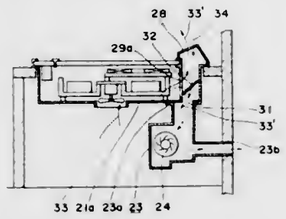
Akihiko Arai; Kazuichi Okada, both of Hirakata; Tetsuo Kamo, Yawata, and Eiji Shiota, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 129,739, Dec. 7, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 315,220

Claims priority, application Japan, Dec. 11, 1986, 61-295254

Int. Cl.[4] H05B *6/12;* **E24C** *15/10*

U.S. Cl. 219—10.493 **2 Claims**



1. A suction and exhaust system of a heat cooking apparatus comprising:

a main casing defining a compartment adapted to house heating components of the cooking apparatus, and a ventilation hole open to said compartment;

a cooling device disposed in an air cooling relationship with said compartment for introducing cooling air into said compartment;

an exhaust device defining an exhaust intake open to the exterior of the system and an exhaust passage extending from said exhaust intake, and

said exhaust device comprising a fan disposed in an air suction relationship with said exhaust passage for generating suction to draw vapors generated by an object to be heated by the apparatus through said exhaust intake and into said exhaust passage,

said exhaust passage open to said ventilation hole, and said exhaust device disposed in an air suction relationship with said compartment through said ventilation hole in which the suction generated by said fan also draws the cooling air introduced into said compartment by said cooling device through said ventilation hole and into said exhaust passage; and

a switch operatively connected to said fan for turning said fan on and off independently of the operation of said cooling device.

4,899,029

ELECTRICAL CONNECTOR HIGH-SPEED WELDING APPARATUS

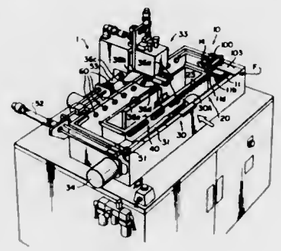
Naoki Kumagai, Machida, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

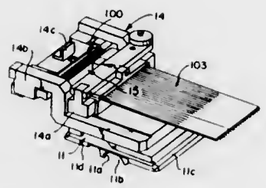
Filed Oct. 25, 1988, Ser. No. 262,389

Claims priority, application Japan, Nov. 12, 1987, 62-286438

Int. Cl.[4] B23K *11/16, 9/12*

U.S. Cl. 219—56.1 **6 Claims**





1. A high-speed welding apparatus for welding electrical conductors of an electrical cable (**103**) to electrical contacts of an electrical connector (**100**) comprising a holder (**14**) for holding the connector and cable, a carrier member (**11**) onto which the holder (**14**) is mounted, a frame (**F**) for supporting the carrier member (**11**) and along which the carrier member moves, a welding device (**33**) for welding the conductors to the contacts as the connector and cable move relative thereto along a welding station (**30**), characterized in that a first conveying mechanism (**20**) on said frame (**F**) moves the carrier member (**11**) to the welding station (**30**); a feed mechanism (**30A**) on said frame (**F**) engaging said carrier member (**11**) to continuously feed the carrier member with the connector (**100**) and cable (**103**) thereon along the welding station while the welding device (**33**) automatically welds the conductors of the cable (**103**) to the contacts of the connector (**100**); and a second conveying mechanism (**40**) mounted on the frame (**F**) for moving the carrier member away from the welding station after the cable conductors have been welded to the connector contacts.

4,899,030

HIGH-POWER-DENSITY BEAM WELDING METHOD IN COMBINATION WITH UPSET WELDING AND APPARATUS THEREFOR

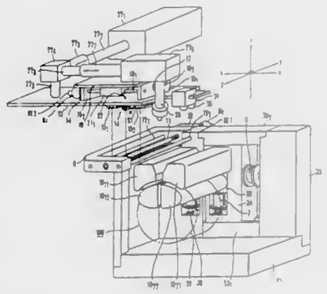
Yasunobu Miyazaki; Tohru Saito, and Taizo Nakamura, all of Kanagawa, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 240,612

Claims priority, application Japan, Sep. 4, 1987, 62-221562; Aug. 8, 1988, 63-197697

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.63 **14 Claims**



1. A method of welding, comprising the steps of:

(i) placing two substantially planar surfaces of a workpiece or workpieces in spaced facing relation, said planar surfaces defining edges of said workpiece or workpieces;

(ii) heating said workpiece or workpieces near said edges to a welding temperature and pressing said surfaces together to thereby form a substantially continuous upset weld line; and

(iii) irradiating said upset weld line formed in step (ii) with a high power density beam to thereby form a substantially continuous final weld line.

4,899,031

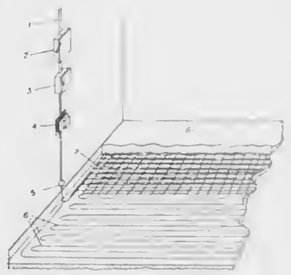
PULSED ELECTRICAL HEATING OF CONCRETE

David F. Dyer, P.O. Box 2255, Auburn, Ala. 36831, assignor to David F. Dyer, Auburn, Ala.

Filed Nov. 14, 1988, Ser. No. 271,120

Int. Cl.[4] H05B *1/00*

U.S. Cl. 219—213 **3 Claims**



1. A method of supplying a pulsed flow of electric heat within green concrete for curing purposes, comprising the steps of

a. having a designed form for molding concrete,

b. positioning at selected locations within said form a medium for conducting electric heat within the form,

c. having means for wiring the medium to an electric timer equipped to control the flow of electric current passing through said timer to multiple selections of pulsed on and off cycles and having means for furnishing electric current to said timer,

d. placing soft green concrete in the form and surrounding the medium with said concrete to allow the electric timer to deliver selected on and off pulsed heat within said concrete.

4,899,032

ELECTRIC HEATING ELEMENT UTILIZING CERAMIC PTC RESISTORS FOR HEATING FLOORING MEDIA

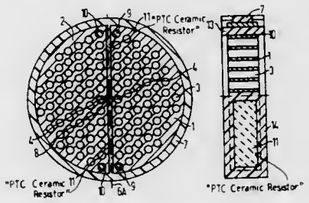
Helmut Schwarzl, Leutschach, and Josef Unterlass, Graz, both of Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 9, 1988, Ser. No. 166,011

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3708056; Mar. 12, 1987, 8703749

Int. Cl.[4] H05B *1/02, 3/14, 3/20;* **H01C** *7/02*

U.S. Cl. 219—375 **17 Claims**



1. A heating element for heating a flowing medium comprising:

a plurality of metallic bodies arranged in side-by-side juxtaposed relationship and means for mechanically fixing the bodies together along juxtaposed boundary surfaces thereof to form a substantially cylindrically shaped heat exchanger,

said metallic bodies having a plurality of regularly arranged passageways for the medium to flow through the bodies, said passageways being tapered in a conical fashion at inlets thereof in the direction of the flow of the medium,

said means for fixing including at least one bridge formed of an electrically insulating synthetic resin material having a thermal expansion coefficient equal to that of the metallic bodies, which extends across said juxtaposed boundary surfaces of adjacent metallic bodies and through a passageway located in each body adjacent the boundary surface thereof,

said metallic bodies having a volume excluding the volume of the passageways being at least equal to the volume of the passageways,

said metallic bodies being made of a good heat conducting metal;

at least one disc-like positive temperature coefficient ceramic PTC resistor located between the juxtaposed boundary surfaces of two adjacent metallic bodies;

said at least one ceramic PTC resistor having large surfaces with a covering mechanically attached and electrically coupled to the boundary surface of the respective adjacent metallic body by an electrically and thermally conductive adhesive, any cavity remaining between the boundary surfaces and around said at least one ceramic PTC resistor being filled to encase said ceramic PTC resistor in a casing of the electrically insulating synthetic resin material, said casing insulating said at least one ceramic PTC resistor from external influences, said synthetic resin material having virtually

the same thermal expansion coefficient as the metallic bodies; and

said metallic bodies having means for forming a connection to a current supply to provide current to said at least one ceramic PTC resistor.

4,899,033

ELECTRIC HOTPLATE CONNECTING PIECE

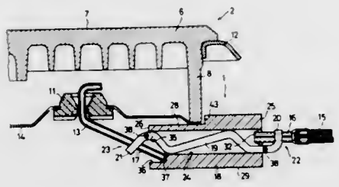
Robert Kicherer; Felix Schreder, and Stefan Reif, all of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,768

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728528

Int. Cl.⁴ H05B *3/70*

U.S. Cl. 219—451 **27 Claims**



14. An electric hotplate connecting piece for electrically connecting at least one connecting member of a hotplate to supply lines, comprising:

an insulator body for receiving at least one electrical lead provided for connecting at least one connecting member of a botplate to at least one supply line by means of at least one electric connection point, said at least one connection point having a projecting connecting part of said lead provided to be connected to a freely projecting, associated incoming connecting part, wherein said lead has a length extension between ends and connecting parts, said lead being located substantially in a single median longitudinal plane over substantially said entire length extension, said lead being curved and bent several times in opposite directions between said ends and said connecting parts, at the most one of said ends being located transverse to said median longitudinal plane.

4,899,034

METHOD OF OPERATING A CONTROL UNIT

Brian J. Kadwell, Holland; Daniel L. Fowler, Kentwood, and Gregory F. Gawron, Holland, all of Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 939,872, Dec. 10, 1986, Pat. No. 4,782,215.

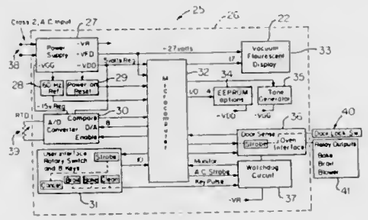
This application Oct. 18, 1988, Ser. No. 259,189

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—494 **18 Claims**

1. In a method of operating a temperature regulating control unit comprising a RTD temperature sensor means and a microcomputer for receiving digital signals from said sensor means in relation to the temperature being sensed by said sensor means, the improvement comprising the step of applying a varying voltage to said sensor means and comparing the resultant current level through said sensor means at certain values of aid voltage applied thereto with a fixed reference current level that has been predetermined as being the current level that would exist through said sensor means when that particular certain voltage is being applied to said sensor means while said sensor means would be sensing a particular certain temperature within a predetermined temperature range, the step of applying said varying voltage to said sensor means applying said varying voltage in an increasing manner from a starting low voltage toward a higher stopping voltage until a particular certain voltage between said starting voltage and said stopping voltage is applied to said sensor means that creates a current level through said sensor means that substantially equals said fixed reference current level whereby said microcomputer will receive said digital signal means in a manner to determine the actual temperature being sensed by said sensor means at that time and when said actual temperature is within said temperature range.



4,899,035

SCANNING DEVICE FOR A CHIP CARD
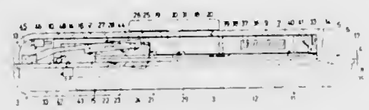
Peter Goldmann; Gerhard Habelt, both of Vienna, and Hans Weihs, Purkersdorf, all of Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1988, Ser. No. 262,914

Claims priority, applicatioo Austria, Oct. 27, 1987, 2821/87

Int. Cl.⁴ G06K *7/06*

U.S. Cl. 235—441 **9 Claims**



1. A scanning device for a chip card having a lever arm, which is pivotably journalled, carries a set of contacts and can be pivoted towards a chip card inserted into the scanning device and then occupying an operating position, the set of contacts contacting contacts provided on the chip card, characterized in that the lever arm is pivoted towards the operating position of a chip card by a slide slidably guided parallel to the direction of insertion of a chip card into the scanning device, which slide is in turn displaceable by an individual operating member that can be operated by hand.

4,899,036

TRANSACTION SYSTEM

John A. McCrindle; Antony F. Steiner, and Andrew M. Jackson, all of Chelmsford, England, assignors to The General Electric Company, p.l.c., London, England

Division of Ser. No. 849,296, Apr. 8, 1986, Pat. No. 4,845,347.

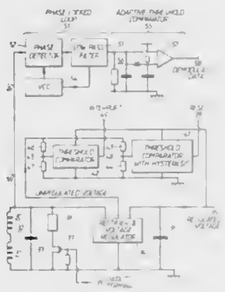
This application May 22, 1989, Ser. No. 342,863

Claims priority, application United Kingdom, Apr. 10, 1985, 8509135

Int. Cl.⁴ G06K *5/00*

U.S. Cl. 235—380 **33 Claims**

1. A transaction system including a terminal; a token having an on-board data processing capability; means for inductively coupling the token with the terminal to permit data communication therebetween; means for transmitting data from the terminal to the token via a modulated carrier signal; and means for transmitting data from the token to the terminal by modulation of the level of the carrier signal at the terminal by the token as it draws power from the terminal.



4,899,037

MAGNETIC INFORMATION-RECORDING ELEMENT AND METHOD OF MANUFACTURE

Claude Marechal, and Christian Schmuckle, both of Paris, France, assignors to Eastman Kodak Company, Rochester, N.Y.

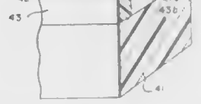
PCT No. PCT/EP87/00224, § 371 Date Jan. 19, 1988, § 102(e) Date Jan. 19, 1988, PCT Pub. No. WO87/06745, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 23, 1987, Ser. No. 150,419

Claims priority, application France, Apr. 28, 1986, 8606238

Int. Cl.⁴ G06K *19/06*

U.S. Cl. 235—493 **12 Claims**



1. A magnetic information recording element comprising a support having thereon a coated layer of at least one magnetic information recording track in contact and adjacent to at least one non-magnetic track, the magnetic tracks comprising dispersed magnetic particles and the non-magnetic tracks comprising dispersed non-magnetic particles.

4,899,038

IDENTIFICATION CARD

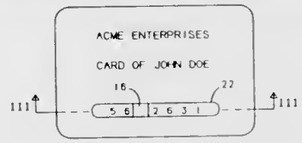
Alfred R. Rearigh, 550 Finnin Rd., New Kensington, Pa. 15068

Filed Dec. 2, 1987, Ser. No. 127,687

Int. Cl.⁴ G06K *19/06*

U.S. Cl. 235—493 **4 Claims**

1. An identification system comprising a card bearing a code, in combination with a means operable by a holder of the card for hiding a selected portion of the code for creating a subcode associated with the proper holder, said means comprising a slide movable along a track on the card, the track bearing the code.



4,899,039

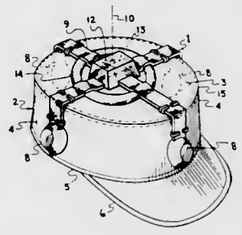
PHOTODETECTOR ARRAY FOR SOFT HAT MOUNTING USING A LOOP ANTENNA

Leo O. Taylor, and Fritz W. Healey, both of Alta Loma, Calif., assignors to Loral Electro-Optical Systems Inc., Pasadena, Calif.

Filed Feb. 11, 1988, Ser. No. 155,107

Int. Cl.⁴ F41G *3/26*

U.S. Cl. 250—209 **5 Claims**



1. A soft hat photodetector array including:

a plurality of signal generating photodetectors;

a radio transmitter assembly including a source of power;

a loop antenna electrically coupled to the transmitter;

wiring connecting the photodetectors and antenna to the transmitter whereby signals generated by the photodetectors are received for transmission by the transmitter assembly through the antenna; and

means for flexibly mounting said photodetectors, assembly, antenna and wiring to a soft hat.

4,899,040

LIGHT-CONDITIONING APPARATUS FOR AN IMAGE SCANNER ILLUMINATION SYSTEM

Michael H. Davis, Marion, and Gary L. Erck, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 8, 1988, Ser. No. 241,685

Int. Cl.⁴ H01J *3/14; G03B 27/00*

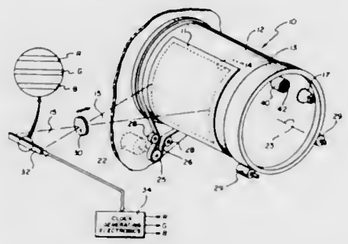
U.S. Cl. 250—216 **5 Claims**

1. In image scanner apparatus including a linear image scanner, and lens apparatus having a given field of view to focus a line of light in an object plane onto said linear image sensor, the improvement comprising:

(a) a source of light having an irradiance profile; and

(b) light-conditioning illuminator apparatus interposed between said light source and said object plane having (1) an input arranged adjacent said light source to receive substantially all of the light radiating from said light source, and (2) an output, facing said object plane, distributed to radiate the light received in a line-like pattern in said object plane wherein the amount of radiant power along

the line varies progressively as a function of the reciprocal of the anticipated irradiance along said image sensor aris-



ing when said lens apparatus focuses a line of light of uniform power.

4,899,041

LIGHT SENSOR FOR DETECTING AN OBJECT IN A CERTAIN DISTANCE

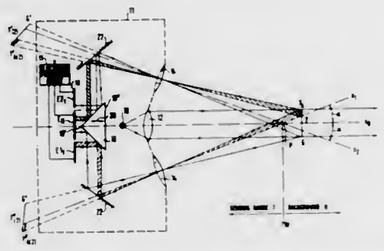
Günter Fetzer, Gundelfingen, and Thomas Meinert, Emmendingen, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 239,732

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729334

Int. Cl.[4] G01C *3/08*

U.S. Cl. 250—222.1 **11 Claims**



1. Light sensor comprising a light transmitter having a light source and an optical transmitting system which radiates light along an axis of the transmitting system; and two light receiving systems arranged on opposite sides of the light transmitter; wherein each light receiving system has an objective lens which picks up light scattered back from an object to be detected along an axis of the receiving system which lies symmetric to the axis of the transmitter system, the receiving system axes and the transmitter system axis lying in the same plane; wherein the receiving systems each contain two light sensitive element detection zones of which one picks up light essentially from a sensing region and the other picks up light essentially from a background region of the field of view of the light sensor; and wherein an output signal used to recognize the article is obtained by additive superposition of signals from the detection zones associated with the sensing region and of the signals from the detection zones associated with the background region and by difference formation of the two summed signals, characterized in that a light sensitive element is provided with three photoelectric detection zones ($E1_T$, E_H, $E2_T$) with a central detection zone (E_H) being associated with the background region (H); in that received light picked up by the two objective lenses (14) is transferred to the central detection zone for additive signal superposition by means of two fixedly arranged deflecting mirrors (22) and a roof edge mirror (18) located between them; in that the roof edge mirror (18) is adjustable along the axis (x_O) of the transmitting system for the purpose of adjusting the angle between the axes of the receiving system (x_1, x_2) which are determined by central rays which pass through the centers of the respected objective lenses (14) and along respective imaginary lines disposed between and separating the three detection zones ($E1_T$, E_H, $E2_T$).

4,899,042

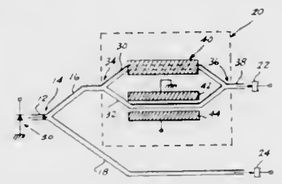
INTEGRATED OPTIC FIELD SENSOR CONSISTING OF AN INTERFEROMETER FORMED IN SUBSTRATE

Robert A. Falk, Renton, and Raymond W. Huggins, Mercer Island, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 17, 1987, Ser. No. 121,466

Int. Cl.[4] H01J *40/14*; **G01D** *5/34*

U.S. Cl. 250—227 **14 Claims**



1. An integrated optic electric field sensor for measuring the strength of an electric field, the sensor comprising:

an interferometer formed in a substrate, the interferometer comprising first and second arms, each arm having first and second ends and comprising an optical waveguide formed in the substrate, the interferometer further comprising field sensitive means having a physical property and positioned adjacent the first arm, the field sensitive means including means for varying the physical property in accordance with the strength of the electric field, and for thereby changing the optical path length of the first arm in accordance with the strength of the electric field;

means for coupling radiation into the first ends of the first and second arms; and

means for combining radiation from the second ends of the first and second arms to produce an optical output signal having an amplitude that varies in strength with the strength of the electric field.

4,899,043

FAULT MONITORING SYSTEM FOR OPTICAL FIBER COMMUNICATION SYSTEMS

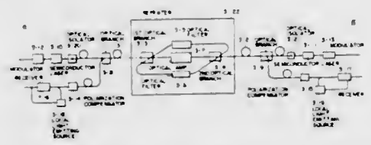
Kiyofumi Mochizuki, Hachioji; Noboru Edagawa, Tokyo, and Yoshinao Iwamoto, Wakayama, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,601

Claims priority, applicatioo Japan, Jul. 23, 1987, 62-182243

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **2 Claims**



1. A fault monitoring system for an optical fiber transmission system having a bidirectional optical amplifier between first and second optical fiber transmission lines:

wherein first and second optical branches are provided in first and second input/output ports of the bidirectional optical amplifier at the sides of the first and second optical fiber transmission lines, respectively; a first optical filter which permits the passage therethrough of an optical monitoring signal of a first frequency transmitted from a first station is provided in a first optical branch path which is branched by the first optical branch, coupled to the second optical branch and connected to the second input-/output port of the bidirectional optical amplifier; a second optical filter which permits the passage therethrough of a optical monitoring signal of a second frequency which is transmitted from a second station and not permitted to pass through the first optical filter is provided in a second optical branch path which is branched by the second optical branch, coupled to the first optical branch and connected to the input/output port of the bidirectional optical amplifier; and monitor means provided at each of the first station and the second station to monitor for the location of a fault monitor signals of the first and second frequencies which are sent back to the first and second optical fiber transmission lines, respectively.

4,899,044

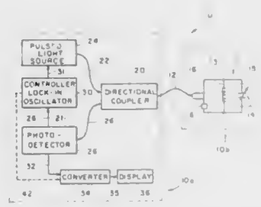
OPTICALLY COUPLED REMOTE SENSOR APPARATUS AND SYSTEM

J. Richard Hansen, Wilkins, Twp., Allegheny County; Juris A. Asars, and Robert M. Oates, both of Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1988, Ser. No. 188,245

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—227 **12 Claims**



1. A sensor apparatus comprising:

a sensor having an electrical parameter which varies in value in accordance with a condition being sensed;

a tuned circuit incorporating the electrical parameter of the sensor and generating an oscillatory voltage of a predetermined amplitude and at a natural resonant frequency and corresponding period which is a function of and varies in accordance with variations in the electrical parameter value of the sensor;

a light emitting diode connected in parallel with the tuned circuit and being operable in both a photovoltaic mode and a light emitting mode; and

means for biasing the light emitting diode in a back-biased and non-conducting state during a majority of the period of the oscillatory voltage of the tuned circuit, the light emitting diode, when back-biased and exposed to light, generating a photovoltaic current for ringing the tuned circuit and, when forward-biased by the oscillatory voltage, emitting a corresponding sensor-output light pulse.

4,899,045

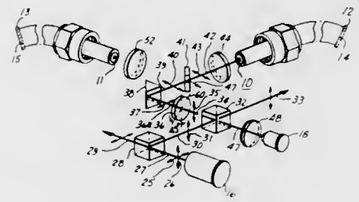
MULTIPLE CHANNEL FIBER OPTIC CONTINUITY TEST SYSTEM

David M. Kramer, Rancho Palos Verdes, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed May 24, 1988, Ser. No. 197,931

Int. Cl.[4] G01N *21/88*

U.S. Cl. 250—227 **4 Claims**



1. An optical system for individually testing each one of a plurality of optical fibers for continuity, each said fiber having a proximal end and a distal end with a dichroic reflector at each distal end reflective of wavelengths respective to a source of testing light and transmissive to other wavelengths, said system comprising:

a source of testing light;

a first polarizing element adapted to reflect impinging light of a selected polarization along a segment, and to pass all other light out of the system, a non-polarizing first beam splitter with one axis normal to that of a source of said testing light and one axis coincident therewith, a polarizing second beam splitter having the property of transmitting only light polarized in one plane and reflecting only light polarized in a plane that forms a 90 degree dihedral angle therewith, and a polarization rotator half-wave plate in the optical path between the first beam splitter and the second beam splitter, said rotator being insertable into and removable from the optical path to determine which plane of polarization will represent light to be presented from said second polarizing beam splitter to a selected one of said fibers.

4,899,046

OPTICAL SENSOR OF PHYSICAL MAGNITUDE

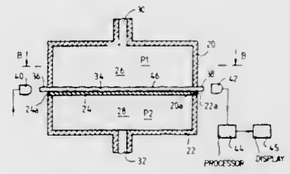
Oliver Wright, Paris, and Sylvain Janssen, Neuilly-sur-Seine, both of France, assignors to Schlumberger Industries, S.A., Montrouge, France

Continuation of Ser. No. 944,121, Dec. 22, 1986, abandoned. This application Feb. 9, 1989, Ser. No. 309,958

Claims priority, application France, Dec. 24, 1985, 85 19111; Aug. 14, 1986, 86 11767

Int. Cl.[4] G01L *1/24, 13/00*

U.S. Cl. 250—227 **19 Claims**



1. An optical sensor of a physical magnitude comprising:

a light guide having a first and a second end between which said light guide is substantially straight, said light guide comprising a single uniform medium for conveying light from said first end to said second end, said medium being

bounded by a wall extending between both of said ends, at least one portion of said wall having a light absorptivity greater than that of said medium;

a light source at said first end for applying a light beam to said first end of said light guide;

means at said second end and optically arranged facing said second end of said light guide for receiving a least a part of the light beam transmitted through said light guide and for generating a signal therefrom;

deformable support means extending at all points between said first and second ends for supporting said light guide;

means for applying to substantially the entire support means a bending deformation which is representative of a value of said physical magnitude, the amount of light transmitted through said light guide being affected by contact with said at least one portion of said wall having a light absorptivity greater than that of said single medium as a result of said bending deformation of said light guide; and

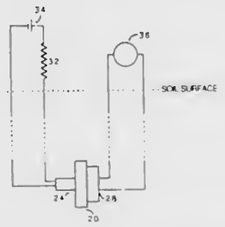
means for processing the received signal in order to derive therefrom a characteristic feature of the deformation of the support means.

4,899,047

METHOD AND APPARATUS FOR SELECTIVELY DETECTING ONE OF TWO IMMISCIBLE LIQUIDS IN THE PRESENCE OF THE OTHER LIQUID

John W. Cry; Randy R. Kirkham; John F. McBride; Carver S. Simmons, and Glendon W. Gee, all of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Jun. 24, 1988, Ser. No. 210,874
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **16 Claims**



1. Apparatus for detecting a first of two immiscible liquids in the presence of the second liquid, comprising a translucent, porous, dimensionally stable body that absorbs the first liquid in preference to the second liquid, and means for detecting the amount by which light incident on the body is attenuated on propagation through the body.

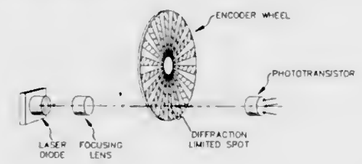
4,899,048

FOCUSED OPTICAL BEAM ENCODER OF POSITION

David J. Shelander, St. Paul, Minn., assignor to Printware, Inc., Saint Paul, Minn.

Filed Apr. 27, 1987, Ser. No. 43,167
Int. Cl.[4] G01D *5/34*; H01J *3/14*
U.S. Cl. 250—231 SE **25 Claims**

1. In an optical position encoder having a source of light, a detector of light from the source of light, and a grating which moves relative to a path of light between the source and the detector in order to, by such movement, selectively interrupt the light path between source and detector so that the motion of the grating may be detected by these interruptions, an improvement comprising:



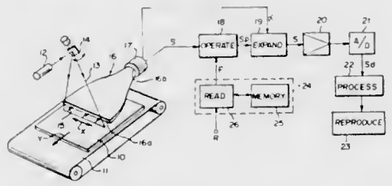
a focusing means between the source of light and the grating for convergently focusing the light from the source of light onto the grating.

4,899,049

RADIATION IMAGE READ-OUT APPARATUS

Kazuhiro Hishinuma, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 17, 1986, Ser. No. 920,219
Claims priority, application Japan, Oct. 18, 1985, 60-232509
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 **4 Claims**



1. A radiation image read-out apparatus comprising:

(i) a stimulating ray emission means for emitting stimulating rays to a stimulable phosphor sheet carrying a radiation image of an object stored thereon by exposure to a radiation passing through said object,

(ii) a photodetector for photoelectrically detecting light emitted by said stimulable phosphor sheet in proportion to the stored radiation energy when said stimulable phosphor sheet is exposed to said stimulating rays,

(iii) an amplifier for amplifying a read-out image signal generated by said photodetector,

(iv) an A/D converter for digitizing an output of said amplifier,

(v) a scattered radiation amount predictor for predicting a scattered radiation amount stored on said stimulable phosphor sheet,

(vi) an operation circuit positioned between said amplifier and said photodetector for subtracting a signal component representing said scattered radiation amount from said read-out image signal on the basis of said scattered radiation amount predicted by said scattered radiation amount predictor, and

(vii) an expander positioned between said operation circuit and said amplifier for adjusting an image signal generated by said operation circuit to a predetermined level.

4,899,050

CEILING FAN CONTROL WAND

Robert A. Cianflone, 885 Lovingston Dr., Pittsburgh, Pa. 15216

Filed Jan. 11, 1989, Ser. No. 295,504
Int. Cl.[4] H01H *3/20*
U.S. Cl. 200—331 **6 Claims**

1. A control wand for use in connection with a ceiling fan of the type having a pull chain and having a slide switch button thereon, the control wand comprising a first elongated rod-shaped body having a handle formed at a first end and a hook portion formed at a second end, a second elongated rod-shaped body slidably positioned adjacent said first body and having a hook portion formed at a first end and a right angle bent portion formed at a second end, said bent portion also having a hook-shaped element formed at an end region and adapted to engage the pull chain when in use, said control wand further comprising a first tubular bushing surrounding said first and



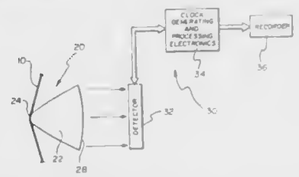
second elongated rod-shaped bodies and secured to the hook portion at the second end of the first rod-shaped body to permit sliding movement of said second rod-shaped body therethrough and a second tubular bushing surrounding said first and second elongated rod-shaped bodies and secured to the hook portion at the first end of the second elongated body to permit sliding movement of the first elongated body therethrough, whereby, in use, said first and second elongated rod-shaped bodies are extensible and contractable to vary the reach of said control wand.

4,899,051

METHOD AND DEVICE FOR SIMULATING THERMAL EFFECTS AT THE INTERFACE OF A MAGNETIC HEAD AND A RECORDING MEDIUM

Michael J. Helm, Schenectady, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,191
Int. Cl.[4] G01N *3/56, 21/84*
U.S. Cl. 250—340 **5 Claims**



5. A method for simulating wear of a magnetic transducer head comprising:

(a) simulating an actual magnetic transducer head with an infrared transmitting material having a wear-resistant property approximating that of the actual magnetic head and configured to have (1) a working surface geometrically closely approximating the dimensions and contour of a working surface of the actual head, and (2) an opposing surface geometrically closely approximating the dimensions and contour of a light-transmitting surface of a positive spherical lens;

(b) moving a magnetic storage medium in transducing relationship over the working surface of the infrared transmitting material; and

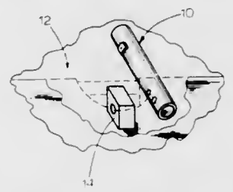
(c) transmitting infrared radiation emitted at the interface between said working surface and the magnetic storage medium through the opposing surface of the material onto a detector.

4,899,052

INFRARED DIAGNOSTIC INSTRUMENT

Donald F. Lindquist, Sweetwater, Tenn., assignor to Eastern Gate, Inc., Jeffersonville, Ind.

Filed Aug. 24, 1988, Ser. No. 236,048
Int. Cl.[4] G01J *1/44*
U.S. Cl. 250—342 **15 Claims**



1. A diagnostic instrument for the detection of infrared radiation in the repair of electronic equipment containing an infrared radiation emitter, said instrument comprising:

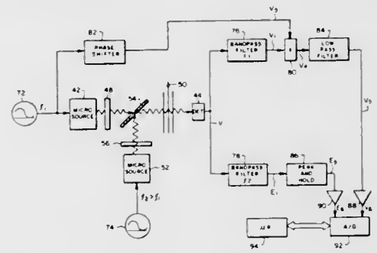
a housing dimensioned for being received within said equipment; and an electronic circuit received within said housing, said circuit comprising means for testing the functioning of an infrared emitter while said emitter is contained within said equipment, said means for testing being operable to detect the presence of infrared radiation emitted from said infrared radiation emitter, wherein the amount of disassembly of said equipment required to effect said testing is minimized.

4,899,053

SOLID STATE NON-DISPERSIVE IR ANALYZER USING ELECTRICAL CURRENT-MODULATED MICROSOURCES

N. C. Joseph Lai, Brookfield; Edward J. Zuperku, Elm Grove, and Roy A. Henning, Milwaukee, all of Wis., assignors to Criticare Systems, Inc., Waukesha, Wis.

Filed Oct. 21, 1987, Ser. No. 111,621
Int. Cl.[4] G01N *21/31, 21/35*
U.S. Cl. 250—343 **23 Claims**



12. An optical system for measuring levels of a selected gas, comprising:

a sample chamber which defines a measuring axis;

a first optical source operative to generate a measuring beam directed along the measuring axis through the sample chamber, said measuring beam comprising radiation at a wavelength corresponding to a selected absorption peak of the selected gas;

a detector responsive to the measuring beam after it has

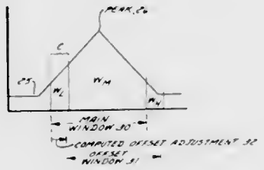
passed through the sample cell to produce a detector signal;
means for supplying a time modulated current to the first optical source such that the measuring beam is substantially sinusoidal at frequency f_1;
means for combining an f_1 frequency component of the detector signal with an additional signal matched in frequency to the f_1 frequency component of the detector signal to form a resulting signal having a periodic component at $2 \cdot f_1$ and a low frequency component, wherein the low frequency component varies in amplitude in accordance with the amplitude of the f_1 frequency component of the detector signal; and
means for measuring the amplitude of the low frequency component of the resulting signal to determine the amplitude of the f_1 frequency component of the detector signal.

4,899,054

GAMMA CAMERA WITH IMAGE UNIFORMITY BY ENERGY CORRECTION OFFSETS

Jesper M. Barfod, Molle, Denmark, assignor to General Electric Company, Milwaukee, Wis.

Filed Jan. 19, 1988, Ser. No. 144,900
Int. Cl.[4] G01T *1/161*
U.S. Cl. 250—369 **14 Claims**



1. A method for validating detected events in a gamma camera comprising the steps of:
forming an energy signal corresponding to the energy of a detected event;
determining the location of said event and whether said location has a sensitivity greater than a predetermined sensitivity, said location having a corresponding energy range and comprising a first location type if the sensitivity of said location is greater than said predetermined sensitivity and otherwise comprising a second location type;
validating said detected event if said determined location is of a first location type and said energy signal falls within said corresponding range of energies as said range of energies is displaced in a manner to reduce said sensitivity to substantially said predetermined sensitivity; and
validating said detected event if said determined location is of a second location type and said energy falls within said corresponding energy range without displacement of said range.

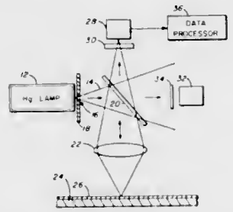
4,899,055

THIN FILM THICKNESS MEASURING METHOD

Arnold Adams, Goleta, Calif., assignor to Tencor Instruments, Mountain View, Calif.

Filed May 12, 1988, Ser. No. 193,902
Int. Cl.[4] G01N *21/55*
U.S. Cl. 250—372 **7 Claims**

1. A method of measuring a thickness of thin film on a reflective substrate comprising the steps of:
illuminating a portion of a test thin film and substrate with ultraviolet light of a fixed wavelength corresponding to a persistent spectral line;
measuring the intensity of the ultraviolet light reflected from the test thin film and substrate;
providing a standard reflectivity calibration of a known thickness of the thin film on a substrate of known reflectivity, at the wavelength λ, the standard calibration including an intensity of reflected ultraviolet light;
determining the light intensity reflectivity R of the test thin film and substrate by multiplying the known reflectivity



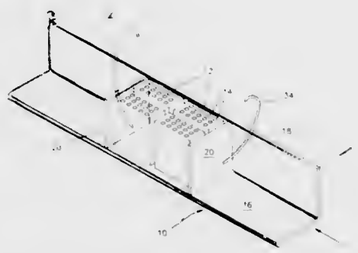
R_0 by the ratio of the reflected light intensity of the test thin film and substrate divided by the reflected light intensity of the standard reflectivity calibration; and
determining the thickness d of the thin film in the test thin film and substrate by inversion of the relation for reflectivity R, expressed as a function of the thin film thickness d.

4,899,056

CLEANING SYSTEM FOR ULTRAVIOLET LIGHT PRODUCING LAMPS

Sidney Ellner, Bedford, N.Y., assignor to Ultravinlet Purification Systems, Inc., Bedford Hills, N.Y.

Filed Jul. 7, 1988, Ser. No. 216,403
Int. Cl.[4] C02F *1/32*
U.S. Cl. 250—431 **11 Claims**



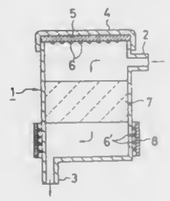
1. In a method of disinfecting waste water wherein ultraviolet light producing lamps are positioned in lamp modules and contained within quartz lamp jackets and wherein said modules are positioned within a flow of said water, a process for removing particulates and films from said lamp jackets comprising removing one or more of said modules from said flow and inserting said removed modules into a tank containing a lamp jacket cleaning agent wherein said lamp jackets are submerged in said cleaning agent and cleaned by direct contact.

4,899,057

SANITARY DEVICE

Masashi Koji, Shinjuku, Japan, assignor to Hoshin Kagaku Sangyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 144,033, Nov. 19, 1987, abandoned.
This application Jun. 7, 1989, Ser. No. 364,561
Claims priority, application Japan, Mar. 26, 1986, 61-67451; Mar. 26, 1986, 61-67452; Mar. 26, 1986, 61-67453; Mar. 26, 1986, 61-67454
Int. Cl.[4] A61L *2/10*
U.S. Cl. 250—436 **18 Claims**



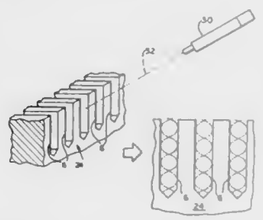
1. A sanitation device comprising means for supporting objects to be sanitized and a plurality of semiconductor light emission diodes, each emitting rays of light which prevent proliferation of bacteria, said semiconductor light emission diodes being arranged in such proximity to said objects as to irradiate said objects with a light intensity sufficient to prevent growth of bacteria in or on said objects.

4,899,058

MICROARCHITECTURAL DEEP WELL SURFACES

Jay N. Zemel, Jenkintown, Pa., assignor to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Feb. 26, 1988, Ser. No. 160,779
Int. Cl.[4] G21K *1/00*
U.S. Cl. 250—492.1 **2 Claims**



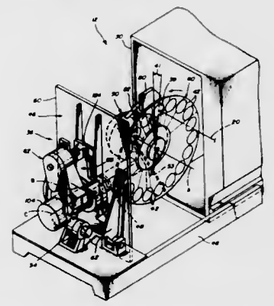
1. A method of stimulating quantum states in a microarchitectured surface comprising:
providing a microarchitectured surface,
said surface having a plurality of wells having depths greater than or equal to 45 micrometers,
said wells having lengths at least about two times less than said depths and uniform repeat distances on the order of said depths,
illuminating said surface with radiation, and
allowing quantized standing waves to be formed in said wells of said microarchitectured surface.

4,899,059

DISK SCANNING APPARATUS FOR BATCH ION IMPLANTERS

Avrum Freytsis, Swampscott; Richard J. Hertel, Boxford, and Eric L. Mears, Rockport, all of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 195,729, May 18, 1988, abandoned.
This application Jun. 9, 1989, Ser. No. 366,202
Int. Cl.[4] H01J *37/20*
U.S. Cl. 250—492.2 **36 Claims**



1. Apparatus for workpiece translation in an ion beam treatment system, comprising:
a vacuum envelope defining a vacuum chamber;
means for generating an ion beam;
a disk including a plurality of workpiece mounting sites, said disk being positioned within said vacuum chamber so that one of said workpiece mounting sites intercepts said ion beam;
disk drive means for rotating said disk about a disk rotation axis so that said workpiece mounting sites successively intercept said ion beam;
scan arm means for supporting said disk and said disk drive means within said vacuum chamber, said scan arm means extending through said vacuum envelope and being mounted for movement around a scan axis;
scan drive means for scanning said scan arm means about said scan axis so that said disk and said disk drive means move along an arc-shaped path in said vacuum chamber; and
pivot drive means for pivoting said scan arm means, said disk drive means and said disk about a pivot axis to and between a treatment position and a load/unload position for loading and unloading of workpieces.

4,899,060

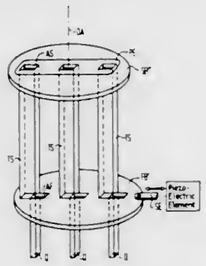
DIAPHRAGM SYSTEM FOR GENERATING A PLURALITY OF PARTICLE PROBES HAIVNG VARIABLE CROSS SECTION

Burkhard Lischke, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 191,708, May 9, 1988, abandoned. This application Jun. 13, 1989, Ser. No. 368,959
Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715427
Int. Cl.[4] H01J *1/52, 3/12*
U.S. Cl. 250—505.1 **4 Claims**

1. A diaphragm system for generating a plurality of particle probes having variable cross sections from a particle beam, comprising:
a first diaphragm for receiving a particle beam and having a first multi-aperture structure;
a second diaphragm disposed following said first diaphragm in a direction of the particle beam, said second diaphragm

having a second multi-aperture structure corresponding to said first multi-aperture structure of said first diaphragm, said first and second diaphragms oriented relative to one another so that in a non-displaced condition apertures of said first multi-aperture structure coincide with corresponding apertures of said second multi-aperture structure; and



means for displacing one of said first or second diaphragms in a plane perpendicular to the direction of the particle beam.

4,899,061

DETERMINING A WIDTH AND/OR THICKNESS OF A GENERALLY RECTANGULAR OBJECT

Hendrik C. Van Hoek, Wantirna, and Daryl N. Williams, Mount Waverley, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Victoria, Australia

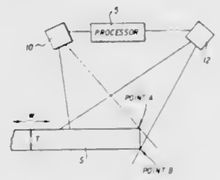
PCT No. PCT/AU87/00237, § 371 Date Mar. 11, 1988, § 102(e) Date Mar. 11, 1988, PCT Pub. No. WO88/01366, PCT Pub. Date Feb. 25, 1988

PCT Filed Jul. 27, 1987, Ser. No. 191,143

Claims priority, application Australia, Aug. 13, 1986, PH07429

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—560 **7 Claims**



1. A method of determining a dimension of an article, said method comprising the steps of:

viewing four points on the article with a sensing means to obtain image positions of said four points, said four points comprising first and second pairs of points being displaced by known relationships;

using the known relationships between the first pair of points and the image positions of the first pair of points to determine a location in space of one of said first pair of points;

using the known relationships between the second pair of points and the image positions of the second pair of points to determine a location in space of one of said second pair of points; and

using the location in space of the said one point of the first pair of points and the location in space of the said one point of the second pair of points to determine a dimension of said article between said one point of the first pair of points and said one point of the second pair of points.

4,899,062

PROCESS AND APPARATUS FOR THE GENERATION OF TRANSMISSION CURRENT SIGNALS IN AN ALTERNATING CURRENT DISTRIBUTION NETWORK

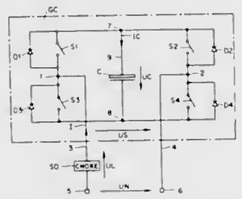
Bernhard Konrad, Wetzikoo, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland

Filed Dec. 8, 1987, Ser. No. 130,196

Claims priority, application Switzerland, Dec. 9, 1986, 04893/86

Int. Cl.[4] H02J *3/02;* **H04M** *11/04*

U.S. Cl. 307—3 **43 Claims**



1. A method for the generation of transmission current signals in an alternating current distribution network comprising the steps of:

generating an exchange current by means of a transmitter connected to said network, said transmitter including a non-resonant circuit, said non-resonant circuit having at least two energy storage devices to provide for a mutual exchange of energy between said energy storage devices, and said transmitter including at least two switches to control the exchange of energy between said energy storage devices, and

operating said switches to control the flow of said exchange current over said network to thereby produce a series of current impulses forming the transmission signal such that the resulting transmission signal corresponds at least approximately to a desired theoretical signal.

4,899,063

POWER WINDOW SWITCH FOR AN AUTOMOBILE

Yoon-Gi Suck, Sinbanpo 7th Apartment 301-608, 130-17, Cham-won-Dong, Seocho-Ku, Seoul, Rep. of Korea

Filed Jul. 29, 1988, Ser. No. 225,920

Claims priority, application Rep. of Korea, May 13, 1988, 88-5607

Int. Cl.[4] H01H *13/70*

U.S. Cl. 307—9.1 **13 Claims**



1. A power window switch for an automobile, comprising:

a printed circuit board which includes a switching circuit;

a casing secured to said circuit board;

a contact plate which includes a first fixed contact, and said contact plate being secured within said casing;

a first button which includes an elastic slope portion, said elastic slope portion secured to said casing;

a first conductive rubber contact secured to a surface of said button, and said first button being positioned with respect to said first fixed contact such that, when said elastic slope portion is in a non-compressed state, said first conductive rubber contact is in a spaced relationship with said first fixed contact and when said elastic slope portion is in a compressed state said first conductive rubber contact is in contact with said first fixed contact; and

said switching circuit including a first up-circuit comprised of an up-switch, said up-switch including said first fixed contact, and said first fixed contact including two first fixed contact points one of which is connected to an input power source line the other of which is connected in parallel with a first resistance (R1) and a second resistance (R2), said first resistance (R1) being connected to the collector of a first transistor (Q12) and the base of a second transistor (Q1), the collector of said second transistor (Q1) being connected through a third resistance (R3) to the input power source line, the output terminal of said second transistor (Q1) being connected to the base of a third transistor (Q9) so as to apply a bias power and also through a fourth resistance (R4) to ground, the collector of said third transistor (Q9) being connected through a fifth resistance (R6) to the input power source line, and the emitter of said third transistor (Q9) being connected to the base of a fourth transistor (Q6), the emitter of a fifth transistor (Q3), operating point symmetrically, being connected to the input power source line and the base of said fifth transistor (Q3) being connected to the emitter of a sixth transistor (Q7), the base of said sixth transistor (Q7) being connected through a first diode to the collector of said second transistor (Q1) in parallel with said third resistance (R3), and the output of said sixth transistor (Q7) being connected through a sixth resistance (R5) to ground, a first load line extending from the collector of said fifth transistor (Q3), a second load line extending from the collector of said fourth transistor (Q6), a load connected between a first point on said first load line and a second point on said second line, said second resistance (R2) connected at one end to said input power source line and at the other end to the base of a seventh transistor (Q11), the collector of said seventh transistor (Q11) being connected to the base of an eighth transistor (Q2) and the emitter of said seventh transistor (Q11) being connected to ground.

4,899,064

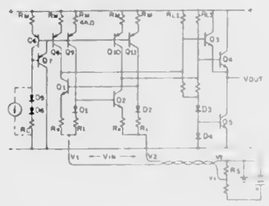
ABSOLUTE VALUE DIFFERENTIAL AMPLIFIER

Robert A. Neidorff, Bedford, N.H., assignor to Unitrode Corporation, Lexington, Mass.

Filed Jun. 1, 1988, Ser. No. 201,476

Int. Cl.[4] H03K *5/00*

U.S. Cl. 307—261 **11 Claims**



1. An absolute value amplifier, comprising:

a first and a second input transistor connected to receive an input signal and each having a corresponding output signal;

a current source connected to said first and said second transistors providing an equal flow of current through each of said first and said second transistors, wherein

said first and said second transistors are responsive to opposite polarity of said input signal;

a first and second output means coupled to receive the output signals of said first and said second transistor and having a common connected output providing an amplifier output corresponding to the absolute value of said input signal.

4,899,065

PRE-DRIVE CIRCUIT

Shigeo Nakamura, Minamitsuru, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

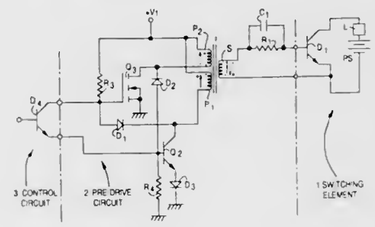
PCT No. PCT/JP88/00403, § 371 Date Oct. 31, 1988, § 102(e) Date Oct. 31, 1988, PCT Pub. No. WO88/08643, PCT Pub. Date Nov. 3, 1988

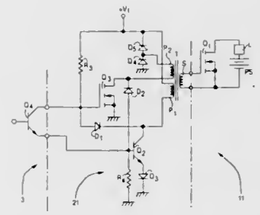
PCT Filed Apr. 25, 1988, Ser. No. 265,677

Claims priority, application Japan, Apr. 30, 1987, 62-107253

Int. Cl.[4] H03K *17/00, 3/30*

U.S. Cl. 307—270 **7 Claims**





1. A pre-drive circuit, for on/off control of a switching transistor element, including a pulse transformer having two primary windings, comprising:

first and second switching elements, each having a signal output terminal and a control terminal, and one being associated with each of the primary windings, which control currents flowing through the respective primary windings; and

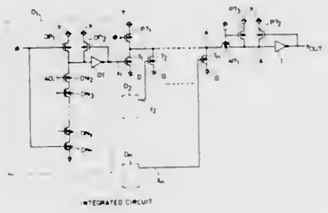
feedback circuits which cross-connect the signal output terminals and the control terminals of said first and second switching elements.

4,899,066

OR-TYPE CMOS LOGIC CIRCUIT WITH FAST PRECHARGING

Masatoshi Aikawa; Hiromasa Nakagawa, and Tsunenori Umeki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 848,563
Claims priority, application Japan, Jun. 20, 1985, 60-135333
Int. Cl.⁴ H03K *19/017, 19/094;* **G11C** *7/00, 11/40*
U.S. Cl. 307—45.2 **4 Claims**



1. An OR-type CMOS logic circuit with fast precharging comprising:

a single data line having a first portion and a second portion;

a plurality of MOS transistors connected to said first portion of said single data line in a wired OR manner, said plurality of MOS transistors operative in response to address decode signals;

inverter means connected to said second portion of said single data line for outputting a signal on said second portion of said single data line;

an MOS transistor connected to the input of said inverter for stabilizing an input signal of said inverter means, said MOS transistor operative in response to the output of said inverter;

a first precharging MOS transistor connected to said first portion of said single data line for precharging said first portion of said single data line to a predetermined level in response to a precharging signal;

a second precharging MOS transistor connected to said second portion of said single data line for precharging said second portion of said single data line to said predetermined level in response to said precharging signal; and

an isolating MOS transistor interposed between said first and second portions of said single data line for isolating said first portion of said single data line from said second portion of said single data line in response to said precharging signal.

4,899,067

PROGRAMMABLE LOGIC DEVICES WITH SPARE CIRCUITS FOR USE IN REPLACING DEFECTIVE CIRCUITS

Hock-Chuen So, Milpitas, and San-Ching Wong, Hillsborough, both of Calif., assignors to Altera Corporation, Santa Clara, Calif.

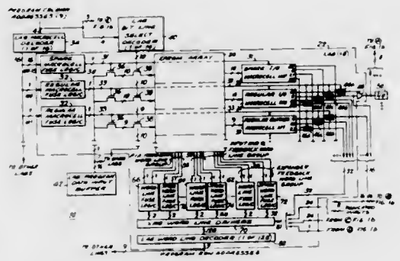
Filed Jul. 22, 1988, Ser. No. 222,832
Int. Cl.⁴ H03K *19/003*
U.S. Cl. 307—465 **15 Claims**

1. A programmable logic device having a plurality of first conductors and a plurality of second conductors, each of said second conductors being programmably interconnectable to each of said first conductors for producing on each of said second conductors a signal which is a logical function of the signals on the first conductors to which said second conductor is interconnected, said programmable logic device comprising:

preprogrammable means associated with each of the conductors in at least one of said pluralities of conductors for producing an output indication of whether or not the associated conductor is to be used; and

signal diverting means responsive to an output indication from said preprogrammable means that a particular conductor is not to be used for diverting the signals associated with said particular conductor to another conductor in the same plurality;

wherein the plurality of conductors with which said preprogrammable means is associated includes a spare conductor for use in the event that one of the conductors in the same plurality, which are referred to as regular conductors, is not to be used, wherein said regular conductors are disposed in an ordered sequence on said programmable logic



device, and wherein said signal diverting means comprises;

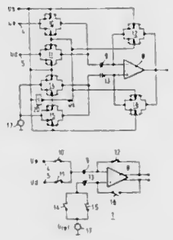
means responsive to an output indication from said preprogrammable means that a particular regular conductor is not to be used for shifting the signals associated with said particular regular conductor and any regular conductors to one side of said particular regular conductor in said ordered sequence to the corresponding next adjacent regular conductor in the direction of said shifting, the last of the shifted signals being diverted from the last of said regular conductors to said spare conductor.

4,899,068

COMPARISON CIRCUIT WITH ERROR COMPENSATED MOS SWITCHES

Hans-Peter Klose, Halstenbek; Kurt König, Hamburg, and Wolfgang Schwartz, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,634
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723919
Int. Cl.⁴ H03K *3/023, 3/027, 5/24, 17/687*
U.S. Cl. 307—494 **6 Claims**



1. In an MOS device, a comparison circuit for comparing two input voltages, comprising: a differential amplifier including

a first input supplied through a first capacitor and a switch arrangement during a first time period with a first input voltage (Ue) and during a second time period, succeeding the first time period, with a second input voltage (Ud) by means of the first capacitor and the switch arrangement,

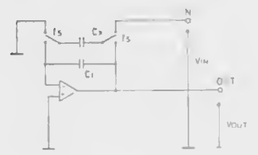
means connecting a second input of the differential amplifier via a second capacitor and a change-over device to a reference voltage source whereby the change-over device alternately connects the second capacitor to the reference voltage source during said first and second time periods, and second means connecting an output of the differential amplifier during the first time period to the first and the second input thereof.

4,899,069

INTEGRATED ACTIVE LOW-PASS FILTER OF THE FIRST ORDER

Germano Nicollini, Piacenza, Italy, assignor to SGS-Thomson Microelectronics s.r.l., Brianza, Italy

Filed Dec. 16, 1988, Ser. No. 285,204
Claims priority, application Italy, Dec. 22, 1987, 83685 A/87
Int. Cl.⁴ H03B *1/00;* **H03K** *5/00*
U.S. Cl. 307—520 **1 Claim**



1. An integrated, low-pass, active filter of the first order operable for producing an output signal at an output terminal thereof in function of a signal applied to an input terminal thereof and comprising an operational amplifier having an inverting input and a noninverting input and a single output coinciding with said output terminal of the filter and provided with a negative feedback network which comprises a continuous integration capacitor connected between said output terminal of the filter and said inverting input of the operational amplifier, the noninverting input of which being connected to ground, and characterized by comprising

a single switched capacitor and two switches operating at a preset frequency;

a first armature of said switched capacitor being switched by a first one of said two switches between said inverting input of the operational amplifier and ground;

a second armature of said switched capacitor being switched by the other of said two switches between said input terminal and said output terminal of the filter.

4,899,070

BIT LINE SENSE AMPLIFIER FOR PROGRAMMABLE LOGIC DEVICES

Jung-Hsing Ou, San Jose, and Sau-Ching Wong, Hillsborough, both of Calif., assignors to Altera Corporation, Santa Clara, Calif.

Filed Jul. 13, 1988, Ser. No. 218,556
Int. Cl.⁴ H03K *3/353, 17/26, 17/28;* **G11C** *7/02*
U.S. Cl. 307—530 **12 Claims**

1. A programmable logic device comprising:

a bit line conductor;

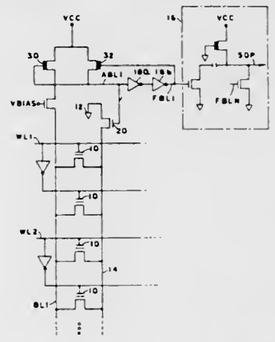
a source of ground electrical potential;

a virtual ground line conductor;

a plurality of word line conductors, each of which conducts an associated word line signal;

a plurality of programmable interconnection devices, each of which, if programmed, is controlled by the word line signal on a respective one of said word line conductors to selectively connect said bit line conductor to said virtual ground line conductor; and

variable current limiting means connected in series between said virtual ground line conductor and said source of ground electrical potential, said variable current limiting means being means responsive to the voltage of the signal



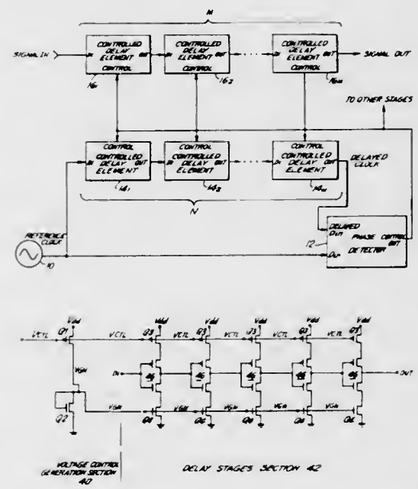
on said bit line conductor so that said variable current limiting means becomes less conductive and conducts less current between said virtual ground line conductor and said source of ground electrical potential as the voltage of the signal on said bit line conductor approaches said ground electrical potential.

4,899,071

ACTIVE DELAY LINE CIRCUIT

Lou Morales, South Setauket, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Aug. 2, 1988, Ser. No. 227,731
Int. Cl.⁴ H03K *5/159, 5/13*
U.S. Cl. 307—605 **4 Claims**



1. A digital delay circuit comprising a first and a second array of an integral number N and M of series-connected controllable delay elements, respectfully, each of said delay

elements being characterized in that the delay established between its input and output is controlled by a control signal applied to a control input thereat, a source of a reference clock, means for delaying said reference clock through one of said first and second arrays of delay elements, thereby to establish a delayed reference clock, means coupled to said clock source and to said first array of delay elements for comparing said reference clock and said delayed reference clock to produce a control signal representative of the comparison between said reference clock and said delayed reference clock, and means for applying said control signal to the control input of each of said controllable delay elements, thereby to vary the delay introduced by each of said delay elements to an input signal.

4,899,072

PULSE MOTOR

Masataka Ohta, Kamakura, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

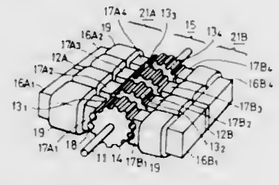
PCT No. PCT/JP87/00685, § 371 Date May 10, 1988, § 102(e) Date May 10, 1988, PCT Pub. No. WO88/02194, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 17, 1987, Ser. No. 205,395

Claims priority, application Japan, Sep. 20, 1986, 61-220969; Sep. 20, 1986, 61-220971

Int. Cl.⁴ H02K *37/00*

U.S. Cl. 310—49 R **16 Claims**



1. A thin pulse motor comprising:

a rotary shaft;

an array of 2n columnar rotor cores of a soft magnetic material mounted side by side on said rotary shaft in its axial direction, where n is an integer equal to or greater than 2, each of said columnar rotor cores having teeth formed in its peripheral surface at a fixed pitch;

a first flat stator including: a first array of 2n flat magnetic poles arranged side by side in said axial direction, each of said magnetic poles of said first array having flat surfaces parallel to said rotary shaft, and each of said magnetic poles of said first array being disposed opposite a portion of the peripheral surface of a corresponding one of said columnar rotor cores and having a flat-surfaced coil wound thereon; and first flat yoke means for magnetically coupling together at least n of said flat magnetic poles of said first array from one end thereof and for magnetically coupling together at least the remaining ones of said 2n flat magnetic poles of said first array, said 2n magnetic poles of said first array having teeth formed in end faces thereof facing said 2n columnar rotor cores at the same angular pitch as that of said teeth of said columnar rotor cores;

permanent magnet means fixedly mounted at a location selected from the group consisting of said first yoke means and said rotary shaft between the nth and (n+1)th ones of the columnar rotor cores in said columnar rotor core array; and

a second flat stator disposed opposite said first stator across said 2n columnar rotor cores, said second stator including: a second array of 2n flat magnetic poles arranged side by side in said axial direction, each of said magnetic poles of said second array having flat surfaces parallel to said rotary shaft, and each of said magnetic poles of said second array being disposed opposite another portion of the peripheral surface of a corresponding one of said 2n columnar rotor cores and having a flat-surfaces coil wound thereon; and said second flat yoke means for magnetically coupling together at least n of said magnetic poles of said second array and for magnetically coupling together at least the remaining ones of said magnetic poles of said second array; said 2n magnetic poles of said second array having teeth formed in end faces thereof facing said 2n columnar rotor cores at the same angular pitch as that of the teeth of said 2n magnetic poles of said first array; said rotary shaft, said first and second flat yoke means, and said first and second arrays of flat magnetic poles all being disposed in a flat arrangement in a plane which includes said rotary shaft; and the relative angular positions of said teeth of said 2n columnar rotor cores and the teeth of said 2n flat magnetic poles of each of said first and second arrays being displaced 0, $\frac{1}{2n}$, 2/2n, . . . , and (2n−1)/2n times apart from one of said 2n columnar rotor cores.

4,899,073

3-POSITION ROTATIONAL ACTUATOR

Muneo Takeuchi, Handa; Hiroji Kinbara, Okazaki, and Masafumi Tsuruta, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 25, 1988, Ser. No. 224,117

Claims priority, application Japan, Jul. 24, 1987, 62-186450; Jul. 24, 1987, 62-186451; Apr. 22, 1988, 63-100867

Int. Cl.⁴ H02K *7/00, 33/12*

U.S. Cl. 310—116 **8 Claims**



1. A 3-position rotational actuator comprising:

a yoke;

a stator covered by said yoke and having two pairs of field poles each of which are in spaced and opposed relation to each other, the opposed field poles being excited with opposite polarities;

a rotor made up of a magnet and arranged to be rotatable to take three positions which are a first stable point due to a field produced by one pair of field poles of said stator, a second stable point due to the positive magnetic pole produced by the other pair of field poles of said stator spaced from said first stable point, and a third stable point due to the opposite field;

a base member fixedly secured to said yoke and enclosing said stator and said rotor together with said yoke; and

a rotation limiting member provided on said base member for compulsorily retarding the rotation of said rotor on the way from said first stable point to said second stable point and from said first stable point to said third stable point,

wherein the magnetic flux to said rotor from the other pair of field poles of said stator for rotating said rotor from said first stable point is substantially equal in magnitude to the magnetic flux to said rotor from the one pair of field poles of said stator for maintaining said rotor at said first stable point, and the magnetic flux density of the other pair of field poles of said stator applied to said rotor is smaller that that of the one pair of field poles of said stator.

4,899,074

PERMANENT MAGNET ROTARY DYNAMO ELECTRIC MACHINES

John G. W. West, Pershore, United Kingdom, assignor to Magneti Marelli Electrical Limited, Birmingham, England

Filed Oct. 11, 1988, Ser. No. 255,946

Claims priority, application United Kingdom, Oct. 13, 1987, 8724000

Int. Cl.⁴ H02K *1/08*

U.S. Cl. 310—154 **23 Claims**



1. A unidirectional, permanent magnet, direct current, rotary dynamo electric machine comprising a stator, a rotor rotatable relative to the stator and having an air gap between the rotor and the stator, the permanent magnet poles of the machine each including a flux shunt comprising first and second magnetically continuous portions formed from a material of high saturation flux density, each first portion extending from the back iron, upon which its respective pole is mounted, towards the air gap of the machine and being magnetically continuous with the back iron, each first portion being adjacent that end of its respective permanent magnet which is the strong tip end in use and having its end remote from the back iron magnetically continuous with the respective shunt second portion, each shunt second portion extending from the respective shunt first portion circumferentially of the machine towards that end of the respective permanent magnet which is the weak tip end in use, and engaging the air gap face of the respective permanent magnet each second portion in that region thereof which is engaged with the respective permanent magnet being shaped such that its cross-sectional area increases substantially linearly from a minimum at its free end, each shunt first portion having a minimum cross sectional area equal to or greater than the maximum cross sectional area of the respective second portion, and each shunt extending over a maximum of 80% of the pole arc of its respective pole from the strong tip end thereof wherein the circumferential dimension and the positioning of the permanent magnet of each pole is such in relation to the overall pole arc that a gap is defined between the first portion of each shunt and the adjacent end of the respective permanent magnet, wherein the poles are carried by the stator and a, or each, through bolt of the machine is accommodated in said gap of a respective pole.

4,899,075

TWO-PHASE DC BRUSHLESS MOTOR

Yoichi Hasebe, Saku, Japan, assignor to Shinano Kenshi Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 128,090, Dec. 3, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 282,924

Int. Cl.⁴ H02K *1/14*

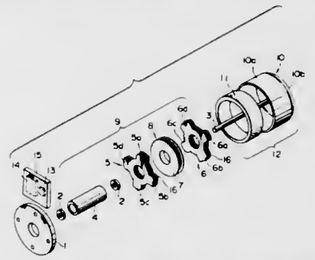
U.S. Cl. 310—257 **16 Claims**

1. A brushless motor comprising:

a cylindrical bobbin-wound coil coaxially mounted on a stator axis and energized in two-phase mode;

first and second annular stator discs coaxially mounted on said stator axis with said coil therebetween;

first and second sets of substantially equally spaced stator poles projecting in a plate-like form and perpendicular to said stator axis from the outer peripheral edges of said first and second stator discs, respectively, said first and second sets of stator poles having protruding ends lying in a common imaginary cylindrical surface and magnetically linked to said coil by the respective one of said first and second stator discs, said stator poles of said first set being equal in number to and angularly spaced approximately 180° electrically from said stator poles of said second set, each stator pole of said first and second sets having a notched portion formed in one of opposite corners of said protruded end thereof and oriented so as to be next to the unnotched corner of said stator pole adjacent thereto;



a rotor coaxially rotatable relative to said stator axis and having permanent magnetic poles equal in number to all of said stator poles and spaced alternately north and south and circumferentially arranged on a cylindrical flange of said rotor to overlap all of said stator poles with a slight annular gap therebetween, each of said permanent magnetic poles having an angular width substantially equal to the sum of angular widths of said protruded end and said notched portion of said stator pole; and

position detecting means opposed to said permanent magnetic poles with a gap left therebetween for detecting the position and polarity of said magnetic pole to thereby switch a direction of direct current charged to said coil.

4,899,076

PIEZOELECTRIC OSCILLATOR

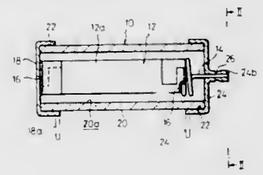
Toshitake Kato, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 202,066

Claims priority, application Japan, Mar. 6, 1987, 62-032796; Jun. 5, 1987, 62-086638[U]

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—356 **11 Claims**



1. A piezoelectric oscillator comprising:

a tubular casing means defining therein an axial vacuum chamber extending between opposite ends thereof;

a piezoelectric oscillating element received within said axial vacuum chamber of said tubular casing means;

first and second mutually insulated electrically conductive means arranged at the opposite ends of said tubular casing means for permitting an extraction of an electric oscillating signal from said piezoelectric oscillating element; at

least said first conductive means including a first electric lead means;

a sealing means for hermetically sealing said axial tubular casing means at one end thereof to thereby maintain said chamber of said tubular casing means in a vacuum condition;

elastic support means for elastically supporting one end of said piezoelectric element within said axial vacuum chamber of said tubular casing to thereby protect said piezoelectric oscillating element from thermal stress and impulsive and vibratory forces; and

said elastic support means including a conductive and elastically displacable element having a holding portion for positioning and fixedly holding said one end of said piezoelectric element, a rotationally and axially movable arm portion having one end connected to said holding portion and capable of being rotationally and axially moved in response to a thermal axial displacement of said piezoelectric oscillating element, a torsionally displacable portion connected at one end thereof to the other end of said rotationally and axially movable arm portion, and a fixed end bar portion connected to the other end of said torsionally displacable portion, said rotationally and axially movable arm portion and said torsionally displacable portion performing an elastic absorption action to compensate for said axial and thermal displacement of said piezoelectric oscillating element, said fixed bar portion being attached to said hermetic sealing means, and said second conductive means including at least a second electric lead means electrically connected to the other end of said piezoelectric oscillating element, and cooperating with said first electric lead means of said first conductive means to extract said electric oscillating signal.

4,899,077

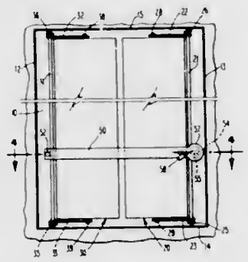
SELF-SERVICE DISPENSING CABINET

Sherman L. Larson, Palmyra, N.J., assignor to Sherman Industries, Inc., Palmyra, N.J.

Filed Jan. 23, 1989, Ser. No. 300,269

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—325 **2 Claims**



1. Support means for a self-service rear load vendor intended to dispense packaged products from an open face of a pivotable cabinet when facing forwardly and to be restocked through said open face when facing rearwardly, said cabinet being supported on a fixed faceplate, said support means comprising:

a. a vertical hinge rod mounted on said face-plate for pivotal movement about its vertical axis, said rod forming a first pivot axis for said cabinet;

b. a pair of horizontal hinge arms secured to said hinge rod, one arm near the top and the other near the bottom, each hinge arm having a recess at its outward end; and

c. a pair of pivot posts, one post secured to the top surface and another to the bottom surface of said cabinet, said pivot posts being located on a common vertical axis, each pivot post received within a recess in a hinge arm, said pivot posts forming a second pivot axis for said cabinet;

d. the horizontal length of each hinge arm and the pivotal movement of said hinge rod allowing said second pivot axis to be moved to a position such that the horizontal distance between said second pivot axis and said faceplate becomes greater than the horizontal distance between said second pivot axis and any point on the periphery of said cabinet, where said cabinet may be pivoted through at least 180° about said second pivot axis;

e. said cabinet having a forwardly projecting trigger plunger adapted to project through a hole in said fixed faceplate, the length of said horizontal hinge arms and the pivotal movement of said vertical hinge rod being such as to allow said cabinet to be moved rearwrdly and forwardly to allow withdrawal and reinsertion of said trigger plunger along a substantially straight line relative to said hole in said faceplate.

4,899,078

THERMIONIC HAIRPIN CATHODE

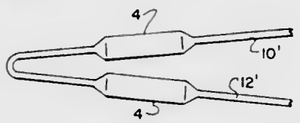
Otto Winkler, Balzers, Liechtenstein, assignor to Balzers Aktiengesellschaft, Furstentum, Liechtenstein

Filed Apr. 12, 1988, Ser. No. 180,850

Claims priority, application Switzerland, Apr. 24, 1987, 01582/87

Int. Cl.[4] H01J *1/16*

U.S. Cl. 313—37 **17 Claims**



1. A hairpin type cathode with longer lifetime especially for use in electron microscopes and other electron-optical instruments, comprising: a hairpin-shaped one piece high melting metal wire having a pair of diverging leg portions and a vertex portion interconnecting said leg portions, said vertex portion acting as a thermionic electron source and each of said leg portions having a connection end, the cross sectional area of the wire being substantially the same throughout said vertex portion and said leg portions, and each of said leg portions having a section of enlarged peripheral surface with respect to the peripheral surface of the vertex portion and of the other parts of the legs, said section of enlarged peripheral surface being short in relation to the leg portion length and being positioned between said vertex portion and said connecting end, so close to the vertex portion, that in operation due to the higher heat radiation losses at said section of enlarged peripheral surface, the temperature gradient adjacent said vertex portion is increased thereby causing a maximum temperature at the vertex portion during the entire lifetime of the cathode.

4,899,079

CATHODE RAY TUBE

Aart A. Van Gorkum; Leopold C. M. Beirens, and Gerardus A. H. M. Vrijssen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

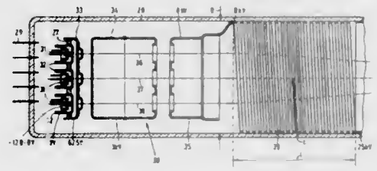
Filed Mar. 7, 1985, Ser. No. 709,464

Claims priority, application Netherlands, Mar. 12, 1984, 8400779

Int. Cl.[4] H01J *29/58*

U.S. Cl. 313—412 **10 Claims**

1. An improved cathode ray tube comprising an envelope having a longitudinal axis, a display screen, an electron gun system disposed on said axis for producing and focusing a plurality of electron beams directed at the display screen, and deflection means longitudinally-spaced from said system for deflecting said beams across said screen, wherein the improvement comprises convergence means for converging the beams substantially at the screen independently of said focusing, said convergence means comprising a helically-wound, beam-surrounding resistive element disposed between the electron gun system and the deflection means, said element having a maximized diameter D and extending along the path of propagation



of the electron beams by a length l which is no longer than twice said diameter, said element further including longitudinally-separated means for applying predetermined potentials thereto which effect production of a potential gradient along said length to establish a large diameter, high strength electromagnetic convergence lens through which the electron beams pass.

4,899,080

PROJECTION TELEVISION DISPLAY TUBE WITH COOLING MEANS AND DISPLAY DEVICE HAVING SUCH A DISPLAY TUBE

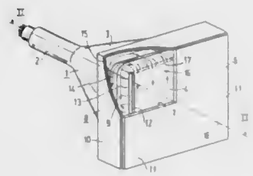
Leendert Vriens; Gerrit B. Gerritsen, and Willem M. Van Alphen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 738,199, May 24, 1985, abandoned. This application Jan. 18, 1989, Ser. No. 298,378

Claims priority, application European Pat. Off., Jun. 1, 1984, 84200784

Int. Cl.[4] H01J *29/86, 5/20*

U.S. Cl. 313—477 R **15 Claims**



1. A projection television display tube having an evacuated envelope with a display window which on its inside comprises a display screen and in front of which a light permeable second window is provided on its outside, a cooling liquid flowing through the space between the display window and the second window from at least one inlet aperture to at least one outlet aperture, namely by temperature differences in said cooling liquid, characterized in that around the tube end at the area of the windows and the space a cooling jacket comprising an outer wall is provided which together with at least an outer peripheral edge of the second window defines at least one duct which transports the cooling liquid around the periphery of the window from the outlet aperture to the inlet aperture of the said space.

4,899,081

FLUORESCENT DISPLAY DEVICE

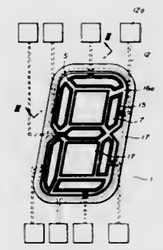
Takao Kishino; Minoru Katayama; Kazuyuki Yano, and Isao Ohtsuka, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Sep. 30, 1988, Ser. No. 252,052

Claims priority, application Japan, Oct. 2, 1987, 62-250392

Int. Cl.[4] H01J *63/02*

U.S. Cl. 313—496 **3 Claims**



1. A fluorescent display device comprising:

an insulating substrate;

phosphor-deposited anodes arranged on said insulating substrate;

grids arranged on said insulating substrate in proximity to said anodes;

filamentary cathodes stretched above said anodes;

said grids each being constituted by a metal film section arranged on said substrate, an insulating layer section laminatedly arranged on said metal film section in a manner to expose a peripheral portion of said metal film section surrounding said anode and a conductive layer section laminatedly arranged on said insulating layer section so as to be electrically connected to said metal film section.

4,899,082

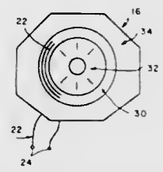
APPARATUS FOR COMPENSATING FOR IMAGE ROTATION IN A CRT DISPLAY

Robert M. Sands, Tyngsboro, and John J. Fitzgerald, Leominster, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 30,459, Mar. 25, 1987, abandoned. This application May 13, 1988, Ser. No. 195,401

Int. Cl.[4] H01J *29/06*

U.S. Cl. 315—8 **3 Claims**



1. A video display unit for displaying an image on a screen, said unit being subject to an external magnetic field, said external magnetic field causing a rotation of said image with respect to said screen, said unit comprising:

A. cathode ray tube means, said tube means including an electron gun and a screen, said gun for emitting an electron beam along a path toward said screen, said beam for forming an image on said screen;

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UMI

B. deflection yoke means, said yoke means being disposed between said electron gun and said screen, said yoke means operating to deflect said electron beam, thereby forming said image, said yoke means having a first end juxtaposed with said screen and a second end juxtaposed with said electron gun, said first end including a recessed area,

1. said yoke means further including a conductive winding having first and second ends, said winding being substantially disposed in said recessed area, said winding oriented substantially transverse to said path; and

C. control means, said control means coupled to said first and second ends of said winding, said control means for producing a compensation current which is conducted through said winding, said compensation current producing a compensating magnetic field for substantially canceling said external magnetic field.

4,899,083

AUTOMATIC LIGHTING SYSTEM FOR AUTOMOBILE

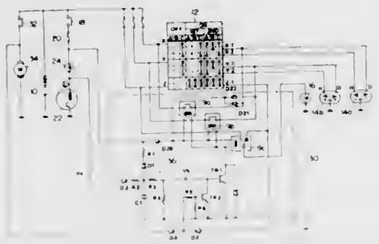
Sachiro Katsoka, Ebina; Yukio Yamamoto, Atsugi, and Saburo Okai, Ayase, all of Japan, assignors to Nisson Motor Co., Ltd., Yokohama, Japan

Filed Apr. 23, 1986, Ser. No. 854,922

Claims priority, application Japan, Apr. 26, 1985, 60-88740; Apr. 26, 1985, 60-88741

Int. Cl.⁴ B60Q *1/02*

U.S. Cl. 315—77 **9 Claims**



5. An automatic lighting system for an automobile including an engine, an electric power source, an ignition switch, a fuse, an alternator having one terminal connected via the fuse and the ignition switch to the electric power source and an opposite grounded terminal, a stator motor switch, and a stator motor for cranking the engine connected via the stator motor switch to the electric power source, the system comprising:

electrically responsive lights;

a manual lighting switch connected between the electric power source and said lights for selectively supplying current from the electric power source to said lights;

bypass circuit means connected between the electric power source and said lights to bypass said manual lighting switch and supply current from the electric power source to said lights when the bypass circuit means is closed;

bypass circuit driver means having one end connected via the fuse and the ignition switch to the source of electric power source and an opposite end grounded, said bypass circuit driver means being energized in response to a stable engine operating condition indicating voltage signal being derived at the one terminal of the alternator, said bypass circuit driver means closing siad bypass circuit means;

means cooperating with said manual lighting switch for opening said bypass circuit driver means when said manual lighting switch is closed thereby to open said bypass circuit means when said manual lighting switch is closed; and

means for supplying current from the electric power source to said bypass circuit driver means to bypass the fuse and the ignition switch and hold said bypass circuit driver means closed once said bypass circuit driver means has been closed.

4,899,084

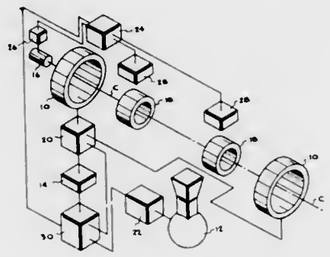
PARTICLE ACCELERATOR EMPLOYING TRANSIENT SPACE CHARGE POTENTIALS

Richard F. Post, Walnut Creek, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 25, 1988, Ser. No. 160,384

Int. Cl.⁴ H05H *5/00*; H01J *7/24*

U.S. Cl. 315—111.81 **16 Claims**



1. An method of accelerating ions or charged particles, comprising the steps of:

generating a plasma of electrons and ions confined in a magnetic mirror field with a central axis;

heating the plasma electrons to high temperatures;

directing an ion or particle beam substantially along the central axis of the magnetic mirror field; and

pulsing one or more local coils aligned substantially along the central axis of the magnetic mirror field, as the ions or charged particles pass the local coils wherein each local coil is pulsed rapidly so that the local coil increases the magnetic field substantially along the central axis of the magnetic mirror field near that local coil, thus generating a transient positive space charge which accelerates the ion or particle beam.

4,899,085

IGNITING DEVICE FOR A HIGH-PRESSURE DISCHARGE LAMP CAPABLE OF BATTERY VOLTAGE COMPENSATION

Mitsutoshi Kimura, Yokohama, and Yasuhiro Nieda, Yokosuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

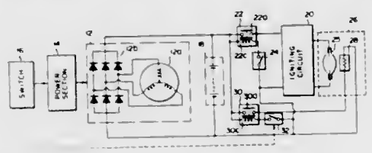
Continuation of Ser. No. 924,035, Oct. 28, 1986, abandoned.

This application Feb. 19, 1988, Ser. No. 161,247

Claims priority, application Japan, Oct. 28, 1985, 60-240963

Int. Cl.⁴ H01K *1/62*; H01J *17/34*

U.S. Cl. 315—116 **20 Claims**



1. An operating apparatus for a high-pressure discharge lamp having a light-emitting tube and a heater, said operating

apparatus receiving power from a power source having a battery, charging means for charging the battery, and charging switch means for causing said charging means to start and stop the charging of said battery, said operating apparatus comprising:

operating circuit means, including light switch means independent of heater operation and lighting circuit means, for receiving the power supplied from said power source and for generating a predetermined output only when said light switch means is turned on so as to start and maintain an ON state of said light-emitting tube;

heater switch means, operated independently of said light switch means, for causing said heater to operate independently of an operating state of said light switch means; and

heater control means for enabling power to be supplied to said heater by turning on said heater switch means only when said charging means is operated, and for turning off said heater switch means whenever said charging switch means is turned off.

4,899,086

ELECTROLUMINESCENCE LIGHT EMISSION APPARATUS

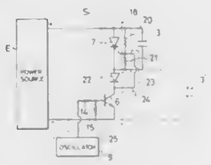
Shinji Hirata, and Katsumi Horinishi, both of Osaka, Japan, assignors to West Electric Company Ltd., Osaka and Canon, Inc., Tokyo, both of, Japan

Filed Dec. 28, 1987, Ser. No. 138,487

Claims priority, application Japan, Dec. 29, 1986, 61-311074; Dec. 29, 1986, 61-311075; Dec. 29, 1986, 61-201315[U]

Int. Cl.⁴ H05B *41/36*

U.S. Cl. 315--169.3 **16 Claims**



15. An electroluminescence light emission apparatus powered by a DC supply voltage produced from first and second output terminals of a power source, comprising:

first and second switch circuits connected in parallel between said power source terminals, each of said switch circuits comprising a thyristor, a diode and a switch element having a control electrode, said thyristor, diode and switch element being successively connected in series, with a cathode of said thyristor connected to an anode of said diode;

control means coupled to the control electrodes of said switching elements of said first and second switch circuits, for setting said switching elements in a conducting state and a non-conducting state respectively in a mutually alternating manner; establishing a first operating condition in which said switch element is held in a conducting state and a second operating condition in which said switch element is held in a non-conducting state;

an electroluminescence element coupled between the point of connection of the thyristor and diode of said first switch circuit and the thyristor and diode of said second switch circuit;

first gate bias circuit means coupled to a gate electrode of the thyristor of said first switch circuit and driven by a flow of current produced through said electroluminescence element when the switch element of said second switch circuit is set in the conducting state, to set said thyristor of the first switch circuit in the conducting state, and second gate bias circuit means coupled to a gate electrode of the thyristor of said second switch circuit and driven by a flow of current produced through said electroluminescence element when the switch element of said first switch circuit is set in the conducting state, to set said thyristor of the second switch circuit in the conducting state; and, first reverse bias circuit means for applying a voltage drop developed across the diode of said first switch circuit while the switch element of said first switch circuit is in the conducting state, as a reverse bias to the gate electrode of the thyristor of said first switch circuit, and second reverse bias circuit means for applying a voltage drop developed across the diode of said second switch circuit while the switch element of said second switch circuit is in the conducting state, as a reverse bias to the gate electrode of the thyristor of said second switch circuit.

4,899,087

TRIGGERING CIRCUIT FOR SERIES CONNECTED FLASH LAMPS

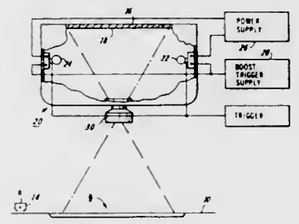
Thomas J. Hammond, and Lawrence J. Mason, both of Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 014,001, Feb. 12, 1987, abandoned.

This application Apr. 8, 1988, Ser. No. 180,680

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—241 P **5 Claims**



1. A circuit for causing high speed, repetitive discharge of a pair of flash lamps connected in series, said circuit comprising:

a main dc power supply connected across said series connected flash lamps, said main power supply adapted to provide the flash energy to said lamps to sustain discharge;

a trigger circuit for initiating flash operation by providing a low level trigger signal to each lamp and

a preflash boast voltage circuit for providing a boost voltage across a first flash lamp and across a common electrical connection between the two lamps, said boost voltage circuit including an auxilary dc power supply, for charging a boost capacitor connected in parallel across said first lamp and further including a blocking impedance connected between said capacitor and said common electrical connection, said boost voltage circuit adapted to charge said boost capacitor prior to initiation of flash operation,

whereby, when flash operation is initiated, said trigger signals are applied initiating current flow in both lamps and the boost voltage is applied across said first lamp lowering the impedance of said first lamp and accelerating the breakdown of the second lamp.

4,899,088

POWER CONTROL CIRCUIT FOR INDUCTIVE LOADS

Robert A. Black, Jr., Brooklyn Park, and Arlon D. Kompelien, Cross Lake, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 31, 1988, Ser. No. 239,209

Int. Cl.⁴ H05B *41/36*

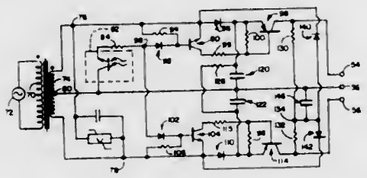
U.S. Cl. 315—291 **24 Claims**

1. Apparatus for use with an inductive load having first and second terminals and which is normally supplied with alternat-

ing current by a source connected to the first and second terminals but which may be interrupted from connection with the source for predetermined time periods during the Positive and negative portions of the current supplied, the apparatus operable to provide a current path, only during the predetermined time periods, for any accumulated charge in the load comprising:

first and second unidirectional conductors each poled to conduct current from an input to an output terminal thereof;

first and second unidirectional switches each having a control terminal operable upon receipt of control signals to turn the switches "on" and "off", each switch being poled to conduct current from an input terminal to an output terminal thereof only when activated to an "on" condition by a control signal at the control terminal;



control means operable to produce a first output during substantially only the predetermined time periods occurring in the positive portions of the current supplied by the source and a second output during substantially only the predetermined time periods occurring in the negative portions of the current supplied by the source; and

connection means connecting the output terminals of the first and second conductors and the input terminals of the first and second switches to the first and second terminals of the load, respectively, connecting the input terminals of the first and second conductors to the output terminals of the first and second switches and connecting the control terminals of the first and second switches to the control means, the first output of the control means providing the control signal to turn the second switch "on" and the second output of the control means providing the control signal to turn the first switch "on".

4,899,089

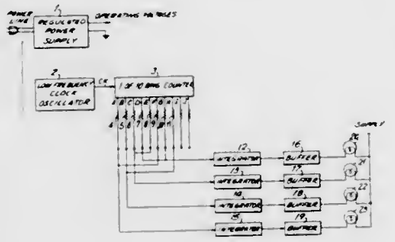
TIME-VARIABLE ILLUMINATING DEVICE

Dorothy E. Hayes, 30 E. 4th St., New York, N.Y. 10003

Continuation of Ser. No. 863,801, May 9, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 106,980

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 215—323 **2 Claims**



1. A device comprising:

an opaque base having a plurality of light sources;

a translucent block secured to the base for illumination by said light sources, said block being partitioned into zones differentiated by different optical characteristics; and

a control circuit disposed in said base for activating and deactivating said light sources in a preselected sequence; said control circuit comprising only:

a pulse generator for generating clock pulses;

a single ring counter operatively connected to said pulse generator, and having a plurality of outputs, each output being provided to generate output pulses sequentially in response to said clock pulses; and

a plurality of integrators each being coupled to one of the light sources, each said integrator being connected directly to at least one ring counter output for generating a shaped pulse in response to a respective output pulse for activating said one of said light sources wherein the control circuit further comprises a buffer interposed between an integrator and a corresponding light source and wherein the integrator comprises an operational amplifier with an amplified output and the buffer comprises a transistor with a base connected to the amplifier output and a collector in series with said light source.

4,899,090

RARE GAS DISCHARGE LAMP DEVICE

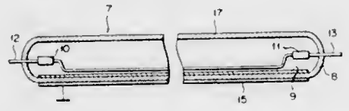
Yoshiji Yoshiike, Yokosuka, and Yoshinori Satou, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 55,610, May 29, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,256

Claims priority, application Japan, May 30, 1986, 61-124974; Aug. 29, 1986, 61-203348

Int. Cl.⁴ H05B *41/00*

U.S. Cl. 315—335 **24 Claims**



1. A rare gas discharge lamp for producing light using a predetermined voltage comprising:

an elongated bulb having an inner and an outer surface;

a rare gas sealed inside said bulb;

a pair of internal electrodes provided within said bulb and set apart from each other along the longitudinal axis of said bulb, a positive column being produced when the predetermined voltage is applied between said internal electrodes,

a phosphor layer formed on said inner surface of said bulb, and

means, disposed on said outer surface of said bulb in a region between said electrodes and kept at ground potential, for attracting said positive column toward a portion of said inner surface of said bulb which is close to said attracting means to maintain a potential difference between said attracting means and said positive column between said internal electrodes throughout operation of said rare discharge lamp to obtain a uniform light emission.

4,899,091

CATHODE-RAY-TUBE ASTIGMATISM CORRECTION APPARATUS

Conrad J. Odenthal, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

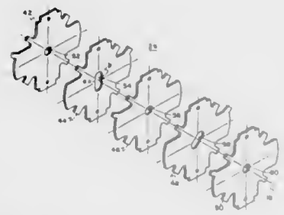
Continuation-in-part of Ser. No. 614,510, May 29, 1984, abandoned. This application Mar. 5, 1985, Ser. No. 708,602

Int. Cl.⁴ H01J *29/58, 29/50, 29/74*

U.S. Cl. 315—382 **26 Claims**

1. Astigmatism correction apparatus for an electromagnetically deflected cathode-ray-tube having an electron gun including beam-forming, accelerator and focusing electrodes forming an electron beam and an electromagnetic deflection yoke which establishes two orthogonal deflection fields and deflects said electron beam across a screen of said cathode-ray-tube in response to beam deflection signals applied to said electromagnetic deflection yoke, and wherein said magnetic deflection yoke produces distortion of said electron beam, said apparatus comprising:

electrostatic correction means disposed along said electron beam and through which said electron beam passes before reaching said deflection yoke, said electrostatic correction means, comprising at least first, second and third plateform electrodes spaced along the direction of the electron



beam and each having an aperture through which said beam passes, the aperture in the first electrode being non-circular and being elongated in a direction parallel to one of the two deflection fields, the aperture in the third electrode being non-circular and being elongated in a direction intermediate the directions of the two deflection fields, and the aperture in the second electrode, which is disposed between the first and third electrodes, being circular, and

means connected to said electrostatic correction means and responsive to the beam deflection signals for varying the electrostatic field produced by said electrostatic correction means to compensate dynamically for the distortion caused by said deflection yoke at a plurality of predetermined locations on said screen.

4,899,092

JUXTAPOSED DISCHARGE TUBES WITH OPPOSED TRIGGER ELECTRODES

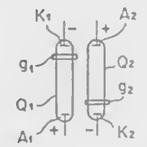
Kenji Tsuji, and Tsutomu Ichikawa, both of Kashiwara, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 101,814, Sep. 28, 1987, abandoned. This application Jun. 2, 1989, Ser. No. 361,829

Claims priority, application Japan, Sep. 29, 1986, 61-230778

Int. Cl.⁴ H01J *61/54*

U.S. Cl. 313—594 **4 Claims**



1. In a light emitting device which includes a plurality of discharge tubes arranged in a juxtaposed relationship and each having first and second electrodes to which energy for emitting light is applied and a trigger electrode to which a predetermined voltage to trigger energization of the corresponding discharge tube is applied, and wherein said discharge tubes are selectively controlled such that one of said discharge tubes is selectively caused to emit light or some or all of said discharge tubes are caused to emit light at the same time, the improvement wherein the trigger electrodes of each adjacent ones of said discharge tubes are located at opposite positions to each other with respect to the adjacent discharge tubes, wherein the trigger electrodes of each adjacent ones of said discharge tubes are located in a spaced relationship in a direction of the length of the discharge tubes by a distance insufficient to induce discharging of one of the adjacent discharge tubes when a predetermined voltage is applied to a trigger electrode of a different adjacent discharge tube to cause discharging of the latter.

4,899,093

CIRCUITRY FOR ELECTRONICALLY COMMUTATING A DIRECT-CURRENT MOTOR

Günter Gleim, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Deutsche-Thomson Brandt GmbH, Villingen, Fed. Rep. of Germany

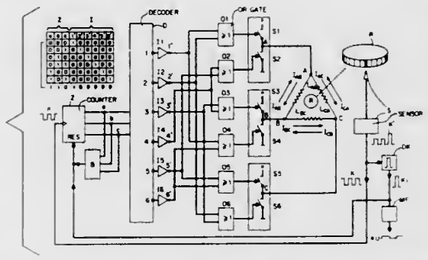
PCT No. PCT/EP87/00494, § 371 Date Apr. 29, 1988, § 102(e) Date Apr. 29, 1988, PCT Pub. No. WO88/01807, PCT Pub. Date Mar. 10, 1988

PCT Filed Sep. 2, 1987, Ser. No. 192,519

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 3630312

Int. Cl.⁴ H02P *6/02*

U.S. Cl. 318—254 **11 Claims**



1. A circuit for electronically commutating a multiphase direct-current motor having a stator and a rotor with a circumference, comprising: a predetermined number of markers distributed around said circumference of said rotor; said motor having phase windings; a sensor for detecting said markers and generating corresponding commutating pulses to activate said phase windings; a counter advanced by said pulses, said counter having a plurality of outputs; a plurality of switches controlled by said outputs for connecting said phase windings alternately to an operating voltage and to a reference voltage; said counter resetting itself to zero after receiving a predetermined number of commutating pulses that is a whole-number divisor of said predetermined number of markers; and an additional marker on said stator for resetting said counter from outside of said counter so that said stator applies a torque to said rotor which is always optimum and phase displacement is prevented.

4,899,094

METHOD OF CALIBRATION FOR AN AUTOMATIC MACHINE TOOL

David I. Pilborough, Wotton-under-Edge, United Kingdom, assignor to Renishaw plc, England

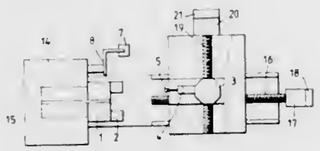
PCT No. PCT/GB87/00644, § 371 Date May 9, 1988, § 102(e) Date May 9, 1988, PCT Pub. No. WO88/02139, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 16, 1987, Ser. No. 194,571

Claims priority, application United Kingdom, Sep. 16, 1986, 8622218

Int. Cl.[4] G05B *19/24*

U.S. Cl. 318—567 **6 Claims**



1. A method of calibration for an automatic machine tool having workpiece-holding means which is rotatable about an axis for machining a workpiece held therein, data processing means, and a trigger probe, which probe can be triggered against a point on the surface of the workpiece, in response to which the data processing means produces information representative of positional co-ordinates of the probe at the trigger point, the co-ordinates being with respect to a datum point which is based upon an assumed position of the axis of rotation of the workpiece holding means, the method comprising:

(a) calibrating the probe, by triggering it against at least one point on an item having a known dimension and, using said dimension and a positional co-ordinate of the or each trigger point as indicated by the data processing means, computing a probe correction ofset; and

(b) calibrating the machine tool, by providing a physical feature having an axis of rotation centered with respect to the actual position of the axis of rotation of the workpiece holding means; triggering said probe against first and second points on said feature; and, on the basis of the mean of respective positional co-ordinates of the trigger points as indicated by the data processing means, corrected by the probe correction offset, computing an offset Xe related to the difference, if any, between the actual position and the assumed position of the axis of rotation of the workpiece holding means.

4,899,095

ROBOT CONTROL SYSTEM

Hajimu Kishi, Hino; Shinsuke Sakakibara, Komae, and Tatsuo Karakama, Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00319, § 371 Date Feb. 25, 1987, § 102(e) Date Feb. 25, 1987, PCT Pub. No. WO87/00310, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 24, 1986, Ser. No. 32,519

Claims priority, application Japan, Jun. 25, 1985, 60-138334

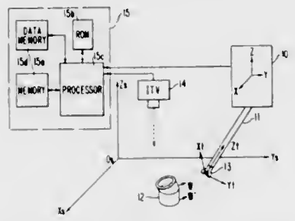
Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568.16 **6 Claims**

1. A robot control system adapted to execute a task using a tool at a predetermined position upon correction of a tool position offset of a robot, the correction being based on information indicative of a position of a workpiece supported by a working surface, said system comprising:

sensor means for sensing the position of the workpiece as represented by a gripping direction vector in a fixed coordinate system of said sensor means, the fixed coordinate system defined by a Z-axis substantially normal to the working surface, an X-axis and a Y-axis; and

control means for calculating an amount of rotational



correction of the tool, with regard to the fixed coordinate system of said sensing means, from position information based on the gripping direction vector of the workpiece sensed by said sensing means.

4,899,096

INVOLUTE INTERPOLATION SPEED CONTROLLING METHOD

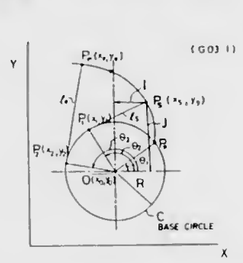
Hideaki Kawamura, Hachioji; Kentaro Fujibayashi, Musashino, and Toshiaki Otsuki, Hino, all of Japan, assignors to Fanuc LTC, Minamitsuru, Japan

Filed Feb. 7, 1989, Ser. No. 309,669

Claims priority, application Japan, Jun. 24, 1987, 62-157302

Int. Cl.[4] G05B *19/41, 19/415*

U.S. Cl. 318—573 **2 Claims**



1. In an involute interpolation speed controlling method for use in machining by a numerical control apparatus, an involute interpolation method for interpolating an involute curve comprising the steps of: instructing a rotational direction of the involute curve, coordinates of an end point, a center position of a base circle as viewed from a start point, a radius (R) of the base circle, and a speed;

obtaining coordinates (X_0, Y_0) of the center of the base circle of the involute curve, an angle ($\theta 2$) of the start point, an angle ($\theta 3$) of the end point and a curve start angle ($\theta 1$) on the basis of the instructions and coordinates (Xs, Ys) of the start point; and

with respect to an involute curve represented by

$$X = R\{\cos(\theta+\theta 1)+\theta \sin(\theta+\theta 1)+X_0$$

$$Y = R\{\sin(\theta+\theta 1)-\theta \cos(\theta+\theta 1)\}+Y_0$$

increasing θ in a range from $\theta=(\theta 2-\theta 1)$ to $\theta=(\theta 3-\theta 1)$ according to a relation defined by

$$\theta_{n+1}=\theta_n+K/(R\cdot\theta)$$

to thereby obtain corresponding points X_{n+1}, Y_{n+1} from the above equation.

4,899,097

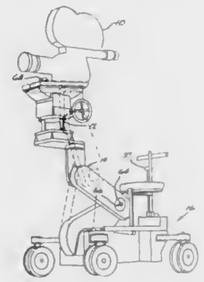
MOTORIZED TANG DRIVE SYSTEM

Leonard T. Chapman, 13760 Chandler Blvd., Van Nuys, Calif. 91401

Filed Oct. 2, 1986, Ser. No. 914,490

Int. Cl.[4] B66F *3/34*

U.S. Cl. 318—663 **11 Claims**



1. An electronic valve actuator system for controlling movement of an extendable boom arm actuated by a rotary control valve, comprising:

an actuator arranged to selectively operate the rotary control valve;

a rotator driver for selectively rotating said actuator; and

a controller for controlling actuator movement including a speed controller for controlling the speed at which said actuator actuates the rotary control valve,

a movement limiter for limiting the amount of actuation of said actuator, and

an actuator position sensor for detecting the position of the actuator, and

a boom position sensor for detecting the position of the boom arm.

4,899,098

LOW VOLTAGE DROP SERIES REGULATOR WITH OVERVOLTAGE AND OVERCURRENT PROTECTION

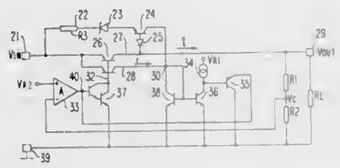
Roberto Gariboldi, Lacchiarella, Italy, assignor to SGS-Thomson Microelectronics S.p.A., Agrate Brinza, Italy

Filed Jun. 27, 1988, Ser. No. 211,925

Claims priority, application Italy, Jun. 25, 1987, 21039 A/87

Int. Cl.[4] G05F *1/569*

U.S. Cl. 323—277 **6 Claims**



1. An integratable series voltage regulator having a low voltage drop, and having a power transistor protected against overvoltages and overcurrents, comprising:

an input terminal and an output terminal respectively connected to an emitter terminal and to a collector terminal of said power transistor;

a common terminal which is common to both said input and output terminals; a first means for providing a voltage proportional to an output voltage between said output terminal and common terminal;

a comparison and control circuit means having an output connected to a base terminal of said power transistor, a first input terminal connected to said first means and a second input terminal connected to a reference voltage, said reference voltage having a value such that a control current flows into said base of said power transistor in order to keep said output voltage between said output terminal and said common terminal at a substantially constant predetermined value;

a means for determining a collector current of said power transistor, comprising an auxiliary transistor having its base and emitter terminals respectively coupled to the base and emitter terminals of said power transistor, wherein a collector of said auxiliary transistor provides a first measuring current which is substantially proportional to said collector current of said power transistor;

a circuit means for determining the collector-emitter voltage of said power transistor and for generating a second measuring current at its output terminal when said collector-emitter voltage of said power transistor exceeds a preset value;

a processing circuit means having a summing input node, to which are connected said collector of said auxiliary transistor and said output terminal of said circuit means for determining the collector-emitter voltage of said power transistor, and an output terminal connected to a third input terminal of said comparison and control circuit means, said processing circuit means reducing a control current to said power transistor as a function of the algebraic sum of said first and second measuring currents, when said sum exceeds a limiting value of current, said limiting value being arranged such that said collector current and said collector-emitter voltage of said power transistor define a point within safe operating area of said power transistor.

4,899,099

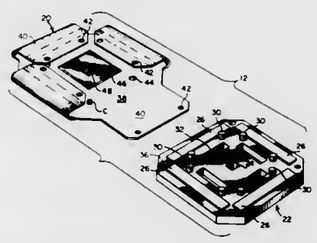
FLEX DOT WAFER PROBE

David W. Mendenhall, Greenville, and Jay T. Goff, Cranston, both of R.I., assignors to Augat Inc., Attleboro, Mass.

Filed May 19, 1988, Ser. No. 196,048

Int. Cl.[4] G01R *1/02, 1/04*

U.S. Cl. 324—158 F **19 Claims**



12. For use in testing the electrical integrity of at least one integrated circuit formed on a semiconductor wafer, a probe test system including a flex dot wafer probe and external test equipment having signal transmitting elements disposed in a predetermined pattern for providing electrical test signals to test the electrical integrity and performance of each integrated circuit, and wherein each integrated circuit includes a predetermined pattern of contact elements adapted to receive the electrical test signals, said flex dot wafer probe comprising:

a probe board for interfacing with the external test equipment, said probe board including

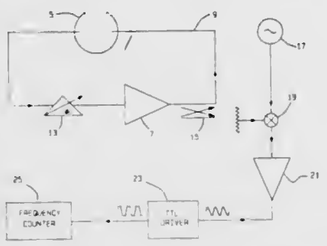
interface contact pads having a predetermined pattern,
means for electrically interfacing with the signal transmitting elements of the external test equipment, and
means for electrically interconnecting said interface contact pads and said electrical interface means;
a wafer probe head configured to be forcibly urged into physical and electrical engagement with said probe board and to interface with each integrated circuit to be tested, said wafer probe head including
a resilient bendable film having a base plane and at least one tab extending from said base plane with the extremity thereof disposed approximately planar to said base plane,
a plurality of protrusions formed on each said at least one tab in a mirror-image pattern corresponding to said predetermined pattern of said interface contact pads of said probe board, said plurality of protrusions being forcibly urged into physical and electrical engagement with said interface contact pads in a nondeformable manner to provide electrical continuity therebetween for the electrical test signals,
a plurality of wafer contact pads formed on said base plane in a mirror-image pattern corresponding to said predetermined pattern of the contact elements of each integrated circuit to be tested, said wafer contact pads being forcibly urged into physical and electrical engagement with corresponding contact elements of each integrated circuit to be tested in a scrubbing and nondeformable manner to provide enhanced electrically continuity therebetween for the electrical test signals, and
a plurality of coplanar line conductors formed on said base plane and said tabs to electrically interconnect corresponding ones of said plurality of protrusions and said plurality of wafer contact pads wherein the electrical test signals are transmitted from said interface contact pads to said plurality of protrusions, from said plurality of protrusions to said wafer contact pads via said plurality of coplanar line conductors and from said wafer contact pads to the contact elements of the integrated circuit to be tested to determine the electrical integrity and performance of the integrated circuit.

4,899,100

MICROWAVE MEASUREMENT OF THE MASS OF FROZEN HYDROGEN PELLETS

Vera Talanker, Golden, Colo., and Martin Greenwald, Belmont, Mass., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 1, 1988, Ser. No. 226,571
Int. Cl.[4] G01R *27/04*
U.S. Cl. 324—636 **9 Claims**



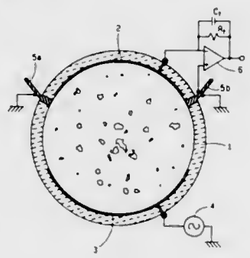
9. A method for determining the mass of a moving object of known composition comprised of the steps of:
driving a microwave transmission cavity contained in a microwave circuit at resonant frequency, said microwave transmission cavity being aligned so that the object passes through said microwave transmission cavity; and
comparing the resonant frequency of said microwave transmission cavity when the moving object is passing through said microwave transmission cavity with the resonant frequency of said microwave transmission cavity in the absence of the moving object;
whereby the mass of the moving object can be determined.

4,899,101

ONLINE CAPACITIVE DENSITOMETER

Karl G. Porges, Evanston, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 21, 1988, Ser. No. 146,509
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—663 **11 Claims**



1. Apparatus for measuring fluid density comprising:
(a) conveyance means for conveyance of a fluid;
(b) electrode plates positioned in relation to said conveyance means so that the fluid passes between said electrode plates;
(c) means for measuring the electrical capacitance of said electrode plates whereby the density of the fluid can be measured;
(d) means for uniformizing the electrode field between the electrode plates and confining the electric field inside said conveyance means.

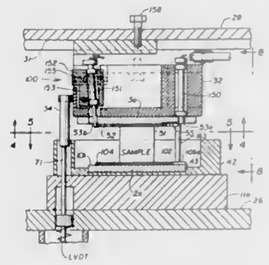
4,899,102

ELECTRODE SYSTEM FOR A PARALLEL PLATE DIELECTRIC ANALYZER

Kendall B. Hendrick, Landenberg, Pa., and John R. Reader, Jr., Newark, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 206,092, Jun. 13, 1988. This application Apr. 12, 1989, Ser. No. 337,131
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—663 **3 Claims**

1. An electrode system comprising a support means, a response electrode which has a ceramic substrate and is detachably attached to said support means by mechanical means and an excitation electrode which has a ceramic substrate with a



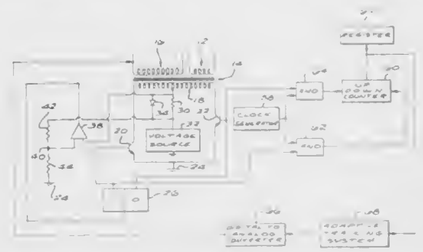
temperature sensor adhered to the surface of said ceramic substrate.

4,899,103

CURRENT METER

Henry S. Katzenstein, Pacific Palisades, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Jul. 16, 1987, Ser. No. 74,256
Int. Cl.[4] G01R *33/00, 19/00*
U.S. Cl. 324—99 D **74 Claims**



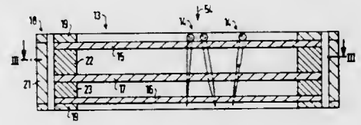
50. Apparatus for determining a variable electrical current, including,
a magnetizable member disposed in a closed loop,
a first winding magnetically coupled to the magnetizable member to receive a current variable in accordance with the variations in the variable electrical current and to produce in the magnetizable member a flux related to such current,
a second winding magnetically coupled to the magnetizable member to produce a flux in the magnetizable member in an opposite direction to that produced by the current in the first winding,
a third winding magnetically coupled to the magnetizable member, the third winding being center tapped,
bistable means having first and second stages of operation, one of the stages being connected between the center tap and one end terminal of the third winding and the other stage being connected between the center tap and the other end terminal of the third winding,
means including the bistable stage for alternately producing a flow of current to a particular magnitude in one direction between the center tap and one end terminal of the third winding and in an opposite direction between the center tap and the other end terminal of the third winding,
means responsive to the flow of current in the opposite directions in the third winding for producing a digital count in one direction of the time for the flow of such current in one direction to the particular magnitude and for producing a digital count in the opposite direction of the time for the flow of such current in the opposite direction to the particular magnitude, and
means responsive to the count in the digital counter in each cycle of operation of the bistable means for adjusting the polarity and magnitude of the current in the second winding to obtain the production by the second winding of flux nullifying in the magnetizable member the flux produced in the magnetizable member by the current in the first winding.

4,899,104

ADAPTER FOR A PRINTED CIRCUIT BOARD TESTING DEVICE

Martin Maelzer, Hagenburger Str. 26, D-3050 Wunstorf, Fed. Rep. of Germany; Rüdiger Dehmel, Wunstorf, Fed. Rep. of Germany; Hans-Hermann Higgen, Stadthagen, Fed. Rep. of Germany, and Andreas Gülzow, Springe, Fed. Rep. of Germany, assignors to Erich Luther and Martin Maelzer, both of Wunstorf, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,039
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639359; Oct. 29, 1987, 3736689
Int. Cl.[4] G01R *1/02, 1/04*
U.S. Cl. 324—158 F **26 Claims**



1. An adapter for a printed circuit board testing device, by means of which test contacts located on a grid can be connected to test points of a printed circuit board to be tested that are located on and/or off grid, said adapter comprising a test pin guide structure formed with guide holes arranged on the grid on one side of said structure and at least partially out of said grid on the other side of the structure, test pins received in said guide holes in the adapter, at least one of said pins being formed with a pointed contact section that projects from the adapter toward a respective contact point of the printed circuit board, said one pin test pin having an adjacent guidance section that is guided in an associated guide hole of the test pin guide structure, the cross-section of the guidance section of said one pin being greater than that of its respective pointed contacting section and being reduced along its length towards the contacting section, and the cross-section of the associated guide hole in said test pin guide structure being correspondingly reduced to permit said test pins to extend through the guide structure at converging inclinations so that respective contact points of adjacent test pins contact closely positioned test points on said printed circuit board.

4,899,105

METHOD OF TESTING ELECTRICAL CHARACTERISTICS OF LCD WITH PROBE DEVICE

Shuji Akiyama, Kofu, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Sep. 2, 1988, Ser. No. 239,677
Claims priority, application Japan, Sep. 2, 1987, 62-219639
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—158 F **10 Claims**

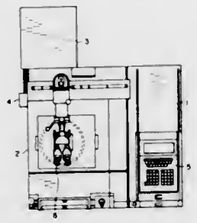
4. A method of testing electrical characteristics of an object with a probe device, said method comprising the steps of:
(a) placing an object to be tested on a stage inside the probe device;
(b) setting a light output end of a light supplying means to oppose the object;
(c) guiding light from a light source unit outside the probe

device to a light incident end of the light supplying means; and

(d) testing the electrical characteristics of the object while light is kept supplied from the light output end of the light supplying means,

wherein:

(e) an incident end portion of the light supplying means is



located between the probe device and the light source unit in a flexed state; and

(f) the light supplying means is moved in response to movement of the stage due to flexure of the light supplying means, wherein:

(g) the light output end of the light supplying means is supported inside the stage so as to oppose a support surface of the stage.

4,899,106

PERSONALITY BOARD

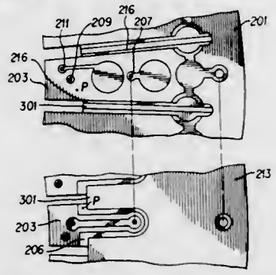
Mitsuhiro Ogura, Kunitachi, Japan, assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Jul. 28, 1988, Ser. No. 225,492

Claims priority, application Japan, Aug. 18, 1987, 62-125439[U]

Int. Cl.[4] G01R *31/02, 1/06*

U.S. Cl. 324—158 F **5 Claims**



1. A personality board for use with a semiconductor wafer test set interposed between a test set test head and a probe card, said personality board comprising:

a plurality of electrically conductive pad groups disposed on a circuit board of insulating material, each of said pad groups corresponding to a terminal group of said test head, said terminal group including at least a first terminal, a second terminal and a third terminal;

each pad group disposed on said circuit board in spaced-apart relationship with each of the other pad groups, each pad group separated from adjacent pad groups by a slit in said insulating material;

an electrically conductive material disposed on said circuit board in a predetermined pattern forming a first guard pattern surrounding and enclosing said plurality of pad groups, said first guard pattern electrically connected to the pad in each of said plurality of pad groups corresponding to said third terminal; and

each of the pads in each group corresponding to said first terminal and said second terminal, respectively, being electrically separated from each other on said circuit board.

4,899,107

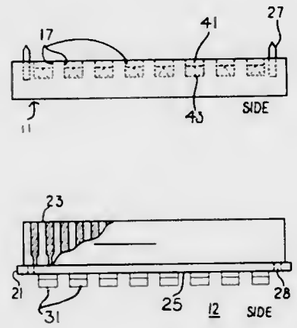
DISCRETE DIE BURN-IN FOR NONPACKAGED DIE

Tim J. Corbett, and Alan G. Wood, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 30, 1988, Ser. No. 252,606

Int. Cl.[4] G01R *31/28, 31/02*

U.S. Cl. 324—158 F **16 Claims**



9. Discrete testing apparatus for testing a plurality of semiconductor devices in unpackaged die form, for performing electrical tests in a manner similar to that accomplished with discrete packaged semiconductor devices, comprising:

(a) a first plate;

(b) a plurality of die-receiving cavities in the first plate;

(c) a second plate having a plurality of die contacting conductors extending therefrom;

(d) alignment means for aligning the first plate with the second plate;

(e) the die contacting conductors being positioned on the second plate so that, when the first plate and the second plate are aligned by the alignment means and the dice are positioned in the die-receiving cavities, the die contacting conductors are in alignment with contact locations on the dice;

(f) connector terminals in an electrical communication with the die contacting conductors, the connector terminals being mounted to the second plate; and

(g) the die receiving cavities having biased platforms therein, the biased platforms extending biasing forces against the dice which are sufficiently uniform to cause the dice to establish contact with the respective die contacting conductors on the second plate.

4,899,108

HIGH FREQUENCY COIL

Michiru Fujita, and Masao Higuchi, Kawasaki, both of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 17, 1988, Ser. No. 235,313

Claims priority, application Japan, Aug. 21, 1987, 62-207635; Aug. 21, 1987, 62-207636; Dec. 25, 1987, 62-329133

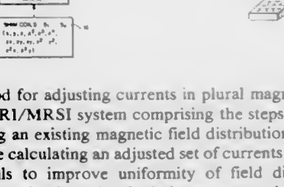
Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 **15 Claims**

1. A high frequency coil comprising:

a plurality of unit coils each of which has a first elementary coil including two line sections in parallel with each other and a second elementary coil confronting said first elementary coil and including two line sections in parallel with said two line sections of said first elementary coil;

all of said line sections included in said plurality of unit coils being provided on an outer peripheral surface of a common elliptic cylinder and having their longitudinal centers substantially on one plane which intersects perpendicularly the center axis of said elliptic cylinder;



said four line sections included in each unit coil occupying respective corners of a rectangle on said plane, each of said rectangles formed of said unit coils including a common central point and corresponding sides of each of said rectangles being disposed in parallel with each other; and

said line sections in each said unit coil being respectively electrically connected so as to generate a magnetic flux in the same direction at said common central point.

4,899,110

MAGNETIC RESONANCE IMAGING APPARATUS WITH STABILIZED MAGNETIC FIELD

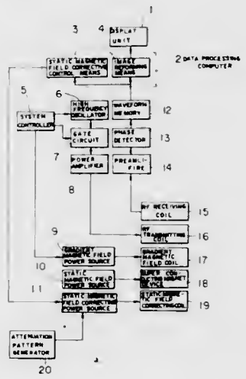
Hiroshi Furukawa, Otawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 22, 1988, Ser. No. 274,577

Claims priority, application Japan, Nov. 25, 1987, 62-295362

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—320 **10 Claims**



5. A static magnetic field stabilizer for a magnetic resonance apparatus, said static magnetic field stabilizer comprising:

a memory storing attenuation pattern information, said attenuation pattern information representing decay of a first magnetic field, generated by a superconducting magnet, over time; and

a correcting coil generating a second magnetic field superimposed on said first magnetic field, said second magnetic field compensating for decay of said first magnetic field such that decay of a net magnetic field experienced by a subject in said magnetic resonance apparatus is lessened.

4,899,109

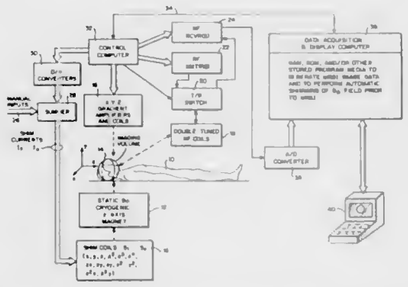
METHOD AND APPARATUS FOR AUTOMATED MAGNETIC FIELD SHIMMING IN MAGNETIC RESONANCE SPECTROSCOPIC IMAGING

James S. Tropp, Berkeley; Kevin A. Derby, S. San Francisco, and K. Christine Hawryszko, Millbrae, all of Calif., assignors to Diasonics Inc., South San Francisco, Calif.

Filed Aug. 17, 1988, Ser. No. 233,021

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—320 **47 Claims**



1. A method for adjusting currents in plural magnetic shim coils in an MRI/MRSI system comprising the steps of:

(a) mapping an existing magnetic field distribution;

(b) machine calculating an adjusted set of currents for actual shim coils to improve uniformity of field distribution while also using in such calculation an assumed uniformly distributed fictitious pseudo shim coil which does not actually exist thereby permitting uniform offset adjustments to be included in the calculations; and

(c) applying said adjusted set of currents to the actual shim coils.

4,899,111

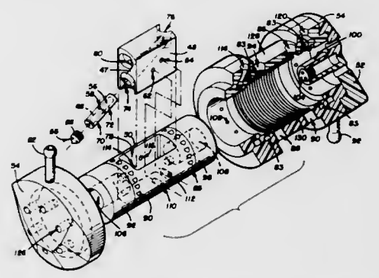
PROBE FOR HIGH RESOLUTION NMR WITH SAMPLE REORIENTATION

Alexander Pines, Berkeley, Calif., and Ago Samoson, Tallinn, U.S.S.R., assignors to The Regents of the University of California, Oakland, Calif.

Filed Aug. 3, 1988, Ser. No. 227,729

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—321 **16 Claims**



1. An apparatus for measuring the NMR spectra of a sample, said apparatus comprising:

means for holding said sample in a magnetic field, the orientation of said sample being specified by a set of angles, Ω, said set of angles being measured with reference to the direction of said magnetic field; and

orientation means for causing the orientation of said sample to change relative to said magnetic field, the orientation of said sample at time t being equal to Ω(t), wherein the time average of each of two different sets of spherical harmonic functions, Y_{lm}, is substantially zero over the values Ω(t) realized during the time of said NMR measurement.

4,899,112

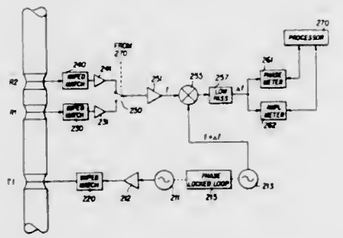
WELL LOGGING APPARATUS AND METHOD FOR DETERMINING FORMATION RESISTIVITY AT A SHALLOW AND A DEEP DEPTH

Brian Clark; Jacques Jundt; Martin Luling, all of Missouri City, and Michael O. Ross, Needville, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 30, 1987, Ser. No. 115,503

Int. Cl.[4] G01V *3/30, 3/18*

U.S. Cl. 324—338 **67 Claims**



1. Apparatus for determining the resistivity of earth formations surrounding a borehole, comprising;

means for generating electromagnetic wave energy at a first location in the borehole;

means for receiving electromagnetic wave energy at second and third locations in the borehole, said second and third locations being successively spaced longitudinally in the borehole from said first location;

means for detecting the phase shift between electromagnetic energy received at said second and third locations in the borehole;

means for detecting the attenuation between electromagnetic energy received at said second and third locations in the borehole;

means for determining, as a function of the detected phase shift, the resistivity of formations at a relatively shallow depth of investigation around said second and third locations; and

means for determining, as a function of the detected attenuation, the resistivity of formations at a relatively deep depth of investigation around said second and third locations.

4,899,113

SWITCHING HELIX POWER SUPPLY FOR A TWT

Wolter Bulkema, Borne, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Jun. 15, 1988, Ser. No. 209,451

Claims priority, application Netherlands, Jun. 29, 1987, 8701515

Int. Cl.[4] H03J *19/82, 25/34*

U.S. Cl. 328—258 **7 Claims**

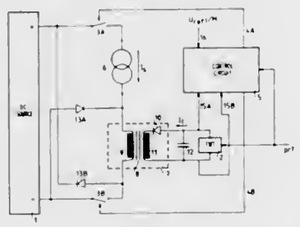
1. A switching power supply including a dc voltage source for generating a dc voltage for a pulsating load comprising:

buffer means for powering said load;

converter means having a primary and a secondary, said secondary connected to the buffer means;

a constant current source connected to the dc voltage source;

switch means connected to said constant current source and the primary of said converter means; and



load responsive control means connected to the switch means for selectively connecting said constant current source to the primary of the converter means in response to said pulsating load.

4,899,114

VOLTAGE SOURCE AMPLIFIER FOR USE IN A PSEUDOTERNARY CODE TRANSMITTER

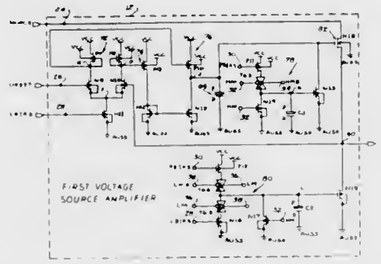
Geoffrey E. Berhmer, and Joe W. Peterson, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 146,988, Jan. 22, 1988, Pat. No. 4,829,541.

This application Jan. 23, 1989, Ser. No. 299,908

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—253 **3 Claims**



1. A voltage source amplifier comprising:

differential amplifying means (72) formed of a first N-channel input transistor (N9) and a second N-channel input transistor (N10), a first P-channel load transistor (P7), a second P-channel load transistor (P8), and a third N-channel current source transistor (N11) for comparing an output voltage at an output node with a reference voltage to generate a differentially amplified signal;

said first N-channel transistor (N9) having its drain connected to the drain and gate of said first load transistor (P7), its source connected to the source of said second input transistor (N10), and its gate connected to receive the reference voltage;

said second N-channel transistor (N10) having its drain connected to the drain and gate of said second load transistor (P8), and its gate connected to receive the output voltage;

said third N-channel transistor (N11) having its drain connected to the common sources of said first and second N-channel transistors (N9, N10), its source connected to a ground potential (VSS) and its gate connected to a bias voltage;

said first and second P-channel transistors (P7, P8) having their sources connected to a supply potential (VCC);

a first gain stage circuit (74) formed of a third P-channel drive transistor (P9) and a fourth N-channel load transistor (N12), said third P-channel transistor (P9) having its source connected to the supply potential (VCC), its drain connected to the drain of said fourth N-channel transistor (N12), and its gate connected to the gate and drain of said second P-channel transistor (P8), said fourth N-channel transistor (N12) having its gate and drain connected together and its source connected to the ground potential (VSS);

a second gain stage circuit (76) formed of a fourth P-channel drive transistor (P10) and a fifth N-channel load transistor (N13), said fourth P-channel transistor (P10) having its source connected to the supply potential (VCC), its drain connected to the drain of said fifth N-channel transistor (N13), and its gate connected to the gate and drain of said first P-channel transistor (P7), said fifth N-channel transistor (N13) having its gate connected to the gate and drain of fourth N-channel transistor (N12) and its source connected to the ground potential (VSS);

a push-pull output stage (82) formed of an N-channel output sourcing transistor (N18) and an N-channel output sinking transistor (N19), said output sourcing transistor (N18) having its drain connected to receive a drive current, its source connected to the drain of said output sinking transistor (N19) and to the output node, and its gate connected to the drain of said fourth P-channel drive transistor (P10) and a first charge control signal, said output sinking transistor (N19) having its gate connected to a second charge control signal and its source connected to the ground potential (VSS); and

first linear charging means (78) for generating said first charge control signal and being formed of a P-channel charging transistor (P11), a transmission gate (TG3), a pull-down transistor (N14), a capacitor (C1), and a switching transistor (N15).

4,899,115

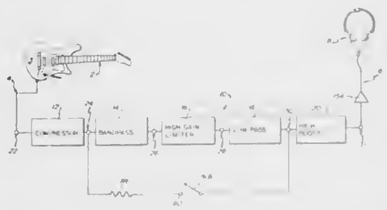
SYSTEM FOR CONTROLLING THE DYNAMIC RANGE OF ELECTRIC MUSICAL INSTRUMENTS

David E. Christian, Danbury, Conn., assignor to CB Labs, Inc., Bridgeport, Conn.

Filed Nov. 18, 1988, Ser. No. 274,443

Int. Cl.[4] H03F *3/191*

U.S. Cl. 330—302 **32 Claims**



1. A signal control circuit for an electrical musical instrument comprising:

(a) an amplifier circuit having a noninverting input port for receiving an electrical musical instrument input signal to be controlled, said input signal having an amplitude range varying between minimum and maximum values, an output port for supplying a controlled output signal, and an inverting input port for receiving a feedback signal from said output port for controlling amplifier gain;

(b) input compressing circuit means operatively coupled to said noninverting input port for compressing the amplitude of the input signal applied to said input port to a compressed input signal having an amplitude no greater than about a predetermined maximum level, said input compressing circuit means also for converting said compressed signal to a substantially nonlinear function of said input signal to preferentially emphasize desired harmonic content of said compressed signal; and

(c) feedback circuit means operatively coupling said output port to said inverting input port for feeding back a portion of said output signal as a feedback signal, said feedback circuit means including feedback signal compressing means for compressing said feedback signal to a compressed feedback signal having an amplitude no greater than a preselected maximum value, said feedback circuit means also for reducing the gain of said amplifier as a nonlinear function of said output signal as said output signal increases,

whereby said output signal has preferentially emphasized harmonic content and has an amplitude compressed within a selected range relatively independently of the range of said input signal.

4,899,116

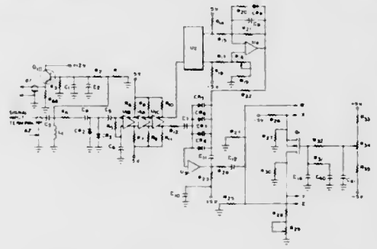
APPARATUS AND METHOD FOR PARALLELING POWER FIELD EFFECT TRANSISTORS IN HIGH FREQUENCY AMPLIFIERS

Don P. Roehrs, New River, and Helge O. Granberg, Phoenix, both of Ariz., assignors to Signal One Corporation, Phoenix, Ariz.

Continuation of Ser. No. 58,592, May 26, 1987, Pat. No. 4,733,194, which is a continuation of Ser. No. 701,492, Feb. 16, 1985, abandoned. This application Mar. 17, 1988, Ser. No. 169,401

Int. Cl.[4] H03F *3/217*

U.S. Cl. 330—251 **19 Claims**



1. Apparatus for providing a constant duty cycle rectangular wave signal in response to an input sine wave signal over the 1.6 MHz to 30 MHz frequency range and above, comprising:

wave shaping means for converting said input sine wave signal into a square wave signal, said square wave signal having a same frequency as said input sine wave signal;

voltage means coupled to said wave shaping means for providing a voltage signal having an amplitude determined by said square wave signal frequency;

integrator circuit means for providing a triangular wave signal in response to said square wave signal, triangular wave signal having a slope determined by said voltage signal amplitude; and

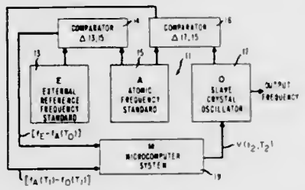
comparator means for controlling a duty cycle of said rectangular wave signal in response to said triangular wave signal.

4,899,117

HIGH ACCURACY FREQUENCY STANDARD AND CLOCK SYSTEM

John R. Vig, Colts Neck, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 24, 1987, Ser. No. 138,790
Int. Cl.[4] H03L 7/26
U.S. Cl. 331—3 2 Claims



1. A device comprising, in combination:
an atomic frequency standard as a reference frequency source;
a temperature compensated slave crystal oscillator having voltage-controlled frequency adjustment circuitry responsive to control by command signals from a microcomputer;
a microcomputer in circuit with said atomic frequency standard and with said slave crystal oscillator, said microcomputer being programmed to command said adjustment circuitry to change the frequency of said slave crystal oscillator in accordance with periodic signals from said microcomputer developed in accordance with corresponding comparison signals produced by periodic comparisons of signals from said slave crystal oscillator and signals from said atomic frequency source; and
said microcomputer contains temperature and aging data for both said atomic frequency standard and said crystal oscillator and said microcomputer is further programmed to command said voltage-controlled frequency adjustment circuitry to vary the frequency of said crystal oscillator to bring said crystal oscillator into syntonization with an external frequency source.
2. A device comprising, in combination:
an atomic frequency standard;
a temperature compensated crystal oscillator having pulse control circuitry responsive to pulse deletion signals from a microcomputer;
a microcomputer compensated digital clock in circuit with said atomic frequency standard and with said crystal oscillator, said microcomputer compensated digital clock being programmed to send pulse deletion signals to said pulse control circuitry in accordance with periodic signals produced by comparisons of pulses from said crystal oscillator with pulses from said atomic frequency standard.

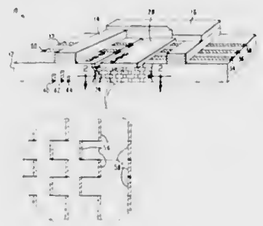
4,899,118

LOW TEMPERATURE COFIRED CERAMIC PACKAGES FOR MICROWAVE AND MILLIMETER WAVE GALLIUM ARSENIDE INTEGRATED CIRCUITS

Paul W. Polinski, Sr., Dana Point, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 27, 1988, Ser. No. 289,862
Int. Cl.[4] H01P 5/00
U.S. Cl. 333—246 15 Claims

13. A hybrid microcircuit package comprising:
a low temperature cofired layered substrate having buried passive components disposed between selected layers of the substrate and having a plurality of interconnected vias extending though the substrate to provide electrical interconnection to each of the buried passive components;
at least one cavity formed in the top surface of the substrate;
a plurality of conductor metallization paths disposed on selected surfaces of the substrate and extending from the outside edge of the substrate to the edge of the cavity;



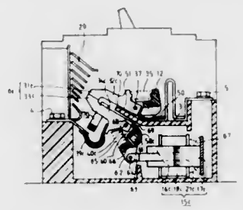
a low temperature cofired sidewall disposed on the top surface of the substrate surrounding the cavity;
a cover attachable to the top surface of the sidewall for enclosing the package.

4,899,119

CIRCUIT BREAKING APPARATUS WITH REMOTE CONTROLLED OPENING AND CLOSING OF ITS CIRCUITS

Elie Belbel, Epinay Sur Seine; Christian Blanchard, Nanterre; André Haury, Le Raincy, and Michel Lauraire, Courbevoie, all of France, assignors to La Telemecanique Electrique, France

Continuation of Ser. No. 135,518, Dec. 18, 1987, abandoned, which is a continuation of Ser. No. 798,666, Nov. 15, 1985, abandoned. This applicatioo Jun. 28, 1989, Ser. No. 373,654
Claims priority, application France, Nov. 16, 1984, 8417505
Int. Cl.[4] H01H 75/00
U.S. Cl. 335—14 7 Claims



1. A circuit breaking apparatus, in particular a multiphase circuit breaker comprising:
i- a common quick trip mechanism which may be set and released by means of a local manual control member.
ii- at least a power circuit comprising between two terminals a switching having a first mobile contact connected to the mechanism so as to be actuated thereby between closed and opened positions, and a second mobile contact carried by a first pivoting lever so as to effect with respect to the first mobile contact, retracting or advancing movements between at least a retracted position, wherein the second mobile contact is spaced from the first mobile contact, and an advanced position, wherein the second mobile contact bears on the first mobile contact with the said first mobile contact is in its closed position,
iii- detectors which react to overcurrent passing through said power circuit by causing the tripping of said mechanism and consequently the automatic opening of the switch, and
iv- an electromagnet which is associated with the apparatus

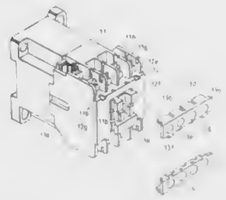
for causing remote controlled opening of the switch not causing the tripping of said mechanism, said electromagnet having an armature which is connected to said first pivoting lever through transmission means including an insulating pivoting support pivoted about a fixed axis and having a first arm on which is pivoted the said first pivoting lever and a second arm which is connected to the armature through articulation means, and a spring disposed under compression between the first pivoting leer and a bearing surface of the insulating pivoting support.

4,899,120

ELECTROMAGNETIC CONTACTOR

Shigeaki Ohtake; Kuniyuki Kogawa, and Takato Hirota, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jul. 13, 1988, Ser. No. 220,035
Claims priority, application Japan, Jul. 24, 1987, 62-113394[U]
Int. Cl.[4] H01H 67/02
U.S. Cl. 335—132 10 Claims



1. An electromagnetic contactor comprising:
a contactor body;
a plurality of fixed contacts, each of said fixed contacts having a terminal end and a contact end;
a plurality of movable contacts, each of said movable contacts being associated with a different one of said fixed contacts for making selective electrical connection at a contact point with said contact end of said associated fixed contact; and
selectively removable arc-extinction cover means for preventing electrical arcing between said contact point and said terminal end of said fixed contacts, said arc-extinction cover means being detachably secured to said contactor body, said movable contacts making said selective electrical connection when said cover means is attached to and detached from said contactor body, said cover means being removable to allow selective inspection, cleaning, and removal of each of said movable contacts.

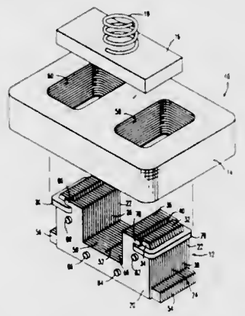
4,899,121

ALTERNATING CURRENT ELECTROMAGNET

Edwin J. Boothroyd, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1989, Ser. No. 345,873
Int. Cl.[4] H01F 7/10
U.S. Cl. 335—245 11 Claims

1. An alternating current electromagnet with a magnetic assembly, said magnetic assembly comprising:
a circuitous shading coil having a first portion, second and third portions each adjacent to said first portion, and a fourth portion adjacent to said second and third portions,
magnetic core means having a pole face and two generally opposed parallel sides with an open channel formed in said pole face and extending from one said parallel side to the other said parallel side for receiving said first portion of said shading coil with said adjacent second portion extending along said one parallel side of said magnetic core means in a lateral direction and said third portion extending along said other parallel side of said magnetic core means in a lateral direction,
sideplate means arranged along each of said two opposed parallel sides of said magnetic core means and attached to said core means,



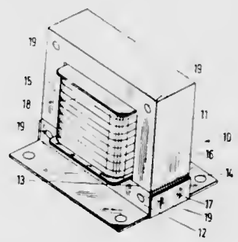
said each sideplate means having slot means with a lateral opening for receiving a different one of said second and third portions of said shading coil, and extension means located adjacent to said slot means and extending across said open channel along said opposed parallel sides of said magnetic core means in a manner to retain said shading coil in said open channel of said magnetic core means.

4,899,122

TRANSFORMER, CHOKE AND THE LIKE

Friedrich-Wilhelm Sommer, Soest, Fed. Rep. of Germany, assignor to ABB CEAG Licht- und Stromversorgungstechnik GmbH, Soest, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 280,167
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 8716135[U]
Int. Cl.[4] H01F 27/26
U.S. Cl. 336—65 4 Claims



1. Transformer, choke or the like, and fastening assembly comprising a magnetic core assembled from two lamination packets formed of laminations layered in a given direction, said lamination packets having outer contacting surfaces defining a partition line therebetween, a weld seam transverse to said given direction fastening said contacting surfaces to one another and overlapping said partition line, and a fastening element for fastening the transformer, choke or the like to a floor or a wall, upright tabs formed on said fastening element, said upright tabs having free edges alongside said partition line being partially welded with said weld seam.

4,899,123

HIGH CURRENT CAPACITY SUB-MINIATURE FUSE

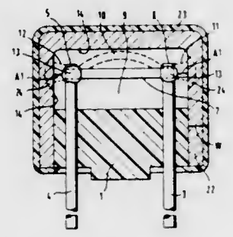
Norbert Asdollahi, Witten; Karl Poerschke, Sprockhövel; Klaus Stärk, Witten, and Claus Friedrich, Gevelsberg, all of Fed. Rep. of Germany, assignors to Wickmann-Werke GmbH, Witten, Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 284,498

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742532; Sep. 26, 1988, 8812144

Int. Cl.[4] H01H *85/38*

U.S. Cl. 337—273 **19 Claims**



1. A fuse having a sealed chamber which is formed by a plastic base, a cap, two contacts which traverse said base, a fusible wire which melts under an over-current condition and a metal surface within said chamber for receiving heat during quenching of an arc which is generated after said fusible wire has been interrupted by fusing, the improvement comprising:

forming and positioning said metal surface relative to said fusible wire and said contacts in such a way that the arc jumps onto said metal surface and is thus quenched.

4,899,124

THERMALLY CONTROLLED ELECTRIC SWITCH

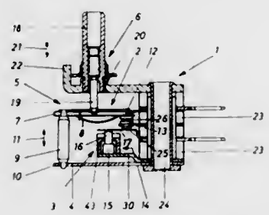
Walter Hollweck, Heroldsberg, Fed. Rep. of Germany, assignor to Thermostat-und Schaltgeraeteban GmbH & Co. KG, Bad Kissingen, Fed. Rep. of Germany

Filed Oct. 18, 1988, Ser. No. 259,275

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1987, 3735334

Int. Cl.[4] H01H *37/02*

U.S. Cl. 337—299 **25 Claims**



1. In a thermally controlled electrical switching arrangement for limiting the temperature of a heated or heating element, said arrangement being of the type having

a temperature controller comprising

a bimetallic strip, and

a snap-action switch actuated by said bimetallic strip and having a movable contact and a contact spring, wherein a dead center position of said contact spring is displaceable by a manually operable setting device in order to influence the control point, and

a temperature limiter constructed as a melting metal fuse having

a fusible element,

a pressure element and

at least one switching contact member having a fixed contact and a movable contact maintained in closed position by the pressure element as long as the limiter has not responded,

the improvement wherein said fixed contact of said limiter has respectively opposite first and second contact faces, wherein said movable contact of said limiter as influenced by said pressure element is in biased engagement with said first contact face of said fixed contact and wherein said movable contact of said temperature controller as influenced by said contact spring is in biased engagement with said second contact face of said fixed contact.

4,899,125

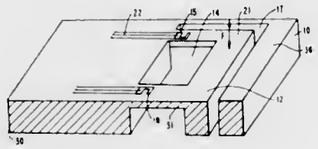
CANTILEVER BEAM TRANSDUCERS AND METHODS OF FABRICATION

Anthony D. Kurtz, Teaneck, N.J., assignor to Kulite Semiconductor Products, Inc., Leonia, N.J.

Filed Jul. 24, 1987, Ser. No. 82,407

Int. Cl.[4] G01L *1/22*

U.S. Cl. 338—2 **21 Claims**



1. In a cantilever beam transducer of the type employing a deflectable beam secured at one end to permit deflection at an unsecured opposite end, said beam being a relatively planar rectangular member and having a top and a bottom surface, the combination therewith comprising:

a rectangular aperture extending through said beam from said top and said bottom surface with said aperture forming thinned beam sections on either side of said aperture and piezoresistive bridge arrays mounted on said beam upon said thinned sections and located on said top surface of said beam whereby there is an array on each side of said aperture on said top surface.

4,899,126

THICK FILM RESISTOR TYPE PRINTED CIRCUIT BOARD

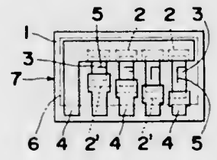
Takeharu Yamada, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 4, 1989, Ser. No. 293,416

Claims priority, application Japan, Mar. 7, 1988, 63-30869[U]

Int. Cl.[4] H01C *1/012*

U.S. Cl. 338—309 **6 Claims**



1. A thick film resistor type printed circuit board comprising:

an insulating substrate;

a plurality of pairs of terminal electrode layers made of silver, which are formed on said insulating substrate;

a plurality of resistor layers which are formed on said terminal electrode layers so as to connect the pairs of said terminal electrode layers, respectively;

a plurality of wiring conductive layers made of copper, which are, respectively, connected to predetermined ones of said terminal electrode layers so as to coat said terminal electrode layers; and

a protective layer for covering at least a portion of said insulating substrate, in which portion said terminal electrode layers and said resistor layers are formed.

4,899,127

SIZE COMPARING CIRCUIT

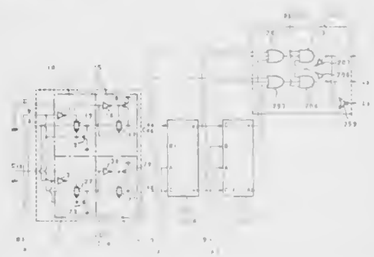
Hiroyuki Kawai, and Kazuya Ishihara, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 8, 1988, Ser. No. 242,006

Claims priority, application Japan, Jan. 21, 1988, 63-11207

Int. Cl.[4] G06F *7/02*

U.S. Cl. 340—146.2 **3 Claims**



1. A size comparing circuit for comparing sizes between a first n-bit binary data and a second n-bit binary data, comprising;

n number of one bit judging means each of which has

as a first and second data input corresponding to a bit of said first and second binary data;

a logical "0" signal as a first and second external input signal to the judging means corresponding to the Most Significant Bit,

each of said judging means having a first and second external output signals, which are used as the first and second external input signal for the next less significant bits means; and has

a first comparing means outputting "1" in the case where said first data is "1" and said second data is "0", and outputting "0", and outputting "0" in the other cases;

a second comparing means outputting "1" in the case where said second data is "1" and said first data is "0" in the other cases;

a first compared result outputting means taking an output signal of said first comparing means when the first external input signal is "0", and taking a signal "1" when the first external input signal is "1" respectively as an external output signal; and

a second compared result outputting means taking an output signal of said second comparing means when the second external input signal is "0", and taking a signal "1" when the second external input signal is "1" respectively as an external output signal; and

a judging means which has

a first gate outputting "1" when any one of outputs of said first compared result outputting means of said respective one-bit judging means is "1";

a second gate outputting "1" when any one of outputs of said second compared result outputting means of said respective one-bit judging means is "1"; and

a judgement signal outputting means outputting a first judgement signal as a result of judgment that the first binary data is larger that the second binary data when said both gate outputs are inputted and only said first gate output is "1", outputting a second judgment signal as result of judgment that the second binary data is larger than the first binary data when only said second gate output is "1", and outputting a third judgement signal as a result of judgment that the both binary data are equal when said both gate outputs are "0".

4,899,128

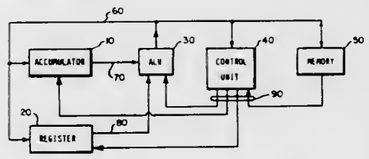
METHOD AND APPARATUS FOR COMPARING STRINGS USING HASH VALUES

Ehud Y. Shapiro, Rehovot, Israel, assignor to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Dec. 11, 1985, Ser. No. 807,552

Int. Cl.[4] G06F *7/02*

U.S. Cl. 340—146.2 **15 Claims**



9. Apparatus for comparing strings of data generated simultaneously by two or more computer programs running in parallel comprising:

means for generating a hash code for each string, each also string comprising other information,

means for storing each string and hash code generated therefor,

means for generating a unique pointer for each different string stored in said storing means,

first and second registers,

an arithmetic logic unit, and

means of comparing a pair of said strings comprising:

means for loading the pointers for such strings into said first and second registers,

means for comparing the contents of said first and second registers,

means for loading the hash codes into said first and second registers if the pointers are different as determined by said comparison,

means for comparing the contents of said first and second registers, and

means for comparing other information in each said string if the hash codes are the same as determined by said comparison to determine if the strings are the same.

4,899,129

AUTOMATED APPLIANCE AND ENERGY DISTRIBUTION CONTROL SYSTEM

David J. MacFadyen, Derwood, Md.; Robert G. Edwards, Oak Ridge, Tenn.; Kenneth P. Wacks, stoneham, and Daniel J. Foley, Chelmsford, both of Mass., assignors to Smart House Limited Partnership, Upper Marlboro, Md.

Division of Ser. No. 126,794, Dec. 1, 1987. This application Nov. 8, 1988, Ser. No. 268,368

Int. Cl.[4] H04M *11/04*

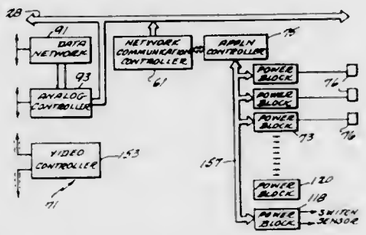
U.S. Cl. 340—310 R **2 Claims**

1. An automated system apparatus for providing AC energy from an energy source and communications services within a house to appliances capable of receiving said AC energy and appliance digital data and generating appliance digital data, comprising:

energy distribution means for supplying said AC energy

from said energy source to appliances throughout the house;

appliance coordination data network means for communicating appliance digital data throughout the house, said appliance coordination data network means including a plurality of outlet control power block means responsive to a power desired appliance digital data signal for applying said AC energy from said energy distribution means to said appliances throughout the house; and



a plurality of common outlet means for connectable attachment of one of said appliances, each common outlet means connected to one of said outlet control power block means and capable of receiving said AC energy only after attachment of one of said appliances and after said outlet control power block means receives said power desired appliance digital data signal generated by said appliance.

4,899,130

ELECTRIC DESIRED-VALVE INDICATOR

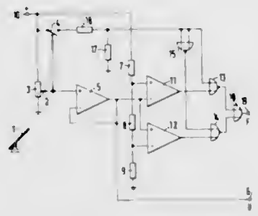
Rainer Rossberg, Schwalbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,117

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643946

Int. Cl.⁴ B60G *1/00*

U.S. Cl. 340—438 **5 Claims**



4. An electric desired-value transmitter for automotive vehicles, particularly for a vehicle having an electric gas pedal, the transmitter comprising

an actuating element and a potentiometer, a wiper of the potentiometer being mechanically connected to the actuating element, the wiper serving as an output terminal of the potentiometer and providing an output voltage of the transmitter;

a switch mechanically coupled to the actuating element, a state of the switch changing to an actuation state as a function of position of the actuating element;

a comparison device connected to the switch, and providing an output signal dependent on the switch state;

a reference circuit coupled to the comparison device and providing a first comparison voltage and a second comparison voltage different from said first comparison voltage; and wherein

the output voltage of the desired-value transmitter and said first and said second comparison voltages are fed to the comparison device, the second comparison voltage being larger than the first comparison voltage, the value of said transmitter output voltage lying between values of said first and said second comparison voltages during absence of a failure in an operating condition of said transmitter; and

said comparison device includes means for comparing said transmitter output voltage to said first and said second comparison voltages, said comparing means outputting a plurality of comparison signals designating a relative magnitude and said transmitter output voltage to said comparison voltages, said comparison device further including a logic circuit which is connected to said switch and evaluates logical state of the comparison signals in accordance with a state of said switch to output the output signal of the comparison device, the output signal of the comparison device serving as an error signal designating the presence of a failure when the output voltage of said transmitter lies outside a range of voltage defined by said first and said second comparison voltages and by a state of said switch.

4,899,131

LOCAL CONTROL SYSTEM FOR DOMESTIC APPLIANCES AND ALARM DEVICES

Sven T. Wilk, Vintrie, and John G. Olsson, Bjärred, both of Sweden, assignors to Aktiebologet Electrolux, Stockholm, Sweden

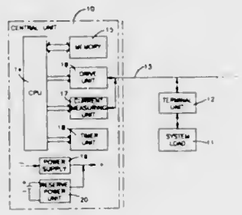
PCT No. PCT/SE87/00173, § 371 Date Nov. 23, 1987, § 102(e) Date Nov. 23, 1987, PCT Pub. No. WO87/06380, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 19, 1987, Ser. No. 128,500

Claims priority, application Sweden, Apr. 7, 1986, 8601545

Int. Cl.⁴ G08B *26/00*

U.S. Cl. 340—518 **7 Claims**



1. In a local control system for system loads, comprising a central unit and a two-wire bus line interconnecting the central unit and the system loads, wherein the system loads are connected to the bus line via terminal units which are responsive to a voltage signal emitted by the central unit and being unique with respect to a respective terminal unit for applying a control signal to a predetermined system load, the central unit being connected to apply a DC voltage to the bus line for supplying operating power to the respective terminal unit and system loads connected to the system, the central unit comprising means for detecting changes in the bus line current and for determining the status of a system load from said changes, the improvement wherein said central unit comprises means for emitting a first signal unique to a respective terminal unit and followed by an additional signal, said respective terminal unit comprising means responsive to the first signal for transferring said additional signal to an output of the terminal unit, and further comprising a manual control unit connected to said output, said manual control unit comprising a keyboard having keys and including means responsive to depression of said keys

for varying current flowing in said bus line, said central unit being responsive to variation in said current in said bus line for applying a signal including said first and additional signals to said terminal unit said additional signal operating to identify the key being pressed.

4,899,132

MOTION SENSOR

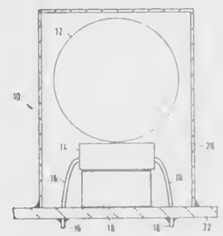
Anatoli Stobbe, Berliner Strasse 5e, D-3000 Hanover, and Wilfried Herrmann, Gehrden, both of Fed. Rep. of Germany, assignors to Anatoli Stobbe, Hanover, Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 180,186

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1987, 3713416

Int. Cl.⁴ G08B *13/24*; G01C *9/06*

U.S. Cl. 340—551 **15 Claims**



1. A motion sensor for the generation of a signal or a plurality of signals in the presence of a motion acting on the motion sensor, the motion sensor comprising a freely movable body formed of magnetizable material, and a detector comprising a resonant element which responds to changes in a magnetic field.

4,899,133

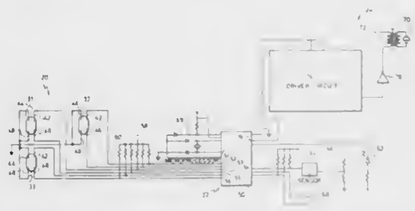
PROGRAMMABLE MOVEMENT ANALYZER WITH A PLURALITY OF MERCURY SWITCHES

Alan Bartlett, New Braunfels, Tex., assignor to Detex Corporation, New Braunfels, Tex.

Filed Feb. 8, 1988, Ser. No. 153,162

Int. Cl.⁴ G08B *23/00*

U.S. Cl. 340—573 **18 Claims**



1. A device for warning when a person has ceased normal movement comprising:

a housing;

power supply means coupled to the housing;

means coupled to the housing and operably connected to the power supply means for selectably initiating a warning;

switch means operably connected to the power supply means; and

means connected to the power supply means and warning means for sensing and analyzing movement of a person wearing the device and for enabling operation of the warning means if normal movement ceases, including—

mercury switch means having at least two switches, each switch having structure defining an enclosure, at least a pair of electrical contacts disposed in the enclosure, and a pool of mercury shiftably disposed in the enclosure for electrically connecting and disconnecting the contacts upon motion of the person, the two switch enclosures being skewed relative to each other,

a microcomputer operably connected for receiving separate inputs from each of said two mercury switches, the microcomputer being programmed for determining normal movement from the switch inputs, normal movement being programmed as requiring at least two switches to connect and disconnect electrically within less than about a 30 second period.

4,899,134

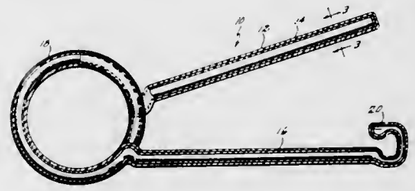
NEWBORN ANTI-THEFT DEVICE

Clifford R. Wheeless, Jr., 1006 St. Georges Rd., Baltimore, Md. 21210

Filed Aug. 4, 1988, Ser. No. 228,111

Int. Cl.⁴ G03B *23/00*

U.S. Cl. 340—573 **7 Claims**



1. An apparatus for detecting the movement of a newborn within a predetermined area using a sensing system that causes an alarm comprising:

an umbilical cord clamp; and

detectable means disposed inconspicuously inside said umbilical cord clamp for triggering said sensing system and causing said alarm when said detectable means enters said predetermined area.

4,899,135

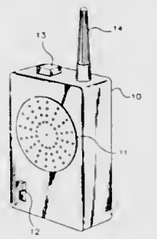
CHILD MONITORING DEVICE

Mehdi Ghahariiran, 3717 Nobel Dr. No. 1213, San Diego, Calif. 92122

Filed Dec. 5, 1988, Ser. No. 279,968

Int. Cl.⁴ G08B *23/00*

U.S. Cl. 340—573 **1 Claim**



1. A range sensitive system employing two or more ultra sonic transceivers to monitor the activities of a child, children or individuals, carrying transceivers monitored by a base trans-

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ceiver carried by a guardian wherein the improvement comprises:

a, the transceivers operating in ultra sonic frequency spectrum;

b, the child's transceiver transmitting a constant signal which is received by the guardian's transceiver which converts the signal into an audio tone;

c, the guardian's transceiver having a threshold receiving circuit adjustable to correlate a prescribed distance from the transceiver carried by the child;

d, the loss of a signal from the child's transceiver energizing an audio generator in the guardian's tranceiver;

e, a signal from the guardian's transceiver energizing an audio tone transmitter in the child's transceiver;

f, the child's transceiver carried in a holster having means to open the transmission circuit if the transceiver is removed from the holster; and,

g, the child's transceiver in the holster being attached to the child by a support belt having means to open the transmission circuit if the belt is removed from the child.

4,899,136

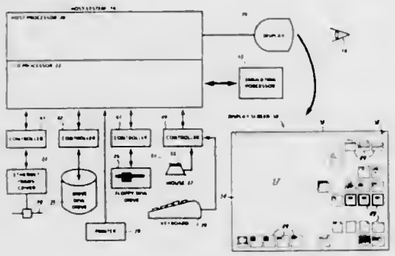
DATA PROCESSOR HAVING A USER INTERFACE DISPLAY WITH METAPHORIC OBJECTS

Marian H. Beard, Sunnyvale; Perry A. Caro, Palo Alto; Jennifer B. Hsiao, San Jose; Kevin J. Mackey; James G. Sandman, Jr., both of Palo Alto; Gary R. Steinbach, Mountain View, and Donald R. Woods, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1986, Ser. No. 856,525

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—706 **22 Claims**



1. In a proprietary data processor having a display for displaying information on the screen of said display and user input means connected to said proprietary data processor for input to said display screen,

a user interface on said screen including operative metaphoric objects with which a user interacts via said input means,

said objects including an emulator with operative metaphoric objects currently displayed with the display of operative metaphoric objects of said proprietary data processor and which are both independently and concurrently operative as displayed,

said emulator when opened via said user interaction produces an emulation window on a portion of said display screen allocated thereto by said proprietary data processor and emulating the display screen of a target processor unit,

said emulator having an operating and filing system with a instruction set alien to that of said proprietary data processor,

emulated drive means represented as metaphoric object on said screen,

means to configure said emulator to bind said emulated drive means to the operation of said emulator, and

means in said emulation window to indicate the presence of said emulated drive means.

4,899,137

ARRANGEMENT FOR THE INPUT AND PROCESSING OF CHARACTERS AND/OR GRAPHIC PATTERNS

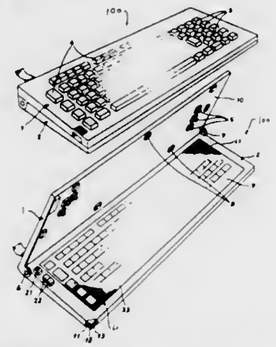
Herbert Behrens, Neuenburg, and Norbert Zeising, Oldenburg, both of Fed. Rep. of Germany, assignors to AEG Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,303

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732519

Int. Cl.[4] G06F *3/02*

U.S. Cl. 340—711 **18 Claims**



1. An apparatus for the selective input of characters and graphic patterns for processing in an electronic data processing system, comprising:

a graphics tablet having an input layer, and a plurality of sensor elements disposed on said input layer which are each actuable to produce electrical signals corresponding to the location of the respective actuated sensor element;

a keyboard which is movable relative to said graphics tablet to a keyboard operating position for keyboard entry of characters and to a second operating position to permit direct entry of information to said input layer, said keyboard having a plurality of movable keys, in said keyboard operating position, each of said movable keys overlying a corresponding predetermined group of sensor elements; and

operating mode detecting means for detecting whether said keyboard is in said keyboard operating position or in said second position for signalling the data processing system to respectively interpret information from said graphics tablet either as characters corresponding to keys on said keyboard, or to graphic patterns corresponding to actuated ones of said plurality of sensor elements.

4,899,138

TOUCH PANEL CONTROL DEVICE WITH TOUCH TIME AND FINGER DIRECTION DISCRIMINATION

Morio Araki; Shigeto Mori; Michihiro Kaneko, and Yasunao Go, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 161,929

Int. Cl.[4] G09G *3/02*

U.S. Cl. 340—712 **3 Claims**

1. A touch panel control device for outputting control data to select an operation mode for an electronic device according to how a finger touches a touch panel, comprising:

touch position detecting means arranged in a matrix form on said touch panel, for detecting the coordinates of a touch position of said touch panel;

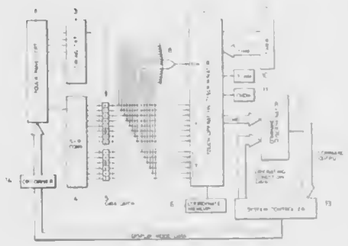
scanning means for periodically scanning said touch position detecting means;

memory means responsive to said touch position detecting means for storing the coordinates of a detected touch position on said touch panel;

coordinate comparing means for comparing, for each scan, said coordinates stored in said memory means with those of a current touch position while a finger touches said panel to determine the direction of finger movement;

timer means for performing a time measuring operation initiated when a finger first touches a touch position on said touch panel as detected by said touch position detecting means and continuing so long as the finger continues to touch said touch position; and

an operation discriminator for selectively outputting said



control data to select an operation mode from a plurality of possible operation modes dependent upon the time measuring operation of said timer means and the results of comparisons of said coordinate comparing means, whereby said operation modes are discriminated based upon the direction of finger movement when the finger moves across the touch panel for more than a predetermined distance, and whereby said operation modes are discriminated based upon the time duration a finger touches said touch panel when the finger moves across said touch panel for less than said predetermined distance.

4,899,139

DISPLAY CONTROL DEVICE FOR SUPERIMPOSING DATA WITH A BROAD CASE SIGNAL ON A TELEVISION SCREEN

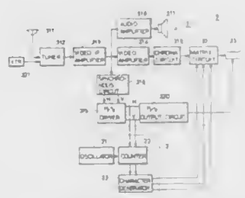
Haruki Ishimochi, Nikko; Kimio Yamamura, Yaita; Yuji Fukuyama, Yaita; Masato Yanai, Yaita, and Satoshi Takahashi, Yaita, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 19, 1983, Ser. No. 524,866

Claims priority, application Japan, Aug. 24, 1982, 57-146573; Aug. 25, 1982, 57-148399; Aug. 26, 1982, 57-148542; Aug. 30, 1982, 57-151341

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—721 **4 Claims**



1. A cathode-ray tube control apparatus for connecting a personal computer with a television receiver to superimpose information provided by the computer on the picture of a television broadcast, the control apparatus comprising:

means for storing data to be displayed, said means for storing receiving said information provided by said computer for storage therein as said data;

oscillator means for producing clock signals in synchronism with horizontal and vertical synchronizing signals developed by said television receiver;

means for developing timing signals defining a horizontal scanning display period, a horizontal scanning retrace period, a vertical scanning display period, and a vertical retrace period by counting the clock signals produced by said oscillator means;

means for controlling the read-out of data to be displayed, from said means for storing, in accordance with said timing signals received from said means for developing and for supplying the data for display on said television receiver;

means for supplying said timing signal defining said vertical retrace period to said personal computer;

said personal computer including means for processing information, said means for processing information being enabled in response to said timing signal defining said vertical retrace period to thereby perform processing of information during said vertical retrace period;

said timing signals including a character timing signal, said character timing signal including a plurality of character representation pulses each representative of a character having a predetermined number of display dots, all multiples of said character representation pulses having a frequency different from a chrominance subcarrier frequency of a signal supplied to said television receiver to develop the picture of a television broadcast;

said timing signal developing means including,

means for counting said character representation pulses, and

means for modifying the count of said means for counting so as to alter a length of character representation pulses developed during each of the horizontal scanning retrace periods so that said chrominance subcarrier frequency is a multiple of the frequency of the total of said character representation pulses developed during both said horizontal scanning retrace period and said horizontal scanning display period;

said picture elements thereby being developed horizontally on the screen of the television receiver to form one picture of said television broadcast.

4,899,140

DISPLAY DEVICE FOR COPYING MACHINES AND THE LIKE

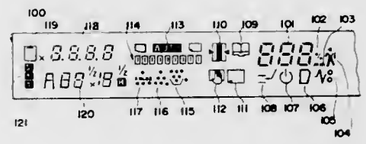
Masazumi Ito, Toyohashi; Kadotaro Nishimori, Toyokawa, and Masaaki Oyabu, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1987, Ser. No. 96,591

Claims priority, application Japan, Sep. 13, 1986, 61-216143; Sep. 13, 1986, 61-216144

Int. Cl.[4] G09G *3/04*

U.S. Cl. 340—756 **7 Claims**



1. A display device, for use with copying machines, having a first display for displaying a number of copies to be produced, a second display for displaying a magnification ratio to be used for copies and additional indicators provided between the first and second displays, the display device comprising:

means for storing data of a total copy number of copies made on the copying machine, data of the magnification ratio and data of the number of copies to be produced, the data stored in said storing means being applied to said first and second displays;

means for activating the display of the data of the total copy number stored in the storing means;

means, in response to the activating means, for dividing the data of the total copy number into high-order columns and low-order columns so as to display the low-order columns and the high-order columns in the first and second displays respectively, and

means, in response to the activating means, for controlling the additional indicators on the display device so as to turn off or reduce the intensity of light emissions of the additional indicators relative to the first and second displays when the means for activating is enabled to inform the operator that a mode of operation showing a total number of copies is being displayed jointly on the first and second displays.

4,899,141

MATRIX PANEL WITH AN ACTIVE DRIVING SYSTEM

Shinji Morozumi; Toshiyuki Misawa, and Yoshio Nakazawa, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

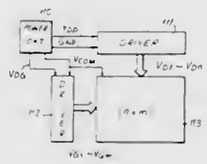
Continuation of Ser. No. 481,049, Mar. 31, 1983, Pat. No. 4,591,848. This application Feb. 20, 1986, Ser. No. 831,202

Claims priority, application Japan, Apr. 1, 1982, 57-54339; Apr. 6, 1982, 57-56945

The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.

Int. Cl.[4] G09G *3/36*

U.S. Cl. 340—784 38 Claims



1. An active driving system for a liquid crystal matrix panel having a plurality of cells each including switching means having a switching terminal for switching the cell on and off during selected and non-selected periods respectively and a picture element, said matrix panel receiving an external video signal adapted to a cathode ray tube display and a frame signal, the active driving system comprising: scaling means for amplifying the external video signal to produce two scaled video signals having bias voltages and amplitudes of opposite polarities, the scaling means being adapted to produce voltages in a range between a high driving voltage and ground and the switching terminal voltage of each of the switching means during non-selected periods is in the voltage range of the scaling means.

4,899,142

RING NETWORK SYSTEM AND CONFIGURATION CONTROL METHOD

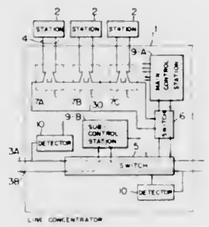
Susumu Nakayashiki, Yokohama; Jiro Kashio, Kawasaki; Takeshi Harakawa; Yoshinori Bekki, both of Hadano, and Mitsuhiro Yamaga, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 4, 1987, Ser. No. 46,031

Claims priority, application Japan, May 2, 1986, 61-100902; Jul. 18, 1986, 61-167919

Int. Cl.[4] H04Q *3/00;* **H04J** *3/14*

U.S. Cl. 340—825.050 22 Claims



1. A ring network system comprising:

a plurality of line concentrator means each having at least one station connected thereto by a pair of branch lines; and

at least one ring transmission path for interconnecting said plurality of line concentrator means in a ring configuration;

wherein each line concentrator means includes

an internal transmission line having a plurality of port means for connecting said pairs of branch lines to said internal transmission line, wherein each port means is connected to a pair of branch lines and wherein said internal transmission line interconnects each of said pairs of branch lines and said ring transmission path in series to each other; and

switch means for disconnecting said internal transmission line from said ring transmission path to form a local ring which includes said pairs of branch lines and said internal transmission line while maintaining said ring transmission path in a conductive state at said each line concentrator means.

4,899,143

HIGH CAPACITY COMMUNICATION SYSTEM OVER COLLISION-TYPE CHANNELS

Bhaskarpillai Gopinath, Berkeley Heights, and Shuo-Yen R. Li, Gillette, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 21, 1988, Ser. No. 184,509

Int. Cl.[4] H04Q *1/20, 1/30*

U.S. Cl. 340—825.5 7 Claims

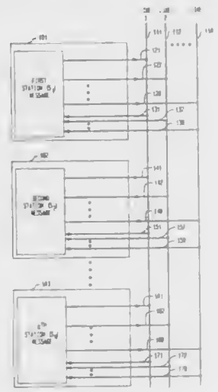
1. A method for transmitting a multiplicity of messages over a plurality of Collision-type lines interconnecting numerous synchronized stations, wherein each message is generated by a corresponding station and is partitioned into a number of bit intervals, and wherein a Collision-type line propagates a composite logic level having: a logic zero level whenever no station transmits a logic one bit; a logic one level whenever only one station transmits a logic one bit; and a logic two level whenever two or more logic one bits are transmitted over the line by the stations, the method for any arbitrary bit interval comprising the steps of

assigning available ones of the lines to corresponding ones of the stations,

broadcasting a logic level by each of the stations over a corresponding one of its assigned lines to produce a composite logic level on each line,

detecting the composite logic level on each line by all the stations

for each line having a composite logic one level and thereby identifying a unique message, assigning only the station generating said unique message with said corresponding one of its assigned lines for the remaining bit intervals, and



identifying those lines not propagating a unique message as available for subsequent assignment during operation of the method following said arbitrary bit interval,

wherein said composite level on each line after the last bit interval determines successfully transmitted messages.

4,899,144

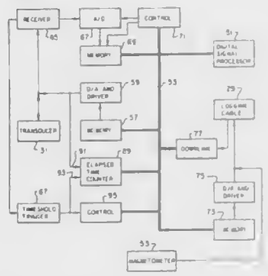
METHOD OF TRANSMITTING ULTRASONIC AMPLITUDE & TIME TRAVEL INFORMATION OVER A LOGGING CABLE

Donald G. Kyle, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1988, Ser. No. 291,522

Int. Cl.[4] G01V *1/00*

U.S. Cl. 340—856 5 Claims



1. A method of transmitting data over a cable connecting an ultrasonic logging apparatus and surface equipment, said data derived from an acoustic return from the ultrasonic logging apparatus operating in a well borehole, said ultrasonic logging apparatus generating an acoustic waveform and receiving the acoustic return from said generated acoustic waveform, said acoustic return having a peak amplitude and a time of travel as measured from said generated acoustic waveform, comprising the steps of:

(a) providing transmitting means in said ultrasonic logging apparatus to transmit electrical signals over said cable;

(b) producing a synchronization signal with said transmitting means, said synchronization signal being synchronized with said generated acoustic waveform, and transmitting said synchronization signal over said cable with said transmitting means;

(c) determining the time of travel and the peak amplitude of said acoustic return;

(d) producing with said transmitting means a time travel signal at a time interval from said synchronization signal corresponding to the time of travel of said acoustic return, and transmitting said time travel signal over said cable with said transmitting means;

(e) producing an amplitude signal with said transmitting means, said amplitude signal having an amplitude corresponding to the peak amplitude of said acoustic return, and transmitting said amplitude signal over said cable with said transmitting means.

4,899,145

ENCODER AND METHOD OF ADJUSTING MAGNETIC FIELDS OF THE SAME

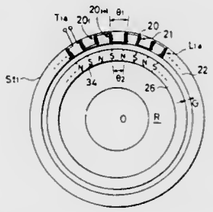
Hironori Okuda, Kobe, and Takashi Matsubara, Nishinomiya, both of Japan, assignors to Shin Meiwa Industry Co., Ltd., Hyogo, Japan

Filed Jun. 26, 1986, Ser. No. 878,659

Claims priority, application Japan, Jul. 3, 1985, 60-148476; Aug. 6, 1985, 60-173926; Mar. 31, 1986, 61-074933

Int. Cl.[4] H03M *1/22*

U.S. Cl. 341—15 24 Claims



1. An encoder having a stator and a movable element facing each other for magnetically detecting relative positional relation between said stator and said movable element, said encoder comprising:

multipole magnetic field generating means provided in one of said movable element and said stator; and

magnetic field detecting means provided in the other of said stator and said movable element and facing said multipole magnetic field generating means,

said magnetic field detecting means having a plurality of magnetic cores formed by a magnetic substance having magnetization characteristics with low hysteresis and arrayed at a pitch corresponding to a magnetic pole pitch in said multipole magnetic field generating means, and magnetic field detecting coils extended across respective ones of said plurality of magnetic cores to be magnetically coupled with said plurality of magnetic cores.

4,899,146

METHOD OF AND APPARATUS FOR CONVERTING DIGITAL DATA BETWEEN DATA FORMATS

J. B. Podolak, Schaumburg, and Ronald B. Saluski, Bolingbrook, both of Ill., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Division of Ser. No. 44,238, Apr. 30, 1987, Pat. No. 4,816,829. This application Dec. 16, 1988, Ser. No. 285,092

Int. Cl.[4] H03M *5/10*

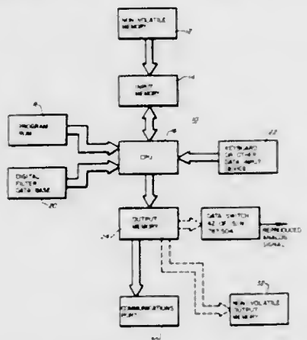
U.S. Cl. 341—51 4 Claims

1. A method of converting digital data encoded in one format into digital data encoded in a different format wherein the

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data of the one format comprises a series of words each having a first plurality of bits defining the amplitude of an analog signal at the beginning of an interval thereof and a second plurality of bits defining the length of the interval and wherein the data of the different format comprises a further series of words representing the amplitude of the analog signal at the beginning of further intervals thereof whereby the further intervals are of equal duration, comprising the steps of:

(a) selecting a word of the one format;



(b) analyzing the second plurality of bits of the selected word to determine the number of further intervals contained in the interval represented by the selected word;

(c) utilizing the first plurality of bits of the selected word to determine the amplitude of the analog signal at the beginning of each further interval;

(d) encoding a number of words of the different format, each word representing an amplitude determined in step (c);

(e) selecting a further word of the one format; and

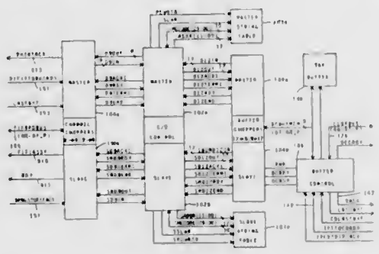
(f) repeating steps (b)–(e) to derive the data of the different format.

4,899,147

DATA COMPRESSION/DECOMPRESSION APPARATUS WITH THROTTLE, START-UP AND BACKWARD READ CONTROLS

Anthony P. Schiavo, Lafayette Hill; Paul H. Selby, III, Norristown, and Harold L. Gibson, Lansdale, all of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jun. 3, 1988, Ser. No. 202,733
Int. Cl.[4] H03M *7/30*
U.S. Cl. 341—60 **13 Claims**



1. A data compression system for compressing incoming data characters, said system comprising:

a string table having a plurality of addressable storage locations each capable of storing a prefix code, a string code and a sub-block count;

a string code counter for producing an output signal upon reaching a predetermined count;

means for incrementing said code counter each time a string code is written into said string table;

a sub-block counter;

means responsive to said output signal for incrementing the count in said sub-block counter;

address hashing means responsive to an incoming data character for successively addressing said string table to read the prefix code and sub-block count from the addressed locations;

comparing means for comparing each sub-block count read from said string table with the count in said sub-block counter and producing a comparison signal when they are equal; and,

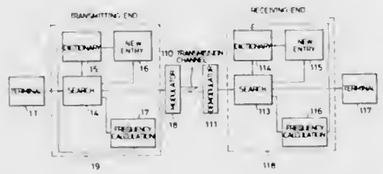
means responsive to said comparing means for writing the sub-block count in said sub-block counter, the string code in said code counter and a prefix code into said string table only if said comparing means does not produce said comparison signal.

4,899,148

DATA COMPRESSION METHOD

Takuro Sato; Yoshihito Shimazaki, and Manabu Kawabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 157,691
Claims priority, application Japan, Feb. 25, 1987, 62-40453; Feb. 25, 1987, 62-4054
Int. Cl.[4] H03M *7/40*
U.S. Cl. 341—65 **4 Claims**



1. A method of compressing text data including character codes, comprising the steps of:

extracting input words from the text data, each input word including a series of word codes composed of one or more character codes;

providing a dictionary containing, as entries, words composed of characters;

storing a word code in association with each of said words contained in said dictionary;

storing occurrence counts of respective words contained in the text data to be compressed;

searching said dictionary to determine whether a selected input word from the text data to be compressed matches any of said words contained in said dictionary;

producing, if said selected input word is determined to match any of said words contained in said dictionary, the word code assigned to the word contained in said dictionary which said input word has been found to match;

updating, if said selected input word is determined to match any of said words contained in said dictionary, the respective one of said occurrence counts of said word contained in said dictionary which said input word has been found to match; and

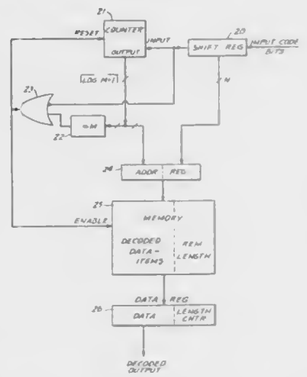
entering, if said input word is not determined to match any of said words in said dictionary, said input word as a new word in said dictionary.

4,899,149

METHOD OF AND APPARATUS FOR DECODING HUFFMAN OR VARIABLE-LENGTH COEES

Gary Kahan, 444 Neptune Ave., Brooklyn, N.Y. 11224

Filed Feb. 28, 1986, Ser. No. 834,636
Int. Cl.[4] H03M *7/42*
U.S. Cl. 341—67 **13 Claims**



1. A method for decoding input variable-length code-words wherein each code-word is divided into two parts, a prefix part consisting of the first 0 bit together with all the preceding 1 bits and a remainder part consisting of all the bits following the first 0 bit, whereby fixed-length binary data-symbols corresponding to said input code-words are stored in sections of a decoding table that correspond to the different code-word prefixes, said decoding method comprising the following two steps:

first, determining the position of the first 0 bit in each input code-word and thus the code-word prefix, where said prefix specifies a section in the decoding table; and

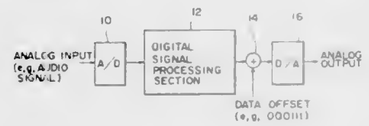
second, using the input bits following the first 0 bit which include the code-word remainder to specify an address in said decoding table section and thus retrieve the data-symbol corresponding to a given input code-word.

4,899,150

DIGITAL SIGNAL PROCESSING CIRCUIT

Masayuki Iwamatsu, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 22, 1988, Ser. No. 171,687
Claims priority, application Japan, Mar. 26, 1987, 62-72600
Int. Cl.[4] H03M *1/08*
U.S. Cl. 341—118 **2 Claims**



1. A digital signal processing circuit comprising:

digital signal processing means for receiving input digital signal data and subjecting the input digital signal data to digital signal processing in which frequency characteristics of the digital signal data are changed;

data offset means receiving output of said digital signal processing means for providing data offset to the input digital signal data; and

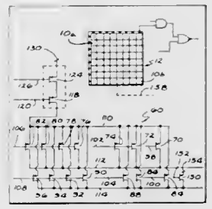
digital-to-analog conversion means receiving an output of said data offset means for converting the input digital signal; data to analog voltage signal data and delivering this analog voltage signal data, said digital-to-analog conversion means including plural weighted current sources corresponding to the number of bits of the conversion means which are turned on and off by respective bit signals and a current-to-voltage converter for converting the summed current from the current sources to said analog voltage signal data, wherein the current value provided by the current source corresponding to the most significant bit of the conversion means is set at a value different from its proper weighted value in comparison with the other current sources so as to improve linearity of conversion.

4,899,151

APPARATUS FOR CONVERTING DIGITAL VALUES TO ANALOG VALUES

Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Oct. 6, 1986, Ser. No. 915,784
Int. Cl.[4] H03M *1/68*
U.S. Cl. 341—145 **14 Claims**



1. In combination for converting a digital value into an analog value,

means for providing a plurality of first input signals each coding for an individual binary bit of relatively high binary significance and each having logic levels respectively coding for binary "1" and binary "0",

a plurality of output members disposed electrically in a matrix relationship in a pair of co-ordinate directions,

means responsive to the first input signals for energizing particular ones of the output members in the plurality, each with a particular magnitude, to indicate in analog form the binary value coded by the logic levels of the first input signals,

there being an additional output member in the matrix relationship, such additional member being other than the output members in the plurality,

means for providing a plurality of second input signals each coding for a binary bit of individual binary significance and of lower binary significance than the binary bits represented by the first input signals and each having logic levels respectively coding for a binary "1" and a binary "0",

the first and second input signals cumulatively coding for the digital value,

means for decoding the second input signals to produce an analog signal having an amplitude dependent upon such decoding and for energizing the additional output member with a magnitude, less than the particular magnitude, dependent upon the amplitude of such analog signal, and

means for providing an output indication cumulatively representing the sum of the magnitudes of energizing the particular output members and the additional output member.

4,899,152

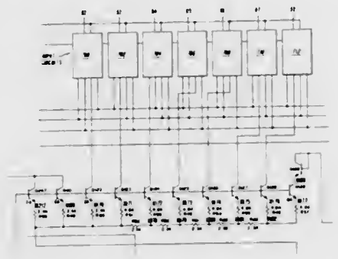
METHOD AND APPARATUS FOR TEMPERATURE COMPENSATING A DIGITAL TO ANALOG CONVERTER

Jeffrey G. Barrow, Oak Ridge, N.C., and Adrian P. Brokaw, Burlington, Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Division of Ser. No. 945,654, Dec. 23, 1986, Pat. No. 4,742,331. This application May 2, 1988, Ser. No. 189,316

Int. Cl.[4] H03M 1/78

U.S. Cl. 341—154 **27 Claims**



1. A method of operating a digital-to-analog converter having a plurality of parallel-connected transistors with emitters connected to an R-2R resistor network to cause the transistors to operate as binary-weighted current sources, said transistors being arranged in order from a most significant bit transistor to a least significant bit transistor, to compensate for errors introduced by varying emitter currents, said method comprising the steps of:

A. drawing a current through the digital-to-analog converter which is proportional to absolute temperature, and

B. applying to said R-2R resistor network at the least significant bit end a compensating current generated by placing across a resistor of value 2R a compensating voltage generated by means including a transistor having an emitter area which is larger than the emitter area of the least significant bit transistor so that said compensating voltage has a magnitude of 2(kT/q) ln 2 volts greater than the base-emitter voltage of the least significant bit transistor.

4,899,153

FAST HIGH-RESOLUTION ANALOG-TO-DIGITAL CONVERTER

Lanny L. Lewyn, Laguna Beach, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Apr. 3, 1986, Ser. No. 846,545

Int. Cl.[4] H03M 1/14

U.S. Cl. 341—156 **54 Claims**

1. In combination for converting between analog values and binary coded values,

means for providing a signal having an amplitude representing the analog value,

a plurality of switches each having first and second states of operation,

means for connecting the switches in sub-sets each having an individual binary significance, the switches in the sub-sets being connected in a repetitive array,
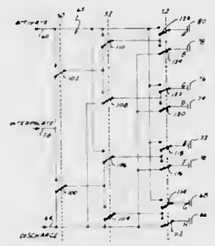
a plurality of output members each constructed to store energy,

energizing means for the output members,

means for connecting the output members to the switches in the repetitive array and to the energizing means to obtain a storage of energy in the output members in accordance with the operation of the switches in the repetitive array in the first and second states,

means responsive to the analog signal for storing energy representative of the amplitude of such signal,

comparator means responsive to the energy stored in the output members and in the analog storage means for comparing the magnitudes of the energy stored in such means and for producing a signal having an amplitude representing any difference in any such comparison,



means responsive to the signals from the comparator means for storing in binary coded form signals having logic levels cumulatively representing the amplitude of the signal from the comparator means, and

means responsive to the signals from the last mentioned storage means for activating the switches in the different sub-sets in accordance with the logic levels of such signals to provide a binary indication in such switches of the amplitude of the signal from the comparator means.

4,899,154

FLASH COMPARATOR

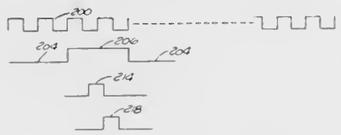
Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Jul. 26, 1988, Ser. No. 224,871

Claims priority, application Switzerland, Aug. 13, 1987, 3120/87

Int. Cl.[4] H03M 1/36

U.S. Cl. 341—159 **24 Claims**



1. In combination in a flash comparator,

means for providing an input voltage,

means for providing a reference voltage,

first means operative at first particular times for producing a first current in accordance with the magnitude of the input voltage,

second means for producing a second current in accordance with the magnitude of the reference voltage,

first terminal means responsive to the first current for producing a first voltage in accordance with the magnitude of the first current,

second terminal means responsive to the second current for producing a second voltage in accordance with the magnitude of the second current,

the first means being responsive to the reference voltage at second particular times different from the first particular times to produce a third current in accordance with the magnitude of the reference voltage,

means responsive to any difference between the magnitudes of the second and third currents during the second particular times to provide voltages compensating for any such difference, and

means responsive to the compensating voltages for introducing such compensating voltages to the first and second terminal means in the first particular times to provide a compensation in the first time periods of any differences between the magnitudes of the second and third currents in the second time periods.

4,899,155

APPARATUS AND METHOD FOR ANALOGUE TO DIGITAL CONVERSION

Thomas Jackson, Hanwell, England, assignor to Plessey Overseas Limited, Ilford, England

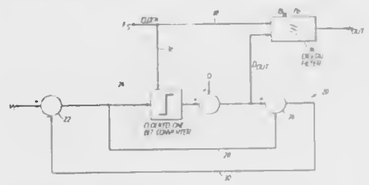
PCT No. PCT/GB86/00029, § 371 Date Nov. 14, 1986, § 102(e) Date Nov. 14, 1986, PCT Pub. No. WO86/04470, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 16, 1986, Ser. No. 914,842

Claims priority, application United Kingdom, Jan. 16, 1985, 8501034

Int. Cl.[4] H03M 1/12

U.S. Cl. 341--200 **6 Claims**



1. An interpolating analogue to digital converter, comprising:

a first analogue signal combiner having first and second inputs, and an output, and being arranged to receive at said first input a continuously variable analogue input signal having a predetermined bandwidth and being arranged to receive at said second input a quantization error signal in analogue form and to provide at said output a combined version of the signals at said first and second inputs;

a one step digital quantizer means directly coupled to said output of the first signal combiner for producing a binary valued quantized signal, and clock means connected to the quantizer means having a clock rate substantially greater than the predetermined bandwidth of the input signal;

a second signal combiner having a first input, a second input and output, the first input being coupled to receive said quantized signal and a second input being directly coupled to said output of the first signal combiner to receive a feed forward signal therefrom whereby to provide at said output of the second signal combiner said quantization error signal; and,

feedback means for directly coupling the quantization error signal to the second input of the first combiner;

the arrangement being such that said quantizer means provides a serial output of pulses representing a digitized value of the input signal.

4,899,156

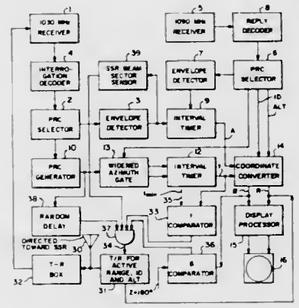
VIRTUAL ATCRBS USING SIGNALS OF REMOTE SSR

George B. Litchford, Northport, and Burton L. Hulland, Glenwood Landing, both of N.Y., assignors to Litchstreet Company, Northport, N.Y.

Continuation of Ser. No. 65,779, Jun. 24, 1987, abandoned. This application Jul. 13, 1989, Ser. No. 379,651

Int. Cl.[4] G01S 13/74

U.S. Cl. 342—37 **16 Claims**



1. In a system for indicating the position of a transponder with respect to a reference position at a known location within the service area of a secondary surveillance radar (SSR) by receiving at said location interrogations from said SSR and replies from the transponder and determining the position of the transponder from the time relationships between said received interrogations and replies, the improvement comprising, at said reference position:

(a) an antenna;

(b) active range measuring transmitter-receiver means coupled to said antenna;

(c) means for providing a control output in response to the presence of the transponder in an area on or close to a line between the reference position and the SSR which is geometrically unfavorable to passive determination of its range; and

(d) means responsive to said control output to actuate said active range measuring means briefly and intermittently.

4,899,157

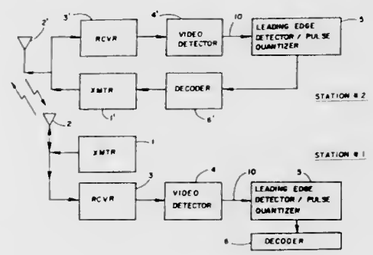
LEADING EDGE DETECTOR/REPLY QUANTIZER

Norman R. Sanford, Cockeysville; Bernard J. Lyons, and Robert C. Ylenger, both of Baltimore, all of Md., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 3, 1989, Ser. No. 332,135

Int. Cl.[4] G01S 13/74

U.S. Cl. 342—40 **20 Claims**



1. In a pulse code communications system having a receiver, a video detector producing a composite video signal which

may be formed by interfering pulse signals received by said receiver and a leading edge detector/pulse quantizer for processing said composite video signal to separate interfering pulses therein, said leading edge detector including:

a source of clock signals;

means responsive to the amplitude and rate of change of amplitude of said composite video signal to provide:

(a) a positive slope (PS) signal which persists during the time said rate of change of amplitude increases at a predetermined rate;

(b) a negative slope (NS) signal which persists during the time said rate of change of amplitude decreases at a predetermined rate; and

(c) a quantized video (QV) signal which persists during the time said amplitude exceeds a predetermined level;

a first shift register for propagating said PS signals according to their relative times of appearance;

a second shift register for propagating said NS signals according to their relative times of appearance;

a third shift register for propagating said QV signals according to their relative times of appearance;

each of said first, second and third registers propagating the signals contained therein at a rate determined by said clock signals;

first logic means for examining the contents of said first and third registers to determine the truth of a condition in which:

said third register contains a signal which has persisted for two or more clock signals after the appearance of a first signal in said first register; and for inserting a signal in said first register at a position two clock signals after said first signal therein if said condition is true;

second logic means for examining the contents of said first and second registers to determine the truth of a condition in which:

a signal is present in said second register at a position of between 11 and 18 clock signals after a first signal appears in said first register and no second signal is present in said first register in said 11–18 clock signal interval; and for inserting a second signal in said first register at a position corresponding to a time of 7 clock signals before the time of appearance of said signal in said second register; and

means for unloading the contents of said first register in serial-by-bit format after operation of said first and second logic means:

the improvement wherein said first logic means further includes:

means for determining the truth of a second condition in which:

a first and second signal are present in said first register separated by one clock signal interval and said third register contains a signal at the time said first signal of said first register ends; and

means for deleting said second signal from said first register if said second condition is not true.

4,899,158

MOVING OBJECT DISCRIMINATING SYSTEM

Takashi Saeki; Takayuki Nii; Hirotake Fukui; Toshiro Mishina; Haruo Nakano, and Hitoshi Sakakibara, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

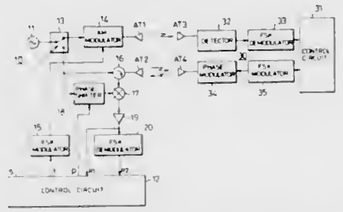
Filed Sep. 13, 1988, Ser. No. 243,833

Claims priority, application Japan, Sep. 26, 1987, 62-242086; Sep. 26, 1987, 62-242088; Jan. 14, 1988, 63-5928; Jan. 14, 1988, 63-5929; Apr. 25, 1988, 63-101789

Int. Cl.[4] G01S *13/78*

U.S. Cl. 342—44 **6 Claims**

1. A moving object discriminating system comprising an interrogator which transmits a transmission signal, and a responder which is mounted to a moving object and stores data for said moving object, said responder including a control means for processing said transmission signal received from said interrogator and for answering said interrogator, wherein said responder further including a phase modulator which modulates the phase of an answer signal supplied from said responder to said interrogator with said data stored in the responder, and said interrogator further including means for processing said answer signal to discriminate therefrom said moving object, an oscillator which oscillates a non-modulated signal of a fixed frequency toward said responder, and a comparator for comparing the phase of said oscillated signal with that of said answer signal from said responder and a phase shifter disposed between said oscillator and said phase comparator for providing a phase shift to an output of said oscillator so as to provide the phase comparator with a reference signal to permit the phase comparator to generate a sufficient demodulating output for processing said answer signal.



4,899,159

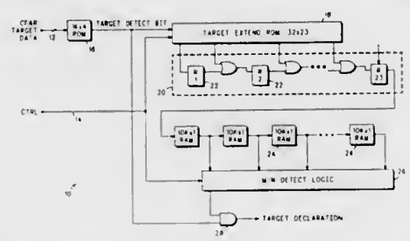
METHOD AND DEVICE FOR A M-OUT-OF-N DETECTION SCHEME

Jeffrey D. Marchant, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 1, 1988, Ser. No. 226,910

Int. Cl.[4] G01S *7/30, 13/04*

U.S. Cl. 342—90 **5 Claims**



3. A M-out-of-N detections method comprising the steps of:

providing target detections for each of a plurality of integration periods;

extending said target detections in both range directions;

storing extended target detections for each integration period;

analyzing each of said extended targets in said integration periods using a M-out-of-N determination; and

outputting a target declaration if said M-out-of-N determination has been met.

4,899,160

GUIDANCE EQUIPMENT FOR MICROWAVE LANDING SYSTEM

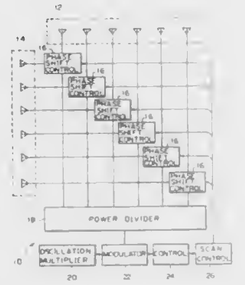
Yoshihiko Kuwahara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 20, 1988, Ser. No. 246,683

Claims priority, application Japan, Sep. 21, 1987, 62-236487

Int. Cl.[4] G01S *1/16, 1/18*

U.S. Cl. 342—408 **2 Claims**



1. Guidance equipment for a microwave landing system, comprising:

an azimuth radiating element array producing a first scanning beam for azimuth guidance, said azimuth radiating element array including a plurality of azimuth radiating elements;

an elevation radiating element array producing a second scanning beam for elevation guidance, said elevation radiating element array including a plurality of elevation radiating elements;

oscillation multiplier means for generating a radio frequency signal;

a control circuit outputting a preamble signal and transmission timing signals which are individually assigned to said first scanning beam and said second scanning beam;

modulator means for modulating said radio frequency signal with said preamble signal and for transmitting a modulated radio frequency signal together with said radio frequency signal responsive to said transmission timing signals;

a plurality of phase shift control means for distributing a plurality of signal power signals which are fed to said plurality of phase shift control means, each of said phase shift control means individually responding to a control signal for controlling a level of signal power and a drive phase applied to one azimuth radiating element of said azimuth radiating element array during a first time period and to one elevation radiating element of said elevation radiating element array during a first time period;

power divider means for distributing signal power outputted by said modulator means to said plurality of phase shift control means; and

scanning control means for delivering said control signal to each of said plurality of phase shift control means in response to said transmission timing signals and for controlling said plurality of phase shift control means such that at a transmission timing of said preamble signal a radiation pattern characteristic of said elevation radiating element array is changed.

4,899,161

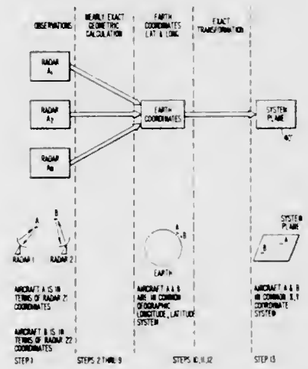
HIGH ACCURACY COORDINATE CONVERSION METHOD FOR AIR TRAFFIC CONTROL APPLICATIONS

Wilfred W. Morin, Jr., Sea Isle City, N.J., and Barry Wasser, Potomac, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 21, 1988, Ser. No. 222,588

Int. Cl.[4] G01S *3/02, 13/00;* **G01C** *15/20;* **G06K** *15/00*

U.S. Cl. 342—451 **4 Claims**



1. In an air traffic control system, including a plurality of radar stations, located on the surface of the Earth, operatively connected to a data processing system, a computer method for displaying the location of aircraft detected by said radar stations, comprising the steps of:

receiving the slant range, azimuth and altitude measurements of an aircraft at a first one of said radar stations;

computing the geodetic latitude and longitude of said aircraft in an ellipsoidal reference system;

computing the conformal latitude and longitude of the aircraft in a conformal spherical reference system;

projecting the conformal latitude and the longitude of said aircraft from said conformal spherical reference system to a system plane by means of a stereographic projection;

whereby aircraft positions are depicted accurately and all angles are preserved.

4,899,162

OMNIDIRECTIONAL CYLINDRICAL ANTENNA

Jean-Christophe M. Bayetto, Betton, and Claude J. Vinatier, Rennes, both of France, assignors to L'etat Francais, Represente par le Ministre des PTT (CNET) and Etablissement Public de Diffusion dit Telediffusion de France, both of, France

Continuation of Ser. No. 869,412, Jun. 2, 1986, abandoned. This application Jul. 13, 1988, Ser. No. 220,993

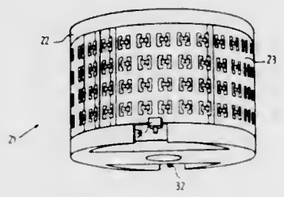
Claims priority, application France, Jun. 10, 1985, 85 08840

Int. Cl.[4] H01Q *21/20*

U.S. Cl. 343—700 MS **7 Claims**

1. An antenna array with a circular symmetry, said antenna comprising a cylindrical surface having a circumference; an array of elementary radiating sources in three layer printed circuits, each elementary radiating source being applied on said cylindrical surface; a plurality of said elementary radiating sources being arranged in successive circular rows which are longitudinally distributed across said cylindrical surface; said elementary radiating source centers in each circular row being angularly separated by a constant angular step, the sizes, angular width and longitudinal length of each elementary radiating source being substantially smaller than the circumference of the cylindrical surface; each elementary radiating source hav-

ing, when still planar and before being applied onto said cylindrical surface, a linearly polarized directive diagram; adjacent elementary radiating source centers being separated by a distance in the order of 0.9 λo, where λo is the free space wave-



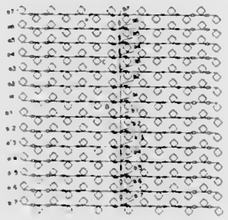
length of a carrier frequency transmitted by the antenna, all said elementary radiating sources being fed in phase by signals having the same amplitude through a three conductor layer feed triplate line.

4,899,163

MICROWAVE PLATE ANTENNA IN PARTICULAR FOR DOPPLER RADAR

Jean-Pierre L. M. Daniel, Rennes; Phillipe Dupuis, Perros Guirec, and Jean-Luc Alanic, Treguier, all of France, assignors to Le Centre Regional D'Innovation et de Transfert de Technologie de Bretagne Loi Le Centre National de la Recherche Scientifique, Etablissement Public National a Caractere Scientifique et Technologiqu, France

Filed Aug. 9, 1988, Ser. No. 230,466
Claims priority, application France, Sep. 9, 1987, 87 12579
Int. Cl.⁴ H01Q *1/38*
U.S. Cl. 343—700 MS **13 Claims**



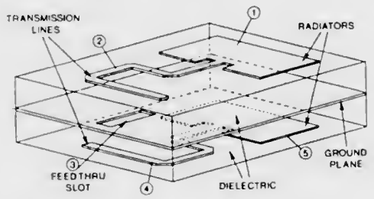
1. A microwave antenna having a Janus configuration for use in a doppler radar system, said antenna comprising a printed circuit board having thereon a plurality of substantially identical parallel and symmetrical elongated linear sub-networks, the pitch between said sub-networks being equal to a wave length of said signal, each of said sub-networks having an even number of radiating elements disposed at regular intervals along said sub-networks, each of said sub-networks having a center of symmetry aligned along a line perpendicular to said elongation of said linear sub-networks, said parallel networks being separated from each other by a uniform pitch, means for feeding each of said sub-networks an in-phase signal corresponding to the operational frequency of said antenna, said sub-networks radiating fields being dephased by 180° from one radiating element to the following radiating element.

4,899,164

SLOT COUPLED MICROSTRIP CONSTRAINED LENS

Daniel T. McGrath, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 16, 1988, Ser. No. 245,843
Int. Cl.⁴ H01Q *19/06*
U.S. Cl. 343—754 **6 Claims**



1. A slot coupled microwave beamforming lens system comprising:
a planar lens which has an aperture side and a feed side;
a plurality of apertures side antenna elements which are housed upon said aperture side of said planar lens, said aperture side antenna elements being regularly distributed over said aperture side;
a plurality of feed side antenna elements which are housed upon said feed side of said planar lens with a distribution that varies as a function of radius to provide a first degree of freedom to said microwave array beamforming lens system;
a plurality of aperture side transmission lines with lengths that vary as a function of radius of said planar lens to help provide a second degree of freedom in said planar microwave array beamforming lens, each of said plurality of aperture side transmission lines being electrically connected to one of said aperture side antenna elements;
a plurality of feed side transmission lines with lengths that vary as a function of radius of said planar lens to help provide said second degree of freedom, each of said plurality of feed side transmission lines being electrically connected to one of said feed side antenna elements; and
a metal ground plane which is fixed in parallel between said aperture side and feed side antenna elements and said aperture side and feed side transmission lines, said metal ground plane having a plurality of feed-through slots, each of which electrically connect one said aperture transmission lines with one of said feed side transmission lines by having each of said plurality of feed-through shots being positioned directly between one of said plurality of aperture side and feed side transmission lines so that they extend just past said feed-through slot's center, so that each of said feed-through slots can conduct microwave energy therebetween.

4,899,165

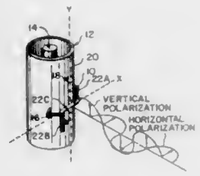
VARIABLE CIRCULAR POLARIZATION ANTENNA HAVING PARASITIC Z-SHAPED DIPOLE

John L. Schadler, Lindelwold, N.J., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 20, 1988, Ser. No. 261,049
Int. Cl.⁴ H01Q *13/12, 11/14*
U.S. Cl. 343—767 **7 Claims**

1. A circularly polarized antenna system comprising:
a conductive cylindrical mast having a slot extending axially at the outer periphery of the mast;
means for feeding said slot for exciting horizontally polarized waves;
a parasitic Z-shaped dipole spaced radially outwardly from said slot, and in the same horizontal plane as the horizontally polarized waves from said slot, for exciting vertically

polarized waves in phase quadrature with said horizontally polarized waves;
said Z-shaped dipole having a center portion which couples across said slot, thereby parasitically coupling said slot to said dipole; and



means for affixing said parasitic Z-shaped dipole to said mast at circumferentially spaced points thereon remote from said slot.

4,899,166

SELF PROTECTED AND TRANSPORTABLE FLAT LATTICE ANTENNA

Alain Menestreau, Saintry S/Seine; Maurice Marchand, Sevran; Alain Corau, Cachan, and Richard Le Brun, Malakoff, all of France, assignors to IMT Radio Professionnelle, Boulogne Billancourt, France

Filed Apr. 5, 1988, Ser. No. 177,977
Claims priority, application France, Apr. 10, 1987, 87 05106
Int. Cl.⁴ H01Q *1/42*
U.S. Cl. 343—873 **9 Claims**



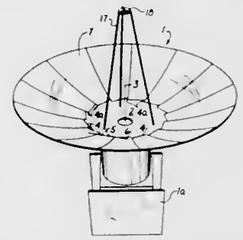
1. A flat, self protected and transportable lattice antenna comprising
a flat three-plate line radiating structure,
a foam sheet, having a different thermal expansion coefficient than said flat three-plate line radiating structure, bonded to each face of the radiating structure by an adhesive which allows the radiating structure to slide with respect to the foam, and
a thin rigid plate bonded to each said foam sheet.

4,899,167

COLLAPSIBLE ANTENNA

Manfred Westphal, Bermatingen, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 67,728
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621578
Int. Cl.⁴ H01Q *15/20*
U.S. Cl. 343—915 **3 Claims**



1. A foldable and deployable antenna reflector comprising:
a central panel being a part of the antenna and participating in reflection, the panel having along its circular periphery a circular-sawtooth shaped contour with ramplike edges separated by radial cut backs; and
a plurality of similar, rigid reflector panel segments forming the antenna reflector corresponding in number and width to the number and width of the ramplike sawtooth edges, each segment having a foot edge respectively hinged by means of two, single hinge axis hinges to the ramplike sawtooth edges, the singe axis running at least near parallel to these ramplike sawtooth edges.

4,899,168

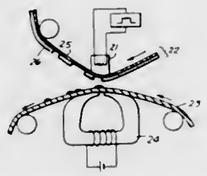
OPTICAL RECORDING MEDIUM

Yoichi Osato, Yokohama; Ichiro Saito, Kawasaki, and Yoshio Takasu, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 946,622, Dec. 29, 1986, abandoned, which is a division of Ser. No. 749,116, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 563,585, Dec. 20, 1983, abandoned. This application Aug. 25, 1988, Ser. No. 236,306
Claims priority, application Japan, Dec. 21, 1982, 57-224384
Int. Cl.⁴ G01D *9/00*
U.S. Cl. 346—1.1 **13 Claims**

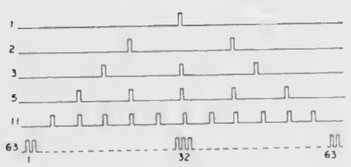
1. A method for preparing a laser beam-readable optical recording medium comprising:
providing a medium including a substrate having thereon a thin film containing a sulfur compound and a substance capable of undergoing a change in reflectivity through the absorption of electromagnetic radiation; and
irradiating said medium with an electromagnetic radiation beam which is sufficient to form on said thin film, pitted sections having higher reflectivity than unpitted sections of said medium surrounding said pitted sections but is insufficient to cause depressions or to create holes in said thin film.

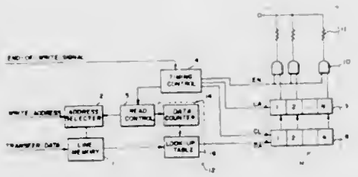
4,899,169
IMPRINTING APPARATUS
Katsumori Takei, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Continuation of Ser. No. 841,925, Mar. 20, 1986, Pat. No. 4,769,649. This application Feb. 22, 1988, Ser. No. 222,450
Claims priority, application Japan, Mar. 22, 1985, 60-57960; Mar. 22, 1985, 60-57961; Mar. 22, 1985, 60-57962
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—742 **9 Claims**



1. A thermoplastic magnetic ink medium comprising a heat-resistance support and a thermoplastic magnetic ink layer containing ferromagnetic fine particles disposed on the support and wherein said ink layer has an uneven surface.

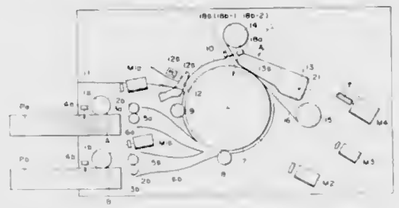
4,899,170
SELECTIVE ENERGIZATION OF THERMAL PRINTERS
Masaki Izumi, Tokyo, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 22, 1988, Ser. No. 288,316
Claims priority, application Japan, Dec. 22, 1987, 62-324261
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **2 Claims**





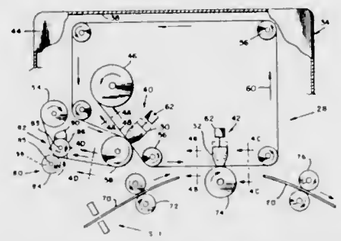
1. A head driving device for a continuous thermal transfer printer, comprising:
a driving circuit for selectively turning on and off a plurality of heating resistors incorporated in a thermal transfer printer head a number of times during a pixel time interval having a midpoint, the number of on times of each heating resistor corresponding to density gradation data associated with each pixel of a line in an image to provide a desired density gradation for such image pixel; and
said driving circuit including means for turning on and off each heating resistor at times uniformly and symmetrically distributed in time about the midpoint of each pixel time interval.

4,899,171
THERMAL PRINTER
Tokihiko Ogura; Yoshiyuki Mizoguchi; Kelichi Ikeda, all of Yokohama, and Tomishige Taguchi, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 2, 1988, Ser. No. 266,070
Claims priority, application Japan, Nov. 5, 1987, 62-278177
Int. Cl.[4] G01D *15/10;* **B41J** *11/50*
U.S. Cl. 346—76 PH **13 Claims**



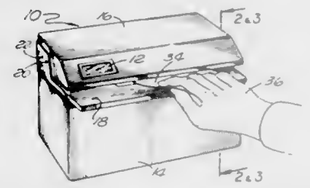
1. A thermal printer for recording an image on a recording medium, comprising:
a first supply means for supplying a first recording medium;
a second supply means for supplying a second recording medium different from said first recording medium;
image processing unit having a memory means for storing inputted black-and-white image information and an inputted color image information;
an inked sheet having a plurality of colors, for recording a color image on said first recording medium;
a recording means for recording images on said first recording medium and on said second recording medium; and
a control means for operation of said first or second supply means and of said inked sheet, in accordance with conditions whether a black-and-white image stored in said memory means is to be recorded or whether a color image stored in said memory means is to be recorded.

4,899,172
METHOD AND APPARATUS FOR PERFORATING INDICIA ON USED THERMAL TRANSFER RIBBON WITHIN A CASSETTE
William Berson, Westport; Julius Gluck, Norwalk; Patrick Murphy, Stamford; Christopher D. Smith, New Milford, and Duc H. Tran, Bridgeport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed Dec. 28, 1987, Ser. No. 138,425
Int. Cl.[4] G01D *15/10;* **B41J** *32/00, 33/02*
U.S. Cl. 346—76 PH **21 Claims**



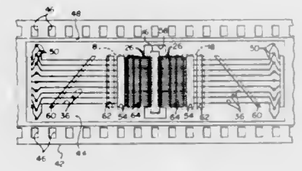
1. In printing apparatus of the type which includes a cassette, a ribbon in the cassette, and means for thermally transferring ink from the ribbon to a workpiece, wherein the ribbon includes a backing layer and an ink donor layer, a printing process comprising the steps of:
(a) transferring ink from the ink donor layer to the backing layer;
(b) perforating the inked backing layer within the cassette; and
(c) sensing step (b).

4,899,173
TIME CLOCK DEVICE
Jack L. Ellisno, North Hollywood, Calif., assignor to Electra Print Time Recorder Company, Hollywood, Calif.
Filed Apr. 20, 1988, Ser. No. 183,925
Int. Cl.[4] G01D *15/10;* **G06K** *7/10;* **B41J** *29/38;* **B41F** *1/00*
U.S. Cl. 346--82 **5 Claims**



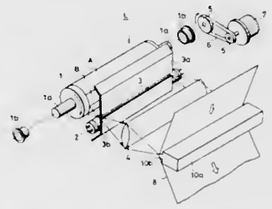
1. A time clock device for use with a time card comprising a clock, a time display, a thermal print head hving a plurality of print segments adapted to print upon thermographic paper, said thermal print head being located in a rotatable lid, said lid having a time card shelf, driver means to simultaneously actuate a selection of said print segments upon insertion of the time card and rotation of the shelf to a closed position.

4,899,174
METHOD OF MAKING LED ARRAY PRINTHEAD WITH TAB BONDED WIRING
David A. Newman, Rochester; William R. Laubengayer, Hoiley, and William B. Scott, Jr., Bergen, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 228,641, Aug. 5, 1988, Pat. No. 4,851,862. This application Jun. 30, 1989, Ser. No. 373,971
Int. Cl.[4] G01D *9/42, 15/06, 9/00*
U.S. Cl. 346--107 R **2 Claims**



1. The method of making a module for an LED printhead having a plurality of LED array modules mounted end-to-end on a support member, each of said LED array modules comprising an LED array chip connected along each edge to one edge of a corresponding one of two control chips, and circuit board means carried by said support means and connected to the other edges of said control chip, said method comprising:
(a) preparing a TAB frame comprising a sheet of insulative plastic material supporting multiple internal conductive wires arranged to electrically connect an LED array chip to said two control chips spaced from said array chips at opposite sides thereof and multiple external conductive wires arranged to connect with opposite edges of said control chips and for subsequent connection with said circuit board means;
(b) providing windows in said TAB frame surrounded by said plastic material to respectively receive said LED array chip and said two control chips at opposite sides of said LED array chip and to expose those portions of said multiple conductive wires overlying the edges of said chips received in said windows and those portions of said wires connected to said control chip which are subsequently connected to said circuit board means;
(c) positioning said chips in respective ones of said openings and bonding the adjacent exposed conductive wire portions to said chips;
(d) electrically testing the testable module so fabricated on said TAB frame by means of said conductive wires; and
(e) cutting said TAB frame to remove excess material and thereby provide an excised assembly module with said LED diode array located transversely across the center region thereof and extending at both sides slightly beyond the corresponding edges of the plastic material comprising the unsupported LED array module.

4,899,175
RECORDING SYSTEM WITH ILLUMINATION MEANS UTILIZING A PLURALITY OF FLUORESCENT SUBSTANCES
Toshiaki Harada; Tadashi Yamamoto, both of Kawasaki, and Masanori Takenonchi, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 41,043, Apr. 21, 1987, abandoned. This application Nov. 5, 1987, Ser. No. 116,789
Claims priority, application Japan, Apr. 24, 1986, 61-93368; Sep. 11, 1986, 61-212802; Sep. 11, 1986, 61-212803; Sep. 24, 1986, 61-223726; Nov. 27, 1986, 61-280738
Int. Cl.[4] G01D *15/14;* **H04N** *1/23, 1/46*
U.S. Cl. 346—108 **12 Claims**



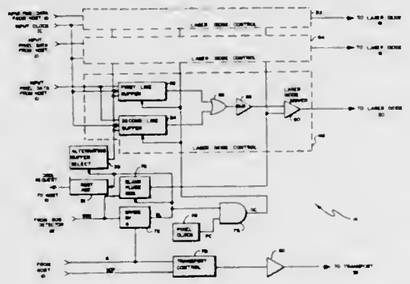
1. A recording system adapted for recording an image on a subject comprising:
a recording section having illumination means for imparting light energy to an image forming member; and
a transfer section for transferring onto a recording medium the image which is formed on said image forming member,
said illumination means including:
a plurality of fluorescent substances each having a different spectral characteristic, with said fluorescent substances being disposed in different planes;
drive means capable of repeatedly positioning said plurality of fluorescent substances at a predetermined position; and
a light source for illuminating said predetermined position to cause said fluorescent substances located at said predetermined positioned to emit light.

4,899,176
METHOD OF REDUCING AVERAGE DATA RATE IN ROTATING MIRROR LASER RECORDER
John M. McQuade, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 25, 1988, Ser. No. 236,463
Int. Cl.[4] G01D *9/42;* **G02B** *26/08;* **H04N** *1/23*
U.S. Cl. 346—108 **9 Claims**

1. Apparatus for recording an image on a medium as a function of digital pixel data, the apparatus comprising:

first and second buffer means for receiving and accumulating pixel data at a first rate and for supplying the pixel data to the means for modulating at a second higher rate; and

select means for alternately selecting one of the first and second buffer means to receive and accumulate pixel data for one scan line and the other of the first and second



buffer means to supply pixel data for another scan line to the means for modulating;

means for scanning a radiation beam across the medium in a first direction using non-successive facets of a multifaceted rotating mirror; and

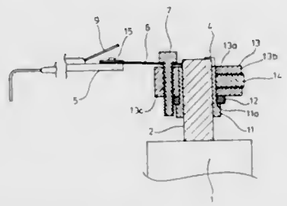
means for modulating the beam as a function of the pixel data accumulated to record the scan line on the medium.

4,899,177

STRUCTURE FOR INSTALLING A RECORDING PEN

Tsuguharu Hosoya, Ichikawa, Japan, assignor to 501 Nihon Kohden Corporation, Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 305,389
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—139 R **2 Claims**



1. A structure for installing a recording pen, in which a proximal end of a recording pen for recording a measured waveform on a sheet of recording paper is secured to a drive shaft of a driving source for oscillating said recording pen, said structure comprising:

a cylindrical spacer fitted about and secured to said drive shaft and having a step portion formed at one end of said cylindrical spacer, said cylindrical spacer having an axial direction and an outer peripheral portion;

packing formed of a resilient material having an upper surface and an outer side portion and being fitted about said outer peripheral portion of said cylindrical spacer, and abutting against said step portion in said cylindrical spacer;

a pen-holder fitted about said outer peripheral portion of said cylindrical spacer and abutting against said upper surface of said packing;

an installation screw being screwed in said pen-holder perpendicularly to said axial direction of said cylindrical spacer, and being adapted to secure said pen-holder to said cylindrical spacer; and

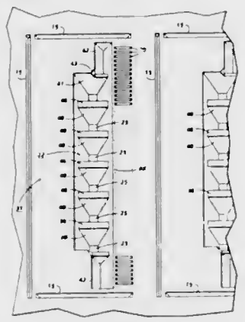
an adjustment screw having a distal end, said adjustment screw being screwed into said pen-holder to which said proximal end of said recording pen is secured, and passing through said pen-holder in a direction parallel to said axial direction of said cylindrical spacer, said distal end of said adjustment screw pressing against said outer side portion of said packing so as to provide frictional interengagement between said distal end of said adjustment screw and said outer side portion of said packing.

4,899,178

THERMAL INK JET PRINTHEAD WITH INTERNALLY FED INK RESERVOIR

Thomas A. Tellier, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 2, 1989, Ser. No. 305,041
Int. Cl.[4] G01D *15/16;* **B41J** *3/04*
U.S. Cl. 346—140 R **5 Claims**



1. An improved thermal ink jet printhead of the type formed by the mating and bonding of first and second substrates, the first substrate being silicon and having anisotropically etched in one surface thereof a through recess and a plurality of parallel, elongated grooves, the second substrate having a plurality of heating elements and addressing electrodes patterned on one surface thereof, the through recess serving as an ink reservoir with its open bottom serving as an ink inlet and the elongated grooves serving as ink channels, one end of which is open to serve as ink droplet emitting nozzles, each heating element being located in a respective one of the ink channel grooves a predetermined distance upstream from the nozzles, and said printhead having means to place the ink channel grooves into communication with the through recess, so that selective application of electrical pulses representing digitized data to the heating elements eject and propel ink droplets from the nozzles to a recording medium, wherein the improvement comprises:

said ink reservoir being produced by patterning vias in an etch resistant mask on a surface of the first substrate and anisotropically etching for a predetermined time period the first substrate to provide a linear series of individual through recesses and at least one outer shallow, V-groove recess on each of the outer ends of the series of through recesses, so that the ink reservoir is segmented; and

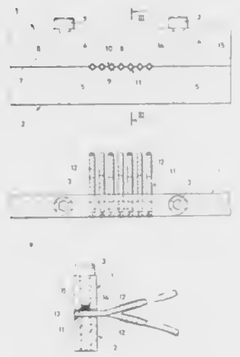
means for placing the through recesses and V-groove recesses into communication with each other, so that the V-groove recesses are internally fed from the through recesses of the segmented reservoir.

4,899,179

NOZZLE SUPPORT HEAD FOR INK-JET MARKING DEVICES

Augusto Marchetti, Piazza Sicilia, 7, 20146 Milano, Italy

Filed Feb. 21, 1989, Ser. No. 312,944
Claims priority, application Italy, Feb. 29, 1988, 19579 A/88
Int. Cl.[4] G01D *15/18;* **B05B** *15/06*
U.S. Cl. 346—140 R **5 Claims**



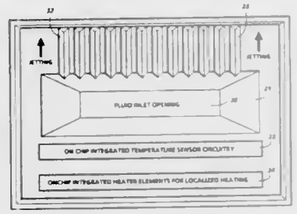
1. Nozzle support head for ink-jet marking devices, characterized in that it is accomplished in two superimposed pieces which can be fastened and released, mating along respective faces provided with respective successions of notches which together with the corresponding notches in the mating face of the other piece define a succession of holes to house respective ink atomizers.

4,899,180

ON CHIP HEATER ELEMENT AND TEMPERATURE SENSOR

Abdul M. Elhatem, Hawthorne, and Steven A. Bubler, Redondo Beach, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1988, Ser. No. 187,779
Int. Cl.[4] G01D *18/00;* **B41J** *3/04*
U.S. Cl. 346—140 R **2 Claims**



1. A thermal ink jet array device formed on a silicon substrate comprising:

an array of ink jet channels,

an ink inlet,

connecting means for allowing ink to flow from said inlet to said ink jet channels,

a sensor means for sensing the temperature of said device and for outputting a signal which is a function of the device temperature, said sensor means comprising a temperature sensing element, and a differential amplifier for outputting said signal which is a function of the temperature sensed by said sensing element, and

means for heating coupled to said signal for heating said device,

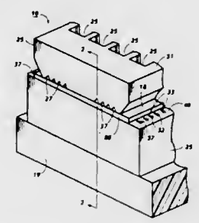
said channels, inlet and connecting means being cavities etched into said silicon substrate, and said sensor means and means for heating being integrated on said silicon substrate.

4,899,181

LARGE MONOLITHIC THERMAL INK JET PRINTHEAD

William G. Hawkins, Webster, and Donald J. Drake, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1989, Ser. No. 303,620
Int. Cl.[4] G01D *15/16;* **B41J** *3/04*
U.S. Cl. 346—140 R **4 Claims**



1. An improved thermal ink jet printhead of the type formed by the mating and bonding of first and second substrates, the first substrate being silicon with {100} crystal plane surfaces and having anisotropically etched in one surface thereof a reservoir and a plurality of parallel, elongated ink channels grooves, the second substrate having a plurality of heating elements and addressing electrodes patterned on one surface thereof, and the elongated ink channel grooves having one end adjacent the ink reservoir and opposite end open to serve as ink droplet emitting nozzles, each heating element being located in a respective one of the ink channel grooves a predetermined distance upstream from the nozzles, and said printhead having means to place the ink channel grooves into communication with an ink supply, so that selective application of electrical pulses representing digitized data to the heating elements eject and propel ink droplets from the nozzles to a recording medium, wherein the improvement comprises:

said ink reservoir being segmented by dividing walls to provide a segmented reservoir in which each segment of the reservoir is isolated from each other, the segmented reservoir being produced by patterning an etch resistant mask and anisotropically etching a linear series of separate through recesses, adjacent through recesses being separated by dividing walls in which opposing wall surfaces are in separate segments, the dividing walls strengthening the printhead when the number of nozzles and thus the length of the reservoir are increased and reducing the effects of angular misalignment between mask and first substrate crystal planes.

4,899,182

ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS

Motoichiro Inoue, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,910

Claims priority, application Japan, Sep. 18, 1987, 62-142884[U]; Sep. 18, 1987, 62-142887[U]; Sep. 18, 1987, 62-142886[U]; Sep. 18, 1987, 62-142885[U]; Jun. 15, 1988, 63-147578

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—153.1 **15 Claims**



1. An electrophotographic image forming apparatus comprising;

scanning means for optically scanning an image on a document;

sheet feed means for feeding a sheet to be printed;

image forming means for forming an image data to be printed from a scanned image;

printing means for printing the image data on the sheet fed by the sheet feed means;

sheet ejecting means for ejecting a printed sheet to an ejection tray;

controller means for controlling the scanning means, sheet feed means, image-forming means, printing means and sheet ejecting means so as to carry out a sequence of a printing operation;

a housing for accommodating the scanning means, sheet feed means, image forming means, printing means, and the sheet ejecting means; and

a controller cartridge detachably accommodated in a space formed into the housing for accommodating the controller means.

4,899,183

IMAGE FORMING APPARATUS

Hirohisa Kitano; Itaru Saito; Ken Matsubara; Kouichi Shingaki, and Tomohiko Masuda, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 7, 1989, Ser. No. 307,738

Claims priority, application Japan, Feb. 8, 1988, 63-26754

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—154 **7 Claims**

1. An image forming apparatus comprising:

an optical shutter array having a plurality of optical shutters constructed of material possessing electro-optical effects;

polarizing member provided on the entering light side of the optical shutter array;

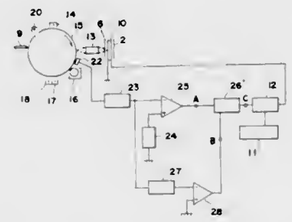
analyzing member provided on the exiting light side of the optical shutter array;

actuation voltage impression means for applying an actuation voltage to the optical shutter array based on image signals;

a photosensitive member on which an electrostatic latent image is formed by exposure to light transmitted through the optical shutter array;

detecting means for detecting a decayed surface potential of the photosensitive member induced by light exposure;

compensating means, when the detected value by the detecting means is greater than a predetermined reference value, for changing the actuation voltage applied to the optical



shutters until said detected value is less than the reference value; and

control means, upon detection of the detected value to be less than said reference value, for setting the compensated voltage as a compensated actuation voltage to be applied to the optical shutter array.

4,899,184

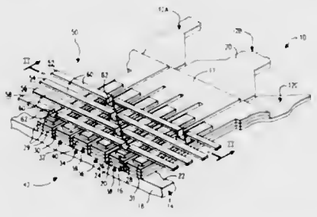
MULTIPLEXED THIN FILM ELECTROLUMINESCENT EDGE EMITTER STRUCTURE AND ELECTRONIC DRIVE SYSTEM THEREFROM

David Leksell, Oakmont, and Juris A. Asars, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 24, 1989, Ser. No. 343,697

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—155 **16 Claims**



1. A thin film electroluminescent (TFEL) edge emitter structure, comprising:

a substrate layer;

a plurality of TFEL assemblies disposed on said substrate layer, each said TFEL assembly including a first layer of electrically conductive material, a second layer of electrically conductive material spaced from said first layer of electrically conductive material and an electrically energizable, light-emitting composite layer interposed therebetween;

at least the second electrically conductive layer of each TFEL assembly being segmented to form a plurality of second electrically conductive elements, said plurality of second electrically conductive elements in combination with said first electrically conductive layer and said electrically energizable, light-emitting composite layer forming a pixel group including a plurality of individual light-emitting pixels; and

the portion of the light-emitting, composite layer associated with an individual pixel of a particular pixel group being operable to emit light energy at a light-emitting edge

surface of said pixel upon the application of a first electrical signal to said first electrically conductive layer common to each said pixel of said particular pixel group and a second electrical signal to said individual pixel second electrically conductive element.

4,899,185

HIGH DENSITY TAPE-AUTOMATED BONDING (TAB) OF ELECTRONIC COMPONENTS

David A. Newman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 24, 1989, Ser. No. 397,816

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—155 **5 Claims**



1. An electronic assembly including two electronic devices provided with mutually corresponding, narrowly spaced, generally parallel first and second alternating electrodes provided with respective bonding pads, said bonding pads of said first electrodes of each device being aligned in a first row near one edge thereof and bonding pads of said second electrodes being aligned between said alternate electrodes in a second row farther from said edge, and, first and second superimposed mutually separated layers of spaced bonding wires, said wires of said first layer connecting said first electrodes of one of said devices to corresponding first electrodes of the other of said devices, said wires of said second layer being longer than said wires of said first layer and connecting said second electrodes of one of said devices to the corresponding second electrodes of the other of said devices.

4,899,186

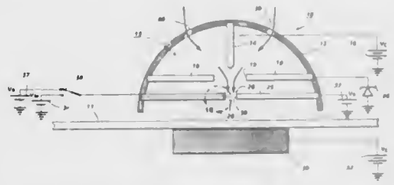
IONOGRAPHIC DEVICE WITH PIN ARRAY CORONODE

Billy D. Walcott, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 19, 1989, Ser. No. 367,917

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—159 **17 Claims**



1. An ionographic imaging device, for depositing charge in imagewise configuration of an imaging surface moving in a process direction, comprising:

a support member;

a pin array coronode supported on the support member and positioned transverse to the process direction, having an array of projections directed towards the imaging surface, and coupled to a coronode power supply suitable to drive the coronode to a corona producing condition to produce a supply of ions directed toward the imaging surface;

a corona controlling grid member, supported on the support member, and arranged between the pin array coronode and the imaging surface, and biased to a selected grid voltage level, the grid member formed to provide an opening therethrough, through which ions generated at the pin array coronode pass;

an array of control electrodes supported on an array substrate and positioned transverse to the process direction, in generally parallel opposition to a conductive member, the substrate and the conductive member supported on the support member with respect to each other to form an ion modulation path therebetween, through which ions generated at the pin array coronode pass, each control electrode of the array connected to an imaging control power supply and individually biasable to a selected electrode voltage level with respect to a reference voltage, whereby the passage of ions through the ion modulation path, past the array of control electrodes to the imaging surface, is controlled.

4,899,187

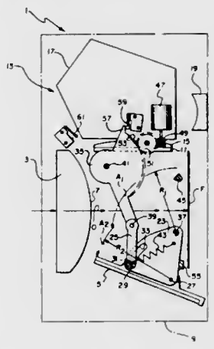
MIRROR SYSTEM FOR A SINGLE LENS REFLEX CAMERA

John H. Alligood, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 12, 1989, Ser. No. 364,918

Int. Cl.[4] G03B *19/12*

U.S. Cl. 354—152 **5 Claims**



1. An improved single lens reflex camera wherein (a) a unitary mirror can be positioned in a light-reflecting position between the rear of a taking lens and the film to reflect the rays of light that come through said lens on to a focusing screen of a viewfinder, and can be positioned in a non-reflecting position substantially facing the bottom of said camera to allow the rays of light that come through the lens to expose the film, and (b) supporting means supports said mirror to pivot about two axes, forward toward the rear of said lens and downward to at least partially underneath the film, from the light-reflecting position to the non-reflecting position, and wherein the improvement comprises:

said supporting means includes compound motion means for enabling said mirror to pivot first only about one of said axes then only about the other axis; and

change-over means cooperates with said compound motion means for effecting a change-over of mirror movement from about one of said axes to about the other axis.

4,899,188

LIGHT SCATTERING OPTIC GUIDE

Maurice Lecover, 142 S. Kilkea Dr., Los Angeles, Calif. 90048

Filed Jan. 3, 1989, Ser. No. 294,263

Int. Cl.[4] G03B *29/00*

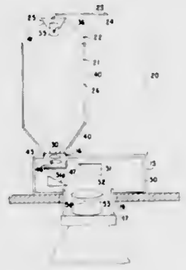
U.S. Cl. 354—75 **12 Claims**

1. For use in a photorecorder in which a camera having an

eyepiece, an internal focusing reticle and an image lens is supported in relation to a baseboard surface which supports a to-be-photographed object, a light scattering optic guide comprising:

a light source;

a light coupler formed of a transparent material having a



generally cylindrical portion having an external surface, an entrance surface coupled to said light source, an exit surface coupled to said eyepiece and a plurality of facets arranged to transition said cylindrical portion to said exit surface; and

a reflective coating formed on said exterior surface of said cylindrical portion and said plurality of facets.

4,899,189

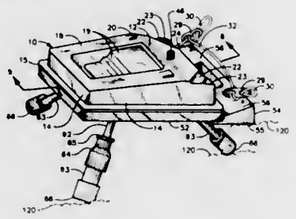
SUPPORT AND PROTECTIVE BASE DEVICE FOR CAMERA

George E. Frost, 6535 S. Race Cir. E., Littleton, Colo. 80121

Filed Oct. 31, 1988, Ser. No. 265,417

Int. Cl.[4] G03B *17/00*

U.S. Cl. 354—293 **20 Claims**



1. A lightweight base device for stabilization and protection of a camera or the like in freestanding, transporting or hand held configuration, comprising;

a structural shell body member comprising a camera platform having a hole for a camera interface screw for secure mounting to a camera, ribs at each side of a depressed trough extending forward and downward from the said camera body platform, and supporting shell walls extending downward from said platform and said ribs to a base rim.

4,899,190

ZOOMING OPTICAL SYSTEM CONTROL DEVICE

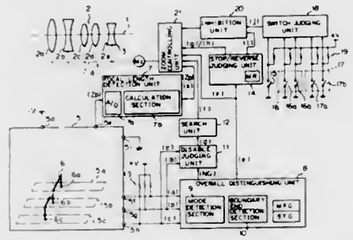
Daisuke Hata, Funabashi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,459

Claims priority, application Japan, May 31, 1987, 62-136634; Jun. 2, 1987, 62-137681; Jun. 2, 1987, 62-138568

Int. Cl.[4] G03B *3/10, 5/00, 17/04, 15/22*

U.S. Cl. 354—400 **6 Claims**



1. A zooming optical system control device for controlling the setting of a zooming optical system to one of a plurality of regions such as a zooming region wherein said optical system ensures zooming photographing, a macro region wherein said optical system ensures macro photographing and a containment region wherein said optical system is contained into a predetermined position, said optical system comprising a zooming lens group, a macro lens group and a focusing lens group each disposed on one identical optical axis,

said control device comprising;

(a) a generating means for generating a distinguishing information representing said one of a plurality of regions wherein said optical system is situated and for generating a disable information representing that said optical system is situated in a non-distinguishable region in which said generating means can not distinguish a region wherein said optical system is situated in a case where said optical system is situated in said non-distinguishable region,

(b) an instructing means for instructing a setting region whereto said optical system is to be set,

(c) a driving means for driving said optical system in order to set said optical system to said setting region, and

(d) a control means for controlling said driving means in such a manner that said driving means drives said optical system to said setting region and drives said optical system toward said one of a plurality of regions when said generating means generates said disable information.

4,899,191

EXPOSURE CONTROL APPARATUS FOR LENS-SHUTTER TYPE CAMERA

Atsushi Maruyama, Yokohama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1989, Ser. No. 316,504

Claims priority, application Japan, Mar. 10, 1988, 63-55011; Mar. 22, 1988, 63-65905

Int. Cl.[4] G03B *7/097, 17/16, 15/03, 5/00*

U.S. Cl. 354—421 **10 Claims**

1. An exposure control apparatus for a lens-shutter type camera having a lens whose focal length can be varied and shutter blades whose aperture size in a full-open state changes in accordance with a change in the focal length of the lens and which serve as an aperture, comprising:

first table means for storing a correspondence between a luminance of an object to be photographed and a shutter-blade aperture time at a specific focal length;

second table means for storing a correspondence between

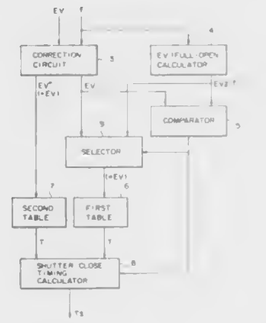
the luminance of the object and an effective exposure time at the specific focal length;

correction means for correcting the luminance of the object in accordance with a difference between the specific focal length and the focal length of said lens for said first and second table means, respectively, so as to calculate first and second corrected luminance;

full-open luminance calculating means for calculating, in accordance with the focal length of said lens, a full-open luminance as the luminance of the object with which said shutter blades are fully opened;

determination means for comparing the first corrected luminance and the full-open luminance to determine whether correct exposure can be obtained before or after said shutter blades are fully opened;

supply means for supplying the first corrected luminance or the full-open luminance to said first table means in accordance with an output from said determination means, said supply means supplying the first corrected luminance to said first table means when said determination means



determines that correct exposure is obtained before the shutter blades are fully opened, and supplying the full-open luminance to said first table means when said determination means determines that correct exposure is obtained after the shutter blades are fully opened; and

control means for controlling a shutter-blade close timing by outputs from said first and second table means in accordance with an output from said determination means, said control means determining a close timing using the shutter-blade aperture time output from said first table means on the basis of the first corrected luminance when said determination means determines that correct exposure is obtained before the shutter blades are fully opened, and determining a close timing using a sum of the effective exposure time output from said second table means on the basis of the second corrected luminance and a half of the shutter-blade aperture time output from said first table means on the basis of the full-open luminance when said determination means determines that correct exposure is obtained after the shutter blades are fully opened.

4,899,192

IMAGE INFORMATION APPARATUS

Yukitoshi Fujita, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 13,916, Feb. 12, 1987, abandoned. This application May 26, 1988, Ser. No. 203,540

Claims priority, application Japan, Feb. 18, 1986, 61-34261

Int. Cl.[4] G03B *27/48, 27/50, 27/70*

U.S. Cl. 355—51 **6 Claims**

1. An image formation apparatus comprising

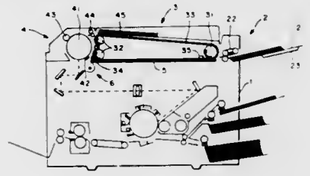
a housing,

an optical system,

an automatic document feeder with a document supplying section at one end in the upper part of said housing,

an automatic document winding device at the other end of said housing with a drum for wrapping a document therearound,

a document size sensor for detecting the size of a document supplied from said document supplying section relative to the size of said drum, and



selecting means capable of automatically selecting on the basis of document size detected by said document size sensor between a first mode of operation wherein a document is transported by said automatic document feeder and said optical system is moved to scan said document and a second mode of operation wherein a document is transported by said automatic document winding device and wherein said optical system remains fixed and said drum is rotated to scan said document.

4,899,193

IMAGE RECORDING APPARATUS HAVING ADJUSTABLE OPTICAL SYSTEM

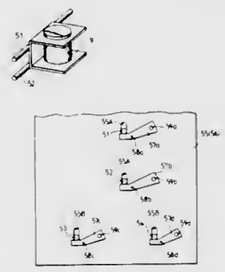
Yoichi Horaguchi, Nagoya; Takashi Tomizawa, Aichi; Shigeyuki Hayashi, Nagoya; Motoshi Ohno, Nagoya, and Takashi Nakata, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 8, 1988, Ser. No. 281,336

Claims priority, application Japan, Dec. 11, 1987, 62-189349[U]

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—55 **5 Claims**



1. An image recording apparatus for forming an image on an image recording medium, which image corresponds to an image of an original comprising:

a casing;

a light source disposed in said casing;

an exposure unit at which said image recording medium is exposed to light reflected at said original to form a latent image on said image recording medium;

optical components for directing light from said light source and reflected at said original toward said exposure unit, said optical components being accommodated in said casing;

supporting means for supporting said optical components

within said casing, said supporting means being disposed in said casing and parts of said supporting means extending through said casing toward outside; and

adjusting means for moving said supporting means within said casing, said adjusting means being disposed outside said casing and engageable with said parts of said supporting means.

4,899,194

METHOD OF AND DEVICE FOR DETECTING IMAGE

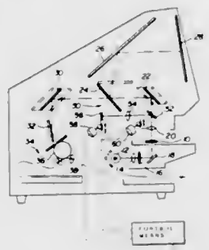
Hisamitsu Hori, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 22, 1988, Ser. No. 274,544

Claims priority, application Japan, Nov. 24, 1987, 62-293960; Jan. 14, 1988, 63-004659

Int. Cl.[4] G03B *27/34*

U.S. Cl. 355—56 **10 Claims**



1. In the method of detecting an image in an auto-focusing apparatus in which a projection lens is controlled to focus the image by scanning the light projecting through the original image with an image sensor and by utilizing the image signals generated from said image sensor, an improvement which comprises:

(a) the step of making a histogram which represents the number of picture elements in relation of the image signal values sensed by said image sensor in one focus zone;

(b) the step of judging whether or not an image is present in said one focus zone on the basis of a profile of said histogram;

(c) the step of setting a binarization level using said histogram when it is judged that no image is present at the preceding step (b);

(d) the step of counting the reversing number N of which the image signals of another focus zone change from a value under/over said binarization level to a value over/under said binarization level; and

(e) the step of judging that an image is present in said another focus zone when the image reversing number N counted at the preceding step (d) is equal to or more than a programmed number M.

4,899,195

METHOD OF EXPOSING A PERIPHERAL PART OF WAFER

Manabu Gotoh, Yokohama, Japan, assignor to Ushio Denki, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,793

Claims priority, application Japan, Jan. 29, 1988, 63-17286; Sep. 9, 1988, 63-224531

Int. Cl.[4] G03B *27/32*

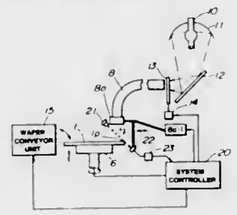
U.S. Cl. 355—77 **2 Claims**

1. A method of exposing a peripheral part of wafer which comprises,

turning a wafer on which photoresist coated,

exposing a peripheral part of said wafer to light guided by optical fiber lightguide,

detecting the edge of said wafer by sensor,



and controlling the light emission end of said optical fiber lightguide to expose a fixed distance from the edge of said wafer according to signal from said sensor.

4,899,196

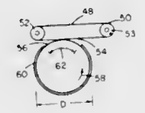
COPY APPARATUS HAVING A NON-INTEGRALLY SIZED TRANSFER DEVICE

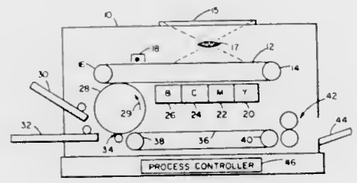
Gregory P. Mahoney, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 275,828, Nov. 25, 1988, abandoned. This application Feb. 22, 1989, Ser. No. 313,678

Int. Cl.[4] G03G *15/00, 15/01*

U.S. Cl. 355—271 **15 Claims**





1. Copy apparatus for placing final images onto flat sheets, with the final images consisting of a plurality of intermediate images, said apparatus comprising:

an image carrying surface arranged in the form of an endless belt containing a seam across the surface of the belt;

means for placing a plurality of toned intermediate images onto the image carrying surface;

a continuous, non-seamed surface closely positioned to said image carrying surface;

means for transferring the intermediate images from the image carrying surface to the continuous surface in registration to form a final image, and for transferring the final image on the continuous surface to a flat sheet, said continuous surface being arranged to include at least one frame area for accepting the transferred image and at least one interframe area; and

means for controlling the movement of said two surfaces such that the seam of the image carrying surface precesses through the interframe area of the continuous surface during the plurality of intermediate image transfers between the two surfaces.

4,899,197

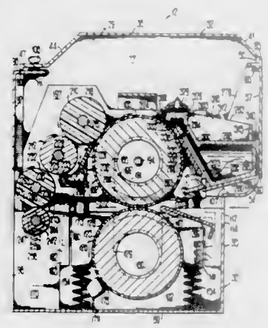
FUSER FOR USE IN AN ELECTROPHOTOGRAPHIC PRINT ENGINE

David R. Davis, Buford; Danny L. Slayton, Lilburn, and Raymond J. Shook, Lawrenceville, all of Ga., assignors to Colorocs Corporation, Norcross, Ga.

Filed May 17, 1988, Ser. No. 194,756

Int. Cl.[4] G03G *15/20*

U.S. Cl. 355—290 **12 Claims**



1. An improved fuser apparatus for fusing toner to an image receptor sheet in an electrophotographic print engine, the improved fuser apparatus comprising:

a fixing member having an outer surface;

a compression member having an outer surface contacting a portion of the outer surface of the fixing member;

means for moving the fixing member so as to draw a receptor sheet bearing toner between the fixing member and the compression member;

means for heating the fixing member so as to fuse toner to the image receptor sheet as the image receptor sheet is drawn between the fixing member and the compression member;

the outer surface of the fixing member and the outer surface of the compression member are substantially mutually compressible, so the image receptor sheet does not adhere to either the outer surface of the fixing member or the outer surface of the compression member as the image receptor passes between the fixing member and the compression member, and so the outer surface of the fixing member and the outer surface of the compression member conform to contours of the toner-laden image receptor sheet thereby providing a substantially uniform and thorough fusing of the toner to the image receptor sheet.

4,899,198

DUAL PURPOSE CLEANING APPARATUS

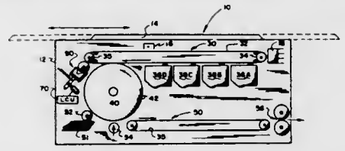
Gregory Mahoney, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 139,226, Dec. 29, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 246,707

Int. Cl.[4] G03G *15/21*

U.S. Cl. 355--297 **10 Claims**

7. An electrostatographic copier or printer that forms toner particle images and transfers them to a copy sheet by utilizing a moving photoconductor and a moving intermediate image transfer member in image transfer relationship with the photoconductor, said copier or printer including a single cleaning apparatus having a cleaning element directly engageable against the surface of the photoconductor or against the surface of the intermediate image transfer member for removing



residual particles from said surface of the photoconductor and said surface of the intermediate image transfer member.

4,899,199

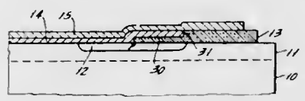
SCHOTTKY DIODE WITH TITANIUM OR LIKE LAYER CONTACTING THE DIELECTRIC LAYER

Herbert J. Gould, Sherman Oaks, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Sep. 30, 1983, Ser. No. 537,509

Int. Cl.[4] H01L *29/48*

U.S. Cl. 387—15 **14 Claims**



1. A semiconductor device having a monocrystalline silicon substrate of one conductivity type and having at least one planar surface;

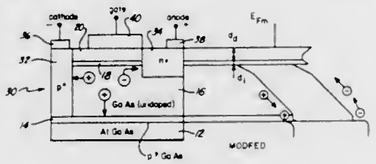
a planar junction of the opposite conductivity type formed in said planar surface and separating said planar surface into a first surface portion of said one conductivity type and a second surface portion of said opposite conductivity type; said planar junction forming a guard ring; a thin layer of dielectric material on said planar surface and extending across and passivating at least one portion of said planar junction and exposing at least a portion of the area of said first surface portion; a first metal layer in contact with at least a portion of said area of said first portion and forming a Schottky barrier therewith; said guard ring surrounding said barrier; said first metal layer being of a material characterized in having a relatively good adherence to said first portion of said silicon substrate and relatively poor adherence to the surface of said layer of dielectric material; and a second continuous metal layer overlying and physically contacting at least an outer portion of the upper surface of said first metal layer including the lateral periphery of said first metal layer, and extending beyond at least the outer peripheral portion of said first metal layer and contacting at least a portion of the upper surface of said dielectric layer; said second metal layer being characterized in having good adherence to said first metal layer and to said dielectric layer and defining a stepped field plate extending from said first metal layer, and over the surface of said dielectric layer.

4,899,200

NOVEL HIGH-SPEED INTEGRATED HETEROSTRUCTURE TRANSISTORS, PHOTODETECTORS, AND OPTOELECTRONIC CIRCUITS

Michael Shur, Golden Valley, Minn., and John G. Simmons, Amherst, Mass., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 3, 1988, Ser. No. 202,178
Int. Cl.[4] H01L 27/14
U.S. Cl. 357—30 **15 Claims**



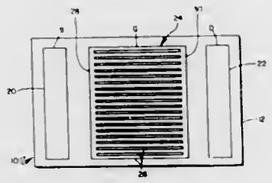
1. A planar photodetector comprising:
a bottom confinement layer of a first wider bandgap material;
a buried layer of a second narrower bandgap material overlying the bottom confinement layer, the buried layer having a first conductivity type;
a essentially undoped layer of the second material overlying the buried layer;
a top confinement layer overlying the undoped layer and having a wider bandgap than the second material;
a first contact region of first conductivity extending vertically through the top region and the relatively undoped layer to make electrical contact with the buried layer;
a second contact region of second conductivity type spaced laterally from the first contact region and extending vertically into the undoped layer, the second contact region being spaced from the buried layer;
first terminal means electrically connected to the first contract region; and
second terminal means electrically connected to the second contact region.

4,899,201

ELECTRONIC AND OPTOELECTRIC DEVICES UTILIZING LIGHT HOLE PROPERTIES

Jingming Xu, Toronto, Canada; Michael Shur, Golden Valley, Minn., and Mark Sweeny, Ossining, N.Y., assignors to Regents of the University of Minnesota, St. Paul, Minn.

Continuation of Ser. No. 85,908, Aug. 14, 1987, abandoned. This application May 31, 1989, Ser. No. 363,367
Int. Cl.[4] H01L 29/80
U.S. Cl. 357—22 **7 Claims**



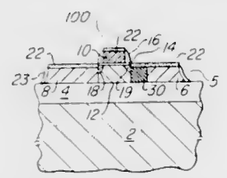
1. A semiconductor device comprising:
a body having a first surface;
a first p-type region in the body;
a second p-type region in the body spaced from the first p-type region;
a hole confinement region in the body generally parallel to the first surface, having a first end connected to the first p-type region and a second end connected to the second p-type region, the hole confinement region confining movement of holes in a direction generally perpendicular to the first surface; and
first gate means having a plurality of generally parallel conductive strips which are generally parallel to the first surface and extend in a direction from the first to the second p-type region for creating in the hole confinement region, as a function of an applied electric field, a plurality of generally parallel one-dimensional p-type conducting regions extending between the first and second p-type regions, wherein for each adjacent pair of the conductive strips, a one-dimensional p-type conducting region is induced.

4,899,202

HIGH PERFORMANCE SILICON-ON-INSULATOR TRANSISTOR WITH BODY NODE TO SOURCE NODE CONNECTION

Terence G. W. Blake, and Hsiodao Lu, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 8, 1988, Ser. No. 216,933
Int. Cl.[4] H01L 27/12, 29/78, 29/06
U.S. Cl. 357—23.7 **22 Claims**



1. A transistor formed in a semiconductor layer overlying an insulating film, comprising:
a gate electrode overlying a body node portion of said semiconductor layer, said body node portion being of a first conductivity type and having first and second sides, said gate electrode overlying a surface of said semiconductor layer opposite said insulating film;
a drain region of said semiconductor layer, said drain region being of said second conductivity type and disposed adjacent a first side of said body node portion;
a source region of said semiconductor layer, said source region being of said second conductivity type and comprising:
a first portion adjacent a second side of said body node portion; and
a second portion adjacent said first portion, said second portion relatively heavily doped relative to said first portion;
a first contact region of said layer of said semiconductor layer, said first contact region being of said first conductivity type, disposed at said surface of said semiconductor layer between said first portion of said source region and said second portion of said source region in a direction perpendicular to said gate electrode, and having a depth deeper than said first portion of said source region so that said first contact region is in contact with said body node portion; and
a ohmic connection between said first contact region and said source region.

4,899,203

SEMICONDUCTOR MEMORY INTEGRATED CIRCUIT AND PROCESS OF FABRICATING THE SAME

Masayoshi Ino, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1988, Ser. No. 280,155
Claims priority, application Japan, Dec. 11, 1987, 62-312014
Int. Cl.[4] H01C 21/72
U.S. Cl. 357—23.6 **14 Claims**



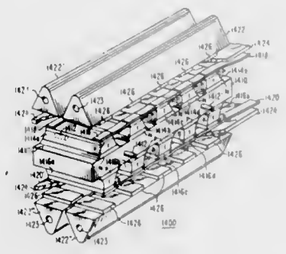
1. A semiconductor memory integrated circuit device having a stacked capacitor cell comprising:
(a) a semiconductor substrate;
(b) a first diffusion region, a channel region and a second diffusion region formed in the substrate;
(c) a gate insulating film and a gate electrode formed over the channel region;
(d) a first insulating film formed over said second diffusion region;
(e) a first plate electrode formed over said first insulating film;
(f) a second insulating film formed over said first plate electrode;
(g) a charge storage electrode formed over said second insulating film and having a part extending through a first contact hole, said first contact hole being provided through said first insulating film, said first plate electrode and said second insulating film, and said part extending through said first contact hole being arranged so as to contact said second diffusion region;
(h) a third insulating film formed over said charge storage electrode; and
(i) a second plate electrode formed over said third insulating film and having a part extending through a second contact hole, said second contact hole being provided through said second insulating film and said third insulating film, and said part extending through said second contact hole being arranged so as to contact said first plate electrode.

4,899,204

HIGH VOLTAGE SWITCH STRUCTURE WITH LIGHT RESPONSIVE DIODE STACK

Har'el Rosen, and Arye Rosen, both of Cherry Hill, N.J., assignors to General Electric Company, Morrestown, N.J.

Filed Dec. 1, 1987, Ser. No. 128,116
Int. Cl.[4] H01L 27/14
U.S. Cl. 357—30 **12 Claims**



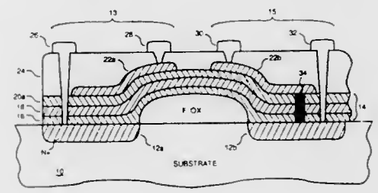
1. An electrical switch, device comprising:
a first PIN diode comprising a substantially intrinsic first semiconductor portion including mutually opposed first and second flat surfaces, said first semiconductor portion being doped near said first surface with one of N and P impurities, and near said second surface with the other one of said N and P impurities;
a second PIN diode comprising a substantially intrinsic second semiconductor portion including mutually opposed first and second flat surfaces, said second semiconductor portion being doped near said first surface with said one of said N and P impurities, and near said second surface with said other one of said N and P impurities, said first surface of said second semiconductor portion being electrical contact with said second surface of said first semiconductor portion for generating a physical stack of PIN diodes in which said PIN diodes are electrical connected in series, and poled for current flow in the same direction therethrough between said first surface of said first semiconductor portion and said second surface of said second semiconductor portion;
coupling means coupled to said first surface of said first semiconductor portion and to said second surface of said second semiconductor portion and adapted for coupling to a source of electrical potential, which includes a direct current component, associated with a load to be switched, in a manner which simultaneously reverse-biases said first and second PIN diodes, said reverse bias substantially preventing the flow of current through said diodes; and
switching control means coupled to said first and second PIN diodes, said switching control means comprising light generating means for simultaneously illuminating at least an interior portion of said first and second PIN diodes with light for causing said first and second PIN diodes to conduct in the presence of light, and for allowing said PIN diodes to revert, in the absence of light, to said condition of reverse bias and prevention of the flow of current therethrough.

4,899,205

ELECTRICALLY-PROGRAMMABLE LOW-IMPEDANCE ANTI-FUSE ELEMENT

Esmat Z. Hamdy, Fremont; Amr M. Mohsen, and John L. McCullum, both of Saratoga, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 861,519, May 9, 1986, Pat. No. 4,823,181. This application Dec. 28, 1987, Ser. No. 137,935
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[4] H01L 27/02, 29/86
U.S. Cl. 357—51 **38 Claims**



1. An electrically-programmable, low-impedance anti-fuse element, including:
a p-type semiconductor substrate,
a first electrode comprising a diffusion region in said substrate,
a dielectric layer over said diffusion region, said dielectric layer including a first silicon dioxide portion and a second silicon nitride portion over said first silicon dioxide portion,
a second electrode over said dielectric layer,
wherein at least one of said first and said second electrodes

is heavily doped or implanted with arsenic such that a high concentration of arsenic atoms exists at the interface between said dielectric layer and said electrode, and a controlled radius conductive filament in said dielectric layer electrically connecting said first and second electrodes.

4,899,206

SEMICONDUCTOR DEVICE

Hiromi Sakurai, and Yoichi Akasaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 374,865, May 4, 1982. This application Apr. 1, 1985, Ser. No. 717,597

Claims priority, application Japan, May 6, 1981, 56-69561; May 6, 1981, 56-69562; May 6, 1981, 56-69563; May 6, 1981, 56-69564

Int. Cl.[4] H01L *23/54, 21/88*

U.S. Cl. 357—67 **10 Claims**

1. A semiconductor device having a metal wiring selected from the group consisting of aluminum and an aluminum alloy which is substantially free of whiskers and hillocks, said metal wiring formed on a semiconductor wafer including at least one device, wherein said metal wiring has an amorphous layer of 800 to 2000 Å, and whereby said amorphous layer containing impurities prevents the formation of whiskers and hillocks in said metal wiring, said impurities being selected from the group consisting of aluminum, argon, phosphorous, arsenic and antimony and is present in a concentration of higher than 0.5% in relationship to the metal wiring.

4,899,207

OUTER LEAD TAPE AUTOMATED BONDING

David L. Hallowell, Westford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 900,789, Aug. 27, 1986, abandoned. This application Jul. 14, 1988, Ser. No. 219,858

Int. Cl.[4] H01L *23/48, 23/10, 23/12*

U.S. Cl. 357—70 **16 Claims**

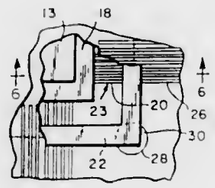
1. A lead tape assembly for electrically connecting a semiconductor chip to a substrate, the lead tape assembly comprising:

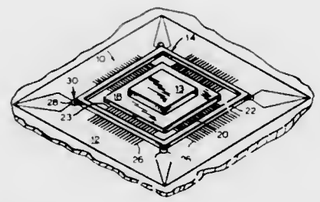
A. a plurality of conductive fingers for electrically connecting bond points on the semiconductor chip to substrate leads on the substrate, each conductive finger having an inner lead for bonding to a semiconductor chip bond point, and an outer lead distally located from the inner lead for bonding to a substrate lead;

B. an inner support ring over said conductive fingers between said inner leads and said outer leads, said inner support ring forming an aperture for receiving the semiconductor chip, said inner leads extending into said aperture;

C. an outer support ring over the ends of the outer leads for restricting the movement of the individual outer leads; and

D. adhesive means on said outer support ring securing said outer support ring to said substrate so that said outer leads





are at least temporarily maintained in registration with the substrate leads.

4,899,208

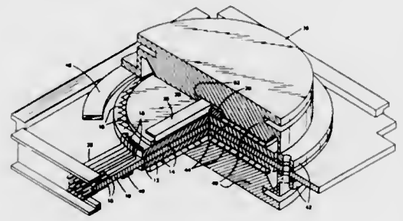
POWER DISTRIBUTION FOR FULL WAFER PACKAGE

Hans E. Dietsch, Essex, and William J. Nestork, Hinesburg, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,480

Int. Cl.[4] H01L *23/02*

U.S. Cl. 357—74 **13 Claims**



I. An integrated circuit package comprising

a substrate adapted to support a semiconductor wafer on a least one side thereof;

a semiconductor wafer mounted on at least one side of said substrate;

each semiconductor wafer having a plurality of integrated circuit devices formed thereon and a plurality of electrically conducting lines extending in parallel relationship thereon, said lines being divided into at least a first group constituting a first voltage level, and a second group constituting a second voltage level, said lines being electrically connected to power the integrated circuit devices on said wafer;

first and second electrically conducting strips extending across each wafer transverse to said electrically conducting lines,

connection means connecting said first and second strips to said first and second groups of conducting lines respectively;

means to connect said first and second strips to separate voltage levels,

whereby said strips supply operative voltage levels across the surface of the wafer; and

means to provide signals to and receive signals from said integrated circuit devices.

4,899,209

RESIN SEALED SEMICONDUCTOR DEVICE

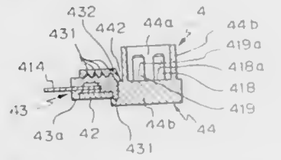
Hiroshi Shibata; Fuyuki Maehara, both of Kariya; Akira Shintai, Chita, and Hidetoshi Kato, Suzuka, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 3, 1988, Ser. No. 201,757

Claims priority, application Japan, Jun. 5, 1987, 62-142043; Apr. 30, 1988, 63-108520

Int. Cl.[4] H01L *21/56*

U.S. Cl. 357—74 **53 Claims**



1. A resin sealed IC regulator comprising a first connecting terminal electrically connected to a generator, a second connecting terminal electrically connected to a device other than said generator, a monolithic IC which controls an operation of said generator mounted on a conductive member and electrically connected to both said first connecting terminal and said second connecting terminal and a resin molded portion of an electric insulating resin sealing said monolithic IC and at least a portion of said first and second connection terminals connected to said monolithic IC;

wherein said first and second connecting terminals and said conductive member are made of the same material;

wherein said resin molded portion further has a connector housing portion integrally formed thereon by molding resin in such a way that said second connecting terminals are surrounded therewith;

wherein said resin molded portion comprises a first molded portion molded with a first resin for sealing said monolithic IC and at least a portion of said first and second connecting terminals connected to said monolithic IC, and a second molded portion molded with a second resin, and externally covering at least a portion of said first molded portion;

wherein said second molded portion is integrated with a connector housing portion integrally molded with said second resin, and wherein said connector housing portion is also molded in such a way that said second connecting terminals are surrounded therewith;

wherein the first resin and the second resin are the same kind of resin.

4,899,210

HEAT SINK

Victor Lorenzetti, Dedham, and Manuel Pontes, Somerville, both of Mass., assignors to Wakefield Engineering, Inc., Wakefield, Mass.

Filed Jan. 20, 1988, Ser. No. 146,213

Int. Cl.[4] H01L *23/34, 23/36*

U.S. Cl. 357—81 **21 Claims**

1. A heat sink for an element to be cooled comprising:

a base;

a plurality of pins extending substantially perpendicular to the base, said pins being arranged in a predetermined pattern; and

at least one projection integral with said base, extending from the side thereof adjacent the element to be cooled and having an area for the projection surface parallel to the side from which it extends and adapted to make thermal contact with the element to be cooled which is sufficient to provide good thermal transfer between the heat



sink and the element while maintaining the area of contact to a fraction of the base area sufficiently small to assure that uneven thermal expansion between the heat sink and element does not cause damage to the element.

4,899,211

SEMICONDUCTOR COOLING MECHANISMS

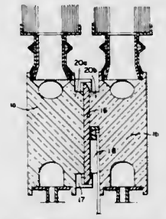
Jean-Loup Dumoulin, Chanpagne-sur-Seine, France, assignor to Jeumont Schneider Corporation, Cedex, France

Filed Jan. 12, 1987, Ser. No. 2,460

Claims priority, application France, Jan. 16, 1986, 86 00544

Int. Cl.[4] H01L *25/04*

U.S. Cl. 357—82 **21 Claims**



1. A power semiconductor cooling mechanism, comprising a metallic evaporator containing a heat-carrying fluid and configured for face-to-face contact with a power semiconductor device at an axial end of said evaporator, a condenser tube extending laterally of said evaporator and having a first end which is closed and a second end which is connected in fluid communication with said evaporator by way of an electrically insulating fluid conduit, a flexible expansion-accommodating fluid connection connecting said electrically insulating fluid conduit to said evaporator, and an envelope secured to said electrically insulating fluid conduit and enclosing said condenser tube so as to define a fluid chamber about said condenser tube, said envelope having inlet and outlet means for conducting a cooling fluid through said fluid chamber to cool said condenser tube, with pressure internally of the assembly of said condenser tube, said fluid conduit, and said evaporator being below atmospheric pressure.

4,899,212

WHITE BALANCE ADJUSTING DEVICE FOR A CAMERA

Kiyotaka Kaneko; Izumi Miyake; Kazuya Oda; Yoshio Nakane, and Hiroshi Shimaya, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 236,992, Aug. 26, 1988, abandoned. This application Jun. 15, 1989, Ser. No. 366,210

Claims priority, application Japan, Aug. 28, 1987, 62-214382; Aug. 28, 1987, 62-214383

Int. Cl.[4] H04N *9/73*

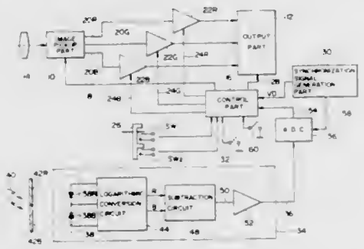
U.S. Cl. 358—29 **6 Claims**

4. A white balance adjusting device for use in a camera in which a field is photographed and a video signal representing said field is formed, said device comprising:

photographic mode setting means for setting a still mode for photographing said field as a still image and a movie mode for photographing said field as a moving image;

color temperature detecting means for detecting a color temperature of said field and outputting a color temperature signal representing said color temperature; and

control means for adjusting a white balance of said video signal in response to color temperature data that is obtained from said color temperature signal, said control



means receiving a set output from said photographic mode setting means and adjusting said white balance of said video signal at a shorter cycle as compared with said movie mode when said camera is set in said still mode.

4,899,213

A SYSTEM FOR PRODUCING IMAGE SIGNALS OF A SUBJECT IMAGE BY AN IMAGE SENSING DEVICE

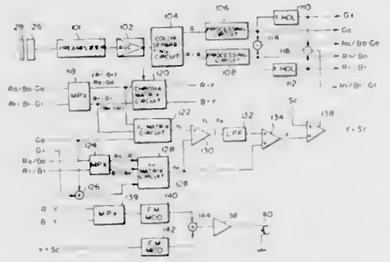
Masahiro Konishi; Masafumi Inuiya; Akira Muramatsu, and Masahiro Kato, all of 2-26-30 Nishi-azabu, Minato-ku, Tokyo, Japan

Continuation of Ser. No. 8,165, Jan. 29, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 366,220

Claims priority, application Japan, Jan. 29, 1986, 61-17163

Int. Cl.[4] H04N *9/077, 9/04*

U.S. Cl. 358—44 **16 Claims**



1. A system for producing image signals, comprising:

image sensing means for picking up an image of a subject, said image sensing means comprising an image sensing device and a color filter formed thereon, said image sensing device comprising alternately-arranged first and second horizontal scanning lines of picture elements, said color filter comprising filter elements opposed to said picture elements of said image sensing device, wherein filter elements opposed to picture elements of said first horizontal scanning lines comprise alternately-arranged filter elements for separably transmitting at least red light and green light, and wherein filter elements opposed to picture elements of said second horizontal scanning lines comprise alternately-arranged filter elements for separably transmitting at least blue light and green light, said picture elements accumulating color image signals representing said image of said subject; and

signal processing means for reading out said color image signals accumulated in said picture elements of said image sensing device to produce a color difference signal R−Y in response to color image signals read out from the picture elements of a first horizontal scanning line and color image signals read out from the picture elements of a second horizontal scanning line one horizontal scanning line duration before and to produce a color difference signal B−Y in response to color image signals read out from the picture elements of a second horizontal scanning line and color image signals read out from the picture elements of a first horizontal scanning line one horizontal scanning line duration below, thereby producing line-sequential color difference signals R−Y and B−Y.

4,899,214

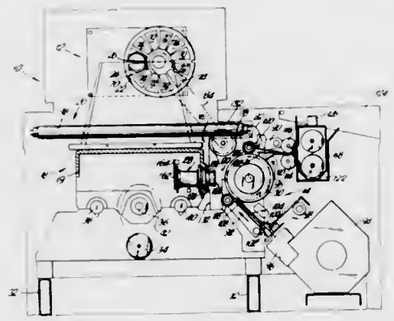
LOW COST COLOR SCANNER

Daniel H. Robbins, Rochester; John S. Wirtz, Henrietta; Juergen Lein, West Henrietta, and Michael A. Brookmire, Pittsford, all of N.Y., assignors to Itek Graphic Corp., Waltham, Mass.

Filed Sep. 2, 1988, Ser. No. 241,101

Int. Cl.[4] H04N *1/04, 1/10*

U.S. Cl. 358—75 **20 Claims**



19. A method of operating a color scanner having a movable scanning table supporting an original artwork receiving surface and a dot generator exposure source, the artwork receiving surface having a scanning table vacuum channel; an illumination source for illuminating a linear strip portion of said artwork receiving surface, said linear strip portion being perpendicular to the direction of travel of said movable scanning table; a rotating color filter wheel including at least one set of alternating red, green and blue filters; a linear detector; optical means for projecting an image of said illuminated linear strip portion through said color filter wheel to said linear detector; a cylindrical exposure drum rotatably mounted substantially parallel to the direction of travel of said dot generator exposure source; photosensitive material handling means for automatically withdrawing a sheet of photosensitive material of predetermined length from a photosensitive material supply, loading the sheet of photosensitive material onto said drum surface for exposure and unloading said sheet from said drum surface after exposure;

the method comprising the steps of:

placing an original artwork on said original artwork receiving surface;

activating said scanning table vacuum to hold said original artwork on said original artwork receiving surface;

activating said photosensitive material handling means to withdraw a sheet of photosensitive material and load said photosensitive sheet onto said exposure drum;

rotating said exposure drum for scanning exposure;

activating said illumination source;

rotating said rotating filter wheel;

advancing said scanning table;

sequentially scanning linear strip portions of said original artwork surface through said filters with said linear detector to produce scanned readings as said scanning table advances;

activating said dot generator exposure source in response to said scanned readings to expose a halftone separation image onto the photosensitive material disposed on the surface of the rotating scanning drum as said scanning table advances and, after exposure;

activating said photosensitive material handling means to remove the exposed photosensitive material from said drum surface for processing.

4,899,215

COLOR IMAGE RECORDING APPARATUS

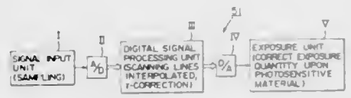
Hideki Morita; Kazuhiro Sugawara, both of Hachioji; Pe-Chieh Hung, Naritahigashi; Hirotaka Hara, Hachioji; Tadashi Nakamura, Sagamiko; Kazuyuki Kobayashi, Tama; Masashi Azuma, Hino, and Tsuyoshi Katsuta, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 804,346, Dec. 3, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 138,353

Claims priority, application Japan, Dec. 12, 1984, 59-262492; Feb. 26, 1985, 60-36771; Feb. 26, 1985, 60-36772; Mar. 19, 1985, 60-56958; Mar. 21, 1985, 60-58019; Mar. 22, 1985, 60-59284

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—78 **11 Claims**



1. A color image recording apparatus having means for exposing a color photosensitive material to light responsive to a color still image signal to record a color image comprising means for obtaining picture element data by sampling each color signal of three primary colors of a still image with respect to one sample picture element every horizontal scanning line, A/D conversion means for converting the sample picture element data obtained by said means to digital signals, memory means for storing the picture element data converted by the sampled picture element data to the digital signal, means for reading out the data stored in said memory means to obtain picture element data to be recorded, means for γ-correcting said picture element to be recorded based on the data read out, D/A conversion means for converting the γ-corrected data to analog data and exposing means for exposing said color photosensitive material to three primary colors responsive to the picture element data from said D/A conversion means.

4,899,216

METHOD OF AND APPARATUS FOR PROCESSING AN IMAGE WITH GRADATION CORRECTION OF VIDEO SIGNAL

Setsuji Tatsumi; Kazuo Shiota; Hitoshi Urabe, and Osamu Shimazaki, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 26, 1987, Ser. No. 89,553

Claims priority, application Japan, Sep. 2, 1986, 61-205173; Sep. 2, 1986, 61-205174; Sep. 2, 1986, 61-205175; Sep. 2, 1986, 61-205176

Int. Cl.[4] H04N *1/46*

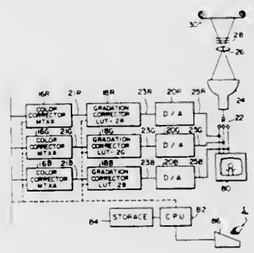
U.S. Cl. 358—80 **36 Claims**

1. A method of image processing input video signals based on lookup table data to produce gradation corrected output signals comprising the steps of:

receiving input video signals and establishing highlight points and shadow points for each of the input video signals based on cumulative histograms generated from each input video signal;

converting standard lookup table data LO through a functional transformation represented by an expression

$$L(v)=S[c\ LO\{a(v+b)\}+d]$$



to attain lookup table data L(v) associated with the input video signals in which parameters a, b, c and d are determined by passing the function represented by the expression through the highlight points and the shadow points thus established; and

effecting an image processing on the input video signals based on the lookup table data associated with the input video signals to produce said gradation corrected output signals.

4,899,217

COMMUNICATION AND ENERGY CONTROL SYSTEM FOR HOUSES

David J. MacFadyen, Derwood, Md.; Robert G. Edwards, Oak Ridge, Tenn.; Kenneth P. Wacks, Stoneham, Mass., and Daniel J. Foley, Chelmsford, Mass., assignors to Smart House Limited Partnership, Upper Marlboro, Md.

Filed Dec. 1, 1987, Ser. No. 126,794

Int. Cl.[4] H04M *11/00*

U.S. Cl. 358—86 **17 Claims**

1. An automated system apparatus for providing energy from an energy source and communication services within a house to appliances capable of receiving and generating appliance digital data, comprising:

appliance coordination data network means for communicating appliance digital data within the house;

higher capacity data network means for transferring higher capacity digital data at a rate faster than said appliance digital data within the house;

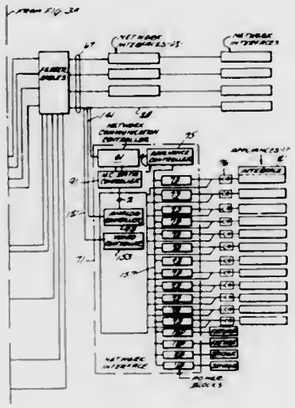
energy distribution means for supplying said energy from said source to appliances throughout the house responsive to said appliance digital data received from said appliances;

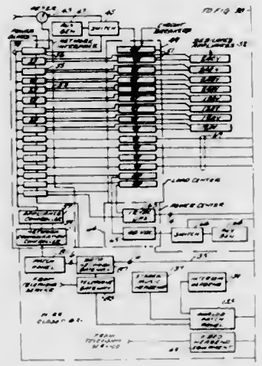
analog services distribution means for distributing conventional analog signals throughout the house;

video services distributing means for distributing conventional video signals throughout the house; and

a plurality of common outlet means disposed throughout the house for connectable attachment of said appliances, each common outlet means connected to and capable of trans-

ferring signals from said appliance digital data network means, said higher capacity data network means, said energy distribution means, said analog services distributing means and said video services distributing means.





4,899,218

VEHICLE WHEEL ALIGNMENT APPARATUS AND METHOD

Thomas J. Waldecker, Ypsilanti; Robert Dewar, Troy; David R. Wybo, Novi, and Richard Woroniec, West Bloomfield Township, Oakland County, all of Mich., assignors to Perceptron, Inc., Farmington Hills, Mich.

Continuation of Ser. No. 15,943, Feb. 18, 1987, Pat. No. 4,745,469. This application May 16, 1988, Ser. No. 194,495

Int. Cl.[4] H04N *7/18*

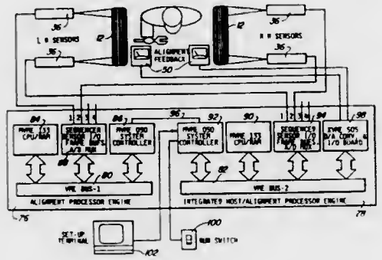
U.S. Cl. 358—93 **3 Claims**

1. A system for measuring a predetermined alignment characteristic of a wheel defining a plane normal to the axis of the axle of the vehicle on which the wheel is mounted, comprising:

means for establishing a predetermined target associated with the wheel that defines the position and orientation of said plane in three-dimensional space;

optical sensor means having associated therewith a field of view and being positioned relative to wheel so that said target is located within said field of view for creating an image of said target and converting said image to corresponding electrical signals;

processor means for processing said electrical signals, determining therefrom the position and orientation of said plane in three-dimensional space relative to a predefined datum, and calculating therefrom said predetermined alignment characteristic of said wheel.



4,899,219

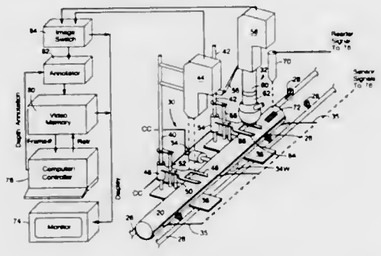
MACROVIEW AND MICROVIEW VIDEO RECORD OF CORE

Houston B. Mount, II, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 31, 1988, Ser. No. 265,089

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—107 **19 Claims**



1. Method for providing a video record of whole core comprising:

translating whole core supported by a core trough in discrete increments to a video recording zone;

for recording each increment of core, interrupting the movement of the core and dampening movement of the core and taking a video record of an increment of core in the video recording zone; and

storing thus taken video records of increments of core in a random access video m emory for retrieval and display.

4,899,220

METHOD AND APPARATUS FOR RECOMBINING A MAIN PANEL COMPONENT WITH A AUGMENTATION PANEL COMPONENT TO CREATE A WIDE ASPECT RATIO TELEVISON DISPLAY

Carlo Basile, New York; Alan P. Cavallerano, Ossining, and Mikhail Tsinberg, Riverdale, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Jun. 2, 1987, Ser. No. 57,848

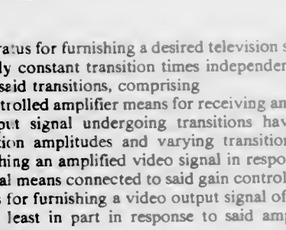
Int. Cl.[4] H04N *7/04*

U.S. Cl. 358—141 **14 Claims**

1. Apparatus for creating a wide aspect ratio display comprising a plurality of horizontal line signals, in response to a plurality of main panel component signals and a corresponding multiplicity of first and second augmentation panel component signals, said plurality of horizontal line signals constituting at least a portion of one field, said apparatus comprising:

means for combining said plurality of main panel component signals with respective ones of said first and second augmentation panel component signals to create respective horizontal line signals, wherein for each horizontal line signal of said respective horizontal line signals the main panel component signal is combined with the first augmentation panel component signal at a first stitch point and said main panel component signal is combined with the second augmentation panel component signal at a second stitch point, and

means connected to said combining means for varying the location of at least one of said first stitch point and said second stitch point in at least one of said horizontal line signals relative to another of said horizontal line signals within said portion.



4,899,221

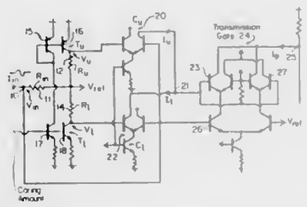
TELEVISION SIGNAL PROCESSING APPARATUS INCLUDING RISE TIME NORMALIZATION AND NOISE REDUCTION

William G. Miller, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Corp., Knoxville, Tenn.

Continuation of Ser. No. 941,498, Dec. 15, 1986, abandoned. This application Feb. 15, 1989, Ser. No. 311,439

Int. Cl.[4] H04N *9/64*

U.S. Cl. 358—167 **9 Claims**



1. Apparatus for furnishing a desired television signal having substantially constant transition times independent of the amplitude of said transitions, comprising

gain controlled amplifier means for receiving and amplifying an input signal undergoing transitions having varying transition amplitudes and varying transition times, and furnishing an amplified video signal in response thereto;

additional means connected to said gain controlled amplifier means for furnishing a video output signal of said apparatus at least in part in response to said amplified video signal;

feedback means connected to said additional circuit means for generating a gain control signal having an amplitude varying only as a function of said transition times; and

means for applying said gain control signal to said gain controlled amplifier means to control the gain thereof, whereby said video output signal constitutes said desired television signal.

4,899,222

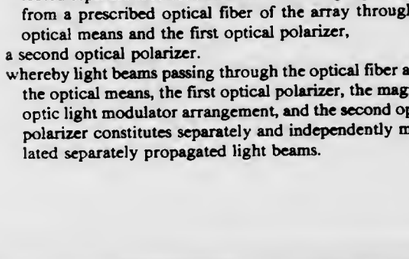
MAGNETO-OPTIC AND FIBER-OPTIC DIGITAL PRINT HEAD

Edgar E. Price, 402 Giovanni Dr., Nokomis, Fla. 34275

Filed Dec. 16, 1988, Ser. No. 284,916

Int. Cl.[4] G01D *9/42;* **G02F** *1/09;* **G02B** *5/30, 6/00*

U.S. Cl. 358—296 **18 Claims**



1. An optical system for separately and independently modulating or on-off switching light in each of a multiplicity of separately propagated light beams, including,

an array of a multiplicity of optical fibers, each having an input region at which light can enter and be received, a region through or along which light can be propagated internally, and an output region from which light can emerge, the disposition of the array being such that light can be directed into and be received at the input region of each optical fiber and light leaving the output region of each optical fiber emerges at a predesignated one of a set of predetermined separate positions propagated along a predesignated one of a set of predetermined separate directions,

a first optical polarizer,

optical means to receive light propagated from the output region of each optical fiber of the array and direct it through the first optical polarizer to a prespecified one of a set of preselected separate locations,

an arrangement of a multiplicity of magneto-optic light modulators, each on a different part of the surface of a single body, each having an input region at which light can enter and be received, a region in which light can be modulated, and an output region from which modulated light can emerge, each magneto-optic light modulator of the arrangement being controlled separately electrically or electronically to modulate the received light, the disposition of the arrangement being such that the input region of each magneto-optic light modulator of the arrangement coincides with a preestablished one of the set of preselected separate locations and can receive light propagated from a prescribed optical fiber of the array through the optical means and the first optical polarizer,

a second optical polarizer,

whereby light beams passing through the optical fiber array, the optical means, the first optical polarizer, the magneto-optic light modulator arrangement, and the second optical polarizer constitutes separately and independently modulated separately propagated light beams.

4,899,223

ELECTRODE ARRAY FOR AN ELECTROOPTICAL FACSIMILE RECORDER AND METHOD OF CONTROLLING SAID ELECTRODE ARRAY

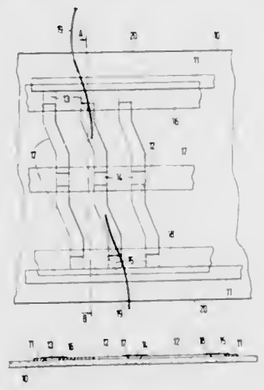
Johann Springer, Aichwald, and Wolfgang Heck, Gerlingen, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Nov. 16, 1988, Ser. No. 272,482

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739381

Int. Cl.[4] G01D *9/42, 15/14*

U.S. Cl. 358—302 **26 Claims**



1. Electrode array deposited on a common surface of an electrooptical substrate so as to form at least three partial lines of electrically, each having at least three independently, controllable light gates, said electrode array comprising

two main electrodes extending parallel to one another in a line direction parallel to said partial lines, and

a plurality of spot electrodes interposed between said two main electrodes in a second direction generally perpendicular to the line direction and electrically isolated from each other and from the main electrodes,

wherein each of the light gates is defined by opposing portions of two adjacent said electrodes.

4,899,224

RECORDING APPARATUS AND METHOD UTILIZING AN ARRAY OF LIQUID CRYSTAL CELLS

Yuji Ooba, Tokyo; Shigeo Sugihara, Kunitachi; Tadaaki Masumori, Kodaira, and Shinichi Shiwa, Yokosuka, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jun. 23, 1988, Ser. No. 210,448

Claims priority, application Japan, Jul. 3, 1987, 62-165186; Dec. 1, 1987, 62-301411; Dec. 1, 1987, 62-301412

Int. Cl.[4] H04N *5/76*

U.S. Cl. 358—332 **27 Claims**

1. A recording apparatus comprising:

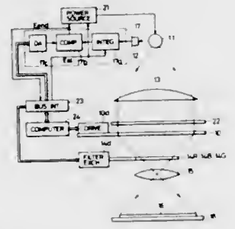
a two-dimensional recording head having windows arranged in a matrix form, said windows being capable of controlling the transmission and interception of light in accordance with a binary image signal representing an image and retaining the transmitting and intercepting states;

write control means for applying said image signal to said two-dimensional recording head so that the light transmitting or intercepting state corresponding to the image is written into each of said matrix-arranged windows in accordance with said image signal, said write control means including means for generating an exposure start signal after completion of writing the light transmitting and intercepting states into said two-dimensional recording head;

light irradiating means disposed on one side of said two-dimensional recording head for irradiating said two-dimensional recording head with light;

holding means fixedly positioned on the other side of said two-dimensional recording head for holding a recording medium;

optical image forming means disposed between said two-dimensional recording head and said holding means for



forming on said recording medium an optical image represented by the light transmitting and intercepting states of said matrix-arranged windows; and

exposure control means for starting exposure of said recording medium to the optical image formed thereupon in response to said exposure start signal and controlling the exposure so that the total quantity of light which has been irradiated on said two-dimensional recording head since the generation of said exposure start signal becomes equal to a predetermined exposure value.

4,899,225

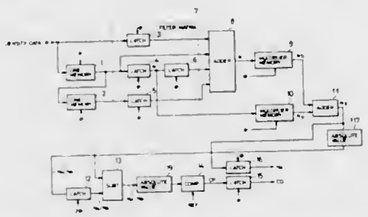
IMAGE PROCESSING METHOD

Kazuyasu Sasuga; Hiroaki Ishizawa; Hisao Suzuki, and Masato Toho, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,129

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—448 **14 Claims**



7. An image processing apparatus for subjecting a plurality of picture elements representing an image comprised of character and half tone areas to a plurality of individual enhancement processings on an area basis, said apparatus comprising:

means for reading out density data corresponding to a respective one of the plurality of picture elements;

a two-dimensional image filter centered around a subject picture element corresponding to one of the plurality of picture elements;

means for switching coefficients of said two-dimensional image filter on a time-sharing basis to a plurality of sets of selected values, at least one of said plurality of sets of selected values corresponding to one of said plurality of individual enhancement processings to output a plurality

of filter outputs corresponding to said plurality of picture elements;

means for selecting one of said character and half tone areas corresponding to said subject picture element, based on said plurality of filter outputs; and

means for subjecting said subject picture element to related enhancement processing in accordance with said selected area corresponding to said subject picture element.

4,899,226

IMAGE READING APPARATUS WHICH CORRECTS FOR A READING ERROR CAUSED BY READING AN IMAGE AT A CONTINUOUSLY-VARIABLE IMAGE READING DENSITY WITH STAGGERED LINE IMAGE SENSORS

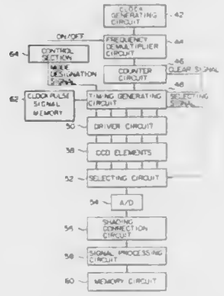
Koji Tanimoto, Yokohama; Kunihiko Miura, Hiratsuka, and Junichi Koseki, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 16, 1987, Ser. No. 134,508

Claims priority, application Japan, Dec. 20, 1986, 61-304363

Int. Cl.[4] H04N *1/393, 1/028, 1/10, 1/12*

U.S. Cl. 358—451 **8 Claims**



1. An image-reading apparatus having a deviation correcting function comprising:

first and second line image sensor means for scanning an object in a main scanning direction and photoelectrically converting light from the object, and having an image reading density variable in a secondary scanning direction perpendicular to said main scanning direction, said first and second line image sensor means arranged in two rows separated in said secondary scanning direction such that said first line image sensor means reads an image of the object earlier than said second line image sensor means;

memory means for storing a plurality of drive signals corresponding to the separation of the first and second line image sensor means in the secondary scanning direction and a plurality of image reading densities;

designating means for designating one of the drive signals stored in the memory means which corresponds to a current image reading density of the first and second line image sensor means; and

drive means for supplying said designated drive signal to said first and second line image sensor means in response to the designation by said designating means.

4,899,227

IMAGE PROCESSING APPARATUS DETECTING THE SIZE OR POSITION OF AN INFORMATION PORTION OF AN ORIGINAL

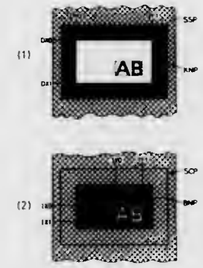
Masanori Yamada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1988, Ser. No. 147,357

Claims priority, application Japan, Jan. 26, 1987, 62-17054; Mar. 12, 1987, 62-57361

Int. Cl.[4] H04N *1/393, 1/387, 1/40*

U.S. Cl. 358—452 **9 Claims**



1. An image processing apparatus comprising:

an original supporting table for supporting an original, the original having an information portion and a non-information portion;

reading means for reading an area of said table including an area on which the original is placed, and for generating image data corresponding to the read area;

first detector means for detecting the position of the original on said table based on image data from said reading means; and

second detector means for detecting the position or the size of the information portion of the original based on image data from said reading means.

4. An image processing apparatus comprising:

an original supporting table for supporting an original, said original having an information portion and a non-information portion;

reading means for reading an area of the table including and area on which the original is placed and for generating image data corresponding to the read area;

first detector means for detecting the position or size of the original on said table based on image data from said reading means;

second detector means for detecting the position or size of the information portion of said original based on image data from said reading means; and

process means for processing image data from said reading means based on either the result of the detection by said first detector means or the result of the detection by said second detector means.

7. An image processing apparatus comprising:

an original supporting table for supporting an original, said original having an information portion and non-information portion;

reading means for reading an area of said table including an area on which the original is placed, and for generating image data corresponding to the read area;

detector means for detecting the position or size of the information portion of said original based on image data from said reading means; and

process means for processing image data corresponding to the information portion of the original based on the result of the detection by said detector means.

4,899,228

MANUALLY SWEEPING APPARATUS WITH IMAGE SENSOR

Teruo Sano, Kawasaki, and Masaharu Shioya, Akikawa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

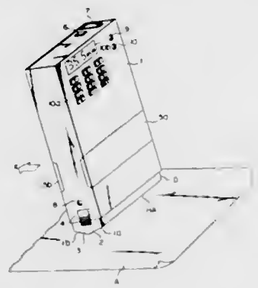
PCT No. PCT/JP87/00380, § 371 Date Feb. 3, 1988, § 102(e) Date Feb. 3, 1988, PCT Pub. No. WO87/07804, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 12, 1987, Ser. No. 171,873

Claims priority, application Japan, Jun. 12, 1986, 61-134893; Dec. 24, 1986, 61-309421

Int. Cl.⁴ H04M *1/04*

U.S. Cl. 358—473 **17 Claims**



1. A manually sweeping apparatus, including a manually manipulatable housing, said housing comprising:

reading means having a reading area with a predetermined length, for reading image information on a material and for producing image information signals in accordance with the image information, while said housing is manually swept across the material in a direction substantially perpendicular to a direction of the length of the reading area;

memory means for storing the image information signals produced by said reading means;

designating means for designating a reading length over which the image information will read, said reading length being in a direction of the length of said reading area;

position detecting means for detecting a relative position of said housing with respect to said material while said housing is being swept across said material, and for producing a position signal every time said housing is swept over a predetermined distance, said position signal representing the position of said housing with respect to said material; and

storing control means for controlling a storing operation of said memory means in response to the reading length designated by said designated means, and for storing the image information signals produced by said reading means into said memory means, said image information signals corresponding to image information which exists on said material in the reading length designated by said designating means.

4,899,229

VIDEO INFORMATION EDITING SYSTEM FOR PROVIDING VIDEO DATA IN A CONTROLLED FORMAT

Masashi Hashimoto, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1988, Ser. No. 158,431

Claims priority, application Japan, Feb. 2, 1987, 62-38631

Int. Cl.⁴ G11B *27/02*

U.S. Cl. 360—141 **15 Claims**

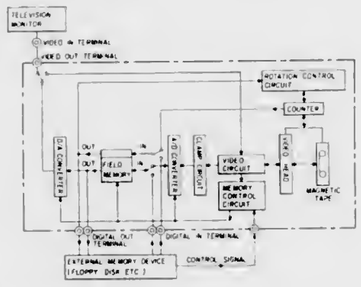
1. A video information editing system for providing the video data produced on a video tape by a video tape recorder/-playback device in a controlled format to permit selective viewing of the video data as graphically displayed on a video monitor upon playback thereof, said video information editing system comprising:

a video tape recorder/playback device including video head means and adapted to contain a video tape;

field memory means having memory storage for storing at least one frame of video data, said field memory means being operably connected to said video tape recorder/-playback device;

video data write means connected to the output of said video tape recorder/playback device for accepting analog video data from a video tape upon reproduction thereof;

analog-digital converter means interposed between said video data write means and said field memory means for converting analog video data from the output of said



video data write means into digital video data for input to said field memory means;

memory control means connected between said video data write means and said field memory means for regulating the writing of video data from said video data write means into said field memory means;

interface means operably connected to said field memory means and to said video tape recorder/playback device, said interface means being adapted to be connected to external memory means to control the writing of digital video data from said field memory means into the external memory means and from the external memory means into said field memory means; and

digital-analog converter means connected to the output of said field memory means to convert the digital video data output therefrom into analog video data for input to a video monitor for graphic display thereof.

4,899,230

TAPED DATA COPYING UTILIZING MULTIPLE ADDRESSABLE MEMORIES

Jay G. Sherritt, Boulder, Colo., assignor to IDB Corporation, Boulder, Colo.

Filed Dec. 22, 1987, Ser. No. 137,523

Int. Cl.⁴ G11B *5/86*

U.S. Cl. 360—15 **21 Claims**

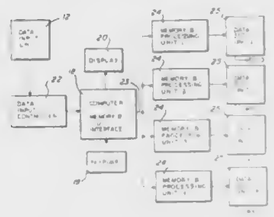
1. A device for generating multiple copies of data stored on a master, said device comprising:

means for reading said data stored on said master and, without contemporaneous storage of a substantial amount of said data thereat, providing output indicia indicative thereof;

a broadcast line for receiving said indicia from said read means and directly broadcasting said indicia thereon;

a plurality of memory means connected with said broadcast line so that each of said plurality of memory means receives said indicia and stores a representation thereof, and with each of said memory means providing from said representations said indicia as the output therefrom; and

a plurality of copying means each of which is connected with a different one of said plurality of memory means to



receive said indicia therefrom, each of said copying means, responsive to receipt of said indicia from said memory means connected therewith, generating a copy of said master.

4,899,231

VIDEO CAMERA AND SEPARABLE VIDEO RECORDER/REPRODUCER ARRANGEMENT

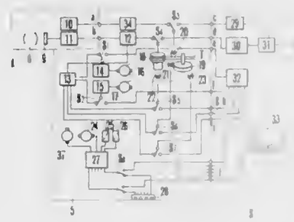
Masaya Maeda; Hiroyuki Takimoto, and Susumu Kozuki, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 153,463, Feb. 1, 1988, abandoned, which is a continuation of Ser. No. 57,714, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 729,682, May 2, 1985, abandoned, which is a continuation of Ser. No. 351,605, Feb. 23, 1982, Pat. No. 4,531,164. This application Feb. 8, 1989, Ser. No. 309,045

Claims priority, application Japan, Feb. 26, 1981, 56-27140; Mar. 6, 1981, 52-32106; Mar. 6, 1981, 52-32107; Jun. 24, 1981, 56-97913

Int. Cl.⁴ H04N *5/782*

U.S. Cl. 360--33.1 **7 Claims**



1. An information signal recording apparatus, comprising:

(a) a rotary head for recording information signals on a tape-shaped recording medium;

(b) a cylindrical member for supporting the rotary head, said cylindrical member having a peripheral surface;

(c) a head driving motor for rotating the rotary head at a predetermined speed;

(d) tape loading means for shifting the tape-shaped recording medium between a first position in which said medium does not contact the peripheral surface of the cylindrical member, and a second position in which said medium is aligned with the peripheral surface;

(e) a power source for generating electrical power;

(f) a power switch which can be changed over between a first condition and a second condition by one stroke of a manual operation and supplies said electrical power to said head driving motor and said tape loading means when it is in the first condition, and does not supply the electrical power to said head driving motor and said tape loading means when it is in the second condition, said power switch being directly connected to said power source;

(g) a trigger switch operated by a manual operation for instructing a recording start by said rotary head, said trigger switch being invalid while said power switch is in said second condition; and

(h) a control circuit responsive to the manual operation for changing over said power switch from said second condition to said first condition, for controlling said head driving motor and said tape loading means, so that said rotary head rotates at the predetermined speed and the tape-shaped recording medium is shifted from the first position to said second position.

4,899,232

APPARATUS FOR RECORDING AND/OR REPRODUCING DIGITAL DATA INFORMATION

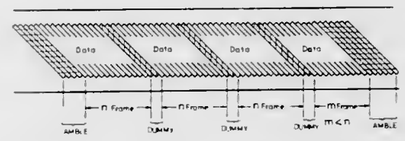
Kentaro Odaka, Tokyo; Shinya Ozaki, Kanagawa; Masaki Yamada, Kanagawa; Hiroshi Ishibashi, Kanagawa, and Yoshizumi Inazawa, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 5, 1988, Ser. No. 177,624

Claims priority, application Japan, Apr. 7, 1987, 62-085388; Jun. 15, 1987, 62-148174; Jun. 25, 1987, 62-158346; Jun. 26, 1987, 62-158885

Int. Cl.⁴ G11B *5/09*

U.S. Cl. 360—48 **6 Claims**



1. An apparatus for recording digital data information on a recording medium, comprising:

(a) recording means for recording inputted digital signals in separate frames, each one of which is made up of two oblique tracks; and

(b) control means for dividing said inputted digital data information into N frames, where N is an integer, interspersing between each such N frames of inputted digital data information a predetermined number of frames of non-inputted digital data information, and supplying the divided inputted digital data information and non-inputted digital information to said recording means whereby between every N frames of recorded inputted digital data information there are a predetermined number of frames of recorded non-inputted digital information.

4,899,233

APPARATUS FOR REPRODUCING A MAGNETICALLY RECORDED DIGITAL SIGNAL USING A ROTARY HEAD WITH AUTOMATIC TRACK FINDING SIGNAL EXTRACTION AND SELECTION FOR TRACKING CONTROL

Shiro Yoshida, Maebashi, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 21, 1988, Ser. No. 171,079

Claims priority, application Japan, Mar. 20, 1987, 62-66534

Int. Cl.⁴ G11B *5/52*

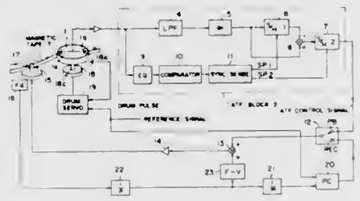
U.S. Cl. 360—77.14 **3 Claims**

1. An apparatus for reproducing a recorded digital signal using a rotary head which recorded digital signal is a multiple signal including pulse code modulated sound data of a fixed time period duration obtained by applying a pulse code modulation to an audio signal, subcodes time-divisionally multi-

plexed before and after said pulse code modulated sound data by predetermined time periods, respectively, and a track finding signal, and which recorded digital signal is recorded on tracks formed in succession on a magnetic tape by a rotary head in a first mode, or in a second mode where its data capacity per unit time is nearly one-half of that in said first mode and in which second mode a revolving speed of said rotary head and a magnetic tape running speed are nearly one-half of those in said first mode, thus to reproduce a signal including cross-talk components of a pilot signal from an adjacent track and having been recorded on said recorded magnetic tape, said apparatus comprising:

an automatic track finding signal selecting and extracting circuit means for forming a start signal by using input data read from said tape and a clock;

a timing signal generating circuit means for responding to said start signal from said automatic track finding signal



selecting and extracting circuit means to count clock periods, thus to generate a trigger signal every time the count value thereof reaches a first predetermined value and to form a reset signal every time said count value thereof reaches a second predetermined value larger than said first predetermined value;

a sampling signal generating circuit means reset by said reset signal and counting clock periods, for forming a sampling signal every time said sampling signal generating circuit means counts a predetermined number of clock periods in accordance with said trigger signal;

a sensing circuit means for sensing an automatic track finding signal in said reproduced signal in accordance with said sampling signal from said sampling signal generating circuit means; and

means for generating a tracking error signal from said sampling signal and said cross-talk components.

4,899,234

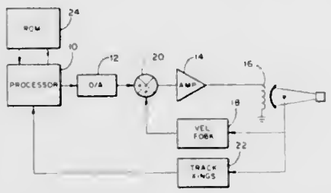
ADAPTIVE VELOCITY PROFILE FOR DISK ACTUATOR CONTROL

Stephen R. Genheimer, Yukon, Okla., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Apr. 4, 1988, Ser. No. 177,301

Int. Cl.[4] G11B *5/55, 21/08*

U.S. Cl. 360—78.06 **6 Claims**



5. The method of moving a head from a first position adjacent a first track on a disk to a second position adjacent second track on the disk, comprising

accelerating said head to a predetermined maximum velocity,

measuring the time required to accelerate said head to a predetermined position, the velocity of said head at said predetermined position being less than or equal to said maximum velocity,

identifying the time required to accelerate said head to said predetermined position under "worst case" acceleration conditions,

calculating a performance factor based on the ratio of the measured and identified times,

identifying a third position for said head where deceleration of said head is expected to commence to halt movement of said head at said second position under "worst case" deceleration conditions,

determining a fourth position of said head, between said third and second positions, based on the third position and said performance factor, and

commencing deceleration of said head when said head reaches its fourth position.

4,899,235

MAGNETIC TAPE LOADING MECHANISM AND METHOD

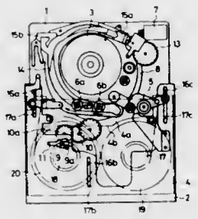
Kiyoshi Kano; Nobuyuki Kaku; Atsuo Osawa; Shinya Fujimori, all of Yokohama, and Yoshihiro Fukagawa, Katsuta, all of Japan, assignors to Hitachi Video Engineering, Inc., Yokohama and Hitachi, Ltd., Tokyo, both of, Japan

Filed Feb. 4, 1988, Ser. No. 152,377

Claims priority, application Japan, Feb. 10, 1987, 62-29308

Int. Cl.[4] G11B *15/66*

U.S. Cl. 360—85 **9 Claims**



1. A magnetic tape cassette loading mechanism comprising a rotary cylinder on which a magnetic head is provided, cassette receiving means on which a magnetic tape-carrying cassette is to be set, a tape loading mechanism having a tape loading arm and being adapted to withdraw said magnetic tape from said cassette by said tape loading arm and wind said magnetic tape around said rotary cylinder, a cassette moving mechanism adapted to start moving said cassette toward said rotary cylinder a predetermined period of time after the starting of movement of said tape loading arm and complete the movement of said cassette before the completion of movement of said tape loading arm, and supporting means having a first chassis for supporting said rotary cylinder, said cassette receiving means, said tape loading mechanism and said cassette moving mechanism.

4,899,236

RECORDING OR REPRODUCING APPARATUS USING CONTAINER MOUNTED STRIP-LIKE RECORDING MEDIUM

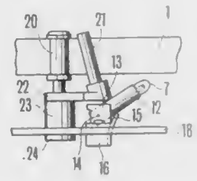
Hiroo Edakubo, Tokyo; Takashi Itani; Takashi Narasawa, both of Kanagawa; Tatsuzo Ushiro, Tokyo; Hiroshi Watanabe, Tokyo, and Masahide Hasegawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 861,108, May 6, 1986, abandoned, which is a continuation of Ser. No. 437,470, Oct. 28, 1982, abandoned. This application Jan. 13, 1988, Ser. No. 145,657

Claims priority, application Japan, Nov. 5, 1981, 56-177450; Nov. 5, 1981, 56-177449

Int. Cl.[4] G11B *15/665*

U.S. Cl. 360—95 **10 Claims**



1. A recording and/or reproducing apparatus using a strip-like recording medium in a container, the apparatus comprising:

(a) recording and/or reproducing means for recording and/or reproducing a signal on and or from the recording medium;

(b) loading means for taking out the strip-like recording medium from the container for recording and/or reproducing by said recording and/or reproducing means;

(c) light emitting and/or light receiving means for detecting a specified part of the strip-like recording medium, the specified part having a characteristic different from other parts of the medium;

(d) supporting means for supporting at least a part of said light emitting and/or light receiving means so that it is shiftable between a first position outside a space through which the medium is passed by the taking out operation of said loading means and a second position located within said space; and

(e) positioning means for positioning said part of the light emitting and/or light receiving means at said first position during a term when said medium is passing said second position by the taking out operation of said loading means and for positioning said part of the light emitting and/or light receiving means at said second position after said medium has passed said second position.

4,899,237

DIVIDED HOUSING FOR SUPPORTING MAGNETIC DISKS

Kazunori Tochiyama, Kawasaki, and Takahisa Mihara, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 142,999, Jan. 12, 1988, abandoned. This application Jun. 15, 1939, Ser. No. 366,366

Claims priority, application Japan, Jan. 14, 1987, 62-004993

Int. Cl.[4] G11B *5/012, 17/08*

U.S. Cl. 360—98.02 **9 Claims**

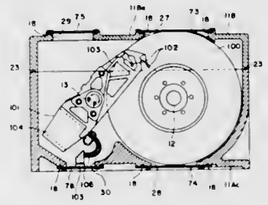
1. A housing for supporting a magnetic disk pack and a magnetic head positioner therein, said magnetic disk pack including a plurality of magnetic disks supported by a first spindle having opposite ends, said magnetic head positioner including a second spindle having opposite ends and supporting a plurality of arms, each arm carrying a magnetic head, the housing comprising:

a shell having an open end, a closed end and two opposite sidewalls, said shell having a one-piece construction;

a cover detachably connected to the open end of said shell, said cover having a one-piece construction:

said shell and cover having open edges which are coplanar when joined to each other to form a chamber which encloses said magnetic disk pack and said magnetic head positioner therein, thereby mechanically sealing the magnetic disk pack and magnetic head positioner off from the exterior of the chamber;

said shell mechanically supporting both of said magnetic disk pack and said magnetic head positioner, and said cover closing the open end of the shell through which said



magnetic disk pack and said magnetic head positioner are inserted; and

a first pair of supporting means mounted in a first pair of axially aligned circular holding holes, one hole of each pair being formed in each of the two opposite sidewalls of said shell for receiving a corresponding one of the first pair of supporting means which supports said first spindle at opposite ends thereof, each hole of the first pair of circular holding holes having a continuous circumferential edge;

the plane containing said open edges of said shell and cover being-non-intersecting with and non-tangent to said first pair of holding holes and said first pair of supporting means.

4,899,238

CARTRIDGE SHUTTER ACTUATING DEVICE IN RECORDING AND/OR REPRODUCING APPARATUS

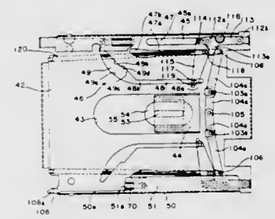
Yoshihisa Inoue, Saitama, and Yasunori Arai, Tokyo, both of Japan, assignors to Nakamichi Corporation, Tokyo, Japan

Filed Oct. 31, 1988, Ser. No. 265,212

Claims priority, application Japan, Oct. 31, 1987, 62-276778

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—99.06 **6 Claims**



1. A device for opening a laterally slideable shutter of a disc cartridge along with insertion of the disc cartridge in a disc cartridge inserting direction into a holder of a recording and/or reproducing apparatus for performing recording and/or reproducing operation on a disc-shaped recording medium contained in the disc cartridge, comprising;

at least one arm member rotatable about a pivot provided at

one end thereof and having at the other end a first engaging portion adapted to be in engagement with said shutter substantially during insertion of said disc cartridge;

first guide means extending in an oblique direction between the cartridge inserting direction and a direction in which said shutter is slid to open for guiding therealong a second engaging portion of said arm member during insertion of said disc cartridge, thereby rotating said arm member to open said shutter due to continued engagement thereof with said first engaging portion;

supporting means for moveably supporting said pivot of said arm member while said second engaging portion is being guided along said first guide means; and

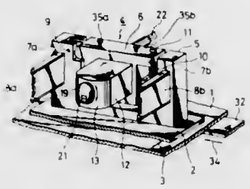
spring means for biasing said arm member toward a direction opposite to the cartridge inserting direction.

4,899,239

AUTO-REVERSE TAPE RECORDER OF THE HEAD TURNING OVER TYPE

Kunio Kido, Wako, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1987, Ser. No. 99,604
Claims priority, application Japan, Mar. 3, 1987, 62-46763
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—106 **9 Claims**



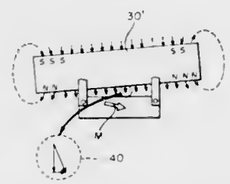
1. A tape recorder of the automatic reversing type, comprising a head mount, a magnetic head structure including a magnetic head, means on said head mount for mounting said magnetic head for rotation around an axis at a substantially fixed position on said head mount, said head mount being mounted for movement between an inoperative position and an operative position in which at least part of said magnetic head structure is received in a tape cassette loaded in position in said tape recorder and said magnetic head contacts with a tape in the tape cassette in order to effect recording or reproduction of the tape, a pair of fixed tape guides secured to said head mount for contacting, at opposite positions within respect to said magnetic head, with the tape to inhibit lateral widthwise movement of the tape w hen said head mount is in its operative position, and a head turning over mechanism operable in response to a tape feeding direction reversing signal for rotating said magnetic head structure substantially by an angle of 180° degrees around its axis of rotation with said magnetic head held in contact with the tape in order to allow said magnetic head to subsequently record on or reproduce from the tape during subsequent feeding of the tape in the reverse direction, wherein said head mount includes a fixed base member secured to a head plate which is mounted for movement toward and away from the tap cassette loaded in position, said magnetic head structure being coupled to said fixed base member, said head mount further including a movable base member mounted on said fixed base member in such a manner as to allow adjustment of the position of said movable base member in a lateral widthwise direction of the tape.

4,899,240

BIASING FOR A UMR HEAD

Richard J. McClure, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,416
Int. Cl.[4] G11B *5/39*
U.S. Cl. 360—113 **10 Claims**



1. A substantially unshielded magnetoresistive head comprising

a. an elongated thin-film structure having an easy axis of magnetization that is generally along the length of said film, and having a hard axis of magnetization that is generally in the plane of and perpendicular to the easy axis of the film, and

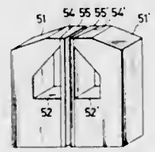
b. single magnetic means in proximity to said film and having a composite field exiting therefrom which has first and second field components cooperative with said film, said first field component being in the direction of the easy axis of said film, and said second component being in the direction of the head axis of said film.

4,899,241

METHOD OF MANUFACTURING A MAGNETIC HEAD HAVING A THIN FILM IN A PORTION OF ITS CORE

Hideaki Miyakawa, and Makoto Kameyama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 20,176, Feb. 27, 1987, abandoned, which is a continuation of Ser. No. 621,718, Jun. 18, 1984, abandoned. This application Jan. 28, 1988, Ser. No. 149,945
Claims priority, application Japan, Jul. 5, 1983, 58-121908
Int. Cl.[4] G11B *5/16*
U.S. Cl. 360—125 **14 Claims**



1. A method for manufacturing a magnetic head which forms a track of a predetermined track width on a magnetic recording medium, comprising the steps of:

depositing a thin film of a non-magnetic material on at least a portion of a first surface of a magnetic member;

depositing a magnetic thin film on said non-magnetic thin film to form a laminated block, the direction of growth of said magnetic film being substantially perpendicular to said first surface;

cutting said laminated block in a plurality of planes parallel with each other to form a plurality of magnetic head core blocks, wherein the planes cross through said magnetic member, said non-magnetic thin film and said magnetic thin film, and an interval of two adjacent planes of said plurality of planes corresponding to the predetermined track width; and

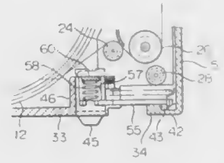
bonding two reinforcing members of a non-magnetic material on two opposing surfaces of at least one of said magnetic head core blocks provided by said two adjacent planes of said cutting step.

4,899,242

LOCKING MECHANISM OF MAGNETIC TAPE CASSETTE

Kenji Hashizume, Nagano; Masaru Ikebe, Komoro; Masatoshi Okamura, Saku, and Haruo Shiba, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 6, 1988, Ser. No. 215,833
Claims priority, application Japan, Jul. 9, 1987, 62-104487; Jul. 9, 1987, 62-104488; Jul. 9, 1987, 62-104489; Jul. 9, 1987, 62-104490
Int. Cl.[4] G11B *23/08*
U.S. Cl. 360—132 **5 Claims**



1. A front cover locking mechanism in a magnetic tape cassette to be used in a recorder, comprising a cassette case having a front portion having opposite lateral ends, a front cover provided with end plates juxtaposed with the respective lateral ends of said case, said front cover being pivotally mounted on said lateral ends of said front portion of the case at said end plates for opening and closing said front portion of the cassette case and a front cover locking mechanism,

said front cover locking mechanism including a locking lever slidably mounted in at least one of the said lateral ends of said case, a compression coil spring for biasing the locking lever and an anchoring means provided in said end plate, said locking lever comprising an elongated slide member slidably guided by a guiding mechanism formed in said lateral end of the cassette case, a free end engageable by an unlocking means in the recorder to unlock the locking lever and an anchoring click facing the end plate of said front plate and adapted to engage the anchoring means of said end plate under the action of said compression coil spring, which normally biases said locking lever toward the end plate.

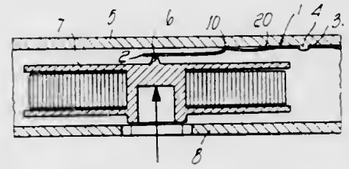
4,899,243

FLAT SPRING STRUCTURE FOR MAGNETIC TAPE CASSETTES, IN PARTICULAR VIDEO CASSETTES

Abramo Bordignon, Senago, Italy, assignor to A.T.B. S.p.A., Senago MI, Italy

Filed Dec. 8, 1987, Ser. No. 130,254
Claims priority, application Italy, Dec. 23, 1986, 24218/86[U]; Dec. 23, 1986, 24219/86[U]
Int. Cl.[4] G11B *23/02*
U.S. Cl. 360—132 **9 Claims**

1. Flat spring structure for magnetic tape cassettes, in particular video cassettes, comprising an elastic lamina with an elongated configuration which is coupleable, at a middle portion thereof, with the cover of a cassette and acting, proximate to its free ends, on the central pivot of the reels supporting the magnetic tape, said spring comprising, on the side facing towards said reels, the configuration of a concave piecewise line with at least one fold line in the portion comprised between the free end and the zone of coupling with the cover, said fold line, with said elastic lamina inserted in said cassette, being adapted to engage by contact with said cover to define at least one fulcrum point for elastic oscillation of said lamina, said fulcrum point having a distance from said pivot of the reel



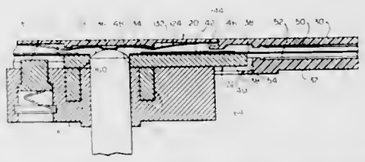
which is smaller than the distance between said pivot and said zone of coupling with the cover.

4,899,244

DISK CARTRIDGE WITH HUB SEAL

John B. Morse, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 28, 1988, Ser. No. 225,463
Int. Cl.[4] G11B *23/03, 17/022*
U.S. Cl. 360—133 **17 Claims**



1. A disk cartridge for use with a disk drive having a rotor, including a spindle, for rotating a disk, said cartridge comprising:

a disk having a recording medium thereon and including a hub having a spindle receiving central aperture through which the spindle extends and protrudes when said hub is in engagement with the rotor;

a case enclosing said disk, said case including first and second walls disposed on opposite sides of said disk, said first wall having an access opening therein providing access for the rotor to engage said hub when said cartridge is operatively positioned in the disk drive;

means, within said case disposed in a first position engaging disk when said cartridge is not operatively positioned in the disk drive, for urging said disk toward said first wall so that said hub closes said access opening and said urging means closes said central aperture to prevent entry of disk contaminants therethrough, said urging means being displaceable from said first position by said spindle protruding from said central aperture, when said cartridge is operatively positioned in the disk drive, to a second position wherein said urging means is disengaged from said disk to free said disk for rotation.

4,899,245

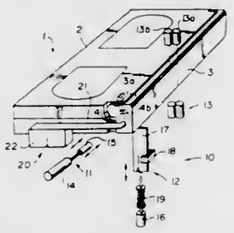
METHOD OF CHECKING MAGNETIC TAPE CASSETTE LID OPENING OPERATION

Kazuo Kubota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 27, 1988, Ser. No. 212,380
Claims priority, application Japan, Jul. 1, 1987, 62-164688
Int. Cl.[4] G11B *23/00*
U.S. Cl. 360—137 **1 Claim**

1. A method of checking a videotape cassette for opening and closing function of a cassette cover which is mounted on a cassette casing to be movable between a closed position and an open position and is urged toward the closed position by a

closing spring, the cassette casing being provided with a lock mechanism having a lock member which is movable between a locking position in which it is engaged with the cassette cover in the closed position to lock the cassette cover to the closed position, and a lock releasing position in which it releases the cassette cover, and a locking spring which normally urges the the lock member toward the locking position,



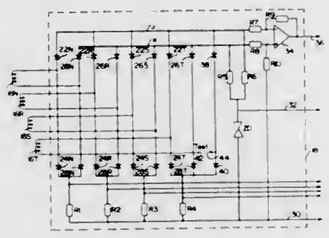
said method comprising steps of urging the lock member toward the lock releasing position, releasing the lock member, urging the cover toward the open position, releasing the cover, subsequently detecting the position of the cover, urging the lock member to the lock releasing position, bringing the cover to the open position with the lock member held in the lock releasing position, releasing the cover and detecting the position of the cover.

4,899,246

SOLID-STATE TRIP DEVICE COMPRISING A ZERO SEQUENCE CURRENT DETECTION CIRCUIT

Paul Tripodi, Eybens, France, assignor to Merlin Gerin, France

Filed Mar. 1, 1988, Ser. No. 162,592
Claims priority, application France, Mar. 9, 1987, 87 03291
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—44 **7 Claims**



1. A multipole electrical circuit breaker, protecting an A.C. electrical supply system, including a solid-state trip device, comprising:

a current sensor per pole, which generates a signal proportional to the current flowing through the associated conductor of the supply system protected by the circuit breaker;

a detection and rectification circuit to which said signals are applied to supply on the one hand signals representative of the currents flowing through the conductors to be protected and on the other hand a zero sequence signal if an insulation fault occurs; and

an electronic processing unit to which the output signals from the detection and rectification circuit are applied to perform delayed and/or instantaneous tripping functions and delivering, with or without a time delay, a circuit breaker tripping order when preset thresholds are exceeded by the signals representative of the currents flowing through the conductors or by the zero sequence signal,

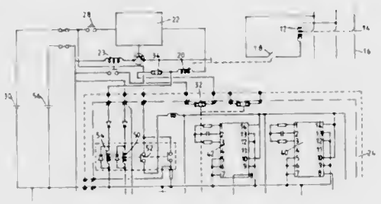
wherein the detection and rectification circuit comprises first rectification means producing a first signal representative of the sum of the positive half-waves of the output signals from the set of current sensors, second rectification means producing a second signal representative, in absolute value, of the sum of the negative half-waves of the output signals from the set of current sensors, and means effecting the difference between the first and second summed signals so as to produce said zero sequence signal.

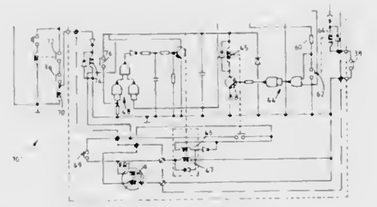
4,899,247

AUTO RECLOSER COIL BURN-OUT PROTECTION

John S. Stewart, Nottingham, United Kingdom, assignor to Brush Switchgear Limited, Loughborough, England

Filed Jul. 6, 1988, Ser. No. 215,731
Claims priority, application United Kingdom, Jul. 7, 1987, 8715934
Int. Cl.[4] H02H *3/07*
U.S. Cl. 361—72 **16 Claims**





1. An auto-recloser for a power line comprising:

main contacts coupled to the power line;

a high voltage closing coil means for closing the main contacts of the auto-recloser in the power line;

non-latching switch means for controlling energising of said closing coil;

a control circuit for generating a closing pulse to close said non-latching switch means; and

circuit means for monitoring the status of said main contacts and preventing energising of said closing coil in response to said main contacts being open a preselected time after generation of said closing pulse;

wherein said control circuit comprises a low voltage coil means for closing said switch means in response to application of said closing pulse; and second switch means controlled by said circuit means for controlling application of said closing pulse to said low voltage coil means; and

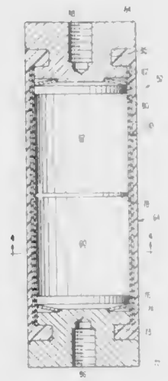
wherein said second switch means includes a first, set coil means energisable to actuate said second switch means to prevent application of said closing pulse to said low voltage coil means and a second, reset coil means energisable to reset said second switch means.

4,899,248

MODULAR ELECTRICAL ASSEMBLIES WITH PLASTIC FILM BARRIERS

Donald E. Raudabaugh, Wadsworth, Ohio, assignor to Hubbell Incorporated, Orange, Conn.

Continuation-in-part of Ser. No. 33,765, Apr. 3, 1987, which is a continuation-in-part of Ser. No. 681,800, Dec. 14, 1984, Pat. No. 4,656,555. This application Mar. 31, 1988, Ser. No. 176,319
Int. Cl.[4] H02H *1/04*
U.S. Cl. 361—127 **22 Claims**



1. A modular electrical assembly, comprising:

a plurality of conductive electrical components, aligned in a column along an axis and having axially directed ends, said electrical components being electrically connected at said axially directed ends;

a plastic film barrier laterally surrounding and tightly engaging said electrical components;

first and second conductive end members located at opposite ends of said column, said end members having shoulders extending radially relative to said axis; and

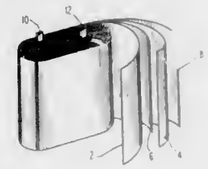
a non-conductive filament winding wrapped about said plastic film barrier, said electrical components and said end members, engaging said shoulders and applying an axially directed compressive force through said shoulders on said electrical components and end members to maintain electrical connection therebetween, said plastic film barrier separating said non-conductive filament winding from said electrical components.

4,899,249

FLUORINE-CONTAINING DIELECTRIC MEDIA AND CAPACITORS EMPLOYING SUCH MEDIA

James L. Reilly, Towamencin; Ludwig K. Huber, Wayne, and Gordon R. Leader, Chester, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 21, 1988, Ser. No. 184,524
Int. Cl.[4] H01G *4/22;* **H01B** *3/24;* **H01F** *27/12*
U.S. Cl. 361—317 **13 Claims**



1. A dielectric medium containing an effective amount of a compound, or mixtures thereof, having one of the following formulae:

(c) $R^1(SO_2NR^2R^3)_m$, or (d) $(R^1SO_2N)_mR^2{}_nR^3{}_o$

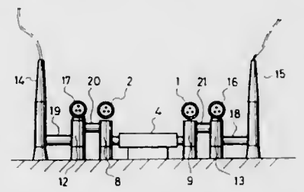
wherein R^1 is a saturated or unsaturated alkyl or unsubstituted mono- or polyfunctional hydrocarbon radical having 1 to 12 carbon atoms, a cycloalkyl radical having 3 to 12 carbon atoms, an aryl radical having 6 to 12 carbon atoms or an alkaryl radical having 1 to 6 carbon atoms in the alkyl moiety, said radicals substituted with at least two fluorine atoms, R^2 and R^3 are the same or different and independently selected from saturated and unsaturated alkyl or unsubstituted mono- or polyfunctional hydrocarbon radicals having 1 to 12 carbon atoms, cycloalkyl radicals having 3 to 10 carbon atoms, aryl radicals having 6 to 10 carbon atoms or alkaryl radicals having 1 to 6 carbon atoms in the alkyl moiety, R^2 and R^3 may together form the ring of a single cycloalkyl radical having 3 to 10 carbon atom, m, n and o are independently integers of from 1 to 5.

4,899,250

GAS INSULATED SWITCHGEAR WITH CIRCUIT BREAKERS PERPENDICULAR TO MAIN BUSES

Kosaku Itai, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,759
Claims priority, application Japan, Oct. 26, 1987, 62-271169
Int. Cl.[4] H02B *1/20*
U.S. Cl. 361—341 **5 Claims**



1. A gas insulated switchgear comprising:

a pair of main buses which are disposed in substantial parallelism with each other;

a plurality of circuit breakers which are parallelly aligned in a spaced defined between said main buses with a substantial right angle to said main buses, said circuit breakers being electrically connected in series with each other between said main buses;

a plurality of connection buses each electrically connecting an adjacent two of said circuit breakers, each of said connection buses being electrically connected to a feeder;

a plurality of main disconnecting switches which are connected to said circuit breakers in series with each other between said main buses, said main disconnecting switches being disposed above extended axial centerlines of said circuit breakers at respective ends of said circuit breakers; and

a plurality of feeder disconnecting switches connecting each of said connection buses to said feeder;

wherein said connection buses connect an adjacent two of said circuit breakers through an adjacent two of said disconnecting switches; and

wherein said main buses are disposed above said main disconnecting switches, and said connection buses are disposed above said feeder disconnecting switches.

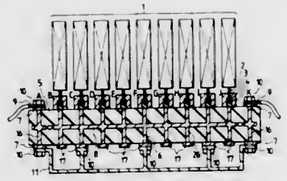
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4,899,251

POWER SUPPLY NETWORK OF PRINTED CIRCUIT BOARD

Tsutomu Imai, and Norio Sengoku, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 264,039
Claims priority, application Japan, Oct. 29, 1987, 62-274432
Int. Cl.[4] H05K *1/00*
U.S. Cl. 361—346 **20 Claims**



1. A power supply network for supplying power to a plurality of loads attached on one of two surface planes of a printed circuit board, comprising:

an internal conductor network on a plane in said printed circuit board;

a plurality of first through hole conductors intersecting said internal conductor network and being electrically connected to at least one of said loads;

at least one horizontal bus attached on the other surface plane of said printed circuit board and being electrically connected within said printed circuit board to said first through hole conductors;

a power supply conductor attached on one of the surface planes of said printed circuit board; and

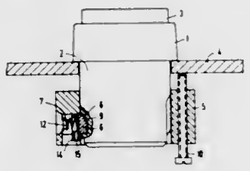
second through hole conductors electrically isolated within said printed circuit board from said internal conductor network and from said first through hole conductors, and said second through hole conductors being electrically connected to said bus and to said power supply conductor so as to minimize dispersions of feeding voltages to said loads fed from said power supply conductor.

4,899,252

MOUNTING FOR A CONTROL DEVICE

Josef Birzer, Schwandorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 2, 1989, Ser. No. 318,072
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 8802896
Int. Cl.[4] H02B *1/04*
U.S. Cl. 361—350 **6 Claims**



1. An arrangement for mounting a control switch mechanism in a control panel;

the control panel having a first side, a second side and a borehole extending between the first side and the second side;

the control switch mechanism including a rim portion and a cylindrical portion, the rim portion resting on the first side of the control panel, the cylindrical portion extending through the borehole and including a plurality of recesses;

a holder, for connecting the cylindrical portion to the second side of the control panel, the holder having a first side facing the second side of the control panel and a second side which is remote from the control panel and the holder including an opening for receiving the cylindrical portion, the holder further comprising a plurality of symmetrically disposed locking bolts, the locking bolts being slidable in a predetermined direction between a first position in which the bolts extend into the opening and a second position in which the locking bolts do not extend into the opening, and a spring associated with each one of the plurality of locking bolts for biasing the locking bolts toward the first position, the locking bolts being movable against the bias of the springs into the second position and each one of the plurality of locking bolts being movable into the opening and into engagement with one of the plurality of recesses formed in the cylindrical portion when the cylindrical portion is received in the opening; and

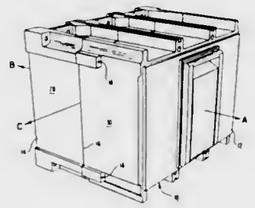
a plurality of clamping bolts, each clamping bolt being screwed into the holder and including a portion engaging the second side of the control panel.

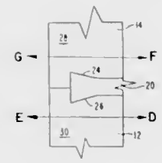
4,899,253

MOLDED CASE CIRCUIT BREAKER HOUSING REINFORCEMENT

Clifford A. Buxton, Lawrenceville, Ga., assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Sep. 19, 1988, Ser. No. 246,470
Int. Cl.[4] H02B *1/04*
U.S. Cl. 361—376 **6 Claims**





1. A circuit breaker having a molded housing, the housing comprising:

a housing reinforcing means; and

a first portion and a second portion, wherein the first and second portions each comprise a first side wall and a second side wall, wall, each side wall having a surface at which the portions are joined, each surface including an elongated groove for accepting the housing reinforcing means, the housing reinforcing means being adapted to rest within the elongated grooves;

the housing reinforcing means comprising:

a first member adapted to rest within the elongated grooves of the first side wall; and

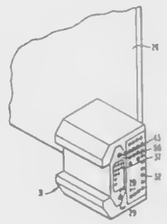
a second member adapted to rest within the elongated grooves of the second side wall, wherein the first and second members have a substantially dovetail cross-section.

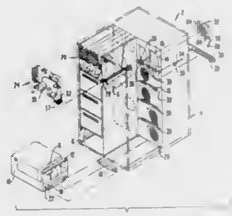
4,899,254

ELECTRONIC MODULE INTERCONNECTION SYSTEM

Joerg U. Furchau, Morgan Hill; Hoa V. Pham, San Jose, and Randall J. Diaz, Gilroy, all of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Jul. 22, 1987, Ser. No. 76,458
Int. Cl.[4] H05K *7/20*; **H01R** *13/629*
U.S. Cl. 361—384 **3 Claims**





1. An electronic system of the type including electronic modules coupled to a power supply and to signal lines, and system comprising:

a housing;

a circuit board mounted within the housing and forming a structural support element of the system, the circuit board including power supply traces and signal traces connected to the power supply and to the signal lines, respectively;

a first blind mateable connector mounted to each of the modules;

second blind mateable connectors mounted to chosen positions on the circuit board for connection with chosen ones of the power supply and signal traces, the second blind mateable connectors configured for mating engagement with respective ones of the first blind mateable connectors;

a fan mounted to the circuit board at a selected position;

the circuit board having an opening at the selected position to allow air to be forced therethrough by the fan, the circuit board configured to divide the housing into sections so the circuit board acts as an air duct barrier; and

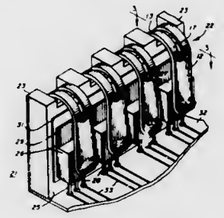
module guide elements for guiding the modules into position adjacent the circuit board so the first and second blind mateable connectors engage one another thus interconnecting the modules with one another and connecting the modules to the power supply and to the signal lines.

4,899,255

HEAT SINK CLIP AND ASSEMBLY AND METHOD OF MANUFACTURE

Maxwell H. Case; Lawrence M. Hartzell, both of New Braunfels, Tex., and David W. Currier, Algonquin, Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jul. 25, 1988, Ser. No. 223,507
Int. Cl.[4] H01L *23/36*
U.S. Cl. 361—386 **30 Claims**



1. A heat sink clip for attaching a power dissipation device to a heat sink, comprising:

a generally U-shaped clip constructed of resilient spring material and having a central apex portion and at least two arm portions forming arms of said U shape, each of said arm portions extending away from associated opposite ends of said central apex portion, respectively, and forming an open end of said clip between said arm portions;

one of said arm portions having a surface thereof for contacting said power dissipation device and biasing it toward said heat sink; and

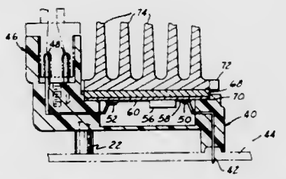
said central apex portion having a slot therein extending through said central apex portion, whereby said slot permits passage of either a portion of said power dissipation device to be heat sunk or permits passage of an insertion tool which facilitates attaching said heat sink clip about said power dissipation device and said heat sink.

4,899,256

POWER MODULE

Min Sway-Tin, Troy, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jun. 1, 1988, Ser. No. 201,246
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **9 Claims**



1. A power module comprising:

a housing defining a cavity and including a rim peripherally about said cavity, said rim including a surface and a flange extending from said surface, said surface and flange adapted for receiving and positioning a first conduit board including circuitry onto said housing such that said circuitry is positioned within said cavity;

means for supporting said housing in a spaced relationship with respect to a second circuit board, said means or supporting unitarily formed with said housing;

means for electrically coupling the circuitry of the first circuit board in said cavity with the second circuit board or an electrical system, said electrical means having a

contact portion extending into said cavity adapted to couple with the circuitry on the first circuit board, a contact portion extending from said housing adapted to be coupled with the second circuit board or the electrical system, and the remainder of the electrical means is concealed within said housing such that a portion of the remainder of the electrical means electrically coupling the first and second circuit board is passed through at least one of said supporting means.

4,899,257

ELECTRIC DEVICE WITH AN OPERATION INDICATING LAMP

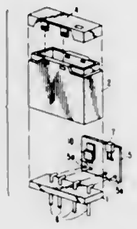
Masato Yamamoto, Imari, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 25,744, Mar. 13, 1987, abandoned. This application Apr. 4, 1989, Ser. No. 333,865

Claims priority, application Japan, Mar. 14, 1986, 61-37798[U]

Int. Cl.⁴ H05K 1/14

U.S. Cl. 361—395 **8 Claims**



7. An electric device with an operation indicating lamp comprising:

a base member;

a case member including a main frame and a case cover, said main frame being fitted to said base member, and said case cover having an indicating hole therein;

at least one electric component disposed in said case member;

an operation indicating lamp housed within said case member abutting said indicating hole and visible therethrough, said indicating lamp having a diameter which is larger than a diameter of said indicating hole; and

a resin material for fixing said lamp and said electronic component in said case member, said resin material being disposed in a portion of the space provided by said base and said main frame, there being no resin in the vicinity of said indicating hole;

said indicating hole having a tapered opening which tapers toward said indicating lamp.

4,899,258

SOLID ELECTROLYTE CAPACITOR WITH INTEGRAL FUSE

Didier Gouvernelle, Semblancay, France, assignor to Sprague Electric Company, North Adams, Mass.

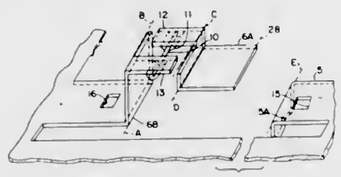
Filed Mar. 16, 1989, Ser. No. 324,131

Claims priority, application France, Jul. 4, 1988, 8809015

Int. Cl.⁴ H01G 9/06

U.S. Cl. 361—534 **12 Claims**

1. Solid electrolyte capacitor comprising a capacitor body having two electrodes, two connecting leads provide output terminals each connected to a respective electrode, a fusible member of predetermined length connected in series between said capacitor body and a preselected output terminal, wherein the connecting lead providing said preselected output terminal includes a first section fixed to one of said electrodes and a second section electrically insulated and mechanically separate from said first section and said capacitor body to form said preselected output terminal, and said fusible member alone establishes an electrical connection between said first section



and said second section and is embedded in a rigid thermally insulative support mass of resin and extending between said first section and said second section so as to alone couple them together mechanically in fixed spaced relationship.

4,899,259

ENCASED ELECTRIC COMPONENT

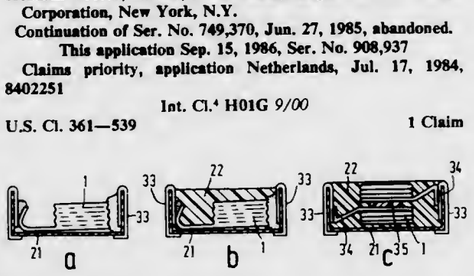
Hendrik Voeten, Zwolle, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 749,370, Jun. 27, 1985, abandoned. This application Sep. 15, 1986, Ser. No. 908,937

Claims priority, application Netherlands, Jul. 17, 1984, 8402251

Int. Cl.⁴ H01G 9/00

U.S. Cl. 361—539 **1 Claim**



1. An encased electric component provided with a pair of electrically conductive contacts, situated in a prismatic casing made of an electrically insulating material and separated from the inner surfaces of said casing by an electrically insulating molding material, said casing being open on at least one side, having a wall portion opposed to said open side bonded by two opposing end wall portions and having external contact faces situated at opposing ends of the external surface of said wall portion opposing said open side thereof, which contact faces are conductively connected to said pair of electrically conductive contacts provided on said component, characterized in that each of said external contact faces is part of a strip of conductive material extending along one of said ends, along the external surface of an adjacent end wall portion, along the external surface of an edge of said end wall portion adjacent to said open side and folded inwardly to extend along the inner surface of said adjacent end wall portion thereby to form a contact face inside of said casing and in that the electrically conductive contacts of the component are secured to the contact faces by means of a lacquer which has been rendered conductive and which has been cured by means of UV radiation.

4,899,260

OPTICAL CONDUCTOR BODY FOR ILLUMINATING INDICATION ELEMENTS OF ELECTRICAL APPARATUSES

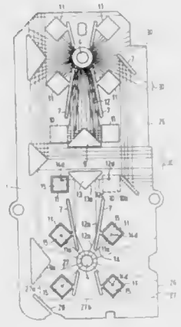
Manfred F. L. Schrammek, Wetzlar, and Mathias Sprengart, Wetzlar-Nauborn, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1988, Ser. No. 266,176

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737514

Int. Cl.⁴ F21V 7/04

U.S. Cl. 362—32 **15 Claims**



1. An optical conductor body for illuminating indication elements of an electrical apparatus from the inside comprising:

a plate of optically transmissive material, having a substantially planar surface which plate is arranged behind element parts to be illuminated and through which light beams pass from at least one illumination source by total reflection within the plate to the areas to be illuminated and are conducted by deflection at reflection surfaces to the individual areas to be illuminated;

the optical conductor body (1) comprises a plate (1) with a substantially planar surface,

openings (7,8,9) at least one opening extending transversely through the plate and having walls extending at right angles to a central plane (5) of the plate and at an acute angle to the course of the light beam for reflecting the light beams in a direction parallel to the central plane (5) of the plate within the plate; and at least one recess formed in the plate having a reflection surface (10b) inclined with respect to the central plane (5) of the plate for reflecting a light beam out of the plate in a direction away from the body.

4,899,261

AUTOMOBILE HEADLAMP WITH SMALL HEIGHT AND HIGH FLUX RECOVERY

Eric Bluseau, Les-Pavillons-sous-Bois, and Norbert Brun, Bobigny, both of France, assignors to Cibie Projecteurs, Bobigny Cedex, France

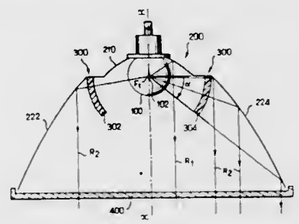
Filed Oct. 13, 1988, Ser. No. 257,211

Claims priority, application France, Oct. 13, 1987, 87 14114

Int. Cl.⁴ F21V 13/04

U.S. Cl. 362—61 **11 Claims**

1. A headlamp for an automobile vehicle, of the kind comprising a light source, a reflector defining an optical axis, and a closing glass, wherein the reflector comprises a base part substantially in the form of a paraboloid of revolution focussed on the light source, and side pieces in the form of parabolic cylinders having a vertical generatrix, and said headlamp further comprises a deflecting means extending near the source substantially over the full height of the headlamp and adapted to deflect the direction of the light rays coming from the source in order to re-emit them in an essentially horizontal direction towards the said side pieces of the reflector, which in turn



reflect them in a direction essentially parallel to the optical axis to participate in the formation of the beam.

4,899,262

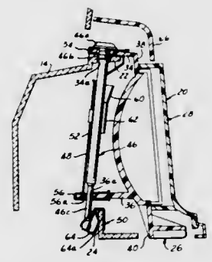
ATTACHMENT ARRANGEMENT FOR VEHICLE TAIL LAMP ASSEMBLY

Kenneth W. Hammond, Detroit; Herbert W. Gilbert, Royal Oak, and Gerald E. Swierb, Plymouth, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Feb. 13, 1989, Ser. No. 308,925

Int. Cl.⁴ B60Q 1/26

U.S. Cl. 362—80 **10 Claims**



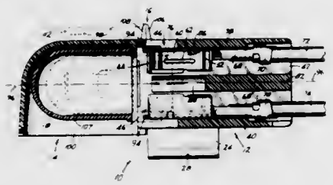
1. In an automobile vehicle provided with a rearwardly projecting mounting flange, an upwardly extending mounting bracket, a spring clip mounted on said bracket and having a resilient leg extending therefrom, a lamp assembly having a top, a bottom, and forwardly projecting upper and lower locating flanges, said flanges having generally vertically aligned apertures therethrough, and mounting means for mounting the lamp assembly to said vehicle, said mounting means including an elongated threaded shaft having a body portion extending generally vertically downwardly through the apertures and an end portion which engages the spring leg, the mounting means characterized by: fastener means for rigidly securing the top of said assembly to said vehicle such that the bottom thereof is free to move in a horizontal direction towards said vehicle, a one-piece clip member having an upper and a lower clip portion, secured, respectively, to one and the other locating flanges, the shaft passing through the clip portions, and means for fixedly securing the shaft to said upper clip portion.

4,899,263

LAMP FIXTURE FOR ILLUMINATING INTERIOR OF CIGAR LIGHTER SOCKET

Peter J. Lupoli, Hamden; Donald J. Mattis, Norwalk, and Robert S. Miller, Stratford, all of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Nov. 2, 1984, Ser. No. 667,559
Int. Cl.[4] B60Q *3/04*
U.S. Cl. 362—80 **27 Claims**



1. A one-piece resilient plastic lamp unit for attachment to the socket of an electric cigar lighter for automobiles and other conveyances, comprising in combination:
(a) a receptacle body portion having means for supporting a lamp at one exterior surface thereof,
(b) a hood portion disposed adjacent the said exterior surface of the body portion, said hood portion having open sides to provide for the passage of said lamp thereinto, and
(c) a "living" hinge integral with and connecting said body and hood portions to each other,
(d) said hinge being joined to the hood portion at an edge thereof which borders one of its open sides, and being joined to said body portion at an edge of said exterior surface thereof,
(e) said one open side of the hood portion being spanned by the exterior surface of the body portion, and said hood and body portions essentially constituting continuations of each other when the hood portion is enclosing a lamp supported by the body portion,
(f) another of the open sides of said hood portion constituting a window through which light rays from the lamp can pass when the hood portion is enclosing the lamp.

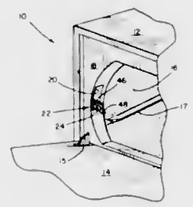
4,899,264

DRYER DRUM LAMP ASSEMBLY

Stuart W. Ries, St. Joseph Township, Berrien County, and Irene M. Shembarger, Berrien Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 18, 1989, Ser. No. 381,575
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—92 **20 Claims**

1. A lamp assembly for use in a clothes dryer, said clothes dryer including a rotatable drum and a cabinet for housing said drum, said cabinet including an aperture in one wall thereof and a cover for said aperture, said lamp assembly comprising:
a lamp socket;
bracket means for pivotably supporting said lamp socket, said bracket adapted to be secured to a said cabinet whereby said lamp socket may be pivoted from a servicing position in which a lightbulb installed in the socket extends through said aperture to an operating position away from said aperture wherein the lightbulb illuminates the interior of a said drum; and



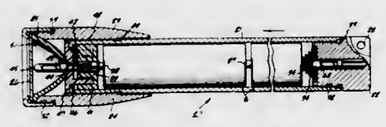
interference means connected to said lamp socket for permitting installation of a said cover over said aperture only if said lamp socket is in said operating position.

4,899,265

MINIATURE FLASHLIGHT

Anthony Maglica, Ontario, Calif., assignor to Mag Instrument, Inc., Ontario, Calif.

Continuation of Ser. No. 34,918, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 828,729, Feb. 11, 1986, Pat. No. 4,658,336, which is a continuation of Ser. No. 648,032, Sep. 6, 1984, Pat. No. 4,577,263. This application Jul. 19, 1988, Ser. No. 222,378
The portion of the term of this patent subsequent to Aug. 18, 2003, has been disclaimed.
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—187 **13 Claims**



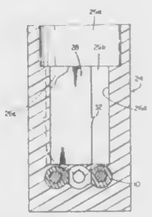
1. A flashlight comprising:
a barrel for retaining at least one dry cell battery;
a lamp bulb having a filament;
bulb holding means positioned adjacent one end of the barrel and adapted to locate the bulb filament axially beyond the one end of the barrel;
a substantially parabolic reflector;
a substantially planar lens;
means for retaining the reflector and the lens being engageable with the barrel at the end of the bulb holding means is positioned and adapted to be controllably translatable along the barrel such that the relative positional relationship between the reflector and the lamp bulb may be varied, thereby varying a reflection dispersion of a light beam emanating through the lens from said lamp bulb;
means for electrically coupling a center electrode of one of the batteries to a first electrode of the lamp bulb; and
means for electrically coupling a case electrode of one of the batteries to a second electrode of the lamp bulb;
wherein relative motion of the head means for retaining the reflector and the lens in an axial direction away from the barrel closes an electrical contact of one of the coupling means and further relative motion in said same axial direction separates said means for retaining the reflector and the lens from the barrel to expose the lamp bulb and thereby permits the dispersion of substantially spherical illumination.

4,899,266

MINIATURE LIGHT SETS AND LAMPHOLDERS AND METHOD FOR MAKING THEM

Joseph M. Ahroni, 2701 W. Manor Pl., #204, Seattle, Wash. 98199

Continuation-in-part of Ser. No. 131,027, Dec. 10, 1987, Pat. No. 4,807,098, which is a continuation-in-part of Ser. No. 945,602, Dec. 22, 1986, Pat. No. 4,779,177, which is a continuation-in-part of Ser. No. 664,153, Oct. 24, 1984, Pat. No. 4,631,650. This application Dec. 22, 1988, Ser. No. 290,239
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—238 **24 Claims**



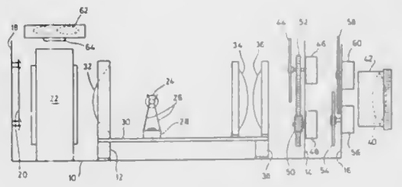
1. In a method for making a lighting string:
providing a multiwire insulated cord;
forming a cutout in one wire of said cord;
enclosing said cutout and the adjacent portions of the cord in a multipart mold for a lampholder;
introducing plastic into said mold to form a lampholder on the cord which houses said cutout and adjacent portions of the cord and presents a lamp socket exposed to the cord at opposite ends of said cutout and adapted to receive two push-in contact members and a push-in lamp; and
freeing the molded lampholder and cord from the mold.

4,899,267

SPOTLIGHT AND CONTROL SYSTEM THEREFOR

Paul F. Mardon, Fulbourn, Great Britain, assignor to Pulsar Light of Cambridge Ltd, Cambridge, England

Filed Dec. 29, 1988, Ser. No. 290,363
Claims priority, application United Kingdom, Mar. 9, 1988, 8805581; Apr. 19, 1988, 8809216
Int. Cl.[4] F21V *11/08*
U.S. Cl. 362—277 **10 Claims**



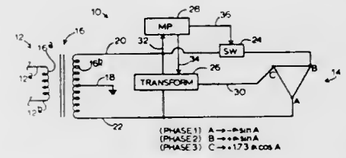
1. A spotlight having n adjustable parameters, comprising a housing and, for each adjustable parameter) a bipolar electric stepper motor mounted within the spotlight housing, and wherein there is provided a first control signal input means by which n different analogue electrical signals for the spotlight may be used to control the rotational position of the n different stepper motors, to allow remote control of the n different parameters, a second control signal input means by which a single transmission path carrying control signals as a serial datastream can be connected to the spotlight, and receiver means associated with the second signal input means and adapted only to respond to a precursor of one particular data stream, so that the spotlight may be uniquely addressed from a remote control means, which generates the appropriate precursor and transmits thereafter the requisite data as a serial data stream, thereby to alter one or another or all of the n controllable parameters of the spotlight by using n different channels within the transmitted data.

4,899,268

FREQUENCY-DEPENDENT SINGLE-PHASE TO THREE-PHASE AC POWER CONVERSION

Theodore G. Hollinger, Redmond, Oreg., assignor to APC-Onsite, Inc., Redmond, Oreg.

Filed May 10, 1989, Ser. No. 351,080
Int. Cl.[4] H02M *5/00*
U.S. Cl. 363—4 **4 Claims**



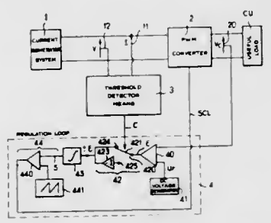
1. Apparatus for supplying to a three-phase electrical load including three input terminals, operating power from a single-phase, known-frequency, sinusoidal power source including two output terminals, said apparatus, in operative condition, comprising
means operatively connecting each of a first and second of such input terminals with a different one of such output terminals of the direct supply to the latter of voltage from the former, and
electronic means operatively connected both to such two output terminals and to the third input terminal for supplying the latter with a sinusoidal voltage artifact matching the frequency of the source and having an amplitude which is a predetermined absolute value greater than that of the source.

4,899,269

SYSTEM FOR REGULATING THE OPERATING POINT OF A DIRECT CURRENT POWER SUPPLY

Christian Rouzies, Toulouse, France, assignor to Centre National D'Etudes Spatiales, Paris, France

Filed Jan. 24, 1989, Ser. No. 300,923
Claims priority, application France, Jan. 29, 1988, 88 01057; Jul. 18, 1988, 88 09682
Int. Cl.[4] G05F *1/67*
U.S. Cl. 363—41 **14 Claims**



1. System for regulating the operating point of a direct current power supply comprising a current generator system and a pulse width modulation converter connected to said current generator system, said regulation system comprising:
means for sampling and measuring the current and voltage supplied by said current generator system to said con-

verter and adapted to provide a signal representing said current and voltage,

threshold detector means for sensing stalling of said converter connected to receive said signal representing said current and voltage supplied by said current generator system and adapted to provide a logic signal representing the stalled or non-stalled state of said converter relative to defined threshold values of said threshold detector means, and

a loop for regulating the width of pulses supplied by said converter and comprising:

means for sampling and measuring the voltage supplied by said converter to a load,

differential amplifier means connected to receive on a first input said signal supplied by said means for measuring the voltage supplied by said converter and on a second input a first reference signal and adapted to provide an amplified error signal,

inverter means comprising an input connected to receive said amplified error signal and an inversion control input connected to receive said logic signal supplied by said threshold detector means and adapted to provide an inverted or non-inverted error signal,

integrator means connected to receive said inverted or non-inverted error signal and adapted to provide an integrated error signal, and

pulse width modulator means comprising a sawtooth signal generator and a first comparator having a first input connected to receive from said integrator means said integrated error signal, a second input connected to receive the signal supplied by said sawtooth signal generator and an output adapted to provide a pulse width control signal to said pulse width modulation converter.

4,899,270

DC-TO-DC POWER SUPPLY INCLUDING AN ENERGY TRANSFERRING SNUBBER CIRCUIT

Eric D. Bond, Burnaby, Canada, assignor to Statpower Technologies Corp., Burnaby, Canada

Filed Mar. 14, 1989, Ser. No. 322,903
Int. Cl.[4] H02H *7/122*
U.S. Cl. 363—56 **15 Claims**

1. A direct current to direct current power including:

(a) a power conductor and a reference conductor connectable to a power source;

(b) flux producing means for producing a changing magnetic flux and for producing a first potential, the flux producing means including a first inductor and a switching element for interrupting electric current flow through the first inductor, the first inductor and the switching element being connected in series with the power conductor and the reference conductor;

(c) a first capacitor for storing electric charge and for developing a second potential in response to the stored electric charge, the first capacitor being connected to the reference conductor;

(d) first means for permitting electric current flow from the producing means to the first capacitor and for blocking electric current flow from the first capacitor to the producing means, the first means being connected between the producing means and the first capacitor;

(e) a second inductor for inducing a third potential in response to the changing magnetic flux, the second inductor being magnetically coupled to the producing means and being connected in series with the first capacitor to add the second potential to the third potential to produce a combined potential;

(e) an output conductor for supplying an output current at an output voltage to a load connected between the output conductor and the reference conductor;

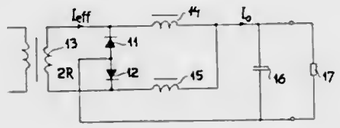
(f) second means for permitting electric current flow from the second inductor to the output conductor and for blocking electric current flow from the output conductor to the second inductor, the second means being operatively connected to the second inductor and the output conductor.

4,899,271

POWER SUPPLY CIRCUIT

Ole S. Seiersen, Horsholm, Denmark, assignor to Scanpower, Horsholm, Denmark

Filed Jul. 21, 1988, Ser. No. 222,207
Claims priority, application Denmark, Jul. 22, 1987, 3826/87
Int. Cl.[4] H02M *7/06*
U.S. Cl. 363—126 **3 Claims**



1. A power supply circuit comprising a transformer including a secondary winding having two secondary winding ends, and a pair of rectifier diodes each diode having a first type of electrode and a second type of electrode, each of the diodes having a first type of its electrodes connected directly to a respective one of the secondary winding ends, the second electrode of each of the diodes being connected to a first output terminal of the power supply circuit,

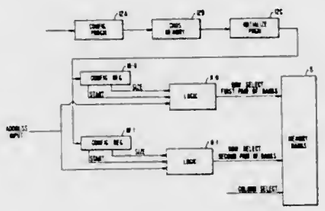
characterized in that the power supply circuit further comprises two reactive components wherein the first type electrodes of the diodes are further connected to the second output terminal of the power supply circuit via a respective one of the reactive components such that the sum of the current through the diodes is substantially equal to the output current, and that the reactive components are dimensioned such that one reactive component sends current through one diode serving as a free-wheeling diode, while the secondary winding of the transformer sends current through the same diode.

4,899,272

ADDRESSING MULTIPLE TYPES OF MEMORY DEVICES

Michael G. Fung, San Jose, and Justin Wang, Saratoga, both of Calif., assignors to Chips & Technologies, Inc., San Jose, Calif.

Filed Oct. 23, 1987, Ser. No. 112,967
Int. Cl.[4] G11C *8/00, 7/00;* **G06F** *1/00, 11/00*
U.S. Cl. 365—230.03 **14 Claims**



1. A memory addressing system for a memory that has a plurality of banks of memory devices having a first and a second size, comprising:

means for supplying address signals to said memory banks and for generating row and column accessing signals for said memory;

a plurality of hardware configuration registers, each associated with at least one of said memory banks;

means for programming said configuration registers to indicate the type of memory devioce that have been inserted in the particular memory banks and to indicate the starting address of the particular set of memory banks; and

logic means, having inputs coupled to said means for supplying address signals and at least one of said configuration registers, for using the information in said configuration register to modify said accessing signals;

whereby it is not necessary to insert the largest memory devices in the physical first memory banks and whereby memory devices of either size can be inserted in either set of memory banks.

4,899,273

CIRCUIT SIMULATION METHOD WITH CLOCK EVENT SUPPRESSION FOR DEBUGGING LSI CIRCUITS

Koichiro Omoda, Sagamihara; Shunsuke Miyamoto, Tokyo; Takayuki Nakagawa; Yoshio Takamine, both of Kokubunji; Shigeo Nagashima, Hachioji; Masayuki Miyoshi, Hadano; Yoshiharu Kazama, Hadano, and Yoshiaki Kinoshita, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,539
Claims priority, application Japan, Dec. 11, 1985, 60-276761
Int. Cl.[4] G06F *9/44, 11/22, 11/26*
U.S. Cl. 364—200 **2 Claims**



1. A logic simulation method for computing, by means of a computer, the variation of the output of at least one latch of a clock-synchronized logic circuit which includes a combination logic circuit having a plurality of logic gates and which is connected to receive at least one input signal and a plurality of clock signals of different phases, said latch being responsive to the output of said combination logic circuit in response to the rise or fall of said clock signals for latching said combination circuit output, comprising the steps of:

(a) determining whether the outputs of said logic gates have the value 0 to 1 and determining a function of the signal values of one of said clock signals, on the basis of the initial value of said input signal, the logic function of each of said logic gates, and connection information between each of said logic gates and another logic gate or clock signal source;

(b) calculating the output of each of said logic gates at each of a plurality of sampling instants for each of a plurality of machine cycles which coincide with the rise or fall of a first phase clock signal, including judging whether or not said input signal has varied during a time period between sampling instants, and calculating said outputs only when said input signal has varied for such one of said logic gates as is possibly susceptible to the influences of the variation of said input signal;

(c) calculating the output of said latch at each of said sampling points from both the value of such outputs calculated at said step (b) as have been inputted to the latch and a predetermined function to be executed by said latch at each of said sampling points, including calculating, when said output value is a function of the value of one of said clock signals, the output of said latch on the basis of the signal value, which relates to said one clock signal at each of said sampling points, and said function of the latch; and

(d) repeating said steps (b) and (c) in response each of the clock signals of different phases.

2. A logic simulation method according to claim 1, wherein said step (b) further include the sub-steps of;

(e) calculating the output of a first one of said logic gates, to which said input signal is fed, and comparing said output with the output calculated at a preceding sampling instant;

(f) calculating the output of a second one of said logic gates, to which the output of said first logic gate is fed as an input, and comparing said output with the output of said second logic gate, which has been detected at a previous sampling instant;

(g) conducting a comparison of the output of a third one of said logic gates, to which the output of said second logic gate is fed as an input, when an inconsistency is detected as a result of the comparison at said step (f);

(h) sequentially executing similar processings for succeeding ones of said logic gates each time an inconsistency is detected as a result of the comparison of said step (g); and

(i) interrupting the executions of said steps (f), (g) and (h), respectively, when the inconsistencies are detected at the respective comparisons of said steps (e), (f) and (g).

4,899,274

DYNAMIC TERMINAL ADDRESS ALLOCATION BY THE TERMINAL ITSELF IN A DATA PROCESSING SYSTEM

Barry W. Hansen, Rochester, and Raymond F. Romon, Oronoco, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 789,798, Nov. 21, 1985, abandoned.
This application May 2, 1989, Ser. No. 348,143
Int. Cl.[4] G06F *7/00*
U.S. Cl. 364—200 **12 Claims**

1. In a data-processing system having a central processor and multiple terminals connected thereto by a common communications medium, wherein all of said terminals require mutually different terminal addresses for passing data to and from said processor over said medium, and wherein each of said terminals includes microprocessor, memory, and input-/output means all interconnected by a bus, a combination physically located in at least one of said terminals for assigning a terminal address to said one terminal, comprising:

(a) a terminal controller coupled to said bus and having enabled and disabled states, said controller being coupled to said medium and adapted when in said enabled state to pass signal frames, containing both address bits and data bits representing character codes and commands, between said terminal and said processor using a predetermined one of said terminal addresses as the address of said one terminal;

(b) means for setting said controller to said disabled state;

(c) means coupled to said communication medium for detecting which ones of said terminal addresses have been transmitted on said communications medium;

(d) a table containing a set of candidate terminal addresses selected from said mutually different terminal addresses;

(e) an emulator for comparing said candidate terminal addresses with said terminal addresses transmitted on said medium, and for assigning as said predetermined one of said terminal addresses, one of said candidate addresses other than said terminal address detected by said detecting means, and thereafter for setting said controller to said

enabled state, said emulator being further adapted for processing said data bits;

(f) arbiter means capable of assigning any of multiple groups of addresses in an address space of said microprocessor for coupling said controller to said bus;

(b) latch means coupled to said arbiter for specifying one of said multiple groups of addresses.

4,899,275

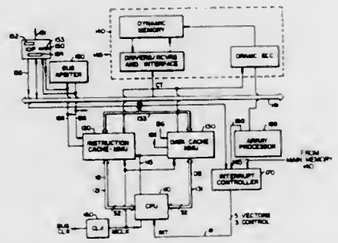
CACHE-MMU SYSTEM

Howard G. Sachs, Los Altos; James Y. Cho, Los Gatos, and Walter H. Hollingsworth, Campbell, all of Calif., assignors to Intergraph Corporation, Huntsville, Ala.

Continuation of Ser. No. 915,120, Oct. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 704,497, Feb. 22, 1985, abandoned. This application May 1, 1989, Ser. No. 346,251

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **54 Claims**



1. In a computer having a processor and an addressable primary memory for storing digital system information, an integrated cache memory management system comprising:

an addressable read-write cache memory for storing digital system information;

a tag memory for storing an associative map of addresses corresponding to digital system information presently stored in the cache memory;

comparator means, coupled to the tag memory and to the processor, for providing a hit signal responsive to the correspondence of an address received from the processor to a presently mapped cache memory addressable location, and for providing a miss signal responsive to a determination of a lack of such correspondence;

memory controller means, coupled to the primary memory and to the cache memory, for communicating digital system information between the primary memory and the cache memory;

access controller means for communicating digital system information between the cache memory and the processor responsive to a hit signal; and

processor interface means, coupled to the access controller means and to the processor, the processor interface means including a plurality of serially interconnected registers coupled to the access controller means and to the processor for storing a stack of digital system information for serial transfer of the stored digital system information at high speed from the access controller means to the processor.

4,899,276

FIELD-DIRECTED SCREEN HELP TECHNIQUE

Fred Stadler, Tarrant County, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1984, Ser. No. 640,743

Int. Cl.[4] G06F *3/14*

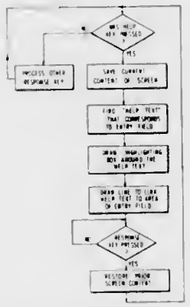
U.S. Cl. 364—300 **3 Claims**

1. In a data entry system which employs data entry screens and a save area for saving data describing a current data entry screen, said data entry screens comprising a plurality of fields in which a user enters data, corresponding labels identifying the fields, and a label identifying a current data entry field in which the user is next to enter data, said system storing help text associated with each data entry field label, a field-directed screen help technique comprising the steps of:

monitoring an input from the user requesting help,

when a request for help is detected, saving the data describing the current data entry screen in the save area,

using the current data entry field label, determining the current data entry field and the help text for that data entry field,



displaying the help text on the current data entry screen at a location which obscures part of the data entry screen but not the current data entry field,

drawing a box around the help text and drawing a line from the box to the current data entry field to link the help text to the current data entry field on the data entry screen, and

restoring the prior data entry screen by reading the data entry screen in the save area to the screen when the user presses a response key.

4,899,277

BORE HOLE SCANNER WITH POSITION DETECTING DEVICE AND LIGHT POLARIZERS

Yunosuke Iizuka; Takashi Ishii; Yoshihiro Mukawa; Kouji Nagata, all of Tokyo; Yoshitaka Matsumoto, Yokohama, and Osamu Murakami, Funabashi, all of Japan, assignors to Shimizu Construction Co., Ltd. and Core Inc., both of Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 263,950

Claims priority, application Japan, Oct. 30, 1987, 62-275545

Int. Cl.[4] G02B *23/26*

U.S. Cl. 364—422 **2 Claims**

1. A bore hole scanner for observing a bore hole wall by continuously imaging the bore hole wall by an image pick-up means accommodated in a sonde which is raised and lowered in the bore hole, said bore hole scanner comprising:

light projecting means for projecting a light beam toward the bore hole wall;

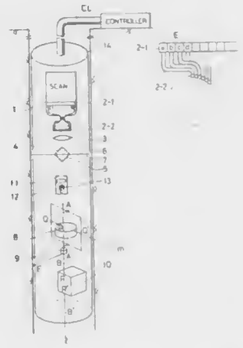
a conical mirror, arranged coaxially with respect to said sonde, for condensing light reflected from the bore hole wall;

image forming means arranged in front of said conical mirror;

photoelectric transducing means for converting a light signal into an electric signal, said photoelectric transducer means comprises sets, each set having respective polarizing functions corresponding to three primary colors of light;

optical fibers for introducing an image, by said image forming means, to said photoelectric transducing means, said optical fibers formed in concentric circles;

data processing means for scanning and extracting signals from said photoelectric transducing means, and for generating and processing image data indicative of the bore hole wall surface; and



sonde position detecting means for detecting orientation and position of the sonde.

4,899,278

AUTOMATIC TRANSMISSION WITH ERRONEOUS SHIFT PREVENTING FUNCTION

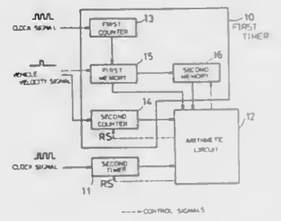
Masanari Yamamoto; Yasunobu Ito, and Kenji Suzuki, all of Anjo, Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

Filed Aug. 10, 1987, Ser. No. 83,391

Claims priority, application Japan, Aug. 11, 1986, 61-188196

Int. Cl.[4] B60K *41/18;* **G06F** *15/20*

U.S. Cl. 364—424.1 **6 Claims**



1. An automatic transmission with shift solenoids controlled by a microcomputer in dependence upon a signal indicative of vehicle velocity and a signal indicative of throttle opening and having an erroneous shift preventing function at very low speeds, comprising:

a vehicle velocity sensor for outputting a pulsed signal the period of which varies in dependence upon vehicle velocity;

a first timer for measuring time required for a predetermined number of pulses to enter from said vehicle velocity sensor;

a second timer for counting clock pulses; and

an arithmetic circuit for selectively calculating vehicle velocity and for providing said calculating vehicle velocity to said microcomputer as a vehicle velocity signal for actuating said shift solenoids based on a value measured by said first timer only when a value measured by said second timer is less than a predetermined value indicating very low vehicle velocity.

4,899,279

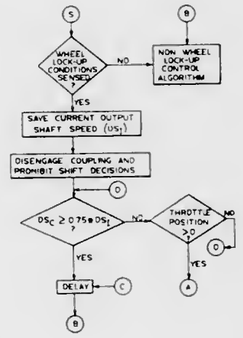
METHOD FOR CONTROLLING AMT SYSTEM INCLUDING WHEEL LOCK-UP DETECTION AND TOLERANCE

William F. Cote, Farmington Hills, and Robert R. Smyth, Bloomfield Hills, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 7, 1986, Ser. No. 848,610

Int. Cl.[4] B60K *41/02*

U.S. Cl. 364—424.05 **15 Claims**



1. A control method for controlling a vehicular automatic mechanical transmission system utilized in connection with a vehicle equipped with vehicle wheel brakes for retarding the rotation of at least one of the vehicle drive wheels, said automatic mechanical transmission system comprising a throttle-controlled engine, a change gear transmission having a plurality of gear ratio combinations selectably engagable between a transmission input shaft and the transmission output shaft, said transmission output shaft drivingly coupled to said vehicle drive wheels, and a disengagable coupling drivingly interposed said engine and said transmission input shaft, said automatic mechanical transmission system additionally comprising an information processing unit having means for receiving a plurality of input signals including (1) an input signal indicative of the rotational speed of said transmission output shaft, and (2) an input signal indicative of operator set throttle position, said processing unit including means for processing said input signals in accordance with a program to provide a predetermined gear ratio for a given combination of input signals and for generating command output signals whereby said transmission system is operated in accordance with said program, and means associated with said transmission system effective to actuate said transmission system to effect engagement of one of said gear ratio combination in response to said output signals from said processing unit, the method characterized by:

sensing the presence of a wheel lock-up condition; and

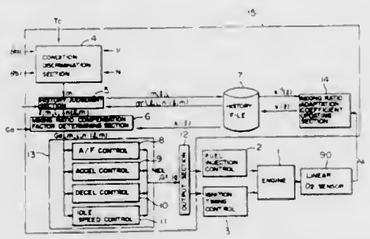
if the presence of a wheel lock-up condition is sensed, causing said coupling to be immediately disengaged, and then processing said input signals to determine if said previously sensed existing or impending wheel lock conditions have terminated if, after sensing the presence of a wheel lock-up condition, the sensed throttle position exceeds a predetermined minimum reference value.

4,899,280

ADAPTIVE SYSTEM FOR CONTROLLING AN ENGINE ACCORDING TO CONDITIONS CATEGORIZED BY DRIVER'S INTENT

Mikihiko Onari, Kokubunji; Teruji Sekozawa, Kawasaki, and Motohisa Funabashi, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,542
Claims priority, application Japan, Apr. 8, 1987, 62-84743
Int. Cl.[4] F02B 3/00; F02D 41/34
U.S. Cl. 364—431.05 11 Claims



1. An adaptive control system for controlling an engine of a vehicle in a plurality of categorized conditions, comprising:

a plurality of driving operation sensors for detecting a driving operation of the vehicle taken according to a driver's intent;

a plurality of operating condition sensors including a linear oxygen sensor for detecting operating conditions of the vehicle and the engine;

a plurality of actuators for controlling means for operating the engine;

condition discrimination means for determining one of engine control conditions from the detected results of the driving operation sensors and the operating condition sensors;

a history file for storing past engine control conditions;

history judgment means for judging whether the engine control condition at present is in a continuation of same engine control condition or in a transition process between different engine control conditions by comparing a past engine control condition retrieved from the history file with the engine control condition determined by the condition discrimination means;

control parameter determining means for determining engine control parameters from the result of judgment of the history judgment means and from an adaptive parameter retrieved from the history file updating means by use of a weighting process corresponding to a degree of transition between control conditions when the history judgment means judges that the engine is in said transition process between different ones of said plurality of engine control conditions, wherein the degree of transition between said different ones of said plurality of engine control conditions is determined from the ratio between a predetermined number of engine detonations needed for a smooth transition between said different ones of said plurality of engine control conditions and a number of engine detonations that has occurred from a first detonation at the start of said transition process;

control means having a plurality of control modes corresponding to said control conditions for applying an operating signal to each of the plurality of actuators on the basis of the control parameters determined by the control parameter determining means in each control mode in accordance with the engine control condition discriminated by the condition discrimination means; and

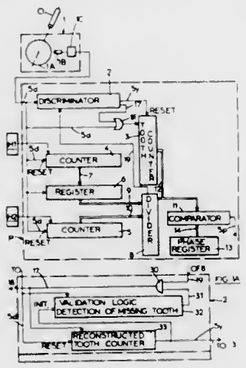
adaptive parameter updating means for receiving a control response parameter from the output of the operating condition sensors and for calculating an updated value of the adaptive parameter and for storing the updated value of said adaptive parameter in the history file.

4,899,281

DEVICE FOR TRIGGERING AN EVENT IN PHASE WITH AN ANGULAR POSITION OF A ROTARY COMPONENT AND APPLICATION THEREOF

Jean-Michel Grimaud, Grenade, and Jean-Marc Nozeran, Toulouse, both of France, assignors to Bendix Electronics S.A., Toulouse, France

Filed Jnl. 22, 1988, Ser. No. 223,209
Claims priority, application France, Jul. 24, 1987, 87 10539
Int. Cl.[4] F02P 5/04, 17/00
U.S. Cl. 364—431.04 12 Claims



1. A device for triggering an event in phase with a predetermined angular position of a component (0) driven to execute a rotational movement, comprising:

angular encoding means delivering a pulsed input signal (Sd) in phase with equal angular steps of the component,

means for delivering a synchronizing signal (Sy, S'y) in response to the passage of the component through at least one angular reference position, and

electronic circuits for utilizing said signals ensuring the triggering of the event at the position determined by counting the pulses of the input signal, wherein the electronic circuits comprise:

an angular counter incremented from zero by the input signal (Sd) and reset to zero by the synchronizing signal (Sy, S'y) to exhibit permanently on its outputs a condition which is the image of the instantaneous angular position of the component in relation to the reference position,

at least one memory circuit in which there is stored a number representing the predetermined angular position in relation to the reference position,

means for loading said at least one memory circuit with such a number at a time that is independent of the angular position of the component, and

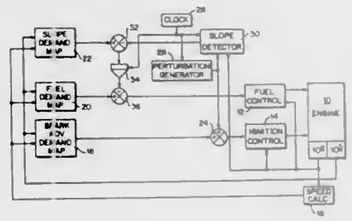
at least one comparator which permanently compares the condition of the outputs of said angular counter with that of the outputs of said memory circuit and which delivers a signal for triggering an event (Sp) in response to the detection of a coincidence between said conditions.

4,899,282

METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

Michael Holmes, Birmingham, England, assignor to Lucas Industries public limited company, Birmingham, England

Continuation-in-part of Ser. No. 888,067, Jul. 22, 1986, Pat. No. 4,843,556. This application Feb. 20, 1987, Ser. No. 16,790
Claims priority, application United Kingdom, Jul. 23, 1985, 8518593; Feb. 20, 1986, 8604259; Feb. 20, 1986, 8604260
Int. Cl.[4] F02D 37/02
U.S. Cl. 364—431.08 36 Claims



1. A system for determining an internal combustion engine input control parameter, said system comprising:

means for determining a first engine operating parameter;

means for determining a second engine operating parameter;

means for determining a basic value for an engine input control parameter in accordance with a fixed map;

a correction map means for storing correction values for said input control parameter as a two-dimensional array as a function of said two engine operating parameters

means for providing a calculated correction value for said two prevailing engine operating parameters, said providing means includes means for multiplying each of n correction values stored in said correction map means at n array points in said two-dimensional array which surround the prevailing engine operating parameters, by respective weighting factors to provide n product values and then summing said n product values to produce a calculated correction value;

means for determining a command value for said input control parameter by summing said basic value and a calculated correction value; and

means for updating said values stored in said correction map means, said updating means comprising means for producing a series of error values, multiplying each error value by a respective weighting factor for each of n array points surrounding the prevailing engine operating parameters to form n product values, and using said n product values to update said correction values stored at said n array points, said weighting factors being related to the distance of the prevailing engine operating parameters from the n array points respectively, and calculating said weighting factor for each array point in relation to its distance from the prevailing engine operating parameters, wherein n is an integer greater than 2.

4,899,283

TOMOGRAPHIC APPARATUS INCLUDING MEANS TO ILLUMINATE THE BOUNDED FIELD OF VIEW FROM A PLURALITY OF DIRECTIONS

Martin Annis, Cambridge, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.

Filed Nov. 23, 1987, Ser. No. 123,630
Int. Cl.[4] G06F 15/38
U.S. Cl. 364—413.15 16 Claims

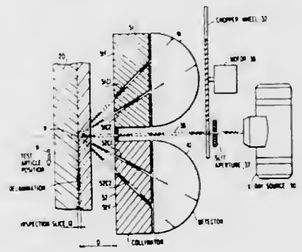
1. Apparatus useful in producing a tomographic image of a selected slice of an object to be examined, said apparatus comprising:

a source of penetrating radiation,

sweep means for forming energy from said source into a pencil beam and for repeatedly sweeping said pencil beam over a line in space to define a sweep plane,

means for supporting said object to be examined so that said pencil beam intersects said object along a path passing through said object and said selected slice,

line collimating means for filtering radiation scattered by said object, said line collimating means having a field of view which intersects said sweep plane in a bounded line so that said line collimating means passes only radiation scattered by elementary volumes of said object lying along said bounded line,



positioning means for repositioning said object so that a linear segment of said selected slice of said object is illuminated by said sweeping pencil beam from a plurality of different directions,

radiation detector means responsive to radiation passed by said line collimating means for generating at least a different signal sequence for each of said different directions of illumination of said linear segment of said selected slice of said object, and

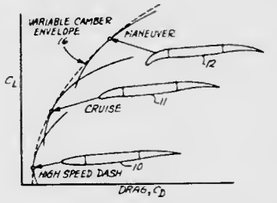
processing means responsive to said signal sequences for producing a line image component of a tomographic image.

4,899,284

WING LIFT/DRAG OPTIMIZING SYSTEM

George E. Lewis, Renton; Robert E. Thomasson, Seattle, and David W. Nelson, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 27, 1984, Ser. No. 656,131
Int. Cl.[4] G06G 7/70
U.S. Cl. 364—435 3 Claims



1. For an aircraft that includes a wing having at least one leading edge surface and at least one trailing edge surface, wherein said surfaces are movable to vary said wings, camber, said aircraft being subject to variations in flight conditions that include changes in aircraft speed, altitude and normal acceleration, all of which are substantially caused by aircraft in-flight maneuvers, an apparatus for continuously optimizing the L/D ratio of said wing during said maneuvers, comprising:

means for continuously sensing actual values of aircraft, speed, aircraft normal acceleration, aircraft weight, and air dynamic pressure while said aircraft is in-flight,

an on-board computer, operatively connected to said sensing means for continuously receiving said sensed speed, acceleration, weight and dynamic pressure therefrom, said computer being operative to continuously calculate a coefficient of lift from said sensed acceleration, weight and dynamic pressure,

with said computer including a data memory bank having stored test data that indicates the desired optimum position for each of said surfaces for optimizing said wing's L/D ratio given certain values of coefficient of lift, aircraft speed, and dynamic pressure, wherein

said computer is operatively connected to said leading and trailing edge surfaces to move said surfaces, and wherein

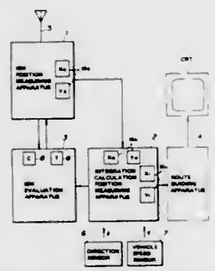
said computer is further operative to continuously obtain from said data memory bank the optimum position of said surfaces by compairing said test data with said calculated coefficient of lift, said actual aircraft speed and said actual dynamic pressure, and to accordingly adjust said surfaces to said optimum position in a continuous manner during said maneuvers.

4,899,285

SYSTEM AND METHOD FOR MEASURING A POSITION OF A MOVING OBJECT WITH A HYBRID NAVIGATION APPARATUS

Okihiko Nakayama, Kamakura; Toshiyuki Itoh, and Katsuhiko Mizushima, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 25, 1987, Ser. No. 66,159
Claims priority, application Japan, Jun. 26, 1986, 61-148050
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—453 **14 Claims**



1. A hybrid system for deriving a position of a moving object, comprising:

(a) first means for receiving an electromagnetic wave from at least one satellite and a Global Positioning System for the measurement of an absolute position of the moving object and for deriving the position of the moving object on the basis of data from the received electromagnetic wave;

(b) second means, having a first sensor for detecting a movement direction of the moving object and a second sensor for detecting a movement speed of the moving object, for calculating a product of the detected movement direction and movement speed of the moving object and integrating the product with respect to time so as to derive a movement distance of the moving object and direction thereof with respect to a reference position and for calculating a sum of

(i) the derived movement distance, and

(ii) direction and the reference position so as to derive a current position of the moving object;

(c) third means for comparing at least two successively derived positions of the first means with the derived current position of the second means so as to evaluate a reliability of the at least two derived positions of the first means; and

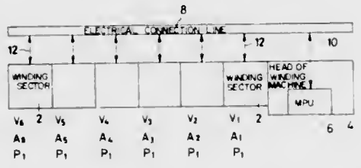
(d) fourth means for setting a latter one of said at least two derived positions of the third means as the reference position when the third means evaluates that the two derived positions of the first means are reliable.

4,899,286

PROCESS FOR DETERMINING THE OPTIMUM WINDING SPEED, AS WELL AS THE OPTIMUM WINDING PARAMETERS FOR EACH TYPE OF YARN

Luigi Colli; Roberto Badiali, and Nereo Marangone, all of Pordenone, Italy, assignors to Savio, S.p.A., Pordenone, Italy

Filed Dec. 16, 1987, Ser. No. 133,311
Claims priority, application Italy, Dec. 23, 1986, 22809
Int. Cl.[4] G06F *15/46*; D01H *13/26*; B65H *54/02*
U.S. Cl. 364—470 **3 Claims**



1. A process of determining the optimum values of operating parameters of an automatic coner machine, comprising:

(a) subdividing the winding front of the automatic coner machine into various winding sectors wherein each of said sectors includes at least one winding unit;

(b) presetting the values of operating parameters for the speed, acceleration, and braking different from winding sector to winding sector by means of a central microprocessor unit;

(c) presetting the same value of the remaining processing parameters for all of said winding sectors; and

(d) receiving and comparing the data from each of said winding sectors with each other by said central microprocessor unit for defining and displaying said speed, acceleration, and braking values for achieving high yarn winding productivity.

4,899,287

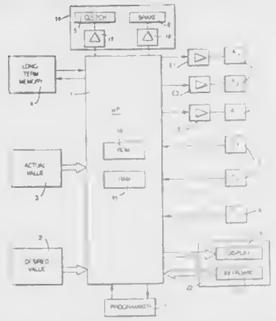
PROCESSOR FOR SEWING MACHINES

Hartmut Hülshoff, Bad Wimpfen; Peter Kothe, Darmstadt-Eberstadt; Michael Luft, Darmstadt, and Ulrich Schütz, Darmstadt-Arheiligen, all of Fed. Rep. of Germany, assignors to Quick-Rotan Elektromotoren GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 887,111, Sep. 9, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 162,245
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441485
Int. Cl.[4] G06F *15/46*; D05B *19/00*
U.S. Cl. 364—470 **24 Claims**

1. Sewing processor arrangement for operational control of at least one sewing device, including auxiliary units, and for rotational speed control of a positioning drive which drives the at least one sewing device, comprising long term memory means for storing operational control characteristics and rotational speed control characteristics, digital programming means for writing into and retrieving from said long term memory means all parameters necessary for at least one sewing operation and for the rotational speed control of the position drive, said parameters including sewing machine parameter data as well as operating data, wherein the operating control

and rotational speed control characteristics can be stored in said long term memory means and modified by the digital programming means during operation, said sewing processor arrangement further including an interface through which the parameters can be written into and read out from the long term memory means by said digital programming means, and a



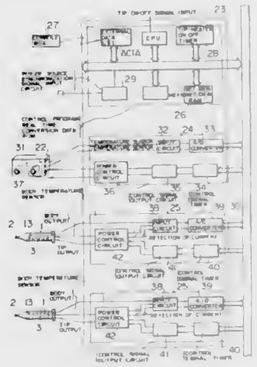
sewing machine plug or adaptor for recognizing a connected sewing device by a code word before beginning a sewing operation by sensor lines and, in case of incompatibility, for transmission of an error code for avoiding erroneous functions and preventing a start of the entire sewing operation or a specific sewing operation.

4,899,288

TEMPERATURE CONTROL INDICATING APPARATUS OF A HOT RUNNER IN A THERMOPLASTIC SYNTHETIC RESIN INJECTION MOLDING SYSTEM

Shigeru Tsutsumi, 1165 Touyama-Machi, Yonezawa-shi-Yamagata-ken, Japan

Continuation of Ser. No. 5,247, Mar. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 914,132, Nov. 1, 1986, abandoned, which is a continuation of Ser. No. 803,418, Dec. 2, 1985, abandoned. This application May 12, 1988, Ser. No. 193,403
Claims priority, application Japan, Dec. 5, 1984, 59-255687
Int. Cl.[4] B29F *1/00*; G06F *15/00*
U.S. Cl. 364—476 **4 Claims**



1. A temperature control indicating apparatus for a hot runner in a thermoplastic synthetic resin injection molding system, which comprises:

a central processor including digital controller including a microprocessor;

a bi-directional communication channel connected to said central processor;

hot runners, each hot runner including a body heater remotely positioned from said central processor; and

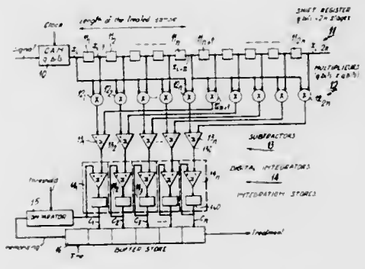
a hot runner temperature controller having A/D converter connected to each hot runner and said bi-directional communication channel for controlling current to said body heater of each hot runner.

4,899,289

APPARATUS FOR AND METHOD OF PROCESSING SIGNALS IN A COMPOSITE WAVEFORM INCLUDING NOISE AND A PERIODIC COMPONENT

Jean Appel, Vanves, France, assignor to Office National d'Etudes et de Recherche Aerospatiales, Chatillon, France

Filed Oct. 30, 1987, Ser. No. 114,748
Claims priority, application France, Oct. 31, 1986, 86 15250
Int. Cl.[4] G06G *7/19*; G01R *23/02*
U.S. Cl. 364—484 **3 Claims**



1. Apparatus for detecting the occurrence of a periodic signal embedded in noise, including real time means for calculating the autocorrelation functions of the signal and deducing the frequency of the signal from the value of the autocorrelation function coefficients, said apparatus comprising:

an analog to digital converter for periodically transforming samples of the signal into digital signals, each of the digital signals having at least one bit,

means for delaying each of said digital signals by a predetermined time interval Δt and multiples thereof, said delaying means including a first delay circuit group of n delay circuits for delaying said digital signals by Δt, $2\Delta t$ $n\Delta t$ and a second delay circuit group of n delay circuits for delaying said digital signals by $(n+1)\Delta t$, $(n+2)\Delta t$, . . . , $2n\Delta t$;

multiplying means including a first multiplying circuit group of n multiplying circuits for multiplying the digital signals derived by said converter by digital output signals of the first delay circuit group and a second multiplying circuit group of n multiplying circuits for multiplying digital signals derived by the last delaying circuit of the first delay circuit group by digital signals derived by the second delay circuit group;

subtractor means for respectively subtracting digital signals representing products derived by the second multiplying circuit group from digital signals representing products derived by the first multiplying circuit group;

integrator means for integrating digital signals representing differences derived by said subtractor means, the signals derived by said integrator means being the coefficients of the autocorrelation function of the input signal;

means for selecting at least one of said coefficients; and

comparator means for comparing the selected coefficient with a predetermined threshold, said comparator means deriving an output signal in response to the input signal containing a periodic component.

4,899,290

SYSTEM FOR SPECIFYING AND EXECUTING PROTOCOLS FOR USING ITERATIVE ANALOGY AND COMPARATIVE INDUCTION IN A MODEL-BASED COMPUTATION SYSTEM

David J. Hartzband, Nashua, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 16, 1987, Ser. No. 109,555
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—513 **49 Claims**



1. A system for iteratively performing logical evaluation operations in connection with a set of objects, each having an associated reference structure, comprising:

A. initial evaluation means for performing a logical evaluation operation in connection with a predetermined pair of objects from said set to generate an evaluation reference structure identifying selected relationships between the reference structures of said predetermined pair of objects; and

B. iterative evaluation means for iteratively performing a logical evaluation operation in connection with the reference structure of each of the objects in said set and a previously generated reference structure to produce a reference structure to be used during a succeeding iteration and a score identifying a similarity relationship between the object's reference structure and a reference structure generated during a previous iteration.

4,899,291

IMAGE PROCESSING SYSTEM

Masaharu Tsukada, Kawasaki; Shigeru Aoi, and Takaaki Ashizuma, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 733,768, May 14, 1985, abandoned.
This application Aug. 4, 1987, Ser. No. 81,445
Claims priority, application Japan, May 22, 1984, 59-103116; May 22, 1984, 59-103117; May 22, 1984, 59-103118
Int. Cl.[4] H04N *1/21, 1/23*
U.S. Cl. 364—518 **32 Claims**

1. An image processing system comprising:

a memory medium capable of storing image information representative of a plurality of images;

designating means for designating desired image information to be read out from said memory medium and which corresponds to a plurality of pages;

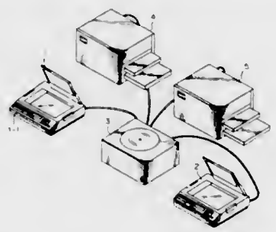
readout means for reading, in order, image information designated by said designating means, from said memory medium;

image forming means for forming the image information from said readout means;

interface means for synchronizing said readout means with said image forming means, wherein said interface means comprises a plurality of line buffer memories for storing the image information read by said readout means;

generating means for generating an indicating signal which indicates that the image information stored in said plurality of line buffer memories should be output to said image forming means; and

control means for controlling said interface means such that



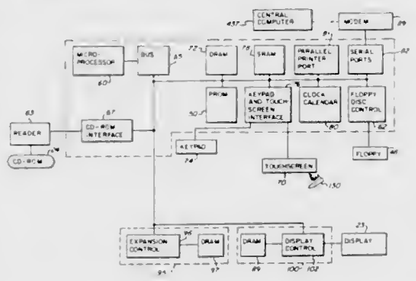
the image information stored in said plurality of line buffer memories is output to said image forming means before the image information designated by said designating means, corresponding to each of said plurality of pages, has been completely read out by said readout means.

4,899,292

SYSTEM FOR STORING AND RETRIEVING TEXT AND ASSOCIATED GRAPHICS

John A. Montagna, Trenton; Gary Irving, Skillman; Lee Farrell, Lawrenceville, all of N.J.; Gerald Cross, Philadelphia, and Stephen A. Miller, Upper Black Eddy, both of Pa., assignors to Image Storage/Retrieval Systems, Inc., Langhorne, Pa.

Filed Mar. 2, 1988, Ser. No. 163,398
Int. Cl.[4] G06F *3/03*
U.S. Cl. 364—521 **18 Claims**



15. A process for storing and displaying documents including graphic images, said process comprising the steps of:

storing a multiplicity of documents in digital form;

storing a multiplicity of graphic images in compressed, digital form, a first plurality of said graphic images being associated with a first one of said documents;

selecting said first document for processing from said multiplicity of documents;

decompressing said first plurality of graphic images after said first document is selected;

displaying first selection information corresponding to a first decompressed graphic image in said first plurality and second selection information corresponding to a second decompressed graphic image in said first plurality;

selecting said first decompressed graphic image for display by touching a region of a touch screen overlaying said first selection information;

displaying said first decompressed graphic image without displaying said second decompressed graphic image;

selecting said second decompressed graphic image for display by touching a second region of said touch screen overlaying said second selection information;

displaying said second selected decompressed graphic image after displaying said first decompressed graphic image;

displaying third selection information representing a command to scroll the display of said first document;

touching a third region of said touch screen corresponding to said third selection information; and

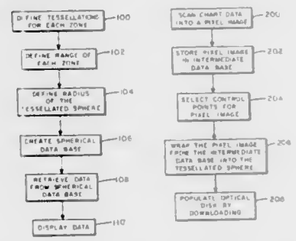
scrolling said first document in response to the touching of said third region of said touch screen.

4,899,293

METHOD OF STORAGE AND RETRIEVAL OF DIGITAL MAP DATA BASED UPON A TESSELLATED GEOID SYSTEM

John F. Dawson, and Edward W. Ronish, both of Albuquerque, N. Mex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 24, 1988, Ser. No. 261,109
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—521 **5 Claims**



5. A method for the storage and retrieval of aeronautical chart data onto an optical disk image comprising the steps of:

(a) scanning the chart data into a pixel image;

(b) storing the pixel image into an intermediate data base;

(c) selecting control points for the pixel image;

(d) warping the pixel image from the intermediate data base into a spherical data base representative of a tessellated sphere having five zones wherein the tessellations for the zones are defined so as to cause an overlap of two rows where adjacent rows meet, and wherein the zone boundary is defined at the middle of the overlap; and

(e) populating the optical disk image by down sampling the pixel image from the spherical data base.

4,899,294

GRAPHICS PROCESSING SYSTEM

Colin J. Easton, Romsey, and Adrian C. Gay, Fareham, both of United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1987, Ser. No. 121,976
Claims priority, application United Kingdom, Nov. 18, 1986, 8627552
Int. Cl.[4] G06F *15/72*
U.S. Cl. 364—522 **14 Claims**

1. A graphics processing system of the type comprising:

a source of image data defining the boundary of an area forming at least part of an image to be displayed on a display having a plurality of display lines;

image storage defining a map of said image in terms of the individual picture elements for each of plural display lines; and

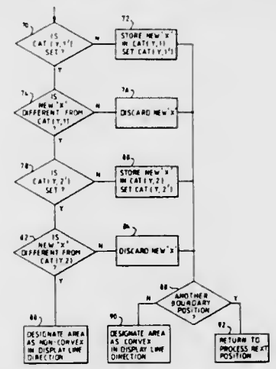
means for generating an image map from said image data, wherein said generating means comprises:

means for defining a plurality of paired storage locations in said image storage, each of said pairs of locations being associated with a corresponding one of said plural display lines and each of said storage locations being capable of being occupied by a computed displacement value of a sequential boundary point;

processing means for initially processing said image data by computing the displacements along each display line at which sequential boundary points are to be displayed and producing respective displacement values in accordance therewith;

means for detecting whether said storage locations are occupied by displacement values and storing the computed displacement values of the points, as they are computed, in storage locations for their respective display lines, that are not already occupied by displacement values;

means for determining if said area is non-convex in the displacement direction of the display lines by determining whether both storage locations of a given display line are occupied by displacement values different from the displacement value just computed therefor by said porcessing means and for producing a first indication, in response to a positive determination, indicating that said area is nonconvex;



means for determining if the complete boundary of said area has been processed and at most two different displacement values per display line have been detected and stored in the appropriate storage locations, and for providing a second indication, in response to a positive determination, indicating said area is at least one dimensionally convex in the displacement direction of the display lines; and

control means for reactuating said processing means to continue the processing of said image data in either a first or a second further processing mode, respectively in response to said first or second indications, to generate an image map from said image data.

4,899,295

VIDEO SIGNAL PROCESSING

Brian R. G. Nonweiler, Berkshire, Great Britain, assignor to Quantel Limited, Kenley, Great Britain

Filed May 20, 1987, Ser. No. 52,464
Claims priority, application United Kingdom, Jun. 3, 1986, 8613447
Int. Cl.[4] G06F *15/72*
U.S. Cl. 364—522 **8 Claims**

1. A video signal processing system for changing the shape of a video image so that a video frame appears to take the form of a three-dimensional object, comprising:

(a) an address storage device for storing an address map defining the shape of said three-dimensional object;

(b) a frame store;

(c) means for loading pixels of an input frame into the frame store in a first sequence;

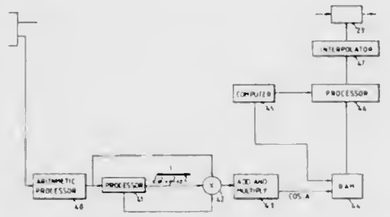
(d) means for reading said pixels out of said frame store in a

second sequence, wherein the relationship between said first sequence and said second sequence is determined from the address map;

(e) a processing device for processing the address data in combination with an indication of the position of an imaginary light source to produce light intensity factors; and

(f) means for adjusting the value of each pixel in the video frame in response to a light intensity factor to produce a video frame having shading due to the imaginary light source;

in which:



said processing device includes means for calculating the angle between a vector which is perpendicular to a surface of the three dimensional object and a vector from said surface to said light source, and means for producing a light intensity factor related to said angle; and

said address map representing the three dimensional object consists of a plurality of point coordinates, and the processing device includes means for calculating a light intensity factor for each surface defined by three adjacent coordinates.

4,899,296

PAVEMENT DISTRESS SURVEY SYSTEM

Anwar S. Khattak, 612 S. Lincoln, Spokane, Wash. 99204

Continuation-in-part of Ser. No. 195,321, May 18, 1988, abandoned, Ser. No. 120,066, Nov. 13, 1987, Pat. No. 4,788,859, Ser. No. 144,986, Jan. 19, 1988, abandoned, and Ser. No. 150,955, Feb. 1, 1988. This application Aug. 8, 1988, Ser. No. 229,655

Int. Cl.⁴ G01B *11/30*

U.S. Cl. 364—550 **9 Claims**



1. A pavement distress survey system comprising:

a surface vehicle means for moving over a length of a pavement being inspected;

a first video camera means for optically inspecting said pavement for surface defects, wherein said first video camera means is mounted on said surface vehicle means and is projected towards said pavement, and wherein said first video camera means moves over a surface of said pavement as said surface vehicle means is moved over said length of said pavement;

a second video camera means for optically inspecting said pavement for surface defects, wherein said second video camera means is mounted on said surface vehicle means spaced apart from said first video camera means and is projected onto said pavement surface at a generally acute angle relative to said first video camera means for having a second field of view which has at least a portion thereof in common with said first video camera means; and

a video signal processing means for determining a surface condition of said length of said pavement travelled by said surface vehicle means, wherein said video signal processing means is operatively connected to said first and second video camera means,

wherein said first and second video camera means comprise infrared video camera means for capturing the pavement surface temperature profile from said surface vehicle means.

4,899,297

METHOD AND APPARATUS FOR AUTOMATICALLY TESTING TEMPERATURE MEASURING DEVICES

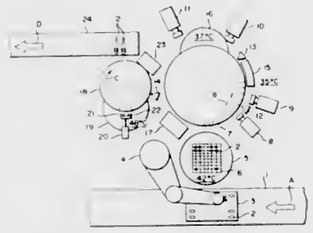
Yoshikazu Sano; Susumu Kobayashi, and Kiyoshi Endo, all of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,492

Claims priority, application Japan, Apr. 8, 1987, 62-84526

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—557 **7 Claims**



1. A method of automatically testing a temperature measuring device having a plurality of functions to be tested, the temperature measuring device including a temperature responsive element, the method comprising the steps of:

heating at least the temperature responsive element of the temperature measuring device until thermal equilibrium of a predetermined temperature is attained;

testing a thermal equilibrium temperature measurement function of said temperature measuring device by reading display information from said temperature measuring device after said heating step and comparing this display information with information indicative of the predetermined temperature;

cutting off power to said temperature measuring device after said testing step and then reintroducing power to said temperature measuring device; and

testing an initial display function of said temperature measuring device by reading the display information from said temperature measuring device after the reintroduction of power and comparing this display information with predetermined information.

4,899,298

HIGH RESOLUTION MEASUREMENT OF MOVING MATERIALS USING A SCINTILLATION DETECTOR

Mario W. Overhoff, c/o Overhoff Technology Corporation, 1160 U.S. Route 50, Milford, Ohio 45150

Filed Feb. 25, 1988, Ser. No. 160,369

Int. Cl.⁴ G06F *15/46;* **G01B** *15/02*

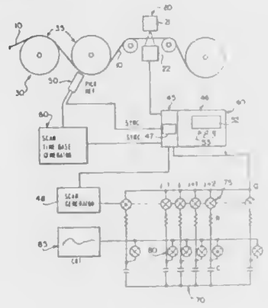
U.S. Cl. 364—558 **12 Claims**

1. A method of using a scintillation detector to measure the areal density of an article wherein there are periodic repetitions of the areal density, the method comprising the steps of

causing relative movement between said detector and the article,

measuring the areal density by the scintillation detector at regular intervals, which intervals define a measurement increment,

repeating the measurements within each measurement increment at the same relative position within the periodic repetition, and



averaging the measurements taken within each increment over a plurality of periodic repetition intervals to obtain an accurate measurement of the areal density of the article.

4,899,299

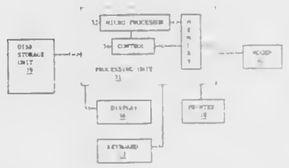
METHOD FOR MANAGING THE RETENTION OF ELECTRONIC DOCUMENTS IN AN INTERACTIVE INFORMATION HANDLING SYSTEM

Margaret G. MacPhail, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1987, Ser. No. 138,231

Int. Cl.⁴ G60K *15/00*

U.S. Cl. 364—570 **10 Claims**



1. A method for automatically controlling the retention and deletion of a plurality of electronic documents of different types stored in an interactive information handling system by a plurality of end users, each said stored document being assigned to either one of said end users or an administrator of said system to insure that said documents are retained in said system until the latest of two independently established expiration dates, said method comprising the steps of,

(A) storing in said system in association with each said document, first and second expiration dates which have been selected respectively in accordance with first and second different criteria, said first and second criteria reflecting future retention needs for said type of document respectively of said one of said end users and said administrator,

(B) periodically logically comparing with said system each said expiration date with a current date to determine if a predetermined relationship exists among said dates for each of said plurality of documents, and

(C) deleting said associated document only when said step of comparing indicates that said current date is later than both of said expiration dates.

4,899,300

CIRCUIT TO PERFORM A LINEAR TRANSFORMATION ON A DIGITAL SIGNAL

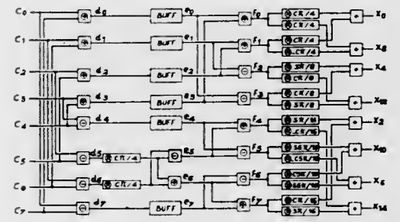
Francis Jatand, 167 rue Etienne Dolet, 94230 Cachan; Nicolas Demassieux, 4 Impasse Reille, 75014 Paris, and Michel Dana, 53 rue de la Colonie, 75013 Paris, all of France

Continuation of Ser. No. 33,793, Apr. 3, 1987, abandoned. This application Mar. 30, 1989, Ser. No. 331,012

Claims priority, application France, Apr. 4, 1986, 86 04845

Int. Cl.⁴ G06F *15/332*

U.S. Cl. 364—725 **3 Claims**



1. A circuit for performing a linear transformation on a digital signal composed of N samples, wherein N is an integer, said circuit comprising:

a first plurality of successive operator stages wherein each of said stages performs addition and subtraction operations by means of associated adders according to a determined linear transformation graph,

a second plurality of operator stages which perform multiplication operations by means of associated multipliers according to said graph, each stage of multiplication being between two stages of addition/subtraction;

buffers between two successive stages of addition/subtraction;

said graph including a third plurality of stages equal in number to said first plurality of successive stages of said circuit and wherein said graph further includes a plurality of branches wherein each branch represents an operation of multiplication by one of said associated multipliers between a variable operand and a determined coefficient and wherein said graph further comprises a plurality of nodes with each node representing an operation of addition or subtrraction by one of said associated adders between two variable operands,

the multiplier associated with each one of said branches being wired according to the value of said determined coefficient associated with said branch,

the adder for each of said plurality of nodes being wired according to one of the addition operation and the subtraction operation associated with said node.

4,899,301

SIGNAL PROCESSOR FOR RAPIDLY CALCULATING A PREDETERMINED CALCULATION A PLURALITY OF TIMES TO TYPICALLY CARRYING OUT FFT OR INVERSE FFT

Takao Nishitani; Yuichi Kawakami; Hideo Tanaka, and Ichiro Kuroda, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 29, 1987, Ser. No. 8,684

Claims priority, application Japan, Jan. 30, 1986, 61-16697

Int. Cl.⁴ G06F *7/34, 15/35*

U.S. Cl. 364—726 **5 Claims**

1. A signal processor for processing zero-th through (N−1)-th input elements of an input data signal into zero-th through (N−1)-th output elements of an output data signal, where N represents a predetermined positive integer, said signal processor comprising a memory unit having a plurality of addresses,

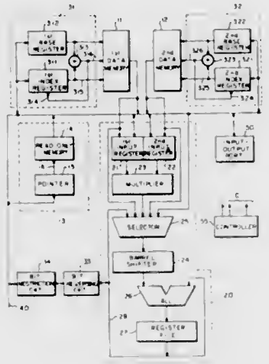
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memory accessing means for accessing said memory unit to initially store said input elements in the respective memory addresses as stored elements, respectively, coefficient producing means for producing predetermined coefficients, and calculation performing means for performing a predetermined calculation a plurality of times on the stored elements read from said memory means by using said coefficients to generate said output elements as a function of said input elements and said coefficients, each of said stored elements being divided into a real part and an imaginary part, said memory unit comprising a first data memory having said plurality of memory addresses for storing the real parts of said stored elements and a second data memory having said plurality of memory addresses for storing the imaginary parts of said stored elements, said memory accessing means comprising:

a first address circuit coupled to said first data memory for calculating a first address to access the first data memory;

a second address circuit coupled to said second data memory for calculating the first address to access the second data memory;

a first register in cooperation with said first address circuit for indicating an address distance from said first address among said first data memory;



a second register in cooperation with said second address circuit for indicating the address distance from said first address among said second data memory;

a first adder coupled to said first address circuit and said first register for adding the address distance to the first address to supply said first data memory with a second address;

a second adder coupled to said second address circuit and said second register for adding the address distance to the first address to supply said second data memory with the second address;

reading means for reading a pair of stored elements from said first and said second addresses as a pair of read elements;

storing means for storing a pair of calculated elements in said first and said second addresses, said calculated elements being obtained by once performing said predetermined calculation on said pair of read elements;

a first line coupled to said first adder and said first address circuit for delivering said second address to said first address circuit; and

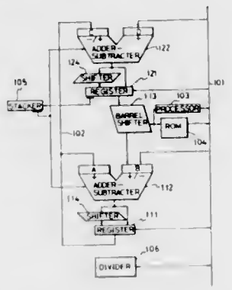
a second line coupled to said second adder and said second address circuit for delivering said second address to said second address circuit.

4,899,302

ARITHMETIC UNIT FOR INVERSE TRIGONOMETRIC FUNCTION

Misayo Nakayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 15, 1989, Ser. No. 311,168
Claims priority, application Japan, Feb. 17, 1988, 63-35901
Int. Cl.[4] G06F *15/347*
U.S. Cl. 364—729 **5 Claims**



1. An arithmetic unit for carrying out sequentially arithmetic pseudo division and reverse-sequentially arithmetic pseudo multiplication according to algorithm based on CORDIC method utilizing constant values $(2^k)\arctan(2^{-k})$ so as to calculate value of inverse trigonometric function arctan Y/X, the unit comprising: generating means for sequentially generating the constant values $(2^k)\arctan(2^{-k})$ from k=m−1 to k=0 where k=0, 1, . . . , m−1; a first register operable during the pseudo division for storing a first variable and operable during the pseudo multiplication for storing a destined variable; a second register operable during the pseudo division for storing a second variable; a barrel shifter for right-shifting the value of second variable by a given shift bit count 2_k where k=1, 2, . . , m−2, m−1, m; a first adder-subtracter operative during the pseudo division for selectively adding or subtracting the right-shifted value of second variable to or from the value of first variable to output the result into the first register to thereby update the value of first variable, and operative during the pseudo multiplication for selectively adding or subtracting the constant value of generating means to or from the value of destined variable stored in the first register to output the result into the first register to thereby update the value of destined variable; a second adder-subtracter operative during the pseudo division for selectively adding or subtracting the value of first variable to or from the value of second variable to output the result into the second register to thereby update the value of second variable; and m-stage stack means operative to process a sign bit of the second variable in First-In, Last-Out basis for controlling the first and second adder-subtracters to selectively carry out adding or subtracting operation.

4,899,303

FAULT DETECTION SYSTEM FOR AN ARITHMETIC UNIT

Masayuki Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,163
Claims priority, application Japan, Mar. 27, 1987, 62-75653
Int. Cl.[4] G06F *11/10*
U.S. Cl. 364—739 **6 Claims**

1. A fault detection system for an arithmetic unit, said fault detection system comprising:

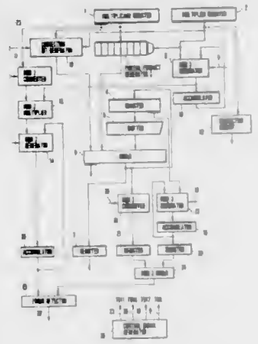
a shift-and-add multiplier capable of both a normal multiplication and a division for calculating a quotient as a product of a dividend and a reciprocal of a divisor;

modulo 3 emulator means for emulating said multiplier in modulo 3 arithmetic;

conversion means for converting a multiplication result of said multiplier into a modulo 3 equivalent;

comparison means for comparing outputs from said conversion means and said modulo 3 emulator means to detect a bit error; and

control means for supplying, to said modulo 3 emulator means and to said conversion means, a control signal



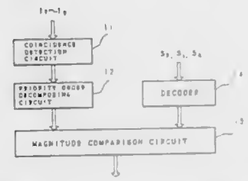
representing at least one of a normal multiplication mode of said multiplier, a multiplication mode for calculating a product of a divisor and a reciprocal of said divisor, a multiplication mode for calculating a product of a dividend and a reciprocal of a divisor, and a multiplication mode for calculating a partial quotient in a division process, and for controlling generation of module 3 equivalents in said modulo 3 emulator means and said conversion means.

4,899,304

OVERFLOW DETECTION CIRCUIT

Hideyuki Terane, and Kazuya Ishihara, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 2, 1988, Ser. No. 202,159
Claims priority, application Japan, Jan. 12, 1988, 63-5295
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—745 **1 Claim**



1. An overflow detection circuit for a shifter comprising:

a coincidence detection circuit for detecting coincidence and non-coincidence between the most significant bit of data to be shifted and another bit besides the most significant bit so as to output binary bit string signals respectively corresponding to the coincidence and non-coincidence;

a priority order decomposing circuit which receives the above mentioned bit string signals;

a decoder for decoding signals representing a shift value used in shifting the aforementioned data; and

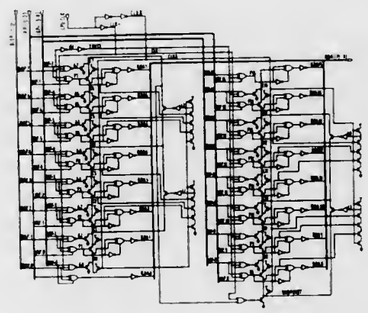
a magnitude comparison circuit for comparing the magnitude of the outputs of the aforementioned priority order decomposing circuit and the decoder so as to output binary signals according to the compared magnitude, wherein the output of said magnitude comparison circuit is employed as an overflow detection signals.

4,899,305

MANCHESTER CARRY ADDER CIRCUIT

William M. Needles, Arlington, Tex., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Jun. 15, 1988, Ser. No. 207,322
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—787 **6 Claims**



1. A Manchester carry adder circuit of the type that includes a plurality of series-connected elemental adder circuits for performing addition of bit position n+1 of N-bit terms A and B by adding the operands A_{n+1} and B_{n+1} and the carry C_n from the previous bit position n to produce a sum digit and a possible carry-out digit C_{n+1} for carry to the subsequent bit position n+2, the circuit comprising

(a) a first x bit adder that uses a static technique to perform addition of the least significant bit of the terms A and B and a dynamic technique to perform addition on the remaining x−1 bits;

(b) a second N-x bit adder that uses a static technique to perform addition on the most significant bit of the terms A and B and a dynamic technique to perform addition on the remaining N−x−1 bits; and

(c) means for combining the first and second adders at the most significant bit of the first adder and the least significant bit of the second adder using the carry-out C_x of the first adder and the carry-in of the least significant bit position of the second adder.

4,899,306

TEST INTERFACE CIRCUIT WHICH GENERATES DIFFERENT INTERFACE CONTROL SIGNALS FOR DIFFERENT TARGET COMPUTERS RESPONDING TO CONTROL SIGNALS FROM HOST COMPUTER

Steven C. Greer, Lisle, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 26, 1985, Ser. No. 769,138
Int. Cl.[4] G06F *15/20, 9/06*
U.S. Cl. 364—900 **6 Claims**

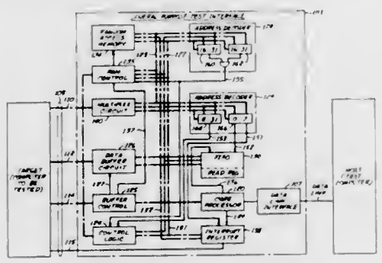
1. An adaptable test interface for use with a host computer and a plurality of target computers of different types having differing input/output characteristics comprising:

memory means;

first control means, connected to said memory means, responsive to control signals from said host computer to write test data received from said host computer into and read target output data from said memory means and to

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generate a unique set of interpretation control signals for each computer type to be tested;
interconnecting means for connecting said first control means to said host computer;
second control means, connected to said first control means, responsive to said interpretation controll signals and control signals from a target computer to be tested for generating interface control signals; and
address decoder means, connected to said second control means, responsive to said interface control signals and address signals from said target computer to generate memory control signals;



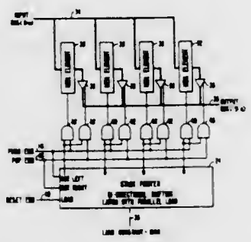
said memory means, connected to said address decoder means, responsive to said memory control signals to access memory locations defined by said address signals from said target computer and selectively transmit said test data to and store said target output data from said target computer;
whereby a target computer obtains from the memory means test data supplied by the host computer and returns target output data to the memory means for examination by the host computer.

4,899,307

STACK WITH UNARY ENCODED STACK POINTER

Daniel E. Lenoski, Mountain View, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Apr. 10, 1987, Ser. No. 36,607
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—78 **7 Claims**



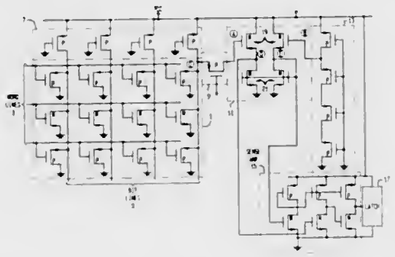
1. A memory stack comprising:
a plurality of multi-bit storage elements for storing data in fixed positions as a stack;
I/O bus means coupled to each of said storage elements;
a plurality of control means for enabling the input and output of data, each being coupled between said I/O bus means and a single one of said storage elements; and
an unary encoded stack pointer consisting of a serial, bidirectional shift register having a plurality of single bit outputs, each single bit output being coupled to a single one of said control means, such that a value having a single active bit can be shifted in said shift register to point to a one of said storage elements which is a top of said stack.

4,899,308

HIGH DENSITY ROM IN A CMOS GATE ARRAY

Emdadur R. Khan, San Jose, Calif., assignor to Fairchild Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 11, 1986, Ser. No. 940,363
Int. Cl.[4] G11C *11/40*; H03K *19/094*
U.S. Cl. 365—104 **13 Claims**



1. A memory device for storing information, comprising:
a matrix of CMOS FETs for storing information, wherein each FET has a drain, a gate and a source, the gates of the FETs in each row of the matrix are connected to one of a plurality of word-lines, the drains of N-channel FETs in each column of the matrix are connected to one of a plurality of bit-lines, the sources of P-channel FETs in each column of the matrix are also connected to one of the plurality of bit-lines, and the stored information is read by sensing voltage levels on the bit-lines;
a plurality of load transistors which connect respective bit lines of said memory device to a power supply voltage source;
a level-shifting circuit having a first input which is coupled to one of the plurality of bit-lines to produce an output that is indicative of the voltage level on that bit line and is shifted in a direction away from the voltage of said voltage source;
a reference voltage circuit for providing a reference level for a bit-line voltage which compensates for power supply fluctuations and variations in manufacture of the device, said reference voltage circuit comprising a series-connection of a predetermined number of FETs and having an output connected to a second input of said level-shifting circuit;
a sense amplifier connected to the output of said level shifting circuit for detecting the bit-line voltage levels; and
a latch circuit for holding an output voltage from the sense amplifier.

4,899,309

CURRENT SENSE CIRCUIT FOR A ROM SYSTEM

Shooji Kitazawa; Hiroshi Kuwabara, and Teruhiro Harada, all of Tokyo, Japan, assignors to Oki Electric Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,374
Claims priority, application Japan, Aug. 3, 1987, 62-194257
Int. Cl.[4] G11C *7/00, 11/40*; H03F *3/45*
U.S. Cl. 365—189.01 **8 Claims**

1. A current sense circuit for detecting a read current from a selected memory cell in a memory cell matrix of a ROM, comprising:

a first series circuit and a second series circuit, each comprising:
a current supply means having a first main electrode connected to a power supply and a second main electrode;
a first MOS FET having a first main electrode connected to the second main electrode of said current supply means, a second main electrode and a gate electrode; and
a second MOS FET having a first main electrode connected to the second main electrode of said first MOS FET, a second main electrode connected to a second power supply, and gate electrode connected to the first main electrode of said first MOS FET;



wherein the gate electrode of said first and said second MOS FETs of said reference voltage generator are connected together;
the gate electrodes of said first MOS FETs of said first and second series circuits are connected together; and
the ratio of the current driving capability between said first MOS FET of said first series circuit and said first MOS FET of said second series circuit is substantially equal to the ratio of the current driving capability between said second MOS FET of said first series circuit and said second MOS FET of said second series circuit.

4,899,310

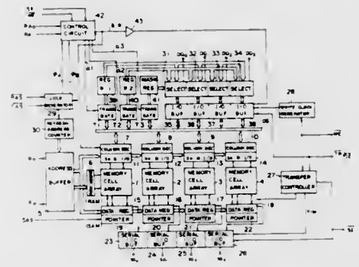
SEMICONDUCTOR MEMORY DEVICE HAVING A REGISTER

Fumio Baba, Kawasaki; Kazuya Kobayashi, Itabashi; Seiji Enomoto, Seto, and Hiroaki Ogawa, Nagoya, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu VLSI Limited, Kasugai, both of, Japan

Filed Jun. 22, 1988, Ser. No. 209,819
Claims priority, application Japan, Jun. 25, 1987, 62-158575
Int. Cl.[4] G11C *11/40, 13/00*
U.S. Cl. 365—189.05 **17 Claims**

1. A semiconductor memory device having a register comprising:
a memory cell array having memory cells;
a data bus;
input/output means provided between the memory cell array and the corresponding data bus;
register means for storing predetermined data;
transfer gate means being connected between the data bus and the register means;
first data buffer means for transferring data on the data bus to an external circuit;
second data buffer means for transferring data derived from the external circuit to the data bus; and
controlling means for disconnecting the input/output means from the data bus and turning OFF the transfer gate means in a first operation mode and for connecting the input/output means to the data bus and turning ON the transfer gate means in a second operation mode,
wherein in the first operation mode, one of a data read operation and write operation is performed between the memory cell array and the external circuit via the data bus and either one of the first and second buffer means, and alternatively in the second operation mode one of the data read operation and write operation is performed between the register means and the external circuit via the transfer gate means, the data bus and either one of the first and second buffer means.

9. A semiconductor memory device having a register comprising:
a plurality of memory cell arrays each having memory cells;
a plurality of data buses each provided for the respective memory cell arrays;
a plurality of input/output means each provided between the respective memory cell arrays and data buses;
register means connected to any one of the plurality of data buses for storing predetermined data;



transfer gate means being connected between the register means and the data bus to which the register means is connected;
a plurality of first data buffer means each provided for the respective memory cell arrays for transferring data on the respective buses to an external circuit;
a plurality of second data buffer means each provided for the respective memory cell arrays for transferring data derived from the external circuit to the respective data buses; and
controlling means for disconnecting the input/output means from the data bus to which the transfer gate means is connected and turning OFF the transfer gate means in a first operation mode and for connecting the input/output means to the data bus and turning ON the transfer gate means in a second operation mode,
wherein in the first operation mode, one of a data read operation and write operation is performed between the memory cell arrays and the external circuit, and alternatively in the second operation mode one of the data read operation and write operation is performed between the register means and the external circuit.

4,899,311

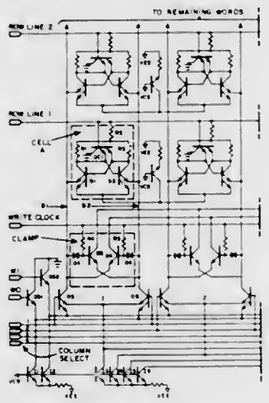
CLAMPING SENSE AMPLIFIER FOR BIPOLAR RAM

Richard J. Petschauer, Edina, and Robert J. Bergman, Roseville, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 29, 1988, Ser. No. 237,470
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.06 **12 Claims**

1. In a bipolar random access memory comprising a plurality of memory cells, a plurality of select word lines and a plurality of pairs of select bit lines coupled to said memory cells, and an output driver, the improvement comprising first and second

clamping means, a plurality of sense amplifier means each comprising first and second bipolar transistor means each of which comprise a collector-emitter current path and a gate means for controlling current flow in its associated collector-emitter path, wherein both of said collector-emitter paths are coupled between said output driver and a different select bit line of the same pair of said plurality of pairs of said bit lines,



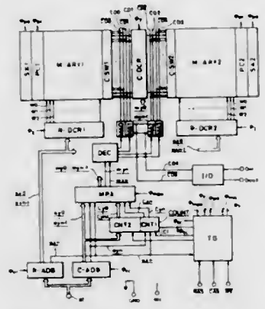
and said gate means of said bipolar transistor means has its collector-emitter path coupled to a first one of said select bit lines of said pair of bit lines through said first clamping means to the second one of said select bit lines of said pair of bit lines, and said gate means of said other bipolar transistor has its collector-emitter path coupled to said second one of said pair of said select bit lines through said second clamping means to said first one of said select bit lines.

4,899,312

SEMICONDUCTOR MEMORY

Katsuyuki Sato, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 820,326, Jan. 21, 1986, Pat. No. 4,758,995. This application Jul. 1, 1988, Ser. No. 214,542
Claims priority, application Japan, Jan. 23, 1985, 60-9046
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230.09 **20 Claims**



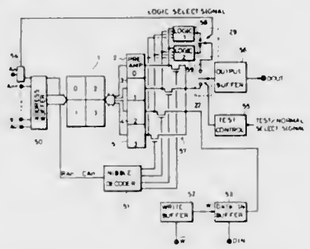
1. A semiconductor memory comprising:
a plurality of memory cells; selecting means for selecting a plurality of memory cells in said plurality of memory cells in accordance with first internal address signals; an input means for inputting data to the selected memory cells; storing means for storing a plurality of data read out of the selected memory cells; an output means for outputting said stored data in said storing means sequentially in response to change in a second internal address signal; signal generating means for generating said first internal address signals which indicate a plurality of memory cells to next be selected during the time that said storing means stores the data read out of the selected memory; and during the time that said storing means store data read out of the selected memory cells, said selecting means select a next plurality of memory cells.

4,899,313

SEMICONDUCTOR MEMORY DEVICE WITH AN IMPROVED MULTI-BIT TEST MODE

Masaki Kumanoya; Hideshi Miyatake; Katsumi Dosaka, and Yasuhiro Konishi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,427
Claims priority, application Japan, Apr. 15, 1987, 62-93514
Int. Cl.[4] G11C *7/00, 8/00*
U.S. Cl. 365—201 **15 Claims**



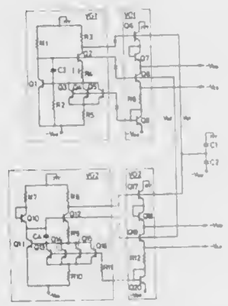
1. A semiconductor memory device comprising a memory cell array constituted by a plurality of memory cell bits each of which storing information, and internal signal generation means which reads and outputs simulataneously the information stored in the plural bit memory cells from said memory cell array, provided with operation modes including: a normal mode, in which the information is read from said internal signal generation means based on an external address; and a test mode, in which the information from said internal signal generation means is received by plural bit unit and a logic value corresponding to said received plural bit information is outputted, said device comprising:
logical operation means which receives plural bit memory cell information simulataneously from said internal signal generation means and carries out selectively at least two predetermined logical operations for outputting results from said at least two predetermined logical operations;
a first terminal for receiving a logical operation select signal;
first selection means for selectivity outputting one of the results of the at least two logical operations carried out by said logical operation means in response to said logical operation select signal;
a second terminal for receiving a signal for selecting one of said test mode and said normal mode; and
second selection means which passes said first selection means output in said test mode and which passes the memory cell information from said internal signal generation means in said normal mode.

4,899,314

SEMICONDUCTOR MEMORY

Kazuhisa Miyamoto; Shuuichi Miyaoka, both of Ohme, and Masanori Odaka, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,661
Claims priority, application Japan, Apr. 24, 1987, 62-99775
Int. Cl.[4] G11C *11/34*
U.S. Cl. 365—226 **7 Claims**



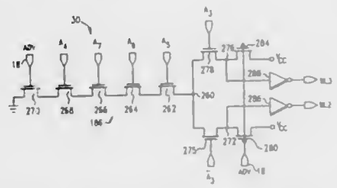
1. A semiconductor integrated circuit device comprising:
a first level generate means and a second level generate means for respectively generating different reference levels;
a first output means and a second output means linked to each other and each respectively supplied with one of the reference levels, wherein the first and second output means each respectively generate an output voltage corresponding to the reference level supplied thereto; and
selective link means for linking either one of said first and second level generate means to said first and second output means.

4,899,315

LOW-POWER, NOISE-RESISTANT READ-ONLY MEMORY

Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 43,381, Apr. 28, 1987, Pat. No. 4,811,301. This application Nov. 14, 1988, Ser. No. 270,168
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365--230.06 **2 Claims**



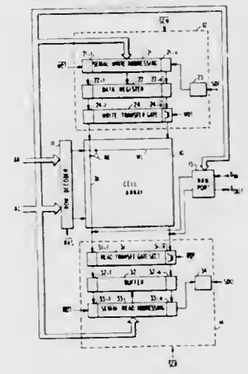
1. A memory including a plurality of rows and columns of memory cells, each row of memory being associated with a row address comprising a plurality of address bits, each row being capable of receiving a control signal through a word line, comprising:
a row decoder for decoding an address of one of said rows, said row decoder comprising a plurality of NAND circuits, each NAND circuit being capable of receiving input from signals including a selected set of signals corresponding to a selected set consisting of address bits, complements of address bits or a combination thereof, each NAND circuit being further capable of outputting a plurality of signals received by selected word lines;
each NAND circuit comprising a plurality of first transistors having current paths coupled in series between a voltage reference and a node, respective gates of said first transistors capable of receiving input from signals including a selected set of signals corresponding to a selected set consisting of address bits, complements of address bits or a combination thereof;
a second transistor capable of having a current path for coupling said node to a selected signal output from a selected NAND circuit; and
a third transistor having a current path for coupling said node to a signal selected from a set of signals corresponding to a selected set consisting of address bits, complements of address bits, or a combination thereof.

4,899,316

SEMICONDUCTOR MEMORY DEVICE HAVING SERIAL WRITING SCHEME

Akira Nagami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,451
Claims priority, application Japan, Dec. 26, 1985, 60-294147
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.01 **8 Claims**



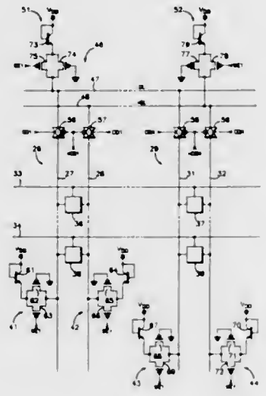
1. A semiconductor memory device comprising; a memory array of a plurality of memory cells arranged in rows and columns, means for selecting one of said rows thereby to enable the memory cells of the selected row for writing data thereto or reading data therefrom through said columns, a random access circuit coupled to said columns of said memory array for performing a random selection of said column for reading data therefrom or writing data thereto in response to column address information, a first terminal, a serial read circuit coupled to said first terminal and said columns for sequentially k outputting at said first terminal data from said columns one by one, a second terminal to which write data are sequentially applied one by one, a serial write circuit couple to said second terminal and to said columns for operatively writing write data sequentially applied to said second terminal to said columns simultaneously, first control means for enabling said serial read circuit, and second control means for enabling said serial write circuit independently of said serial read circuit.

4,899,317

BIT LINE PRECHARGE IN A BIMOS RAM

George P. Hoekstra, Fair Oaks, Calif.; Lal C. Sood, and Samuel E. Alexander, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 1, 1988, Ser. No. 151,044
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—203 **12 Claims**



1. A memory having a read mode and a write mode and having a first power supply terminal for receiving a positive power supply voltage, comprising:

an array of MOS memory cells respectively coupled to bit line pairs and word lines at intersections thereof, each said MOS memory cell characterized as providing a voltage differential on the bit line pair to which it is coupled when the word line to which it is coupled is enabled when the memory is in the read mode;

a pair of data lines;

column decoder means, coupled to the bit line pairs, for coupling a selected bit line pair to the pair of data lines as determined by a column address;

row decoder means, coupled to the word lines, for enabling a selected word line as determined by a row address;

bit line precharge means, coupled to the bit line pairs, for charging the bit line pairs to one Vbe below the voltage at the first power supply terminal in response to the memory switching from the write mode to the read mode;

sense amplifier means comprised of bipolar transistors and coupled to the data lines for amplifying a voltage differential present on the pair of data lines when the memory is in the read mode; and

wherein the bit line precharge means comprises:

a plurality of bipolar transistors, each bipolar transistor corresponding to an associated bit line and having a base and collector coupled to the first power supply terminal, and an emitter; and

a plurality of coupling means, each coupling means comprising a MOS transistor having a first current electrode coupled to the emitter of an associated bipolar transistor, a second current electrode coupled to the bit line to which the associated bipolar transistor corresponds, and a control electrode for receiving a write enable signal which is responsive to the memory switching from the write mode to the read mode.

4,899,318

METHOD AND DEVICE FOR RECONSTRUCTING THE SHAPE AND POSITION OF OBJECTS IN SPACE

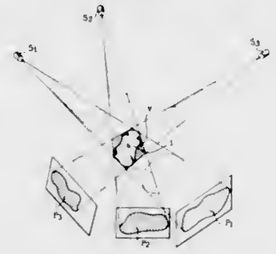
Etienne Schlumberger, Tour Plein Ciel, 8 rue Emile Deslandres, Paris 75013, and Maurice Schlumberger, Le Churut, 38700 Le Chappey en Chartreuse, both of France

Filed Dec. 5, 1988, Ser. No. 279,519
Claims priority, application France, Dec. 9, 1987, 8717140
Int. Cl.[4] G03H *3/00*
U.S. Cl. 367—8 **12 Claims**

1. A method for reconstructing the shape and position of objects in space from at least two projections of these objects obtained by transmission from sources at spaced locations of waves that are modified by passage through said objects, wherein said method comprises the steps of:

(a) determining in respect of each point of each projection the distance traversed through an object by each ray derived from a corresponding one of the sources,

(b) determining a volume which contains the object, the



volume comprising an envelope of all the rays which are derived from the sources and pass through said object,

(c) plotting the distances determined in step (a) from the external limits of the envelope determined in step B,

(d) determining a first space in which the distances plotted in step (c) overlap, said first space being necessarily located inside the object,

(e) plotting the distances determined in step (a) from the external limits of the first space as determined in step (d) so as define a second space, which is necessarily located outside the object and which is more restricted than the envelope determined in step (b),

(f) repeating steps (d) and (e) with the successively determined inner and outer spaces so as to determined, by iteration spaces which are located alternately outside and inside the object in increasing proximity to said object and thus progressively approach the shape and position of the object.

4,899,319

METHOD FOR DETERMINING INDUCED FRACTURE AZIMUTH IN FORMATIONS SURROUNDING A CASED WELL

W. L. Medlin, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 11, 1988, Ser. No. 192,446
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—35 **4 Claims**

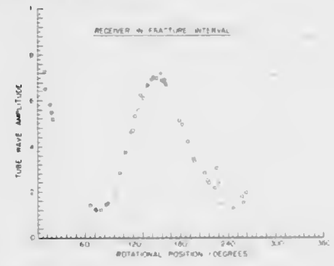
1. A method of acoustic well logging for identifying formation fracture intervals behind a cased well comprising the steps of:

(a) traversing a fluid-filled cased well with a well logging tool containing an asymmetric acoustic energy transducer for producing a positive pressure wave in the fill-fluid in one direction and a negative pressure wave in the fill-fluid in an opposite direction,

(b) rotating said logging tool as it traverses said cased well

(c) exciting said transducer with a plurality of tone bursts on

fixed frequency to drive said transducer to resonate and produce the positive and negative pressure waves in the fill-fluid, the impact of said pressure waves against the casing of said well causing said casing to deflect and produce asymmetric cased well tube waves which travel within said casing,



(d) receiving said asymmetric tube waves at a spaced apart position within said cased well by one or more receivers sensitive to said asymmetric cased well tube waves,

(e) recording the amplitudes of said received cased well tube waves, and

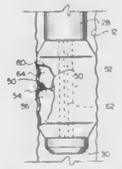
(f) identifying the azimuthal direction of a fracture interval intersected by said cased well from the rotational position of said logging tool at which there is an increased amplitude in said received cased well tube waves.

4,899,320

DOWNHOLE TOOL FOR DETERMINING IN-SITU FORMATION STRESS ORIENTATION

David D. Hearn, Richardson; Eric S. Pasternack, and Daniel J. Segalman, both of Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 751,779, Jul. 5, 1985, abandoned. This application Apr. 29, 1988, Ser. No. 188,728
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—35 **8 Claims**



1. A method of identifying the orientation of the horizontal in-situ stress field of a formation beneath an earth surface comprising the steps of:

(a) penetrating said formation with a downwardly-directed cylindrical borehole having a sidewall;

(b) exerting adjustable uniform radial pressure against substantially the entire circumference of said sidewall at a desired depth within said formation;

(c) measuring the displacement of said sidewall at said depth in each of a plurality of different radial directions with respect to the longitudinal axis of said borehole corresponding to successively greater values of said pressure;

(d) generating separate signals respectively representative of said displacements;

(e) associating each of said signals with the radial direction of the displacement which it represents;

(f) monitoring said signals in order to compare the relative magnitude of said signals, and

(g) increasing said pressure until said comparison reveals a variation in said displacements from a maximum in at least one of said radial directions to a minimum in at least one other of said radial directions.

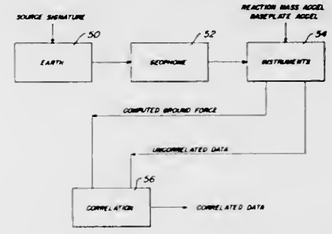
4,899,321

METHOD AND APPARATUS FOR DETERMINING THE SOURCE SIGNATURE OF LAND VIBRATORS

J. J. Solanki, Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,133
Int. Cl.[4] G01V *1/28*
U.S. Cl. 367—48 **6 Claims**

1. In seismic exploration wherein a vibratory seismic source locked at a first one of baseplate phaselock, reaction mass phase lock or ground force phase lock generates vibrative energy into the ground and the amplitude and phase of reflections of said first generated phaselocked vibrative energy is



detected and recorded to produce a first set of seismic data and a vibratory source locked at a second one of baseplate phaselock, reaction mass phaselock or ground force phaselock generates vibrative energy into the ground and the amplitude and phase of reflections of said second generated phaselocked vibrative energy is detected and recorded to produce a second set of seismic data, a method of processing said first and second sets of produced seismic data comprising the steps of:

determining a first computed ground force on the earth during said first generation of vibrative energy;

correlating said first computed ground force with said first set of produced seismic data to produce a first zero phase wavelet imaging the subsurface;

determining a second computed ground force on the earth during said second generation of vibrative energy;

correlating said second computed ground force with said second set of produced seismic data to produce a second zero phase wavelet imaging the subsurface; and

comparing said first and second produced zero phase wavelets to determined if correct imaging of the subsurface has been produced.

4,899,322

INTEGRATED GEOPHYSICAL SURVEY SYSTEM

William C. Crutcher, and Joseph R. Paysinger, both of P.O. Box 965, Katy, Tex. 77492

Filed Oct. 2, 1987, Ser. No. 104,449
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—59 **5 Claims**

1. Apparatus for conducting a land-based geophysical survey, comprising:

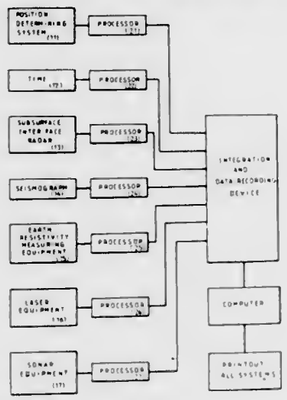
sensor means for measuring selected underground geophysical parameters with said sensor means being land-based and being capable of being designated to measure geophysical parameters, including means for determining a position of an underground object, means for sub-surface interface radar, means for seismography, means for measuring earth-resistivity equipment, means for laser equipment, means for sound-transmitting detection equipment, and means for measuring time;

a series of microprocessors in communication with said sensor means;

a data recording device in communication with said series of microprocessors;

a computer in communication with said data recording device for integrating information collected via said sensor means; and,

means for displaying or printing out of said information.



4,899,323

ANTI-SEISMIC DEVICE

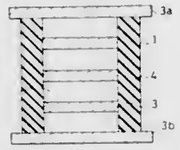
Yoshihide Fukahori, Hachioji; Hiromu Kojima, Higashimurayama; Akihiko Ogiso; Shigenobu Suzuki, both of Kodaira, and Toshikazu Yoshizawa, Hachioji, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 306,263, Feb. 1, 1989, abandoned, which is a continuation of Ser. No. 78,621, Jul. 28, 1987, abandoned. This application Apr. 12, 1989, Ser. No. 337,045

Claims priority, application Japan, Aug. 4, 1986, 61-183196; Sep. 16, 1986, 61-217689; Oct. 2, 1986, 61-234897; May 2, 1988, 63-109604

Int. Cl.[4] E04B *1/98*

U.S. Cl. 367—176 **20 Claims**



1. An anti-seismic device which comprises anti-seismic rubber bearings and dampers arranged in parallel, said anti-seismic rubber bearing being formed by laminating a plurality of rigid hard plates and soft boards having a viscoelastic property one over another, said damper being composed mainly of a viscoelastic material having the physical properties (i) and (ii) defined below.

(i) the hysteresis ratio (h_{50}) is greater than 0.3 at 50% tensile deformation at 25° C.

(ii) the storage modulus (E) measured dynamically at a frequency of 5 Hz, a strain of 0.01%, and a temperature of 25° C. is in the range of $1 \leqq E \leqq 2 \times 10^4$ (kg/cm^2).

4,899,324

CLOCK WITH PENDULAR ELEMENT

Raul Barbieri, and Giorgio Marianelli, both of Via Faruffini, 13, 20149 Milan, Italy

Filed Jul. 8, 1988, Ser. No. 216,800

Claims priority, application Italy, Aug. 4, 1987, 22165/87[U]

Int. Cl.[4] G04B *19/00, 19/06*

U.S. Cl. 368—76 **13 Claims**

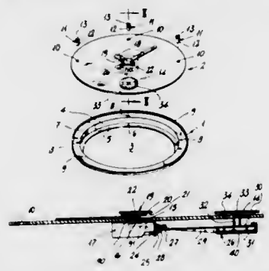
1. A clock comprising

a support for a substantially flat dial,

a clock mechanism for indicating hours, minutes and seconds being secured to a rear side of said substantially flat dial,

a swinging arm arranged to be actuated by said clock mechanism to oscillate,

a pendular member removably connected to said swinging arm, and situated at least partially on the rear side of the dial,



an aperture through said dial and an element positioned on a front side of the dial, said element being connected to said pendular member through said aperture in the dial, wherein

the pendular member comprises an arm with a hook-shaped end for removably engaging an eyelet provided at a free end of the swinging arm which is driven by the clock mechanism.

4,899,325

FINE ACCESS METHOD AND CIRCUIT FOR AN OPTICAL DISK DRIVE USING A MULTI-TRACK JUMP

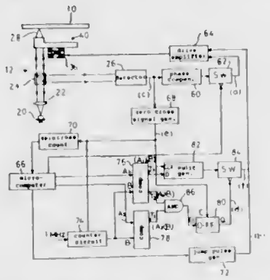
Wataru Katsuhara, Atsugi, and Shigeru Arai, Zushi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 5, 1988, Ser. No. 190,644

Claims priority, application Japan, May 7, 1987, 62-112047

Int. Cl.[4] G11B *7/00, 21/08*

U.S. Cl. 369—32 **14 Claims**



1. A method for controlling movement of an access head between acceleration and deceleration jump pulses respectively beginning and ending a single jump of the access head across multiple tracks on a rotating device, said method comprising the steps of:

(a) measuring a time interval required for the access head to travel a predetermined distance across the tracks;

(b) comparing the time interval measured in step (a) with first and second reference time intervals, the first reference time interval being at least as large as the second reference time interval;

(c) applying an acceleration correction pulse to the access head, if said comparing in step (b) indicates that the time interval measured in step (a) is larger than the first reference time interval;

(d) applying a deceleration correction pulse to the access head if said comparing in step (b) indicates that the time interval measured in step (a) is smaller than the second reference time interval.

4,899,326

MAGAZINE-HOUSED DISK PLAYER

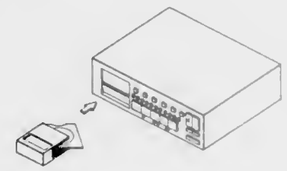
Noriyoshi Takeya; Hidehiro Ishii; Osamu Watanabe; Junichi Yoshio; Kazuhiko Katakami, and Takeshi Izumo, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

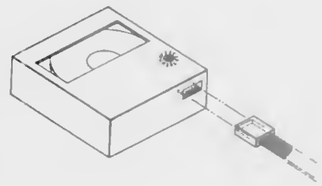
Filed Oct. 15, 1987, Ser. No. 108,607

Claims priority, application Japan, Oct. 15, 1986, 61-244965; Oct. 28, 1986, 61-258031; Nov. 18, 1986, 61-274986; Nov. 18, 1986, 61-274987; Nov. 18, 1986, 61-274988; Dec. 26, 1986, 61-311260; Dec. 26, 1986, 61-311261

Int. Cl.[4] G11B *17/00, 5/48*

U.S. Cl. 369—36 **9 Claims**





1. A disk player for playing disks housed in a plurality of magazines, each magazine identified by a different identification mark carried by the magazine and in which a selected one of said plurality of magazines containing one or more disks and carrying an identification mark thereon to identify that magazine is loaded, said disks of said loaded magazine being selectively moved to a reproducing section and reproduced, comprising:

reproduction control means for controlling said reproducing section in accordance with a command;

memory means in the player for storing magazine content information indicative of the contents of the disks housed in each of said plurality of magazines; and

reading means for reading said identification mark carried by the one of said magazines loaded into said player and for causing said magazine content information corresponding to the magazine identified by the read identification mark to be read from said memory means.

4,899,327

FOCUS SERVO LOOP CORRECTION

Keith A. Bates, Lafayette; Russell A. Budd, Longmont; Millard A. Habegger, Boulder, and Mark L. Rhoades, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 698,517, Feb. 4, 1985, abandoned. This application May 4, 1987, Ser. No. 52,115

Int. Cl.[4] G11B *7/08, 21/00;* **H04N** *5/76*

U.S. Cl. 369—45 **3 Claims**

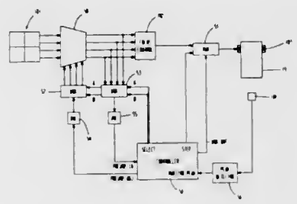
1. In an optical disc apparatus having

means including a laser for supplying energy to read and to write information on an optical disc,

monitor diode means responsive to energy reflected through the laser for supplying a feedback signal to control the laser energy output power, and

means for focussing said energy on a read plane on the optical disc, the improvement comprising:

means for establishing substantial best focus comprising



peak detecting means responsive to said feedback signal for supplying a signal indicative that a peak value in said feedback signal has been attained,

means responsive to the peak value signal for setting a reference signal; and

means for controlling said focussing means with respect to the reference signal.

4,899,328

DATA REPRODUCING APPARATUS AND METHOD FOR LOCKING A REPRODUCING HEAD

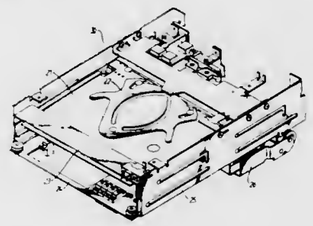
Masaru Ishii, Fujisawa, and Kazuharu Odawara, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 3, 1987, Ser. No. 56,901

Claims priority, application Japan, Jun. 13, 1986, 61-137881

Int. Cl.[4] G11B *3/10, 7/00*

U.S. Cl. 369—77.2 **4 Claims**



1. An apparatus for reproducing data form a data storage medium, comprising:

head means, disposed opposite the data storage medium, for processing data from the data storage medium, said head means including a catching portion integrally formed thereon;

means for moving the head means and said integral catching portion between first and second spaced positions along a radial direction of the data storage medium;

lock means, having a hook member, for engaging with the catching portion of the head means, said hook member being configured to securely mate with said catching portion thereby preventing movement of the head means;

means for manually inputting a start command signal to the moving means for initiating movement of said head means; and

means for releasing the engaging state of the lock means in response to the start command signal from the start command signal input means.

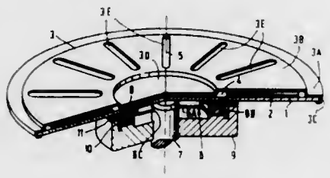
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4,899,329

OPTICALLY READABLE DISC WITH A CENTERING MEMBER FIXED TO A TRANSPARENT SUBSTRATE

Franciscus T. Sleegers; Pieter D. Schuitmaker, and Peter J. M. Janssen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,801
Claims priority, application Netherlands, Feb. 9, 1983, 8300479
The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.
Int. Cl.[4] G11B 7/24, 23/14
U.S. Cl. 369—275 3 Claims



1. An optically readable disc adapted to be driven about a central axis of rotation, comprising a round transparent substrate and an information layer disposed to one side of the substrate,

characterized in that the substrate comprises a substantially rigid disc without aperture, said disc being flat at least on the side where the information layer is disposed, and

an axially projecting central centering member of ferromagnetic material disposed on the other side of the substrate and joined thereto by a layer of glue, said centering member cooperating with centering means of an apparatus for inscribing and/or reading optically readable discs.

4,899,330

ADAPTOR FOR MINI CD

Hermanus F. Einhaus, Ham, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1988, Ser. No. 239,809
Claims priority, application Netherlands, Sep. 16, 1987, 8702202
Int. Cl.[4] G11B 23/00
U.S. Cl. 369—289 8 Claims



1. An adaptor comprising:

an annular body having an inner rim which bounds a centre hole in which said disc record can be placed, which annular body has an outer diameter which is substantially larger than the outer diameter of said optical disc;

an annular sheet of material substantially thinner than said annular body, said annular sheet affixed to a surface of said annular body and having an inner rim which bounds a center hole smaller than the center hole in said annular body; and

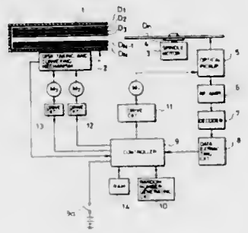
an a layer of adhesive on the portion of said annular sheet of material that is accessible through the center hole of said annular body.

4,899,331

RANDOM REPRODUCING SYSTEM FOR DISK PLAYER

Naoki Masaki, and Masayuki Yoshida, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 113,693
Claims priority, application Japan, Oct. 24, 1986, 61-163431; Oct. 31, 1986, 61-260424[U]
Int. Cl.[4] G11B 17/22, 27/19
U.S. Cl. 369—32 4 Claims



1. A disk player, comprising:

playing means for playing one disk of one or more disks and including a controllably movable mechanical component;

numerical value forming means for forming a numerical value which changes at predetermined time intervals;

means for starting said numerical value forming means and for controlling said mechanical component to begin movement from a first position to a second position;

means for determining that said mechanical component has moved to said second position;

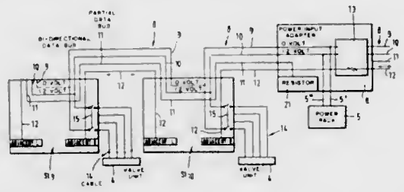
means responsive to said determining means for reading a current value from said numerical value forming means when said mechanical component has moved to said second position and for using said current value for randomly selecting one piece from said one or more disks for playing by said playing means.

4,899,332

DATA TRANSMISSION/RECEPTION SYSTEMS FOR ELECTRO-HYDRAULIC CONTROL SYSTEMS

Johannes König, Munich, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia GmbH, Fed. Rep. of Germany

Filed May 9, 1988, Ser. No. 191,550
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715588
Int. Cl.[4] H04J 15/00; E21D 23/12
U.S. Cl. 370—32 9 Claims



1. An electro-hydraulic control system comprising control units associated with roof supports, said control units serving to actuate electro-magnetic valves and being arranged in groups with each group of control units allocated to several adjacent supports having an intrinsically safe D.C. electrical energy source associated therewith, microcomputer-controlled data transmission and reception stations which are

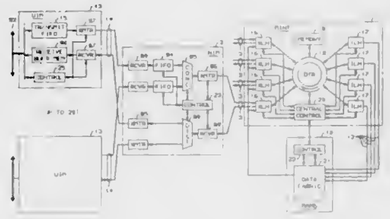
associated with the control units, a bi-directional data bus interconnecting adjacent pairs of the transmission and reception stations and a partial-bus which overlaps the transmission and reception stations of the groups of the control units and forms a further data channel with which the transmission and reception stations of the control units of the relevant group are coupled for data communication; wherein the bi-directional data bus is a single-wire data bus for simultaneous transmission and reception of data between the transmission and reception stations of an adjacent pair of said control units and forms a summation point for the addition of the transmission signals of the stations, each of the transmission and reception stations is provided with a subtraction circuit with an output connected to the receiver of the relevant transmission and reception station, a first input to which the transmission signals of the transmitter of the relevant transmission and reception station are conveyed and a second input connected to the bi-directional data bus.

4,899,333

ARCHITECTURE OF THE CONTROL OF A HIGH PERFORMANCE PACKET SWITCHING DISTRIBUTION NETWORK

Gary A. Foediger, Downers Grove, Ill., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,542
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—60 10 Claims



1. In a data network having a plurality of inlets and outlets, said network comprising first data switching means for switching received data packets, each packet comprising destination information, from at least one input terminal to at least one output terminal, said data switching means comprising a control means comprising:

a plurality of first processors for controlling the storing of each of said received data packets in a memory means; and

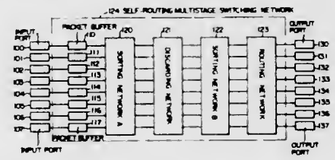
a plurality of second processors, responsive to said destination information of said received data packets, for ascertaining an identity of an outlet for reaching a destination specified by said destination information of each data packet, and for linking, for each outlet of said network, memory locations in said memory means of data packets whose destinations are reachable via said each outlet, wherein each of said packets further comprises source information, wherein said second plurality of processors comprises at least one processor for verifying authority of a source, identified by said source information of a packet, to transmit said packet.

4,899,334

SELF-ROUTING MULTISTAGE SWITCHING NETWORK FOR FAST PACKET SWITCHING SYSTEM

Sbogo Shimizu, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 256,405
Claims priority, application Japan, Oct. 19, 1987, 62-261639; Nov. 9, 1987, 62-281152
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—60 4 Claims



1. A self-routing multistage switching network for a fast packet switching system for transmitting a plurality of packets applied to a plurality of input ports to a plurality of output ports, comprising;

(a) packet buffer means capable of storing packets, provided only in an input stage, and respectively connected to the input ports;

(b) self-routing multistage switching means, including a switching network connected to the output terminals of the packet buffer means, for routing a packet over a variable transmission route, having no packet storing function, and including a plurality of unit switches capable of self-routing control;

(c) detecting means for detecting beforehand whether or not the packets applied to the self-routing multistage switching means are transmitted through the selfrouting multistage switching means without being discarded;

(d) reporting means for reporting identification information which identifies a packet which can be transmitted instead of being discarded, backward to the packet buffer means through the same transmission route of the self-routing multistage switching means through which the packet has been transmitted; and

(e) control means for deleting a packet from a storage means of the packet buffer means after completion of sending out of a packet, if the packet is identified by the identification information given to the packet buffer means by the reporting means as a packet which can be transmitted instead of being discarded

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4,899,335

SELF ROUTING PACKET SWITCHING NETWORK ARCHITECTURE

James M. Johnson, Jr., and Ronald A. Spanke, both of Wheaton, Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 21, 1988, Ser. No. 287,775
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—60 13 Claims

1. A packet routing arrangement for routing packets including destination information comprising:

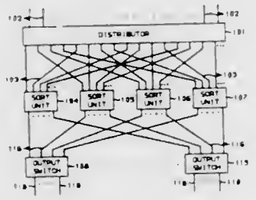
a plurality of output switch means, each output switch means comprising a plurality of output ports, for routing packets received thereby to said output ports;

input means for receiving said packets and responsive to said destination information thereof for distributing said received packets to a plurality of intermediate means such that each intermediate means receives approximately the same number of said packets destined for each output switch means as other intermediate means; and

each of said intermediate means comprises means responsive

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to said destination information for identifying packet groups with a common output switch means destination



and for transmitting said groups of packets to said output switch means.

4,899,336

CENTRALLY CONTROLLED TELECOMMUNICATIONS EXCHANGE SYSTEM

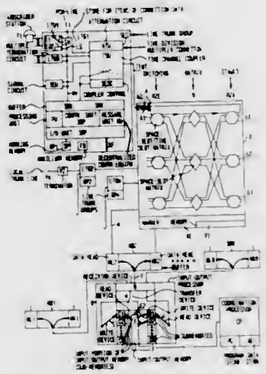
Hans Baur, Starnberg, and Hans Bittermann, Neuried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 1, 1988, Ser. No. 201,497

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719517

Int. Cl.[4] H04Q *3/545, 11/04*

U.S. Cl. 370—63 **5 Claims**



1. A centrally controlled telecommunications exchange system comprising:

a central section including a central switching network and a central coordination processor;

decentral line trunk groups each including a subsidiary switching network, connected to the central switching network via connection paths for establishing dialed connections, and a program-controlled subsidiary control unit for switching-through connections via said subsidiary switching network, the line trunk groups being connected via connection-individual and/or subscriber-individual terminating circuits to respective connection and/or subscriber lines and to corresponding channels in transmission systems; and

a control channel extending from the central coordination processor to the subsidiary control units; wherein

the central coordination processor, in association with the start of the switching operation of a respective line trunk group, transmits to said line trunk group, peripheral data items which are obtained from a central store assigned to the central coordination processor and which are stored semi-permanently by this line trunk group decentrally in an assigned store, and which consist in part of items of program information for its switching-orientated program control sequences and in part of items of connection data which are individually assigned to the terminating circuits and to the connected channels and which govern the switching and control operation in each individual case, including subscriber number, subscriber connection state, assignment data, operating state data, operating category data, subscriber type date, connection line type and channel type data, the transmission of the peripheral data to each of the line trunk groups comprising a first transmission procedure which is carried out prior to the start of its respective switching operation sequence on the one hand, and a second transmission procedure following the start of the switching operation sequence on the other hand, the first transmission procedure transmitting only the items of program information, and the second transmission procedure including a plurality of individual subsidiary transmission procedures which, during the already started operating sequence, are inserted into a data exchange, which is used for this purpose, between the central coordination processor and the subsidiary control units in such manner that, in the case off every incoming or outgoing seizure which takes place for the first time following the respective state to the switching operation sequence, of in each case one of the connection-individual and/or subscriber-individual terminating circuits or one of the corresponding connected channels, the respective line-individual channel-individual items of connection data, which in some cases are firstly requested by the respective subsidiary control unit, are transmitted from the central coordination processor individually in respect of each one of the connection-individual and/or subscriber-individual terminator circuits and each corresponding channel, to the respective line trunk group and are stored in the store thereof.

4,899,337

TIME DIVISION MULTIPLEXER WITH AUTOMATIC CALL FUNCTION

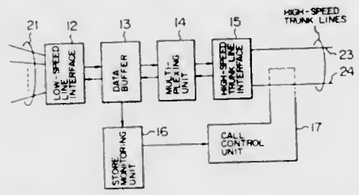
Masato Hirai, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1988, Ser. No. 230,063

Claims priority, application Japan, Aug. 17, 1987, 62-203011

Int. Cl.[4] H04J *3/17*

U.S. Cl. 370—80 **10 Claims**



1. A multiplexer for trunking, over at least one high-speed trunk line on a multiplex basis under statistical time-division multiplexing control, transmission data on low-speed lines connected to a plurality of data terminal units, said statistical time-division multiplexer comprising:

a data buffer which temporarily stores data to be sent from said low-speed lines to said high-speed trunk line and data to be sent from said high-speed trunk line to said low-speed lines;

a multiplexing line interface unit which sends out data stored in said data buffer over said high-speed trunk line on a multiplex basis and converts multiplexed data received on said high-speed trunk line into data for each terminal unit and sends the converted data to said data buffer, said interface unit being normally connected with at least one leased high-speed trunk line;

a store monitoring unit which monitors the quantity of low-speed line data stored in said data buffer and generates a call control signal for calling a public line intended for multiplexed data high-speed trunking when the quantity of stored data has exceeded a predetermined level; and

a call control unit connected between said store monitoring unit and said high-speed trunk line which, in response to said call control signal received from said store monitoring unit, calls said public line and connects said public line to said multiplexing line interface unit as a high-speed trunk line in addition to said leased high-speed trunk lines.

4,899,338

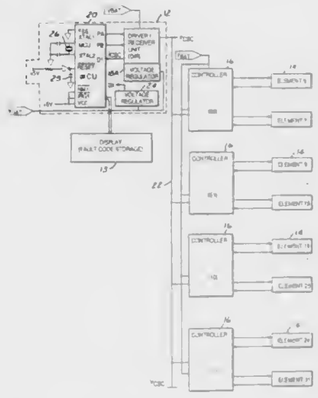
ELECTRICAL DEVICE COMMAND SYSTEM, SINGLE WIRE BUS AND SMART OCTAL CONTROLLER ARRANGEMENT THEREFOR

Thomas R. Wroblewski, Sterling Heights, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 15, 1988, Ser. No. 284,886

Int. Cl.[4] H04J *3/14*

U.S. Cl. 370—85.1 **8 Claims**



1. A multiplex system within a motor vehicle for commanding and monitoring the status of a plurality of electrical devices or elements disposed throughout the motor vehicle, each of the elements having command terminals for receiving commands in the form of a voltage signal for activating or deactivating each of the elements, each of the command terminals also being used to provide a status indication in the form of a current signal upon being commanded, said system comprising:

(a) a bi-directional, single wire bus for transmitting voltage signals in a first direction and current signals in a second direction, said bus being routed throughout the vehicle, said voltage and said current signals being developed in said multiplexed system;

(b) a plurality of smart octal controllers disposed throughout the motor vehicle, each of said plurality of controllers having (1) a single input/output terminal connected by a single wire to a single point along said bus for receiving the transmitted voltage signals from said bus and for sending the current signals to said bus; (2) a pair of input power lines connected across a power source of the vehicle; (3) a group of eight output command lines with each line from the group coupled to one of the elements disposed throughout the vehicle for commanding ON or OFF the element; (4) a group of eight status lines with each line from the group coupled to a corresponding one of the elements; and (5) means for a preprogrammed identifying address;

each of said plurality of controllers providing command signals to the eight elements for turning ON or OFF an individual element of said group; each of said plurality of controllers receiving in response to the command, a current signal indicative of the status of a commanded element;

(c) a driver and receiver means connected to the power source of the vehicle and a terminal of said single-wire bus for generating an undulating voltage signal containing a series of dual-duty cycle voltages forming the address and command information of which a first portion of the address information is used to address one of said plurality of controllers, one of said plurality of controllers being addressed if the first portion of the address information matches the predetermined address code, and of which a second portion of the address information is used to enable said addressed controller to command the operation of a selected element connected thereto;

said undulatory voltage signal being driven onto said bus and into each of said plurality of controllers by said driver and receiver means, said driver and receiver means also having means for receiving from said bus the current signals sent over said bus by each of said addressed controllers indicative of the status of the commanded element;

(d) display means for displaying the status of each of the commanded elements; and

(e) a microcomputer means interconnecting said driver and receiver means and display means for (1) writing logic commands to said driver and receiver means for controlling the generation of the undulatory voltage used to develop the address and command information placed on said bus for addressing and commanding each of said plurality of controllers in order to cause each of said plurality of controllers to operate the elements connected thereto, (2) reading current signals indicative of the status of the commanded element that is sent by said addressed controller, (3) establishing a history of performance of each of the commanded elements and (4) transferring updated status information to said display means.

4,899,339

DIGITAL MULTIPLEXER

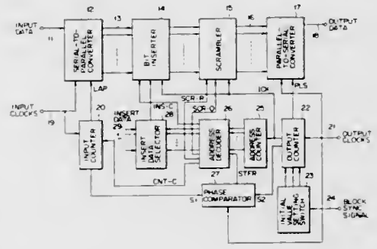
Taro Shibagaki, Tokyo; Takehiko Atsumi, Ichikawa; Hiroyuki Ibe, Yokohama, and Sadao Tanikoshi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 7, 1988, Ser. No. 254,847

Claims priority, application Japan, Oct. 9, 1987, 62-254996; Oct. 9, 1987, 62-254997; Oct. 9, 1987, 62-254998; Oct. 9, 1987, 62-254999; Oct. 9, 1987, 62-255000

Int. Cl.[4] H04J *3/06*

U.S. Cl. 370—102 **18 Claims**



1. A framing unit used for a digital multiplexer comprising: serial-to-parallel converting means having m parallel output

lines, for converting serial input data to parallel data of m bits or (m+n) bits of less than m bits by at least one bit, and issuing the parallel data onto m output lines or (m−n) output lines of less than m output lines by at least one line;

switching means for selectively switching the parallel data issued by said serial-to-parallel converting means between m bits and (m−n) bits;

framing means connecting to said output lines, for inserting at least one control bit necessary for framing into said at least one output line when the (m−n)-bit parallel data are issued from said serial-to-parallel converting means; and

parallel-to-serial converting means for converting output data of said framing means to serial data.

4,899,340

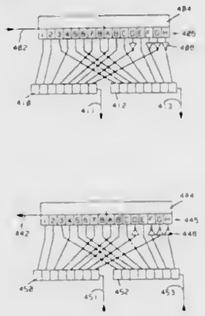
ERROR CORRECTING CODE AND ERROR CORRECTING CIRCUIT USING THE SAME

Daniel P. Lubarsky, San Jose, Calif., assignor to Pacific Bell, San Francisco, Calif.

Filed Jun. 28, 1988, Ser. No. 212,601

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—37.1 9 Claims



1. An error correcting circuit comprising:

means for receiving an n-bit received digital word, including means for coupling said error correcting circuit to an incoming user line;

means for transmitting first and second transmission encrypted words on first and second outgoing transmission lines, said first transmission encrypted word having n_1 bits and said second transmission encrypted word having n_2 bits, said transmitting means including means for encrypting said received digital word according to an error correcting code to form said first and second transmission encrypted words, wherein said first and second transmission encrypted words are different from 0 for all possible values of said n-bit digital word; and

means for receiving first and second reception encrypted words on first and second incoming transmission lines, respectively, said first reception encrypted word having n_1 bits and said second reception encrypted word having n_2 bits, said receiving means including means for decrypting said first and second reception encrypted words using said error correcting code to form an n-bit transmitted digital word and means for coupling said n-bit transmitted digital word to an outgoing user line.

4,899,341

ERROR CORRECTION CIRCUIT

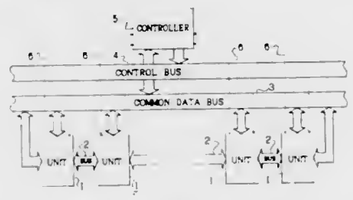
Yasuharu Tomimitsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,447

Claims priority, application Japan, Jan. 28, 1987, 62-19301

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—37.6 3 Claims



3. An error correction circuit comprising:

(a) a plurality of Galois field operation units coupled in cascade through a first bus and operated in parallel, each of said units including:

(1) a register file coupled to receive data to be corrected,

(2) A Galois field multiplication circuit having a first input connected to the data stored in said register file and a second input connected to receive another data through the first bus from a first adjacent unit, and

(3) a Galois field addition circuit having a first input connected to an output of said Galois field multiplication circuit and a second input connected to receive another data through the first bus from said adjacent unit, an output of said Galois field addition circuit being connected to a second adjacent unit through the first bus; and

(b) a controller coupled to said plurality of Galois field operation units through a second bus provided independently of said first bus, said controller unit including:

(1) a memory storing the data to be corrected, a register file,

(2) a Galois field multiplication circuit having a first input coupled to said memory and a second input connected to said register file,

(3) an arithmetic logic unit connected to an output of said Galois field multiplication circuit, and

(4) a microprogram control unit for controlling the operations of said plurality of Galois field operation units.

4,899,342

METHOD AND APPARATUS FOR OPERATING MULTI-UNIT ARRAY OF MEMORIES

David Potter, Acton; Laurence N. Provost, Arlington; John M. Baron, Grafton; David Stefanovic, Allston; Eric D. Sharakan, Brighton; David A. Sheppard, Cambridge, and Marshall A. Isman, Newton, all of Mass., assignors to Thinking Machines Corporation, Cambridge, Mass.

Filed Feb. 1, 1988, Ser. No. 150,814

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—10.1 18 Claims

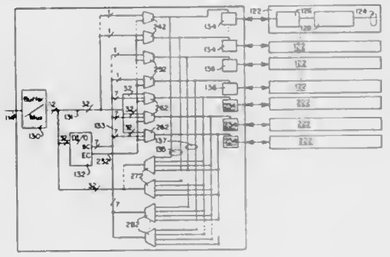
1. A multi-unit memory system comprising:

an error correction code generation circuit which generates for each block of data to be stored in said memory system an error correction code, each block of data comprising a first plurality of digits and each error correcting code comprising a second plurality of digits from which at least one digit of error may be detected and corrected in the block of data,

a plurality of read/write memory units, which store the digits of said blocks of data and associated error correction codes generated by said error correction code generation circuit and read said digits, at least some of the different digits of each code and its associated data block being stored in different memory units,

at least one spare read/write memory unit that is similar in operation to an individual read/write memory unit of said plurality of read/write memory units,

means for generating from the digits of a block of data and associated error correction code read from said memory units a digit which corrects an error in a digit read from



one of said memory units, said generating means operating on a sequence of said blocks of data and associated error correction codes to generate a sequence of correct digits, and

means for accessing the spare read/write memory unit to store therein said sequence of correct digits as the sequence of blocks of data and associated error correction codes are read from the plurality of read/write memory units.

4,899,343

LASER LAYOUT

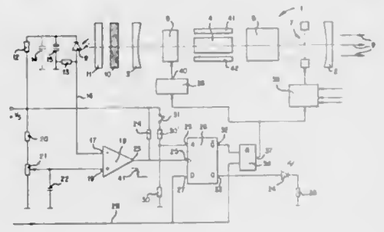
Daniel Wildmann, Dielsdorf, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 5, 1989, Ser. No. 293,337

Claims priority, application Switzerland, Jan. 20, 1988, 183/88

Int. Cl.⁴ H01S *3/10*

U.S. Cl. 372—9 20 Claims



1. Laser layout comprising:

an optical resonator chamber bounded by a fully reflecting mirror and a partially reflecting mirror;

an active laser medium and a crystal for generating second and higher harmonics located in said chamber;

a power sensor device provided outside the resonator chamber in an approximate alignment with a longitudinal axis of the resonator chamber near the fully reflecting mirror, said power sensor including:

a scatter disk for scattering light energy received from said chamber;

a filter for absorbing frequency doubled wavelength of the laser medium and the wavelength of a pumping light; and.

an optical sensor for receiving light energy from said scatter disk and being connected with a comparator circuit, an output of said power sensor being used to actuate a device to deactivate the laser layout.

4,899,344

SEMICONDUCTOR LASER CONTROL APPARATUS

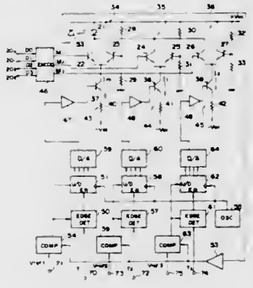
Isamu Shibata, Fuchu; Takahiro Asai, Yokohama; Kiyoto Nagasawa, Yokohama, and Kenichirou Asada, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 279,211

Claims priority, application Japan, Dec. 7, 1987, 62-308938; Jan. 14, 1988, 63-4853; Feb. 12, 1988, 63-30661; Feb. 25, 1988, 63-43049

Int. Cl.⁴ H01S *3/13*

U.S. Cl. 372—29 20 Claims



1. A semiconductor laser control apparatus for controlling an optical output of a semiconductor laser to a predetermined value, said semiconductor laser control apparatus comprising:

switching means coupled in series with the semiconductor laser and controlled by an N-bit image signal;

N constant current supply circuits coupled in parallel to each other and in series with said switching means for supplying currents to said switching means so that a driving current is supplied to the semiconductor laser from said switching means;

detector means for detecting the optical output of the semiconductor laser and for outputting a detection signal indicative of the detected optical output; and

control means responsive to the detection signal from said detector means for controlling the driving current by controlling said N constant current supply circuits so that the optical output of the semiconductor laser becomes the predetermined value.

4,899,345

ATOMIC RESONANCE IN CROSSED LINEAR POLARIZATION

Normand Cyr, Ste-Foy; Michel Têtu, Cap-Rouge, both of Canada, and Vincent Giordano, Orsay, France, assignors to Universite Laval, Quebec, Canada

Filed Apr. 21, 1989, Ser. No. 341,209

Int. Cl.⁴ H01S *3/13*

U.S. Cl. 372—32 19 Claims

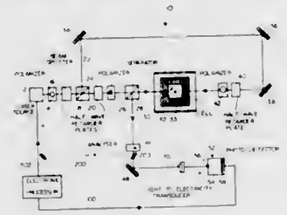
1. In combination:

a cell containing a medium capable to manifest light absorption resonance;

means for generating substantially collinear pump and probe light beams propagating toward said cell in opposite directions to interact with the said medium, said pump and probe light beams having linear polarizations which are generally orthogonal;

means for producing a substantially non-fluctuating magnetic field within said cell to allow the said medium to

manifest a particular state of light absorption resonance when the frequencies of said pump and probe light beams are located within a narrow absorption resonance frequency bandwidth characterizing said medium; and



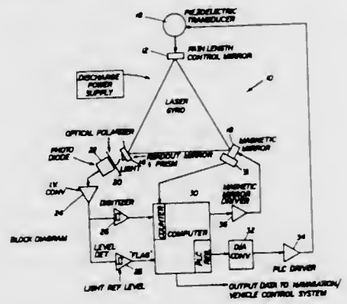
means responsive to the polarization of the probe beam transmitted through said medium, optically coupled to said cell for generating an output signal indicative of said particular state of absorption resonance.

4,899,346

PATH LENGTH CONTROL SYSTEM FOR MAGNETIC MIRROR DITHERED RING LASER GYROS

Harley A. Perkins, Brookline, Mass., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jan. 21, 1988, Ser. No. 146,443
Int. Cl.[4] H01S *5/13*
U.S. Cl. 372—32 **9 Claims**



1. A laser gyro including means forming a resonant cavity; an active media disposed in said cavity; mirror means coupled to said cavity to form a ring laser gyro, said mirror means including a path control mirror, an output mirror, and a magnetic mirror having two magnetization states to magnetically dither said gyro between two laser light output frequencies $f_{up}f_{dn}$; and means for exciting said cavity into laser oscillation, the improvement comprising:

means for detecting said output frequencies f_{up}, f_{dn} of the two states of magnetization,

means for computing a reference frequency, f_o, characteristic of the magnetic mirror,

means for computing a path length error signal from the output frequencies f_{up}, f_{dn} and from the reference frequency f_o,

means for moving said path length control mirror,

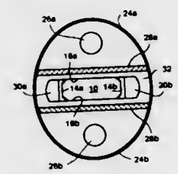
means for generating a drive signal from said path length error signal, said drive signal being connected to said means for moving said path control mirror, aid means for moving being responsive to said drive signal for moving said path length control mirror to a position corresponding to zero path length error signal.

4,899,347

SOLID STATE LASER GAIN MEDIUM WITH DIAMOND COATING

Norman R. Kuchar, Burnt Hills, and Farzin H. Azad, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 11, 1989, Ser. No. 350,265
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—33 **20 Claims**



1. An article comprising:

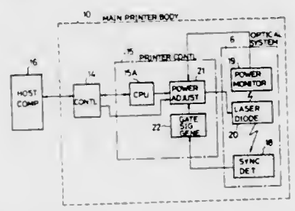
a solid state laser gain medium having an outer surface, and means for reinforcing said medium and for reducing parasitic oscillations comprising a diamond coating disposed on at least a portion of said outer surface.

4,899,348

METHOD AND APPARATUS FOR CONTROLLING OPTICAL OUTPUT OF LASER LIGHT SOURCE

Yukitoshi Kiya, Kawasaki, and Kazuyuki Shimada, Chofu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,335
Claims priority, application Japan, Dec. 29, 1987, 62-336548; Jan. 27, 1988, 63-14560
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—38 **9 Claims**



1. A method of controlling an optical output of a laser light source which scans a photosensitive body, said method comprising the steps of:

detecting an optical output of the laser light source and generating a monitor signal which has a logic level indicative of whether a laser power of the optical output is greater than or less than a predetermined value;

generating signals including a gate signal indicative of a scan time in which the photosensitive body is scanned based on a synchronization detection signal indicative of each scanning line, first and second laser diode signals respectively having logic levels for turning the laser light source ON and OFF and first and second enable signals based on said monitor signal, said gate signal and a power set start signal indicative of a start of a power set operation in which the laser power is controlled to said predetermined value, said first laser diode signal having a logic level for tuning the laser light source ON during an entire time in which said gate signal has a predetermined logic level corresponding to the scan time in which the photosensitive body is scanned even when said monitor signal undergoes two successive transitions before an end of the time in which said gate signal has said predetermined logic level, said first enable signal having a logic level for enabling an adjustment of a driving current supplied to said laser light source only when said gate signal has said predetermined logic level until the logic level of said monitor signal undergoes two successive transitions, said second laser diode signal having the logic level for turning the laser light source ON during a time from a start of said power set start signal to a time when the logic level of said monitor signal undergoes two successive transitions, said second enable signal having a logic level for enabling the adjustment of said driving current during a time when said second laser diode signal has the logic level for turning the laser light surface ON;

selectively outputting said first laser diode signal and said first enable signal respectively as a selected laser diode signal and a selected enable signal in a first mode and outputting said second laser diode signal and said second enable signal respectively as the selected laser diode signal and the selected enable signal in a second mode; and

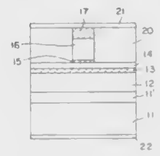
adjusting said driving current supplied to said laser light source based on said monitor signal when enabled by said enable signal so as to control the laser power to said predetermined value.

4,899,349

SEMICONDUCTOR LASER DEVICE

Toshiro Hayakawa, Nara; Takahiro Suyama, Tenri; Kohsei Takahashi, Tenri; Masafumi Kondo, Tenri, and Saburo Yamamoto, Hnibara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 885,920, Jul. 15, 1986, abandoned. This application Dec. 14, 1988, Ser. No. 285,342
Claims priority, application Japan, Jul. 18, 1985, 60-160941
Int. Cl.[4] H11S *3/19*
U.S. Cl. 372—44 **5 Claims**



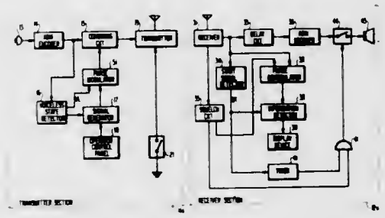
1. In a semiconductor laser device, a double-heterostructure multi-layered crystal containing an active layer for laser oscillation and including a striped etching-protective thin layer formed on said double-heterostructure multi-layered crystal, a stripped-mesa mesa multi-layered crystal formed on said striped etching-protective thin layer and includes a cladding layer, and a burying layer formed on said double-heterostructure multi-layered crystal outside outside of both the striped thin layer and the striped-mesa multi-layered crystal, wherein said cladding layer and said burying layer contain aluminum and wherein a ratio of the aluminum mole ratio of said burying layer to the aluminum mole ratio of said cladding layer is at least approximately 1,6, thereby providing refractive index distributions within said active layer corresponding to the inside and the outside of said striped-mesa multi-layered crystal and providing a striped structure functioning as a current path composed of said striped-mesa mult-layered crystal.

4,899,350

SIGNAL COMMUNICATION CAPABLE OF AVOIDING AN AUDIBLE REPRODUCTION OF A SEQUENCE OF INFORMATION SIGNALS

Kouzou Kage, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 18, 1987, Ser. No. 50,431
Claims priority, application Japan, May 16, 1986, 61-111988; May 16, 1986, 61-111989
Int. Cl.[4] H04L *27/10*
U.S. Cl. 375—52 **12 Claims**



1. A signal transmission device for use in transmitting a sequence of output digital signals to a signal reception device, said signal transmission device comprising adaptively converting means for adaptively converting a voice signal into a sequence of digital voice signals within an audible frequency range and information signal producing means for producing a sequence of digital information signals which has a signal component which is preceded by a digital start signal, wherein the improvement comprises:

phase modulation means coupled to said information signal producing means for phase-modulating said digital information signal sequence which has a signal component preceded by said digital start signal into a phase-modulated signal which has a signal distribution falling within an inaudible frequency region different from said audible frequency range, so that said phase-modulated signal is thereby not audibly reproduced by said signal reception device even when said digital start signal is wrongly detected by said signal reception device; and

combining means coupled to said adaptively converting means and said phase modulation means for combining said digital voice signal sequence with said phase-modulated signal into a combined signal sequence; and

transmitting means coupled to said combining means for transmitting said combined signal sequence to said signal reception device as said output digital sequence.

4,899,351

TRANSIENT FREE CLOCK SWITCH LOGIC

Carl Bonke, Rancho Santa Margarita, Calif., assignor to Western Digital Corporation, Irvine, Calif.

Filed Jul. 18, 1988, Ser. No. 220,534
Int. Cl.[4] H04L *7/00*
U.S. Cl. 375—108 **6 Claims**

1. A clock switching circuit for selectively enabling first and second clocks comprising

means for selecting the first or second clock, the selection means having a selection signal output;

first means for synchronizing the selection signal output to the first clock;

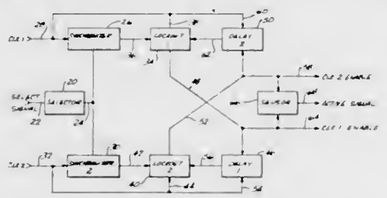
second means for synchronizing the selection signal output to the second clock;

a first lock-out circuit having a first input responsive to the first synchronizer means; a second input responsive to the first clock, a third enabling input and an output providing a first clock enable signal;

a second lock-out circuit having a first input responsive to the second synchronizer means; a second input responsive

to the second clock; a third enabling input and an output providing a second clock enabling signal;

a first delay circuit responsive to the second clock driven by the output of the first lockout circuit and having an output connected to the third input of the second lockout circuit; and,



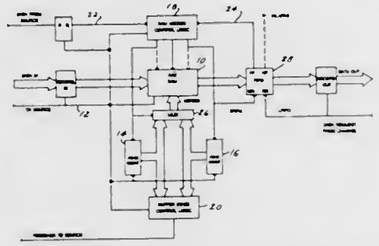
a second delay circuit responsive to the first clock driven by the output of the second lockout circuit and having an output connected to the third input of the first lockout circuit.

4,899,352

SYSTEM AND DEVICE TO INTERFACE ASYNCHRONOUS APPARATUSES

Silvio Cucchi, Gaggiano, and Vittorio Corradi, Monza, both of Italy, assignors to Telettra Telefonia Elettronica e Radio S.p.A., Milan, Italy

Filed Sep. 23, 1987, Ser. No. 100,022
Claims priority, application Italy, Sep. 25, 1986, 21810 A/86
Int. Cl.⁴ H03K *5/135*
U.S. Cl. 375—118 **5 Claims**



1. A system for interfacing asynchronous equipment operating a different clock frequencies, comprising:

(a) a single-port RAM synchronized with the clock of the asynchronous equipment having the higher frequency;

(b) a FIFO memory coupled to said single-port RAM; and

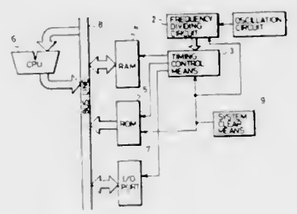
(c) priority logic which controls read/write access to said single-port RAM from said asynchronous equipment and which, in the event of a conflict arising from simultaneous read/write requests from said asynchronous equipment, gives the request from the asynchronous equipment having a higher clock frequency priority access to said single-port RAM, the request from the asynchronous equipment having a lower clock frequency being fulfilled by read/-write to said FIFO memory.

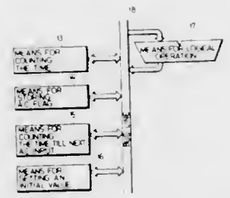
4,899,353

INITIAL VALUE SETTING SYSTEM FOR ELECTRONIC DEVICE

Yasushi Nakabayashi, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 124,877
Claims priority, applicatioo Japan, Nov. 27, 1986, 61-282289
Int. Cl.⁴ H03K *21/40*
U.S. Cl. 377—28 **2 Claims**





1. An initial value setting system for an electronic device comprising:

means for generating a trigger pulse in response to each fluctuation in the voltage level of a power source for the device;

means for determining the time interval between successive ones of said trigger pulses;

means for providing a predetermined time interval including a timer responsive to a system clock;

means for storing a first indication in the presence of said trigger pulse;

means for starting said timer in response to said first indication;

means for storing a replacement indication for said first indication when said timer times out; and

means for actuating an initializing operation of the electronic device upon detection of said first indication when the time interval between successive ones of said trigger pulses is shorter than said predetermined time interval.

4,899,354

ROENTGEN LITHOGRAPHY METHOD AND APPARATUS

Albert Reinhold, Wunstorf, Fed. Rep. of Germany, assignor to Feinfocus Rontgensysteme GmbH, Wunstorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 644,212, Aug. 24, 1984. This application Jan. 14, 1987, Ser. No. 3,192
Int. Cl.⁴ G21K *5/00*
U.S. Cl. 378—34 **14 Claims**

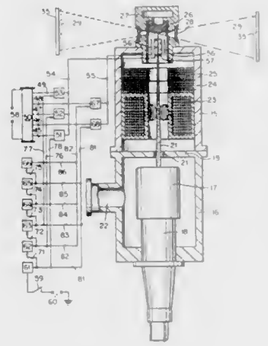
10. Roentgen lithography apparatus comprising a roentgen tube for producing long wave roentgen radiation comprising an electron gun having a glow cathode and a grid, electron beam deflecting and focusing means for producing a continuous electron beam, a stationary target on which said electron beam is directed, and a plurality of exit windows around said target through which roentgen rays produced on said target are projected,

said target having a plurality of radiation surface areas which are all of identical material and are displaced radially from a central axis of said electron gun and target, each of said radiation surface areas being positioned to direct roentgen rays solely through a respective exit windows,

said electron beam deflecting and focussing means comprising means for directing a sharply focused high intensity electron beam sequentially on said radiation surface areas with a focal spot on said target having a diameter less than 10^{-4} m. to produce roentgen radiation directed sequentially out through respective exit windows,

a plurality of substrate holders arranged around said roentgen tube for holding substrates in position to receive roentgen rays emitted through said exit windows respectively, and

a like plurality of mask holders for holding lithographic masks in front of said substrates respectively, said masks and respective substrates being illuminated sequentially by said roentgen rays,



said electron beam deflecting and focussing means operating to cause said continuous electron beam to be displaced angularly relative to said central axis and to fall successively on said radiation surface areas of said target under a target angle of from 0° to 10° with a dwell for a predetermined period of time on each radiation surface area and rapid shifting from one radiation surface area to another, the dwell time on each radiation surface area being sufficiently long to provide adequate exposure of said substrate and sufficiently short to avoid damage to said target,

said deflection and focussing means comprising first and second pairs of electron beam deflection plates disposed perpendicularly to one another about the path of said electron beam and circuitry to apply selected voltages to said deflection plate pairs,

said circuitry comprising a source of a plurality of different voltages, gate means for selectively applying selected voltages from said source to said deflection plate pairs respectively to direct said continuous electron beam to selected radiation surface areas and control circuit means including programmed timing means for controlling said gate means to rapidly shift said continuous electron beam sequentially from one to another of said radiation surface areas in predetermined repeated sequence with a predetermined dwell time on each radiation surface area.

4,899,355

X-RAY LITHOGRAPHY SYSTEM

Hans-Peter Stormberg, Stolberg, Fed. Rep. of Germany, and Yoshio Watanabe, Tokyo, Japan, assignors to U.S. Philips Corporation, New York, N.Y. and Hitachi Ltd.

Filed Jul. 5, 1988, Ser. No. 215,698
Claims priority, application Japan, Jul. 10, 1987, 62-170958
Int. Cl.⁴ G21K *5/00*
U.S. Cl. 378—34 **2 Claims**



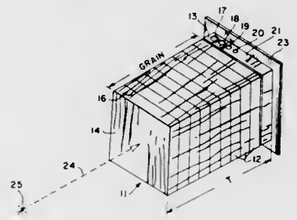
1. An X-ray lithography system comprising an X-ray source formed of a linear discharge plasma extending along a first axis, a resist film to be irradiated by the X-ray source, said resist film comprising a surface that is tilted at a predetermined angle of tilt with respect to said first axis, a band slit which is located between said X-ray source and said resist film, said slit having a long side which is parallel to a second axis that is perpendicular to said first axis, wherein the angle of tilt of said resist film surface is of sufficient magnitude that an interval of non-uniformity of said X-ray source seen from a point on said surface is smaller than the length of said X-ray source seen from said point.

4,899,356

METHOD OF RADIOGRAPHIC INSPECTION OF WOODEN MEMBERS

Maggie L. Berry, and Robert F. Berry, Jr., both of Hayes, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 25, 1987, Ser. No. 125,678
Int. Cl.⁴ G01B *15/06*
U.S. Cl. 378—58 **4 Claims**



1. A non-contaminating method of radiographic inspection of a wooden specimen comprising the steps of:

introducing a non-contaminating, highly evaporative radiopaque penetrant formed of a fluorocarbon cleaning solvent into internal defects in said wooden specimen to be inspected through a surface opening therein;

subjecting the wooden specimen to a beam of radiation sufficient to pass through said wooden specimen; and

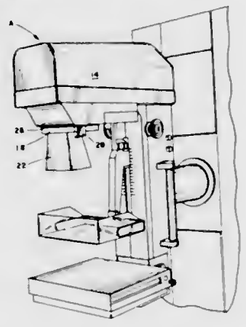
making a radiographic film image of said beam of radiation passing through said wooden specimen, said non-contaminating radiopaque penetrant in said internal defects within said specimen absorbing a portion of said beam of radiation passing therethrough, thereby enhancing the resulting film image of said internal defects without contaminating said wooden specimen.

4,899,357

X-RAY CONE SAFETY PLATE FOR X-RAY SYSTEM

Leonard F. Plut, Willowick, and William F. Nyman, Newbury, both of Ohio, assignors to Picker International Inc., Highland Hts., Ohio

Filed Sep. 9, 1988, Ser. No. 242,150
Int. Cl.[4] G21K *1/02*
U.S. Cl. 378—148 **15 Claims**



15. A method of safely removing an x-ray cone from an x-ray system, the method comprising:

providing an x-ray system having at least an x-ray tube, a housing, a flange-bearing x-ray cone, an x-ray cone holder, a release element, and a safety plate;

inserting the x-ray cone flange into the cone holder;

depressing a latch button to cause the release element to move from supporting the flange whereby the cone is released and the cone drops;

catching the dropped cone on stationary tabs which extend from the safety plate; and

removing the cone from the system by horizontally sliding its flange along the tabs.

4,899,358

CALL ANNOUNCEMENT ARRANGEMENT

James R. Blakley, Chicago, Ill., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 8, 1988, Ser. No. 230,224
Int. Cl.[4] H04M *1/57, 3/50*
U.S. Cl. 379—67 **26 Claims**

9. A method of processing a call from a calling communication station to a called communication station comprising

in response to said call, effecting a search for information associated with said calling station,

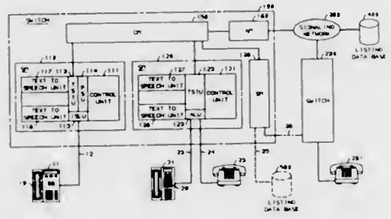
determining whether said called station is busy on another cali,

upon determining that said called station is busy on another call, disconnecting a communication path between a calling communication station for said another call and said called station,

after disconnecting said communication path, transmitting speech signals, generated from information obtained during said search, to said called station,

after transmitting said speech signals to said called station, completing a communication path between said last-mentioned calling station and said called station, and

after said completing and in response to receipt of signaling from said called station, completing a communication path between said first-mentioned calling station and said called station.



21. A method of processing a call from a calling communication station to a called communication station comprising

in response to said call, effecting a search for information associated with said calling station,

transmitting speech signals, generated from information obtained during said search, to said called station, and

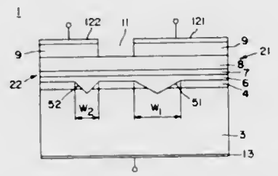
in response to disconnect signaling from said called station, transmitting call information, including said obtained information, to a message center.

4,899,359

OPTICAL MEMORY SEMICONDUCTOR LASER APPARATUS

Seiki Yano, Kashihara, and Toshiki Hijikata, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 870,511, Jun. 4, 1986, abandoned. This application Dec. 8, 1988, Ser. No. 283,013
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 **5 Claims**



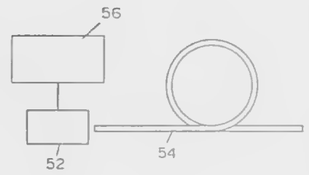
1. An optical memory semiconductor laser apparatus incorporating a recording semiconductor laser device for an optical memory and a replaying semiconductor laser device for an optical memory, therein into a single body, wherein both said replaying semiconductor laser device and said recording semiconductor laser device are of a VSIS laser device comprising a semiconductor substrate with a V-channel that is formed through a current blocking layer, the width of the V-channel of said replaying semiconductor laser device being smaller than that of the V-channel of said recording semiconductor laser device, and the oscillation threshold current of said replaying semiconductor laser device is smaller than that of said recording semiconductor laser device.

4,899,360

SEMICONDUCTOR LASER DEVICE HAVING MONOLITHICALLY FORMED ACTIVE AND PASSIVE CAVITIES ON THE SAME SUBSTRATE

Toshihiro Fujita, Toyonaka; Jun Ohya, Neyagawa; Kenichi Matsuda, Moriguchi, and Hiroyuki Serizawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 708,848, Mar. 5, 1985, Pat. No. 4,794,608. This application Nov. 8, 1988, Ser. No. 276,763
Claims priority, application Japan, Mar. 6, 1984, 59-43301; Mar. 6, 1984, 59-43302; Feb. 15, 1985, 60-28680; Feb. 18, 1985, 60-29593; Feb. 18, 1985, 60-29598; Feb. 18, 1985, 60-29607; Feb. 18, 1985, 60-29608
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 **4 Claims**



1. An optical signal transmission apparatus comprising:

a. a laser device including,

a semiconductor substrate,

an active cavity formed on said semiconductor substrate; and

a passive cavity formed on said semiconductor substrate, said active and passive cavities being integrally formed on said semiconductor substrate with monolithic structure and coupled in the direction of optical axes of said cavities,

said active cavity including,

an active layer for emitting light therefrom,

clad layers for confining said light into said active layer, and

electrodes for injecting current into said active layer,

said passive cavity including,

a waveguide layer for transferring therethrough the light emitted in said active cavity, and

clad layers for confining said light to said waveguide layer,

said active and passive cavities having rectangular waveguide structure to confine said light in a plane perpendicular to said direction of optical axes of said cavities,

resonator means for laser oscillation of said semiconductor laser device,

the ratio L_0/L_1 of optical length L_0 of said passive cavity to optical length L of said active cavity being set in a range of $L_0/L_1 \geqq 0.5$,

b. an optical fiber coupled to said laser device, said optical fiber comprising an optical transmission source,

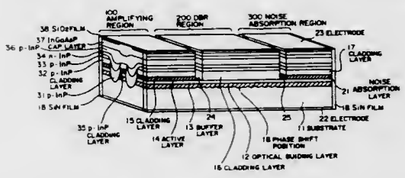
wherein the light emitted in said active cavity is transferred through said passive cavity and reflected and fed back to said active cavity such that the laser device comprises an optical transmission source and means for achieving analog modulation of a drive circuit.

4,899,361

OPTICAL FILTER DEVICE

Takahiro Numai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,137
Claims priority, application Japan, Apr. 14, 1987, 62-92257
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 **4 Claims**



1. An optical filter device comprising:

an amplifying region including an active layer for amplifying light of a first predetermined wavelength band;

a noise absorption region including a noise absorption layer which is transparent for light of said first predetermined wavelength band, and which absorbs light of a second predetermined wavelength band;

a distributed feedback region positioned between said amplifying and noise absorption regions, and including no active layer and no noise absorption layer;

electrodes provided on the top and back surfaces of said amplifying, noise absorption, and distributed feedback regions; and

non-reflection structures provided on both outer and facets of said amplifying and noise absorption regions;

wherein said amplifying, noise absorption, and distributed feedback regions include a common optical guiding layer; and

a bandgap energy of said noise absorption layer is smaller than that of said optical guiding layer, and is larger than that of said active layer.

4,899,362

METAL VAPOR LASER WITH IMPROVED LASER MEDIUM FORMATION

Arthur Maitland, St Andrews, and Ewan S. Livingstone, Kinrose, both of Scotland, assignors to EEV Limited, Chelmsford Essex, United Kingdom

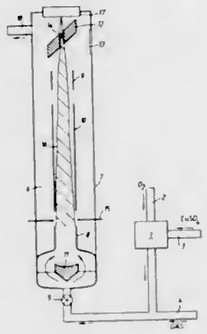
Filed Dec. 5, 1988, Ser. No. 279,645
Claims priority, application United Kingdom, Dec. 4, 1987, 8728422; Jan. 18, 1988, 8801022; Jun. 6, 1988, 8813347
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—55 **23 Claims**

1. In a laser device including a laser discharge chamber; a first electrode, a second electrode and a discharge region within said chamber, said discharge region being disposed between said electrodes, the improvement comprising:

means for generating a supply of atomized solid or liquid material, at least part of the material forming a laser amplifying medium;

means for mixing the atomized material into a gas flow

creating a gas and material mixture having droplets of the material suspended in the gas flow; and



means for introducing the mixture into said discharge region.

4,899,363

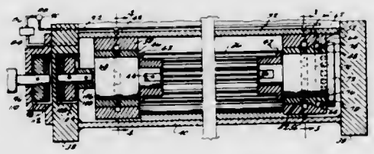
GAS BEARINGS FOR GAS LASERS

Gordon A. Murray, Carlsbad; Robert A. Golobic, and Stephan G. Derrickson, both of Colorado Springs, all of Colo., assignors to The Spectranetics Corporation, Colorado Springs, Colo.

Continuation of Ser. No. 76,906, Jul. 23, 1987, abandoned. This application May 26, 1988, Ser. No. 301,870

Int. Cl.[4] H01S *3/03*

U.S. Cl. 372—65 **16 Claims**



1. A long-life transverse electric discharge laser assembly comprising:

a housing for containing an excimer laser gas;

means for electrically exciting said laser gas within said housing;

means for circulating the laser gas within said housing; and gas bearings including

means for supporting said circulating means on a cushion of laser gas to reduce friction and to allow baking of said housing at high temperatures, which baking enables the laser to operate for extended periods.

4,899,364

AUTOMATIC GAIN CONTROL SYSTEM

Shigeo Akazawa; Masaharu Mori, and Masahiro Hamatsu, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1988, Ser. No. 224,576

Claims priority, application Japan, Jul. 31, 1987, 62-192219; Oct. 23, 1987, 62-267763

Int. Cl.[4] H04L *9/00*

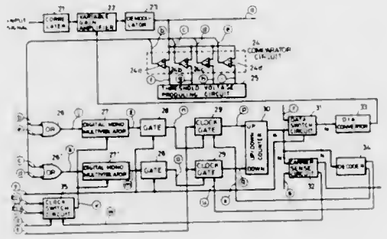
U.S. Cl. 375—1 **12 Claims**

1. An automatic gain control system in a spread spectrum receiver comprising:

correlation means for correlating a reference signal and spread spectrum signal received by the receiver;

a demodulator for demodulating data from a correlation output from said correlation means;

variable gain amplifier means provided between said correlation means and said demodulator to amplify said correlation output; and



gain control means responsive to a demodulation output from said demodulator for controlling the gain of said variable gain amplifier means.

4,899,365

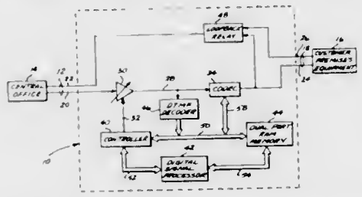
APPARATUS AND METHOD FOR ADAPTIVE AMPLITUDE EQUALIZATION

Robert G. Hove, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 29, 1988, Ser. No. 162,113

Int. Cl.[4] H04B *3/10*

U.S. Cl. 375—13 **26 Claims**



1. A circuit for connection to a signal channel for adaptively amplitude equalizing the signal channel over a predetermined channel frequency range, the circuit comprising:

means for receiving a plurality of alignment signals from the signal channel, each alignment signal being at a predetermined alignment frequency;

means for measuring the amplitude of each alignment signal and for determining filter data based upon the alignment signal amplitudes;

means for storing the filter data; and

signal processor means for filtering an input signal present on the channel to produce a filtered output signal, the signal processor means including means for adjusting its amplitude response in response to the filter data stored by said means for storing, such that the combined amplitude response of the signal channel and the signal processor means is substantially flat over said channel frequency range.

4,899,366

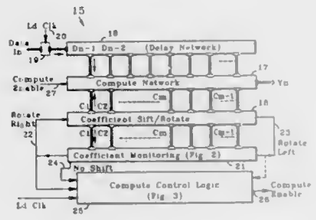
TAP ROTATION N FRACTIONALLY SPACED EQUALIZER TO COMPENSATE FOR DRIFT DUE TO FIXED SAMPLE RATE

Gordon T. Davis, and Baiju D. Mandalia, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1988, Ser. No. 227,582

Int. Cl.[4] H04B *3/06*

U.S. Cl. 375—14 **9 Claims**



1. A modem receive section comprising:

a source of fixed rate clock pulses for loading sampled signals which represent information quantized as analog amplitude signals; said information being asynchronous relative to said clock pulses;

a fractional tap spacing equalizer for processing said sampled signals in time coordination with said clock pulses; said equalizer having an optimized ensemble of coefficients positioned at a number of computing taps arranged about a reference tap and having optimized relative to said reference tap; said coefficients being used in computations involving said sampled signals; and

means coupled to said equalizer for correcting for misalignment of said coefficients relative to said reference tap due to relative drift between transmissions representing said analog amplitude and said fixed rate clock pulses.

4,899,367

MULTI-LEVEL QUADRATURE AMPLITUDE MODULATOR SYSTEM WITH FADING COMPENSATION MEANS

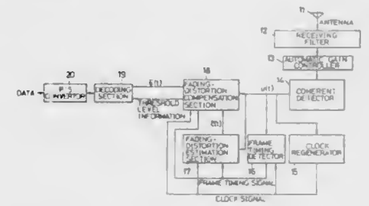
Seiichi Sampei, Akishima, Japan, assignor to Communications Research Laboratory Ministry of Posts and Telecommunications, Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,170

Claims priority, application Japan, Feb. 2, 1988, 63-21203

Int. Cl.[4] H04B *7/005*

U.S. Cl. 375—39 **1 Claim**



1. A multi-level quadrature amplitude modulator system comprising:

a transmitter section having a serial-to-parallel converter, baseband signal generator, transmitting filter, quadrature modulator, amplifier and antenna that is provided with: a frame symbol insertion section that inserts one known symbol per prescribed number of information symbols as a reference symbol; and

a receiving section having an antenna, receiving filter, automatic gain control, coherent detector, clock regenerator and decoding section that is provided with: a fading-distortion estimation section that estimates transmission path distortion in the information symbols from transmission path distortion that is detected on the basis of the inserted reference symbols; and a fading-distortion compensation section which uses the transmission path distortion information, as estimated by the fading-distortion estimation section, to compensate for distortion in the received baseband signal and estimates the threshold value information required for data determination by the decoding section.

4,899,368

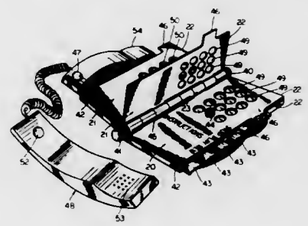
SWITCHING MECHANISM FOR ELECTRICAL DEVICES

Lisa Krohn, 45 Gramercy Park N., New York, N.Y. 10010, and Tucker Viemeister, 74 Fifth Ave., New York, N.Y. 10011

Filed Jan. 22, 1988, Ser. No. 147,312

Int. Cl.[4] H01H *3/16;* **H04M** *1/21, 1/64*

U.S. Cl. 379—67 **8 Claims**



1. A switching mechanism for an electronic device having a plurality of operations comprising a plurality of actuating members each specific for the selection of an operation of the device, each operation having a plurality of functions and each connected to a switch means for selecting the operation of the device, each actuating member having the appearance of a page, and being constructed, configured and dimensioned to actuate the switch means from a non-operating to an operating condition upon the turning of each member in a manner which simulates the turning of a page of a book, each switch means being connected to and actuating a functional switch means which controls functions of operations of the device, each functional switch means being connected to and controlling a plurality of functional switch actuating means.

4,899,369

RADIO-ANALOGUE METHOD OF AUDIO PRESENTATION AND CONTROL FOR AUDIOTEX SERVICES

James M. Kondziela, Fairfield, Conn., assignor to NYNEX, New York, N.Y.

Filed May 5, 1989, Ser. No. 348,716

Int. Cl.[4] H04M *11/08*

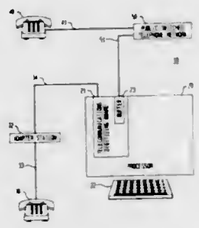
U.S. Cl. 379—101 **29 Claims**

1. A method for presenting and controlling audiotex services comprising the steps of

in response to a telephone call received at an audiotex processor from a user, playing for the user via the public switched telephone network, an excerpt from each of a plurality of audiotex services in a sequence, and

in response to a DTMF signal generated at a telephone of

said user and received at said audiotex processor, halting the sequential playing of said excerpts and playing for said



user additional information from one of said audiotex services.

4,899,370

REMOTE CONTROL APPARATUS FOR ELECTRONIC EQUIPMENT

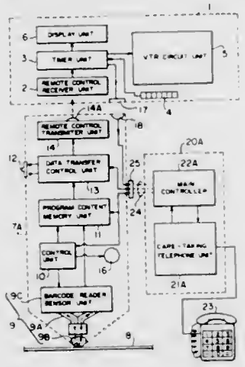
Akitaka Kameo, and Isao Koza, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 13, 1988, Ser. No. 209,494

Claims priority, application Japan, Jun. 12, 1987, 62-147596; Jun. 15, 1987, 62-148566; Jun. 15, 1987, 62-148572

Int. Cl.[4] H04M *11/00*; H04N *7/10*; G06K *7/10*

U.S. Cl. 379—104 **21 Claims**



1. A remote control apparatus for controlling electronic equipment using a local telephone set and a remote telephone set, said electronic equipment having a housing and having a timer reservation unit which includes a wireless communication input unit in said housing, said timer reservation unit causing the electronic equipment to start and stop a predetermined operation at respective predetermined times in accordance with reservation information received via said input unit, said remote control apparatus comprising: a remote controller to perform wireless communication with said input unit of said timer reservation unit, said remote controller additionally being coupled to a main controller of said local telephone set, and said remote controller further including means for transmitting said reservation information to said input unit of said timer reservation unit in response to predetermined push button or dial operations of said remote telephone set, received via said main controller of said local telephone set, said means for transmitting including a remote control signal transmitter unit; and

holding means for holding said remote controller so as to maintain a predetermined mutual positional relationship between said remote controller and said electronic equipment, said holding means including

a first member capable of detachably holding said remote controller, and

a second member detachably mounted on said housing of said electronic equipment for supporting said first member such that said remote control signal transmitter unit of said remote controller faces said input unit of said electronic equipment with a predetermined clearance therebetween.

4,899,371

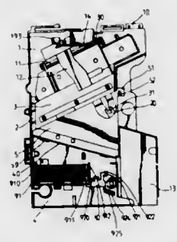
COIN SLOT STRUCTURE FOR COIN CALL TELEPHONE APPARATUS

Lih-Chuan Su, No. 1, Alley 33, Lane 788, Hsin Chuan Chih Rd., Kaohsiung, Taiwan

Filed Apr. 26, 1989, Ser. No. 343,208

Int. Cl.[4] H04M *17/02*; G07F *5/06*

U.S. Cl. 379—146 **10 Claims**



1. A coin slot structure for coin call telephone apparatus, including:

a base having a slot holder set at the upper right side for insertion therethrough of three different kinds of coins, a mandrel set at the right upper side for mounting thereon of an actuating plate, a suspension plate movably set at the right upper side through a revolving shaft, said suspension plate comprising a linking plate extending to the back side of said base to connect to a pull rod to pull a coin discharging mechanism;

a middle cover plate being fixedly mounted on said base at the right lower side to cover over half of the area;

an actuating plate including an L-shaped rod set at the right lower end to penetrate through said base, and being forced by a spring plate to constantly face toward said base with its bottom end covering over the upper part of said middle cover plate;

a bottom cover plate being set below said middle cover plate, having a right side portion to match with said base to define a coin outlet chamber and comprising an elongated convex edge set at the upper side; and

an outer cover plate having bottom ribs set at both sides to connect with said elongated convex edge of said bottom cover plate, and comprising an extension integrally set at the right upper angle through which the outer cover plate is fixedly connected with said base by a screw, said outer cover plate being arranged to space away from said actuating plate to provide a space for turning therearound of said actuating plate.

4,899,372

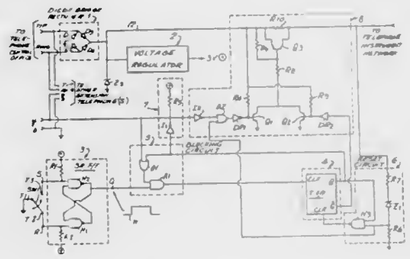
MULTI USE TELEPHONE EXTENSION CONTROL CIRCUIT AND DEVICE PROVIDING LOCKOUT FOR PRIVACY

Ashok L. Wani, Somerville, N.J., and Priya Jakatdar, Branford, Conn., assignors to Better Communications, Inc., Somerville, N.J.

Filed Jan. 5, 1988, Ser. No. 141,106

Int. Cl.[4] H04M *1/70*

U.S. Cl. 379—184 **21 Claims**



1. A control circuit for connection to the talking path of a telephone comprising

a switch (SW1, 3) for providing a pulse to a first gate (A1),

a flip/flop (4) connected to receive a pulse from said first gate and to be switched thereby to a first state with a signal on a first output (Q),

said output being connected to said first gate (A1) and enabling said gate when said flip/flop is in said first state,

a switch circuit (8) having a controlling input (DR2) connected to said flip/flop output, and a controlling path (Q3) connectible in a talking path of a telephone, said switching circuit normally providing a talking path, and interrupting said path in response to said flip/flop output,

a terminal (y) connected to said switching circuit, for rendering said switching circuit in an interrupted talking state (12/O2/DR1 or Q1 and Q3 both off) when a signal is received thereon from outside the control circuit,

said terminal (y) also being connected to said flip/flop output (Q) and adapted to be connected to an external circuit for controlling said external circuit, and

a reset circuit (6) connected to said flip-flop (4) to switch said flip/flop into a second state in response to a signal that said telephone has gone from off-hook to on-hook.

4,899,373

METHOD AND APPARATUS FOR PROVIDING PERSONALIZED TELEPHONE SUBSCRIBER FEATURES AT REMOTE LOCATIONS

Chinmel C. Lee, Woodridge, and Stephen A. McGaw, Schaumburg, both of Ill., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 28, 1986, Ser. No. 935,812

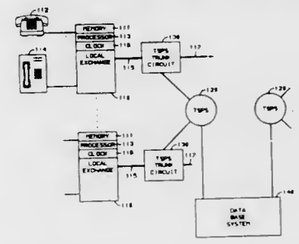
Int. Cl.[4] H04M *3/44, 7/14*

U.S. Cl. 379—207 **17 Claims**

10. A data base system for use with a telephone exchange, said telephone exchange having telephone terminals connected thereto and having assigned telephone subscribers and equipped to complete telephone calls in response to external stimuli initiated from said terminals, said data base system comprising:

storage means having a plurality of data storage areas corresponding to subscriber personal identification numbers, said storage areas for storing feature data defining presubscribed telephone features for subscribers not assigned to said telephone exchange, and

means for connecting to said telephone exchange and responsive to signals from said exchange defining a personal identification number provided to said exchange by one of said subscribers not assigned to said exchange to retrieve from an area of said storage means corresponding to said



personal identification number of said one subscriber and to transmit to said exchange feature data defining presubscribed features to be used in said exchange for completing telephone calls for said one subscriber.

4,899,374

METHOD FOR A PROGRAM-CONTROLLED TELEPHONE SWITCHING SYSTEM IN WHICH PERFORMANCE FEATURES RELATING TO THE SETUP OF A CALL CONNECTION CAN BE INITIATED FROM A SUBSCRIBER STATION

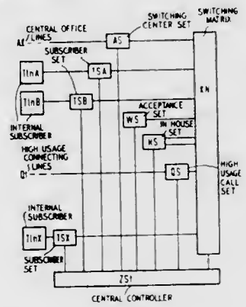
Marc Van Landeghem, Deinze, Belgium, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 23, 1988, Ser. No. 235,175

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728345

Int. Cl.[4] H04M *3/48*

U.S. Cl. 379—215 **3 Claims**



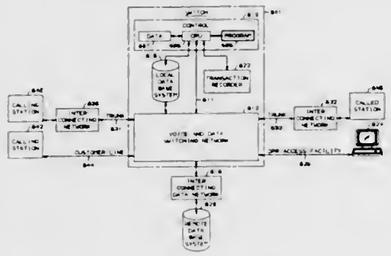
1. A method for a program-controlled telephone switching system which comprises a central controller which executes all switching functions, and said central controller has a memory in which all the information required for the execution of the switching functions are stored and where specific performance features relating to the set-up of a call connection are respectively initiatable by a subscriber station, comprising the steps of calling subscriber station calling a called subscriber station, and when the called subscriber station (T1nB) is busy, automatically initiating higher-priority performance features call-back when not busy, call waiting and cut-in in succession after prescribed timed intervals until the desired connection occurs.

4,899,375

MORE EFFICIENT CALL HANDLING FOR OPERATOR ASSISTANCE CALLS

Thomas M. Bauer, Belle Mead, N.J.; Richard W. Hemmeter, Naperville, Ill.; Robert Petrelli, Naperville, Ill.; Richard J. Piereth, Naperville, Ill., and Cyreaus M. Rubald, Naperville, Ill., assignors to American Telephone & Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J. and American Telephone & Telegraph Company, New York, N.Y.

Filed Sep. 23, 1988, Ser. No. 248,459
Int. Cl.[4] H04M *3/60*
U.S. Cl. 379—264 **27 Claims**



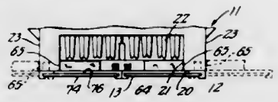
1. A method of setting up an operator assistance call from a calling party to a called party, comprising the steps of:
connecting said party to a first operator position;
responsive to first signals from said first operator position, disconnecting said first operator position and setting up a connection to said called party; and
responsive to receipt of an answer signal from said called party, setting up a connection between a second operator position, which may be different from said first operator position, and said called party.

4,899,376

IDENTIFICATION STRIP AND HOLDER FOR TELEPHONE CONNECTOR BLOCKS

Helmuth Neuwirth, Garden City, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Apr. 27, 1989, Ser. No. 343,679
Int. Cl.[4] H04Q *1/02*
U.S. Cl. 379—327 **6 Claims**



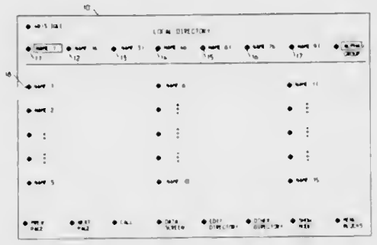
1. An improved identification marker device for use with a telephone connector block having cooperative engaging means on an exposed surface thereof for the selective reception of said marker device comprising: An elongated main body having first and second opposed planar surfaces, said first surface having retention means thereon for selectively engaging an indicia bearing member; said second surface having a plurality of laterally extending projections in mutually spaced rows thereon selectively engaging said cooperative engaging means in one of plural relative positions.

4,899,377

COMMUNICATION TERMINAL TELEPHONE DIRECTORY WITH DYNAMIC DIRECTORY TABBING

Eric J. Bauer, Matawan; Esther L. Davenport, Dunellen; Mary Kinal, North Plainfield, all of N.J., and Michael C. King, Boulder, Colo., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Dec. 10, 1985, Ser. No. 808,015
Int. Cl.[4] H04M *1/27*
U.S. Cl. 379—354 **9 Claims**



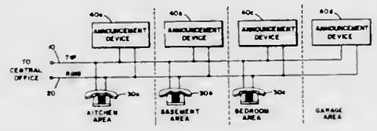
1. An arrangement for use in a terminal having a display, said terminal being adapted to display any one of a plurality of different screens, one of said screens being used in conjunction with a directory feature of the kin in which a list of alphabetic entries are stored in said terminal, said arrangement comprising
means for changing the composition of said list,
means responsive to a request from a user of said terminal for displaying said directory screen on said display,
means responsive to each such request for creating from the then current composition of said list a plurality of tab labels representing respective ones of said entries and for presenting on said display at least said tab labels, said tab labels being selected from said list in accordance with a predetermined selection criterion, and
means thereafter operative in response to the selection of a particular one of said tab labels by said user for presenting on said display the respective entry and a plurality of those of said entries that immediately succeed it alphabetically.

4,899,378

TELEPHONE ANNOUNCEMENT SYSTEM

William C. Hamer, 4709 Upper Ter., Edina, Minn. 55435

Filed Jan. 27, 1988, Ser. No. 149,188
Int. Cl.[4] H04M *1/72*
U.S. Cl. 379—374 **10 Claims**



1. A self-contained telephone announcement device for transmitting baseband announcement information over only the tip and ring wires used by existing telephone equipment without modifying the connections between the telephone wires and without modifying the existing telephone equipment, comprising:
connection means for connecting to the tip and ring wires of a subscriber's telephone line in parallel to the subscriber's telephone equipment and independent of the subscriber's telephone equipment;

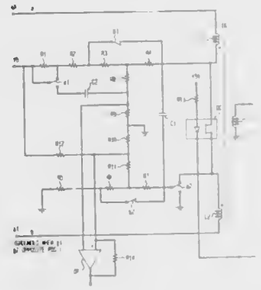
detector means attached to said connection means for monitoring the telephone line, for generating an ON signal in response to detecting a specific baseband DTMF tone pair on the telephone line and further for generating an OFF signal in response to detecting said baseband DTMF tone pair on the telephone line;
amplifier means attached to said connection means and said detector means for amplifying baseband audio signals placed on the telephone line by the subscriber's equipment, said amplifying being in response to said ON signal generated by said detector means; and
a speaker attached to said amplifier means such that the amplified audio signals are output through said speaker.

4,899,379

CIRCUIT ARRANGEMENT FOR THE CONNECTION OF LINE CIRCUITS OF A DIGITAL TIME MULTIPLEX-TELEPHONE NETWORK

Peter Vaclavik, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 20,814, Mar. 2, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 366,273
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3613715
Int. Cl.[4] H04M *3/22, 7/14*
U.S. Cl. 379—377 **2 Claims**



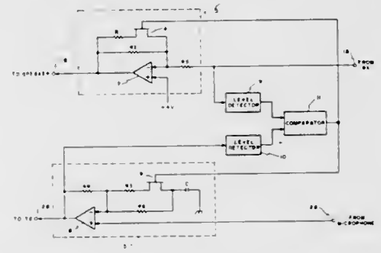
1. A circuit arrangement for coupling a telephone line circuit, having core conductors, to any one of: a subscriber station; dual subscriber stations of a dual service connection; and a branch exchange; said circuit arrangement comprising:
a detector circuit coupled by a voltage divider circuit to said core conductors of said telephone line circuit, to selectively provide one of: a loop closure indication of said telephone line circuit; a ground potential indication on one of said core conductors of said telephone line circuit for telephone signaling; and an off-hook indication for one of said dual subscriber stations in said dual service connection; in response to a control signal, whereby the voltage divider includes resistances of such value that alternating current noise voltages coupled into said core conductors compensate each other at the input of the detector circuit;
first switching means by which a resistance is inserted into one of said core conductors on which a ground potential indication occurs, during said ground potential indication and said off-hook indication, of such magnitude to provide a higher sensitivity of said detector circuit required for such indication and for activating at least one filter circuit to prevent the effects of the said alternating current noise voltages upon said detector circuit, and through which switching means another conductor of said core conductors of said telephone line circuit is isolated at ground potential from the detector circuit; and
second switching means for shunting said core conductors of said telephone line circuit with a low resistance.

4,899,380

LOUDSPEAKING TELEPHONE WITH A VARIABLE GAIN CIRCUIT

Keiko Shimada, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 5, 1988, Ser. No. 215,052
Claims priority, application Japan, Jul. 6, 1987, 62-169272
Int. Cl.[4] H04M *1/60, 9/08*
U.S. Cl. 379—389 **12 Claims**



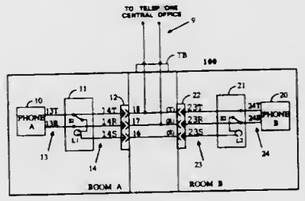
1. A loudspeaking telephone with a variable gain circuit comprising:
a receive path including first amplifying means for amplifying a receiving signal by a first gain to provide a received speech signal;
a transmit path including second amplifying means for amplifying a transmitting speech signal by a second gain to provide a transmit signal;
first means for comparing a signal level on said receive path with a signal level on said transmit path to provide a control signal to control said first and said second gains; and
second means responsive to said control signal for switching between said first and second gains to make one of said gains larger than the other of said gains, said switching occurring during a discrete change over period;
wherein the total gain obtained from said first and second gains during the changeover period of said gains is no greater than the total gain during the stable period excluding said changeover period.

4,899,381

SINGLE-LINE TELEPHONE HOLD CIRCUIT

Gerritt S. K. Lee, Honoluiu, Hi., assignor to GTE Hawaiian Telephone Company Incorporated, Honolulu, Hi.

Filed Apr. 7, 1989, Ser. No. 334,623
Int. Cl.[4] H04M *9/02*
U.S. Cl. 379—393 **12 Claims**



1. Auxiliary telephone apparatus for use in combination with a pair of telephones connected to a single telephone line cir-

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cuit, said apparatus for placing a temporary hold on the telephone line circuit and comprising:

first interface means for operatively connecting one of said telephones to said telephone line circuit having tip and ring leads, said first interface means including:

first indicator lamp means having first and second terminals, and,

first manually actuated switching means for connecting said first terminal of said indicator lamp means to either of said tip or ring leads;

second interface means for operatively connecting the other of said telephones to said telephone line circuit, said second interface means including:

second indicator lamp means having first and second terminals, and,

second manually actuated switching means for connecting said first terminal of said second indicator lamp means to either of said tip or ring leads; and,

means for interconnecting said second terminals of said first and second indicator lamp means;

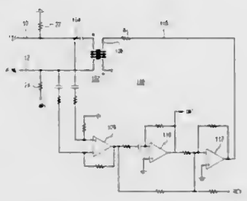
said first and second indicator lamp means having a combined internal series resistance sufficient to provide an off-hook condition on said telephone line circuit when both of said telephones are on-hook and when said first and second indicator lamp means are operatively connected across said tip and ring leads.

4,899,382

TELEPHONE CIRCUIT USING DC BLOCKED TRANSFORMER AND NEGATIVE IMPEDANCE TECHNIQUE

Todd H. Gartner, Phoenix, Ariz., assignor to Siemens Transmission Systems, Inc., Phoenix, Ariz.

Filed Jun. 15, 1988, Ser. No. 207,607
Int. Cl.[4] H04M *9/00*
U.S. Cl. 379—413 **16 Claims**



1. In a telephone subscriber line circuit for providing line current to one or more subscriber lines from a source of dc battery voltage, the improvement comprising:

line feed resistance means for coupling said battery voltage to said subscriber line;

ac input impedance synthesis circuit means, including means for sensing the voltage on said subscriber line, and a feedback loop responsive to said sensed voltage such that an effective negative impedance is provided in parallel with said line feed resistance to raise the effective input impedance of said line circuit to a value higher than the value of said line feed resistance means; and

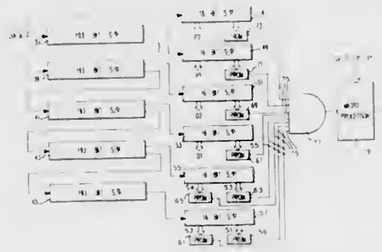
a dc blocked transformer having a primary winding coupled to said line feed resistance means and a secondary winding coupled to said ac input impedance synthesis circuit to provide isolation from line transients.

4,899,383

APPARATUS AND METHOD FOR SECURE DIGITAL COMMUNICATION

Charles W. Einolf, Jr., Murrysville; Harold B. Shutterly, Edgewood Boro, both of Pa.; Shan C. Sun, Coral Springs, Fla.; Russel W. Gonnam, Coral Springs, Fla.; Roger E. Ray, Coral Springs, Fla.; Karl C. Koch, Pittsburgh, and Pamela M. Maynard-Nenno, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 8, 1987, Ser. No. 94,186
Int. Cl.[4] H04L *7/08*
U.S. Cl. 380—48 **28 Claims**



1. A secure multichannel digital communications system comprising:

means for time multiplexing a plurality of channels to form a serial bit stream comprising successive frames with each frame containing a fixed number of bits from each of said channels, and for encoding said serial bit stream by repetitively inserting in the fixed number of bits for a selected channel in each of n successive frames, one of a sequence of separate uniquely coded signals of said fixed number of bits;

means for transmitting the encoded serial bit stream to a remote location;

means for receiving said encoded serial bit stream at the remote location;

means for continuously retaining the most recent bits of said serial bit stream received by the receiving means equal in number to the number of bits spanned by the selected channel in said n frames;

means for comparing sequential fixed number of bit length portions of the retained bit stream spaced apart by the length of a frame with stored values of said sequence of separate uniquely coded signals, and for generating a match signal when the sequential fixed number of bit length portions have a selected match with said stored values of said sequence of separate uniquely coded signals; and

means responsive to said match signal for demultiplexing said multichannel signal.

4,899,384

TABLE CONTROLLED DYNAMIC BIT ALLOCATION IN A VARIABLE RATE SUB-BAND SPEECH CODER

William G. Crouse, and Malcolm S. Ware, both of Raleigh, N.C., assignors to IBM Corporation, Armonk, N.Y.

Filed Aug. 25, 1986, Ser. No. 900,113
Int. Cl.[4] G10L *3/02;* **H04B** *1/66*
U.S. Cl. 381—31 **8 Claims**

1. In a sub-band speech coder system having means for sampling input speech signals, means for converting the input speech signal samples to digital sample values, means for subdividing said digital sample values into spectral frequency subbands and means for transmitting normalized and compacted values of said speech signal samples together with encoded indicia descriptive of the normalization and compaction used

to a remote receiver, an improved method of bit allocation for compacted input signal sample data comprising steps of:

sampling the input speech signals and converting the resulting samples to digital data samples;

dividing the sampled input signals into time blocks of digital data samples;

measuring the block peak energy level of said digital data samples in each said time block of digital data samples;

measuring the individual sub-band peak energy levels in each said spectral frequency sub-band in said digital data samples;

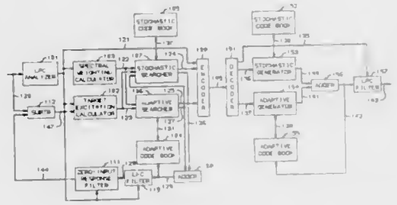
deleting a variable number of bits from each of said digital data samples in said time block in accordance with the values of said block peak energy level and of said sub-band peak energy level measurements and the spectral distribution of said sub-band peak energy levels in said time block, thereby allocating a variable total number of bits for each said time block.

4,899,385

CODE EXCITED LINEAR PREDICTIVE VOCODER

Richard H. Ketchum, Wheaton; Willem B. Kleijn, Batavia, and Daniel J. Krasinski, Glendale Heights, all of Ill., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 26, 1987, Ser. No. 67,649
Int. Cl.[4] G10L *7/02*
U.S. Cl. 381--36 **18 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 37 Pages)



1. A method of encoding speech using a plurality of candidate sets of excitation information stored in a table where said speech comprises frames of speech each frame having a plurality of samples, comprising the steps of:

storing said candidate sets of excitation information in a table in an overlapping manner whereby each candidate set differs from a previous candidate set by only a first and a second subset of excitation information where said first subset of excitation information comprises sequential samples from the beginning of each candidate set and said second subset of excitation information comprises sequential samples from the end of each candidate set;

forming a target set of excitation information in response to a present one of said frames of speech;

determining a set of filter coefficients in response to said present one of said frames of speech;

calculating information to model a finite impulse response filter from said set of filter coefficients;

recursively calculating an error value for each present one of said plurality of candidate sets of excitation information in response to the finite impulse response filter information and each of said candidate sets of excitation information and said target set of excitation information by removing a portion of the error value of said error value of said previous candidate set of excitation information contributed by said first subset of said excitation information of said previous candidate set of excitation information from said error value for said previous candidate set of excitation information to form a temporary error value and adding in a portion of error value of each present one of said candidate sets of excitation information contributed by said second subset of excitation information of each present one of said candidate sets of excitation information to said temporary error value to form an error value for each present one of said candidate sets of excitation information; and

selecting one of said candidate sets of excitation information whose calculated error value is the smallest;

determining a location in said table of said selected one of said candidate sets of excitation information;

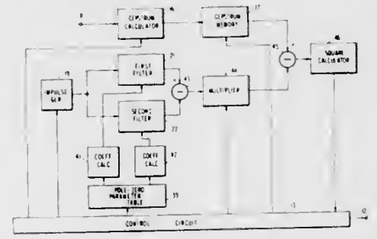
communicating said set of filter coefficients and information representing said location of said selected one of said candidate sets of excitation information.

4,899,386

DEVICE FOR DECIDING POLE-ZERO PARAMETERS APPROXIMATING SPECTRUM OF AN INPUT SIGNAL

Masako Ichikawa, and Yukio Mitome, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 167,275
Claims priority, application Japan, Mar. 11, 1987, 62-57330; Mar. 16, 1987, 62-61737; Mar. 16, 1987, 62-61738
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **6 Claims**



1. A pole-zero analyzer responsive to an input cepstrum related to each time window of an input signal for deciding optimum pole parameters, n in number, and optimum zero parameters, m in number, where each of n and m represents a predetermined integer, said analyzer comprising:

pole-zero memory means for memorizing a plurality of candidate pole and zero parameters in memorized set pairs, each memorized set pair consisting of a pole parameter set of n candidate pole parameters and a zero parameter set of m candidate zero parameters, said pole-zero memory means producing one of said memorized set pairs at a time as a candidate set pair;

first signal producing means responsive to the pole parameter set of said candidate set pair for producing a first output signal;

second signal producing means responsive to the zero parameter set of said candidate set pair for producing a second output signal;

converting means for converting said first and said second output signals to a converted signal which is equivalent to a model output cepstrum of a model output signal produced by a pole-zero model defined by said candidate set pair;

a subtracter for calculating a difference between said input cepstrum and said converted signal to produce a difference signal representative of said difference; and

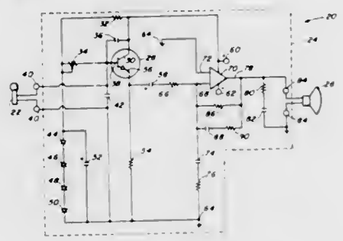
selecting means responsive to said difference signal for selecting one of said memorized set pairs as a selected set pair consisting of said optimum pole parameters and said optimum zero parameters.

4,899,387

ACTIVE LOW FREQUENCY ACOUSTIC RESONANCE SUPPRESSOR

Nelson S. Pass, Auburn, Calif., assignor to Threshold Corporation, Auburn, Calif.

Filed Dec. 2, 1988, Ser. No. 279,406
Int. Cl.[4] G10K 11/16
U.S. Cl. 381—71 10 Claims



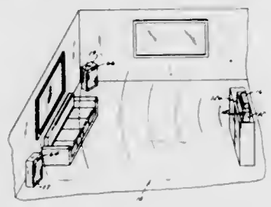
1. An active acoustic system for low frequency resonance attenuation for an enclosed volume, such as a room, the system comprising:
an elongated housing having opposed ends;
a speaker being mounted in the housing and having a cone with an axial base with speaker drive provided to the base for generating outbound sound waves from the housing into the enclosed volume;
input means having first and second signal terminals and being located forward of the cone, for sensing incoming sound waves that form an increased pressure zone with pressure above ambient pressure and for generating an electrical input signal in response to the increased sound pressure in the increased pressure zone;
signal processing means, for receiving the electrical input signal, for generating an inverse signal relative to the input signal, and for communicating the inverse signal to the cone, thereby producing outbound sound waves that offset the increased pressure in the increased pressure zone; and
feedback means within said signal processing means adjusting the level of the inverse signal to a desired level, where the feedback means has a feedback impedance that is finite and positive for dc signals and that decreases in magnitude with increasing input signal frequency.

4,899,388

INFRARED STEREO SPEAKER SYSTEM

Allan G. Mlodzikowski, Milwaukee, Wis.; Yih-Pyng Tsui, and Hai-Pin Ku, both of Taipei, Taiwan, assignors to Koss Corporation, Milwaukee, Wis.

Filed Jan. 13, 1988, Ser. No. 143,588
Int. Cl.[4] H04B 9/00; H04H 5/00
U.S. Cl. 381—77 8 Claims



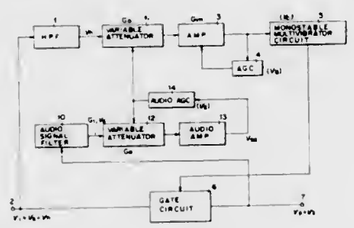
1. A stereophonic audio system, comprising:
source means for providing a source of analog electric signals containing stereophonic signal information, including an analog left channel signal and an analog right channel signal;
converting means for receiving said analog electric signals, for converting said analog electric signals to a single analog infrared signal containing both of said channel signals, and for radiating said single analog infrared signal throughout a signal area;
first electronic selecting means for disposition within said signal area for receiving said single analog infrared signal, for selecting one portion of said single analog infrared signal, for converting said one portion of said single analog infrared signal to a first audible sound signal corresponding to said right channel signal, and for radiating said audible sound signal throughout a listening area; and
second electronic selecting means for disposition within said signal area but remote from said first selecting means for receiving said single analog infrared signal, for selecting another portion of said single analog infrared signal corresponding to said left channel signal, for converting said another portion of said single analog infrared signal to a second audible sound signal, and for radiating said second audible sound signal throughout said listening area.

4,899,389

PULSATING NOISE REMOVAL DEVICE

Kiyoshi Amazawa, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,362
Claims priority, application Japan, Feb. 17, 1987, 62-34341; Feb. 17, 1987, 62-34342
Int. Cl.[4] H04B 1/10, 1/64
U.S. Cl. 381—94 9 Claims



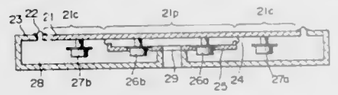
1. A pulsating noise removal device comprising:
noise detection means for extracting noise signal components in an entered signal;
gate means for swithcing the entered signal;
audio signal detection means for extracting audio signal components in the gated entered signal;
first level changing means for varying the signal level of the extracted noise signal component;
second level changing means for varying the signal level of the extracted audio signal component;
level control means responsive to the audio signal component varied by said second level changing means to control said first and second level changing means; and
gate control means responsive to the noise signal component varied by said first level changing means to control the switching action of said gate means.

4,899,390

THIN SPEAKER HAVING AN ENCLOSURE WITHIN AN OPEN PORTION AND A CLOSED PORTION

Hiroyuki Takewa, Kaizuka; Mitsuhiko Serikawa; Seiichi Ishikawa, both of Hirakata; Sawako Usuki, Kobe; Yoichi Kimura, Ashiya, and Shuichi Obata, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 96,528
Claims priority, application Japan, Sep. 19, 1986, 61-223149; Oct. 20, 1986, 61-248726; Nov. 27, 1986, 61-282501; Dec. 19, 1986, 61-304326; Apr. 1, 1987, 62-80015; Apr. 20, 1987, 62-96502
Int. Cl.[4] H04R 7/06, 1/24
U.S. Cl. 381—154 18 Claims



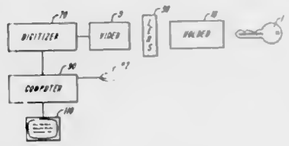
1. A speaker of the direct radiator-type comprising:
an enclosure having a first and second openings, said enclosure additionally having length, width, and thickness dimensions, with the thickness dimension being substantially smaller than the length dimension and the width dimension;
a diaphragm connected to said enclosure at said first opening;
at least one voice coil unit connected to said diaphragm; and
means for partitioning said enclosure to provide a closed enclosure portion and an open enclosure portion which communicates with said second opening, part of said diaphragm being exposed to said closed enclosure portion and another part of said diaphragm being exposed to said open enclosure portion.
wherein said enclosure includes a rear plate, said second opening being located in said rear plate of said enclosure, wherein said means for partitioning includes means connected to said rear plate for providing a tunnel to said second opening, and wherein, when said speaker is mounted adjacent a wall so that said rear plate is spaced apart from said wall by a gap, an acoustic duct is formed which extends through said tunnel and said gap.

4,899,391

AUTOMATIC KEY IDENTIFICATION SYSTEM

William J. Cimino, 325 Rice Ave., Revere, Mass. 02151, and Robert E. Powers, Jr., 188 Faywood Ave., E. Boston, Mass. 02128

Filed Jun. 24, 1988, Ser. No. 212,342
Int. Cl.[4] G06K 9/00
U.S. Cl. 382--1 18 Claims



1. A system for identifying and matching key blanks when duplicating an original key, comprising:
a holding device into which the original key is inserted;
a lensing subsystem adjacent to said holding device which illuminates and forms an image of the front profile of said original key;
a video subsystem adjacent to said lensing subsystem which converts said image into an electrical signal;
a digitizer connected to said video subsystem which converts said electrical signal into a digital image;
a computer subsystem, having memory, connected to said digitizer which stores said digital image into said memory, processes said stored image, compares said stored image to stored images of known key blanks, identifies the proper key blank to be used in duplicating said original key, and outputs said identification data; and
an output subsystem which signals said identification data.

4,899,392

METHOD AND SYSTEM FOR OBJECTIVELY GRADING AND IDENTIFYING COINS

Henry A. Merton, Saratoga Springs, N.Y., assignor to Cing Corporation, Saratoga Springs, N.Y.

Filed Dec. 3, 1987, Ser. No. 128,494
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—1 57 Claims

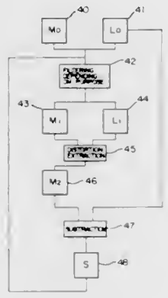
1. An automated method for objectively assigning a numismatic grade to a test coin of particular issue, said method comprising the steps of:
(a) electronically identifying and locating each detracting mark on one of the obverse and reverse sides of the test coin;
(b) electronically measuring the surface area of each identified detracting mark;
(c) utilizing computer means to automatically assign to each identified detracting mark a quantity proportional to the detracting significance thereof based upon the location and measured surface area of the mark on said one side of the test coin;
(d) automatically summing said assigned quantities using said computer means to arrive at an amount representative of all identified detracting marks on said one side of the test coin;
(e) automatically correlating said summed amount into a numismatic grade for said one side of the test coin with reference to a preexisting computer database of scaled values representative of numismatic grades; and
(f) repeating steps (a)–(e) for the opposite side of the test coin.

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4,899,393
METHOD FOR IMAGE REGISTRATION

Koichi Morishita, Kawasaki; Tetsuo Yokoyama, Tokyo, and Kazuhiro Sato, Kitasoma, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 13,072
Claims priority, application Japan, Feb. 12, 1986, 61-26705
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—6 **3 Claims**

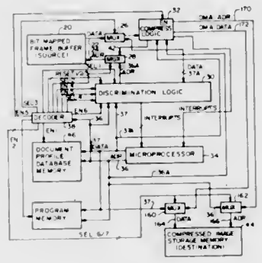


1. A method for image registration comprising the steps of:
taking first and second images of a certain region of a test object under different conditions;
adaptively selecting high frequency component emphasis coefficients corresponding to the image gray value of a desired portion to be registered in said certain region;
performing a high frequency emphasis filtering processing for the entire region of said first and second images using the adaptively selected emphasis coefficient;
defining a desired portion of said first and second images after the filtering processing; and
performing image registration between the images of the defined desired portion.

4,899,394
APPARATUS AND METHOD FOR IMAGE COMPRESSION

Jeffery H. Lee, Cupertino, Calif., assignor to Prodigy Systems Corporation, Mountain View, Calif.

Filed May 9, 1986, Ser. No. 861,510
Int. Cl.[4] G06K *9/18*
U.S. Cl. 382—9 **3 Claims**



1. An apparatus for comprising a bit mapped image stored at a first resolution to a compressed image which has zones stored at said first resolution and zones stored at a second resolution comprising:
means for profiling digital data representing said bit mapped image to determine where probable zones of text are located by determining the smallest space of a selected color and examining other spaces of the same color to determine whether the sizes of these other spaces is an integer multiple of said smallest space of said selected color and for determining where probable zones of graphics are located by examining patterns of blank spaces in the image; and
means coupled to said means for profiling for compressing said zones of text at said second resolution and for converting said compressed zones to text to compressed data and for storing said compressed data along with said bit mapped data representing said zones of graphics as said compressed image.

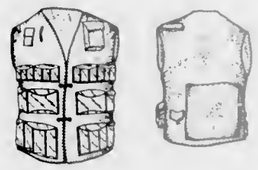
DESIGNS

FEBRUARY 6, 1990

305,825
FISHERMAN'S VEST

Frederick A. Tenore, 6267 Kelez Ct., San Jose, Calif. 95120

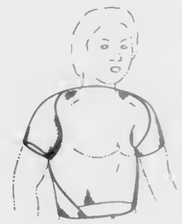
Filed Sep. 15, 1986, Ser. No. 907,534
Term of patent 14 years
U.S. Cl. D2--187



305,826
BODY SHIRT

Stanmore G. Langford, III, 1431 E. 4th St., National City, Calif. 92050

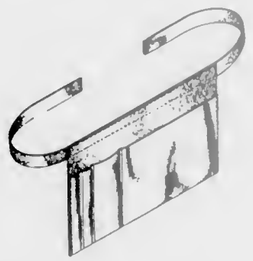
Filed Mar. 28, 1988, Ser. No. 174,339
Term of patent 14 years
U.S. Cl. D2—211



305,827
POCKETTED APRON

Joyce D. Flowers, 6330 Beechwood St., Philadelphia, Pa. 19138

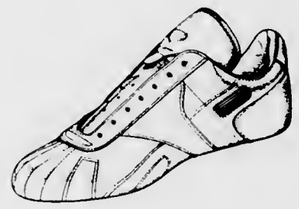
Filed Jul. 6, 1989, Ser. No. 375,854
Term of patent 14 years
U.S. Cl. D2—229



305,828
SPORT SHOE UPPER

Ian H. Whatley, Nashville, Tenn., assignor to Genesco Inc., Nashville, Tenn.

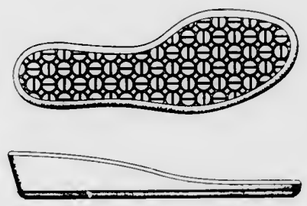
Filed Feb. 11, 1988, Ser. No. 155,015
Term of patent 14 years
U.S. Cl. D2—314



305,829
SHOE SOLE

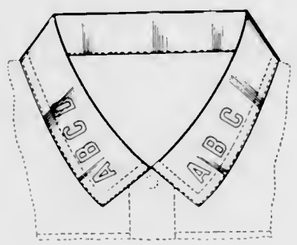
Dominick Violi, Jr., Windham, N.H., assignor to Lowell Shoe, Inc., Hudson, N.H.

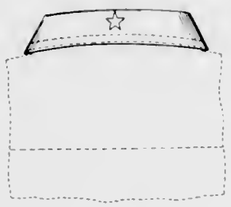
Filed Jul. 6, 1987, Ser. No. 72,571
Term of patent 14 years
U.S. Cl. D2—320



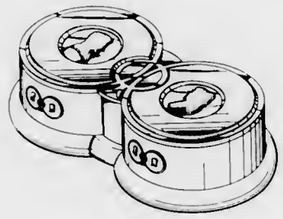
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305,830
COLLAR FOR SHIRTS AND THE LIKE
Aldo Ciavatta, Superstrada Consolare San Marino 76, Rimini (Forli), Italy
Filed Sep. 3, 1986, Ser. No. 903,580
Claims priority, application Italy, May 30, 1986, 22050/86[U]; May 30, 1986, 22051/86[U]
Term of patent 14 years
U.S. Cl. D2—602





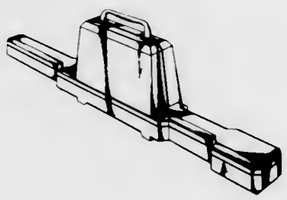
305,832
DUAL JEWELRY BOX
Gary L. Pence, 1008 Hwy. 98 E., Apt. 53, Destin, Fla. 32541
Filed Oct. 3, 1986, Ser. No. 915,332
Term of patent 14 years
U.S. Cl. D3—75



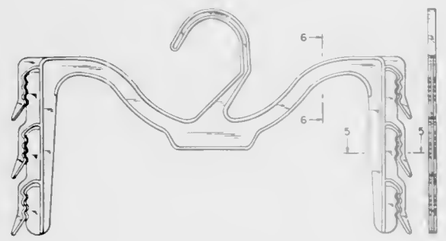
305,833
COMBINED EASEL AND CARRIER FOR ARTISTS' CANVASSES OR THE LIKE
Thomas Koves, P.O. Box 1387, Anahuac, Tex. 77514
Filed Apr. 25, 1986, Ser. No. 857,589
Term of patent 14 years
U.S. Cl. D6—312

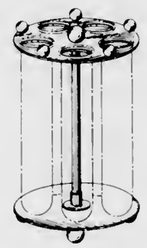


305,831
SKI EQUIPMENT CARRIER
Paul J. Vanderhorst, 1817 Enid Dr., Lithonia, Ga. 30058
Filed Aug. 15, 1986, Ser. No. 896,830
Term of patent 14 years
U.S. Cl. D3—36

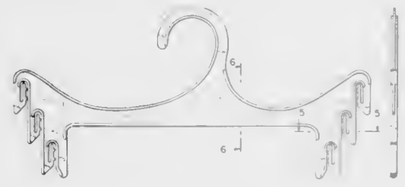


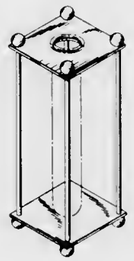
305,834
GARMENT HANGER
Joseph DeVito, Hauppauge, N.Y., assignor to Plasti-form Enterprises, Inc., Deer Park, N.Y.
Filed Oct. 5, 1988, Ser. No. 253,736
Term of patent 14 years
U.S. Cl. D6—326



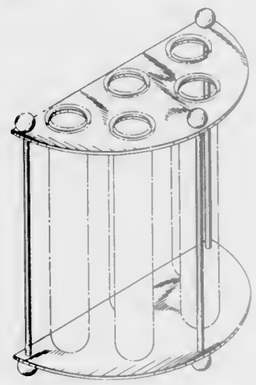


305,835
GARMENT HANGER
Joseph DeVito, Hauppauge, N.Y., assignor to Plasti-form Enterprises, Inc., Deer Park, N.Y.
Filed Oct. 5, 1988, Ser. No. 253,735
Term of patent 14 years
U.S. Cl. D6—326

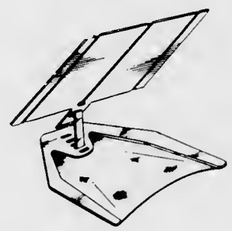




305,836
STAND FOR FLORAL CONTAINER OR THE LIKE
Ronaldo Maia, New York, N.Y., assignor to Ronaldo Maia Ltd., New York, N.Y.
Filed Dec. 30, 1987, Ser. No. 140,257
Term of patent 14 years
U.S. Cl. D6—405



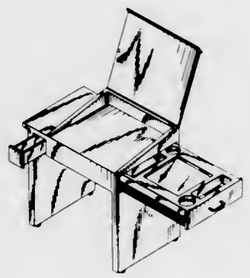
305,837
BOOK HOLDER
William R. Bowman, P.O. Box 612104, Sonth Lake Tahoe, Calif. 95761
Filed Feb. 2, 1987, Ser. No. 10,288
Term of patent 14 years
U.S. Cl. D6—419





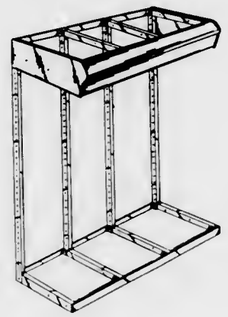
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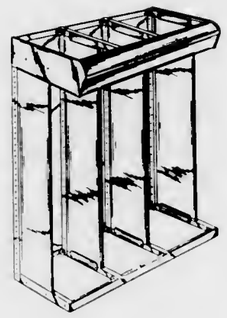
305,838
DESK OR SIMILAR ARTICLE
Berta Biesenstock, Rockaway Park, N.Y., assignor to Maneuverability, Inc., Brooklyn, N.Y.
Filed Mar. 20, 1987, Ser. No. 28,532
Term of patent 14 years
U.S. Cl. D6—420



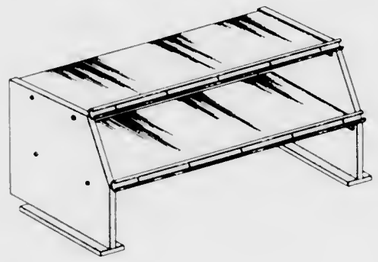


305,839
MERCHANDISING DISPLAY FRAME
Fred Howard, New York, and Sydney Edson, East Meadow, both of N.Y., assignors to Sara Lee Corporation, Winston-Salem, N.C.
Filed Apr. 17, 1987, Ser. No. 39,378
Term of patent 14 years
U.S. Cl. D6—462

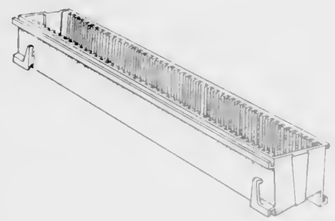




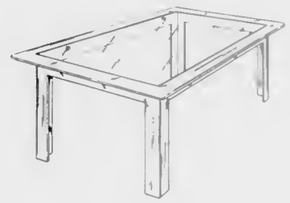
305,840
SHELF UNIT
Edward J. Mepham, 1502 Huron, Royal Oak, Mich. 48073
Filed May 8, 1987, Ser. No. 47,062
Term of patent 14 years
U.S. Cl. D6—474



305,841
DISPLAY TRAY FOR PACKAGES OF TOOTHBRUSH
Roderick I. MacQueen, Brookvale, Australia, assignor to Exhibition Displays Pty. Limited, New South Wales, Australia
Filed Apr. 10, 1986, Ser. No. 851,410
Claims priority, application Australia, Jan. 26, 1986, 3932/86
Term of patent 14 years
U.S. Cl. D6—475



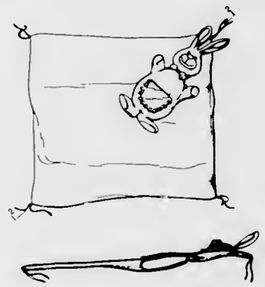
305,842
TABLE OR SIMILAR ARTICLE
Theodore W. Herr, 1960 N. Lincoln Park W., Chicago, Ill. 60614
Filed Jan. 15, 1987, Ser. No. 6,601
Term of patent 14 years
U.S. Cl. D6—480



305,843
ADJUSTABLE SEAT AND BACKREST UNIT FOR A SWIVEL CHAIR
Ola Haukvik, Stathelle, and Martin Lunde, Stranda, both of Norway, assignors to J. E. Ekornes A/S, Ikornnes, Norway
Division of Ser. No. 857,574, Apr. 25, 1986. This application Mar. 18, 1988, Ser. No. 197,001
Term of patent 14 years
U.S. Cl. D6—502

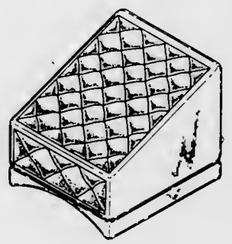


305,844
BLANKET WITH POCKET
Wei-weo Chang, P.O. Box 10780, Taipei, Taiwan
Filed Dec. 12, 1986, Ser. No. 941,928
Term of patent 14 years
U.S. Cl. D6—598





305,845
INFLATABLE CUSHION
Roger V. Foster, 6631 Buena Vista St., San Antonio, Tex. 78227
Filed Oct. 2, 1986, Ser. No. 914,758
Term of patent 14 years
U.S. Cl. D6—601



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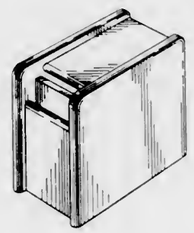
305,846
CEREAL BOWL WITH INSERT
Walter L. Griffith, 51 E. Cavalier Rd., Scottsville, N.Y. 14546
Filed Dec. 18, 1986, Ser. No. 943,301
Term of patent 14 years
U.S. Cl. D7—555



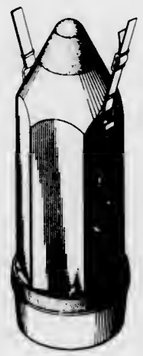
305,847
BOWL OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510 Arques, France
Filed Jul. 2, 1987, Ser. No. 69,583
Term of patent 14 years
U.S. Cl. D7—564



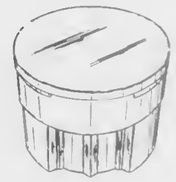
305,848
DRINKING STRAW DISPENSING CONTAINER
Ellen M. Marqua, and John T. Marqua, both of Rockford, Ill., assignors to Expressions in Wood, Inc., Rockford, Ill.
Filed Apr. 13, 1987, Ser. No. 37,576
Term of patent 14 years
U.S. Cl. D7—635



305,849
INSULATING CONTAINER FOR WATER, BEVERAGES, AND SOUPS
Ajit K. Das, 3213 S. Pacific Ave., Santa Ana, Calif. 92704; Edward Bobowski, Addison, Ill., and Tsuneo Nakazato, Tokyo, Japan, assignors to Ajit K. Das, Santa Ana, Calif.
Filed Dec. 4, 1987, Ser. No. 129,072
Term of patent 14 years
U.S. Cl. D7—606



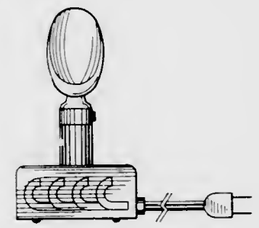
305,850
COMBINATION COOLER, STOOL AND TABLE
Warren J. Peterson, Crestwood, and Thomas M. Carroll, St. Louis, both of Mo., assignors to River City Drum, Inc., St. Louis, Mo.
Filed Apr. 10, 1987, Ser. No. 36,694
Term of patent 14 years
U.S. Cl. D7—608



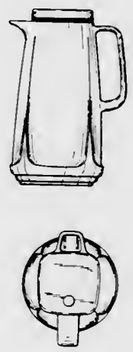
305,851
COOLER BOX
Arthur R. Carlson, Rowville, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia
Filed Apr. 11, 1986, Ser. No. 851,433
The portion of the term of this patent subsequent to Jun. 2, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—605



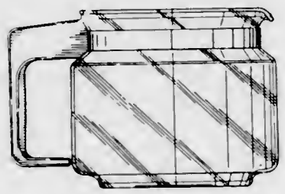
305,852
BATTERY HEATED ICE CREAM SCOOP
Richard N. Clement, and Theresa M. Karczmarczyk, both of Arthur St., Ludlow, Mass. 01056
Filed Sep. 28, 1987, Ser. No. 102,594
Term of patent 14 years
U.S. Cl. D7—681



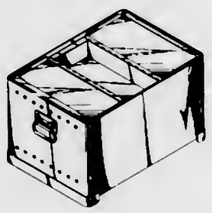
305,853
INSULATED JUG
Anso Zimmermann, Niederaula, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Dec. 9, 1986, Ser. No. 939,761
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1986, MR244
Term of patent 14 years
U.S. Cl. D7—317



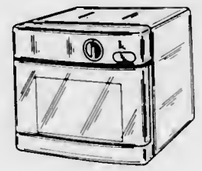
305,854
CARAFE
Thomas J. Ryan, San Diego, Calif., and Jeffrey W. DeLong, Chillicothe, Ohio, assignors to Proctor-Silex, Inc., Glen Allen, Va.
Filed May 15, 1986, Ser. No. 863,679
Term of patent 14 years
U.S. Cl. D7—319



305,855
NACHOS VENDING UNIT
Howard R. Mandat, 5217 Pensacola, Garland, Tex. 75043
Filed Mar. 9, 1987, Ser. No. 23,130
Term of patent 14 years
U.S. Cl. D7—323

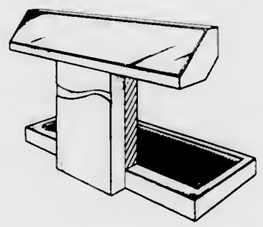


305,856
MICROWAVE OVEN
Wataru Iwahashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 9, 1987, Ser. No. 130,729
Claims priority, application Japan, Jun. 9, 1987, 62-23712
The portion of the term of this patent subsequent to Jan. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351



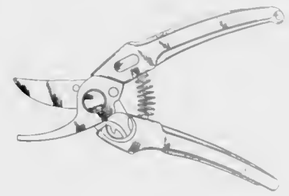


305,857
TOWER FOR A BEVERAGE DISPENSER
Alvin H. Schechter, New York, N.Y., and Carl R. Thompson, Stratford, Conn., assignors to The Coca-Cola Company, Atlanta, Ga.
Division of Ser. No. 841,749, Mar. 5, 1986. This application Nov. 3, 1988, Ser. No. 266,967
Term of patent 14 years
U.S. Cl. D7—397

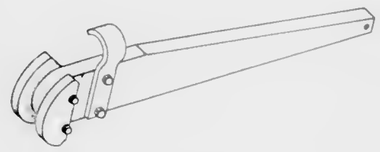


305,858
PRUNING SHEARS
Kimikazu Ishida, and Tsuneo Ishida, both of Miki, Japan, assignors to Saboten Co., Ltd., Hyogo, Japan
Filed Apr. 5, 1988, Ser. No. 178,076
Claims priority, application Japan, Feb. 4, 1988, 63-4348
Term of patent 14 years
U.S. Cl. D8—5

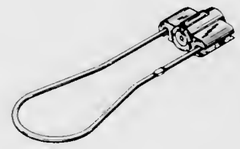




305,859
HOOK USED IN MOORING A BOAT OR SIMILAR ARTICLE
Lewis P. White, 3436 Brookwood Rd., Birmingham, Ala. 35223
Filed Feb. 17, 1987, Ser. No. 15,723
Term of patent 14 years
U.S. Cl. D8—14



305,860
WIRE GRIPPER
Robert V. DeFrance, Poughkeepsie, N.Y., assignor to Fargo Manufacturing Company, Inc., Poughkeepsie, N.Y.
Filed Feb. 27, 1986, Ser. No. 838,041
Term of patent 14 years
U.S. Cl. D8—14



305,861
LOCK WITH DIGITAL CONTROL
Jean-Jacques Kautt, Strasbourg, France, assignor to Ferco International Usine de Ferrures de Batiment, Sarrebourg, France
Filed Oct. 13, 1987, Ser. No. 107,031
Claims priority, application France, Apr. 13, 1987, 872510
Term of patent 14 years
U.S. Cl. D8—330

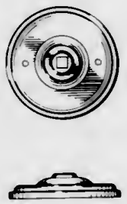


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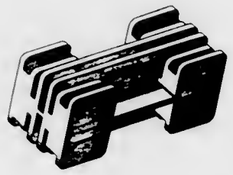
305,862
ESCUTCHEON
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Mar. 22, 1988, Ser. No. 171,926
Term of patent 14 years
U.S. Cl. D8—350



305,863
BACK PLATE
Stanley T. Gresens, Chicago, and A. Denton Green, Evanston, both of Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Aug. 21, 1986, Ser. No. 898,640
Term of patent 14 years
U.S. Cl. D8—352



305,864
CONNECTOR FOR FOLDING CRATES
Jam Sun, No. 39, Lane 106, Sec. 7, Yen-Ping N. Rd., Taipei, Taiwan
Filed Jan. 12, 1987, Ser. No. 2,187
Term of patent 14 years
U.S. Cl. D8—382



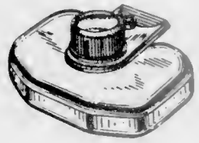
305,865
CONTAINER FOR MOIST TOWELETTES OR THE LIKE
Aaron Zutler, 19 Clearmeadow La., Woodbury, N.Y. 11797
Filed May 4, 1987, Ser. No. 45,147
Term of patent 14 years
U.S. Cl. D9—311



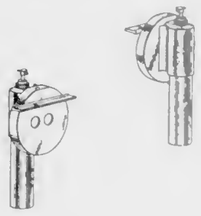
305,866
CONTAINER FOR UNDERGARMENTS
Philip Kemp, Closter, N.J., assignor to J. E. Morgan Knitting Mills, Inc., Tamaqua, Pa.
Filed Mar. 25, 1987, Ser. No. 29,880
Term of patent 14 years
U.S. Cl. D9—311



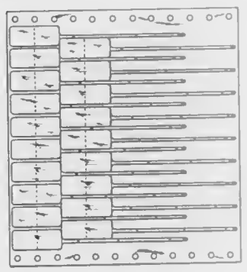
305,867
BOTTLE AND SLIDING GUIDE ASSEMBLY OR SIMILAR ARTICLE
Michel A. Moret, Geneva, Switzerland, assignor to Les Produits Associes LPA-Broxo S.A., Switzerland
Filed Dec. 3, 1986, Ser. No. 937,663
Term of patent 14 years
U.S. Cl. D9—337



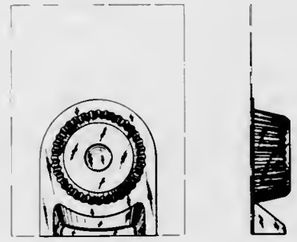
305,868
COMBINED SPRAY PUMP DISPENSER AND SQUEEGEE FOR CLEANING WINDSHIELDS
Larry O. Westall, 2815 Klondike Trail, Sioux Falls, S. Dak. 57103
Filed Oct. 13, 1987, Ser. No. 107,758
Term of patent 14 years
U.S. Cl. D9—337



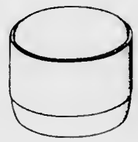
305,869
PACKAGE OF SELF-ADHESIVE LABELS
Peter J. Gollon, 15 Eleanor Pl., Huntington, N.Y. 11743, and Ira Teper, 57 Columbine La., Kings Park, N.Y. 11754
Continuation-in-part of Ser. No. 686,607, Dec. 27, 1984. This application Jun. 5, 1986, Ser. No. 871,663
Term of patent 14 years
U.S. Cl. D9—341



305,870
BLISTER ENCLOSURE FOR A DISPLAY PACKAGE
William H. Perkins, Oxford, Ohio, assignor to Drackett Company, Cincinnati, Ohio
Filed Mar. 30, 1987, Ser. No. 32,191
Term of patent 14 years
U.S. Cl. D9—415



305,871
BOTTLE CAP
Reinold Geiger, Neuilly, France, assignor to A.M.S., a corporation of France, Saint-Ouen-L'Aumone, France
Filed Nov. 13, 1986, Ser. No. 929,706
Claims priority, application France, May 16, 1986, 86 2629
Term of patent 14 years
U.S. Cl. D9—435

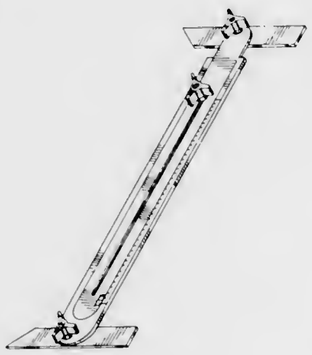


305,872
AEROSOL SPRAY HEAD
Trinidad G. Garcia, 2862 W. Imperial Hwy., Inglewood, Calif. 90303
Filed Dec. 17, 1986, Ser. No. 942,860
Term of patent 14 years
U.S. Cl. D9—448

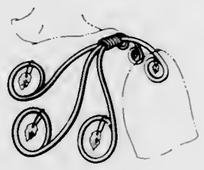


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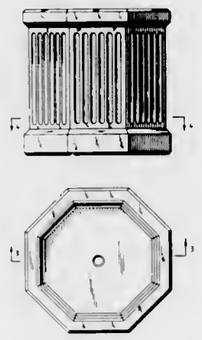
305,873
TREAD AND RISER STAIR GAUGE
Ronald J. Bisson, RFD, Hardwick, Vt. 05836
Filed Feb. 10, 1986, Ser. No. 836,446
Term of patent 14 years
U.S. Cl. D10—62



305,874
BODY JEWELRY
Linda J. Jackson, 1424 Constitution, Pueblo, Colo. 81001
Filed Jul. 20, 1987, Ser. No. 75,864
Term of patent 14 years
U.S. Cl. D11—1



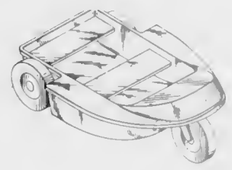
305,875
PLANT HOLDER
Kenneth P. Morritt, deceased, late of Cheltenham, Great Britain; Kenneth Morritt, executor, Cheltenham, and Robin Morritt, executor, Andoversford, both of England, assignors to Rokes Limited, Cheltenham, England
Filed Apr. 14, 1987, Ser. No. 38,531
Claims priority, application United Kingdom, Oct. 14, 1986, 1037393
Term of patent 14 years
U.S. Cl. D11—143

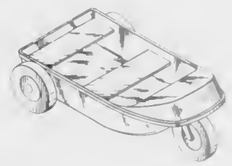


305,876
HEADSTONE FLORAL HOLDER
Marcus N. Gewinner, 207 N. Lee St., LaGrange, Ga. 30240
Filed Oct. 6, 1987, Ser. No. 105,198
Term of patent 14 years
U.S. Cl. D11—147

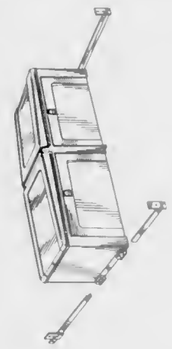


305,877
AMPHIBIOUS VEHICLE
Bill Price, II, P.O. Box 730, Morehead City, N.C. 28557
Filed Jul. 14, 1987, Ser. No. 72,853
Term of patent 14 years
U.S. Cl. D12—3

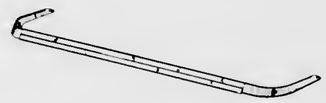




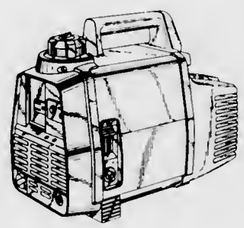
305,878
COMBINED ROLLABLE VEHICLE CABINET AND SUPPORT RAILS THEREFORE
Victor L. Schneider, 12020 Shadowbrook Dr., Olympia, Wash. 98502
Filed May 18, 1987, Ser. No. 51,039
Term of patent 14 years
U.S. Cl. D12—157



305,879
VEHICLE ROOF WIND DEFLECTOR
Bruce M. Gantner, Rochester, and Mark Gorentz, Milford, both of Mich., assignors to Webasto Sunroof Inc., Rochester Hills, Mich.
Filed Jun. 3, 1987, Ser. No. 56,980
Term of patent 14 years
U.S. Cl. D12—181



305,880
POWER GENERATOR
Jun Ito, and Takeshi Yamaguchi, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 5, 1986, Ser. No. 870,791
Term of patent 14 years
U.S. Cl. D13—2

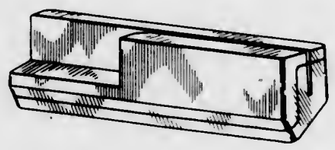


305,881
HOUSING FOR OCCUPANCY-ACTIVATED WALL SWITCH OR THE LIKE
Gregory B. Bergeron, Montebello, Calif., assignor to NOVITAS, Santa Monica, Calif.
Filed Nov. 10, 1986, Ser. No. 929,673
Term of patent 14 years
U.S. Cl. D13—38



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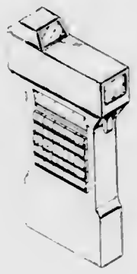
305,882
CARD READER OR SIMILAR ARTICLE
Shuzo Kato, and Yasushi Nakamura, both of Hiratsuka, Japan, assignors to NCR Corporation, Dayton, Ohio
Filed Sep. 25, 1987, Ser. No. 101,347
Claims priority, application Japan, Mar. 30, 1987, 62-11685
Term of patent 14 years
U.S. Cl. D14—105



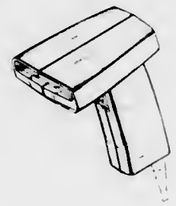
305,883
PORTABLE COMPUTER
Michel A. Burton, Lawrenceville, Ga., assignor to Intelligent Systems Corporation, Norcross, Ga.
Filed Mar. 10, 1987, Ser. No. 24,152
Term of patent 14 years
U.S. Cl. D14—106



305,884
HAND-HELD LASER SCANNING TERMINAL
Mark Krichever, Hauppauge, and Boris Metlitsky, Stony Brook, both of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.
Filed Dec. 9, 1988, Ser. No. 281,686
Term of patent 14 years
U.S. Cl. D14—116



305,885
HAND-HELD OPTICAL SCANNER
Edward D. Barkan, South Setauket; Howard M. Shepard, Great River; Frank Gong, Williston Park, and Mark J. Krichever, Hauppauge, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.
Filed Jun. 24, 1988, Ser. No. 210,776
Term of patent 14 years
U.S. Cl. D14—116



305,886
MEMORY CARD FOR A COMPUTER SYSTEM
Toshinobu Banjo, and Shigeo Onoda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 30, 1987, Ser. No. 79,505
Claims priority, application Japan, Mar. 20, 1987, 62-10447
Term of patent 14 years
U.S. Cl. D14—117

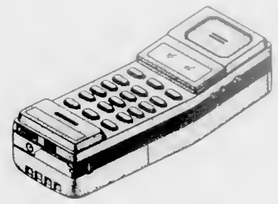


305,887
OPTICALLY STORED DATA CARD
Hiroshi Nishimura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 24, 1988, Ser. No. 172,353
Claims priority, application Japan, Sep. 25, 1987, 62-39329
Term of patent 14 years
U.S. Cl. D14—117

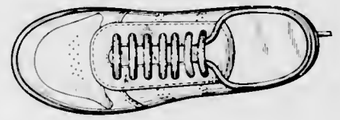


305,888
PORTABLE RADIOTELEPHONE UNIT
Ernest M. Bevilacqua, Wilton, Conn.; Nathan Ehrlich, Morris Township, Morris County, N.J.; Anthony D. Franks, New Canaan, Conn.; Henry G. Grilk, West Milford; Wen-Jeng Li, Somerville, both of N.J., and Arthur B. Nichols, IV, New Canaan, Conn., assignors to Goldstar Products Co., Ltd., Scottsdale, Ariz.
Filed Dec. 5, 1988, Ser. No. 280,254
Term of patent 14 years
U.S. Cl. D14—138

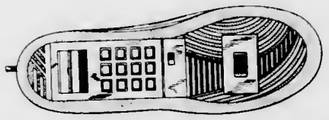




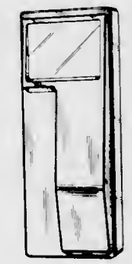
305,889
ATHLETIC SHOE TELEPHONE
John Plunkett, Mt. Kisco, and Martin Shampaine, New York, both of N.Y., assignors to The Time Inc., Magazine Company, New York, N.Y.
Filed May 22, 1989, Ser. No. 355,541
Term of patent 14 years
U.S. Cl. D14—143







305,890
HOUSING FOR AN UPRIGHT TELEPHONE BASE
Clifford D. Read, Stittsville, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Jnn. 8, 1988, Ser. No. 204,488
Term of patent 14 years
U.S. Cl. D14—146

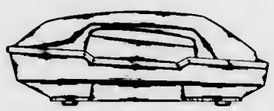




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305,891
TELEPHONE SET
David Atkins, Clifton Hill, Australia, assignor to Australian Telecommunications Corporation, Melbourne, Australia
Filed Oct. 17, 1988, Ser. No. 258,980
Claims priority, application Australia, Apr. 22, 1988, 1299/88
Term of patent 14 years
U.S. Cl. D14—151





305,892
SPEAKER CABINET
Jerry F. Freed, Fort Worth, Tex., assignor to Rhythm Band, Inc., Forth Worth, Tex.
Filed May 12, 1987, Ser. No. 48,809
Term of patent 14 years
U.S. Cl. D14—213

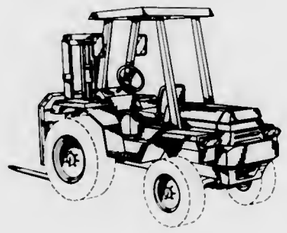


305,893
SPEAKER ENCLOSURE
Michael O. Maloney, 6301 Riggs Pl., Los Angeles, Calif. 90045
Filed Jan. 2, 1987, Ser. No. 941
Term of patent 14 years
U.S. Cl. D14—215





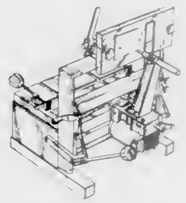
305,894
FORKLIFT TRACTOR
Hisato Kato; Shigeru Morita; Keiichi Sasaki, and Takashi Fukutaka, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed May 5, 1986, Ser. No. 859,898
The portion of the term of this patent subsequent to Sep. 6, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—23



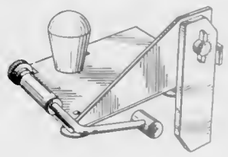
305,895
DEBARKING TOOL
Karl-Erik Jonsson, Sodra Skeppsbron 4, 802 33 Gavle, Sweden
Filed Mar. 19, 1986, Ser. No. 841,322
Term of patent 14 years
U.S. Cl. D15—29



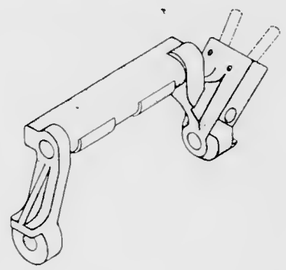
305,896
WOODWORKING ROUTER
Kouichi Miyamoto, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan
Filed Jun. 5, 1987, Ser. No. 59,674
Claims priority, application Japan, Dec. 8, 1986, 61-48805
Term of patent 14 years
U.S. Cl. D15—127



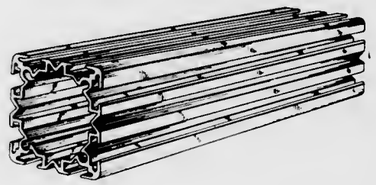
305,897
TABLE SAW STOCK FEEDER
Gordon E. Snoeyenbos, Decatur, Ill., assignor to Vega Enterprises, Inc., Decatur, Ill.
Filed Jun. 11, 1987, Ser. No. 62,041
Term of patent 14 years
U.S. Cl. D15—133



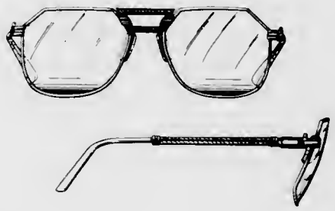
305,898
CUTTER CHAIN LINK AND TOOL HOLDER COMBINATION UNIT
John B. Whitaker, Jr., Wetumpka, and Rama N. Bail, Montgomery, both of Ala., assignors to Kershaw Manufacturing Company, Inc., Montgomery, Ala.
Filed Jun. 23, 1986, Ser. No. 877,686
Term of patent 14 years



305,899
FRAME MEMBER FOR AN INDUSTRIAL PLATFORM
Kenneth Fasth, Halmstad, Sweden, assignor to Aktiebolaget Parts Invent, Halmstad, Sweden
Filed Mar. 10, 1987, Ser. No. 24,336
Claims priority, application Sweden, Sep. 12, 1986, 86 2092
Term of patent 14 years
U.S. Cl. D15—141

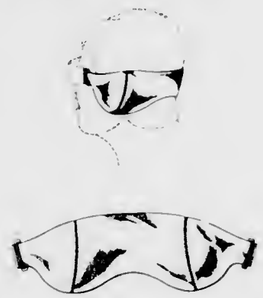


305,900
PAIR OF EYEGLASSES
Henri Samuel, Paris, France, assignor to FRED, Paris, France
Filed Feb. 11, 1987, Ser. No. 14,376
Term of patent 14 years
U.S. Cl. D16—102

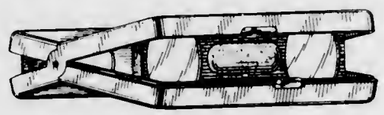


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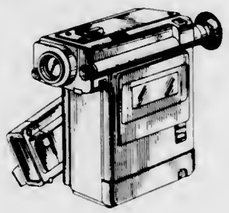
305,901
GOGGLE STRAP
Wayne Witzel, 978 E. 4555 South, Salt Lake City, Utah 84117
Continuation-in-part of Ser. No. 652,130, Sep. 20, 1984, Pat. No.
Term of patent 14 years
U.S. Cl. D16—123



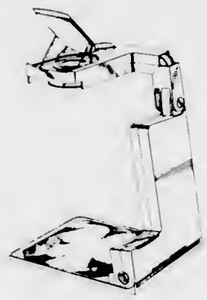
305,902
OPERA GLASSES
Shoji Wakayama, and Akio Akiyama, both of Tokyo, Japan, assignors to Young Optical Co., Ltd., Tokyo, Japan
Filed Apr. 28, 1988, Ser. No. 191,028
Term of patent 14 years
U.S. Cl. D16—133



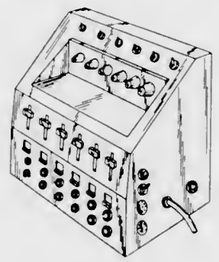
305,903
VIDEO CAMERA COMBINED WITH VIDEO TAPE RECORDER
Kaoru Sumita, Tokyo, Japan, assignor to Sony Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 22, 1986, Ser. No. 945,452
Claims priority, application Japan, Jun. 25, 1986, 61-24591
Term of patent 14 years
U.S. Cl. D16—202



305,904
OVERHEAD PROJECTOR
Nobuki Matsumoto, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Aug. 5, 1986, Ser. No. 893,264
Claims priority, application Japan, Feb. 12, 1986, 61-004,603
Term of patent 14 years
U.S. Cl. D16—232



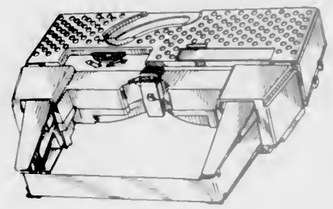
305,905
TUNER FOR A GUITAR PICKUP
John W. Hall, Rte. 1, Box 305, Dublin, Ga. 31021
Filed Jul. 24, 1986, Ser. No. 888,837
Term of patent 14 years
U.S. Cl. D17—99



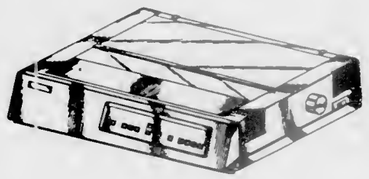
305,906
ELECTRONIC CALCULATOR WITH RADIO
Yubisui Takahisa; Hiroshi Sakaguchi, and Tadahiko Saimen, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Aug. 12, 1986, Ser. No. 895,747
Claims priority, application Japan, Feb. 13, 1986, 61-5034
Term of patent 14 years
U.S. Cl. D18—2



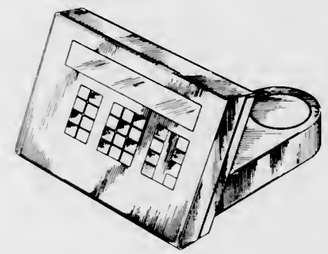
305,907
PRINTING RIBBON CARTRIDGE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Turin, Italy
Filed Apr. 10, 1987, Ser. No. 36,700
Claims priority, application Italy, Oct. 21, 1986, 53984-8/86
Term of patent 14 years
U.S. Cl. D18—12



305,908
PRINTER FOR COMPUTER
Mitsugu Fujiwara, Morioka, Japan, assignor to Alps Electric Co., Ltd, Tokyo, Japan
Filed Dec. 9, 1985, Ser. No. 807,163
Claims priority, application Japan, Jun. 12, 1985, 24628/85
Term of patent 14 years
U.S. Cl. D18—13



305,909
OPERATOR'S CONSOLE
Stephan Feger, Stuttgart; Walter Fischer, Böblingen; Norbert Köller, Gäufelden, and Manfred Krautwald, Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 9, 1987, Ser. No. 1,924
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1986, MR 6113
Term of patent 14 years
U.S. Cl. D18—41



305,910
BALL-POINT PEN
Suk J. Kim, Seoul, Rep. of Korea; Atsushi Deguchi, Tokyo, and Sadao Yoshinaga, Ichikawa, both of Japan, assignors to Yoshinaga Prince Company Limited, Tokyo, Japan
Filed Feb. 26, 1987, Ser. No. 19,493
Claims priority, application Japan, Sep. 19, 1986, 61-37075
Term of patent 14 years
U.S. Cl. D19—42

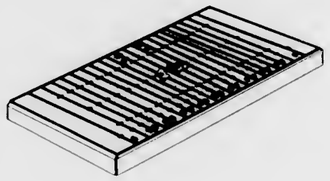


305,911
TAG HOLDER FOR RECEIVING INFORMATION PIECES
Albert A. Burlando, Flanders, N.J., assignor to Almetek Industries, Incorporated, Hackettstown, N.J.
Filed May 15, 1986, Ser. No. 863,677
Term of patent 14 years
U.S. Cl. D20—44



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305,912
FOOTBALL GAMEBOARD
Renald A. Poisson, 118 Alfred St., Biddeford, Me. 04005
Filed Feb. 9, 1987, Ser. No. 12,720
Term of patent 14 years
U.S. Cl. D21—29



305,913
SET OF GAME STRAWS
Peter Hegedus, 5500 Ackerfield Ave., #405, Long Beach, Calif. 90805
Filed Nov. 8, 1985, Ser. No. 804,360
Term of patent 14 years
U.S. Cl. D21—51



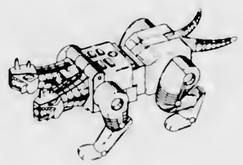
305,914
COMBINED SIMULATIVE TOY PEN BOX AND PENS
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,535
Term of patent 14 years
U.S. Cl. D21—59

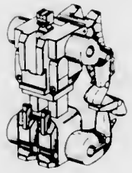


305,915
TOY ROCKING HORSE
Robb E. Hackworth, Florin Branch 8156 Florin Rd., Sacramento, Calif. 95828
Filed Sep. 3, 1987, Ser. No. 92,752
Term of patent 14 years
U.S. Cl. D21—75

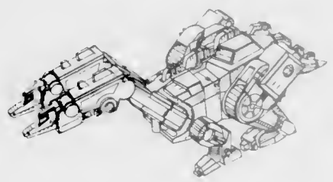


305,916
RECONFIGURABLE TOY MONSTER
Daishirou Shibukawa, Matsudo, Japan, assignor to Takara, Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,763
Claims priority, application Japan, Dec. 2, 1986, 61-47698
Term of patent 14 years
U.S. Cl. D21—149



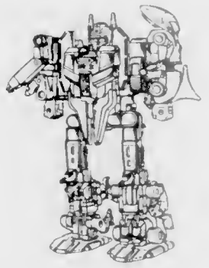


305,917
RECONFIGURABLE TOY MONSTER
Daishirou Shibukawa, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,710
Claims priority, application Japan, Dec. 2, 1986, 61-47699
Term of patent 14 years
U.S. Cl. D21—149



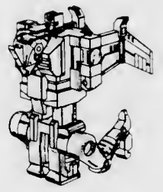


305,918
ROBOTIC-HUMANOID TOY ASSEMBLY
Daishirou Shibukawa, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,558
Claims priority, application Japan, Dec. 2, 1986, 61-47700
Term of patent 14 years
U.S. Cl. D21—150



305,919
RECONFIGURABLE TOY MONSTER
Daishirou Shibukawa, Matsudo, Japan, assignor to Takara Co. Ltd., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,707
Claims priority, application Japan, Dec. 2, 1986, 61-47695
Term of patent 14 years
U.S. Cl. D21—148





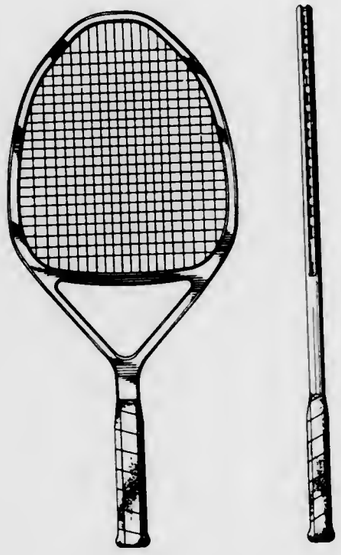
305,920
DOLL STAND
Jean Butler, 324 Whitney Ave., Trumbull, Conn. 06611
Filed May 11, 1987, Ser. No. 47,997
Term of patent 14 years
U.S. Cl. D21—189



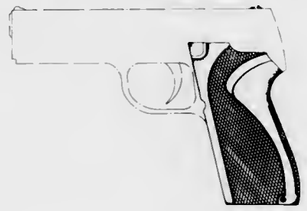
305,921
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Aug. 6, 1986, Ser. No. 893,816
Term of patent 14 years
U.S. Cl. D21—217



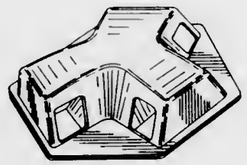
305,922
TENNIS RACQUET
Armando L. Mercado, P.O. Box 162256, Miami, Fla. 33116-2256
Filed Feb. 27, 1987, Ser. No. 19,606
Term of patent 14 years
U.S. Cl. D21—212



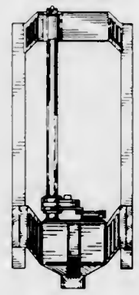
305,923
GRIP FOR HANDGUN
Robert J. Ferraro, Ludlow, Mass., and Gary A. Soiczak, Windsor, Conn., assignors to Smith & Wesson Corp., Springfield, Mass.
Filed Feb. 13, 1989, Ser. No. 309,230
Term of patent 14 years
U.S. Cl. D22—104



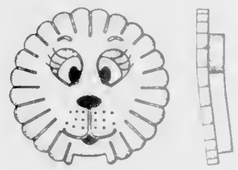
305,924
BAIT STATION
Scott W. Demarest, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Sep. 27, 1988, Ser. No. 250,033
Term of patent 14 years
U.S. Cl. D22—122



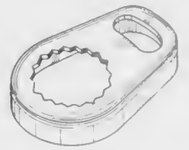
305,925
LAWN SPRINKLER
Malcolm Hastings, Coventry, and John Lang, Bicester, both of England, assignors to Hozelock-ASL Limited, Aylesbury, England
Filed Jun. 29, 1987, Ser. No. 67,474
Term of patent 14 years
U.S. Cl. D23—216



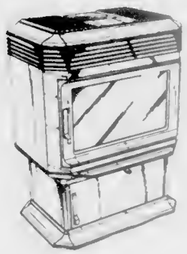
305,926
BATHROOM FIXTURE COVER
Michael J. Butler, 20566 Haynes St., Canoga Park, Calif. 91306
Filed Sep. 17, 1986, Ser. No. 908,530
Term of patent 14 years
U.S. Cl. D23—249



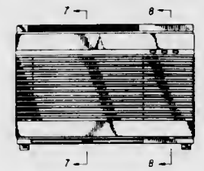
305,927
NUT LOCK PLATE
Ray D. Linderman, Streetsboro, and Peter C. Williams, Cleveland Heights, both of Ohio, assignors to Whitey Co., Highland Hts., Ohio
Filed Mar. 27, 1986, Ser. No. 847,007
Term of patent 14 years
U.S. Cl. D23—249



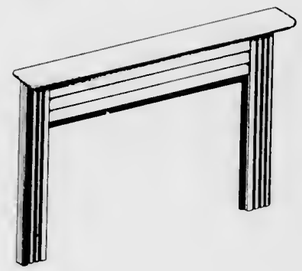
305,928
FIRE PLACE
Niels-Erik Heger, Jessheim, Norway, assignor to A/S Jotul, Oslo, Norway
Filed Aug. 30, 1988, Ser. No. 238,276
Claims priority, application Norway, Mar. 18, 1988, 69196
Term of patent 14 years
U.S. Cl. D23—350



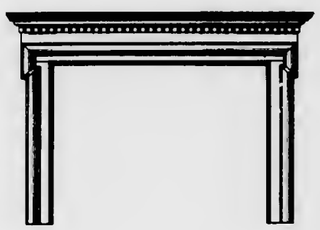
305,929
AIR CLEANER
Hideyuki Ikeda; Shinkichi Hida, and Toshinori Kitagawa, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 2, 1987, Ser. No. 56,682
Claims priority, application Japan, Dec. 2, 1986, 61-47637
Term of patent 14 years
U.S. Cl. D23—364



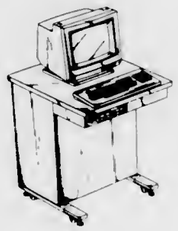
305,930
FIREPLACE MANTLE
George K. MacAleese, Huntington, Ind., assignor to Majco Building Specialties, L.P., New York, N.Y.
Filed Mar. 3, 1988, Ser. No. 163,459
Term of patent 14 years
U.S. Cl. D23—404



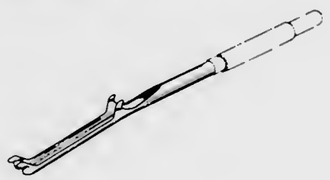
305,931
FIREPLACE MANTLE
George K. MacAleese, Huntington, Ind., assignor to Majco Building Specialties, L.P., New York, N.Y.
Filed Mar. 3, 1988, Ser. No. 163,456
Term of patent 14 years
U.S. Cl. D23—404



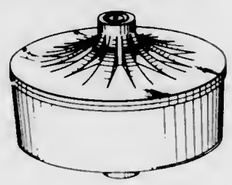
305,932
INDICATOR FOR A BLOOD ANALYZER
Yawara Nagai, Hachioji; Shigeru Yoshinari, Tokyo, and Masao Ushikubo, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan
Filed May 28, 1986, Ser. No. 868,335
Term of patent 14 years
U.S. Cl. D24—1.1



305,933
ORTHODONTIC ELASTIC APPLICATION TOOL
Richard K. Thompson, Jr., 12303 Windsor Dr., Carmel, Ind. 46032
Filed Jan. 11, 1988, Ser. No. 142,226
Term of patent 14 years
U.S. Cl. D24—10



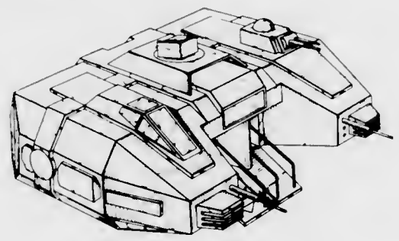
305,934
FILTER FOR TREATING BLOOD
Yoshihisa Sone, Tokyo, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed May 21, 1987, Ser. No. 53,414
Claims priority, application Japan, Nov. 27, 1986, 61-46597
Term of patent 14 years
U.S. Cl. D24—21



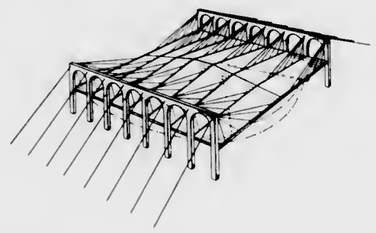
305,935
DENTAL HANDPIECE
Reinhard Straihammer, Heppenheim, and Werner Schuss, München, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Oct. 6, 1987, Ser. No. 106,432
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1987, MR10/17 183
Term of patent 14 years
U.S. Cl. D24—12



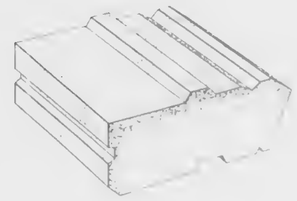
305,936
MOBILE THEATER
Lenny Sigalov, 16254 Mandalay Dr., Encino, Calif. 91436, and Timothy S. Mahoney, 5651 Eagle Court, North Vancouver, British Columbia, Canada
Filed Dec. 11, 1987, Ser. No. 132,047
Term of patent 14 years
U.S. Cl. D25—11



305,937
OPPOSED TOWER CABLE STAY SUPPORTED ROOF STRUCTURE
Adam T. Schildge, Jr., 899 Green St., San Francisco, Calif. 94133
Filed May 8, 1987, Ser. No. 47,064
Term of patent 14 years
U.S. Cl. D25—56



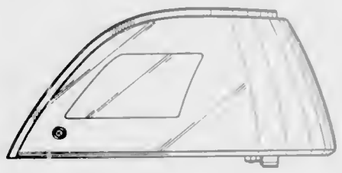
305,938
MODULAR BLOCK
Angelo Risi, and Antonio Risi, both of Richmond Hill, Canada, assignors to Rothbury Investments Limited, Gormley, Canada
Filed Jun. 16, 1989, Ser. No. 367,111
Claims priority, application Canada, Dec. 16, 1988, 16-12-88-7
Term of patent 14 years
U.S. Cl. D25--113



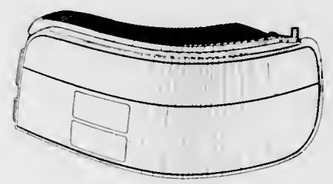
305,939
CLEARANCE LAMP FOR AN AUTOMOBILE
Hiroshi Iwagami, Yokohama, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 48,918
Claims priority, application Japan, Aug. 19, 1986, 61-32176
Term of patent 14 years
U.S. Cl. D26—28



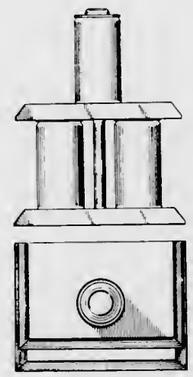
305,940
CLEARANCE LAMP FOR AN AUTOMOBILE
Kazumi Fukagawa, Tokyo, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 49,090
Term of patent 14 years
U.S. Cl. D26—28



305,941
REAR COMBINATION LAMP FOR AN AUTOMOBILE
Hisao Hara, Owariasahi, and Akira Nakanishi, Kariya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 48,916
Term of patent 14 years
U.S. Cl. D26—35

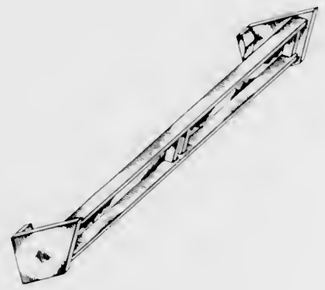


305,942
LAMP BASE
Jimmy L. Reasons, Rte. 2, Box 72, Humboldt, Tenn. 38343
Filed Apr. 24, 1987, Ser. No. 42,452
Term of patent 14 years
U.S. Cl. D26—93

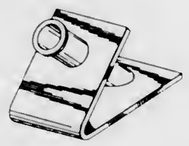


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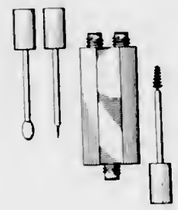
305,943
DIFFUSER FOR A WALL MOUNTED LIGHT FIXTURE
Andrew Ossip-Klein, 145 Georgian Ct., Rochester, N.Y. 14610
Filed Feb. 6, 1987, Ser. No. 12,116
Term of patent 14 years
U.S. Cl. D26—118

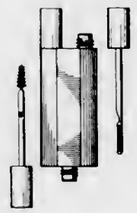


305,944
CURLING IRON HOLDER
Lela Mellott, 4560 Mellinger Rd., Canfield, Ohio 44406
Filed Feb. 12, 1987, Ser. No. 14,038
Term of patent 14 years
U.S. Cl. D28—38



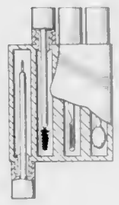
305,945
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 765,394, Aug. 14, 1985, abandoned. This application Apr. 14, 1989, Ser. No. 337,532
Term of patent 14 years
U.S. Cl. D28—77

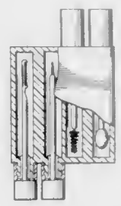




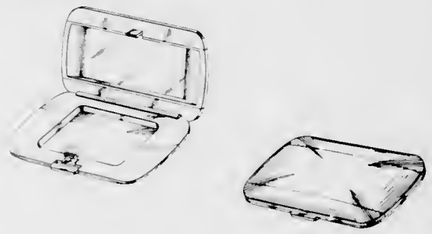


305,946
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 790,517, Oct. 23, 1985. This application Mar. 10, 1989, Ser. No. 321,553
The portion of the term of this patent subsequent to Mar. 14, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—77

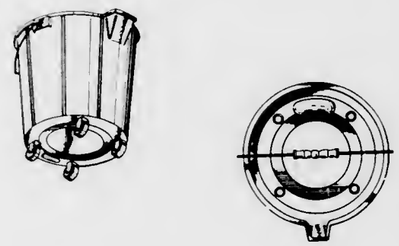




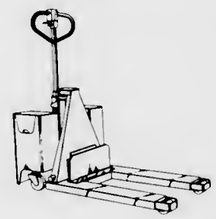
305,947
COSMETIC CASE
Alain Chevassus, Sceaux, France, assignor to LIR, Chevilly Larue, France
Filed Sep. 3, 1986, Ser. No. 903,438
Claims priority, application World Int. Prop. O., Mar. 3, 1986, DM/006587
Term of patent 14 years
U.S. Cl. D28—78



305,948
BUCKET
David L. Rentz, Wynnewood, Pa., assignor to York Plastics Corporation, Philadelphia, Pa.
Filed May 4, 1988, Ser. No. 190,222
Term of patent 14 years
U.S. Cl. D32—53



305,949
LIFT FOR MOVING A CONTAINER WITH CASTORS
Hiroyuki Kawada, Hekinan, Japan, assignor to Sugiyasu Industries Co., Ltd., Aichi, Japan
Filed May 6, 1988, Ser. No. 190,940
Claims priority, application Japan, Mar. 20, 1988, 63-11,161
Term of patent 14 years
U.S. Cl. D34—31



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LIST OF PATENTEES

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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Berhmer, Geoffrey E.; and Peterson, Joe W., to Advanced Micro Devices, Inc. Voltage source amplifier for use in a pseudoternary code transmitter. 4,899,114, Cl. 330-253.000.
Berry, Maggie L.; and Berry, Robert F., Jr., to United States of America, National Aeronautics and Space Administration. Method of radiographic inspection of wooden members 4,899,356, Cl. 378-58.000.
Berry, Robert F., Jr.: *See*—
Berry, Maggie L.; and Berry, Robert F., Jr., 4,899,356, Cl. 378-58.000.
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., to Pitney Bowes Inc. Method and apparatus for perforating indicia on used thermal transfer ribbon within a cassette. 4,899,172, Cl. 346-76.0PH.
Bertolini, Carlo, to Rockwell-CIM. Manual control device for opening a vehicle door. 4,898,413, Cl. 292-336.300.
Beste, Marion D., to Johnson Products Co., Inc. Initiated hair straightening composition and system. 4,898,726, Cl. 424-72.000.
Betchan, Jerry L. Portable deicer sprayer. 4,898,330, Cl. 239-135.000.
Better Communications, Inc.: *See*—
Wahi, Ashok L.; and Jakatdar, Priya, 4,899,372, Cl. 379-184.000.
Betz Laboratories, Inc.: *See*—
Chen, Fu; and Carey, William S., 4,898,684, Cl. 252-181.000.
Betz, Walter: *See*—
Fitzner, Klaus; Betz, Walter; Plitt, Uwe; and Schmitt, Wolfgang, 4,898,087, Cl. 98-40.100.
Beunk, Gerrit: *See*—
Van Wechem, Guus; Beunk, Gerrit; Van Den Elst, Frits; and Van Der Ploeg, Arie, 4,898,142, Cl. 123-557.000.
Beverly, James A.: *See*—
Schultz, Gary R.; and Beverly, James A., 4,898,216, Cl. 141-4.000.
Beyerle, Rudi: *See*—
Schonafinger, Karl; Beyerle, Rudi; and Schindler, Ursula, 4,898,866, Cl. 514-252.000.
Bhatia, Sushil K.: *See*—
Pickering, J. H.; Bhatia, Sushil K.; and Chevrette, Roger, 4,898,405, Cl. 281-29.000.
Bianchi, Maurice P., to TRW Inc. Method for cleaning spacecraft critical surfaces. 4,898,347, Cl. 244-158.00R.
Bigo, Louis; and Allart, Bernard, to Societe Anonyme: Poclain Hydraulics, B.P. Multiple cylinder-capacity pressurized fluid (motor or pump) mechanism. 4,898,076, Cl. 91-491.000.
Birzer, Josef, to Siemens Aktiengesellschaft. Mounting for a control device. 4,899,252, Cl. 361-350.000.
Bitter, Ingrid; Scholz, Wolfhard; and Schneider, Werner, to Henkel Kommanditgesellschaft auf Aktien. Bubble-bath concentrate gel. 4,898,690, Cl. 252-554.000.
Bittermann, Hans: *See*—
Baur, Hans; and Bittermann, Hans, 4,899,336, Cl. 370-63.000.
Bjorne Enterprises, Inc.: *See*—
Moe, Rolf; Correia, David J.; and Downs, Michael, 4,898,639, Cl. 156-345.000.
Black & Decker Inc.: *See*—
Wheeler, Dale K., 4,897,919, Cl. 89-845.000.
Black, James. Tile mounting system. 4,898,122, Cl. 122-6.00A.
Black, Robert A., Jr.; and Kompelien, Arlon D., to Honeywell Inc. Power control circuit for inductive loads. 4,899,088, Cl. 315-291.000.
Blackburn, Raymond L., to Coils, Inc. Method for making a tranformer core assembly. 4,897,916, Cl. 29-609.000.
Blake, Terence G. W.; and Lu, Hsindao, to Texas Instruments Incorporated. High performance silicon-on-insulator transistor with body node to source node connection. 4,899,202, Cl. 357-23.700.
Blakley, James R., to American Telephone and Telegraph Company AT&T Bell Laboratories. Call announcement arrangement. 4,899,358, Cl. 379-67.000.
Blanchard, Christian: *See*—
Belbel, Elie; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,899,119, Cl. 335-14.000.
Blankenburg, Karl. Method and apparatus for assembling parts. 4,898,493, Cl. 403-407.100.
Blatt, John A. Quick disconnect boom mount. 4,898,287, Cl. 212-177.000.
Block, Wayne F.; Wright, Wade S.; and Klapheke, Chris G., to Armco Advanced Materials Corporation. Hot working method for producing grain oriented silicon steel with improved glass film formation. 4,898,628, Cl. 148-111.000.
Blondel, Philippe: *See*—
Maj, Philippe; Blondel, Philippe; and Cuzin, Daniel, 4,898,896, Cl. 528-323.000.
Blount, Inc.: *See*—
Hille, Arvin A., 4,898,057, Cl. 83-831.000.
Blusseau, Eric; and Brun, Norbert, to Cibie Projecteurs. Automobile headlamp with small height and high flux recovery. 4,899,261, Cl. 362-61.000.
Boebel, Manfred: *See*—
Messroghli, Hossein; and Boebel, Manfred, 4,898,157, Cl. 606-147.000.
Boehringer Mannheim GmbH: *See*—
Klose, Sigmar; and Stahler, Fritz, 4,898,832, Cl. 436-45.000.
Boeing Company, The: *See*—
Christensen, Stephen; and Rakel, Jay O., 4,898,754, Cl. 427-369.000.
Falk, Robert A.; and Huggins, Raymond W., 4,899,042, Cl. 250-227.000.
Hove, Robert G., 4,899,365, Cl. 375-13.000.
Lewis, George E.; Thomasson, Robert E.; and Nelson, David W., 4,899,284, Cl. 364-435.000.
Maxville, David C.; Meade, Kenneth R., Sr.; and Beal, David G., 4,897,928, Cl. 33-534.000.
Boes, Chris E.: *See*—
Herbst, David H.; and Boes, Chris E., 4,898,299, Cl. 220-90.400.
Boker, Reinhard: *See*—
Raasch, Hans; and Boker, Reinhard, 4,897,993, Cl. 57-302.000.
Bommier, Christophe; Gimenez, Philippe; Kucza, Jean-Claude; and Rabiet, Jacques, to Pechiney. Process for identifying Al alloys by electrochemical means. 4,898,646, Cl. 204-1.00T.
Bond, Eric D., to Statpower Technologies Corp. DC-to-DC power supply including an energy transferring snubber circuit. 4,899,270, Cl. 363-56.000.
Bonke, Carl, to Western Digital Corporation. Transient free clock switch logic. 4,899,351, Cl. 375-108.000.
Books, Jeffrey T.: *See*—
Klobucar, W. Dirk; Kolich, Charles H.; and Books, Jeffrey T., 4,898,929, Cl. 528-399.000.
Boothroyd, Edwin J., to Westinghouse Electric Corp. Alternating current electromagnet. 4,899,121, Cl. 335-245.000.
Borden, Inc.: *See*—
Gallant, William E., 4,897,896, Cl. 17-74.000.

Subramaniam, Anandaraman; Ozogar, Robert M.; and Bergsbaken, Carlton K., 4,898,739, Cl. 426-35.000.

Bordignon, Abramo, to A.T.B. S.p.A. Flat spring structure for magnetic tape cassettes, in particular video cassettes. 4,899,243, Cl. 360-132.000.

Borges, John: *See*—
Livingston, Glen L.; Borges, John; and Mina, George L., 4,898,994, Cl. 568-720.000.

Borgwarth, Dennis, to FMC Corporation. Inflatable ammunition gripping device. 4,898,071, Cl. 89-45.000.

Borsanyi, Alexander S.; and Redmond, Russell J., to Baxter Healthcare Corporation. Implantable patient-activated fluid delivery device and outlet valve therefor. 4,898,583, Cl. 604-153.000.

Borsanyi, Alexander S.; Redmond, Russell J.; Vidal, Claude A.; and Spaeth, Edmund E., to Baxter Healthcare Corporation. Implantable patient-activated fluid delivery device. 4,898,584, Cl. 604-153.000.

Borsanyi, Alexander S.; and Jones, Michael L., to Baxter Healthcare Corporation. Implantable patient-activated fluid delivery device with bolus injection port. 4,898,585, Cl. 604-153.000.

Borzo, Marie; and Stuetz, Dagobert E., to Hoechst Celanese Corporation. Organic nonlinear optical media. 4,898,691, Cl. 252-589.000.

Boston Scientific Corporation: *See*—
Norman, Daniel A.; Newton, Ronald R.; Nicholas, Glenn V.; Bellofatto, Steven; and Onody, Stephen K., 4,898,169, Cl. 606-42.000.

Bosworth, William R., Jr.: *See*—
Mancewicz, James M.; and Bosworth, William R., Jr., 4,898,046, Cl. 74-502.900.

Bottoms, Stanley; and Korzik, James L., to Paradyne Corp. Hybrid interface adapter. 4,898,547, Cl. 439-652.000.

Botzman, Thomas J.; and Landers, Samuel P., to Goodyear Tire & Rubber Company, The. Stiff rubber composition and articles having components thereof. 4,898,223, Cl. 152-547.000.

Boucher, Stephen G., to Airmar Technology Corporation. Marine instrument. 4,898,029, Cl. 73-187.000.

Bourzat, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, to Rhone-Poulenc Sante. Pyrrole derivatives and pharmaceutical compositions which contain them as hypnotics and anticonvulsants. 4,898,871, Cl. 514-300.000.

Bouse, James R.: *See*—
Conner, John P.; and Bouse, James R., 4,898,365, Cl. 256-65.000.

Bowlay-Williams, Iris E. Line identifying bookmark. 4,898,115, Cl. 116-236.000.

Bowman, Michael A.: *See*—
Swinderman, R. Todd; Bowman, Michael A.; and Goldbeck, Larry J., 4,898,272, Cl. 198-841.000.

Boyer, Robert. Binocular stabilizer device. 4,898,311, Cl. 224-257.000.

Braddick, Britt O., to Texas Iron Works, Inc. Retrievable well bore tubular member packer arrangement and method. 4,898,245, Cl. 166-387.000.

Brandes, Wilhelm: *See*—
Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, 4,898,875, Cl. 514-383.000.

Brandstadter, Jack M. Active hydropneumatic suspension system. 4,898,257, Cl. 180-9.100.

Brase, Ingrid E., to National Starch and Chemical Corporation. Process for inhibiting scale formation and modifying the crystal structure of barium sulfate and other inorganic salts. 4,898,677, Cl. 210-701.000.

Brauch, Gundo: *See*—
Vietmeier, Juergen; Pfoehler, Peter; Brauch, Gundo; Druschke, Wolfgang; and Zosel, Albrecht, 4,898,909, Cl. 524-820.000.

Braun, Steve W., to Honeywell Inc. Direction sensing apparatus for data transmission cable connections. 4,898,565, Cl. 455-612.000.

Brawn, R. James, deceased: *See*—
Groshong, Leroy E.; Groshong, Judson C.; and Brawn, R. James, deceased, 4,898,579, Cl. 604-67.000.

Breckenfeld, Paul W.; and Broughton, George L., to Outboard Marine Corporation. Crankcase seal arrangement for two cycle engine. 4,898,134, Cl. 123-195.00R.

Brehm, Lothar, to Metallgesellschaft Aktiengesellschaft. Piston for a high-enthalpy wind tunnel. 4,898,028, Cl. 73-147.000.

Bremenour, Edwin L.: *See*—
Tratar, Michael F.; Bremenour, Edwin L.; and Terdan, Dale R., 4,898,538, Cl. 439-76.000.

Bresatac Limited: *See*—
Symons, Robert H., 4,898,951, Cl. 548-303.000.

Bricheno, Terry: *See*—
Epworth, Richard E.; Wright, Stephen; and Bricheno, Terry, 4,898,443, Cl. 350-96.150.

Bridgestone Corporation: *See*—
Fukahori, Yoshihide; Kojima, Hiromu; Ogino, Akihiko; Suzuki, Shigenobu; and Yoshizawa, Toshikazu, 4,899,323, Cl. 367-176.000.

Brierley, Corale L.: *See*—
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,898,827, Cl. 435-244.000.
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., to Advanced Mineral Technologies, Inc. Metal recovery. 4,898,827, Cl. 435-244.000.

Brin, Constantin, to Dr. Ing. h.c.F. Porsche AG. Latching arrangement for a top. 4,898,410, Cl. 292-241.000.

Brink's Incorporated: *See*—
Gunn, William L.; Heath, William D., Jr.; and Mantovani, John C., 4,898,564, Cl. 453-3.000.

Bristol-Myers Company. *See*—
Han, William T.; and Wright, John J., 4,898,950, Cl. 548-253.000.
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,898,940, Cl. 540-460.000.
Wright, John J.; Sit, Sing-Yuen; Balasubramanian, Neelakantan; and Brown, Peter J., 4,898,949, Cl. 548-253.000.

British Petroleum Company PLC, The: *See*—
Dave , Dilip; and Hall, Antony H. P., 4,899,006, Cl. 585-415.000.

Broadhurst, Thomas E., to Exxon Research and Engineering Company. Multi-point cold solvent injection in scraped surface dewaxing chillers. 4,898,659, Cl. 208-33.000.

Brochand, Max, to Pomagalski SA. Aerial transport installation with two suspension-traction cables and pulleys displaced vertically. 4,898,100, Cl. 104-192.000.

Brockwell, Jonathan L.: *See*—
Manyik, Robert M.; Brockwell, Jonathan L.; and Kendall, John E., 4,899,003, Cl. 585-313.000.

Broersma, Lester V.; and Wurster, Fritz W., to Bell Bicycles, Inc. Helmet strap clip, and assembly. 4,897,888, Cl. 2-421.000.

Brokaw, Adrian P.: *See*—
Barrow, Jeffrey G.; and Brokaw, Adrian P., 4,899,152, Cl. 341-154.000.

Broken Hill Proprietary Company Limited, The: *See*—
Van Hoek, Hendrik C.; and Williams, Daryl N., 4,899,061, Cl. 250-560.000.

Bromine Compounds Limited: *See*—
Becker, Abram; Kornberg, Nurit; and Croitoru, Berta, 4,898,993, Cl. 568-658.000.
Peled, Michael, 4,898,900, Cl. 524-220.000.

Bronton Limited: *See*—
Magninat, Michel; and Charden, Eric, 4,898,460, Cl. 351-114.000.

Brooker, Dennis B., to Ventura Forge, Inc. Folding knife. 4,897,922, Cl. 30-166.000.

Brookmire, Michael A.: *See*—
Robbins, Daniel H.; Wirtz, John S.; Lein, Juergen; and Brookmire, Michael A., 4,899,214, Cl. 358-75.000.

Brooktree Corporation: *See*—
Colles, Joseph H., 4,899,151, Cl. 341-145.000.
Colles, Joseph H., 4,899,154, Cl. 341-159.000.
Katzenstein, Henry S., 4,899,103, Cl. 324-99.00D.
Lewyn, Lanny L., 4,899,153, Cl. 341-156.000.

Brose, Peter W., to Torrington Product Ventures, Inc. Animal training and restraining system. 4,898,120, Cl. 119-29.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,899,193, Cl. 355-55.000.
Yokoi, Takeshi; Nakamura, Shigeo; and Yamanaka, Hiroshi, 4,898,488, Cl. 400-642.000.

Broughton, George L.: *See*—
Breckenfeld, Paul W.; and Broughton, George L., 4,898,134, Cl. 123-195.00R.

Brown, Arthur K., Jr., to Allied-Signal, Inc. Adaptive braking system having hydraulic booster and pump-back system. 4,898,432, Cl. 303-114.000.

Brown, Bernard T.; Donnelly, Donald E.; and Toth, Bartholomew L., to Emerson Electric Co. Thermostat with integral means for detecting out-of-phase connection of a two-transformer power source. 4,898,229, Cl. 165-11.100.

Brown, Frederick J.; and Yee, Ying K., to ICI Americas Inc. Heterocyclic carboxamides. 4,898,863, Cl. 514-235.200.

Brown, Josephine S.; and Sipinen, Alan J., to Minnesota Mining and Manufacturing Company. Easy tear sterilization indicator tape. 4,898,762, Cl. 428-152.000.

Brown, Peter J.: *See*—
Wright, John J.; Sit, Sing-Yuen; Balasubramanian, Neelakantan; and Brown, Peter J., 4,898,949, Cl. 548-253.000.

Brown, Richard R.: *See*—
Klas, Kenneth H.; and Brown, Richard R., 4,897,942, Cl. 37-244.000.

Brown & Williamson Tobacco Corporation: *See*—
Johnson, Robert R.; and Riehl, Tilford F., 4,898,191, Cl. 131-359.000.

Brownlee, Merrel, to Alliance Group Inc. Surgical cast venting device. 4,898,160, Cl. 128-91.00R.

Bruce, Charles F. Lobster trap. 4,897,953, Cl. 43-102.000.

Bruckert, Serge: *See*—
Lechelle, Alain; Guidat, Thierry; and Bruckert, Serge, 4,897,950, Cl. 42-62.000.

Brueggemann, Harry P., to Xerox Corporation. Wobble correction by two reflections on a facet without bow. 4,898,437, Cl. 350-6.700.

Brull, Robert A.; Del Signore, James R., II; and Walker, Alan H., to NCR Corporation. Print head carriage for matrix printer. 4,898,487, Cl. 400-354.000.

Brun, Norbert: *See*—
Blusseau, Eric; and Brun, Norbert, 4,899,261, Cl. 362-61.000.

Brunn, Oswald. Folding furniture. 4,898,421, Cl. 297-28.000.

Brunner, Heinz; and Sauter, Karl-Jurgen, to Sipra Patententwicklungs- Und Beteiligungsgesellschaft. Thread storing and supplying device for textile machines, particularly knitting machines. 4,898,337, Cl. 242-151.000.

Brunswick Corporation: *See*—
Bankstahl, Herbert A., 4,898,553, Cl. 440-76.000.
Phillips, George E.; and Griffiths, John M., 4,898,127, Cl. 123-73.00A.
Winberg, Arvid E.; and Gavriles, James N., 4,898,261, Cl. 184-6.220.

Brush Switchgear Limited: *See*—
Stewart, John S., 4,899,247, Cl. 361-72.000.

Brydges, Ronald. Window-box and support. 4,897,958, Cl. 47-68.000.

Bubien, James K. Golf club grip cleaner. 4,897,892, Cl. 15-21.00C.

Bubik, Alfred: *See*—
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.

Buchecker, Richard; Germann, Alfred; Kelly, Stephen; and Schadt, Martin, to Hoffmann-La Roche Inc. Pyridine liquid crystalline compounds. 4,898,455, Cl. 350-350.00R.

Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Mercapto-substituted hydroxyethyl-(triazol-l-yl) derivatives. 4,898,875, Cl. 514-383.000.

Buchko, Raymond G.; and Halgren, John A., to Curwood, Inc. Continuous motion package forming machine. 4,897,985, Cl. 53-559.000.

Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., to Hoechst Celanese Corporation. Optical light switch or modulator device with a liquid crystalline composite optical component. 4,898,454, Cl. 350-350.00R.

Buckley, Alan: *See*—
Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., 4,898,755, Cl. 427-389.700.

Budd, Russell A.: *See*—
Bates, Keith A.; Budd, Russell A.; Habegger, Millard A.; and Rhoades, Mark L., 4,899,327, Cl. 369-45.000

Budde, Rolf: *See*—
Rossig, Manfred; and Budde, Rolf, 4,898,511, Cl. 414-792.600.

Buderus-Sell GmbH: *See*—
Schulz, Thilo; Schmitz, Karl-Heinz; and Schneider, Thomas, 4,898,426, Cl. 297-452.000.

Buese, George J.; and Yoon, Hee K., to Johnson & Johnson Orthopaedics, Inc. Ravel-free orthopaedic casting tapes. 4,898,159, Cl. 128-90.000.

Buffington, Larry J. Amusement apparatus. 4,898,383, Cl. 273-1.00G.

Buhler, Steven A.: *See*—
Elhatem, Abdul M.; and Buhler, Steven A., 4,899,180, Cl. 346-140.00R.

Buikema, Wolter, to Hollandse Signaalapparaten B.V. Switching helix power supply for a TWT. 4,899,113, Cl. 328-258.000.

Burgdorf, Marten; Kuhne, Wilhelm; and Maus, Udo-Hermann, to Mauser-Werker GmbH. Bunged vessel. 4,898,296, Cl. 220-72.000.

Burk, Charles E.: *See*—
VerWeyst, Gordon E.; Burk, Charles E.; and Phengo, Douglas E., 4,898,292, Cl. 215-237.000.

Burlington Industries, Inc.: *See*—
Riggins, Phillip H.; and Hauser, Peter J., 4,898,596, Cl. 8-490.000.

Burt, Donald W.; and Hans, Gerald A., to Hughes Aircraft Company. Powder metal mirror. 4,898,711, Cl. 419-27.000.

Burton, Charles D. Hypochlorite distinfectant stabilized with calcium chelant. 4,898,681, Cl. 252-102.000.

Burton, Philip J., to Charles Winn (Valves) Limited. Butterfly and ball valves. 4,898,363, Cl. 251-173.000.

Butzen, James K., to Snap-on Tools Corporation. Fluid driven rotary motor. 4,898,524, Cl. 418-136.000.

Buxton, Clifford A., to Siemens Energy & Automation, Inc. Molded case circuit breaker housing reinforcement. 4,899,253, Cl. 361-376.000.

Byerly, David J.; Frates, Paul S.; and Scholl, Charles H., to Nordson Corporation. Apparatus for melting and dispensing thermoplastic material. 4,898,302, Cl. 222-49.000.

Bystrom, Olof L.; and Johansson, Sven-Erik V., to Sandvik AB. Tool for chip removing machining. 4,898,054, Cl. 82-160.000.

C-l-L Inc.: *See*—
Marz, Horst F., 4,898,066, Cl. 86-20.100.

Calderwood, Gary G.: *See*—
Rozak, Alexander T.; and Calderwood, Gary G., 4,898,091, Cl. 99-336.000.

California Institute of Technology: *See*—
Collins, Earl R., Jr., 4,898,631, Cl. 156-89.000.

Callaghan, Stephen P.: *See*—
Sewell, Wesley C.; and Callaghan, Stephen P., 4,898,469, Cl. 356-350.000.

Callahan, Thomas, to Thinking Machines Corporation. Flat cable support comb. 4,898,544, Cl. 439-498.000.

Camden, James B.: *See*—
Cox, William A.; Camden, James B.; and Roseberry, George L., 4,898,477, Cl. 383-33.000.

Campagnolo S.p.A.: *See*—
Romano, Antonio, 4,898,064, Cl. 74-594.600.

Campbell, Simon F.; Morris, David S.; and Roberts, David A., to Pfizer Inc. Imidazo[4,5-b]pyridyl quinolone cardiac stimulants. 4,898,872, Cl. 514-303.000.

Canada, National Research Concil of: *See*—
Tweedle, Thomas A.; Kutowy, Oleh; and Tremblay, Andre , 4,898,693, Cl. 264-41.000.

Canamer International, Inc.: *See*—
Double, Paul B.; Orr, Frederick W.; and Dotterwick, Robert E., 4,897,970, Cl. 52-4.000.

Canon, Inc.: *See*—
Hirata, Shinji; and Horinishi, Katsumi, 4,899,086, Cl. 315-169.300.

Canon Kabushiki Kaisha: *See*—
Edakubo, Hiroo; Itani, Takashi; Narasawa, Takashi; Ushiro, Tatauzo; Watanabe, Hiroshi; and Hasegawa, Masahide, 4,899,236, Cl. 360-95.000.

Harada, Toshiaki; Yamamoto, Tadashi; and Takenouchi, Masanori, 4,899,175, Cl. 346-108.000.
Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, 4,899,231, Cl. 360-33.100.
Miyakawa, Hideaki; and Kameyama, Makoto, 4,899,241, Cl. 360-125.000.
Murakami, Tsutomu; and Kanai, Masahiro, 4,898,118, Cl. 118-723.000.
Ogura, Tokihiko; Mizoguchi, Yoshiyuki; Ikeda, Keiichi; and Taguchi, Tomishige, 4,899,171, Cl. 346-76.0PH.
Okada, Shinjiro; Taniguchi, Osamu; Tsuboyama, Akira; and Enari, Masahiko, 4,898,456, Cl. 350-350.00S.
Osato, Yoichi; Saito, Ichiro; and Takasu, Yoshio, 4,899,168, Cl. 346-1.100.
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.
Tsukada, Masaharu; Aoi, Shigeru; and Ashinuma, Takaaki, 4,899,291, Cl. 364-518.000.
Yamada, Masanori, 4,899,227, Cl. 358-452.000.

Capet, Marc: *See*—
Bourzat, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,898,871, Cl. 514-300.000.

Carabbio, Robert M.: *See*—
Herbermann, Alfred F.; and Carabbio, Robert M., 4,898,490, Cl. 403-56.000.

Cardosi, Marco: *See*—
Turner, Anthony P. F.; Swain, Ann; Ramsay, Graham; Cardosi, Marco; and Schneider, Bernard H., 4,898,816, Cl. 435-34.000.

Cardoso, Joaquim P., to Cipan-Companhia Industrial Produtora De Antibioticos, S. A. Biocatalytic reactors for gel-like and other types of immobilized biocatalysts. 4,898,718, Cl. 422-211.000.

Carey, William S.: *See*—
Chen, Fu; and Carey, William S., 4,898,684, Cl. 252-181.000.

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Nakamura, Shingo; and Nagahara, Hiroshi, 4,898,935, Cl. 536-119.000.

Daido Tokushuko Kabushiki Kaisha: *See—*
Ito, Shigeo; Imaeda, Toshihiko; Takagi, Ryuhei; and Sato, Ryutaro, 4,898,317, Cl. 228-41.000.

Daiichi Seiyaku Co., Ltd.: *See—*
Isoda, Sumiro; Aibara, Shunzo; Miwa, Tamotsu; Fujiwara, Hiroyuki; Yokohama, Shuichi; and Matsumoto, Hiroo, 4,898,943, Cl. 544-251.000.

Daikin Industries Ltd.: *See—*
Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Simasaki, Shuhei, 4,898,779, Cl. 428-402.000.

Daimler Benz AG: *See—*
Kolle, Erwin; and Klink, Josef, 4,898,423, Cl. 297-362.000.
Lutz, Wolfgang; and Happel, Robert, 4,898,136, Cl. 123-269.000.
Roehringer, Arno, 4,898,074, Cl. 91-371.000.

Dainippon Ink & Chemicals, Inc.: *See—*
Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, 4,898,617, Cl. 106-281.100.
Sato, Toshio; Matsumoto, Hitoshi; and Kakegawa, Hisao, 4,898,890, Cl. 514-685.000.

Daiwa Seiko, Inc.: *See—*
Takeuchi, Shinji, 4,898,339, Cl. 242-231.000.

Daly, Mark D.; Maerzke, James T.; Gengler, Jeffrey R.; and Trick, Robert E., to Medical Engineering Corporation. Penile implant with improved pressure relief valve. 4,898,158, Cl. 128-79.000.

D'Ambra, Thomas E.: *See—*
Bailey, Denis M.; Lesher, George Y.; and D'Ambra, Thomas E., 4,898,880, Cl. 514-406.000.

Damitz, Joerg P., to Glyco Antriebstechnik GmbH. Process for testing driving axles and device for performing the process. 4,898,026, Cl. 73-118.100.

Dana Corporation: *See—*
Jones, Ronald L., 4,898,083, Cl. 92-255.000.

Dana, Michel: *See—*
Jutand, Francis; Demassieux, Nicolas; and Dana, Michel, 4,899,300, Cl. 364-725.000.

Daniel, Jean-Pierre L. M.; Dupuis, Phillipe; and Alanic, Jean-Luc, to Le Centre Regional D'Innovation et de Transfert de Technologie de Bretagne Loi Le Centre National de la Recherche Scientifique, Etablissement Public National a Caractere Scientifique et Technologiqu. Microwave plate antenna in particular for Doppler radar. 4,899,163, Cl. 343-700.0MS.

Daniel, Thomas M. Latching switch. 4,899,021, Cl. 200-43.130.

Danieli & C. Officine Meccaniche SpA: *See—*
Benedetti, Giampietro; and Fasano, Fulvio, 4,898,227, Cl. 164-417.000.

Date, Haruyuki: *See—*
Osada, Koji; Date, Haruyuki; Saihara, Yasuhiro; Yamauchi, Toshiyuki; and Koike, Shiro, 4,898,727, Cl. 424-76.100.

Datta, Ravindra; and Eyman, Darrell P., to University of Iowa Research Foundation. Catalyst dispersed in supported molten salt. 4,898,845, Cl. 502-3.000.

Dave , Dilip; and Hall, Antony H. P., to British Petroleum Company PLC, The. Production of aromatics from ethane and/or ethylene. 4,899,006, Cl. 585-415.000.

Davenport, Esther L.: *See—*
Bauer, Eric J.; Davenport, Esther L.; Kinal, Mary; and King, Michael C., 4,899,377, Cl. 379-354.000.

David, Lawrence D., to International Business Machines Corporation. Organometallic-derived cordierite and other compounds comprising oxides of silicon. 4,898,842, Cl. 501-9.000.

Davidson Textron Inc.: *See—*
Horton, Roger L., 4,898,697, Cl. 264-37.000.

Davis, David R.; Slayton, Danny L.; and Shook, Raymond J., to Colorocs Corporation. Fuser for use in an electrophotographic print engine. 4,899,197, Cl. 355-290.000.

Davis, Franklin J.; Wilcox, Gilbert B.; and Wright, Richard R., to United Technologies Corporation. Apparatus for a fuel system. 4,898,329, Cl. 239-13.000.

Davis, Gordon T.; and Mandalia, Baiju D., to International Business Machines Corporation. Tap rotation n fractionally spaced equalizer to compensate for drift due to fixed sample rate. 4,899,366, Cl. 375-14.000.

Davis, Michael H.; and Erck, Gary L., to Eastman Kodak Company. Light-conditioning apparatus for an image scanner illumination system. 4,899,040, Cl. 250-216.000.

Dawson, John F.; and Ronish, Edward W., to Honeywell Inc. Method of storage and retrieval of digital map data based upon a tessellated geoid system. 4,899,293, Cl. 364-521.000.

Day, James C., to North American Philips Consumer Electronics Corp. Electron gun integral beam correctors and method. 4,898,556, Cl. 445-36.000.

Day, Victor S.; and Collette, David A., to Fulflex International Co. Plastic lined packaging. 4,897,982, Cl. 53-449.000.

Deal, Philip A., to R. J. Reynolds Tabacco Company. Adjustable air dilution cigarette with pressure drop compensation. 4,898,190, Cl. 131-336.000.

DeBlois, Raymond L.: *See—*
Nieter, Jeffrey J.; and DeBlois, Raymond L., 4,898,520, Cl. 418-1.000.

Decker, Raymond F.: *See—*
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,898,827, Cl. 435-244.000.

Deere & Company: *See—*
Gage, Douglas M.; and Neagle, Stuart L., 4,898,078, Cl. 91-524.000.
Schweitz, Kenneth D.; and Benter, Dean W., 4,897,988, Cl. 56-202.000.

DeGiacomo, Ralph: *See—*
Liggett, Louis; McGuire, Michael; Palmer, Marcia; and DeGiacomo, Ralph, 4,898,744, Cl. 426-557.000.

DeHaan, Peter H.: *See—*
Rappoldt, Louis M.; and DeHaan, Peter H., 4,898,105, Cl. 110-245.000.

Dehmel, Rudiger: *See—*
Maelzer, Martin; Dehmel, Rudiger; Higgen, Hans-Hermann; and Gulzow, Andreas, 4,899,104, Cl. 324-158.00F.

Dekura, Takateru. Corrosion inhibited synthetic lubricants. 4,898,682, Cl. 252-47.500.

Dekura, Takateru. Synthetic lubricants. 4,898,683, Cl. 252-51.000.

Delany, Paul N. Case and pallet systems. 4,898,321, Cl. 229-23.00R.

Delco Electronics Corporation: *See—*
Bender, James G.; Herron, Lee F.; and Struthers, Keith D., 4,898,361, Cl. 251-129.050.

Del Signore, James R., II: *See—*
Brull, Robert A.; Del Signore, James R., II; and Walker, Alan H., 4,898,487, Cl. 400-354.000.

Demassieux, Nicolas: *See—*
Jutand, Francis; Demassieux, Nicolas; and Dana, Michel, 4,899,300, Cl. 364-725.000.

De Meij, Johannes P.: *See—*
Kamp, Ronald P. T.; and De Meij, Johannes P., 4,899,025, Cl. 219-10.570.

Den, Tohru: *See—*
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

Dennison Manufacturing Company: *See—*
Pickering, J. H.; Bhatia, Sushil K.; and Chevrette, Roger, 4,898,405, Cl. 281-29.000.

DePasquale, Ralph J.: *See—*
Ollmann, James E.; and DePasquale, Ralph J., 4,898,936, Cl. 536-17.100.

DePrince, Randolph B.; and Viswanathan, Ravi, to International Minerals & Chemical Corp. Layered, compression molded device for the sustained release of a beneficial agent. 4,898,733, Cl. 424-425.000.

Derby, Kevin A.: *See—*
Tropp, James S.; Derby, Kevin A.; and Hawryszko, K. Christine, 4,899,109, Cl. 324-320.000.

DeRoss, Robert: *See—*
Case, Arnold A.; and DeRoss, Robert, 4,898,548, Cl. 439-686.000.

Derouane, Eric G.; and von Ballmoos, Roland, to Mobil Oil Corp. Synthesis of crystalline SAPO-37. 4,898,722, Cl. 423-328.000.

Derrickson, Stephan G.: *See—*
Murray, Gordon A.; Golobic, Robert A.; and Derrickson, Stephan G., 4,899,363, Cl. 372-65.000.

Determan, William J.: *See—*
Wells, Hoyt M.; Determan, William J.; Vanis, Vernon V.; Hrivnak, John E.; Richeson, Donald E.; and Saupe, Timothy P., 4,898,703, Cl. 264-166.000.

Detex Corporation: *See—*
Bartlett, Alan, 4,899,133, Cl. 340-573.000.

Dethlefs, Ralf-Burkhard; Scholz, Bernd; and Wysk, Wolfram, to Felix Schoeller jr GmbH & Co. KG. Photographic paper support with a water resistant coating of polyethylene. 4,898,773, Cl. 428-332.000.

Deutsche-Thomson Brandt GmbH: *See—*
Gleim, Gunter, 4,899,093, Cl. 318-254.000.

Deutsche Voest-Alpine Industrieanlagenbau GmbH: *See—*
Vuletic, Bogdan, 4,898,366, Cl. 266-160.000.

Deutz-Allis Corporation: *See—*
McDermott, William C., 4,898,108, Cl. 111-185.000.

De Villiers, John L. Board game. 4,898,390, Cl. 273-249.000.

Dewar, Robert: *See—*
Waldecker, Thomas J.; Dewar, Robert; Wybo, David R.; and Woroniec, Richard, 4,899,218, Cl. 358-93.000.

DeWeese, F. Thane: *See—*
Swisher, David R.; and DeWeese, F. Thane, 4,898,593, Cl. 604-319.000.

Diasonics Inc.: *See—*
Tropp, James S.; Derby, Kevin A.; and Hawryszko, K. Christine, 4,899,109, Cl. 324-320.000.

Diaz, Randall J.: *See—*
Ferchau, Joerg U.; Pham, Hoa V., and Diaz, Randall J., 4,899,254, Cl. 361-384.000.

Dichter, Anna, heir: *See—*
Horowitz, Carl; Sanduja, Mohan; and Dichter, Michael, deceased, 4,898,676, Cl. 210-668.000.

Dichter, Michael, deceased: *See—*
Horowitz, Carl; Sanduja, Mohan; and Dichter, Michael, deceased, 4,898,676, Cl. 210-668.000.

Dick, William R.: *See—*
Easter, David A.; Dick, William R.; Hackman, Donald J.; and Alexander, Kathryn E., 4,898,051, Cl. 81-57.200.

Dickinson, Norman L., to Dipac Associates. Pressurized wet combustion of wastes in the vapor phase. 4,898,107, Cl. 110-346.000.

Dickore, Karlfried; Engels, Hans D.; Kratzer, Hans; and Merz, Walter, to Bayer Aktiengesellschaft. Production of 3,3-dimethyl-2-oxobutyric acid salt. 4,898,974, Cl. 562-577.000.

Dicks, Lori A.: *See—*
Dunaway, Thomas J.; Spielberger, Richard K., and Dicks, Lori A., 4,898,320, Cl. 228-245.000.

Diesel Kiki Co., Ltd.: *See—*
Sakurada, Muneo, 4,898,325, Cl. 237-12.30B.
Sakurai, Yoshihiko, 4,898,005, Cl. 62-115.000.

Dietsch, Hans E.; and Nestork, William J., to International Business Machines Corporation. Power distribution for full wafer package. 4,899,208, Cl. 357-74.000.

Digital Equipment Corporation: *See—*
Hallowell, David L., 4,899,207, Cl. 357-70.000.
Hartzband, David J., 4,899,290, Cl. 364-513.000.
Sands, Robert M.; and Fitzgerald, John J., 4,899,082, Cl. 315-8.000.

Diman, Charles, Marcus, David; Mitchell, Philip; and Sachs, Samuel B., to Kendall Company, The. Point-of-use membrane filtration system. 4,898,667, Cl. 210-138.000.

DiMarco, Joel: *See—*
Mills, Perry A.; and DiMarco, Joel, 4,898,371, Cl. 269-136.000.

Dipac Associates: *See—*
Dickinson, Norman L., 4,898,107, Cl. 110-346.000.

di Priolo, Carlo L.: *See—*
Failla, Charles C.; Pouring, Andrew A.; Rankin, Bruce; di Priolo, Carlo L.; McCowan, William; and Gosewisch, Dennis, 4,898,135, Cl. 123-263.000.

Dr. Ing. h.c.F. Porsche AG: *See—*
Ampferer, Herbert, 4,898,125, Cl. 123-52.0MC
Brin, Constantin, 4,898,410, Cl. 292-241.000.

Dodin, Andre; Siffert, Odile; Le Thuillier, Georgette; and Allard, Patrice, to Institut Pasteur. Novel synthetic peptide, process for its preparation and medicaments containing it. 4,898,815, Cl. 435-7.000.

Dohi, Hideyuki: *See—*
Kawakami, Shigenobu; Endo, Keiji; Dohi, Hideyuki, and Sato, Atsushi, 4,899,009, Cl. 585-471.000.

Doi, Hidekazu; and Yabuki, Ritsue, to Mitsubishi Metal Corporation. Hydrogen absorbing Ni,Zr-based alloy and rechargeable alkaline battery. 4,898,794, Cl. 429-59.000.

Doi, Hiroshi: *See—*
Masuoka, Shigeru; Doi, Hiroshi; and Honda, Yoshihiro, 4,898,895, Cl. 523-122.000.

Dolgin, Stuart M.; and Torbet, Philip, to Dolgin, Stuart M. Fluid passing apparatus with means for covering the same. 4,898,589, Cl. 604-198.000.

Dolnick, Earl M.: *See—*
Goldstein, Mark K.; and Dolnick, Earl M., 4,898,531, Cl. 431-12.000.

Donald Guthrie Foundation for Medical Research, Inc. *See—*
Kwon, Byoung S., 4,898,814, Cl. 435-6.000.

Doni, Fabrizio; and Ferrario, Bruno, to SAES Getters SpA. Domestic oven observation window having a low temperature external surface. 4,898,147, Cl. 126-200.000.

Donnelly, Donald E.: *See—*
Brown, Bernard T.; Donnelly, Donald E.; and Toth, Bartholomew L., 4,898,229, Cl. 165-11.100.

Dorawala, Tansukhlal G.: *See—*
Pasternak, Mordechai; and Dorawala, Tansukhlal G., 4,898,674, Cl. 210-638.000.

Doree, Richard H.; and Ugro, Josef V., Jr., to Minnesota Mining and Manufacturing Company. Article containing microencapsulated materials. 4,898,633, Cl. 156-145.000.

Dornier GmbH: *See—*
Kramer, Bernhard, 4,898,070, Cl. 89-34.000.

Dornier System GmbH: *See—*
Westphal, Manfred, 4,899,167, Cl. 343-915.000.

Dosaj, Vishu D.; May, James B.; and Jeffress, Robert D., to Dow Corning Corporation. Two-stage ferrosilicon smelting process. 4,898,712, Cl. 420-578.000.

Dosaj, Vishu D.; Halm, Roland L.; and Wilding, Oliver K., Jr., to Dow Corning Corporation. Method of direct process performance improvement via control of silicon manufacture. 4,898,960, Cl. 556-472.000.

Dosaka, Katsumi: *See—*
Kumanoya, Masaki; Miyatake, Hideshi; Dosaka, Katsumi; and Konishi, Yasuhiro, 4,899,313, Cl. 365-201.000.

Doshi, Praful, to Pilkington Visioncare Holdings, Inc. Method for tinting hydrophilic plastic articles. 4,898,695, Cl. 264-2.600.

Dotterwick, Robert E.: *See—*
Double, Paul B.; Orr, Frederick W.; and Dotterwick, Robert E., 4,897,970, Cl. 52-4.000.

Double, Paul B.; Orr, Frederick W.; and Dotterwick, Robert E., to Canamer International, Inc. Method of covering and securing material. 4,897,970, Cl. 52-4.000.

Doumoto, Hideki; and Kimura, Takashi, to Ryobi Ltd. Apparatus and method for controlling a plurality of continuous paper printing machines connected to each other. 4,898,094, Cl. 101-485.000.

Dow Chemical Company, The: *See—*
McCullough, Francis P., Jr.; Hotchkiss, Robert L.; Snelgrove, R. Vernon; Hall, David M.; and McCullough, Jacqueline R., 4,898,783, Cl. 428-408.000.
Morris, Gregory J. E., 4,898,653, Cl. 204-128.000.
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., 4,898,724, Cl. 424-1.100.

Dow Corning Corporation: *See—*
Baile, Gnaneshwar R.; McVannel, Donald E.; Reading, Kirsten L.; and Hall, Ginger L., 4,898,961, Cl. 556-479.000.
Dosaj, Vishu D.; May, James B.; and Jeffress, Robert D., 4,898,712, Cl. 420-578.000.
Dosaj, Vishu D.; Halm, Roland L.; and Wilding, Oliver K., Jr., 4,898,960, Cl. 556-472.000.
Halloran, Daniel J.; Kasprzak, Kenneth A.; Savastano, Stefano G.; and Swihart, Terence J., 4,898,614, Cl. 106-3.000.
Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, 4,898,907, Cl. 524-490.000.
Hilty, Terrence K., 4,898,956, Cl. 556-401.000.
Kamis, Russell P.; Klosowski, Jerome M.; and Lower, Loren D., 4,898,910, Cl. 524-860.000.
Lee, Chi-Long; and Ulman, Katherine L., 4,898,920, Cl. 525-477.000.
Pleueddemann, Edwin P.; and Revis, Anthony, 4,898,957, Cl. 556-418.000.
Rasch, Diane M.; and Fiedler, Lawrence D., 4,898,903, Cl. 524-398.000.
Ziemelis, Maris J.; and Park, William R. R., 4,898,913, Cl. 525-301.000.

Dow Corning Limited: *See—*
Fridd, Petrina F.; and Taylor, Rosemary M., 4,898,595, Cl. 8-405.000.

Downhole Systems Technology Canada: *See—*
Sask, David, 4,898,236, Cl. 166-65.100.

Downs, Michael: *See—*
Moe, Rolf; Correia, David J.; and Downs, Michael, 4,898,639, Cl. 156-345.000.

Draghi, Carlo: *See—*
Corbo, Leonard; and Draghi, Carlo, 4,898,217, Cl. 141-83.000.

Drake, Donald J.: *See—*
Hawkins, William G.; and Drake, Donald J., 4,899,181, Cl. 346-140.00R.

Droulon, Georges: *See—*
Pipon, Yves; and Droulon, Georges, 4,898,356, Cl. 248-429.000.

Druschke, Wolfgang: *See—*
Vietmeier, Juergen; Pfoehler, Peter; Brauch, Gundo; Druschke, Wolfgang; and Zosel, Albrecht, 4,898,909, Cl. 524-820.000.

Dubrinsky, Max M.: *See—*
Edwards, Marysue; and Dubrinsky, Max M., 4,898,378, Cl. 272-69.000.

Duckworth & Kent Surgical Instruments Limited: *See—*
Hofmann, Robert F.; and Waldock, David B., 4,898,170, Cl. 606-166.000.

Duffy, Stephen A.; Prior, Christopher P.; and Scott, Randal W., to Invitron Corporation. Method to solubilize tissue plasminogen activator. 4,898,826, Cl. 435-226.000.

Dumoulin, Jean-Loup, to Jeumont Schneider Corporation. Semiconductor cooling mechanisms. 4,899,211, Cl. 357-82.000.

Dunaway, Jerry A.; Zimmerman, Leon H.; and LaTondress, Nancy T., to Reemay, Inc. Barrier fabric and method. 4,898,761, Cl. 428-137.000.

Dunaway, Thomas J.; Spielberger, Richard K.; and Dicks, Lori A., to Honeywell, Inc. Method of manufacturing a high-yield solder bumped semiconductor wafer. 4,898,320, Cl. 228-245.000.

Dunbar, Donald W. Sheath cutting tool. 4,897,920, Cl. 30-90.400.

Dunbar, Sidney G., to Owens-Corning Fiberglas Corporation. Process for producing preformable continuous strand mats using a mixture of thermosetting and thermoplastic resin. 4,898,770, Cl. 428-283.000.

Dunlop Limited a British Company: *See—*
Harrington, Robert, 4,897,939, Cl. 36-108.000.

Dunn, Donald P.: *See—*
Bellew, Roy G.; Dunn, Donald P.; Stilwell, Charles T.; and Wood, Johnny D., 4,898,106, Cl. 110-346.000.

Du Pont de Nemours, E. I., and Company: *See—*
Carney, Walter P., 4,898,932, Cl. 530-387.000.
Elco, Richard A.; and Fusselman, David F., 4,898,546, Cl. 439-608.000.
Hendrick, Kendall B.; and Reader, John R., Jr., 4,899,102, Cl. 324-663.000.
Huang, Hsu-Nan, 4,898,991, Cl. 568-615.000.
Luckey, David W., 4,898,704, Cl. 264-180.000.
Michel, John B., 4,898,851, Cl. 505-1.000.
Vassiliou, Eustathios, 4,898,020, Cl. 73-19.000.

Dupuis, Phillipe: *See—*
Daniel, Jean-Pierre L. M.; Dupuis, Phillipe; and Alanic, Jean-Luc, 4,899,163, Cl. 343-700.0MS.

Durston, Gordon G., to GSW Inc. Washroom partition. 4,897,971, Cl. 52-35.000.

Dutchess Bakers' Machinery Company, Inc.: *See—*
Willard, Mark L.; Beatty, David E.; and Nyquist, Jeffery A., 4,898,528, Cl. 425-185.000.
Dwivedy, Shailesh G., to Petrolite Corporation. Composition and method for prevention of adhesion of particulate matter to containers. 4,898,751, Cl. 427-230.000.
Dwyer, Francis G.: *See—*
Chu, Pochen; Dwyer, Francis G.; and Schwartz, Albert B., 4,899,007, Cl. 585-467.000.
Dyer, David F., to Dyer, David F. Pulsed electrical heating of concrete. 4,899,031, Cl. 219-213.000.
Dynapert, Inc.: *See—*
Hawkswell, Victor T., 4,898,507, Cl. 414-225.000.
E.G.O. Elektro-Gerate Blanc u. Fischer: *See—*
Kicherer, Robert; Schreder, Felix; and Reif, Stefan, 4,899,033, Cl. 219-451.000.
E & M Lamort: *See—*
Lamort, Jean-Pierre, 4,898,665, Cl. 209-273.000.
Eagle Industry Co., Ltd.: *See—*
Sakamaki, Hiroshi; Horikoshi, Yukio; and Jinnouchi, Takeshi, 4,898,526, Cl. 418-257.000.
Eason, W. Jeter. Flossing device. 4,898,196, Cl. 132-327.000.
Easter, David A.; Dick, William R.; Hackman, Donald J.; and Alexander, Kathryn E., to Battelle Memorial Institute. Connector mate/demate tool. 4,898,051, Cl. 81-57.200.
Eastern Gate, Inc.: *See—*
Lindquist, Donald F., 4,899,052, Cl. 250-342.000.
Eastman Kodak Company: *See—*
Alligood, John H., 4,899,187, Cl. 354-152.000.
Cleaveland, Edwin E., 4,898,470, Cl. 356-359.000.
Davis, Michael H.; and Erck, Gary L., 4,899,040, Cl. 250-216.000.
Gruenbaum, William T.; Mey, William; and Robinson, Kelly S., 4,898,797, Cl. 430-51.000.
Helm, Michael J., 4,899,051, Cl. 250-340.000.
Hyche, Kenneth W.; and Gose, William C., 4,898,616, Cl. 106-271.000.
Izumi, Masaki, 4,899,170, Cl. 346-76.0PH.
Jones, Glenn C.; and Nottingham, William D., 4,898,969, Cl. 560-187.000.
Mahoney, Gregory, 4,899,198, Cl. 355-297.000.
Mahoney, Gregory P., 4,899,196, Cl. 355-271.000.
Marechal, Claude; and Schmuckle, Christian, 4,899,037, Cl. 235-493.000.
McClure, Richard J., 4,899,240, Cl. 360-113.000.
Milch, James R., 4,898,467, Cl. 356-328.000.
Newman, David A.; Laubengayer, William R.; and Scott, William B., Jr., 4,899,174, Cl. 346-107.00R.
Newman, David A., 4,899,185, Cl. 346-155.000.
Easton, Colin J.; and Gay, Adrian C., to International Business Machines Corporation. Graphics processing system. 4,899,294, Cl. 364-522.000.
Eaton Corporation: *See—*
Cote, William F.; and Smyth, Robert R., 4,899,279, Cl. 364-424.050.
Garrett, Wayne H.; and Janson, David A., 4,898,266, Cl. 192-21.500.
Garrett, Wayne H.; and Janson, David A., 4,898,267, Cl. 192-21.500.
Schultz, Gary R.; and Beverly, James A., 4,898,216, Cl. 141-4.000.
Searfoss, Jerry R.; and Keister, Bernard, 4,898,212, Cl. 138-130.000.
Eberly, David S. Padlock protector. 4,898,008, Cl. 70-56.000.
ECCA Calcium Products, Inc.: *See—*
Rayfield, Jerry W.; Baker, Robert; and Weber, Kenneth E., 4,898,620, Cl. 106-464.000.
Edagawa, Noboru: *See—*
Mochizuki, Kiyofumi; Edagawa, Noboru; and Iwamoto, Yoshinao, 4,899,043, Cl. 250-227.000.
Edakubo, Hiroo; Itani, Takashi; Narasawa, Takashi; Ushiro, Tatsuzo; Watanabe, Hiroshi; and Hasegawa, Masahide, to Canon Kabushiki Kaisha. Recording or reproducing apparatus using container mounted strip-like recording medium. 4,899,236, Cl. 360-95.000.
Edelman, Elazar: *See—*
Mathiowitz, Edith; Langer, Robert S.; Warshawsky, Abraham; and Edelman, Elazar, 4,898,734, Cl. 424-426.000.
Edelmayer, Thomas C., to Teledyne Industries, Inc. System for cooling the rotary engine rotor. 4,898,522, Cl. 418-61.200.
Eduard Wille GmbH u. Co.: *See—*
Neuhaus, Klaus, 4,898,068, Cl. 81-483.000.
Edwards, Clarence K.; and Edwards, Lawrence D., to Kadee Metal Products Co. Track joining system. 4,898,326, Cl. 238-10.00E.
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Gray, Coy J., to Milliken Research Corporation. Method to produce three-ply yarn and fabric made therefrom. 4,897,989, Cl. 57-239.000.
Gray, Tommy L., to Span Instruments, Inc. Flow responsive transmitter and indicator. 4,898,036, Cl. 73-861.740.
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Greenberg, Jerald: *See—*
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Greenwald, Martin: *See—*
Talanker, Vera; and Greenwald, Martin, 4,899,100, Cl. 324-636.000.
Greer, David G., to AgriChem, Inc. Feed grain conditioning apparatus. 4,898,092, Cl. 99-487.000.
Greer, Steven C., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Test interface circuit which generates different interface control signals for different target computers responding to control signals from host computer. 4,899,306, Cl. 364-900.000.
Gregoire, Jean-Pierre, to SMH Alcatel. Transport device for transporting objects in the form of strip segments. 4,898,313, Cl. 226-197.000.
Grehier, Alain; and Rojey, Alexandre, to Institut Francais Du Petrole. Heat exchange device useful more particularly for heat exchanges between gases. 4,898,233, Cl. 165-166.000.
Gresa, Ludwig: *See—*
Fux, Kuno; and Gresa, Ludwig, 4,898,671, Cl. 210-333.010.
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Phillips, George E.; and Griffiths, John M., 4,898,127, Cl. 123-73.00A.
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Grimaud, Jean-Michel; and Nozeran, Jean-Marc, to Bendix Electronics S.A. Device for triggering an event in phase with an angular position of a rotary component and application thereof. 4,899,281, Cl. 364-431.040.
Grimes, Gary J.; Haas, Lawrence J.; and Sauer, Jon R., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Non-invasive optical coupler. 4,898,444, Cl. 350-96.150.
Grob, James T.: *See—*
Luebke, Clement J.; Slade, Frank A.; Sank, Gerald W.; Grob, James T.; Price, George M.; and Hubbard, Elbert M., 4,898,151, Cl. 126-391.000.
Grobb, Finn; Hvalso, Kurt; and Madsen, Benni, to Gyproc A/S. Method and tool for punching plaster plates. 4,898,056, Cl. 83-689.000.
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Cavagna, Giancarlo A.; Groome, Ernest J., Murphy, Joseph M.; and Raschella, Domenick L., 4,898,752, Cl. 427-265.000.
Gropp, Heiko U., to Rheinmetall GmbH. Weapon and ammunition carrier for a gun. 4,898,072, Cl. 89-45.000.
Groshong, Judson C.: *See—*
Groshong, Leroy E.; Groshong, Judson C.; and Brawn, R. James, deceased, 4,898,579, Cl. 604-67.000.
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Gross, Anthony E., to Nalco Chemical Company Polymeric ore agglomeration aids. 4,898,611, Cl. 75-3.000.
Gross, Rainer: *See—*
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Meyer, Horst; Schwenner, Eckhard; Bechem, Martin; Gross, Rainer; Schramm, Matthias; Kayser, Michael; and Hebisch, Siegbert, 4,898,877, Cl. 514-521.000.
Grozdits, George A.: *See—*
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Gruber, Bert: *See—*
Hoeffkes, Horst; Seidel, Kurt; Giede, Karl; Struve, Alfred; and Gruber, Bert, 4,898,725, Cl. 424-70.000.
Gruber, Robert J.: *See—*
Hsieh, Bing R.; Gruber, Robert J.; and Haack, John L., 4,898,802, Cl. 430-110.000.
Gruber, Thomas J. Selectively openable filtering assembly. 4,898,602, Cl. 55-359.000.
Gruenbaum, William T.; Mey, William; and Robinson, Kelly S., to Eastman Kodak Company. Multiple xeroprinted copies from a single exposure using photosensitive film buffer element. 4,898,797, Cl. 430-51.000.
Grundei, Hans, to S+G Implants GmbH. Forceps for pushing apart vertebrae. 4,898,161, Cl. 606-105.000.
Gruner, Heiko, to Plasmainvent AG. CR_2O_3-protective coating and process for its manufacture. 4,898,785, Cl. 428-472.000.
GSW Inc : *See—*
Durston, Gordon G., 4,897,971, Cl. 52-35.000.
Lewis, Brian, 4,898,150, Cl. 126-361.000.
GT Development Corporation: *See—*
Morris, John M.; Gabrlik, Zdenek; and Green, Charles J., 4,898,199, Cl. 137-68.100.
GTE Hawaiian Telephone Company Incorporated. *See—*
Lee, Gerritt S. K., 4,899,381, Cl. 379-393.000
GTE Laboratories Incorporated: *See—*
Rourke, William J.; Lai, Wen-Chao, and Natansohn, Samuel, 4,898,719, Cl. 423-21.500.
GTE Products Corporation: *See—*
Cooper, David A., 4,898,448, Cl. 350-96.200.
Jones, Gerald M., 4,898,215, Cl. 140-105.000
Ritsko, Joseph E.; Johnson, Walter A.; and Kopatz, Nelson E., 4,898,749, Cl. 427-216.000.
Shaffer, John W., 4,898,558, Cl. 445-53.000.
GTE Valenite Corporation: *See—*
Cusack, Robert F., 4,897,930, Cl. 33-644.000.
Gueret, Jean-Louis, to L'Oreal. Brush for the application of cosmetic products. 4,898,193, Cl. 132-218.000.
Guidat, Thierry: *See—*
Lechelle, Alain; Guidat, Thierry; and Bruckert, Serge, 4,897,950, Cl. 42-62.000.
Guirguis, Raafat H. Liquid turbojet engine. 4,897,995, Cl. 60-221.000.
Gulzow, Andreas: *See—*
Maelzer, Martin; Dehmel, Rudiger; Higgen, Hans-Hermann; and Gulzow, Andreas, 4,899,104, Cl. 324-158.00F.
Gunn, William L.; Heath, William D., Jr.; and Mantovani, John C., to Brink's Incorporated. Apparatus for coin sorting and counting. 4,898,564, Cl. 453-3.000.
Gunther, Andreas: *See—*
Gallenkamp, Bernd; Gunther, Andreas; Mohrmann, Karl-Heinrich; and Schmidt, Thomas, 4,898,979, Cl. 564-418.000.
Gunze Limited: *See—*
Ikada, Yoshito; Suong, Hyu H.; Shimizu, Yoshihiko; Watanabe, Satoshi; Nakamura, Tatsuo; Suzuki, Masakazu; and Shimamoto, Takeshi, 4,898,186, Cl. 606-62.000.
Gupta, Balaram B. G., to Hoechst Celanese Corporation. Process for the preparation of poly(vinylphenol) from poly(acetoxystyrene) by acid catalyzed transesterification. 4,898,916, Cl. 525-344.000.
Gussoni, Damiano: *See—*
Costanzi, Silvestro; Gussoni, Damiano; and Pallini, Luciano, 4,898,946, Cl. 546-216.000.
Gustavsson, Bert U., to Profish International AB. Apparatus for baiting long lines. 4,897,954, Cl. 43-27.400.
Gwynn, Leslie B.: *See—*
Coffey, James B.; and Gwynn, Leslie B., 4,898,322, Cl. 229-69.000.
Gyproc A/S: *See—*
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H.Y.O., Inc.: *See—*
Kime, James A.; and McMenamin, Gregory R., 4,898,333, Cl. 239-657.000.
Haack, John L.: *See—*
Hsieh, Bing R.; Gruber, Robert J.; and Haack, John L., 4,898,802, Cl. 430-110.000.
Haas, Lawrence J.: *See—*
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Habegger, Millard A.: *See—*
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Habelt, Gerhard: *See—*
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Hachimori, Hideo: *See—*
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Hackman, Donald J.: *See—*
Easter, David A.; Dick, William R.; Hackman, Donald J.; and Alexander, Kathryn E., 4,898,051, Cl. 81-57.200.
Hackney, John. Catamaran sailboat user support platforms and packaged elements therefore. 4,898,111, Cl. 114-61.000.
Hadassah Medical Organization: *See—*
Barenholz, Yechezkel; and Gabizon, Alberto, 4,898,735, Cl. 424-450.000.
Haefliger, William W.: *See—*
Watson, W. Keith R., 4,898,884, Cl. 514-553.000.
Haga, Toru; Nagano, Eiki; Morita, Kouichi; and Sato, Ryo, to Sumitomo Chemical Company, Limited. Benzothiazolylazolidines, and their production and use. 4,898,948, Cl. 548-171.000.
Hagin, Faust; and Martini, Stefan, to MAN Nutzfahrzeuge GmbH. Low-loss cyclically-operating pressure-responsive bypass valve for fixed displacement pump flow control. 4,897,996, Cl. 60-468.000.
Hagiya, Koji: *See—*
Suzukamo, Gohfu; Sakito, Yoji; Fukao, Masami; and Hagiya, Koji, 4,898,655, Cl. 204-157.870.
Hahnle, Reinhard: *See—*
Schlafer, Ludwig; Springer, Hartmut; and Hahnle, Reinhard, 4,898,933, Cl. 534-605.000.
Hakansson, Olle, to FFV Autotech Aktiebolag. Overload-protected torque transmitting telescopic shaft. 4,898,566, Cl. 464-167.000.
Halasz, Ferenc: *See—*
Antal, Kalman; Rimay, Bela; and Halasz, Ferenc, 4,898,554, Cl. 445-6.000.
Halberstadt, Louis; Mertinooke, Peter E.; Perry, Joseph V.; and Muessel, Dan C., to Amesbury Industries, Inc. Process and apparatus for extruding a low density elastomeric thermoplastic foam. 4,898,760, Cl. 428-122.000.
Halgren, John A.: *See—*
Buchko, Raymond G.; and Halgren, John A., 4,897,985, Cl. 53-559.000.
Hall, Antony H. P.: *See—*
Dave , Dilip; and Hall, Antony H. P., 4,899,006, Cl. 585-415.000.
Hall, David M.: *See—*
McCullough, Francis P., Jr.; Hotchkiss, Robert L.; Snelgrove, R. Vernon; Hall, David M.; and McCullough, Jacqueline R., 4,898,783, Cl. 428-408.000.

Hall, Ginger L.: *See—*
Baile, Gnaneshwar R.; McVannel, Donald E.; Reading, Kirsten L., and Hall, Ginger L., 4,898,961, Cl. 556-479.000.

Halliburton Company: *See—*
Stegemoeller, Calvin L.; and Walker, Lonnie R., 4,898,473, Cl. 366-132.000.

Halloran, Daniel J.; Kasprzak, Kenneth A.; Savastano, Stefano G.; and Swihart, Terence J., to Dow Corning Corporation. Water sheeting zwitterionomeric aminofunctional siloxanes. 4,898,614, Cl. 106-3.000.

Hallowell, David L., to Digital Equipment Corporation. Outer lead tape automated bonding. 4,899,207, Cl. 357-70.000.

Halm, Roland L.: *See—*
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Halpern, Alfred: *See—*
Miller, Ronald B.; Halpern, Alfred; Leslie, Stewart; and Hofer, Peter, 4,898,729, Cl. 424-80.000.

Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, to Dow Corning Corporation. Compositions of platinum and rhodium catalyst in combination with hydrogen silsesquioxane resin. 4,898,907, Cl. 524-490.000.

Hamada, Mitsuo; Shimizu, Koji; and Wakita, Haruki, to Toray Silicone Company, Ltd. Electroconductive silicone rubber particles. 4,898,689, Cl. 252-510.000.

Hamada, Takaki: *See—*
Ishigaki, Naoyuki; Hamada, Takaki; and Fujimura, Setsuo, 4,898,613, Cl. 75-251.000.

Hamaguchi, Shigeki: *See—*
Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.

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Hamanaka, Izumi: *See—*
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Hamatsu, Masahiro: *See—*
Akazawa, Shigeo; Mori, Masaharu; and Hamatsu, Masahiro, 4,899,364, Cl. 375-1.000.

Hamblin, Ronald F., to SKF (UK) Limited. Bearing assembly. 4,898,481, Cl. 384-581.000.

Hamdy, Esmat Z.; Mohsen, Amr M.; and McCullum, John L., to Actel Corporation. Electrically-programmable low-impedance anti-fuse element. 4,899,205, Cl. 357-51.000.

Hamer, William C. Telephone announcement system. 4,899,378, Cl. 379-374.000.

Hammond, Kenneth W.; Gilbert, Herbert W.; and Swierb, Gerald E., to Chrysler Motors Corporation. Attachment arrangement for vehicle tail lamp assembly. 4,899,262, Cl. 362-80.000.

Hammond, Thomas J.; and Mason, Lawrence J., to Xerox Corporation. Triggering circuit for series connected flash lamps. 4,899,087, Cl. 315-241.00P.

Hamrik, Odlrich: *See—*
Salajka, Zdenek; Hamrik, Odlrich; Kratochvila, Jan; Gheorghiu, Mihnea; Krivanek, Josef; Sindelar, Pavel; Zaloudik, Petr; Legeza, Vasil; and Jansa, Ladislav, 4,898,847, Cl. 522-110.000.

Han, William T.; and Wright, John J., to Bristol-Myers Company. Preparation of antihypercholesterolemic tetrazole compounds. 4,898,950, Cl. 548-253.000.

Hannecart, Etienne, to Solvay & Cie. Compositions based on vinylidene fluoride polymers which have a reduced smoke-generating capacity. 4,898,906, Cl. 524-406.000.

Hannig, Helmut, to Alfing Kessler Sondermaschinen GmbH. Clamping device for pallets. 4,898,269, Cl. 198-346.100.

Hans, Gerald A.: *See—*
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Hansen, Barry W.; and Romon, Raymond F., to International Business Machines Corporation. Dynamic terminal address allocation by the terminal itself in a data processing system. 4,899,274, Cl. 364-200.000.

Hansen, J. Richard; Asars, Juris A.; and Oates, Robert M., to Westinghouse Electric Corp. Optically coupled remote sensor apparatus and system. 4,899,044, Cl. 250-227.000.

Hansen, Ove E.; and Healy, Christopher P., to A/A Niro Atomizer. Atomizer wheel with bushings of different inwardly protruding lengths. 4,898,331, Cl. 239-223.000.

Happel, Robert: *See—*
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Hara, Masanori: *See—*
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Harada, Ichiya: *See—*
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Harada, Teruhiro: *See—*
Kitazawa, Shooji; Kuwabara, Hiroshi; and Harada, Teruhiro, 4,899,309, Cl. 365-189.010.

Harada, Toshiaki; Yamamoto, Tadashi; and Takenouchi, Masanori, to Canon Kabushiki Kaisha. Recording system with illumination means utilizing a plurality of fluorescent substances. 4,899,175, Cl. 346-108.000.

Harakawa, Takeshi: *See—*
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Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corp. Integrated staged conversion of methanol to gasoline and distillate. 4,899,002, Cl. 585-312.000.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corp. Process for olefins to gasoline conversion. 4,899,015, Cl. 585-533.000.

Harner, Donald R.: *See—*
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Harpell, Gary A.: *See—*
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Harrington, Robert, to Dunlop Limited a British Company. Footwear reinforcement. 4,897,939, Cl. 36-108.000.

Harter, Lynn J., to Thrall Car Manufacturing Company. Vehicle hopper body with internal reinforcing members. 4,898,101, Cl. 105-247.000.

Hartzband, David J., to Digital Equipment Corporation. System for specifying and executing protocols for using iterative analogy and comparative induction in a model-based computation system. 4,899,290, Cl. 364-513.000.

Hartzell, Lawrence M.: *See—*
Case, Maxwell H.; Hartzell, Lawrence M.; and Currier, David W., 4,899,255, Cl. 361-386.000.

Harwath, Frank L., to Suntec Industries Incorporated. Gear pump with ring-type shaft retainer. 4,898,523, Cl. 418-70.000.

Harwood, H. James; Majumdar, Ramendra N.; and Yang, Shih-Liang, to University of Akron. Alternating copolymerization of donor monomers having protected amine groups with acceptor monomers. 4,898,915, Cl. 525-326.700.

Hasebe, Yoichi, to Shinano Kenshi Kabushiki Kaisha. Two-phase DC brushless motor. 4,899,075, Cl. 310-257.000.

Hasegawa, Masahide: *See—*
Edakubo, Hiroo; Itani, Takashi; Narasawa, Takashi; Ushiro, Tatsuzo; Watanabe, Hiroshi; and Hasegawa, Masahide, 4,899,236, Cl. 360-95.000.

Hashida, Koichi: *See—*
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Hashimoto, Masashi, to Texas Instruments Incorporated. Video information editing system for providing video data in a controlled format. 4,899,229, Cl. 360-141.000.

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Hashizume, Kenji; Ikebe, Masaru; Okamura, Masatoshi; and Shiba, Haruo, to TDK Corporation. Locking mechanism of magnetic tape cassette. 4,899,242, Cl. 360-132.000.

Hata, Daisuke, to Ricoh Company, Ltd. Zooming optical system control device. 4,899,190, Cl. 354-400.000.

Hatanaka, Chitoshi: *See—*
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Hatkoski, James W.: *See—*
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Hatkoski, Richard: *See—*
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Hattori, Eizou: *See—*
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Hattori, Reiko: *See—*
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Hauber, Peter. Safe and secure camper shell door latch. 4,898,408, Cl. 292-7.000.

Haug, Werner, to Frama AG. Franking machine. 4,898,093, Cl. 101-91.000.

Haury, Andre : *See—*
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Hauser, Peter J.: *See—*
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Havens, Marvin R., to W. R. Grace & Co.-Conn. Agent for imparting antistatic characteristics to a thermoplastic polymer and a thermoplastic polymer composition containing the agent. 4,898,771, Cl. 428-316.000.

Havenstein, Alfred G.; Kahle, Werner; and Schnell, Dagmar, to Lever Brothers Company. Package containing a water-in-oil fat dispersion. 4,898,740, Cl. 426-106.000.

Hawie Manufacturing Co., The: *See—*
Hawie, Robert L., 4,897,952, Cl. 43-21.200.

Hawie, Robert L., to Hawie Manufacturing Co., The. Fishing rod hanger. 4,897,952, Cl. 43-21.200.

Hawkins, Brian; Greenberg, Jerald; Alon, Ofer; Marten, Victor; Banyai, Edward; Edwards, Jennifer A., Banyai, David M.; Sanchez, Juan C.; Sitnik, Eran; and Yozzo, Joseph A. Apparatus for evaluating heart fitness. 4,898,182, Cl. 128-707.000.

Hawkins, William G.; and Drake, Donald J., to Xerox Corporation. Large monolithic thermal ink jet printhead. 4,899,181, Cl. 346-140.00R.

Hawkinson, Rodney B.; and Sarto, Julius A. Merchandise display rack. 4,898,282, Cl. 211-49.100.

Hawkswell, Victor T., to Dynapert, Inc. Apparatus for handling electrical or electronic components. 4,898,507, Cl. 414-225.000.

Hawryszko, K. Christine: *See—*
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Hay, John; Markhoff-Matheny, Carole J.; and Swanson, Brian E., to Norton Company. Frit bonded abrasive wheel. 4,898,597, Cl. 51-298.00D.

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Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Semiconductor laser device. 4,899,349, Cl. 372-44.000.

Hayasaka, Katsuhiro: *See—*
Takeda, Kazuo; Sekikawa, Nobuyuki; Hayasaka, Katsuhiro; Fujunuma, Chikao; Itoh, Nobuo; and Kubota, Tetsuya, 4,898,837, Cl. 437-31.000.

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Hayata, Osamu, to Yamaha Hatsudoki Kabushiki Kaisha. Low slung small vehicle. 4,898,508, Cl. 414-476.000.

Hayes, Dorothy E. Time-variable illuminating device. 4,899,089, Cl. 215-323.000.

Healey, Fritz W.: *See—*
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Healy, Christopher P.: *See—*
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Hearn, David D.; Pasternack, Eric S.; and Segalman, Daniel J., to Atlantic Richfield Company. Downhole tool for determining in-situ formation stress orientation. 4,899,320, Cl. 367-35.000.

Heath, William D., Jr.: *See—*
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Hebisch, Siegbert: *See—*
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Heck, James V.; and Lewis, Michael D., to Merck & Co. Inc. Acetylenic esters. 4,898,853, Cl. 514-63.000.

Heck, Wolfgang: *See—*
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Heerema Engineering Service BV: *See—*
Erdbrink, Robert J., 4,898,288, Cl. 212-191.000
van de Wetering, Wietse J., 4,898,289, Cl. 212-270.000.

Heide, Jan B., to Skarhamn International AB. Method for thawing of food articles. 4,898,741, Cl. 426-231.000.

Heilmann, Steven M.: *See—*
Katritzky, Alan R.; Krepski, Larry R., Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,898,923, Cl. 528-73.000.

Heinrich Nickel GmbH: *See—*
Fitzner, Klaus; Betz, Walter; Plitt, Uwe; and Schmitt, Wolfgang, 4,898,087, Cl. 98-40.100.

Heller, Jorge; Penhale, Donald W. H.; and Ng, Steve Y., to Sandoz Pharmaceuticals Corp. Polyacetal and polyketal hydrogels formed from acetals or ketals and polyols. 4,898,928, Cl. 528-392.000.

Helm, Michael J., to Eastman Kodak Company. Method and device for simulating thermal effects at the interface of a magnetic head and a recording medium. 4,899,051, Cl. 250-340.000.

Helmling, Walter: *See—*
Schwaiger, Gunther; Springer, Hartmut; and Helmling, Walter, 4,898,944, Cl. 544-337.000.

Hemmeter, Richard W.: *See—*
Bauer, Thomas M.; Hemmeter, Richard W., Petrelli, Robert; Pieneth, Richard J.; and Rubald, Cyrenus M., 4,899,375, Cl. 379-264.000.

Hempel, Gerhard; Kennecke, Mario; Krieger, Bernhard; Phillippson, Rainer, Triem, Hermann; and Weber, Alfred, to Schering Aktiengesellschaft. Process for production of 6α,9α-difluoro-11β,17α-dihydroxy-16α-methyl-4-pregnene-3,20-dione and its derivatives. 4,898,693, Cl. 260-397.400.

Henderson, Mark: *See—*
Kallman, Robert A.; and Henderson, Mark, 4,897,891, Cl. 5-493.000.

Hendrick, Kendall B.; and Reader, John R., Jr., to Du Pont de Nemours, E. I., and Company. Electrode system for a parallel plate dielectric analyzer. 4,899,102, Cl. 324-663.000.

Hendricks, Debra S. Protective fan shield. 4,898,516, Cl. 416-247.00R.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Bitter, Ingrid; Scholz, Wolfhard; and Schneider, Werner, 4,898,690, Cl. 252-554.000.
Hoeffkes, Horst; Seidel, Kurt; Giede, Karl, Struve, Alfred; and Gruber, Bert, 4,898,725, Cl. 424-70.000.
Pruehs, Horst; Schenker, Gilbert; Altenschoepfer, Theodor; and Piorr, Robert, 4,898,621, Cl. 134-25.200.

Hennessy, Bernard M.: *See—*
Baggiolini, Enrico G.; Hennessy, Bernard M.; and Uskokovic, Milan R., 4,898,855, Cl. 514-167.000.

Henning, Roy A.: *See—*
Lai, N. C. Joseph; Zuperku, Edward J.; and Henning, Roy A., 4,899,053, Cl. 250-343.000.

Henriksson, Ragnar, to Asea Stal AB. Method of attaching tubes in a tube plate in a heat exchanger. 4,897,908, Cl. 29-890.440.

Heraeus Quarzschmelze GmbH: *See—*
Sauerwein, Paul, 4,898,604, Cl. 65-18.100.

Herbermann, Alfred F.; and Carabbio, Robert M., to Syron Engineering and Manufacturing Corporation. Structure formed from ball jointed links. 4,898,490, Cl. 403-56.000.

Herbst, David H.; and Boes, Chris E., to Imperial Cup Corporation. Push and drink lid. 4,898,299, Cl. 220-90.400.

Herold, Peter; and Angst, Christof, to Ciba-Geigy Corporation. Processes for the preparation of 5-amino-4-hydroxyvaleric acid derivatives. 4,898,977, Cl. 564-191.000.

Herrmann, Rainer; and Funken, Dieter, to Endress u. Hauser GmbH u. Co. Arrangement for measuring the water vapor dew point in gases. 4,898,476, Cl. 374-28.000.

Herrmann, Wilfried: *See—*
Stobbe, Anatoli; and Herrmann, Wilfried, 4,899,132, Cl. 340-551.000.

Herron, Lee F.: *See—*
Bender, James G.; Herron, Lee F.; and Struthers, Keith D., 4,898,361, Cl. 251-129.050.

Hershberger, Charles L.; Larson, Jeffrey L.; and Reynolds, Patricia A., to Eli Lilly and Company. Ultrahigh copy number streptomycetes plasmids. 4,898,828, Cl. 435-252.300.

Hertel, Richard J.: *See—*
Freytsis, Avrum; Hertel, Richard J.; and Mears, Eric L., 4,899,059, Cl. 250-492.200.

Heublein, Inc.: *See—*
Shrikhande, Anil J.; and Alioto, Joseph A., 4,898,742, Cl. 426-271.000.

Hewlett Packard Company: *See—*
Ogura, Mitsuhiro, 4,899,106, Cl. 324-158.00F.

Heyneker, Herbert L.: *See—*
Goeddel, David V.; and Heyneker, Herbert L., 4,898,830, Cl. 435-320.000.

Hi-Shear Corporation: *See—*
Kramer, David M., 4,899,045, Cl. 250-227.000.

Higgen, Hans-Hermann: *See—*
Maelzer, Martin; Dehmel, Rudiger; Higgen, Hans-Hermann; and Gulzow, Andreas, 4,899,104, Cl. 324-158.00F.

Higuchi, Masao: *See—*
Fujita, Michiru; and Higuchi, Masao, 4,899,108, Cl. 324-318.000.

Hijikata, Toshiki: *See—*
Yano, Seiki; and Hijikata, Toshiki, 4,899,359, Cl. 372-44.000.

Hiki, Susumu: *See—*
Takano, Masayuki; Hiki, Susumu; and Kikuti, Yuusiti, 4,898,177, Cl. 128-662.030.

Hikita, Makoto: *See—*
Tamamura, Toshiaki; Katsuta; Niwa, Osamu; Hikita, Makoto; and Sugita, Akio, 4,898,766, Cl. 428-195.000.

Hille, Arvin A., to Blount, Inc. Low vibration center drive cutter chain. 4,898,057, Cl. 83-831.000.

Hilti Aktiengesellschaft: *See—*
Froehlich, Peter, 4,898,505, Cl. 411-55.000.
Neumaier, Anton; Plank, Uto; and Rumpp, Gerhard, 4,898,250, Cl. 173-48.000.

Hilty, Terrence K., to Dow Corning Corporation. Method to prepare thermo-oxidatively stable phenylmethylsiloxane fluids. 4,898,956, Cl. 556-401.000.

Himes, Glenn R.: *See—*
Sanders, Andrea; and Himes, Glenn R., 4,898,784, Cl. 428-412.000.

Hinchcliffe, Dennis; Labbe, Francis A. M.; Molins, Desmond W.; and Wiese, Paul R., to Molins PLC. Cigarette manufacture. 4,898,187, Cl. 131-284.000.

Hinckley, Roger L., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber connector. 4,898,446, Cl. 350-96.200.

Hineno, Kazuhiro: *See—*
Kamioka, Yosio; Hineno, Kazuhiro; and Kanazawa, Tuneo, 4,898,268, Cl. 198-345.000.

Hippocrates, Exarchou. Motor, pump and flow meter with a planetary system. 4,898,525, Cl. 418-227.000.

Hirabayashi, Keiji: *See—*
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

Hirabayashi, Tsugio; and Hamanaka, Izumi, to Konica Corporation. Copy paper processing apparatus. 4,898,372, Cl. 270-53.000.

Hirai, Masato, to Hitachi, Ltd. Time division multiplexer with automatic call function. 4,899,337, Cl. 370-80.000.

Hirai, Yoshikatsu: *See—*
Nakai, Satoru; Kaneta, Mayumi; Kikumoto, Yoshikazu; Hong, Yeong-Man; Kawai, Kazuyoshi; Takegata, Setsuko; Ishii, Kiyoshi; Yanagihara, Yasuo; and Hirai, Yoshikatsu, 4,898,818, Cl. 435-69.100.

Hiramitsu, Tetsushi: *See—*
Ohno, Satoshi; and Hiramitsu, Tetsushi, 4,899,020, Cl. 174-68.500.

Hirano, Tetsuji: *See—*
Inoue, Hiroshi; Muramatsu, Tadao; Narahara, Yasuji; and Hirano, Tetsuji, 4,898,753, Cl. 427-276.000.

Hirata, Mitsuteru: *See—*
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; Onogi, Kazuhiro; and Nagakura, Masahiko, 4,898,876, Cl. 544-391.000.

Hirata, Shinji; and Horinishi, Katsumi, to West Electric Company Ltd.; and Canon, Inc. Electroluminescence light emission apparatus. 4,899,086, Cl. 315-169.300.

Hirayama, Koji: *See—*
Aiyama, Fumihiko; and Hirayama, Koji, 4,898,039, Cl. 74-6.000.

Hirota, Takato: *See—*
Ohtake, Shigeaki; Kogawa, Kuniyuki; and Hirota, Takato, 4,899,120, Cl. 335-132.000.

Hishinuma, Kazuhiro, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,899,049, Cl. 250-327.200.

Hitachi, Ltd.: *See—*
Aoyagi, Yuuji; Yokoyama, Syouji; and Yanagita, Tomohiko, 4,898,484, Cl. 400-120.000.
Hirai, Masato, 4,899,337, Cl. 370-80.000.
Imai, Tsutomu; and Sengoku, Norio, 4,899,251, Cl. 361-346.000.
Kano, Kiyoshi; Kaku, Nobuyuki; Osawa, Atsuo; Fujimori, Shinya; and Fukagawa, Yoshihiro, 4,899,235, Cl. 360-85.000.
Kuroda, Michio; Sato, Isao; Ishibashi, Yoji; Uchiyama, Yoshihiro; Ohmori, Takashi; Akatsu, Shigeyuki; Kato, Fumio; Segawa, Yorihide; and Iizuka, Nobuyuki, 4,898,001, Cl. 60-733.000.
Miyamoto, Kazuhisa; Miyaoka, Shuuichi; and Odaka, Masanori, 4,899,314, Cl. 365-226.000.
Morishita, Koichi; Yokoyama, Tetsuo; and Sato, Kazuhiro, 4,899,393, Cl. 382-6.000.
Nakayashiki, Susumu; Kashio, Jiro; Harakawa, Takeshi; Bekki, Yoshinori; and Yamaga, Mitsuhiro, 4,899,142, Cl. 340-825.050.
Ochiai, Izumi; Miyagi, Masahiro; Nozawa, Yoshio; and Kitayama, Yukio, deceased, 4,898,232, Cl. 165-151.000.
Okuyama, Kousuke, 4,898,840, Cl. 437-41.000.
Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 4,899,273, Cl. 364-200.000.
Onari, Mikihiko; Sekozawa, Teruji; and Funabashi, Motohisa, 4,899,280, Cl. 364-431.050.
Sakurai, Kazuo; and Tamura, Takahiro, 4,898,521, Cl. 418-55.000.
Sato, Katsuyuki, 4,899,312, Cl. 365-230.090.
Stormberg, Hans-Peter; and Watanabe, Yoshio, 4,899,355, Cl. 378-34.000.

Hitachi Medical Corporation: *See—*
Morishita, Koichi; Yokoyama, Tetsuo; and Sato, Kazuhiro, 4,899,393, Cl. 382-6.000.

Hitachi Video Engineering, Inc.: *See—*
Kano, Kiyoshi; Kaku, Nobuyuki; Osawa, Atsuo; Fujimori, Shinya; and Fukagawa, Yoshihiro, 4,899,235, Cl. 360-85.000.

Hite, William H.; and Allebach, Gene E., to National Machinery Company, The. Quick-change tooling for progressive formers and the like. 4,898,017, Cl. 72-405.000.

Hitoshio, Akio; Takamatsu, Hisao; and Hattori, Reiko, to Showa Denko Kabushiki Kaisha. Process for production of isomaltulose. 4,898,820, Cl. 435-95.000.

Ho, Vu Q., to Northern Telecom Limited. Method of filling contact holes for semiconductor devices and contact structures made by that method. 4,898,841, Cl. 437-200.000.

Hodgkins, David H.; and Shinkevich, Alex, to Stanadyne Automotive Corp. Fuel filter with heater. 4,898,668, Cl. 210-180.000.

Hoechst AG: *See—*
Stankowiak, Achim; and Schulz, Hildegard, 4,898,992, Cl. 568-618.000.

Hoechst Aktiengesellschaft: *See—*
Bergmann, Andreas; Bartmann, Wilhelm; Beck, Gerhard; and Lau, Hans-Hermann, 4,898,868, Cl. 514-277.000.
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Jagers, Erhard; and Kohl, Georg, 4,898,966, Cl. 560-38.000.
Muchnik, Boris J.; and Fischer, Bernd F., 4,898,529, Cl. 425-542.000.
Schlafer, Ludwig; Springer, Hartmut; and Hahnle, Reinhard, 4,898,933, Cl. 534-605.000.
Schwaiger, Gunther; Springer, Hartmut; and Helmling, Walter, 4,898,944, Cl. 544-337.000.
Voigt, Hartmut; and Freudenreich, Reinhold, 4,898,645, Cl. 203-67.000.

Hoechst Celanese Coproration: *See—*
Swofford, Howard W., 4,898,786, Cl. 428-480.000.

Hoechst Celanese Corporation: *See—*
Borzo, Marie; and Stuetz, Dagobert E., 4,898,691, Cl. 252-589.000.
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,898,454, Cl. 350-350.00R.
Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., 4,898,755, Cl. 427-389.700.
Chenevey, Edward C.; and Kafchinski, Edward R., 4,898,924, Cl. 528-183.000.
Collins, George L.; Wissbrun, Kurt F.; and Kim, Hongkyu, 4,898,925, Cl. 528-230.000.
Gupta, Balaram B. G., 4,898,916, Cl. 525-344.000.
Sansone, Michael J., 4,898,917, Cl. 525-420.000.

Hoeffkes, Horst; Seidel, Kurt; Giede, Karl; Struve, Alfred; and Gruber, Bert, to Henkel Kommanditgesellschaft auf Aktien. Preparations for washing or rinsing hair containing di- or tri- carboxylic acids. 4,898,725, Cl. 424-70.000.

Hoekstra, George P.; Sood, Lal C.; and Alexander, Samuel E., to Motorola, Inc. Bit line precharge in a bimos ram. 4,899,317, Cl. 365-203.000.

Hofer, Peter: *See—*
Miller, Ronald B.; Halpern, Alfred; Leslie, Stewart; and Hofer, Peter, 4,898,729, Cl. 424-80.000.

Hoffarth, Rainer. Device for displaying graphic information. 4,898,536, Cl. 434-114.000.

Hoffman-La Roche Inc.: *See—*
Baggiolini, Enrico G.; Hennessy, Bernard M.; and Uskokovic, Milan R., 4,898,855, Cl. 514-167.000.

Hoffman, Ronald W. Container stand. 4,898,352, Cl. 248-96.000.

Hoffmann-La Roche Inc.: *See—*
Buchecker, Richard; Germann, Alfred; Kelly, Stephen; and Schadt, Martin, 4,898,455, Cl. 350-350.00R.
Chan, Ka-kong; and Saucy, Gabriel G., 4,898,953, Cl. 549-408.000.
Chan, Ka-kong; and Saucy, Gabriel G., 4,898,962, Cl. 558-58.000.
Morgan, James I.; Spector, Sydney; and Wang, James K. T., 4,898,861, Cl. 514-221.000.

Hofmann, Hans; and Wendt, Hartmut, to Messerschmitt-Boelkow-Blohm GmbH. Method for bonding a porous metal layer to a cermet surface. 4,898,699, Cl. 264-43.000.

Hofmann, Peter: *See—*
Lueders, Harald; and Hofmann, Peter, 4,898,934, Cl. 536-18.600.

Hofmann, Robert F.; and Waldock, David B., to Duckworth & Kent Surgical Instruments Limited; and Medical Titanium Corporation. Surgical knife. 4,898,170, Cl. 606-166.000.

Hogenkamp, Wilhelm; and Wostbrock, Gert, to Otto Hansel GmbH. Wrapper for tubular products, especially chocolate bars and method of manufacturing it. 4,897,983, Cl. 53-461.000.

Hohenecker, Harald, to Aari Cine & Video Gerate Gesellschaft M.b.H. Macrolens assembly having a distance adjustment of more than 360 degrees. 4,898,453, Cl. 350-255.000.

Holcblat, Alain, to Framatome. Water cleansing tank for steam generator. 4,898,123, Cl. 122-379.000.

Holcombe, Cressie E., Jr.; and Chapman, Lloyd R., to ZTP Coatings. Paintable composition for protecting metals and ceramics during thermal treatment. 4,898,618, Cl. 106-287.340.

Holik, Herbert: *See—*
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.

Holland, William D.: *See—*
Leone, David A.; Moody, G. Lawrence; Holland, William D.; Bell, Mark E.; and Robbins, W. Dale, 4,899,022, Cl. 200-50.00A.

Hollandse Signaalapparaten B.V.: *See—*
Buikema, Wolter, 4,899,113, Cl. 328-258.000.

Holler, Tod P.: *See—*
Shapiro, Bennett M.; Turner, Eric E.; Hopkins, Paul B.; Klevit, Rachel E.; Holler, Tod P.; and Spaltenstein, Andreas, 4,898,878, Cl. 514-386.000.

Hollinger, Theodore G., to APC-Onsite, Inc. Frequency-dependent single-phase to three-phase AC power conversion. 4,899,268, Cl. 363-4.000.

Hollingsworth, Walter H.: *See—*
Sachs, Howard G.; Cho, James Y.; and Hollingsworth, Walter H., 4,899,275, Cl. 364-200.000.

Hollweck, Walter, to Thermostat-und Schaltgeraetebau GmbH & Co. KG. Thermally controlled electric switch. 4,899,124, Cl. 337-299.000.

Holmes, Michael, to Lucas Industries public limited company. Method and apparatus for controlling an internal combustion engine. 4,899,282, Cl. 364-431.080.

Holmwood, Graham: *See—*
Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, 4,898,875, Cl. 514-383.000.

Holoubek, George H.; Rhoades, John J.; and Whitaker, George P., to Wheeling Stamping Company. Method for shaping closed bottom of tubular container. 4,898,708, Cl. 264-515.000.

Holtje, Bruce E., to Imagitek, Inc. Feed device with automatic sheet alignment. 4,898,375, Cl. 271-246.000.

Hon, Clarence C., to Mobil Oil Corp. Circulating water system and sump pump strainer apparatus. 4,898,513, Cl. 415-121.200.

Honda Giken Kogyo K. K.: *See—*
Fujimoto, Sachito; and Sugino, Takuya, 4,898,143, Cl. 123-571.000.

Honda Giken Kogyo K.K.: *See—*
Sanada, Makoto; Yamashita, Hiroshi; Izawa, Shinichiro; and Hamamoto, Toshikazu, 4,898,131, Cl. 123-90.440.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Kenmochi, Toshihisa; and Nakamura, Tatsunori, 4,898,419, Cl. 296-204.000.
Kurihara, Junichi; and Hara, Masanori, 4,898,764, Cl. 428-188.000.

Honda, Keiji: *See—*
Nakamura, Naohiro; Mori, Yoshikatsu; and Honda, Keiji, 4,898,500, Cl. 407-62.000.

Honda, Shuichi: *See—*
Ichikawa, Toru; Kodama, Shuichi; Kagoroku, Nobuo; Ito, Shotaro; and Honda, Shuichi, 4,898,003, Cl. 62-244.000.

Honda, Yoshihiro: *See—*
Masuoka, Shigeru; Doi, Hiroshi; and Honda, Yoshihiro, 4,898,895, Cl. 523-122.000.

Honeywell Inc.: *See—*
Black, Robert A., Jr.; and Kompelien, Arlon D., 4,899,088, Cl. 315-291.000.

Braun, Steve W., 4,898,565, Cl. 455-612.000.
Dawson, John F.; and Ronish, Edward W., 4,899,293, Cl. 364-521.000.
Dunaway, Thomas J.; Spielberger, Richard K.; and Dicks, Lori A., 4,898,320, Cl. 228-245.000.
Jordan, Norman M.; and McLaughlin, Donald, 4,898,097, Cl. 102-283.000.
Jungkman, David L.; Comey, David M.; Stern, Ronald D.; and Musicant, Bruce L., 4,898,435, Cl. 350-1.100.

Hong, Yeong-Man: *See—*
Nakai, Satoru; Kaneta, Mayumi; Kikumoto, Yoshikazu; Hong, Yeong-Man; Kawai, Kazuyoshi; Takegata, Setsuko; Ishii, Kiyoshi; Yanagihara, Yasuo; and Hirai, Yoshikatsu, 4,898,818, Cl. 435-69.100.

Honjou, Toshio: *See—*
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, 4,898,801, Cl. 430-106.600.

Hoots, John E.: *See—*
Johnson, Donald A.; Hoots, John E.; Fong, Dodd W.; and Crucil, Guy A., 4,898,686, Cl. 252-389.200.

Hoover, John W.; and Marracino, Charles R., to Nidec Corporation. Molded printed circuit board for use with a brushless electric motor. 4,898,759, Cl. 428-99.000.

Hopkins, Larry K.; Fischer, Gregory J.; and Green, David G., to Golden Aluminum Company. Apparatus for aligning and transporting containers. 4,898,270, Cl. 198-396.000.

Hopkins, Paul B.: *See—*
Shapiro, Bennett M.; Turner, Eric E.; Hopkins, Paul B.; Klevit, Rachel E.; Holler, Tod P.; and Spaltenstein, Andreas, 4,898,878, Cl. 514-386.000.

Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus having adjustable optical system. 4,899,193, Cl. 355-55.000.

Hori, Hisamitsu, to Fuji Photo Film Co., Ltd. Method of and device for detecting image. 4,899,194, Cl. 355-56.000.

Horii, Satoshi; and Fukase, Hiroshi, to Takeda Chemical Industries, Ltd. Inosose derivatives, production and use thereof. 4,898,986, Cl. 568-376.000.

Horikoshi, Yukio: *See—*
Sakamaki, Hiroshi; Horikoshi, Yukio; and Jinnouchi, Takeshi, 4,898,526, Cl. 418-257.000.

Horinishi, Katsumi: *See—*
Hirata, Shinji; and Horinishi, Katsumi, 4,899,086, Cl. 315-169.300.

Horn, Petr, to Novasina AG. Apparatus and method for the measuring of dew points. 4,898,475, Cl. 374-28.000.

Horowitz, Carl; Sanduja, Mohan; and Dichter, Michael, deceased (by Dichter, Anna, heir), to Puro Corporation of America. Bacteriostatic activated carbon filter. 4,898,676, Cl. 210-668.000.

Horowitz, Fred: *See—*
Lesser, Norman; and Horowitz, Fred, 4,898,088, Cl. 98-49.000.

Horrobin, David F., to Efamol Limited. Pharmaceutica and dietary compositions. 4,898,885, Cl. 514-560.000.

Horsch, Joachim, to J. I. Case Company. Hydraulically actuated indexing mechanism. 4,898,075, Cl. 91-477.000.

Horstermann, Peter: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Jagers, Erhard; and Kohl, Georg, 4,898,966, Cl. 560-38.000.

Horton, Roger L., to Davidson Textron Inc. Rotational slush molding method. 4,898,697, Cl. 264-37.000.

Hoshin Kagaku Sangyosho Co., Ltd.: *See—*
Koji, Masashi, 4,899,057, Cl. 250-436.000.

Hoshino Gakki Co., Ltd.: *See—*
Hoshino, Yoshihiro, 4,898,062, Cl. 84-422.300.

Hoshino, Masahiro; Kobayashi, Isao; Seko, Kenji; Iwasawa, Naozumi; Akaki, Yuu; and Kondo, Toshio, to Kansai Paint Co., Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Electrodeposition coating process of photoresist for printed circuit board. 4,898,656, Cl. 204-181.100.

Hoshino, Yoshihiro, to Hoshino Gakki Co., Ltd. High hat stand with a rotary member. 4,898,062, Cl. 84-422.300.

Hosoda, Yoshikazu: *See—*
Onouchi, Takashi; Sugai, Hironori; Sekiguchi, Kazuo; Hosoda, Yoshikazu; and Yoshida, Eiichi, 4,898,781, Cl. 428-402.220.

Hosokawa, Yasutoshi: *See—*
Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000

Hosoya, Tsuguharu, to Nihon Kohden Corporation. Structure for installing a recording pen. 4,899,177, Cl. 346-139.00R.

Hosten, Daniel, to Siemens Aktiengesellschaft. Electroplating apparatus for plate-shaped workpieces. 4,898,657, Cl. 204-198.000.

Hotchkiss, Robert L.: *See—*
McCullough, Francis P., Jr.; Hotchkiss, Robert L.; Snelgrove, R. Vernon; Hall, David M.; and McCullough, Jacqueline R., 4,898,783, Cl. 428-408.000.

Houston, David L. Press brake deflection compensating device. 4,898,015, Cl. 72-389.000.

Houston, Theodore W., to Texas Instruments Incorporated. Low-power, noise-resistant read-only memory. 4,899,315, Cl. 365-230.060.

Hovakeemian, George: *See—*
Lahaih, Shawqui; and Hovakeemian, George, 4,898,908, Cl. 524-593.000.

Hove, Robert G., to Boeing Company, The. Apparatus and method for adaptive amplitude equalization. 4,899,365, Cl. 375-13.000.

Howa Machinery, Ltd.: *See—*
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Williams, Bruce E., 4,898,945, Cl. 546-95.000.
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Mintel, Thomas E.: *See*—
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Mita, Hiroshi *See*—
Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, 4,898,617, Cl. 106-281.100.
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Gatturna, Roland F.; Nicholson, James E., and O'Leary, James, 4,898,156, Cl. 606-72.000.
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Aikawa, Masatoshi; Nakagawa, Hiromasa; and Umeki, Tsunenori, 4,899,066, Cl. 307-45.200.
Hoshino, Masahiro; Kobayashi, Isao; Seko, Kenji; Iwasawa, Naozumi; Akaki, Yuu; and Kondo, Toshio, 4,898,656, Cl. 204-181.100.
Itai, Kosaku, 4,899,250, Cl. 361-341.000.
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Kitamura, Yutaka, 4,898,038, Cl. 74-6.000.
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Matsumura, Mitsuie; Tanaka, Toshihide; Urushibata, Hiroaki; and Sato, Kazunao, 4,898,793, Cl. 429-38.000.
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Mitsubishi Gas Chemical Company, Inc.: *See*—
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Taujimura, Osamu; Arai, Tatsuo; Nakayama, Masaaki; and Okawa, Masayuki, 4,898,499, Cl. 407-42.000.
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Mitsubishi Petrochemical Co., Ltd.: *See*—
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Mitsubishi Rayon Co., Ltd.: *See*—
Yamamoto, Naoki; Mori, Hiroshi; Nakata, Akira, and Suehiro, Misayo, 4,898,918, Cl. 525-425.000.
Mitsuhashi, Susumu: *See*—
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Miyajima, Toshikazu: *See*—
Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, 4,898,095, Cl. 102-201.000.
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Kaneko, Kiyotaka; Miyake, Izumi; Oda, Kazuya; Nakane, Yoshio; and Shimaya, Hiroshi, 4,899,212, Cl. 358-29.000.
Miyama, Takao: *See*—
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Miyazaki, Yasunobu; Saito, Tohru; and Nakamura, Taizo, to Nippon Steel Corporation. High-power-density beam welding method in combination with upset welding and apparatus therefor. 4,899,030, Cl. 219-121.630.
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Mizushima, Katsuhiko: *See*—
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Mlodzikowski, Allan G.; Tsui, Yih-Pyng; and Ku, Hai-Pin, to Koss Corporation. Infrared stereo speaker system. 4,899,388, Cl. 381-77.000.
Mobay Corporation: *See*—
Slack, William E., 4,898,971, Cl. 560-359.000.
Mobil Oil Corp.: *See*—
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Chu, Pochen; Dwyer, Francis G.; and Schwartz, Albert B., 4,899,007, Cl. 585-467.000.
Chu, Yung F.; Kresge, Charles T.; and LaPierre, Rene B., 4,899,011, Cl. 585-481.000.
Derouane, Eric G.; and von Ballmoos, Roland, 4,898,722, Cl. 423-328.000.

Harandi, Mohsen N.; and Owen, Hartley, 4,899,002, Cl. 585-312.000.
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Hon, Clarence C., 4,898,513, Cl. 415-121.200.
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,898,716, Cl. 422-190.000.
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Jennings, Alfred R., Jr.; and Shu, Paul, 4,898,242, Cl. 166-285.000.
LaPierre, Rene B.; and Morrison, Roger A., 4,899,008, Cl. 585-467.000.
Medlin, W. L., 4,899,319, Cl. 367-35.000.
Min, Taeik; and Touhsaent, Robert E., 4,898,782, Cl. 428-407.000.
Min, Taeik; and Touhsaent, Robert E., 4,898,787, Cl. 428-480.000.
Solanki, J. J., 4,899,321, Cl. 367-48.000.
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Mohrmann, Karl-Heinrich: *See—*
Gallenkamp, Bernd; Gunther, Andreas; Mohrmann, Karl-Heinrich; and Schmidt, Thomas, 4,898,979, Cl. 564-418.000.

Mohsen, Amr M.: *See—*
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Molex Incorporated: *See—*
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Molins, Desmond W.: *See—*
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Molyneux, Ian: *See—*
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Monsanto Company: *See—*
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Montagna, John A.; Irving, Gary; Farrell, Lee; Cross, Gerald; and Miller, Stephen A., to Image Storage/Retrieval Systems, Inc. System for storing and retrieving text and associated graphics. 4,899,292, Cl. 364-521.000.

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Moore, Danny R.; Owens, James W.; and Schoggen, Howard L., to Procter & Gamble Cellulose Company, The. Twisted, chemically stiffened cellulosic fibers and absorbent structures made therefrom. 4,898,642, Cl. 162-157.600.

Morales, Lou, to Standard Microsystems Corporation. Active delay line circuit. 4,899,071, Cl. 307-605.000.

Morel, Simone, to Societe de Conseils et D'Etudes Des Emballages S.C.E.E. Closing device for containers. 4,898,293, Cl. 215-250.000.

Morgan Construction Company: *See—*
Simmons, Thomas E., 4,898,479, Cl. 384-130.000.

Morgan, James I.; Spector, Sydney; and Wang, James K. T., to Hoffmann-La Roche Inc. Method for inhibiting the proliferation of tumor cells. 4,898,861, Cl. 514-221.000.

Mori, Hiroshi: *See—*
Yamamoto, Naoki; Mori, Hiroshi; Nakata, Akira; and Suehiro, Misayo, 4,898,918, Cl. 525-425.000.

Mori, Kei. Light radiation device for use in medical treatment. 4,898,438, Cl. 350-96.100.

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Mori, Masaharu: *See—*
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Mori, Masahito: *See—*
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Mori, Shigeto: *See—*
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Mori, Takashi: *See—*
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Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizo, to Mitsui Toatsu Chemicals, Incorporated. Methods for purification of single-chain and double-chain tissue plasminogen activator. 4,898,825, Cl. 435-212.000.

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Kobari, Toshiaki, 4,898,635, Cl. 156-245.000.

Morin, Wilfred W., Jr.; and Wasser, Barry, to International Business Machines Corporation. High accuracy coordinate conversion method for air traffic control applications. 4,899,161, Cl. 342-451.000.

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Morita, Hideki; Sugawara, Kazuhiro; Hung, Pe-Chieh; Hara, Hirotaka; Nakamura, Tadashi; Kobayashi, Kazuyuki; Azuma, Masashi; and Katsuta, Tsuyoshi, to Konishiroku Photo Industry Co., Ltd. Color image recording apparatus. 4,899,215, Cl. 358-78.000.

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Morozumi, Shinji; Misawa, Toshiyuki; and Nakazawa, Yoshio, to Seiko Epson Corporation. Matrix panel with an active driving system. 4,899,141, Cl. 340-784.000.

Morra, Luigi, to Industrie Riunite SpA. System for measuring the height above ground level of vehicles. 4,898,027, Cl. 73-118.100.

Morris, David S.: *See—*
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Morris, Francis J.; and Evans, Stephen A., to Texas Instruments Incorporated. Method for fabricating a poly emitter logic array. 4,898,838, Cl. 437-31.000.

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Morris, John M.; Gabrlik, Zdenek; and Green, Charles J., to GT Development Corporation. Breakaway fluid coupling. 4,898,199, Cl. 137-68.100.

Morris, William, to Morris, William. Condiment container and dispenser. 4,898,305, Cl. 222-142.500.

Morrison, Douglas C.: *See—*
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Morse, John B., to Polaroid Corporation. Disk cartridge with hub seal. 4,899,244, Cl. 360-133.000.

Moschel, Charles C., to Beloit Corporation. Controlled deflection roll using inert gasses and independent lubrication system. 4,897,905, Cl. 29-116.200.

Moscovich, Ivan. Mirror pattern forming amusement device. 4,898,560, Cl. 446-85.000.

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Gorodissky, Boris P.; Lotts, Jury A.; and Veretenov, Lev N., 4,898,262, Cl. 184-6.400.

Moskowitz, Ronald: *See—*
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Moss, Ernest. Stay-in-place pacifier. 4,898,171, Cl. 606-236.000.

Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, to Dainippon Ink & Chemicals, Inc.; and Taisei Road Construction Co., Ltd. Working material for construction or repair. 4,898,617, Cl. 106-281.100.

Motor Wheel Corporation: *See—*
LaVoy, Warren J., 4,897,909, Cl. 29-894.325.

Motorola Inc.: *See—*
Case, Maxwell H.; Hartzell, Lawrence M., and Currier, David W., 4,899,255, Cl. 361-386.000.
Hoekstra, George P.; Sood, Lal C.; and Alexander, Samuel E., 4,899,317, Cl. 365-203.000.
Marchant, Jeffrey D., 4,899,159, Cl. 342-90.000.

Mount, Houston B., II, to Amoco Corporation. Macroview and microview video record of core. 4,899,219, Cl. 358-107.000.

MTS Minitunnelsysteme GmbH: *See—*
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Muchnik, Boris J.; and Fischer, Bernd F., to Hoechst Aktiengesellschaft. Apparatus for molding magneto-optic substrates. 4,898,529, Cl. 425-542.000.

Muessel, Dan C.: *See—*
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Mundy, Philip C. Seat belt kit for wheelchairs. 4,898,425, Cl. 297-444.000.

Murai, Yasushi *See—*
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Murakami, Tsutomu; and Kanai, Masahiro, to Canon Kabushiki Kaisha. Apparatus for forming functional deposited film by microwave plasma CVD process. 4,898,118, Cl. 118-723.000.

Muramatsu, Akira: *See—*
Konishi, Masahiro; Inuiya, Masafumi; Muramatsu, Akira; and Kato, Masahiro, 4,899,213, Cl. 358-44.000.

Muramatsu, Ichiro: *See—*
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Muramatsu, Tadao: *See—*
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Murphy, Joseph M.: *See—*
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Murphy, Patrick: *See—*
Berson, William; Gluck, Julius; Murphy, Patrick, Smith, Christopher D., and Tran, Duc H., 4,899,172, Cl. 346-76.0PH.

Murray, Gordon A.; Golobic, Robert A.; and Derrickson, Stephan G., to Spectranetics Corporation, The. Gas bearings for gas lasers. 4,899,363, Cl. 372-65.000.

Murray, William V.; and Wachter, Michael P., to Ortho Pharmaceutical Corporation. Regioselective synthesis of a 1,5-disubstituted pyrazole. 4,898,952, Cl. 548-378.000.

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Musicant, Bruce L.: *See—*
Jungkman, David L.; Comey, David M.; Stern, Ronald D.; and Musicant, Bruce L., 4,898,435, Cl. 350-1.100.

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Nagahama, Fumio; Kakimoto, Norihiro; and Miyao, Kohei, to Asai Germanium Research Institute. Resistance imparting agent for cold syndrome of low pulmonary function patients. 4,898,882, Cl. 514-492.000.

Nagahara, Hiroshi: *See—*
Nakamura, Shingo; and Nagahara, Hiroshi, 4,898,935, Cl. 536-119.000.

Nagahori, Hitoshi: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Sugiyama, Mitsuo; Saito, Fujio; Koike, Hiroyuki; Oshima, Takeshi; Simoji, Yasuo; and Nagahori, Hitoshi, 4,898,862, Cl. 514-236.200.

Nagai, Tomoaki; Yamanashi, Hideyuki; and Hachimori, Hideo, to Adeka Fine Chemical Co., Ltd.; and Asahi Denka Kogyo Kabushiki Kaisha. Binder composition for injection molding. 4,898,902, Cl. 524-275.000.

Nagakura, Masahiko: *See—*
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; Onogi, Kazuhiro; and Nagakura, Masahiko, 4,898,876, Cl. 544-391.000.

Nagami, Akira, to NEC Corporation. Semiconductor memory device having serial writing scheme. 4,899,316, Cl. 365-189.010.

Nagano, Eiki *See—*
Haga, Toru; Nagano, Eiki; Morita, Kouichi; and Sato, Ryo, 4,898,948, Cl. 548-171.000.

Nagasawa, Kiyoto: *See—*
Shibata, Isamu; Asai, Takahiro; Nagasawa, Kiyoto; and Asada, Kenichirou, 4,899,344, Cl. 372-29.000.

Nagase, Mamoru: *See—*
Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000.

Nagashima, Akira: *See—*
Aoai, Toshiaki; Aoshima, Keitaro; and Nagashima, Akira, 4,898,803, Cl. 430-191.000.

Nagashima, Shigeo: *See—*
Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 4,899,273, Cl. 364-200.000.

Nagata, Kouji: *See—*
Iizuka, Yunosuke; Ishii, Takashi; Mukawa, Yoshihiro; Nagata, Kouji; Matsumoto, Yoshitaka; and Murakami, Osamu, 4,899,277, Cl. 364-422.000.

Nakabayashi, Yasushi, to Seiko Instruments Inc. Initial value setting system for electronic device. 4,899,353, Cl. 377-28.000.

Nakadate, Takanori: *See—*
Kiyohara, Kazuto; Yamazaki, Toshiaki; Harada, Ichiya; Nakadate, Takanori; Noguchi, Kentaro; Nakano, Michiteru; Sakae, Shigeru; and Okuma, Kazuhiro, 4,898,897, Cl. 523-343.000.

Nakagawa, Hiromasa: *See—*
Aikawa, Masatoshi; Nakagawa, Hiromasa; and Umeki, Tsunenori, 4,899,066, Cl. 307-45.200.

Nakagawa, Takayuki: *See—*
Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 4,899,273, Cl. 364-200.000.

Nakahara, Yutaka; and Tobita, Etsuo, to Adeka Argus Chemical Co., Ltd. Poly(2,2,6-tetramethyl piperidyl amino)-1,3,5-triazines as stabilizers for synthetic polymer compositions. 4,898,688, Cl. 252-400.240.

Nakai, Akira: *See—*
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; and Nakai, Akira, 4,898,939, Cl. 540-310.000.

Nakai, Satoru; Kaneta, Mayumi; Kikumoto, Yoshikazu; Hong, Yeong-Man; Kawai, Kazuyoshi; Takegata, Setsuko; Ishii, Kiyoshi; Yanagihara, Yasuo; and Hirai, Yoshikatsu, to Otsuka Pharmaceutical Co., Ltd. Antitumor active substance, process for preparing the same, drug containing the substance, gene coding for the substance, vector containing the gene and recombinant microorganism. 4,898,818, Cl. 435-69.100.

Nakajima, Hideyuki: *See—*
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Okamura, Keiichiro; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,898,723, Cl. 423-447.400.

Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, to Omron Tateisi Electronics Co. Connector built from one or more single rowed housings, with long lasting locking mechanism. 4,898,549, Cl. 439-701.000.

Nakamichi Corporation: *See—*
Inoue, Yoshihisa; and Arai, Yasunori, 4,899,238, Cl. 360-99.060.

Nakamura, Naohiro; Mori, Yoshikatsu; and Honda, Keiji, to Sumitomo Electric Industries, Ltd. Ball end mill with throw away insert. 4,898,500, Cl. 407-62.000.

Nakamura, Shigeo, to Fanuc Ltd. Pre-drive circuit. 4,899,065, Cl. 307-270.000.

Nakamura, Shigeo: *See—*
Yokoi, Takeshi; Nakamura, Shigeo; and Yamanaka, Hiroshi, 4,898,488, Cl. 400-642.000.

Nakamura, Shingo; and Nagahara, Hiroshi, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Method of producing sucrose fatty acid ester granules. 4,898,935, Cl. 536-119.000.

Nakamura, Tadashi: *See—*
Morita, Hideki; Sugawara, Kazuhiro; Hung, Pe-Chieh; Hara, Hirotaka; Nakamura, Tadashi; Kobayashi, Kazuyuki; Azuma, Masashi; and Katsuta, Tsuyoshi, 4,899,215, Cl. 358-78.000.

Nakamura, Taizo: *See—*
Miyazaki, Yasunobu; Saito, Tohru; and Nakamura, Taizo, 4,899,030, Cl. 219-121.630.

Nakamura, Tatsunori: *See—*
Kenmochi, Toshihisa; and Nakamura, Tatsunori, 4,898,419, Cl. 296-204.000.

Nakamura, Tatsuo: *See—*
Ikada, Yoshito; Suong, Hyu H.; Shimizu, Yoshihiko; Watanabe, Satoshi; Nakamura, Tatsuo; Suzuki, Masakazu; and Shimamoto, Takeshi, 4,898,186, Cl. 606-62.000.

Nakamura, Yoshio: *See—*
Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.

Nakane, Yoshio: *See—*
Kaneko, Kiyotaka; Miyake, Izumi; Oda, Kazuya; Nakane, Yoshio; and Shimaya, Hiroshi, 4,899,212, Cl. 358-29.000.

Nakano, Haruo: *See—*
Saeki, Takashi; Nii, Takayuki; Fukui, Hirotake; Mishina, Toshiro; Nakano, Haruo; and Sakakibara, Hitoshi, 4,899,158, Cl. 342-44.000.

Nakano, Michiteru: *See—*
Kiyohara, Kazuto; Yamazaki, Toshiaki; Harada, Ichiya; Nakadate, Takanori; Noguchi, Kentaro; Nakano, Michiteru; Sakae, Shigeru; and Okuma, Kazuhiro, 4,898,897, Cl. 523-343.000.

Nakata, Akira: *See—*
Yamamoto, Naoki; Mori, Hiroshi; Nakata, Akira; and Suehiro, Misayo, 4,898,918, Cl. 525-425.000.

Nakata, Takashi: *See—*
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,899,193, Cl. 355-55.000.

Nakayama, Masaaki: *See*—
Tsujimura, Osamu; Arai, Tatsuo; Nakayama, Masaaki; and Okawa, Masayuki, 4,898,499, Cl. 407-42.000.

Nakayama, Misayo, to NEC Corporation. Arithmetic unit for inverse trigonometric function. 4,899,302, Cl. 364-729.000.

Nakayama, Okihiko; Itoh, Toshiyuki; and Mizushima, Katsuhiko, to Nissan Motor Company, Limited. System and method for measuring a position of a moving object with a hybrid navigation apparatus. 4,899,285, Cl. 364-453.000.

Nakayashiki, Susumu; Kashio, Jiro; Harakawa, Takeshi; Bekki, Yoshinori; and Yamaga, Mitsuhiro, to Hitachi, Ltd. Ring network system and configuration control method. 4,899,142, Cl. 340-825.050.

Nakazawa, Yoshio: *See*—
Morozumi, Shinji; Misawa, Toshiyuki, and Nakazawa, Yoshio, 4,899,141, Cl. 340-784.000.

Nalco Chemical Company: *See*—
Gross, Anthony E., 4,898,611, Cl. 75-3.000.
Johnson, Donald A.; Hoots, John E.; Fong, Dodd W., and Crucil, Guy A., 4,898,686, Cl. 252-389.200.

Nalge Company: *See*—
Leoncavallo, Richard A.; Kover, Linda J., and Phillips, Gregory R., 4,898,278, Cl. 206-443.000.

Narahara, Yasuji: *See*—
Inoue, Hiroshi; Muramatsu, Tadao; Narahara, Yasuji; and Hirano, Tetsuji, 4,898,753, Cl. 427-276.000.

Narasawa, Takashi: *See*—
Edakubo, Hiroo; Itani, Takashi; Narasawa, Takashi; Ushiro, Tatsuzo; Watanabe, Hiroshi; and Hasegawa, Masahide, 4,899,236, Cl. 360-95.000.

Naruo, Nomura: *See*—
Kazuo, Ogawa; Ichiro, Yamawaki; Yoichi, Matsushita; Naruo, Nomura; and Issei, Okazaki, 4,898,867, Cl. 514-258.000.

Narutomi, Yuji; Katsumata, Manabu; Osawa, Yasuko; and Uchikuga, Saburo, to Sogo Pharmaceutical Company Limited. Pyrroloquinoline quinone compounds useful as an enzyme inhibitor. 4,898,870, Cl. 514-292.000.

Nashua Corporation: *See*—
Kang, Ming-Huang J., 4,898,849, Cl. 503-214.000.

Natansohn, Samuel: *See*—
Rourke, William J.; Lai, Wen-Chao; and Natansohn, Samuel, 4,898,719, Cl. 423-21.500.

National Gypsum Company: *See*—
Menchetti, Robert J., 4,897,978, Cl. 52-363.000.

National Machinery Company, The: *See*—
Hite, William H.; and Allebach, Gene E., 4,898,017, Cl. 72-405.000.

National Research Development Corporation: *See*—
Cottenden, Alan [illegible] 4,898,594, Cl. 604-397.000.

National Semiconductor Corp.: *See*—
Needles, William M., 4,899,305, Cl. 364-787.000.

National Starch and Chemical Corporation: *See*—
Brase, Ingrid E., 4,898,677, Cl. 210-701.000.

Nayuki, Shin-ichi: *See*—
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Okamura, Keiichiro; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,898,723, Cl. 423-447.400.

NCR Corporation: *See*—
Brull, Robert A.; Del Signore, James R., II; and Walker, Alan H., 4,898,487, Cl. 400-354.000.
Coffey, James B.; and Gwynn, Leslie B., 4,898,322, Cl. 229-69.000.

Neagle, Stuart L.: *See*—
Gage, Douglas M.; and Neagle, Stuart L., 4,898,078, Cl. 91-524.000.

NEC Corporation: *See*—
Endo, Hiroshi; Suzuki, Takao; Komoto, Mitsuo; Uekido, Kouzou; and Tokaichi, Tetsuro, 4,898,545, Cl. 439-578.000.
Ichikawa, Masako; and Mitome, Yukio, 4,899,386, Cl. 381-43.000.
Kage, Kouzou, 4,899,330, Cl. 375-52.000.
Kimura, Masayuki, 4,899,303, Cl. 364-739.000.
Kuwahara, Yoshihiko, 4,899,160, Cl. 342-408.000.
Nagami, Akira, 4,899,316, Cl. 365-189.010.
Nakayama, Misayo, 4,899,302, Cl. 364-729.000.
Nishitani, Takao; Kawakami, Yuichi; Tanaka, Hideo; and Kuroda, Ichiro, 4,899,301, Cl. 364-726.000.
Numai, Takahiro, 4,899,361, Cl. 372-50.000.
Shimada, Keiko, 4,899,380, Cl. 379-389.000.
Shimizu, Haruhito, 4,898,441, Cl. 350-96.140.
Tomimitsu, Yasuharu, 4,899,341, Cl. 371-37.600.

Nederlandse Organisatie voor Toegepastnatuurwetenschappelijk Onderzoek TNO: *See*—
Rappoldt, Louis M.; and DeHaan, Peter H., 4,898,105, Cl. 110-245.000.

Needles, William M., to National Semiconductor Corp. Manchester carry adder circuit. 4,899,305, Cl. 364-787.000.

Neidorff, Robert A., to Unitrode Corporation. Absolute value differential amplifier. 4,899,064, Cl. 307-261.000.

Neilsen, Hildaur L. Adjustable multiple paper punch. 4,898,055, Cl. 83-571.000.

Nelson, David W.: *See*—
Lewis, George E.; Thomasson, Robert E.; and Nelson, David W., 4,899,284, Cl. 364-435.000.

Nelson, George C., to Cyclonaire Corporation. Injector valve. 4,898,208, Cl. 137-614.200.

Nelson, Robert J.: *See*—
Karger, Barry L.; Paulus, Aran, Cohen, Aharon S.; and Nelson, Robert J., 4,898,658, Cl. 204-299.00R.

Ness, Ronald J.: *See*—
Weigand, Francis K.; Ness, Ronald J.; and Koerner, Michael S., 4,898,000, Cl. 60-740.000.

Nestork, William J.: *See*—
Dietsch, Hans E.; and Nestork, William J., 4,899,208, Cl. 357-74.000.

Neuhaus, Klaus, to Eduard Wille GmbH u. Co. Torque wrench. 4,898,068, Cl. 81-483.000.

Neukermans, Armand P.: *See*—
Vaught, John L.; Neukermans, Armand P.; Keldermann, Herman F.; and Koenig, Franklin R., 4,898,471, Cl. 356-394.000.

Neumaier, Anton; Plank, Uto; and Rumpp, Gerhard, to Hilti Aktiengesellschaft. Hand-held tool with switching means for variable operation. 4,898,250, Cl. 173-48.000.

Neuwirth, Helmuth, to Porta Systems Corp. Identification strip and holder for telephone connector blocks. 4,899,376, Cl. 379-327.000.

New York University: *See*—
Musacchio, Jose M.; and Tortella, Frank C., 4,898,860, Cl. 514-215.000.

Newell, Edwin R.; and Franks, Terry E., to Square D Company. Fiber optic switching system. 4,898,445, Cl. 350-96.200.

Newman, David A.; Laubengayer, William R.; and Scott, William B., Jr., to Eastman Kodak Company. Method of making LED array printhead with tab bonded wiring. 4,899,174, Cl. 346-107.00R.

Newman, David A., to Eastman Kodak Company. High density tape-automated bonding (TAB) of electronic components. 4,899,185, Cl. 346-155.000.

Newsome, John R. High speed signature manipulating apparatus. 4,898,373, Cl. 270-58.000.

Newton, Ronald R.: *See*—
Norman, Daniel A.; Newton, Ronald R.; Nicholas, Glenn V.; Bellofatto, Steven; and Onody, Stephen K., 4,898,169, Cl. 606-42.000.

Ng, Steve Y.: *See*—
Heller, Jorge; Penhale, Donald W. H.; and Ng, Steve Y., 4,898,928, Cl. 528-392.000.

NGK Insulators, Ltd.: *See*—
Yajima, Yasuhito; and Watanabe, Yasushi, 4,898,035, Cl. 73-727.000.

Nguyen, Luu Thanh: *See*—
Ledermann, Peter G.; and Nguyen, Luu Thanh, 4,898,117, Cl. 118-665.000.

Nicholas, Glenn V.: *See*—
Norman, Daniel A.; Newton, Ronald R.; Nicholas, Glenn V.; Bellofatto, Steven; and Onody, Stephen K., 4,898,169, Cl. 606-42.000.

Nicholson, James E.: *See*—
Gatturna, Roland F.; Nicholson, James E.; and O'Leary, James, 4,898,156, Cl. 606-72.000.

Nicol, Alexander C., to University of Strathclyde. Electrical angular displacement sensor. 4,897,927, Cl. 33-534.000.

Nicollini, Germano, to SGS-Thomson Microelectronics s.r.l. Integrated active low-pass filter of the first order. 4,899,069, Cl. 307-520.000.

Nidec Corporation: *See*—
Hoover, John W.; and Marracino, Charles R., 4,898,759, Cl. 428-99.000.

Nieda, Yasuhiro: *See*—
Kimura, Mitsutoshi; and Nieda, Yasuhiro, 4,899,085, Cl. 315-116.000.

Nieter, Jeffrey J.; and DeBlois, Raymond L., to United Technologies Corporation. Method of and arrangement for reducing bearing loads in scroll compressors. 4,898,520, Cl. 418-1.000.

Nihon Kohden Corporation: *See*—
Hosoya, Tsuguharu, 4,899,177, Cl. 346-139.00R.

Nihongi, Shigeru: *See*—
Sekiyama, Shigeo; Nihongi, Shigeru; and Mogami, Sadatoshi, 4,897,998, Cl. 60-614.000.

Nii, Takayuki: *See*—
Saeki, Takashi; Nii, Takayuki; Fukui, Hirotake; Mishina, Toshiro; Nakano, Haruo, and Sakakibara, Hitoshi, 4,899,158, Cl. 342-44.000.

Niikura, Yasuhiro, to Nissan Motor Co., Ltd. Electro-hydraulic control for reducing engagement shock in an automatic transmission. 4,898,049, Cl. 74-866.000.

Nikko Co., Ltd.: *See*—
Ishimoto, Zenichi, 4,898,562, Cl. 446-460.000.

Ninomiya, Hiroshi: *See*—
Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, 4,898,549, Cl. 439-701.000.

Nippon Cable System Inc.: *See*—
Baba, Masanao, 4,898,045, Cl. 74-471.00R.

Nippon Hypox Laboratories Incorporated: *See*—
Sato, Toshio; Matsumoto, Hitoshi; and Kakegawa, Hisao, 4,898,890, Cl. 514-685.000.

Nippon Iron Powder Co., Ltd.: *See*—
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, 4,898,801, Cl. 430-106.600.

Nippon Kayaku Kabushiki Kaisha: *See*—
Ishikura, Tsukasa; and Fukushima, Tatuharu, 4,898,996, Cl. 568-938.000.

Nippon Oil Co., Ltd.: *See*—
Ushio, Masaru; and Okazaki, Hajime, 4,898,661, Cl. 208-117.000.

Nippon Oil and Fats Co., Ltd.: *See*—
Masuoka, Shigeru; Doi, Hiroshi; and Honda, Yoshihiro, 4,898,895, Cl. 523-122.000.

Nippon Oil and Fats Company, Limited and Kajima Corporation: *See*—
Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, 4,898,095, Cl. 102-201.000.

Nippon Petrochemicals Co. Ltd.: *See*—
Kawakami, Shigenobu; Endo, Keiji, Doi, Hideyuki, and Sato, Atsushi, 4,899,009, Cl. 585-471.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Igarashi, Tomoharu; Yokote, Yoshiniro; and Yamamoto, Kazuo, 4,898,492, Cl. 280-804.000.
Osawa, Nobuyuki, 4,898,478, Cl. 384-45.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Minami, Kenji; Yatagai, Hidetaka; and Sano, Yoshinori, 4,898,788, Cl. 428-481.000.

Nippon Soken, Inc.: *See*—
Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.

Nippon Steel Corporation: *See*—
Miyazaki, Yasunobu; Saito, Tohru; and Nakamura, Taizo, 4,899,030, Cl. 219-121.630.
Oka, Joji, and Nishioka, Ryoji, 4,898,775, Cl. 428-336.000.

Nippon Telegraph and Telephone: *See*—
Osaka, Takaaki; Matsui, Norio; Susaki, Shinichi; and Egawa, Yutaka, 4,897,918, Cl. 29-830.000.

Nippon Telegraph and Telephone Corporation: *See*—
Ohta, Masataka, 4,899,072, Cl. 310-49.00R.
Ooba, Yuji; Sugihara, Shigeo; Masumori, Tadaaki, and Shiwa, Shinichi, 4,899,224, Cl. 358-332.000.
Tamamura, Toshiaki; Katsuta; Niwa, Osamu, Hikita, Makoto; and Sugita, Akio, 4,898,766, Cl. 428-195.000.

Nippondenso Co., Ltd.: *See*—
Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.
Shibata, Hiroshi; Machara, Fuyuki, Shintai, Akira, and Kato, Hidetoshi, 4,899,209, Cl. 357-74.000.
Shiga, Syoji; Matsuda, Akira; Shibata, Nobuyuki, and Akasaka, Kiichi, 4,898,318, Cl. 228-183.000.
Takeuchi, Muneo; Kinbara, Hiroji; and Tsuruta, Masafumi, 4,899,073, Cl. 310-116.000.

Nishihata, Ken: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Kudo, Toshiaki; Yoshida, Takashi; Nishihata, Ken; and Kondo, Shinichi, 4,898,858, Cl. 514-206.000.

Nishikiori, Hiroshi: *See*—
Ohe, Takeshi; Taniguchi, Yoshiaki; and Nishikiori, Hiroshi, 4,898,258, Cl. 180-79.100.

Nishimori, Kadotaro: *See*—
Ito, Masazumi; Nishimori, Kadotaro, and Oyabu, Masaaki, 4,899,140, Cl. 340-756.000.

Nishimura, Eiji; Nobumoto, Kazutoshi; Matsuoka, Toshihiro; Tsuyama, Toshiaki; and Sotoyama, Kaoru, to Mazda Motor Corporation. Engine control apparatus. 4,898,138, Cl. 123-399.000.

Nishimura, Makoto; Nonaka, Takashi; Uenishi, Isao; and Goto, Tamotsu. Highly shrinkable substantially acrylic filament yarn. 4,897,990, Cl. 57-247.000.

Nishimura, Shigeru: *See*—
Ueki, Noriyuki; and Nishimura, Shigeru, 4,898,207, Cl. 137-539.000.

Nishioka, Ryoji: *See*—
Oka, Joji; and Nishioka, Ryoji, 4,898,775, Cl. 428-336.000.

Nishitani, Takao; Kawakami, Yuichi; Tanaka, Hideo, and Kuroda, Ichiro, to NEC Corporation. Signal processor for rapidly calculating a predetermined calculation a plurality of times to typically carrying out FFT or inverse FFT. 4,899,301, Cl. 364-726.000.

Nishizeki, Masato: *See*—
Tachibana, Noriki; Nishizeki, Masato; and Kagawa, Nobuaki, 4,898,808, Cl. 430-510.000.

Nissan Motor Company, Limited: *See*—
Futami, Tohru; and Takeuchi, Mikio, 4,898,010, Cl. 70-278.000.
Kitayama, Tooru; and Ohtani, Toshiya, 4,898,139, Cl. 123-425.000.
Nakayama, Okihiko; Itoh, Toshiyuki; and Mizushima, Katsuhiko, 4,899,285, Cl. 364-453.000.
Niikura, Yasuhiro, 4,898,049, Cl. 74-866.000.
Takeuchi, Kiyoshi, 4,898,024, Cl. 73-115.000.

Nisson Motor Co., Ltd.: *See*—
Kataoka, Sachiro; Yamamoto, Yukio; and Okai, Saburo, 4,899,083, Cl. 315-77.000.

Nitta, Jiro, to Kabushiki Kaisha Neriki. Gas-cylinder valve. 4,898,210, Cl. 137-614.190.

Nitto Kohki Co., Ltd.: *See*—
Saito, Masayuki; and Kazama, Yasuo, 4,898,370, Cl. 269-91.000.

Niven, Benjamin F., Jr.; and Mays, Charles D., to R. J. Reynolds Tobacco Company. Tobacco Processing. 4,898,188, Cl. 131-296.000.

Niwa, Osamu: *See*—
Tamamura, Toshiaki; Katsuta; Niwa, Osamu; Hikita, Makoto; and Sugita, Akio, 4,898,766, Cl. 428-195.000.

NKK Corporation: *See*—
Iwasa, Hiroki; Watanabe, Toyofumi; and Furuya, Hirohide, 4,898,649, Cl. 204-28.000.
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshi; Mori, Takashi; and Okimoto, Kazutaka, 4,898,226, Cl. 168-415.000.

Noble, David: *See*—
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 4,898,821, Cl. 435-119.000.

Noble, Hazel M.: *See*—
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 4,898,821, Cl. 435-119.000.

Nobumoto, Kazutoshi: *See*—
Nishimura, Eiji; Nobumoto, Kazutoshi; Matsuoka, Toshihiro; Tsuyama, Toshiaki; and Sotoyama, Kaoru, 4,898,138, Cl. 123-399.000.

Noda, Akihiko: *See*—
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, 4,898,801, Cl. 430-106.600.

Noehren, William L.: *See*—
Beno, Edward A.; and Noehren, William L., 4,898,515, Cl. 416-134.00A.

Noguchi, Kentaro: *See*—
Kiyohara, Kazuto; Yamazaki, Toshiaki; Harada, Ichiya; Nakadate, Takanori; Noguchi, Kentaro; Nakano, Michiteru; Sakae, Shigeru; and Okuma, Kazuhiro, 4,898,897, Cl. 523-343.000.

Noguchi, Toshiaki, to Olympus Optical Co., Ltd. Out-body observing apparatus. 4,898,175, Cl. 128-634.000.

NOK Corporation: *See*—
Kawase, Ritsuo, 4,898,395, Cl. 277-207.00A.

Nomura, Etsuzo; Takeuchi, Hirokazu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, to Kogyo Kabushiki Kaisha. Pattern-matching sewing machine. 4,898,110, Cl. 112-314.000.

Nomura, Kenichiro: *See*—
Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, 4,898,617, Cl. 106-281.100.

Nonaka, Takashi: *See*—
Nishimura, Makoto; Nonaka, Takashi; Uenishi, Isao; and Goto, Tamotsu, 4,897,990, Cl. 57-247.000.

Nonweiler, Brian R. G., to Quantel Limited. Video signal processing. 4,899,295, Cl. 364-522.000.

Nordica S.p.A.: *See*—
Sartor, Mariano, 4,897,940, Cl. 36-119.000.

Nordson Corporation: *See*—
Byerly, David J.; Frates, Paul S.; and Scholl, Charles H., 4,898,302, Cl. 222-49.000.

Norman, Daniel A.; Newton, Ronald R.; Nicholas, Glenn V.; Bellofatto, Steven; and Onody, Stephen K., to Boston Scientific Corporation. Medical instrument for therapy of hemorrhoidal lesions. 4,898,169, Cl. 606-42.000.

Norris, Alan H. Living space ventilation. 4,898,086, Cl. 98-33.100.

Norris, Annie B. Flying insect container guard. 4,898,298, Cl. 220-90.200.

Norris, Jerome J.: *See*—
Jones, Frank A., Jr., 4,898,542, Cl. 439-371.000.

North American Philips Consumer Electronics Corp.: *See*—
Day, James C., 4,898,556, Cl. 445-36.000.
Miller, William G., 4,899,221, Cl. 358-167.000.

North American Philips Corporation: *See*—
Basile, Carlo; Cavallerano, Alan P.; and Tsinberg, Mikhail, 4,899,220, Cl. 358-141.000.

Northeastern University: *See*—
Karger, Barry L.; Paulus, Aran; Cohen, Aharon S.; and Nelson, Robert J., 4,898,658, Cl. 204-299.00R.

Northern Telecom Limited: *See*—
Ho, Vu Q., 4,898,841, Cl. 437-200.000.

Northrop Corporation: *See*—
Perkins, Harley A., 4,899,346, Cl. 372-32.000.

Norton Company: *See*—
Hay, John; Markhoff-Matheny, Carole J.; and Swanson, Brian E., 4,898,597, Cl. 51-298.000.

Nottingham, John R.; and Spirk, John. Self-inflating toy. 4,898,561, Cl. 446-220.000.

Nottingham, William D.: *See*—
Jones, Glenn C.; and Nottingham, William D., 4,898,969, Cl. 560-187.000.

Novasina AG: *See*—
Horn, Petr, 4,898,475, Cl. 374-28.000.

Nozawa, Masaei: *See*—
Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.

Nozawa, Yoshio: *See*—
Ochiai, Izumi; Miyagi, Masahiro; Nozawa, Yoshio; and Kitayama, Yukio, deceased, 4,898,232, Cl. 165-151.000.

Nozeran, Jean-Marc: *See*—
Grimaud, Jean-Michel; and Nozeran, Jean-Marc, 4,899,281, Cl. 364-431.040.

Nugent, Walter J., to Walter Locks Pty Ltd. Lock. 4,898,011, Cl. 70-379.00R.

Numai, Takahiro, to NEC Corporation. Optical filter device. 4,899,361, Cl. 372-50.000.

Numata, Ken-ichi: *See*—
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,898,940, Cl. 540-460.000.

Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Device for detecting a transmissivity of a substance. 4,898,462, Cl. 356-70.000.

Numbers, Jody L.: *See*—
Lakoski, Robert P.; and Numbers, Jody L., 4,898,009, Cl. 70-58.000.

Nyman, William F.: *See—*
Plut, Leonard F.; and Nyman, William F., 4,899,357, Cl. 378-148.000.

NYNEX: *See—*
Kondziela, James M., 4,899,369, Cl. 379-101.000

Nyquist, Jeffery A.: *See—*
Willard, Mark L.; Beatty, David E.; and Nyquist, Jeffery A., 4,898,528, Cl. 425-185.000.

Oates, Robert M.: *See—*
Hansen, J. Richard; Asars, Juris A., and Oates, Robert M., 4,899,044, Cl. 250-227.000.

Obata, Shuichi: *See—*
Takewa, Hiroyuki; Serikawa, Mitsuhiko; Ishikawa, Seiichi; Usuki, Sawako; Kimura, Yoichi; and Obata, Shuichi, 4,899,390, Cl. 381-154.000.

Ocello, Dennis M.; and Taylor, Harry L., to Ocello Tool & Die Co Portable door lock. 4,898,411, Cl. 292-292.000.

Ocello Tool & Die Co.: *See—*
Ocello, Dennis M.; and Taylor, Harry L., 4,898,411, Cl. 292-292.000.

Ochiai, Izumi; Miyagi, Masahiro; Nozawa, Yoshio; and Kitayama, Yukio, deceased (by Kitayama, Yuko, Midori Kitayama, Takahisha Kitayama, successors), to Hitachi, Ltd. Heat exchanger and process for producing the same. 4,898,232, Cl. 165-151.000.

O'Connor, Lawrence J., to KT Technologies Inc. Cable shielding tape and cables incorporating such tape. 4,898,640, Cl. 156-204.000.

Oda, Kazuya: *See—*
Kaneko, Kiyotaka; Miyake, Izumi; Oda, Kazuya; Nakane, Yoshio; and Shimaya, Hiroshi, 4,899,212, Cl. 358-29.000.

Oda, Yukio: *See—*
Maruyama, Toshio; Oda, Yukio; and Yamaguchi, Syoji, 4,897,967, Cl. 51-165.870.

Odajima, Katsuhiko; and Ikehata, Motoshige, to Shoketsu Kinzohu Kogyo Kabushiki Kaisha. Electropneumatic transducer. 4,898,200, Cl. 137-85.000.

Odaka, Kentaro; Ozaki, Shinya; Yamada, Masaki; Ishibashi, Hiroshi; and Inazawa, Yoshizumi, to Sony Corporation. Apparatus for recording and/or reproducing digital data information. 4,899,232, Cl. 360-48.000.

Odaka, Masanori: *See—*
Miyamoto, Kazuhisa; Miyaoka, Shuuichi; and Odaka, Masanori, 4,899,314, Cl. 365-226.000.

Odawara, Kazuharu: *See—*
Ishii, Masaru; and Odawara, Kazuharu, 4,899,328, Cl. 369-77.200.

Odenthal, Conrad J., to Tektronix, Inc. Cathode-ray-tube astigmatism correction apparatus. 4,899,091, Cl. 315-382.000.

ODL, Incorporated: *See—*
Artwick, Kert E.; Wilkening, Steven R.; and Pallin, Leslie L., 4,897,975, Cl. 52-208.000.

Oefner, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Insert for a sandwich structure. 4,898,756, Cl. 428-34.100.

Office National d'Etudes et de Recherche Aerospatiales: *See—*
Appel, Jean, 4,899,289, Cl. 364-484.000.

Ogasawara, Katsura: *See—*
Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, 4,898,095, Cl. 102-201.000.

Ogata, Seishiro; and Taki, Katsumi, to Sumitomo Heavy Industries, Ltd. Planetary reduction gear. 4,898,065, Cl. 475-179.000.

Ogawa, Hiroaki: *See—*
Baba, Fumio; Kobayashi, Kazuya; Enomoto, Seiji; and Ogawa, Hiroaki, 4,899,310, Cl. 365-189.050.

Ogawa, Hiroyasu: *See—*
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Okamura, Keiichiro; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,898,723, Cl. 423-447.400.

Ogden, Frank J.: *See—*
Clark, Maxwell J.; McMillan, Roy; and Ogden, Frank J., 4,898,251, Cl. 175-27.000.

Ogihara, Masahiro; Makikawa, Shinji; and Iguchi, Masaaki, to Shin-Etsu Chemical Co., Ltd. Single crystal wafer of lithium tantalate. 4,898,641, Cl. 156-601.000.

Ogino, Akihiko: *See—*
Fukahori, Yoshihide; Kojima, Hiromu; Ogino, Akihiko; Suzuki, Shigenobu; and Yoshizawa, Toshikazu, 4,899,323, Cl. 367-176.000.

Oglevee, J. Robert; and Craig, Richard, to Oglevee, Ltd.; and Research Corporation Technologies, Inc., a part interest. Precision flowering of regal pelargoniums (*pelargonium xdomesticum*). 4,897,957, Cl. 47-58.000.

Oglevee, Ltd.: *See—*
Oglevee, J. Robert; and Craig, Richard, 4,897,957, Cl. 47-58.000.

Oguchi, Yoshihiro: *See—*
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, to Onoda Cement Co., Ltd.; and Tosoh Corporation. Process for producing fluorinated esters. 4,898,970, Cl. 560-236.000.

Ogura, Mitsuhiro, to Hewlett Packard Company. Personality board. 4,899,106, Cl. 324-158.00F.

Ogura, Tokihiko; Mizoguchi, Yoshiyuki; Ikeda, Keiichi; and Taguchi, Tomishige, to Canon Kabushiki Kaisha. Thermal printer. 4,899,171, Cl. 346-76.0PH.

Oh, Ki Tae, to Goldstar Co., Ltd. Automatic cooking control system for a microwave oven. 4,899,026, Cl. 219-10.55M.

Ohashi, Masahiko: *See—*
Kitoh, Osamu; and Ohashi, Masahiko, 4,898,630, Cl. 156-79.000.

Ohashi, Takehisa: *See—*
Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.

Ohe, Takeshi; Taniguchi, Yoshiaki; and Nishikiori, Hiroshi, to Jidosha Kiki Co., Ltd. Electric power steering apparatus. 4,898,258, Cl. 180-79.100.

Ohmori, Takashi: *See—*
Kuroda, Michio; Sato, Isao; Ishibashi, Yoji; Uchiyama, Yoshihiro; Ohmori, Takashi; Akatsu, Shigeyuki; Kato, Fumio; Segawa, Yorihide; and Iizuka, Nobuyuki, 4,898,001, Cl. 60-733.000.

Ohmori, Toshitaka, to Olympic Co., Ltd. Rotary electric tool. 4,898,249, Cl. 173-12.000.

Ohno, Motoshi: *See—*
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,899,193, Cl. 355-55.000.

Ohno, Satoshi; and Hiramitsu, Tetsushi, to Toyoda Gosei Co., Ltd. Printed wiring unit for horn switch. 4,899,020, Cl. 174-68.500.

Ohoka, Masaharu: *See—*
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizo, 4,898,825, Cl. 435-212.000.

Ohta, Masataka, to Nippon Telegraph and Telephone Corporation. Pulse motor. 4,899,072, Cl. 310-49.00R.

Ohtake, Shigeaki; Kogawa, Kuniyuki; and Hirota, Takato, to Fuji Electric Co., Ltd. Electromagnetic contactor. 4,899,120, Cl. 335-132.000.

Ohtani, Toshiya: *See—*
Kitayama, Tooru; and Ohtani, Toshiya, 4,898,139, Cl. 123-425.000.

Ohtsuka, Isao: *See—*
Kishino, Takao; Katayama, Minoru; Yano, Kazuyuki; and Ohtsuka, Isao, 4,899,081, Cl. 313-496.000.

Ohtsuka, Tatsumi: *See—*
Oikawa, Takahiro; Suzuki, Yoshiyuki; and Ohtsuka, Tatsumi, 4,898,031, Cl. 73-505.000.

Ohya, Jun: *See—*
Fujita, Toshihiro; Ohya, Jun; Matsuda, Kenichi; and Serizawa, Hiroyuki, 4,899,360, Cl. 372-50.000.

Oikawa, Takahiro; Suzuki, Yoshiyuki; and Ohtsuka, Tatsumi, to Yazaki Corporation. Vibrational angular velocity sensor. 4,898,031, Cl. 73-505.000.

Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,898,338, Cl. 242-198.000.

Oka, Joji; and Nishioka, Ryoji, to Nippon Steel Corporation. Paint coated metal sheets. 4,893,775, Cl. 428-336.000.

Oka, Masahisa: *See—*
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,898,940, Cl. 540-460.000.

Okada, Kazuichi: *See—*
Arai, Akihiko; Okada, Kazuichi; Kamo, Tetsuo; and Shiota, Eiji, 4,899,028, Cl. 219-10.493.

Okada, Shinjiro; Taniguchi, Osamu; Tsuboyama, Akira; and Enari, Masahiko, to Canon Kabushiki Kaisha. Liquid crystal optical device. 4,898,456, Cl. 350-350.00S.

Okai, Saburo: *See—*
Kataoka, Sachiro; Yamamoto, Yukio; and Okai, Saburo, 4,899,083, Cl. 315-77.000.

Okamoto, Masakatsu: *See—*
Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000.

Okamoto, Tsuneo; and Sakaguchi, Yasuo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Fluidized-bed activation furnace for activated carbon. 4,898,533, Cl. 432-58.000.

Okamoto, Tsutomu: *See—*
Tamada, Hitoshi; Kaneko, Masahiko; and Okamoto, Tsutomu, 4,898,440, Cl. 350-96.130.

Okamoto, Yasunari: *See—*
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.

Okamura, Keiichiro: *See—*
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Okamura, Keiichiro; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,898,723, Cl. 423-447.400.

Okamura, Masatoshi: *See—*
Hashizume, Kenji; Ikebe, Masaru; Okamura, Masatoshi; and Shiba, Haruo, 4,899,242, Cl. 360-132.000.

Okawa, Masayuki: *See—*
Tsujimura, Osamu; Arai, Tatsuo; Nakayama, Masaaki; and Okawa, Masayuki, 4,898,499, Cl. 407-42.000.

Okawa, Susumu: *See—*
Tatara, Yudai; Sato, Kiyoomi; Okawa, Susumu; and Jufuku, Yasunobu, 4,898,567, Cl. 474-174.000.

Okazaki, Hajime: *See—*
Ushio, Masaru; and Okazaki, Hajime, 4,898,661, Cl. 208-117.000.

Oki Electric Co., Ltd.: *See—*
Kitazawa, Shooji; Kuwabara, Hiroshi; and Harada, Teruhiro, 4,899,309, Cl. 365-189.010.

Oki Electric Industry Co., Ltd.: *See—*
Ino, Masayoshi, 4,899,203, Cl. 357-23.600.
Sato, Takuro; Shimazaki, Yoshihito; and Kawabe, Manabu, 4,899,148, Cl. 341-65.000.
Shimizu, Shogo, 4,899,334, Cl. 370-60.000

Oki, Yuji: *See—*
Yamamoto, Takehiko; Kubota, Terumasa; Itoh, Isao; Kato, Hiroyuki; Kikuchi, Terumi; Kawasaki, Hiroko; Mashimoto, Misako; and Oki, Yuji, 4,898,738, Cl. 426-17.000.

Okimoto, Kazutaka: *See—*
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshi; Mori, Takashi; and Okimoto, Kazutaka, 4,898,226, Cl. 168-415.000.

Okonogi, Tsuneo: *See—*
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Kudo, Toshiaki; Yoshida, Takashi; Nishihata, Ken; and Kondo, Shinichi, 4,898,858, Cl. 514-206.000.

Okoshi, Noboru: *See—*
Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitomi; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, 4,898,617, Cl. 106-281.100.

Oku, Masuo: *See—*
Ito, Junya; Chiba, Akihiko; Oku, Masuo; and Komada, Hitoshi, 4,897,933, Cl. 34-58.000.

Okuda, Hironori; and Matsubara, Takashi, to Shin Meiwa Industry Co., Ltd. Encoder and method of adjusting magnetic fields of the same. 4,899,145, Cl. 341-15.000.

Okuma, Kazuhiro: *See—*
Kiyohara, Kazuto; Yamazaki, Toshiaki; Harada, Ichiya; Nakadate, Takanori; Noguchi, Kentaro; Nakano, Michiteru; Sakae, Shigeru; and Okuma, Kazuhiro, 4,898,897, Cl. 523-343.000.

Okuyama, Kousuke, to Hitachi, Ltd. Semiconductor integrated circuit device and a method of producing the same. 4,898,840, Cl. 437-41.000

Old, Donald J.: *See—*
Moeller, Jon D.; and Old, Donald J., 4,898,016, Cl. 72-342.000.

Oldendorf, Christian; Melcher, Franz-Josef; and Berg, Christoph, to Sartorius GmbH. Electronic balance for dosing. 4,898,253, Cl. 177-25.130

O'Leary, James: *See—*
Gatturna, Roland F.; Nicholson, James E., and O'Leary, James, 4,898,156, Cl. 606-72.000.

Olesky, Edward R.: *See—*
Cochran, Ivan L., 4,898,552, Cl. 440-71.000.

Ollmann, James E.; and DePasquale, Ralph J., to PCR, Inc. 2-deoxyuridines and riboside precursors. 4,898,936, Cl. 536-17.100.

Olsson, John G.: *See—*
Wilk, Sven T.; and Olsson, John G., 4,899,131, Cl. 340-518.000.

Olympia Aktiengesellschaft: *See—*
Johannsen, Fred, 4,897,903, Cl. 29-25.350

Olympic Co., Ltd.: *See—*
Ohmori, Toshitaka, 4,898,249, Cl. 173-12.000

Olympus Optical Co., Ltd.: *See—*
Maruyama, Atsushi, 4,899,191, Cl. 354-421.000.
Noguchi, Toshiaki, 4,898,175, Cl. 128-634.000.
Uchiyama, Naoki; Shishido, Yoshio; and Ueda, Yasuhiro, 4,898,574, Cl. 604-22.000.

OMI International Corporation: *See—*
Bammel, Brian D.; Wieczerniak, Walter J., and Snell, Kenneth D., 4,898,552, Cl. 204-44.200.

Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, to Hitachi, Ltd. Circuit simulation method with clock event suppression for debugging LSI circuits. 4,899,273, Cl. 364-200.000.

Omron Tateisi Electronics Co.: *See—*
Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, 4,898,549, Cl. 439-701.000
Yamamoto, Masato, 4,899,257, Cl. 361-395.000

Omura, Haruo: *See—*
Kanda, Nobuo; Omura, Haruo; Abe, Yukihiro; and Kondo, Mitsuru, 4,898,941, Cl. 540-596.000.

Onari, Mikihiko; Sekozawa, Teruji; and Funabashi, Motohisa, to Hitachi, Ltd. Adaptive system for controlling an engine according to conditions categorized by driver's intent 4,899,280, Cl. 364-431.050.

Onishi, Yoichiro: *See—*
Takada, Mitsuyuki; Takasago, Hayato; and Onishi, Yoichiro, 4,898,805, Cl. 430-315.000.

Onoda Cement Company, Ltd.: *See—*
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, 4,898,970, Cl. 560-236.000.

Onody, Stephen K.: *See—*
Norman, Daniel A.; Newton, Ronald R.; Nicholas, Glenn V.; Bellofatto, Steven; and Onody, Stephen K., 4,898,169, Cl. 606-42.000.

Onogi, Kazuhiro: *See—*
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; Onogi, Kazuhiro; and Nagakura, Masahiko, 4,898,876, Cl. 544-391.000.

Onouchi, Takashi; Sugai, Hironori; Sekiguchi, Kazuo; Hosoda, Yoshikazu; and Yoshida, Eiichi, to Showa Denko K.K. Water-soluble microcapsules. 4,898,781, Cl. 428-402.220.

Ooba, Yuji; Sugihara, Shigeo; Masumori, Tadaaki; and Shiwa, Shinichi, to Nippon Telegraph and Telephone Corporation. Recording apparatus and method utilizing an array of liquid crystal cells. 4,899,224, Cl. 358-332.000.

Ooi, Satoru: *See—*
Meguro, Kanji; Fujita, Takeshi; Hatanaka, Chitoshi; and Ooi, Satoru, 4,898,947, Cl. 546-280.000.

Oppermann, Gunter; and Feld, Fritz, to Bayer Aktiengesellschaft. Sensor-controlled hydraulic system with electroviscous fluids. 4,898,084, Cl. 73-118.100.

Opresko, Stephen T., to RCA Licensing Corporation. Material deposition process analysis system. 4,898,746, Cl. 427-10.000.

Orlandi, Arthur A. Storage system and connector for the same. 4,898,286, Cl. 211-187.000.

Orr, Frederick W.: *See—*
Double, Paul B.; Orr, Frederick W.; and Dotterwick, Robert E., 4,897,970, Cl. 52-4.000.

Ortho Pharmaceutical Corporation: *See—*
Murray, William V.; and Wachter, Michael P., 4,898,952, Cl. 548-378.000.

Osabe, Kuniji: *See—*
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

Osada, Koji; Date, Haruyuki; Saihara, Yasuhiro; Yamauchi, Toshiyuki; and Koike, Shiro, to Matsushita Electric Works, Ltd. Deodorant and filter using same, as well as method of producing the deodorant. 4,898,727, Cl. 424-76.100.

Osaka, Takaaki; Matsui, Norio; Susaki, Shinichi; and Egawa, Yutaka, to Nippon Telegraph and Telephone. Method of manufacturing an interboard connection terminal. 4,897,918, Cl. 29-830.000.

Osato, Yoichi; Saito, Ichiro; and Takasu, Yoshio, to Canon Kabushiki Kaisha. Optical recording medium. 4,899,168, Cl. 346-1.100.

Osawa, Atsuo: *See—*
Kano, Kiyoshi; Kaku, Nobuyuki; Osawa, Atsuo; Fujimori, Shinya; and Fukagawa, Yoshihiro, 4,899,235, Cl. 360-85.000.

Osawa, Nobuyuki, to Nippon Seiko Kabushiki Kaisha. Linear guide apparatus. 4,898,478, Cl. 384-45.000.

Osawa, Yasuko: *See—*
Narutomi, Yuji; Katsumata, Manabu; Osawa, Yasuko; and Uchikuga, Saburo, 4,898,870, Cl. 514-292.000.

Osborne, William E., to Marlin Firearms Company, The. Firearm safety. 4,897,951, Cl. 42-70.060.

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Horowitz, Carl; Sanduja, Mohan; and Dichter, Michael, deceased, 4,898,676, Cl. 210-668.000.

QO Chemicals, Inc.: *See—*
Van Horn, Wendell E., 4,898,644, Cl. 203-15.000

Quakenbush, Laura S.: *See—*
Szucs, Stephen S.; Quakenbush, Laura S.; and Marc, Pierre A., 4,898,609, Cl. 71-105.000.

Quantel Limited: *See—*
Nonweiler, Brian R. G., 4,899,295, Cl. 364-522.000.

Quantum Group, Inc.: *See—*
Goldstein, Mark K.; and Dolnick, Earl M., 4,898,531, Cl. 431-12.000.

Quenneville, Raymond N.: *See—*
Meistrick, Zdenek S.; and Quenneville, Raymond N., 4,898,206, Cl. 137-512.300.

Quick-Rotan Elektromotoren GmbH: *See—*
Hulshoff, Hartmut; Kothe, Peter; Luft, Michael; and Schutz, Ulrich, 4,899,287, Cl. 364-470.000.

R. J. Reynolds Tabacco Company: *See—*
Deal, Philip A., 4,898,190, Cl. 131-336.000.

R. J. Reynolds Tobacco Company: *See—*
Niven, Benjamin F., Jr.; and Mays, Charles D., 4,898,188, Cl. 131-296.000.

R. R. Donnelley & Sons Company: *See—*
Podolak, J. B.; and Saluski, Ronald B., 4,899,146, Cl. 341-51.000.

Raasch, Hans; and Boker, Reinhard, to W. Schlafhorst & Co. Cleaning device for open end spinning rotor. 4,897,993, Cl. 57-302.000.

Rabiet, Jacques: *See—*
Bommier, Christophe; Gimenez, Philippe; Kucza, Jean-Claude; and Rabiet, Jacques, 4,898,646, Cl. 204-1.00T.

Raj, Kuldip; Gowda, Hanumaiah L.; and Moskowitz, Ronald, to Ferrofluidics Corporation. Compact ferrofluidic electrically conducting sealed bearing. 4,898,480, Cl. 384-446.000.

Rajan, John B.; Kumar, Romesh; and Vissers, Donald R., to United States of America, Energy. Process for direct conversion of reactive metals to glass. 4,898,692, Cl. 252-629.000.

Rakel, Jay O.: *See—*
Christensen, Stephen; and Rakel, Jay O., 4,898,754, Cl. 427-369.000.

Ramsay, Graham: *See—*
Turner, Anthony P. F.; Swain, Ann; Ramsay, Graham; Cardosi, Marco; and Schneider, Bernard H., 4,898,816, Cl. 435-34.000.

Ramun, John R., to Allied Gator Inc. Metal cutting shear with changeable multiple cutting edge portions. 4,897,921, Cl. 30-134.000.

Randhawa, Harbhajan S., to Vac-Fec Systems, Inc. Layered structure for adhering gold to a substrate and method of forming such. 4,898,768, Cl. 428-216.000.

Rankin, Bruce: *See—*
Failla, Charles C.; Pouring, Andrew A.; Rankin, Bruce; di Priolo, Carlo L.; McCowan, William; and Gosewisch, Dennis, 4,898,135, Cl. 123-263.000.

Rappoldt, Louis M.; and DeHaan, Peter H., to Nederlandse Organisatie voor Toegepastnatuurwetenschappelijk Onderzoek TNO. Filter device. 4,898,105, Cl. 110-245.000.

Rasch, Diane M.; and Fiedler, Lawrence D., to Dow Corning Corporation. Thermally stable fluorinated organosiloxane gel composition. 4,898,903, Cl. 524-398.000.

Raschella, Domenick L.: *See—*
Cavagna, Giancarlo A.; Groome, Ernest J.; Murphy, Joseph M.; and Raschella, Domenick L., 4,898,752, Cl. 427-265.000.

Rasmussen, Jerald K.: *See—*
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,898,923, Cl. 528-73.000.

Rassmussen GmbH: *See—*
Zeidler, Siegmund, 4,898,407, Cl. 285-328.000.

Rau, Harald: *See—*
Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, 4,898,772, Cl. 428-332.000.

Rauber, Walter: *See—*
Frey, Yvonne; Kutzli, Jorg; Rauber, Walter; Schmocker, Hans; and Tobler, Markus, 4,898,098, Cl. 102-334.000.

Raudabaugh, Donald E., to Hubbell Incorporated. Modular electrical assemblies with plastic film barriers. 4,899,248, Cl. 361-127.000.

Rauschenbach, Kurt; and Lee, Charles A., to Cornell Research Foundation. Self-aligned, high resolution resonant dielectric lithography. 4,898,804, Cl. 430-311.000.

Ravichandran, Ramanathan; Pastor, Stephen D.; Seltzer, Raymond; and Patel, Ambelal R., to Ciba-Geigy Corporation. Long chain N-alkyl-alpha-alkyl nitrones and polyolefin compositions stabilized therewith. 4,898,901, Cl. 524-237.000.

Ray, Roger E.: *See—*
Einolf, Charles W., Jr.; Shutterly, Harold B.; Sun, Shan C.; Gonnam, Russel W.; Ray, Roger E.; Koch, Karl C.; and Maynard-Nenno, Pamela M., 4,899,383, Cl. 380-48.000.

Raychem Limited: *See—*
Towle, Ian D. H., 4,898,983, Cl. 568-322.000.

Rayfield, Jerry W.; Baker, Robert; and Weber, Kenneth E., to ECCA Calcium Products, Inc. Dry ground/wet ground calcium carbonate filler compositions. 4,898,620, Cl. 106-464.000.

Raytheon Company: *See—*
Kliger, Isaac E.; and Beckerleg, Richard A., 4,898,340, Cl. 244-3.110.
Terzian, John, 4,898,341, Cl. 244-3.160.

Razzano, John S.: *See—*
Fitzgerald, Thomas H.; Razzano, John S.; and Stegman, Todd R., 4,898,898, Cl. 523-351.000.

RCA Licensing Corporation: *See—*
Opresko, Stephen T., 4,898,746, Cl. 427-10.000.

Reader, John R., Jr.: *See—*
Hendrick, Kendall B.; and Reader, John R., Jr., 4,899,102, Cl. 324-663.000.

Reading, Kirsten L.: *See—*
Baile, Gnaneshwar R.; McVannel, Donald E.; Reading, Kirsten L.; and Hall, Ginger L., 4,898,961, Cl. 556-479.000.

Rearigh, Alfred R. Identification card. 4,899,038, Cl. 235-493.000.

Reboul, Michel; and Glachet, Charles, to Commissariat A L'Energie Atomique; and Euritech. Connector device for two reactor containments. 4,897,963, Cl. 49-507.000.

Reckitt & Colman Products Limited: *See—*
Fox, Rodney T.; and Goreham, Philip W., 4,898,328, Cl. 239-6.000.

Redmond, Russell J.: *See—*
Borsanyi, Alexander S.; and Redmond, Russell J., 4,898,583, Cl. 604-153.000.
Borsanyi, Alexander S.; Redmond, Russell J.; Vidal, Claude A.; and Spaeth, Edmund E., 4,898,584, Cl. 604-153.000.

Reece, Vernon E. Sifter for use in separating dough balls from breading. 4,898,664, Cl. 209-235.000.

Reed, Jerry O.: *See—*
Yu, Michael C.; Scoggins, Lacey E.; and Reed, Jerry O., 4,898,904, Cl. 524-399.000.

Reed Tool Company Limited: *See—*
Barr, John D., 4,898,252, Cl. 175-379.000.

Reemay, Inc.: *See—*
Dunaway, Jerry A.; Zimmerman, Leon H.; and LaTondress, Nancy T., 4,898,761, Cl. 428-137.000.

Reichmann, Mark G.: *See—*
Amelse, Jeffrey A.; and Reichmann, Mark G., 4,899,010, Cl. 585-480.000.

Reif, Stefan: *See—*
Kicherer, Robert; Schreder, Felix; and Reif, Stefan, 4,899,033, Cl. 219-451.000.

Reilly, James L.; Huber, Ludwig K.; and Leader, Gordon R., to Pennwalt Corporation. Fluorine-containing dielectric media and capacitors employing such media. 4,899,249, Cl. 361-317.000.

Reinecke, Paul: *See—*
Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, 4,898,875, Cl. 514-383.000.

Reinhold, Albert, to Feinfocus Rontgensysteme GmbH. Roentgen lithography method and apparatus. 4,899,354, Cl. 378-34.000.

Reinker, Joseph F., Jr.: *See—*
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,898,211, Cl. 137-615.000.

Reinsch, James W.: *See—*
Albarella, James P.; Charlton, Steven C.; Reinsch, James W.; and Warchal, Mary E., 4,898,813, Cl. 435-4.000.

Reiser, Wolf: *See—*
Mohrmann, Karl H.; Reiser, Wolf; Linke, Siegfried W.; and Zerbes, Rudolf, 4,898,954, Cl. 549-519.000.

Reist, Walter, to Ferag AG. Apparatus for the continuous winding-up or winding-off of substantially flat structures into a package and from a package, respectively. 4,898,336, Cl. 242-59.000.

Reliance Comm/Tec Corporation: *See—*
Ayer, George E., 4,898,550, Cl. 439-718.000.

Remington, Robert W., to Wimer, Claude R., Jr., a part interest. Center of gravity holster. 4,898,310, Cl. 224-238.000.

Renaco AS: *See—*
Kristiansen, Cato, 4,898,273, Cl. 206-204.000.

Renishaw plc: *See—*
Pilborough, David I., 4,899,094, Cl. 318-567.000.

Reseal International Limited Partnership: *See—*
Pardes, Greg, 4,898,306, Cl. 222-206.000.

Research Corporation Technologies, Inc.: *See—*
Oglevee, J. Robert; and Craig, Richard, 4,897,957, Cl. 47-58.000.

Research Foundation of the State University of N.Y.: *See—*
Andors, Leonard, 4,898,590, Cl. 604-198.000.

Revel, Michel: *See—*
Lavie, David; Revel, Michel; Rotman, Dalia; and Velde, Vincent V., 4,898,891, Cl. 514-732.000.

Revis, Anthony: *See—*
Pleueddemann, Edwin P.; and Revis, Anthony, 4,898,957, Cl. 556-418.000.

Reynolds, Charles E. Portable working chute system. 4,898,121, Cl. 119-98.000.

Reynolds, Patricia A.: *See—*
Hershberger, Charles L.; Larson, Jeffrey L., and Reynolds, Patricia A., 4,898,828, Cl. 435-252.300.

Rheinmetall GmbH: *See—*
Gropp, Heiko U., 4,898,072, Cl. 89-45.000.

Rhoades, John J.: *See—*
Holoubek, George H.; Rhoades, John J.; and Whitaker, George P., 4,898,708, Cl. 264-515.000

Rhoades, Mark L.: *See—*
Bates, Keith A.; Budd, Russell A.; Habegger, Millard A.; and Rhoades, Mark L., 4,899,327, Cl. 369-45.000.

Rhone-Poulenc Sante: *See—*
Bourzat, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,898,871, Cl. 514-300.000.

Rhone-Poulenc Specialities Chimiques: *See—*
Linossier, Jean-Louis, 4,898,819, Cl. 435-93.000.

Rice, Wayne K.; and Singh, Laxman, to Vitamins, Inc. Dynamic supercritical fluid extraction system. 4,898,673, Cl. 210-634.000.

Riceman, Robert G., to Scheer, Donald J. Safety cover for electrical receptacles. 4,899,019, Cl. 174-67.000.

Rich, John W. Vehicle support assembly. 4,898,019, Cl. 72-461.000.

Richard Wolf GmbH: *See—*
Messroghli, Hossein; and Boebel, Manfred, 4,898,157, Cl. 606-147.000.

Richardson, James E. In-store refrigerated display system. 4,898,004, Cl. 62-255.000.

Richeson, Donald E.: *See—*
Wells, Hoyt M.; Determan, William J.; Vanis, Vernon V.; Hrivnak, John E.; Richeson, Donald E., and Saupe, Timothy P., 4,898,703, Cl. 264-166.000.

Richison, David E., to Richison Industries Incorporated. Adjustable fitting for fireplace insert flue connection. 4,898,154, Cl. 126-500.000.

Richison Industries Incorporated: *See—*
Richison, David E., 4,898,154, Cl. 126-500.000.

Richman, Philip: *See—*
Clark, Keith R.; and Richman, Philip, 4,899,016, Cl. 585-826.000.

Ricoh Company, Ltd.: *See—*
Hata, Daisuke, 4,899,190, Cl. 354-400.000.
Inoue, Motoichiro, 4,899,182, Cl. 346-153.100.
Kiya, Yukitoshi; and Shimada, Kazuyuki, 4,899,348, Cl. 372-38.000.
Shibata, Isamu; Asai, Takahiro; Nagasawa, Kiyoto; and Asada, Kenichirou, 4,899,344, Cl. 372-29.000.
Shimada, Tomoyuki; Sasaki, Masaomi; Hashimoto, Mitsuru; and Aruga, Tamotsu, 4,898,800, Cl. 430-59.000.

Ricoh Electronics, Inc.: *See—*
Shibata, Tomoo, 4,898,848, Cl. 503-200.000.

Riedle, Armin; and Zientek, Horst, to Total Walther Feuerschutz GmbH. Quick release valve for sprinkler head. 4,898,246, Cl. 169-38.000

Riehl, Tilford F.: *See—*
Johnson, Robert R.; and Riehl, Tilford F., 4,898,191, Cl. 131-359.000.

Ries, Stuart W.; and Shembarger, Irene M., to Whirlpool Corporation. Dryer drum lamp assembly. 4,899,264, Cl. 362-92.000

Rieter Machine Works, Ltd.: *See—*
Staheli, Paul, 4,897,897, Cl. 19-114.000.

Rifar S.r.L.: *See—*
Marsili, Leonardo, 4,898,938, Cl. 540-230.000

Riggins, Phillip H.; and Hauser, Peter J., to Burlington Industries, Inc. Exhaust process for simultaneously dyeing and improving the flame resistance of aramid fibers. 4,898,596, Cl. 8-490.000.

Rigling, Walter S. Multilayer printed wiring registration method and apparatus. 4,898,636, Cl. 156-626.000

Riley, Dennis P.: *See—*
Fields, Donald L., Jr.; Grabiak, Raymond C., and Riley, Dennis P., 4,898,972, Cl. 562-17.000.

Rimay, Bela: *See—*
Antal, Kalman, Rimay, Bela; and Halasz, Ferenc, 4,898,554, Cl. 445-6.000.

Ritsko, Joseph E.; Johnson, Walter A.; and Kopatz, Nelson E., to GTE Products Corporation. Method for producing aluminum oxide coated cobalt powder. 4,898,749, Cl. 427-216.000.

Robbins, Daniel H.; Wirtz, John S., Lein, Juergen; and Brookmire, Michael A., to Itek Graphic Corp. Low cost color scanner. 4,899,214, Cl. 358-75.000.

Robbins, W. Dale: *See—*
Leone, David A.; Moody, G. Lawrence; Holland, William D.; Bell, Mark E.; and Robbins, W. Dale, 4,899,022, Cl. 200-50.00A.

Roberts, Christopher W. Hypodermic syringe splatter shield. 4,898,588, Cl. 604-187.000.

Roberts, David A.: *See—*
Campbell, Simon F.; Morris, David S., and Roberts, David A., 4,898,872, Cl. 514-303.000.

Roberts, Edgar P., Jr.: *See—*
Beard, Bryce P., III; Kluttz, James W., and Roberts, Edgar P., Jr., 4,898,388, Cl. 273-181.00R.

Robertshaw Controls Company: *See—*
Kadwell, Brian J.; Fowler, Daniel L.; and Gawron, Gregory F., 4,899,034, Cl. 219-494.000.

Robertson, Kenneth L., to Ken-Koat, Inc. Electrostatic coating of rubber-to-metal adhesives on metal parts. 4,898,747, Cl. 427-31.000.

Robinson, Alan: *See—*
Scanlan, Ian F.; and Robinson, Alan, 4,898,442, Cl. 350-96.150.

Robinson, Kelly S.: *See—*
Gruenbaum, William T.; Mey, William; and Robinson, Kelly S., 4,898,797, Cl. 430-51.000.

Roche, Jean J. Roundabout with climbing effect fitted with an airplane. 4,898,377, Cl. 272-36.000.

Rockwell-CIM: *See—*
Bertolini, Carlo, 4,898,413, Cl. 292-336.300.

Roediger, Gary A., to American Telephone and Telegraph Company AT&T Bell Laboratories. Architecture of the control of a high performance packet switching distribution network. 4,899,333, Cl. 370-60.000.

Roehringer, Arno, to Daimler-Benz AG. Servo-valve arrangement for power steering. 4,898,074, Cl. 91-371.000.

Roehrs, Don P.; and Granberg, Helge O., to Signal One Corporation. Apparatus and method for paralleling power field effect transistors in high frequency amplifiers. 4,899,116, Cl. 330-251.000.

Rohm GmbH Chemische Fabrik: *See—*
Siol, Werner; and Terbrack, Ulrich, 4,898,912, Cl. 525-199.000.

Rohner, Joachim, deceased (by Rohner, Jutta, heir); Langen, Manfred; and Gebald, Gregor, to Zinser Textilmaschinen GmbH; and Innovatex Unternehemensberatung GmbH. Method and apparatus for automatic orderly removal and collection of fully-spun cops from textile ring spinning machines. 4,897,991, Cl. 57-281.000.

Rohner, Jutta, heir: *See—*
Rohner, Joachim, deceased; Langen, Manfred; and Gebald, Gregor, 4,897,991, Cl. 57-281.000.

Rohr, Wolfgang: *See—*
Keil, Michael; Jahn, Dieter; Becker, Rainer; Rohr, Wolfgang; and Wuerzer, Bruno, 4,898,610, Cl. 71-121.000.

Rojey, Alexandre: *See—*
Grehier, Alain; and Rojey, Alexandre, 4,898,233, Cl. 165-166.000.

Rollins, Marvin J., to Maxon Corporation. Wear compensating stem sealing apparatus. 4,898,393, Cl. 277-27.000.

Romano, Antonio, to Campagnolo S.p.A. Pedal with a safety device, for race-bicycles. 4,898,064, Cl. 74-594.600.

Romon, Raymond F.: *See—*
Hansen, Barry W.; and Romon, Raymond F., 4,899,274, Cl. 364-200.000.

Ronish, Edward W.: *See—*
Dawson, John F.; and Ronish, Edward W., 4,899,293, Cl. 364-521.000.

Roos, George B. Laminar flow work table with controllable ventilation of a work surface. 4,898,089, Cl. 98-115.100.

Rose, Robert J.; and Sundsrud, Larry A., to Physician Engineered Products, Inc. Resuscitation bag control apparatus. 4,898,166, Cl. 128-205.130.

Roseberry, George L.: *See—*
Cox, William A.; Camden, James B.; and Roseberry, George L., 4,898,477, Cl. 383-33.000.

Rosen, Arye: *See—*
Rosen, Har'el; and Rosen, Arye, 4,899,204, Cl. 357-30.000.

Rosen, Har'el; and Rosen, Arye, to General Electric Company. High voltage switch structure with light responsive diode stack. 4,899,204, Cl. 357-30.000.

Rosenthal, Wayne O., to Teledyne Industries, Inc. Retrievable bridge plug. 4,898,239, Cl. 166-133.000.

Ross, Albert, to Western/Scott Fetzer Company. Stem regulator. 4,898,205, Cl. 137-505.120.

Ross, Michael O.: *See—*
Clark, Brian; Jundt, Jacques; Luling, Martin; and Ross, Michael O., 4,899,112, Cl. 324-338.000.

Ross, Richard E.; and Ross, Shelley D. Method of cooking lobster. 4,898,743, Cl. 426-523.000.

Ross, Shelley D.: *See—*
Ross, Richard E.; and Ross, Shelley D., 4,898,743, Cl. 426-523.000.

Rossberg, Rainer, to VDO Adolf Schindling AG. Electric desired-valve indicator. 4,899,130, Cl. 340-438.000.

Rossig, Manfred; and Budde, Rolf, to Kolbus GmbH & Co. KG. Apparatus for stacking products that are highly susceptible to damage, particularly books. 4,898,511, Cl. 414-792.600.

Roth, Mario; Esche, Vordem; and Scholl, Heinz, to Saint-Gobain Vitrage. Method of manufacturing a safety glass pane comprised of a sheet of glass and a sheet of flexible plastic material. 4,898,632, Cl. 156-99.000.

Rotman, Dalia: *See—*
Lavie, David; Revel, Michel; Rotman, Dalia; and Velde, Vincent V., 4,898,891, Cl. 514-732.000.

Roubalova, Alena: *See—*
Kasafirek, Evzen; Rybak, Miroslav; Krejci, Ivan; Sturc, Antonin; Roubalova, Alena; Vanzura, Jiri; Krepela, Evzen; and Bartik, Michal, 4,898,930, Cl. 530-332.000.

Rourke, William J.; Lai, Wen-Chao; and Natansohn, Samuel, to GTE Laboratories Incorporated. Liquid extraction procedure for the recovery of scandium. 4,898,719, Cl. 423-21.500.

Roussel, Gerard: *See—*
Bourzat, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,898,871, Cl. 514-300.000.

Rouzies, Christian, to Centre National D'Etudes Spatiales. System for regulating the operating point of a direct current power supply. 4,899,269, Cl. 363-41.000.

Rozak, Alexander T.; and Calderwood, Gary G. Self venting food frying apparatus. 4,898,091, Cl. 99-336.000.

Rubalcaba, Bernardino, Jr., to Baxter International Inc. Drug infusion system with calculator. 4,898,578, Cl. 604-66.000.

Rubald, Cyrenus M.: *See—*
Bauer, Thomas M.; Hemmeter, Richard W.; Petrelli, Robert; Piereth, Richard J.; and Rubald, Cyrenus M., 4,899,375, Cl. 379-264.000.

Ruddy, Henry J.: *See—*
Sperry, Lawrence B.; and Ruddy, Henry J., 4,898,327, Cl. 239-1.000.

Rudick, Arthur G., to Coca-Cola Company, The. Removable syrup package. 4,898,308, Cl. 222-325.000.

Ruka, Roswell J.: *See—*
Singh, Prabhakar; Ruka, Roswell J.; and George, Raymond A., 4,898,792, Cl. 429-19.000.

Rumpp, Gerhard: *See—*
Neumaier, Anton; Plank, Uto; and Rumpp, Gerhard, 4,898,250, Cl. 173-48.000.

Runge, Heinz F., to Kraft, Inc. Reclosable bag. 4,898,280, Cl. 206-604.000.

Russo, Anthony. Socket wrench extension with extensible magnet. 4,898,053, Cl. 81-125.000.

Rutkowski, Wayne L.: *See—*
Chen, Tien-Tsung; Wegdell, C. Stefan; Rutkowski, Wayne L.; and Kao, Kim Y., 4,898,323, Cl. 229-92.300.

Rybak, Miroslav: *See—*
Kasafirek, Evzen; Rybak, Miroslav; Krejci, Ivan; Sturc, Antonin; Roubalova, Alena; Vanzura, Jiri ; Krepela, Evzen; and Bartik, Michal, 4,898,930, Cl. 530-332.000.

Ryno, Robert W.: *See—*
Granberg, Dirk N.; Suchomel, Frank H.; and Ryno, Robert W., 4,898,124, Cl. 122-382.000.

Ryobi Ltd.: *See—*
Doumoto, Hideki; and Kimura, Takashi, 4,898,094, Cl. 101-485.000.

Sachs, Howard G.; Cho, James Y.; and Hollingsworth, Walter H., to Intergraph Corporation. Cache-MMU system. 4,899,275, Cl. 364-200.000.

Sachs, Samuel B.: *See—*
Diman, Charles; Marcus, David; Mitchell, Philip; and Sachs, Samuel B., 4,898,667, Cl. 210-138.000.

Sachtler, J. W. Adriann; and Lawson, R. Joe, to UOP. Catalyst for the isomerization of aromatics. 4,899,012, Cl. 585-482.000.

Sadakata, Toshimasa: *See—*
Fujinuma, Chikao; Sekikawa, Nobuyuki; Tabata, Teruo; Takada, Tadayoshi; Sano, Yoshiaki; and Sadakata, Toshimasa, 4,898,839, Cl. 437-33.000.

Saeki, Takashi; Nii, Takayuki; Fukui, Hirotake; Mishina, Toshiro; Nakano, Haruo; and Sakakibara, Hitoshi, to Matsushita Electric Works, Ltd. Moving object discriminating system. 4,899,158, Cl. 342-44.000.

SAES Getters SpA: *See—*
Doni, Fabrizio; and Ferrario, Bruno, 4,898,147, Cl. 126-200.000.

Safe/Stress, Inc.: *See—*
Edwards, Marysue; and Dubrinsky, Max M., 4,898,378, Cl. 272-69.000.

Saihara, Yasuhiro: *See—*
Osada, Koji; Date, Haruyuki; Saihara, Yasuhiro; Yamauchi, Toshiyuki; and Koike, Shiro, 4,898,727, Cl. 424-76.100.

Sailors, John C. Nursing bottle with removable pacifier. 4,898,291, Cl. 215-11.400.

St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., to General Motors Corporation. Method of using a robot for installing weather stripping in a door or like opening. 4,897,913, Cl. 29-450.000.

Saint-Gobain Vitrage: *See—*
Roth, Mario; Esche, Vordem; and Scholl, Heinz, 4,898,632, Cl. 156-99.000.

Saito, Fujio: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Sugiyama, Mitsuo; Saito, Fujio; Koike, Hiroyuki; Oshima, Takeshi; Simoji, Yasuo; and Nagahori, Hitoshi, 4,898,862, Cl. 514-236.200.

Saito, Ichiro: *See—*
Osato, Yoichi; Saito, Ichiro; and Takasu, Yoshio, 4,899,168, Cl. 346-1.100.

Saito, Itaru: *See—*
Kitano, Hirohisa; Saito, Itaru; Matsubara, Ken; Shingaki, Kouichi; and Masuda, Tomohiko, 4,899,183, Cl. 346-154.000.

Saito, Keishi: *See—*
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

Saito, Masaaki, to Yamaichi Electric Mfg. Co., Ltd. Connector for a printed circuit board. 4,898,540, Cl. 439-153.000.

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Meyer, Horst; Schwenner, Eckhard; Bechem, Martin; Gross, Rainer; Schramm, Matthias; Kayser, Michael; and Hebisch, Siegbert, 4,898,877, Cl. 514-521.000.
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Hearn, David D.; Pasternack, Eric S.; and Segalman, Daniel J., 4,899,320, Cl. 367-35.000.
Segawa, Yorihide: *See*—
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Morozumi, Shinji; Misawa, Toshiyuki; and Nakazawa, Yoshio, 4,899,141, Cl. 340-784.000.
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Selby, Paul H., III: *See*—
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Sentoku, Hideshi; and Asaoka, Takayoshi, to Laurel Bank Machines Co. Ltd. Coin receiving and wrapping apparatus. 4,897,984, Cl. 53-501.000.
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Yano, Seiki; and Hijikata, Toshiki, 4,899,359, Cl. 372-44.000.
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Shelander, David J., to Printware, Inc. Focused optical beam encoder of position. 4,899,048, Cl. 250-231.0SE.
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Cohen, Joel B.; and Marhefka, Matthew, 4,898,300, Cl. 220-334.000.
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Corley, Larry S., 4,898,999, Cl. 570-207.000.
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Shely, William W.; and Wells, Peter M., to All States Inc. Cable tie. 4,897,899, Cl. 24-16.0PB.
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Larson, Sherman L., 4,899,077, Cl. 312-325.000.
Sherritt, Jay G., to IDB Corporation. Taped data copying utilizing multiple addressable memories. 4,899,230, Cl. 360-15.000.
Sherwood, Daniel A. Solar energy panel. 4,898,153, Cl. 126-448.000.
Sherwood Medical Company: *See*—
Swisher, David R.; and DeWeese, F. Thane, 4,898,593, Cl. 604-319.000.
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Hashizume, Kenji; Ikebe, Masaru; Okamura, Masatoshi; and Shiba, Haruo, 4,899,242, Cl. 360-132.000.
Shiba, Kenzo, to Tsuyama Mfg. Co., Ltd. Cycle trainer having a load applying device. 4,898,379, Cl. 272-73.000.
Shibagaki, Taro; Atsumi, Takehiko; Ibe, Hiroyuki; and Tanikoshi, Sadao, to Kabushiki Kaisha Toshiba. Digital multiplexer. 4,899,339, Cl. 370-102.000.
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Kudo, Toshiaki; Yoshida, Takashi; Nishihata, Ken; and Kondo, Shinichi, to Meiji Seika Kaisha Ltd.; and Mitsuhashi, Susumu. Cephalosporin derivatives and antibiotics containing the same. 4,898,858, Cl. 514-206.000.
Shibakawa, Takahiro: *See*—
Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.
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Shibata, Isamu; Asai, Takahiro; Nagasawa, Kiyoto; and Asada, Kenichirou, to Ricoh Co., Ltd. Semiconductor laser control apparatus. 4,899,344, Cl. 372-29.000.
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Shibata, Tomoo, to Ricoh Electronics, Inc. Thermal label with remoistenable adhesive. 4,898,848, Cl. 503-200.000.
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Shimada, Kazuyuki: *See*—
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Shimada, Keiko, to NEC Corporation. Loudspeaking telephone with a variable gain circuit. 4,899,380, Cl. 379-389.000.
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Shimada, Yoshio: *See*—
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Shimizu Construction Co., Ltd.: *See—*
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Shimizu, Masayuki: *See—*
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Shimizu, Shogo, to Oki Electric Industry Co., Ltd. Self-routing multi-stage switching network for fast packet switching system. 4,899,334, Cl. 370-60.000.
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Ikada, Yoshito; Suong, Hyu H.; Shimizu, Yoshihiko; Watanabe, Satoshi; Nakamura, Tatsuo; Suzuki, Masakazu; and Shimamoto, Takeshi, 4,898,186, Cl. 606-62.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Kishita, Hirofumi; Yamaguchi, Koichi; and Yoshida, Akira, 4,898,958, Cl. 556-448.000.
Ogihara, Masahiro; Makikawa, Shinji; and Iguchi, Masaaki, 4,898,641, Cl. 156-601.000.
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Shinano Kenshi Kabushiki Kaisha: *See—*
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Shine, Jerry P. Releasable mount for window grilles. 4,897,961, Cl. 49-141.000.
Shingaki, Kouichi: *See—*
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Shioya, Masaharu: *See—*
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Shippers Paper Products Company: *See—*
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Shiraki, Hiroyuki, to Takeda Chemical Industries, Ltd. Urethane resins. 4,898,922, Cl. 528-60.000.
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Shoen, Jerry W.; and Margerum, David E., to Armco Advanced Materials Corporation. Ultra-rapid heat treatment of grain oriented electrical steel. 4,898,626, Cl. 148-111.000.
Shoketsu Kinzohu Kogyo Kabushiki Kaisha: *See—*
Odajima, Katsuhiko; and Ikehata, Motoshige, 4,898,200, Cl. 137-85.000.
Shook, Raymond J.: *See—*
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Shrikhande, Anil J.; and Alioto, Joseph A., to Heublein, Inc. Process for the decharacterization of base wine. 4,898,742, Cl. 426-271.000.
Shroot, Braham: *See—*
Lang, Gerard; Forestier, Serge; Lagrange, Alain; and Shroot, Braham, 4,898,883, Cl. 514-544.000.
Shu-Hwa, Lee. Bicycle brake light control switch assembly. 4,899,023, Cl. 200-61.120.
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Jennings, Alfred R., Jr.; and Shu, Paul, 4,898,242, Cl. 166-285.000.
Shuker, Brian; and Huggett, Richard D. J., to Lewmar Marine Limited. Two-speed winch. 4,898,364, Cl. 254-342.000.
Shur, Michael; and Simmons, John G., to University of Minnesota, Regents of the. Novel high-speed integrated heterostructure transistors, photodetectors, and optoelectronic circuits. 4,899,200, Cl. 357-30.000.
Shur, Michael: *See—*
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Siecor Corporation: *See—*
Story, Christopher A., 4,898,451, Cl. 350-96.230.
Siegel, Seymour; and Maggio, Louis. Method and apparatus for obtaining ozone saturated water. 4,898,679, Cl. 210-752.000.
Siemens Aktiengesellschaft: *See—*
Baur, Hans; and Bittermann, Hans, 4,899,336, Cl. 370-63.000.
Birzer, Josef, 4,899,252, Cl. 361-350.000.
Hosten, Daniel, 4,898,657, Cl. 204-198.000.
Kuhlmann, Werner, 4,898,447, Cl. 350-96.200.
Lischke, Burkhard, 4,899,060, Cl. 250-505.100.
Schwarzl, Helmut; and Unterlass, Josef, 4,899,032, Cl. 219-375.000.
Vaclavik, Peter, 4,899,379, Cl. 379-377.000.
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Siemens Energy & Automation, Inc.: *See—*
Buxton, Clifford A., 4,899,253, Cl. 361-376.000.
Leone, David A.; Moody, G. Lawrence; Holland, William D.; Bell, Mark E.; and Robbins, W. Dale, 4,899,022, Cl. 200-50.00A.
Siemens Transmission Systems, Inc.: *See—*
Gartner, Todd H., 4,899,382, Cl. 379-413.000.
Siepmann, Friedrich W.; and Teutscher, Michael. Apparatus for the detection of biodegradable and toxic substances in aqueous solutions. 4,898,829, Cl. 435-289.000.
Siffert, Odile: *See—*
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Simasaki, Shuhei: *See—*
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Simmons, Carver S.: *See—*
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Simmons, Thomas E., to Morgan Construction Company. Roll neck bearing assembly and inner bearing component therefor. 4,898,479, Cl. 384-130.000.
Simo, Miroslav A. Arrow rest and holder. 4,898,145, Cl. 124-41.00A.
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Morisawa, Yasuhiro; Kataoka, Mitsuru; Sugiyama, Mitsuo; Saito, Fujio; Koike, Hiroyuki; Oshima, Takeshi; Simoji, Yasuo; and Nagahori, Hitoshi, 4,898,862, Cl. 514-236.200.
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., to Dow Chemical Company, The. Organis amine phosphonic acid complexes for the treatment of calcific tumors. 4,898,724, Cl. 424-1.100.
Simplicity Manufacturing, Inc.: *See—*
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Simpson, Jeff A.: *See—*
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Simpson Strong-Tie Company, Inc.: *See—*
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Texas Instruments Incorporated: *See—*
Blake, Terence G. W.; and Lu, Hsindao, 4,899,202, Cl. 357-23.700.
Hashimoto, Masashi, 4,899,229, Cl. 360-141.000.
Houston, Theodore W., 4,899,315, Cl. 365-230.060.
Morris, Francis J.; and Evans, Stephen A., 4,898,838, Cl. 437-31.000.
Van Wechem, Guus; Beunk, Gerrit; Van Den Elst, Frits; and Van Der Ploeg, Arie, 4,898,142, Cl. 123-557.000.

Texas Iron Works, Inc.: *See—*
Braddick, Britt O., 4,898,245, Cl. 166-387.000.

TGC Corporation: *See—*
Tepley, George T., 4,897,924, Cl. 33-2.00R.

Th. Goldschmidt AG: *See—*
Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, 4,898,772, Cl. 428-332.000.

Thebeau, Donald W. Load carrying skid assembly. 4,898,102, Cl. 108-56.100.

Theodoridis, George, to FMC Corporation. Phosphorylaminophenyltriazolinone herbicides. 4,898,606, Cl. 71-86.000.

Thermostat-und Schaltgeraetebau GmbH & Co. KG: *See—*
Hollweck, Walter, 4,899,124, Cl. 337-299.000.

Thinking Machines Corporation: *See—*
Callahan, Thomas, 4,898,544, Cl. 439-498.000.
Potter, David; Provost, Laurence N.; Baron, John M.; Stefanovic, David; Sharakan, Eric D.; Sheppard, David A.; and Isman, Marshall A., 4,899,342, Cl. 371-10.100.

Thomas, Gunther: *See—*
Franckowiak, Gerhard; Bechem, Martin; Kayser, Michael; Gross, Rainer; Schramm, Matthias; Seuter, Friedel; Perzborn, Elisabeth; and Thomas, Gunther, 4,898,865, Cl. 514-252.000.

Thomasson, Robert E.: *See—*
Lewis, George E.; Thomasson, Robert E.; and Nelson, David W., 4,899,284, Cl. 364-435.000.

Thompson, Owen R. Hydraulic device. 4,898,248, Cl. 173-12.000.

Thorn EMI Electronics Limited: *See—*
Voles, Roger, 4,898,032, Cl. 73-505.000.

Thorne, Glenn A.; Joy, Robert D.; and Simpson, Jeff A., to Bee Line Company. Method and apparatus for determining the position of an object. 4,898,464, Cl. 356-152.000.

Thrall Car Manufacturing Company: *See—*
Harter, Lynn J., 4,898,101, Cl. 105-247.000.

Threshold Corporation: *See—*
Pass, Nelson S., 4,899,387, Cl. 381-71.000.

Thunnissen, Kees W., to Talson Transport Engineering, B.V. Cargo transporter, particularly of the trailer type having a front elevated loading floor. 4,898,509, Cl. 414-495.000.

Thyssen Industrie AG Henschel: *See—*
Manschwetus, Helmut, 4,898,334, Cl. 241-194.000.

Thyssen Stahl AG: *See—*
Lang, Cestmir; and Meyer, Lutz, 4,898,629, Cl. 148-12.00B.

Tillman, Richard M.: *See—*
Allison, Joe D.; and Tillman, Richard M., 4,899,004, Cl. 585-321.000.

Tiramani, Paolo M. B., to Goody Products, Inc. Spray caps. 4,898,307, Cl. 222-207.000.

Tittizer, Gabriel: *See—*
Junghans, Ewald; and Tittizer, Gabriel, 4,898,129, Cl. 123-90.130.

Tittle, Fred: *See—*
Cochran, Ivan L., 4,898,552, Cl. 440-71.000.

TLV Co., Ltd.: *See—*
Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000.

To, Ping K. Musical adapter for nursing bottle. 4,898,060, Cl. 84-95.200.

Toagosei Chemical Industry Co.: *See—*
Isobe, Yasuji, 4,898,899, Cl. 524-90.000.

Tobita, Etsuo: *See—*
Nakahara, Yutaka; and Tobita, Etsuo, 4,898,688, Cl. 252-400.240.

Tobler, Markus: *See—*
Frey, Yvonne; Kutzli, Jorg; Rauber, Walter; Schmocker, Hans; and Tobler, Markus, 4,898,098, Cl. 102-334.000.

Tochiyama, Kazunori; and Mihara, Takahisa, to Fujitsu Limited. Divided housing for supporting magnetic disks. 4,899,237, Cl. 360-98.020.

Toda, Fumio; Tanaka, Kouichi; Taniguchi, Masatoshi; and Sasaoka, Michio, to Otsuka Kagaku Kabushiki Kaisha. Method of producing optically active β-lactam derivatives. 4,898,654, Cl. 204-157.710.

Toho, Masato: *See—*
Sasuga, Kazuyasu; Ishizawa, Hiroaki; Suzuki, Hisao; and Toho, Masato, 4,899,225, Cl. 358-448.000.

Toho Rayon Co., Ltd.: *See—*
Yoshinari, Osamu; Kawakatsu, Yoshifumi; Takahashi, Hayashi; and Fukuizumi, Hideaki, 4,898,700, Cl. 264-83.000.

Tokaichi, Tetsuro: *See—*
Endo, Hiroshi; Suzuki, Takao; Komoto, Mitsuo; Uekido, Kouzou; and Tokaichi, Tetsuro, 4,898,545, Cl. 439-578.000.

Tokin Corporation: *See—*
Otsuka, Tsutomu; and Otsuki, Etsuo, 4,898,625, Cl. 148-101.000.

Tokyo Electron Limited: *See—*
Akiyama, Shuji, 4,899,105, Cl. 324-158.00F.

Tokyo Sanyo Electric Co., Ltd.: *See—*
Tsuchiyama, Yuji; and Shimizu, Masayuki, 4,898,230, Cl. 165-12.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kuze, Takashi, 4,898,622, Cl. 148-2.000.

Toledo Scale Corporation: *See—*
Gaines, Ronald J., 4,898,255, Cl. 177-211.000.

Tomihashi, Nobuyuki: *See—*
Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Simasaki, Shuhei, 4,898,779, Cl. 428-402.000.

Tomimitsu, Yasuharu, to NEC Corporation. Error correction circuit. 4,899,341, Cl. 371-37.600.

Tomita, Koji: *See—*
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,898,940, Cl. 540-460.000.

Tomizawa, Takashi: *See—*
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,899,193, Cl. 355-55.000.

Toray Silicone Company, Ltd.: *See—*
Hamada, Mitsuo; Shimizu, Koji; and Wakita, Haruki, 4,898,689, Cl. 252-510.000.
Yoshitake, Makoto; Yamane, Shinichiro; and Shirahata, Akihiko, 4,898,959, Cl. 556-466.000.

Torbet, Philip: *See—*
Dolgin, Stuart M.; and Torbet, Philip, 4,898,589, Cl. 604-198.000.

Torigai, Katsumi; and Takahashi, Masanori, to Sanshin Kogyo Kabushiki Kaisha. Trim apparatus for marine propulsion unit. 4,898,563, Cl. 440-1.000.

Torii, Kohske: *See—*
Ueda, Ryuichi; Mori, Masahito; and Torii, Kohske, 4,898,919, Cl. 525-440.000.

Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; and Nakai, Akira, to Taiho Pharmaceutical Co., Ltd.; and Otsuka Kagaku Kabushiki Kaisha. Process for preparing 2β-substituted-methylpenicillin derivatives. 4,898,939, Cl. 540-310.000.

Torrington Product Ventures, Inc.: *See—*
Brose, Peter W., 4,898,120, Cl. 119-29.000.

Tortella, Frank C.: *See—*
Musacchio, Jose M.; and Tortella, Frank C., 4,898,860, Cl. 514-215.000.

Tosoh Corporation: *See—*
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, 4,898,970, Cl. 560-236.000.

Total Walther Feuerschutz GmbH: *See—*
Riedle, Armin; and Zientek, Horst, 4,898,246, Cl. 169-38.000.

Toth, Bartholomew L.: *See—*
Brown, Bernard T.; Donnelly, Donald E.; and Toth, Bartholomew L., 4,898,229, Cl. 165-11.100.

Touhsaent, Robert E.: *See—*
Min, Taeik; and Touhsaent, Robert E., 4,898,782, Cl. 428-407.000.
Min, Taeik; and Touhsaent, Robert E., 4,898,787, Cl. 428-480.000.

Towle, Ian D. H., to Raychem Limited. Preparation of aryl carbonyl compounds. 4,898,983, Cl. 568-322.000.

Toyama, Sachio: *See—*
Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, 4,898,859, Cl. 514-210.000.

Toyo Seikan Kaisha, Ltd.: *See—*
Yamada, Morio; and Kimura, Yoshihiko, 4,898,023, Cl. 73-52.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Kubo, Masashige; Sakka, Hideo; and Tsutsumi, Yukihiro, 4,898,998, Cl. 570-204.000.

Toyoda Gosei Co., Ltd.: *See—*
Ohno, Satoshi; and Hiramitsu, Tetsushi, 4,899,020, Cl. 174-68.500.

Toyoda Koki Kabushiki Kaisha: *See—*
Maruyama, Toshio; Oda, Yukio; and Yamaguchi, Syoji, 4,897,967, Cl. 51-165.870.

Toyota Jidosha Kabushiki: *See—*
Kitoh, Osamu; and Ohashi, Masahiko, 4,898,630, Cl. 156-79.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Tatara, Yudai; Sato, Kiyoomi; Okawa, Susumu; and Jufuku, Yasunobu, 4,898,567, Cl. 474-174.000.

Tran, Danh C.: *See—*
Kindler, Edwin A.; and Tran, Danh C., 4,898,777, Cl. 428-364.000.

Tran, Duc H.: *See—*
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., 4,899,172, Cl. 346-76.0PH.

Tratar, Michael F.; Bremenour, Edwin L.; and Terdan, Dale R., to Allen-Bradley Company, Inc. Self aligning connector. 4,898,538, Cl. 439-76.000.

Tremblay, Andre : *See—*
Tweedle, Thomas A.; Kutowy, Oleh; and Tremblay, Andre , 4,898,698, Cl. 264-41.000.

Trick, Robert E.: *See—*
Daly, Mark D.; Maerzke, James T.; Gengler, Jeffrey R.; and Trick, Robert E., 4,898,158, Cl. 128-79.000.

Triem, Hermann: *See—*
Hempel, Gerhard; Kennecke, Mario; Krieger, Bernhard; Phillippson, Rainer; Triem, Hermann; and Weber, Alfred, 4,898,693, Cl. 260-397.400.

Tripodi, Paul, to Merlin Gerin. Solid-state trip device comprising a zero sequence current detection circuit. 4,899,246, Cl. 361-44.000.

Trivino Vazquez, Fernando; and Clenin, Roger J., to Catrel S.A. Societe D'Etudes et D'Applications Industrielle. Method of manufacturing cement. 4,898,615, Cl. 106-103.000.

Trojan Luggage Company, The: *See—*
Stout, Darwin E.; Wilcox, Robert C.; and Peloquin, Charles A., 4,898,274, Cl. 206-289.000.

Trondle, Robert: *See—*
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert, Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.

Tropp, James S.; Derby, Kevin A.; and Hawryszko, K. Christine, to Diasonics Inc. Method and apparatus for automated magnetic field shimming in magnetic resonance spectroscopic imaging. 4,899,109, Cl. 324-320.000.

Trout, Kenneth G.: *See—*
Israel, Michael G.; Grozdits, George A.; and Trout, Kenneth G., 4,898,776, Cl. 428-336.000.

Troutner, David E.: *See—*
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., 4,898,724, Cl. 424-1.100.

TRW Inc.: *See—*
Bianchi, Maurice P., 4,898,347, Cl. 244-158.00R.

Tsai, David M. Remote control animal collar. 4,898,119, Cl. 119-29.000.

Tschanen, Mark S.: *See—*
Large, Danny E.; and Tschanen, Mark S., 4,898,303, Cl. 222-65.000.

Tsinberg, Mikhail: *See—*
Basile, Carlo; Cavallerano, Alan P.; and Tsinberg, Mikhail, 4,899,220, Cl. 358-141.000.

Tsubouchi, Hidetsugu: *See—*
Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, 4,898,859, Cl. 514-210.000.

Tsuboyama, Akira: *See—*
Okada, Shinjiro; Taniguchi, Osamu; Tsuboyama, Akira; and Enari, Masahiko, 4,898,456, Cl. 350-350.00S.

Tsuchiyama, Yuji; and Shimizu, Masayuki, to S. ...lectric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Air conditioner with an energy switch. 4,898,230, Cl. 165-12.000.

Tsudakoma Corp.: *See—*
Takegawa, Yujiro, 4,898,213, Cl. 139-1.00R.

Tsui, Yih-Pyng: *See—*
Mlodzikowski, Allan G.; Tsui, Yih-Pyng; and Ku, Hai-Pin, 4,899,388, Cl. 381-77.000.

Tsuji, Kenji; and Ichikawa, Tsutomu, to Minolta Camera Kabushiki Kaisha. Juxtaposed discharge tubes with opposed trigger electrodes. 4,899,092, Cl. 313-594.000.

Tsuji, Kouichi: *See—*
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert, Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.

Tsujimura, Osamu; Arai, Tatsuo; Nakayama, Masaaki; and Okawa, Masayuki, to Mitsubishi Kinzoku Kabushiki Kaisha. Ball end mill. 4,898,499, Cl. 407-42.000.

Tsukada, Masaharu; Aoi, Shigeru; and Ashinuma, Takaaki, to Canon Kabushiki Kaisha. Image processing system. 4,899,291, Cl. 364-518.000.

Tsuruta, Masafumi: *See—*
Takeuchi, Muneo; Kinbara, Hiroji; and Tsuruta, Masafumi, 4,899,073, Cl. 310-116.000.

Tsutsumi, Shigeru. Temperature control indicating apparatus of a hot runner in a thermoplastic synthetic resin injection molding system. 4,899,288, Cl. 364-476.000.

Tsutsumi, Yukihiro: *See—*
Kubo, Masashige; Sakka, Hideo; and Tsutsumi, Yukihiro, 4,898,998, Cl. 570-204.000.

Tsuyama Mfg. Co., Ltd.: *See—*
Shiba, Kenzo, 4,898,379, Cl. 272-73.000.

Tsuyama, Toshiaki: *See—*
Nishimura, Eiji; Nobumoto, Kazutoshi; Matsuoka, Toshihiro; Tsuyama, Toshiaki; and Sotoyama, Kaoru, 4,898,138, Cl. 123-399.000.

Tucker, Hugh N.: *See—*
Madsen, David C.; and Tucker, Hugh N., 4,898,879, Cl. 514-400.000.

Tucker, Robert C., Jr.: *See—*
Schaffer, Paul J.; and Tucker, Robert C., Jr., 4,898,368, Cl. 266-222.000.

Tungsram Reszvenytarsasag: *See—*
Antal, Kalman; Rimay, Bela; and Halasz, Ferenc, 4,898,554, Cl. 445-6.000.

Turner, Anthony P. F.; Swain, Ann; Ramsay, Graham; Cardosi, Marco; and Schneider, Bernard H., to Paul de la Pena Limited. Mediators for bioelectrochemical cells to test for microbiological activity. 4,898,816, Cl. 435-34.000.

Turner, Eric E.: *See—*
Shapiro, Bennett M.; Turner, Eric E.; Hopkins, Paul B.; Klevit, Rachel E.; Holler, Tod P.; and Spaltenstein, Andreas, 4,898,878, Cl. 514-386.000.

Tweedle, Thomas A.; Kutowy, Oleh; and Tremblay, Andre , to Canada, National Research Concil of. Method of casting a porous membrane of polymeric material. 4,898,698, Cl. 264-41.000.

Twerdochlib, Michael: *See—*
Weaver, Karen L.; and Twerdochlib, Michael, 4,898,021, Cl. 73-40.700.

UBE Industries, Ltd.: *See—*
Inoue, Hiroshi; Muramatsu, Tadao; Narahara, Yasuji; and Hirano, Tetsuji, 4,898,753, Cl. 427-276.000.

Uchikuga, Saburo: *See—*
Narutomi, Yuji; Katsumata, Manabu; Osawa, Yasuko; and Uchikuga, Saburo, 4,898,870, Cl. 514-292.000.

Uchiyama, Naoki; Shishido, Yoshio; and Ueda, Yasuhiro, to Olympus Optical Co., Ltd. Lithotomic apparatus. 4,898,574, Cl. 604-22.000.

Uchiyama, Yoshihiro: *See—*
Kuroda, Michio; Sato, Isao; Ishibashi, Yoji; Uchiyama, Yoshihiro; Ohmori, Takashi; Akatsu, Shigeyuki; Kato, Fumio; Segawa, Yorihide; and Iizuka, Nobuyuki, 4,898,001, Cl. 60-733.000.

Udagawa, Tsunekazu, to Ishikawa Gasket Co., Ltd. Steel laminate gasket. 4,898,396, Cl. 277-235.00B.

Udd, Eric, to McDonnell Douglas Corporation. Sagnac distributed sensor. 4,898,468, Cl. 356-345.000.

Ueda, Ryuichi; Mori, Masahito; and Torii, Kohske, to Sunstar Giken Kabushiki Kaisha. Polyurethane adhesive. 4,898,919, Cl. 525-440.000.

Ueda, Yasuhiro: *See—*
Uchiyama, Naoki; Shishido, Yoshio; and Ueda, Yasuhiro, 4,898,574, Cl. 604-22.000.

Ueki, Noriyuki, and Nishimura, Shigeru, to Kawasaki Jukogyo Kabushiki Kaisha. Oil relief valve for lubrication systems for internal combustion engines. 4,898,207, Cl. 137-539.000.

Uekido, Kouzou: *See—*
Endo, Hiroshi; Suzuki, Takao; Komoto, Mitsuo; Uekido, Kouzou; and Tokuichi, Tetsuro, 4,898,545, Cl. 439-578.000.

Uemichi, Sachio: *See—*
Furukawa, Hiroshi; Uemichi, Sachio; Isoi, Toshihiro; and Kawakita, Kenzo, 4,898,796, Cl. 429-178.000.

Uemura, Toshinobu; Kai, Keiji; Kodani, Masateru; Yoshida, Fumiyo; and Aratani, Matsuhiko, to Fujisawa Pharmaceutical Co., Ltd. α-crystals of cefazolin sodium. 4,898,937, Cl. 540-227.000.

Uenishi, Isao: *See—*
Nishimura, Makoto; Nonaka, Takashi; Uenishi, Isao; and Goto, Tamotsu, 4,897,990, Cl. 57-247.000.

Ueno, Takehiko: *See—*
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.

Ueyama, Satoshi; and Isoda, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Method for measuring cell counts and/or methane producing activity of methanogens. 4,898,833, Cl. 436-63.000.

Ugro, Josef V., Jr.: *See—*
Doree, Richard H.; and Ugro, Josef V., Jr., 4,898,633, Cl. 156-145.000.

Ulman, Katherine L.: *See—*
Lee, Chi-Long; and Ulman, Katherine L., 4,898,920, Cl. 525-477.000.

Ulrich, Donald R.: *See—*
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,898,454, Cl. 350-350.00R.
Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., 4,898,755, Cl. 427-389.700.

Ultradent Products, Inc.: *See—*
Fischer, Dan E., 4,898,309, Cl. 223-111.000.

Ultraviolet Purification Systems, Inc.: *See—*
Ellner, Sidney, 4,899,056, Cl. 250-431.000.

Umeki, Tsunenori: *See—*
Aikawa, Masatoshi; Nakagawa, Hiromasa, and Umeki, Tsunenori, 4,899,046, Cl. 307-45.200.

Union Carbide Chemicals and Plastics Company Inc.: *See—*
Manyik, Robert M.; Brockwell, Jonathan L.; and Kendall, John E., 4,899,003, Cl. 585-313.000.

Union Carbide Corporation: *See—*
Schaffer, Paul J.; and Tucker, Robert C., Jr., 4,898,368, Cl. 266-222.000.
Wilson, Stephen T.; Lok, Brent M.; and Flanigen, Edith M., 4,898,690, Cl. 208-114.000.

Unisys Corporation: *See—*
Petschauer, Richard J.; and Bergman, Robert J., 4,899,311, Cl. 365-189.060.
Schiavo, Anthony P.; Selby, Paul H., III; and Gibson, Harold L., 4,899,147, Cl. 341-60.000.

United Engineering, Inc.: *See—*
Ginzburg, Vladimir B.; and Vidil, F. Ronald, 4,898,014, Cl. 72-247.000.
Jones, George B.; and Mills, Edward A., 4,898,012, Cl. 72-11.000.

United Kingdom Atomic Energy Authority: *See—*
Clayton, Colin G., 4,898,709, Cl. 376-159.000.

United States of America
Air Force: *See—*
Hutta, Joseph J., 4,898,603, Cl. 65-3.130.
McGrath, Daniel T., 4,899,164, Cl. 343-754.000.
Army: *See—*
Vig, John R., 4,899,117, Cl. 331-3.000
Energy: *See—*
Kupperman, David S.; and Linzer, Melvin, 4,898,034, Cl. 73-644.000.
Porges, Karl G., 4,899,101, Cl. 324-663.000.
Post, Richard F., 4,899,084, Cl. 315-111.810
Rajan, John B.; Kumar, Romesh; and Vissers, Donald R., 4,893,692, Cl. 252-629.000.
Talanker, Vera; and Greenwald, Martin, 4,899,100, Cl. 324-636.000.
National Aeronautics and Space Administration: *See—*
Berry, Maggie L.; and Berry, Robert F., Jr., 4,899,356, Cl. 378-58.000.
Cheng, Li-Jen; Gheen, Gregory O.; and Partovi, Afshin, 4,898,436, Cl. 350-3.640.
Kahn, Jon B., 4,898,348, Cl. 244-161.000.
U.S. Philips Corporation: *See—*
Einhaus, Hermanus F., 4,899,330, Cl. 369-289.000.
Goldmann, Peter; Habelt, Gerhard; and Weihs, Hans, 4,899,035, Cl. 235-441.000.
Kamp, Ronald P. T.; and De Meij, Johannes P., 4,899,025, Cl. 219-10.570.
Klose, Hans-Peter; Konig, Kurt; and Schwartz, Wolfgang, 4,899,068, Cl. 307-494.000.
Schrammek, Manfred F. L.; and Sprengart, Mathias, 4,899,260, Cl. 362-32.000.
Sleegers, Franciscus T.; Schuitmaker, Pieter D.; and Janssen, Peter J. M., 4,899,329, Cl. 369-275.000.
Stormberg, Hans-Peter; and Watanabe, Yoshio, 4,899,355, Cl. 378-34.000.
Van Gorkum, Aart A.; Beirens, Leopold C. M.; and Vrijssen, Gerardus A. H. M., 4,899,079, Cl. 313-412.000.
Voeten, Hendrik, 4,899,259, Cl. 361-539.000.
Vriens, Leendert; Gerritsen, Gerrit B.; and Van Alphen, Willem M., 4,899,030, Cl. 313-477.00R.
Vroomen, Laurentius C. J.; Van Esdonk, Johannes; Khoe, Giok D.; and Swemmers, Antonius H. M., 4,898,449, Cl. 350-96.210.
United Technologies Corporation: *See—*
Beno, Edward A.; and Noehren, William L., 4,898,515, Cl. 416-134.00A.
Davis, Franklin J.; Wilcox, Gilbert B.; and Wright, Richard R., 4,898,329, Cl. 239-13.000.
McCracken, James R., 4,898,514, Cl. 416-95.000.
Nieter, Jeffrey J.; and DeBlois, Raymond L., 4,898,520, Cl. 418-1.000.
Perkinson, Robert H.; Stearns, Charles F.; and Belanger, Rene F., 4,898,324, Cl. 236-92.00R.
Unitek Corporation: *See—*
Georgakis, Evangelos G., 4,898,276, Cl. 206-369.000.
Unitrode Corporation: *See—*
Neidorff, Robert A., 4,899,064, Cl. 307-261.000.
Universite Laval: *See—*
Cyr, Normand; Tetu, Michel; and Giordano, Vincent, 4,899,345, Cl. 372-32.000.
University of Akron: *See—*
Harwood, H. James; Majumdar, Ramendra N.; and Yang, Shih-Liang, 4,898,915, Cl. 525-326.700.
University of Alabama at Birmingham/Research Foundation, The: *See—*
Urry, Dan W., 4,898,926, Cl. 528-328.000.
University of British Columbia, The: *See—*
Levy, Julia G.; Steele, J. Kevin; and Stammers, Anthea T., 4,898,730, Cl. 424-88.000.
University of California, The Regents of the: *See—*
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Yoshiike, Yoshiji; and Satou, Yoshinori, to Kabushiki Kaisha Toshiba. Rare gas discharge lamp device. 4,899,090, Cl. 315-335.000.

Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Simasaki, Shuhei, to Daikin Industries Ltd. Powders of tetrafluoroethylene copolymer and process for preparing the same. 4,898,779, Cl. 428-402.000.

Yoshinari, Osamu; Kawakatsu, Yoshifumi; Takahashi, Hayashi; and Fukuizumi, Hideaki, to Toho Rayon Co., Ltd. Process for producing preoxidized fibers from acrylic fibers. 4,898,700, Cl. 264-83.000.

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Yu, Michael C.; Scoggins, Lacey E.; and Reed, Jerry O., to Phillips Petroleum Company. Method to modify poly(aryle sulfide) resins. 4,898,904, Cl. 524-399.000.

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Yule, Bruce, to Smiths Industries Public Limited Company. Inflation indicators for cuffed tubes. 4,898,168, Cl. 128-207.150.

Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, to TLV Co., Ltd. Steam trap operation detector. 4,898,022, Cl. 73-46.000.

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Zambrano, Raffaele; and Musumeci, Salvatore, to SGS-Thomson Microelectronics S.R.L. Process for forming an integrated circuit on an N type substrate comprising PNP and NPN transistors placed vertically and insulated one from another. 4,898,836, Cl. 437-31.000.

Zamzow, William H.; and Miller, Anthony M., to Kraft, Inc. Method for manufacturing of pasta filata cheese with extended shelf life. 4,898,745, Cl. 426-582.000.

Zapata, Manuel, to Superior Granite & Marble Restoration. Compound and method for polishing stone. 4,898,598, Cl. 51-309.000.

Zbed, Brian D., to Baxter International Inc. Sliding reconstitution device with seal. 4,898,209, Cl. 137-614.040.

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Zeidler, Siegmund, to Rassmussen GmbH. Coupling for pipes with plain ends. 4,898,407, Cl. 285-328.000.

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Zellweger Uster AG: *See—*
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Zembrot, Anton: *See—*
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Zemel, Jay N., to University of Pennsylvania, Trustees of the. Microarchitectural deep well surfaces. 4,899,058, Cl. 250-492.100.

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Ziemelis, Maris J.; and Park, William R. R., to Dow Corning Corporation. Method of making hydrophobic copolymers hydrophilic. 4,898,913, Cl. 525-301.000.

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Zinser Textilmaschinen GmbH: *See—*
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Zivin, Justin A. Reduction of stroke damage. 4,898,869, Cl. 514-280.000.

Zosel, Albrecht: *See—*
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ZTP Coatings: *See—*
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Zuperku, Edward J.: *See—*
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LIST OF REISSUE PATENTEES

TO WHOM

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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Dental Association Health Foundation: *See—*
Brown, Walter E.; and Chow, Laurence C., Re. 33,161, Cl. 423-308.000.

Bauer, Peter. Fluidic oscillator with resonant inertance and dynamic compliance circuit. Re. 33,159, Cl. 239-589.100.

Bauer, Peter: *See—*
Stouffer, Ronald D.; and Bauer, Peter, Re. 33,158, Cl. 239-589.100.

Bowles Fluidics Corporation: *See—*
Stouffer, Ronald D.; and Bauer, Peter, Re. 33,158, Cl. 239-589.100.

Brown, Walter E.; and Chow, Laurence C., to American Dental Association Health Foundation. Combinations of sparingly soluble calcium phosphates in slurries and pastes as mineralizers and cements. Re. 33,161, Cl. 423-308.000.

Chow, Laurence C.: *See—*
Brown, Walter E.; and Chow, Laurence C., Re. 33,161, Cl. 423-308.000.

Cues, Inc.: *See—*
Guthrie, Kenneth R.; and Martin, James R., Re. 33,160, Cl. 73-40.50R.

Guthrie, Kenneth R.; and Martin, James R., to Cues, Inc. Method and apparatus for inspecting lateral lines. Re. 33,160, Cl. 73-40.50R.

Martin, James R.: *See—*
Guthrie, Kenneth R.; and Martin, James R., Re. 33,160, Cl. 73-40.50R.

Stouffer, Ronald D.; and Bauer, Peter, to Bowles Fluidics Corporation. Fluidic oscillator with resonant inertance and dynamic compliance circuit. Re. 33,158, Cl. 239-589.100.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Burroughs Willcome Co.: *See—*
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., B1 3,956,327, Cl. 544-325.000.

Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., to Burroughs Willcome Co. Method of preparing 2,4-diamino-5-benzyl pyrimidines. B1 3,956,327, 2-6-90, Cl. 544-325.000.

Day, Allon C. *See—*
Kyffin, Robin A.; Young, Peter A.; and Day, Allon C., B1 4,728,471, Cl. 264-43.000.

Dean, Mark E., to International Business Machines Corporation. Refresh generator system for a dynamic memory. B1 4,575,826, 2-6-90, Cl. 365-222.000.

International Business Machines Corporation: *See—*
Dean, Mark E., B1 4,575,826, Cl. 365-222.000.

J. W. Greaves & Sons Limited: *See—*
Kyffin, Robin A.; Young, Peter A.; and Day, Allon C., B1 4,728,471, Cl. 264-43.000.

Kyffin, Robin A.; Young, Peter A.; and Day, Allon C., to J. W. Greaves & Sons Limited. Treatment of expansible materials to form lightweight aggregate. B1 4,728,471, 2-6-90, Cl. 264-43.000.

Mentha, John W.: *See—*
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., B1 3,956,327, Cl. 544-325.000.

Seaman, Russell L.: *See—*
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., B1 3,956,327, Cl. 544-325.000.

Young, Peter A.: *See—*
Kyffin, Robin A.; Young, Peter A.; and Day, Allon C., B1 4,728,471, Cl. 264-43.000.

LIST OF DESIGN PATENTEES

A.M.S.: *See—*
Geiger, Reinold, 305,871, Cl. D9-435.000.

A/S Jotul: *See—*
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Akiyama, Akio: *See—*
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Alps Electric Co., Ltd.: *See—*
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Amerock Corporation: *See—*
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Gresens, Stanley T.; and Green, A. Denton, 305,863, Cl. D8-352.000.

Antonious, Anthony J. Golf club head. 305,921, 2-6-90, Cl. D21-217.000.

Atkins, David, to Australian Telecommunications Corporation. Telephone set. 305,891, 2-6-90, Cl. D14-151.000.

Australian Telecommunications Corporation: *See—*
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Bail, Rama N.: *See—*
Whitaker, John B., Jr.; and Bail, Rama N., 305,898, Cl. D15-138.000.

Banjo, Toshinobu; and Onoda, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. Memory card for a computer system. 305,886, 2-6-90, Cl. D14-117.000.

Barkan, Edward D.; Shepard, Howard M.; Gong, Frank; and Krichever, Mark J., to Symbol Technologies, Inc. Hand-held optical scanner. 305,885, 2-6-90, Cl. D14-116.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Printing ribbon cartridge. 305,907, 2-6-90, Cl. D18-12.000.

Bergeron, Gregory B., to NOVITAS. Housing for occupancy-activated wall switch or the like. 305,881, 2-6-90, Cl. D13-38.000.

Bevilacqua, Ernest M.; Ehrlich, Nathan; Franks, Anthony D.; Grilk, Henry G.; Li, Wen-Jeng; and Nichols, Arthur B., IV, to Goldstar Products Co., Ltd. Portable radiotelephone unit. 305,888, 2-6-90, Cl. D14-138.000.

Bienenstock, Berta, to Maneuverability, Inc. Desk or similar article. 305,838, 2-6-90, Cl. D6-420.000.

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Bismark, Otto H., H743, Cl. 323-313.000.
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NOTE.—First number, class; second number, subclass; third number, patent number

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60 4,899,147
65 4,899,148
67 4,899,149
118 4,899,150
145 4,899,151
154 4,899,152
156 4,899,153
159 4,899,154
200 4,899,155

CLASS 342

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40 4,899,157
44 4,899,158
90 4,899,159
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451 4,899,161

CLASS 343

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4,899,163
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767 4,899,165
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915 4,899,167

CLASS 346

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76 PH 4,899,170
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82 4,899,172
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140 R 4,899,178
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742 4,899,169

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1.1 4,898,435
3.64 4,898,436
6.7 4,898,437
96.10 4,898,438
4,898,439
96.13 4,898,440
96.14 4,898,441
96.15 4,898,442
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4,898,444
96.20 4,898,445
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96.21 4,898,449
4,898,450
96.23 4,898,451
97 4,898,452
255 4,898,453
350 R 4,898,454
4,898,455
350 S 4,898,456
463 4,898,457
584 4,898,458

CLASS 351

46 4,898,459
114 4,898,460
169 4,898,461

CLASS 354

75 4,399,188
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293 4,399,189
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271 4,399,196
290 4,399,197
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73.1 4,898,463
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313 4,898,466
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345 4,898,468
350 4,898,469
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23.6 4,899,203
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70 4,899,207
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81 4,899,210
82 4,899,211

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29 4,899,212
44 4,899,213
75 4,899,214
78 4,899,215
80 4,899,216
86 4,899,217
93 4,899,218
107 4,899,219
141 4,899,220
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448 4,899,225
451 4,899,226
452 4,899,227
473 4,899,228

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48 4,899,232
77.14 4,899,233
78.06 4,899,234
85 4,899,235
95 4,899,236
98.02 4,899,237
99.06 4,899,238
106 4,899,239
113 4,899,240
125 4,899,241
132 4,899,242
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133 4,899,244
137 4,899,245
141 4,899,229

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317 4,899,249
341 4,899,250
346 4,899,251
350 4,899,252
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386 4,899,255
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534 4,899,258
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104 4,899,308
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189.06 4,899,311
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118 4,899,352

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389.7 4,898,755

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188 4,898,764
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316 4,898,771
332 4,898,772
4,898,773
336 4,898,774
4,898,775
4,898,776
364 4,898,777
368 4,898,778
402 4,898,779
402.21 4,898,780
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407 4,898,782
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412 4,898,784
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4,898,787
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58 4,898,798
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548 4,898,812

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11 4,898,530
12 4,898,531
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CLASS 432

58 4,898,533
250 4,898,534

CLASS 433

6 4,898,535

CLASS 434

114 4,898,536
130 4,898,537

CLASS 435

4 4,898,813
6 4,898,814
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34 4,898,816
49 4,898,817
69.1 4,898,818
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95 4,898,820
119 4,898,821
121 4,898,822
172.3 4,898,823
180 4,898,824
212 4,898,825
226 4,898,826
244 4,898,827
252.3 4,898,828
289 4,898,829
320 4,898,830

CLASS 436

32 4,898,831
45 4,898,832
63 4,898,833

CLASS 437

22 4,898,834
29 4,898,835
31 4,898,836
4,898,837
4,898,838
33 4,898,839
41 4,898,840
200 4,898,841

CLASS 439

76 4,898,538
81 4,898,539
153 4,898,540
248 4,898,541
371 4,898,542
374 4,898,543
498 4,898,544
578 4,898,545
608 4,898,546
652 4,898,547
686 4,898,548
701 4,898,549
718 4,898,550
789 4,898,551

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71 4,898,552
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CLASS 445

6 4,898,554
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26 4,898,556
49 4,898,557
53 4,898,558
64 4,898,559

CLASS 446

85 4,898,560
220 4,898,561
460 4,898,562

CLASS 453

3 4,898,564

CLASS 455

612 4,898,565

CLASS 464

167 4,898,566

CLASS 474

174 4,898,567
245 4,898,568

CLASS 475

179 4,898,065

CLASS 493

361 4,898,569
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200 4,898,848
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CLASS 505

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USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 18, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 10, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,641,379 through 4,642,813
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 8, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,371,983 through 4,373,210
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 26, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,302,551	06/218,483	11/24/81
4,302,603	06/217,937	11/24/81
4,554,682	06/597,045	11/26/85
4,554,684	06/542,420	11/26/85
4,554,689	06/699,943	11/26/85
4,554,690	06/662,318	11/26/85
4,554,693	06/563,167	11/26/85
4,544,695	06/576,706	11/26/85
4,554,697	06/552,244	11/26/85
4,554,701	06/579,167	11/26/85
4,544,707	06/631,918	11/26/85
4,544,709	06/630,553	11/26/85
4,554,715	06/582,981	11/26/85
4,554,723	06/634,825	11/26/85
4,554,732	06/617,056	11/26/85
4,554,737	06/604,313	11/26/85
4,554,738	06/532,288	11/26/85
4,554,739	06/586,700	11/26/85
4,554,746	06/627,869	11/26/85
4,554,751	06/657,084	11/26/85
4,554,752	06/727,345	11/26/85
4,554,753	06/530,194	11/26/85
4,554,755	06/556,990	11/26/85
4,554,758	06/535,286	11/26/85
4,554,759	06/484,154	11/26/85
4,554,761	06/616,246	11/26/85
4,554,764	06/424,157	11/26/85
4,554,768	06/487,063	11/26/85
4,554,770	06/569,998	11/26/85
4,554,793	06/502,475	11/26/85
4,554,797	06/656,246	11/26/85
4,554,798	06/580,010	11/26/85
4,554,800	06/548,353	11/26/85
4,554,803	06/702,757	11/26/85
4,554,807	06/541,113	11/26/85
4,554,812	06/639,582	11/26/85
4,554,814	06/666,144	11/26/85
4,554,816	06/392,274	11/26/85
4,554,818	06/528,676	11/26/85
4,544,819	06/536,679	11/26/85
4,554,823	06/624,063	11/26/85
4,554,826	06/343,397	11/26/85
4,554,831	06/567,320	11/26/85
4,554,834	06/546,519	11/26/85
4,554,852	06/517,467	11/26/85
4,544,856	06/586,123	11/26/85
4,554,859	06/609,565	11/26/85
4,554,864	06/618,888	11/26/85
4,554,870	06/586,689	11/26/85
4,554,882	06/450,411	11/26/85
4,554,884	06/587,687	11/26/85
4,554,888	06/591,927	11/26/85
4,554,906	06/660,525	11/26/85
4,554,910	06/470,609	11/26/85
4,554,911	06/541,457	11/26/85
4,554,916	06/517,846	11/26/85
4,554,926	06/430,003	11/26/85
4,554,930	06/625,651	11/26/85
4,554,939	06/533,934	11/26/85
4,554,941	06/619,745	11/26/85
4,554,949	06/637,552	11/26/85
4,554,950	06/614,680	11/26/85
4,554,952	06/567,275	11/26/85
4,554,955	06/498,018	11/26/85
4,554,962	06/639,393	11/26/85
4,554,965	06/590,280	11/26/85
4,554,978	06/593,885	11/26/85
4,554,983	06/625,157	11/26/85
4,554,989	06/459,439	11/26/85
4,555,001	06/562,127	11/26/85
4,555,003	06/533,421	11/26/85
4,555,005	06/571,725	11/26/85
4,555,011	06/517,408	11/26/85
4,555,013	06/540,409	11/26/85
4,555,015	06/484,763	11/26/85
4,555,026	06/727,818	11/26/85
4,555,037	06/618,073	11/26/85
4,555,040	06/647,434	11/26/85
4,555,044	06/521,340	11/26/85
4,555,051	06/713,094	11/26/85
4,555,063	06/576,908	11/26/85
4,555,074	06/513,071	11/26/85
4,555,077	06/554,929	11/26/85
4,555,083	06/622,981	11/26/85
4,555,088	06/653,487	11/26/85
4,555,090	06/535,322	11/26/85
4,555,099	06/505,204	11/26/85
4,555,104	06/653,812	11/26/85
4,555,106	06/543,984	11/26/85

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Patent Number	Serial Number	Issue Date
4,555,111	06/526,602	11/26/85
4,555,114	06/547,013	11/26/85
4,555,115	06/618,028	11/26/85
4,555,123	06/455,739	11/26/85
4,555,138	06/543,393	11/26/85
4,555,142	06/559,764	11/26/85
4,555,147	06/647,921	11/26/85
4,555,174	06/563,123	11/26/85
4,555,183	06/577,488	11/26/85
4,555,196	06/490,403	11/26/85
4,555,209	06/602,273	11/26/85
4,555,214	06/450,974	11/26/85
4,555,216	06/553,534	11/26/85
4,555,217	06/690,828	11/26/85
4,555,226	06/453,179	11/26/85
4,555,229	06/511,998	11/26/85
4,555,234	06/709,200	11/26/85
4,555,237	06/628,527	11/26/85
4,555,251	06/605,585	11/26/85
4,555,272	06/598,960	11/26/85
4,555,280	06/648,430	11/26/85
4,555,283	06/443,510	11/26/85
4,555,284	06/464,912	11/26/85
4,555,292	06/580,839	11/26/85
4,555,294	06/596,319	11/26/85
4,555,306	06/653,815	11/26/85
4,555,323	06/614,107	11/26/85
4,555,329	06/679,728	11/26/85
4,555,339	06/557,617	11/26/85
4,555,343	06/469,241	11/26/85
4,555,351	06/480,770	11/26/85
4,555,361	06/495,538	11/26/85
4,555,370	06/658,444	11/26/85
4,555,393	06/622,829	11/26/85
4,555,395	06/424,608	11/26/85
4,555,401	06/589,863	11/26/85
4,555,412	06/357,819	11/26/85
4,555,424	06/582,985	11/26/85
4,555,425	06/582,986	11/26/85
4,555,426	06/543,365	11/26/85
4,555,433	06/530,640	11/26/85
4,555,441	06/708,674	11/26/85
4,555,444	06/536,211	11/26/85
4,555,458	06/537,390	11/26/85
4,555,493	06/559,048	11/26/85
4,555,510	06/626,837	11/26/85
4,555,514	06/690,051	11/26/85
4,555,521	06/552,595	11/26/85
4,555,550	06/705,168	11/26/85
4,555,562	06/584,021	11/26/85
4,555,596	06/501,791	11/26/85
4,555,607	06/616,026	11/26/85
4,555,616	06/645,171	11/26/85
4,555,628	06/478,987	11/26/85
4,555,632	06/538,999	11/26/85
4,555,639	06/625,775	11/26/85
4,555,650	06/481,737	11/26/85
4,555,656	06/572,398	11/26/85
4,555,680	06/510,664	11/26/85
4,555,696	06/502,175	11/26/85
4,555,697	06/581,075	11/26/85
4,555,705	06/442,935	11/26/85
4,555,710	06/451,193	11/26/85
4,555,711	06/525,389	11/26/85
4,555,713	06/601,472	11/26/85
4,555,716	06/541,307	11/26/85
4,555,725	06/526,080	11/26/85
4,555,726	06/586,366	11/26/85
4,555,727	06/532,172	11/26/85
4,555,736	06/369,977	11/26/85
4,555,747	06/302,257	11/26/85
4,555,754	06/615,450	11/26/85
4,555,762	06/334,060	11/26/85
4,555,787	06/476,946	11/26/85
4,555,791	06/377,803	11/26/85
5,555,794	06/549,369	11/26/85
4,555,804	06/630,236	11/26/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,736,337, Re. S. N. 07/454,380, Filed Dec. 20, 1989, Cl. 364/900, MONOLITHIC INTERGRATED CIRCUIT HAVING COMMON EXTORNIAL TERMINAL FOR ANALOG AND DIGITAL SIGNALS AND DIGITAL SYSTEM USING THE SAME, Shirou Baba, Owner of Record: *Hitachi Ltd., Tokyo, Japan*, Attorney or Agent: Thomas E. Beall, Jr., Ex. Gp.: 231

4,805,760, Re. S. N. 07/454,500, Filed Dec 21, 1989, Cl. 198/456, PACKAGE POSITIONING APPARATUS AND METHOD, Fritz F. Treiber, Owner of Record: *Hobart Corporation, Troy, Ohio*, Attorney or Agent: William Weigl, Ex. Gp.: 317

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,098,546, Reexam. No. 90/001,916, Dec. 26, 1989, Cl. 439/20, ELECTRICAL CONDUCTOR ASSEMBLY, Harold L. Swartz, et al., Owner of Record: *Honeywell Inc., Minneapolis, Minn.*, Attorney or Agent: Unknown, Ex. Gp.: 320, Requester W. A. Cosler, Poway, Calif.

4,125,297, Reexam. No. 90/001,918, Requested Dec. 27, 1989, Cl. 308/3.600, UNIVERSAL DRAWER SLIDER, Paul Mertes, Owner of Record: *GWN Inc., Los Angeles, Calif.*, Attorney or Agent: Spensley, Horn, Jubas & Lubitz, Ex. Gp.: 310, Requester: Owner

4,191,793, Reexam. No. 90/001,920, Requested Dec. 22, 1989, Cl. 427/276, METHOD OF FORMING A DURABLE CREASE, James D. M. Gibson, et al., Owner of Record: *Wool Development International Ltd., Ilkley, England*, Attorney or Agent: Kenyon & Kenyon, Ex. Gp.: 150, Requester: Owner

4,315,398, Reexam. No. 90/001,914, Requested Dec. 15, 1990, Cl. 57/58.950, OPEN-END SPINNING APPARATUS, Parker, et al., Owner of Record: *Platt Saco Lowell Ltd., Rossendale, England*, Attorney or Agent : D. H. Feldman, Ex. Gp.: 260, Requester: Owner

4,420,386, Reexam. No. 90/001,919, Requested Jan. 4, 1990, Cl. 204/192, METHOD FOR PURE ION PLATING USING MAGNETIC FIELDS, Gerald W. White, Owner of Record: *White Engineering Corp., Dallas, Tex.*, Attorney or Agent: Ross, Howison, Clapp & Korn, Ex. Gp.: 110, Requester: Owner

4,461,311, Reexam. No. 90/001,917, Requested Dec. 28, 1989, Cl. 131/365, METHOD AND SMOKING ARTICLE WRAPPER FOR REDUCING SIDE STREAM SMOKE, Inventor: John Mathews, et al., Owner of Record: *Kimberly-Clarke Corp., Neenah, Wis.*, Attorney or Agent: W. D. Herrick, Ex. Gp.: 330, Requester: Ecusta Div. of P.H. Glatfelter Co., Pisgah Forest, N.C.

4,690,055, Reexam. No. 90/001,913, Requested, Dec. 22, 1989, Cl. 101/451, KEYLESS INKING SYSTEM FOR OFFSET LITHOGRAPHIC PRINTING PRESS, Thomas A. Fadner, et al., Owner of Record: *Rockwell International Corp., Pittsburgh, Pa.*, Attorney or Agent: Richard A. Speer, Ex. Gp.: 330, Requester: Owner

4,759,820, Reexam. No. 90/001,915, Requested Dec. 8, 1989, Cl. 156/600, PROCESS FOR MAKING A POLYMER MATRIX CONTAINING NON-CENTROSYMMETRIC CRYSTALS, Paul D. Calvert, et al., Owner of Record: *The British Petroleum Co., London, England*, Attorney or Agent: Brooks, Haidt, Haffner & Delahunty, Ex. Gp.: 110, Requester: Owner

PATENTS AVAILABLE FOR LICENSE OR SALE

Patent Counsel, GE Appliances, General Electric Company, Appliance Park 2-226, Louisville, Ky. 40225

4,318,519	WASHING MACHINE HOSE GUIDE
4,643,663	HOLDING APPARATUS
4,474,017	METHOD OF ASSEMBLING AN ANTI-SWEAT HEATER IN A REFRIGERATOR CABINET
4,474,038	DRIVE SYSTEM FOR AUTOMATIC CLOTHES WASHING MACHINE
4,786,799	POWER CONTROL FOR COOKING APPLIANCE WITH MULTIPLE HEATING UNITS
4,787,956	FRICTION WELDING APPARATUS
4,788,398	TEMPERATURE SENSOR FAILURE DETECTION ARRANGEMENT USING A HEATER ENERGY COUNTER
4,788,415	DUAL BIMETAL POWER CONTROL SWITCHING ARRANGEMENT FOR ELECTRONICALLY CONTROLLED APPLIANCES

4,266,112 WEB-CUTTING PROCESS, William P. Niedermeyer, 1024 Mount Mary Drive, Green Bay, Wisc. 54301

4,482,939 DIRECTIONALLY VARIABLE LIGHTING ASSEMBLY, Andrew Tishman, 170 East 88 St. #8B, New York, N. Y. 10128

4,565,382 COMBINED PORTABLE TABLE AND HAND TRUCK, Gerald S. Schur, Welsh & Katz, Ltd., 135 S. LaSalle St., Suite 1625, Chicago, Ill., 60603

4,576,178 AUDIO SIGNAL GENERATOR, David Johnson, Box 68, 436 East 69th St., New York, N. Y. 10021

4,702,704 TETRAHEDRAL CONDON STEREO-TABLE, Leonard R. Svensson, Birch, Stewart, Kolasch & Birch, 301 N. Washington St., P. O. Box 747, Falls Church, Va. 22046

4,838,006 SPACER FOR PANES OF MULTIPLE-PANED WINDOWS, Peter K. Kontler, 1 Landmark Square, Stamford, Conn. 06901

4,879,554 BARRIER ASSEMBLY FOR A PARKING SPACE, Jorge Diaz-Silveria, 9817 N. W. 4th Terrace, Miami, Fla. 33172

D.294,195 HANDBAG WITH CONVERTABLE STRAP, Kelvin L. Starks, 1708 Arlington Ave., #5, Los Angles, Calif. 90019

DES.300,067 AQUARIUM, Debra A. Smith & Armand R Smalls, 8416 Paseo, Kansas City, Mo. 64131

United States Patent and Trademark Office
Before the Commissioner of Patents and Trademarks

CAMERON WEIFFENBACH, Director, Office of Enrollment and Discipline

v.

WESLEY TURNER, Respondent.

Proceeding No. D89-6

NOTICE BY PUBLICATION

Notice is hereby given to the above named respondent that proceedings under 35 U.S.C. [g49 32 have been instituted against him. A copy of the COMPLAINT AND NOTICE OF PROCEEDINGS UNDER 35 U.S.C. 32, including the charges against respondent, was twice mailed to respondent's residence address of record and business address of record. The COMPLAINT AND NOTICE was twice returned from respondent's residence and business addresses of record by the U.S. Postal Service.

Respondent may obtain a copy of the above-mentioned COMPLAINT AND NOTICE from:

John H. Raubitschek
Associate Solicitor
U.S. Patent and Trademark Office
Office of Enrollment and Discipline
P.O. Box 15667
Arlington, Va. 22215

This notice will appear in the *Official Gazette* for four (4) consecutive weeks beginning with the issue of January 30, 1990.

Respondent has thirty (30) days from the date of the last publication of this notice to file and answer to the charges against him. Failure to file an answer will be taken as an admission of the charges. 37 CFR § 10.136(d).

CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

January 4, 1990

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PATENT NOTICES

Certificates of Correction For Week of February 13, 1990

PP. 06634	4,793,976	4,816,840	4,832,569
PP. 06637	4,794,011	4,817,016	4,832,584
Re. 32937	4,794,417	4,818,154	4,832,587
D. 300,732	4,795,086	4,818,468	4,832,648
4,579,817	4,795,598	4,818,627	4,832,767
4,588,417	4,796,069	4,818,685	4,833,137
4,612,582	4,796,720	4,818,994	4,833,360
4,682,234	4,798,612	4,819,253	4,833,479
4,693,746	4,798,955	4,819,406	4,833,603
4,734,956	4,800,573	4,819,591	4,833,651
4,740,606	4,800,854	4,820,300	4,834,378
4,742,075	4,801,113	4,820,347	4,834,438
4,743,954	4,802,444	4,820,746	4,834,610
4,748,349	4,802,478	4,821,191	4,834,643
4,751,134	4,802,746	4,822,466	4,834,800
4,761,445	4,803,207	4,824,105	4,834,834
4,763,515	4,803,214	4,824,231	4,835,030
4,763,732	4,803,611	4,824,733	4,835,043
4,764,282	4,805,698	4,824,840	4,835,077
4,765,050	4,806,505	4,827,162	4,835,154
4,765,971	4,806,539	4,827,266	4,835,223
4,767,332	4,806,640	4,828,379	4,835,230
4,770,779	4,807,491	4,828,399	4,835,337
4,773,406	4,807,653	4,828,422	4,835,888
4,776,157	4,807,876	4,828,499	4,836,064
4,776,413	4,810,655	4,830,805	4,836,133
4,778,764	4,810,716	4,830,807	4,863,365
4,779,206	4,810,763	4,830,844	4,836,369
4,780,170	4,812,457	4,831,122	4,836,605
4,782,215	4,813,085	4,831,624	4,836,610
4,784,797	4,813,443	4,831,748	4,837,357
4,784,816	4,813,763	4,831,866	4,839,113
4,784,918	4,813,996	4,831,985	4,846,993
4,788,060	4,814,759	4,832,012	4,848,353
4,789,788	4,815,281	4,832,112	4,850,247
4,790,664	4,815,413	4,832,458	
4,791,604	4,816,703	4,832,459	
4,793,737	4,816,717	4,832,520	

SPECIAL BOXES FOR MAIL

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF December 30, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-21-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	1-13-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-28-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	12-24-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
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MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during December 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,704,469 to 3,707,728 inclusive
Plant Patents ..... 3262 to 3280 inclusive

REEXAMINATIONS

FEBRUARY 13, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in *italics* indicates additions made by reexamination.

B1 4,719,920 (1206th)

EXERCISE-RESPONSIVE RATE-ADAPTIVE CARDIAC PACEMAKER

Eckhard Alt, Munich, Fed. Rep. of Germany, and Richard Calfer, assignors to Intermedics, Inc., Angleton, Tex.

Reexamination Request No. 90/001,662, Dec. 8, 1988.

Reexamination Certificate for Patent No. 4,719,920, issued Jan. 19, 1988, Ser. No. 917,558, Oct. 10, 1986.

Int. Cl.[4] **A61N** *1/36*

U.S. Cl. 128—419 PG



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1-18** is confirmed.

1. A rate-responsive cardiac pacemaker, comprising means for sensing the central venous blood temperature of the patient,

means responsive to the sensed blood temperature for detecting the onset of exercise by the patient by recognition of the characteristic drop in blood temperature associated therewith, and

adjusting means responsive to detection of the onset of exercise for thereupon stepping up the stimulation rate of the pacemaker.

B1 4,769,014 (1207th)

GASTROENTERIC FEEDING TUBE FOR FEEDING ENDOSCOPIC PLACEMENT

Ronald D. Russo, Barrington, R.I., assignor to Superior Biosystems Inc., Cumberland, R.I.

Reexamination Request No. 90/001,741, Apr. 3, 1989.

Reexamination Certificate for Patent No. 4,769,014, issued Sep. 6, 1988, Ser. No. 57,431, Jun. 2, 1987.

Int. Cl.[4] **A61M** *25/00*

U.S. Cl. 604—270



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2-10**, dependent on an amended claim, are determined to be patentable.

1. A gastroenteric feeding tube comprising an elongated tubular flexible main portion having a longitudinally extending lumen therein, said main portion having distal and proximal ends and having at least one side aperture therein which extends between said lumen and the exterior of said main portion adjacent said distal end thereof, a weighted bolus portion extending in substantially aligned relation from the distal end of said main portion and having a terminal end and a *highly supple and* flexible cord element attached to said bolus portion so that it extends outwardly a distance from substantially the axis of said bolus portion beyond said terminal end terminating in a free end.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,162

METHOD AND APPARATUS FOR GUIDANCE OF AN OPERATION OF OPERATING POWER PLANTS

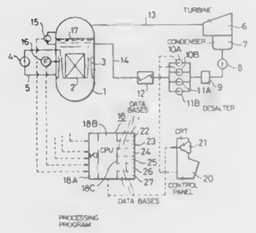
Kenichi Yoshida, Hachioji; Takao Watanabe, Hitachi, and Takashi Kiguchi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,563,746, dated Jan. 7, 1986, Ser. No. 433,908, Oct. 12, 1982. Application for reissue Jan. 6, 1988, Ser. No. 141,304

Claims priority, application Japan, Oct. 14, 1981, 56-164632

Int. Cl.[4] **G06F** *15/46, 15/18*

U.S. Cl. 364—192 **71 Claims**



8. An operating method comprising the steps of:

(1) inputting data of a system to be operated;

(2) identifying the actual status of all members of the system indicating an abnormality of the system from the inputted data;

(3) estimating at least one cause of an occurrence of the abnormality in accordance with the actual status of the members;

(4) predicting the status of all members after a given period of time has passed in accordance with the estimated cause;

(5) determining whether or not the actual status of the members are present in the predicted status of the members;

(6) repeatedly carrying out the step of estimating at least one cause of occurrence of the abnormality and predicting the status of all members in accordance therewith when it is determined that the actual status of all members are not present in the predicted status of the members until the actual status of all members come to exist in the predicted status of the members;

(7) selecting an operation plan for overcoming the estimated cause of occurrence of the abnormality when the actual status of all of the members are present in the status of the predicted members; and

(8) operating the system according to the selected operation plan.

Re. 33,163

GAS EQUALIZER FOR DOWNHOLE PUMP

Raymond D. Madden, Odessa, Tex., assignor to Madden Sales & Service, Inc., Odessa, Tex.

Original No. 4,781,547, dated Nov. 1, 1988, Ser. No. 30,586, Nov. 13, 1986. Application for reissue Mar. 10, 1989, Ser. No. 322,350

Int. Cl.[4] **F04B** *7/00, 21/04*

U.S. Cl. 417—444 **29 Claims**

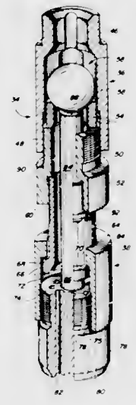
25. A gas release device for use in connection with a well pump adapted for reciprocal movement in a vertical direction and having a traveling valve assembly including a ball valve for controlling the flow of fluid through a flow passage, said gas release device comprising:

a body member having a vertically extending through passage;

means for connecting said body member to said traveling valve assembly for movement therewith;

a port sub defining passage means for receiving fluid in said well, said passage means having a diameter less than the diameter of said flow passage to create a pressure differential across said port sub;

a push rod extending through said passage of said body member in a coaxial relation to said body member and between said



port sub and said ball valve in an operative relationship thereto; and

a cylindrical skirt having an upper end portion extending over said body member in a coaxial telescoping relationship, said port sub being connected to the lower end portion of said skirt;

said fluid pressure differential permitting downward movement of said traveling valve assembly relative to said port sub on the downstroke of said pump so that said push rod unseats said ball valve to permit fluid flow through said flow passage.

Re. 33,164

INFLUENZA VACCINE PRODUCTION IN LIQUID CELL CULTURE

Karen K. Brown, Kansas City, Mo., and Richard C. Stewart, Merriam, Kans., assignors to Mobay Corporation, Pittsburgh, Pa.

Original No. 45,005,139, dated Feb. 19, 1985, Ser. No. 428,495, Sep. 29, 1982. Continuation-in-part of Ser. No. 39,236, May 15, 1979, abandoned. Application for reissue Feb. 18, 1987, Ser. No. 15,827

Int. Cl.[4] **A61K** *39/12;* **C12N** *7/00, 7/02, 7/04*

U.S. Cl. 424—89 **34 Claims**

16. A method of preparing an influenza virus vaccine which comprises the steps of

(a) infecting a portion of the cells of a liquid cell culture substantially free of proteolytic enzyme with an influenza virus;

(b) incubating the already infected culture in the presence of a proteolytic enzyme present in an amount sufficient to assure further infection and replication of the virus in cells other than the originally infected cells until the EID_{50}*/ml titer has increased by a factor of at least about* 10^2*;*

(c) harvesting the virus from the culture; and

(d) preparing a vaccine from the harvested virus.

Re. 33,165

BOAT HULL WITH FLOW CHAMBER

Robert M. Whitehead, Box 337, Big Pine Key, Fla. 33043

Original No. 4,609,360, dated Sep. 2, 1986, Ser. No. 630,300, Jul. 12, 1984. Application for reissue Aug. 30, 1988, Ser. No. 238,558

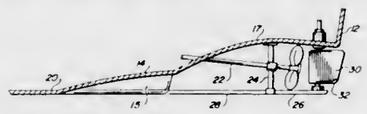
Int. Cl.[4] B63H *5/16*

U.S. Cl. 440—69 **10 Claims**

7. A boat hull having at least one two-stage flow chamber comprising:

a V-bottom hull having a forward flow chamber stage defined by a first surface beginning with a flow entry portion parallel to adjacent surfaces of the boat hull and gradually increasing in depth as said forward stage extends toward an aft end of the boat hull, said first surface angularly varying fram a plane parallel to said surface of the hull to a plane lying substantially parallel to a surface of water when the boat hull is at rest in the water; and

an aft flow chamber stage aligned with an aft end of said forward flow chamber stage and defined by a second surface



beginning at said aft end of said forward flow chamber stage and curving upward into an inverted V-shape and having a pair of opposed planar sides connecting said second surface to said boat hull.

PLANT PATENTS

GRANTED FEBRUARY 13, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,146

APPLE TREE — SCHNEICA

Georg Schneider, Grenzhofer Strasse 60, D-6803 Edingen-Neckarhausen 1, Fed. Rep. of Germany

Filed Apr. 21, 1988, Ser. No. 184,481

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree named Schneica as described and illustrated, and particularly characterized by its relatively deep overcolor intensity.

7,147

MALUS HUPEHENSIS NAMED 'CARDINAL'

William Flemer, III, Princeton, N.J., assignor to New Plant Associates, Princeton, N.J.

Filed Dec. 30, 1988, Ser. No. 292,114

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of *Malus hupehensis* tree substantially as herein shown and described, characterized particularly as to novelty, by the abundant bright red flowers and small, very glossy red fruits produced, the ability to resist defoliation and leaf injury from apple scab fungus or mildew under conditions severely affecting other trees of *Malus hupehensis* growing in the same area, and the rapid growth rate of the new variety, with wide spreading crown.

7,148

PLUM TREE, "JAKE'S BEST"

John M. Garabedian, P.O. Box 7883, Fresno, Calif. 93747

Filed Nov. 7, 1988, Ser. No. 268,347

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of Plum Tree substantially as illustrated and described and which is somewhat similar to the Wuhl Plum tree (U.S. Plant Pat. No. 5,585) with which it is somewhat closely similar in its physical appearance, but from which it is distinguished therefrom and characterized principally as to novelty by bearing fruit which are ripe for commercial harvesting and shipment approximately May 27 through June 3 at Fresno, Calif. and which further produces a semi-freestone fruit which has a good flavor and an attractive skin coloration.

7,149

GERANIUM PLANT NAMED MARPANET

Siegfried Klemm, Hanfacker 8, D-7000 Stuttgart 50, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 262,332

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinct geranium variety, substantially as herein shown and described, characterized by its relatively large flower clusters containing many closely grouped florets which, when mature, have a solid red-purple coloration, the plant being of bushy form, medium height, and with abundant foliage.

7,150

ERYNGIUM PLANUM PLANT NAMED SILVER STONE

Floris Vletter, Rijnsburg, Netherlands, assignor to de Vennootschap Onder Firma Gebr, Vletter & J.A. Den Haan, Netherlands

Filed Oct. 21, 1988, Ser. No. 260,731

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of *Eryngium planum* named Silver Stone, as illustrated and described.

7,151

ERYNGIUM PLANUM PLANT NAMED BLUE RIBBON

Floris Vletter, Rijnsburg, Netherlands, assignor to de Vennootschap Onder Firma Gebr, Vletter & J. A. Den Haan, Netherlands

Filed Oct. 21, 1988, Ser. No. 260,695

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of *Eryngium planum* named Blue Ribbon, as illustrated and described.

7,152

ERYNGIUM PLANUM PLANT NAMED CALYPSO

Floris Vletter, XS Rijnsburg, Netherlands, assignor to de Vennootschap Onder Firma Gebr, Vletter & J.A. Den Haan, Netherlands

Filed Oct. 21, 1988, Ser. No. 260,726

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of *Eryngium planum* named Calypso, as illustrated and described.

7,153

GERANIUM PLANT NAMED MARKTEX

Siegfried Klemm, Hanfacker 8, D-7000 Stuttgart 50, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 262,331

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive geranium cultivar, substantially as herein shown and described, characterized in particular by the very large size of the umbel-formed flower clusters of about twelve, dark salmon-colored florets, each of which has broad, closely imbricated petals, and by its abundant foliage of medium sized, dark green leaves.

7,154

CARNATION NAMED DIGIFIC

Antonio Di Giorgio, and Renato Di Giorgio, both of San Remo, Italy, assignors to Laboratoire de Physiologie Vegetale, La Londe-Les Maures, France

Filed Jan. 10, 1989, Ser. No. 295,369

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—71 **1 Claim**

1. The new and distinct standard carnation cultivar, substantially as herein shown and described, particularly characterized by its very large flowers having a Venetian Pink color, the plant having a profuse production of flowers grown on strong, upright stems with moderately abundant foliage during its recurrent flowering periods.

7,155

ASPARAGUS PLANT NAMED 'JERSEY PRINCESS'

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Dec. 7, 1988, Ser. No. 280,750

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—89 **1 Claim**

1. A new and distinct variety of asparagus plant as herein shown and described, distinguished particularly as to novelty by its unique combination of predominantly female characteristics, producing high yield, having tolerance to rust (*Puccinia asparagi*), root rot (*Fusarium oxysporum*) and crown rot (*F. moniliforme*), and substantially greater market yield as compared with hybrid plants, these characteristics enabling growth of the plant where standard susceptible cultivars cannot be grown profitably.

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PATENTS

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ERRATA

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028-252	4,899,426
475-205	4,899,621
475-160	4,899,622
606-27	4,899,741
606-180	4,899,742
606-139	4,899,743
606-153	4,899,744
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606-144	4,899,746
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606-133	4,899,748
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505-001	4,900,710
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360-104	4,901,185
364-131	4,901,218
381-013	4,901,350

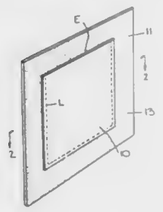
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PATENTS

GRANTED FEBRUARY 13, 1990

GENERAL AND MECHANICAL

4,899,395
CONCEALABLE, SELF-SUFFICIENT POCKET
Donald Spector, 380 Mountain Road, Union City, N.J. 07087
Filed Mar. 23, 1989, Ser. No. 327,684
Int. Cl.[4] A41D *27/20*
U.S. Cl. 2—250 5 Claims



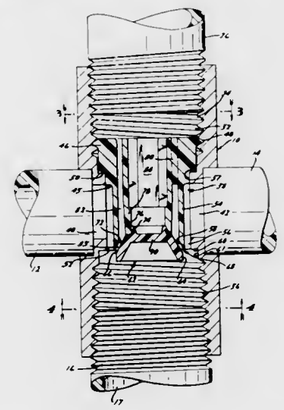
1. A self-sufficient pocket for concealing a small item, the pocket being attachable to the inner surface of an undergarment or garment where it is accessible only to the wearer thereof, said pocket comprising:
(a) a rectangular back sheet;
(b) a larger rectangular front sheet, said back sheet being centered with respect to the front sheet and being marginally sealed thereto on all sides except for the top side to leave a top entry to form an open pocket for receiving the item, the margin on the front sheet surrounding the back sheet defining a frame-like border; and
(c) a layer of pressure-sensitive adhesive on the border, whereby after the open pocket is loaded with the item, the pocket may then be pressed against said inner surface and conformed thereto to close the pocket.

4,899,396
SHOULDER PAD
David M. Mindel, Los Angeles, Calif., assignor to Damin Industries Inc., Los Angeles, Calif.
Continuation-in-part of Ser. No. 129,835, Dec. 8, 1987, abandoned. This application Dec. 2, 1988, Ser. No. 282,945
Int. Cl.[4] A41D *27/26*
U.S. Cl. 2—268 27 Claims



1. A device for shaping a shoulder of a wearer, said device comprising: a unitary piece of a porous foamed resinous material having a lower surface having a length and a width said length being at least 50% greater than said width which lower surface defines a dome-shaped, arcuate opening adapted to receive a shoulder, the dome-shaped arcuate opening being defined such that when placed on a shoulder, the device contacts the front, back, top and side of the shoulder wherein the device remains in position on said shoulder and further wherein the porous foamed resinous material is substantially uncovered so that, in use, the porous foamed resinous material is in direct contact with both the shoulder and a garment.

4,899,397
ASPIRATOR FOR A TUB/SHOWER DIVERTER ASSEMBLY
Dennis W. Crawford, Pontiac, and Larry G. Turner, Fenton, both of Mich., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Mar. 30, 1988, Ser. No. 175,080
Int. Cl.[4] E03C *1/00*
U.S. Cl. 4—191 14 Claims



1. A tub/shower diverter aspirator for being positioned in a fitting having a vertical bore with a lower outlet and upper outlet and at least one side inlet, said aspirator characterized by:
an upper end sealingly and fixedly attached to an internal wall of the bore between said lower and upper outlets;
a cylindrical body depending from said top end and having an outer radius sized such that an outer restricting annular space is formed between the bore and the cylindrical body and in open communication with said lower outlet; said cylindrical body being positioned laterally from said at least one side inlet and extending below said side inlet;
a fixed inner deflector means fixed radially within said cylindrical body for forming an annular passage between the body and said deflector means fluidly communicating said lower outlet to said upper outlet.

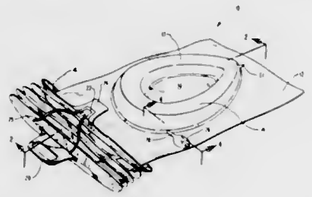
4,899,398
IN-TANK TOILET DISPENSER
Richard S. Hutchings, Cincinnati, Ohio, and Carey B. Bottom, Overland Park, Kans., assignors to The Drackett Company, Cincinnati, Ohio
Division of Ser. No. 59,352, Jun. 8, 1987, Pat. No. 4,787,984. This application Oct. 5, 1988, Ser. No. 253,815
Int. Cl.[4] E03D *9/02*
U.S. Cl. 4—228 9 Claims

1. An in-tank toilet dispenser containing a cleaning composition and adapted to release an effective cleaning amount of said composition into the toilet, said composition comprising up to about 15% surfactant, and from about 0.05 to about 10% by weight of the water-dissipatable polyester polymer which is the reaction product of (a) a difunctional dicarboxylic acid, (b) a difunctional sulfomonomer, and (c) a glycol or a glycol and diamine mixture, the polyester having an inherent viscosity of at least 0.1, the cleaning composition containing above about 65% water, the amount of said composition released from the

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dispenser being sufficient to provide a polymer concentration of from about 40 ppb to about 100 ppm, whereby heavy metal ions are captured by the polymer to inhibit staining.

4,899,399
INFLATABLE, DISPOSABLE BEDPAN APPARATUS AND METHOD
J. Winslow Young, 803 E. Center St., Centerville, Utah 84014
Filed Feb. 22, 1989, Ser. No. 314,175
Int. Cl.[4] A61G *9/00*
U.S. Cl. 4—451 **18 Claims**

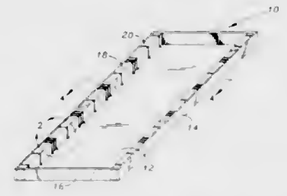




1. An inflatable, disposable bedpan comprising:
a base sheet for placement under a patient, said base sheet being fabricated from a liquid-impervious material;
an inflatable torus mounted to said base sheet;
inflation means connected to said inflatable torus for selectively inflating said inflatable torus;
a waste disposal bag mounted to an end of said base sheet, said waste disposal bag receiving said base sheet and said inflatable torus for disposal, said waste disposal bag comprising a mouth at first end and a closed end at second end, said waste disposal bag including a first handle means at said first end for hand grasping said first end of said waste disposal bag and a second handle means at said second for hand grasping said second end of said waste disposal bag along with an end of said base sheet, said second handle means providing a handle for pulling said base sheet and said inflatable torus into said waste disposal bag while holding said first handle means at a generally fixed position and holding said mouth open with said first handle means.

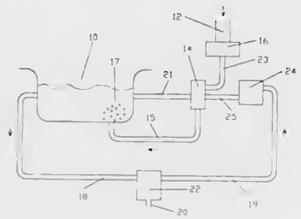
4,899,400
RAIN-COLLECTION PAD
Guillermo M. Torres, Newport Beach; Michael W. Bowler, Laguna Hills, and Robert A. Otto, Pasadena, all of Calif., assignors to Serrot Corporation, Huntington Beach, Calif.
Filed Oct. 7, 1987, Ser. No. 106,061
Int. Cl.[4] B65D *88/34*
U.S. Cl. 4—487 **44 Claims**

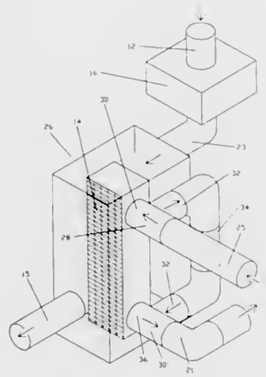
1. A rain-collection pad for exposed surfaces of liquids or suspensions comprising a pad having a horizontal bottom wall, four vertically extending contiguous side walls, an open top, stiffening means attached to at least one of the side walls to stiffen at least one of the side walls, attachment means connected to the pad for detachably attaching stiffening means to



at least one of the side walls, said pad being adapted to capture rain water and to float on the exposed surfaces liquids or suspensions.

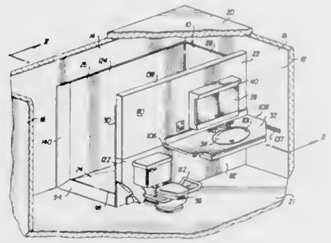
4,899,401
SYSTEM FOR PROVIDING HEATED AIR BUBBLES TO A SPA OR TUB
Robert Savarese, 5620 Funston St., Hollywood, Fla. 33023
Filed Apr. 28, 1989, Ser. No. 344,716
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 **6 Claims**





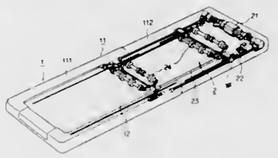
1. A system in combination with a heated spa or tub for providing heated air bubbles to said heated spa or tub positioned within a heated water circuit having a pump means therein, the system comprising:
(a) an ambient air input conduit including blower means therein;
(b) a heat exchanger positioned within a air fluid integral closet, said heat exchanger having a central fluid transfer coil and heat sink means in thermal communication therewith, said heat sink means projecting outwardly into the interior of said air fluid closet, said air closet having as its input an output of said ambient air input conduit, said fluid transfer coil having as its input and output a by-pass of said heated water circuit; and
(c) an internal air conduit having as its input the output of said air closet and, as its output, said spa or tub,
whereby the passage of heated water from said by-pass through said fluid transfer coil will provide heat to said heat sink means which, in turn, will communicate heat to the ambient air furnished to said air closet thereby providing a heated air input to said internal air conduit and, at the output of said conduit, heated air bubbles to said spa or tub.

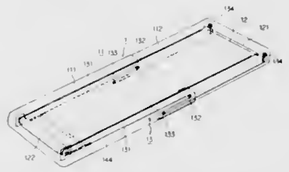
4,899,402
HANDICAP-ACCESSIBLE BATH FACILITY
John Maynard, and Dale Sexton, both of Ashland, Ky., assignors to A. C. Marble, Inc., Ashland, Ky.
Filed Sep. 29, 1988, Ser. No. 251,160
Int. Cl.[4] A47K *4/00*
U.S. Cl. 4—663 **14 Claims**



1. A method of constructing a handicap-accessible bath facility in an existing room having room walls, a ceiling, and a floor said method comprising the steps of:
placing a prefabricated rectangular, relatively flat, shower base in a corner of said existing room with a long edge of said shower base contacting a first existing wall of said existing room and a back edge of said shower base contacting a second existing wall of said existing room which is perpendicular to said first existing wall, said shower base being molded of a single piece of non-porous material to form a flat bottom surface for resting on said room floor, said shower base having a drain bole therein for allowing drain water from said shower to pass therethrough, a top surface of said shower base being molded to form a depression surrounding said drain hole for channeling water contacting said top surface at said depression into said drain hole, said top surface of said shower base being further molded to form a ramp at a ramp edge thereof which is opposite to said back edge, said ramp edge facing, but being spaced a substantial distance from, a third existing wall of said existing room which is perpendicular to said first existing room wall, said ramp leading upwardly from the bottom surface of said shower base at said ramp edge to a water-retaining barrier line on the top surface at a height of at least 1 inch above said bottom surface across the entire width of said shower base, said water retaining barrier line being positioned between said ramp edge and said depression and being space from said ramp edge not less than 3 inches, said depression beginning approximately at said barrier line, said ramp edge having a length at least as great as the width of a wheelchair but the length of said shower base (the distance from said ramp edge to said back edge), and the length of said depression (approximately the distance from said barrier line to said back edge) being substantially greater than the length of said ramp edge;
placing a prefabricated modular wall against a second elongated side edge of said shower base, on an opposite side edge from said first existing room well, on said floor, with a first end edge of the modular wall abutting against said second existing room wall, said modular wall having a length which is approximately the same as said shower base and a height which is substantially less than a height of said existing room extending from said floor to said ceiling and fastening said modular wall to said floor and said second existing room wall;
mounting waterproof wall panels on said first existing room wall, said second existing room wall, and said modular wall so that bottom ends of said wall panels are sealingly attached to said shower base, whereby water flowing down said wall panels falls on said top surface of said shower base and cannot flow over said first, second and back edge of said shower base;
mounting a shower head and shower control knobs on said modular wall above said shower base for spraying water on said shower base depression;
placing utility lines in said modular wall; and
connecting said shower head and faucet to said utility lines in said modular wall.

4,899,403
APPARATUS FOR CONTROLLING EXPANSION OR CONTRACTION OF COVER CLOTH WITH RESPECT TO BED BASE
Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Fuji Iryoki and Kabushiki Kaisha Japan Health, both of Osaka, Japan
Filed Mar. 3, 1989, Ser. No. 319,219
Int. Cl.[4] A61G *7/00;* **A61H** *7/00*
U.S. Cl. 5—60 **8 Claims**





3. In a massaging-type bed provided with a bed base, a flexible sheetlike cover positioned so as to extend over an upper surface of the bed base, and a movable roller assembly mounted on the bed base below the cover to permit massaging of a body positioned on the cover, the improvement comprising:
said bed base including first and second generally U-shaped bed base members each including a bight part and a pair of leg parts which project generally perpendicularly from opposite ends of the respective bight part in generally parallel relationship to another, the leg parts of one bed base member being slidably telescoped generally into the leg parts of the other bed base member so as to permit the lengthwise dimension of the bed base to be selectively extended to contracted;
locking means coacting between said first and second bed

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base members for permitting the bed base members to be selectively fixedly locked together in a selected one of a plurality of lengthwise positions to permit selective expansion or contraction in the length of the bed base;

a guiding member mounted on said bed base adjacent the bight part of said first bed base member and extending transversely thereacross, said sheetlike cover having one end edge disposed adjacent and fixedly anchored relative to the bight part of said second bed base member, said cover having an upper portion which extends transversely across the bed base and which extends from said one end edge to a point of engagement with said guiding member, said cover having an intermediate portion which wraps downwardly around said guiding member and joins to a lower portion which is disposed downwardly from the upper portion and projects away from the guiding member in a direction toward the bight part of said second bed base member, said lower portion terminating in another end edge; and

a compensating mechanism coacting between said bed base and said another end edge of said cover for maintaining the upper portion of said cover in a taut condition while still fully covering the upper surface of said bed base when said bed base is expanded or contracted.

4,899,404

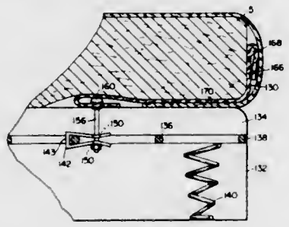
ELEVATION SYSTEM FOR A BED ASSEMBLY

Michael H. Galumbeck, 5577 Vantage Point Rd., Columbia, Md. 21044

Continuation-in-part of Ser. No. 31,221, Mar. 27, 1987, Pat. No. 4,742,586, which is a continuation of Ser. No. 802,053, Nov. 25, 1985, abandoned. This application May 9, 1988, Ser. No. 191,879

Int. Cl.[4] A61G *7/00;* **A47C** *23/04*

U.S. Cl. 5—72 **21 Claims**



1. An adjustable bed unit for elevating one end section of a mattress from the plane of the remainder of the mattress simultaneously in two stages and at differential angles to create and maintain an area of said end section adjacent the juncture of the end section with said remainder of the mattress in a smooth, substantially concave arcuately curved configuration comprising a sectional support means divided into a plurality of substantially planar sections, said support means including an elongate body section having a longitudinal axis and extending in a first plane and a pivoted end assembly means connected to said body section and adapted to extend substantially in said first plane, said pivoted end assembly means including an intermediate section having a first end pivotally connected by a first pivot means to one end of said body section and a second end opposite to said first end, and a head section pivotally connected by a second pivot means to the second end of said intermediate section, said head section having a free end spaced from said second pivot means, said body section including a first rigid base means, said intermediate section including a second rigid base means, said first pivot means being connected between said second rigid base means and one end of said first rigid base means, and said head section including a third rigid base means, said second pivot means being connected between said second rigid base means and said third rigid base means, said first, second and third rigid base means being substantially equal in width, said first rigid base means being longer than said third rigid base means and said third rigid base means being longer than said second rigid base means, said second and third rigid base means having a combined length which is no more than one-half the length of said first rigid base means, said sectional support means including resilient body means having upper support surface means spaced above said first, second and third rigid base means and resilient means extending between at least said first and third rigid base means and said upper support surface, said upper support surface means including longitudinal, spaced first and second border support means extending respectively along opposite sides of said sectional support means, each said border support means including a first border wire section extending above said first rigid base means and terminating at a first wire end spaced above and over said second rigid base means, a second border wire section extending above said third rigid base means and terminating at a second wire end spaced above and over said second rigid base means and spaced from said first wire end, and hinge means extending between said first and second wire ends, said hinge means including an elongate central link spaced between said first and second wire ends and said second rigid base means, and first and second elongate pivot links extending outwardly from said first and second wire ends respectively to opposite ends of said elongate central link, one end of said first and second elongate pivot links being pivotally connected to said first and second wire ends respectively and an opposite end of said first and second elongate pivot links being pivotally connected to said elongate central link, and elevating means connected to said support means for simultaneously moving said intermediate and head sections in the same direction either away from or toward the plane of said body section in a manner to maintain said free end of said head section further from said first plane than the remainder of said pivoted end assembly means when said end assembly means is moved from said first plane, said elevating means being connected to said head section and operable to directly move said head section to initiate simultaneous movement of the head and intermediate sections to pivot said intermediate section about said first pivot means and to pivot said head section about said second pivot means to create a first angle between said intermediate section and said body section and a second angle between said intermediate section and said head section.

4,899,405

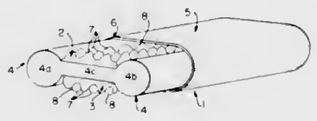
ORTHOPEDIC PILLOW

Michael Rothbard, 3500 Piedmont Rd. Ste. 105, Atlanta, Ga. 30305

Filed Mar. 31, 1989, Ser. No. 332,515

Int. Cl.[4] A47G *9/00*

U.S. Cl. 5—434 **4 Claims**



1. A reversible, generally rectangular orthopedic pillow for supporting a user's head and neck while a user is lying in a substantially horizontal position comprising:

a member made of resilient material having two elongated cylindrical shaped bolsters of substantially the same size attached to opposite long ends of a generally horizontal rectangular resilient element that connects the bolsters to each other, having generally planar upper and lower surfaces, and a thickness smaller than the diameters of the bolsters, thereby defining an upper and lower cavity;

two generally rectangular resilient cushions, each being substantially the same size as said planar surfaces, each consisting of a multitude of pyramid shaped nodes arranged in a matrix fashion on one side, each cushion being joined to a respective upper and lower surface of the resilient element, within the respective cavities so as to expose said pyramid shaped nodes,

whereby a user can rest his or her head on either cushion while supporting his or her neck on either of said bolsters and yield maximum support and comfort.

4,899,406

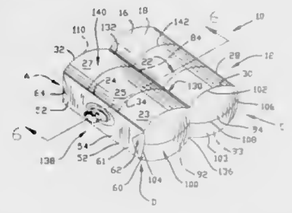
FOLDING CUSHION

William Sanderson, St. Petersburg, Fla., and Michael Zinn, 3700 Bayshore Blvd. N.E., St. Petersburg, Fla. 33703, assignors to Michael Zinn, St. Petersburg, Fla.

Continuation of Ser. No. 95,832, Sep. 14, 1987, Pat. No. 4,774,735. This application Sep. 30, 1988, Ser. No. 252,806

Int. Cl.[4] A47K *11/02*

U.S. Cl. 5—449 **5 Claims**



1. An inflatable, deflatable and foldable device comprising:

a first and a second plastic sheet member;

each said first and said second plastic sheet members having a front edge, a back edge, a first side edge and second side edge;

said front edges, said back edges, said first side edges and said second side edges of said first and said second plastic sheet members, respectively, sealed together to provide a fluid tight chamber between said first and said second plastic sheet members to receive an inflating fluid;

a first folding means extending from said front edge to said back edge of said first plastic sheet member thereby dividing said first plastic sheet member into a first portion and a second portion and for providing a first hinge line on said first plastic sheet member to enhance the folding memory of said first plastic sheet member along said first hinge line;

a second folding means extending from said front edge to said back edge of said second plastic sheet member thereby dividing said second plastic sheet member into a first portion and a second portion and for providing a second hinge line on said second plastic sheet member to enhance the folding memory of said second plastic sheet member along said second hinge line;

a valve means positioned in one of said first and said second plastic sheet members for permitting fluid communication of said inflating fluid into said chamber to define an inflated device and for further permitting fluid communication of said inflating fluid out of said chamber to define a collapsed and deflated device to enable said first folding means and said second folding means to be simultaneously folded along said first hinge line and said second hinge line, respectively, such that said first and second portions of said first plastic sheet member are proximate each other to form a flat, partially folded and deflated inflatable device.

4,899,407

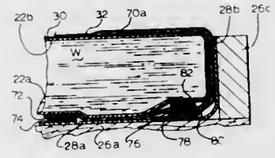
WATERBED SHEET FASTENERS

Brian McCue, 11 Lafleur Street - Apt 102, LaSalle, Canada (H8R 3G4)

Filed Apr. 13, 1989, Ser. No. 337,466

Int. Cl.[4] A47C *21/02*

U.S. Cl. 5—508 **7 Claims**



1. A sheet securing assembly for use in releasably maintaining in extended condition over the quadrangular mattress of a bed the quadrangular bedsheet and quadrangular mattress cover of that bed, said mattress being supported by a support frame member, said securing assembly comprising four strap members each mounted to one corresponding corner of said quadrangular bed mattress; wherein each strap member includes an elongated body defining first and second end portions, first fastening means proximate said first end portion of said strap, and positioned under said mattress to releasably anchor said strap body to said support frame member, second fastening means to releasably anchor said strap body to said bedsheet, and third fastening means to releasably anchor said strap body to said mattress cover; said second and third fastening means of a given strap being positioned between the two end portions of this strap such that in use, said second and third fastening means are positioned under said mattress, each said strap member further including release means comprised by said second end portion of said release strap, said second end portion being of sufficient length to extend along the side edge portion of the mattress and onto the top edge portion thereof, whereby upon being grasped and pulled with a sufficient force, said second end portion permits effortless disengagement of said fastening means without having to lift said mattress spacedly above said support frame member.

4,899,408

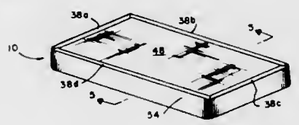
BEDDING SYSTEM

Lori D. Illingworth, 7208 Second St., Lakeport, Mich. 48060

Filed Jul. 19, 1989, Ser. No. 382,257

Int. Cl.[4] A47G *9/04*

U.S. Cl. 5—484 **14 Claims**



1. A bedding attachment system comprising:

a coverlet adapted to be disposed about top, head, foot and side panels and at least the peripheral edges of the top and bottom panels of a mattress, said coverlet comprising:

an upper peripheral edge means arranged to be disposed about the perimeter of the top panel of the mattress and terminating in a pair of opposing upper and lower flap members having inner and outer surface areas, said flap members being arranged to be disposed on said top panel of said mattress;

fastening means disposed upon the inner surface of each of the opposing flap members, said flap members adapted to

releasably secure the peripheral edge of a cover sheet member and arranged to be held in overlying relationship to said mattress;

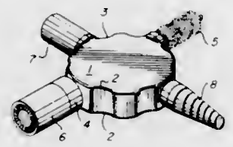
an intermediate member attached to said upper peripheral edge means, said intermediate member extending continuously about the foot, head and side panels of said mattress.

4,899,409

MANUAL TOOL FOR PREPARING TUBE ENDS FOR JOINTURE

David W. Cox, Jr., 601 Four Mile Road, Apt. 308, Alexandria, Va. 22305

Filed May 15, 1989, Ser. No. 351,748
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—167 **4 Claims**



1. A manual tool for preparing, cleaning and scarifying ends of tubing or pipefittings for jointure by soldering, welding, brazing, and the like, which comprises:

(a) a tool body adapted to fit readily and comfortably in the hand of a user and having a generally circular shape;

(b) at least three arm members projecting radially outwardly from said body in generally equally spaced relationship;

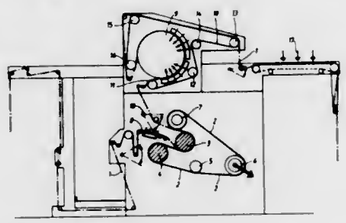
(c) each of said arm members including a tool unit for performing a predetermined operation on a tubing end externally or internally thereon, said tool units being securely fastenable to the main body but detachably connected thereto.

4,899,410

CONTINUOUS FABRIC TREATMENT PROCESS

Dieter Riedel, Porta Westfalica, Fed. Rep. of Germany, assignor to Johannes Menschner Maschinenfabrik GmbH & Co. KG, Viersen, Fed. Rep. of Germany

Filed Jun. 8, 1987, Ser. No. 59,613
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1986, 3630716
Int. Cl.[4] D06B *5/08*
U.S. Cl. 8—149.3 **1 Claim**



1. A process for continuous treatment of fabric, including the steps of

pressing and fixing the fabric by passing it around a heatable cylinder beneath a heated thrust belt, and

decatizing finishing the fabric by passing it around a steaming and suction cylinder,

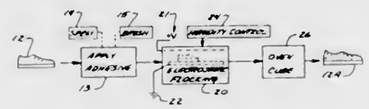
the decatizing finishing step being carried out immediately in time after the pressing and fixing step.

4,899,411

PROCESS FOR APPLYING A FLOCKED COATING TO A CLOTH SURFACE SUCH AS A TENNIS SHOE

Donald H. Johnson, Edina, and Benedict F. Gorecki, Milaca, both of Minn., assignors to Donald H. Johnson, Edina, Minn.

Filed May 26, 1988, Ser. No. 199,000
Int. Cl.[4] A43B *23/00;* **A43D** *8/16*
U.S. Cl. 12—142 R **5 Claims**



1. A process for coating a flexible, canvas athletic shoe having an upper and a sole, comprising the steps of:

applying adhesive at desired locations on the upper;

applying flocking material to embed into the adhesive in at least portions of the upper with end portions of the flock material protruding from the adhesive, the application of flocking material being done electrostically in a chamber having a controlled relative humidity, the application including applying between 20 and 100 kilovolts charge between the upper and the atmosphere in the electrostatic chamber, the flocking material comprising fibers ranging in size between 1 and 10 denier, and between 1 and 10 mm in length; and

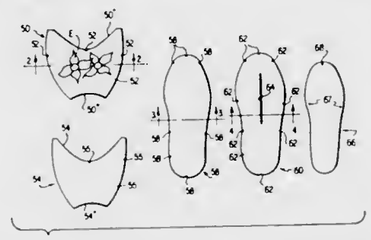
oven drying the canvas athletic shoe after applying the flocking material, and selecting the adhesive coating to be substantially waterproof when dried and such that it remains flexible to permit the upper to flex.

4,899,412

SLIPPER AND METHOD OF MAKING SAME

Michael H. Ganon, Bexley, Ohio, assignor to R. G. Barry Corporation, Pickerington, Ohio

Filed Sep. 7, 1988, Ser. No. 241,312
Int. Cl.[4] A43B *10/00, 1/02, 3/10*
U.S. Cl. 12—142 A **22 Claims**



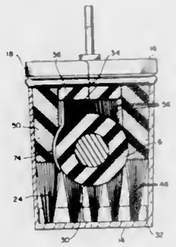
1. The method of making a slipper comprising attaching a portion of an outsole having a right side and a wrong side to a portion of an outsole pad having a right side and a wrong side, attaching a vamp having a right side and a wrong side to said outsole, attaching said outsole to a sock having a right side and a wrong side, turning the outsole pad, vamp and sock to their right sides through an opening in said outsole, and securing a further portion of the outsole to a further portion of the outsole pad to provide a finished slipper.

4,899,413

GOLF BALL CLEANING DEVICE

Ralph A. Trobiani, 844 Grant Dr., Addison, Ill. 60101

Filed Nov. 23, 1988, Ser. No. 275,305
Int. Cl.[4] A63B *47/04*
U.S. Cl. 15—21 A **13 Claims**



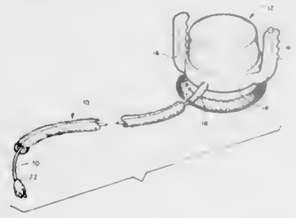
1. A golf ball cleaning device comprising a small container, a cavity therein to receive a golf ball for cleaning, first cleaning means positioned to clean the upper surface portion of said golf ball when received in said cavity, second cleaning means positioned to clean the lower surface portion of said golf ball when received in said cavity, a third cleaning means to clean the remaining surface portion of said golf ball between said upper and lower surface portions when received in said cavity, and ball grip rotation means to loosely grip and rotate said golf ball relative to all three of said first, second and third cleaning means when received in said cavity, and to rotate said golf ball relative to said ball grip rotation means.

4,899,414

POLISHED SURFACE PROTECTIVE SLEEVE FOR COVERING THE ELECTRICAL CORD OF A CAR WAX POLISHING AND BUFFING MACHINE

James K. Irwin, 6880 Barker Way, San Diego, Calif. 92119

Filed Sep. 19, 1988, Ser. No. 245,560
Int. Cl.[4] A47L *25/00;* **H01B** *7/24;* **B24B** *29/02*
U.S. Cl. 15—97 B **1 Claim**



1. The combination of a car wax polishing and buffing machine and a polished surface protective sleeve comprising:

said car wax polishing and buffing machine having an elongated electrical cord having a plug on one end, said electrical cord having a predetermined outside diameter;

an elongated tubular member having a predetermined length and a predetermined internal diameter, the internal diameter of said tubular member being greater than the outside diameter of said electrical cord, said tubular member having a first end and a second end, said electrical cord being inserted into said tubular member and passing through its entire length, said tubular member having an outer surface that is nonabrasive so it won't mar a polished paint surface;

said tubular member being made of an elongated strip of fabric whose opposite lateral edges have been folded over toward each other and stitched together thus forming a radially inwardly extending tab; and

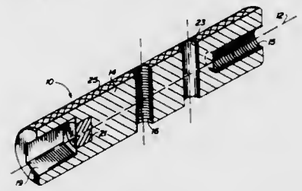
the first end of said tubular member having a strip of hook and loop fastening material attached to its inner surface and it mates with a ring of hook and loop fastening material that has been secured to structure of said electrical cord.

4,899,415

CLEANING ROD HANDLE

Raymond A. Wheeler, Lakeland, Fla., assignor to Peace River Arms & Accessories, Inc., Lakeland, Fla.

Filed Nov. 21, 1988, Ser. No. 274,292
Int. Cl.[4] F41C *31/00*
U.S. Cl. 15—104.05 **13 Claims**



1. A multipurpose handle for use in cooperation with a gun cleaning rod and tool bit, comprising:

an elongated body member having a longitudinal axis and two ends;

a first bore formed at one end of the member in coaxial alignment with the axis;

a second bore formed centrally of the member in perpendicular alignment with the axis;

a socket opening formed at the other end of the member;

a third bore formed intermediate the ends of the member and spaced from the second bore, the third bore extending through the member in perpendicular alignment with the axis;

means on the handle for releasably retaining the tool bit within the socket opening;

the first and second bores being dimensioned and configured for matingly engaging a complementary end of the rod, the first bore enabling the handle to serve as a "push" handle for the rod, the second bore enabling the handle to serve as a "pull" handle for the rod;

the socket opening enabling the handle to serve as a driver handle for the bit; and

the third bore being dimensioned and configured for receiving a midportion of the rod therein, for applying additional torque to the bit when the handle serves as the handle.

4,899,416

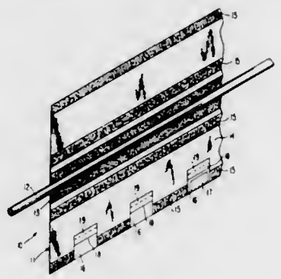
WIND POWERED CLEANING AND POLISHING FLAP FOR BOAT RAILS

Charles Francis, 5127 Neptune Sq., Oxnard, Calif. 93035

Filed Jan. 23, 1989, Ser. No. 299,791
Int. Cl.[4] B08B *1/00;* **B60S** *1/00;* **A47L** *25/00*
U.S. Cl. 15—104.93 **4 Claims**

1. A wind powered cleaning and polishing flap for boat handrails. comprising, a panel that drapes over a boat handrail, a bristled plastic strip secured to an inside surface said panel, providing for engagement with an outer periphery of said handrail and retaining a cleaning and polishing agent, mating hook and loop pile fasteners secured to said panel for retaining said draped panel on said handrail, and pockets secured to said

panel, for removably receiving lead weights that provide a means for said panel to depend downwards from said handrail



after each movement caused by wind force reacting on the surface of said draped panel.

4,899,417

ROLLER APPLICATOR WITH FOLDING HANDLE

Stanley Schaffer, and Bert Schussel, both of 10201 Hammocks Blvd., Store #148, Miami, Fla. 33196

Filed Aug. 29, 1988, Ser. No. 238,115
Int. Cl.[4] B05C *17/02*; B43M *11/02*
U.S. Cl. 15—230.11 **8 Claims**



1. An applicator comprising:
a roller;
a holder rotatably supporting said roller and presenting a recess which is open along one side away from the roller;
and a folding handle pivoted to said holder and selectively adjustable between a folded position seated in said recess in the holder and an extended position projecting away from said holder and said roller.

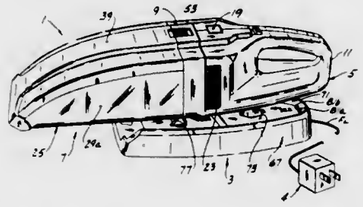
4,899,418

PORTABLE WET/DRY VACUUM CLEANER AND RECHARGING BASE

Robert E. Steiner, Chesterfield, Mo., and Daniel S. Soultanian, Bristol, Va., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 77,234, Jul. 24, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 274,724
Int. Cl.[4] A47L *5/24*
U.S. Cl. 15—344 **11 Claims**

1. A portable hand held vacuum cleaner comprising a handle base and a nozzle/debris container secured at an inner end to said handle base and having an outer end, top and bottom, said bottom being substantially horizontally directed throughout its length when resting on a substantially horizontally directed supporting surface, said top extending upwardly and rearwardly from said bottom to said handle base, said handle base comprising a housing having a handle permitting a user to lift and control said vacuum cleaner, said housing having a motor, a blower driven by said motor, said blower being in communication which said container for forcibly drawing air and debris entrained in the air into said container for depositing said debris within said container and for exhausting air therefrom, a channel extending from the outer end of and along the top of and within said container and having inner and outer channel ends, the outer end of said channel being proximate the container bottom and constituting an air/debris inlet of said channel adjacent the container bottom of said nozzle/debris container, said channel being in communication with said container and being constructed to extend upwardly and rearwardly from the air/debris inlet adjacent said container bottom toward said housing along the container top, but terminating short of said housing, an air duct within said container in communication with said blower, said air duct having an inlet within said container spaced from the inner end of said channel and being above the bottom of said container, an air conveyed



liquid/debris deflector between the inner end of said channel and said air duct inlet for directing air conveyed liquid and debris exhausted into said container via said channel and away from said air duct inlet, and a flexible squeegee removably insertable into the air/debris inlet and extending a predetermined distance into said channel so as to provide an air/liquid passageway of smaller cross section than said channel proximate said squeegee in said air/debris inlet and channel to substantially increase the air velocity in the air liquid passageway of smaller cross section and air convey liquid into the container via said channel while said air conveyed liquid/debris deflector being operative to effectively and efficiently direct air conveyed liquid and debris through said channel into said container and away from said air duct inlet, to facilitate the pick-up of liquid from a surface to be cleaned adjacent the container bottom.

4,899,419

PENCIL ERASER ASSEMBLY

Merrill E. Saleen, 1250 W. Ustick Rd., Meridian, Id. 83642

Filed May 18, 1989, Ser. No. 353,705
Int. Cl.[4] B43K *29/02*
U.S. Cl. 15—428 **10 Claims**



1. For use with a pencil having a generally cylindrical barrel segment and an attached frustum shaped segment and a pencil lead extending out from the point end of said frustum segment, a pencil eraser which comprises:
an elongated hollow eraser sleeve formed to align in elemental parallel spaced relationship with a portion of the cylindrical barrel of the pencil and to extend in elemental parallel spaced relationship along the frustum shaped segment of said pencil to a point adjacent to the point end of said frustum segment, said sleeve having an opening at the end adjacent to the point end of the frustum segment for receiving an elongated eraser plug, and further having an elongated slot running substantially the length of and along the longitudinal axis of said sleeve;

an elongated eraser plug slidably retained within said sleeve;
means for extending the eraser plug out through said sleeve opening slidably disposed with said sleeve; and
means for attaching the sleeve to the pencil.

4,899,420

HINGE SYSTEM

Duane Bye, Devils Lake, Md., and Robert Haugen, N. Fargo, N. Dak., assignors to Laurie Stanley Hardie, Surfers Paradise and Leonard John Coleman, Seafarer Court, both of, Australia

Filed Sep. 9, 1988, Ser. No. 242,353
Int. Cl.[4] E05F *3/02*
U.S. Cl. 16—1 C **20 Claims**



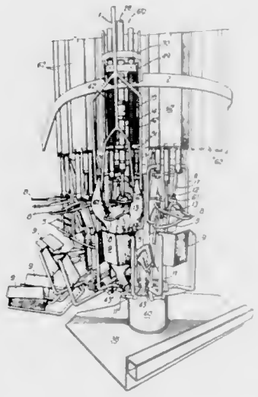
3. The combination according to claim 2, wherein said opening and closing means is rotatably attached to said quick connect-disconnect means and to said second hinge means.

4,899,421

METHOD AND APPARATUS FOR REMOVING FECAL MATTER IN POULTRY

Harry Van Der Eerden, Gainesville, Ga., assignor to Stork-Gamco, Inc., Gainesville, Ga.

Filed Aug. 8, 1988, Ser. No. 229,910
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 **27 Claims**



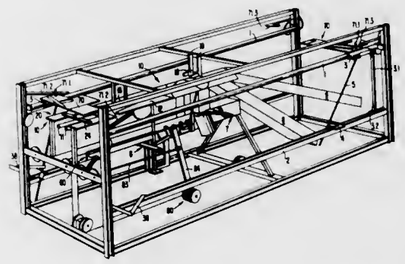
1. In an automated poultry processing line, an apparatus for removing fecal matter from the rectal cavity of poultry comprising:
(a) a hollow substantially tubularly shaped probe, one end of the probe having an open end and being dimensioned to fit inside of the rectal cavity through the anus of the poultry;
(b) means for inserting the open end of the probe through the anus into the rectal cavity of the poultry and for extracting the probe from the poultry, said inserting means including a guide means attached to said probe, and track means, the guide means interacting with said track means to impart motion to said probe; and
(c) means for drawing a vacuum through the probe while positioned within the poultry, thereby removing the fecal matter from the rectal cavity of the poultry.

4,899,422

FISH PROCESSING MACHINE WITH AUTOMATIC LENGTH RESPONSIVE CUTTING CONTROL MECHANISM

James J. King, 33 Hazelhurst Street, Darthmouth, Nova Scotia B2Y 3N1, Canada

Filed Oct. 28, 1988, Ser. No. 263,860
Int. Cl.[4] A22C *25/06*
U.S. Cl. 17—54 **19 Claims**



1. An apparatus for automatically controlling engagement of processing mechanisms comprising:
a substantially linear guide structure forming a processing path;
first transport carriage means for conveying items along said processing path comprising a first transport carriage;
a substantially straight bar having first and second ends, said first end being pivotally associated with said first transport carriage;
locking means for enabling angular and linear displacement of the second end of said bar when the first end of said bar is aligned with a first measuring portion of said processing path and restraining such angular and linear displacement when the first end of said bar is aligned with a second portion of said processing path downstream from said first measuring portion;
at least one control means for controlling engagement of at least one of the processing mechanisms; and
at least one sensing means for sensing when a portion of said bar is disposed vertically beneath said second path portion and generating an actuation signal denoting such a condition to said at least one control means.

4,899,423

ROPE CLEAT

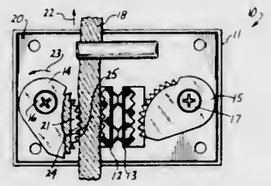
Richard C. Randall, 27622 San Blas, Mission Viejo, Calif. 92692

Filed Dec. 19, 1988, Ser. No. 286,452
Int. Cl.[4] B63B *21/08*; F16G *11/00*
U.S. Cl. 24—134 R **6 Claims**

1. A rope cleat, comprising:
a base, a rope abutment structure on the base, a cam, and means for mounting the cam on the base so that the cam can rotate about a rotational axis for purposes of gripping a rope between the cam and the rope abutment structure;
the cam having a plurality of teeth, each of which teeth has an edge disposed generally toward the rope abutment structure; and
means for enhancing the gripping of a rope having a known diameter against movement between the cam and the rope abutment structure along a path that is generally tangen-

tial relative to the rotational axis, including a groove in the cam that has a width less than the known diameter of the rope;

the groove extending transversely to the edges of the teeth



so that each edge includes first and second segments separated by the groove, each of the first and second segments of each edge thereby having an end portion disposed toward the groove with which to grip the rope against such movement.

4,899,424

SEAT BELT BUCKLE

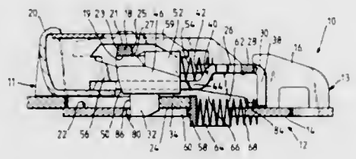
Brian A. Barnes, Carrickfergus; Ron Clarke, Holywood; Brian M. Martin, Newtownabbey, and John J. M. McCandless, Holywood, all of Ireland, assignors to General Motors Corporation, Detroit, Mich.

Filed May 4, 1989, Ser. No. 347,535

Claims priority, application United Kingdom, May 11, 1988, 8811139

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—641 **6 Claims**



1. A seat belt buckle adapted to releasably engage with a latch plate insertable within a latch passage in the seat belt buckle, said seat belt buckle comprising: a rigid frame having an open forward end defining said latch passage, an opposite rearward end adapted to be attached to a seat belt, an apertured rectangular base plate, an upstanding side wall extending from each longitudinal edge of said base plate, and a fixed bar extending across the width of said base plate between the forward and rearward ends thereof, parallel to, and spaced apart from, said base plate, said fixed bar being secured at each end thereof to a respective sidewall; a locking member pivotally supported by said frame side walls so as to pivot about an axis substantially parallel to, and spaced apart from, said fixed bar of said frame, between a latched position, in which the locking member retains said latch plate within said latch passage in the buckle, and an unlatched position, in which the locking member is held clear of said latch passage, the locking member including a depending lock bar extending therefrom, which lock bar extends across said latch passage and into an aperture of said apertured base plate of the frame when the locking member is in said latched position, there being a predetermined clearance existing between a forward edge of the lock bar and a forward edge of the aperture when the locking member is in said latched position; a shaped blocking member slidably mounted upon said pivoted locking member for longitudinal movement relative to said locking member between a first position, where the locking member is in said latched position and the blocking member is interposed between said fixed bar and said locking member to block any pivotal movement of the locking member towards said unlatched position, and a second position, where the locking member is in said unlatched position and the blocking member engages the fixed bar to retain the locking member in said unlatched position; a push button slidably mounted on said frame side walls above said latch passage, for iongitudinal movement relative to the frame base plate so as to move said blocking member from said first position to said second position; and a spring means located between the blocking member and the locking member which biases the blocking member towards said first position; and the locking member is pivoted in the frame side walls by elastically-deformable integral wing portions, which wing portions will elastically deform when the buckle in a latched condition is subjected to applied loads beyond a predetermined limit, so as to allow the forward edge of the lock bar to make contact with the forward edge of the aperture in the apertured base plate.

4,899,425

APPARATUS FOR STRAIGHTENING WEFT YARNS IN FABRICS

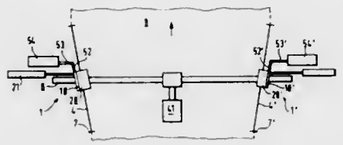
Helmut Epple, Saal/Donau, Fed. Rep. of Germany, assignor to Mahlo GmbH & Co. Kg., Saal/Donau, Fed. Rep. of Germany

Filed Oct. 13, 1987, Ser. No. 108,020

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3638909; May 6, 1987, 3715086

Int. Cl.[4] D06C *3/06*

U.S. Cl. 26—51.4 **3 Claims**



1. An apparatus for straightening weft yarns in a continuous fabric web being transported in a transporting direction, comprising:

two tensioning means, situated at margins of said fabric web for retaining respective salvages of said fabric web over a predetermined length thereof and for stretching said fabric web essentially in the weft direction with a force increasing in the transporting direction; and

driving means for driving said two tensioning means, said driving means including a drive shaft, driving motor means for rotating said drive shaft at a rotational speed and free wheel coupling means provided in each of said tensioning means for transferring a driving momentum only in said transport direction from said drive shaft to each said tensioning means and for allowing free rotational movement of each of said tensioning means at rotational speeds higher than said rotational speed of said drive shaft.

4,899,426

METHOD AND APPARATUS FOR RANDOMIZING MULTIPLE YARN STRANDS

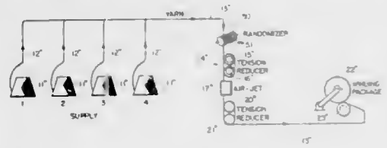
Edward L. Hand, Belmont, N.C., assignor to Belmont Textile Machinery Co. Inc., Belmont, N.C.

Continuation-in-part of Ser. No. 226,297, Jul. 29, 1988. This application Feb. 15, 1989, Ser. No. 311,138

Int. Cl.[4] D02G *3/24, 1/16*

U.S. Cl. 28—252 **5 Claims**

1. In a winding apparatus including a plurality of yarn supply package stations for holding packages of multifilament yarn, a processing station for receiving yarns from the yarn supply packages and processing the yarn, and a take-up package, the improvement which comprises randomizing means positioned downstream from the supply packages and upstream from the processing station for intermixing filaments within a single yarn and among the plurality of yarns in a random and irregular manner before delivery of the yarns to



the processing station thereby preventing patterning in the processed yarn, said randomizing means comprising a roller having threads thereon for randomly reciprocating said filaments along the length of said roller between two ends thereof.

4,899,427

TENSIONING MACHINE FOR THE HEAT TREATMENT OF TEXTILE FABRIC

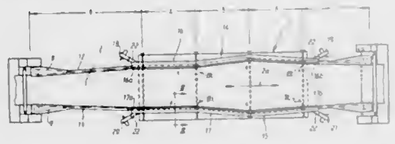
Harry Gresens, Benningen/Neckar, Fed. Rep. of Germany, assignor to Bruckner Trockentechnik GmbH & Co. KG, Leonberg, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 170,984

Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717774

Int. Cl.[4] D06C *3/02*

U.S. Cl. 26—92 **5 Claims**



1. A tensioning machine for the heat treatment of lengths of material which are guided widthways, in particular lengths of textile material, comprising:

(a) an elongated heating chamber having a longitudinal axis comprising:

(i) a first sidewall, a second opposite sidewall, a top wall and a bottom wall, each wall being disposed in parallel to the longitudinal axis of the chamber;

(ii) an inlet opening and an oppositely disposed outlet opening, both openings being transverse to the longitudinal axis of the chamber; and

(iii) means for heating air within the chamber;

(b) a tensioning chain assembly comprising:

(i) a first tensioning chain drawn tightly around a pair of opposing rotatable seaves, both seaves being disposed outside of the heating chamber with one seave disposed proximate to the inlet opening and the other seave being disposed proximate to the outlet opening, the first tensioning chain being thereby disposed proximate to the first side wall of the heating chamber in a continuous rotatable loop having an advancing strand moiety and a returning strand moiety;

(ii) a second tensioning chain drawn tightly around a pair of opposing rotatable seaves, both seaves being disposed outside of the heating chamber with one side disposed proximate to the inlet opening and the other seave being disposed proximate to the outlet opening, the second tensioning chain being thereby disposed proximate to the second side wall of the heating chamber in a continuous rotatable loop having an advancing strand moiety and a returning strand moiety;

(iii) holding elements attached to both the first tensioning chain and the second tensioning chain disposed protruding away from the advancing strand moieties of each tensioning chain in a direction towards the longitudinal axis of the heating chamber and adapted for gripping the edge of a length of cloth; and

(iv) means for rotating both the first tensioning chain and the second tensioning chain about their respective chain and the second tensioning chain about their respective opposing seaves so that the advancing strand moiety of each tensioning chain travels in a direction from the inlet opening towards the outlet opening;

(c) a first returning strand housing which encloses that portion of the first returning strand moiety within the heating chamber, the first returning strand housing having oppositely disposed open ends for the ingress and egress of the returning strand moiety of the first tensioning chain;

(d) a second returning strand housing which encloses that portion of the second returning strand moiety within the heating chamber, the second returning strand housing having oppositely disposed open ends for the ingress and egress of the returning strand moiety of the second tensioning chain;

(e) a first advancing strand housing which partially encloses that portion of the first advancing strand moiety within the heating chamber, the first advancing strand housing comprising walls which define a continuous advancing strand housing lateral opening which is parallel with and facing the longitudinal axis of the heating chamber, the first advancing strand housing being in fluid communication with the first returning strand housing, and the first advancing strand housing having oppositely disposed open ends for the ingress and egress of the advancing strand moiety of the first tensioning chain;

(f) a second advancing strand housing which partially encloses that portion of the second advancing strand moiety within the heating chamber, the second advancing strand housing comprising walls which define a continuous advancing strand housing lateral opening which is parallel with and facing the longitudinal axis of the heating chamber, the second advancing strand housing being in fluid communication with the second returning strand housing, and second advancing strand housing having oppositely disposed open ends for the ingress and egress of the advancing strand moiety of the second tensioning chain;

(g) means for blowing air into at least one end of each of the returning strand housings; whereby a length of material can be stretched between the two advancing strand moieties by attachment to the respective tensioning chain holding elements and drawn through the heating chamber from the inlet opening to the outlet opening so that the length of material can be heated by hot air within the heating chamber, and whereby air can be caused to flow into at least one end of each of the returning strand housings so as to cool the returning strand moieties, whereby such air can thereafter be caused to flow from each returning strand housing into one of the advancing strand housings so as to cool the advancing strand moiety and whereby such air can thereafter be caused to flow from each advancing strand housing via the continuous lateral opening into the heating chamber so as to provide the heating chamber with preheated air.

4,899,428

GOLF CLUB HANDLE SLEEVE ASSEMBLING MECHANISM

Kuo H. Hsu, 1 Fl., No. 1-2, Sec. 2, Hsin Sheng S. Rd., Taipei, Taiwan

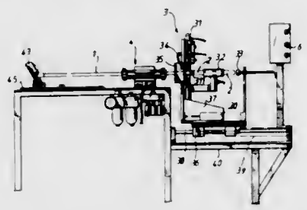
Filed Aug. 1, 1989, Ser. No. 387,815

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—235 **4 Claims**

1. A golf club handle sleeve assembling mechanism comprising a working table, having a first clamp device provided for clamping a golf club, and a head seat provided for supporting

a golf club bead; and a handle sleeve supporting and assembling unit being disposed on one side of said working table; said handle sleeve supporting and assembling unit including a first table slidable longitudinally relative to said golf club by means of a first actuator, a second table slidable relative to said first table by means of a second actuator, a second clamp device being disposed on said second table for clamping a handle sleeve, triple actuators each having a respective draw hook provided radially around said handle sleeve at a front end



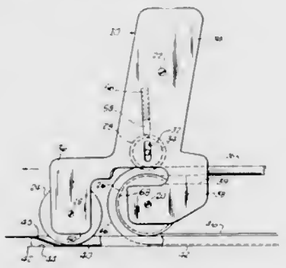
thereof for expanding said front end of said handle sleeve, said triple actuators being disposed on said second table, an air blower being disposed on said first table and aligned with said handle sleeve, and a control box being provided on said first table for controlling said actuators, said triple actuators and said air blower; said air blower starting to blow air into a rear end of said handle sleeve for expanding said handle sleeve when said front end of said handle sleeve contacts a handle portion of said golf club and is blocked thereby.

4,899,429

SCREEN INSTALLER TOOL

Gustavo Londono, 9117 Tivoli Pl., Boca Raton, Fla. 33434

Filed Aug. 22, 1988, Ser. No. 234,555
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—235 **19 Claims**



1. A manually movable screen installing tool for installing screen into a screen holder channel of the type in which the screen is bent into the channel opening and a pliable strip is inserted against that portion of the screen bent in the channel to hold the screen therein, said tool comprising:

a frame including a bottom;

a first circular disk rotatably positioned at a point within said frame and having a convex edge extending from said frame bottom, said first disk edge being sized to fit within said channel for bending said screen into said channel as said tool moves along a path following said channel;

a second disk rotatably positioned about a point within said frame and having a concave edge extending from said frame bottom, said second disk being totally remote from said first disk and offset in a direction perpendicular to said channel when said tool is in use; and

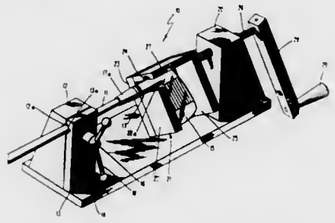
a feeding path for said pliable strip through said frame and around a portion of said second disk edge, said second disk inserting said strip into said channel above said bent screen as said tool moves along said path following said channel.

4,899,430

ASSEMBLY FOR REMOVING A HEAD FROM A GOLF CLUB

Robert Farino, 12842 Jefferson Ave., Newport News, Va. 23602

Division of Ser. No. 93,569, Sep. 4, 1987, Pat. No. 4,783,893.
This application Aug. 12, 1988, Ser. No. 232,113
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—240 **14 Claims**



1. An assembly for removing a head portion from a golf club by extracting a shaft from a hosel section having an outer surface, said assembly comprising:

(a) securing means for fixing the position of a shaft of a golf club along the longitudinal axis of the shaft,

(b) head grasping means mounted to rotate about an axis of rotation that is substantially co-extensive with the longitudinal axis of the shaft secured in a fixed position, said head grasping means includes alignment fixing means and pressure applying means,

said alignment fixing means being effective to maintain the position of the club head and hosel section for keeping the axis or rotation parallel to the longitudinal axis, and

said pressure applying means being effective to urge the head in a direction away from the securing means,

(c) said head grasping means being effective to hold the head portion at a laterally spaced distance from the securing means to allow the application of heat to the outer surface of the hosel section when the shaft is secured in said fixed position, and

(d) drive means for rotating the head grasping means about said axis of rotation while applying pressure onto the head in a direction parallel to said longitudinal axis and away from said shaft secured in said fixed position.

4,899,431

ANCHOR SETTING TOOL

Harvey S. Borntrager, 412 High St., P.O. Box 124, Weyauwega, Wis. 54983

Filed Jun. 13, 1988, Ser. No. 206,176
Int. Cl.[4] B23P *19/06*
U.S. Cl. 29—244 **12 Claims**

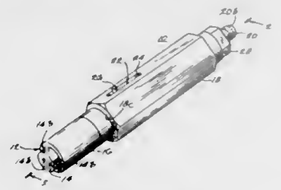
1. A tool for setting threaded anchors comprising:

a body having a polygonal cross-section and a longitudinal bore, and a pinway passing from outside said body to said bore, and reliefs formed at each end of said body;

a threaded shaft received in said bore and retained therein by a retaining pin in engagement with said threaded shaft and projecting laterally through said pinway, said shaft projecting beyond both ends of said body to form a nut engaging end and an anchor engaging end; and

a nut engaged with said nut engaging end of said shaft;

whereby a threaded anchor, separate and distinct from said body and including an anchor frustum having a longitudinal threaded bore by which it is removably engaged with said anchor engaging end of said shaft, and a soft sleeve surrounding said frustum, is set by said tool;



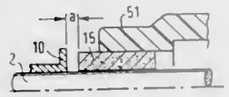
said tool being removable from said anchor and reusable after said anchor is set, leaving behind the set anchor.

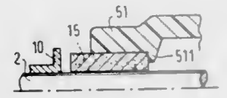
4,899,432

METHOD FOR ADJUSTING THE AXIAL PLAY BETWEEN THE ROTOR AND A MOTOR

Peter Adam, Hochberg, and Ronald Gleixner, Ochsenfurt, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 909,219, Sep. 18, 1986, abandoned. This application Dec. 28, 1988, Ser. No. 292,653
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534333
Int. Cl.[4] H02K *15/00*
U.S. Cl. 29—596 **7 Claims**





1. A method for adjusting the axial play between the rotor and the stator of a motor, characterized by the features that an operating fixed bearing for the rotor shaft (2) is axially moved for adjusting the axial play relative to a bearing sleeve, and is fixed in an adjusted position by a subsequent deformation of the bearing sleeve.

4,899,433

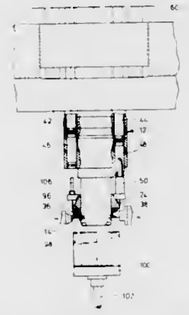
METHOD AND DEVICE FOR LAMINATION PICKUP FROM A STACK

Richard Mörschel, Nidderau, and Hagen Ludwig, Maintal, both of Fed. Rep. of Germany, assignors to Statomat-Globe Maschinenfabrik GmbH, Niederdorfelden, Fed. Rep. of Germany

Filed Oct. 6, 1988, Ser. No. 254,214
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733813; Oct. 23, 1987, 3735870
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—595 **15 Claims**

1. A method for the pickup of packets with a varying number of stamped laminations, for instance for stators or rotors of electrical machines, from a lamination stack which is compressed between a plurality of clamping plates said method comprising:

splitting a first half of a packet of laminations along a first plane determined by a first axially adjustable stop of one of said clamping plates and an axial position of a blade that can be forced against a side of said stack, rotating said first half of the packet of laminations by 180° , reuniting said first half of the packet of laminations with said stack, and splitting an entire packet of laminations along a second plane determined by a second axially adjustable stop of said one clamping plate and the axial position of the blade, said packet of laminations is comprised of a varying number of laminations selected from a stack of laminations which is compressed between said plurality of clamping plates, said stack, while compressed being supported,



together with one said clamping plate, on said axially adjustable stops.

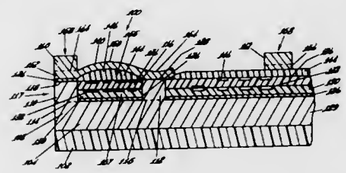
4. A device for picking up packets of stator or rotor laminations comprising a pair of clamping plates that are axially movable relative to each other to compress a stack of laminations, a blade which can be forced against a side of said stack, one said clamping plate being rotatable through 180° with a first half packet of said laminations into two respective angular positions, said clamping plate being axially supported in said two angular positions by two respective axially adjustable stops.

4,899,434

METHOD OF MAKING A THIN FILM MAGNETIC HEAD WITH A LEVELER LAYER AND SUPERSTRATE

Gary E. Roberts, Santa Barbara, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Divislon of Ser. No. 78,911, Jul. 28, 1987, Pat. No. 4,872,079.
This application Jul. 24, 1989, Ser. No. 384,750
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 **10 Claims**



1. The method of forming a leveler layer on a thin film magnetic transducer having a bottom pole piece formed on a substrate, a top pole piece having a front gap section which cooperates with the bottom pole piece to form a front magnetic transducing gap, a contoured outer surface having a step formed thereon, a rear magnetic closure portion which cooperates with the bottom pole piece to form a rear magnetic closure section and a rearward support section, and coil windings enclosed by an insulating structure, a portion of which are

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located between the bottom pole piece and the top pole piece and a portion of which extend rearwardly on the rearwardly extending section of the bottom pole piece beyond the rear magnetic closure section and wherein the rearward support section is located on that portion of the insulating structure enclosing the coil winding which extends rearwardly on the bottom pole piece which extends rearwardly beyond the rear magnetic closure section comprising the steps of

forming a leveler pattern mask on the top pole piece and insulating structure containing the coil windings with unmasked sections thereof located on the front gap section of the top pole piece and on the support section to produce an unmasked front gap section and an unmasked support section with the remaining portion of the top pole piece and insulating structure being masked by the leveler pattern mask;

depositing a leveler layer of a thickness which exceeds the height of the step of the contoured outer surface onto the unmasked front gap section of the top pole piece and the unmasked support section forming a leveler layer having a forward leveler section on the front gap section of the top pole piece and a rearward leveler section on the support section; and

removing the remainder of the leveler pattern mask leaving a space located remotely from and rearward of the magnetic transducing gap and between the forward leveler section, the rearward leveler section and the contoured outer surface of the top pole piece.

4,899,435

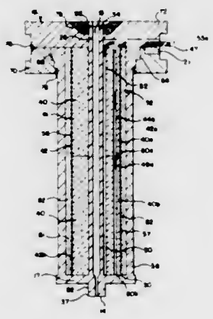
SPRUE BUSHING ASSEMBLY AND METHOD OF MAKING SAME

Panos Trakas, 21 W. Wrightwood, Glendale Heights, Ill. 60139

Division of Ser. No. 250,769, Sep. 28, 1988. This application Aug. 14, 1989, Ser. No. 393,476

Int. Cl.⁴ H05B *3/00*

U.S. Cl. 29—611 **6 Claims**





1. A method of manufacturing an internally heated sprue bushing assembly which includes a unitary bushing casing-core element having an integral outer side wall, end wall and elongate inner core, said elongate inner core axially extending within the bushing casing and including a melt runner passage therein which is in flow communication with an inlet and an outlet of said sprue bushing assembly, and heating means surrounding said elongate inner core, said method comprising the steps of:

shaping a metal blank to define a generally cylindrical main body portion of a bushing casing;

forming an annular cavity in said main body portion to define the axially extending elongate inner core, the annular cavity extending from a first end of the main body portion of the bushing casing and terminating within said bushing casing inwardly of a second end of said main body portion to provide a unitary bushing casing-core element having an integral outer side wall, end wall and elongate inner core;

inserting a heating means within said annular cavity in surrounding relation to said elongate inner core, said heating means including at least one preformed electrically nonconductive sleeve sized to be received on said elongate inner core and to occupy only a portion of said annular cavity;

filling the remainder of said annular cavity with a particulate refractory material;

compacting said particulate refractory material into a unified mass which, together with said heating means, fully occupies said annular cavity of said bushing casing-core element, the unified mass of refractory material and heating means comprising a heater-bushing blank assembly; and

forming a melt runner passage in said elongate inner core, said melt runner passage being interposed between an inlet and an outlet in the finished sprue bushing assembly.

4,899,436

REMOTELY CONTROLLED DEVICE FOR FITTING AND WITHDRAWING A PLUG FOR CLOSING A STEAM GENERATOR TUBE

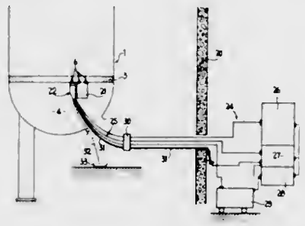
Paul Jacquier, Tassin la Demi-Lune, France, assignor to Framatome, Courbevoie, France

Filed Oct. 17, 1988, Ser. No. 258,733

Claims priority, application France, Oct. 16, 1987, 87 14326

Int. Cl.⁴ B23P *15/26*

U.S. Cl. 29—727 **6 Claims**



1. Remotely controlled device for fitting and withdrawing a plug (7) for closing a tube (6) of a steam generator, said stem generator comprising a shell (1) inside which a water box (4) is delimited by a tube plate (3) and a bundle of tubes (6) each having two rectilinear legs (6*a*, 6*b*) having end parts fastened inside the tube plate (3) and accessible from the water box (4), the closing plug (7) capable of being housed in an end part of the tube (6) to be closed, said plug comprising a tubular body (10) closed by a bottom (10*a*) at one of its ends and a clamping means (11, 12) of tubular shape capable of being inserted into the body (10) of the plug (7), the device comprising a handling means (21) arranged in the water box (4) for its remotely controlled and its positioning relative to the end section (6*a*, 6*b*) of the tube (6) in the alignment of the axial direction of this end section (6*a*, 6*b*), wherein said device additionally comprises:

(a) a means for moving (35) in the axial direction (ZZ'), fastened to the handling means (21);

(b) a support (44) fastened to the means for moving (35), movable in the axial direction (Z—Z');

(c) a jack having a chamber (45) integrally fixed to the support (44) and a piston (47) mounted in the chamber (45) for movement in the axial direction (Z—Z');

(d) a connecting member (51) carried by the support (44) having a threaded section (52) for connecting to the plug body (10);

(e) a rod (55) integral in axial translation with the piston (47) of the jack (45), said jack being mounted for axial sliding movement in the support (44) and comprising an end section having a threaded section (56) for connecting to the clamping means (11, 12) of the plug (10) and a bearing surface intended to abut on the bottom (10*a*) of the plug (10) in order to stretch it by a thrust;

(f) a means (40) for delivering plugs (7) from outside the water box (4) to a position close to the tube (6) in its axial alignment; and

(g) a connecting member (51) consisting of a tubular sleeve having external grooves slidably engaged with the grooves (49) of a bush (48) rotatably mounted in the support (44) and comprising a second set of grooves (50), the rod (55) being mounted along the axis (Z—Z') of the sleeve (52) and of the bush (48) and comprising a first grooved section (58) engaging with a pinion for driving in rotation (60) and a second grooved section (57) capable of engaging the grooves (50) of the bush (48) in a position of the sliding rod (55) so as to drive the connecting member (51) in rotation through the intermediary of the bush (49).

4,899,437

APPARATUS FOR ASSEMBLING ROLLER TYPE UNIVERSAL JOINT AND ROLLER ASSEMBLY UNIT

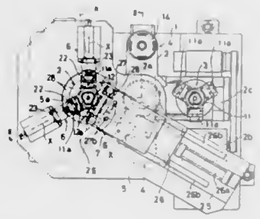
Mituharu Ozawa; Nobuyoshi Nagatsuma, and Naofumi Nagata, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1989, Ser. No. 324,496

Claims priority, application Japan, Mar. 18, 1988, 63-65538

Int. Cl.⁴ B23P *21/00*

U.S. Cl. 29—787 **7 Claims**



1. An apparatus for assembling a roller type universal joint in which a roller is mounted onto each of a plurality of projections provided on an outer periphery of a spider fitted to one end of a shaft having an axis with an axial line and an axial direction and then an outer member is mounted in place around the spider, said apparatus comprising:

an assembling station for setting the shaft in place;

plural roller assembling units mounted at the assembling station disposed at each of plural locations around the spider corresponding to a location aligned with one of X axes, each of said X axes being constituted by a radially extending line with which each projection of the spider is to be aligned;

and a roller setting jig and an outer member assembling jig mounted at the assembling station and alternately movable to an assembling position located on an axial line which is the same as that of the shaft, said roller setting jig including roller jig body movable back and forth along the axial direction of the shaft, means for moving said roller jig body, and a setting member mounted on the jig body having holding portions so disposed at a plurality of locations around said jig and along the X-axis direction as to hold the rollers detachably, said outer member assembling jig including an outer member jig body movable back and forth along the axial direction of the shaft, means for moving said outer member assembly jig, and a chuck member mounted on said outer member jig body for clamping the outer member;

each said roller assembling unit comprising a unit body movable back and forth along the X-axis direction, means for moving said unit body, and a holder means mounted on the unit body for receiving a roller from the roller setting member held by each of the holding portions thereof when the jig body of the roller setting jig is advanced toward the shaft, then centering the roller in such a way as to be aligned with the X-axis and holding it in that centered position.

4,899,438

ASSEMBLY DEVICE FOR PRESSING C-SHAPED SHEET METAL NUT ONTO A PLATE

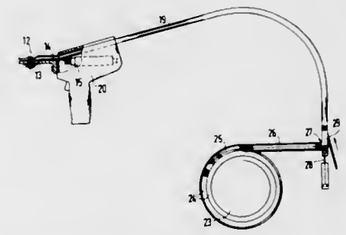
Klaus Muller, Weil-Haltingen; Lothar Escher, Bad Bellingen; Gerhard Mack, Rheinfelden-Adelhausen, and Ernst Kramer, Inzlingen, all of Fed. Rep. of Germany, assignors to A. Raymond, Lorrach, Fed. Rep. of Germany

Division of Ser. No. 937,390, Dec. 3, 1986, Pat. No. 4,793,753. This application Oct. 5, 1988, Ser. No. 253,577

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542841

Int. Cl.⁴ B23Q *7/16*

U.S. Cl. 29—813 **5 Claims**



1. An assembly device for pressing C-shaped sheet-metal nuts onto the edge of a plate comprising, in combination, a plurality of sheet metal nuts of substantially rectangular cross-section and having first and second legs integrally connected at one end by a transverse web to form a C-shaped nut open at the end opposite the web for insertion of the nut onto the edge of a plate, the legs each having two lateral side edges and a pair of guide webs extending upwardly from the two lateral side edges of one of the legs at right angles to said one leg and away from the other of said legs, said guide webs having upper edges parallel with and outer side surfaces in line with the lateral side edges of said other leg and an assembly gun having a retaining head for holding a sheet-metal nut with its open end facing forwardly for insertion onto a plate, a displacement channel for feeding the nuts to the head with their open end facing forwardly and displacement means acting on the transverse web of the nuts for ejecting the sheet-metal nuts from the head, a flexible guide channel of rectangular inside cross-section compatible with the rectangular contour of the nuts connected at one end to the displacement channel of the gun and means connected to the other end of the guide channel for orienting

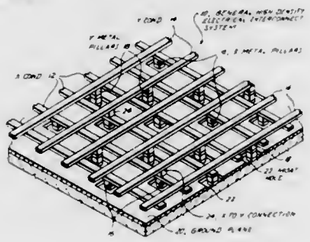
the nuts into side-by-side relation with the outer side surfaces of the guide webs adjacent one another from a supply of nuts, feeding them to the guide channel and transporting them through the guide channel with their open ends facing forward to the displacement channel of the gun.

4,899,439

METHOD OF FABRICATING A HIGH DENSITY ELECTRICAL INTERCONNECT

Curtis N. Potter; Lawrence N. Smith, and Harry Kroger, all of Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Jan. 15, 1989, Ser. No. 367,418
Int. Cl.[4] H05K *3/02*
U.S. Cl. 29—846 **5 Claims**



1. A method of fabricating a high density electrical interconnect system comprising,
covering a substrate with a layer of an insulating material,
applying an adhesion layer to the insulating material,
applying a conductive ground plane and a plurality of first layers of support pillars over the adhesion layer leaving openings in the ground plane around the first layers for isolating the support pillars from the ground plane,
applying a second adhesion layer to the first layers and the ground plane,
applying a second layer of insulating material over the second adhesion layer,
etching holes in the second layer of insulating material over the first layers of the support pillars,
plating a second layer onto each of the first layers of the support pillars,
applying a third adhesion layer over the second layer of the support pillars,
applying a third layer of insulating material over the third adhesion layer,
etching the third layer of insulating material to form openings for a third layer of support pillars and at least one metallic conductor,
plating into the openings in the third layer of insulating material a third layer of support layers onto some of the second layers of support layers,
forming additional layers of support pillars and metallic conductors above the third layer of support layers and said metallic conductor, and
removing the layers of insulating material.

4,899,440

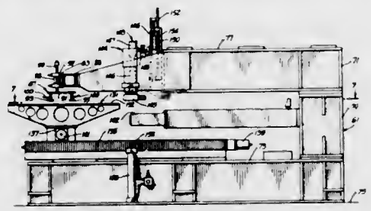
METHOD AND APPARATUS FOR LOCATING TARGETS ON A PANEL AND PERFORMING WORK OPERATIONS THEREON

Larry A. Pomatto, Santa Ana, and Kevin T. Franklin, San Diego, both of Calif., assignors to Systems Analysis and Integration, Anaheim, Calif.

Filed Dec. 31, 1986, Ser. No. 948,329
Int. Cl.[4] H05K *3/00*; B23P *21/00*
U.S. Cl. 29—846 **39 Claims**

1. A method for use with a panel having sheet material on opposite faces of the panel and at least a first target between the sheet material which is detectable with radioactive rays, said method comprising:
relatively moving the panel and a radioactive detection apparatus along a search path;
directing radioactive rays from the detection apparatus toward the panel to accurately locate the first target without removing any of the sheet material; and
performing a work operation on said panel utilizing the location of the first target, said work operation being carried out at a known location on said panel with respect to the first target.

13. An apparatus for use with a panel having face sheets and at least a first target between the face sheets which is detectable with radioactive rays, said apparatus comprising:



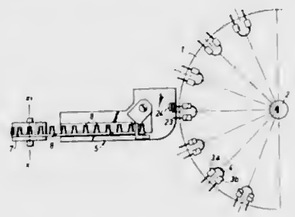
a support adapted to receive the panel, said support including means for releasably retaining the panel thereon;
a radioactive detection apparatus for directing rays toward the support;
means for relatively moving the support and the detection apparatus along a search path whereby the detection apparatus can locate the first target through at least one of the face sheets; and
means for performing a work operation on the panel using the location of the first target, said work operation being carried out at a known location on said panel with respect to the first target.

4,899,441

METHOD AND APPARATUS FOR ATTACHING BAND SUPPORTED TERMINALS ON CONDUCTORS

Claude F. Ricard, Villa Sainte Madeleine - 52, Cours Gambetta, 13100 - Aix-en-Provence, France

Continuation-in-part of Ser. No. 49,139, May 13, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 323,084
Claims priority, application France, May 16, 1986, 86 07158
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—863 **4 Claims**



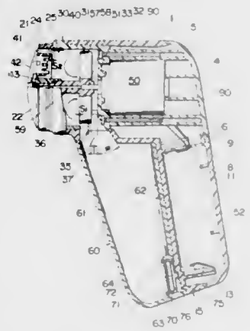
1. Method for fastening, on conductor wire ends, terminals which are fixed sideways on a band wound on a coil and which comprise fastening fins, said method comprising the following steps:
placing said coil in an extension of a fastening station comprising a fastening press having a mobile plate and a fixed plate, an axis of the coil being perpendicular to a longitudinal axis of the station;
fixing a manipulator device on said plates, said manipulator device comprising stampers and die beds for fastening terminals tightly on the conductor wire ends, and a carriage which pivots around a vertical axis and a guiding passage for said band;
introducing said band into said guiding passage and moving said band forward until a first terminal of said band is introduced in said carriage;
cutting said band between said first and second terminals to free said first terminal and a band section attached thereto;
pivoting said carriage 90° in order to present said first terminal aligned with a conductor wire end;
moving said conductor wire end between said fastening fins of said first terminal;
lowering said mobile plate of said press so that said stampers and said die beds fasten tightly said fastening fins on said wire end and simultaneously detaching said band section from said first terminal; and
lifting up said mobile plate, removing said conductor wire end fitted with said first terminal, pivoting back said mobile carriage 90°, moving again said band forward in order to introduce said second terminal and a band section in said carriage and starting a new cycle.

4,899,442

HAND-HELD CLIPPER FOR REMOVING ENTANGLED FIBER STRANDS FROM THE SURFACE OF FABRICS

Sadashige Horii; Hideaki Haraguchi, both of Hikone, and Ayako Chatani, Ashiya, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Aug. 15, 1988, Ser. No. 232,228
Claims priority, application Japan, Sep. 4, 1987, 62-222478
Int. Cl.[4] B26B *19/14*
U.S. Cl. 30—133 **9 Claims**



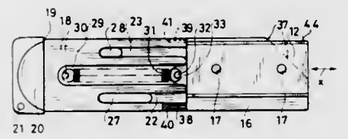
6. A hand-held clipper for removing entangled fibers from the surface of fabrics comprising:
an elongate handle grip having a longitudinal axis;
a cutting head formed at one longitudinal end of said handle grip, said cutting head comprising a perforated outer shearing foil and an inner cutter means driven to move in shearing engagement with the undersurface of said outer shearing foil for shearing the entangled strands of fibers entering the perforations in said outer shearing foil;
said cutting head having a center axis which is perpendicular to general top plane of said outer shearing foil;
said cutting head incorporating a fan operating together with said inner cutter means for producing an air flow which draws in outside air through said perforations of the outer shearing foil and flows outwardly through a discharge port of said cutting head carrying clipped fiber strands in said air flow;
said handle grip being provided with a detachably mounted recovery chute for receiving therein said clipped fiber strands carried in the air flow;
said cutting head extending forwardly from said one longitudinal end of said handle grip with the center axis thereof inclined at an obtuse angle to the longitudinal axis of said handle grip;
said chute extending substantially the full length of the front surface of the handle grip from its one longitudinal end adjacent to said cutting head and to the other longitudinal end, said recovery chute having an exhaust port for discharging the air outwardly while storing the clipped fiber strands therein; and
said recovery chute having along its length a tapered front surface which tapers from said one longitudinal end adjacent to the cutting head to the other end of the handle grip such that said tapered front surface is spaced from the general top plane of the outer shearing foil by a greater distance toward said other end than at the one end adjacent to said cutting head wherein
said handle grip includes a handle body extending along said longitudinal axis and having a generally flat front surface on which said recovery chute is slidable along said longitudinal axis for attachment and detachment therefrom,
said recovery chute including a filter grid which is fitted over said exhaust port of the recovery chute and carries a filter for entrapping the clipped fiber strands within said chute while allowing the air to pass therethrough,
said exhaust port located in the rear wall of said recover chute facing the front surface of said handle body to form therebetween an air passage leading outwardly of said handle grip through an air vent formed between the rear edge of said recover chute and the front surface of said handle body, and
said filter grid being made of a resilient material and formed with a resilient hook which is resiliently engaged with a stop projection on the front surface of said handle body for retaining the recovery chute in an attached position to said handle body.

4,899,443

SAFETY KNIFE FOR CARDBOARD AND LIKE MATERIALS

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Filed Oct. 31, 1988, Ser. No. 265,618
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1987, 3736968
Int. Cl.[4] B26B *1/08*
U.S. Cl. 30—162 **15 Claims**



1. A knife, comprising:
a handle sleeve of uubstantially rectangular cross section open at opposite ends;
an elongated stationary holding and guide piece removably received in said handle sleeve, projecting from said handle sleeve at one of said ends, and formed with a longitudinally extending guide;
a blade holder engaging said guide and shiftable in said sleeve, said blade holder being provided with a pair of side members receiving between them a blade lying between said holding and guide piece and the other of said ends, said blade having a cutting edge extending from said blade

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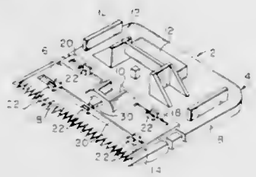
holder, said sleeve having two opposite sides flanking said members;
a tension spring anchored to said holding and guide piece and connected to said blade holder for automatically retracting said cutting edge into said sleeve; and
respective openings formed in said sides of said sleeve and extending inwardly from said other of said ends and through which a finger can be inserted to engage a respective one of said members to press said holder against a force of said spring from said other end of said sleeve and expose said edge for cutting.

4,899,444

DISPOSABLE CLIPPER HEAD AND METHOD FOR MAKING THE SAME

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Filed May 16, 1988, Ser. No. 194,197
Int. Cl.[4] B26B *19/02*
U.S. Cl. 30—208 **11 Claims**



1. A disposable clipper head for attachment to an electric clipper for clipping hair, comprising
(a) a rigid base formed of synthetic plastic material, said base containing a recess in the bottom surface thereof for receiving the clamping mechanism of the electric clipper for attachment thereto, said base including fixed and movable portions adapted for connection with the reciprocating drive mechanism of the clipper, said fixed portion including hook means;
(b) a first planar metal cutting blade connected with said base fixed portion and containing an opening;
(c) a second planar metal cutting blade connected with said base movable portion in contiguous relation above said first cutting blade and containing an opening aligned with said first blade opening, said hook means extending through said aligned openings for clasping said first and second blades together, said first and second cutting blades each having a generally rectangular configuration and including a toothed forward edge, said toothed edges of said first and second blades being superimposed, whereby when the clipper is turned on, the clipper drive mechanism laterally displaces said base movable portion and said second blade relative to said first blade for clipping hair.

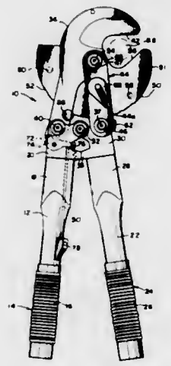
4,899,445

HAND-HELD RATCHET TOOL FOR MOVING A PAIR OF JAW MEMBERS TOWARD AND AWAY FROM EACH OTHER

Robert S. Erbrick, Danboro; Manfred E. Strohecker, Doylestown, and Joseph E. Erbrick, Jr., Chalfont, all of Pa., assignors to Electroline Corp., Danboro, Pa.

Filed May 23, 1989, Ser. No. 356,030
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—251 **19 Claims**

1. A hand-held ratchet tool for moving a pair of jaw members toward and away from each other, said hand-held ratchet tool comprising:
a first elongated handle having a first end and a second end;
a second elongated handle having a first end and a second end, said second end of said first handle being pivotally connected to said second end of said second handle;
a first jaw member pivotally mounted on said second end of said first handle;
an elongate linkage having a first end pivotally mounted on said second end of said second handle and having a second end;



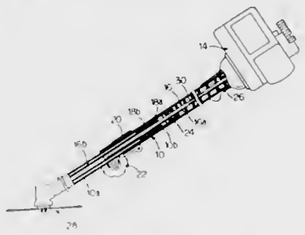
a second jaw member including a plurality of ratchet teeth, said second end of said linkage, said first jaw member and said second jaw member all being pivotally connected along a common pivot axis;
drive means mounted on said second end of said second handle and drivingly connected to said ratchet teeth for driving said second jaw member with respect to said first jaw member when said first and second handles are moved with respect to each other.

4,899,446

HAND-HELD MACHINE WITH POWER DISENGAGING MEANS

Genji Akiba, Kamiiwahashi; Kohya Tanaka, Narashino, and Shigetoshi Ishida, Chiba, all of Japan, assignors to Tanaka Kogyo Co., Ltd., Chiba, Japan

Filed Oct. 31, 1988, Ser. No. 265,250
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—276 **12 Claims**



1. A hand-held machine comprising:
a drive shaft pipe means which is extendable in the lengthwise direction thereof;
an operational means rotatably attached at an end of said drive shaft pipe means;
a driving mechanism coupled to the another end of said drive shaft pipe means;

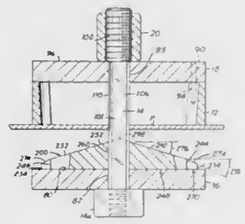
drive shaft means rotatably mounted in said drive shaft pipe means, said drive shaft means being extendable in the lengthwise direction thereof and being coupled at one end to said operational means and at another end to said driving mechanism;
said drive shaft pipe means comprising a first pipe section of given diameter on the side of said operational means, and a second pipe section of a different diameter than said first pipe section on the side of said driving mechanism, the smaller diameter of said first and second pipe sections being slidably inserted in the other of said pipe sections for extending or contracting the drive shaft pipe means in the lengthwise direction thereof;
said drive shaft means comprising a first drive shaft member of substantially circular outer periphery provided on the side of said driving mechanism, and a second pipe-like drive shaft member provided on the side of said operational means, said first drive shaft member being engaged with and inserted in said second drive shaft member for extending and contracting said drive shaft means in the lengthwise direction thereof;
at least one one-way clutch coupled to said second pipe-like drive shaft member at an end portion thereof which is engaged with said first drive shaft member, said at least one one-way clutch being movable along said first drive shaft on the driving mechanism side and operatively coupling said drive shaft member together to transmit rotary motion from said driving mechanism to said operational means via said drive shaft members;
means for disengaging said driving mechanism from said operational means responsive to the length of said drive shaft type means becoming shorter than a predetermined length, said disengaging means being operatively coupled to at least one of said one-way clutch and said driving mechanism; and
fixing means provided on said drive shaft pipe means where said first and second drive shaft pipe sections are engaged with each other, to fixedly support the smaller diameter drive shaft pipe section at an axial position relative to the larger diameter drive shaft pipe section.

4,899,447

PANEL PUNCH

Larry Adleman, Rockford, Ill., assignor to Greenlee Textron Inc., Rockford, Ill.

Filed Jan. 22, 1988, Ser. No. 147,221
Int. Cl.[4] B26F *1/00*
U.S. Cl. 30—360 **12 Claims**



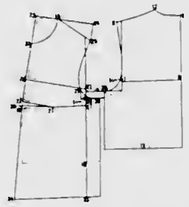
1. A punch for punching an opening in a panel for an article comprising: a main punch having ends, a base, a pair of spaced apart lateral working surfaces and a pair of inclined working surfaces spaced from said base, said inclined working surfaces extending between said spaced apart lateral working surfaces; said inclined working surfaces each extending toward said base to a respective end of said main punch in diverging relation to one another and configured to punch said opening in the panel for receiving the article; at least one secondary punch having a pair of spaced apart lateral working surfaces and an inclined working surface, said inclined working surface extending between said spaced apart lateral surfaces and being configured for punching a secondary opening intersecting with and extending from said opening for receiving the article, said secondary opening being configured for receiving mounting means for attaching said article to the panel, said at least one secondary punch extending from one of said respective ends of the main punch and terminating in a remote secondary punch end, said at least one secondary punch having said inclined working surface thereof integrally interconnecting with an adjacent one of the inclined working surfaces of said main punch, the maximum height of said secondary punch inclined working surface relative to said base not exceeding the minimum height of said main punch inclined working surfaces and the height relative to said base of said secondary punch end being less than the maximum height of said secondary punch inclined working surface.

4,899,448

BASIC FORMULA FOR ACTIVE SKETCH PATTERN DRAWING IN UPPER BODY TAILORING

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Filed May 16, 1988, Ser. No. 194,319
Int. Cl.[4] A41H *3/00*
U.S. Cl. 33—17 R **5 Claims**



1. A method of preparing a pattern drawing of the upper body tailoring by means of the data obtained from the measure of shoulder depth, arm girth, back width, shoulder width, neck base girth, back length, front length, bust depth, breast depth, bust width, bust breadth, chest girth, breast girth and abdominal depth and by obtaining a front side line, which consists of: first drawing a horizontal line from a free point (1), setting a point (2) rightward along the horizontal line at an arbitrary distance, drawing a vertical line downward from the point (2) for the front side line, setting a point (3) rightward along the horizontal line (1) from point (2) at a distance equal to $\frac{1}{4}$ of the arm girth + 4 cm, the distance between points (2) and (3) being equal to the width of armhole, drawing a vertical line downward from point (3); drawing a horizontal line (4) downward from the point (2) or point (3) at a distance equal to $\frac{1}{4}$ of arm girth + 14 cm for armhole depth; setting a back shoulder point (5) downward from point (3) at a distance equal to 1/6 of shoulder width and at 1.3 cm leftward from the vertical line of the point (3); setting a front shoulder point (6) downward from point (2) at a distance equal to 4/6 of shoulder width—0.5 cm and at 2.5 cm rightward from the vertical line of the point (2); setting a back armpit point point (7) at 2.5 cm upward from the horizontal line (4) along the vertical line from point (3); drawing a horizontal line rightward from point (7) for back width and setting a point (8) at a distance equal to one-half of back width, the distance between points (7) and (8) being equal to the back width; setting a point (9) rightward along the horizontal line (1) at a distance equal to one-half of the shoulder width from point (5); when the shoulder width point (9) is wider than the back width point (8), drawing a vertical line downward from point (9) for the back central line (10), when the back width point is equal to the shoulder width point, drawing a vertical line through points (9) and (8); when the back width

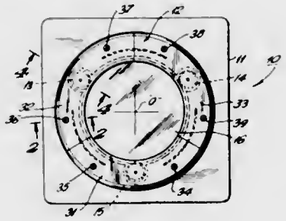
point (8) is wider than the shoulder width point (9), drawing a vertical line through point (8) for the back central line (10); setting a point (11) leftward from the cross point between the horizontal line (1) and the back central line (10) at a distance equal to 1/6 of neck base girth + 1.3 cm so as to obtain the size for the back collar width; setting a point (12) at 2 cm upward vertically from point (11) so as to obtain the size for the depth of back neck point; setting a point (13) at 0.5 cm downward from the point (12), drawing an oblique line to connect points (5) and (13); drawing a curved line from point (12) of a length of 3 cm to connect with the line between points (5) and (13) at point (14); drawing a horizontal line downward from point (12) at a distance equal to the back length as the back waistline (15); setting a point (16) along the horizontal line (1) left-upper side from the point (6) at a distance equal to the distance between points (5) and (12) for the front neck point, when the shoulder dart is present, deducting the length of the shoulder dart; setting a point (17) for the bust depth downward from point (2) at a distance equal to the bust depth, setting a point (18) for breast depth leftward along a horizontal line from point (17) at a distance equal to the breast depth, when the breast depth protrudes over abdominal depth, drawing a vertical line downward directly from point (18); setting a point (19) downwardly directly from point (2) at a distance equal to front length and drawing a horizontal line for the front waist line, thus obtaining the difference between the front waistline (19) and the back waistline (15); setting a point (20) leftward along horizontal line (1) from point (16) at a distance equal to the back collar width—0.5 cm for the front collar width; setting a bust point (21) rightward along the horizontal line from point (18) at a distance equal to one-half of the bust width; placing a triangle with the short side aimed at point (21) in a length equal to the distance between points (18) and (21) and with the longer side aimed at point (20) drawing a rectangular line by both sides of the triangle to cross at the peak point (22), thus obtaining the expansion of the central bust dart between points (18) and (22); drawing a vertical line upward from point (6) to obtain a cross point (6^1) with the horizontal line (1); setting a point (24) from point (16) along the extension line through points (23) and (16) at a distance equal to the size between points (16) and (6^1); applying a triangle with the long side aimed at the connecting line between points (16) and (24), setting a point (25) along the short side of the triangle from point (24) at a distance equal to the distance between points (6^1) and (6) as a moved shoulder point; drawing a line to connect points (16) and (25); drawing a horizontal line below the horizontal armhole line (4) at a distance equal to the depth between points (1) and (24) so as to obtain a cross point (26) with the vertical front side line (2) for adjustment of the armpit line; setting a front armpit point (27) at 2.5 cm upward along the vertical line from point (26); applying a triangle with the long side aimed at the connecting line between points (20) and (22) and with the short side passing through point (27) so as to obtain a peak point (28); applying a triangle with the longer side aimed at the connecting line between points (20) and (28) and with the short side passing through neck point (16) to obtain a cross point (23) to form an adjusted front shoulder line; drawing a line to connect points (27) and (28) for the bust breast line, setting a point (29) rightward from point (28) along the bust breast line at a distance equal to ½ of the bust breast; setting a point (30) along the horizontal line (4) from the vertical line (2) at a distance equal to ½ of the armhole width and draw a vertical line downward from the point (30), setting a point (31) leftward from the point (26) at a distance equal to the distance between points (27) and (29); drawing a vertical line to temporarily separate front and back side line; setting a point (32) for the depth of front collar opening downward from point (23) along the connecting line between points (23) and (22) at a distance equal to 2 cm + the length between points (16) and (23); drawing a line to connect points (5), (14) and (12) for the back shoulder width, to draw a curved line from point (12) to cut with the horizontal line (1) and to extend to the back central line (10), for the collar opening; drawing a curved line from point (5) to cut with vertical lines (3), (7) and horizontal line (4), up to the point (30) for the back armhole, combining with the back central line (10), vertical side line (30) and back waistline (15) to form a basic pattern for the back part of the upper body; connecting points (16) and (25) for the front shoulder length, drawing a curved line to connect points (16) and (32) for the collar opening, drawing a curved line from point (25) through point (29) to cut with the horizontal line (31) for the front armhole; drawing a straight line to connect points (32) and (22), a straight line to connect points (22) and (21), a straight line to connect points (21) and (18) so as to leave a blank space between points (18) and (22) for bust dart, from the front central line (18) downward from the side vertical line (31) downward and the front waistline (19) to form a basic pattern for the front part of the upper body, then combining the front part pattern and the back part pattern at respective side line point (30) and (31) along the vertical lines to complete the pattern for the upper body.

4,899,449

DRAFTING INSTRUMENT

Simon Fouladian, 24 Estates Ter. North, Manhasset, N.Y. 11030

Filed Sep. 29, 1988, Ser. No. 251,110
Int. Cl.[4] B43L 9/04
U.S. Cl. 33—27.03 **7 Claims**



1. A drafting instrument capable of centering a templet at a selected location above a planar surface without the necessity of having a center point pass through the center of said templet into said planar surface for purposes of maintaining the centering of said templet about said center point, wherein said drafting instrument comprises;

(a) A base plate defining a circular opening;

(b) Mounting member assemblies positioned about said circular opening formed through said base plate and structurally affixed to said base plate;

(c) A templet member capable of coming into direct mechanical contact with each of said mounting member assemblies about said templet's circular perimeter in a compressive mechanical interfit such that a force is applied from each of said mounting member assemblies against said templet such that the line of force from each of said mounting member assemblies intersect at a common point;

(d) A cover plate capable of being structurally affixed to said base plate whereby said cover plate and said base plate have cooperating means so as to cause a structural mounting between said base plate and said cover plate of said mounting member assemblies such that said cover plate causes a force to be applied from each of said mounting member assemblies against said templet member.

4,899,450

OPEN SIGHT ADDITION FOR A TELESCOPIC GUN SIGHT

Edward R. Huggins, P.O. Box 78, Klawock, Ak. 99925

Division of Ser. No. 892,836, Aug. 4, 1986, Pat. No. 4,777,730.
This application Aug. 8, 1988, Ser. No. 229,635
Int. Cl.[4] F41G 1/38
U.S. Cl. 33—245 **2 Claims**



1. A telescopic gun sight of a type having a front bell which includes a cylindrical forward portion and a frustoconical rearward portion having an upper central surface portion which slopes upwardly to the cylindrical forward portion, and an open sight addition comprising:

a sight bead on an upper central portion of the cylindrical forward portion of the bell, said sight bead projecting vertically upwardly from the cylindrical forward portion of the bell;

an elongated sight line on said sloping upper central portion of the frustoconical rearward portion of the bell, rearwardly of and in axial alignment with the sight bead on the forward cylindrical portion of the bell, said sight line sloping upwardly towards the sight bead, and said sight bead and said sloping sight line together forming a sight plane on top of the telescopic gun sight and together forming an open sight addition to the telescopic gun sight; and

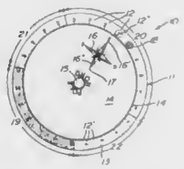
said telescopic gun sight including no other open sight element rearwardly of the front bell, wherein in use of the open sight addition for aiming, the user sights along said sight line towards the sight beard and the target.

4,899,451

SOLAR COMPASS AND TIME INDICATOR DEVICE

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Filed Apr. 11, 1988, Ser. No. 180,206
Int. Cl.[4] G01C 17/34
U.S. Cl. 33—269 **21 Claims**



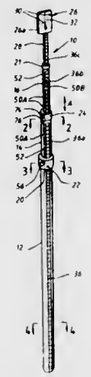
1. A solar compass device comprising a first member having spaced apart markings indicative of time and disposed in a counterclockwise direction in a circular ring pattern thereon, a second member rotatably displaceable with respect to said first member to permit rotational displacement between said first and second members with said members disposed in substantially parallel planes, and a single fixed indicating means on said second member aligned on a radius between a center point relative to said ring, said radius representing a north-south axis with said indicating means being disposed at a south end of said axis, said indicating means when aligned with a marking indicative of approximately the time of day, and said first member when oriented with one of said markings which is representative of 12 o'clock aligned substantially in the direction of the sun, the north end of said axis is automatically aligned in the direction of the north pole.

4,899,452

STEPPING STAFF

Richard J. Schafer, 12 Roberts St., Frankston, Australia

PCT No. PCT/AU87/00042, § 371 Date Jul. 12, 1988, § 102(e) Date Jul. 12, 1988, PCT Pub. No. WO87/05387, PCT Pub. Date Sep. 11, 1987
PCT Filed Feb. 17, 1987, Ser. No. 259,566
Claims priority, application Australia, Mar. 6, 1986, PH04936
Int. Cl.[4] G01C 15/00
U.S. Cl. 33—296 **12 Claims**



1. A stepping staff, said stepping staff having a plurality of sections coupled together for movement relative to one another, one of said sections having a sighting target, at least one of said plurality of said sections having a plurality of sets of coupling means, and an adjacent one of the sections having engaging means for engaging with one of the coupling means in one of the set, each coupling means in each set of coupling means being spaced apart by a prescribed distance, the prescribed distance between coupling means in one set of coupling means being different to the prescribed distance between coupling means in another of the sets of coupling means, and wherein upon relative movement of the at least one section and adjacent section one coupling means on the at least one section can be coupled with the engaging means on the adjacent section and wherein said plurality of sections are rotatable relative to one another to enable the engaging means to engage with a coupling means in any of the sets of coupling means.

4,899,453

COMPASS WITH LED ILLUMINATION

Ramachandra K. Bhat; Janine P. Guadagno, both of Springfield, and Clarence E. Duncan, Fredricksburg, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 27, 1988, Ser. No. 249,940
Int. Cl.[4] G01C 17/10
U.S. Cl. 33—348 **20 Claims**

1. A magnetic compass comprising:

a compass rose having a periphery with an array of indicia, indicative of direction disposed therearound;

a compass bowl or cup of nonmagnetic material having a

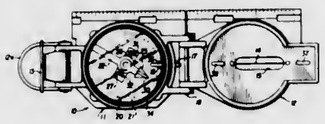
pivot projecting therefrom on which the compass rose is supported for free rotation thereon, the cup having transparent cover disposed thereover to enclose the compass rose, the cup having an opening through the bottom thereof;

a case of nonmagnetic material having a bottom and a top and a cavity therein for receiving said cup; the said top of the case constituting a pivoted lid with a sighting slot therein for sighting the compass, the lid slot having a sighting cross hair extending therethrough;

the case further having a back plate for closing an access aperture in the bottom of the case;

a rotating bezel overlying the transparent cover of the cup and enclosing the top of the case beneath the hinged lid;

a light emitting diode disposed in the opening through the bottom of the cup;



a battery for energizing the light-emitting diode disposed between the back plate of the case and the bottom of the cup;

switch means disposed between the back of the plate and the cup, the switch means having one lead connected to one pole of the battery and another lead attached to one lead of the light emitting diode, the other lead of the light emitting diode being connected to the other pole of the battery, and

external activating means accessible from the exterior of the case for operating the switch to energize the light emitting diode with the battery, and

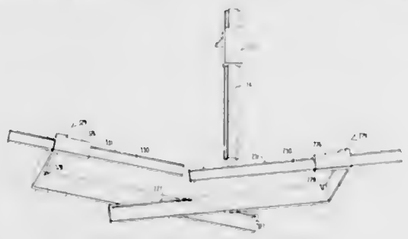
wherein the battery, light emitting diode, switch and activating means are all of nonmagnetic character.

4,899,454

PERSPECTIVE DRAWING MACHINE

John G. R. Francis, Manning, S.C., assignor to Trig.o.metrics Corporation, Manning, S.C.

Filed May 16, 1988, Ser. No. 194,246
Int. Cl.[4] B43L *13/14*
U.S. Cl. 33—432 **23 Claims**



23. A drafting table of the type for use in the preparation of drawings by the use of at least a vertical straight edge and at least one horizontal straight edge, said table comprising:

vertical straight edge support means (23) for determining the horizontal position of said vertical straight edge;

horizontal straight edge support means (226) for determining the vertical position of said horizontal straight edge; and

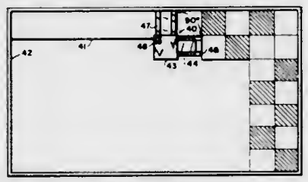
horizontal straight edge control means operable in at least a first mode for moving said horizontal straight edge support means such that, upon vertical movement of said horizontal straight edge, said horizontal straight edge is automatically controlled to always point to a predetermined point mechanically decoupled from said horizontal straight edge.

4,899,455

TILE SQUARING DEVICE

Alessio A. Bovino, P.O. Box 454, Fishkill, N.Y. 12524, and Robert C. Bitting, C-14 Fleetwood Condos, Wappingers Falls, N.Y. 12590

Filed Jan. 6, 1989, Ser. No. 294,252
Int. Cl.[4] G01B *5/00*
U.S. Cl. 33—527 **13 Claims**



1. A tile squaring device comprising:

a distance rod;

an anglehead having a first connector means and a second connector means disposed in such a way that a first straight edge extension and a second straight edge extension may be attached to said first and second connector means, respectively, at a right angle to each other; and

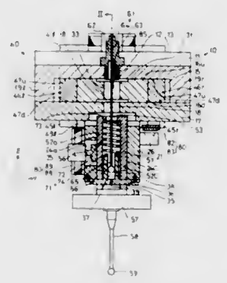
a squaring means for connecting said anglehead to said distance rod such that said anglehead is positioned at a right angle off of said distance rod.

4,899,456

SURFACE CONTOUR MEASURING TRACER

Hideo Morita; Kenji Abiko, and Katsuaki Anzawa, all of Kawasaki, Japan, assignors to Mitutoyo Corporation, Tokyo, Japan

Filed Aug. 23, 1988, Ser. No. 235,360
Claims priority, application Japan, Aug. 24, 1987, 62-210426; Aug. 24, 1987, 62-210427
Int. Cl.[4] G01B *7/28*
U.S. Cl. 33—561 **9 Claims**



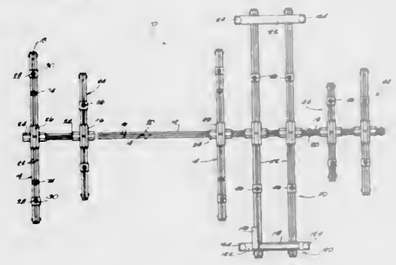
1. A surface contour measuring tracer comprising a probe element and support means, having a base member, for supporting said probe element for movement in three orthogonally related directions by means of X-, Y- and Z-sliders mounted on said base member, said probe element being adapted to engage and follow a surface of a work while in sliding contact therewith to thereby facilitate a detecting of a surface contour of said work as an electric signal, said Z-slider means including a multisided hollow portion defined by side surfaces extending in direction of a Z-axis, respective portions of said X-slider means and said Y-slider means being coupled to said hollow portion, said X-slider means including first bearing means for supporting said X-slider means directly on said base member so as to be movable in the direction of an X-axis and be immovable in the direction of said Z-axis, said Y-slider means including second bearing means for supporting said Y-slider means directly on said base member so as to be movable in the direction of a Y-axis and be immovable in the direction of said X-axis and be immovable in the direction of said Z-axis.

4,899,457

VEHICLE FRAME MEASURING BRIDGE INCLUDING SPRING ACTUATED TELESCOPING LEGS

Dean Fergus, West Allis, and Craig A. Wisner, Wauwatosa, both of Wis., assignors to Hein-Werner Corporation, Waukesha, Wis.

Filed Nov. 10, 1988, Ser. No. 269,468
Int. Cl.[4] G01B *3/38, 5/14*
U.S. Cl. 33—608 **11 Claims**



1. A measuring bridge for determining the orientation of measured points on a motor vehicle with respect to reference points; the measuring bridge comprising:

an elongated main beam;

a pair of set-up beams connected to the elongated beam, the set-up beams being positioned in spaced apart parallel relation and extending generally perpendicularly to the elongated main beam, the set-up beams each including opposite ends, and the set-up beams and the elongated main beam being adapted to be positioned beneath a vehicle;

vertically extending set-up pointers supported by the set-up beams and including upper ends adapted to engage reference points on the motor vehicle;

means for connecting the set-up pointers to the set-up beams for adjustable movement along the length of the set-up beams;

at least one measuring beam connected to the elongated main beam and extending generally perpendicularly to the elongated main beam;

a measuring pointer supported by the measuring beam; and

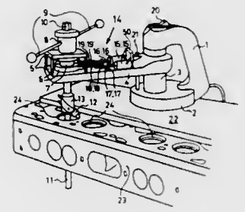
means for resiliently supporting the set-up beams such that the set-up pointers are selectively biased upwardly against the vehicle frame, the means for resiliently supporting including a plurality of extensible legs.

4,899,458

PROCESS AND DEVICE FOR CENTERING A GUIDE MANDREL

Italo Minelli, Pfaffikon, Switzerland, assignor to Minelli AG, Switzerland

Filed Jul. 13, 1988, Ser. No. 218,690
Claims priority, application Switzerland, Jul. 21, 1987, 2770/87
Int. Cl.[4] G01B *5/25*
U.S. Cl. 33—644 **19 Claims**



1. A process for the centering of a pilot shaft (11), serving as a guide mandrel in a valve guide (25), for a precision machining of a valve seat (24), with a device for guiding a rotary shaping tool (12), said device comprising said pilot shaft (11) fitting into said valve guide (25) and passing through a swiveling ball (7), whereby said pilot shaft (11), by means of said swiveling ball (7), is positioned and supported so as to be displaceable and fixable on all sides in a support mounting on an arm (4) of said device, said process comprising the steps:

(a) displacing said pilot shaft (11) back and forth through at least two crossing directions in succession outside said valve guide (25) by means of an electronically controlled drive mechanism (14), measuring, storing and calculating a motion path between both end positions of a horizontal displacement range of a respective support mounting by means of an electronic control unit, moving said pilot shaft (11) into central positions outside said valve guide of calculated displacement ranges by movement of said respective support mounting by means of said drive mechanism (14) which are controlled by said control unit;

(b) inserting said pilot shaft (11) into said valve guide (25) of said valve seat (24), and attaching the arm (4) of said device in a non-movable manner with respect to said valve seat (24);

(c) moving said pilot shaft (11) successively through at least two crossing directions back and forth in an overall horizontal displacement range of the support mounting by means of said electronically controlled drive mechanism (14) thereby centering said pilot shaft (11) within a clearance in said valve guide (25), said pilot shaft (11) moving within the clearance in said valve guide (25), measuring, storing and calculating the motion path between both said end positions of the specific displacement range of the support mounting by means of said electronic control unit, moving said pilot shaft (11) back into the central position of a previously dimensioned displacement range through moving its support mounting by means of said drive mechanism (14), said drive mechanism being controlled by said control unit; and

(d) clamping said pilot shaft (11) solidly in said respective support mounting with clamping devices in an immovable manner, as a holder for said rotary shaping tool (12) for the precision machining of said valve seat (24).

4,899,459

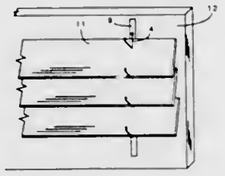
SIDING APPLICATION TOOL

Andrew W. Taggart, 15425 6th SW., Seattle, Wash. 98166

Continuation-in-part of Ser. No. 250,862, Sep. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 102,630, Sep. 30, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 294,795

Int. Cl.[4] G01B *3/30*

U.S. Cl. 33—646 **17 Claims**



1. A tool or gauge for mounting sliding strips on a wall or similar surface which comprises:

a thin, elongated flexible strap-like means for attachment to a wall prior to application of siding strips;

a plurality of uniformly spaced apart, generally L-shaped hanger means, each hanger means having a proximal portion separably attached to the strap means and a distal portion positioned generally normal to the strap means and protruding therefrom; and

attachment means for removably fastening the hanger means to the strap means,

so that when the tool is mounted on a wall the hanger means serve to hold and position siding strips prior to their attachment to the wall and said hanger means can be pulled free of the strap means and withdrawn from beneath siding strips after said siding strips have been attached.

4,899,460

TAPE MEASURING RULER BRAKE

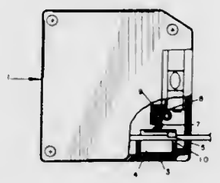
Dong M. Kang, Seoul, Rep. of Korea, assignor to Korea Measures Co., Ltd., Busan, Rep. of Korea

Filed Jul. 19, 1988, Ser. No. 221,315

Claims priority, application Rep. of Korea, Jul. 21, 1987, 11868/87[U]

Int. Cl.[4] G01B *3/10*

U.S. Cl. 33—767 **1 Claim**



1. In a measuring tape ruler containing a rolled up measuring tape within a tape ruler case body, a measuring tape stopping means of the measuring tape ruler comprising:

a pressing button formed with a rectangular square box having an empty cavity therein;

a moveable friction stopper formed at the upper end integral of the said pressing button;

a slit formed longitudinally at the middle portion of a side surface of the said pressing button, through which the measuring tape passes into the empty cavity;

a protruding core bar on which a coil spring is to be inserted;

said pressing button being mounted at the front end portion immediately adjacent of the opening of the tape ruler case body whereby the coil spring is mounted to the spring base plate which is a part of the tape ruler body;

a counter steady friction stopper formed integrally at the position immediately beneath the movable friction stopper as a part of the tape ruler body so that the measuring tape passes between the two stoppers; and

said pressing button is assembled completely with measuring tape within the measuring tape ruler body.

4,899,461

METHOD OF DRYING A PAPER BOARD OR PAPER WEB

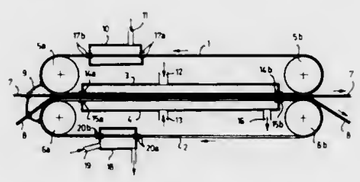
Jukka Lehtinen, Helsinki, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Jan. 12, 1989, Ser. No. 296,506

Claims priority, application Finland, Jan. 29, 1988, 880407

Int. Cl.[4] D21F *5/00;* **F26B** *3/20*

U.S. Cl. 34—13 **7 Claims**



1. A method of drying a paper board or paper web by leading the web together with at least one dryer felt between two moving, air-tight bands having a good thermal conductivity and being substantially parallel with each other over a distance, the bands enclosing the web therebetween over the entire width thereof to form a drying zone having a drying rate, the method comprising the steps of:

exposing a web and a dryer felt to an air removal treatment whereby air is removed out of pores to the greatest possible degree;

passing said web and dryer felt between two moving, air-tight bands which are substantially parallel to each other;

subjecting an outer surface of each of said bands to substantially equal pressure;

heating the one of said bands which makes contact with said web prior to entry into said drying zone to a temperature for evaporating water from said web;

cooling the other of said bands which makes contact with said dryer felt to a predetermined temperature before it reaches said drying zone for condensing said water evaporated from said web into said dryer felt;

separating said dryer felt from said web after passing through said bands and removing condensed water therefrom;

adjusting the mechanical compression exerted on the web to a predetermined value by adjusting the pressure acting on the outer surface of the bands and the temperature of the cooling band to produce a difference between the pressure acting on the outer surface of the bands and the saturation pressure of steam condensed in drying said web determined by the temperature of the cooling band which is substantially equal to the desired mechanical compression force; and

adjusting the drying rate of the web to a desired value by adjusting the temperature of the band exposed to said heating which heats said web before it reaches said drying zone so that it corresponds to the desired drying rate.

4,899,462

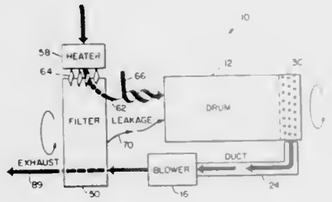
LINT BURNING CLOTHES DRYER

Brett J. Putnam, Ripon, Wis.; David H. McFadden, Lexington, and William P. Dowst, Wakefield, both of Mass., assignors to Speed Queen Company, Ripon, Wis.

Filed Oct. 14, 1988, Ser. No. 257,663

Int. Cl.[4] F26B *11/04*

U.S. Cl. 34—19 **10 Claims**



1. A clothes dryer comprising:

a clothes drum having perforations;

a substantially cylindrical lint screen extending axially from said drum;

a blower having an inlet and an outlet, said blower being connected between said perforations and said lint screen with said inlet being coupled to said perforations and said outlet being directed to said lint screen wherein air is drawn by negative pressure from said drum through said perforations and then passes through said blower before being directed through said lint screen such that lint in said air is collected on the high pressure blower side of said lint screen; and

means for burning said lint on said lint screen.

4,899,463

METHOD AND DEVICE IN A CYLINDER DRYER OF A PAPER MACHINE

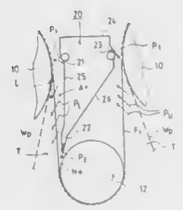
Pertti Heikkilä, Raisio; Markku Karlsson, Parainen, and Hannu Kokkala, Turku, all of Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Sep. 29, 1988, Ser. No. 251,542

Claims priority, application Finland, Sep. 29, 1987, 874266

Int. Cl.[4] F26B *13/08*

U.S. Cl. 34—23 **8 Claims**



1. Method in a cylinder dryer of a paper machine in which a paper web is guided by an upper wire around upper cylinders and by a lower wire around lower cylinders,

with these wires being guided over faces of the respective cylinders and by guide rolls situated in spaces between respective upper cylinders or respective lower cylinders,

so that the web is pressed by the upper wire into direct drying contact with the faces of the upper cylinders along an upper line of cylinders and correspondingly pressed by the lower wire onto the faces of the lower cylinders along a lower line of cylinders, and

the web is additionally passed from one line of cylinders to the other over a certain distance as an open draw,

comprising the steps of

directing a blowing of drying air at at least one of the drying wires within an area of a line and which the respective drying wire is detached from a respective cylinder,

thereby disrupting a moist boundary layer which is derived from water diffused from the web and onto the respective wire,

supplying a sufficient amount of dry air on an inlet run of the upper or lower wire from the respective drying cylinder to a respective guide roll,

directing the air to pass from an area of a pressurized space formed on the inlet run through the respective wire and into a pocket space defined by the respective wire and a respective free draw of the web,

applying a second blowing into a pressurized inlet nip formed between the respective wire and guide roll,

thereby producing an intensified flow of air through the wire so as to supply additional drying air into the pocket space, and

regulating said first and second blowings over a transverse direction of the web, so as to control at least one of moisture profile of the web to be dried and transverse flows taking place in the pocket space.

4,899,464

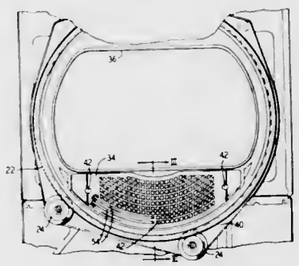
DRYER OUTLET GRILL WITH SENSOR

Keith E. Carr, Lincoln Township, Berrien County, and Karl Jautakis, Chikaming Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 14, 1988, Ser. No. 270,670

Int. Cl.[4] F26B *11/02, 21/06*

U.S. Cl. 34—133 **22 Claims**

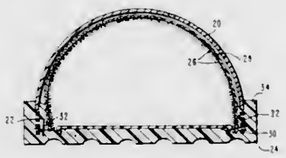


1. A sensor assembly for use in an automatic dryer having a rotatable dryer drum for containing a supply of material to be dried, and an exhaust duct opening for exhausting an air stream from said drum, said sensor assembly comprising:

an electrically non-conductive exhaust outlet grill covering said exhaust duct opening and having a plurality of openings formed therein; and

a pair of spaced apart elongated sensor strips each secured directly to said exhaust outlet grill closely adjacent said plurality of openings and closely adjacent said rotatable dryer drum and exposed to the interior of said drum for intermittent contact by said material.

4,899,465
WATERPROOF FOOTWEAR
Walter Bleimhofer, Penzberg, and Thorger Hübner, Kolbermoor, both of Fed. Rep. of Germany, assignors to W. L. Gore & Associates, Inc., Newark, Del.
Filed Jul. 8, 1988, Ser. No. 216,928
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 3722589
Int. Cl.[4] A43C *13/08*
U.S. Cl. 36—14 20 Claims



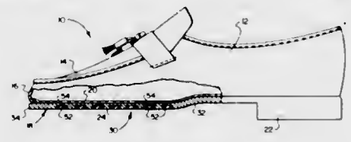
1. Footwear comprising an insole having a bottom side, an upper having lower and upper portions, said lower portion sewn to the insole forming connecting seams, a lining that lines the upper and is also sewn to the insole at a connecting seam and has a microporous functional layer which is waterproof and permeable to water vapor, and a plastic sole which is injection-molded to the bottom side of the insole and the lower portion of the upper, and encloses the connecting seams, characterized in that at least the lower portion of the upper which is adjacent the insole is formed by porous material adapted to be penetrated by the plastic sole which is liquid during injection molding.

4,899,466
FOOTWEAR LACE LOCKING ASSEMBLY
Joseph J. Skaja, San Antonio, Tex., assignor to Kaepa, Inc., San Antonio, Tex.
Continuation-in-part of Ser. No. 916,531, Oct. 8, 1986, abandoned. This application Jul. 17, 1987, Ser. No. 74,953
Int. Cl.[4] A43B *11/00*; A43C *5/00*
U.S. Cl. 36—50 7 Claims



1. In a lacing assembly for an article of footwear:
(a) a first vamp section including opposed vamp portions and a second vamp section, disposed upwardly adjacent of the first vamp section and including opposed vamp portions,
(b) the first vamp portions having an upper end and a lower end and a plurality of lace-receiving eyelets including a pair of opposed eyelets disposed at said upper end,
(c) the second vamp portions having an upper end and a lower end and a plurality of lace-receiving eyelets including a pair of opposed eyelets disposed at said lower end, longitudinally adjacent said first vamp portion upper end eyelets,
(d) the upper end eyelets of the first vamp portions including locking means, said locking means including a plate portion having an opening and a communicating slit extending inwardly of said associated vamp portion and said lower end eyelets of said second vamp portions include locking means, said locking means including a plate portion having an opening and a communicating slit extending inwardly of said associated vamp portion,
(e) a single continuous lace having opposed side lengths, said side lengths being received by opposed lace-receiving eyelets in said first vamp portions, and said side lengths extending between said first and second vamp sections and being received by opposed lace-receiving eyelets in said second vamp portions, said lace being received by said lace-receiving locking eyelets in selectively lockable relation to permit the first vamp section to be adjusted and maintained in adjustment substantially independently of the second vamp section, and
(f) each plate portion including a substantially straight margin portion and an arcuate margin portion connecting the ends of said straight margin portion and said opening being disposed substantially closer to one end of said straight margin that said other end.

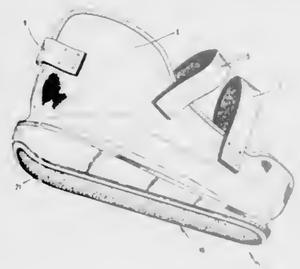
4,899,467
COMPOSITE OUTSOLE
Charles P. Mackey, Ava, Mo., assignor to Forest A. Pruitt, Oklahoma City, Okla.
Filed Jul. 29, 1988, Ser. No. 226,240
Int. Cl.[4] A43C *15/02*
U.S. Cl. 36—59 A 4 Claims



1. A composite outsole for a shoe comprising a sole piece having a body portion, an outsole tread surface formed on one side of said body portion and an inner support surface formed on the opposite side of said body portion, said body portion having multiple stud cavities intersecting said outside tread surface and extending partially into said body portion within a ball support region, said outsole body portion surrounding each stud cavity being undercut thereby defining a counterbore pocket in communication with said cavity, and an injection body of resin material embedded within each cavity and in each counterbore pocket, respectively, thereby defining a stud and a back plate in each pocket, with each stud and back plate being integrally formed together.

4,899,468
SOLE FOR CAST SHOE
Henry L. Richbourg, 1801 Barkley Rd., Statesville, N.C. 28677, and Hugh W. Dayton, 36 S. Main St., Jeffersonville, Ohio 43128
Filed Jan. 29, 1986, Ser. No. 823,778
Int. Cl.[4] A43B *3/12*; A61F *13/00*
U.S. Cl. 36—110 2 Claims

1. In a cast shoe, an improved sole comprising:
(a) a posterior portion having a curved surface;
(b) a substantially flat weightbearing portion adjacent said posterior portion; and
(c) an anterior portion adjacent said weightbearing portion and having an anteroposterior curvature so as to provide a stable walking surface and having a mediolateral curvature so as to provide assistance in approximating a normal toe-off position during walking, wherein said mediolateral curvature varies in radius of curvature in the anterior to posterior direction.

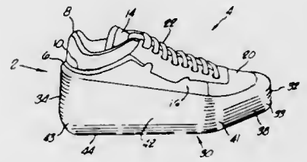


4,899,469
DEVICE FOR SECURING A LEG OR LEG COVER ON SKI BOOTS
Kurt Hilgarth, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft m.b.H., Graz, Austria
Filed Aug. 10, 1988, Ser. No. 230,416
Claims priority, application Austria, Aug. 11, 1987, 2023/87
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—120 5 Claims



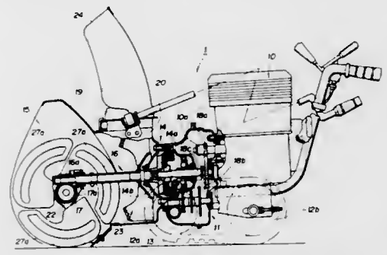
1. A catch for securing a shell and a leg cover of a ski boot, at least a heel part of the leg cover pivots about an axis extending transverse to a longitudinal axis of the boot, said catch being subjected to a spring force biassing the catch into a closed position and which may be forced against the spring force into an open position, said catch comprising:
a double-armed lever located in a recess of the leg cover and pivoting about a pin having a diameter less than the catch bore in which the pin is located thereby providing a clearance between the pin and the catch bore, and the catch having two stop faces each opposite one stop face of the shell or cover in the closed position of the catch.

4,899,470
ATHLETIC SHOE
Philo K. Holland, III, 924 E. 200 S. #4, Salt Lake City, Utah 84102
Filed May 8, 1987, Ser. No. 47,731
Int. Cl.[4] A43B *5/02*
U.S. Cl. 36—133 7 Claims



1. An athletic shoe for controlling an object for a game or the like, said shoe comprising a sole having a non-curved instep and a substantially planar object control surface extending from said instep.

4,899,471
AUGER FOR SELF-PROPELLED SNOW REMOVING MACHINE
Ichiro Sasaki, and Takeo Ogano, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 62,431, Jun. 12, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 373,687
Claims priority, application Japan, Jun. 18, 1986, 61-142598; Nov. 7, 1986, 61-171211[U]
Int. Cl.[4] E01H *5/09*
U.S. Cl. 37—233 13 Claims



1. An auger in a self-propelled snow removing machine including an engine, running means drivable by the engine, and a snow blower for discharging snow collected by the auger, said auger comprising an auger cover disposed on a front portion of the snow removing machine, an auger output shaft disposed transversely in the auger cover and drivable by the engine, and at least one blade mounted on the auger output shaft and having an outer peripheral edge forming a substantially continuous helix around the auger output shaft wherein:
said blade comprises a plurality of mutually separate fins having outer peripheral edges jointly forming the helix and made of a resilient steel material so that the blade can resiliently flex when small stones and the like enter between the blade and the auger cover;
each of said fins comprising a flat base attached to said auger output shaft substantially perpendicularly to an axis thereof, and an arcuate portion extending helically from an outer end of said base so that snow can be collected in an axial direction of said auger output shaft and thereafter discharged by said snow blower; and
said arcuate portion of each of said fins has an arcuate edge

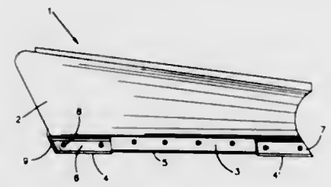
of a relatively large radius of curvature at a base end thereof so that a small gap is defined in side elevation between a distal end of the arcuate portion of one fin and the base end of the arcuate portion of another fin following said one fin.

4,899,472

SNOW PLOW GUARDS COMPRISING PLIANT POLYMER

Kent L. Winter, P.O. Box 463, 38255 Ridge Rd., Willoughby, Ohio 44094

Continuation-in-part of Ser. No. 154,911, Feb. 11, 1988, Pat. No. 4,833,801. This application Mar. 15, 1989, Ser. No. 323,666
The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.
Int. Cl.[4] E01H *5/06*; B32B *9/00*
U.S. Cl. 37—270 **12 Claims**



1. A guard adapted for attachment to the front of an outer side end of the expendable blade disposed across the moldboard of a snow plow, the guard being attachable for extending the service life of the blade and including:

a panel portion that conforms generally to the front part of said outer end of the blade; and

a curb feeler portion comprising a flexible polymer,

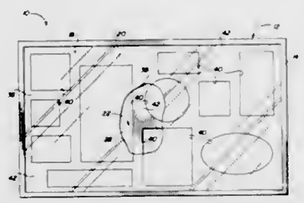
the curb feeler portion being integral with at least part of the panel portion and supported thereby to project to the side of and sweep rearwardly around said outer end of the blade.

4,899,473

PICTURE FRAME ASSEMBLY

Alan Wiener, 5327 Andasol Ave., Encino, Calif. 91316

Filed Aug. 15, 1988, Ser. No. 232,398
Int. Cl.[4] A47G *1/06*; G09F *1/12*
U.S. Cl. 40—152 **10 Claims**



1. An improved picture frame assembly, said assembly comprising, in combination:

(a) a frame defining a viewing window,

(b) a backboard having a frame-supporting outer perimeter area disposed within and secured to said frame, said backboard lying within a plane located between the front and back surface planes of said frame, and an openable generally central portion bearing a hinge, said central portion permitting insertion of pictures therethrough without removing said backboard from within said frame, said central portion abutting said perimeter in a line; and,

(c) a mask having a picture opening and a masking perimeter, said mask being between said backboard and said window, said masking perimeter masking said backboard abutting line and said hinge wherein said assembly includes support inserts affixed to the back of said frame at each corner which releasably retain the corners of said central portion of said backboard in a closed position.

4,899,474

OPEN SLEEVE SUPPORT FOR WIRE MARKING ELEMENTS

Ivana Piana, and Silvano Piana, both of Genoa, Italy, assignors to Graphoplast S.p.A., Italy

Filed Oct. 29, 1984, Ser. No. 665,615
Claims priority, application Italy, Nov. 7, 1983, 12659 A/83
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—316 **12 Claims**



1. An open sleeve identification device for electrical cables, which comprises:

(a) a central body portion having opposed side edges;

(b) a pair of opposed leg portions extending from said side edges and terminating in distal ends thereof, said leg portions being tapered towards said distal ends; and

(c) a pair of resilient flange portions, each connected at one end thereof to a said distal end of said leg portions by a close bend fillet and terminating in a free end thereof at approximately the mid point of the leg portion, said flange portions having a normal position in which they are parallel,

(d) said resilient flange portions being operable to be urged apart from said normal position to a more widely spaced apart position when a cable of a first size is forced therebetween toward said central body portion and to return to said normal position when said first size cable contacts said body portion, whereby said first size cable contacts and is secured between said free ends of said flange portions and said central body portion; and

(e) said resilient flange portions being further operable to be urged apart from said normal position to a more widely spaced apart position when a cable of a larger size than said first size is forced therebetween toward said central body portion and to remain in a said more widely spaced position when said larger size cable contacts said body portion, whereby said larger size cable is gripped by said flange portions and contacts said central body portion.

4,899,475

CONTAINER FOR A PILE OF SHEETS

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Continuation of Ser. No. 900,149, Jul. 11, 1986. This application Jul. 7, 1988, Ser. No. 216,414
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441464
Int. Cl.[4] G09F *11/30*
U.S. Cl. 40—513 **13 Claims**

1. A container for a stack of substantially rectangular sheets, including:

a housing;

a slider received in said housing in an inner end position and adapted to be withdrawn out of said housing in a predetermined withdrawal direction so as to convey sheets into an outer sheet removal position; and

a grip on said slider extending rearwards with respect to said withdrawal direction and, with said slider in its inner end



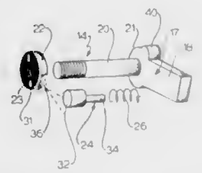
position, into a housing wall recess, wherein a support element extends into said recess in order to supportingly engage beneath adjacent ends of sheets when said slider is in said outer position and prevent any edge of said recess from contacting said adjacent ends of sheets when said slider is moved from said outer position to said inner end position.

4,899,476

REVERSIBLE MAGAZINE CATCH MECHANISM FOR HANDGUNS

Kurt J. Hindle, South Hadley, Mass., assignor to Smith & Wesson Corp., Springfield, Mass.

Filed Jun. 2, 1989, Ser. No. 360,854
Int. Cl.[4] F41C *25/06*
U.S. Cl. 42—7 **5 Claims**



1. A reversible magazine catch for a semi-automatic handgun having a frame with a downwardly opening cavity adapted to receive therein a cartridge holding magazine, a notch on each side of said magazine, a bore extending through said frame and opening on opposite sides thereof, sockets disposed adjacent said bore and opening outwardly toward opposite sides of the frame, each side of said frame having a cutout communicating with the bore and each of said sockets, said magazine catch comprising a rod with an arm at one end thereof adapted to engage each of said notches in said magazine, said rod having a threaded end and a nut removably screw-fitted thereon, a detent and spring adapted to be received in each of said sockets to urge said arm selectively into engagement with each of said notches whereby said magazine catch is reversible upon removing said nut from the rod and reversing the rod from one end to the other of said frame.

4,899,477

HAND-HELD AUTOMATIC FIREARM

Friedrich Aigner, St. Valentin, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Sep. 8, 1988, Ser. No. 241,855
Claims priority, application Austria, Sep. 22, 1987, 2394/87
Int. Cl.[4] F41C *15/00*
U.S. Cl. 42—25 **3 Claims**

1. A handheld automatic firearm comprising

a receiver,

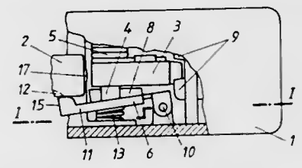
a barrel carried by said receiver, said barrel having a forward end, and a rear end disposed in said receiver,

a breechblock, which is disposed in said receiver, is axially aligned with said barrel, and is slidably mounted in said receiver for axial reciprocating movement forwardly into engagement with said rear end of said barrel and rearwardly away from said rear end of said barrel to a rearmost position, said breechblock having a forward end formed with a standing face for engagement with a cartridge disposed in said barrel at said rear end thereof;

said breechblock having a peripheral surface, said peripheral surface being formed with a generally axially extending track groove which opens into said standing face,

a hammer, which is pivoted to said receiver and is cocked by said breechblock as said breechblock moves rearwardly,

a hammer spring opposing movement of said hammer as said hammer is cocked, said hammer spring tending to impart



to said hammer a forward pivotal movement for firing a cartridge disposed in said barrel at said rear end thereof,

a dual function sustained-fire and ejector lever which is pivotally mounted in said receiver and is responsive to said reciprocating movement of said breechblock, said dual function sustained-fire and ejector lever catching said hammer to prevent forward pivotal movement and thereafter releasing said hammer for forward pivotal movement during said reciprocating movement of said breechblock,

said dual function sustained-fire and ejector lever comprising a follower arm extending into said track groove and riding therein during said reciprocating movement of said breechblock, said follower arm including a free end portion which protrudes forwardly beyond said standing face when said breechblock is in said rearmost position thereby to eject an empty cartridge case after each discharge of a cartridge.

4,899,478

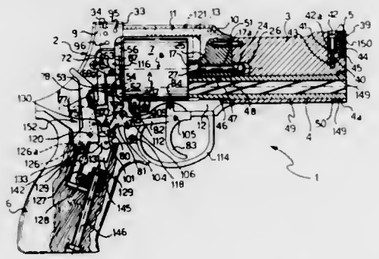
DEBASED BARREL REVOLVER

Emilio Ghisoni, Via Villa Serafina, 4 - 27100 Pavia, Italy

Filed Aug. 1, 1988, Ser. No. 308,506
Claims priority, application Italy, Feb. 10, 1988, 19367 A/88
Int. Cl.[4] F41C *1/00, 17/08*
U.S. Cl. 42—65 **16 Claims**

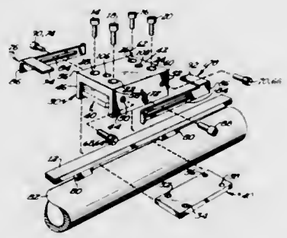
1. A debased barrel revolver comprising a stock having rear mount, a cylinder carried rotatably on said stock at a location close against aid rear mount, a barrel mounted on said stock aligned to a bottom cartridge chamber of the cylinder, a release and percussion mechanism, and a chamber formed in the rear mount and extending therein in a perpendicular direction to and above said barrel, wherein said release and percussion mechanism comprises a trigger pivoted on said stock, a distributor lever pivoted on said stock and operatively linked to said trigger, a cylinder rotating arm movable vertically within said chamber and having a bottom end journalled of said distributor lever and a top end engaged with the cylinder, a rod-like safety catch lying parallel to said arm and being movable vertically

within said chamber, first spring means carried on the rear mount and biasing said safety catch, a lever connecting said top



end to said safety catch and a two-stage release mechanism setting device operatively linked to said top end.

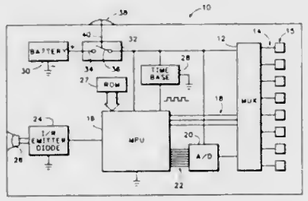
4,899,479
SHOTGUN RIB MOUNT
Ronald J. Sanders, P.O. Box 658, Floodwood, Minn. 55736
Filed Sep. 2, 1988, Ser. No. 240,753
Int. Cl.[4] F41G *1/46*
U.S. Cl. 42—102 **24 Claims**



1. Device for mounting sighting apparatus comprising, in combination: a weapon having a raised vented rib; an upper plate for resting on top of the raised vented rib; a lower plate for placement beneath the raised vented rib and between the raised vented rib and the weapon; and means for drawing the upper plate and the lower plate together to clamp the upper plate and the lower plate to the raised vented rib.

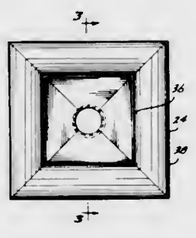
4,899,480
FISHING PROBE APPARATUS
Michael C. Park, 5945 SW. Arrowwood La., Portland, Oreg. 97225
Filed Jul. 19, 1988, Ser. No. 221,264
Int. Cl.[4] A01K *31/06, 89/00*
U.S. Cl. 43—4 **15 Claims**

4. A probe apparatus comprising:
an optic fiber having a first end and a second end;
sensor means responsive to a given aquatic condition;
means responsive to said sensor means for introducing an optic signal into the first end of said optic fiber, the optic signal being representative of the given aquatic condition;
means optically coupled to the second end of said optic fiber for receiving the optic signal; and
means responsive to an optic signal delivered to said probe apparatus by way of said optic fiber for influencing the condition of said probe apparatus, said influencing means comprising fin means interactive with a body of fluid moving relative to said probe apparatus and means for actuating said fin means in accordance with said optic



signal delivered to said probe apparatus to affect the position of said probe apparatus in said body of fluid.

4,899,481
AUTOMATIC LONG LINE COMMERCIAL FISHING APPARATUS
Charles D. Burton, 484 "B" St., and Matthew Morgan, 8224 Snohomish Rd., both of Blaine, Wash. 98230
Filed Oct. 11, 1988, Ser. No. 255,744
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—4 **15 Claims**

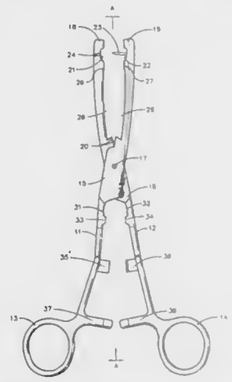


1. An automatic commercial fishing apparatus for use with long line fishing gear of the type including a ground line, a plurality of spaced leaders attached thereto and a plurality of hooks each attached to an associated leader, the apparatus comprising:
power means for advancing the long line gear through the apparatus;
hook orienting means including a guide funnel for discharging the hooks substantially in a preselected plane, the guide funnel having a releasable means to facilitate the passage through the funnel of an obstruction attached to the long line gear; and,
means for receiving the hooks from the orienting means and guiding them sequentially to storage.

4,899,482
MULTI-UTILITY FISHING TOOL
Connie D. Gerdes, Parker, Colo., assignor to Barbco, Inc., Parker, Colo.
Filed Jul. 27, 1989, Ser. No. 385,360
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—4 **18 Claims**

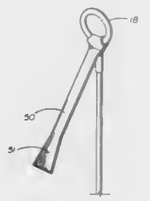
1. In a hemostat adapted for activities associated with fishing, the improvement comprising:
(a) a first space between the jaws of the hemostat clamp section and along the centerline of the hemostat of a width

which permits rotation with minimal friction of hooks of predetermined size held around a hook retaining pin;
(b) a second, longer and more rearward space, and



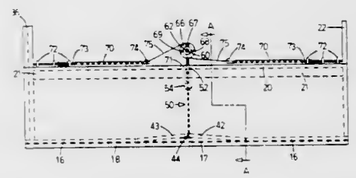
(c) a hook retaining pin adapted to extend across the first space and into an anchoring means, said pin being substantially perpendicular to the center line of the hemostat.

4,899,483
WEEDLESS HOOK
Aaron J. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.
Filed Sep. 8, 1988, Ser. No. 242,032
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—43.6 **17 Claims**



1. A fishing hook for catching fish in water containing weeds or similar objects which may inadvertently snag or contaminate the hook, the fishing hook comprising:
a hook having an elongate shank lying along a shank axis, an eye at one end of the shank, and an arcuate portion at an opposing end of the shank and having a barbed tip;
an elongate sheet-like metallic guard secured at one end to securing portion of the hook adjacent the eye, the one end passing through the eye of the hook and having a reduced width portion for wrapping about an eye portion of the hook and an increased width portion for wrapping about the shank portion at the hook;
the sheet-like metallic guard having an opposing free end normally spaced between the barbed tip and the eye, and a flexible portion between the one end and the opposing free end for enabling movement of the free end with respect to the hook;
a center point of the securing portion of the hook and the barbed tip of the arcuate portion defining a tip-to-shank-securing-portion line, and a lateral midpoint of the free end of the sheet-like guard and the tip-to-shank-securing-portion line defining a hook plane, the free end of the sheet-like guard spaced in the hook plane to normally deflect the weeds around the barbed tip;
the flexible portion of the sheet-like metallic guard having a width substantially perpendicular to the hook plane and being substantially greater than its thickness, such that the width of the flexible portion normally prevents the free end of the guard from moving in a direction perpendicular to the hook plane and out of alignment for protecting the barbed tip, and such that the thickness of the flexible portion allows movement of the free end within the hook plane toward the shank axis to expose the barbed tip so as to hook the fish.

4,899,484
HUMANE ANIMAL TRAP
Marcel Morin, P.O. Box 53, Falher, Alberta, Canada (T0H 1M0)
Filed May 18, 1989, Ser. No. 353,488
Int. Cl.[4] A01M *23/20*
U.S. Cl. 43—61 **10 Claims**



1. An animal trap comprising an elongate chamber having a top, a bottom and a pair of sides, a pair of end covers at least one of which is slidable vertically between a raised open position and a lowered closed position, a floor including a pair of centrally hinged panels, link means projecting upwardly from the hinged panels through an opening in said top, trap setting means including a shaft laterally disposed on said top, said shaft being rotatably connected to a pair of fastening means, a disc attached to said shaft and located over said link means, biasing means attached to said shaft and one of said fastening means, said disc including a circumferentially located detent, and a pair of diametrically opposed holes arranged 90° to said detent, at least one locking means releasably connectable to at least one of said end covers in a raised position thereof, said locking means being connected to one of said holes in said disc by a flexible attachment, and a connecting loop joined to said link means and adapted to rest in said detent when said detent is in a vertically uppermost position.

4,899,485
DISPOSABLE INSECT TRAP WITH FLEXIBLE CONTAINER
Rodney G. Schneidmiller, S. 1911 Conklin Rd., Veradale, Wash. 99037
Continuation-in-part of Ser. No. 938,454, Dec. 5, 1986, abandoned. This application Jan. 25, 1988, Ser. No. 148,049
Int. Cl.[4] A01M *1/10*
U.S. Cl. 43—122 **13 Claims**

1. A containment type trap with a flexible containment bag for trapping flying insects comprising, in combination:
a rigid top member having a body portion with an outwardly flaring bag supporting portion depending therefrom, said body portion having means to aid its support and defining at least one entryway for insects, said entryway having a dimple communicating to a medial truncated conic entry orifice having its base uppermost and defining a sharp lower edge, and
a flexible containment bag having a top defining an orifice so

that the containment bag may be suspended from and supported by the top member with the body portion of the



top member projecting upwardly through the orifice of the bag.

4,899,486

TREE SHELTERS

Graham F. Hurlstone, Willow Cottage, Farnham Lane, Haslemere, Surrey GU27 1EY, United Kingdom

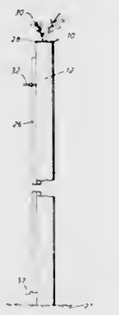
PCT No. PCT/GB86/00593, § 371 Date Jun. 2, 1987, § 102(e) Date Jun. 2, 1987, PCT Pub. No. WO87/01904, PCT Pub. Date Apr. 9, 1987

PCT Filed Oct. 2, 1986, Ser. No. 72,259

Claims priority, application United Kingdom, Oct. 4, 1985, 8524506

Int. Cl.[4] A01G *13/02*

U.S. Cl. 47—30 **7 Claims**



1. A tree shelter comprising an elongate body continuous in a circumferential direction and an integral channel, wherein said body and a wall of said channel form an elongate tubular enclosure for surrounding a tree and said channel is for receiving a stake, wherein said enclosure is open at opposed ends, said enclosure is made of an unperforate plastic material which allows light to pass therethrough, and upper and lower ends of said channel are substantially coterminous with respective opposed ends of said body and said channel is arranged to receive said stake remote from said enclosure for stabilizing said shelter against said stake and for preventing fumes from said stake from entering said enclosure.

4,899,487

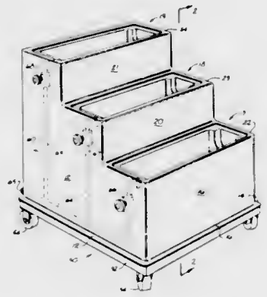
STORAGE AND DISPLAY RECEPTACLE ASSEMBLY

Richard W. Brownlee, 605 Derrick Rd., Spartanburg, S.C. 29378

Filed Jan. 12, 1988, Ser. No. 142,916

Int. Cl.[4] A47F *3/04*

U.S. Cl. 47—41.01 **16 Claims**



10. An assembly for receipt of floral items and the like comprising:

(a) a housing, said housing including opposite side walls having stepped upper surfaces, a rear wall extending between said side walls, a front wall section extending between said side walls at each step and upper wall sections extending between said side walls at each step;

(b) a container located at each step and extending down into said housing, said containers defining drain openings therein;

(c) water drain means associated with said container drain openings for removal of water therefrom, said drain means including control means; and

(d) water supply means associated with said containers for supplying water thereto, said water supply means including valve means for control of water supply to said containers.

4,899,488

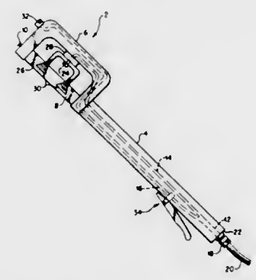
MULTI-FUNCTIONAL TOOL FOR APPLYING FLUID AGRICULTURAL AGENTS

Jeffrey E. Faulkner, Teaneck, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,476

Int. Cl.[4] A01G *29/00*

U.S. Cl. 47—57.5 **20 Claims**



1. A tool for applying an agricultural treatment fluid, said tool comprising:

a tool handle and a tool head attached to an end of the handle,

a cutting blade having a forward cutting edge mounted to said tool head,

first fluid discharge means including a first fluid discharge outlet mounted to said tool head proximate to said cutting blade,

first switch means operatively associated with said first fluid discharge means for controlling the discharge of fluid from said first fluid discharge outlet,

second fluid discharge means including a second fluid discharge outlet mounted to said tool, and

second switch means operatively associated with said second fluid discharge means for controlling the discharge of fluid from said second fluid discharge outlet.

4,899,489

DEVICE FOR GROWING PLANTS

Viktor V. Shishkin, Krasnodar, U.S.S.R., assignor to Ibzheneroy Tsentr "Truboprovod", Krasnodar, U.S.S.R.

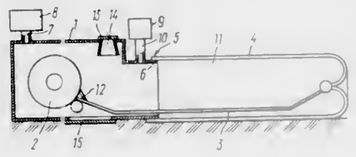
PCT No. PCT/SU86/00132, § 371 Date Jul. 27, 1987, § 102(e) Date Jul. 27, 1989, PCT Pub. No. WO87/03777, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 17, 1986, Ser. No. 112,563

Claims priority, application U.S.S.R., Dec. 24, 1985, 3989055; Dec. 24, 1985, 3988673

Int. Cl.[4] A01G *9/00, 31/00*

U.S. Cl. 47—65 **4 Claims**



1. A device for growing plants, comprising: a hermetically sealed chamber (1) which accomodates a perforated flexible band (3) having one end mounted on a driven drum whereby said drum may be rotatably driven to reel said flexible band thereon, systems (8,9) for feeding working agent and nutrient solution respectively to the chamber (1) wherein the chamber (1) comprises a flexible tubing (4) whose one end is connected to a second end of the perforated band (3) the other end of the tubing being turned inside out and held in place peripherally on the chamber (1) to form a hermetically sealed space (11), said flexible tubing (4) arranged to be extended as the working agent is fed to the chamber and the perforated band tensioned as the flexible tubing is extended, wherein the tubing (4) and band (3) comprise a growing area.

4,899,490

WINDOW INTRUSION BARRIER "B"

Isidore Jokel, 420 Newport "H", Deerfield Beach, Fla. 33441

Continuation-in-part of Ser. No. 224,673, Jul. 27, 1988, Pat. No. 4,837,974, which is a continuation-in-part of Ser. No. 948,204, Dec. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 854,428, Apr. 21, 1986, Pat. No. 4,680,890. This application Feb. 21, 1989, Ser. No. 313,772

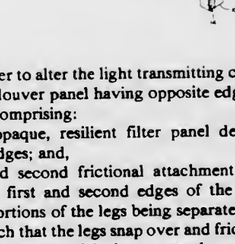
Int. Cl.[4] E06B *3/68*

U.S. Cl. 49—55 **5 Claims**

1. A barrier apparatus for a framed vertically adjustable rectangular window, the apparatus having an adjustable length for insertion into a window casement of said window, said apparatus slideably positionable within said casement, said barrier apparatus, comprising:

(a) a first and a second gridwork panel in horizontally spaced co-planar juxtaposition, said panels comprising rigid rectangular frames adapted to border and support said panels, each frame comprising horizontally disposed upper and lower borders, and inner and outer vertically oriented side borders said inner side borders facing each other, said facing side borders having vertically spaced guide holes;

(b) first and second horizontally directed posts affixed medially between said upper and lower horizontal borders of each panel, said posts affixed to said facing inner sideborders and adapted to post through said guide hole, said horizontally directed posts having a plurality of co-vertically spaced pairs of notches thereon;



(c) locking means for mutually securing said first and second horizontal posts relative to each other, said locking means having a pair of parallel cylindrical apertures having internal surfaces for complemental contact with said notched pairs of said horizontal post, thereby defining the horizontal extend of slideable horizontal length of said barrier apparatus.

4,899,491

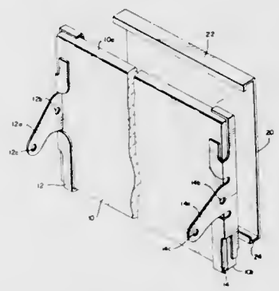
SUN FILTER FOR A LOUVER PANEL

Gordon Okumoto, 853 Ilaniwai St., Honolulu, Hi. 96813

Filed Apr. 13, 1988, Ser. No. 180,961

Int. Cl.[4] E05B *7/02*

U.S. Cl. 49—62 **15 Claims**



1. A sun filter to alter the light transmitting characteristics of a transparent louver panel having opposite edges separated by a distance d comprising:

(a) a non-opaque, resilient filter panel defining first and second edges; and,

(b) first and second frictional attachment legs extending from the first and second edges of the panel with the closest portions of the legs being separated a distance less than d such that the legs snap over and frictionally contact the opposite edges of the louver panel to removably attach the sun filter to the louver panel.

4,899,492

SYSTEM FOR WINDOW OPERATION, ESPECIALLY IN A MOTOR VEHICLE

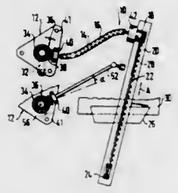
Ferenc Szerdahelyi, Coburg, Fed. Rep. of Germany, assignor to Brose Fahrzeugteile GmbH & Co. Kommanditgesellschaft, Coburg, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 249,350

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732431

Int. Cl.[4] E05F *11/48*

U.S. Cl. 49—352 16 Claims



1. A window actuation system, especially in a motor vehicle, comprising:

a first guide rail (20; 320);

a first entrainment member (26; 326) for a window glass plate (30; 330) supported at the guide rail (20; 320) so as to be movable in its longitudinal direction (A);

a force transmission member (22) engageable at the first entrainment member (26; 326) and guided so as to be mobile parallel to the longitudinal direction (A) of the first guide rail;

a drive member (18) for the force transmission member (22) attached to the first guide rail (20; 320); and

drive means for driving the drive member (18), said drive means selectively including a manual drive unit (12) arranged remotely from the guide rail (20) and connected with the drive member (18) by a torque transmission member (14; 52), and a motorized drive unit (46; 346) coupled with the drive member (18) so as to be able to transmit force, the drive member (18) having a wrap around spring brake (42; 342), and the motorized drive unit (46; 346) being directly attachable to one of the drive member (18) and the guide rail (20; 320) in the region of the drive member.

4,899,493

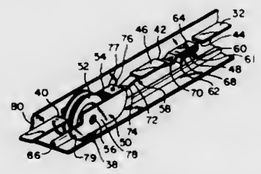
REPLACEABLE SLIDING DOOR ROLLER ASSEMBLY

James E. Baumgarten, San Pedro, Calif., assignor to Columbia Manufacturing Corporation, Gardena, Calif.

Filed Mar. 13, 1989, Ser. No. 322,426

Int. Cl.[4] E05D *13/00*

U.S. Cl. 49—425 13 Claims



1. A sliding panel assembly comprising a planar panel for sliding longitudinally within a panel opening along tracks at the top and bottom of said panel opening and wherein the upper and lower portions of said panel are hollow behind upper and lower discontinuous transverse edges which define therein wheel receiving pockets, mounting hook insertion gaps longitudinally separated from said wheel receiving pockets by transverse bearing tabs, and hook clearance gaps longitudinally separated from said mounting hook insertion gaps by transverse mounting tabs, a plurality of removable wheel assemblies each having a wheel housing, a wheel rotatably mounted in said wheel housing, and a longitudinally extending leaf spring coupled at one end to said wheel housing and formed with a hook at its opposite end, whereby said hook of each leaf spring is engageable about a mounting tab to carry said wheel housing in a wheel receiving pocket with said leaf spring bearing against a bearing tab, such that said wheel housing is resiliently deflectable in the plane of said panel within said wheel receiving pocket in which it is carried.

4,899,494

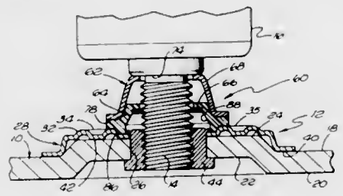
FINISHING ARTICLE HAVING AN INTEGRAL MOUNTING HUB AND IMPROVED BASE

Joseph H. MacKay, Jr., 17551 Cabela Dr., San Diego, Calif. 92127

Continuation-in-part of Ser. No. 212,448, Jun. 28, 1988, which is a continuation-in-part of Ser. No. 5,812, Jan. 21, 1987, Pat. No. 4,760,670, which is a continuation-in-part of Ser. No. 847,793, Apr. 3, 1986, Pat. No. 4,694,615. This application Jan. 18, 1989, Ser. No. 298,375

Int. Cl.[4] B24B *45/00*

U.S. Cl. 51—168 7 Claims



1. A finishing article having a disposable drive member non-removably affixed thereto for mounting on a threaded rotatable spindle for use with a power tool comprising:

a finishing article having a face and a back and having a first centrally disposed aperture therethrough;

a backing member having an inner and outer surface and a diameter smaller than the diameter of said finishing article and defining a second centrally disposed aperture therethrough, said backing member inner surface seated on said back of said finishing article with said first and second apertures aligned;

a retaining nut having a hollow internally threaded body having first and second ends and a first radially outwardly extending flange extending from said first end of said body, said body extending through said first and second apertures of said finishing article with said radial flange seated against said face;

means protruding outwardly from said second end of said body to non-removably secure said retaining nut and said backing member together on said finishing article without the use of adhesives and allowing relative axial movement between said retaining nub and said backing member; and

adapter means for applying force to said finishing article when said finishing article is threadably affixed to and seated on said spindle, whereby relative axial movement between said retaining nut and adapter means toward each other is permitted to thereby increasingly compress said finishing article as operative loads are applied to said finishing article during use on said power tool, said adapter means including an inverted generally cup shaped metallic member and a molded plastic bearing member, said bearing member being sandwiched between said metal cup and said backing member.

4,899,495

DISC WHEEL SANDING MACHINE

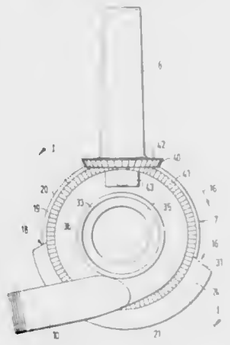
Karl Attinger, Holzmaden; Wolfgang Koch, and Peter Maier, both of Neidlingen, all of Fed. Rep. of Germany, assignors to Festo K.G., Esslingen, Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 306,506

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 3805962

Int. Cl.[4] B24B *23/00*

U.S. Cl. 51—170 T 16 Claims



1. A disc wheel sanding machine, comprising a housing, a motor driven rotatable sanding disc mounted to said housing for rotation about a substantially vertical axis, said sanding disc having a round periphery with a horizontal sanding surface exposed out of said housing for contact with a work piece to be sanded, a dust extraction hood connected with said housing and including a sealing wall portion spaced closely around only a portion of the periphery of said disc and a further wall portion spaced closely to the periphery of said disc at a first end of said further wall with the spacing from the further wall portion to the disc widening along a peripheral direction of said disc to a second end of said further wall portion located radially outwardly with respect to the periphery of said disc and defining a dust withdrawal slot with said disc, extending into said dust extraction hood.

4,899,496

PORTABLE CHILD ENCLOSURE

Bonnie G. Chew, II, 909 Euclid Ave., Birmingham, Ala. 35213

Filed Oct. 29, 1987, Ser. No. 114,200

Int. Cl.[4] A47D *13/06*

U.S. Cl. 5—98 R 2 Claims

1. A portable child enclosure, comprising:

a dissassemblable base frame including stabilization means for preventing tipping of the enclosure;

upright detachable corner posts coupled to said base frame;

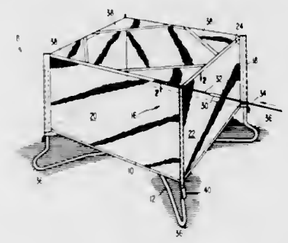
a fabric compartment with corner post tubes sealed at the top and closely supported by said upright detachable corner posts, said compartment defining a space for containing the child;

corner covering means overhanging the space and for preventing a child from climbing out of said compartment; and

wherein said stabilization means comprises J-shaped frame members extending exterior of the fabric compartment,

wherein said fabric compartment includes side support means for supporting top edges of the sides of said compartment, and

wherein said fabric compartment has an upper edge compartment running between said corner posts along the top edge of said compartment and said side support means



comprises an insertable side rail inserted in said upper edge oompartment and closely supported by said corner posts.

4,899,497

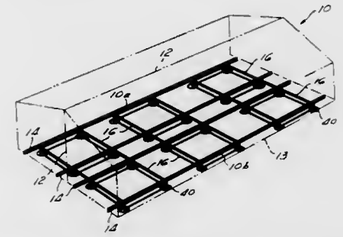
FOUNDATION SYSTEM AND DERIVATIVE BRACING SYSTEM FOR MANUFACTURED BUILDING

Jos. Madl, Jr., 2161 Vista Entrada, Newport Beach, Calif. 92660

Filed Jan. 15, 1988, Ser. No. 144,421

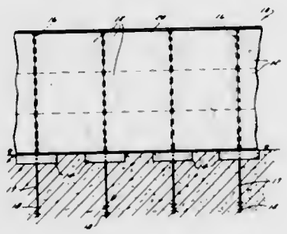
Int. Cl.[4] E04D *15/00*

U.S. Cl. 52—126.6 12 Claims



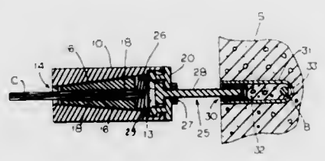
1. A building foundation system comprising a pair of spaced, vertically extending pedestals and a truss extending between said pedestals wherein said pedestals and said truss from a vertically oriented rigid frame, said pedestal including an upper portion to which said truss is attached, a base, and a vertically adjustable connection between said base and said upper portion that enables each pedestal to be precisely adjusted vertically so that the upper ends of the pedestal are dead level and yet the pedestals accommodate variations in elevation of the surfaces on which the bases rest, said truss comprises a pair of parallel, transversely extending, vertically spaced members rigidly attached to said pedestal upper portions, and braces extending diagonally between and rigidly connected to said members, a generally U-shaped channel on the top of each of said pedestal upper portions with the open end of the channel facing upwardly, and with the upper one of said truss members being positioned between the legs of the channel, and a bolt extending through the channel and said upper member.

4,899,498
FOAM CEMENT HIGHWAY SOUND BARRIER
Donald L. Grieb, 2001 Chateau Ct., Grafton, Wis. 53024
Filed Oct. 3, 1988, Ser. No. 253,063
Int. Cl.[4] E04B *1/82, 2/58*
U.S. Cl. 52—144 **13 Claims**



1. A highway sound barrier comprising:
a number of panels mounted in a vertical abutting relation;
each of said panels being formed from one or more self-supporting foam cement blocks;
each of said blocks being formed from a load bearing foam core;
a reinforcement grid mounted on the exposed surfaces of said core; and
a cementitious coating applied to the reinforcement grid for securing the grid to said foam core, said block having a sufficient thickness to form a load bearing structure.

4,899,499
CABLE ANCHORING APPARATUS
Charles F. Hoekstra, 4294 Hopkins Lake Dr., Duluth, Ga. 30136
Continuation-in-part of Ser. No. 44,319, Apr. 30, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 268,764
Int. Cl.[4] E04H *12/20*
U.S. Cl. 52—146 **13 Claims**



1. Apparatus for anchoring the end of a cable to a concrete structure or the like comprising, in combination, a tubular body having an opening in one end into which an end of a cable may be inserted; means for gripping the end of a cable within said tubular body; a threaded post mounted to the other end of said body for free rotation with respect thereto without longitudinal change in position within said tubular body; and an insert adapted to be at least partially embedded in the concrete structure to which insert said post may be threaded without rotation of the tubular body.

4,899,500
CMR CELL SITE
Harmon R. Miller; William J. Smith; Hollie M. Stanley, Jr., and William J. Smith, all of Houston, Tex., assignors to GTE Mobilnet, Incorporated, Houston, Tex.
Filed Dec. 21, 1987, Ser. No. 135,855
Int. Cl.[4] E04H *12/20*
U.S. Cl. 52—146 **44 Claims**

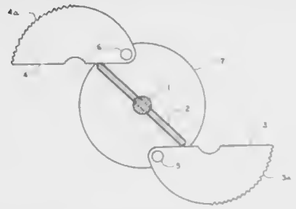


1. A CMR cell site comprising:
a foundation that includes:
(a) a rectangular center structure that includes a front section, a rear section, a left section, and a right section,
(b) a left leg section attached to the rear section and extending substantially cellinearly therewith,
(c) a right leg section attached to the rear section and extending substantially cellinearly therewith,
(d) a left exterior crossmember section attached to the left leg section and to the left section,
(e) a right exterior crossmember section attached to the right leg section and to the right section, and
(f) a nose structure attached to and extending from the front section, said CMR cell site further comprising:
an edifice having a roof and a floor, said roof residing above said floor, and said edifice resting on the foundation, the edifice for housing CMR equipment and ancillary equipment;
a tower brace supported by the roof;
an antenna tower mounted on and supported by the roof and secured by the tower brace;
a support column extending between the roof and the floor of the edifice for providing structural support for the tower; and
a plurality of guy wires attached between the tower and the foundation for guying the tower to the foundation

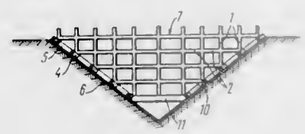
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4,899,501
EXPANDING ANCHORING DEVICE
Victor Yates, 8 Fairway Rd., Sewickley, Pa. 15143
Filed Aug. 11, 1988, Ser. No. 230,911
Int. Cl.[4] E02D *5/80*
U.S. Cl. 52—160 **1 Claim**

1. An expanding anchoring device comprising: a rotatable shaft, a base plate attached thereto, two pivotally mounted expanding members attached to said base plate, and an expansion means for moving said expanding members radially outwardly from said rotatable shaft, said expansion means being a spring steel rod passing through and rigidly attached to said rotatable shaft and extending equally in opposite directions from said shaft.

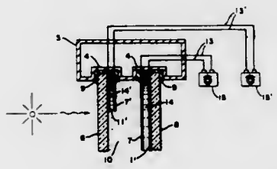


4,899,502
BUILDING OR STRUCTURE ERECTED ON A SLOPE
Semen P. Valts; Viktor A. Golovko; Alexei N. Stepanenko, all of Yalta; Alexandr N. Tetior, Simferopol; Karim P. Fen, Yalta; Alexandr M. Lekhno; Boris J. Barykin, both of Simferopol; Vitaly L. Altunin; Valentin V. Pekarsky, both of Yalta, and Georgy K. Meleshko, Evpatoria, all of U.S.S.R., assignors to Golovnoi Nauchno-Issledovatelsky i Proektny Institut "KrymNIIproekt" Simferopolsky Filtal Dnepropetrovskogo Inzhenernostroitelnogo Instituta, Simferopol, U.S.S.R.
PCT No. PCT/SU86/00068, § 371 Date Mar. 4, 1987, § 102(e) Date Mar. 4, 1987, PCT Pub. No. WO87/00229, PCT Pub. Date Jan. 15, 1987
PCT Filed Jul. 4, 1986, Ser. No. 51,461
Int. Cl.[4] F02D *27/02*
U.S. Cl. 52—169.4 **8 Claims**



1. A building or structure erected on a surface of at least one slope, comprising:
a foundation having a base extending along the surface of the at least one slope;
a frame of vertical components and horizontal components connected to said foundation;
means provided on said foundation receiving slanting components of external loads on the frame and the foundation directed along the at least one slope, wherein the foundation is a reinforced concrete grate made up of longitudinal strips and cross strips arranged on opposite slopes of a ravine, and wherein the means receiving the slanting components of the external loads on the frame and the foundation receives the slanting components of the external load directed along each slope and forms a connection between lower ends of said cross strips.

4,899,503
DUAL-PANE THERMAL WINDOW WITH LIQUID CRYSTAL SHADE
Ray H. Baughman, Morris Plains; Ernest D. Buff, Far Hills; Helmut Eckhardt, Madison, and Gerhard H. Fuchs, Far Hills, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Division of Ser. No. 350,808, May 12, 1989, which is a division of Ser. No. 66,299, Jun. 25, 1987, Pat. No. 4,848,875. This application Aug. 25, 1989, Ser. No. 398,599
Int. Cl.[4] E04C *2/54;* **G02F** *1/133*
U.S. Cl. 52—171 **6 Claims**

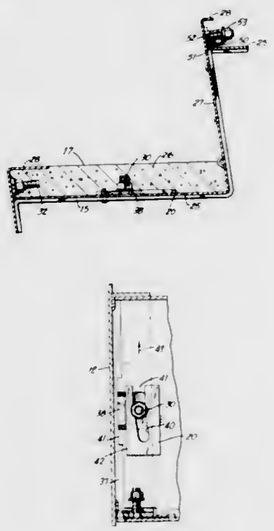


1. A thermal-pane window with an electro-optical shade for use in a window space of a building structure, comprising:
(a) window frame means for securing the mutual orientation of a plurality of transparent, substantially parallel, sequentially spaced panes and for sealingly isolating a space therebetween;
(b) a first transparent pane mounted in said window frame means in a position toward an exterior facing side of said frame means;
(c) a second transparent pane, substantially parallel to and spaced from said first pane, mounted in said frame means in a position toward an interior facing side of said frame means;
(d) a liquid crystal cell comprising a first wall composed of transparent, electrically conductive film, a second wall composed of transparent, electrically conductive film and a liquid crystal material disposed between opposing faces of said first and second walls, said liquid crystal material being electro-optically responsive and said first and second walls having sufficient supporting strength to maintain the integrity of said cells;
(e) said first wall of said cell being affixed to a fractional portion of one of the opposing faces of said first and second panes, said other of said opposing faces having affixed thereto one wall of a second liquid crystal cell and said second wall of said cell delimiting with the other opposing face of said first and second panes a space providing a thermal break; and
(f) electrical means for applying an electric field between said conductive films and through said liquid crystal material of a selected field strength at least sufficient to change the optical transmission of said liquid crystal material.

4,899,504
BOLTED STEEL STAIRCASE
Richard S. Hirschhorn, Sterling Rd., Harrison, N.Y. 10528
Filed Apr. 28, 1989, Ser. No. 345,192
Int. Cl.[4] E04F *11/00*
U.S. Cl. 52—182 **7 Claims**

1. A bolted metal staircase including a pair of spaced apart and parallel side stringers, a plurality of horizontally aligned carrier brackets fastened to each stringer, and a plurality of stair pans, each of said stair pans having a horizontally aligned pan portion; characterized in that:
a pair of upwardly protruding lance means are formed on said pan portions, each lance means being near an outer edge of said pan portion and proximate said stringers;
a vertically aligned bolt having a shank portion is positioned on said bracket;

a flat plate wedge having a side face and a slit angled relative to said side face is positioned on said pan portion with said bolt shank portion within said slit and with said wedge



side face in contact with said lance means to cam said pan portion toward said stringer as said wedge is driven parallel to said outer edge of the pan portion.

4,899,505

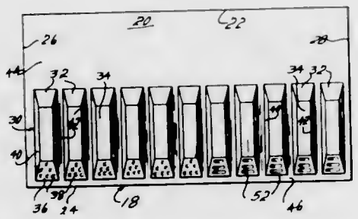
ROOF VENTILATOR

Jerry Williamson, Canby, Oreg., and Keith Muters, 2831 N. Willis Rd., Portland, Oreg. 97217, assignors to Keith Muters, Rohnert Part, Calif.

Filed Sep. 13, 1982, Ser. No. 417,368

Int. Cl.[4] E04B *7/00*

U.S. Cl. 52—199 **9 Claims**



1. A ventilator for use on a sloping roof of a building and for being integral with said building and comprising:

a. a base;

b. said base rising into an elevated louver identified as a first elevated louver;

c. said first elevated louver having a first end;

d. said first elevated louver having a lower part;

e. said first end being on the lower part of said first elevated louver;

f. said first end having a first upper edge;

g. said first end having a second lower edge;

h. said first end of said first elevated louver being a wall;

i. a plurality of apertures in said first end to allow a fluid to flow into and out of said ventilator;

j. said first elevated louver being exposed;

k. said first elevated louver having a second end;

l. said first elevated louver having an upper part;

m. said second end being on the upper part of said first elevated louver;

n. a flat top connecting said first end and said second end;

o. said second end being a wall and connecting said flat top and said base;

p. spaced apart sides connecting with said flat top, said first end and said second end, and with said base;

q. said base rising into an elevated louver identified as a second elevated louver;

r. said second elevated louver having an end identified as third end;

s. said base having a first edge;

t. said first end being near said first edge;

u. said base having a second edge;

v. said third end being near said second edge;

w. an aperture in said third end of said second elevated louver to allow fluid to flow into and out of said ventilator;

x. said base having a first flap between said first elevated louver and said first edge;

y. said base having a second flap between said second elevated louver and a second edge; and,

z. said base having a third flap between said first elevated louvere and said second elevated louver.

4,899,506

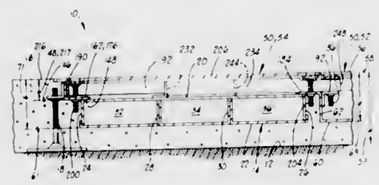
LARGE CAPACITY ELECTRICAL SERVICE FITTING FOR CONCRETE FLOORS

Donald L. Chapman, Liberty, Ind., and Robert L. Kimbrough, Oxford, Ohio, assignors to Square D Company, Palatine, Ill.

Filed Apr. 24, 1989, Ser. No. 342,940

Int. Cl.[4] E04G *5/48*

U.S. Cl. 52—221 **24 Claims**



1. A floor construction having an electrical duct system, comprising:

a base floor;

a main duct located above said base floor, said main duct having a top, a bottom and first and second transverse sides, said top being located at a first elevation above said base floor, said main duct having a plurality of cells and having an access means defined through said top of said main duct for providing access to each of said cells;

a service fitting including:

a service box located adjacent one of said transverse sides of said main duct, said service box having a box top located at a second elevation above said base floor, said second elevation being substantially higher than said first elevation; and

an auxiliary duct engaging and extending transversely across said top of said main duct, said auxiliary duct having a bottom with a wiring opening defined therein communicated with said access means, said auxiliary duct having a closed first end and an open second end, said second end being communicated with said service box so that wiring can extend from said main duct through said auxiliary duct into said service box; and

a concrete floor poured over said main duct, said concrete floor having a depth extending from said base floor up to approximately said second elevation of said box top of said service box.

4,899,507

CURVED GLAZED PANELS

Henri Mairlot, Acoz, Belgium, assignor to Glaceries De Saint-Roch S.A., Sambreville, Belgium

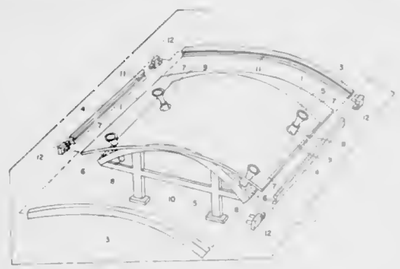
Filed Feb. 25, 1988, Ser. No. 160,318

Claims priority, application Belgium, Feb. 27, 1987, 8700186

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.[4] E04C *2/30*

U.S. Cl. 52—222 **27 Claims**



1. A curved glazed panel, comprising:

a thermally-tempered, cold-curved-sheet of glass having a resiliently-flexed curvature formed therein; and

a frame secured to the sheet of glass and maintaining the resiliently-flexed curvature of the glass under constraint.

4,899,508

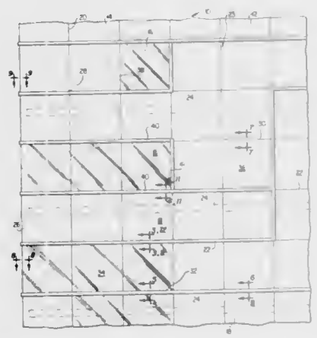
PANEL AND GLASS CURTAIN WALL SYSTEM

Lawrence Biebuyck, Garland, Tex., assignor to Butler Manufacturing Company, Kansas City, Mo.

Continuation-in-part of Ser. No. 187,551, Apr. 28, 1988, abandoned. This application Sep. 9, 1988, Ser. No. 242,461

Int. Cl.[4] E04B *2/88*

U.S. Cl. 52—235 **21 Claims**



1. A combination stone and glass curtain wall system comprising:

a structural wall section including a plurality of generally vertical steel mullions disposed one from the other in generally parallel spaced relationship;

a plurality of discrete, horizontal steel clips adapted for securement to said vertical steel mullions in generally parallel spaced relationship one to the other and in generally orthogonal relationship relative to said vertical steel mullions;

means for securing said descrete horizontal steel clips to said vertical steel mullions;

means associated with said discrete horizontal steel clips for securing said stone thereto;

a plurality of horizontal aluminum mullions adapted for securement to said vertical steel mullions in generally parallel spaced relationship one the other and in generally orthogonal relationship to said vertical steel mullions;

means for mounting said horizontal aluminum mullions to said vertical steel mullions;

said horizontal aluminum mullions being disposed adjacent to said discret horizonatal steel clips in generally parallel spaced relationship thereto for the securement of glass in direct association with stone supported thereby; and

means for sealably securing said stone and said glass adjacent to one another in said curtain wall.

4,899,509

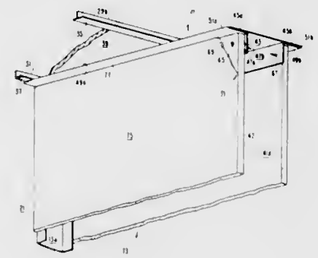
HEAD TRACK SYSTEM AND METHOD

Richard S. Power, Indianapolis, Ind., assignor to Interior Creators, Inc., Indianapolis, Ind.

Filed May 21, 1987, Ser. No. 53,159

Int. Cl.[4] E04H *5/00*

U.S. Cl. 52—238.1 **5 Claims**



1. A partition system, comprising:

(a) a suspended ceiling having a grid of bars supporting a plurality of ceiling tiles, said bars each having a flat bottom surface;

(b) a partition framework including a plurality of spaced, upright studs;

(c) a parallel pair of upright wall panels secured to opposite sides of said partition framework, said wall panels each having a thickness and an upper edge;

(d) a one-piece construction head track interconnecting said grid, said partition framework and said wall panels, said head track being secured to said ceiling grid and having:

an elongated, horizontal web;

a pair of laterally opposed, elongated, coplanar, horizontal flanges extending from said web over said upper edges of said wall panels, said horizontal flanges each having a flat upper surface in contact with the flat bottom surfaces of said plurality of bars and further having an exposed flat bottom surface outward of said wall panels; and

a pair of laterally opposed, elongated, vertical flanges extending downward from said web between said wall panels and said partition framework,

wherein said web, said horizontal flanges, and said vertical flanges are integral; and

(e) an exterior coating of finishing compound between said upper edges of said wall panels and said horizontal flanges;

wherein said web, said pair of laterally opposed horizontal flanges and said pair of laterally opposed vertical flanges of said head track are a unitary material; and

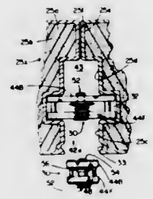
wherein said web, said pair of laterally opposed horizontal flanges and said pair of laterally opposed vertical flanges of said head track are formed from a longitudinal sheet material having not more than four longitudinal folds.

4,899,510

BUILDING ENCLOSURE SYSTEM AND METHOD

Robert L. Propst, 18845 NE. 49th Pl., Redmond, Wash. 98052

Filed Jun. 17, 1988, Ser. No. 208,896
Int. Cl.[4] E04C *1/10*; F04H *1/00*
U.S. Cl. 52—238.1 **15 Claims**



1. In a wall structure:

a pair of coplanar panels having opposed longitudinal meeting edges presenting opposed longitudinal recesses, each having opposed longitudinal recess faces, said panels collectively providing a longitudinal accessway giving external access to said longitudinal recesses along substantially the length thereof when said meeting edges are in engagement; and

clamping means gripping said recess faces by a spreading action, said clamping means having a clamping mode and a released mode, said clamping means being adapted when in its released mode to pass in its entirety through said accessway to a position between said recesses and to be then turned into a position occupying said opposed recesses and activated to its clamping mode gripping said recess faces by operation of a tool passing through said accessway.

4,899,511

POST CONSTRUCTION KIT

Erland Andersson, Gustavsberg, and Tage Sköavall, Hökerum, both of Sweden, assignors to Gustavsberg VVS Aktiebolag, Gustavsberg, Sweden

Filed Mar. 29, 1988, Ser. No. 174,766
Claims priority, application Sweden, Mar. 30, 1987, 8701331
Int. Cl.[4] E04H *12/08*
U.S. Cl. 52—292 **17 Claims**

1. A post implanted in a base terrain, said post comprising:

at least a first post section implanted in the base terrain;

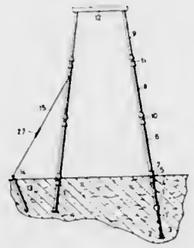
said at least first post section having at least one substantially cylindrical hollow tubular post portion; said at least first post section having interconnection means, said interconnection means comprising socket member means;

said at least first post section comprising centrifugally cast ductile iron;

said socket member means being disposed on the uppermost portion of said at least one substantially cylindrical hollow tubular post portion;

said socket member means having an outwardly tapered surface, said outwardly tapered surface being greater in diameter at an upper portion of the socket means than at a lower portion of the socket means, said outwardly tapered surface having at least one diameter being substantially greater than the diameter of the at least one substantially cylindrical hollow tubular post portion;

at least a second post section, said at least one of said second post section having a tapered protrusion at an end thereof for interconnection with said socket member means of



said at least one first post section, said tapered protrusion comprising a portion of said interconnecting means;

said socket member means of said at least one substantially cylindrical hollow tubular post portion having an internal conical portion being disposed for receiving and holding said tapered protrusion of said at least a second post section from above; and

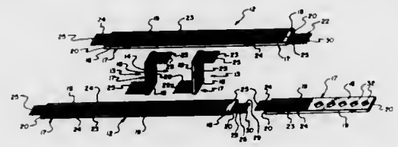
said interconnecting means interconnecting said at least one first post section and said at least one second post section.

4,899,512

SPACER AND FABRIC MESH REINFORCEMENT MEMBER FOR GLASS BLOCK MASONRY INSTALLATION

Lonnie C. DeGooyer, 349 E. 5600 South, Murray, Utah 84107

Filed Feb. 10, 1988, Ser. No. 154,238
Int. Cl.[4] E04B *1/62*
U.S. Cl. 52—396 **10 Claims**



1. A spacer and fabric mesh reinforcement member for masonry installation of glass blocks, comprising

an elongate slab of a resilient, compressible material having substantially flat upper and lower surfaces, lateral side edges, first and second end edges and a desired thickness sufficient for the slab to act as a spacer between glass blocks;

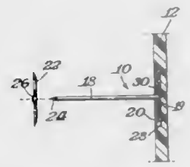
an elongate piece of fabric mesh having first and second, lateral sides and opposite, first and second ends, with the width of said piece of mesh being no greater than the dimension between the lateral side edges of said slab, said piece of mesh being adhered to said slab so as to lie flat against one of said surfaces of said slab and extend longitudinally along said one of said surfaces, said piece of mesh further having a longitudinal length which is significantly greater than the longitudinal distance between the end edges of said slab, with the first end of said piece of mesh being positioned closer to said first end edge of said slab than to said second end edge of said slab, and with the second end of said piece of mesh extending from said second end edge of said slab.

4,899,513

ANCHOR FOR SIMULATED MARBLE PANELS

Phillip L. Morris, 15 Ridgewood Dr., Hockessin, Del. 19707

Filed Jan. 25, 1989, Ser. No. 301,393
Int. Cl.[4] E04B *1/41*; E04C *2/02*
U.S. Cl. 52—511 **10 Claims**



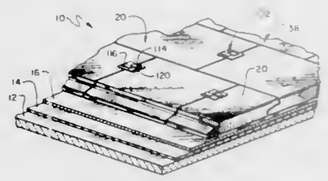
1. In combination therewith, a simulated marble panel including a pattern of recesses, a structural substrate, a plurality of anchoring systems securing said panel to said substrate, each of said anchoring systems comprising an elongated pin having a remote end and a base end opposite therefrom, an anchor plate secured to said base end, said anchor plate being disposed against said panel, one of said anchor plates being in each of said recesses, on the side of said substrate opposite to said anchor plate, a retainer plate mounted on said pin and disposed against said substrate on said side of said substrate opposite said anchor plate to mount said anchoring system to said substrate, a bonding agent disposed over said anchor plate filling said perforations of said anchor plate and completely covering said anchor plate and filling each of said recesses, and said bonding agent being of similar composition to the material of said simulated marble panel to form a monolithic integral bond between said bonding agent and said simulated marble panel with said anchor plate completely embedded therebetween.

4,899,514

BALLAST BLOCK FOR ROOFING STRUCTURES

George C. Brookhart, Jr., 1557 W. Briarwood Ave., Littleton, Colo. 80120

Filed Nov. 13, 1985, Ser. No. 797,458
Int. Cl.[4] E04D *1/16*
U.S. Cl. 52—553 **77 Claims**



16. A ballast block assembly comprising:

a plurality of ballast blocks, each said block adapted to rest upon a supporting surface without being attached to the supporting surface, each said block being in the form of a planar plate member having top and bottom surfaces, front and rear end portions aligned substantially orthogonally to a first plate axis, and oppositely disposed lateral side portions aligned substantially orthogonally to a second plate axis, said axes lying within the plane of said plate member, said bottom surface including a plurality of pad members upon which said ballast block is adapted to rest and engage the supporting surface to permit the flow of liquid beneath said bottom surface;

each said end portion including means for linking adjacently aligned blocks to prevent substantial uplift and rotational displacement of said blocks when the front and rear end portions of each block are interconnected in overlapping relationship with corresponding front and rear end portions of adjacent blocks;

said plurality of blocks being aligned to abut the lateral side portions of aligned blocks and to interlink in overlapping relationship the front and rear end portions of adjacent blocks; and

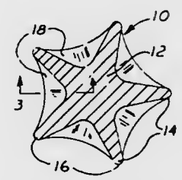
means for clamping the abutting lateral side portions of at least a portion of said aligned blocks.

4,899,515

CONCRETE REINFORCING BAR SUPPORT

Frank R. Potucek, Palmetto, Fla., assignor to American Rebar, Inc., Midway, Ga.

Continuation-in-part of Ser. No. 45,097, May 1, 1987, Pat. No. 4,791,772. This application May 12, 1988, Ser. No. 193,424
The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.
Int. Cl.[4] E04C *5/03*
U.S. Cl. 52—738 **22 Claims**



1. An elongate concrete reinforcing bar or rebar having a transverse cross section in the form of a five pointed star and wherein five fins extend radially from a central core of said rebar at equidistantly and circumferentially spaced intervals to define a common fin-included angle between each contiguous pair of fins, wherein a diameter of an imaginary circle coincident with the radially outermost edges of said fins is about three times greater than a diameter of said central core, wherein an elongate cup-shaped bight is formed along the extent of said rebar where contiguous fins join said central core, and wherein a plurality of longitudinally extending raised surface areas having concave bights are formed along the extent of said elongate cup-shaped bight.

4,899,516

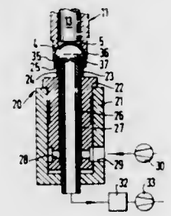
SEALING DEVICE FOR TWO-PIECE CAPSULES

Eberhard Krieger, Weinstadt, and Theo Moser, Steinenberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 254,624
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3735260
Int. Cl.[4] B65B *7/28, 1/00*
U.S. Cl. 53—306 **2 Claims**

1. A sealing device for applying a proper amount of sealant onto a cap of a two-piece capsule comprising a capsule body (**1**) and an attachable cap (**4**), said sealing device comprises at least one capsule-body carrier (**41**) and at least one cap holder (**11**), each of which are movable relative to one another for assembly of the cap onto the capsule body, said device including a nozzle element (**22**) for insertion into said cap which is held by said cap holder, a tube (**26**) in said nozzle that forms a co-axial annular channel (**27**) through which viscose sealing material is applied to an inside surface of the cap, said nozzle

element (22) includes apertures (25) which extend to said annular channel (27) at an angle relative to radial lines of said nozzle element (22), and a vacuum mechanism connected to said tube



(26), said tube (26) includes top (36) which forms an annular channel between an end of said nozzle element (22) and said top through which said vacuum mechanism evacuates excessively applied sealing material from said cap through said tube.

4,899,517

STORAGE, TRANSPORATION METHOD, PACKAGING MATERIAL, AND PACKAGE FOR AGRICULTURAL PRODUCTS

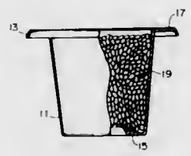
Yoshisuke Shima, Tokyo; Kunihiro Shibazaki, Shiki; Yoshiyuki Kouishi, Nagoya; Toshiro Ryuno, Nagoya; Mitsunobu Fujita, Nagoya, and Hisaji Yoshida, Ohmota, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc.; Kyokujitsu Co., Ltd. and Koike Chemical Co., Ltd., all of Tokyo, Japan

Filed Oct. 7, 1987, Ser. No. 105,722

Claims priority, applicatioo Japan, Oct. 13, 1986, 61-156560[U]; Nov. 27, 1986, 61-283990[U]; Nov. 27, 1986, 61-183223; Jun. 24, 1987, 62-096883[U]; Jul. 21, 1987, 62-181547

Int. Cl.⁴ B65B *31/00*

U.S. Cl. 53—432 **17 Claims**



1. A storage and transportation method for agricultural products comprising the steps of:

filling agricultural products into a package having shape retention capability made of a gas-barrier plastic material, together with an inert gas,

tightly sealing said package, and

storing and transporting said tightly sealed package in a tightly sealed state,

wherein said package has a smaller part of its walls made of a film portion which is thinner than the remaining larger portion of its walls, said film portion capable of being drawn towards the inside of said package when the inner pressure of said package is decreased as said inert gas is adsorbed by said agricultural products, wherein said plastic material is a high nitrile resin comprising a copolymer of (i) an unsaturated nitrile component in an amount of 50 wt.% or more, and (ii) a monomer component which is capable of being copolymerized with said unsaturated nitrile component.

4,899,518

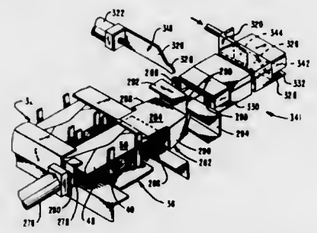
ENVELOPE PACKING APPARATUS

John A. Beeman, Dayton, Ohio; James L. Leep, Martin, Mich.; Wayne S. Marvin, Kalamazoo, Mich.; Troy F. Smith, Kalamazoo, Mich., and Floyd R. Solt, Garland, Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 16, 1987, Ser. No. 3,985

Int. Cl.⁴ B65B *13/20*

U.S. Cl. 53—439 **8 Claims**



1. An apparatus for packing stacks of sheet-like articles into an end of a set-up carton comprising:

means for placing a plurality of flexible sheet-like articles upon each other to form a stack;

conveyor means for transporting a stack of sheet-like articles such that an end of said stack is in registry with an open end of a set-up carton;

means for displacing said stack in a sideward direction from said conveyor means through said open end into an interior of said carton; and

gate means for guiding said stack into said carton, said gate means including a pair of gate members mounted to pivot about parallel axes offset from a sideward path of said stack,

said gate members each including a U-shaped, sidewardly-opening channel having fixed top, bottom, and side walls oriented relative to each other to converge such that said stack is compressed in height by said top, bottom and side walls as it passes there through:

said gate means including means independent of said articles for pivoting both of said gate members to an open, packing position such that said gate members extend into said carton interior, and to a closed transfer position such that said gate members are pivoted out of said carton interior, thereby permitting said carton to be transported in a direction substantially perpendicular to said sideward direction.

4,899,519

FLUID INJECTION SYSTEM CASSETTE AND FLUID PACKAGING METHODS

Harold R. Williams, Capistrano Beach, and Robert M. Spencer, San Juan Capistrano, both of Calif., assignors to Surgikos, Inc., Arlington, Tex.

Division of Ser. No. 52,460, May 20, 1987, Pat. No. 4,817,800. This application Dec. 8, 1988, Ser. No. 282,099

Int. Cl.⁴ B65B *9/04, 61/18*

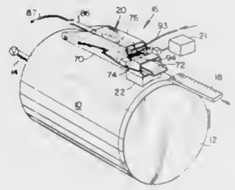
U.S. Cl. 53—449 **4 Claims**

1. A method of packaging fluid to be dispensed, comprising the steps of:

forming a closed cell with a known quantity of fluid sealed therein, with said cell having a movable wall;

sealing said cell in a cassette having a compartment formed therein for enclosing said cell, and forming thereby a pressure cavity and a delivery cavity;

forming a hole in the wall of said delivery cavity through which fluid from said cell may be dispensed; and



forming an aperture in a wall of said pressure cavity through which pressure may be applied to said movable wall to force fluid out of said cell.

4,899,520

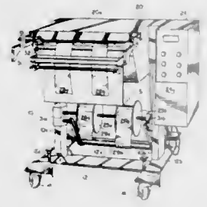
PACKAGING APPARATUS AND METHOD

Bernard Lerner, Peninsula; John Gereby, Rocky River, and Rick Wehrmann, Hudson, all of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio

Filed Mar. 29, 1988, Ser. No. 174,824

Int. Cl.⁴ B65B *43/06, 43/36*

U.S. Cl. 53—459 **23 Claims**



1. A packaging apparatus, comprising:

(a) structure establishing a path of travel for at least two independent packaging webs, each web comprising at least one longitudinal chain of interconnected, bag-like containers, contiguous containers being interconnected with each other along a transverse line of weakness;

(b) an advancing means including a nip roll assembly associated with each of said webs and a drive means for selectively actuating said nip roll assemblies to selectively advance said webs; and,

(c) each of said nip roll assemblies including a feed roller and a pinch roller, said feed rollers being axially aligned;

(d) a heat sealing unit including a heating element and a sealer bar having a first bag engaging surface;

(e) a pressure bar including a second bag engaging surface, reciprocally mounted for movement towards and away from said sealer bar, said pressure bar operative to exert a clamping force to sidewalls of a bag held between said sealer bar and said pressure bar;

(f) biasing means resiliently biasing one of said bag engaging surfaces towards an extended position;

(g) monitoring means for monitoring said extended position of said resiliently biased bag engaging surface and a position of said pressure bar, said monitoring means operative to cause said pressure bar to retract to a spaced positioned upon sensing movement in said resiliently biased surface before said pressure bar has moved to a predetermined position with respect to said heat sealing unit.

4,899,521

ANTISTATIC THERMOPLASTIC/POLYAMIDE-POLYETHER COMPOSITIONS AND ANTISTATIC POLYMERIC FILMS MADE THEREFROM

Marvin R. Havens, Greer, S.C., assignor to W. R. Grace & Co. - Conn., Duncan, S.C.

Continuation-in-part of Ser. No. 918,451, Oct. 14, 1986. This application Sep. 28, 1987, Ser. No. 101,909

Int. Cl.⁴ C08K *5/43;* **C08L** *77/10*

U.S. Cl. 53—461 **28 Claims**

17. A method for protecting packaged static sensitive devices from electrostatic charges comprising:

(a) providing a package comprising an antistatic film having at least one layer comprising a blend of a polyether block amide copolymer in admixture with an aromatic sulfonamide antistatic agent, wherein said aromatic sulfonamide is substantially non-hygroscopic and substantially non-migratable; and

(b) enclosing said film about a selected device.

4,899,522

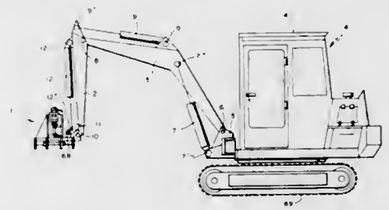
HYDRAULIC POWERED ARM OF BALANCE CUTTER DEVICE

Serge Munger, 1141, Blvd. Auger East, Alma, Quebec, Canada (G8B 5V2)

Filed Nov. 21, 1988, Ser. No. 274,276

Int. Cl.⁴ A01D *25/08*

U.S. Cl. 56—10.4 **11 Claims**



1. A device for cutting brushwood including bushes, shrubs and the like, comprising:

a protective frame structure;

a massive, circular flywheel disk having a geometrical axis and an annular, outer edge surface, which flywheel disk is mounted rotative about its geometrical axis on said frame structure;

rotative driving means, also mounted on said frame structure, for rotating the flywheel disk at high speed about its geometrical axis;

a first blade attached to the said flywheel disk through a first pivot peripherally mounted on the circular disk, and a second blade also attached to the said disk through a second pivot also peripherally mounted on the massive disk, said first and second pivots being diametrically opposed with respect to each other;

the frame structure including a front, transversal frame member, and a rear, transversal frame member, the said flywheel disk and said first and second blades rotating between said front and rear frame members, and at least one intermediate transversal frame member interposed between said front and rear frame members and defining an elongated aperture in which the said disk and said first and second blades rotate; and

whereby, in operation, (a) rotation at high speed of the flywheel disk produces a centrifugal force on the first and second blades to protrude said blades outwardly beyond the annular, outer edge surface of the circular disk, (b) the frame structure is so moved that the protruding blades hit the brushwood to cut the same, (c) the first and second

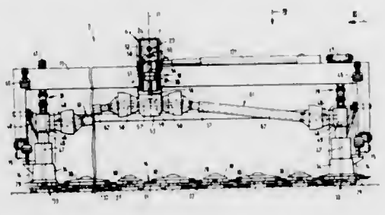
blades pivot on their respective first and second pivots to prevent damage to said blades when hitting larger bushes and shrubs, bush and shrub stumps, and other obstacles, (d) the flywheel nature of the circular disk helps said disk to maintain its rotational speed constant to allow said blades to efficiently cut the brushwood, and (e) as the flywheel disk is massive and circular, obstruction in the rotational movement of the said disk caused by bushes, shrubs, bush and shrub stumps, and other obstacles contacting the disk is greatly reduced and possible only by friction whereby damage to the flywheel disk caused by obstruction is prevented.

4,899,523

MOWER

Johny Frumholtz, Saverne, and Roland Helfer, Lampertheim, both of France, assignors to Kuhn s.a., Saverne Cedex, France

Filed Jun. 27, 1988, Ser. No. 212,326
Claims priority, application France, Jun. 26, 1987, 87 09182
Int. Cl.[4] A01D *34/66*
U.S. Cl. 56—155 **33 Claims**



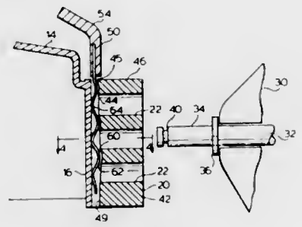
1. A mower comprising:
(a) a frame;
(b) a plurality of wheels connected in an articulated manner to said frame by wheel arms so as to be able to be moved in relation to said frame to move said frame away from or closer to the ground;
(c) a tongue which, in use, makes it possible to hitch said mower to a tractor vehicle, said tongue being connected to said frame by a joint with an axis directed upwardly;
(d) a cutting device connected in an articulated manner to said frame, said cutting device comprising two groups of mowing elements and each one of said two groups of mowing elements comprising drive elements; and
(e) transmission means for transmitting the movement from a driving source to said drive elements of each one of said two groups of mowing elements, said transmission means comprising:
(i) an input means located at least approximately in the middle of said frame seen crosswise to the direction of work and
(ii) movement distribution means for distributing the movement of said input means to said drive elements, wherein:
(f) said two groups of mowing elements are connected rigidly to one another;
(g) said cutting device is connected to said frame by a deformable quadrilateral device;
(h) said drive elements of each one of said two groups of mowing elements comprises a transmission member that extends over the one of said mowing elements located on the outside end of the corresponding group of mowing elements; and
(i) said movement distribution means of each one of said two groups of mowing elements comprises a distribution shaft with universal joints, said distribution shaft conducting the movement to said transmission member of said corresponding group of mowing elements.

4,899,524

HEIGHT ADJUSTER FOR LAWN MOWERS

Frank A. Eilles, 46 Autumn Drive, Caledon Hills, Ontario, Canada (L0N 1C0)

Filed Dec. 2, 1988, Ser. No. 279,164
Int. Cl.[4] A01D *34/74*
U.S. Cl. 56—17.2 **6 Claims**



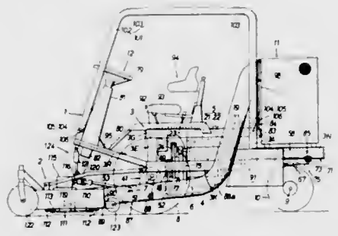
1. In a lawnmower including:
a housing;
wheels and wheel axles for supporting said housing from a ground surface;
said housing having a series of vertically spaced apart bores therein associated with each said wheel for selectively engaging a wheel axle therein for varying the clearance of the housing from the ground surface, each said axle having adjacent the proximal end thereof a peripheral groove, the improvement wherein said lawnmower comprises:
guide means on said housing associated with each series of bores, said guide means comprising a slotted passageway, each said bore of an associated series of bores being completely intersected by said passageway, and
blade means having a plurality of transversely aligned corrugations therealong slidable along each said slotted passageway, said blade means having an elongated opening to engage said peripheral groove therein to secure a said axle in a selected bore, with corrugated portions of said blade means in interfering relationship with said guide means along the length thereof.

4,899,525

CLIPPING COLLECTOR EQUIPPED WITH FRONT MOWER

Terutaka Takei; Shigeru Morita, and Hiroaki Kawakita, all of Osaka, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 7, 1988, Ser. No. 178,974
Claims priority, application Japan, Apr. 9, 1987, 62-87680; Apr. 9, 1987, 62-87682
Int. Cl.[4] A01D *34/70*
U.S. Cl. 56—202 **11 Claims**



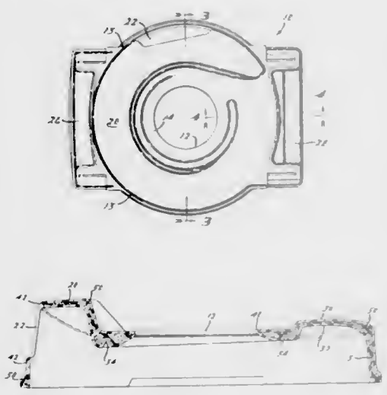
1. A clipping collector equipped with a front mower and comprising a frame having an engine and a speed change unit mounted thereon to provide a vehicle body, a pair of opposed front wheels supported by a front axle at the front portion of the vehicle body, the mower being positioned to the front of the front wheels and attached to the vehicle body by a mount assembly, at least one rear wheel supported by a rear axle at the rear portion of the vehicle body, a clipping container disposed above the rear wheel, the mower having at least one cutter operable by the power transmitted from the engine, the mower having a clipping outlet at a widthwise intermediate portion of its rear side, and clipping transfer means having a duct extending from the clipping outlet to the clipping container, the duct extending from the clipping outlet generally horizontally rearward under the front axle, and being bent upward at a lengthwise intermediate portion thereof and connected to the clipping container, and the engine and the speed change unit are arranged adjacent to each other widthwise of the frame between the front and rear axles.

4,899,526

MOWER DECK CONSTRUCTION AND METHOD FOR MAKING SAME

Jack E. Harris, Savannah, Ga., assignor to Savannah Plastics, Inc., Savannah, Ga.

Filed Aug. 8, 1988, Ser. No. 229,845
Int. Cl.[4] A01D *67/00*
U.S. Cl. 56—320.2 **8 Claims**



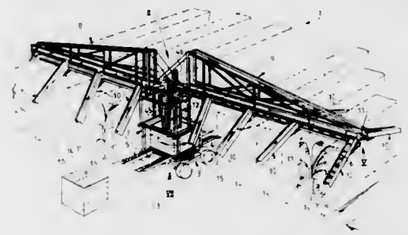
1. A deck for use in a rotary lawnmower comprising:
first and second walls of a polymeric material blow molded together to form the top and bottom respectively of said deck, portions of said walls spaced apart from each other to form a cavity between said layers;
a foam material filling said cavity; and
said deck having an annular mounting surface on the top of said deck for supporting motor means, said mounting surface defining an opening for the output shaft of said motor means to extend through to the bottom of said deck.
8. A mower deck for use in a rotary lawn mower comprising:
an integrally formed one piece housing, said housing including
a first wall having a contour to define a first surface of said mower deck;
a second wall having a contour to define a second surface of mower deck, said second surface facing a direction opposite that of said first surface and portions of said second wall being spaced from said first wall to define a cavity therebetween; and
means integrally formed on at least one of said first and second walls for enabling supporting wheels, power means and handle means to be secured thereto externally of said cavity.

4,899,527

HARVESTING MACHINE

P. J. M. van den Munckhof, Lindweg 1, and M. R. M. J. van den Munckhof, Westerholtstraat 51, both of Horst, Netherlands

Filed Dec. 22, 1987, Ser. No. 136,563
Claims priority, application Netherlands, Dec. 23, 1986, 8603284
Int. Cl.[4] A01D *46/00*
U.S. Cl. 56—328.1 **16 Claims**



1. In a harvesting machine, the combination of a wheeled vehicle adapted to be progressed along a passageway between rows of fruit-bearing crop, the vehicle including a carriage receiving container means for harvested fruit and superstructure defining a vertical passage leading upwardly from the carriage, a boom connected to the superstructure and extending transversely therefrom so that the machine tends to be tipped over due to the weight of the boom, means for counteracting the tendency of the machine to be tipped over by the boom, generally horizontal conveyer means supported on the boom and having a discharge end above the superstructure for discharging harvested fruit into the confines of the vertical passage, holder conveyor means for receiving harvested fruit from the discharge end of the generally horizontal conveyer means and including a vertically disposed conveyer belt for conveying such harvested fruit gently in row-like fashion downwardly through the vertical passage into the container means, and adjusting means for vertically moving the holder conveyer means within the vertical passage along a path closely adjacent the discharge end of the generally horizontal conveyer means in response to accumulation of harvested fruit within the container means, and means for continuously operating said conveyor belt in a downward direction while the holder conveyer means is moved vertically by the adjusting means.

4,899,528

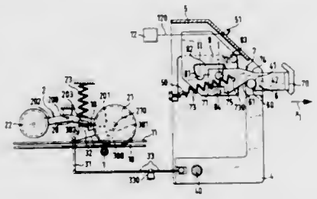
CONTROL DEVICE TO DRIVE AND STOP AN OPEN-END SPINNING ELEMENT

Maximilian Fahmuller, Kelheim; Edmund Schuller, and Gottfried Schneider, both of Ingolstadt, all of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/DE88/00252, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO88/09837, PCT Pub. Date Dec. 15, 1988
PCT Filed Apr. 28, 1988, Ser. No. 290,101
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719676
Int. Cl.[4] D01H *1/26, 1/241, 7/882, 15/02*
U.S. Cl. 57—92 **30 Claims**

1. A control device for controlling the operation of an openend spinning element, comprising:
(a) a first drive means for driving said openend spinning element at a production rate of speed;

(b) a second drive means for driving said open-end spinning element at a piecing rate of speed;
(c) braking means for applying a braking force to said open-end spinning element for stopping its rotation;
(d) a pivoted control lever, one end of which is operatively connected to selectively connect said first or second drive means to drive said open-end spinning element or to apply said braking means to said element for stopping it, and the other end of which is movable between a production position whereby said open-end spinning element is connected to said first drive means, a piecing position whereby said open-end spinning element is connected to



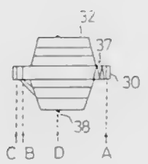
said second drive means, and a stopping position wherein said braking means is applied to stop the rotation of said open-end spinning element;
(e) a common control element adapted to selectively engage and hold said other end of said control lever in the production and piecing positions, said control element being capable of recipricatory motion between said production and said piecing positions and being movable to apply said braking means to said open-end spinning element; and
(f) means to hold said control element in either the production or piecing positions, whereby said open-end spinning element is selectively connected to said first or second drive means by said pivoted control lever.

4,899,529

METHOD FOR WINDING A COVERED YARN

Tanae Fumio, Iyo, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Dec. 12, 1988, Ser. No. 283,308
Claims priority, application Japan, Dec. 22, 1987, 62-324560
Int. Cl.[4] D01H *13/16, 15/00*
U.S. Cl. 57—261 **2 Claims**



1. A method for winding a covered yarn in a covered yarn manufacturing machine, wherein a non-elastic yarn supplied from a wrapping yarn bobbin is wrapped around a core yarn made of an elastic yarn to form a covered yarn, and said covering yarn is traversed by a traverse guide along a winding bobbin and is wound around said winding bobbin, which method further comprises:
displacing said traverse guide along said winding bobbin to a position outside a normal traversing region when said non-elastic yarn on said wrapping yarn bobbin is almost consumed;
thereafter, stopping said covered yarn manufacturing machine;
replacing said consumed wrapping yarn bobbin of non-elastic yarn by a new wrapping yarn bobbin of non-elastic yarn; and
restarting said covered yarn manufacturing machine wherein the steps of displacing, stopping, replacing and restarting are repeated with regard to one winding bobbin and, wherein a subsequent position to which said traverse guide is displaced is a position on the side of a previous starting which is away from the yarn package as said steps are repeated.

4,899,530

DOFFING AND DONNING APPARATUS

William A. Morrison, Newtonabbey, Ireland, assignor to James Mackie & Sons Limited, United Kingdom

Filed Sep. 1, 1988, Ser. No. 239,296
Claims priority, application United Kingdom, Sep. 4, 1987, 8720842
Int. Cl.[4] D01H *9/00, 9/04, 9/18*
U.S. Cl. 57—274 **17 Claims**



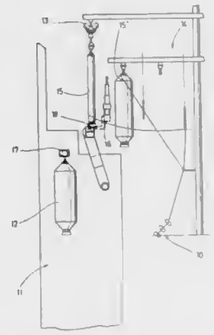
1. A yarn spinning, twisting or doubling machine comprising bobbin doffing and donning apparatus for the spindles of the machine, the apparatus comprising bobbin conveying means extending along and above a row of spindles in the same vertical plane as said spindles, a series of bobbin grippers corresponding to said row of spindles spaced at the same pitch as the spindles and disposed in the same vertical plane as said conveying means and said spindles, each gripper being mounted for vertical movement between its corresponding spindle and the conveyor, each gripper being designed to hold or grip a bobbin at a point beyond one end of a package wound on the bobbin so that the grippers can lift the wound bobbin from its spindle for engagement by means on the conveyor and then release the bobbin for subsequent removal, or grip an empty bobbin on the conveyor and move it to its respective spindle and control means operable to move the conveyor after it has received the full doffed bobbins and to bring empty bobbins into line with the spindles so that the grippers can place empty bobbins on the spindles.

4,899,531

METHOD AND APPARATUS FOR AUTOMATIC EXCHANGE OF ROVING BOBBINS OF A RING SPINNING MACHINE

Karl-Heinz Mach, Weilheim, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 254,874
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734264
Int. Cl.[4] D01H *13/00, 15/00*
U.S. Cl. 57—281 **26 Claims**



1. Method for exchanging a full roving bobbin stored on an individual bobbin support member of a spare bobbin support means for another roving bobbin on a bobbin holder of a textile machine in which roving is fed from the bobbins for processing in the textile machine, comprising:
transferring the full roving bobbin from the individual bobbin support member of the spare bobbin support means to a service unit adjacent the textile machine;
transferring the another roving bobbin from the bobbin holder to the individual bobbin support member of the spare bobbin support means while substantially continuously maintaining the feed of roving therefrom;
transferring the full roving bobbin from the service unit to the bobbin holder;
piecing the roving from the full bobbin with the roving from the other bobbin; and
severing the roving from the other bobbin from the roving from the full bobbin after piecing the roving from the full bobbin therewith.

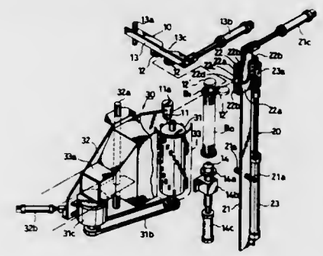
4,899,532

RESIDUAL ROVING CLEARING APPARATUS

Hiroaki Sanno, Ishikawa, Japan, assignor to Murao Boki Kabushiki Kaisha, Kanazawa, Japan

Filed Mar. 16, 1989, Ser. No. 324,468
Claims priority, application Japan, Mar. 22, 1988, 63-67969
Int. Cl.[4] D01H *11/00*
U.S. Cl. 57—304 **13 Claims**

1. A residual roving clearing apparatus for clearing a roving remaining on a roving bobbin, comprising:
a bobbin holding device for rotatably holding a roving bobbin;
a cutting device for cutting layers of coils of roving remaining on a roving bobbin by setting a blade with its cutting edge in near contact with the circumference of the roving bobbin and moving the blade in parallel to the axis of the roving bobbin; and
a rotary brush device including a rotary brush which is rotated and held in contact with the surface of the layers of coils of rovings on the roving bobbin to clear the layers



of coils of roving cut by the cutting device from the roving bobbin.

4,899,533

MOTOR MOUNT FOR FALSE TWIST TEXTURING UNIT

Gunther Schmitt, Hammelburg, and Christian Schmitt, Völkersleier, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 275,404
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743708
Int. Cl.[4] D01H *1/244, 7/92*
U.S. Cl. 57—339 **14 Claims**

3. Apparatus for false-twist texturing a filament, said apparatus comprising:
(a) a machine frame;
(b) a motor block fastened in a stationary position to said machine frame, and a stator fixed within said motor block; and
(c) a rotor located within said stator, a first shaft connected to said rotor, a rotor guide for guiding said rotor, and a texturing disc connected to said shaft, said rotor guide being supported on and separable from said motor block, said texturing disc, shaft, rotor guide, and rotor being removable from said motor block as a unit without removing said motor block from said machine frame.

4,899,534

AIR TURBINE STARTER HAVING A PANEL AND RATCHET CLUTCH

Kal K. Sorenson, Tempe, Ariz., assignor to Allied-Signal Inc., Phoenix, Ariz.

Filed Mar. 8, 1988, Ser. No. 165,664
Int. Cl.[4] F02C *7/277*
U.S. Cl. 60—39.06 **13 Claims**

7. The method of operating an air turbine starter in conjunc-

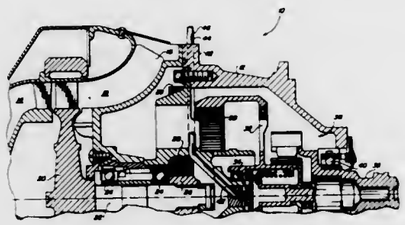
tion with a combustion turbine engine, said method comprising the steps of;

providing a pawl and ratchet clutch between said air turbine starter and a rotatable shaft of said combustion turbine engine, and thereby drivingly connecting the former to the latter for starting of said engine;

connecting a ratchet wheel of said pawl and ratchet clutch to said air turbine starter for rotation in unison therewith;

connecting a pawl hub portion of said pawl and ratchet clutch to said shaft of said combustion turbine engine for rotation in unison therewith;

configuring said pawl and ratchet clutch to include centrifugally responsive pawl members carried by said pawl hub portion and drivingly connecting the latter to said ratchet wheel, and moving out of engagement with said ratchet wheel in response to rotation of said engine shaft;



providing yieldable means biasing said pawl members into engagement with said ratchet wheel in opposition to centrifugal force to establish a pawl drop in speed of said shaft at which speed said pawl members move into engagement with said ratchet wheel during deceleration of said engine shaft;

providing an engagement blocking member in a first position preventing engagement of said pawl members with said ratchet wheel;

providing means moving said engagement blocking member to a second position only for a selected interval immediately following initiation of air turbine starter operation, in said second position said pawls being engagable with said ratchet wheel; and

scheduling the no-load acceleration rate of said air turbine starter from rest so that said pawl drop in speed is not attained by said ratchet wheel during said selected interval.

4,899,535

TURBOJET FUEL SUPPLY SYSTEM WITH FUEL RECYCLING

Gérard C. H. Dehan, Montgeron; Michel G. A. Doublier, Le Mee S, and Gérard Greiner, Champigny, all of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs d'Aviation "SNECMA", Paris, France

Filed Aug. 8, 1988, Ser. No. 229,473

Claims priority, application France, Aug. 12, 1987, 87 11453

Int. Cl.[4] F02C *7/14, 7/224*

U.S. Cl. 60—39.08 **9 Claims**

1. Fuel supply system for a turbojet aero-engine comprising:

(a) a fuel tank;

(b) a booster pump disposed in said fuel tank;

(c) a low pressure pump for receiving fuel delivered from said fuel tank by said booster pump;

(d) a high pressure pump for receiving fuel delivered by said low pressure pump;

(e) a feed flow regulator for receiving fuel delivered by said high pressure pump;

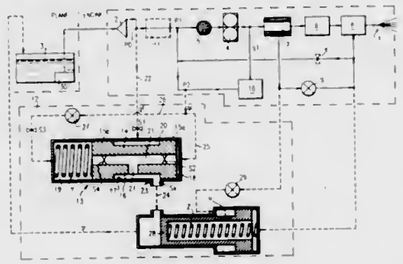
(f) a fuel injection system for receiving a regulated supply of fuel from said feed flow regulator;

(g) a first branch for diverting a diverted flow of fuel q1 from beteen said high pressure pump and said feed flow regulator and recycling said diverted flow of fuel q1 to said supply system at a point P1 between said low pressure pump and said high pressure pump, the fuel in said diverted flow of fuel q1 being hot after passage through said high pressure pump;

(h) a control valve in said first branch for controlling said diverted flow of fuel q1 so as to maintain substantially constant the difference between the fuel pressures upstream and downstream of said feed flow regulator;

(i) a second branch for tapping a tapped flow of hot fuel qc from said diverted flow of fuel q1 at a point P2 in said first branch between said control valve and said point P1;

(j) return means for returning said tapped flow of hot fuel qc to said fuel tank;



(k) a third branch for tapping a flow of cold fuel qf from a point P0 between said low pressure pump and said point P1; and

(l) a mixing device for mixing said tapped flow of hot fuel qc with said flow of cold fuel qf to form a flow qr of lukewarm fuel for return to said fuel tank by said return means,

whereby the temperature of said fuel delivered to said high pressure pump is lowered as a result of the portion of cold fuel received from said low pressure pump increasing by an amount equal to said tapped flow of hot fuel qc tapped from said diverted flow of fuel q1 recycled to said point P1 for delivery to said high pressure pump with said cold fuel from said low pressure pump.

4,899,536

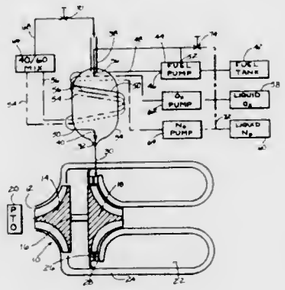
STARTING SYSTEM FOR A TURBINE ENGINE

Roy W. Vershure, Escondido, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 21, 1988, Ser. No. 222,542

Int. Cl.[4] F02C *7/27*

U.S. Cl. 60—39.142 **12 Claims**



1. A starting system for a turbine engine including a rotatable turbine wheel and a nozzle for directing hot gases against the turbine wheel to impart a rotative force thereto, said system comprising:

a combustor having a gas outlet adapted to be in fluid communication with a turbine engine nozzle, a fuel inlet and an oxidant inlet so that fuel may be oxidized within said combustor by an oxidant to provide hot gases at the outlet;

a first pressure vessel adapted to receive liquid oxygen;

a second pressure vessel adapted to receive liquid nitrogen;

means establishing a flow path between said vessels on the one hand and said oxidant inlet on the other, including a section in heat exchange relation with said combustor; and

mixing means in said flow path establishing means for mixing oxygen and nitrogen flowing therein in a desired proportion.

4,899,537

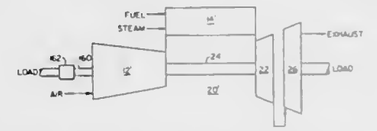
STEAM-INJECTED FREE-TURBINE-TYPE GAS TURBINE

Dah Yu Cheng, Los Altos Hills, Calif., assignor to International Power Technology, Inc., Redwood City, Calif.

Filed Feb. 7, 1984, Ser. No. 577,899

Int. Cl.[4] F02C *3/10*

U.S. Cl. 60—39.161 **4 Claims**



1. In a free turbine type gas turbine comprising:

compressor means;

a core turbine mechanically coupled with said compressor means to power it;

a power turbine which is independent from said core turbine; and

a combustion chamber for providing a heated working fluid;

means for adding steam to said working fluid;

means for providing a single flow path for said working fluid, first through said core turbine and then through said power turbine; and

wherein the improvement comprises:

means for preventing mismatch between the core turbine and the compressor due to the addition of steam comprising coupling a variable output load to the compressor.

4,899,538

HOT GAS GENERATOR

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 20, 1987, Ser. No. 123,303

Int. Cl.[4] F23R *3/00*

U.S. Cl. 60—39.465 **7 Claims**

1. A hot gas generator comprising:

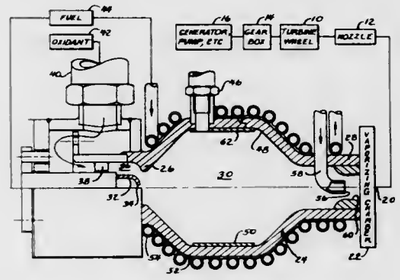
a vessel having a narrow inlet end, a narrow outlet end and an intermediate, relatively wide, combustion chamber;

means at said inlet end for introducing a carbonaceous fuel to be combusted into said combustion chamber generally axially of said vessel;

an oxidant inlet port concentric with and disposed about said fuel introducing means;

an axial fuel discharge port concentric with said narrow outlet end and downstream of said wide combustion chamber for introducing a fuel to be vaporized into said outlet and whereby such fuel is vaporized by hot gases of combustion exiting from said combustion chamber; and

a heat shield at least partially lining the interior of said combustion chamber, said heat shield protecting said vessel from excessive heat from combustion of fuel within said chamber while presenting a surface to said chamber capable of sustained operation at temperatures sufficiently high to prevent carbon build up within said vessel.



4,899,539

FLOW MIXER AND FLAME STABILIZER FOR A TURBOFAN ENGINE

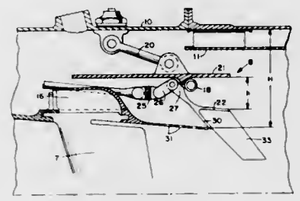
Philippe M. D. Gastebois, Vert Saint Denis; Alain G. J. Habrard, St Martin en Biere, and Jean L. Picard, Vaux le Penil, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA), Paris, France

Filed Jan. 12, 1989, Ser. No. 295,998

Claims priority, application France, Jan. 14, 1988, 88 00345

Int. Cl.[4] F02K *3/10*

U.S. Cl. 60—261 **15 Claims**



1. In a turbojet engine having an outer casing, an afterburner portion, primary afterburner fuel injectors extending substantially radially with respect to a longitudinal axis of the engine, primary flame stabilizers associated with the primary afterburner fuel injectors, the improvements comprising:

(a) an intermediate casing located within the outer casing and dividing the gas flowing through the turbojet engine into hot and cold gas flow portions such that the primary afterburner fuel injectors are operatively associated with only the hot gas flow;

(b) a secondary afterburner fuel injection manifold located at the confluence of the hot and cold gas flow portions;

(c) a secondary flame stabilizer associated with the secondary afterburner fuel injection manifold comprising a fixed leg having a portion extending downstream of the secondary afterburner fuel injection manifold and a movable leg having a portion extending downstream of the secondary afterburner fuel injection manifold; and,

(d) actuator means operatively associated with the movable leg so as to move the movable leg between a closed position wherein downstream edge portions of the movable leg and the fixed leg are in close proximity to each other, and an open position wherein downstream edge portions

of the movable leg and the fixed leg are separated a maximum distance h.

4,899,540

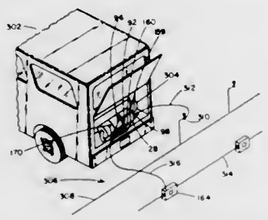
MUFFLER APPARATUS WITH FILTER TRAP AND METHOD OF USE

Wayne M. Wagner, Apple Valley, and Douglas E. Flemming, Rosemount, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 88,055, Aug. 21, 1987, Pat. No. 4,851,015. This application Oct. 15, 1987, Ser. No. 109,155

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—274 **8 Claims**



1. A method for regenerating a ceramic filter loaded with particulates from exhaust gases of a diesel engine, said ceramic filter being mounted to a housing, said method comprising the steps of:

turning on a heating element to radiate heat toward one end of said ceramic filter;

turning on an air source to blow a low flow of air passed said heating element and toward said one end of said ceramic filter;

sensing one of a temperature of said heating element, a temperature of fluid between said heating element and said ceramic filter, and a temperature of said one end of said ceramic filter and identifying a first triggering relationship when said one temperature is no less than a predetermined temperature which is less than the combustion temperature of said particulates;

turning off said air after identifying said first triggering relationship;

sensing said one temperature and identifying a second triggering relationship when said one temperature is no less than the combustion temperature of said particulates;

turning on said air source after identifying said second triggering relationship to blow a regular flow of air passed said heating element and toward said one end of said ceramic filter;

starting a timer after identifying said second triggering relationship;

turning said heating element off after identifying said second triggering relationship; and

turning said air source off after said timer has timed out.

4,899,541

AXLE DRIVING APPARATUS

Hideaki Okada, Takarazuka, and Koichiro Fujisaki, Kobe, both of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Japan

Filed Feb. 24, 1989, Ser. No. 315,306

Claims priority, application Japan, Mar. 1, 1988, 63-48344; Mar. 18, 1988, 63-36574[U]; Apr. 18, 1988, 63-51708[U]

Int. Cl.[4] F16D *39/00*

U.S. Cl. 60—464 **7 Claims**

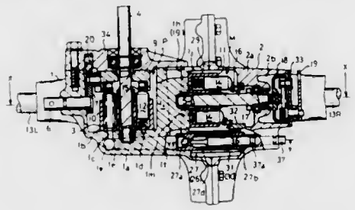
1. An axle driving apparatus characterized in that,

a right-hand axle and a left-hand axle are separately supported through bearings to a left transmission casing and a right transmission casing respectively, said transmission casings being horizontally divided,

a hydraulic pump connected to an engine and a hydraulic motor receiving oil pressure from said hydraulic pump and driven by said oil pressure to transmit a power to said axles, said hydraulic pump and motor being disposed within a casing formed by jointing said left and right transmission casings,

a pump mounting surface for said hydraulic pump is formed at the inner surface of a bottom wall of said left transmission casing and a pump shaft of said hydraulic pump is disposed perpendicularly with respect to said axles,

a motor mounting surface for said hydraulic motor is formed at the surface of a vertical wall erected in continuation of said bottom wall facing said right transmission casing and a motor shaft of said hydraulic motor is disposed in parallel to said axles,



a pair of horizontal oil passages communicating with a pair of crescent-shaped oil passages formed at said pump mounting surface are horizontally bored into said bottom wall from below said motor mounting surface of said vertical wall,

two vertical oil passages are bored in said vertical wall downwardly from the upper end face thereof so as to communicate with a pair of crescent-shaped oil passages formed at said motor mounting surface and communicate in an intersecting manner with said horizontal oil passages respectively, and

said horizontal oil passages and vertical oil passages are closed at their other ends respectively, thereby forming a closed circuit of said hydraulic pump and hydraulic motor.

4,899,542

CONTROL DEVICE FOR A CONTINUOUSLY VARIABLE TRANSMISSION FOR MOTOR VEHICLES

Takashi Iino, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

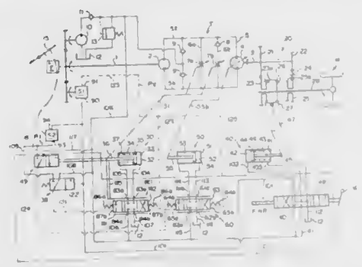
Filed Jul. 27, 1988, Ser. No. 225,002

Claims priority, application Japan, Jul. 31, 1987, 62-192346

Int. Cl.[4] F16H *47/00*

U.S. Cl. 60—487 **15 Claims**

1. A control device for a continuously variable vehicle transmission having a closed hydraulic circuit with two passages disposed between a hydraulic pump and a hydraulic motor, at least one of said hydraulic pump and said hydraulic motor being of the variable displacement type, said hydraulic pump being connected to an engine and said hydraulic motor being driven by a hydraulic pressure from said hydraulic pump for driving road wheels, the improvement comprising, bypass passage means connected between said two passages of said closed hydraulic circuit, clutch valve means disposed in said bypass passage means for adjusting the opening of said bypass passage means, and means for operating said clutch valve means, the arrangement being such that means for opening said bypass passage means when said continuously variable transmission receives driving forces from the road wheels opens the bypass passage means to a greater opening than the opening of



said bypass passage means when said continuously variable transmission is driven by the engine.

4,899,543

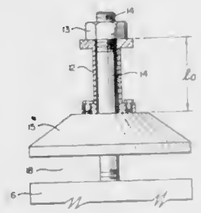
PRE-TENSIONED SHAPE MEMORY ACTUATOR

Marcello J. Romanelli, Dix Hills, and Paul J. Otterstedt, Farmingdale, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 29, 1989, Ser. No. 330,385

Int. Cl.[4] F03G *7/06*

U.S. Cl. 60—527 **16 Claims**



7. A clamping device in accordance with claim 6 wherein the alloy possesses the following properties:

Transition Temperature Range (T_z)	−200° C. to 80° C.
Service Temperature Range	−200° C. to 100° C.
Beta Mechanicals	
Yield Strength (psi × 10^3)	40
Young's Modulus (psi × 10^6)	15
Tangent Modulus (psi × 10^6)	3.0
Martensite Mechanicals	
Yield Strength (psi × 10^3)	15 to 30
Young's Modulus (psi × 10^6)	10
Tangent Modulus (psi × 10^6)	0.06
Recoverable Strain -	
One Time Device	
Tension (%)	2
Shear (%)	4
Cyclic Device	
Tension (%)	1
Shear (%)	2
Density (lb/in^3)	0.29
Electrical Resistivity (ohm - in × 10^{-6})	3
Thermal conductivity (BTU/ ft- hr-F.°)	60

4,899,544

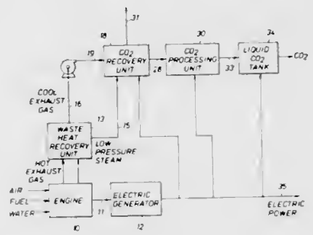
COGENERATION/CO_2 PRODUCTION PROCESS AND PLANT

Randall T. Boyd, 2639 Cooper's Post La., Sugarland, Tex. 77478

Continuation of Ser. No. 84,847, Aug. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 860,914, May 8, 1986, abandoned. This application May 19, 1989, Ser. No. 355,894

Int. Cl.[4] F01K *23/10*

U.S. Cl. 60—618 **29 Claims**



1. A method of generating electric power in a manner that qualifies as a cogeneration facility and producing carbons dioxide (CO_2) from exhaust gases, comprising the steps of: driving an electric generator with a prime mover that burns a mixture of fossil fuel and an oxygen-containing gas such as air and produces hot exhaust gases; passing said hot exhaust gases through a waste heat recovery unit to recover thermal energy; directing cooled exhaust gases coming out of said waste heat recovery unit to a CO_2 recovery unit; processing said cooled exhaust gases in said recovery unit to extract CO_2 from said exhaust gases; and using said recovered thermal energy in said processing step.

4,899,545

METHOD AND APPARATUS FOR THERMODYNAMIC CYCLE

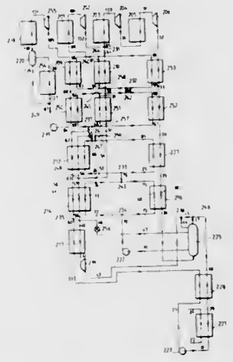
Alexander I. Kalina, 105 Glen Garry Way, Hillsborough, Calif. 94010

Filed Jan. 11, 1989, Ser. No. 295,787

The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.

Int. Cl.[4] F01K *25/06*

U.S. Cl. 60—673 **31 Claims**



1. A method for implementing a thermodynamic cycle comprising the steps of:

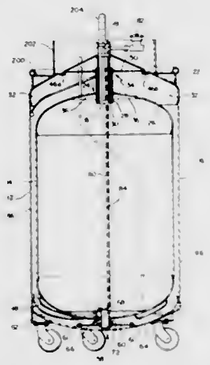
expanding a gaseous working stream to transform its energy into usable form;
removing from the expanded gaseous working stream a withdrawal stream;
combining the withdrawal stream with a lean stream, having a higher content of a higher-boiling component than is contained in the withdrawal stream, to form a composite stream;
condensing the composite stream to provide heat;
separating the composite stream to form a liquid stream, the liquid stream forming a portion of the lean stream that is combined with the withdrawal stream, and a vapor stream;
forming an oncoming liquid working stream that evaporates at a temperature lower than the temperature at which the composite stream condenses; and
evaporating the oncoming liquid working stream, using the heat produced by condensing the composite stream and heat provided by an external heat source, to form the gaseous working stream.

4,899,546

CRYOGENIC LIQUID CONTAINER

Lester K. Eigenbrod, Indianapolis, Ind., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Nov. 2, 1988, Ser. No. 265,903
Int. Cl.[4] F17C *9/02*
U.S. Cl. 62—50.2 **13 Claims**



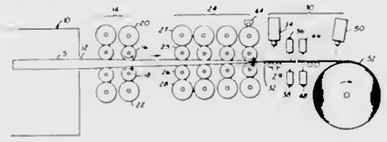
1. A container for storing liquefied gas comprising:
an inner vessel having an opening in an upper portion thereof and adapted to hold said liquefied gas in an interior portion of said inner vessel;
an outer shell having an upper head, a lower head and a sidewall extending between said upper and said lower heads;
means for suspending said inner vessel from said outer shell, said suspending means being sealed to said opening in said inner vessel, wherein an evacuable space is created between said inner vessel and said outer shell; and
means for delivering said liquefied gas in a gaseous phase, said delivering means having a vaporizing circuit comprising a portion of said outer shell, said outer shell being so constructed and arranged to have an integral heat exchanger portion, said heat exchanger portion being constructed of an expanded metal and having an exterior portion exposed to an external atmosphere, said expanded metal having a fluid flow path traversing internally therethrough, means for withdrawing liquefied gas from said inner vessel, means for introducing said liquefied gas into said fluid flow path of said integral heat exchanger portion of said outer shell, and means for removing said gas after said gas has passed through said heat exchanger portion.

4,899,547

HOT STRIP MILL COOLING SYSTEM

Richard D. Irwin, Mount Clemens, Mich., assignor to Even Flow Products, Inc., Centerline, Mich.

Filed Dec. 30, 1988, Ser. No. 292,562
Int. Cl.[4] F25D *13/06*
U.S. Cl. 62—63 **25 Claims**



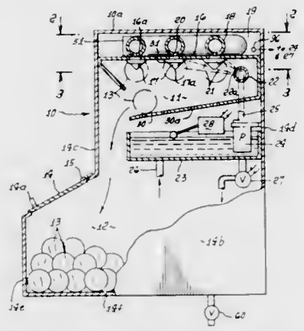
1. An apparatus for applying coolant to a segment of a longitudinally moving strip, said apparatus comprising:
an infrared sensor for measuring the temperature of a segment of the strip at a plurality of locations spaced transversely across the strip;
a coolant manifold for applying coolant to the segment of strip after the temperature is sensed from a plurality of independently controllable outlets spaced transversely across the strip; and
control means for adjusting the coolant flow rate of each of the outlets in response to the temperature measurement, selectively cooling the strip in order to establish a desired transverse temperature profile.

4,899,548

ICE FORMING APPARATUS

Berge A. Dimijian, 919 S. Highland Ave., Los Angeles, Calif. 90036, assignor to Berge A. Dimijian and Beverly Rodeo Development Corporation, both of Los Angeles, Calif., a part interest

Filed Feb. 17, 1989, Ser. No. 311,765
Int. Cl.[4] F25C *1/12*
U.S. Cl. 62—138 **10 Claims**



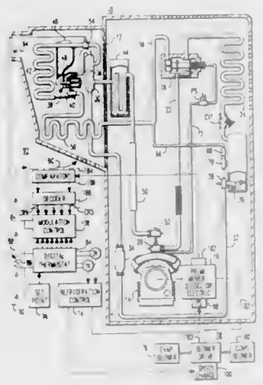
9. In ice making apparatus, the combination comprising
(a) a plate forming a plurality of through openings, the plate having an under surface facing downwardly,
(b) a plurality of thermal tips projecting downwardly from said openings, said tips consisting of heat conductive metal,
(c) there being downwardly extending thermal isolator surfaces surrounding the tips proximate the plate,
(d) first means for supplying refrigerant fluid to extract heat from at least some of the tips and thereby cool them to ice forming temperature,
(e) and second means to spray water onto said under surface of the plate to drain down said isolator surfaces onto the tips, whereby ice progressively forms on the tips below the plate, and the tips may be heated to effect release of the ice from the tips to drop downwardly, for harvesting, said second means comprising a spray head located beneath said plate, and angled to direct the spray laterally and upwardly to impinge upon plate extents between the tips,
(f) said second means including a water reservoir from which water is supplied to the spray head, and including control means to control the amount of water supplied to the reservoir,
(g) said second means also including a pump to pump water from the reservoir for supply to the spray head, and a water supply valve, the control means including a first sensor to sense water level in the reservoir, to close said supply valve and start said pump when the water level reaches a pre-set upper limit in the reservoir, and to open said supply valve when the water level drops to a pre-set lower limit, the pump continuing to operate to flush water from the reservoir during removal of ice from the tips.

4,899,549

TRANSPORT REFRIGERATION SYSTEM WITH IMPROVED TEMPERATURE AND HUMIDITY CONTROL

Jeffrey B. Berge, Bloomington; Jayaram Seshadri, Minneapolis, and Jay L. Hanson, Bloomington, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Jan. 3, 1989, Ser. No. 304,686
Int. Cl.[4] F25B *13/00*
U.S. Cl. 62—160 **12 Claims**



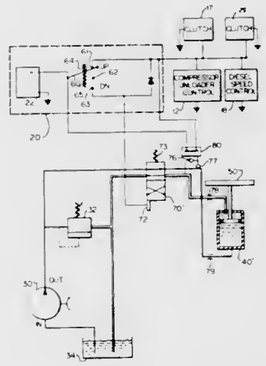
1. In a transport refrigeration system having a refrigeration circuit including a compressor having discharge and suction ports, a condenser, an evaporator, a liquid line between the condenser and evaporator, expansion means in the liquid line, a suction line between the evaporator and suction port of the compressor, a hot gas line, and valve means disposed to selectively connect the hot gas line from the discharge port of the compressor to either the condenser or the evaporator to initiate cooling and hot gas heating cycles, respectively, and further including air delivery means for the evaporator which draws air from a served space for conditioning by the evaporator, and for returning the conditioned air to the served space, and a prime mover for the compressor, the improvement comprising:
a thermostat having a temperature sensor disposed to sense the temperature of the air returning to the evaporator from the served space,
said thermostat providing a digital signal responsive to the difference between the sensed temperature of the air and a desired set point temperature,
a modulation valve in the suction line,
and modulation control responsive to the digital signal provided by said thermostat for continuously controlling said modulation valve in a predetermined temperature range above and below the desired set point temperature, during both cooling and hot gas heating cycles,
whereby the temperature of the served space when containing a load of fresh produce may be maintained close to set point primarily by the cooling cycle, with minimal temperature drop across the evaporator, minimizing moisture removal from the conditioned air and maintaining a high relative humidity in the served space, and the set point may be set close to freezing without danger of damaging the load.

4,899,550

REFRIGERATION UNIT AND HYDRAULIC POWER SYSTEM

Robert A. Chopko, Liverpool, N.Y., and Joel W. Androff, Rowland Heights, Calif., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,646
Int. Cl.[4] F25B *27/00*
U.S. Cl. 62—163 **7 Claims**



1. A refrigeration unit and hydraulic power system comprising:
diesel engine means including speed control means;
compressor means connected to said diesel engine means so as to be driven thereby and including unloading means;
hydraulic pump means having an inlet and an outlet;
clutch means connecting said pump means to said diesel engine means so as to permit said pump means to be driven thereby responsive to the speed of said diesel engine means;
a reservoir containing hydraulic fluid connected to said inlet for supplying hydraulic fluid to said pump means;
platform means;
hydraulic means for moving and returning said platform means;
valve means having a first port connected to said outlet, a second port connected to said hydraulic means and a third port connected to said reservoir;
electrical circuitry connected to said clutch means, said unloading means, said speed control means and said valve means and including a switch means having a first position in which said valve means is in a first position which

connects said first and second ports whereby hydraulic fluid is supplied to said hydraulic means for moving said platform means and said switch means having a second position in which said valve means is in a second position which connects said second and third ports whereby said hydraulic means is connected to said reservoir for returning said platform means; and

means for causing said unloading means to unload said compressor means when required for said diesel engine means to provide sufficient power to said hydraulic pump means.

4,899,551

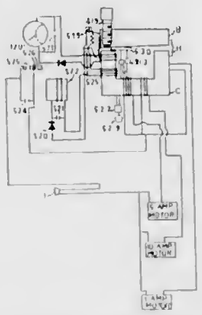
AIR CONDITIONING SYSTEM, INCLUDING A MEANS AND METHOD FOR CONTROLLING TEMPERATURE, HUMIDITY AND AIR VELOCITY

Morton Weintraub, P.O. Box 229, Brooklyn, N.Y. 11230

Continuation-in-part of Ser. No. 633,360, Jul. 23, 1984, abandoned. This application Oct. 29, 1987, Ser. No. 114,541

Int. Cl.[4] F25B *49/00;* **F25D** *17/00*

U.S. Cl. 62—176.6 **37 Claims**



1. A control apparatus comprising means for controlling a size of a first variable chamber such that said chamber controls a pressure of a medium of a first output device producing a point temperature of a space in a relationship in accordance with said size, said first output device comprising any one the following:

a first refrigeration circuit, a gas heating system, a steam heating system,

and for simultaneously and independently controlling a current input to a second output device providing a point temperature of a space in a relationship in accordance with said input, said second output device comprising any one of the following: a compressor of a second refrigeration circuit, an oil burner pump motor, a motor of a motorized coal system, a conducting element of a hydronic boiler, a conducting element of electric heating system,

and for controlling simultaneously and independently a size of a second variable chamber such that said chamber controls a pressure of a medium of a third output device producing a point humidity of a space in a relationship in accordance with said size, said third output device comprising a third refrigeration circuit,

and for simultaneously and independently controlling a current input to a fourth output device providing a point humidity of a space in a relationship in accordance with said input, said fourth output device comprising a compressor of a fourth refrigeration circuit,

and for controlling simultaneously and independently a current input to a fan motor providing a point air velocity in a relationship in accordance with said current input,

first scanning means for scanning temperature responsive means thereby determining whether or not said size of said first chamber and said current input to said second output device is to be increased or decreased such that said increase or decrease providing a temperature of said space that is equal to the point temperature of a temperature setting, and wherein said medium pressure and said current input is increased or decreased in accordance with said determination, a first plurality of magnetic switching means, a first of said plurality of magnetic switching means activating and deactivating a first winding of said motor, a second of said plurality of magnetic switching means activating and deactivating a second winding of said motor, said magnetic switching means is controlled by a first magnet moving in and out of the magnetic influence of said magnetic switching means, such that said motor is activated when said temperature is not equal to the point temperature of said temperature setting,

second scanning means for scanning humidity responsive means thereby determining whether or not said size of said second chamber controlling said medium pressure of said third output device and said current input to said fourth output device is to be increased or decreased such that said increase or decrease providing a humidity of said space that is equal to the point humidity of a humidity setting, and wherein said pressure and said current is increased or decreased in accordance with said determination, a second plurality of magnetic switching means, a first of said plurality of magnetic switching means activating and deactivating said first winding of said second motor, a second of said plurality of magnetic switching means activating and deactivating said second winding of said motor, said magnetic switching means is controlled by a second magnet moving in and out of the magnetic influence of said magnetic switching means such that said motor is activated when said humidity of said space is not equal to the point humidity of said humidity setting,

third scanning means for scanning air velocity responsive means thereby determining whether or not said current input to a third motor is to be increased or decreased such that said increase or decrease providing said air velocity that is maintained equal to the point air velocity of an air velocity setting, and wherein said current input is increased or decreased in accordance with said determination, said air velocity is defined as a magnitude of the flow of said air from said fan to said air velocity responsive means, a third plurality of magnetic switching means, a first of said plurality of magnetic switching means activating and deactivating said first winding of said third motor, a second of said plurality of magnetic switching means activating and deactivating a second winding of said motor, said magnetic switching means is controlled by a third magnet moving in and out of the magnetic influence of said magnetic switching means such that said motor controlling said current input is activated when said air velocity is not equal to the point air velocity of said air velocity setting.

4,899,552

REFRIGERATING SYSTEM FOR ICE MAKING MACHINE

Katsunobu Minari, Toyoake, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed May 17, 1989, Ser. No. 353,402

Claims priority, application Japan, May 30, 1988, 63-70347[U]

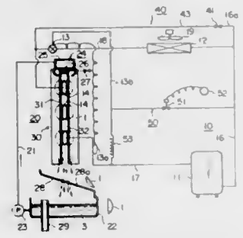
Int. Cl.[4] F25C *5/10*

U.S. Cl. 62—352 **3 Claims**

1. A refrigerating system for an ice making machine including an ice making unit, said system comprising:

a main refrigerating circuit including therein a compressor, a condenser, an external equalizer expansion valve having a pressure equalizing tube connected thereto, and an evaporator tube, wherein pressure of a coolant prevailing at an exit of said evaporator tube mounted in the ice making unit is placed in communication with said expansion valve by way of said pressure equalizing tube so that opening and closing of said expansion valve is controlled in accordance with temperature and pressure of the coolant prevailing at the exit of said evaporator tube;

a hot gas pipe bypassing said pressure equalizing tube and having a hot gas valve incorporated therein; and



a pressure adjusting pipe branched from said pressure equalizing tube at an intermediate portion thereof and communicated to the discharge side of said compressor, said pressure adjusting pipe including an on-off valve opened in correspondence with opening operation of said hot gas valve.

4,899,553

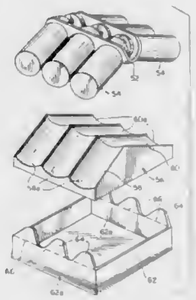
COOLING DEVICE FOR BEVERAGE CONTAINERS

Charles S. Drummond, III, 8 Berkshire Dr., Richmond, Va. 23229

Continuation-in-part of Ser. No. 302,369, Jan. 27, 1989, which is a division of Ser. No. 186,066, Apr. 25, 1988, Pat. No. 4,821,525, which is a continuation-in-part of Ser. No. 92,178, Aug. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 11,199, Feb. 5, 1987, abandoned. This application Jun. 16, 1989, Ser. No. 366,621

Int. Cl.[4] F25D *3/08*

U.S. Cl. 62—372 **6 Claims**



1. A cooling device for providing cooling of beverage containers of a multi-container package of the type wherein the containers of the package are secured together as a package at the tops thereof in two rows and wherein the rows of beverage containers can be deflected away from each other to at least partially flatten out the package without releasing the containers from the package, said cooling device consisting solely of a shaped slab of ice including an upper surface comprising first and second inclined generally planar areas which slant downwardly away from each other from a raised central region, said areas each including part-cylindrical recesses therein, in which the sides of the beverage containers of a partially flattened out package can be received, so that the ice-formed said recesses directly engages and supports the containers of the package and provides cooling thereof.

4,899,554

REFRIGERATOR WITH PLURAL STORAGE CHAMBERS

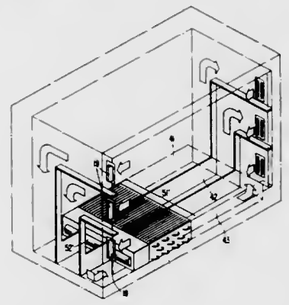
Isao Kato, Isesaki, and Mamoru Sunaga, Ota, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Jan. 11, 1988, Ser. No. 142,710

Claims priority, application Japan, Jan. 8, 1987, 62-1342[U]; Jan. 9, 1987, 62-1078[U]

Int. Cl.[4] F25D *13/02*

U.S. Cl. 62—442 **26 Claims**



1. A refrigerator comprising:

a cabinet including a substantially planar bottom member and side members extending vertically therefrom, said cabinet further comprising storage chamber means for storing items to be refrigerated, said storage chamber means having a front opening and a normally closed door hingedly associated therewith to provide access to said storage chamber means, said storage chamber means also having at least one shelf extending between said side members and horizontally dividing said storage chamber means into at least two discrete storage spaces;

refrigeration means for refrigerating air, said refrigeration means comprising means for forcing circulation of said refrigerated air through at least two discrete air circulation paths; and

at least two non-communicating discrete air flow conduits, each conduit being associated with a storage space and forming a portion of one of said circulation paths, each conduit being closed from an inlet to an outlet thereof and comprising means for directing said refrigerated air from said outlet to said inlet in a substantially horizontal path relative to said at least one shelf, wherein by controlling the temperature of air within each conduit, each storage space may be maintained at a different temperature.

4,899,555

EVAPORATOR FEED SYSTEM WITH FLASH COOLED MOTOR

David N. Shaw, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 19, 1989, Ser. No. 353,981

Int. Cl.[4] F25B *31/00*

U.S. Cl. 62—505 **4 Claims**

1. An economized refrigeration system comprising:

a positive displacement, hermetic compressor means having a motor therein and having inlet means including a plurality of inlets and an outlet;

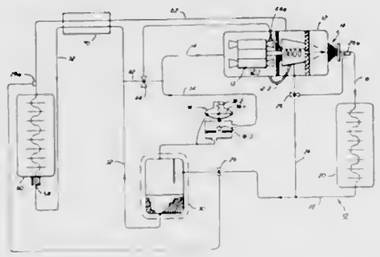
condenser means connected to said outlet via a first fluid flow path means;

economizer means connected to said condenser means via a second fluid flow path means containing an expansion device;

a third fluid flow path means containing a pressure regulator means and connecting said economizer means to said inlet

means for supplying gaseous refrigerant to said compressor means for cooling said motor means when said economizer means generates sufficient vapor flow;

a fourth fluid flow path means connecting said economizer means to an evaporator means for supplying liquid refrigerant from said economizer means to said evaporator means;



a fifth fluid flow path means connecting said evaporator means to said inlet means; and

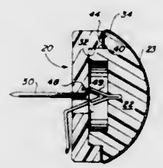
a sixth fluid flow path means containing valve means connecting said fourth fluid flow path means to said inlet means for supplying liquid refrigerant for cooling said motor means when said pressure regulator means is passing insufficient flow for cooling said motor means.

4,899,556

JEWELRY WITH INTERCHANGEABLE ORNAMENTATION

Donna M. Ford, Box 4665, New River Stage, Phoenix, Ariz. 85029

Division of Ser. No. 55,593, May 29, 1987, Pat. No. 4,793,155.
This application Oct. 3, 1988, Ser. No. 252,588
Int. Cl.[4] A44C 7/00; A44B 1/12
U.S. Cl. 63—14.1 **8 Claims**



1. A jewelry device for removably holding and displaying a selected ornamental flexible sheet member and for detachable securement to a selected substrate, said jewelry device comprising:

(a) a backing member including

(i) a front side;

(ii) a rear side; and

(iii) a forwardly directed contact surface;

(b) a removable member including

(i) a front surface for receiving said sheet member thereover; and

(ii) a complemental contact surface opposing said contact surface for receiving a peripheral portion of said sheet member therebetween;

(c) coupling means for detachably affixing said removable member to said backing member and compressively gripping said sheet member between said contact surfaces and further including:

(i) a female member carried by said removable member and having an inwardly directed engagement element;

(ii) a male member carried by said backing member having a complemental engagement element for receiving said engagement element in snap engagement when said male member is inserted into said female member; and

(iii) release means for selectively disengaging said complemental engagement element from said engagement element; and

(d) attachment means projecting from the rear side of said backing member for detachably securing said jewelry device to said substrate; and

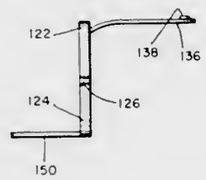
(e) alignment means whereby said removable member is received by said backing member in axial alignment.

4,899,557

STABLE FINGERNAIL RING

Marcus Schwartz, 5642 Etiwanda Ave., #10, Tarzana, Calif. 91356

Filed Sep. 26, 1988, Ser. No. 248,614
Int. Cl.[4] A44C 9/02
U.S. Cl. 63—15 **2 Claims**



1. A finger ring comprising:

a. a supporting section which supports the ring between the first and second knuckle of a finger;

b. said supporting section comprising a generally circular ring have a gap in its circumference;

c. a decorative section further comprising a base portion attached to the supporting section, an elongated portion extending from the base portion, and a decorative portion extending from the elongated portion;

d. said base portion of said decorative section is attached adjacent the top of said supporting section so that the base portion and the elongated portion of said decorative section rest on top of the finger on which the supporting section is located;

e. said decorative portion of the decorative section resting over the fingernail of the finger on which the ring is supported;

f. a stabilizing section attached to and extending perpendicular to the supporting section and positioned beneath the finger on which the supporting section is located; and

g. said stabilizing section is a flat element extending in the direction of the tip of the finger and is attached adjacent the bottom of the supporting section;

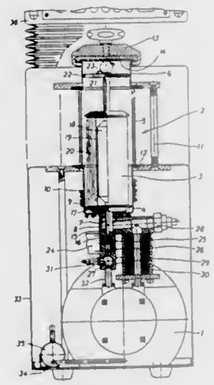
h. whereby the supporting section and the stabilizing section enable the ring to be securely retained on the finger and enable the decorative portion of the decorative section to rest securely on the finger nail and said ring can be tightened and further stabilized on said finger by reducing the diameter of the supporting section to tighten the supporting section around the finger.

4,899,558

LABORATORY APPARATUS FOR A WET TREATMENT OF TEXTILE MATERIALS

Josef Süess, Reussbühl, and Werner Wyss, Eich, both of Switzerland, assignors to Ahiba AG, Dietlikon, Switzerland

Filed Aug. 17, 1988, Ser. No. 233,238
Claims priority, application Switzerland, Aug. 20, 1987, 340/87
Int. Cl.[4] D06B 5/18
U.S. Cl. 68—15 **18 Claims**



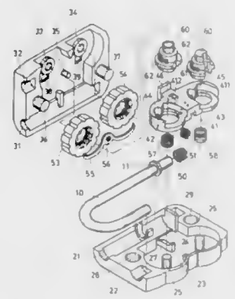
1. A laboratory apparatus having minimal dead space for a wet treatment of textile materials, including a specimen carrier located in an exactly defined path of flow of a treatment liquid in a treatment chamber which in turn is integrated with a conveying unit for said treatment liquid into a structural unit, said conveying unit comprising a pump having a rotating pumping means comprising a rotary vane pump for generating a nonpulsating flow of the treatment liquid of which pumping means the sense of rotation is reversible whereby the flow in said path of flow can be reversed.

4,899,559

HANGING LOCK

Jenn-Rong Chern, 113 Pirng-deeng Rd., Diing-Tsuoh Lii, Luh-Gaang Jehn, Jang-Huah Hsien, Taiwan

Filed Nov. 30, 1988, Ser. No. 278,255
Int. Cl.[4] E05B 37/14
U.S. Cl. 70—25 **1 Claim**



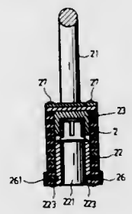
1. A locking device of the type which is opened and closed by adjusting to preselected numbers, which comprises a U-shaped locking rod (10) having one arm longer than the other and having stop (11), a slide plate (40), an upper cover (30), a lower plate (20), said slide plate being located between said upper cover and said lower cover, two dials with numbers (53, 54), located at one side of the device, said lower cover (20) having two semicircular grooves (21, 22), one of said grooves (21) being longer than the other for engagement with the longer arm of said locking rod, a first spring (50) disposed in said groove (21), a pair of posts (25, 26) on said lower cover, a slide guide rail (27) disposed horizontally between said posts, said slide guide rail having a concave portion for fitting a second spring (51), said slide guide rail protruding at one end to form a flange (24), said slide plate (40) being capable of moving backward and forward to open and close the locking device, said upper cover having two semicircular grooves (31, 32) in position to form two cylindrical holes together with said grooves (21, 22) in said lower cover for insertion of said locking rod, two holes (33, 34) in said upper cover for engagement with said posts (25, 26) on said lower cover, a pair of square holes (38, 39) arranged on a tangent of said circular holes for the display of the numbers, a reed (55) having an opening (56) in the center, a post, (35) between said holes (33, 34) for engagement with said opening (56) in said reed, two fixing axles (37, 38) on said upper cover for engagement with two holes (28, 29) on said lower cover, said slide plate (40) having a groove (41) at the bottom thereof for engagement with said slide guide rail, two circular openings (42, 43) and a flange (44, 45) extending from each of said circular openings, said lower plate (20) forming an opening (23), said slide plate (40) forming a groove (411) and a groove (412) in the center of said slide plate for engagement with said flange (24), said flange (44, 45) extending at the same angle from said circular openings at the concave angle (61, 61A), a pushing block (46) at one end of said slide plate for braking the stop (11) of said locking rod, said dials (53, 54) being placed on top of said circular holes (42, 43) on said slide plate, springs (57, 58) located below and supporting said dials two number cases (60) being installed on the top of each of the circular holes of the slide plate, a concave angle (61, 61A) being located on the circumference of each case to match with said flanges (44, 45), said pushing block (46) blocking said stop (11) in the closed position, and when the dials are turned to the preselected numbers, said pg,10 flanges (44, 45) gear with the concave angles (61, 61A) of said cases (60), whereby said slide plate is pushed along said slide guide rail and the stop (11) is released.

4,899,560

LAMINATED PADLOCK

Chang-Yu Chen, 5, Lane 505, Fu-Shin S. Rd., Sec. 1, Ping-Tung City, Taiwan

Filed Apr. 24, 1989, Ser. No. 341,973
Claims priority, application Taiwan, Mar. 17, 1989, 78202389
Int. Cl.[4] E05B 67/02
U.S. Cl. 70—52 **1 Claim**



1. A laminated padlock comprising a casing which is formed of a plurality of metal plates; a shackle having two ends to be inserted into said casing; a barrel member fitted in said casing, said barrel member having a bore into which a cylinder is rotatably inserted; an activating member connected with said cylinder in said casing so as to be rotated with said cylinder;

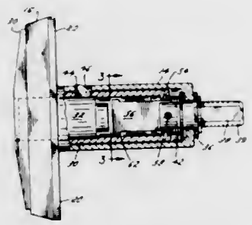
two balls disposed adjacent to said activating member for restraining the movement of said shackle; a spring member mounted in said casing for urging said shackle to move outward and a sleeve member for covering an outer surface of said casing, said sleeve member having a protrusion projecting from an inner surface thereof so as to engage with a concave portion which is formed on the outer surface of said casing at a position where said plate is depressed, wherein said barrel member has a groove formed on an outer surface thereof, one of said plates being depressed inwardly to engage with said groove of said barrel member so that said barrel member can be fixed within said casing.

4,899,561

POP-OUT HANDLE LOCK ASSEMBLY

Gary L. Myers, River Grove, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Apr. 10, 1989, Ser. No. 335,229
Int. Cl.[4] E05B *13/10*
U.S. Cl. 70—208 **4 Claims**



1. In a pop-out handle lock assembly containing a lock cylinder mechanism, the combination comprising:

(a) a cylindrical open-ended housing having at its front end a radially outwardly extending rim flange with a shallow elongated recess in the forward end of the flange, the rearward end of said housing having a first central bearing opening,

(b) a handle housing having a cylindrical portion adapted to be telescopically received in a central cylindrical portion of the rim flange housing so as to be slidable inwardly and outwardly, the inner end of said handle housing having a second central bearing opening and the outer end of said handle housing having a central opening receiving the lock cylinder mechanism and at least one radially outwardly extending arm defining an operating handle shaped to be received in the rim flange recess when the handle is in its inward most locked position,

(c) latch bolt means operated by said lock cylinder mechanism engageable with the cylindrical rim flange housing for maintaining said handle portion in its innermost locked position until released by an appropriate key in said lock cylinder mechanism to allow the handle to slide outwardly from said rim flange housing,

(d) compression spring means disposed between the inside rear end of the rim flange cylindrical housing and the outside inner end of the handle cylindrical housing so as to normally urge said handle housing to its outwardly projecting position when the latch bolt is released,

(e) shaft means fixedly rotatably mounted within the first central bearing opening of said cylindrical rim flange housing, the rearward end of said shaft means projecting outwardly and having connecting means thereon for coupling with a complementary locking member, the inward end of said shaft means having a head portion including a transverse slot and perpendicularly disposed pivot pin openings, said shaft head being adapted to project into the central bearing opening of said handle housing when the handle housing is in its fully retracted position,

(f) a generally T-shaped holder member made of flat plate material having an aperture adjacent its lower end and adapted to be received in the transverse slot of the shaft head, the holder member being pivotally mounted to said shaft head by pin means positioned within the pivot pin openings and holder member aperture; and,

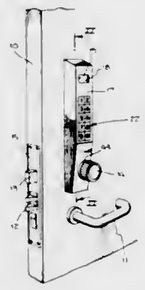
(g) the outer end of said T-shaped holder member having radially projecting arms adapted to engage with slot means adjacent the lower inner end of the handle housing cylindrical portion when the handle is in its fully outwardly extended position so as to permit rotation of the holder member and shaft means upon rotation of the handle in its outward extended position.

4,899,562

ELECTRONIC DOOR LOCK

Klaus W. Gartner, 2632 Via Anacapa, Palos Verdes, Calif. 90274, and Alan K. Uyeda, 8317 Elsmore Dr., Rosemead, Calif. 91770

Filed May 11, 1988, Ser. No. 193,520
Int. Cl.[4] E05B *47/00*
U.S. Cl. 70—277 **9 Claims**



1. A dial and push electronic door lock having a code entry and door bolt control knob comprising:

circuit board means with a plurality of electrical contact switches disposed in a semi-circular array for receiving a predetermined coded sequence of switch actuation and to produce a code responsive electrical signal;

switch actuating means including a switch engaging pad mounted eccentrically of a center portion thereof;

mounting means for mounting said switch actuating means for rotative and axial movement of said center portion;

a knob connected to said switch actuating means for manually rotating said pad relative said array of switches and for manually pushing said pad against a selected one of said switches;

limit means for normally limiting the arc of rotation of said switch actuating means to an arcuate rotation of only the extent of said array of switches;

electrically operated means associated with said circuit board means for deactivating said limit means on receipt of a code responsive electrical signal sent by said circuit board means;

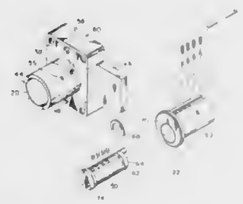
door bolt connecting means for connecting said knob to said door bolt for shifting said door bolt between protracted and retracted positions relative said door in response to manipulation of said knob through an arc of rotation which is arcuately displaced from that provided for operating said switches.

4,899,563

RE-KEYABLE PIN TUMBLER DRAWER LOCK AND PIN TUMBLER CABINET DOOR LOCK

Frank J. Martin, Seattle, Wash., assignor to Frank J. Martin Company, Seattle, Wash.

Continuation of Ser. No. 40,364, Apr. 17, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 328,748
Int. Cl.[4] E05B *27/00*
U.S. Cl. 70—367 **4 Claims**



1. A re-keyable lock, comprising:

a bolt housing including a movable bolt operatively engaged with a rotatable cam mechanism having a rotary guide portion;

a unitary shell having a bolt housing cover connected to the bolt housing, an elongated cylinder housing defining an elongated, unthreaded cylindrical cavity having a forward opening sized to removably receive a cylinder and plug assembly, a rearward opening sized and positioned to receive the guide portion of the cam mechanism to guide rotation of the cam mechanism about a cam rotation axis, and a radially directed, threaded circular aperture;

an unthreaded cylinder having a smooth exterior surface, a radially directed threaded bore, a plurality of radially directed, spring-loaded pin tumblers, and an axially directed plug cavity for receipt of a cylinder plug;

a cylinder plug sized for receipt of the plug cavity, the cylinder plug having a cam mechanism driver; and

a set screw threadably engageable with the threaded bore and the threaded aperture wherein the unthreaded cylinder and the cylinder plug can be combined as an assembly which is forwardly removable through the forward opening for replacement of the pin tumblers by removal of the set screw alone so that the cam mechanism remains positively centered about the cam rotation axis and so that when the assembly is reinserted through the forward opening and the threaded bore aligned with the threaded aperture, the cam mechanism is properly engaged with the cam mechanism driver and so that the cylinder is fixed against rotation and longitudinal movement after the set screw is engaged.

4,899,564

DOORKNOB SECURITY DEVICE

Leamon A. Gilbert, Route 3, Box 479, Benson, N.C. 27504

Filed Jun. 3, 1988, Ser. No. 201,941
Int. Cl.[4] E05B *17/14*
U.S. Cl. 70—428 **6 Claims**

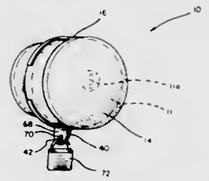
1. A doorknob security device comprising:

(a) a first doorknob enclosing a means; and

(b) a second doorknob enclosing means disposed in rotational relationship with the first doorknob enclosing means, and wherein the first and second doorknob enclosing means form an internal cavity in which a doorknob may be substantially enclosed;

(c) the second doorknob enclosing means being contained within the first doorknob enclosing means and wherein the first and second doorknob enclosing means are rotatively movable between an open position and a closed position; and

(d) wherein in the open position there is formed a doorknob access opening that permits the doorknob security device to be placed over the doorknob and wherein in the closed



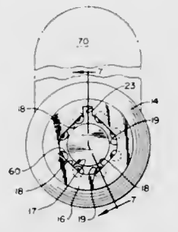
position the doorknob is securely held within the security device and access is not permitted to the keyhole of the doorknob.

4,899,565

SQUARE SHAPED AXIAL SPLIT PIN TUMBLER LOCK

Robert Steinbach, Glendale Heights, Ill., assignor to Chicago Lock Company, Chicago, Ill.

Filed Aug. 30, 1989, Ser. No. 400,781
Int. Cl.[4] E05B *27/08*
U.S. Cl. 70—491 **6 Claims**



1. In an axial split pin tumbler lock mechanism having increased pick resistant of the type including a lock cylinder, a barrel assembly secured within the lock cylinder and having a longitudinal axis extending between front and rear ends thereof, barrel assembly including a lock shaft having a forward and a rear end and a forwardly disposed operating part rotatable about the longitudinal axis formed by the lock shaft carrying a cylindrical head portion adjacent the forward end thereof, a stationary sleeve member carried on the lock shaft adjacent the rear end thereof and adjoining the cylindrical head portion at a transverse interfacial plane, a plurality of longitudinal bores formed in each of said cylindrical head portion and sleeve member, the bores being disposed radially around the longitudinal axis thereof and being relatively movable into and out of longitudinal alignment upon rotation of the operating part, tumbler means each including a forwardly disposed driver tumbler carried in the cylindrical head portion and a rearwardly disposed follower tumbler carried in the stationary sleeve member, the tumbler means being axially reciprocable to provide a rotationally movable position when the respective driver tumblers and follower tumblers coincide with the interfacial plane between the cylindrical head portion and the sleeve member, and a lock position when at least one of the tumblers bridges the interfacial plane, spring means carried in one set of the bores for yieldingly urging the tumblers in aligned bores into the lock position and the driver tumblers having front ends engagable with a key such that rearward movement of the key moves the tumblers in aligned bores rearwardly to positions wherein tumbler joints coincide with the interfacial plane, the improvement comprising in combination,

said lock cylinder formed by a hollow cylinder body carry-

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ing a lock head at the forward end thereof and the hollow cylinder body adapted to carry the barrel assembly therein,

said lock head provided with a substantially square shaped keyhole formed therein, said substantially square shaped keyhole defining a front face on said lock head which includes a series of thickened face sections alternating with a series of thinner face sections, and said keyhole defining an inner face defined by said substantially square-shaped keyhole,

said inner face of said keyhole providing a tumbler ledge forming a riding surface for the front ends of said driver tumblers positioned within said cylindrical head portion whereby said driver tumblers ride in a path alternating between thickened sections and thinner sections of said tumbler ledge,

said cylindrical head portions of said operating part having a forward end provided with a substantially square shaped cut-out section presented therein,

said substantially square shaped cut-out section radially traversing the tumbler bores formed therein,

said substantially square shaped cut-out section of said cylindrical head portion being in axial alignment with and disposed immediately rearward of said substantially square shaped keyhole formed in said lock head,

and a tubular key having an inner circular core and an outer substantially square shaped face adapted to matingly engage within said substantially square shaped keyhole in said lock head and said substantially square shaped cut-out section in said cylindrical head portion,

said outer substantially square shaped key face having bitted sections around the periphery thereof for engagement with corresponding driver tumblers located in said cylindrical head portion,

whereby only a properly bitted key having an outer substantially square shaped face may be inserted in said substantially square shaped keyhole and into said substantially square shaped cylindrical head portion to manipulate the driver tumblers and operate said lock mechanism,

said driver tumblers otherwise being at least partially shielded from manipulation by a lock pick by the thickened sections of said tumbler ledge.

4,899,566

APPARATUS FOR MAKING GUTTERS AND THE LIKE

Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401

Filed Sep. 6, 1988, Ser. No. 240,273
Int. Cl.[4] B21D *5/08*
U.S. Cl. 72—129 **22 Claims**



1. In apparatus for making shaped members having different widths using a series of spaced forming stations by successively deflecting sheet material transversely of its longitudinal movement, each forming station comprising

upper and lower roller means between which a sheet material is passed for being shaped, each of said roller means including a fixed roller portion and an axially movable adjustable roller portion, and

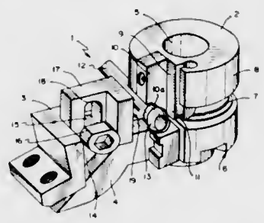
adjustment means for each of said upper and lower roller means for controlling the position and movement of each adjustable roller portion to locate, guide during movement and lock each adjustable roller portion at either of first and second position for forming shaped members having different width dimensions, said first and second positions being located a preselected fixed axial distance from one another to form shaped members of two different selected widths with said adjusting means including a locking member that provides for the guiding of said adjustable roller position along said fixed axial distance.

4,899,567

METHOD AND APPARATUS FOR BENDING TUBES WITH END FITTINGS

Michel Lenglet, Le Coudray Montceaux, and Andri Sens, Dammarie Les Lys, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA), Paris, France

Filed Nov. 28, 1988, Ser. No. 276,475
Claims priority, application France, Dec. 2, 1987, 87 16699
Int. Cl.[4] B21D *7/04*
U.S. Cl. 72—159 **9 Claims**



1. A bending die for bending a pipe or tube having an end fitting on an end thereof comprising:

(a) a bending die member having a generally cylindrical configuration defining a generally circumferentially extending die groove having a substantially semi-circular cross-sectional configuration to accommodate the pipe or tube therein and further defining a generally longitudinally extending clearance notch extending across the die groove to provide a clearance for a portion of the end fitting therein;

(b) a clamping die member having a generally semi-circular clamping surface positioned to contact the pipe or tube and clamp it into at least a portion of the die groove; and,

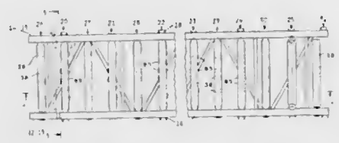
(c) a clamping jaw member on the clamping die member, the clamping jaw member having a substantially planar clamping face positioned to contact only the end fitting during the bending operation so as to enable the pipe or tube to be bent a distance L from its end.

4,899,568

ROLLING MILL MACHINE FOR LONGITUDINAL BENDING OF PLATE

Lars I. Ingvarsson, Borlänge, Sweden, assignor to Ortic AB, Borlänge, Sweden

Filed Oct. 7, 1988, Ser. No. 255,688
Claims priority, application Sweden, Oct. 9, 1987, 8703923
Int. Cl.[4] B21D *5/08, 13/04*
U.S. Cl. 72—181 **20 Claims**



1. A rolling mill machine for bending of plate along the longitudinal axis of the plate as the plate is moved along a path which is generally parallel to the longitudinal axis of the plate through the rolling mill machine to provide a cross-sectional profile comprising:

means for advancing said plate along said path through said machine;

a plurality of shaping stations disposed in spaced relationship along said path;

each of said shaping stations each having forming rolls positioned adjacent to said path of said plate;

each of said shaping stations including an upper row of a plurality of forming rolls and a lower row of a plurality of forming rolls disposed in spaced relationship with said upper row and said lower row defining a direction which is transverse to said path of said plate for respectively bending said plate advancing therebetween to form said profile; and

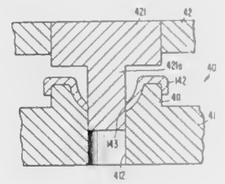
at least some of said shaping stations having at least some of said forming rolls being positioned out of said rows from the rows defined by the other of said forming rolls in said upper and said lower rows for initially bending said plate as said plate is advanced through each of said some of said shaping stations.

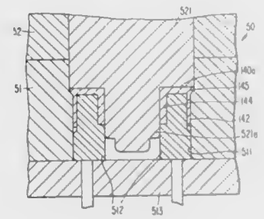
4,899,569

METHOD FOR MANUFACTURING A ROTOR FRAME OF AN ELECTROMAGNETIC CLUTCH

Takashi Matsushita, and Kozaburo Tsuchiya, both of Isesaki, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Feb. 27, 1989, Ser. No. 315,848
Claims priority, application Japan, Feb. 29, 1988, 63-46109
Int. Cl.[4] B21D *28/32, 53/26*
U.S. Cl. 72—336 **9 Claims**





1. A method for manufacturing a rotor frame for an electromagnetic clutch, said method comprising:

forming a blank exhibiting a regular polygon shape from an iron plate, said blank having a top surface, edges, and a central area;

forming a convexly curved bulge in said central area of said blank, said bulge having a dome shape with a first radius of curvature;

forming a first annular projection at said edges in said bulged blank, said first annular projection being oriented in a projection axis substantially perpendicular to the top surface of said blank;

removing at least a center portion of said bulge to form a hole in said blank surrounded by curving annular walls;

expanding said hole and bending said curving walls of dome shape to form a second annular projection oriented in a direction substantially parallel to said first annular projection;

extending said first annular projection along said projection axis; and

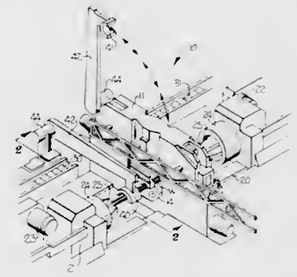
machining end surfaces into the first and second annular projections.

4,899,570

APPARATUS AND METHOD OF ROTARY FORGING WITH INDUCTION HEATING

Gary L. Mills, Monroe, and B. Dean Bowen, Matthews, both of N.C., assignors to Teledyne Industries, Inc., Monroe, N.C.

Filed Apr. 5, 1988, Ser. No. 177,783
Int. Cl.[4] B21J *1/06*
U.S. Cl. 72—364 **11 Claims**



1. Forging apparatus comprising manipulator means for grasping a heated workpiece and for advancing the workpiece axially along a predetermined path of travel,

a rotary forge mounted adjacent to said manipulator means for receiving the heated workpiece therethrough, said rotary forge including a plurality of cooperating pairs of forging dies and means for moving each pair of forging dies in a rapidly reciprocating motion into contact with the workpiece for working and reshaping the workpiece, wherein the rotary forge ordinarily puts work into the workpiece at a rate which equals or exceeds adiabatic cooling losses from the workpiece, and

induction heating means for selectively heating the workpiece as it is advanced into said rotary forge, and including electric power supply means and induction heating coil means operatively connected to said power supply means and positioned surrounding the path of travel of the workpiece as it enters the forge

said induction heating coil means comprising a coil of generally C-shaped cross-sectional configuration, mounting means mounting said coil, said mounting means including a support base and longitudinal arm pivotably attached to said support base, with said coil mounted to said arm so that said coil can be selectively, pivotably moved from an operative position where the coil surrounds the path of travel of the workpiece as it enters the rotary forge to an inoperative position away from the path of travel of the workpiece into the forge, whereby the workpiece can be selectively heated, when needed, as it enters the forge to compensate for cooling losses.

4,899,571

APPARATUS FOR DRAWING-IN A PIPE END BY COLD FORMING

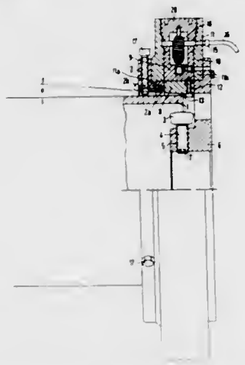
Robert Weber, Uttenreuth, and Helmut Mechtold, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 21, 1988, Ser. No. 222,270

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724309

Int. Cl.[4] B21D *41/04*

U.S. Cl. 72—401 8 Claims



1. Apparatus for drawing-in a pipe end by plastic cold forming, comprising a clamping cody, an annular body disposed on said clamping body and having an inner surface and a center, an internal tool in the form of a stop ring centrally supported on said annular body for defining a desired inside pipe profile, a plurality of jaws disposed on said annular body for extending over the outside of a region of a pipe to be drawn-in, said annular body having blind bores serving as cylinders formed therein in radial directions with openings facing toward said inner surface of said annular body, and pistons connected to said jaws being inserted in said cylinders and movable radially toward the center of said annular body by a pressure medium, said stop ring having individual stop means in the form of stop heads for abutting the inner surface of the pipe during a drawing-in operation, said stop heads having threaded shafts being radially adjustably screwed into radial threaded bores formed in said stop ring, and said threaded shafts having ends with means for allowing rotation of said threaded shafts.

4,899,572

PNEUMATIC-HYDRAULIC BOOSTER TYPE DRIVING DEVICE FOR THE CUSHION-KNOCKOUT MECHANISM ASSOCIATED WITH THE SLIDE OF A PRESS-MACHINE

Keitaro Yonezawa, Amagasakishi, Japan, assignor to Kabushiki Kaisha Kosmek, Hyogoken, Japan

Filed Dec. 24, 1987, Ser. No. 137,814

Claims priority, application Japan, Dec. 26, 1986, 61-314775

Int. Cl.[4] B21J *9/18*

U.S. Cl. 72—453.13 5 Claims

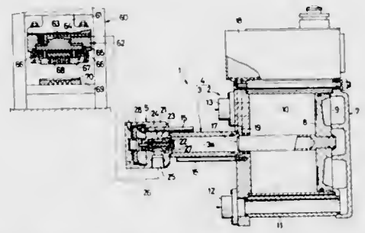
1. A pneumatic-hydraulic booster type driving device for a cushion knockout mechanism associated with a slide of a press-machine that includes a cushion cylinder containing an oil under pressure, comprising:

a pneumatic-hydraulic booster comprising a pneumatic cylinder of a first diameter and a pneumatic piston slidably fitted therein, said booster having a hydraulic cylinder of a second diameter smaller than said first diameter and a plunger that is connected to the piston and slidably fitted into said hydraulic cylinder, the hydraulic cylinder and the plunger cooperating to define a plunger chamber, said plunger chamber being connected in communication with a valve chamber, said valve chamber comprising a pressurized oil inlet/outlet port for flow of pressurized oil therethrough, a valve seat and an outlet chamber;

a valve unit having a valve seat formed therein and comprising a single movable valve body and a valve closing spring disposed to bias said movable single valve body toward said valve seat to form a valve thereby, said valve unit being in communication with said plunger chamber, said valve being closed under a resultant force including a spring force of said valve closing spring and a force due to oil pressure in said valve chamber, said valve unit being formed to also comprise a back pressure cylinder for receiving pressurized oil for opening said valve by biasing said valve body away from said valve seat;

said valve body being provided with a valve stem and and end wall of said valve chamber being provided with a guide hole opposed to said valve seat so as to support and slidably guide said valve stem of said valve body and to accommodate said valve closing spring between said guide hole and said valve body;

said back pressure cylinder being disposed at a side of the



outlet chamber opposite to the valve chamber and in communication therewith, and comprising a back pressure piston connected to the valve body and slidably fitted in said back pressure cylinder to define a back pressure cylinder chamber therewith, wherein the diameter of said back pressure piston is smaller than the diameter of said valve seat; and

a knockout actuator connected to said valve unit, said knockout actuator comprising a knockout piston and an air-vent piston both being coaxial and biased by a return spring, said knockout piston having a larger diameter than said air-vent piston, said air-vent piston having an elongate output portion extending from said knockout unit in an airtight manner to reach and exert a force on the valve body when said air-vent piston is moved due to a cushion actuating pressure of pressurized oil from said cushion cylinder of said press-machine, whereby a flow area available to flow of oil to or from said plunger chamber is controlled to be larger or smaller in response to said cushion actuating pressure, the output portion of said knockout actuator being opposed to said back pressure piston to be movable to push the same in a valve opening direction.

4,899,573

APPARATUS AND AN ASSOCIATED METHOD FOR LEAK AND VOLUME INSPECTION OF CONTAINERS

Henry M. Dimmick, Butler, and Richard A. Spryn, Fenelton, both of Pa., assignors to American Glass Research, Inc., Butler, Pa.

Filed Feb. 24, 1989, Ser. No. 315,530

Int. Cl.[4] G01M *3/32*

U.S. Cl. 73—49.2 44 Claims

1. Apparatus for testing containers comprising

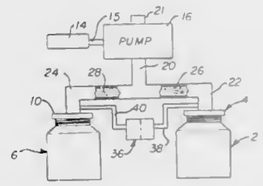
volume standard means for comparison with the container being tested and being of generally the same interior volume as the container being tested,

pump means for applying a pressure pulse to the interior of the container being tested and said volume standard means,

first conduit means for connecting said pump means with said test container,

second conduit means for connecting said pump means with said volume standard means,

acoustic impedance means for facilitating obtaining a pressure differential between said volume standard means and said container being tested interposed between said pump



means and said test container and between said pump means and said volume standard means,

differential pressure measuring means operatively associated with said test container and said volume standard means for monitoring the pressure differential between said test container and said volume standard means and emitting a signal corresponding to said pressure differential, and

electronic processing means for receiving said signals from said differential pressure measuring means and determining if said test container leaks.

4,899,574

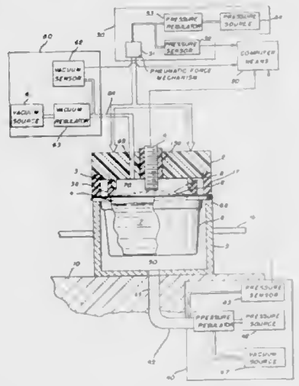
METHOD AND APPARATUS FOR DETECTING LEAKS IN A SEALED CONTAINER

Thomas M. Porteiger, Mableton, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 1, 1989, Ser. No. 305,530

Int. Cl.[4] G01M *3/36*

U.S. Cl. 73—52 19 Claims



1. The method of testing the integrity of a container comprising a thin walled cup having a rim portion defining a mouth thereof and a flexible lid sealed to said rim portion, said container enclosing a volume of filler material and a volume of head space, said method comprising the steps of:

applying a force to an elongated edge portion of the lid which circumscribes a central portion of the lid which is coaxial with the center of the cup thereby causing said lid to bow outwardly from the cup;

measuring the position of the bowed portion of the lid by means which apply no substantial force to said bowed portion;

comparing the position of the lid with a first predetermined acceptable position value.

4,899,575

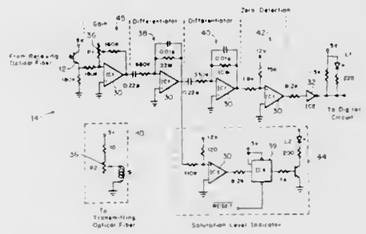
METHOD AND APPARATUS FOR DETERMINING VISCOSITY

Benjamin Chu, Setauket, and Harbans S. Dhadwal, Westbury, both of N.Y., assignors to Research Foundation of State University of New York, Albany, N.Y.

Filed Jul. 29, 1988, Ser. No. 226,300

Int. Cl.[4] G01N *11/06*

U.S. Cl. 73—55 17 Claims



15. A method for determining the flow time of a liquid between two points within a capillary viscometer tube, comprising:

introducing a liquid within said tube;

causing said liquid to flow within said tube in a selected direction;

introducing light within said tube; detecting said light at a first point within said tube;

detecting said light at a second point within said tube, said second point being a selected distance from said first point;

generating a first electric signal corresponding to the intensity of light detected as the meniscus of said liquid passes said first point;

generating a second electric signal corresponding to the intensity of light detected as the meniscus of said liquid passes said second point;

differentiating said first electric signal to obtain the first derivative thereof;

starting a timer when said derivative of said first electric signal is at a peak;

differentiating said second electric signal to obtain the first derivative thereof; and

stopping said timer when said first derivative of said second electric signal is at a peak.

4,899,576

METHOD FOR TESTING REPEATABILITY OF A RHEOLOGIC SYSTEM

Daniel November, New York, N.Y.; William E. Langley, Lodi, N.J.; Harry Darnopuk, Brooklyn, N.Y., and George V. Hectus, Verona, N.J., assignors to Haake-Fisons Instruments, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 88,404, Aug. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 917,619, Oct. 19, 1986, abandoned. This application Jan. 17, 1989, Ser. No. 297,989

Int. Cl.[4] G01N *11/14*

U.S. Cl. 73—59 7 Claims

1. A method for testing the torque-parameter repeatability of

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test runs of a rheological measuring system, said system having a power shaft and a test chamber, the method comprising the steps of:

(a) providing a circumferential mixing element for said power shaft in said test chamber, said mixing element, when rotated, having a dynamic curvature;

(b) orienting a transducer within a spiral segment of a curved plane of rotation of said power shaft, said plane corresponding to the dynamic curvature of said mixing element



of said power shaft, to reiteratively compare integrated axial and radial reactive torques imparted to said mixing element through the use of rheologic reference material samples for comparing the reactive torques thereof,

whereby, reactive torques, both axial and radial, will be transmitted through the power shaft of said transducer and, further whereby, differences in the comparative reactive torques will indicate a lack of repeatability in sequential test runs of a measuring system.

4,899,577

DEVICE FOR A HARDNESS MEASURING INSTRUMENT

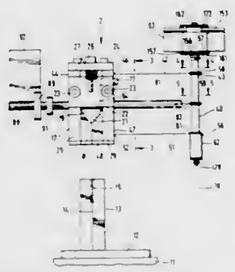
Helmut Fischer, Industriestrasse 20, 7032 Sindelfingen-6, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,623

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738106

Int. Cl.[4] B21D *22/14*

U.S. Cl. 73—82 **16 Claims**



1. A non-destructive microhardness measuring instrument comprising

a housing,

a bar device having an end portion and pivotable about a pivot center,

a test body supported on said end portion,

a measuring device, which works on the basis of measuring the thickness of micro-thin layers, including a probe fixed to the housing and means defining a reference plane for measuring the distance to the probe fixed to the test body,

an energizing means acting on said bar device having a first part rigid with said housing and a second part rigid with said bar device,

a geometric first longitudinal axis passing through the center of said probe and the center of said test body,

and the improvement wherein:

(a) said first part of said energizing means rigid with said housing comprises a cylindrical electromagnetic coil having a geometric second longitudinal axis parallel with said geometric first longitudinal axis,

(b) said coil has an opening for a carrier rod parallel with said geometric second longitudinal axis,

(c) substantially coaxial with said geometric second longitudinal axis, said second part of said energizing means comprises said carrier rod which is rigid in its longitudinal direction relative to said end portion of said bar device and which is connected in entraining fashion to said bar device,

(d) said carrier rod carries an upper magnet carrier above said coil and a lower magnet carrier below said coil,

(e) fixed to each of said magnet carriers are a plurality of rigid permanent magnets each having one pole that points axially in the same direction, and

(f) the travel of said carrier rod amounts to a few millimeters.

4,899,578

DRIVING DEVICE FOR A HARDNESS MEASURING INSTRUMENT

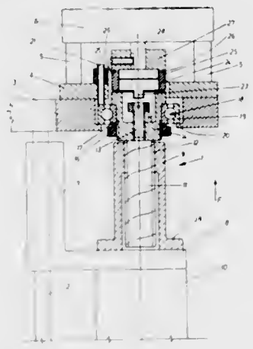
Alfred Ernst, Via S. Martino, 6, Vezia Ticino, Switzerland

Filed Mar. 2, 1988, Ser. No. 162,866

Claims priority, application Switzerland, Mar. 18, 1987, 1029/87

Int. Cl.[4] G01N *3/42*

U.S. Cl. 73—82 **23 Claims**



23. A driving device of a hardness measurement arrangement, comprising:

a fixed structure;

a movable member;

screw means for driving the movable member relative to the fixed structure during a measurement cycle; and

motor means for driving the screw means, the screw means including two screws (11, 13) having differently pitched threads that are wound in the same direction, one of the screws being formed for initially driving the movable member quickly to provide a moderate force and the other of the screws being formed for subsequently driving the movable member slowly to provide a stronger force.

4,899,579

ONBOARD DIAGNOSTIC SYSTEM OF VEHICLE IGNITION SYSTEM

Michael S. Sweppy, Livonia; Richard R. Tuttle, Utica, and Everett P. Schumaker, Mt. Clemens, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 3, 1988, Ser. No. 252,620

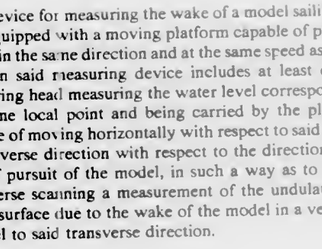
Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—118.1 **10 Claims**

1. A method of testing an internal combustion engine with a distributorless ignition system having an ignition coil, for an ignition fault including the steps of:

detecting the time period between the actual occurrence of a spark plug firing and the occurrence of a reference signal;

calculating the time period between the occurrence of a spark plug firing and the occurrence of a reference signal; and



determining the difference between the calculated time period and the detected time period to see if the difference comes within a predetermined time duration and indicating a fault if the time period of occurrence of the calculated and the detected spark period do not come within the predetermined time duration.

4,899,580

DEVICE FOR MEASURING THE WAKE OF A SAILING MODEL

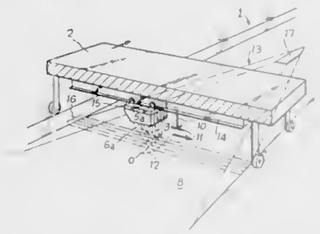
Pierre L. Leguen, Bures/Yvette, and Jean-Claude Dern, Paris, both of France, assignors to Etat Francais représenté par le Délégué général pour l'armement, Paris, France

Filed Aug. 4, 1988, Ser. No. 228,181

Claims priority, application France, Aug. 13, 1987, 87 11521

Int. Cl.[4] G01M *10/00*; G01F *23/28*

U.S. Cl. 73—143 **8 Claims**



1. Device for measuring the wake of a model sailing in a trial tank equipped with a moving platform capable of pursuing the model in the same direction and at the same speed as the model, wherein said measuring device includes at least one optical measuring head measuring the water level corresponding to at least one local point and being carried by the platform and capable of moving horizontally with respect to said platform in a transverse direction with respect to the direction of its motion of pursuit of the model, in such a way as to provide by transverse scanning a measurement of the undulations of the water surface due to the wake of the model in a vertical plane parallel to said transverse direction.

4,899,581

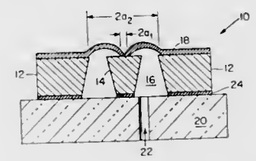
METHOD AND APPARATUS FOR THE QUANTITATIVE MEASUREMENT OF ADHESION OF THIN FILMS

Mark G. Allen, and Stephen D. Senturia, both of Boston, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 158,276, Feb. 19, 1988, abandoned. This application May 4, 1989, Ser. No. 351,330

Int. Cl.[4] G01N *19/04, 3/10*

U.S. Cl. 73—150 A **15 Claims**



1. A device used in measuring adherence of a test film to a subject surface, comprising:

a substrate surface for holding the test film thereon and having a cavity therethrough, the subject surface positioned in the cavity such that the substrate surface and the subject surface lie in a common plane, and in the plane the cavity surrounds the subject surface such that the subject surface is spaced apart from the substrate surface on all sides across the cavity; the film having one portion adhered to the substrate surface and a second portion suspended over the cavity, and a region of the suspended second portion of the film being adhered to the subject surface;

means for applying a pressure differential across the suspended second portion of the film such that the film debonds from the subject surface;

means for measuring residual stress of the film;

means for measuring applied pressure differential at which debonding of the adhered region of the film is initiated; and

means for measuring radius of the region of film adhered to the subject surface with respect to applied pressure; wherein said applied pressure differential, residual stress and radius measurement along with a measurement of film thickness are used to provide a quantitative measurement of adherence of the test film to the subject surface.

4,899,582

AIR SYSTEM ANALYZER

Harold S. O'Dougherty, 534 Dryad Rd., Santa Monica, Calif. 90402

Filed Mar. 24, 1988, Ser. No. 172,492

Int. Cl.[4] G01M *19/00*

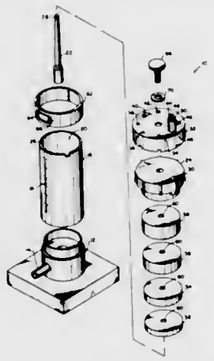
U.S. Cl. 73—168 **4 Claims**

1. A method of analyzing the performance of a low volume air pump using an air system analyzer device having a plurality of selectable output ports of respective diameters and a plurality of float members selectively mountable within said device; said method comprising the steps of:

(a) connecting the output of said pump to supply air through said air system analyzer device;

(b) selecting that one of said float members which will pro-

vide the maximum range of movement within said device; and



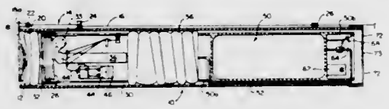
(c) reading the flow rate obtainable with said float member for each of said selectable output ports as an indication of the performance of said pump.

4,899,583

ATMOSPHERIC SOUNDING APPARATUS

D. Ray Booker, Jenks, Okla., assignor to Aeromet Inc., Tulsa, Okla.

Filed Dec. 2, 1988, Ser. No. 278,714
Int. Cl.[4] G01W *1/00*
U.S. Cl. 73—170 R **22 Claims**



21. An air-launched unit for providing meteorological data to a remote monitoring station, said unit comprising:

a protective deployment housing;

a parachute system, housed within said housing and deployable from the housing, for, when deployed, controlling the descent of the unit after release thereof from an aircraft;

a balloon housed within said housing and releasable therefrom;

sensor and transmitter means, connected to said balloon and releasable from said housing therewith, for sensing at least one parameter in the environment of the balloon and for transmitting a signal in accordance therewith;

a lighter-than-air gas storage tank housed within said housing from which said balloon is filled with a lighter-than-air gas during the descent of said unit;

sensing means for sensing the approach of the unit to the Earth and for producing an output signal when a predetermined approach condition is sensed;

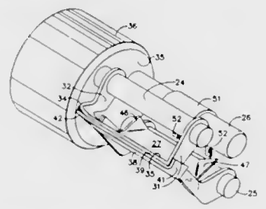
control means, responsive to said sensing means for, responsive to said output signal from said sensing means, controlling releasing of said balloon and the sensor and transmitter means connected thereto from the remaining components of the unit so that the sensor and transmitter means is able to transmit a said signal during the ascent of said balloon.

4,899,584

FLUIDIC AMPLIFIER FOR SENSING FLUID MOTION

Malcolm M. McQueen, Fallbrook, Calif., assignor to Fluid Components, Inc., San Diego, Calif.

Filed Oct. 31, 1988, Ser. No. 265,786
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204.21 **11 Claims**



1. A fluidic amplifier for sensing changes in fluid position, said amplifier comprising:

a housing;

a heater probe extending from said housing and adapted to be connected to a source of energy;

a reference sensor probe extending from said housing and spaced from said heater probe by a first predetermined distance;

an active sensor probe extending from said housing and spaced from said heater probe and from said reference probe by a second and a third predetermined distance, respectively;

bracket means mounted to said amplifier;

baffle means mounted to said bracket means, and baffle means being positioned generally between said active sensor probe and said reference sensor probe; and

strength reinforcing means integrally formed with said baffle means, said reinforcing means being so configured as to make its mounting to said bracket means of suitable strength while not interfering with the fluid flow path, said reinforcing means comprising a plurality of tab means extending from said baffle means, said tab means being fixed to said bracket means;

said amplifier being adapted to be positioned with said probe oriented transversely with respect to the normally expected direction of motion of the fluid to be monitored, said active sensor probe being generally downstream from said heater probe;

said baffle means being shaped and configured to direct moving fluid passing said heater probe away from said active sensor probe.

4,899,585

LIQUID LEVEL DETECTOR AND METHOD FOR A VAPOR DEPOSITION CONTAINER

Edward Kulha, Santa Clara, Calif., assignor to Semi-Gas Systems, Inc., San Jose, Calif.

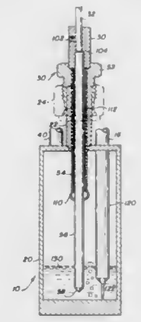
Filed Jul. 19, 1988, Ser. No. 221,277
Int. Cl.[4] G01F *23/02*
U.S. Cl. 73—293 **10 Claims**

1. A liquid level detector for a vapor deposition container comprising:

a pressurized container for storing a supply of liquid chemical, the container having an inlet port for delivering a carrier gas to said liquid, and having an outlet port for discharging said carrier gas;

a glass rod having no outer cladding, extending through and hermetically sealed to the container, the rod having a conically shaped end; and

a fiber optic transmitter and receiver optically connected to the glass rod for transmitting a beam of light and for



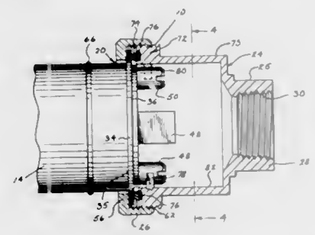
detecting a reflected light beam when said glass rod is not in contact with said liquid.

4,899,586

ENCLOSURE FOR ELECTRICAL SENSOR

Donald J. Koneval, Brookfield; Harold J. Pollnow, Dousman, and Richard J. Molus, Sr., Greenfield, all of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Division of Ser. No. 104,345, Oct. 2, 1987, Pat. No. 4,825,710.
This application Nov. 16, 1988, Ser. No. 271,812
Int. Cl.[4] G01D *11/24, 11/00*
U.S. Cl. 73—431 **8 Claims**



1. A sensor enclosure comprising:

a housing having a cylindrical portion at one end;

an end cap having a cylindrical portion abutting the one end of said housing;

a coupling ring engaging both said housing and said end cap in a manner which fastens the latter two elements together; and

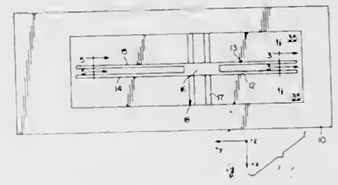
means for preventing said end cap and said housing from rotating with respect to each other more than 360 degrees.

4,899,587

METHOD FOR SENSING ROTATION USING VIBRATING PIEZOELECTRIC ELEMENTS

Juergen H. Staudte, Anaheim, Calif., assignor to Piezoelectric Technology Investors, Limited, Laguna Hills, Calif.

Continuation of Ser. No. 733,719, May 13, 1985, abandoned, which is a division of Ser. No. 572,783, Jan. 23, 1984, Pat. No. 4,524,619. This application Mar. 13, 1987, Ser. No. 27,104
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[4] G01P *9/04*
U.S. Cl. 73—505 **3 Claims**



1. A method of sensing rotation, comprising the steps of:

vibrating a first pair of piezoelectric tines at a first frequency; and

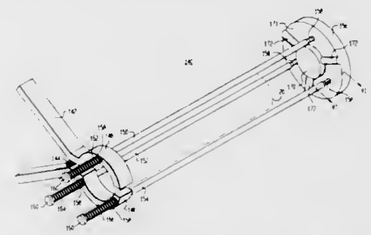
sensing piezoelectric voltages in a second pair of tines parallel to and interconnected with said first pair of tines, said voltages induced in the second pair of tines by the vibration of said second pair of tines being caused by the vibration of said first pair of tines and the rotation of said first and second pair of interconnected tines.

4,899,588

METHOD AND APPARATUS FOR DETERMINING ELASTIC CONSTANTS IN TUBES

Joseph D. Titlow, Boulder; Wilmot Brost, Northglenn, and David T. Hahn, Longmont, all of Colo., assignors to Micro Motion Incorporated, Boulder, Colo.

Division of Ser. No. 93,424, Sep. 4, 1987, Pat. No. 4,845,989.
This application Jan. 23, 1989, Ser. No. 300,331
Int. Cl.[4] G01H *5/00*
U.S. Cl. 73—597 **6 Claims**



1. Apparatus for use in evaluating a tubular specimen fabricated of a given material for use as a corresponding flow tube within a Coriolis mass flow rate meter having at least two flow tubes and a reduced zero level offset, said apparatus comprising:

a first fixture having a plate disposed to make substantially intimate contact with a first end of a tubular specimen;

striking means for striking the plate in order to excite stress waves in the first end of said tubular specimen;

a first accelerometer, operative in response to said striking means, for detecting when the striking means strikes the plate and for generating a first output signal thereupon;

a second fixture for maintaining a second accelerometer in

substantially intimate contact with a second end of the tubular specimen;

said second accelerometer disposed for detecting the arrival of the stress waves at the second end of the tubular specimen and, in response thereto, producing a second output signal,

means, operative in response to said first and second output signals, for measuring a value of transit time for the stress waves to propagate from said first end through said tubular specimen and to the second end thereof;

means, responsive to said measured transit time value and predetermined numerical data, for determining a value of Young's modulus of said tubular specimen for use in determining whether said specimen possesses a Young's modulus value existing within a pre-determined range and is therefore suitable for use as a flow tube within the Coriolis mass flow rate meter; and

wherein either said first fixture or second fixture comprises:

clamping means having spring-loaded opposing jaws that substantially conform to and grip an exterior surface of the tubular specimen, each of said jaws having a predefined number of through holes therethrough and a layer of resilient material existing on a surface thereon for abuttingly contacting said exterior surface of said specimen;

a number of tie rods equal in number to the number of said through holes, each of said tie rods having a first and second end, the first end of each of said tie rods passing through a corresponding one of said through holes and slidably positioned within the jaws such that all of the tie rods extend outward from said jaws in a direction substantially parallel to a longitudinal axis of the tubular specimen;

a compression spring encircling the first end of each of said tie rods and positioned between said first end of each tie rod and the jaw;

means for retaining the compression springs on the first ends of said tie rods;

a plate, having a contact surface and a number of through holes corresponding to the through holes existing in the clamping means, for receiving the second ends of each of the tie rods, the plate being positioned adjacent the second ends of all the tie rods such that the plate is positioned approximately perpendicular to the longitudinal axis of the tubular specimen, the diameters of the through holes in the plate and those of the tie rods being dimensioned so as to permit angular motion of the tie rods with respect to the plate thereby lowering an amount of force required to open the jaws; and

means for maintaining the plate in substantially intimate contact with either said first or second end of the tubular specimen.

4,899,589

SEMI-AUTOMATIC FOR ULTRASONIC MEASUREMENT OF TEXTURE

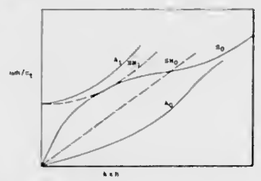
R. Bruce Thompson; John F. Smith, both of Ames, Iowa; Seung S. Lee, Taejon Ch'ungnam, Rep. of Korea, and Yan Li, Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa

Filed Apr. 29, 1988, Ser. No. 188,495
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—597 **29 Claims**

1. A method for measuring texture of polycrystals of various crystallite symmetries, using non-destructive ultrasonic investigation of the material, comprising the steps of:

measuring the velocity of ultrasonic energy waves of low order modes of the material in one or more directions;

measuring velocity dispersion of higher order modes of the material; and



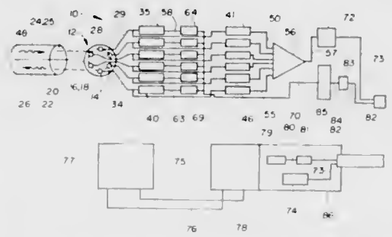
deriving texture characteristics from said measurements of velocity and said velocity dispersion.

4,899,590

PUMP SHAFT INSPECTION SYSTEM

Glenn M. Light; Edward A. Bloom, both of San Antonio, Tex., and Soung-Nan Liu, Freemont, Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Nov. 15, 1988, Ser. No. 271,940
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—622 **2 Claims**



2. A method for inspecting a solid shaft for physical defects comprising the steps of:

positioning a matrix of transducers within a predetermined range of one another to form a transducer head having an aperture for generating bulk longitudinal acoustic waves into a solid shaft from a substantial surface area of the shaft exposed at one end whereby longitudinal acoustic waves travel in the direction of the longitudinal axis of the solid shaft,

coupling each transducer to the output of a respective pulser for applying a voltage across said transducer for generating bulk longitudinal acoustic waves,

coupling each said transducer to the input of a respective preamplifier for amplifying electrical signals generated across said transducer in response to the receipt of reflected acoustic waves,

coupling an output of each said preamplifier to a respective input of a summing amplifier to provide the algebraic sum of the input signals at an output of the summing amplifiers,

coupling the input of each said pulser to the output of a respective pulse width modulator,

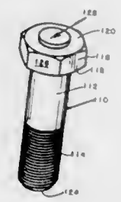
coupling a trigger pulse to the input of each said pulse width modulator whereby the pulse width modulator generates a shaped pulse of predetermined width with respect to its respective transducer it is driving to compensate for variations in transducer parameters.

4,899,591

ULTRASONIC LOAD INDICATING MEMBER, APPARATUS AND METHOD

Ian E. Kibblewhite, Ambler, Pa., assignor to SPS Technologies, Inc., Newtown, Pa.

Division of Ser. No. 96,181, Sep. 11, 1987, Pat. No. 4,846,001.
This application Feb. 9, 1989, Ser. No. 308,356
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—761 **33 Claims**



1. A method of making a load indicating fastener from a fastener having a head and a shank extending from the head, said shank being subjected to elastic deformation when stressed longitudinally such that one portion thereof moves relative to another portion thereof, said method comprising the steps of:

forming a first flat surface on said head and a location remote from said shank, said first flat surface being normal to the longitudinal axis of said shank;

forming a piezoelectric sensor by applying a first and a second electrode means to opposite faces of a piezoelectric disk; and

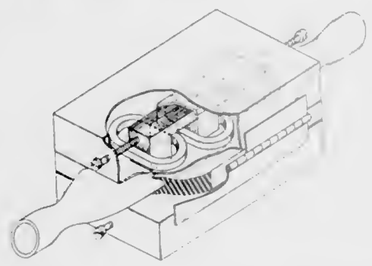
permanently, acoustically, and mechanically interconnecting said piezoelectric sensor to said head of said fastener such as to electrically interconnect a first electrode of said piezoelectric sensor with said head and, further, such as to isolate said second electrode from said head.

4,899,592

FLAT LINEAR FLOWMETER

Hugh C. Behrens, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1985, Ser. No. 741,939
Int. Cl.[4] G01F *1/58*
U.S. Cl. 73—861.11 **4 Claims**



1. An electromagnetic flowmeter for use in measuring the flow of molten metal, said metal melting above about 500° C. and having inducible electromagnetic properties, said flowmeter having no cooling associated therewith, which comprises:

a nonmagnetic tubular member flattened in its central portion having arranged about its flattened external surfaces

a pair of cobalt alloy electromagnetic core members each being comprised of a multiplicity of fingered laminates having an odd number of fingers, which odd number is at least three, the laminates electrically insulated from each other by a mica which as been heated to above about 500° C. (932° F.) in the presence of an oxidizing gas for from about 1 to 24 hours until substantially free of sooty formation visible when heated to 500° C. (932° F.) in an argon atmosphere and assembled into a single member,

an electric current carrying flat deoxygenated copper coil of windings about the finger of each electromagnetic core member which coil is likewise insulated between windings with said mica,

an exterior housing encompassing each of the wound laminated core members and coils from the environment,

a wire in electrical contact with the copper coils about the odd numbered fingers of the core sealably extending through such housing for connection to a single phase alternating current source,

a pair of low resistance electrical current carrying wires connecting the coil(s) on the even numbered finger(s) with a current measuring device,

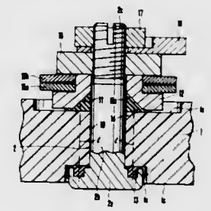
the odd numbered coils being wound in a manner to produce a magnetic field across the path of the molten metal and a flux perpendicular to the flow path of the molten metal when a stream of the molten metal is within the tubular member while the coils are energized from the single phase alternating current source, and the even numbered coil(s) having a sensitive axis which detects the flux formed by the induced current loop formed in the flowing metal and forms an output signal related to the induced current loop as modified by the flow rate of the molten metal.

4,899,593

ELECTRODE STRUCTURE FOR ELECTROMAGNETIC FLOWMETER

Toshihide Inami, and Tsutomu Goto, both of Tokyo, Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1989, Ser. No. 320,347
Claims priority, application Japan, Mar. 17, 1988, 63-61984
Int. Cl.[4] G01F *1/58*
U.S. Cl. 73—861.12 **3 Claims**



1. An electrode structure for an electromagnetic flowmeter, comprising:

a ceramic measuring pipe having an electrode insertion hole in a wall thereof;

an insertion electrode having a large-diameter liquid contact end exposed inside said ceramic measuring pipe and an electrode shaft inserted into said electrode insertion hole from the inside of said ceramic measuring pipe;

a press member fitted on said electrode shaft extending outside said ceramic measuring pipe and opposing said electrode liquid contact end through the wall of said ceramic measuring pipe, said press member having a groove provided adjacent to said insertion electrode on a side which is in contact with an outer surface of said ceramic measuring pipe, said groove being defined by a tapered surface whose diameter is increased toward said ceramic measuring pipe;

an inner gasket contacting a surface of said electrode liquid

contact end which is in contact with an inner wall surface of said ceramic measuring pipe; and

an outer gasket fitted in a space defined by said groove of said press member, the outer surface of said ceramic measuring pipe, and said insertion electrode in said groove so as to be urged against the outer surface of said ceramic measuring pipe,

wherein points of forces acting on the inner and outer surfaces of said ceramic measuring pipe are substantially aligned with each other when said inner and outer gaskets are fastened.

4,899,594

DEVICE FOR MEASURING THE CUTTING FORCES ON MACHINE TOOLS

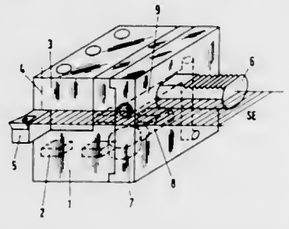
Peter Wolfer, Kleinandelfingen; Hans P. Pfeifer, Andelfingen, both of Switzerland; Günter Spur, Berlin, Fed. Rep. of Germany; Jan C. Siebert, Berlin, Fed. Rep. of Germany, and Klaus-Jürgen Beuzinger, Berlin, Fed. Rep. of Germany, assignors to Kistler Instrumente, Winterthur, Switzerland

Filed Dec. 22, 1988, Ser. No. 288,446

Claims priority, application European Pat. Off., Dec. 22, 1987, 8711903.1

Int. Cl.[4] G01L *5/16;* B23Q *17/09*

U.S. Cl. 73—862.06 14 Claims



1. Device for measuring at least one force component in cutting operations on machine tools comprising:

a modular-assembled toolholder connecting a cutting tool to a machine;

a base module of said toolholder includes a dynamometer integrated therein;

a clamping module of said toolholder for clamping a cutting tool at a first interface with said base module against said dynamometer; and

a mounting module of said toolholder joined at a second interface with said base module for mounting said toolholder to said machine.

4,899,595

MODULAR DYNAMOMETER WITH EXTENDED TESTING RANGE

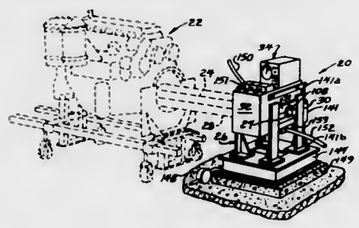
Arthur J. Warsaw, 131 E. Main St., Colfax, Ill. 61728

Filed Feb. 17, 1989, Ser. No. 311,761

Int. Cl.[4] G01L *3/20*

U.S. Cl. 73—862.14 23 Claims

1. A dynamometer comprising: a closed housing containing a working liquid; a rotatable shaft positioned within and extending out of said housing in a sealed manner, wherein said shaft is coupled to and rotationally displaced by a prime mover having a given output power; a plurality of modules disposed within said housing and coupled to said shaft along the length thereof, wherein the number of modules coupled to said shaft establishes an output power measuring range of the dynamometer, with a larger number of modules coupled to said shaft for larger output powers of the prime mover; coupling means for connecting said modules to said housing and said shaft in a manner which facilitates installation in and removal from the dynamometer of one or more of said modules in matching the dynamometer's output power measuring range with the prime mover's output power; and means coupled to said housing and



responsive to rotation of said shaft for measuring the output power of a prime mover.

4,899,596

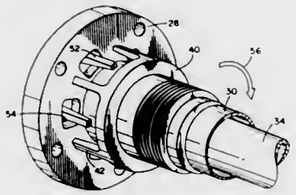
SELF-CALIBRATING TORQUE MEASURING SYSTEM

Stanley Janik, Naugatuck; Kimball J. Rumford, Fairfield, and Timothy Warner, Newtown, all of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed May 4, 1988, Ser. No. 189,976

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.33 20 Claims



1. A universal torque measuring system for hollow drive shafts which automatically compensates for variations in wall thickness exhibited by different drive shafts having the same nominal dimensions comprising:

a hollow drive shaft having a longitudinal axis and a plurality of first indicia thereon at spaced peripheral locations;

an elongated reference shaft coaxial with said drive shaft and having a plurality of second indicia thereon at spaced peripheral locations and proximately disposed relative to said first indicia, said reference shaft being fixed to said drive shaft at a location distant from said first and second indicia such that relative angular displacement of said first and second indicia about said longitudinal axis without regard to the wall thickness of said drive shaft when said drive shaft is subjected to a first predetermined torque produces an initial phase shift, said initial phase shift and said first predetermined torque defining a first operating condition, a second phase shift resulting when said drive shaft is subjected to a second predetermined torque, said second phase shift and said second predetermined torque defining a second operating condition of said drive shaft, said first and second operating conditions defining a characteristic relationship between torque and phase shift for said drive shaft;

sensor means for detecting deviations from said initial phase shift as said drive shaft is rotated under load and operable to generate a signal proportional to each such deviation; and

signal processing means responsive to said signals from said sensor means for automatically deriving a value of torque

being experienced by said drive shaft as a function of each such deviation according to said characteristic relationship.

4,899,597

TORQUE SENSOR

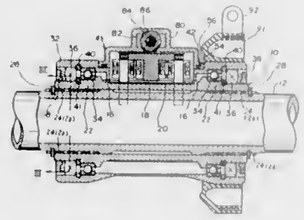
Toru Yagi, and Hideo Matsuki, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,682

Claims priority, application Japan, Feb. 27, 1987, 62-045814; Feb. 27, 1987, 62-045815; Feb. 27, 1987, 62-045816; Feb. 27, 1987, 62-045817

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.36 13 Claims



1. A torque sensor for measuring torque applied to a shaft, comprising:

a tubular member detachably mountable on the shaft to receive a transmission of rotation of the shaft;

a magnetostrictive element fixed at the outer wall of the tubular member responsive to stress caused by the shaft rotation;

an enclosure member housing the tubular member independently of its rotation, said enclosure member having an opening closable by a cover; and

means for detecting change of magnetization of the element to measure torque applied to the shaft, said means being positioned at the inner wall of the cover keeping a predetermined distance from the element, wherein said inner wall of the cover on which said detecting means is positioned, is made flat,

wherein said cover is sealed by an O-ring.

4,899,598

APPARATUS FOR MEASURING TORQUE APPLIED TO A SHAFT

Anand V. Gumaste, Plainsboro, and Izrail Tsals, Princeton Junction, both of N.J., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 4, 1988, Ser. No. 228,093

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.36 6 Claims

5. An apparatus for sensing the torque applied to a shaft, comprising:

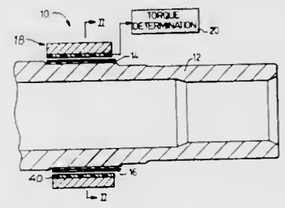
a magnetostrictive material sheet;

a nonferromagnetic sheet being bonded on one side to said magnetostrictive sheet and being bonded on the other side to said shaft;

means for inducing an alternating magnetic flux in said magnetostrictive sheet including a plurality of series connected primary coils disposed concentrically at a predetermined distance about said magnetostrictive sheet;

means for sensing an alternating magnetic flux in said magnetostrictive sheet including a plurality of series connected secondary coils disposed concentrically at a predetermined distance about said magnetostrictive sheet;

feedback means for controllably maintaining the magnitude of said induced alternating magnetic flux to a preselected level;



means for detecting a difference between said induced and sensed magnetic flux, and determining the torque applied to said shaft in response to said difference in magnetic flux of said magnetostrictive material sheet.

4,899,599

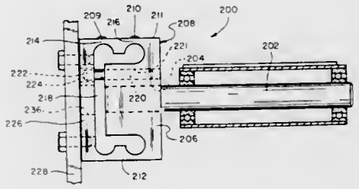
STRAIN FORCE SENSOR MEANS

Gerald R. Eddens, St. Louis, Mo., assignor to Magnetic Power Systems, Inc., Fenton, Mo.

Filed Dec. 7, 1987, Ser. No. 129,472

Int. Cl.[4] G01L *5/10, 1/22, 1/26*

U.S. Cl. 73—862.48 38 Claims



1. A load sensor device and a shaft member supported thereby over and around which a web extends and moves whereby tension on the web exerts force on the shaft member and on the load sensor device, the sensor device including a block of metal material having an opening extending therethrough to form first and second pairs of opposed and connected block portions, one portion of the first pair having means for attaching the block to a supporting structure, the other portion of said first pair having a cross bore therethrough for receiving a portion of the shaft member therein, the second pair of opposed block portions connected at spaced locations to the first pair of block portions whereby the first pair of block portions are allowed movement in parallel relation to each other when pressure is applied to the shaft member and to the block portion that provides support therefor while the second pair of block portions undergoes parallel deflection, means forming areas of reduced cross-section in at least a portion of the second pair of block portions, transducer means attached to the block adjacent to selected ones of areas of reduced cross-section to generate responses representative of the deflection produced in the respective areas of reduced cross-section when the other portion of said first pair of block portions moves under load relative to the portion of the first pair attached to the support structure, and means to limit the amount of relative movement that can take place between the first pair of block portions.

4,899,600

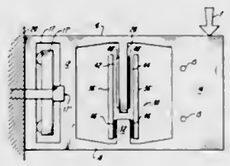
COMPACT FORCE TRANSDUCER WITH MECHANICAL MOTION AMPLIFICATION

Shih-Ying Lee, Lincoln, Mass., assignor to Setra Systems, Inc., Acton, Mass.

Continuation-in-part of Ser. No. 694,927, Jan. 25, 1985, Pat. No. 4,649,759, which is a continuation of Ser. No. 494,450, May 13, 1983, Pat. No. 4,588,600, which is a continuation-in-part of Ser. No. 359,611, Mar. 18, 1982, Pat. No. 4,463,614, which is a continuation-in-part of Ser. No. 265,087, May 19, 1981, Pat. No. 4,448,085. This application Mar. 16, 1987, Ser. No. 25,846

Int. Cl.[4] G01L *1/14;* **G01G** *3/08*

U.S. Cl. 73—862.64 **10 Claims**



1. A force transducer comprising

a pair of rigid force summing members formed of a material which extend generally in a first direction with one of said force summing members receiving a force-to-be-measured along the first direction;

first and second beam members;

said force summing members coupling said beam members to form a parallelogram structure whereby said force-to-be-measured causing said beam members to flex resiliently to produce a relative displacement d of the force summing members with respect to one another measured along said first direction and to produce a counter force to the force-to-be measured, said parallelogram structure being highly resistant to moments and forces tending to cause movement of said beam members not along the first direction,

first and second sensor members rigidly each coupled to an associated one of said first and second beam members when it is flexed through the application of the force-to-be-measured,

a plurality of conductive plates,

said first beam member supporting two of said conductive plates on opposite sides of said first sensor member, and said second sensor member having two arm portions positioned on opposite sides of said first sensor member and each supporting another one of said conductive plates disposed in parallel spaced relationship with said conductive plates on said first sensor member to produce two variable capacitance gaps g, whereby the displacement d simultaneously produces a closing of one of said gaps g and the opening of the other of said gaps g,

said members being oriented and coupled such that conductive plates in said parallel spaced relationship remain substantially parallel during a change Δg in said spacing g in response to said displacement d and Δg, and therefore the associated capacitance, is proportional to the force-to-be-measured.

4,899,601

SAMPLE COLLECTOR

Sun Y. Lee, Arvada, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Feb. 23, 1989, Ser. No. 314,548

Int. Cl.[4] G01N *1/10*

U.S. Cl. 73—864.63 **13 Claims**

1. A sample collector for collecting a sample of a gas-charged liquid from a transmission line through which said liquid is flowing, with said transmission line having a self-closing entry means for insertion of a bored needle through which said liquid can flow, said sample collector comprising:

(a) a cylindrical chamber means for receiving and storing the liquid;

(b) a tube having a first and a second end, wherein the first end thereof has securement means for removably securing it in a leak-proof manner within the chamber means and is positioned and configured so that liquid flowing from said first end is angularly directed against the inside wall of the chamber means to create a downwardly-directed spiral flow along said inside wall, and wherein the second end



thereof has attached thereto a value housing having valve means for controlling liquid flow through the tube, said valve housing additionally having a forward end having needle reception means for releasably securing a bored needle thereto so that the bore of the needle is in communication with the bore of the tube when the valve means is in an open position, with said tube having a relationship between linear length and bore magnitudes conducive to the inhibition of foaming of the gas-charged liquid flowing therethrough into the chamber means; and

(c) a bored needle releasably secured to the forward end of the valve housing.

4,899,602

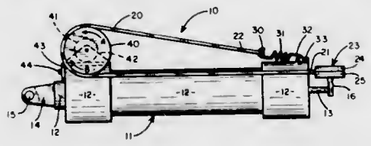
INDICATOR FOR MONITORING LINEAR ACTIVATOR POSITION

Norman Fender, Hudson, Mich., assignor to Graco Robotics, Inc., Livonia, Mich.

Filed Mar. 24, 1989, Ser. No. 328,495

Int. Cl.[4] G01M *19/00;* **G01B** *5/00*

U.S. Cl. 73—865.9 **5 Claims**



1. An indicator for monitoring the position of a linear actuator having a relatively stationary cylinder housing and a piston rod with an actuating, linearly-movable end, comprising:

(a) a rotatable shaft in a housing, said housing affixed to said stationary cylinder housing with said rotatable shaft positioned transverse to the direction of movement of said linearly-movable end;

(b) a toothed sprocket mounted to said shaft;

(c) a rotatable means coupled to said rotatable shaft, for generating signals representative of the position of said rotatable shaft;

(d) a toothed chain having a first end affixed to said linearly-movable end, and engaged about said toothed sprocket, and having a second end; and

(e) tension spring means for applying extensible tension to said toothed chain, said tension spring means having a first end connected to said cylinder housing and a second end connected to said toothed chain second end.

4,899,603

STARTING ELECTRIC MOTOR

Shuzoo Isozumi; Keiichi Konishi, and Akira Morishita, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1988, Ser. No. 238,432

Claims priority, application Japan, Aug. 31, 1987, 62-133385[U]; Aug. 31, 1987, 62-133386[U]

Int. Cl.[4] F02N *15/06*

U.S. Cl. 74—6 **7 Claims**



1. A starting electric motor of an overhang type, comprising:

a front bracket;

a first bearing fitted in said front bracket;

an overrunning clutch having a clutch outer with a helical spline;

a rotary shaft including a helical spline part engaged with the helical spline of said clutch outer, a small diameter part smaller in diameter than said helical spline part, and a stepped part provided between said helical spline part and said small diameter part, said stepped part being smaller in diameter than said spline part and larger than in diameter than said small diameter part;

a hollow movable pinion cylinder mounted on said rotary shaft and engageable with a ring gear of an engine, said hollow movable pinion cylinder including a clutch inner part having an inner wall and forming a part of said overrunning clutch, a cylindrical part having an inner wall and axially slidable in said first bearing, and a pinion part having an inner wall and engageable with said ring gear, said pinion part being smaller in inner diameter than said clutch inner part and said cylindrical part;

a second bearing fitted in the inner wall of said cylindrical part of said movable pinion cylinder and slidable on said small diameter part of said rotary shaft, in which a first minute gap is provided between said small diameter part of said rotary shaft and the inner wall of said pinion part of said movable pinion cylinder, a second minute gap is provided between said stepped part of said rotary shaft and said inner wall of said clutch inner part of said hollow movable pinion cylinder, and a third gap between said small diameter part of said rotary shaft and said inner wall of said cylindrical part of said movable pinion cylinder and housing said second bearing, with said first and second gaps being smaller than said third gap.

4,899,604

ENGINE STARTER

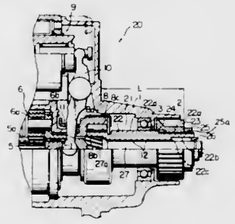
Akira Morishita; Hiroyuki Morikane, and Yoshiaki Kittaka, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,380

Claims priority, application Japan, Jan. 21, 1988, 63-6461[U]

Int. Cl.[4] F02N *15/06*

U.S. Cl. 74—7 A **5 Claims**



1. A starter motor, comprising:

a housing **(1)**;

an electric motor **(5)** having an output rotary shaft **(27)** and mounted within said housing;

an over-running clutch **(8)** axially slidably mounted on said output rotary shaft;

a solenoid switch **(9)** for shifting said over-running clutch;

a pinion shifter assembly **(21)** having a cylindrical shifter main body **(22)** disposed surrounding and in slidable and rotatable engagement with said output rotary shaft, and disposed within and in slidable and rotatable engagement with a bearing **(3)** mounted in an outer end of said housing, said shifter main body being connected att one end thereof to said over-running clutch, and,

a pinion **(23)** detachably mounted on another opposite end of said shifter main body extending outwardly of said bearing and housing for rotation with said shifter main body, said pinion being externally accessible and removably assembled on said another end of said shifter main body.

4,899,605

STARTER WITH PLANET GEAR SPEED REDUCER

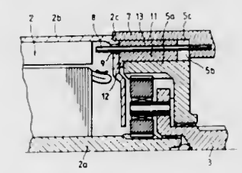
Toshinori Tanaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 331,328

Claims priority, application Japan, Apr. 19, 1988, 63-53415[U]

Int. Cl.[4] F02N *15/06;* **F16H** *1/28;* **F16J** *15/06*

U.S. Cl. 74—7 E **1 Claim**



1. A starter with a planet gear speed reducer in which a front frame thereof is fixedly secured to a periphery of a end face of an electric motor with penetrating bolts which penetrate said electric motor, which comprises:

a cylindrical packing of elastic material arranged adjacent to an end face of said electric motor and fitted on an outer cylindrical wall of an internal gear;

wherein said cylindrical packing has protrusions which are radially outwardly extended from a cylindrical wall of said packing and have holes into which said penetrating bolts are inserted;

said end face of said electric motor has an engaging part which, when said front frame is fixedly secured to said end face of said electric motor with said penetrating bolts, is engaged with said front frame so that said protrusions of said cylindrical packing are inscribed in said front frame and a inner cylindrical walls of said holes formed in said protrusions are brought into close contact with said penetrating bolts; and

said packing is compressed by said end face of said motor and a flange which is radially outwardly extended from a front edge of said outer cylindrical wall of said internal gear.

4,899,606

APPARATUS FOR ASSEMBLING PARTS AND DISCHARGING ASSEMBLED PARTS

Marion K. Harris, P.O. Box 2017, Atascadero, Calif. 93423

Filed Sep. 19, 1988, Ser. No. 245,507

Int. Cl.[4] F16H *19/08*

U.S. Cl. 74—29 **8 Claims**



1. Apparatus for cyclically advancing and retracting a ram in multiple steps, said apparatus comprises:

a flywheel rotatably mounted on its central axis;

a first connecting rod having one end rotatably connected to said flywheel a selected distance, D, from the central axis of said flywheel;

a toothed rack mounted in a fixed position;

a pinion gear having teeth therearound mating with the teeth of said toothed rack, a second end of said first connecting rod rotatably connected to the central axis of the pinion gear for imparting reciprocating motion to the pinion gear along the toothed rack as said flywheel is rotated, the pinion gear having a pitch circumference, C, equal to (2D)/N wherein N is the ratio of revolutions of said pinion gear in half revolution steps to the revolutions of said flywheel with N having an integer value of at least 2;

an arm having one end affixed to the central axis of said pinion gear;

a second connecting rod having one end rotatably connected to a second end of said arm with a second end of the second connecting rod extending away from said flywheel; and

a ram slidably mounted on a fixed surface with the second end of said second connecting rod rotatably connected to the ram.

4,899,607

ELECTRICALLY CONTROLLED PRESSURIZED FLUID ACTUATED X-Y SHIFTING MECHANISM

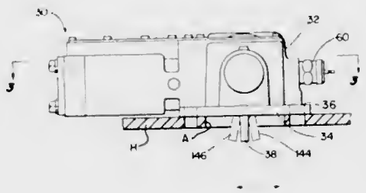
John E. Stainton, Euxton, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 24, 1988, Ser. No. 261,454

Claims priority, application United Kingdom, Nov. 5, 1987, 8725981

Int. Cl.[4] F16H *5/78, 5/80;* **G05G** *9/12*

U.S. Cl. 74—335 **10 Claims**



1. An X-Y shifting mechanism (**30**) for controlling the shifting of mechanical change gear transmission of the type comprising a shift bar housing assembly (**10**) having three substantially parallel shift rails (**12, 14, 16**) axially movable in a first axial direction (Y—Y) in a shift bar housing, each of said rails having a shift fork (**18, 20, 22**) associated therewith and a block mechanism (**24, 26, 28**) engagable by the inner end of a manually operated shift lever movable in a second direction (X—X) substantially perpendicular to said first direction to be aligned with a selected one of said block mechanisms and in said first direction to move the selected one of said shift rails from a first axially nondisplaced position to a second position axially displaced in one direction along said first axis (Y—Y) or to a second position axially displaced in the opposite direction along said first axis;

said X-Y shifting mechanism (**30**) characterized by:

a shift mechanism housing (**32**), mountable to said shift bar housing at the opening thereof provided for said shift lever, a shift finger (**38**) extending from said X-Y shift mechanism housing (**32**) for extension through said opening and cooperation with said block mechanism;

a first shaft (**68**) axially movable in said first axial direction (Y—Y) in said shift mechanism housing, said shift finger (**38**) fixed to first shaft (**68**) for axial movement therewith, said shift finger pivotably movable about the axis of (**142**) said first shaft;

a second shaft (**110**) axially movable in said second axial direction (X—X) in said shift mechanism housing, said second shaft having means (**132**) axially movable therewith engaging said shift finger at a point (**140**) offset the axis (**142**) of said first shaft to a first position aligned with a first shift rail block mechanism, a second position aligned with a second shift rail block mechanism and a third position aligned with a third shift rail block mechanism;

a first electrically controlled pressurized fluid actuated control (**46**) for selectively positioning said first shaft in any selected one of three different selectable axial positions along said first axial direction, said first control comprising a first piston and cylinder assembly defining three (**86, 88, 94**) selectively pressurized first chambers and three electrically controlled first valves (**150, 152, 154**) for selectively independently pressurizing and exhausting said first chambers.

a second electrically controlled pressurized fluid actuated control (**42**) for selectively positioning said second shaft in any selected one of three different selectable axial positions along said second axial direction, said second control comprising a second piston and cylinder assembly defining three selectively pressurized and exhausted second chambers (**116, 118, 122**) and three electrically controlled second valves (**156, 158, 160**) for selectively independently pressurizing and exhausting said second chambers.

4,899,608

GEAR ARRANGEMENT, IN PARTICULAR FOR USE IN CONNECTION WITH MOTOR VEHICLE WINDOW LIFTER DRIVES

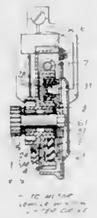
Wolfram Knappe, and Alfred Kümmel, both of Kitzingen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 18, 1987, Ser. No. 98,493

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632501

Int. Cl.[4] F16D *3/68;* **F16H** *55/14;* **E05F** *11/38*

U.S. Cl. 74—411 **8 Claims**



1. In a gear arrangement for use in connection with a motor vehicle window lifter drive and including an output shaft rotatably mounted in a gear box and arranged to corotate by means of an axially interposed cushioning disk with a drive gear driven by a driveshaft; said gear box and said cushioning disk providing axial support for said output shaft; and improvement, which comprises: axially projecting spring lips distributed over the circumference of said cushioning disk and acting to develop a defined preloading pressure upon said output shaft, cushioning disk and drive gear; wherein said spring lips extend tangentially on the cushioning disk.

4,899,609

GEARS HAVING A TOOTH-PROFILE WITH A SMALLER RELATIVE OF CURVATURE AT A CONTACT POINT

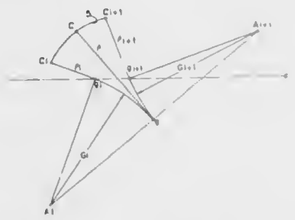
Shigeyoshi Nagata, Tokyo, Japan, assignor to Kyouiku Hagiruma Kogko Kabushiki-Kaisha, Tokyo, Japan

PCT No. PCT/JP86/00555, § 371 Date Mar. 18, 1988, § 102(e) Date Mar. 18, 1988, PCT Pub. No. WO88/03239, PCT Pub. Date May 5, 1988

PCT Filed Oct. 31, 1986, Ser. No. 170,407

Int. Cl.[4] F16H *55/00*

U.S. Cl. 74—462 **8 Claims**



1. A gear having a pitch line and, at least one tooth that has a tooth profile,

said tooth profile comprising a multiplicity of sections joined together, wherein the length of each section constitutes a relatively small percent of the tooth profile,

each said section having an outer surface the shape of which is defined as follows:

each such shape being substantially the same as the shape of the involute of an arc of a base circle having a center, and the centers for the arcs corresponding to every other one of said sections being on one side of said pitch line and the remaining centers being on the other side of said pitch line.

4,899,610

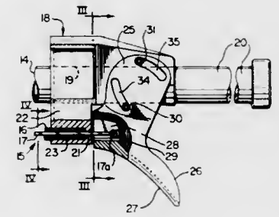
THROTTLE LEVER

Michel Bourret, Drummondville, Canada, assignor to Bombardier Inc., Canada

Filed Sep. 28, 1988, Ser. No. 250,266

Int. Cl.[4] G05G *11/00, 5/06*

U.S. Cl. 74—489 **11 Claims**



1. In a vehicle having a steering mechanism that includes handlebars terminating in handgrips for engagement by the driver's hands, a throttle lever being pivotally mounted on a mounting bracket attached to the handlebars and spring loaded towards a closed position, said throttle lever being located adjacent one said handgrip such that when said one handgrip is grasped by the corresponding hand of the driver the thumb of that hand is in position to manipulate the throttle lever away from said closed position and thus control operation of the vehicle engine, the improvement comprising: said throttle lever having a proximal end that is bifurcate and defines two generally parallel limbs that straddle a section of said mounting bracket, and a distal end for engagement by the thumb of the driver, the limbs of said throttle lever and the confronting surfaces of said section of the mounting bracket having interengaging formations thereon that define spaced first and second pivot axes, and said throttle lever being adapted to perform a two stage pivotal movement about said first and second pivot axes respectively, said axes being so located that during a first stage of pivotal movement of said throttle lever about said first axis away from the closed position an actuating force applied by the driver's thumb acts at a greater mechanical advantage than during a second stage of pivotal movement thereof about said second axis.

4,899,611

DEVICE FOR THE CORRECT POSITIONING OF THE LOWER STEERING SHAFT ON THE STEERING-BOX PINION AND ON THE UPPER SHAFT

Piero Pinna, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed May 18, 1988, Ser. No. 195,564

Claims priority, application Italy, May 19, 1987, 67432 A/87

Int. Cl.[4] B62D *1/16*

U.S. Cl. 74—492 **1 Claim**

1. A vehicle steering system comprising:

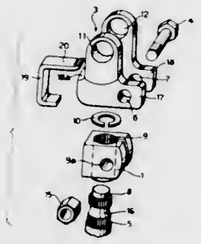
a steering pinion having a splined, cylindrical shank with a circumferential groove,

a split bush having a splined axial hole in which said splined shank of said pinion is engaged and a pair of aligned transverse holes disposed in tangential alignment with said groove,

a steering shaft,

a universal joint connected to said steering shaft and including a fork into which said bush and said shank of said

pinion are fitted, said fork having a pair of aligned holes disposed in alignment with said aligned holes in said bush, a clamping screw engaged in said groove in said shank and extending through said holes in said fork and said bush to connect and clamp said universal joint to said shank, and



reference means comprising a C-shaped bracket welded to said fork and having an upper part arranged to abut said shank of said pinion to determine an exact position wherein said holes in said fork and said bush are aligned for the passage of said clamping screw upon fitting said bush on said shank into said fork.

4,899,612

COVER SLEEVE ARRANGEMENT FOR A VEHICLE STEERING COLUMN

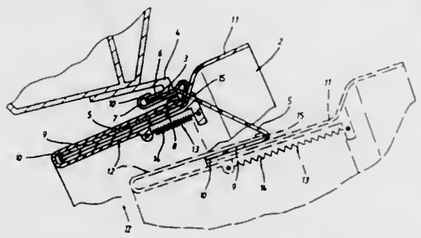
Ulrich Bruhnke, Ehningen; Santiago Duenas, Rottweil; Helmut Fischer, Böblingen; Ferdinand Greiner, Aidlingen; Ingo Jobmann, Grafenau; Jürgen Körber, Sindelfingen; Siegfreid Nothacker, Weil Der Stadt; Jürgen Pfaffenbach, Hemmingen, and Hans Trube, Herrenberg, all of Fed. Rep. of Germany, assignors to Diamler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 236,753

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728457

Int. Cl.⁴ B62D *1/18*

U.S. Cl. 74—493 **12 Claims**



1. Cover sleeve arrangement for the protective covering of a clearance for the passage of a steering column of a motor vehicle through a dashboard, adjustable as to inclination, the cover sleeve covering the clearance smoothly and in a sealing manner from the edge of the clearance up to a casing of the steering column and being configured to follow the movement of the steering column in the plane of the clearance, wherein the cover sleeve is fastened by its end on the clearance side to the rear of the dashboard and by its end on the casing side to the casing so as to be movable with the casing out of the plane of the clearance when there is a longitudinal adjustment of the steering column, and wherein a frame is mounted displaceably in the axial direction of the casing on the end of the casing remote from the steering wheel, behind the cover sleeve, on which frame resilient tensioning element means fixed to the casing can act in its direction of displacement and which frame is engageable against the rear of the cover sleeve by an edge fold and braces said cover sleeve between its fastening ends as soon as the cover sleeve presses onto the frame against the tensile force of the resilient tensioning element means.

4,899,613

STEERING WHEEL ASSEMBLY WITH AN AIR BAG UNIT

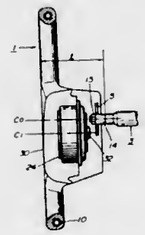
Masaaki Kawaguchi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1987, Ser. No. 20,486

Claims priority, application Japan, Feb. 28, 1986, 61-44771

Int. Cl.⁴ B62D *1/04*; B60R *21/16*

U.S. Cl. 74—552 **6 Claims**



1. A steering wheel assembly with an air bag unit, comprising,

a hub releasably secured onto a steering shaft;

at least one connecting member attached to said hub;

a steering wheel connected to said hub by said at least one connecting member; and

said air bag unit including a casing on said hub, a gas generator mounted in said casing and having a squib projecting substantially centrally downwardly from its lower surface, an air bag attached to said casing and communicating with said gas generator, said air bag being inflated by gas under pressure fed from said gas generator, and a cover adapted to cover said casing,

said gas generator and said squib having central axes axially offset from an axis of rotation of said steering shaft.

4,899,614

PEDAL PAD

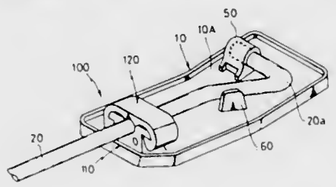
Yoshimasa Kataumi, Kosai, Japan, assignor to Fujikiko Kabushiki Kaisha, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 264,255

Claims priority, application Japan, Oct. 28, 1987, 62-164780[U]

Int. Cl.⁴ G05G *1/14*

U.S. Cl. 74—560 **2 Claims**



1. A pedal pad attached to a pedal arm, which comprises:

(a) a pedal base plate;

(b) an arm end bolding portion formed integral with said pedal base plate, for holding an end of the pedal arm; and

(c) an arm clasping portion including:

(1) an arm clasping base portion formed integral with said base plate, for clasping the pedal arm, said arm clasping base portion being a U-shaped projection formed with a hollow arm seat portion at the center thereof and having outside inward and outside outward ends, said outside inward ends of the U-shaped projection being chamfered for providing an easy insertion of the pedal arm into the hollow arm seat portion and said outside outward ends of the U-shaped projection being formed with hook engagement portions;

(2) an arm securing cover portion for covering said arm clasping base portion to further secure the pedal arm into hooking engagement with said arm clasping base portion, said arm securing cover portion being a bow-shaped member having a hinge portion integral with the base plate, an arcuate central inside portion of the bow-shaped member being adapted to fit between the two chamfered portions of the U-shaped projection of said arm clasping base portion for securing the pedal arm into the hollow arm seat portion, the distal end of the bow-shaped member having a hook portion and a second hook portion adjacent the hinge portion, said hook portions being adapted to be brought into hooking engagement with the hook engagement portions of said arm clasping base portion; and

(d) an arm side stopping portion formed integral with said pedal base plate at a roughly middle portion thereof.

4,899,615

DEVICE FOR ASSEMBLING A CAM MEMBER WITH A CAM SHAFT

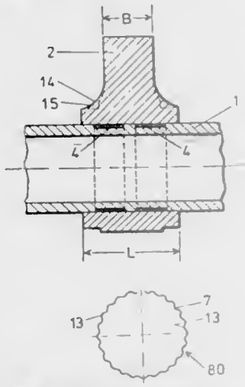
Lukas Matt, Eschen, Fed. Rep. of Germany, assignor to Etablissement Supervis

Continuation of Ser. No. 916,289, Oct. 7, 1986, abandoned. This application Dec. 28, 1988, Ser. No. 290,849

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536296

Int. Cl.⁴ F16H *53/00*

U.S. Cl. 74—567 **1 Claim**



1. A cam shaft assembly comprising:

a shaft member having an outer diameter defined by an outer wall thereof;

at least one cam member rigidly attached to said shaft member by a soldered connection, said cam member having an inner wall defining an axial bore extending therethrough with a cross-sectional profile corresponding to said outer wall of said shaft member and with a diameter which is slightly larger than said outer diameter of said shaft member sufficient to permit said shaft member to be placed to within said axial bore with a loose fit during assembly of said shaft member and said cam member;

recess means formed within said axial bore on said outer wall of said shaft member; and

joinder means including solder located within said recess means for fixing said cam member and said shaft member together, said joinder means comprising an annular piece having solder receptor means therein for holding the solder during assembly of said shaft member and said cam member, said annular piece being constructed from an axially split spring steel strip, said spring steel strip being formed with a corrugated configuration, said solder receptor means being axially extending concavities defined in said spring steel strip within which solder may be introduced and retained during heating of said joinder means to effect joinder of said cam member and said shaft member, said annular piece having an outer diameter when located within said recess means which is slightly larger than the diameter of said axial bore in said cam member so as to effect a press fit with said cam member during assembly thereof with said shaft member.

4,899,616

PRESS WITH STROKE CONTROL DEVICE

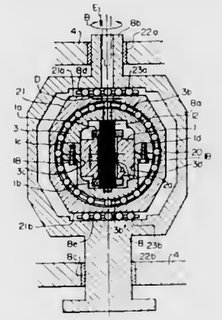
Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,162

Claims priority, application Japan, Dec. 29, 1987, 62-333166

Int. Cl.⁴ G05G *1/00*; B30B *5/00*

U.S. Cl. 74—571 L **1 Claim**



1. A press with a stroke control device comprising:

a drive shaft adapted to be rotatingly driven and having an eccentric member mounting portion;

an eccentric member fitting on said eccentric member mounting portion, said eccentric member having an outer peripheral surface which is at an eccentricity with respect to said drive shaft and sliding surfaces which are in vertical sliding engagement with both side surfaces of said eccentric mounting portion;

a cross slide embracing and rotatably supporting said eccentric member;

a slide having a hollow portion which surrounds said cross slide and supports said cross slide for lateral movement therein, said slide being slidable up and down while supporting said cross slide which moves laterally when said eccentric member rotates within said cross slide together with said drive shaft;

a gear shaft vertically extending through said eccentric member mounting portion and provided with spline-type gear teeth on upper and lower end portions thereof, said gear shaft being rotatably supported at its upper and lower ends thereof by said eccentric member;

a plurality of screw rods arranged on both sides of said gear shaft such as to extend in parallel with said gear shaft through said eccentric member mounting portion, said

screw rods being fixed at their upper and lower ends to said eccentric member; and

gears screwed to upper and lower end portions of said screw rods and meshing with said spline type gear teeth on the upper and lower end portions of said gear shaft, said gears contacting upper and lower end surfaces of said eccentric member mounting portion;

whereby, when said gear shaft is rotated, said gears rotate to cause said screw rods to move up and down relative to said drive shaft together with said gear shaft and said eccentric member so as to cause a change in the amount of eccentricity of said eccentric member with respect to said drive shaft, thereby allowing a control of the length of stroke of said slide.

4,899,617

ROTARY DRIVE TRANSMITTING MECHANISM WITH DAMPING SPRINGS

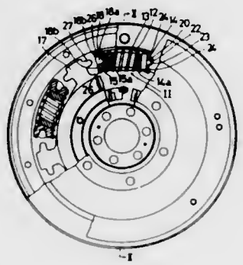
Kiyonori Kobayashi, Chiryu; Masakazu Kamiya, Toyoake, and Junji Kagiyama, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

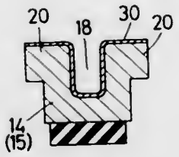
Filed Sep. 30, 1988, Ser. No. 251,405

Claims priority, application Japan, Sep. 30, 1987, 62-150087[U]

Int. Cl.⁴ F16F *15/12*

U.S. Cl. 74—574 **4 Claims**





1. A rotary drive transmitting mechanism comprising rotary drive means adapted to be rotatably driven by an engine; rotary driven means including a flywheel operably connected to said drive means; and damping means including a coil spring operably disposed between said drive means and said drive means in drive transmitting relationship therewith; said spring carrying first and second spring seats at opposite ends thereof for contacting respective ones of said drive means and said driven means, said first seat including a first surface facing said drive means, said second seat including a second surface facing said driven means, and elastic means disposed on said first and second surfaces for suppressing noise tending to occur in response to impact between said first and second seats and said drive means and driven means, respectively, each of said first and second surfaces including concave and convex portions; each of said drive means and said driven means including convex and concave portions facing said concave and convex portions respectively, of said first and second surfaces, said elastic means comprising a first one-piece member covering both said concave and convex portions of said first surface, and a second one-piece member covering both said concave and convex portions of said second surface.

4,899,618

PEDALING UNIT FOR A BICYCLE

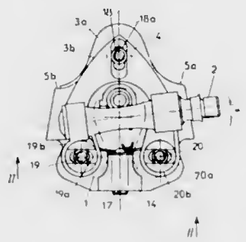
Lilian Caristol, Clermont L'Herault, France, assignor to Societe Manoel Bouchet, S.A., Ladoix Serrigny, France, a part interest

Filed Sep. 6, 1988, Ser. No. 240,914

Claims priority, application France, Sep. 10, 1987, 87 12541

Int. Cl.⁴ G05G *1/14*; B62M *3/08*

U.S. Cl. 74—594.6 **10 Claims**



1. A pedaling unit for a bicycle comprising a pedal crank and a crankset, for use with a shoe having a special sole that comprises a lateral groove on each side of the sole, said unit comprising:

a support mounted on said pedal crank;

a footplate which comprises two lateral guides extending along the branches of a V open toward the rear, each of said lateral guides being adapted to engage with the corresponding lateral groove of said sole;

said footplate comprising a first part which is mounted stationary on said support and which bears the one of said lateral guides which is the nearest to said pedal crank, and a second part which is pivotally mounted with respect to said first part around an axis approximately perpendicular to said first part and which bears the other one of said lateral guides; and

means for locking the shoe with respect to said footplate in the longitudinal direction;

characterized in that it further comprises elastic return means for urging said second part of the footplate to pivot around said axis towards the lateral guide which is borne by said first plate of the footplate.

4,899,619

MANUAL OVERRIDE FOR AN ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION

George Melnik, New Castle, Del.; Bruce E. Amrein, Harford County, Md.; Robert C. Brucksch, Harford, Md.; Curtis L. McCoy, Harford, Md., and James A. Martin, Lancaster, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 31, 1988, Ser. No. 239,570

Int. Cl.⁴ B60K *20/00*

U.S. Cl. 74—625 **9 Claims**

1. For an automatic transmission normally operated by solenoids, an apparatus for mechanically shifting the automatic transmission, comprising:

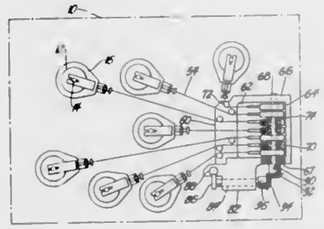
a mounting block on the transmission;

a cam shaft rotatably secured to the mounting block, the cam shaft having a plurality of lobes;

blocks defining apertures surrounding the cam shaft having camming surfaces engageable by the lobes of the cam shaft, whereby the sliding blocks translate when the lobes rotate past the respective camming surfaces;

the lobes being on lines along the cam shaft, the lobes on each line disposed at selected axial locations whereby a selected subset of the sliding blocks translate when the cam shaft rotates to a selected angular position;

solenoid assemblies on the transmission;



a linkage means connected between the solenoid assemblies and the individual sliding blocks for translating the armatures of the solenoid assemblies;

a gear train means for rotating the cam shaft to a selected rotational position, whereby selected solenoid assemblies on the transmission are actuated.

4,899,620

DRIVE FOR A DOUBLE-WORM EXTRUDER

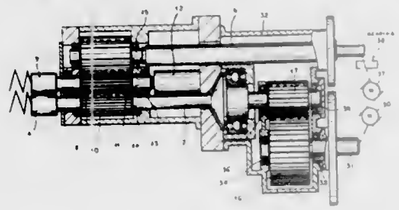
Wernar Schiffer, München, Fed. Rep. of Germany, assignor to Tet Holding Ges.M.B.H., Korneuburg, Austria

Filed Oct. 11, 1988, Ser. No. 256,310

Claims priority, application Austria, Oct. 8, 1987, A2642/87

Int. Cl.⁴ F16H *37/06*

U.S. Cl. 74—665 N **10 Claims**



1. A worm drive for a double-worm extruder, comprising:

a housing;

a relatively long drive shaft journaled in said housing and connected coaxially to a first worm of a double-worm extruder;

a relatively short drive shaft journaled in said housing parallel to said long drive shaft and connected coaxially to a second worm of said double-worm extruder;

a first gear on said long drive shaft and connected thereto;

a second gear on said short drive shaft meshing directly with said first gear and connected to said short drive shaft;

first drive means operatively connected to said long drive shaft for driving same;

a further shaft journaled in said housing parallel to said long and short shafts;

a third gear on said further shaft meshing directly with said second gear, said first, second and third gears having respective axes lying in a common plane; and

second drive means operatively connected to said further shaft for driving same to transmit torque to said second gear, whereby at least some of the torque received by said short shaft is contributed by the second drive means.

4,899,621

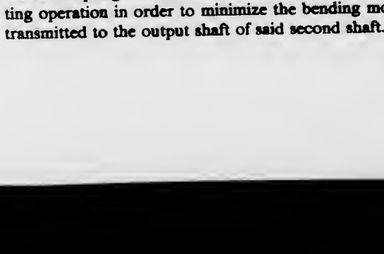
AUTOMATIC TRANSMISSION FOR VEHICLES

Shiro Sakakibara, Toyokawa, Japan, assignor to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Continuation of Ser. No. 81,527, Aug. 3, 1987, abandoned, which is a continuation of Ser. No. 476,541, Mar. 19, 1983, abandoned. This application Feb. 6, 1989, Ser. No. 307,250

Int. Cl.⁴ F16H *37/08*

U.S. Cl. 475—205 **3 Claims**



1. An automatic transmission for a motor vehicle, comprising in combination:

a first shaft rotatably supported by an automatic transmission case and having an input shaft coupled with an engine output shaft, an output shaft disposed coaxially in series with the input shaft, and a first output gear mounted on the output shaft;

a second shaft having a long shaft rotatably provided in parallel with the first shaft, including a second output gear mounted on one end of the long shaft and a short shaft rotatably mounted on the long shaft including an input gear connected to the first output gear such that the axial dimension of said support shaft is reduced;

a differential having a large drive gear connected to the second output gear;

a first speed-changing planetary gear mechanism constituting an underdrive mechanism provided on the first shaft; and

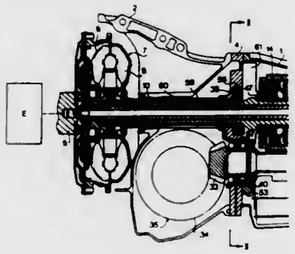
a second speed-changing planetary gear mechanism connecting the short shaft to the long shaft on the second shaft, provided between the one end and the other end of the long shaft, and having a planetary gear set provided with a ring gear, a carrier and a sun gear, one of which is connected to the short shaft close to the first output gear and another of which is connected to the long shaft at the other end;

said long shaft being rotatably supported at the one end and the other end by the transmission case, provided with an axial bore at the one end, and rotatably supported at the axial bore through a bearing by a support shaft projectingly provided on the transmission case, such that the support shaft bears the reaction force imposed on the second output gear at the one end during power transmitting operation in order to minimize the bending moment transmitted to the output shaft of said second shaft.

4,899,622
AUTOMATIC TRANSMISSION FOR A MOTOR VEHICLE

Toshio Kobayashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 52,631, May 20, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 246,308
Claims priority, application Japan, May 23, 1986, 61-119409
Int. Cl.[4] F16H 37/08, 35/08, 55/18, 57/02
U.S. Cl. 475—160 17 Claims



1. In an automatic transmission having an automatic transmission device, an oil pump for supplying hydraulic oil to the automatic transmission device, an input shaft mounted on the transmission device operatively connected with a crankshaft of an engine through a torque converter, a differential mounted between the torque converter and the transmission device and below the input shaft, a ring gear provided on the differential, and a drive pinion shaft provided on the transmission device forming a drive pinion gear engaging with the ring gear to transmit an output of the transmission device to the differential, the improvement of the system comprising:

a differential case defining a differential chamber for mounting the differential and adapted for containing oil for lubricating said differential;

a transmission case defining a transmission chamber for mounting the automatic transmission device and adapted for containing other oil to lubricate the automatic transmission device;

bearing means for rotatably mounting said drive pinion shaft and including a pair of inner races secured to the drive pinion shaft, an adjustable outer race forming a flange member, and rollers disposed between said inner and outer races;

bearing plate means for securing said differential case and the transmission case and forming a recess and an opening to mount said oil pump and said bearing means therein respectively;

adjusting means mounted on the drive pinion shaft for adjusting the inner races;

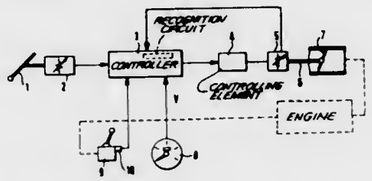
partitioning means for providing a partitioning between said differential and transmission chambers and comprising said bearing means, said adjusting means and a retainer secured to the bearing means; and

sealing means mounted between said adjusting means and said retainer adapted for sealing off said oil and the other oil to prevent mixing of said oils with each other, so as to enable appropriate lubrication of said differential and transmission device, respectively.

4,899,623
CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Andreas Wokan, Darmstadt; Kurt Probst, Schwalbach; Klaus Bluhm, Steinbach, and Manfred Pfalzgraf, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 203,393
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719812
Int. Cl.[4] B60K 41/18
U.S. Cl. 74—860 2 Claims



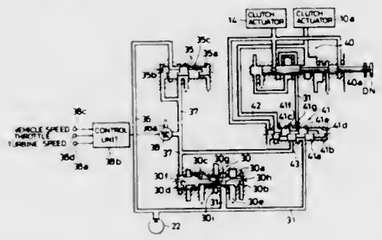
1. In a control system with a conotrolling element for controlling the output of an internal combustion engine followed by transmission for driving a vehicle, the system including a controller responsive to the position of a gas pedal for driving the controlling element for vehicle speeds below a maximum speed limitation, wherein signals are fed to the control system from a speed transmitter in order to implement the maximum speed limitation of the vehicle independently of the position of the gas pedal, the improvement wherein the system comprises

a recognition circuit, there being a neutral-position recognition switch provided on the tranmission in order to determine the neutral position, the recognition circuit eliminating the speed limitation when a neutral-position signal is presented by the switch to allow activation of the controlling element in response to the gas pedal for vehicle speeds in excess of the speed limitation.

4,899,624
CONTROL OF AN AUTOMATIC VEHICLE POWER TRANSMISSION

Keiji Bota, and Tomoo Sawasaki, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 19, 1988, Ser. No. 183,246
Claims priority, application Japan, Apr. 23, 1987, 62-101045
Int. Cl.[4] B60K 41/06
U.S. Cl. 74—868 8 Claims



1. A hydraulic control system for an automatic vehicle transmission including

hydraulic actuator means for friction means in said transmission,

means for producing a pilot pressure in accordance with vehicle operating conditions, pressure regulating means for producing a regulated line pressure in accordance with the pilot pressure,

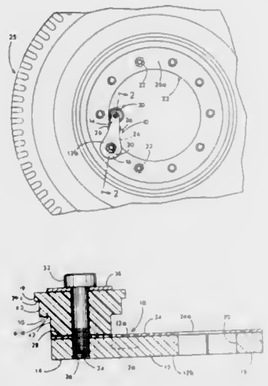
hydraulic passage means provided between said pressure regulating means and said hydraulic actuator means,

switching valve means provided in said hydraulic passage means and responsive to said pilot pressure to take a first position wherein it allows the pilot pressure to be applied to the actuator means when the pilot pressure is below a predetermined value and a second position wherein it allows the regulated line pressure to be applied to the actuator means when the pilot pressure is above the predetermined value.

4,899,625
WRENCH FOR WHEEL LUG NUT

Kenneth Lymburner, R.R. 1, Box 106, Osage, Minn. 56570

Filed Aug. 11, 1989, Ser. No. 392,715
Int. Cl.[4] B25B 9/00
U.S. Cl. 81—13 5 Claims

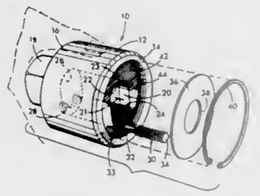


1. A wrench comprising, an elongated wrench body having an upper and a lower face, a polygonal opening at one end thereof to receive a nut and extending from the lower face to the upper face, a retaining head located at the other end of the tool from the opening, the retaining head being secured to the lower face thereof, said retaining head having at least one upwardly facing laterally extending shoulder, each such shoulder having a face upwardly directed toward the lower face of the wrench body and adapted to underlie an inner edge of a wheel rim when the tool is in use with the opening mounted upon a wheel lug nut.

4,899,626
BOLT OR STUD MOUNTING AND EXTRACTING TOOL

Kenneth Lymburner, R.R. 1, Box 106, Osage, Minn. 56570

Filed Aug. 11, 1989, Ser. No. 392,703
Int. Cl.[4] B25B 13/50
U.S. Cl. 81—53.2 4 Claims

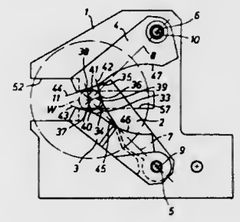


1. A bolt or stud mounting and extracting tool comprising, a tool body having a stud receiving recess therein, said recess having a longitudinal axis which is parallel during operation with the stud, said recess being adapted at one end to receive the stud, the recess has a smoothly contoured interior surface, said interior surface being in the form of an oval in a plane extending perpendicular to the longitudinal axis of the recess, said interior surface having a concave stud-engaging area at one end of a lateral axis to engage an extended portion of the surface of the stud and a concave roll-engaging surface at the other end of the lateral axis, a longitudinally extending gripping roll mounted within the recess in engagement with the roll-engaging surface, said roll-engaging surface being spaced furthest from the longitudinal axis at the intersection with the lateral axis and gradually approaching the longitudinal axis on either side of the lateral axis to force the gripping roll against the stud when the tool is turned, substantially flat connecting surfaces joining the concave surfaces, and a retaining plate member for holding the gripping roll within the recess.

4,899,627
ARRANGEMENT FOR CENTERING AND CLAMPING WORK PIECES

Rudolf Schmidt, Reichenbach, Fed. Rep. of Germany, assignor to EMAG Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Jun. 18, 1988, Ser. No. 204,694
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 3723249
Int. Cl.[4] B23B 5/14
U.S. Cl. 82—117 6 Claims



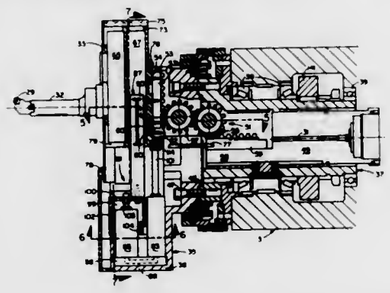
1. In an arrangement for centering and clamping work pieces with three tension levers pivoted around pivots arranged parallel to a chuck axis, which can be driven synchronously and wherein said pivots are equidistant to the chuck axis, the improvement comprising: two pivots; one said pivot serving to support two tension levers, the other pivot serving to support one tension lever; the length of each tension lever being greater than that corresponding to the distance of the respective pivot to the chuck axis; connecting lines of the axes of both pivots forming an angle with the chuck axis which is smaller than or equal to 180°; contact bearing surfaces of the tension levers for gripping work pieces being convex so that straight lines from a particular contact point where workpieces are perpendicular to tangents to the convex contacts surfaces extend through the chuck axis; one tension lever associated with the pivot supporting two tension levers and the tension lever supported by the other pivot being outer tension levers and straight lines connecting the contact points of said two outer tension levers with the chuck axis, when viewed from the side of the pivots, forming an angle of at least 180°.

4,899,628

DYNAMICALLY COMPENSATING COUNTERBALANCE

Daniel J. Seichter, and David L. Oleksen, both of Fond du Lac, Wis., assignors to AMCA International Corporation, Hanover, N.H.

Filed Jun. 13, 1988, Ser. No. 205,688
Int. Cl.[4] B23B 41/00
U.S. Cl. 82—131 **44 Claims**



11. A contouring head for machining surfaces of revolution on a workpiece comprising:

a. a housing adapted to rotate about a central axis;

b. a slide received within the housing for rotation therewith and for reciprocation toward and away from the central axis in a plane perpendicular thereto, the slide including a cutting tool mounted thereon, the slide being formed with pairs of opposed walls that define at least one elongated generally enclosed cavity extending longitudinally therethrough;

c. counterweight means received within the housing for rotation therewith and for reciprocation in the same general plane as the slide, the counterweight means comprising a counterweight piece having at least a portion thereof received within and surrounded by the enclosed slide cavity for reciprocation within and relative to the slide; and

d. means directly interconnecting the slide and counterweight means for directly reciprocating the counterweight means in response to reciprocation of the slide to reciprocate the counterweight means in synchronization with and in opposite directions as the slide,

so that the counterweight means compensates for imbalance caused by the slide and cutting tool reciprocation within the housing.

4,899,629

METHOD FOR DISCARDING SHEET MATERIAL

Hiroki Umebayashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

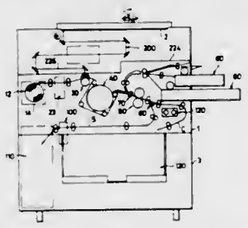
Filed Feb. 24, 1988, Ser. No. 160,044
Claims priority, application Japan, Feb. 25, 1987, 62-40426
Int. Cl.[4] B41J 11/70; B26D 5/20
U.S. Cl. 83—36 **1 Claim**

1. A method of discarding a sheet from an image recorder into a storage box having a bottom of a specified width, comprising the steps of:

detecting the conveyance of said sheet with a sensor at a position upstream of a cutter positioned between first and second pairs of conveyance rollers;

starting a time count when conveyance of said sheet is detected; and

cutting said sheet to a cut-off length when the time count reaches a value indicating that said cut-off length of said sheet is greater than a distance between said first and second rollers and less than said width of the bottom of the box, wherein prior to said step of cutting said sheet to said cut-off length, said sensor and said cutter are separated by a distance not smaller than said distance between said first and second rollers whereupon if said sensor no longer senses said sheet, said time count is terminated so that said



sheet is not cut to insure that said sheet maintains a length not less than said distance between said first and second rollers thereby permitting conveyance thereof from said recorder.

4,899,630

SHEET SLITTING APPARATUS

Tetsuo Shioya, Tokyo, and Katsuhiro Kitano, Hyogo, both of Japan, assignors to Efutsusukei Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1989, Ser. No. 343,651
Claims priority, application Japan, Jun. 6, 1988, 137250
Int. Cl.[4] B26D 1/24
U.S. Cl. 83—425.4 **3 Claims**



1. A slitting apparatus comprising a frame; a rotary shaft mounted on said frame; a plurality of laterally stationary circular blades secured to said rotary shaft; a plurality of laterally movable circular blades movable in the direction along which the stationary blades are disposed and rotatable in slidable contact with said stationary blades so that a sheet passing through between said stationary blades and said movable blades is slit therewith into plural strips each having a width being adjusted by moving said movable blades; a stationary rack extending in parallel with said rotary shaft; a carrier movable back and forth along said rack; means for moving said carrier; and holders detachably engagable with said carrier and moved along said rack by said carrier, each of said holders having a positioning rack adapted to project therefrom for meshing with said stationary rack and withdraw thereinto and a movable member for moving one of said movable blades to and withdraw the same from a position in which said movable blade slidably contacts said stationary blades.

4,899,631

ACTIVE TOUCH KEYBOARD

Richard P. Baker, 112 N. Soledad, Santa Barbara, Calif. 93103

Filed May 24, 1988, Ser. No. 198,191
Int. Cl.[4] G10H 3/00; G10C 3/12
U.S. Cl. 84—719 **42 Claims**

1. A keyboard system for an electronic musical instrument, adapted to enable a desired tactile response of keys in the keyboard system to be effected by performer adjustment of tactile response parameters associated with a keyboard touch response, comprising:

(a) a keyboard, including:

(1) a base structure;

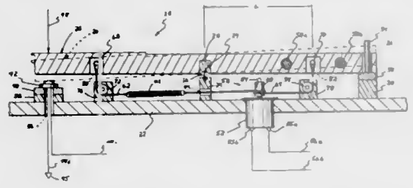
(2) a plurality of playing keys adapted to be pivotally mounted on the base structure and to be linearly arranged in the keyboard; and

(3) means for pivotally mounting and linearly arranging the plurality of playing keys in the base structure;

(b) a plurality of electromechanical key actuation and sensing elements, associated with the keyboard, including:

(1) a plurality of electric motors mounted in said base structure, for generating motor output torque, a back electromotive force that is a function of the speed of said motors, and electrical parameters including current and voltage levels;

(2) means for coupling the electric motors to said keys so as to transmit motor output torque from said motors to said keys;



(3) electrical means for sensing a motor electrical parameter; and

(4) motor control means for controlling said motor output torques and for developing estimates of said motor back electromotive forces from said sensed motor electrical parameter;

(c) performer interface means for enabling performer adjustment of tactile response parameters associated with said keyboard touch response; and

(d) electronic processing means for generating motor control commands for controlling motor output torque in said motor control means in response to said tactile response parameters and said estimates of motor back electromotive force, whereby a desired tactile response of said keys is effected by said performer adjustment of said tactile response parameters.

4,899,632

MULTI-RECORDING APPARATUS OF AN ELECTRONIC MUSICAL INSTRUMENT

Kazuhisa Okamura, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 8, 1988, Ser. No. 153,333
Claims priority, application Japan, Feb. 6, 1987, 62-24866; Feb. 6, 1987, 62-24867; Feb. 6, 1987, 62-24865
Int. Cl.[4] G10F 1/00; G10H 1/00, 3/03
U.S. Cl. 84—601 **11 Claims**

1. A multi-recording apparatus for an electronic musical instrument for providing multi-recording of a newly input performance and a reproduced performance, comprising:

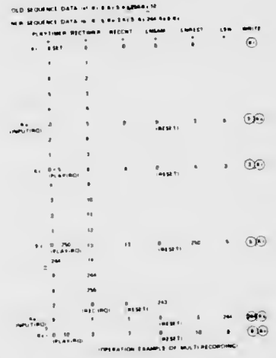
(a) memory means for recording performance information and tone generation timing information together, said performance information representing musical tone generated by playing external performance means, said tone generation timing information representing the tone generation timing when said performance information is generated;

(b) measuring means for measuring a first tone generation timing when newly input performance information is generated by said external performance means;

(c) reproducing control means for reproducing said performance information pre-recorded in said memory means as reproduced performance information in accordance with said tone generation timing information;

(d) extracting means for extracting second tone generation timing information from said reproduced performance information; and

(e) recording control means for simultaneously recording both of said newly input performance information and said reproduced performance information along with third tone generation timing information in said memory



means, said third tone generation timing information for both of said newly input and reproduced performance information being calculated out to be cumulatively equal to said second tone generation timing information,

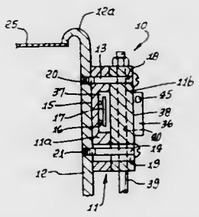
whereby musical tones newly inputted from said external performance means are over-recorded on a channel pre-recorded with the musical tones in said means.

4,899,633

DRUM SYNTHESIZER TRIGGERING APPARATUS

Donald G. Lombardi, 2118 E. Hillcrest Dr., Thousand Oaks, Calif. 91360

Filed May 2, 1988, Ser. No. 189,108
Int. Cl.[4] G10H 3/14
U.S. Cl. 84—730 **12 Claims**



1. In a triggering means for triggering an acoustic drum synthesizer, the combination comprising:

(a) a body having attachment means thereon for firmly attaching the body to the frame of an acoustic drum so as to transmit acoustic vibrations from the frame, the body configured to pass a drum receiver rod,

(b) dual transducer means carried by the body to be responsive to the transmitted vibrations to produce corresponding signals,

(c) and circuit means connected to the dual transducer means to process said signals, passing only a selected high frequency band of such signals to the synthesizer to trigger same,

(d) and including said acoustic drum frame to which said

body is attached, externally of the frame, and a drum tensioner rod carrier by the frame and passing through the body,

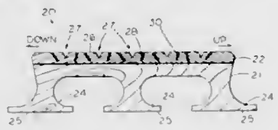
(e) the body comprising a block of material within which said dual transducer means is concealed and contained, and means clamping the body against the frame, to receive acoustic vibrations therefrom, and to pass said tensioner rod, there being support means integral with the body, the dual transducer means carried in position to receive transmission of acoustic vibrations from the block, via said support means.

4,899,634

BRIDGE FOR STRINGED MUSICAL INSTRUMENTS

John F. Geiger, 190 Berwick Dr., NE., Atlanta, Ga. 30328

Filed Apr. 10, 1989, Ser. No. 335,875
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—307 **3 Claims**



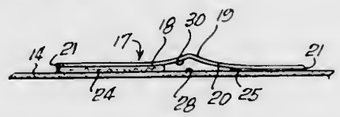
1. A bridge for a strummed stringed musical instrument comprising a thin body having a bottom base portion adapted to be supported upon a resonant member of the instrument and a top crown portion that is formed with a plurality of V-shaped grooves for holding individual string members of the instrument, and a plurality of pairs of substantially straight baffle slits that extend convergently from said crown edge with each of said pairs of slits straddling a different one of said grooves and with each slit terminating to the same side of an adjacent groove from which it extends from said crown edge, and wherein said base and crown portions have opposed edges that are generally parallel with respect to each other, whereby some sound waves emitted from strings held within said grooves and propagated generally laterally through said crown portion are reflected by said baffle slits towards portions of said crown edge located closely adjacent said straddled V-shaped grooves, back onto said V-shaped grooves for enhanced sound sustention and from said grooves towards said bridge base.

4,899,635

DRUM MUTE

Ron L. Santangelo, 531 Amerige #A, Fullerton, Calif. 92632

Filed Jul. 10, 1989, Ser. No. 377,562
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—411 M **16 Claims**



1. A drum mute for eliminating overtones and ringing that occurs when a drum head to which the mute is affixed is struck, said drum mute comprising:

a flexible, resilient sheet having an outer surface, an inner surface and a peripheral edge;

a layer of delayed tack adhesive affixed to at least a portion of said inner surface of said sheet;

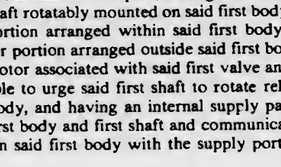
an area of felt affixed to only a portion of said inner surface and positioned so that the inner surface has a portion of said layer of delayed tack adhesive exposed and an area of felt exposed whereby when the layer of delayed tack adhesive is placed into contact with a drum head, the area of felt abuts the drum head thereby muting overtones.

4,899,636

INSTRUMENT FOR TUNING MUSICAL INSTRUMENTS

Mitsuharu Chiba; Kazuyoshi Taniguchi, and Hiroshi Iwase, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Jan. 17, 1989, Ser. No. 298,557
Claims priority, application Japan, Feb. 3, 1988, 63-13461[U]; Sep. 30, 1988, 63-246568
Int. Cl.[4] G01G *7/02*
U.S. Cl. 84—454 **7 Claims**



1. A tuning apparatus for tuning a musical instrument, comprising:

housing means having a resonance frequency lower than a frequency of the lowest note of the musical instrument to be tuned;

mounting means provided on an outer surface of said housing means for mounting the tuning apparatus on the musical instrument;

converting means provided on an inner surface of said housing means for converting a vibration produced by the musical instrument through said mounting means and said housing means into an electrical signal;

signal generating means for generating at least a signal having a reference frequency;

calculating means coupled with said converting means and said signal generating means in said housing means for calculating a pitch of the output signal from said converting means and a pitch deviation between the pitch of said output signal and the pitch of said reference frequency of the signal from said signal generating means; and

display means for displaying information calculated by said calculating means and being disposed on the outer surface of said housing means.

4,899,637

OSCILATORY HYDRAULIC ACTUATORS WITH INTERNAL SUPPLY, RETURN, AND CONTROL PASSAGEWAYS FOR MULTI-AXIS WRIST ACTUATOR

John T. Caruso, Kenmore, N.Y., assignor to Moog Controls Inc., East Aurora, N.Y.

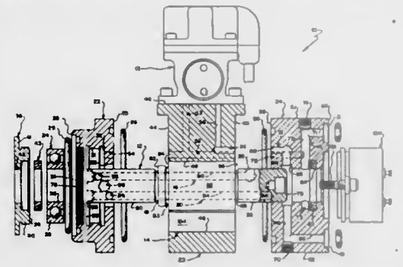
Continuation of Ser. No. 367,625, Apr. 12, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 638,564
Int. Cl.[4] F01C *9/00;* **B25J** *17/02*
U.S. Cl. 91—173 **22 Claims**

9. An actuator assembly, comprising:

a first actuator having an electrically-controllable first valve, said first valve having a supply port, a return port, and a control port, and selectively operable to provide a control pressure at said control port, having a first body, having a first shaft rotatably mounted on said first body and having one portion arranged within said first body and having another portion arranged outside said first body, having a first motor associated with said first valve and selectively operable to urge said first shaft to rotate relative to said first body, and having an internal supply passage within said first body and first shaft and communicating an inlet port on said first body with the supply port of said first valve and with an outlet port on said first shaft other portion;

a first bracket mounted fast to said first shaft other portion for rotation therewith, said first bracket being provided with an internal supply passage therewithin extending between an inlet port in communication with said first shaft supply outlet port, and a bracket supply outlet port; and

a second actuator having an electrically-controllable second valve operable independently of said first valve, said second valve having a supply port, a return port, and a control port, and selectively operable to provide a control pressure at said control port, having a second body, having a second shaft rotatably mounted on said second body



and having one portion arranged within said second body and having another portion arranged outside said second body, having a second motor associated with said second valve and selectively operable to urge said second shaft to rotate relative to said second body, and having an internal supply passage within said second body and second shaft and communicating a supply inlet port on said second body with the supply port of said second valve and with a supply outlet port on said second shaft other portion, said second body being mounted on said first bracket with said second body supply inlet port communicating with said first shaft supply outlet port;

whereby said first body supply inlet port will communicate internally with the supply ports of said first and second valves and with said second shaft supply outlet port.

4,899,638

AUTOMATICALLY-REVERSING PISTON-AND-CYLINDER UNIT

Harold D. Brown, Box 394, Nickerson, Kans. 67561

Filed Jun. 27, 1988, Ser. No. 211,816
Int. Cl.[4] F01L *31/02*
U.S. Cl. 91—346 **7 Claims**

1. A fluid-actuated piston-and-cylinder unit, which comprises:

(a) a cylinder including:

(1) first and second ends;

(2) a bore extending longitudinally between said first and second ends; and

(3) first and second sections associated with said first and second ends respectively;

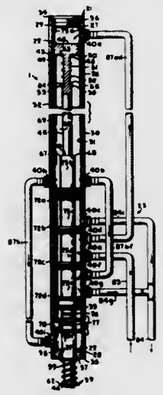
(b) a piston/valve assembly including:

(1) a piston subassembly having a piston rod with first and second ends and a piston mounted on said first end, said piston being reciprocably received in said cylinder first section and having first and second sides; and

(2) a spool valve subassembly having a spool valve member with a longitudinally extending bore slidably receiving said piston rod, said spool valve member having a first position communicating fluid from said cylinder second section to said cylinder first section whereby said piston is reciprocated in said cylinder first section in a power stroke and a second position whereat said piston is permitted to retract in said cylinder first section in a return stroke;

(c) means for engaging said spool valve member with said piston subassembly whereby said spool valve member is moved between its first and second positions.

(d) said cylinder, said piston subassembly and said spool valve subassembly being generally coaxial;



(e) said cylinder first and second sections being generally annular and coaxial with said cylinder, said piston subassembly and said spool valve subassembly; and

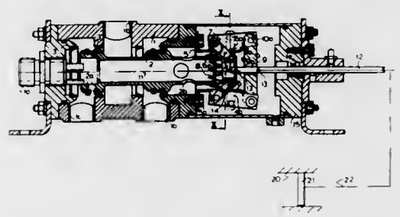
(f) a fluid interconnect line positioned exteriorally of said cylinder and fluidically communicating said cylinder first and second sections with said spool valve member in its first position.

4,899,639

REVERSING MECHANISM FOR A SWITCHOVER SEAT-TYPE VALVE

Franz Seebacher, Graz, Austria, assignor to Rohren- und Pumpenwerk Rudolf Bauer Aktiengesellschaft, Steiermark, Austria

Filed Mar. 21, 1989, Ser. No. 326,616
Claims priority, application Austria, Mar. 21, 1988, 753/88
Int. Cl.[4] F15B *13/04*
U.S. Cl. 91—347 **16 Claims**



1. A switchover valve for hydraulic control, comprising:

a valve housing formed with a plurality of ports and annular seats between said ports;

an elongated hollow valve piston axially shiftable in said housing between opposite positions in which said piston respectively engages said seats to switchover flow through said ports;

a pair of levers pivotally connected to an end of said hollow valve piston;

respective abutment brackets affixed to said housing at locations angularly offset about an axis of said hollow valve piston by about 180°, traversed by the respective lever and each formed with two axially spaced stops engageable by said levers;

a shifting member extending generally perpendicularly to said axis and spaced from said end;

means articulatingly connecting ends of said levers remote from said hollow valve piston to said shifting member for displacing said ends of said levers from positions in which said levers engage respective ones of said stops past deadcenter positions into positions in which said levers engage the other ones of said stops;

spring means biasing said ends of said levers toward one another;

a control rod traversing said shifting member axially and connected with a working piston for effecting the switchover of flow; and

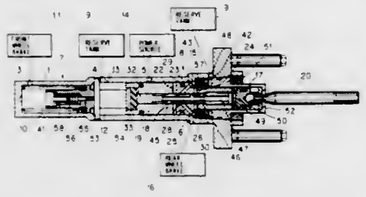
respective entrainers spaced apart on said rod and respectively engageable with opposite outer surfaces of said shifting member selectively upon axial displacement of said control rod for entraining the shifting member in the corresponding direction of axial displacement, thereby displacing said levers through said deadcenter positions and effecting shifting of said hollow valve piston in the opposite axial direction to switchover the flow.

4,899,640

HYDRAULIC BOOSTER

Teruhisa Kono, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 23, 1988, Ser. No. 249,417
Claims priority, application Japan, Sep. 25, 1987, 62-241793
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—369.7 **3 Claims**



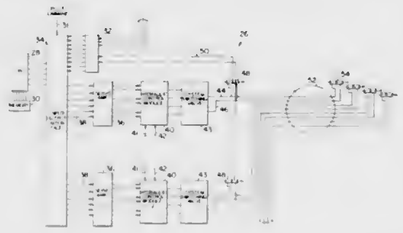
1. A hydraulic booster having a boost chamber and means for receiving auxiliary dynamic pressure from an auxiliary power source in response to an operation of a brake pedal for generating a boost pressure proportional to a pedal force in said boost chamber for assisting a thrust of a master cylinder by said boost pressure, said hydraulic booster comprising a boost piston in said boost chamber, said boost piston having a rear end portion facing said boost chamber for receiving the thrust of said boost pressure to move in a forward direction for urging a master piston of said master cylinder also in a forward brake force applying direction; an input member movable in said boost chamber with respect to said boost piston for receiving input effective in a forward direction, said input being proportional to said pedal force, said input member receiving a rearwardly effective reaction force proportional to said boost pressure; pressure regulating means having an input directional control valve for controlling communication between said boost chamber and said auxiliary power source and an output directional control valve for controlling communication between said boost chamber and a reserve tank being open to the atmosphere for increasing said boost pressure by opening said input directional control valve and closing said output directional control valve when said input member is relatively positioned ahead of a prescribed position with respect to said boost piston while reducing said boost pressure by closing said input directional control valve and opening said output directional control valve when said input member is relatively positioned behind a prescribed position with respect to said boost piston; a housing containing said boost chamber and said boost piston, said input member and said pressure regulating means in its interior; input member positioning means for bringing a rear end of said input member into contact with said housing or a stop member anchored to said housing for stopping a rearward movement of said input member when said pedal force is zero; and boost piston positioning means for balancing a force for rearwardly pushing said boost piston with a force for frontwardly pushing said boost piston by said boost pressure for stopping a rearward movement of said boost piston when said pedal force is zero, so that travel loss and a respective waste of auxiliary dynamic pressure are reduced to a minimum and a spongy brake pedal feeling is avoided.

4,899,641

ELECTRO-HYDRAULIC HELICOPTER SYSTEM HAVING INDIVIDUAL BLADE CONTROL

Zafer N. Khan, Windsor, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed May 16, 1988, Ser. No. 194,400
Int. Cl.[4] F15B *13/044;* **F63H** *3/08*
U.S. Cl. 91—459 **13 Claims**



1. An apparatus for use in providing fluid control signals from a first element to a moveable second element, comprising:

a first member having a outer surface formed with a plurality of sets of grooves, each of said grooves receiving respective fluid control signals by means of corresponding channels formed in said first member interior;

a second member rotatable about a second member longitudinal axis and adapted to receive, at an inner surface thereof, said first member outer surface, said second member inner surface having a plurality of sets of grooves communicating with corresponding interior second member channels, each second member groove in registration with a corresponding first member groove, said registered first and second member grooves continuously commnicating said fluid control signals throughout said second member movement; and

return grooves formed in said first and second members opposed surfaces spaced between said groove sets and communicating with associated return channels in said first and second members for providing fluid isolation between each of said groove sets.

4,899,642

PNEUMATIC COMBINED WITH HYDRAULIC BRAKE CHAMBER

Chrang-Chuan Hwang, 2F, No. 108-1, Fu-Hsing St., Baan-Chyau City, Taipei Hsien, Taiwan

Filed Oct. 13, 1988, Ser. No. 257,007
Int. Cl.[4] F01B *31/00;* **F15B** *13/00*
U.S. Cl. 91—510 **6 Claims**

1. A pneumatic and hydraulic brake system for vehicles having a plurality of wheels, the brake system being activated by an operator pressing on a brake pedal, the brake system comprising:

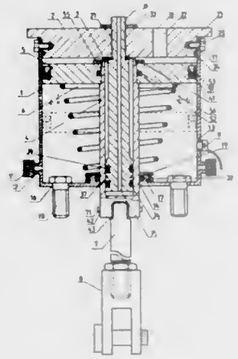
a means for providing compressed air;

a means for providing hydraulic fluid under pressure;

a conventional brake shoe apparatus;

a plurality of brake chambers, one at each wheel, each brake chamber having a cylinder, the cylinder having a cover and a bottom, the cover having an opening therein, the opening being connected to the source of compressed air, the bottom of the cylinder having an opening therein;

a piston within the cylinder, a sleeve having a first end connected to the piston and a second end slidably received in the opening in the bottom of the cylinder, the second end of the sleeve being connected to a rod, the rod connected to the conventional brake shoe apparatus, such that pressing on the brake pedal introduces compressed air into the opening in the cover of the cylinder forcing the piston and the sleeve toward the bottom of the cylinder, thereby pushing the rod to activate pneumatic braking of the brake shoe apparatus;



a shaft slidably disposed within the sleeve, the shaft having a central bore therethrough, the central bore being connected to the pressurized hydraulic fluid, the shaft having a first end and a second end, the first end connected to and extending from the opening in the cover, the second end communicating with the second end of the sleeve;

a helical spring disposed within the cylinder about the sleeve, the spring extending from the piston to the bottom of the cylinder;

such that pressing on the brake pedal introduces pressurized hydraulic fluid into the bore in the shaft which forces the sleeve and piston toward the bottom of the cylinder compressing the helical spring thereby pushing the rod to activate hydraulic braking of the brake shoe apparatus; and

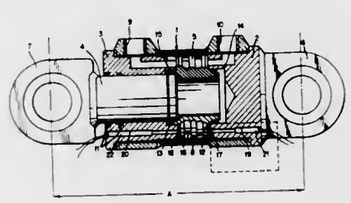
such that when the brake pedal is released the compressed air and the pressurized hydraulic fluid are disconnected, the spring urges the piston and sleeve to the position occupied before the brake pedal was pressed and the conventional brake shoe apparatus is deactivated.

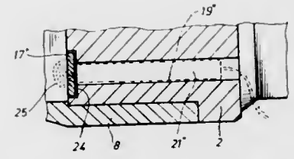
4,899,643

HYDRAULIC CYLINDER COMPRISING AT LEAST ONE ELECTRIC POSITION INDICATOR

Niels Hvilsted, Sandlodsvej 4, DK-325- Gilleleje, and Kaj Pedersen, Smedestraede 31, DK-4793 Bogo, both of Denmark

Filed Jun. 26, 1987, Ser. No. 66,474
Claims priority, application PCT Int'l Appl., Oct. 29, 1985, PCT/DK85/00100
Int. Cl.[4] F01B *25/26, 31/12*
U.S. Cl. 92—5 R **20 Claims**





1. A hydraulic cylinder comprising a piston completely or partially containing electrically conductive material, said cylinder being provided with at least one through opening for mounting an electric position indicator, characterized in that the openings are closed in a liquid- and pressure-proof manner toward the interior of the cylinder by means of a substantially plate-shaped body secured on the inner surface of the cylinder, said plate-shaped body allowing passage therethrough of a magnetic field, wherein at least one of the openings is shaped as a conical hole narrowing toward the plate-shaped body.

4,899,644

FLUID CYLINDER ASSEMBLY FOR ROBOT ACTUATORS

Kenneth J. Susnjara, Santa Claus, Ind., assignor to Thermwood Corporation, Dale, Ind.

Continuation of Ser. No. 853,610, Apr. 18, 1986, abandoned.
This application Sep. 14, 1988, Ser. No. 244,603
Int. Cl.[4] F15B *15/26*
U.S. Cl. 92—18 **15 Claims**

1. A drive assembly for a robot actuator, comprising:

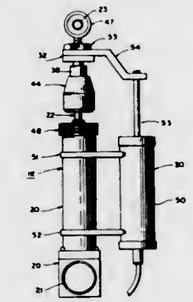
a fluid cylinder;

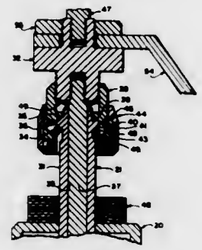
a piston slidably disposed within said fluid cylinder having a piston rod extending through an end of said fluid cylinder, said piston rod having a first section;

a linear potentiometer positioned adjacent to said fluid cylinder, said linear potentiometer having a slide element movable relative to said fluid cylinder along a path substantially parallel to a path of movement of said first rod section, said slide element being connected to the robot actuator to sense the position of said robot actuator relative to said drive assembly; and

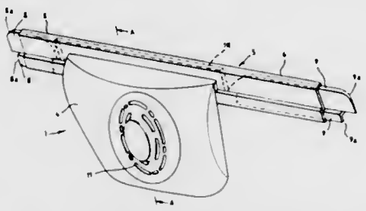
connection means for detachably connecting said first rod section to the robot actuator so that said first rod section can be disconnected from the robot actuator while said slide element remains connected to the robot actuator to allow movement of the actuator without the need to operate or move the drive assembly while the linear po-

tentiometer remains operative to detect relative movement of the robot actuator, whereby said linear potentiometer senses the position of said robot actuator when said actuator is connected to said drive assembly and also when disconnected from said drive assembly.





4,899,645
SOLAR POWERED VENTILATOR
Philip R. Wolfe, Penn; John K. Callaghan, Weadover, and Simon Pidgeon, Tunbridge Wells, all of England, assignors to Intersolar Ltd., United Kingdom
Filed Jan. 3, 1988, Ser. No. 202,351
Claims priority, application United Kingdom, Oct. 17, 1987, 8724384
Int. Cl.[4] B60H *1/24*
U.S. Cl. 98—2.02 **13 Claims**



1. A solar ventilator for fitting to an edge of a member having first and second sides corresponding to first and second regions, the ventilator comprising:
- suspension means for suspending said ventilator from said edge so that said ventilator later will be adjacent to said first region;
- housing means having at least one inlet and at least one outlet, said one inlet being adapted to receive air from one of said regions, said one outlet being adapted to discharge to the other of said regions said received air;
- fan means comprised by said housing means so as to enable said reception and discharge of air; and
- solar generator means for driving said fan means in response to solar radiation;
- said suspension means comprising at least one extension means respectably adjustably projectable from at least one side of said suspension means.

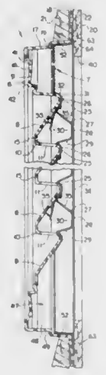
4,899,646
WINDOW RAIN GUARD
Henry S. Maras, Hamburg, N.Y., assignor to H.S.M. Concepts, Hamburg, N.Y.
Filed Feb. 3, 1989, Ser. No. 305,551
Int. Cl.[4] E06B *7/02*
U.S. Cl. 98—99.1 **37 Claims**



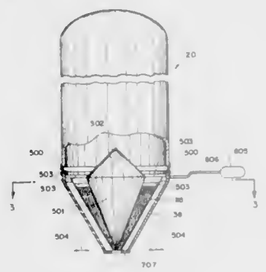
37. A rain guard for use with a triple track storm window comprising a generally rectangular unitary body made of a plastic material having a top edge, a bottom edge and a pair of axially spaced side edges, said body having a vertical flange along each of said side edges, a top flange along its top edge and a dome section extending from said flanges outwardly towards said bottom edge of said body terminating in a bottom edge and forming an access opening, said vertical flanges including means for being adjusted to be fitted within one of the tracks of a triple track storm window.

4,899,647
VENTILATOR SYSTEM
Ray W. Garries, Conneaut; Edward H. Burke, Jefferson, both of Ohio; Joseph D. Leone, Erie, Pa., and Kevin D. Mueller, Conneaut, Ohio, assignors to Webb Mfg., Inc., Conneaut, Ohio
Filed Dec. 22, 1988, Ser. No. 288,462
Int. Cl.[4] F24F *13/18*
U.S. Cl. 98—121.1 **55 Claims**

22. A ventilator system comprising an exterior panel member, an interior baffle member in sealed engagement with a back side of said exterior panel member at a plurality of vertically spaced locations defining therebetween air chamber means, first air passage means in said panel member communicating with said air chamber means, second air passage means in said baffle member communicating with said air chamber means, and valve means within said air chamber means which is acted upon by an air stream entering said air chamber means through said first air passage means to close off said second air passage means when the force of such air stream acting on said valve means exceeds a predetermined level.

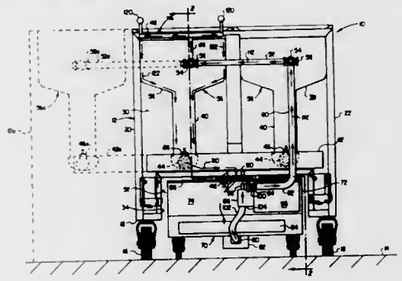


4,899,648
CONTINUOUS PROCESS APPARATUS FOR COOKING CEREAL GRAINS
Robert B. Fast, Ridgewood, N.J., assignor to Nabisco Brands, Inc., East Hanover, N.J.
Division of Ser. No. 671,970, Nov. 16, 1984, Pat. No. 4,699,797.
This application Apr. 28, 1987, Ser. No. 43,466
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—407 **7 Claims**



1. A vertical cooker for cooking grain, comprising:
- a vessel having a top wall and a cylindrical side wall;
- an inlet adapted to receive a slurry;
- a bottom member generally conical in shape and having a means for separating liquid from particulate material;
- and a first conical baffle member adapted to prevent disruption of plug flow of said particulate material downward through said vessel;
- wherein said bottom member is connected to a lowermost edge of said side wall by a flexible joint member, and further comprising a means for vibrating said bottom to assist plug flow from said vessel,
- whereby plug flow occurs in said vessel.

4,899,649
DEEP FAT FRYING APPARATUS HAVING AN IMPROVED COOKING FLUID FILTRATION SYSTEM
James T. Grob, and John M. Kinch, both of Shreveport, La., assignors to The Frymaster Corporation, Shreveport, La.
Continuation-in-part of Ser. No. 168,164, Mar. 15, 1988. This application Jul. 26, 1988, Ser. No. 224,797
Int. Cl.[4] A47J *27/12*
U.S. Cl. 99—408 **11 Claims**



1. A modular system for constructing a filtered, multiple frypot deep fat frying cooking station comprising:
- a first module including:
  - a first floor supportable housing having a plurality of frypots operatively mounted, in a closely adjacent side-by-side relationship, in an upper portion thereof and adapted to hold a predetermined quantity of cooking liquid, each of said frypots having a maximum side-to-side width, said first floor supportable housing having a horizontal width, extending between opposite side walls thereof, which is not substantially greater than the sum of said maximum side-to-side widths of said frypots,
  - first supply header means, interconnected between said plurality of frypots, for receiving cooking liquid from a source thereof and flowing the received cooking liquid into a selected one of said plurality of frypots,
  - first drain header means, interconnected between said plurality of frypots, for receiving cooking liquid drained from a selected one of said plurality of frypots, and
  - filter and pumping means for receiving cooking liquid drained from said first drain header means, and pumping the filtered cooking liquid to and through said first supply header means, said filter and pumping means being removably positionable within said first floor supportable housing directly beneath said plurality of closely adjacent frypots, and being removably interconnectable between said first supply header means and said first drain header means; and
- a second module including:
  - a second floor supportable housing having at least one frypot operatively mounted in an upper portion thereof and adapted to hold a predetermined quantity of cooking liquid,
  - second supply header means, operative connected to said at least one frypot and connectable to said first supply header means to define an extension thereof, for receiving cooking liquid from said first supply header means and flowing the received cooking liquid into a selected one of said at least one frypot, and
  - second drain header means, operatively connected to said at least one frypot and connectable to said first drain header means, for receiving cooking fluid drained from a select one of said at least one frypot and transferring the drained cooking liquid into said first drain header means,
  - whereby said cooking station may be conveniently formed

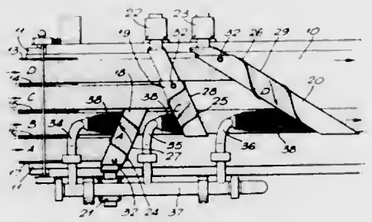
by positioning said first and second housing in an adjacent relationship, with said second floor supportable housing being positioned on either side of said first floor supportable housing, operatively interconnecting said first and second supply header means, and operatively interconnecting said first and second drain header means so that said filter and pumping means may be utilized in conjunction with any selected one of the multiple frypots in the resulting cooking station.

4,899,650

MACHINE FOR LAYERING SHEETS OF FOOD MATERIAL

Hans K. Larsen, Aastorp, Sweden, assignor to Nestec S.A., Vevey, Switzerland

Filed Dec. 9, 1988, Ser. No. 282,123
Claims priority, application European Pat. Off., Jan. 8, 1988, 88100143.2
Int. Cl.[4] A23L 1/16; A23P 1/00
U.S. Cl. 99—450.2 **10 Claims**



1. A machine for layering sheets of food material comprising a conveyor belt adapted to convey a plurality of thin sheets of flexible food material lying flat and parallel to one another, power means connected to the conveyor to advance the sheets of food material downstream and at least one substantially stationary spiral guide positioned above the conveyor belt with its longitudinal axis substantially horizontal and at an oblique angle to the direction of flow of the food material, adapted to enable a respective sheet of flexible food material to pass beneath it and then to be guided at least one complete turn around it so that the said sheet comes to lie above another sheet advancing downstream.

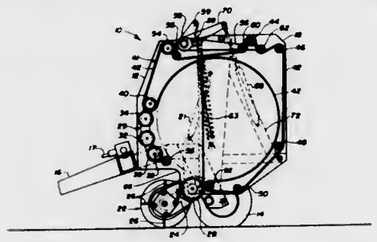
4,899,651

APRON TENSIONING SYSTEM FOR ROUND BALERS

H. Nevin Lausch, Denver; Robert A. Wagstaff, Lancaster, and Richard E. Jennings, Manheim, all of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Oct. 11, 1988, Ser. No. 256,831
Int. Cl.[4] B30B 5/04, 9/00
U.S. Cl. 100—87 **9 Claims**

1. A round baler comprising:
a main frame;
a tailgate pivotally connected to said main frame;
a sledge assembly including a plurality of rollers mounted on said main frame for movement between a bale starting position and a full bale position;
an apron supported on only one take up means mounted in said main frame, said apron having an expandable inner course cooperating with the rollers of said sledge assembly to define a bale starting chamber when said sledge assembly is in said bale starting position;
said take up means being movable from an inner position toward an outer position as the inner course of said apron expands, said take up means including a pair of arms pivotally mounted on said main frame by a common shaft, said arms carrying guide means for supporting said apron, said take up means also including first and second lever means connected to said common shaft;
spring means connected between said first lever means and said tailgate for normally urging said take up means toward said inner position; and



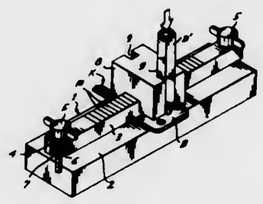
hydraulic means connected between said second lever means and said tailgate for resisting movement of said take up means from said inner position to said outer position.

4,899,652

KEY STAMP

Michael A. Kirkpatrick, P.O. Box 66524, Seattle, Wash. 98166

Filed Apr. 1, 1988, Ser. No. 176,530
Int. Cl.[4] B41F 17/00
U.S. Cl. 101—4 **14 Claims**



11. For use with a key and an elongated die for debossing indicia in the key, a key stamp comprising an anvil having a surface for engaging against the key, means for maintaining the key substantially stationary relative to said anvil, a horizontally elongated rail extending alongside said anvil, and a saddle having a groove of a depth less than the upright dimension of said rail and opening at the bottom thereof for closely receiving the rail and permitting free sliding movement of said saddle lengthwise along said rail, said saddle having a guide slot for closely receiving the die to position it with its length at a desired angle relative to the key such that said saddle is detachable from said rail by manual translation away from said rail and said anvil.

4,899,653

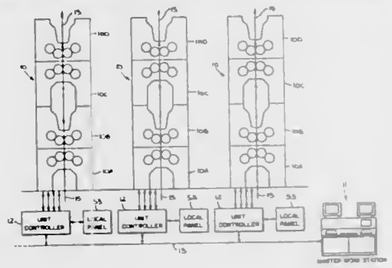
MICROPROCESSOR-BASED PRESS DAMPENING CONTROL

Kurt D. Michl, Homewood; Allen L. Mitchell, Downers Grove; Patrick J. Ahern, Oak Lawn, and Scott P. Letellier, Riverdale, all of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 9, 1988, Ser. No. 191,621
Int. Cl.[4] B41F 7/30; B41L 25/06, 25/02
U.S. Cl. 101—148 **19 Claims**

1. A damprate control system for operating a set of nozzles on a spraybar for a printing press, which comprises:

memory means for storing rate curve data which is employed to control the operation of the nozzles;
interface circuit means coupled to the set of nozzles and being responsive to a pulse rate signal to turn on all of said nozzles at the indicated pulse rate;
processor means coupled to said memory means and said



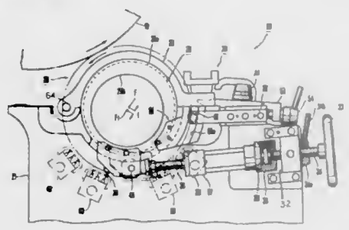
interface circuit means to calculate a pulse rate from said stored rate curve data and to output a corresponding pulse rate signal to said interface circuit means; and
communications means coupled to said memory means and being operable in response to a received rate curve message to alter the rate curve data stored in the memory means.

4,899,654

WIPING APPARATUS FOR INTAGLIO PRINTING PRESS

Toshio Hoshi, and Noboru Okada, both of Chiba, Japan, assignors to Komori Printing Machinery Co., Ltd., Japan

Filed Sep. 8, 1988, Ser. No. 241,577
Int. Cl.[4] B41F 9/08
U.S. Cl. 101—167 **4 Claims**



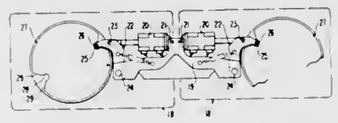
1. A wiping apparatus for an intaglio printing press, comprising:
a wiping roller supported in inner holes of right and left eccentric bearings and operated such that a surface of said wiping roller is brought into contact with a copperplate surface of a copperplate cylinder or separated therefrom upon pivotal movement of said eccentric bearings;
a doctor blade held by a blade holder and operated such that a distal end of said doctor blade is brought into contact with the surface of said wiping roller or separated therefrom;
a blade base mounted on an intaglio printing press side;
a plurality of fixing screws for coupling said blade holder and said blade base to support said blade base so as to be reciprocated in an attachment/detachment direction of said doctor blade with respect to said intaglio printing press side;
cam mechanism coupling said eccentric bearings to both ends of said blade base, respectively, to interlock pivotal movement of said eccentric bearings with reciprocal movement of said blade base; and
a doctor blade contact pressure fine-adjusting mechanism for reciprocating said blade holder relative to said blade base.

4,899,655

DRIVING SYSTEM FOR A ROTARY PRESS

Akikazu Seo, and Mitsunao Miyake, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1988, Ser. No. 278,174
Claims priority, application Japan, Dec. 1, 1987, 62-183484[U]
Int. Cl.[4] B41F 5/06, 13/12
U.S. Cl. 101—181 **6 Claims**



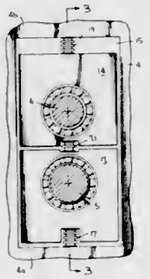
1. In driving system for a rotary press including a plurality of printing units each having plate drums with exchangeable plates, said driving system including a main shaft and a plurality of branch shafts for operatively connecting said main shaft to respective of the printing units, thereby to drive the printing units in synchronism during a printing operation, said main shaft including a plurality of axially connected shaft sections for respective of the driving units, whereby it is necessary periodically to disconnect drive of respective of the printing units by said main shaft and to stop selected of the plate drums to enable exchanges of plates thereof, each printing unit having respective clutch means for disconnecting drive of said main shaft to the respective said shaft section and thereby to the respective said branch shaft, and each printing unit having a respective individual drive motor for driving said respective branch shaft upon disconnection of drive of said main shaft thereto by said respective clutch means, the improvement comprising means for, upon said disconnection by each said clutch means, ensuring that at least a selected plate drum of the respective driving unit is stopped at a predetermined position thereof to enable exchange of the plate thereof, and for, upon completion of such plate exchange operation, ensuring that the disconnected respective said shaft section is aligned with said main shaft to enable said clutch means to reconnect said respective shaft section to said main shaft, said ensuring means comprising:
approach switch means for detecting said predetermined position of the selected plate drum;
electromagnetic brake means operable in response to said approach switch means to stop the selected plate drum at an initial stopped position approximately at said predetermined position thereof;
plate drum positioning means, located adjacent said predetermined position, for, after stopping of the plate drum by said brake means, moving the plate drum from said initial stopped position to said predetermined position;
whereby exchange of the plate is possible; and
main shaft positioning means for moving said disconnected respective shaft section to a position aligned with axially adjacent shaft sections of said main shaft, whereby said clutch means then can be reconnected.

4,899,656

MACHINE FOR PROCESSING A CONTINUOUS WEB OR SHEETS

Hermann Thomas, Darmstadt; Josef Herd, Munster, and Uwe Hasper, Seeheim, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Goebel GmbH, Darmstadt, Fed. Rep. of Germany

Filed Mar. 10, 1989, Ser. No. 321,315
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808142
Int. Cl.[4] B41F 5/00
U.S. Cl. 101—216 9 Claims



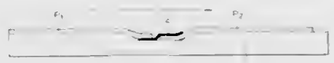
1. In a machine having a pair of cylinders for processing a continuous web or sheets passing between the nip thereof, the cylinders having shafts journalled at opposite ends in a frame of the machine, the size of the nip between said cylinders being adjustable, a first pair of auxiliary casings supporting first bearings on the ends of said shafts and lying in a first plane, a second pair of auxiliary casings adjacent said first casings and supporting second bearings on the ends of said shafts and lying in a second plane, said planes lying parallel to each other and perpendicular to said shafts, said pairs being mounted on said frame for relative adjustment of said casings of each pair to one another and to said frame along said planes, at least one first pressure medium cylinder means acting between said frame and at least one of said casings of said first pair, for effecting said relative adjustment thereof, at least one second pressure medium cylinder means acting between said frame and at least one of said casings of said second pair for effecting said relative adjustment independently of said relative adjustment of said first pair, whereby the size of the nip between the cylinders is adjustable and force flows between said shafts and said frame are caused to travel along each of said planes.

4,899,657

METHOD FOR PREVENTING PENETRATION OF DAMPING SOLUTION BETWEEN SUPPORTING BASE AND PLATE

Toshiro Kondo; Eiji Kanada, and Kyonosuke Yamamoto, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 4, 1988, Ser. No. 140,561
Claims priority, application Japan, Jan. 12, 1987, 62-5764; Feb. 10, 1987, 62-19288[U]; Feb. 13, 1987, 62-30737
Int. Cl.[4] B41F 7/20
U.S. Cl. 101—451 18 Claims



1. A method for lithographic printing which comprises arranging and applying two or more lithographic printing plates, adjacent to one another and in the rotational direction of a master cylinder of a printing machine, onto a flexible supporting resin base,;

said resin base having a groove or grooves in which said adjacent printing plates are connected with one another to form a connected structure;

said connected structure being formed by connecting with a hydrophilic thin film sheet a bottom and a rear edge portion of a first adjacent printing plate with a top and a front edge portion of a second adjacent printing plate;

additional adjacent printing plates can be added to said connected structure with a hydrophilic thin film sheet in the following manner, connecting a bottom and a rear edge portion of said second adjacent printing plate with a top and a front edge portion of a third adjacent printing plate;

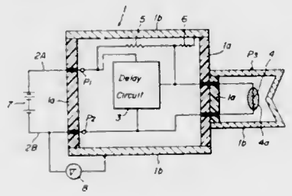
said connected structure preventing penetration of a damping solution and a printing ink between said resin base and said adjacent lithographic printing plates, said front and said rear edge portions of said printing plates receiving substantially no ink.

4,899,658

DELAY TYPE ELECTRIC DETONATOR

Koji Ochi, Iwamizawa, and Masahide Harada, Sapporo, both of Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo and Harada Electronics Industry, Hokkaido, botb of, Japan

Filed Oct. 7, 1988, Ser. No. 254,811
Claims priority, application Japan, Oct. 16, 1987, 62-259779
Int. Cl.[4] F42C 11/00
U.S. Cl. 102—206 10 Claims



1. A delay type electric detonator comprising:

a pair of leg wires which are connectable to a bus wire connected to an electric blaster;

a delay circuit connected across the leg wires and generating at an output terminal an igniting current at a predetermined time;

an igniting resistor connected across the output of the delay circuit and one of the leg wires, and igniting the detonator when said igniting current passes through the igniting resistor; and

by-pass means connected between the other of the leg wires and the igniting resistor and conducting a measuring current through the igniting resistor, said measuring current being smaller than said igniting current;

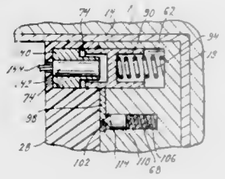
whereby a terminal voltage generated across the igniting resistor by flowing the measuring current through the igniting resistor is measurable from the exterior of the detonator.

4,899,659

SAFE AND ARM DEVICE

Lee R. Hardt, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1989, Ser. No. 374,038
Int. Cl.[4] F42C 15/24, 15/32, 15/36
U.S. Cl. 102—225 18 Claims



1. An acceleration actuated safe and arm device for an external booster explosive, said device having a SAFE position and an ARMED position and, comprising:

a housing having a window at one end, and a longitudinal axis normal to said end,

a means for exploding a booster explosive,

a means for detonating said exploding means,

a fixed base disposed at said window end of said housing and having an intermediate surface facing into said housing normal to said longitudinal axis, an elongated shaft extending normal to said surface from the center thereof and coincident with said longitudinal axis, a first cylindrical receptacle extending partially and longitudinally into said base from and normal to said intermediate surface, a second cylindrical receptacle separated angularly from said first cylindrical receptacle and extending from and normal to said intermediate surface through said base to said window to receive said exploding means, a third cylindrical receptacle separated angularly from said first and second cylindrical receptacles and extending normal from the open end in the intermediate surface of said fixed base partially therethrough, and a boss extending normal to said surface at a point radially spaced from said shaft and angularly displaced on said surface from said exploding means, said boss having at least one planar radial face,

a means rotatably disposed upon said shaft in juxtaposition with said fixed base for holding said detonating means in the SAFE position of said device angularly displaced from said exploding means prior to device acceleration, and in the ARMED position of said device in direct alignment with said exploding means after the required level of device acceleration has been attained, and moving said detonating means between said SAFE and ARMED positions,

an acceleration actuated means movably disposed between said fixed base and said means for holding and moving said detonating means for shrouding said detonator and locking said means for holding and moving said detonating means from rotation prior to device acceleration and, unshrouding said detonator and unlocking said means for holding and moving said detonating means for rotation at a predetermined acceleration said holding and moving means relative to said fixed base for holding said means for exploding when said device is in said SAFE or said ARMED position, respectively, and

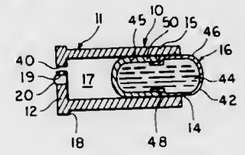
a means affixed to and extending from said means for holding and moving said detonator, to abutting relation with said planar radial face of said boss extending normal to said intermediate surface of said fixed base, for applying force to said boss and turning said means for holding and moving said detonator relative to said fixed base between said SAFE and ARMED positions.

4,899,660

TRAINING ROUND FOR FIREARM

Richard W. Brighton, London, Canada, assignor to Rainier International, Inc., Carson City, Nev.

Filed Apr. 11, 1988, Ser. No. 179,680
Int. Cl.[4] F42B 8/00
U.S. Cl. 102—447 4 Claims



1. A non-lethal training round for use in a revolver type weapon comprising:

a non-lethal projectile;

a casing having walls forming a cavity to receive said projectile, said casing having a first opening in a first wall to allow exiting of said projectile and having a second wall forming an end wall;

a primer cap in said end wall communicating with said cavity and energizeable as the sale source to cause a gas pressure increase in said cavity and drive said projectile from said casing out through said first opening; and

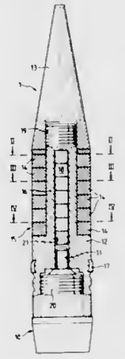
said casing walls including means to limit the pressure buildup in said cavity to thereby limit the force exerted on said projectile including at least one vent opening in said end wall communicating with said cavity.

4,899,661

PROJECTILE CONTAINING A FRAGMENTATION JACKET

Viktor Kaelin, Einsiedeln, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buehrle AG, Zürich, Switzerland

Filed Feb. 14, 1989, Ser. No. 310,314
Claims priority, application Switzerland, Feb. 18, 1988, 00597/88
Int. Cl.[4] F42B 13/18
U.S. Cl. 102—495 1 Claim



1. A projectile containing a fragmentation jacket, comprising:

an explosive charge located within said fragmentation jacket;

a fuze for detonating said explosive charge;

means for fracturing said fragmentation jacket into splinters of a predetermined size;

said fragmentation jacket comprising:
- a hollow mandrel containing a bore within which there is received said explosive charge;
- a plurality of individual rings defining said fracturing means;
- each of said individual rings comprising individual segments assembled together to form each said ring;
- each of said individual rings being stacked upon said mandrel;
- each of said individual rings containing means defining reference fracture locations;
- each of said individual rings fracturing along said reference fracture locations into said splinters of said predetermined size;
- the individual segments of each individual ring comprising sintered interconnected segments for forming the corresponding individual ring; and

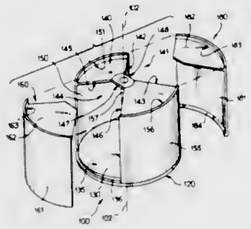
a projectile hood secured to said mandrel for holding together said plurality of individual rings.

4,899,662

CONTAINER-DISPERSER FOR CHAFF CONSTITUTED BY METAL STRIPS OR BY METALLIZED STRIPS

André R. G. Santalucia, Muret, and Gilbert Demarest, Portet sur Garonne, both of France, assignors to Etienne Lacroix Tous Artifices S.A., Muret, France

Filed Jun. 15, 1988, Ser. No. 207,190
Claims priority, application France, Jun. 16, 1987, 87 08385
Int. Cl.[4] F42B *13/00*
U.S. Cl. 102—505 **17 Claims**



1. A container-disperser for chaff constituted by metal strips or by metallized strips, wherein the container-disperser comprises:
- a body, said body including spacers and two generally parallel end plates rigidly interconnected by said spacers, at least one of the end plates having at least one peripheral opening, and
- at least one removable shell, said spacers and said at least one removable shell together forming a continuous envelope between the two end plates, wherein said at least one removable shell has a sheet for complementary engagement with said at least one peripheral opening.

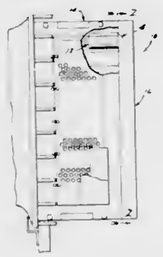
4,899,663

PERCUSSION INITIATED INFLATOR ASSEMBLY

William F. Thorn, Redmond, Wash., assignor to Automotive Systems Laboratory, Inc., Farmington Hills, Mich.

Filed Feb. 15, 1989, Ser. No. 310,858
Int. Cl.[4] F42B *3/04*
U.S. Cl. 102—530 **1 Claim**

1. A percussion initiated inflator assembly comprising
- a housing,
- an airbag forming a front wall of said housing,
- a rigid detonator panel forming a rear wall of said housing,
- a plurality of gas generating cartridge supported within said housing by said detonator panel,
- a percussion initiated primer in each of said cartridges,
- a diaphragm between the percussion primer of each of said cartridges and said detonator panel,
- a single detonator supported internally of said detonator panel in spaced relation to said cartridges, and



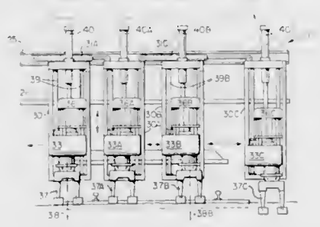
- an explosive trace disposed internally of said detonator panel and extending from said detonator to the diaphragm of each of said cartridges, respectively, for effective percussion ignition thereof.

4,899,664

SPLIT WORKHEAD

Roy J. Moore, Columbia, and Calvin L. Coy, Chapin, both of S.C., assignors to Tamper Corp., Columbia, S.C.

Filed Feb. 9, 1987, Ser. No. 12,608
Int. Cl.[4] E01B *27/12*
U.S. Cl. 104—12 **5 Claims**



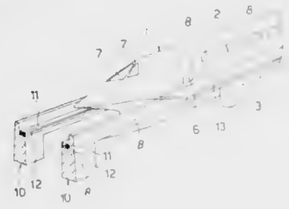
1. A railroad switch tamping machine comprising a wheeled rail travelling vehicle;
- guide frame means extending transversely of the vehicle;
- four tamping units each with a ballast tamping blade mounted for movement in translation parallel to a plane containing the tops of the rails of a track and transversely to the length of the track and mounted for displacement on said guide frame means in a direction perpendicular to said plane;
- means for individually moving each of the four tamping units in the direction of said displacement relative to each other tamping unit; and
- further means for individually moving each of the four tamping units on said guide frame means for causing said ballast tamping blades to be moved only in translation parallel to said plane and transversely to the length of the track and relative to each other tamping unit.

4,899,665

ASSEMBLY COMPRISING BOTH A VEHICLE MOVABLE ON RAILS AND SUPPORTING MEANS FOR THE VEHICLE COMPRISING THE RAILS

Ooofrio La Sorte, Via Gian Carlo Sismondi 50/3, Milan, Italy

Filed Apr. 18, 1988, Ser. No. 182,981
Claims priority, application Italy, Apr. 23, 1987, 20220 A/87
Int. Cl.[4] B61D *15/00*
U.S. Cl. 104—23.1 **9 Claims**



1. An assembly, comprising
- a vehicle adapted to move on rails,
- rails mounted to support said vehicle movably thereon,
- wheels for movably mounting said vehicle on said rails,
- said vehicle comprising a pair of lateral flyers, and being internally divided into two decks,
- an upper deck for accommodating loads such as passengers, and a lower deck for accommodating heavy loads such as cargo,
- a floor of said upper deck being substantially at a level of said flyers,
- means for supporting said rails and providing an empty area between and below said rails,
- said lower deck of said vehicle and a center of gravity of the vehicle being located below a tangent plane passing under said vehicle wheels when said vehicle is substantially level upon said rails,
- wherein said flyers each longitudinally extend along said vehicle,
- said wheels are situated directly underneath each said flyer, and
- each said flyer comprises a recess on a lower surface thereof for accommodating said wheels.

4,899,666

CONVEYING SYSTEM

Jacques Meier, Bäretswil, Switzerland, assignor to SFT AG Spontanfördertechnik, Weinfelden, Switzerland

Filed Oct. 21, 1988, Ser. No. 261,132
Claims priority, application Switzerland, Nov. 10, 1987, 4365/87
Int. Cl.[4] B65G *35/04*
U.S. Cl. 104—88 **22 Claims**



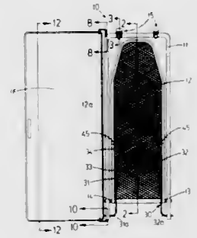
1. A conveying system comprising the combination of a central station;
- a plurality of satellite stations;
- guide means defining a plurality of paths, each path extending between one of said satellite stations and a selected one of said central station and satellite stations;
- a plurality of elongated, single-strand, transfer chain members, each of said chain members being longitudinally movable in said guide means along one of said paths;
- a plurality of drive means for longitudinally bidirectionally driving said chain members, each of said drive means being housed at one of said satellite stations and being coupled to only one of said chain members so that a single drive means bidirectionally drives a single chain member along a predetermined one of said paths, extending and retracting a distal end thereof; and
- a plurality of load conveying means, one of said load conveying means being coupled to each of said chain members near said distal end thereof whereby each of said load conveying means is moved toward and away from an associated one of said satellite stations as the drive means in said one of said satellite stations retracts and extends a chain member coupled thereto.

4,899,667

DOOR MOUNTED IRONING BOARD ASSEMBLY

Benson L. Miller; Paul T. Scherer, both of Lexington, and Neiman C. Maclin, Louisville, all of Ky., assignors to Millex Incorporated, Nicholasville, Ky.

Filed Sep. 21, 1987, Ser. No. 98,558
Int. Cl.[4] A47B *5/00, 3/00*
U.S. Cl. 108—47 **11 Claims**



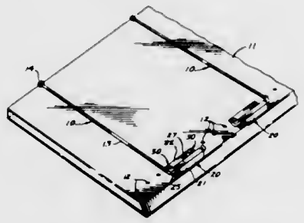
1. An ironing board assembly for standard door mounting or the like comprising:
- a portable mounting frame;
- an ironing board pivotally mounted on said frame for lowering to an operative, substantially horizontal position at normal ironing height and for retracting to a storage, substantially vertical position;
- a U-shaped support brace having a center section and side legs being mounted adjacent the bottom of the frame;
- guide means for the center section of the brace along the bottom of the board and defining a path of travel for said brace a said board is lowered and retracted,
- pin means extending laterally relative to the lower ends of the legs below the board and pivotally coupled to said mounting frame;
- said pin means permitting flexing of at least one of said legs;
- said ironing board including a peripheral frame, said frame positioned adjacent said mounting frame and the legs when in the retracted position; and
- detent means adjacent to and for engagement of said one leg to hold the board in the retracted position, and to release to the operative position upon manual inward flexure of said leg.

4,899,668

SHELF DIVIDER

Stanley C. Valinlis, Rockford, Ill., assignor to Southern Imperial, Inc., Rockford, Ill.

Filed Dec. 15, 1988, Ser. No. 284,731
Int. Cl.[4] A47B *57/58*
U.S. Cl. 108—61 **18 Claims**



1. A divider for a generally horizontal shelf, said shelf having front and rear ends and having a laterally extending row of laterally spaced and upright holes located adjacent the front end of the shelf, said divider comprising an elongated horizontal rod extending from the front end of the shelf toward the rear end thereof, said rod having front and rear ends, an elongated horizontal finger formed integrally with and projecting laterally from the front end of said rod, a bracket attached to said finger and engagaeable with said shelf to space the front end of said rod a predetermined distance above said shelf, and a pair of laterally spaced pins projecting downwardly from said bracket and sized to fit snugly but releasably in two of said holes thereby to hold said divider in a substantially fixed position on said shelf.

4,899,669

VIBRATING APPARATUS AND METHOD IMPROVEMENTS FOR PROVIDING CONTINUOUS FLOW OF REFUSE DERIVED FUEL TO FIRE POWER PLANTS

George D. Dumbaugh, Louisville, Ky., assignor to Kinergy Corporation, Louisville, Ky.

Filed May 24, 1989, Ser. No. 356,255
The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.
Int. Cl.[4] F23H *5/18*
U.S. Cl. 110—101 C **19 Claims**

1. In apparatus for supplying refuse derived fuel, that has been shredded to a predetermined nominal size, to a furnace fuel feed chute that is open to the furnace fire chamber, in a continuous and uninterrupted flow, for burning of such fuel in the furnace fire chamber,

said apparatus comprising:

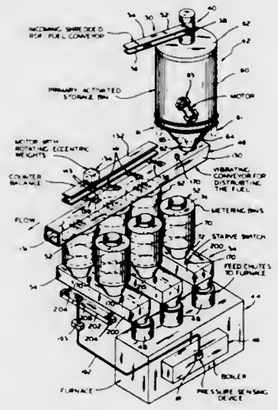
an activated bin defining an essentially vertical central axis, said bin including an upper intake port and a lower discharge port aligned with said axis,

said bin having a plurality of vertically spaced baffle arrangements that are each essentially centered on said axis and are characterized by being open along said axis,

means for continuously storing the fuel in said bin through said intake port at a rate that is substantially in excess of the flow rate of said flow,

means for periodically actuating said bin to vibrate for feeding from the stored fuel quantity through said discharge port the fuel at a predetermined lesser flow rate, and

fuel distributing conveyor means below said primary bin and including means for receiving the fuel from said primary bin discharge port at said lesser flow rate and means for



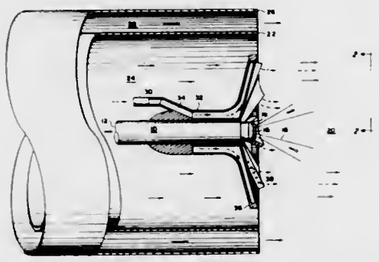
conveying the fuel to and into the furnace fuel supply chute.

4,899,670

MEANS FOR PROVIDING OXYGEN ENRICHMENT FOR SLURRY AND LIQUID FUEL BURNERS

James G. Hansel, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 9, 1988, Ser. No. 282,156
Int. Cl.[4] F23D *1/02*
U.S. Cl. 110—264 **12 Claims**



1. A fuel burner comprising a central axial fuel nozzle, a first annular shell defining a first passage surrounding said nozzle for delivery of primary oxidant gas, a combustion zone downstream of said nozzle where the fuel is combusted with said gas and a diffuser plate for swirling said gas into said combustion zone, wherein said diffuser plate has a series of vanes emanating radially outward from said fuel nozzle, said vanes include conduit means for dispensing oxygen-enriched gas to the primary oxidant gas such oxygen-enriched gas supplied by a pipe means.

4,899,671

METHOD FOR MEASURING TEMPERATURE OF HOT GASES INSIDE A VESSEL WHICH RADIATES MICROWAVE ENERGY

Ronald M. Bass, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 9, 1988, Ser. No. 282,768
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—341 **4 Claims**

1. In a method for measuring temperature of hot gases within a vessel, which gases may contain entrained solids, which method comprises:

(a) sensing the microwave energy emitted from said gases, any entrained solids, and the inner surface of the vessel;

(b) converting said sensed microwave energy into an electrical signal indicative thereof; and

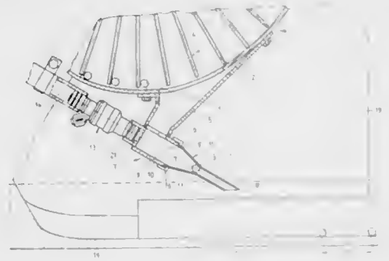
(c) measuring the amplitude of said signal as an indication of the temperature of said gases, the improvement which comprises sensing the microwave energy at a frequency in the range above 100 Gigahertz, whereby the temperature of the gases, the temperature of the entrained solids, and the temperature of substantially only the inner surface of the vessel in contact with the gases contribute to the signal.

4,899,672

METHOD AND ARRANGEMENT FOR SOWING INDIVIDUAL SEEDS IN A FURROW MADE BY A PLOUGHSHARE

Karl-Heinz Paul, Zur Wilde 8, 3590 Bad Wildungen-Wega, Fed. Rep. of Germany

Filed Nov. 3, 1987, Ser. No. 116,628
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 3637530
Int. Cl.[4] A01C *7/20*
U.S. Cl. 111—174 **9 Claims**



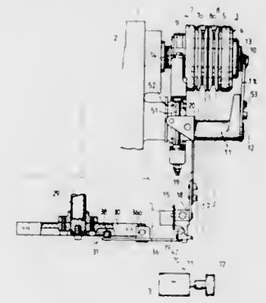
1. A sowing arrangement comprising: seed separating means; guide means and a ploughshare; means for trapping seeds moving in said guide means and for depositing the seeds in a furrow made by the ploughshare in the vicinity of an end of said guide means; said trapping means being set up for trapping and releasing the individual seeds and comprising; an axial substantially closed housing for centering the individual seeds in relation to an axis of the housing according to a predetermined direction of release; said housing having a funnel-shaped part adapted to move into a first position in which the individual seeds are trapped and retained; said funnel-shaped part being adapted to move into a second position for releasing the individual seeds, and a fluid source driven pulsatingly and connected to said housing for releasing the individual seeds into the furrow at constant sowing spacing; said funnel-shaped part of said housing being actuated by said fluid source in both said positions; said housing for trapping and releasing the individual seeds having a substantially cylindrical shape with a cylinder axis, said housing being aligned with said cylinder axis in the direction of release; said housing having laterally an aperture allowing seed to pass out of said guide means; said fluid source being connected to an upper end of said housing, said funnel-shaped part being arranged in a lower part of said housing; said funnel-shaped part comprising wall parts mounted to yield resiliently under pressure; said funnel-shaped wall parts comprising pyramidally-arranged metal elements and return spring means.

4,899,673

CONTROL DEVICE FOR CYCLIC SEWING MACHINE

Akio Takahashi, Hashima, and Mamoru Yasuda, Kasugai, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Mar. 1, 1989, Ser. No. 317,524
Claims priority, application Japan, Mar. 3, 1988, 63-50488
Int. Cl.[4] D05B *3/00, 69/26*
U.S. Cl. 112—67 **5 Claims**



1. A control device for a cyclic sewing machine for controlling the driving condition of a sewing machine main shaft rotatably supported on a sewing machine frame and connected to a driving source; said control device comprising:

a clutch mechanism provided between said driving source and said main shaft said clutch mechanism including at least one pulley rotatably provided on the main shaft and rotated by said driving source and at least one clutch member rotatable together with said main shaft;

a switching member movable selectively into three different positions for switching a clutch mechanism between a power cutoff condition, a low-speed drive condition, and a high-speed drive condition with relative movement of said pulley and said clutch member in an axial direction of said main shaft;

an engaging member connected to said switching member for engaging with said main shaft and stopping the rotation thereof when said switching member is moved into the position corresponding to said power cutoff condition;

a control cam rotatable at a reduced speed in interlinked relation to said main shaft, said control cam including a first control portion corresponding to the power cutoff condition for the main shaft, second control portions disposed on each side of said first control portion radially inwardly of said first control portion toward the center of rotation of the control cam and corresponding to said low-speed drive condition, and a transition portion extending radially inwardly of said second control portions toward the center of rotation of said control cam;

an operating member movably mounted on said frame and operatively coupled to said switching member, said operating member being engageable with said control cam;

a third control portion integral with or separate from said control cam for limiting further movement of said operating member which has moved from said second control portions past said transition portion, said third control

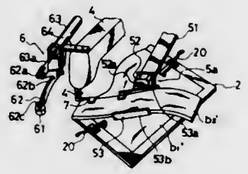
portion corresponding to the high-speed drive condition for said main shaft;
an urging means for normally urging said operating member in a direction to engage said control cam;
a lost-motion connecting means disposed between said operating member and said switching member to produce a lost-motion; and,
a control member operatively coupled to said switching member and operable under an applied external force for moving said switching member from said power cutoff condition to said low-speed drive condition to rotate said main shaft at a low speed.

4,899,674

SEWING APPARATUS FOR AUTOMATICALLY SEWING A CLOTH HAVING A RECTILINEAR SHAPE TO A CLOTH HAVING A CURVED SHAPE

Kiyoshi Kawasaki, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,567
Claims priority, application Japan, May 31, 1988, 63-134073; May 31, 1988, 63-134074
Int. Cl.[4] D05B *21/00, 27/00*
U.S. Cl. 112—121.12 **3 Claims**



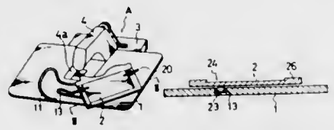
1. A sewing apparatus, by which a rectilinear part of a first base blank material is sewn to a sinuously-cut or wavy part of a second base blank material, comprising;
a sewing machine body having a table;
a stationary plate fixed on said table of said sewing machine body; said stationary plate having three guide grooves formed on its upper surface;
a movable plate slidably mounted on said stationary plate, said movable plate including clamp means for securing said first base blank material thereon and three guide rollers rotatably provided at a reverse surface of said movable plate, said three guide rollers being slidably fitted in said three guide grooves of said stationary plate, respectively,
wherein said three guide grooves are each formed in conformity with respective traces which are to be shown by said three guide rollers in order that said movable plate is so moved on said stationary plate as to sew said rectilinear part of said first base blank material to said sinuously-cut part of said second base blank material, and further two of said three guide rollers are each formed with a widened groove whose area is greater than outer diameters of said guide rollers, so that at least two guide rollers are always slidingly moved along their respective guide grooves,
a supplying guide mechanism provided above said movable plate, said supplying guide mechanism being adapted for supplying said first base blank material to a sewing area of said sewing machine body;
a supportive guide mechanism adapted for supportively guiding and retaining upwardly a free end part of said first base blank material,
whereby, by operation of said sewing machine body, said rectilinear part of said first base material is sewn to and along said sinuously-cut part of said second base material.

4,899,675

SEWING APPARATUS FOR SEWING A CURVED, WAVY CLOTH

Kiyoshi Kawasaki, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,572
Claims priority, application Japan, May 31, 1988, 63-134073; May 31, 1988, 63-134074
Int. Cl.[4] D05B *21/00, 27/00*
U.S. Cl. 112—121.12 **7 Claims**



1. A sewing apparatus, by which a base blank material is sewn, comprising:
a sewing machine body having a table;
a stationary plate fixed on said table of said sewing machine body; said stationary plate having three guide grooves formed on its upper surface; and
a movable plate slidably mounted on said stationary plate, said movable plate including clamp means for securing said base blank material thereon and three guide rollers rotatably provided at a reverse surface of said movable plate, said three guide rollers being adapted to be slidably fitted on said three guide grooves of said stationary plate, respectively,
wherein said three guide grooves are each formed in conformity with respective traces which are to be shown by said three guide rollers in order that said movable plate is moved on said stationary plate so as to effect sewing of said base blank material in a sinuous or wavy fashion, and further two of said three guide rollers are each formed with a widened groove whose area is greater than outer diameters of said guide rollers, so that at least two guide rollers are always slidingly moved along their respective guide grooves, to thereby effect stable sewing of said base blank material,
whereby, by operation of said sewing machine body, said base blank material is sewn in a sinuous or wavy fashion automatically.

4,899,676

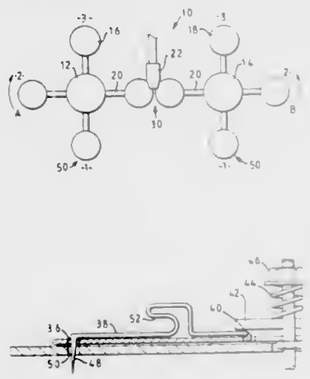
AUTOMATIC FLAT SEAMING APPARATUS

John C. Humphreys, Hinckley, England, assignor to H. Flude & Co. (Hinckley) Limited, Leicestershire, England

Filed Mar. 30, 1989, Ser. No. 331,593
Claims priority, application United Kingdom, Mar. 30, 1988, 8807547
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.15 **15 Claims**

1. An apparatus for flat seaming together two garment portions such as a panti-hose half and a gusset, comprising:
first carrier means for supporting the body portion of said panti-hose half;
second carrier means for supporting said gusset;
a respective support means for supporting said first and second carrier means and moving said first carrier means successively through a loading station, an opening station and a seaming station and moving said second carrier member through a loading station and said seaming station;
respective clamping means for gripping said gusset and said body portion of said panti-hose half to the respective carrier means;
means at said opening station for opening said body portion

along a preselected line extending from a waistband of said body portion to form an opening in said body portion;
means at said seaming station for seaming together free edges of said gusset and said opening in said body portion; and



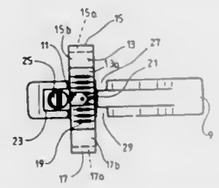
moving means for bringing said first and second carrier means into juxtaposition to align said free edges with one another at said seaming station and means for moving said carrier means relative to one another and to said seaming means to bring successive portions of said edges in juxtaposition during seaming to enable said seaming means to seam said edges together.

4,899,677

SEWING MACHINE PRESSER FOOT WITH NEEDLE GUIDE FOR SLIDE FASTENER APPLICATION

Emmy Frey, Rorschach, and Ernst Dreier, Steckborn, both of Switzerland, assignors to Fritz Gegauf Aktiengesellschaft Bernina-Nähmaschinenfabrik, Steckborn, Switzerland

Filed Oct. 14, 1988, Ser. No. 258,206
Claims priority, application Switzerland, Oct. 17, 1987, 4096/87
Int. Cl.[4] D05B *29/12, 35/10, 35/12*
U.S. Cl. 112—151 **16 Claims**



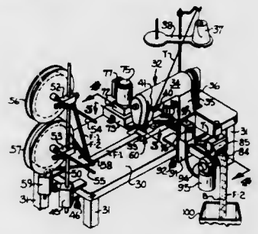
1. A presser foot, particularly for use in machines for sewing marginal portions of fabrics to slide fasteners so that the marginal portions overlie the slide fastener which is attached thereto, comprising a sole plate having first and second sides and a channel; a fabric-engaging guide extending into said channel transversely of said sole plate and having first and second end portions extending beyond the respective sides of said sole plate, each of said end portions including a downwardly extending tip, and said tips being permanently fixed against translation towards and away from one another; and means for adjustably connecting said guide to said sole plate so that the guide is movable transversely of said sole plate between a plurality of different positions.

4,899,678

METHOD AND APPARATUS FOR TESTING SEWING THREAD

Frank H. Simons, Charlotte, N.C., and Carl N. Black, Ft. Mill, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Mar. 31, 1989, Ser. No. 331,158
Int. Cl.[4] D05B *97/00*
U.S. Cl. 112—262.1 **9 Claims**



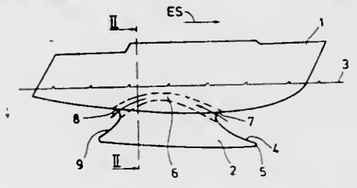
1. A method of testing the sewing characteristics of sewing thread for determining a suitable sewing thread for sewing a seam in a particular type of fabric with a sewing machine having a vertically reciprocable needle, said method comprising;
(1) providing a supply of test strip fabric corresponding to the particular type of fabric to be seamed,
(2) selecting a sewing thread having characteristics that may be suitable for forming seams in the test strip fabric,
(3) feeding the test strip fabric from the supply in a predetermined path of travel and at a preselected rate of travel underneath and past the vertically reciprocable needle of the sewing machine while forming stitching thereon,
(4) collecting the sewn test strip fabric,
(5) visually inspecting the collected sewn test strip fabric for defects in the stitching formed thereon and determining the suitability of the sewing thread for use with the test strip fabric; and
(6) repeating steps 3 to 5 on the test strip fabric with at least one other selected sewing thread having different characteristics and which may be suitable for forming seams in the test strip fabric should it be determined from the visual inspection of the previously collected stitched test strip fabric that stitching defects present therein are commercially unacceptable.

4,899,679

KEEL STRUCTURE

Heerik Immonen, Tampere, Finland, assignor to Sarvis Oy, Tampere, Finland

Filed Oct. 6, 1988, Ser. No. 253,821
Claims priority, application Finland, Oct. 6, 1987, 874384
Int. Cl.[4] B63B *3/38*
U.S. Cl. 114—39.1 **5 Claims**



1. A keel structure for a nautical vessel having a hull, said keel structure comprising:

a keel projecting downwardly from the bottom of the hull, said keel extending along a portion of the length of said hull, said keel having a leading edge provided at one end, and a trailing edge provided at the opposite end thereof;

at least one channel formed substantially inside said hull and extending in a lengthwise direction of said hull;

said channel having an inlet opening formed in said keel at the junction of said end forming said leading edge to the bottom of said hull, and an outlet opening formed in said keel at the junction of said end forming said trailing edge to the bottom of said hull;

said leading edge including a first wedge-shaped guiding surface converging towards said inlet location and said trailing edge including a second guiding surface sloping downwardly from said outlet location and substantially corresponding in shape to said first guiding surface; and

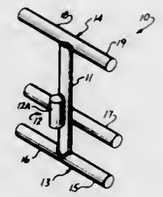
said first guiding surface directing the water displaced by said keel towards said inlet and said second guiding surface directing the water from said outlet downwardly and rearwardly longitudinally of said hull.

4,899,680

BOAT MOORING DEVICE AND METHOD OF USING SAME

Alexander I. Russell, Jr., 631 S. 9 St., Broken Bow, Nebr. 68822

Filed May 23, 1988, Ser. No. 197,768
Int. Cl.[4] B03B *21/04*
U.S. Cl. 114—230 13 Claims



1. A boat mooring device comprising:

a shank member, said shank member being a rod;

a first cross arm member perpendicular to said shank member and disposed on one end thereof;

a second cross arm member perpendicular to said shank member and oppositely disposed said first cross arm member extending from the opposite end of said shank member;

a third cross arm member perpendicular to said shank member and disposed in a parallel spaced-apart manner from said first cross arm member and said second cross arm member;

said third cross arm member being disposed closer to said first cross arm member than said second cross arm member;

said first, second, and third cross arm members each being a rod and being attached to said shank member at their central portions;

said first cross arm member being adapted for attaching a mooring line thereto when said second cross arm member is inserted into a retaining slot formed by planks of one thickness; and

said second cross arm member being adapted to engage a mooring line when said first cross arm member is inserted into a retaining slot formed by planks of a greater thickness.

4,899,681

BOAT MOORING DEVICE

Guy L. Ottmann, 10371 Surrey La., Redding, Calif. 96002, and Dean R. Sherman, Sr., P.O. Box 413, Bella Vista, Calif. 96008

Filed Aug. 3, 1988, Ser. No. 227,674
Int. Cl.[4] B63B *21/00*
U.S. Cl. 114—230 5 Claims



1. A boat mooring device, comprising:

at least two arms, each of said arms having first attaching means for attachment to a boat, second attaching means for attachment to a shore, and an adjusting means whereby the length of said arm is adjustable to facilitate use with a variety of boats and in a variety of shoreline terrains, and

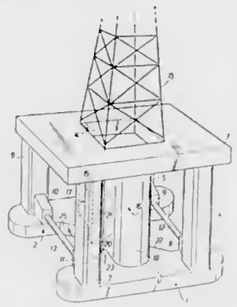
an adjustable-length cross member extending between and attached to said arms whereby said arms are held in relative position with respect to each other.

4,899,682

CATAMARAN-TYPE SEMISUBMERSIBLE DRILLING VESSEL FOR OFFSHORE DRILLING

Gilles Pouget, Nozay; Jean Chevallier, Paris, both of France, and Gene Hampton, Aberdeen, Scotland, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Nov. 19, 1987, Ser. No. 123,020
Claims priority, application France, Dec. 3, 1986, 86 16942
Int. Cl.[4] B63B *35/44*
U.S. Cl. 114—264 9 Claims



1. A semisubmersible drilling vessel of the type comprising:

a pair of substantially parallel, substantially horizontal, elongated submersible hulls separated by a space therebetween;

a deck supported above said hulls and connected thereto by a mounting structure, said deck including an opening surmounted by a derrick overhanging said space;

means for handling pipes; and

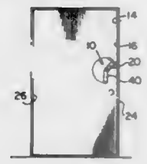
said mounting structure including a pair of hollow, structural, load bearing columns, at least one, internally provided with vertical pipe storage means, each of said columns having walls and being connected to and positioned along one of said hulls to be spaced from and to be facing one another across said space under said opening.

4,899,683

OCCUPANCY MARKER

Antonino Caffaro, 27 Lipston Avenue, Nepean, Ontario, Canada (K2E 5Z2)

Filed Dec. 21, 1987, Ser. No. 135,711
Claims priority, application Canada, Jan. 28, 1987, 528207
Int. Cl.[4] G08B *5/00*
U.S. Cl. 116—215 12 Claims



1. A safety device to indicate whether a closure member, such as a door or window, in a framed opening of a room of an edifice has been opened, said device comprising:

a first member for securement to said closure member; and

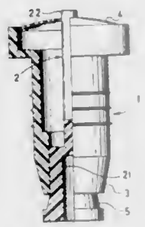
a second member pivotally secured to said first member for pivotal movement about a pivot means having an axis extending substantially at right angles to the planes of said first and second members, said second member being movable by gravity from a first position to a second position, said second member having edge means engageable in said first position with the frame of the opening; whereat said second member conceals said first member from view in said first position and exposes said first member to view in response to opening of said closure member sufficiently for said second member to clear the frame and move to said second position.

4,899,684

PRESSURE INDICATING BOTTLE STOPPER

Vladimir Houzvic, and Viri Jaki, both of Praha, Czechoslovakia, assignors to Jednotne Rolnicke Druzstvo Jedlova Vo Vysnej Jedlovej, Czechoslovakia

Filed Aug. 17, 1988, Ser. No. 232,943
Claims priority, application Czechoslovakia, Aug. 17, 1987, PV6040-87
Int. Cl.[4] G01L *7/16*
U.S. Cl. 116—272 3 Claims



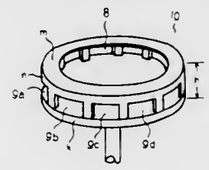
1. A pressure indicating bottle stopper comprising a generally cylindrical external carrier body formed of a deformable viscoelastic material adapted to be tightly inserted into a bottle neck to seal said bottle, said carrier body having an axial opening extending therethrough, an elongated indicator body disposed within said opening such that an upper end thereof extends beyond said carrier body, a lower peripheral portion of said indicator body being conically tapered and adapted to circumferentially engage said external carrier body within said opening to thereby seal said opening, and said indicator body adapted to be moved in a first direction further into said opening in response to an increase in pressure within said bottle to thereby outwardly and elastically deform said carrier body, the magnitude of said movement being in proportion to the magnitude of said pressure increase and discernable by the change in position of said upper end of said indicator body relative to the carrier body, said opening further remaining sealed during movement of said indicator body in said first direction.

4,899,685

SUBSTRATE COATING EQUIPMENT

Kazushi Kawakami, Okayama, Japan, assignor to Tasmo Co., Ltd., Japan

Filed Nov. 22, 1988, Ser. No. 274,883
Claims priority, application Japan, Nov. 23, 1987, 62-295983
Int. Cl.[4] B60G *11/22*; B05C *11/08*
U.S. Cl. 118—50 2 Claims



1. Spin coating apparatus comprising

(1). a subtrate placing table (spin head) having a vacuum adsorption hole to set and fix a subtrate on the upper surface of a spindle,

(2). an air aerial stream control frame body furnished with a through hole whose section is of a reversed-U shape and whose diameter is larger than the size of said subtrate and furnished with a plurality of air exhaust ports at the peripheral side wall having a certain fixed height being mounted at said spin head and to rotate integrally with said spin head, and

(3). a doughnut-like cup being so arranged that said cup can wrap said aerial stream control frame body in the center thereof, having an air suction hole of which size is a little larger than the peripheral side wall height of said aerial stream control frame body at the internal peripheral face of said cup, and a pipe provided with an exhaust fan being interconnected to the bottom of said cup.

4,899,686

COATING DEVICE

Takayuki Toshima, Nirasaki, and Osamu Hirakawa, Kumamoto, both of Japan, assignors to Tokyo Electron Limited, Tokyo and Tel Kyushu Limited, Kumamoto, both of, Japan

Filed Apr. 4, 1989, Ser. No. 332,969
Claims priority, application Japan, Apr. 8, 1988, 63-86735
Int. Cl.[4] B05C *1/02*
U.S. Cl. 118—50 10 Claims

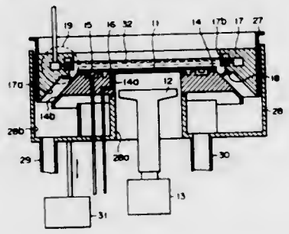
1. A coating device comprising:

a cup means having an opening through which substrates to be processed are mounted in and out of the cup means and serving to form a processing vessel with its bottom sealingly contacted with the underside of the substrate to be processed;

a ring-shaped outer circumferential groove formed in the circumferential wall of said cup means and communicated with the processing vessel;

a plurality of nozzles each connected to a processing liquid supply source at one end thereof and also connected to the

outer circumferential groove, said nozzles being arranged along the inner circumferential rim of the outer circumferential groove at a certain interval; and



a partition wall erected to form an inner wall of the cup means, facing said nozzles with a certain interval interposed between them.

4,899,687

DEVICE FOR COATING A WEB OF MATERIAL TRAVELING AROUND A BACKING ROLLER

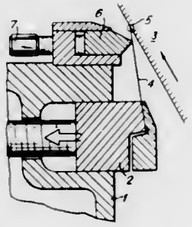
Herbert Sommer, and Peter Rieleit, both of Duesseldorf, Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,481

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729621

Int. Cl.[4] B05C *1/04, 11/04*

U.S. Cl. 118—126 **11 Claims**



1. In a device for coating a web of material traveling around a backing roller, with a flexible doctor having a foot secured in a clamping beam, an edge for contacting a web on the backing roller and supported by a supporting bar and with pressure-adjusting mechanism positioned along the width of the doctor and acting independently of each other in individual positions on the doctor, the improvement wherein the supporting bar is in contact with the doctor below the edge and a portion of the pressure-adjusting mechanism disposed below the supporting bar to act on the doctor to adjusting the pressure of the doctor on the backing roller.

4,899,688

SPIN COATING APPARATUS

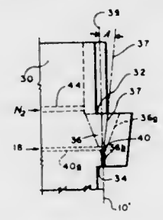
Robert S. Heckrotte, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1988, Ser. No. 271,151

Int. Cl.[4] B05C *3/12;* **C03C** *25/02*

U.S. Cl. 118—405 **3 Claims**

1. A fiber coating apparatus comprising: a body member and a detachable cover held together, said body member and said cover having contiguous surfaces which join at a longitudinal mating line, said surfaces having matching portions of passage lengths formed therein defining a passage through which fiber passes for coating, said passage having a conical length followed by a straight length and a longitudinal axis, said body member having a pair of passages defined therein and connected to a molten polymer supply means for introducing



molten polymer into said passage at directly opposed intermediate locations along said conical length, said longitudinal mating line being angularly displaced from said longitudinal axis.

4,899,689

DEVELOPING DEVICE WITH A DEVELOPING ROLLER AND USING A SINGLE-COMPONENT DEVELOPER AND METHOD FOR PRODUCING SUCH DEVELOPING ROLLER

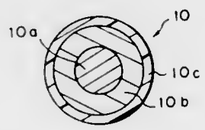
Fuchio Takeda; Koji Sakamoto, both of Tokyo, and Kazuo Kobayashi, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

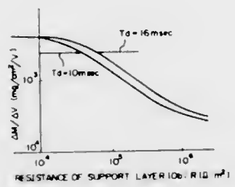
Filed Mar. 10, 1989, Ser. No. 321,374

Claims priority, application Japan, Mar. 10, 1988, 63-56767

Int. Cl.[4] G03G *15/06;* **B21B** *31/08;* **B60B** *5/00;* **B41M** *5/16*

U.S. Cl. 118—651 **8 Claims**





1. In a developing device comprising a developing roller which has at least a dielectric layer provided on a resilient support layer and developing an electrostatic latent image formed on a photoconductive drum through said developing roller by using a single-component developer which is constituted by toner, a resistance component is provided in parallel with a capacitor component of said support layer of said developing roller, a resistance value R of said resistance component being determined to satisfy a condition:

$$\frac{M(Td)}{M(\infty)} \geqq 0.8$$

where M(Td) is an amount of toner deposition M on said photoconductive drum occurring when t=Td in an equation (eq. 22) and determined by an equation (eq. 21), M(∞) is an amount of toner deposition M on said photoconductive drum under a saturated condition which is determined by the equation (eq. 21), a time Td is determined by an equation (eq. 13), and a contact width H_0 of said photoconductive drum and said developing roller which is included in the equation (eq. 13) is determined by an equation (eq. 2).

4,899,690

CONTAINER FOR ELECTROSTATOGRAPHIC TONER OR DEVELOPER

Frank Hacknauer, Honeoye Falls, and Kenneth D. Corby, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1988, Ser. No. 232,062

Int. Cl.[4] G03G *15/06*

U.S. Cl. 118—653 **8 Claims**



1. A two-compartment container for supplying toner to an electrostatographic developing station of the type using a developer which is a mixture of toner particles and carrier particles and which station has means for receiving the container in a toner supplying position and has an egress for spent developer, said container having

means cooperable with such a receiving means for positioning said container in a toner supplying position;

a first compartment for containing at least fresh toner; and

a second compartment having an ingress mateable with a spent developer egress of a developing station for receiving spent developer therethrough when said container is in its toner supplying position.

4,899,691

PRECISION POSITIONING SYSTEM FOR A COATER

John W. Fitzgerald, Jr., Boxford, and Donald Campbell, N. Andover, both of Mass., assignors to Bolton-Emerson, Inc., Lawrence, Mass.

Continuation of Ser. No. 71,415, Jul. 9, 1987. This application Mar. 13, 1989, Ser. No. 323,185

Int. Cl.[4] B05C *11/00*

U.S. Cl. 118--665 **17 Claims**

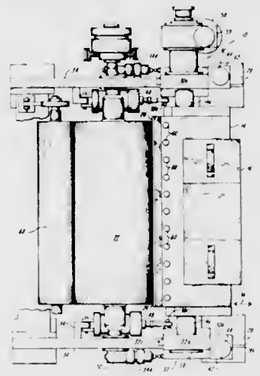
1. Precision positioning means that repeatably locates and adjustably aligns a die with respect to a backing roll, comprising,

a die of rigid side plates having a generally vertical orientation and located at the ends of said die, each of said side plate having a horizontal mounting surface,

linear slides secured on said mounting surfaces, said slides being preloaded so that they move along a first direction with substantially no lost motion,

means for mounting said die at its ends, said mounting means being in turn mounted on said linear slides to allow movement of both sides of said die independently of one another, and

means operatively coupled to said mounting means to drive said mounting means and said die mounted thereon along said first direction on said linear slides, and



means operating in cooperation with said drive means for controlling the position of said die with respect to said backing roll.

4,899,692

AUTOMATIC WAX COATING APPARATUS FOR USE WITH SKIS

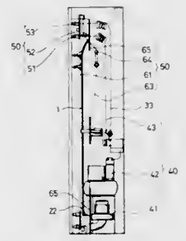
Choushiro Suzuki, Kunitachi, Japan, assignor to Field Corporation, Musashino, Japan

Filed Mar. 14, 1989, Ser. No. 322,855

Claims priority, application Japan, Jun. 30, 1988, 63-163481

Int. Cl.[4] B05C *11/00*

U.S. Cl. 118—668 **7 Claims**



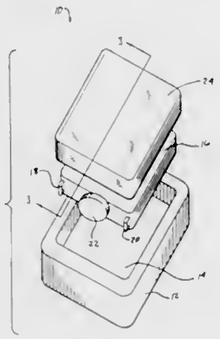
1. An automatic wax coating apparatus for use with skis comprising, a securing device for securing a ski strips, a wax supplying device, a brushing device and a movement device, said each device being provided in the interior of a box for accommodating said a ski strips, in which said brushing device comprises a hot air nozzle for blowing hot air onto said ski strips, a roller brush for brushing the sliding surfaces of said a ski strips, and a wax nozzle for spraying said sliding surface of said a ski strips with a wax supplied from said wax supplying device, whereby said brushing device can be moved along the longitudinal axes of said a ski strips by means of said movement device.

4,899,693

COOLED PET BED

Robert D. Arnold, 804 N. 5th St., Cottonwood, Ariz. 86326

Filed Apr. 14, 1989, Ser. No. 338,042
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—1 1 Claim



1. A combination portable cooled pet bed and drinking reservoir for storing drinking water for human and animal consumption, comprising:

a base formed from a waterproof plastic material and having insulated floor and side wall portions surrounding a rectangular central recess;

said base including an encapsulated refreezable gel refrigerant completely surrounding bottom and sidewalls of said recess;

said base and said recess dimensioned to provide a drinking water dish for small animals;

a rectangular waterproof canteen for carrying drinking water, said canteen having a sealable opening dimensioned to allow insertion of ice cubes, said container dimensioned for reception in said central recess of said base, with a rectangular side surface of said canteen disposed slightly below a top surface of said base;

an open weave fabric mattress for selectively covering an upper surface of said canteen to form a cooled mattress for a pet;

said central recess closely conforming to said canteen and said fabric mattress forming a sealing gasket around said canteen, retained by frictional engagement with side wall portions of said base, said fabric mattress having a thickness such that said mattress is disposed at a level approximately even with said top surface of said; and

means removably securing a carrying strap to said canteen, whereby said canteen may be removed from said base and carried separately from said base, and said recess may be filled with water from said canteen for pet consumption.

4,899,694

ANIMAL RESTRAINT

Michael B. Bellusomini, 120 Dover Ct., Santa Rosa, Calif. 95403

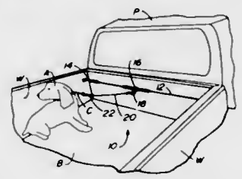
Filed Dec. 15, 1988, Ser. No. 284,901
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—109 3 Claims

1. An animal restraint device for installation in a truck bed having bed side walls, said side walls separated by a first distance, said restraint device comprising:

an elongate rod member comprising a treaded rod, said rod member having a length less than said first distance, said rod member terminating in two ends;

a side attachment portion carried on each of said rod members ends, said side attachment portions conditioned for releasable engagement to said truck bed side walls;

a restraint centering device comprising an adjusting nut mounted on said rod and selectively movable and securable along said rod length; and



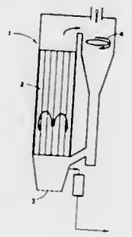
a restraint lead connected to said centering device, said lead having a length generally one-half of said rod member length, said lead terminating in a fastener member conditioned for attachment to an animal collar.

4,899,695

FLUIDIZED BED COMBUSTION HEAT TRANSFER ENHANCEMENT

Pierre L. T. Brian, and Sheldon W. Dean, Jr., both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 14, 1989, Ser. No. 310,560
Int. Cl.[4] F22B *1/00*; F23D *1/00*
U.S. Cl. 122—4 D 5 Claims



1. A process for operating a fluidized bed combustion reactor which is surrounded by water-cooled tubes comprising the steps of:

(a) introducing a solid fuel and an oxygen-containing gas into the reactor;

(b) burning the fuel in the presence of the oxygen-containing gas and a material having inert particles of spheroidal shape possessing a Moh's hardness of between 2 and 4 and a particle diameter of about 50 to 1000 μm to form a hot exhaust gas containing solid particles;

(c) discharging the hot exhaust gas containing the solid particles from the reactor and cooling the exhaust gas by indirect heat exchange against the water cooled tubes of the reactor; and

(d) separating and recycling a portion of the separated solid particles into the fluidized bed reactor whereby erosion of the water-cooled tubes is substantially reduced.

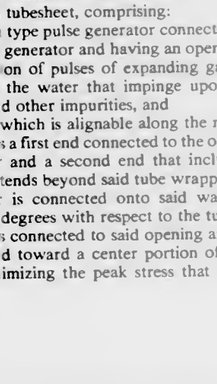
4,899,696

COMMERCIAL STORAGE WATER HEATER PROCESS

Jeffery M. Kennedy, Santa Clara, and Andrew C. Minden, La Honda, both of Calif., assignors to Gas Research Institute, Chicago, Ill.

Continuation of Ser. No. 775,507, Sep. 12, 1985, abandoned. This application Oct. 17, 1986, Ser. No. 920,207
Int. Cl.[4] F22B *5/00*
U.S. Cl. 122—13 R 9 Claims

1. A process for heating water in a tank having a water storage chamber through which an upright cylindrical combustion tube extends, the process including the steps of placing water within the storage chamber to a level around the upper portion of the combustion tube, disposing a radiant burner having a fiber matrix cylindrical wall forming an outer combustion surface concentrically within the combustion tube, holding the burner at a position where the combustion surface is radially spaced from and facing a lower portion of the combustion tube which is below the vertical mid-point of the combustion tube, passing a mixture of fuel and air into the burner



and radially outwardly through the burner wall, flamelessly combusting the fuel and air mixture on the outer combustion surface, transferring heat from the combustion surface primarily by radiation outwardly to the lower portion of the combustion tube, transferring heat by conduction and convection from the lower portion of the combustion tube to the lower strata of water in the storage tank which surrounds the lower portion and causing cool water in the upper strata surrounding the upper portion of the tube to circulate down in exchange with water in the lower strata heated by the combustion tube.

4,899,697

PRESSURE PULSE CLEANING APPARATUS

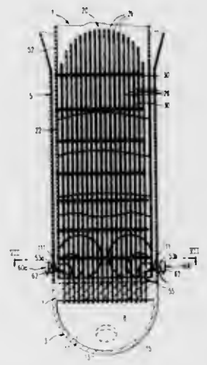
Richard D. Franklin, Jeannette; Gregg D. Auld, Trafford, and David E. Murray, Greensburg, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1988, Ser. No. 183,199
Int. Cl.[4] F22B *37/54*
U.S. Cl. 122—379 28 Claims

28. An apparatus for loosening and removing sludge and other impurities from the interior of the secondary side of a steam generator of the type having a plurality of parallel heat exchanger tubes mounted in a tubesheet that are surrounded by a tube wrapper and define a main tube lane, wherein said secondary side contains sufficient water to at least completely submerge said tubesheet, comprising:

a. an air gun type pulse generator connectable onto a wall of the steam generator and having an opening for generating a succession of pulses of expanding gas to create shock waves in the water that impinge upon and loosen said sludge and other impurities, and

b. a nozzle which is alignable along the main tube lane and which has a first end connected to the opening of the pulse generator and a second end that includes a tip portion which extends beyond said tube wrapper when said pulse generator is connected onto said wall and is oriented about 30 degrees with respect to the tubesheet when said conduit is connected to said opening and which is generally aimed toward a center portion of the tubesheet for both minimizing the peak stress that the pulses emitted therefrom apply to the heat exchanger tubes nearest the tip portion, and for causing the resulting shock wave to



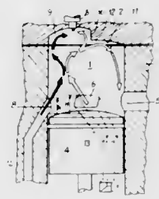
reflect off of the tubesheet in order to cause a uniform displacement of the water submerging the tubesheet.

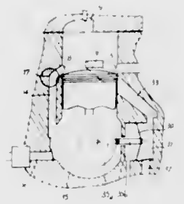
4,899,698

COMBUSTION CHAMBER FOR TWO-STROKE RECIPROCATING ENGINE, AND AND ENGINE MAKING USE THEREOF

Georges Thery, 6 Place du Géeral Leclerc, Pierrefitte

Filed Jul. 7, 1988, Ser. No. 216,200
Claims priority, application France, Oct. 30, 1987, 87 15118
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—65 A 15 Claims





1. A combustion chamber for a reciprocating, two-stroke, controlled-ignition, internal-combustion engine, comprising at least one piston, a cylinder, a cylinder head delimiting said combustion chamber, and admission and exhaust ports at the bottom of the cylinder, via which the components of an inflammable mixture are admitted from two admission devices, air without fuel being admitted via two ports close to the exhaust port and disposed symmetrically thereabout, with the axes of

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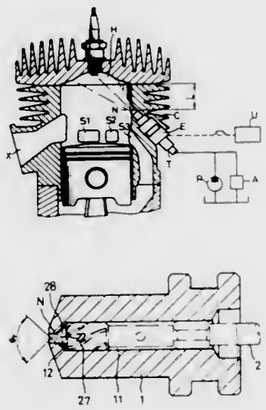
said two ports converging inside the chamber and being directed towards the wall opposite the exhaust port, whereas the mixture containing all of the fuel in air is admitted via at least one port provided in a portion of the cylinder wall which is opposite to the exhaust port, wherein the cylinder head includes a cavity whose portion furthest from the fuel admission port is delimited by a substantially vertical wall, with the axes of the admission devices leading to the abovementioned admission ports being included in such a manner that the admitted flows meet at an angle enabling the fuel-containing flow to be dynamically deflected towards the wall through which it is admitted, and for deflecting the pure air flow towards the bottom edge of the connection between the above-mentioned vertical wall of the cavity and the surface of the cylinder head, said flow of pure air splitting on said edge so as to confine the mixture by means of a counter flow of air in the cavity, and simultaneously scavenge the zone of the combustion chamber adjacent to the exhaust port with pure air, thereby avoiding fuel losses via the exhaust.

4,899,699

LOW PRESSURE INJECTION SYSTEM FOR INJECTING FUEL DIRECTLY INTO CYLINDER OF GASOLINE ENGINE

Huei-Huay Huang, and Yu-Yin Peng, both of Hsin Chu Hsien, Taiwan, assignors to Chinese Petroleum Company, Taipei and Industrial Technology Research Institute, Hsien, both of, Taiwan

Filed Mar. 4, 1988, Ser. No. 164,334
Int. Cl.[4] F02B *19/08*
U.S. Cl. 123—73 C 2 Claims



1. A low pressure injection system for injecting fuel directly into a cylinder of a gasoline engine, comprising:

a solenoid-operated fuel injector mounted on a wall of the cylinder in such a manner that an outlet is just above a scavenging port of said engine opposite an exhaust port with an injecting axis of the injection being directed to a surrounding area around a spark plug,

an electric low pressure fuel pump, and

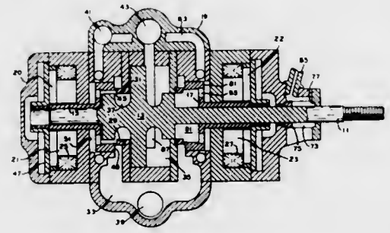
a pressure regulator which maintains fuel pressure at a fixed level, e.g., 3kg/cm^2, said fuel injector being mounted on the cylinder wall away from a cylinder head of said engine so as to inject atomized fuel for mixing with air inside the cylinder, said fuel injector including a coil, an armature, a valve needle, and a valve body, said valve needle having a round stem portion with several spiral grooves with an angle of a spiral passage of each groove varying with respect to a central axis along a length of each groove on its outer circumference, the cross-sectional area of the outlet of said valve body being larger than a total cross-sectional area of said spiral grooves so that said spiral grooves serve to promote the fuel swirl motion and to control the fuel flow rate.

4,899,700

PNEUMATICALLY POWERED VALVE ACTUATOR

William E. Richeson Jr., and Federick L. Erickson, both of Fort Wayne, Ind., assignors to Magnavox Government and Electronic Company, Fort Wayne, Ind.

Filed Feb. 8, 1988, Ser. No. 153,155
Int. Cl.[4] F01L *9/00, 9/04*
U.S. Cl. 123—90.11 21 Claims



1. A bistable electronically controlled fluid powered transducer having an armature reciprocable along an axis between first and second positions; a control valve reciprocable along said axis between open and closed positions; magnetic latching means for holding the control valve in the closed position; an electromagnetic arrangement for temporarily neutralizing the effect of the permanent magnet latching arrangement to release the control valve to move from the closed position to the open position; and a source of high pressure fluid; energization of the electromagnetic arrangement causing movement of the control valve in one direction along the axis allowing fluid to drive the armature in the opposite direction from the first position to the second position along the axis; a second control valve reciprocable along said axis between open and closed positions; second magnetic latching means for holding the second control valve in the closed position; a second electromagnetic arrangement for temporarily neutralizing the effect of the second permanent magnet latching arrangement to release the second control valve to move from the closed position to the open position; energization of the second electromagnetic arrangement causing movement of the second control valve in one direction along the axis allowing fluid to drive the armature in the opposite direction from the second position back to the first position along the axis.

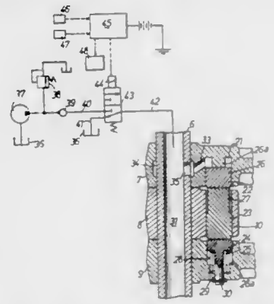
4,899,701

VALVE OPERATION CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Kazuo Inoue, and Noriyuki Kishi, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,153
Claims priority, application Japan, Sep. 22, 1987, 62-237710
Int. Cl.[4] F01H *1/34*
U.S. Cl. 123—90.16 5 Claims

1. A valve operation control device for an internal combustion engine having a valve operation mode changing mechanism for switching the opening/closing operation of an intake or exhaust valve between a low-speed operation mode corresponding to a low-speed operation of the engine and a high-speed operation mode corresponding to a high-speed operation of the engine, and control means for controlling the operation of the valve operation mode changing mechanism according to the rotational speed of the engine, comprising, a rotational speed detector for detecting the rotational speed of the engine connected to said control means, said control means having a first rotational speed setting that is substantially equal to a rotational speed at which the output torque of the engine remains the same in the low- and high-speed operation modes



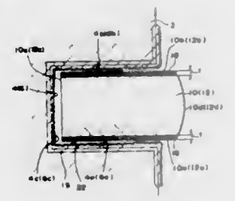
of the valve operation mode changing mechanism for said control means to cause shifting of the valve operation mode changing mechanism from the high-speed operation mode to the low-speed operation mode, and said control means having a second rotational speed setting higher than the first rotational speed for causing of the valve operation mode changing mechanism from the low-speed operation mode to the high-speed operation mode.

4,899,702

ALUMINUM ALLOY PISTON AND PISTON-RING ASSEMBLY TREATED TO SUPPRESS AGGLUTINATION OF THE PISTON ALLOY TO A PISTON-RING

Norio Sasaki, Nishikamo; Kazuhisa Mayumi, Aichi, and Yorishige Maeda, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 23, 1989, Ser. No. 299,439
Claims priority, application Japan, Feb. 12, 1988, 63-28915
Int. Cl.[4] F02F *5/00*
U.S. Cl. 123—193 P 10 Claims



1. A piston and piston-ring assembly for an internal combustion engine, comprising:

a piston comprising aluminum base alloy, the piston being formed with piston-ring grooves, each of the piston-ring grooves being defined by a groove surface including a groove upper surface, a groove lower surface and a groove side surface connecting the groove upper and lower surfaces when the piston is vertically orientated, such a kind of surface hardening treatment as is accompanied by an increase in surface roughness being applied to at least a groove lower surface of at least a top piston-ring groove; and

piston-rings located in the piston-ring grooves, each of the piston-rings including a ring upper surface, a ring lower surface ad a radially inside ring side surface opposing the groove upper surface, the groove lower surface, and the groove side surface of a corresponding piston-ring groove, respectively, when the piston is vertically orientated, at least a surface of a piston ring opposing the hardened surface of the piston-ring groove being formed with a coating layer including resin with an excellent adhesive property as a base material of the coating layer.

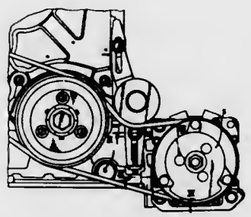
4,899,703

DEVICE FOR FASTENING A FIRST PART SUCH AS AN ACCESSORY TO A SECOND PART SUCH AS A SUPPORT WITH A BUSH FOR ELIMINATING THE ASSEMBLING BACKLASH BETWEEN THE TWO PARTS AND BUSH USED FOR THE FASTENING OF THESE PARTS

Pierre Buferne, Le Port Marly, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly sur Seine, both of, France

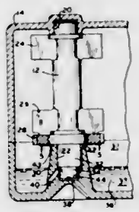
Filed Nov. 16, 1988, Ser. No. 271,679
Claims priority, application France, Dec. 7, 1987, 87 16987
Int. Cl.[4] F02F *7/00*; F46H *7/08*; F16M *1/00*
U.S. Cl. 123—195 A 6 Claims





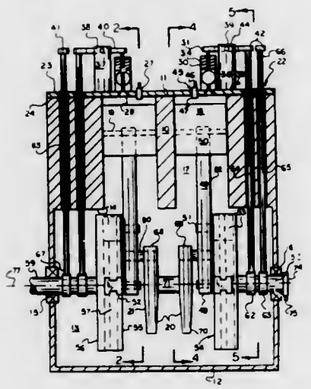
1. A device for fastening a first part comprising at least two substantially parallel fastening lugs, respectively with two inner bearing faces opposite to each other, to a second part with two opposite parallel outer faces disposed between the two bearing faces of the fastening lugs with an assembling backlash, and comprising at least two screws for the fastening respectively of the two fastening lugs to the second part, this device comprising a bush with inner and outer threads with opposite pitches, interposed between the threads of one of the fastening screws and an inside thread of the second part matching with the outer thread of the bush, the inner thread of the bush matching with the thread of the screw with a reduced backlash in order that the bush can move axially in the inside thread during the operation of tightening of the fastening screw so as to abut at one of its two free ends against the inner bearing face of the fastening lug through which the said fastening screw passes.

4,899,704
SELF-LUBRICATING BEARING
Peter G. Kronich, Sheboygan, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.
Filed May 8, 1989, Ser. No. 348,862
Int. Cl.[4] F01M 1/00
U.S. Cl. 123—196 W 25 Claims



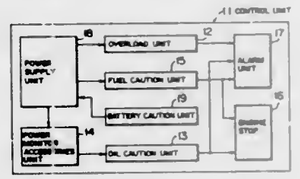
1. An engine comprising:
a crankcase having a sump region;
a journal bearing in said crankcase;
a shaft having a portion thereof disposed within an interior region of said journal bearing;
said journal bearing having a passage extending into said sump to allow passage of oil from said sump to said interior region;
said shaft portion having an axially facing surface disposed in said interior region of said bearing in communication with oil therein; and
an oil channel between said journal bearing and said shaft;
said shaft portion having a pocket in its outer circumferential surface at said axially facing surface and a groove on said outer circumferential surface extending from said pocket to said shaft such that when said shaft portion rotates, oil in said pocket is pumped through said groove to said channel to lubricate said journal bearing.

4,899,705
TRAMMEL CRANK ENGINE
Patrick J. Reed, 321 Brookdale Dr., League City, Tex. 77573
Filed Sep. 1, 1988, Ser. No. 239,225
Int. Cl.[4] F02B 75/32
U.S. Cl. 123—197 AC 1 Claim



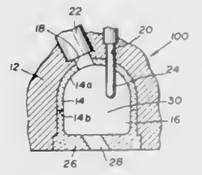
1. In a four cycle piston driven internal combustion engine whose components comprise:
(a) a block having upper and lower surfaces, a crankcase cavity having a ceiling and forward and rear bearing apertures centered upon a common lateral axis, and at least one cylinder bore communicating between said ceiling and said upper surface, said cylinder bore having a centered axis that perpendicularly intersects said lateral axis,
(b) a piston adapted for reciprocating axial motion within said cylinder bore, and having a transversely oriented wrist pin,
(c) a cylinder head having upper and lower surfaces, said lower surface abutting the upper surface of said block and covering said cylinder bore, said cylinder head having a circular intake port, circular exhaust port, and threaded spark plug aperture, said ports and aperture communicating between said upper and lower surfaces,
(d) poppet intake and exhaust valve means having circular faces adapted to make sealing abutment with said intake and exhaust ports, respectively, said valve means having elongated stems,
(e) spring means interactive between said valve means and cylinder head in a manner to bias said valve means toward sealing abutment with its respective port,
(f) elongated fulcrum means fixedly associated with said cylinder head,
(g) a rocker arm interactive with each fulcrum means in a manner to depress an associated valve stem to displace said valve face from said port, and
(h) spark plug means adapted to produce an ignition spark within said cylinder, the improvement comprising:
(i) a trammel crank mechanism interactive with each piston, said trammel crank mechanism comprising:
* an elongated action arm having distal and proximal extremities and at least one flat side, said distal extremity engaging said wrist pin,
** a first sliding block pivotably attached to said flat side adjacent said proximal extremity, and a second sliding block pivotably attached to said side closer to said distal extremity, said blocks being of identical configuration and adapted to rotate in the same plane parallel to said flat side,
*** a disc having a center axis of rotation coinciding with said lateral axis, a front surface facing the flat side of said arm, an opposed rear surface, and two straight channels recessed from said front surface and traversing the diameter of the disc and intersecting at right angles at the center of said disc, said channels adapted to accept and constrain said sliding blocks to reciprocal linear motion as said disc rotates, and
**** an axle perpendicularly emergent from the rear surface of said disc and centered upon said lateral axis,
(j) intake and exhaust cam lobes radially emergent from said axle, said lobes having elliptical perimeters and cam lifts defined as the greatest distance extending radially from said axle to the perimeter of said lobe,
(k) elongated intake and exhaust pushrod means perpendicularly oriented to said axle, said pushrod means having upper and lower extremities, said lower extremities adapted to rest upon said lobes, said upper extremities interacting with rocker arms, whereby
(l) a four stroke cycle of said piston produces one revolution of said axle, and said pushrod means operate the poppet valves pursuant to the requirements of said four stroke cycle.

4,899,706
FUEL SHORTAGE DETECTION SYSTEM FOR ENGINE DRIVEN GENERATOR
Anno Suzuki, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 31, 1989, Ser. No. 304,183
Claims priority, application Japan, Feb. 3, 1988, 63-24482
Int. Cl.[4] F02B 77/00
U.S. Cl. 123—198 D 7 Claims



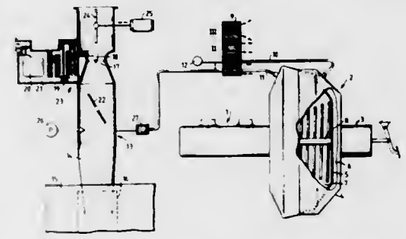
1. A fuel shortage detection system for an engine driven generator comprising:
means for detecting a fuel shortage condition depending on measuring of the level of fuel in a fuel tank and for producing a level signal;
alarm means responsive to said signal from said detection means for generating an alarm;
timer means for providing time lapse signal when said signal from said detection means lasts for a predetermined time;
restart detection means for detecting that said engine is caused to restart and for providing a restart signal;
output means responsive to said signal from said restart means for outputting a signal after a time lapse shorter than said predetermined time lapse; and
engine stop means responsive to said signal from said timer means and said output means for stopping said engine.

4,899,707
ENGINE CYLINDER HEAD WITH PRECOMBUSTION CHAMBERS USING CERAMICS INSERT
Tooru Matsuura, and Yoshinori Narita, both of Aichi Prefecture, Japan, assignors to NGK Spark Plug Company, Limited, Nagoya, Japan
Filed Feb. 17, 1988, Ser. No. 156,570
Claims priority, application Japan, Feb. 23, 1987, 62-24211[U]
Int. Cl.[4] F02B 19/14
U.S. Cl. 123—270 6 Claims



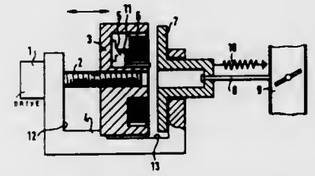
1. A cylinder head for an internal combustion engine, comprising:
a cast metal body having at least one recess which provides a precombustion chamber; and
a hollow member which is made of a porous ceramics and cast-inserted in the inner wall surface of said cast metal body defining said recess and then machine finished such that the inner surface of the hollow member defines a major portion of the precombustion chamber, the porosity of said ceramics being in the range of from 5 to 20%.

4,899,708
VACUUM-GENERATING DEVICE
Christoph Jung, Hattersheim/Main, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Nov. 2, 1988, Ser. No. 265,987
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739913
Int. Cl.[4] F02M 11/00; B60T 8/44
U.S. Cl. 123—331 5 Claims



1. A device for generating a vacuum for an automotive vehicle brake system of the type having slip control including a master cylinder connected to at least one wheel brake cylinder and a vacuum servomotor operatively connected to said master cylinder comprising:
an air intake pipe to an internal combustion engine of the vehicle connected to said vacuum servomotor;
a carburetor having a throttle valve associated with said intake pipe; and means providing for enrichment of air drawn into said intake pipe from said vacuum servomotor during slip control when said throttle valve is closed.

4,899,709
ELECTRIC CONTROLLING ELEMENT FOR THE POWER-SETTING ELEMENT OF AN INTERNAL COMBUSTION ENGINE
Rudolf Aufmkolk, Kelkheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany
Filed Feb. 2, 1989, Ser. No. 306,885
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1988, 3811515
Int. Cl.[4] F02D 7/00
U.S. Cl. 123—399 8 Claims



1. In an electric controlling element for the power-setting element of a internal combustion engine in which the controlling element operates a power setting element such as a throttle valve, the controlling element including a drive device and a clutch, the clutch having an electromagnet and an armature, the clutch being arranged between the drive device and the power-setting element and wherein,
upon passage of current to said electromagnet, the armature is attracted against the force of a spring to close the clutch, the improvement comprising

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switch means connected between the armature and the electromagnet, the switch means being actuated as a function of the distance between the electromagnet and the armature to signal a condition of the clutch.

4,899,710

SYSTEM AND METHOD FOR DETECTING AND DETERMINING KNOCKING IN AN INTERNAL COMBUSTION ENGINE

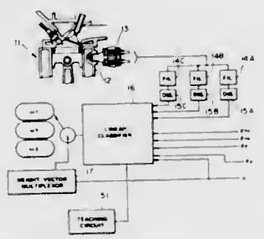
Hiroshi Takahashi, Tokyo, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Sep. 22, 1988, Ser. No. 247,291

Claims priority, application Japan, Sep. 22, 1987, 62-143937[U]

Int. Cl.⁴ F02P *5/14*

U.S. Cl. 123—425 **14 Claims**



1. A system for detecting and determining knocking in an internal combustion engine, comprising:

(a) first means for detecting various engine operating conditions including engine vibrations associated with engine knocking and outputting a plurality of signals indicative of the various engine operating conditions;

(b) second means for weighting various signals detected and outputted by the first means using a weight vector and for producing a knocking occurrence decision signal used to determine whether the engine is knocking;

(c) third means for comparing the knocking occurrence decision signal with a reference signal so as to determine whether the knocking decision signal is accurate on the basis of the comparison result;

(d) fourth means for determining whether the knocking determination carried out by means of the third means is correct on the basis of an externally provided highly-accurate knocking detection information; and

(e) fifth means for correcting the weight vector of the second means on the basis of the determination result by the fourth means in a direction such that a percentage of correct answer determinations made by the fourth means can be enhanced.

14. A method for detecting and determining knocking in an internal combustion engine, comprising the steps of:

(a) detecting various engine operating conditions including engine vibrations associated with engine knocking and outputting a plurality of signals indicative of the various engine operating conditions;

(b) weighting various signals detected and outputted by the step (a) using a weight vector and producing a knock occurrence decision signal used to determine whether the engine is knocking;

(c) comparing the knocking occurrence decision signal with a reference signal so as to determine whether the knocking decision signal is accurate on the basis of the comparison result;

(d) determining whether the knocking determination carried out by means of the third means is correct on the basis of an externally provided highly-accurate knocking detection information; and

(e) correcting the weight vector of the step (b) on the basis of the determination result in the step (d) in a direction such that a percentage of correct answer determinations made in the step (d) can be enhanced.

4,899,711

ENGINE KNOCK CONTROL SYSTEM

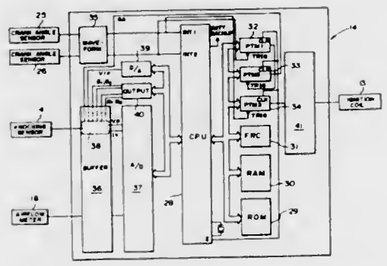
Yoshitaka Tabaru; Tetsuro Takabe, and Tomotsugu Rikitake, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 5, 1988, Ser. No. 177,957

Claims priority, application Japan, Apr. 6, 1987, 62-84464; Apr. 6, 1987, 62-84466

Int. Cl.⁴ F02P *5/15;* **F02D** *41/04*

U.S. Cl. 123—425 **7 Claims**



1. An engine knock detecting system comprising

an oscillation sensor which is mounted on an engine to detect oscillation of the engine and outputs a signal representing the oscillation of the engine,

a maximum value detecting means which detects the maximum value of the output of the oscillation sensor at least during combustion period in each cycle,

a memory means which receives the output of the maximum value detecting means and stores frequency of a plurality of maximum values by which the respective maximum values are detected in a predetermined number of cycles, and

a determining means which determines knock occurrence on the basis of the maximum value which is detected most frequently.

4,899,712

FUEL INJECTION RAIL MANUFACTURING MEANS AND PROCESS

Gerard De Bruya, 30, rue Auguste Blanqui, and Daniel Cleckn, 2, rue Romain Rolland, both of 94250 Gentilly, France

Continuation-in-part of Ser. No. 622,712, Jun. 20, 1984, abandoned, and a continuation-in-part of Ser. No. 91,307, Aug. 28, 1987, abandoned. This application Feb. 19, 1988, Ser. No. 157,900

Claims priority, application France, Jun. 21, 1983, 83 10251; Oct. 31, 1986, 86 15206

Int. Cl.⁴ F02M *39/00;* **B22D** *11/126*

U.S. Cl. 123—468 **5 Claims**



1. A manufacturing process for a single-block fuel injection rail of a type wherein said rail comprises at least one rectilinear hollow main tube (1) to which are joined rigidly at least one fuel intake tip (2); at least one and generally several injector intakes (3), and rail fastening means (4), the improvement comprising:

heating an aluminium alloy billet (5) to a temperature in the range from about 430° C. to about 460° C. and, while in a heated condition, hot die forming in a die (6) made of two parts (6a, 6b), said hot die-forming comprising extruding said billet through an intermediate of said die (6) so as to provide said billet with a full primary shape (7) which corresponds to an outer shape of said rail to be made and which primary shape has one or several buckles (8) of an extruded aluminium alloy;

cooling said primary form (7) to an ambient temperature level;

cold machining said primary form (7), said cold machining comprising:

cutting to an exact axial size required;

removing at least one superfluous area (8b) of the extrusion buckles (8);

retaining at least one functional area (8a) from said extension buckles in existence so as to obtain a secondary full form (9) corresponding partly to an outer form of the rail to be made;

precision jigging said secondary form (9), including joining said secondary form (9) rigidly to a jigging assembly (10) such that the secondary form (9) is held firmly and in a precise position by jig (10) while outer ends (11) of the secondary form (9) remain accessible from the outside for drilling;

cold drilling the secondary form (9) from the outer ends (11) in order to achieve, successively, drilling (a) of the main tube (1) and secondary drillings (2a, 3a) for the fuel intake and the injector intake such as to obtain a tertiary drilled form (13);

cold-finishing machining said tertiary form (13) for forming fuel intake (2) junction tips and fastening means (4) for said rail;

electrochemically deburring and cleaning said tertiary form; and

optionally fitting a plug (14) rigidly to the outer end of said main tube by welding or by brazing.

4,899,713

FUEL INJECTION CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

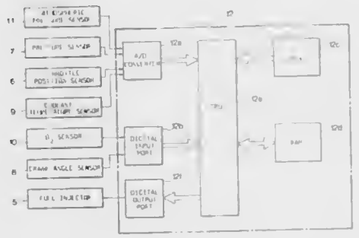
Mitsuo Nakamura, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 309,845

Claims priority, application Japan, Feb. 24, 1988, 63-041575

Int. Cl.⁴ F02P *5/15, 41/26;* **F02D** *25/00, 41/10*

U.S. Cl. 123—478 **3 Claims**



1. A system for controlling fuel injection of an engine for a motor vehicle having an intake passage, a throttle valve provided in the intake passage, and a fuel injector for injecting fuel by a quantity determined by the system, the system comprising:

an engine speed sensor producing an engine speed signal dependent on speed of the engine;

a throttle position sensor producing a throttle position signal dependent on opening degree of the throttle valve;

a pressure sensor producing a pressure signal dependent on pressure in the intake passage;

first calculator means for averaging pressures represented by the pressure signal and for producing an average pressure signal;

estimating means responsive to the engine speed signal and the throttle position signal for estimating pressure in the intake passage and for producing an estimated pressure signal;

means responsive to the average pressure signal and the estimated pressure signal for producing a correcting signal;

second calculator means responsive to the engine speed signal and the average pressure signal for producing a basic fuel injection quantity signal; and

corrector means for correcting the basic fuel injection quantity signal with the correcting signal, for determining the quantity of fuel to be injected.

4,899,714

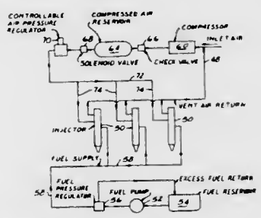
AIR/GAS FORCED FUEL INJECTION SYSTEM

Michael M. Schechter, Southfield, and Martin Cloke, Orchard Lake, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 12, 1988, Ser. No. 256,446

Int. Cl.⁴ F02M *67/02*

U.S. Cl. 123—533 **16 Claims**



7. A method of supplying and discharging a fuel and gas mixture into and from an automotive type fuel injector that is biased to a closed position comprising the steps of, first, connecting a central chamber in the injector to gas at ambient pressure level; secondly, supplying the chamber with fuel to mix with the gas to form at least a partially combustible mixture charge; thirdly, holding the fuel/gas mixture charge in the chamber for a substantial duration of the engine cycle of rotation to promote evaporation of the fuel and further mixing of the fuel and gas; and, fourthly, applying further gas to the chamber at a sufficient pressure level to enhance penetration of the gas into the fuel and evaporation of the fuel and a subsequent discharge of the fuel/gas mixture charge from the injector.

4,899,715

IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINE

Mitsuru Koiwa, and Kouichi Okamura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,735

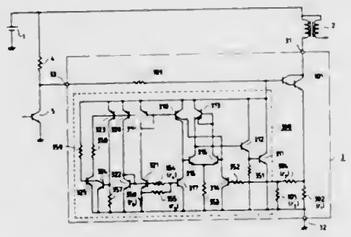
Int. Cl.⁴ F02P *3/04*

U.S. Cl. 123—644 **3 Claims**

1. An ignition device for an internal combustion engine having transistor means for controlling a primary current of an ignition coil to produce a high voltage for spark ignition, comprising:

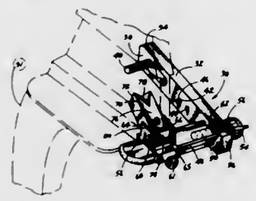
a reference voltage generator for producing a temperature

compensated reference voltage which is independent of a source voltage;
a primary current detecting circuit for producing a voltage corresponding to said primary current of the ignition coil;



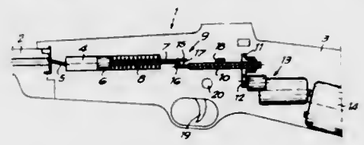
a comparator for comparing said temperature compensated reference voltage with said voltage produced by said primary current detecting circuit; and
a control circuit responsive to an output of said comparator to control a base voltage of said transistor means to a predetermined constant value.

4,899,716
ARROW REST
Terry G. Martin; George T. Newbold, both of Walla Walla, Wash., and Theodore M. Davenport, Corbett, Oreg., assignors to Martin Archery, Inc., Walla Walla, Wash.
Continuation-in-part of Ser. No. 216,782, Jul. 8, 1988, abandoned. This application Dec. 28, 1988, Ser. No. 291,758
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—41 A **14 Claims**



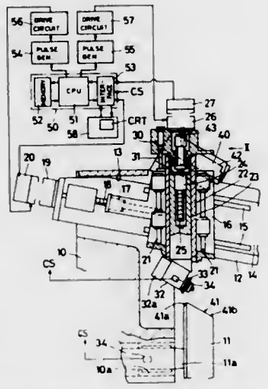
1. An arrow rest apparatus for an archery bow comprising:
an arrow launcher having fore and aft ends, an upper surface and a bottom surface, and a transverse width; the launcher having means for supporting an arrow at its fore end;
an upwardly open transverse slot extending downwardly into the launcher from the upper surface at a position between the launcher fore and aft ends, the slot having a slot extending along the transverse width and base;
a support block supporting the arrow launcher, the support block having at least one upwardly projecting side member; the launcher being received adjacent the at least one side member;
a pivot pin connected to and extending from the at least one side member of the support block and being received through the launcher slot;
a spring of predetermined compression upwardly biasing the fore end of the launcher, and biasing the slot base of the launcher pivotally against the pivot pin;
stop means for limiting upward pivotal movement of the fore end of the launcher relative to the support block to a predetermined resting elevation; and
means for attaching the support block to an archery bow.

4,899,717
AIRGUN
Léon Rutten, Liege, and Jean Rutten, Chaudfontaine, both of Belgium, assignors to Centre D'Innovations Et De Recherches Appliquees, societe anonyme, Visé, Belgium
Filed Dec. 2, 1987, Ser. No. 127,375
Claims priority, application Belgium, Dec. 12, 1986, 61106
Int. Cl.[4] F41B *11/00*
U.S. Cl. 124—67 **21 Claims**



1. An airgun of the type wherein a projectile is fired by compressed air from a chamber provided with a spring-operated piston, the improvement comprising a breech casing, a transport mechanism for compressing the piston spring, the transport mechanism including a worm, a nut mounted on the worm for longitudinal movement therealong with respect to the breech casing between forward and rearward positions, and a pusher catch mounted on the nut, an electric motor for driving the transport mechanism, a battery for powering the electric motor, and the transport mechanism, electric motor and battery being incorporated within the airgun.

4,899,718
APPARATUS FOR TRUING GRINDING WHEEL
Shigesabu Umtani, Nishio; Toshio Maruyama; Tadashi Yamauchi, both of Kariya, and Yasunori Ban, Hashima, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan
Filed Oct. 21, 1988, Ser. No. 260,782
Claims priority, application Japan, Oct. 22, 1987, 62-267519
Int. Cl.[4] B24B *53/08*
U.S. Cl. 125—11 TP **6 Claims**

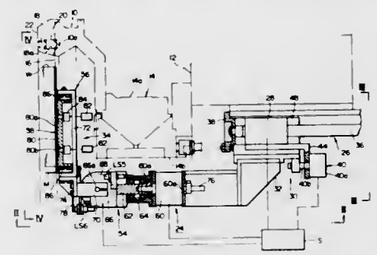


1. A truing apparatus for truing a grinding wheel, comprising:
a base;
a traverse slide movable on said base in a first direction extending across said grinding wheel;
first feed means connected to said traverse slide for moving the same in said first direction;
a follow slide movable on said traverse slide in a second direction toward and away from said grinding wheel;

a follow feed mechanism contacting a template and being connected to said follow slide for moving said follow slide in said second direction to follow said template when said traverse slide is moved in said first direction;
a truing head movable on said follow slide in said second direction and provided with a truing tool for truing said grinding wheel;
second feed means connected to said truing head for moving said truing head relative to said follow slide in said second direction;
a position sensor for detecting the position of said truing head relative to said follow slide in said second direction;
a contact sensor for issuing a contact signal upon contact of said truing tool with said grinding wheel; and
a truing controller connected to said first and second feed means, said position sensor and said contact sensor and including:
locating control means for operating said first and second feed means to position said truing tool selectively to first and second traverse positions spaced in said first direction and to advance said truing tool at each of said first and second traverse positions until said contact sensor issues said contact signal;
storage means for storing first and second feed positions to which said truing head is moved respectively at said first and second traverse positions until said position sensor issues said contact signal;
determination means for determining a truing start position in said second direction based on one of said first and second feed positions stored in said storage means, said one of said first and second feed positions being shorter in distance relative to said follow slide than the other of said first and second feed positions;
start position setting means for operating said first and second feed means to position said truing tool to said truing start position;
truing execution means for operating said first feed means to traverse said truing tool along said grinding surface of said grinding wheel;
ascertaining means for ascertaining whether said contact signal from said contact sensor continues while said truing tool is traversed along said grinding surface;
infeed control means for operating said second feed means to advance said truing head by an infeed amount relative to said follow slide if the discontinuation of said contact signal is ascertained by said ascertaining means; and
repeate control means for repetitively operating said truing execution means and said infeed control means until it is ascertained by said ascertaining means that said contact sensor continues to issue said contact signal while said truing tool is traversed along said grinding surface.

4,899,719
APPARATUS FOR COLLECTING WAFERS
Seiichi Abe, Chiba; Yoshitaka Shiratori, Tokyo, and Tomoyoshi Sakamoto, Abiko, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 22, 1988, Ser. No. 223,512
Claims priority, application Japan, Jul. 31, 1987, 62-192479; Jul. 31, 1987, 62-192480
Int. Cl.[4] B28D *1/04*
U.S. Cl. 125—-14 **5 Claims**

1. An automatic apparatus for collecting wafers sliced from a semiconductor crystal rod adheringly placed on a mounting member, comprising:
primary drive means including a primary mobile member movable toward and away from an end face of the semiconductor crystal rod;
secondary drive means mounted on said primary mobile member and having a secondary mobile member movable relative to said primary mobile member in a direction toward and away from said end face of the semiconductor crystal rod; and
a wafer collecting assembly mounted on said second mobile member for collecting said wafers sliced from the semiconductor crystal rod, and including
(i) vacuum chuck means for chucking said wafers to be collected,
(ii) support means for supporting said chuck means movably in a cutting direction of said semiconductor crystal rod, and
(iii) attitude adjusting means disposed between said secondary mobile member and said support means for regulating the attitude of said chuck means relative to said wafers to be collected;



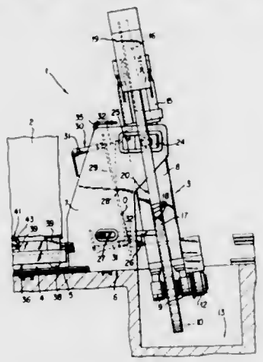
wherein said vacuum chuck means comprises a chuck body having a face to be brought into chucking engagement with said wafers having a plurality of apertures formed therethrough, and a plurality of vacuum generating means, each of the vacuum generating means being connected to a respective one of said apertures; and
wherein said support means comprises a support body for loosely holding said chuck body of said vacuum chuck means, and a pair of urging means interposed between said support body and said chuck body.

4,899,720
MACHINE FOR CUTTING STONE MATERIALS
Chiaffredo Chiri, Via Longoria, 5, 10026 Santena; Pierino Gianoglio, Fossano; Claudio Girando, Cuneo; Sergio Marengo, Fossano, and Giovanni Zaino, Viale Stazione, 6, 12032 Barge, all of Italy, assignors to Tecno-Sameg S.r.L.; Chiaffredo Chiri and Giovanni Zaino, all of, Italy
Filed Jul. 13, 1988, Ser. No. 218,674
Claims priority, application Italy, Jul. 14, 1987, 67607 A/87
Int. Cl.[4] B28D *1/08*
U.S. Cl. 125—21 **8 Claims**

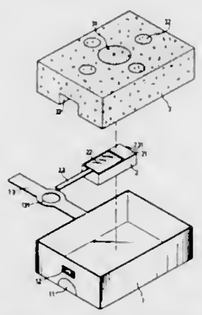
1. A machine for cutting blocks of stone material along a plane of cut, comprising:
a carriage acting to carry a block of said stone material;
a bandsaw (3) having a support body (8);
a pair of fly-wheels mounted on said support body, one of which is driven; and a band blade passing over said fly-wheels and movable along said plane of cut, said carriage acting to translate in a direction parallel to said plane of cut to bring said block into contact with said blade and effect a cutting phase; and
reciprocating means for producing an oscillatory relative motion between said body and said carriage, said motion being parallel to said plane of cut and consisting in a plurality of rotatatory oscillations during said cutting phase about an instantaneous axis of rotation (O), said instantaneous axis of rotation being disposed at a location

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which is a predetermined distance from said blade independently of the position of said carriage, means cooperable between said body and said base for moving the location of the axis of rotation.

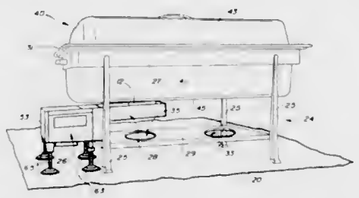


4,899,721
CHARCOAL STOVE CASING SET
Yung-Lang Tsay, Suite A, 9th Floor, No. 290, Ying Tsair Rd., Taichung, Taiwan
Filed Mar. 30, 1989, Ser. No. 330,635
Int. Cl.[4] F24B *3/00*
U.S. Cl. 126—25 B **3 Claims**



1. A charcoal stove casing set comprising:
(a) a presspaper frame body, a solid alcohol trough and a charcoal mixture;
(b) the presspaper body being in the form of a casing defining an inner space, a tearing line formed on the bottom edges at opposed ends of the casing, a phosphorated strip positioned on one end surface of the casing above a tearing line and an integral fixing strap extending from one side of the casing;
(c) the alcohol trough including a solid alcohol body disposed within the inner space of the casing, an aluminum foil wrapping the alcohol body, a match stick disposed between the aluminum foil and the alcohol body and including a match head wrapped by two phosphorated extension boards, with the match head extending slightly beyond the extension boards and a rear end of the match stick disposed adjacent the inner side of a tearing line;
(d) the charcoal mixture being disposed in the inner space of the casing and including a groove, the alcohol trough being disposed within the groove; and
(e) the fixing strap including an end attached to an opposed side of the casing for securing the charcoal mixture therein.

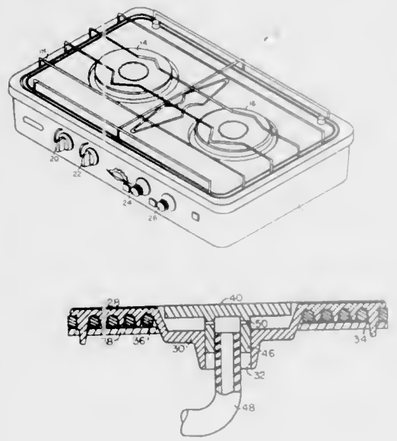
4,899,722
BURNER ASSEMBLY FOR HEATING CHAFING DISHES
Richard L. Horewitch, 2063 22nd Ave., San Francisco, Calif. 94116
Filed Sep. 2, 1988, Ser. No. 240,750
Int. Cl.[4] F24C *3/02*
U.S. Cl. 126—39 H **9 Claims**



1. In a burner assembly for heating a chafing dish having a leg structure for support of said chafing dish above a support surface, said burner assembly including a fuel source, a burner head connected to said fuel source, valve means mounted between said fuel source and said burner head to control the flow of fuel to said burner head, and burner head support means supporting said burner head from said support surface, wherein the improvement comprises:
said support means including a base having a base portion formed for positioning on said support surface proximate and outwardly of said leg structure, said support means further including an arm portion cantilevered from a position on said based portion located outwardly of said leg structure and extending from said position outwardly of said leg structure to a heating position sufficiently under said chafing dish for heating of said chafing dish, said base being movable independently of said leg structure and supporting said arm portion and burner head above said support surface independently of said chafing dish; and
said fuel source being coupled to said burner head by conduit means of sufficient length to position said fuel source beside said chafing dish.

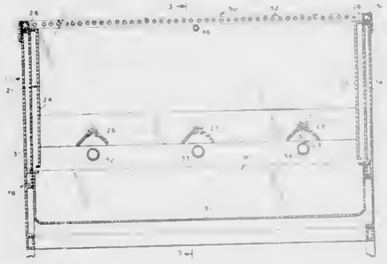
4,899,723
COMBINATION GAS AND ELECTRIC STOVE WITH BURNER ARRANGEMENT THEREFOR
Luis R. Pajares, Trujillo, Peru, assignor to Industrias Fenix S.A., Trujillo, Peru
Filed Jun. 14, 1989, Ser. No. 365,834
Int. Cl.[4] F24C *3/00*; F27D *11/00*
U.S. Cl. 126—39 R **4 Claims**

1. Stove apparatus operable on either gas or electricity, comprising:
a housing;
a burner assembly mounted on a horizontal outer surface of the housing including,
a metal plate having a central opening, a depressed portion surrounding the central opening, and a spiral groove on a major surface,
an electrical heating element lying in the spiral groove,
a protective metal sheet covering the groove and heating element,
a gas distributer having a platelike top with serrated edge and a hollow central fitting slidingly received within the metal plate opening and connected to a gas source pipe; and



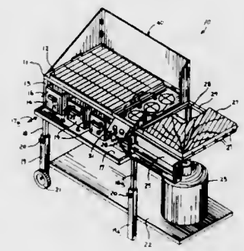
separate gas and electric controls mounted on a side surface of the housing.

4,899,724
GAS HEATED BROILER
Irvin R. Kuechler, 172 E. 27th St., San Bernardino, Calif. 92404
Filed May 11, 1988, Ser. No. 193,253
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—41 R **15 Claims**



1. A broiler particularly suitable for the cooking of chicken and other meat products comprising:
a grill for supporting said products;
at least one radiant heat emitting element spaced away from one side of said grill;
said element being effective upon being heated to emit radiant energy for the cooking of said products;
a heating device for heating said element positioned near the side thereof remote from said grill;
heat sensing means effective to sense the temperature of the region adjacent said grill;
control means responsive to said heat sensing means for controlling the heat flow from said heating device; and
support means for maintaining said grill, said radiant heat emitting element, said heating device, said heat sensing means and said control means in their proper relative positions for proper functioning of said broiler.

4,899,725
BARBECUE GRILL
James O. Barron, Jr., Rte. 9, Box 352C, Albany, Ga. 31705
Filed May 8, 1989, Ser. No. 348,882
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—41 R **1 Claim**



1. A barbecue grill comprising,
a horizontal support framework with a cooking grid mounted thereon,
and a support frame underlying the support framework to define a rectangular parallelepiped configuration,
and a plurality of burner units each mounted within the support frame,
and a drip pan underlying the burner units and slidingly mounted within the support frame,
and plural pairs of fixed legs integrally secured to the support frame and directed orthogonally downwardly therefrom, and each fixed leg cooperatingly secured to a further leg,
and wherein each further leg telescopingly receives a fixed leg with a clamp member directed through each further leg to secure each fixed leg relatively thereto in a preselected orientation,
and including a planar storage shelf integrally secured to each further leg and extending beyond a plurality of further legs beyond the support frame, and a pressurized fuel tank supported on the support shelf,
and including a rectangular support bracket aligned with and directed outwardly of the support framework overlying the support shelf, and the support framework including a utility board fixedly secured thereon, and a plurality of utensil hooks integrally secured to side wall of the utility board, and a spice rack integrally secured to a forward wall of the support bracket directed orthogonally downwardly therefrom with a plurality of spaced shelves integrally formed to the spice rack,
and wherein each of the burner units are slidingly mounted within the support frame, and each burner unit includes a handle fixedly secured to a forward wall thereon,
and wherein each burner unit includes a burner conduit slidably receiving a fluid nozzle therewithin when each burner unit is secured within the support framework,
and wherein a burner control unit is fixedly mounted to the support framework wherein each burner unit includes a fuel conduit directed from the fuel tank to the burner control unit, and the burner control unit includes an individual further fluid conduit with a valve associated therewith directed from the burner control unit to the fluid nozzle,
and including a plurality of circular burners, with each circular burner including an individual burner control secured onto the support frame adjacent the cooking grid,
and including a wind panel hingedly mounted to the support

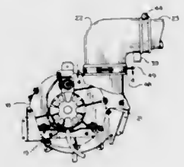
frame wherein the wind panel includes a side panel hingedly mounted to each end of the wind panel.

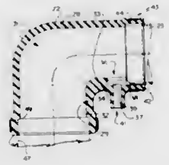
4,899,726

FURNACE INDUCER OUTLET ELBOW

Timothy J. Waterman, Carmel, Ind., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 12, 1988, Ser. No. 242,922
Int. Cl.[4] F24H *3/00*
U.S. Cl. 126—110 R **14 Claims**





1. In an inducer outlet assembly for conducting the flow of exhaust gases from the outlet of a furnace draft inducer to a vent pipe which is susceptible to the formation of condensation therein, an improved dam structure for preventing the flow of condensate from the vent pipe into the draft inducer comprising:

an L-shaped section, with vertical and horizontal portions being attachable to the draft inducer and the vent pipe, respectively;

an internally raised dam structure formed on a lower wall of said horizontal portion, near the end thereof which connects to said vent portion, said raised dam structure having a smooth rounded surface to facilitate the flow of exhaust gases thereover as they move from the vertical to the horizontal portions; and

a well structure located in said horizontal portion between said raised dam structure and the end which is attachable to the vent pipe, said well structure including a side wall which extends upwardly to a height which is substantially higher than a lower wall of the vent pipe to define one end of said raised dam structure and to function to prevent the flow of condensate over said raised dam structure, and a bottom wall including an outlet opening for draining off condensate that flows into said well structure.

4,899,727

IMPERFORATE GROOVE TRIGGER

Guntars I. Kapralis, 15039 Wedgeworth Dr., Hacienda Heights, Calif. 91745; Janis E. Kapralis, 21 Sunset Ave., #3, Venice, Calif. 90291, and Jeralyan Lowther, 756 Hamilton La., Fallbrook, Calif. 92028

Filed Mar. 20, 1989, Ser. No. 326,014
Int. Cl.[4] F24J *1/00*; **B21D** *22/00*
U.S. Cl. 126—263 **22 Claims**

1. For use in initiating crystallization of a supercooled salt solution, the combination that includes a flexible container containing said solution, and an improved trigger located in the container in contact with the solution, the trigger comprising:

(a) a thin, substantially imperforate metallic strip having a perimeter bounding a dished portion,

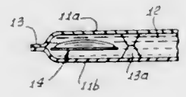
(b) a plurality of spaced generally V-shaped grooves formed at least in part within said dished portion, said dished portion being imperforate at said grooves,

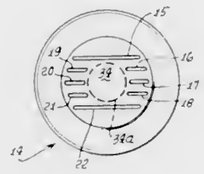
(c) the strip further characterized as having two configurations between which it is bendable with snap-displacement causing the initiation of progressive exothermic crystallization of said salt in the solution, and further having molecular structure which is impact oriented.

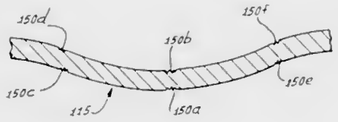
11. For use in initiating crystallization of a supercooled salt solution in a flexible container containing said solution, an improved trigger to be located in the container in contact with the solution, the trigger comprising:

(a) a thin, substantially imperforate metallic strip having a perimeter bounding a dished portion,

(b) said strip having at least two elongated grooves formed therein and extending inwardly of the strip perimeter, the grooves having elongated, outwardly projecting apices defining cracks in the metal thereof,







(c) the strip further characterized as having two configurations between which it is bendable with snap-displacement causing progressive exothermic crystallization of said salt in the solution, and

(d) the strip having molecular structure which is impact oriented.

17. The method of forming an improved trigger for use in initiating crystallization of a supercooled salt solution in a flexible container containing said solution, the improved trigger to be located in the container in contact with the solution, the method comprising:

(a) forming a thin, substantially imperforate metallic strip having a perimeter bounding an intermediate portion, and also forming at least two elongated grooves formed in said intermediate portion, with the grooves formed to have elongated, outwardly projecting, widthwise concave portions, and forming cracks in the metal thereof and extending therealong,

(b) the strip further characterized as having two configurations between which it is bendable with snap-displacement

causing progressive exothermic crystallization of said salt in the solution.

4,899,728

METHOD AND APPARATUS FOR PREHEATING VENTILATION AIR FOR A BUILDING

Rolf W. Peter, Zurich, Switzerland, and John C. Hollick, Maple, Canada, assignors to Solarwall International limited, St. Peter Port, Channel Islands

Filed Jan. 27, 1989, Ser. No. 302,359
Int. Cl.[4] E04D *13/18*
U.S. Cl. 126—428 **8 Claims**



1. A method of preheating ventilation air for a building having a south-facing surface through which heat from the interior of the building escapes, the method comprising the steps:

(a) providing on the south-facing surface of the building a corrugated solar radiation-absorbent collector panel defining an air collection space between itself and said surface, and having, distributed over the panel and its bottom end, a plurality of air inlet located at the inner apexes of said corrugations and openings communicating with said air collection space, the panel being exposed to the ambience;

(b) heating outside air with solar heat from the collector panel and with heat being lost from the interior of the building, and passing the heated air upwardly in laminar flow along the panel; and

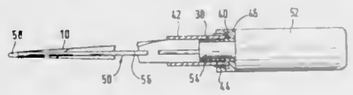
(c) withdrawing heated outside air through the air inlet openings of the collector panel and into the air collection space behind the panel, using air-moving means having an inlet at the top of the air collection space and having an outlet within the interior of the building, the air-moving means establishing a negative pressure differential across the collector panel with respect to the ambience.

4,899,729

EXPANSIBLE CANNULA

Steven S. Gill, 25 New Close, Knebworth, Hertfordshire, and Joseph F. Jackson, 1 West Royd Villas, Halifax, West Yorkshire, HX1 3LS, both of England

Continuation of Ser. No. 868,788, May 29, 1986, abandoned. This application Aug. 3, 1988, Ser. No. 204,165
Claims priority, application United Kingdom, May 30, 1986, 8513702
Int. Cl.[4] A61B *1/32*; **A61M** *29/00*
U.S. Cl. 128—3 **11 Claims**



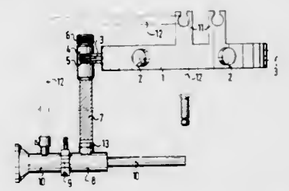
1. An expansible cannula capable of piercing kidney or brain tissue comprising a conical stem having a proximal end and a distal end and means for securing the proximal end of the conical stem against opening, the conical stem being hollow with inner and outer walls and being formed of flexible resilient sheet material coiled on itself and biased by the resilience of the sheet material into a normally closed condition with the apex of the cone at the distal end of the stem, the larger, proximal end of the stem being larger in diameter than the distal end by a multiple greater than unity so that the coil subtends at least 360° about the longitudinal axis of the stem, and a rigid tubular member, for insertion into the stem through the proximal end, wherein the inner wall of the stem has a receiving surface which, when acted upon by the tubular member sliding along the length of the stem causes the stem to open from said normally closed conical angle whereby the stem becomes substantially cylindrical thereby increasing the diameter of the stem at the distal end to approximately the same as that at the proximal end while maintaining a closed circular diameter at all positions along its length, and the resilience of the stem being such that when the tube is withdrawn, the stem will contract back to its closed conical condition.

4,899,730

HOLDER FOR MEDICAL INSTRUMENTS

Eberhard Stennert, Cologne, and Helmut Heckele, Knittlingen, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Dec. 8, 1988, Ser. No. 281,286
Claims priority, applicatioo Fed. Rep. of Germany, Dec. 11, 1987, 3742053
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **19 Claims**



1. A holder for medical instruments, comprising: a support element having means for securing it to a part or a patient's body;

at least one elongated rigid rail secured to said support element; coupling means mounted on said rigid rail; and at least one mounting for a medical instrument being adjustably secured to said coupling means.

4,899,731

ENDOSCOPE

Syuichi Takayama, Hachioji, and Yasuhiro Ueda, Kokubunji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 106,248, Oct. 7, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 289,538
Claims priority, application Japan, Oct. 16, 1986, 61-245773; Oct. 30, 1986, 61-258856; Nov. 19, 1986, 61-2760089
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **6 Claims**

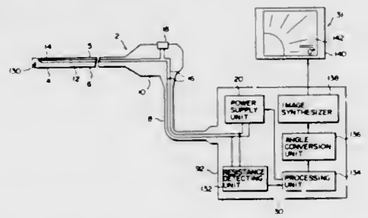
1. An endoscope with an operating section and insertion section having a bending section, comprising:

a bending member, formed of a shape memorizable alloy and disposed in said bending section of said insertion section, for bending said bending section;

a power supply unit connected to said bending member;

detecting means for detecting an amount of deformation of said bending member; and

display means for displaying said amount of deformation of said bending member;



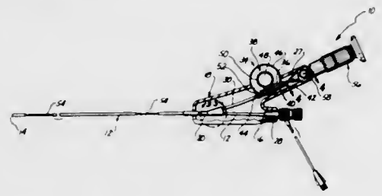
wherein said detecting means comprises a conductive rubber mounted on said bending section.

4,899,732

MINISCOPE

Donald M. Cohen, Irvine, Calif., assignor to Baxter International, Inc., Deerfield, Ill.

Filed Sep. 2, 1988, Ser. No. 240,032
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **31 Claims**



1. A miniscope catheter comprising:
a cylindrical body formed with a distal and proximal end and at least a first lumen traversing through said body;
at least a first optical filament positioned in one of said lumens and eccentrically secured to said body at a region to be deflected;
viewing means associated with the proximal end of said cylindrical body for viewing images through said first lumen of said body; and
means associated with said body which can be operated to apply a force against said optical filament to longitudinally drive said optical filament in at least a first direction within said lumen.

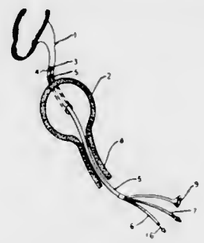
4,899,733

DEVICE AND TECHNIQUE FOR TRANSURETHRAL ULTRASONIC LITHOTRIPSY USING A FLEXIBLE URETEROSCOPE

Eugene A. DeCastro, Jamestown, N.Y., and Roger Goodfriend, Monte Serso, Calif., assignors to Blackstone Ultrasonic, Inc., Jamestown, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,561
Int. Cl.[4] A61B *1/30*
U.S. Cl. 128—7 **15 Claims**

1. An apparatus for machining and fragmenting urinary calculi in place and in a ureter, comprising a flexible ureteroscope, adapted to be inserted in a flexible state into said ureter to abut said urinary calculi to be fragmented, said ureteroscope having at least two substantially parallel lumens extending through said ureteroscope, an optical system in one of said lumens permitting optical observations lengthwise trough said ureteroscope, a solid wave guide extending lengthwise through another of said lumens of said ureteroscope, said solid wave guide having a lateral dimension less than the interior lateral dimension of said other lumen, ultrasonic means in operative relation to said wave guide and acting on said wave guide at one end to cause vibration at the other end, said optical system including a plurality of optical fibers forming an optical bundle and at least a part of said optical fibers being connected to a viewing means, the remaining optical fibers being connected to a light source.



4,899,734

SPECULUM WITH ARRESTING DEVICE

Doris Gelley, Gateshead, Great Britain, assignor to Ottes Trading S.A., Panama City, Panama

Filed Mar. 9, 1988, Ser. No. 166,068
Claims priority, application Switzerland, Mar. 10, 1987, 885/87
Int. Cl.[4] A61B *1/32*; B25B *7/14*
U.S. Cl. 128—17 **5 Claims**



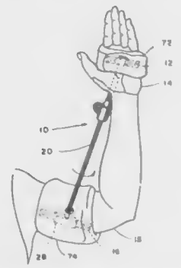
1. A pair of pliers comprising a pair of lever handles with an arresting device means for arresting said pliers in a clamping position, said pliers having an elongated arresting member rotatably secured at one lever handle for rotation about its lengthwise axis, directed towards the other lever handle and extending with its free end through an opening in this other lever handle, which arresting member in one rotational position is axially freely slidable in this opening and by rotation into an arresting position is clampable with the edges of said opening in order to fix an attained spreading position of both lever handles, wherein at least the surface of the arresting member (5) is composed of a deformable material, which is deformable upon clamping the pliers with the arresting member in the arresting position and upon sliding through the edges (15) of the opening (12) in said other lever handle (1) and which, by means of the static friction existing in the rest position, arrest the lever handles (1, 2) in each spreading position in which the lever handles are brought.

4,899,735

TORSION BAR SPLINT FOR FOREARM

Kim R. Townsend, Garner, N.C.; Susan G. Bledsoe, New Lenox, Ill.; Michael Heidenreich, Lafayette, and Michael H. Voelz, Battleground, both of Ind., assignors to Bissell Health Care Corporation, Grand Rapids, Mich.

Filed Dec. 7, 1988, Ser. No. 281,030
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 R **13 Claims**



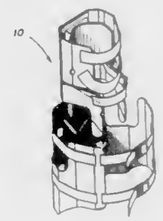
1. A radioulnar mobilization splint comprising:
a first member adapted to be secured to a portion of the hand;
a second member adapted to be secured to a portion of the arm proximal the proximal radioulnar joint;
interconnecting means extending between said members along an axis for interconnecting said members; and
clutch means associated with said interconnecting means for allowing relative rotation between said members along said axis in one direction away from a set orientation and substantially preventing relative rotation between said members along said axis in the direction opposite said one direction and toward said set orientation, whereby progressive unidirectional rotation along said axis is accommodated between the hand to which said first member is coupled and the arm to which said second member is coupled.

4,899,736

OPTIONALLY DISPOSABLE CERVICAL RESTRAINING DEVICE

William R. Nesbitt, 6967 Bloe Oak La., Loomis, Calif. 95650

Continuation-in-part of Ser. No. 871,390, Jun. 6, 1986, Pat. No. 4,718,412, which is a continuation-in-part of Ser. No. 650,206, Sep. 13, 1984, Pat. No. 4,594,999. This application Sep. 8, 1987, Ser. No. 93,610
The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 R **22 Claims**



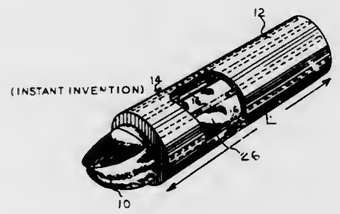
1. An optionally reuseable cervical spine board device adapted to restrain the head and body of an injured person comprising
(A) a main body portion, having a central section and a flat, elongated, centrally disposed reinforcement portion of a rectangular configuration, of an elevation equal to that of a main body, mounted on said central section, and a head stabilizer superposed on said reinforcement portion;
(B) a pair of head flanges, one of which extends outwardly on either side of said central section and which flanges are capable of moving from a first position in the same plane as said central section to a second position generally normally upward from said central section,
(C) a hard neck collar comprising
a pair of neck collar members one on each side of the central portion, also extending outwardly from said central section and extending further than said head flanges, movable from the same first position through a second position to a third position substantially parallel to each other,
each neck collar member having a built in outwardly foldable chin tab,
(D) a pair of body members, one on each side of said central section, said body members including a first L-shaped segment adjacent to said central section and a wing segment capable of moving from a first position in the same axis as the central section upwardly and inwardly toward the other of said wing segments to a spaced relationship second position opposed to the other of said wing members;
(E) means for securing said head flanges to each other and for securing said neck collar members to each other the former in their second position, the latter in their third position.

4,899,737

SPLINT FOR COMPLETE CIRCUMFERENTIAL IMMOBILIZATION OF AN EXTREMITY OR A TERMINAL MEMBER OF AN EXTREMITY

Vartan J. Lazarian, 47 So. Country Rd., Bellport, N.Y. 11713

Filed Sep. 14, 1988, Ser. No. 244,161
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 A **6 Claims**



1. A splint, for a broken terminal member of an extremity or for an extremity, comprising:
(a) a substantially cylindrical elastic outer member free of "O" rings and flaps so that pain is not intensified, said cylindrical elastic outer member open at both ends so that it can expand from the nail bed past the first joint of the finger so that the tip of the finger including the nail is visible and not restrictive throughout the healing process;
(b) a substantially cylindrical liner inside said outer member, open at both ends and
(c) a plurality of stiffening members positioned inside said outer member and each being independent of each other and formed as an integral unit between said liner and said outer member, said stiffening members being stiff enough to substantially prevent bending of said extremity or said terminal member but together with said outer member are

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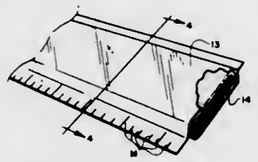
flexible enough to allow for swelling and changes in anatomy.

4,899,738

ROLL FORM MEDICAL BANDAGING PRODUCT

A. Bruce Parker, 3015 Forest Park Dr., Charlotte, N.C. 28209

Continuation of Ser. No. 000,815, Jan. 16, 1987, Pat. No. 4,770,299. This application Sep. 12, 1988, Ser. No. 243,585
The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—90 **11 Claims**



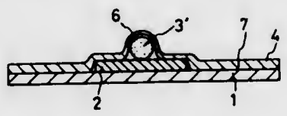
1. A medical bandaging product, comprising:
(a) an outer sleeve formed of moisture-impervious material;
(b) a medical material positioned in said sleeve in substantially moisture-free conditions and sealed therein against entry of moisture until use, said medical material comprising:
(i) a substrate having first and second opposing sides defining therebetween a predetermined thickness;
(ii) a reactive system impregnated into or coated onto said substrate, said system remaining stable when maintained in substantially moisture-free conditions and hardening upon exposure to sufficient moisture to form a rigid, self supporting structure; and
(iii) a soft, flexible, protective, cushion padding means which is freely water and air permeable through the thickness thereof for providing a cushioning barrier between the substrate and the skin of a patient when the material is in use, said padding overlying both said first and second sides of said substrate whereby either side of said bandage may be placed next to the skin of the patient.

4,899,739

ADHESIVE BANDAGE

Ryusaku Konishi, Takarazuka, Japan, assignor to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 775,836, Sep. 13, 1985, Pat. No. 4,858,604, which is a continuation of Ser. No. 447,640, Dec. 7, 1982, abandoned. This application Nov. 23, 1988, Ser. No. 275,597
Claims priority, application Japan, Dec. 8, 1981, 56-198879; Dec. 14, 1981, 56-196996
Int. Cl.[4] A61L *15/00*; A61F *13/00*
U.S. Cl. 128—156 **10 Claims**



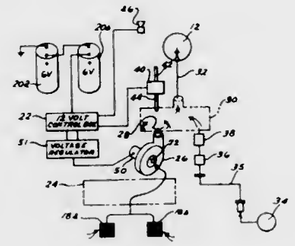
1. An adhesive bandage comprising:
a. adhesive tape;
b. an absorbent pad carried by the tape, which is smaller in its length than the tape; and
c. a release sheet releasably attached to the tape on the side of the adhesive overlaying the whole pad; said release sheet having:
d. a blister having an open side facing the pad; and
e. a rupturable capsule containing a medicine therein, which is placed in the blister; said blister being more rupture-resistant than said capsule and serving to direct medicine from the capsule when ruptured onto said absorbent pad.

4,899,740

RESPIRATOR SYSTEM FOR USE WITH A HOOD OR FACE MASK

Michael L. Napolitano, Georgetown, Ky., assignor to E. D. Ballard Company, Sausalito, Calif.

Filed Jan. 17, 1989, Ser. No. 296,938
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—202.22 **17 Claims**



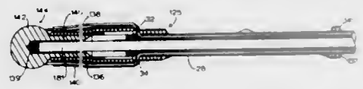
1. A respirator system for supplying breathable air to a bood or face mask comprising
a housing containing a first chamber defining a component cavity,
an air inlet plenum disposed in said housing,
air filter means removably connectable to said housing for removing contaminants from ambient air passing therethrough, said air filter means communicating with ambient atmosphere external to said housing and with said air inlet plenum,
blower means disposed in said component cavity and having an air inlet port and an air outlet port, said air inlet port communicating with said air inlet plenum,
a motor disposed in said component cavity and operatively connected to said blower means,
an air outlet plenum disposed in said component cavity and connected in fluid receiving relation to said blower air outlet port, said air outlet plenum being connectable in air supplying relation to said hood or mask for operation of the system in a powered air purifying respirator mode,
valve means connected between said blower air outlet port and said air outlet plenum for permitting air, under pressure, to flow from said blower means into said air outlet plenum and for preventing air, under pressure, from escaping said air outlet plenum into said blower air outlet port,
differential air pressure sensing means connected in fluid responsive relation between ambient atmosphere and said air outlet plenum for sensing when the difference between the pressure of air in said air outlet plenum and the pressure of ambient atmosphere is less than a preselected minimum value, and
alarm means responsively connected to said sensing means for indicating when said pressure difference is less than said value.

4,899,741

LASER HEATED PROBE AND CONTROL SYSTEM

Joseph R. Bentley, Holiday; Radford G. Ferre, Midvale, both of Utah, and Steven W. Kovalcheck, San Diego, Calif., assignors to HGM Medical Laser Systems, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 3,209, Jan. 14, 1987, Pat. No. 4,760,209. This application Apr. 11, 1988, Ser. No. 180,188
Int. Cl.[4] A61B *17/36*
U.S. Cl. 606—27 **18 Claims**



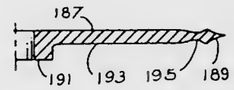
1. A laser-energizable thermal probe system, comprising:
(a) a microsize optical fiber having a proximal end portion connectable to a laser energy source for transmission of laser energy therethrough to a distal end portion thereof;
(b) a laser energy source connected to said proximal end portion of said optical fiber including means for controlling the level of laser energy produced thereby;
(c) a probe assembly connected to said distal end portion of said fiber, comprising:
(i) a thermally conductive probe body including a curvoidal tip and a neck portion joined to said tip and extending proximally therefrom, with an interior passage in said probe body extending between proximal and distal portions of the passage through said neck portion and containing the said distal end portion of said optical fiber whereby laser energy produced by said source and transmitted by said optical fiber to said probe body and converted to thermal energy is transmittable by said tip to a selected site in contact with said tip;
(ii) thermally conductive means mounted to join said optical fiber to said probe body and to provide an extended heat transfer dissipation path for heat generated by said probe assembly in use; and
(iii) a thermocouple assembly including a thermocouple secured proximate and in operative thermal association with the outer surface of said probe body to sense the outer surface temperature thereof and positioned so as to avoid impingement of laser energy thereon and a pair of microsize thermocouple leads with distal and proximal ends extending from said thermocouple;
(d) said optical fiber and thermocouple leads being formed as an integral composite optical fiber-thermocouple lead flexible cable suited to transmitting heat producing radiation to said selected site in a human body cavity as in an arterial or venous channel into which the cable is fed and when necessary bending to accommodate to the curvature of the channel without directional preference and transmitting from the same selected site through said leads signals indicative of the outer surface temperature of said probe body;
(e) control means for said laser energy source connected to said thermocouple leads and rapidly responsive to an output signal developed by the thermal condition of said thermocouple to maintain and rapidly regulate said laser energy source at some level of power and regulate such level corresponding to a predetermined temperature of the outer surface of and size of said probe body; and
(f) matable coupling means joined to said optical fiber and leads at a respective proximal portion and proximal end thereof for connecting said optical fiber to said laser energy source and said thermocouple leads to said control means.

4,899,742

ROTARY SCALPEL BLADE AND BLADE PROTECTOR STRUCTURE

George H. Muller, Apt. 508 M2, 1945 Gulf of Mexico Dr., Longboat Key, Fla. 34228, assignor to Joseph J. Berke, Detroit, Mich. and George H. Muller, Longboat Key, Fla., a part interest

Continuation-in-part of Ser. No. 422,847, Sep. 24, 1982, Pat. No. 4,791,928. This application Mar. 9, 1987, Ser. No. 23,651
Int. Cl.[4] A61B *17/32*
U.S. Cl. 606—180 **5 Claims**



1. A circular rotary scalpel blade including a hub portion having an opening therethrough for mounting the scalpel blade on a rotating member for rotatably driving the scalpel blade, a substantially flat portion extending radially outwardly from the hub portion, a sharpened, radially outer, peripheral edge having smooth and slightly concave sides and an annular groove between the flat portion and peripheral edge os the rotary scalpel blade on each side thereof having sides including a greater slope adjacent the outer peripheral edge of the rotary scalpel blade and a lesser slope adjacent the substantially flat portion of the rotary scalpel blade and being less than one quarter of the radial extend of the blade in transverse dimension.

4,899,743

SUTURE ANCHOR INSTALLATION TOOL

James E. Nicholson, Lincoln, and Roland F. Gatturna, Walpole, both of Mass., assignors to Mitek Surgical Products, Inc., Norwood, Mass.

Filed Dec. 15, 1987, Ser. No. 132,940
Int. Cl.[4] A61B *17/04, 17/08*; A61F *5/04*
U.S. Cl. 606—139 **28 Claims**



1. A suture anchor installation tool for deploying a suture anchor of the sort comprising (a) a coupling member having an end surface, (b) a barb, said barb having a first end and a second end and being curved in its normal unstressed state and being capable of being elastically deformed to a substantially straight configuration, said barb being attached to said coupling member so that said second end of said barb is substantially displaced from said coupling member when said barb is in its normal unstressed state but is capable of being aligned with said coupling member when said barb is deformed to a substantially straight length, and (c) attachment means for attaching one end of a suture to said suture anchor,

VOL 1111 ISS 2 FEB 13 1990 UMI

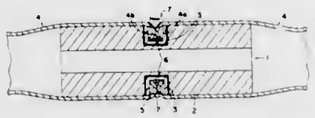
said suture anchor installation tool comprising:
an elongated member having an axial bore defined by an inside wall and sized to receive a portion of said coupling member comprising said end surface of said coupling member, a first end and a second end, stop means positioned to engage said end surface for preventing said coupling member from moving along the axis of said elongate member in a first direction, said stop means comprising at least one surface which projects laterally inward from said inside wall of said axial bore, and a slot extending from said first end towards said second end, said slot being sized to accommodate said barb.

4,899,744

APPARATUS FOR ANASTOMOSING DIGESTIVE TRACT

Tatsuo Fujitsuka, 2061, Oaza Shinbori, Shobu-cho, Minamisaitama-gun, Saitama, and Hiroshi Kawasaki, 17-9 Akabane 2-chome, Kita-ku, Tokyo, both of Japan

Filed Dec. 15, 1988, Ser. No. 284,618
Int. Cl.[4] A61B *17/04, 17/11*
U.S. Cl. 606—153 **10 Claims**



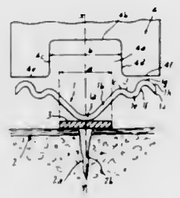
1. An apparatus for anastomosing a digestive tract comprising: a support tube formed mainly of a soluble material and having an outer periphery; an annular groove in said outer periphery having spaced apart inner sides and an inner bottom surface; and a plurality of individual retainers each having spaced apart ends providing an open space therebetween when said retainer is in an open state, said retainer endowed with a property of moving said spaced apart ends to a closed state during use wherein said digestive tract is clamped therebetween, said retainers disposed in said support tube in said open state around said inner side and bottom surfaces at a plurality of spaced apart locations along said groove, said retainers being released from said support tube and allowed to assume said closed state as the soluble material of said support tube is dissolved.

4,899,745

SURGICAL CLIP FOR CUTANEOUS SUTURE AND TOOL FOR APPLYING IT

Jacques-Philippe Labourieau, 24 Fontaine Billenois, and Georges Comte, 27 Bis Rue des Monts de Vigne, both of 21000 Dijon, France

Filed Mar. 31, 1989, Ser. No. 332,534
Claims priority, application France, Apr. 14, 1988, 88 04945
Int. Cl.[4] A61B *17/08;* **F16B** *15/00*
U.S. Cl. 606—142 **14 Claims**



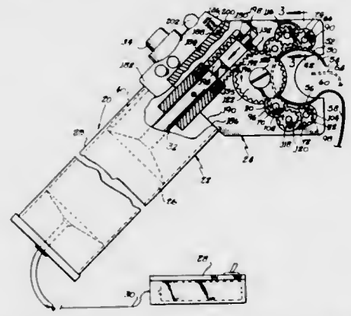
1. A surgical clip for cutaneous suture constituted by a piece of wire made of a rigid but deformable material, particularly of metal, symmetrical with respect to a plane, terminated by two points and presenting, in the open state, a sinuous shape,
wherein it successively comprises, starting from the centre of the clip and on each side of the plane of symmetry of the clip, a rectilinear branch, a first bend with concavity facing the skin into which the clip must be engaged, a second intermediate bend with convexity facing the skin and a third bend with concavity facing the skin, this third bend extending by an end leg terminating in the point of the clip and which is inclined by an angle of about 45° with respect to the general direction of extension of the clip.

4,899,746

SUTURING APPARATUS

Bertil E. Brunk, Lake Geneva, Wis., assignor to Brunk Industries, Inc., Lake Geneva, Wis.

Filed Apr. 28, 1988, Ser. No. 187,573
Int. Cl.[4] A61B *17/04, 17/06;* **D05B** *1/00*
U.S. Cl. 606—144 **6 Claims**



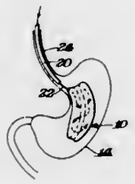
1. An apparatus for suturing comprising a housing and means on said housing for supporting and driving an arcuate needle around a circular path comprising; a plurality of drive rollers spaced along said circular path, speed-reducing gearing including a worm gear having a central bore for receiving a drive shaft, a handle unit including a drive shaft, and means providing a quick-disconnect between said housing and said handle unit and also between said needle driving means and said drive shaft.

4,899,747

METHOD AND APPARTUS FOR TREATING OBESITY

Lloyd R. Garren, and Mary L. Garren, both of P.O. Box 3738, Wilmington, Del. 19807

Continuation-in-part of Ser. No. 329,182, Dec. 10, 1981, Pat. No. 4,416,267. This application Sep. 6, 1983, Ser. No. 529,609
Int. Cl.[4] A61B *17/00*
U.S. Cl. 606—192 **13 Claims**



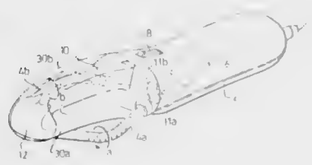
1. A stomach insert for treating obesity in humans by reducing the stomach volume comprising a flexible, free-floating and unattached, inflatable balloon having a manufactured shape and significant resistance to over-inflation, the balloon being inflatable to its manufactured shape to a volume effective to reduce the stomach volume of a person being treated, and at least a portion of the balloon having self-sealing means to facilitate inflation of the balloon.

4,899,748

DEVICE FOR REMOVING HAIR

Joseph Gross, Moshav Mazor, Israel, assignor to Hair Remover Ltd., Tel Aviv, Israel

Filed Aug. 25, 1988, Ser. No. 237,127
Claims priority, application Israel, Mar. 25, 1988, 85867
Int. Cl.[4] A61B *17/00*
U.S. Cl. 606—133 **19 Claims**



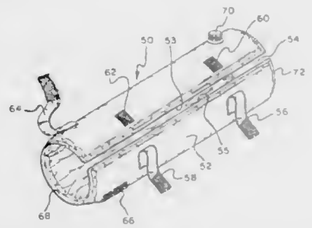
14. A depilatory device for removing body hair, comprising:
a manually-grippable housing;
two hair-plucker bodies each rotatably mounted to the housing and each having an exposed section formed with a plurality of gaps in its outer surface which open and close during the rotation of the hair-plucker body to receive, pluck and eject body hair growing on a surface over which the hair-plucker body is moved;
the two hair-plucker bodies being individually supported to define two oppositely-extending arcs having concave sides facing each other and convex sides facing away from each other;
one end of each of the two hair-plucker bodies being rotatably mounted within the housing, and the other end of each of the two hair-plucker bodies being rotatably mounted to a stem projecting axially of the housing;
and a drive for driving said hair-plucker bodies in opposite directions.

4,899,749

THERMAL VASCULAR DILATING DEVICE AND METHOD

Elizabeth Lsroco, 714 Lancing Rd., Woodbury, N.J. 08096

Filed Nov. 4, 1988, Ser. No. 267,363
Int. Cl.[4] A61F *7/02*
U.S. Cl. 128—402 **11 Claims**



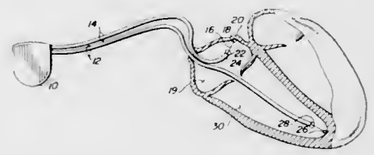
1. A thermal vascular dilating device to fit over a person's extremity comprising:
(a) a heat retaining flowable material tight container comprising:
(i) a cylindrical shaped flexible outside wall having an inner surface, an outer surface, and two circular end edges,
(ii) a cylindrical shaped flexible inside wall having an inner surface, an outer surface, and two circular end edges, the inside wall nested inside the outside wall,
(iii) sealing means to seal the adjacent end edges of the inside and outside walls forming a cylindrical cavity between the outer surface of the inside wall and the inner surface of the outside wall,
wherein the inside wall is heat conductive,
(b) an opening means providing an opening into the cavity to allow it to be filled with warm heat retaining flowable material, sealably closed, opened, and emptied, and
(c) closure means to detachably close off an end of the cylindrical container.

4,899,750

LEAD IMPEDANCE SCANNING SYSTEM FOR PACEMAKERS

Christer Ekwall, Spanga, Sweden, assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed Apr. 19, 1988, Ser. No. 183,191
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 PG **32 Claims**



1. A lead impedance scanning system for an implantable stimulation device for stimulating body tissue, the body tissue having an electrical impedance, said scanning system comprising:
pulse generator means for generating stimulation pulses to the body tissue during a stimulation time interval;
sensing means for sensing, during a sensing time interval, electrical signals generated by the body tissue;
an implantable lead having an electrical impedance, said lead being implantable in the body tissue and coupled to said pulse generator means for delivering said stimulation pulses and to said sensing means for receiving said electrical signals; and
detection means for detecting, during said simulation time interval and said sensing time interval, changes in combined impedance of said lead and of the body tissue at a point of contact of said lead with the body tissue.

4,899,751

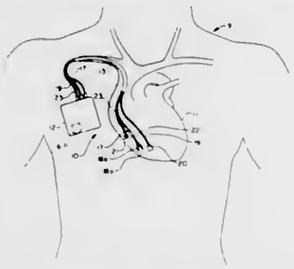
SYSTEM FOR AND METHOD OF THERAPEUTIC STIMULATION OF A PATIENT'S HEART

Todd Cohen, Baltimore, Md., assignor to Leonard Bloom, Towson, Md., a part interest

Division of Ser. No. 201,935, Jun. 3, 1988, which is a continuation-in-part of Ser. No. 105,030, Oct. 6, 1987. This application Jul. 12, 1989, Ser. No. 378,708
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 PG **20 Claims**

1. In a system for therapeutic stimulation of a patient's heart and which includes means for varying escape interval or rate of a means for producing pacing pulses, an improvement comprising means for sensing pressure at a site in circulatory system of a patient, means responsive to output from the sensing means for developing a variable first signal representative of mean pressure at the site over a period of predetermined duration, means responsive to output from the sensing means

for developing a second variable signal representative of mean pressure at the site over a period of given duration less than the period of predetermined duration, means responsive to the first variable signal and to the second variable signal for developing a first control signal whenever the first variable signal and the second variable signal differ by at least a predetermined amount, means responsive to a signal dependent on at least one physiological variable for developing a second control signal, and means for alternatively supplying the first control signal and the second control signal to the means for varying the escape interval or rate of the means for producing pacing pulses, the second control signal being supplied in absence of the first control signal and the first control signal being supplied, when present, to exclusion of the second control signal.



4,899,752

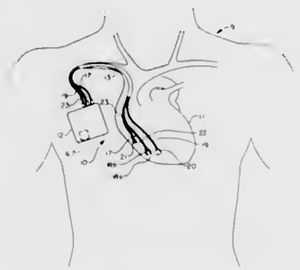
SYSTEM FOR AND METHOD OF THERAPEUTIC STIMULATION OF A PATIENT'S HEART

Todd J. Cohen, Baltimore, Md., assignor to Leonard Bloom, Towson, Md.

Continuation-in-part of Ser. No. 105,030, Oct. 6, 1987. This application Jun. 3, 1988, Ser. No. 201,935

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—419 PG **40 Claims**



1. In a system for therapeutic stimulation of a patient's heart and which includes means for producing pacing pulses and means for varying the escape interval or rate of said means for producing pacing pulses, an improvement comprising means for sensing blood pressure at a site in the circulatory system of a patient to produce an output, means responsive to the output from the sensing means for developing a variable first signal representative of mean blood pressure at the site over a period of predetermined duration, means responsive to the output from the sensing means for developing a variable second signal representing mean blood pressure at the site over a period of given duration less than the period of predetermined duration, means responsive to the first signal and to the second signal for developing a control signal upon the first signal and the second signal differing by at least a predetermined amount, and means responsive to the control signal for controlling the means for varying the escape interval or rate of the means for producing pacing pulses.

4,899,753

ELECTROCARDIOGRAPHIC ELECTRODE

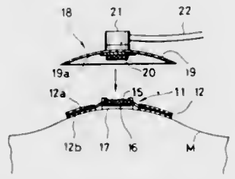
Hirokatsu Inoue, Chiba, and Chuji Shimizu, Funabashi, both of Japan, assignors to Fukuda Denshi Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 911,030, Sep. 24, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 154,460

Claims priority, application Japan, Oct. 2, 1985, 60-151377[U]

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—639 **1 Claim**



1. Apparatus for deriving a voltage from the heart activity of a person, comprising:

an electrocardiographic electrode having:

a viscous member to be held in close contact with the skin of the person, the viscous member having front and back viscous surfaces and a central opening, the back surface of the viscous member fixedly securing to the skin of the person;

a reinforcement member bonded to the front surface of said viscous base member to close the opening;

an electrode member provided in the reinforcement member;

first magnetic means fixedly attached to the electrode member; and wherein the electrocardiographic electrode is adaptable to a lead connector having:

a water-proof suction member;

a lead securement member having a portion extending through the suction member, connected to a lead;

second magnetic means fixedly attached to the securement member at the portion extending through the suction member;

wherein the lead connector is nondetachably fixed to the electrocardiographic electrode by bonding the inside surface of the suction member to the front surface of the viscous member; and

wherein the first and second magnetic means are in abutment to provide an electrical path for the voltage to traverse from the person to an equipment for measuring the voltage;

whereby the apparatus is fixedly secured to the skin of the person.

4,899,754

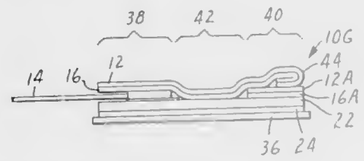
FLAT, CONFORMABLE, BIOMEDICAL ELECTRODE ALLOWING REMOVAL OF ELECTRICAL LEAD WIRE

Jerome G. Bly, Minneapolis, Minn., and Charles W. Roberts, North Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 915,138, Oct. 3, 1986, Pat. No. 4,771,783, which is a continuation-in-part of Ser. No. 892,691, Aug. 1, 1986, Pat. No. 4,727,880. This application Apr. 8, 1988, Ser. No. 179,519

Int. Cl.[4] A61B *5/04*; A61N *1/04*

U.S. Cl. 128—640 **6 Claims**



1. A biomedical electrode adapted to be applied to a body, said electrode having a surface area divided into a first zone, a second zone, and a third zone, comprising:

a first layer of adhesive which is electrically conductive and which is adapted to be applied to said body;

an electrically conductive layer positioned adjacent said first layer of adhesive;

a second layer of adhesive;

a protective, electrically insulative web positioned adjacent said second layer of adhesive;

said second layer of adhesive holding said protective, electrically insulative web to said electrically conductive layer opposite of said first layer of adhesive in said third zone of said electrode;

a removable release liner positioned in said first zone between said second layer of adhesive and said conductive layer preventing said protective, electrically insulative web from sticking to said electrically conductive layer in said first zone of said electrode; and

an insertable electrical lead wire having a distal uninsulated portion and a proximate insulated portion, said distal uninsulated portion of said electrical lead wire being insertable in said first zone between said second layer of adhesive and said electrically conductive layer upon removal of said removable liner;

said protective, electrically insulative web having an edge in said second zone, being easily grasped so that said protective, electrically insulative web may be pulled and removed from said electrode allowing removal of said electrical lead wire;

said third zone being located intermediate said first zone and said second zone;

said edge being formed by having a portion of said protective, electrically insulative web uncoated by said second layer of adhesive;

said edge being spaced from the outside perimeter of said electrode.

4,899,755

HEPATOBILIARY NMR CONTRAST AGENTS

Randall B. Laoffer, Boston, and Thomas J. Brady, Winchester, both of Mass.; assignors to The General Hospital Corporation, Boston, Mass.

Filed May 8, 1985, Ser. No. 731,841

Int. Cl.[4] A61K *43/00, 49/02*

U.S. Cl. 128—654 **24 Claims**

1. A method of altering proton NMR relaxation times in the liver or bile duct of a human patient comprising administering to said patient an agent characterized in that

it is taken up preferentially by human hepatocytes, compared to human reticuloendothelial cells,

it contains a complex of a paramagnetic substance capable of altering said proton NMR relaxation times in said hepatocytes,

and an organic chelating ligand, said complex having a formation constant of at least $10^{15}M^{1}$, a solubility to at least 1.0 mM concentration in normal saline, a molecular weight greater than 250, and a charge of an absolute value of 2 or less,

said organic chelating ligand containing at least one aryl ring, and

said paramagnetic substance being selected from the group consisting of gadolinium (III), iron (III), manganese (II), manganese (III), chromium (III), copper (II), dysprosium (III), terbium (III), holmium (III), erbium (III) and europium (III).

4,899,756

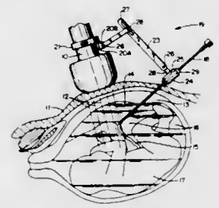
ARTICULATED NEEDLE GUIDE FOR ULTRASOUND IMAGING AND METHOD OF USING SAME

Jiri D. Sonek, 217 Ravine Ridge Dr. North, Powell, Ohio 43065

Filed Jul. 18, 1988, Ser. No. 221,029

Int. Cl.[4] A61B *8/00*

U.S. Cl. 128—662.05 **14 Claims**



1. An articulated needle guide for use with an ultrasound imaging device that generates a generally planar ultrasound beam at one end of a transducer housing, said articulated needle guide comprising: a shoulder mountable upon the transducer housing in substantial alignment with the plane of the ultrasound beam, a first link pivotally connected to the shoulder, a second link pivotally connected to the first link, and a needle mount pivotally connected to the second link and formed with a needle-receiving guideway through which a needle may be inserted into a subject; said needle mount and said transducer housing being wholly movable in substantial alignment with the plane of the ultrasound beam, respectively, prior to and after inserting the needle into the subject.

4,899,757

ULTRASOUND IMAGING PROBE WITH ZERO DEAD SPACE

Joseph L. Pope, Jr.; James M. Griffith; James M. Gessert, all of Newport Beach; Mario Maciel, Phelan, and Paul Zalesky, Huntington Beach, all of Calif., assignors to InterTherapy, Inc., Costa Mesa, Calif.

Filed Feb. 22, 1988, Ser. No. 158,761

Int. Cl.[4] A61B *8/12*

U.S. Cl. 128—662.06 **22 Claims**

1. An ultrasonic imaging probe comprising:

an elongate probe guide assembly;

transducer means connected near a distal end of said probe gnide assembly for transmitting/receiving ultrasonic waves along a first path; and

electrical cable means which includes a two lead cable housed within said probe guide assembly and operatively

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connected to said transducer means for transmitting electrical signals to, and receiving electrical signals from, said transducer means;

said electrical cable means including an inductor coil coaxially housed within said probe guide assembly and having proximal and distal ends, said inductor coil being positioned closely adjacent said transducer means such that said inductor coil distal end is electrically connected to said transducer means, and wherein



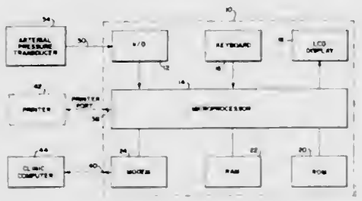
one of said leads of said cable being electrically connected to said proximal end of said inductor coil, and another of said leads of said cable being electrically connected to said transducer means at a location different from said electrical connection of said inductor coil distal end thereto, whereby said one cable lead, inductor coil, transducer means and said other cable lead are in series connection.

4,899,758

METHOD AND APPARATUS FOR MONITORING AND DIAGNOSING HYPERTENSION AND CONGESTIVE HEART FAILURE

Stanley M. Finkelstein, St. Louis Park, and Jay N. Cohn, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 824,629, Jan. 31, 1986, abandoned. This application Aug. 2, 1988, Ser. No. 228,820
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—672 **15 Claims**



1. A congestive heart failure monitor comprising:

RAM means for storing data;

input means for receiving and storing a cardiac output transducer means for converting an arterial pressure to a corresponding electrical analog signal;

analog to digital converter means for receiving said analog signal and digitizing it at a predetermined sampling rate;

means for storing digitized samples produced by said converter means in said RAM means, said samples being stored over a time interval so that one or more pressure waves, each corresponding to a beat of the human heart, are digitized and stored in said RAM means as a series data bytes, each byte representing the instantaneous pressure of the arterial pressure;

means for determining a mean arterial pressure value from said stored data bytes and storing said value;

means for determining the value of the parameter C_2 of the modified Windkessel model from the pulse contour of the diastolic portion of said waves and from said stored mean arterial pressure value and said stored cardiac output value;

means for testing said C_2 value against a predetermined threshold value of approximately 0.07 ml/mm Hg indicative of a congestive heart failure condition and identifying a congestive heart failure condition for C_2 values below said threshold; and

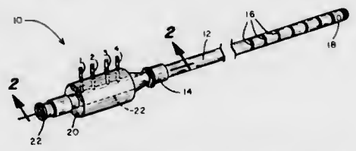
means for indicating said identified condition to a user of said vascular compliance monitor.

4,899,759

FLOW-THROUGH RESISTIVITY CELL

Brian D. Pederson, St. Paul, and Bruce A. Tockman, Minneapolis, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Jan. 17, 1989, Ser. No. 297,664
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—693 **5 Claims**



1. A blood resistivity measuring apparatus comprising:

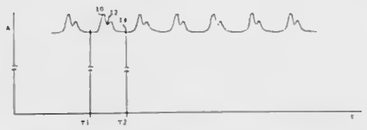
(a) cell means disposed along the length of a tubular intravascular catheter and having an internal chamber of known dimensions for intermittently and statically containing a predetermined volume of a patient's blood being drawn through said catheter, said cell means including a plurality of electrodes longitudinally spaced from one another and exposed to the interior of said chamber, means for applying a sinusoidal constant current signal across a predetermined pair of said plurality of electrodes for allowing the impedance of the blood between a further pair of said plurality of electrodes intermediate said predetermined pair to be measured, in situ.

4,899,760

NOISE REJECTING DETECTOR FOR BIOMEDICAL SIGNALS

Jonathan P. Jaeb, San Antonio, and Merle E. Converse, Helotes, both of Tex., assignors to Colin Electronics Co., Ltd., Komaki, Japan

Filed Jun. 15, 1987, Ser. No. 62,781
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—696 **8 Claims**



1. A biological signal detector, comprising:

means for obtaining an electrical representation of a plurality of biological signals related to the operation of a human heart, each said signal comprising a direct current component, an alternating current component at a first frequency, and an alternating current noise signal at a second frequency, said second frequency being substantially higher than said first frequency, said electrical representation of each of said biological signals being defined by a plurality of pulse amplitude signals having predetermined time intervals;

means for combining said pulse amplitude signals to produce a multiplexed signal comprising an ordered succession of pulses representing each of said biological signals; and

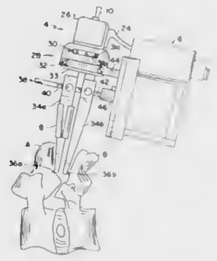
means for demultiplexing said multiplexed signal to obtain a representation of each of said respective biological signals, comprising means for storing a value corresponding to a predetermined portion of the amplitude of the individual pulse amplitude signals during each said time intervals, said means for storing being nonresponsive to said noise signal at said second frequency.

4,899,761

APPARATUS AND METHOD FOR MEASURING SPINAL INSTABILITY

Mark D. Brown, 9421 SW. 103 St., Miami, Fla. 33176, and David C. Holmes, 11262 SW. 169 St., Miami, Fla. 33157

Filed Mar. 31, 1988, Ser. No. 175,755
Int. Cl.[4] A61B *5/10*
U.S. Cl. 128—781 **22 Claims**



1. An apparatus for measuring instability of a motion segment unit of a spine comprising:

distraction means for applying a force to and thereby separate adjacent vertebrae of the motion segment unit at a constant rate;

detection means connected to said distraction means for measuring the resistance of the adjacent vertebrae to said distraction, at a plurality of force-exerting positions, said detection means generating an output signal corresponding to said resistance;

translation means adapted to receive said output signal from said detection means and for translating said output signal into interpretable data corresponding to the relative stiffness of the motion segment unit; and

safety means operatively engaged when the resistance of the adjacent vertebrae to the distraction generated by the distraction means reaches a predetermined level.

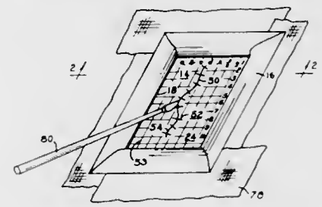
4,899,762

MULTI-PURPOSE INTEGRATED SURGICAL DRAPE, DRESSING, AND CLOSURE STRUCTURE AND METHOD

George H. Muller, Ann Arbor, Mich., assignor to Detroit Neurosurgical Foundation, Detroit, Mich.

Continuation-in-part of Ser. No. 444,842, Nov. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 178,103, Aug. 14, 1980, abandoned. This application Jul. 30, 1987, Ser. No. 79,498
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—850 **12 Claims**

1. A combination surgical drape and dressing for use before, during and after a surgical procedure comprising a central dressing portion for defining a surgical field, a peripheral drape portion extending around the periphery of but not over the central dressing portion connected only to the periphery of the dressing portion for securing surgical towels to the combination surgical drape and dressing, an adhesive on one side of the dressing portion of the combination surgical drape and dressing for securing the dressing portion to the skin of a patient in which an incision is to be made and an adhesive on at least one side of the drape portion of the combination surgical drape and dressing for securing the towels in position around the surgical field, and further including a target tracing of the future incision to be performed, and at least one of index marks transverse to the target tracing or preprinted intersecting grid lines on a protective cover or the top surface of the dressing portion of



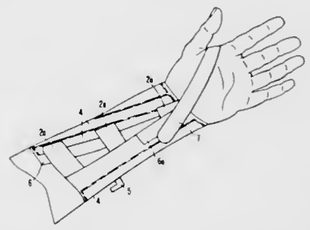
the combination surgical drape and dressing for facilitating making of an incision and alignment of the edges of an incision made through the dressing portion on closing of the incision wherein the preprinted grid lines are radio opaque.

4,899,763

THERAPEUTIC APPLIANCE FOR THE WRIST

Peter R. Sebastian, Salisbury, Md., and Thomas V. Sebastian, Reading, Pa., assignors to Safeguard Industrial Corporation, Leesport, Pa.

Filed Oct. 7, 1988, Ser. No. 254,748
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—878 **14 Claims**



1. An appliance for providing therapeutic immobilization of a person's wrist, said appliance comprising:

a base extending in a longitudinal direction and having opposed ends spaced apart in said longitudinal direction,

said base of such a size as to be placed over a person's wrist;

means for removably attaching said ends together such that the base can be positioned around a person's wrist;

an air bladder supported on said base, said air bladder having opposed terminal ends spaced apart in said longitudinal direction and at least one air chamber to provide support to the wrist when said base is positioned around the wrist and said air bladder is inflated,

each of said at least one air chamber being located on said base between said opposed terminal ends of said air bladder,

said opposed terminal ends of said air bladder being spaced apart from one another a predetermined distance when said attaching means removably attaches said ends of said base together, said distance being such that the appliance is removably securable to the person's wrist in a position at which the air chambers of said air bladder do not cover the median nerve and avoid exerting pressure on the median nerve when said air bladder is inflated; and

air conduit means communicating with said air bladder for

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allowing air to pass through said conduit means to said air bladder to inflate said air bladder.

4,899,764

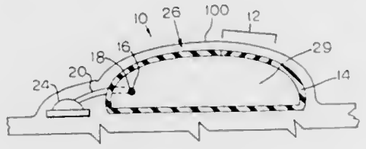
TISSUE EXPANDER AND METHOD OF MAKING AND USING

John R. D. Ganger, Cordova, Tenn., assignor to Dow Corning Wright, Arlington, Texas.

Division of Ser. No. 134,331, Dec. 17, 1987, Pat. No. 4,841,992. This application May 24, 1989, Ser. No. 356,313

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—899 **14 Claims**



1. A tissue expander comprising

(a) a fluid-tight envelope which is inflatable by a single means for inflation, said envelope having an expandable upper section comprising

(i) a first elastic portion formed of a first elastomer and

(ii) a second elastic portion formed of a second elastomer having a lower modulus of elasticity than that of said first elastomer wherein the moduli of elasticity are measured on specimens of said first and second elastomers having no laminations, so that during the inflation of said envelope the modulus of elasticity of each elastomer at least partially controls the amount of expansion of each portion and causes the envelope to assume a complex shape, and

(b) means for inflating said envelope with a biocompatible fluid associated therewith for the controlled inflation of said envelope.

4,899,765

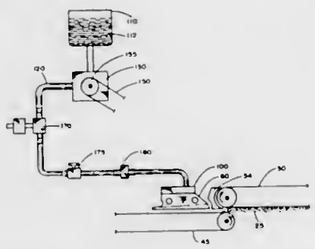
PROCESS FOR MANUFACTURING CIGARETTE RODS

James W. Davis, Lewisville; Philip A. Deal, Winston-Salem; Travis B. Howard, Clemmons, and Clifford R. Marritt, Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jul. 19, 1988, Ser. No. 221,056

Int. Cl.[4] A24C *5/18*

U.S. Cl. 131—84.1 **12 Claims**



1. A process for providing a continuous cigarette rod, the process comprising the steps of:

(a) supplying a continuous stream of smokable filler having a filling capacity of greater than about 500 milliliters per 2.3 psi per 100 g of filler at 12 weight percent moisture at 76° F.;

(b) depositing the stream on a web of wrapping material;

(c) reducing the cross-sectional area of the stream of filler using a constriction member having a filler-contacting surface; and

(d) introducing a liquid fluid to at least a portion of the filler-contacting surface of the constriction member

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4,899,766

SECONDARY SMOKE CATCHER

John R. Ross, Jr., 13020 Longboat Way, Del Mar, Calif. 92014

Filed Nov. 18, 1988, Ser. No. 272,919

Int. Cl.[4] A24D *1/00*; **A24F** *1/00, 5/00*

U.S. Cl. 131—175 **11 Claims**



1. A smoke catcher device for catching the secondary smoke from smoke products, such as cigarettes, cigars and pipes, and from the mouth of a smoker of said smoke product comprising:

a housing having an enclosed interior space and comprising:

a means for installing one of said smoke products in said housing such that the burning end of said smoke product is inside said interior space and the lip end of said smoke product extends outside said interior space,

a smoke intake opening for permitting said smoker to exhale into said interior space smoke sucked by said smoker from said one of said smoke products, and

an exhaust port, and

an exhaust means for exhausting the contents of said interior space to a smoke dump place or through one or more filters.

4,899,767

METHOD AND SYSTEM FOR FLUID TREATMENT OF SEMICONDUCTOR WAFERS

Christopher F. McConnell, Gulph Mills, and Alan E. Walter, Exton, both of Pa., assignors to CFM Technologies, Inc., Lionville, Pa.

Division of Ser. No. 805,203, Dec. 4, 1985, Pat. No. 4,795,497, which is a continuation-in-part of Ser. No. 765,294, Aug. 13, 1985, Pat. No. 4,577,650, which is a continuation-in-part of Ser. No. 747,894, Jun. 24, 1985, which is a continuation-in-part of Ser. No. 612,355, May 21, 1984. This application Dec. 12, 1988, Ser. No. 283,465

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—56 R **19 Claims**

1. Apparatus for treatment of semiconductor wafers with a fluid comprising:

a treatment vessel having means for receiving a flow of fluid and means for supporting at least one wafer in contact with the fluid,

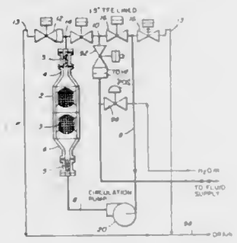
fluid supply means for providing a measured supply of treatment fluid to the vessel, the fluid supply means including

(a) a measuring tank having opposed tank ports

(b) a metering pump having its inlet connected to a said tank port for withdrawing metered amounts of fluid from the tank

(c) a plurality of reservoirs of treatment fluids, each reservoir being connected through an associated valve to a said tank port, and

(d) means for delivering fluid from the tank to the means for receiving of the treatment vessel



said fluid supply means being maintained in a hydraulically full condition, whereby when the metering pump withdraws a metered volume of fluid via a said port from the tank, an identical volume of a treatment fluid is drawn into the tank through the associated valve connecting that treatment fluid to the opposing port.

4,899,768

WAFER WASHING AND DRYING APPARATUS

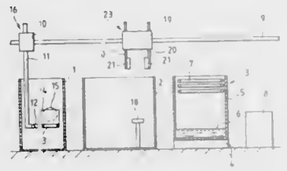
Yasuo Yatabe, Tokyo, Japan, assignor to Tomco Mfg, Ltd., Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 289,833

Claims priority, application Japan, Dec. 28, 1987, 62-197637[U]

Int. Cl.[4] B08B *3/10*

U.S. Cl. 134—65 **3 Claims**



1. In a wafer washing and drying apparatus including a chemical cleaning bath for cleaning a wafer set in a carrier with a liquid chemical reserved therein, a rinse bath for washing off said liquid chemical attached to said water with a washing liquid reserved therein, and an organic vapor drier for drying said wafer in contact with a vapor flow of an organic solvent, the improvement comprising a wafer holding device having a holder for holding said wafer upon transfer from said carrier, said holder having a heat capacity smaller than that of said carrier, said wafer holding device having a function of transporting said wafer from said rinse bath to said organic vapor drier and wafer transferring means for transferring said wafer from said carrier to said holder in said rinse bath.

4,899,769

PAINT SPRAY-GUN CLEANER

Mu-Yuan T. Tsai, No. 111-3, Min-Tsu Rd., Shen-Kang Hsiang, Taichung, Taiwan

Filed Oct. 13, 1988, Ser. No. 257,223

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—111 **2 Claims**

1. A paint spray-gun cleaner comprising:

a tank including a partition fixed therein for dividing the inside of said tank into an upper chamber and a lower chamber, a cover mounted movably on top of said tank for sealing said upper chamber, and a drainage valve disposed at a lower end of said tank, said upper chamber being capable of receiving therein a paint spray-gun to be cleaned while said lower chamber being capable of containing therein a cleaning solvent, said drainage valve being openable to discharge the solvent from said tank;

a plurality of nozzles installed in the periphery of said upper chamber so as to direct said solvent from said lower chamber to said spray-gun;

a solvent pumping unit for forcing said solvent from said lower chamber to said nozzles wherein said solvent pumping unit comprises:

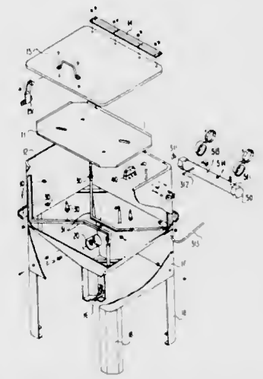
a circular tube having an air inlet, an air outlet and a solvent outlet all of which are formed in a wall of said tube;

two bafflers fixed separately in said circular tube between said air outlet and said solvent outlet for dividing the inside of said circular tube into three compartments;

a piston rod extending movably through the centers of said bafflers;

a piston secured to one end of said piston rod and movable between said air inlet and said air outlet;

a compression spring sleeved on said piston rod between said piston and said bafflers for biasing said piston to move away from said bafflers;



a circular sealing disk secured to the other end of said piston rod at its center;

two caps respectively sealing two ends of said circular tube, one of said caps near said disk having a solvent inlet formed therethrough; and

a solvent pressing ring, sleeved movably on said piston rod between said ring and said bafflers, frictionally fitted and movable in said circular tube between said solvent inlet and said solvent outlet, having a center hole and at least one solvent passage formed therethrough, said solvent passage being sealed by said disk when said ring engages with said disk;

whereby, when compressed air enters said pumping unit through said air inlet, said disk is moved away from said ring to open said solvent passage so that said solvent can flow into a chamber between said ring and said bafflers; and when compressed air is no longer fed into said circular tube, said disk moves toward said ring to impel said ring to in turn extrude said solvent from said pumping unit;

a filter installed in said lower chamber for removing solids from said solvent when said solvent flows from said lower chamber to said solvent pumping unit; and

a switch, installed on the top of said tank, actuatable by said cover to allow compressed air to flow into said solvent

pumping unit, capable of stopping the flow of compressed air into said solvent pumping unit when said cover is opened;

whereby, when said cover is closed and compressed air is supplied to said switch, said solvent pumping unit forces said solvent from said lower chamber to said nozzles to in turn spray said solvent onto said spray-gun.

4,899,770

APPARATUS FOR PREVENTING DETERIORATION OF CONCRETE PIPE

R. E. Wilson, 678 Alderwood Dr., Newport Beach, Calif. 92660

Filed Apr. 30, 1987, Ser. No. 44,405
Int. Cl.[4] B08B *3/02, 9/02*
U.S. Cl. 134—166 C **13 Claims**



1. Apparatus adapted for cleansing away concrete deteriorating acid, introduced by any means including acid forming bacteria, from interior wall surfaces of a concrete sewer conduit normally unwashed by a flow of sewerage therethrough, said apparatus comprising: said concrete sewer conduit, and in a sewerage system, tubular means within and extending along a length of said concrete sewer conduit for conveying a cleansing fluid into said concrete sewer conduit, said tubular conveying means including a plurality of spraying means spaced apart along said length of said concrete sewer conduit for spraying said cleaning fluid onto said normally unwashed interior concrete sewer conduit wall surfaces, and means for disposing and leaving said tubular means with said plurality of spraying means within said concrete sewer conduit a sufficient period of time to enable a spraying operation which can be a continuous operation while said concrete sewer pipe is in use; whereby, when desired, said cleansing fluid may be sprayed from said plurality of spraying means, substantially simultaneously, onto said normally unwashed interior wall surfaces of said length of said concrete sewer conduit to prevent said concrete deteriorating acid, introduced by any means, and including acid forming bacteria, from building-up on said normally unwashed interior wall surfaces and to thereby consequently prolong the useful life of said concrete sewer conduit.

4,899,771

WALKING AID

Kenneth A. Wilkinson, 10230 La Canada Way, Shadow Hills, Calif. 91040

Filed Jan. 3, 1989, Ser. No. 292,834
Int. Cl.[4] A45B *9/04*
U.S. Cl. 135—77 **1 Claim**

1. In a walking aid for use in combination with a walking device comprising:

an elongated walking device;

a broad, flat foot member having an upper and an under surface;

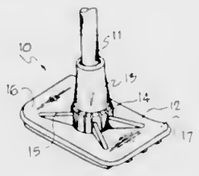
an elongated socket carried centrally on said foot member upper surface projecting upwardly to terminate in an open receptacle for insertably receiving one end of said walking device;

said foot member having opposite curved ends separated by a linear mid-section permitting said foot member to roll in a limited manner during a walking procedure;

a collar base integrally joining said socket to said foot member to provide a unitary construction;

said foot member includes a plurality of parallel spaced-apart ridges downwardly depending from said under surface extending along said mid-section and said opposite curved ends;

said socket, base and said foot member are composed of a



semi-resilient, yieldable material adapted to flex under applied load during the walking procedure;

a plurality of raised, elongated and parallel reinforcement ribs interconnecting said collar base with said foot member and said ribs radiating outwardly from said collar base equidistance apart; and

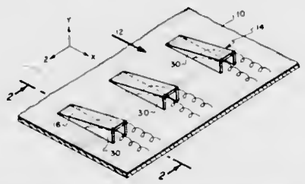
said foot member is of substantially rectangular shape in a plan view having rounded corners with said parallel ribs extending in parallel spaced relationship with opposite sides of said rectangular shape foot member.

4,899,772

MIXING AIDS FOR SUPERSONIC FLOWS

Gadicherla V. R. Rao, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 20, 1988, Ser. No. 260,221
Int. Cl.[4] B01F *5/00*
U.S. Cl. 137—1 **7 Claims**



1. A method for mixing a supersonic primary gas flow and a supersonic secondary gas flow within a duct which extends along an axis, comprising the steps of:

(a) flowing said primary gas flow within said duct in a direction substantially parallel to said duct axis;

(b) diverting a portion of said primary gas flow way from a primary duct side wall of said duct, said primary duct side wall extending in a direction substantially parallel to said duct axis, and thereby forming relatively high pressure zones and relatively low pressure zones within said primary gas flow which result in the formation of primary flow vortices within said primary gas flow, said primary flow vortices having axes parallel to said duct axis; and

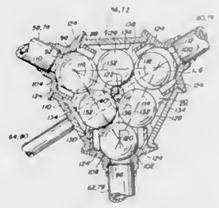
(c) introducing said secondary gas flow into said duct at a location adjacent to where said primary gas flow is diverted, said secondary gas flow having relatively high pressure zones and relatively low pressure zones which are so arranged to result in the formation of secondary flow vortices having axes parallel to said duct axis and being located adjacent to and having the same sign of said primary flow vortices, the relatively low pressure zones within the secondary gas flow having a lower pressure than the relatively low pressure zones within the primary gas flow, the relatively high pressure zones within the secondary gas flow having a higher pressure than the relatively high pressure zones within the primary gas flow, the interaction of said primary flow vortices and said secondary flow vortices resulting in enhanced mixing of said primary and said secondary gas flows.

4,899,773

VALVE APPARATUS AND METHOD

Donald G. Harrison, Phoenix, Ariz., assignor to Allied-Signal Inc., Phoenix, Ariz.

Filed Oct. 14, 1988, Ser. No. 258,229
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—1 **22 Claims**



12. The method of venting gas from a partially full liquid tank having a gas-filled ullage, or of picking up gas-free liquid from such a tank, said method comprising the steps of:

employing a valve body to define a cavity having a regular polygonal or regular polyhedral shape:

defining an inlet port and a respective inward disposed valve seat at each apex or vertex of said polygon or polyhedron, respectively:

providing a plurality of movable valve balls in said cavity, each sealingly engageable with said housing at a respective one of said valve seats:

providing guide means guiding each of said plurality of valve balls linearly along a path extending generally between said respective apex or vertex and the geometric centroid of said polygon or polyhedron;

providing movable space maintaining weight transfer means for both maintaining a certain minimum distance between adjacent ones of said valve balls and for transferring weight from upper ones of said plurality of valve balls to lower ones thereof to sealingly engage the latter with said housing at said respective valve seats;

employing respective ones of said plurality of valve balls to sealingly close all lower inlet ports while unseating a selected number of upper balls from said respective valve seats to open the associated inlet ports; and

providing fluid flow connection from each of said open inlet ports to one of a respective high location or low location of said tank for venting or liquid pickup, respectively.

4,899,774

FLUIDIC DENSITY CONTROL FOR CHLOR ALKALI CELLS

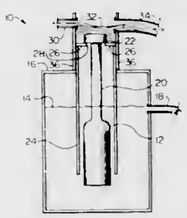
R. Davidson Keller, Jr., 1870 Oak Circle Dr., Dunedin, Fla. 34698

Filed May 22, 1989, Ser. No. 354,723
Int. Cl.[4] G05D *11/00*
U.S. Cl. 137—4 **20 Claims**

16. A method for automatically controlling the density of a fluid, comprising the steps of:

positioning a hydrometer means within the fluid; and

directing a steam of water over the top of said hydrometer means so that when the hydrometer rises in response to an increase in the density of the fluid, the hydrometer will interrupt said stream of water and deflect at least a part of



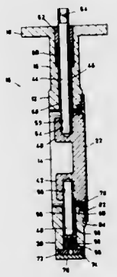
the water into the fluid, thereby reducing the density of the fluid.

4,899,775

CORROSION-RESISTANT OVERLAY FOR THE EDGE OF BUTTERFLY VALVES

Douglas G. Calvin, Missouri City, Tex., assignor to Keystone International Holdings Corp., Houston, Tex.

Division of Ser. No. 25,215, Mar. 12, 1987, Pat. No. 4,773,625.
This application Sep. 13, 1988, Ser. No. 243,902
Int. Cl.[4] F16K *1/22, 1/42, 1/46*
U.S. Cl. 137—15 **6 Claims**



1. A method for placing a corrosion-resistant overlay about a peripheral edge of a pivotal valve closure element comprising the steps of:

providing a strip of corrosion-resistant material having a width at least equal to the width of the disk and a length less than the circumference of said disk;

welding a first end of said strip to a first location on the peripheral edge of said disk;

winding said strip about the circumference of said disk and welding said second end to said disk at a place close to but spaced from said first end to provide a space between said first and second ends and preventing rotation of said strip relative to said disk; and

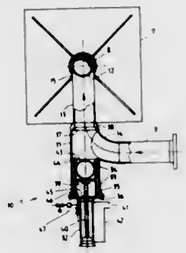
filling the space between said first and second ends with weld material to provide a continuous peripheral surface to prevent leakage.

4,899,776

METHOD AND APPARATUS FOR EMERGENCY DISCONNECTION OF A FLUID PETROLEUM PRODUCT TRANSFER ARM

Eugene Le Devehat, Saligny, France, assignor to FMC Corporation, Chicago, Ill.

Filed Dec. 30, 1988, Ser. No. 282,607
Claims priority, application France, Dec. 30, 1987, 87 18409
Int. Cl.[4] F16L *55/18*
U.S. Cl. 137—15 15 Claims



1. An emergency disconnection method for a petroleum product loading/unloading arm, said arm comprising a fixed tubular portion connected to a fixed pipeline, a mobile tubular portion connected to the fixed tubular portion and equipped with a "when-empty" balancing system, and a coupling device adapted to connect the mobile portion to a mobile pipeline subject to fluctuations in position relative to the fixed pipeline, the method comprising, for a given direction of flow of fluid in the arm, shutting off the flow in an upstream area of the arm and, from this shut-off area, purging the fluid contained in the mobile portion of the arm to a downstream area of the arm by propelling a pipe pig means through said mobile portion.

4. In a petroleum product loading/unloading arm comprising a fixed tubular portion adapted for connection to a fixed pipeline, a mobile tubular portion connected to the fixed portion and equipped with a "when-empty" balancing system, and a coupling device on the mobile portion adapted to connect the arm to a mobile pipeline subject to fluctuations in position relative to the fixed pipeline, the improvement comprising an arm purging device located in an upstream area of the arm relative to the direction of flow of fluid product therethrough, for shutting off the fluid flow into the arm for injecting a pipe pig means into the mobile tubular portion, a pig stop means in a downstream area of the arm adapted to allow the fluid flow to pass through it and to halt movement of the pipe pig means, and a fluid injection system for returning the pipe pig means towards the arm purging device.

4,899,777

THERMALLY ACTIVATED PRESSURE RELIEF PLUG

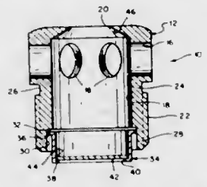
Michael D. Stone, Springfield, and Alan D. O'Neal, Willard, both of Mo., assignors to Tuthill Corporation, Hinsdale, Ill.

Filed Apr. 14, 1989, Ser. No. 338,048
Int. Cl.[4] F16K *17/40*
U.S. Cl. 137—74 18 Claims

1. A temperature activated relief plug assembly for mounting in a port on a pressurized structure comprising

an assembly housing having a chamber formed therein, means on the housing for mounting the assembly on the pressurized structure in position extending between the interior of the pressurized structure and atmosphere, a first opening in the housing between the chamber and atmosphere and a second opening in the housing between the chamber and the inside of the pressurized structure;

means mounted in the second housing opening preventing communication between the chamber and the inside of the pressurized structure, said means including a flanged member having an endless sidewall, an outwardly extending wall formed on one end of said flanged member for movement into position in the second housing opening, and an inwardly extending wall forming a ledge at the opposite end of the flanged member, means closing the second housing opening including a disk member engage-



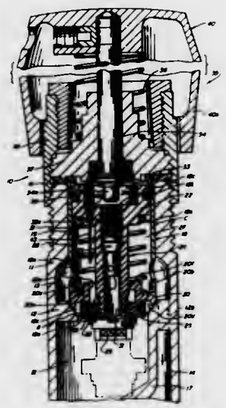
able with the inwardly extending wall, and means for removably attaching the disk member to the inwardly extending wall including attachment means which go from a solid to a liquid phase whenever a predetermined temperature occurs in the pressurized structure thereby enabling disengagement of the disk member from the flanged member.

4,899,778

METERING VALVE

Daniel J. Laube, Oak Park, Ill., assignor to Chicago Faucet Company, Des Plaines, Ill.

Filed Apr. 12, 1989, Ser. No. 336,887
Int. Cl.[4] F16K *31/143*
U.S. Cl. 137—242 10 Claims



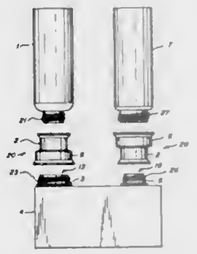
1. A metering valve for controlling flow through a housing, the latter having an inlet, an outlet, and an internal partitioning means having an opening formed therein, the partitioning means being interposed the inlet and outlet; said metering valve comprising an elongate cartridge mountable within the housing between the partitioning means and the outlet; and valve actuating means mountable on the housing adjacent a first end portion of said cartridge and securing the latter within the housing whereby a second end portion of said cartridge is aligned with the partitioning means opening and is in abutting engagement with a portion of the partitioning means circumvent the opening; said cartridge including a stationary tubular unit adapted to be secured within the housing between the partitioning means and said valve actuating means, said tubular unit being provided with port means for communicating with the outlet, and a piston assembly slidably mounted within said tubular unit, said piston assembly having an elongate piston member mounted within said tubular unit and in axial alignment therewith for controlled adjustment between open and close modes; said piston member having a first head portion adapted to be aligned with the partitioning means opening and extending therethrough when said piston member is adjusted to the open mode allowing a primary flow from the inlet through the partitioning means opening and port means to the outlet, said first head portion being biased to normally assume the close mode interrupting the flow through the partitioning means opening, a second head portion spaced longitudinally from said first head portion and disposed adjacent said valve actuating means, and an elongate third portion interconnecting said head portions, said first, second and third portions being provided with a common longitudinally extending internal passage, said second head portion cooperating with said valve actuating means to form therebetween an accumulating chamber in communication with said passage, and secondary valve means mounted within said passage and adapted to normally assume a close position, said secondary valve means being adjusted to an open position by said valve actuating means allowing a secondary flow of fluid into the fluid accumulating chamber through the passage; said second head portion being provided with a metering means communicating with said chamber and port means and regulating flow therebetween upon said piston assembly moving from the open mode to the close mode; said second head portion further having a first and second segment of travel when said piston member moves from the open mode to the close mode with the periphery said second head portion being in sliding sealing engagement with an interior surface of a first portion of said tubular unit only when said piston assembly is moving through said first segment of travel and the periphery of said second head portion disengaging said interior surface during said second segment of travel so that the movement of said piston assembly from the open mode to the close mode through said first segment of travel is at a slower rate than movement thereof through said second segment of travel.

4,899,779

OIL RESERVOIR ASSEMBLY FOR FUSING APPARATUS

Paul O. Stuart, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 11, 1989, Ser. No. 336,390
Int. Cl.[4] B67D *5/00*
U.S. Cl. 137—269 3 Claims



1. A reservoir assembly for use in a liquid supply system for apparatus for fusing toner images, said reservoir assembly being designed to hold only one of two different liquids, said reservoir assembly comprising:

reservoir means for holding liquid, said reservoir means having first and second openings,

an intermediate coupling member having first and second opposed intermediate coupling means;

first and second opening coupling means associated with said first and second openings, respectively,

said first opening coupling means being couplable with said first intermediate coupling means and said second opening coupling means being couplable with said second intermediate coupling means, but said first opening coupling means being not couplable with said second intermediate coupling means and said second opening coupling means being not couplable with said first intermediate coupling means.

said intermediate coupling member having alternative first and second modes of use, wherein

in said first mode said first intermediate coupling means is coupled with said first opening coupling means and said second intermediate coupling means is couplable with a source of oil which has a source coupling means comparable to said second opening coupling means, and

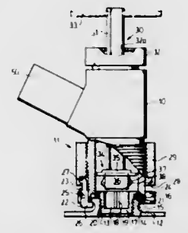
in said second mode said second intermediate coupling means is coupled to said second opening coupling means and said first intermediate coupling means is couplable with a source of oil having a source coupling means comparable to said first opening coupling means.

4,899,780

DEVICE FOR USE IN CONNECTION WITH TAPPING OFF FLUID FROM OR FILLING FLUID INTO A CONTAINER

Erik J. H. Aström, Kärrvägen 26, S-135 55, Tyresö, Sweden

PCT No. PCT/SE88/00387, § 371 Date Mar. 28, 1989, § 102(e) Date Mar. 28, 1989, PCT Pub. No. WO89/00973, PCT Pub. Date Feb. 9, 1989
PCT Filed Jul. 22, 1988, Ser. No. 340,600
Claims priority, application Sweden, Jul. 28, 1987, 8702984; May 13, 1988, 8801810
Int. Cl.[4] F16L *55/10*; F16K *51/00*
U.S. Cl. 137—319 9 Claims



1. A device for use in connection with tapping off fluid from or filling fluid into a container through an internally threaded tapping or filling hole (13; 113) provided in a wall (12; 112) of said container and adapted to be closed by means of an externally threaded generally cup-shaped plug (17; 117) having an outwardly open cavity (18; 118) for receiving an implement serving to rotate the plug (17; 117), said device comprising a bell-like housing (10; 110) which is adapted to be removably mounted with an open end thereof over said hole (13; 113) and which is provided, in its wall, with an opening (50; 150) through which fluid may be fed into or discharged from the housing, and a tool (30; 130) for manually operating the plug (17; 117) from a position outside the housing (10; 110), said tool (30; 130) comprising a shaft (31; 131) which extends slidably and rotatably through a portion (32; 132) of the housing, located opposite to the open end of the housing, and which is provided with a handle (33; 133) at the end thereof located externally of the housing (10; 110), while, at the other end, it is provided with a plug holder (34; 134) comprising a body (35, 36; 136), carried by the tool shaft (31; 131), and two gripping jaws (37; 137) which are mounted for limited movement in said body and which are provided with gripping portions (38; 138)

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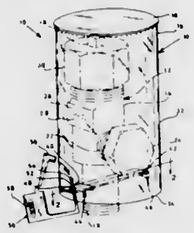
insertable into the cavity of the plug and movable between retracted inner end positions and expanded outer positions, the gripping jaws (37; 137) being arranged to be brought into contact under pressure against two opposite portions of the side wall (20; 120) of said cavity (18; 118) by means of said gripping portions, characterized in that the gripping portions (38; 138) of the gripping jaws (37; 137) are arranged to be moved from their inner end positions to their outer end positions through the action of spring forces applied on the gripping jaws (37; 137) from spring means (45; 144) incorporated in the plug holder (34; 134), the gripping portions (38; 138) of the gripping jaws (37; 137) being constantly spring-biased in directions towards their outer end positions by said spring means (45; 144), the gripping jaws being mounted for movement to retract the gripping jaws back into the body of the plug holder to allow the plug holder to be inserted into the cavity of the plug with the gripping jaws retracted, and retraction means for retracting the gripping jaws into the plug holder, whereupon after insertion of the plug holder into the cavity plug, the gripping jaws under the influence of the spring means are projected to their outer end positions into contact with opposite side wall portions of the said cavity for removal of the plug.

4,899,781

TAMPER INDICATOR ASSEMBLY FOR VALVES AND LIKE DEVICES

Robert E. Monroe, Kingston, Tenn., assignor to Dana Diversified Industries, Inc., Kingston, Tenn.

Filed Dec. 29, 1988, Ser. No. 291,604
Int. Cl.[4] F16K *28/08, 27/12*
U.S. Cl. 137—382 **17 Claims**



15. A device for providing an indication of tampering with a valve having a valve base, which comprises:

an unperforated hollow cylindrical polyvinyl chloride enclosure formed from a cylindrical wall member and a polyvinyl chloride end wall cemented to said wall member whereby said enclosure has an open end to accept said valve and a closed end to prevent access to said valve, said wall member provided with aligned elongated slots proximate said open end of said enclosure;

a flat steel locking bar for passing through said elongated slots proximate said valve base for engaging a portion of said valve to prevent removal of said enclosure from said valve, said locking bar having a first end portion and a body portion disposed through one of said aligned openings, said first end portion oriented substantially perpendicular to said body portion to prevent said first end from passing through said one of said aligned slots, said locking bar provided with an aperture proximate a second end extending exterior to a second of said aligned openings; and

a seal member for passing through said aperture in said locking bar when said locking bar is passed through said aligned slots to prevent removal of said locking bar, said seal member requiring destruction thereof if removed from said aperture to thereby indicate tampering with said valve.

4,899,782

STEAM PRESSURE COOKER

Jürgen Krejza, Kuchen; Eberhard Roth, Lonsee-Urspring, and Sonja Bolek, Ulm, all of Fed. Rep. of Germany, assignors to WMF Wurttembergische Metallwarenfabrik AG, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,514
Claims priority, application European Pat. Off., Mar. 9, 1987, 87103357.7
Int. Cl.[4] A47J *27/08*
U.S. Cl. 137—523 **45 Claims**

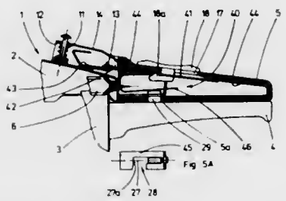


Fig 5A

1. A steam pressure cooker (1), which is provided with a lid (2) and a pressure relief valve (8), comprising a valve seat (7*a*), a valve body (9) adapted to have a load applied thereto in the direction of the valve seat (7*a*) by means of a spring (11) and an adjustable spring abutment (12), which is adapted to be displaced from an operative position in which the valve body (9) is pressed onto the valve seat (7*a*) to a steam-discharge position in which the valve body (9) is relieved of the load to such an extent that the steam can escape and which, for the purpose of cleaning, can be removed from the lid (2) to such an extent that the pressure relief valve (8) is freely accessible, characterized in that the spring abutment (12) is formed on a pivotable flap (14, 68) at which the valve body (9) is guided and supported, and that a control means (16, 40, 48, 56, 72, 75) is provided with the aid of which the flap (14, 68) can be pivoted from the operative position to the steam discharged position as well as to the cleaning position and back.

4,899,783

PINCH VALVE

Edward M. Yusko, Jr., Denmark; Cal R. Brown, Euclid; Terry M. Kalain, Willoughby, and Peter C. Williams, Cleveland Heights, all of Ohio, assignors to Whitey Co., Highland Hts., Ohio

Continuation of Ser. No. 252,257, Sep. 30, 1988, which is a continuation-in-part of Ser. No. 177,971, Apr. 5, 1988, Pat. No. 4,800,920. This application May 2, 1989, Ser. No. 346,066
The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.
Int. Cl.[4] F16K *37/00, 7/07*
U.S. Cl. 137—556 **15 Claims**

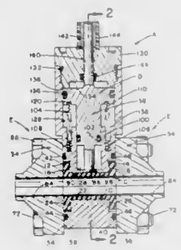
1. A valve comprising:

a body having an opening for communicating with an inlet defined in a first end member and an outlet defined in a second end member, said end members being disposed on opposite sides of said body;

a flexible member closely received in said opening, said flexible member having first and second ends abuttingly engaging said first and second end members and a bore extending through said flexible member communicating with said inlet and outlet, said flexible member having an unstressed, first axial dimension greater than a compressed, second axial dimension;

means for interconnecting said first and second end members

and axially compressing said flexible member to said second axial dimension; and,



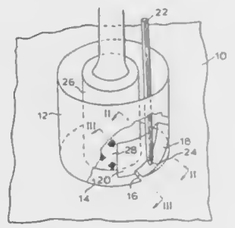
an actuation member associated with said body for selective reciprocation toward and away from said flexible member to affect opening and closing of said valve.

4,899,784

MOTOR VEHICLE FUEL TANK

Michael J. Woodgate, Horndon on the Hill, and Ronald P. Pardy, Tiptree, both of United Kingdom, assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 21, 1986, Ser. No. 842,619
Claims priority, application United Kingdom, May 8, 1985, 8511612
Int. Cl.[4] E03B *11/00*
U.S. Cl. 137—574 **7 Claims**



1. A motor vehicle fuel tank comprising a main volume and a swirl pot having a base and outer wall and being positioned near the bottom of the tank and having an opening adjacent said base and means within the pot for directing a flow of liquid past said opening in such a direction so as to produce a suction through said opening.

4,899,785

PROPORTIONAL PRESSURE REDUCING VALVE

Iwane Inokuchi, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

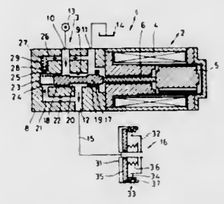
Filed Oct. 7, 1988, Ser. No. 254,896
Claims priority, application Japan, Oct. 8, 1987, 62-154302[U]
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 **9 Claims**

1. A proportional pressure reducing valve comprising:

(a) a valve housing formed with a supply port, an output port, a drain port, and a first feedback chamber communicating with the output port;

(b) a proportional solenoid attached to said valve housing; connected to said

(c) a spool having a first end solenoid and a second end exposed to the feedback chamber, said spool formed with a groove for allowing the supply port to communicate with the output port, when said spool is driven by said proportional solenoid in such a way that output pressure at the output port increases in proportion to current passed through said solenoid under balanced conditions of an axial force applied to the first end of said spool by said proportional solenoid and a feedback force applied to the



second end of said spool within the feedback chamber; and chamber to

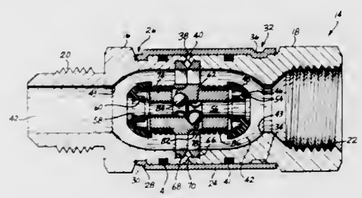
(d) valve means for allowing the feedback communicate with the drain port to control said spool into inbalanced condition, when output pressure at the output port exceeds a predetermined value, to sharply raise output port pressure.

4,899,786

BREAKAWAY FLUID COUPLING

John M. Morris, Auburn; Zdenek Gabrlik, Seattle, and Charles J. Green, Vashon, all of Wash., assignors to GT Development Corporation, Seattle, Wash.

Division of Ser. No. 307,736, Feb. 7, 1989. This application Jul. 25, 1989, Ser. No. 385,304
Int. Cl.[4] F16K *17/40;* F16L *29/00*
U.S. Cl. 137—637.05 **2 Claims**



1. A fluid coupling comprising:

a first valve body, and a second valve body releasably connected to said first body; and bodies having confronting outer end portions and defining a flow passage through the coupling;

a valve element positioned in each of said bodies in said flow passage and having a recess formed thereon;

biasing means for biasing each valve element axially inwardly toward a seated position in which it closes said passage;

a support web carried by said outer end portion of each said body and having a projection extending axially outwardly therefrom; and

a ball detent corresponding to each valve element and received into the recess thereon;

each of said projections being positioned to retain the ball detent in the recess on the valve element positioned in the confronting valve body to prevent the valve element from moving axially inwardly toward its seated position when said bodies are connected, and to allow the ball detent to move out of the recess and the biasing means to seat the valve element when said bodies are detached.

4,899,787

FLEXIBLE TUBE FOR ENDOSCOPE

Teruo Ouchi, Saitama, and Hiromichi Shibuya, Tokyo, both of Japan, assignors to Kabushiki Kaisha Medos Kenkyusho, Japan

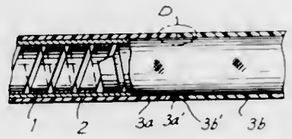
Continuation of Ser. No. 806,379, Dec. 9, 1985, Pat. No. 4,690,175, which is a continuation-in-part of Ser. No. 512,376, Jul. 11, 1983, abandoned, which is a division of Ser. No. 441,998, Nov. 16, 1982, Pat. No. 4,495,134. This application Jun. 16, 1987, Ser. No. 62,451

Claims priority, application Japan, Nov. 17, 1981, 56-184060

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] A61B *1/06*

U.S. Cl. 138—131 **12 Claims**



1. A flexible tube for use in an endoscope, comprising:

a flexible basic tubular core structure including an inner metallic tubular spiral having a series of turns spaced from each other by gaps and an outer surface constituted by an outer meshwork tube formed of a fabric mesh constituted by mesh elements, said outer meshwork tube being situated tightly over said inner metallic tubular spiral; and

at least one thermoplastic synthetic resin tube bonded to the meshwork of said meshwork tube, said synthetic resin tube having an inner diameter prior to being located over said tubular core structure which is less than an outer diameter of said basic tubular core structure, said bonding being accomplished by,

(a) expanding the inner diameter of said synthetic resin tube and locating the same over said meshwork tube of said tubular core structure;

(b) allowing said tube to contract so that said tube exerts a compressive force on said core structure;

(c) heating said synthetic resin tube to a temperature at least slightly higher than a softening point and below a melting point of the synthetic resin of said tube so that the resin softens and enters into the meshwork tube under the compressive force;

(d) cooling said synthetic resin tube so that the resin hardens and is integrally bonded to the meshwork of said meshwork tube while retaining an inherent compressive prestress in the flexible tube so formed; said flexible tube so formed having a construction wherein:

(a) said synthetic resin tube has portions which curve at least partially into spaces between said mesh elements of said outer meshwork tube, so that said resin tube is tightly bonded to said meshwork tube;

(b) said resin of said synthetic resin tube is totally absent from said gaps between said turns of said metallic tubular spiral; and

(c) said synthetic resin tube has an inherent compressive pre-stress acting inwardly on said tubular core structure.

4,899,788

APPARATUS FOR REMOVING A FAULTY WEFT YARN FROM A WEAVING SHED

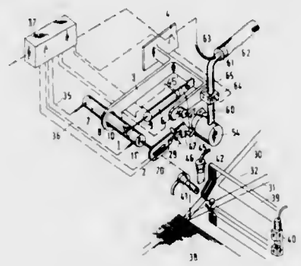
Hubertus H. Aarts, Deurne, Netherlands, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 6, 1988, Ser. No. 190,880

Claims priority, application Switzerland, May 8, 1987, 01772/87

Int. Cl.[4] D03J *1/04*

U.S. Cl. 139—116 A **16 Claims**



1. An apparatus for removing a faulty weft yarn from a shed of warp yarns, said apparatus comprising

a yarn clamp;

a manipulator for moving said yarn clamp among a rest position, a yarn clamping position and a yarn release position;

means for releasing a weft yarn from a beat-up line of a cloth into said clamp with said clamp in said clamping position;

store means at said yarn release position for receiving a released yarn from said clamp, said store means including a drum for winding of the released yarn thereon and a weft yarn catcher disc on said drum for dividing said drum into two parts; and

means for removing the released yarn from said store means.

4,899,789

METERING DEVICE FOR LIQUIDS

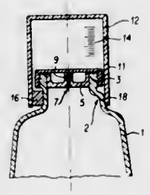
Robert Carow, 2216 Nisb Rd., Crystal Lake, Ill. 60012

Filed Mar. 13, 1987, Ser. No. 25,575

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608138

Int. Cl.[4] B69D *37/00*

U.S. Cl. 141—24 **13 Claims**



1. A metering device for liquids with a container, which has at least one elastically deformable wall section, and a metering vessel, characterized by the following features:

the container has a body for containing liquid, and an outlet with a withdrawal opening which, appropriate for the liquid to be metered, is so narrow, that liquid escapes only when the deformable wall section is indented, and the liquid is prevented from freely flowing out by itself by

remaining securely suspended at the container opening when the withdrawal opening faces downwardly; and

the metering vessel having side walls, a closed bottom and an open top and being detachably connected with the container in such a manner that the open top surrounds the withdrawal opening;

wherein a metering process is carried out when the metering vessel relative to the container is in an upright position with the open top being above the closed bottom, and only upon indentation of the at least one deformable wall section, when the selected metered amount of liquid fills the metering vessel pressure on the at least one deformable wall section is removed, upon removal of the pressure no liquid can be sucked back into the container because means are provided for maintaining separate the liquid level in the metering vessel from the withdrawal opening by an air gap, when the pressure on the at least one deformable wall is released means are provided for aspirating air into the container, at the end of the metering process means are provided for removing the upright metering vessel, in the upright position from the container, and because of the narrowness of the withdrawal opening, liquid cannot escape from the container unless further pressure is exerted on the at least one deformable wall of the container.

4,899,790

FILLING APPARATUS FOR A POWDERY PRODUCT

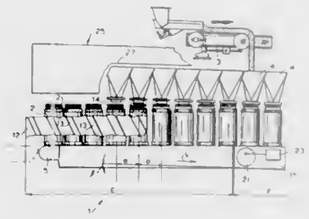
Heinz F. Odenthal, Zülpich, Fed. Rep. of Germany, assignor to Ostma Maschinenbau GmbH, Zulpich, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 237,758

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 8712068

Int. Cl.[4] B65B *43/42*

U.S. Cl. 141—134 **6 Claims**



1. In a filling apparatus for a powdery product, especially for a freeze-dried food product, comprising a container conveyor for a plurality of containers, a measuring device for said product, and a plurality of filling funnels placable on said containers, said container conveyor having an entrance portion with a feed belt, a filling zone adjoining said entrance portion and a discharge belt, the improvement wherein a plurality of said filling funnels are attached to a continuously circulating chain conveyor and are guided in the conveying direction above said container conveyor close to said container conveyor, a conveying screw driven synchronously with said chain conveyor is located in said entrance portion of said container conveyor whose conveying helix grips said containers laterally to feed said containers continuously, said containers being movable with a speed corresponding to the conveying speed of said chain conveyor and being spaced according to the spacing between the outlets of said filling funnels, the path taken by said filling funnels and said container conveyor in said entrance portion being inclined relative to each other and said path taken by said filling funnels and said container conveyor in the vicinity of said discharge belt also being inclined relative to each other, said filling funnels being guidable into and out of said containers while said containers are being moved continuously, and a feeder-weigher operating as said measuring device is located above said container conveyor in the vicinity of said filling zone.

4,899,791

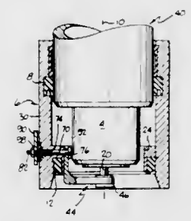
LIQUID LEVEL CONTROL APPARATUS

Roger W. Totten, Lakewood, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Feb. 2, 1989, Ser. No. 305,072

Int. Cl.[4] B67C *3/26*

U.S. Cl. 141—288 **9 Claims**



1. In a can filling operation wherein the can filling apparatus is located within a housing having a longitudinal axis and wherein the level of the liquid being deposited into a can is controlled by a liquid level controller located within the housing, the improvement comprising:

mounting means for mounting said liquid level controller within said housing for providing relative movement between said liquid level controller and said housing;

a tulip having a sidewall having an inner surface slidably mounted on said housing and having a portion thereof adapted to contact the top of a can to be filled; and

control means mounted on an outer surface of said tulip and having a portion thereof extending through said tulip and connected to said mounting means so that movement of said control means produces said relative movement between said liquid level controller and said housing so as to adjust the liquid level controller to control the level of said liquid being deposited into said can.

4,899,792

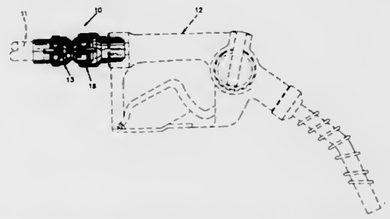
FUELING NOZZLE PROVIDING COMBINATION BREAKAWAY AND SWIVEL COUPLING

Alexander R. Podgers, Lake City, Pa., assignor to Emco Wheaton, Inc., Conneaut, Ohio

Filed Feb. 29, 1988, Ser. No. 161,755

Int. Cl.[4] F16K *17/14, 13/04*

U.S. Cl. 141—382 **17 Claims**



1. A nozzle assembly for fueling vehicles, comprising:

a nozzle having valve means for controlling the flow of fuel therethrough;

a supply hose connected to a source of fuel under pressure; and

a breakaway-swivel assembly directly attached to said nozzle and said hose, said breakaway-swivel assembly including

a body having a swivel portion and a breakaway portion,

a swivel fitting attached at one end to one of said nozzle and said hose, said swivel fitting mating in a swivel connection at the other end with said swivel portion of said body, said swivel fitting cooperating with said swivel portion of said body to provide a fluidtight swivel connection allowing swivel movement of said nozzle with respect to said hose,

a breakaway fitting attached at one end to the other of said nozzle and said hose, said breakaway fitting mating at the other end with said breakaway portion of said body, said breakaway fitting cooperating with said breakaway portion of said body to provide a fluidtight joint therebetween, said breakaway fitting and said breakaway portion being separable without breaking said hose when a predetermined separation force is applied to said nozzle and being swivelable with respect to said swivel fitting, and

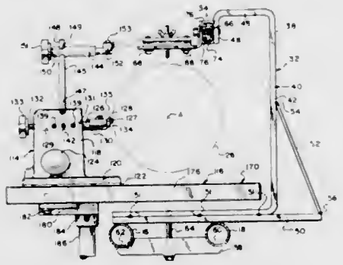
shutoff valve means in said breakaway-swivel assembly operable to close in response to separation of said breakaway portion and operating to prevent continued flow of fuel from said hose.

4,899,793

DUPLICATING SYSTEM FOR A LATHE

Steven A. Snyder, Spring Valley; Jack Smith, Huber Heights; David D. Flora, Arcanum, and Robert L. Bartlett, Dayton, all of Ohio, assignors to Shopsmith, Inc., Dayton, Ohio

Continuation of Ser. No. 483, Jan. 5, 1987, abandoned, which is a division of Ser. No. 875,433, Jun. 17, 1986, Pat. No. 4,694,713.
This application Apr. 10, 1989, Ser. No. 334,790
Int. Cl.[4] B23B *3/28, 29/12*
U.S. Cl. 142—7 12 Claims



1. A lathe duplicating system comprising:

means for supporting a pattern to be duplicated;

table means for supporting a cutting tool; and

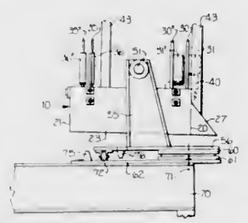
tool support means for holding a cutting tool, said support means including a base adapted to slidably engage said table means, follower means for engaging a pattern including a shaft attached to and extending vertically from said base and having a flat formed on an upper end thereof, a follower rod having a hole to receive said upper end therethrough and extending outwardly therefrom, a follower tip mounted on an end of said rod having arcuate and pointed contours for engaging a pattern, a follower lock knob threaded into said follower rod and displaceable to jam against said flat of said shaft such that said follower rod is selectively positionable therealong, a tool rod having a tool at an end thereof, a shank having a circumferential V-groove therearound and a flat on an upper surface thereof, a bore shaped to nonrotatably receive said tool rod such that it extends outwardly from said body below said follower rod, a tool mounted on an end of said tool rod, a cone point set screw threaded into said body and positioned to extend into said bore to engage said groove only when said tool is vertically aligned with said follower tip, a lock knob having a shank threaded into said body and being colinear with said tool rod, whereby displacement of said knob shank by a predetermined increment allows said tool rod to be displaced by an increment substantially identical to said predetermined increment.

4,899,794

TREE DELIMBING DEVICE WITH SELF-ALIGNING CUTTER HEAD

Thomas E. Hamby, Jr., Rte. 1, Box 27A, Purlear, N.C. 28665

Filed Jun. 22, 1989, Ser. No. 370,030
Int. Cl.[4] A01G *23/00*; B27L *1/00*
U.S. Cl. 144—2 Z 6 Claims



1. A tree delimbing device with a self-aligning cutter head assembly comprising

a rectangular support frame including front and rear ends, and opposite sides,

curved cutting and limb stripping levers pivotally supported for movement toward and away from each other and adjacent said front end of said rectangular support frame, said stripping levers including curved blades fixed thereto and defining a tree encircling cutting opening therebetween for longitudinal movement of a tree in one direction through the cutting opening,

guide means supported adjacent said rear end of said rectangular support frame and defining a tree guide opening for axial movement of the tree trunk through the guide opening,

means supporting said rectangular support frame for pivotal movement in both the vertical and horizontal planes so that said rectangular support frame, said limb stripping blades and said guide means are maintained in alignment with the longitudinal axis of the tree trunk as the tree trunk moves through the respective cutting and guiding means at the respective front and rear ends of said rectangular support frame,

wherein said means for supporting said rectangular support frame in the vertical plane includes pivot means supported on opposite sides of said rectangular support frame, and a support yoke including a horizontal medial portion extending beneath said rectangular support frame, and upstanding vertical legs having upper ends connected to said pivot means on opposite sides of said rectangular support frame, and

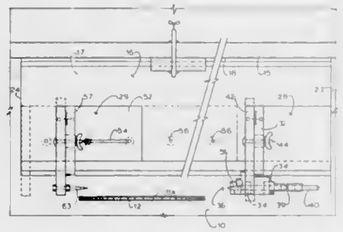
wherein said means for supporting said rectangular support frame in the horizontal plane includes a base plate supported beneath said horizontal medial portion of said yoke member, and pivotal means connecting said horizontal medial portion of said yoke member to said base plate.

4,899,795

LATHE AND INDEXING JIG FOR TABLE SAWS

Larry Hackett, 309 Park Dr., Gleawood Springs, Colo. 81601

Filed May 22, 1989, Ser. No. 354,731
Int. Cl.[4] B27C *5/00*
U.S. Cl. 144—138 20 Claims



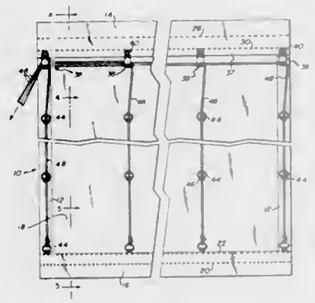
1. A lathe and indexing jig for use on a table saw which includes a planar table having an upper surface and a rotatable saw blade extending therethrough, a rip fence thereon extending parallel to the rotatable saw blade and being selectively moveable and clampable across the table top in direction perpendicular to the plane of rotation of the saw blade; said lathe and indexing jig comprising in combination a substantially rectangular bed plate, hold down means cooperating between said bed plate and the associated rip fence for mounting said bed plate upon the upper surface of the saw table for manual fore-and-aft movement thereon parallel to the plane of rotation of said saw blade and to one side thereof, a tail stock assembly adjustably mounted towards one end of said bed plate for selective and lockable fore-and-aft movement parallel to the plane of rotation of the saw blade, said tail stock including a dead centre component for engaging and supporting one end of an associated work piece, and a live centre assembly mounted towards the other end of said bed plate, said live centre assembly including a live centre component, and means to adjust said dead centre component and said live centre component independently and horizontally, parallel to the upper surface of the table top and relative to one another.

4,899,796

BALLOON SHADE CONSTRUCTION

Madlyn Easley, 75 Brightwood La., West Hartford, Conn. 06110, and Robin Fisher, 47 Fieldstone Run, Farmington, Conn. 06032

Filed Sep. 24, 1984, Ser. No. 653,317
Int. Cl.[4] A47H *5/00*
U.S. Cl. 160—84.1 12 Claims



1. A prestrung balloon shade, comprising:

a main panel of supple material;

a strip of supple material extending across the top of said panel on one side thereof;

means for attaching said strip to said main panel along at least one laterally extending line, and defining a rod-receiving sleeve portion thereabove and a marginal portion of said strip therebelow;

a plurality of relatively rigid loops affixed, by relatively non-protruding means, on and depending from said marginal portion of said strip at laterally spaced locations, each of said loops being fabricated from a low friction material, and defining laterally extending channels therethrough, said channels being aligned generally on an axis parallel to the plane of said panel and lying closely adjacent thereto;

a multiplicity of guide elements arranged in rows and columns on said one side of said main panel, each of said columns being aligned under an associated one of said loops; and

a corresponding plurality of drawstrings, each attached to said panel adjacent the lower edge thereof and being threaded through said guide elements of one of said columns, and through said associated loop to extend therefrom only in the direction of one side edge of said panel, said drawstrings all being threaded through at least the one of said loops positioned most closely adjacent said one side edge, the suppleness of said material of said main panel and said attached strip allowing intentional gathering thereacross to permit variation in the expanse of said shade when mounted upon a rod received through said sleeve portion thereof.

4,899,797

SCREEN RETAINER STRIP ASSEMBLY

Guerry E. Green, 684 Fox Pond Dr., Mt. Pleasant, S.C. 29464

Filed Jan. 13, 1989, Ser. No. 297,186
Int. Cl.[4] A47H *13/00*
U.S. Cl. 160—395 9 Claims

1. A retainer strip assembly for fastening a marginal portion of a screen and the like to a frame member which assembly comprises:

a resilient longitudinal spline for winding said marginal portion of said screen thereabout, said spline having a generally circular cross-section;

a base strip having a top, a bottom a left outer wall and an opposing right outer wall, said bottom of said base strip fastened to said frame member,

said base strip having at least one narrow groove parallel to the long dimension of said base strip, said groove holding temporarily said spline within said groove so that said spline does not readily pull out;

a cap strip having a top, a left side, an opposing right side and a means for holding said spline and said screen in said at least one groove, said cap strip covering said top and said sides of said base strip and releasably secured to said base strip, and said left and said right sides of said cap strip folding said screen around said left and said right outer walls, respectively, of said base strip to provide additional resistance to dislodging said spline and to cover said left and right outer walls of said base strip,

said base strip having a channel adjacent said at least one

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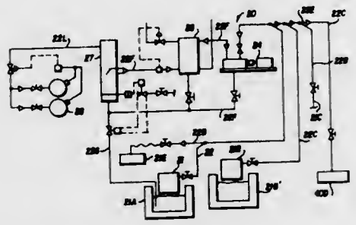
groove, said channel having a floor through which nails or screws can be driven into said frame member for fastening said base strip so that no nails or screws are seen externally of said assembly.

4,899,798

METHOD OF AND APPARATUS FOR RECOVERING AND REUSING ORGANIC PICKLING VAPORS

Ronald R. Martin, and Vernon J. Miller, Sr., both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Nov. 28, 1988, Ser. No. 276,756
Int. Cl.[4] B22D *11/12*
U.S. Cl. 164—5 7 Claims



4. A method of continuously reducing oxides which forms on the surface of copper bar and rod during casting and rolling as the bar emerges hot from a hot continuous casting machine and passes through a rolling mill where it is hot worked to form rod, comprising the steps of:

(a) providing a source of aqueous base non-acid liquid cooling and cleaning mixture at a pH greater than 7.0;

(b) continuously contacting the rod and bar with the cooling and cleaning mixture in at least one treatment zone downstream of the casting machine wherein the cast bar and rod are kept in continuous contact with the cleaning mixture in both its liquid and vapor phases as the bar and rod pass through the treatment zone whereby oxide on the surface of the bar and rod is reduced as the temperature of the bar and rod is lowered;

(c) continuously recirculating the liquid cleaning mixture for reuse;

(d) continuously monitoring and adjusting the pH of the liquid cleaning mixture;

(e) collecting cleaning mixture vapors at emission points and conveying the collected vapor away from the emission points at ambient conditions of temperature and pressure;

(f) increasing the velocity of the collected vapors to a selected velocity; cooling the collected vapors to a temperature at which liquid will form in the collected vapors while maintaining a velocity sufficient to retain turbulent flow of the vapor during cooling and decreasing the velocity of the cooled collected vapors to a velocity at which liquid droplets will separate from any remaining vapor while maintaining the system pressure above the ambient pressure of the system.

(g) lowering the temperature of the collected vapor to a temperature below the temperature at which the vapor will condense and form liquid without lowering the system pressure; and

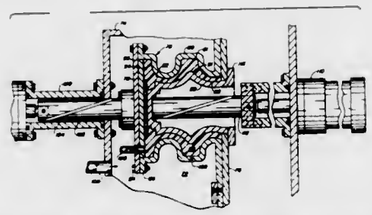
(h) separating condensed liquid phase cleaning mixture from a vapor phase of the cleaning mixture and returning the collected liquid to the source of aqueous base cooling and cleaning mixture.

4,899,799

HELICAL COMPRESSOR AND METHOD OF MAKING SAME

Norman A. Drazy, 1927 E. Duke Dr., Temple, Ariz. 85283

Division of Ser. No. 204,341, Jun. 19, 1988. This application Jun. 9, 1989, Ser. No. 364,618
Int. Cl.[4] B22C *4/04*
U.S. Cl. 164—34 4 Claims



1. The method of making rotors for a screw compressor of the type having helical lands therein defining grooves therebetween, said method comprising:

(a) providing a first mold component having a first surface with helically extending lands and grooves;

(b) providing a second mold component having a second surface with helically extending lands and grooves;

(c) concentrically positioning said first and second mold components to define a pattern mold cavity between said first and second surfaces having an exterior surface defined by said first component and an interior surface defined by said second mold component;

(d) filling the mold cavity with expandable polymeric material;

(e) heating the material to expand the material and form a pattern part in the configuration pattern mold cavity;

(f) removing the pattern part from the mold components by imparting a helical motion to the first and second components relative to the pattern part;

(g) placing said pattern part in a flask with a backing material; and

(h) pouring molten metal onto the pattern to form a part.

4,899,800

METAL MATRIX COMPOSITE WITH COATED REINFORCING PREFORM

Willard M. T. Gallerneault, and Christopher M. Gabryel, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Sep. 28, 1988, Ser. No. 250,759
Claims priority, application Canada, Oct. 15, 1987, 549349
Int. Cl.[4] B22D *27/00, 19/14*
U.S. Cl. 164—58.1 8 Claims

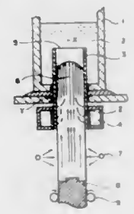
1. A process for forming a composite cast article which comprises providing a preform of bonded-together reinforcing fibres, coating said reinforcing fibres with strontium, infiltrating the coated preform under pressure by a melt of an aluminum-silicon alloy matrix containing a modifying amount of strontium and allowing the composite article thus formed to solidify by cooling the improvement which comprises utilizing a preform in which the fibers are coated with strontium before being infiltrated by the alloy metal.

4,899,801

METHOD FOR CONTINUOUS CASTING OF METAL AND AN APPARATUS THEREFOR

Yoshikatsu Asabe, Saitama, Japan, assignor to Asabe Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 55,307, May 29, 1987, abandoned. This application Jan. 3, 1989, Ser. No. 293,552
Claims priority, application Japan, Jun. 10, 1986, 61-134547
Int. Cl.[4] B22D *27/04*
U.S. Cl. 164—122.1 3 Claims



1. An improvement, in a process of continuous casting of a metal by drawing a solidified bar ingot of the metal through a tubular casting mold vertically held and tightly connected to an opening at the bottom of a crucible containing a melt of the metal, which comprises:

(i) protruding the upper end portion of the tubular casting mold into inside of the crucible in a substantial length in the melt of the metal;

(ii) cooling the tubular casting mold at a portion below the opening at the bottom of the crucible; and

(iii) drawing the solidified bar ingot of the metal out of the lower exit end of the tubular casting mold at such a rate that the melt of the metal inside the tubular casting mold in the portion protruded into the crucible is kept at a temperature substantially lower than the temperature of the bulk of the melt in which the end portion of the tubular casting mold is immersed by the balance of the cooling efficiency and the drawing rate and a complete solidification of the melt of metal occurs inside the tubular casting mold in the portion protruded into the crucible with an upwardly convex profile at the solidification front.

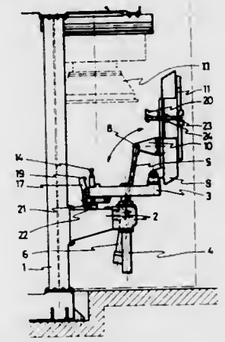
4,899,802

SYSTEM FOR CHANGING AND CLEANING BLOWING PLATES IN CORE BLOWING MACHINES

Agustin A. Erana, Zorrostea, 4 Poligono Ind. Ali. Globa., Vitoria Alava, Spain (01010)

Filed Mar. 1, 1989, Ser. No. 317,615
Claims priority, application Spain, Mar. 25, 1988, 8800929
Int. Cl.[4] B22C *15/24, 19/00, 23/00*
U.S. Cl. 164—158 3 Claims

1. A system for changing and cleaning blowing plates in core blowing machines, comprising a fixed support; a lower platform which is vertically displaceable with respect to said fixed support by means of a pair of vertical guides mounted to said support, a top platform which is laterally pivotally connected to the lower platform at one of its marginal areas so as to swing between a first horizontal position in which said top and lower platforms are superposed, and a second position in which said top platform is pivoted away from said lower platform, said top platform when in said horizontal position resting on a shock absorbent abutment provided on said lower platform; a double catch pivotally connected to said lower platform in an area opposite to said one of its marginal areas for blocking said top and lower platform to each other, said top platform having a bottom base provided with a first abutment, said fixed support being provided with a second abutment, means for actuating said double catch to pivot between two operating positions one of which is a blocking position for blocking said top and lower platform with one another and in which said double catch engages with said first abutment, and another position in which said catch is released from said first abutment and engages with said second abutment so as to permit said top platform to awing with respect to said lower platform, said swinging of said top platform being effected by a single driving hydraulic cylinder positioned between said fixed support and



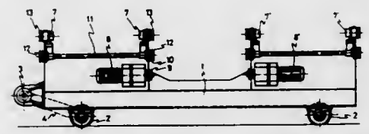
said top platform and extending through said lower platform towards said top platform, said hydraulic cylinder causing said top and lower platform to rise and descend together when said double catch blocks said platforms together and causing said swinging of said top platform when said double catch releases said top platform and engages said lower platform.

4,899,803

DOUBLE CARRIAGE FOR AUTOMATIC TOOL CHANGE IN CORE MAKING MACHINES FOR CASTING

Augustin Arana-Erana, Zorrostea 4 Poligono Industrial Ali-Gobeo, Vitoria (Alava), Spain

Filed Oct. 6, 1988, Ser. No. 254,409
Claims priority, application Spain, Oct. 8, 1987, 8702879
Int. Cl.[4] B22C *19/00, 23/00*
U.S. Cl. 164—158 3 Claims



1. Double carriage for automatic tool change in core making macines for casting, comprising a supporting frame; two sets of motor-driven rollers mounted on said frame for receiving respective tools or boxes of cores and enabling subsequent expulsion of said tools or boxes of cores, said supporting frame being provided with wheels which are adapted to run on rails positioned on the ground; a reduction motor secured to the frame and transmitting movement to shafts of said wheels to move said carriage; said carriage including two opoerative sectors each including an additional reduction motor positioned to said frame and adapted to drive a corresponding set of said rollers, and an intermediate shaft operatively interconnected between a corresponding additional reduction motor and a corresponding set of rollers to transmit movement from said additional reduction motor to said corresponding set of rollers, each operative sector further including an ancillary handling mechanism for the tools or boxes of cores, each handling mechanism being supported on said frame and adapted to open said tools or boxes of cores received by said

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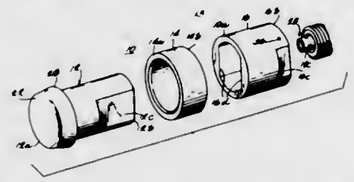
rollers and after opening to place them in a suitable position for periodic cleaning.

4,899,804

PLUNGER TIP FOR COLD CHAMBER DIE CAST MACHINE

Norman L. Hannerer, 3231 W. Southway Dr., Franklin, Wis. 53132

Filed Feb. 21, 1989, Ser. No. 312,445
Int. Cl.[4] B22D 17/08, 17/20
U.S. Cl. 164—312 15 Claims



1. A die casting machine having in combination a shot cylinder having a bore, and a plunger fitted in said bore, said plunger having a tip for displacing molten die casting metal from said shot cylinder, said tip being attached to an end of a plunger shaft, said plunger shaft end being threaded, said tip comprising:

A. a cap, having:
(1) an outside diameter substantially smaller than said bore of said shot cylinder,
(2) a tip end and an attachment end,
(3) an annular shoulder portion, larger in diameter than the rest of said cap but still smaller than said bore of said shot cylinder, said shoulder portion located nearer said tip end, and
(4) threaded attachment means at said attachment end for threadedly attaching said cap to said threaded end of said plunger shaft;

B. a wear ring, the inside diameter of which just fits over said cap between said shoulder and said attachment end of said cap, and the outside diameter of which is sized nominally to said bore of said shot cylinder;

C. a collar, slidably fitted onto said cap so as to capture said wear ring between itself and said shoulder, and having means which cooperate with corresponding means on said cap to prevent relative rotation between said cap and itself; and

D. means for holding said collar with respect to said plunger shaft so as to permit said cap to be threaded tightly onto said plunger shaft without requiring application of a wrench directly to said cap.

4,899,805

RAPID CHILL MOLD

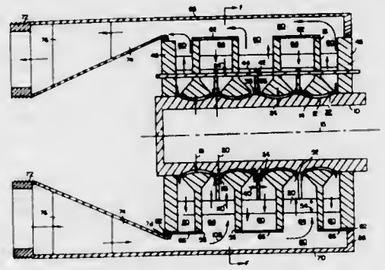
Arthur H. Iversen, 151 Sobey Rd., Saratoga, Calif. 95070

Filed Aug. 1, 1988, Ser. No. 226,779
Int. Cl.[4] B22D 27/04
U.S. Cl. 164—348 26 Claims

1. A liquid cooled mold, comprising:

a. a mold assembly having a heat exchange region including a heat exchange surface for external cooling of said mold by a moving liquid coolant characterized in part by an associated velocity vector, said heat exchange surface comprised of at least one concave periodic curve;

b. coolant diverter means disposed in said heat exchange region outwardly proximate said heat exchange surface for controlling fluid flow to create a pressure gradient having a component generally perpendicular to said heat exchange surface upon flow interaction of said moving liquid with the concave curved heat exchange surface, wherein said diverter means envelops each of said periodic curves to maintain essentially uniform flow characteristics across said heat exchange surface at all points; and



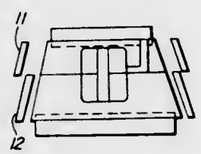
c. ducting means for alternate injection and removal of coolant along a flow path across said heat exchange surface.

4,899,806

APPARATUS FOR FLASKLESS SAND CASTING

Thomas E. Wuepper, Alger, and Terry L. Franklyn, Nunica, both of Mich., assignors to CMI International, Inc., Southfield, Mich.

Division of Ser. No. 28,122, Mar. 19, 1987, Pat. No. 4,791,975.
This application Sep. 22, 1988, Ser. No. 247,823
Int. Cl.[4] B22C 9/02, 21/02
U.S. Cl. 164—377 19 Claims



1. Apparatus for forming a sand cake for flaskless sand mold casting of molten metal, comprising:

a flask having walls forming a lower, drag frame section and an aligned upper, cope frame section within which sections sand may be filled and compacted around a casting pattern which may be removed to form a casting cavity within the sand cake which results from such filling;

said cope frame section being openable for releasing it from and, thereby, removing it from the sand cake;

the opposite walls forming said drag frame section being laterally movable away from each other for sidewise movement of said walls away from the sand cake;

means for selectively securing said walls in an initial flask-forming portion and for releasing said walls for laterally moving them away from each other;

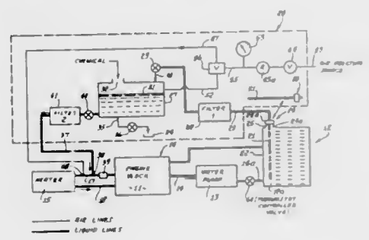
whereby, a compacted, substantially hard sand cake may be formed within the flask by tightly compressing the sand filling in the flask, and the cake may be separated from the flask against whose walls it is tightly pressed, by opening the cope frame section and by laterally moving apart the walls of the drag frame section so that the cake may be removed out of the bottom of the drag frame section for subsequent casting of metal in its cavity.

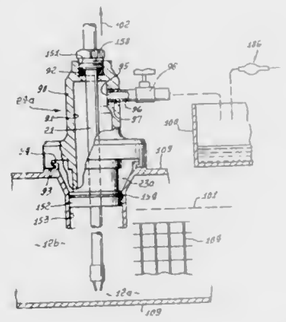
4,899,807

ENGINE COOLANT FLUSH-FILTERING USING EXTERNAL GAS PRESSURE AND BLOCKED RADIATOR FILL PORT

Marcel Vataru, Los Angeles, and James L. Baylor, Fontana, both of Calif., assignors to Wynn Oil Company, Fullerton, Calif.

Continuation-in-part of Ser. No. 87,696, Aug. 20, 1987, Pat. No. 4,793,403. This application Sep. 23, 1988, Ser. No. 248,172
Int. Cl.[4] F28G 13/00
U.S. Cl. 165—1 31 Claims





1. For use with an internal combustion engine cooling system, the combination comprising:

a) first means for forcing the coolant liquid from the cooling system to the exterior of that system,

b) second means in communication with said first means for receiving the coolant liquid at the exterior of the cooling system, for treatment thereof, and

c) third means in communication with said second means for returning the treated coolant liquid to the cooling system,

d) the cooling system including a heat radiator including a container having a coolant liquid fill opening, and said first means includes an elongated tube insertible into the container via said fill opening to extract coolant liquid from the lower extent of the radiator for passage from the radiator, and means associated with the tube for maintaining the fill opening otherwise closed during said passage of coolant from the radiator,

e) said last named means comprising a closure having a through opening in communication with said elongated tube, the closure attachable to the container proximate the fill opening, said closure having a bypass opening to pass pressurized fluid from the container interior outside the tube and proximate the fill opening, and including a means for controllably venting said pressurized fluid via bypass opening.

17. In the method of treating coolant liquid in an internal combustion engine cooling system, the steps that include:

a) forcing the coolant liquid from the cooling system to the exterior of that system,

b) treating the coolant liquid in a zone or zones outside the cooling system, said treating including removing contaminant from the coolant liquid, and

c) returning the treated coolant liquid to the cooling system,

d) said forcing step includes supplying a pressurized gas to the cooling system to drive coolant liquid therefrom,

e) the cooling system including a heat radiator including a container having a coolant liquid fill opening, and said forcing step including employing said gas to drive coolant liquid from the radiator via said container fill opening,

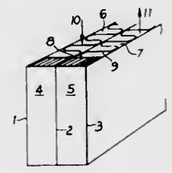
f) and including the step of controllably venting fluid including gas from said container via a closure at said fill opening, during said step of returning the treated coolant liquid to the cooling system.

4,899,808

CONDENSING SURFACE FOR HEAT EXCHANGER WITH FINS ARRANGED TO DRIP CONDENSATE ONTO ONE SIDE ONLY

Edward J. Gregory, Wolverhampton; John Felton, Telford, and Frank T. Cooper, Wolverhampton, all of England, assignors to Marston Palmer Limited, Fordhouses, England

Filed Jan. 6, 1988, Ser. No. 141,254
Claims priority, application United Kingdom, Jan. 14, 1987, 8700801
Int. Cl.[4] F28B 1/00
U.S. Cl. 165—1 7 Claims





1. A plate fin heat exchanger, comprising:

a series of at least three transversally-spaced, vertically-oriented plates facially confronting one another and comprising a first plate, a second plate and a third plate;

vertically-extending edge separator means closing spaces defined respectively between said first and second plates and between said second and third plates at laterally opposite respective portions of perimetrical edges of said plates;

a first corrugated element received in the space between said first plate, said second plate and the respective said vertically-extending edge separator means; said first corrugated element being corrugated and spatially arranged in a sense to provide, on opposite sides thereof, a plurality of vertically-extending first flow channels which are arranged in a first alternating series, with neighboring first

flow channels being on opposite sides of said first corrugated element; said first flow channels being for a first stream of fluid to pass downwardly between said first and second plates to lose heat and thereby at least partially condense to produce a falling condensate;

a second corrugated element received in the space between said second plate, said third plate and the respective said vertically-extending edge separator means; said second corrugated element being corrugated and spatially arranged in a sense to provide, on opposite sides thereof, a plurality of vertically-extending second flow channels which are arranged in a second alternating series, with neighboring second flow channels being on opposite sides of said second corrugated element; said second flow channels being for a second stream of fluid to pass upwardly between said second and third plates to gain heat and thereby cool said first fluid by indirect heat exchange through said second plate;

said first corrugated element comprising peak portions disposed nearer said first plate, trough portions disposed nearer said second plate and angle portions joining respective peak and trough portions, in series, to provide said series of first flow channels;

said first and second flow channels having upper and lower ends passing fluid;

said first corrugated element, at at least one level intermediate said upper and lower ends of said first and second flow channels being provided with slits which extend through said first corrugated element in each of a plurality of said angle portions of said first corrugated element, thereby providing respective slit angle portions;

said slit angle portions being laterally deformed out of vertical registry above and below each said slit to such an extent that condensate dripping from both sides of each respective slit angle portion from above each respective slit will fall on only one side of such respective slit angle portion.

4,899,809

AUTOMOTIVE AIR CONDITIONER SYSTEM WITH AUTOMATIC ADJUSTMENT OF DISCHARGE AIR TEMPERATURE

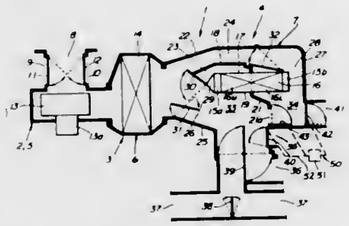
Yasushi Takenaka, and Shunsuke Kajita, both of Kanagawa, Japan, assignors to Nissan Shatai Company, Limited, Kanagawa, Japan

Filed Sep. 23, 1987, Ser. No. 100,259

Claims priority, application Japan, Mar. 31, 1987, 62-48171[U]

Int. Cl.⁴ G05D *23/00;* **F25B** *29/00;* **B60H** *3/00*

U.S. Cl. 165—12 **4 Claims**



1. An automotive air conditioning system for controlling the air temperature of a vehicle cabin comprising:

(a) passage means for conditioning air, said passage means having inlet means for receiving air to be conditioned in said passage means and outlet means for delivering conditioned air to said vehicle cabin;

(b) cooling means provided in said passage means between said inlet means and said outlet means for selectively cooling said air received from said inlet means;

(c) heating means provided in said passage means downstream of said cooling means for selectively heating said air received from said inlet means, said heating means having an inlet to introduce said air to be heated thereto and an outlet to discharge heated air therefrom;

(d) flow control means for selectively controlling the amount of air introduced to said heating means through said inlet;

(e) temperature control means for selecting a desired vehicle cabin temperature (Ts);

(f) first means for continually monitoring ambient temperature (Ta), insolation (Z), vehicle cabin temperature (Tr), discharge air temperature to cabin vehicle (Td) and desired vehicle cabin temperature (Ts) so as to derive a target discharge air temperature (Tdo) for the conditioned air delivered to said vehicle cabin so as to obtain the desired cabin temperature (Ts); and

(g) second means for continually comparing said discharge air temperature (Td) with said target discharge air temperature (Tdo) and operating said flow control means in response to the difference (ΔTd) between said discharge air temperature (Td) and said target discharge air temperature (Tdo) so as to control the amount of air introduced to said heating means by adjusting said discharge air temperature (Td) to said target discharge air temperature (Tdo) in a stepwise manner as a function of KΔTd where K is a value less than unity so as to obtain the desired cabin temperature (Ts) during transition.

4,899,810

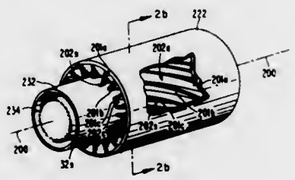
LOW PRESSURE DROP CONDENSER/HEAT PIPE HEAT EXCHANGER

Joseph E. Fredley, Holland, Pa., assignor to General Electric Company, East Windsor, N.J.

Filed Oct. 22, 1987, Ser. No. 111,338

Int. Cl.⁴ F28D *15/02;* **F28B** *1/02*

U.S. Cl. 165—41 **12 Claims**



1. A heat exchanger for a spacecraft having a source of heat, a heat source tube passing through said source of heat, a coolant, and a radiator, comprising in combination:

a heat pipe having one end coupled to said radiator;

a plurality of passages helically wound about said heat pipe, said passages being connected to common first and second junctions at opposite first and second ends of said plurality of passages, said first and second junctions being coupled to respective first and second opposite ends on said heat source tube, said coolant being of a material that tends to be vaporized by said source of heat at said first end of said plurality of passages and tends to liquify at said second end of said plurality of passages, each of said plurality of passages being of a sufficiently small diameter that helical circulation along the walls is primarily due to surface tension and secondary flow effects.

4,899,811

COOLING ROLL

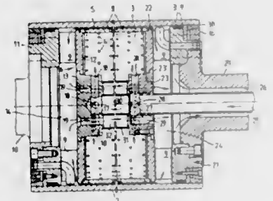
Robert Wolf, Herbrechtingen, and Heinrich Schmid, Steinheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 300,775

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802477

Int. Cl.⁴ F28F *5/02;* **F28D** *11/02*

U.S. Cl. 165—89 **7 Claims**



5. A cooling roll comprising:

a hollow outer roll shell;

a pair of spaced outer radial support disks supporting said outer roll shell;

a pair of journals each supporting one of said pair of outer radial support disks;

a hollow inner body disposed within said outer roll shell and between said pair of outer radial support disks, said inner body having an inner roll shell defining in part a central interior space, said outer roll shell and the inner roll shell defining an annular space therebetween, the inner roll shell having distributed across the length and circumference thereof holes communicating the hollow inner body with the annular space for the passage of coolant into the annular space;

said pair of outer radial support disks and said hollow inner body defining therebetween a pair of disk-shaped end spaces each at an axial end of said inner body, said disk-shaped spaces communicating with the annular space;

a supply channel and a drain channel, one disposed radially outside the other, each extending coaxially from the hollow inner body to one journal supporting the cooling roll; and

a central distributing component at one axial end of the inner body proximate said one journal, said central distributing component having radially extending surfaces and an inner circumferential surface, in which distributing component first channels are disposed having end openings substantially on the radially extending surfaces and connect one of said central interior space and said end spaces with the coaxial supply channel, and in which distributing component second channels are disposed having an end opening beginning at said inner circumferential surface, said second channels being between said first channels and connecting the other of said central interior space and said end spaces with the coaxial drain channel.

4,899,812

SELF-SECURING TURBULENCE PROMOTER TO ENHANCE HEAT TRANSFER

Frank E. Altoz, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 6, 1988, Ser. No. 240,282

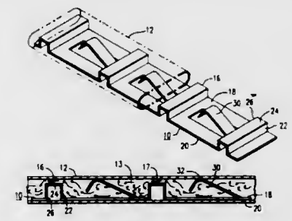
Int. Cl.⁴ F28B *3/02*

U.S. Cl. 165—109.1 **8 Claims**

1. A self-securing turbulence-promoting device for positioning within the interior of a conduit adapted to be filled with a fluid flowing therethrough to enhance heat transfer between the conduit walls and the moving fluid comprising:

(a) a longitudinal member having a length, a width, top surfaces and an essentially planar bottom surface, the member further having a plurality of protuberances along the member length, each protuberance extending across the width of the member and to a predetermined height forming a gap between the protuberance and the conduit wall, which act as restrictions to the fluid flow within the conduit and generate fluid turbulence; and

(b) means for resiliently securing the longitudinal member within the conduit such that the force of the fluid flow will not displace the member, wherein means for resiliently securing is comprised of at least one upwardly sloped cantilevered segment made of resilient material and extending from the plane defined by the bottom surface, the segment having a width less than that of the member and having a length sufficient for the at least one upwardly sloped segment to extend above the height of the protuberances and to contact the conduit wall and urge the planar bottom surface of the member against an opposite wall such that the member is self-secured within the conduit.



4,899,813

PROCESS AND APPARATUS FOR THE SYNTHESIS OF UREA AND MATERIAL USED IN IT

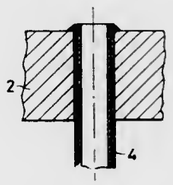
Sergio Menicatti, Milan; Cesare Miola, S.Donato Milanese, and Franco Granelli, Milan, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 722,400, Apr. 12, 1985, abandoned. This application Mar. 22, 1988, Ser. No. 173,032

Claims priority, application Italy, Apr. 20, 1984, 20635 A/84

Int. Cl.⁴ F28F *19/06*

U.S. Cl. 165—133 **4 Claims**



1. An apparatus for use in an ammonium carbamate decomposer and/or a condenser in the synthesis of urea, comprising a nest of stainless steel tubes internally lined with a foil made of unalloyed zirconium which is not welded to said stainless steel tubes, wherein the thickness of said zirconium foil is less than about 0.8 mm.

4,899,814

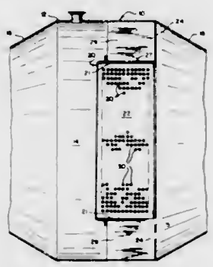
HIGH PRESSURE GAS/LIQUID HEAT EXCHANGER

Richard C. Price, 9816 Frankstown Rd., Pittsburgh, Pa. 15235

Continuation-in-part of Ser. No. 948,154, Dec. 31, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 138,358

Int. Cl.[4] F28D *7/02*

U.S. Cl. 165—163 **11 Claims**



1. A heat exchanger for use with high pressure gases comprising:

at least one serial coil positioned in a plane, said at least one coil following a serpentine path along said plane;

a frame member provided in a shell and adapted to support said at least one coil and contain vibrations of said at least one coil, said frame member comprising at least one tube holder sheet having openings provided therein adapted to receive and secure said at least one coil, and at least two solid plates adapted to secure said tube holder sheet in a fixed position to the shell;

and an inner support frame provided within said shell, said support frame sized and positioned to engage said solid plates of said frame member and align and position said frame member within said shell.

4,899,815

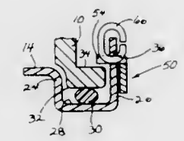
TANK RETAINING STRIP FOR HEAT EXCHANGERS

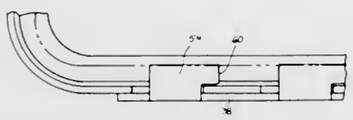
Daniel J. Bosch; John D. Real, both of Racine, and Michael P. Devine, Kenosha, all of, assignors to Modine Manufacturing Co., Racine, Wis.

Filed Feb. 23, 1989, Ser. No. 314,157

Int. Cl.[4] F28F *9/02*

U.S. Cl. 165—173 **15 Claims**





1. A heat exchanger comprising:

a header plate having a peripheral seal receiving groove;

a resilient seal disposed in said groove;

an upstanding flange surrounding said groove;

an aligned row of apertures in said flange above the bottom of said groove;

a tank having a peripheral outwardly directed flange located in said groove and having a first surface sealed against and compressing said seal and an opposed surface nominally aligned with said row of apertures; and

a tank flange retainer including an elongated strip with a plurality of hook-like formations, said strip being disposed on the side of said upstanding flange opposite said groove with said formations extending through said apertures and lodged against said upstanding flange oppositely of said strip in overlying relation to said tank flange.

4,899,816

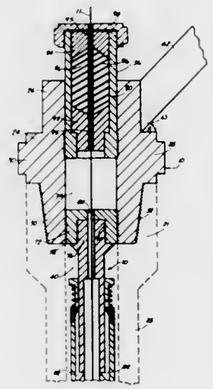
APPARATUS FOR GUIDING WIRELINE

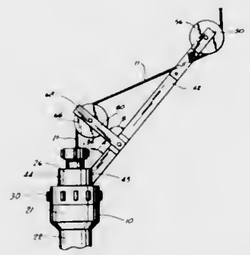
Paul Mine, 113 Tyrona St., Lafayette, La. 70507

Filed Jan. 24, 1989, Ser. No. 301,142

Int. Cl.[4] E21B *33/072, 33/08, 19/00, 23/00*

U.S. Cl. 166—85 **8 Claims**





1. An apparatus for guiding a wireline down a hole, the apparatus comprising:

(a) a body portion secured to the upper end of a section of a drill pipe extending out of the hole, the body portion having a bore therethrough;

(b) pack off means positioned on the upper end of the assembly of the body portion, having a bore in coaxial alignment with the bore of the body portion, for sealing off the bore of the body portion;

(c) an overshot portion, secured to the lower end of the body portion, for latching onto a tool which is retrieved from downhole; and

(d) means positioned upon and secured to the body portion, for feeding a wireline into the body portion, from a point off of vertical center of the body portion, to be fed directly into the bore of the body portion.

4,899,817

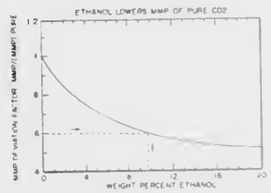
MISCIBLE OIL RECOVERY PROCESS USING CARBON DIOXIDE AND ALCOHOL

Nizar F. Djabbarah, Richardson, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 15, 1988, Ser. No. 284,563

Int. Cl.[4] E21B *43/22, 43/24*

U.S. Cl. 166—252 **30 Claims**



13. A method for modifying the minimum miscibility pressure (MMP) of a displacing fluid utilized in the recovery of hydrocarbonaceous fluids from a reservoir comprising:

(a) injecting a displacing fluid into a reservoir and recovering the displacing fluid and hydrocarbonaceous fluid mixture until displacing fluid breakthrough occurs;

(b) determining said mixture's existing minimum miscibility pressure;

(c) determining the extent to which it is desired to modify the existing minimum miscibility pressure; and

(d) adding alcohol to said displacing fluid in an amount sufficient to modify said pressure to the extent desired which alcohol is selected from the family comprising methanol through octanol and mixtures thereof.

4,899,818

METHOD TO IMPROVE USE OF POLYMERS FOR INJECTIVITY PROFILE CONTROL IN ENHANCED OIL RECOVERY

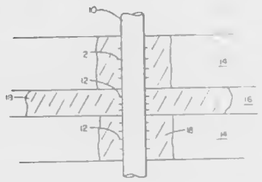
Alfred R. Jennings, Jr., Plano; Mark L. Hoefner, Dallas, both of Tex., and Paul Shu, West Windsor, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 197,490, May 23, 1988, Pat. No. 4,848,464. This application Dec. 30, 1988, Ser. No. 292,126

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.[4] E21B *33/138, 43/22*

U.S. Cl. 166—270 **23 Claims**



1. A method for minimizing formation damage when placing a profile control gel into a formation having varying zones of permeability comprising:

(a) injecting a first solidifiable gel into a formation which gel comprises hydroxypropyl guar gum and a gel breaker where said gel enters a zone of greater permeability without use of a mechanical packer thereby blocking a lesser permeability zone as a result of a filter cake build up;

(b) injecting thereafter a second solidifiable gel lacking a gel breaker into the formation which gel enters said greater permeability zone thereby forcing gel containing said gel breaker deeper into said greater permeability zone which gel comprises;

(i) water;

(ii) about 0.2 to about 5.0 wt. percent of a cross-linkable polymer having at least one functional group selected from a member of the group consisting of an amine, an amide, a hydroxyl, or a thiol group; and

(iii) about 0.02 to about 50.0 wt. percent of a partially methylated aminoplast resin which cross-links with said polymer;

(c) allowing both gels to solidify in the lesser and higher permeability zones;

(d) causing the solidified gel containing a gel breaker to liquefy thereby unblocking said lesser permeability zone to fluid flow while said higher permeability zone remains blocked to fluid flow; and

(e) initiating an enhanced oil recovery method in the zone of lesser permeability and removing hydrocarbonaceous fluids therefrom.

4,899,819

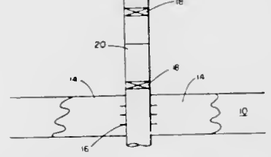
METHOD FOR SUSPENDING WELLS

Randy D. Hazlett, Dallas, and Alfred R. Jennings, Jr., Plano, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 890,679, Jul. 30, 1986, Pat. No. 4,817,719. This application Oct. 5, 1988, Ser. No. 253,292

Int. Cl.[4] E21B *33/13*

U.S. Cl. 166—285 **29 Claims**



1. A method for shutting in a well which minimizes damage to a formation comprising:

(a) placing into said formation a solution containing water and a chemical blowing agent;

(b) causing said chemical blowing agent to decompose thereby liberating a gas which forces formation fluids away from a wellbore into said formation;

(c) pumping a solidifiable gel mixture into the formation's productive interval via said wellbore while formation fluids re being forced away and precluded from said wellbore;

(d) causing said gel mixture to become a solid thereby forming a gel plug within said wellbore and a formation gel within said formation sufficient to withstand environmental formation conditions and pressures which cause hydrocarbonaceous fluids to flow into said wellbore from the formation areas near said wellbore;

(e) placing in said wellbore on top of said plug an amount of cement sufficient to isolate said productive interval when said cement hardens while being supported by said plug; and

(f) allowing said cement to set which set cement in combination with said gel plug is competent to exclude production fluids from said wellbore.

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4,899,820

METHOD AND MEANS FOR INJECTING WELL TREATMENT FLUID

Charles R. Bruce, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Mar. 21, 1988, Ser. No. 170,954
Int. Cl.[4] E21B 41/02
U.S. Cl. 166—310 12 Claims



1. A method of injecting treatment fluid into the well bore of a fluid producing well, the well bore including a casing containing perforations through which production fluid from a surrounding formation may flow, the method comprising the steps of:

filling the casing with a treatment composition having a greater density than the density of the well fluid to form a column of treatment composition bounded on the sides thereof by the casing:

the entire column of treatment composition being located beneath the lowermost production perforation in the casing;

providing a fluid conduit within the casing, the conduit having an outlet located in the path of flow of the production fluid and an inlet in contact with the treatment composition;

exerting fluid pressure on the column of treatment composition so that the pressure exerted adjacent the inlet of the fluid conduit is greater than the pressure of the production fluid adjacent the outlet of the fluid conduit whereby a pressure differential between the outlet and inlet of the fluid conduit exists which is sufficient to cause treatment fluid from the treatment composition to flow through the conduit and into the well bore; and

metering the flow of the treatment fluid by a capillary tube included in the fluid conduit.

4,899,821

METHOD AND APPARATUS FOR SERVICING WELL CASING AND THE LIKE

Kenneth L. Casida, Bakersfield, Calif., assignor to Hydro-Tool Company, Inc., Coalinga, Calif.

Filed Jan. 12, 1989, Ser. No. 296,065
Int. Cl.[4] E21B 37/00, 37/08
U.S. Cl. 166—312 15 Claims

1. An apparatus for servicing well casing and the like comprising a pair of tools; .means interconnecting the tools of said pair in series relation and having a pair of openings, a first of which communicates with a first of the tools of said pair of tools and a second of which communicates with a second of the tools of said pair of tools; a source of fluid communicating with the second of said pair of openings; and a valve assembly borne by said interconnecting means and engageable with the interior of the well casing operable by said contact in movement down said well casing to place said pair of openings in fluid communication with each other to supply said fluid to said first tool and operable by said contact with the interior of the well casing in movement up said well casing substantially to seal said first opening to supply said fluid to said second tool through said second opening.

13. A method for servicing well casing and the like, having an internal surface, comprising the steps of:

A. inserting an apparatus in the well casing to a work area within the well casing;



B. applying a treating fluid to the internal surface of the well casing in said work area in high pressure jets of said treating fluid;

C. terminating said application of treating fluid in high pressure jets; and

D. without removing said apparatus from the well casing, pressurizing an area contiguous with said work area with said treating fluid to a pressure greater than the ambient pressure of any fluid in said work area.

4,899,822

APPARATUS FOR CONTROLLING THE OPERATION OF AN UNDERWATER INSTALLATION

Jean-Louis Daeschler, Tarland, and Anthony J. Asbury, Norwich, both of Great Britain, assignors to Camco Inc., Houston, Tex.

Filed Sep. 2, 1988, Ser. No. 240,058
Claims priority, application United Kingdom, Sep. 4, 1987, 8720777
Int. Cl.[4] E21B 43/01
U.S. Cl. 166—339 15 Claims

1. An apparatus for controlling an underwater installation, said apparatus comprising:

a first control device for providing a first control function for the underwater installation;

a second control device for providing a second control function for the underwater installation, said first and second control devices having means for being releasably connected to a remote underwater vehicle; and

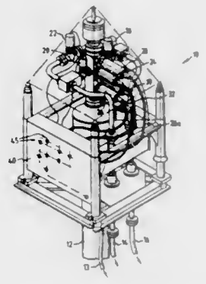
connection means for connecting said control devices to the underwater installation;

said connection means comprising a connection panel, a first connector coupled to said connection panel at a first predetermined location, and a second connector coupled to said connection panel at a second predetermined location;

said first control device comprising a first control element and a first engagement member, said first engagement member being independently slidably engageable with and disengageable from said first connector, said first engagement member including means for transferring hydraulic and electrical signals from said first control device to the underwater installation when said first control device is engaged with said first connector;

said second control device comprising a second control element and a second engagement member, said second engagement member being independently slidably engageable with and disengageable from said second connector, said second engagement member including means for transferring hydraulic and electrical signals from said second control device to the underwater installation when said second control device is engaged with said second connector;

said connection panel including means for receiving at least one indexing device of said remote underwater vehicle, whereby the remote underwater vehicle can engage with said connection panel and independently recover and replace said control devices from said connectors.



4,899,823

METHOD AND APPARATUS FOR RUNNING COILED TUBING IN SUBSEA WELLS

Charles C. Cobb, Lewisville, Tex.; Eric R. McK. Ladbrook, and Peter Cowan, both of Montrose, Scotland, assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 21, 1988, Ser. No. 287,039
Claims priority, application United Kingdom, Sep. 16, 1988, 8821713
Int. Cl.[4] E21B 41/06
U.S. Cl. 166—351 15 Claims

1. The method of introducing a well tubing into a subsea well comprising;

positioning the free end of a tubing coiled on a reel in a tubing injector,

latching the tubing in the tubing injector,

lowering the injector through a body of water from the surface to a wellhead on the bed of the body of water while paying out tubing from the reel and maintaining the tubing latched in the injector,

connecting the tubing injector to said wellhead, and

operating said injector to feed tubing through said wellhead.

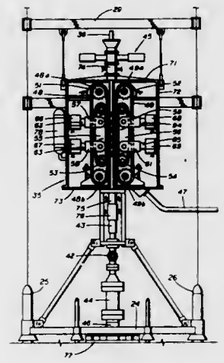
13. A well assembly for servicing subsea wells comprising:

an enclosure including a top and side walls for excluding sea water;

a tubing injector in said enclosure for moving reeled tubing through the injector;

said injector including opposed endless chains for gripping reeled tubing, and means for controlling movement of said chains;

means for maintaining selected pressure conditions in said enclosure to maintain pressure therein substantially equal



to exterior pressure to exclude sea water and protect said injector; and

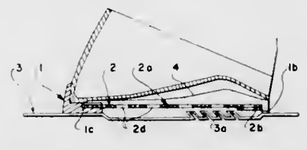
a shear positioned above the tubing injector.

4,899,824

DAMPENING DEVICE FOR THE HOOFS OF UNGULATES, MORE PARTICULARLY HORSES

Jean F. Techer, Pont Salomon, and Jean P. Ounis, Saint Etienne, both of France, assignors to Societe AMF, Pont Salomon, France

Filed Apr. 21, 1988, Ser. No. 184,422
Claims priority, application France, Apr. 23, 1987, 87 06044
Int. Cl.[4] A01L 5/00
U.S. Cl. 168—14 9 Claims



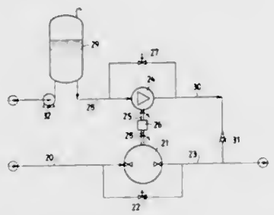
1. Dampening device for horse hoofs equipped with horseshoes, characterized in that said device is comprised of a screen (2) adapted to be secured in combination to fixtures of the horseshoe (1), and of a pre-forming plate (3) which cooperates with the whole surface of the horseshoe, and which is fastenable in a temporary manner to the screen in order to permit the injection of a thermoplastic material into the interior of the whole internal volume of the sole, said pre-forming plate being removed after the polymerisation of the plastic material which remains held in place by screen fittings.

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4,899,825
CONTINUOUS MIXING DEVICE, PARTICULARY SUITABLE FOR PREPARING AQUEOUS SOLUTIONS OF FOAM EXTINGUISHER FOR FIRE-FIGHTING SYSTEMS

Marco Bosoni, San Donato Milanese; Roberto Brusoni, Bollate; Carlo Florentini, Rho, and Pietro Fracassi, Milan, all of Italy, assignors to Saamprogetti, S.p.A., Milan; Tecsa S.r.l., Levate and Allweiler Italia, S.p.A., Opera, all of, Italy

Filed May 24, 1988, Ser. No. 197,978
Claims priority, application Italy, Jun. 25, 1987, 21040 A/87
Int. Cl.[4] A62C *35/16*
U.S. Cl. 169—14 **8 Claims**



1. In a fire fighting system which provides extinguisher foam from a source and mixes the foam with fire fighting water flowing through a line at variable flow rates, a device for continuously delivering a proportionately constant fire fighting extinguisher solution using only the energy supplied by the pressure of the water, comprising:

(a) a volumetric hydraulic motor in said fire fighting water line driven by the pressure energy of the fire fighting water passing therethrough;

(b) a plurality of foam additive metering devices operatively connected to said motor for receiving extinguisher foam additive and metering the extinguisher foam additive in response to the volume of water flowing through said motor, to thereby provide a proportionately constant fire fighting solution using only the energy supplied by the pressure of the fire fighting water;

(c) means for engaging or disengaging at least one of said metering devices from said pump; and

(d) means for recycling the dicharge of foam from each of said metering devices back to its source.

4,899,826
COMBINATION FIRE EXTINGUISHER AND TIRE SEALER

William T. Penn, 20610 East Fuero Dr., Walnut, Calif. 91789

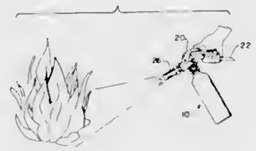
Filed Mar. 25, 1988, Ser. No. 173,424
Int. Cl.[4] A62C *11/00*
U.S. Cl. 169—30 **6 Claims**

1. A method of enabling a fire extinguisher to serve in alternative functions of sealing and reinflating a leaking pneumatic tire, comprising the steps of:

(1) providing a fire extinguisher having a detachable nozzle;

(2) charging said fire extinguisher with a combination of fire-extinguishing and tire-sealing agents;

(3) assembling a conduit assembly comprising a length of conduit fitted at one end with a coupling adapted to engage said fire extinguisher in place of said nozzle, and fitted at the other end with a valve coupler for threadedly engaging a pneumatic tire valve;

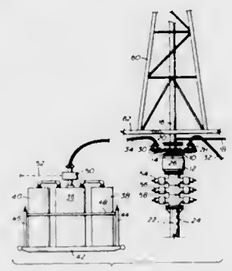


(4) supplying to a user, for deployment aboard a vehicle, (a) said fire extinguisher, thusly charged, (b) said conduit assembly, and (c) a set of operating instructions.

4,899,827
OIL WELL FIRE CONTROL SYSTEM

Douglas Poole, 19327 Gage Lake La., Houston, Tex. 77084

Continuation-in-part of Ser. No. 226,818, Aug. 1, 1988, abandoned. This application Mar. 21, 1989, Ser. No. 326,514
Int. Cl.[4] A62C *35/12*
U.S. Cl. 169—69 **1 Claim**



1. A system for delaying the ignition of and assisting in the extinguishing of a fire around the oil pipe stem on an oil drilling rig during a blowout by injecting chemicals and untreated water into the flow of hydrocarbons in the drill stem before the hydrocarbons are exposed to the ambient at the well head, the drilling rig having a stack of safety devices for horizontally closing off the well located between the well casing and the rig floor and below the mud return line element including in combination

spool apparatus incorporated as an in-line section of the stack above the safety devices but below the rig floor and having valve means for allowing the injection of pressurized chemicals and untreated water directly into the flow of hydrocarbons in the drill pipe before the hydrocarbons are exposed to the atmosphere above the safety devices, said spool apparatus further including

steel ring flange seal means at each vertical end of said spool apparatus for fixedly attaching the ends of said spool apparatus at the bottom to the uppermost one of the safety devices and at the top to the mud return line element,

a plurality of check valves located equidistant from one another around the exterior, circumferential surface of said spool apparatus,

conduit means attached to said plurality of check valves on said spool apparatus for transporting the chemicals and untreated water from storage to said spool apparatus,

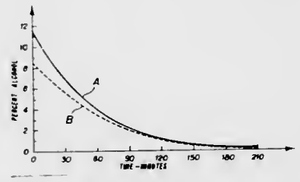
a storage source of chemicals and untreated water associated with the rig and operatively connected to said conduit means, and

activation means associated with said conduit means for activating the system for delivery of the chemicals and untreated water when desired to said spool apparatus and into the flow of hydrocarbons wherein the improvement comprises said plurality of check valves acting to reduce radiant heat by injecting the untreated water into the flow of hydrocarbons in the drill stem before the hydrocarbons are exposed to the ambient at the well head, each of said plurality of check valves including an elongated bore having a chemical inlet connected to said source of chemicals and a water inlet connected to said source of untreated water, a spring positioned in said bore, a ball positioned on one end of said spring near said chemical inlet, a cylindrical hollow member having first and second inside diameters and positioned substantially perpendicular to said elongated bore, and a plug normally sealed with a plurality of O-rings in said cylindrical hollow member whereby blow-out or rupture of said plug allow communication between said cylindrical hollow member and said elongated bore.

4,899,829
APPARATUS FOR MAKING A SUBSTRATE FOR FOREST CULTIVATION

Otto Suuronen, 51330 Kortesalmi, Finland

Filed Aug. 31, 1987, Ser. No. 90,907
Claims priority, application Finland, Sep. 1, 1986, 863530
Int. Cl.[4] A01G *23/00*
U.S. Cl. 172—30 **4 Claims**

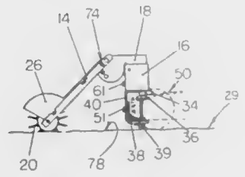


1. Apparatus for making a substrate for forest cultivation, which apparatus is designed to be drawn as a trailer behind a drawing vehicle said drawing vehicle and said trailer having at least one wheel on each side, the tracks of the trailer wheels being essentially the same as those of the drawing vehicle and the trailer being also provided with a container for earth, at the bottom of which container there is an opening through which the earth flows down onto a conveyor unit arranged under the container, wherein the conveyor unit comprises two belt conveyors driven by rollers, the transporting directions of which belt conveyors run crosswise to the trailer's direction of motion and away from the trailer's longitudinal axis, and wherein the axles of the driving rollers of the two belt conveyors are through rolls connected to the corresponding wheels of the trailer, by which means the rotary movement of the wheels is transmitted to the belt conveyors driven by the rollers.

4,899,828
GROUND AERATION DEVICE

Clark R. Harris, 1919-104 Street, Edmonton, Alberta, Canada T6J 5M2

Filed Jan. 28, 1988, Ser. No. 149,630
Int. Cl.[4] A01B *45/02*
U.S. Cl. 172—21 **19 Claims**



1. A ground aeration device, comprising:

a. a cylindrical roller having a plurality of spikes projecting therefrom, said spikes being aligned in a helical row which extends substantially once around the circumference of said roller;

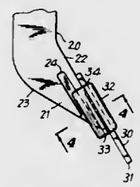
b. support arms having said roller rotatably secured to one end;

c. mounting brackets which are adapted to pivotally mounted the opposed ends of said support arms to the front of a wheeled trolley such that the forward motion of the trolley forces said spikes of said roller to penetrate the underlying ground surface, said support arms being oriented toward the ground at an angle of between 30 and 60 degrees in relation to the horizon, (such that said spikes of said roller penetrate the underlying ground surface).

4,899,830
CUTTING TOOTH ASSEMBLY FOR HEAVY DUTY EARTH WORKING MACHINES

Alfredo M. Larco, Catalino Miranda Av. No. 600, Sarco, Peru

Continuation-in-part of Ser. No. 53,101, May 21, 1987, abandoned. This application Jun. 1, 1989, Ser. No. 359,515
Int. Cl.[4] E02F *5/32, 9/28*; A01B *13/08*
U.S. Cl. 172—699 **5 Claims**



1. A cutting tooth assembly for use in heavy duty earth working machines, comprising in combination:

a shank having a first portion for attachment to a driven member of said machine, and having a second anout portion providing a planar surface for the support of a cutting point;

said second portion including locking grooves extending at a minor angle of divergence relative to said planar surface from a free end of said snout;

a holding clamp having mutually presented flanges for reception in said locking grooves, said holding clamp having internal axially straight longitudinally extending clamping surfaces for sliding and clamping engagement with corresponding axially extending surfaces on a said cutting point; and,

a cutting point comprised of an axially straight continuous

length of bar stock of constant transverse cross-section and of a width greater than the thickness of said shank received within said clamping surfaces of said holding clamp, said cutting point being axially adjustable relative to said snout and said holding clamp prior to tightening down of said holding clamp to provide an earth working tool of a desired length extending forwardly of said snout, and being rigidly and immovably frictionally clamped to said snout in any selected position of axial adjustment of said cutting point upon forcing said holding clamp onto said snout;

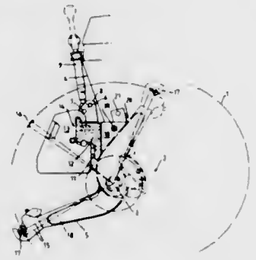
said cutting point including axially short used length of cutting point, welded at the unused end thereof to an unused end of an axially longer said cutting point in series relation receivable in said holding clamp to permit complete utilization of said axially short used length of cutting point.

4,899,831

FRONTAL CONNECTION APPARATUS FOR TRACTORS

Dieter Schillings, Willich; Bernard Peters, Cologne, and Hans G. Oellers, Moenchen-Gladbach, all of Fed. Rep. of Germany, assignors to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 132,235, Dec. 14, 1987, abandoned. This application Apr. 24, 1989, Ser. No. 342,994
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3644019; Jul. 3, 1987, 3719725
Int. Cl.[4] A01B *59/048, 63/108*
U.S. Cl. 172—810 **18 Claims**



1. In tractor frontal connection apparatus of the type including a tractor with front panelling and a front bolster bearing a front axle, two forwardly-extending pivotable lower links, hydraulic cylinder means acting on the lower links, and an upper link secured to an upper connecting lug, the improvement comprising:

the lower links attached to the axle-bearing front bolster at a pivot axis behind the forwardmost point of the front panelling and pivotable to positions behind said forwardmost point, the lower links having rear extensions rearward of the pivot axis; and

the hydraulic cylinder means substantially vertically oriented and having a lower end acting vertically on the rear extensions whereby full extension thereof pivots the lower links to a substantially vertical orientation,

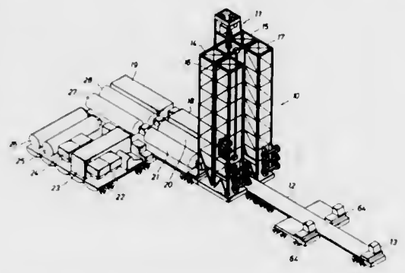
thereby facilitating movement of lower links to inoperative positions.

4,899,832

MODULAR WELL DRILLING APPARATUS AND METHODS

Robert C. Bierscheid, Jr., 11735 Zarroll, Houston, Tex. 77099

Continuation of Ser. No. 766,486, Aug. 19, 1985, abandoned. This application Dec. 10, 1987, Ser. No. 133,246
Int. Cl.[4] E21B *7/02*
U.S. Cl. 173—23 **16 Claims**



1. A modular unitized well drilling apparatus having a plurality of separately transportable and connectable units adapted for transport from one location to a second well sit location and comprising: a separately transportable drilling unit including an elongated mast adapted to be pivoted from a horizontal transport position to a vertical drilling position, said mast carrying a top drive unit for imparting rotary motion to a drill pipe; separately transportable first and second raising units adapted to be positioned on the respective opposite sides of said drilling unit and to be removably connected thereto, each of said raising units including a tower that is adapted to be pivoted from a horizontal to a vertical position; means for removably connecting the tower of each raising unit to said drilling unit at said well site location; base means on each of said raising units adapted to be lowered into engagement with the ground to provide a support; and means on said base means for simultaneously pivoting said towers of said raising units and said separate drilling unit after connection to said raising units to the vertical position from the horizontal position to permit rapid assembly of said well drilling apparatus at a well site.

4,899,833

DOWNHOLE DRILLING ASSEMBLY ORIENTING DEVICE

Tommy M. Warren, Coweta, and Warren J. Winters, Tulsa, both of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 7, 1988, Ser. No. 281,293
Int. Cl.[4] E21B *7/08*
U.S. Cl. 175—45 **11 Claims**

1. A method for indicating at the earth's surface when a steering assembly connected to a drill string located in a wellbore is in a preselected orientation with respect to the earth, comprising:

(a) pumping drilling fluid down the drill string while rotating the drill string in a first direction; and

(b) changing resistance to the flow of the drill fluid in the drill string to create a constant increase in said resistance to indicate that the steering assembly is in a preselected orientation relative to the earth,

wherein step (b) further comprises rotating the drill string in a second direction that is opposite to the first direction to activate a sub located in the drill string above the steering assembly, and

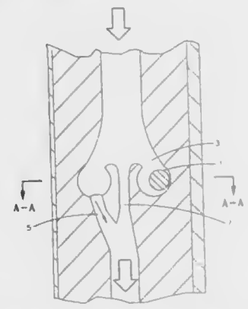
wherein the steering assembly is an eccentric cylindrical collar having a hole passing therethrough, and having a

radially extending borehole engaging means for operatively engaging the borehole during rotary drilling.

2. An apparatus for indicating at the earth's surface when a downhole steering assembly connected to a drill string is in a given orientation relative to the earth, comprising:

a sub for placement in the drill string above the steering assembly for increasing the resistance to the flow of drilling fluid through the drill string in response to rotation of the drill string,

the sub further comprising a housing having a central bore



defining an inlet flow passageway, said housing further defining a toroidal chamber in communication with said passageway, said toroidal chamber having a pocket and a valve seat, said housing further defining a bifurcated outlet flow passageway, said bifurcated outlet flow passageway including an elongated outlet flow passageway in communication with said inlet flow passageway and including a valve seat outlet flow passageway in communication with said valve seat; and

a spherical valve being rotatable in said toroidal chamber from a normally seated position in said pocket.

4,899,834

ELECTROMAGNETIC DRILLING APPARATUS

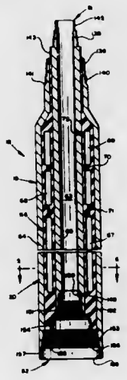
James M. Weldon, Austin, Tex., assignor to Parker Kinetic Designs, Inc., Austin, Tex.

Division of Ser. No. 822,773, Jun. 24, 1986, Pat. No. 4,722,402. This application Dec. 28, 1987, Ser. No. 138,891
The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.
Int. Cl.[4] E21B *7/08, 17/00*
U.S. Cl. 175—73 **9 Claims**

3. In a drill string that extends downhole in a borehole for supporting a drill bit at a lower end thereof, there being a fluid passageway formed axially through the string by which drilling fluid is supplied to the bit, the improvement comprising:

an elongated drill collar for connection into the drill string and used downhole in a borehole for controlling hole deviation; said collar includes inner and outer annular conductive members which are insulated from one another and has an axial passageway through which drilling fluid can flow; connection means at opposed ends of said collar by which the collar is connected in series relationship in the drill string;

a plurality of longitudinal bowing chambers circumferentially extending about said axial passageway for bowing said collar in a selected direction away from the central axis thereof; said chambers are radially spaced from said axial passageway; means for effecting pressure in selected ones of said bowing chambers to effect pressure differential between opposed said bowing chambers and thereby



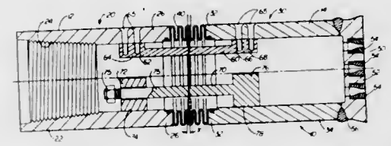
bowing said collar so that the borehole is controllably deviated.

4,899,835

JET BIT WITH ONBOARD DEVIATION MEANS

Martin D. Cherrington, The Cherrington Corp., P.O. Box 254788, Sacramento, Calif. 95865

Filed May 8, 1989, Ser. No. 348,910
Int. Cl.[4] E21B *7/08*
U.S. Cl. 175—74 **27 Claims**



1. A directional drill bit utilizing pressurized fluid as a means for eroding earth in a forward path of said bit, said bit comprising:

an elongate hollow body having a first proximal end and a first distal end, and having at least a rigid first section and at least a rigid second section, said first section and said second section being connected one to the other by a flexible joint positioned intermediately of said first section and said second section, with the combination of said first section, said flexible joint and said second section providing a conduit having leak-free annular sidewalls, said combination thereby defining said elongate hollow body;

a connecting means formed by said first proximal end for joining said elongated hollow body with an appropriate fluid conveyance means used to transport said pressurized fluid;

a nozzle means borne by said first distal end, said nozzle means comprising a nozzle plate having at least one jet nozzle attached to and carried by said nozzle plate:

an articulation means comprising a spring means and a stop means, said articulation means being responsive to changes in fluid pressure and permitting a forward portion of said bit bearing said nozzle structure to change angular position with respect to an aft portion of the bit, by said forward portion moving from a first position relative to said aft portion to a second position relative to said aft portion;

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said spring means having a second proximal end and a second distal end, said second proximal end being secured to said first section and said second distal end being secured to said second section, said spring means being positioned in a manner which defines an initial, preselected degree of axial alignment with said degree of initial, pre-selected axial alignment being described by a first angle formed by the relative position of the longitudinal axis of said first section with the longitudinal axis of said second section when said elongate hollow body is in its "at rest" position; and

said stop means being positioned oppositely from said spring means and having a third proximal end and a third distal end, said third proximal end being operatively connected to said first section and said third distal end being operatively connected to said second section, said stop means being positioned in a manner which defines a final, pre-selected degree of axial alignment with said degree of final, pre-selected axial alignment being described by a second angle formed by the relative position of the longitudinal axis of said first section with the longitudinal axis of said second section when said elongate hollow body is in its maximum degree of angular displacement relative to said initial, pre-selected degree of axial alignment.

4,899,836

HYDRAULIC PERCUSSION INSTRUMENT AND METHOD OF OPERATING SAME

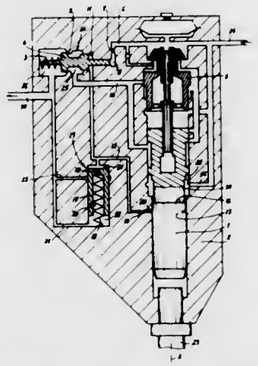
Aime Vernot, Villeurbanne, France, assignor to Etablissements Montabert, Saint-Priest, France

Filed Jul. 16, 1986, Ser. No. 886,546

Claims priority, application France, Jul. 16, 1985, 85 11346; Mar. 18, 1986, 86 04302

Int. Cl.[4] B23B *45/16*

U.S. Cl. 173—134 **15 Claims**



1. A reciprocating percussion instrument comprising:

a housing forming an axially centered chamber having a front end and formed thereat with a pair of adjacent ports;

a tool projecting from the housing and exposed axially in the chamber;

a double-acting forming front and back compartments and axially reciprocatable between a rear end position and a front end position at least generally in axial engagement with the piston, the piston having a groove forming a fluid-connection path in the chamber between the ports only in the front end position of the piston;

a pressure source having a high-pressure side and a low-pressure side;

a conduit connecting one of the ports to one of the sides of the pressure source;

control means including a pilot line connected to the other of the ports and a distributor valve connected between the high- and low-pressure sides of the pressure source and the compartments for cyclically alternately pressurizing and depressurizing the compartments and thereby axially reciprocating the piston between its end positions at a frequency dependent on pressure in the pilot line; and

pilot-feed means at least periodically connecting a one of the sides of the source to the pilot line for biasing the pressure of same away from that of the side of the source connected to the conduit.

4,899,837

MUD SAVER VALVE

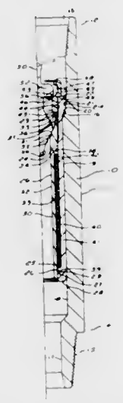
Benton F. Baugh, Houston, Tex., assignor to Citizens Bank, Corpus Christi, Tex., Trustee for C & S Specialty, Inc.; Pension Plans (for the Benefit of James R. Cameron)

Continuation of Ser. No. 888,259, Jul. 23, 1986, Pat. No. 4,779,688. This application Dec. 4, 1987, Ser. No. 128,681

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[4] E21B *21/10*

U.S. Cl. 175—218 **7 Claims**



1. A mud saver valve for retaining drilling fluid in the kelly of a rotary drilling rig, comprising:

(a) a kelly sub defining an open-ended elongated body having threaded ends for forming a connection between the kelly and a drill pipe string;

(b) an enlarged bore formed in said elongated body;

(c) a tubular body received within said enlarged bore of said elongated body, said tubular body including an enlarged portion defining a shoulder for engagement with a shoulder formed in said elongated body;

(d) hollow piston means axially disposed within said tubular body, said piston means being axially movable relative to said tubular body and defining a fluid passage therethrough;

(e) valve means removably mounted within said tubular body, said valve means cooperating with said piston means to normally close the fluid passage through said piston means, wherein said valve means is movable between a first and second position;

(f) a stop member removably connected to said tubular body, said stop member including a first internal circumferential tapered shoulder for limiting downward movement of said valve means; and

(g) means for urging said piston means into engagement with said valve means.

4,899,838

EARTH BORING BIT WITH CONVERGENT CUTTER BEARING

Eric C. Sullivan, and Bruce H. Burr, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Nov. 29, 1988, Ser. No. 277,616

Int. Cl.[4] E21B *10/22*

U.S. Cl. 175—371 **3 Claims**



2. An earth drilling bit which comprises:

a body;

a cantilevered bearing shaft extending inwardly and downwardly from the body;

a cutter rotatable secured to the bearing shaft, with an open end to permit assembly over the cantilevered bearing shaft;

the bearing shaft having a cylindrical journal surface formed around a longitudinal axis;

the cutter having a bearing surface sized to include clearance to permit assembly over the journal surface of the shaft;

a seal groove at the open end of the cutter bearing surface, including an intersecting all that defines an annular, generally rounded corner to oppose the journal surface of the shaft;

seal means disposed in the seal groove to confine lubricant between the bearing surfaces;

the cutter bearing surface having a curved outer region that converges from the annular corner of the seal groove into a cylindrical inner region, the curved region being defined to reduce the stress the corner induces upon the journal bearing surface of the shaft during drilling, including the stress induced by cutter cocking, the curved outer region having an outer toroidal portion of a first radius and an inner toroidal portion with a larger radius than the first radius.

4,899,839

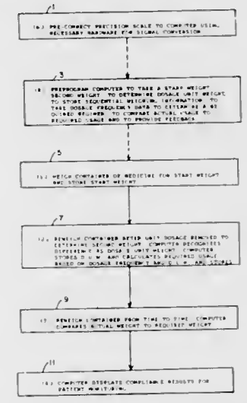
COMPLIANCE AND PATIENT STATUS MONITORING SYSTEM AND METHOD

Albert L. Dessertine, 53 Park Ave., and Thomas P. Hudson, 6 Cider Mill Circle, both of Flemington, N.J. 08822

Filed Jun. 14, 1989, Ser. No. 365,933

Int. Cl.[4] G01G *23/18, 19/52*; G06F *15/42*

U.S. Cl. 177—25.19 **26 Claims**



1. A method of monitoring a patient's medicine compliance, which comprises:

(a) weighing a container of medicine to determine a starting weight on a scale which is connected to a computer with a display unit;

(b) storing the starting weight in said computer;

(c) reweighing the container of medicine after a prescribed dosage is consumed to determine a second weight;

(d) having said computer determine the difference between said starting weight and said second weight to store a dosage unit weight;

(e) having the computer programmed to calculate compliance required weights of the container for each dosage administration for the prescription period of the medicine;

(f) reweighing the container of medicine from time to time on said scale to compare actual weight with compliance required weight to determine compliance; and

(g) visually displaying the compliance results on said display unit to permit compliance monitoring.

4,899,840

APPARATUS FOR WEIGHING A PALLET WITH A LOAD THEREON FOR USE WITH A VEHICLE HAVING TINES OR THE LIKE

Jacques C. Boubille, 12316 Julie La., Saratoga, Calif. 95070

Filed Jun. 22, 1989, Ser. No. 369,867

Int. Cl.[4] G01G *19/08, 23/06*

U.S. Cl. 177—139 **23 Claims**

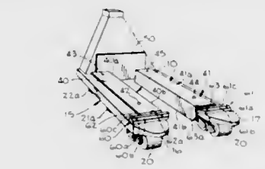
1. A weighing apparatus for a vehicle having tines or the like comprising:

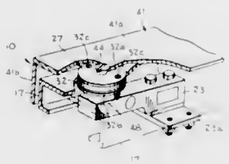
(a) a weighing platform movable in response to a load thereon, said weighing platform having a front end and a rear end as viewed from the direction of travel of the load;

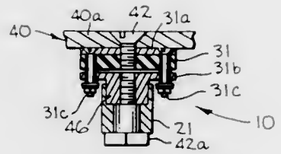
(b) at least one load cell supported below said weighing platform and responsive to the movement of said weighing platform for emitting an electrical signal representative of the weight of the load on said weighing platform; and

(c) a ramp mounted on said tine in front of and spaced from the front end of said weighing platform for attenuating excessive forces resulting from a load advancing toward

said weighing platform, said ramp being mechanically disjoined from said weighing platform for attenuating







excessive forces resulting from an advancing load to reduce the transmission of excessive forces to said weighing platform.

4,899,841

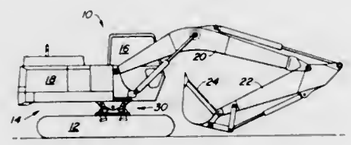
LEVELING ASSEMBLY FOR A WORK VEHICLE

Jerry B. Hawbaker; Dave Kleinschrodt, and Ryland H. Eichhorst, all of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 12, 1989, Ser. No. 296,455

Int. Cl.[4] B62D *55/08*

U.S. Cl. 180—9.52 **7 Claims**



1. A work vehicle for performing a work operation, the vehicle comprising:

an undercarriage for supporting and propelling the vehicle;

an upper structure located above the undercarriage and having an operator's cab from which the vehicle is operated;

a leveling assembly located between the undercarriage and the upper structure, the leveling assembly comprising an upper plate and a lower plate that are pivotally interconnected by a pivot assembly, the leveling assembly is also provided with to hydraulic cylinders operatively positioned between the plates for changing the relative angular position of the plates about the pivot axis, the two hydraulic cylinders are each provided with a trunnion mounting assembly, the trunnion mounting assembly is mounted to the lower plate and a portion of each hydraulic cylinder extends downwardly into the undercarriage of the work vehicle, the upper plate is mounted to the upper structure and the lower plate is mounted to the undercarriage, whereby changing the relative angular position of the upper plate relative to the lower plate changes the relative angular position of the upper structure relative to the undercarriage.

4,899,842

STEERING FORCE CONTROLLER FOR POWER STEERING APPARATUS

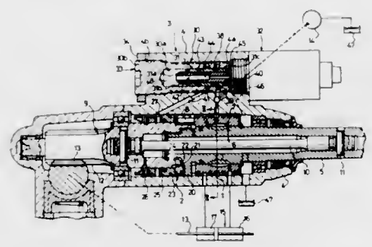
Yasuyoshi Emori; Hiroshi Ohsaki, and Ikuo Nomura, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,632

Claims priority, application Japan, Oct. 30, 1987, 62-166692[U]; Oct. 30, 1987, 62-166693[U]; Oct. 30, 1987, 62-166694[U]

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—142 **7 Claims**



1. A steering force controller for a power steering apparatus which includes a servo valve for controlling the distribution of an oil pressure from a discharge port of a pump to a power cylinder through a relative rotation of a pair of valve members, a reaction mechanism for producing a steering reaction in accordance with an oil pressure supplied to an oil pressure reaction chamber, and a pressure control mechanism including a spool valve which is slidably fitted into a bore formed in a housing and which is displaced fore and aft in accordance with a vehicle speed to thereby control the oil pressure supplied to the reaction chamber in accordance with the displaced position of the spool valve; the steering force controller being characterized by a sleeve slidably fitted into the bore formed in the housing, the spool valve being slidably fitted into the sleeve and operable to control the oil pressure supplied to the reaction chamber in accordance with a displaced position of the spool valve relative to the sleeve, regulating means for causing an axial displacement of the sleeve to regulate a relative reference position between the spool valve and the sleeve, the regulating means including a bolt threadably engaged with the housing, means for securing the bolt to the housing, and a spring for resiliently urging the sleeve into abutment against the bolt, the bolt having an outer diameter which is greater than the outer diameter of the sleeve.

4,899,843

CENTER MEMBER STRUCTURE FOR MOTOR VEHICLE

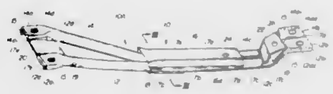
Masamitsu Takano, Fujinomiya, and Takanobu Ide, Isehara, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Yamakawa Industrial Co., Ltd., Fuji, both of, Japan

Filed May 26, 1988, Ser. No. 199,345

Claims priority, application Japan, Jul. 17, 1987, 62-177085

Int. Cl.[4] B60K *5/12*

U.S. Cl. 180—312 **28 Claims**



1. A center member structure for use in a motor vehicle to support thereon an engine unit, comprising:

two pipe members arranged side by side, said pipe members having first portions which extend in parallel and second portions which gradually separate from each other with increase of the distance from generally middle portions of the pipe members; and

two longitudinally extending reinforcing plates welded to given portions of said pipe members to tightly combine the pipe members into a rubust unit.

4,899,844

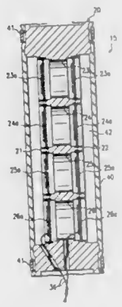
ACOUSTICAL WELL LOGGING METHOD AND APPARATUS

Keith W. Katahara, Allen, and Billy Joe Smith, Richardson, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 23, 1989, Ser. No. 300,010

Int. Cl.[4] G01V *1/40*

U.S. Cl. 181—106 **17 Claims**



7. An acoustic well logging tool comprising:

a sonde having a transmitter section and at least one receiver section; said transmitter section comprising:

a housing having a plurality of parallel horizontal passages therethrough, each passage having its ends open on diametrically-opposed sides of said housing;

a plurality of acoustical signal generating means each having a different resonance frequency, one of said plurality of acoustical signal generating means mounted in each of said passages;

means for simultaneously driving each of said acoustical frequency generating means to thereby generate a plurality of acoustical signals, each of which is effectively centered about its respective resonance frequency;

an elastic sleeve mounted on said housing over said acoustic signal generating means to thereby form a space between said sleeve and said signal generating means; and a liquid filling said space.

4,899,845

ECHOGRAPHIC TECHNIQUE-BASED METHOD AND APPARATUS TO DETECT STRUCTURE AND ANOMALIES OF THE SUBSOIL AND/OR SEA BOTTOM AND THE LIKE

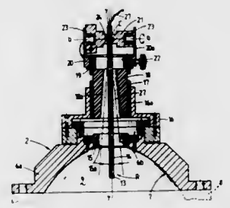
Canneli G. Bosco, and D'ottavi Enrico, both of Rome, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Nov. 30, 1988, Ser. No. 278,089

Claims priority, application Italy, Dec. 11, 1987, 58694 A/87

Int. Cl.[4] G01V *1/16;* **H04R** *17/00*

U.S. Cl. 181—122 **9 Claims**



1. A receiver for receiving reflected acoustic waves, comprising:

a metal body defining an inner hollow chamber and an open base, said hollow chamber having a round paraboloidal reflective surface with an associated axis and a focus;

an elastic diaphragm, mounted on said metal body, for closing said open base;

an electrically insulating liquid in said hollow chamber;

a single ceramic piezoelectric detector mounted within said hollow chamber; and

a head, mounted on said metal body, for adjusting said piezoelectric detector to a plurality of positions including said focus of said reflective surface and at least one position spaced from said focus to focalize the reflected acoustic waves on said piezoelectric detector.

4,899,846

SOUND ABSORBING PIPE

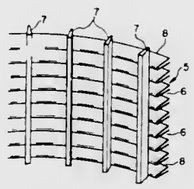
Naoyuki Furuta, Tokyo, and Shinta Yamamura, Kanagawa, both of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed May 7, 1987, Ser. No. 46,687

Claims priority, application Japan, May 19, 1986, 61-75054[U]

Int. Cl.[4] G10K *11/00*

U.S. Cl. 181—210 **16 Claims**



1. A sound absorbing pipe comprising:

a cylindrical shaped substantially hollow body comprising one or more elements having an interior surface and two ends;

open portions provided at generally regular intervals between said one or more elements and forming with said one or more elements a circumferential wall, wherein a predetermined open area ratio exists between an area formed of said open portions with respect to an overall area of said circumferential wall;

a plurality of rods disposed within an interior of said circumferential wall equidistantly so as to extend longitudinally of said body;

a wire being coiled around an outer circumference of said plurality of rods and being welded thereto; and

sound absorbing material disposed in a layer of generally uniform thickness adjacent to said circumferential wall, said interior surface of said circumferential wall being substantially entirely covered with said layer, an interior surface of said layer bounding a hollow area formed in an interior portion of said body, said hollow area being in communication with both of said two ends;

wherein sound generated outside of said sound absorbing pipe passes through said open portions and is absorbed within said sound absorbing pipe.

4,899,847

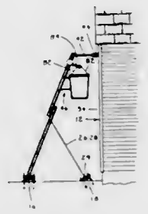
MOBILE SUPPORTS

Elmer S. Lufkin, 233 E. Grove St., Middleboro, Mass. 02346

Continuation-in-part of Ser. No. 128,940, Jan. 25, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 341,969

Int. Cl.[4] E06C *5/00, 5/32, 7/14*

U.S. Cl. 182—13 **7 Claims**



1. The combination of a mobile ladder and a surface, the mobile ladder comprising a ladder, a trough, an inner trough, and a pulley system, the ladder including a bottom portion, a top portion and a first adjustable support rod, the bottom portion having a first roller and the pulley system associated therewith, the first adjustable support rod having a free terminal end, associated with the ladder and the free terminal end having a third roller engaged therewith, the trough and the inner trough in spaced, substantially parallel relationship with each other and both positioned on the surface, the first roller movably associated with the trough and the third roller movably associated with the inner trough, whereby activation of the pulley system moves the first roller within the trough and the third roller within the inner trough.

4,899,848

GUARD FOR UPPER END OF LADDER SIDE RAIL

John W. Parr, 6121 Harvey St., Apt. #16, Panama City, Fla. 32404

Filed Apr. 28, 1989, Ser. No. 345,024

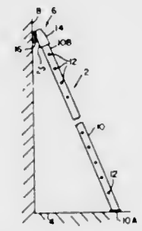
Int. Cl.[4] E06C *7/48*

U.S. Cl. 182—108 **7 Claims**

1. A guard for the upper ends of the side rails of a ladder for providing a protective mounting against a substantially vertical supporting surface for the ladder, comprising:

a rigid body member having an open bottom, and arranged to telescope in snug fitting engagement over the upper end of a side rail;

a resilient pad; and



means for removably affixing the resilient pad to the body member so that said pad engages the supporting surface for providing the protective mounting.

4,899,849

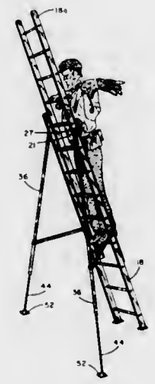
LADDER STABILIZER

Avraham Y. Levi, St. Paul, and Craig D. Quarberg, Brooklyn Park, both of Minn., assignors to A. C. Innovations, Inc., Bloomington, Minn.

Filed Dec. 5, 1988, Ser. No. 280,124

Int. Cl.[4] E06C *5/36, 1/22*

U.S. Cl. 182—172 **8 Claims**



1. Stabilizer apparatus for supporting a two-legged ladder against lateral and rearward movement, comprising in combination:

(a) first and second hinge blocks attachable to the outer side surfaces of the side rails of a two-legged ladder proximate the upper ends thereof, each of said hinge blocks including a planar plate surface for abutting said outer side surfaces of said side rails and with an integrally formed, generally U-shaped channel projecting outwardly from said plate surface at a predetermined acute angle, there being aligned apertures formed centrally through the opposed sides of said U-shaped channel;

(b) first and second elongated, telescopingly extendible, tubular pole members individually connected at one end thereof to said first and second hinge blocks, respectively, by hinge pins passing transversely through said pole members and said aligned apertures; and

(c) a folding brace member attached to said tubular pole members at a location immediate said one and other ends

of said tubular pole members and to said side rails of said ladder for limiting the extent to which said first and second pole members can be spread relative to said side rails of the ladder to which said pole members are hinged.

4,899,850

LUBRICATING DEVICE FOR A TURBOMACHINE

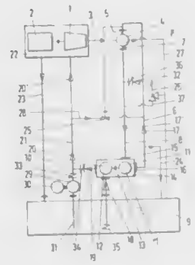
Walter Köller, and Ludger Alfes, both of Staatsangehörigkeit, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 3, 1988, Ser. No. 266,777

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1987, 3737844

Int. Cl.[4] F01D *25/20*

U.S. Cl. 184—6.3 **21 Claims**



1. A lubricating device for a turbomachine comprising

a central rotor shaft;

a main oil pump mechanically connected to the central rotor shaft and having an input port and having an output port;

a suction line connected to the input port of the main oil pump;

a discharge line connected to the output port of the main oil pump;

a main supply line;

a pressure regulator;

a first connection line connecting the main supply line with the pressure regulator;

a second connection line connecting the pressure regulator to the suction line;

a third connection line connecting the pressure regulator to the suction line;

an oil container;

a suction discharge line connecting the suction line to the oil container and provided for the balancing of the leakage losses and for removal of the heat fed to the oil by an occurring friction load output.

4,899,851

PRESSURE LUBRIFICATION DEVICE FOR TRANSMISSION SYSTEMS OF MOTOR VEHICLES WITH TRANSVERSE GEARBOXES

Gian L. Falzoni, and Federico Cordero, both of Turin, Italy, assignors to Fiat Auto S.p.A., Turin, Italy

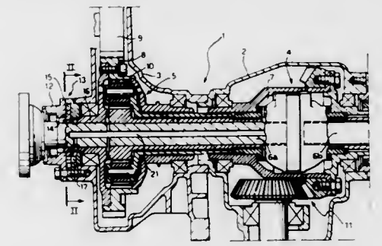
Filed Jun. 23, 1989, Ser. No. 371,381

Claims priority, application Italy, Jul. 1, 1988, 67623 A/88

Int. Cl.[4] F01M *9/10*

U.S. Cl. 184—6.12 **3 Claims**

1. A pressure lubrication device for transmission systems for motor vehicles with transverse gearboxes, particularly a four-wheel-drive transmission including a gearbox output member, a front differential, and a torque divider coaxial with the driveshafts of the front wheels of the vehicle, comprising a rotary pump (3) with internal lobes including a casing (3) siutated beside the torque divider (5), coaxial with one of the front drive-shafts (*6a,6b*) and having an inlet and an outlet (17, 18) for lubricant, and a pair of lobed rotors, inner and outer (14, 15)



respectively, of which the inner one is keyed to the output member (8) of the gearbox.

4,899,852

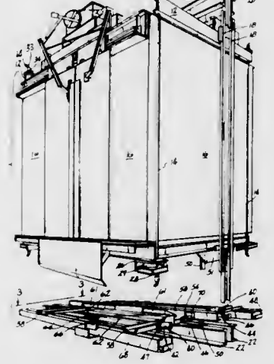
ELEVATOR CAR MOUNTING ASSEMBLY

John K. Salmon, South Windsor, and Young S. Yoo, Avon, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 3, 1988, Ser. No. 266,540

Int. Cl.[4] B66B *9/00*

U.S. Cl. 187—1 R **10 Claims**



1. An elevator car assembly comprising:

(a) a frame adapted to travel through an elevator hoistway;

(b) an elevator car for holding passengers;

(c) pendulum means for mounting said elevator car in said frame in pendulum fashion whereby said elevator car can move laterally within said frame; and

(d) damping means interconnecting said frame and said elevator car for damping lateral movement of said elevator car through a 360° lateral arc, said damping means including means for acting as a spring when said frame is subjected to substantial shocks in the hoistway, and for acting as a damper when the frame is subjected to smaller shocks in the hoistway, said damping means comprising a plurality of pneumatic dashpots operable to induce only laminar internal airflow when subjected to the full range of lateral forces normally encountered during operation of the elevator car assembly in the hoistway.

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4,899,853

HYDRAULIC SHOCK-ABSORBER AND VIBRATION DAMPER WITH AN INNER TUBE

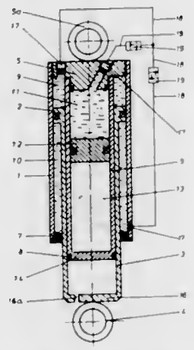
Kurt M. Hummel, Wuppertal, Fed. Rep. of Germany, assignor to Herman Heuscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 275,915

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1987, 3740404

Int. Cl.[4] F16F *9/06*

U.S. Cl. 188—269 **3 Claims**



1. A hydro-pneumatic shock-absorber and vibration damper comprising a cylinder, an annular damping piston disposed inside the cylinder so as to be axially movable therein and dividing off two working chambers in the cylinder which are filled with a hydraulic damping medium, at least one throttle connecting the working chambers to each other, a piston rod in the form of a hollow cylinder mechanically connected to the damping piston and guided outwardly from the cylinder in sealing-tight manner, a compensating chamber connected to a first one of the working chambers for receiving a volume of damping medium displaced by the piston rod, a pneumatic spring chamber separated in sealing-tight manner from the compensating chamber by a freely movable floating piston and filled with a compressible medium, an inner tube extending with slight peripheral clearance through the annular damping piston and into the hollow piston rod so as to be inside the cylinder and coaxial therewith, the floating piston being guided inside the inter tube, wherein the free end region of the inner tube facing the outwardly-guided end of the hollow piston rod is closed in a gas-tight manner whereby the pneumatic spring chamber is bounded by said free end region of the inner tube and by the floating piston, and wherein the hollow piston rod has a vent opening in the part extending axially outwards of the inner tube.

4,899,854

MODULAR ELEMENT AS A COMPONENT OF A DAMPING MEMBER FOR SUPPORT HEADS OF MOTION-PICTURE OR TELEVISION CAMERAS IN PROFESSIONAL CINEMATOGRAPHY AND TELEVISION

Guido Cartoni, No. 31, Via Michele di Lando, 00162 Roma, Italy

Filed Oct. 5, 1988, Ser. No. 253,647

Claims priority, application Italy, Jun. 6, 1988, 48056 A/88

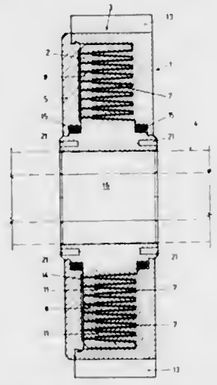
Int. Cl.[4] F16F *15/20*

U.S. Cl. 188—290 **9 Claims**

1. In a damping device for motion picture camera support heads, a modular element comprising

(a) a first annular portion operatively integral with a rotor means and having an inner surface provided with a plurality of continuous concentric overhanging surfaces alternating with a plurality of complementary cavities;

(b) a second annular portion complementary with said first annular portion and operatively integral with a stator means of said damping device, said second annular portion having an inner surface provided with a plurality of continuous concentric overhanging surfaces alternating with a plurality of complementary cavities;



(c) said overhanging surfaces of said second portion engaging with said cavities in the inner surface of said first portion, and said overhanging surfaces of said first portion engaging with said cavities of said second portion;

(d) a continuous hollow space for the circulation of damping fluid between said overhanging surfaces and said complementary cavities; and

(e) cover means for said modular element;

(f) and through holes in a bottom portion of said cavities of said first portion for the passage of excess damping fluid.

4,899,855

PISTON ASSEMBLY HAVING AN OUTER SKIRT AND A SPACED INNER CORE

Christian B. de Carbon, 64 Boulevard Maurice Barrés, 92200 Neuilly-sur-Seine, France

Filed Mar. 7, 1988, Ser. No. 165,075

Claims priority, application France, Mar. 6, 1987, 87 03113

Int. Cl.[4] F16F *9/34*; **F16K** *16/00, 17/26*

U.S. Cl. 188—322.15 **15 Claims**

1. A hydraulic shock absorber having a reciprocable piston assembly mounted at the end of a piston rod and comprising:

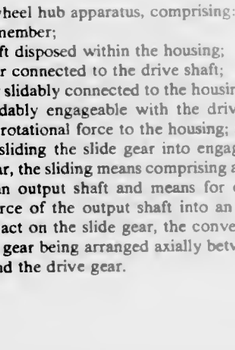
a piston body having a generally cylindrical outer skirt and a generally cylindrical inner core, said core being provided with a central bore adapted for mounting said piston body on said end of the piston rod, a plurality of means in said piston body for integrally joining said inner core to said outer skirt and defining between each other, a plurality of passages for hydraulic fluid through said piston body;

a flat annular bearing washer mounted on said end of the piston rod between said piston body and a shoulder of said piston rod and having an outer diameter greater than the outer diameter of said inner core;

means defining a double-acting floating valve comprising at least one flat annular disk mounted with a given prestress, the outer position of said valve being adapted to bear against a circumferential bearing surface of said outer skirt and the inner portion of said valve being adapted to bear upon an outer portion of said bearing washer;

a flat centering annular washer mounted on said end of the piston rod between said piston body and said bearing washer, surrounded by said annular disk of the floating valve, said centering washer having an outer diameter less than the outer diameter of said bearing washer; and

said bearing surface comprising a plurality of bearing portions located substantially in registry with each of said



hydraulic fluid passages in said piston body, each of said bearing portions in registry with each of said passages having unequal radial dimensions relative to the corresponding hydraulic fluid passage and providing a valve seat for the outer portion of the floating valve.

4,899,857

AUTOMATIC TRANSMISSION APPARATUS FOR VEHICLE

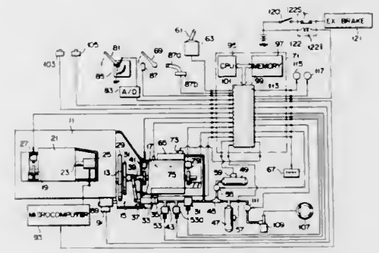
Toshiaki Tateno; Shigeki Fukushima, both of Yokohama; Tomuyuki Iwamoto, Kawasaki, and Nobuo Kijima, Tokyo, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 846,941, Apr. 1, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 173,945

Claims priority, application Japan, Apr. 11, 1985, 60-75291; Apr. 12, 1985, 60-53601; Jun. 17, 1985, 60-131324; Jun. 25, 1985, 60-95972; Jun. 28, 1985, 60-141692; Jul. 24, 1985, 60-163669; Sep. 30, 1985, 60-150062

Int. Cl.[4] B60K *41/28*

U.S. Cl. 192—0.072 **12 Claims**



4,899,856

FREE WHEEL HUB APPARATUS

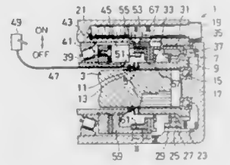
Sakuo Kurihara, Tochigi, Japan, assignor to Tochigifujisangyo Kabushiki Kaisha, Tochigi, Japan

Continuation of Ser. No. 195,199, May 18, 1988, abandoned. This application Jul. 31, 1989, Ser. No. 390,442

Claims priority, application Japan, May 26, 1987, 62-078182[U]

Int. Cl.[4] B60K *41/02*; **F16D** *11/00, 27/09*

U.S. Cl. 192—0.02 R **8 Claims**



1. A free wheel hub apparatus, comprising:

a housing member;

a drive shaft disposed within the housing;

a drive gear connected to the drive shaft;

a slide gear slidably connected to the housing, the slide gear being slidably engageable with the drive gear so as to transmit rotational force to the housing; and

means for sliding the slide gear into engagement with the drive gear, the sliding means comprising an electric motor having an output shaft and means for converting rotational force of the output shaft into an axially directed force to act on the slide gear, the converting means and the slide gear being arranged axially between the electric motor and the drive gear.

1. An automatic transmission apparatus for a vehicle, comprising:

a load sensor for detecting a load on an engine;

a friction clutch connected to an output shaft of said engine;

a clutch actuator for operating said friction clutch;

a clutch sensor for detecting a position of said friction clutch;

a parallel shaft type gear transmission having an input shaft connected to said friction clutch;

speed ratio changing means for changing a speed ratio of said parallel-shaft gear transmission;

change speed control means for operating said speed ratio changing means in response to signals from vehicle drive condition detecting means and drive command means which can instruct a slope-start mode; and

start control means which actuates said clutch actuator to move said friction clutch to a standby position at a time just before the clutch is in the half-engaged state, when it is determined that start control is to be initiated in accordance with the speed ratio and an output from said drive condition detecting means, and starts to move said friction clutch to an engaged position when said load sensor detects an increase in load;

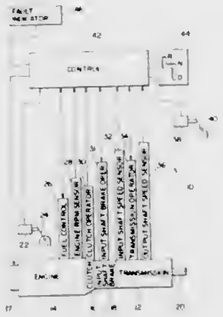
wherein, when said drive command means instructs the slope-start mode, said speed ratio changing means changes said parallel shaft type gear transmission to a slope-start speed ratio, and said start control means operates a wheel brake device of the vehicle and starts to move the clutch to the engaged position when said drive condition detecting means detects a braking force being applied to the vehicle operated by a parking brake of the vehicle, and said start control means maintains the operation of said wheel brake device until and engine rotation speed changes from an increase to a decrease state when the friction clutch reaches an engaged position.

4,899,858

METHOD AND CONTROL SYSTEM FOR UPDATING OF CONTROL PARAMETER VALUE INDICATIVE OF MASTER CLUTCH POINT OF INCIPIENT ENGAGEMENT

William F. Coté , Farmington Hills, and Donald Speranza, Portage, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 2, 1989, Ser. No. 318,100
Int. Cl.[4] B60K *41/02, 41/28*
U.S. Cl. 192—0.09 **10 Claims**



1. A method for controlling a master clutch (16) in an at least partially automated mechanical transmission system (10) for devices having a throttle controlled engine (14), a transmission having a plurality of gear ratio combinations selectively engageable between a transmission input shaft (58) and a transmission output shaft (20), said transmission input shaft being operatively connected to said engine by means of a selectably engageable and disengageable coupling (16) providing driving connection between said engine and said input shaft, an input shaft brake (18) for selectively retarding the rotational movement of said input shaft, said transmission system comprising an information processing unit (42) having means for receiving and storing a plurality of input signals including (1) an input signal (CPV) indicative of the position of the clutch; (2) an input signal indicative of the rotational speed of the transmission input shaft; and, (3) an input signal indicative of the rotational speed of the engine, said input signal indicative of the position of the clutch having a stored value ($IEPCPV_{Last}$) indicative of the incipient engagement point of the clutch, said processing unit including means for processing said input signals in accordance with predetermined logic rules and for generating output signals whereby said transmission system is operated in accordance with said program, and means (30,34) associated with said transmission system effective to actuate said transmission system in response to said output signals from said processing unit, the method characterized by:

updating the value of the control parameter value indicative of the incipient engagement of the clutch ($IEPCPV_{Last}$) by,

at vehicle start-up, if the engine is at idle speed and the transmission is in neutral, maintaining the engine at substantially idle speed, fully disengaging the clutch and applying the input shaft brake to stop rotational speed of the input shaft,

then, while maintaining the input shaft brake applied, gradually reapplying the clutch until initial rotation of the input shaft is sensed, and

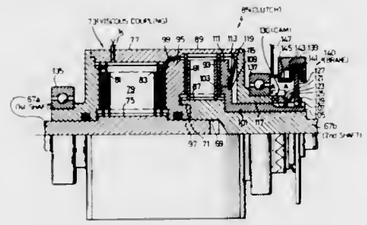
sensing the value of the signal indicative of the position of the clutch (CPV) at the time initial rotation of the input shaft is sensed.

4,899,859

POWER TRANSMISSION APPARATUS

Masao Teraoka, Tochigi, Japan, assignor to Tochigifujisangyo Kabushiki Kaisha, Tochigi, Japan

Filed Nov. 2, 1988, Ser. No. 266,126
Claims priority, application Japan, Nov. 5, 1987, 62-168425[U]
Int. Cl.[4] B60K *23/08*
U.S. Cl. 192—4 A **3 Claims**



1. A power transmission apparatus, comprising:

(a) a first rotary transmission shaft;

(b) a second rotary transmission shaft rotatably and coaxially coupled to said first rotary transmission shaft;

(c) an outer coupling case rotatably and coaxially disposed around said first and second rotary transmission shafts in such a way as to form an enclosed working chamber filled with a viscous fluid between said first rotary transmission shaft and one portion of said outer coupling case and a clutch housing between said second rotary transmission shaft and another portion of said outer coupling case;

(d) a plurality of resistant plates arranged within the working chamber and circumferentially fixed alternately to said first rotary transmission shaft and said outer coupling case, for coupling said first rotary transmission shaft to said outer coupling case via the viscous fluid;

(e) a clutch mechanism disposed within the clutch housing for engaging a disengaging said outer coupling case with or from said second rotary transmission shaft, said clutch mechanism including:

(1) a plurality of clutch plates arranged within the clutch housing so as to be alternatively circumferentially fixed but axially movable relative to said outer coupling case and said second rotary transmission shaft;

(2) a clutch spring arranged within the clutch housing; and

(3) a slide sleeve disposed coaxially with said secondary rotary transmission shaft and urged by said clutch spring toward said clutch plates to bring said clutch plates into contact with each other for clutch engagement; and

(f) clutch operating means including a foot brake, responsive to a braking force applied thereto, for operating said clutch mechanism.

3. A power transmission apparatus, comprising:

(a) a first rotary transmission shaft;

(b) a second rotary transmission shaft rotatably and coaxially coupled to said first rotary transmission shaft;

(c) an outer coupling case rotatably and coaxially disposed around said first and second rotary transmission shafts in such a way as to form an enclosed working chamber filled with a viscous fluid between said first rotary transmission shaft and one portion of said outer coupling case and a clutch housing between said second rotary transmission shaft and another portion of said outer coupling case;

(d) a plurality of resistant plates arranged within the working chamber and circumferentially fixed alternately to said first rotary transmission shaft and said outer coupling case, for coupling said first rotary transmission shaft to said outer coupling case via the viscous fluid;

(e) a temperature sensor for detecting temperature within the working chamber and outputting a temperature signal when the temperature within the working chamber rises above a predetermined temperature; and

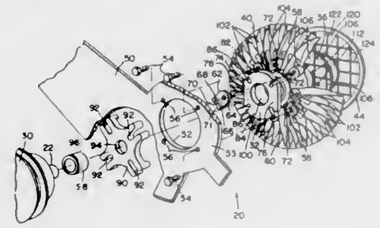
(f) a clutch mechanism, disposed within the clutch housing, for engaging or disengaging said outer coupling case from said second rotary transmission shaft in response to said temperature signal.

4,899,860

FAN CLUTCH MECHANISM

Paul W. Diederich, 633 Hunters Trail, Glendora, Calif. 91740

Continuation of Ser. No. 9,120, Feb. 11, 1987, abandoned. This application Jul. 14, 1988, Ser. No. 219,828
Int. Cl.[4] F16D *35/00*
U.S. Cl. 192—58 B **31 Claims**



1. A fan clutch mechanism for decoupling the rotation of a fan from a driving element including:

a shaft adapted for connection to the driving element having:

a rotor connected thereto, said rotor including:

a first radial substantially flat surface having:

a first plurality of depressed rectilinear grooves having distinct widths defined therein, said grooves including a first set of grooves and a second set of grooves, the two sets of grooves intersecting to define a grid pattern, said grooves of each set being widely spaced from each other by distance equal to at least a plurality of said groove widths to define substantial flat unridged surface areas therebetween; and

a housing having:

bearing means therein for allowing relative rotation of said housing with respect to said shaft and rotor;

fan mounting means thereon;

a first housing surface positioned parallel to and closely spaced to said first radial surface of said rotor, said first housing surface in part with said housing defining a cavity about said rotor, said first housing surface having:

a second plurality of depressed rectilinear grooves defined therein, said grooves being widely spaced apart to define substantial flat surface areas therebetween;

nonlinear fluid in said cavity with said rotor, whereby said nonlinear fluid between said first radial surface and said first housing surface shears when subjected to predetermined torque levels to rotationally decouple said rotor from said housing, and

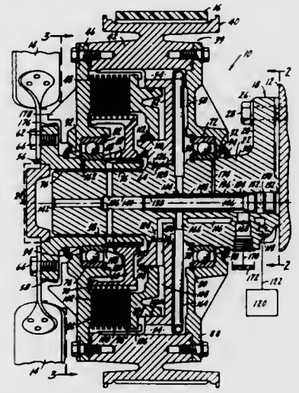
said flat surface areas defined by the grooves of the first plurality and the flat surface areas defined by the second plurality of depressed grooves being sized and configurated to act on said fluid to impart a sweeping action to the fluid to effect a random non-directional fluid movement to prevent development of hot spots within the mechanism.

4,899,861

VARIABLE SPEED DRIVE FOR ENGINE COOLING FANS

Gordon F. Cummings, III, Rockford, Ill., assignor to Rockford Powertrain, Inc., Rockford, Ill.

Filed Mar. 16, 1987, Ser. No. 26,504
Int. Cl.[4] F16D *25/061, 13/74;* **F16H** *57/00*
U.S. Cl. 192—85 AA **3 Claims**



1. A fan drive assembly comprising:

a nonrotatable mounting member having a cantilevered shaft portion;

relatively rotatable driving and driven members rotatably and coaxially arranged on said shaft portion by axially spaced bearings, with said driving member being provided with a fluid receiving chamber;

a wet clutch assembly disposed intermediate to said driving and driven members, said clutch assembly including at least two friction elements operatively connected to said respective members and adapted to be axially compressed to relatively couple said members, with said coupling varying as to relative rotational slip of said members in accordance with the force of axial compression thereon; and

a fluidically actuatable member cooperatively arranged in said chamber for applying a force of axial compression on said friction elements to compress same as a function of the amount of fluid pressure introduced into said chamber, said actuatable member and said chamber being arranged such that substantially no axial thrust load is applied to said bearings when a force of axial compression is applied to said friction elements;

said driving and driven members being provided with complementary means for preventing cord debris from becoming entangled thereabout.

4,899,862

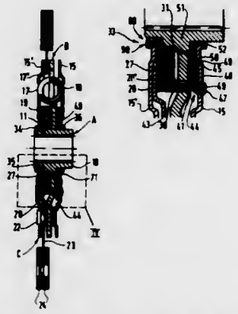
TORSION DAMPING DEVICE WITH A CENTRING RING MEMBER

Michel Graton, Paris, and Jacques Alas, Eaubonne, both of France, assignors to Valeo, Paris, France

Filed Apr. 14, 1988, Ser. No. 181,592
Claims priority, application France, Apr. 14, 1987, 87 05295
Int. Cl.[4] F16D *3/14, 3/66*
U.S. Cl. 192—106.2 **3 Claims**

1. A torsion damping device, especially for a disc type friction clutch for an automotive vehicle, said damping device comprising at least three coaxial parts rotatable with respect to each other within the limits of a predetermined sector of angular displacement and against the biassing action of resilient

means, said three parts being a first part comprising a hub, a second part comprising a main damper plate with between it and said hub relative rotational displacement means, and a third part comprising at least one rotatable element, which constitutes transversely an annular member surrounding said hub without displacement means, said device further having a resilient ring member radially interposed between said rotatable element and said hub and extending axially; and wherein said ring member comprises at least two separate elements of which a first portion is resiliently deformable radially with an



inner portion in contact with said hub, and a second element is relatively rigid with respect to said first element, said second portion comprising centring means for centring said ring member with respect to the main damper plate, and being mounted rotatably with respect to said rotatable element with an outer portion of said second elements being in contact with said rotatable element, and said second element being rigid and being centred with respect to the main damper plate by means of a spacing ring fixed with respect to said second portion element and extending entirely transversely of said hub.

4,899,863

METHOD OF MAKING A SHAFT FOR A CLUTCH FOR A COOLING FAN OF A MOTOR VEHICLE

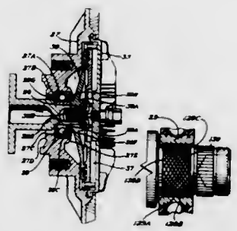
David J. Settles, Ft. Worth, Tex., assignor to Dayco Products-Eaglemotive, Inc., Fort Worth, Tex.

Division of Ser. No. 158,413, Feb. 22, 1988, abandoned, which is a division of Ser. No. 895,976, Aug. 12, 1986, Pat. No. 4,741,091. This application Oct. 21, 1988, Ser. No. 260,627

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[4] F16D *35/00*

U.S. Cl. 192—110 R **4 Claims**



1. In a method of making a shaft for a clutch for a cooling fan of a motor vehicle, said shaft having a first end to be attached to a rotatable member of the motor vehicle and having a second end defined by a cylindrically shaped knurled portion and an adjacent second portion, said knurled portion having protuberances defined by slots formed in the exterior of said shaft, said knurled portion having an outer diameter and having an inner edge adjacent said second portion and an outer edge adjacent said first end whereby a bearing means having an inner race member is adapted to be press-fitted onto said knurled portion, the improvement comprising the step of forming said shaft before using said shaft to form said clutch with a solid ring shaped portion between said knurled portion and said second portion and next to said inner edge of said knurled portion and with said solid ring shaped portion having an outer diameter about equal to that of said outer diameter of said knurled portion so as to have part of said inner race member of said bearing means be adapted to be press-fitted thereon whereby said solid ring shaped portion is adapted to block the flow of viscous fluid by way of said slots which define said protuberances of said knurled portion, said step of forming said shaft comprising the steps of first forming said knurled portion with said protuberances so that said knurled portion has a diameter larger than said solid ring shaped portion and then burnishing said protuberances and said solid ring shaped portion to about the same diameter, so that then said bearing means can be press-fitted on said knurled portion of said shaft so that said part of said inner race member of said bearing means can remain press-fitted on said solid ring shaped portion.

4,899,864

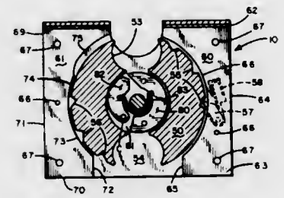
MULTIPLE COIN MECHANISM FOR A VENDING MACHINE

Roger Van Horn, Waconia, Minn., assignor to Protocol, Inc., Mendota Heights, Minn.

Filed Jul. 11, 1988, Ser. No. 217,156

Int. Cl.[4] G07F *5/02*

U.S. Cl. 194—237 **7 Claims**



1. For ensuring, before an item is vended, the deposit of a predetermined number of coins of a predetermined denomination into a vending machine having a vending linkage for controlling the dispensing of an item, a coin mechanism comprising:

(a) a front plate, said front plate including a coin slot;

(b) a rotatable knob having a shaft passing through the front plate;

(c) a cylindrical coin carrier fixed to said shaft for rotation therewith, said coin carrier including a pair of diametrically opposed coin members each of which are alignable with said coin slot, the coin chambers being dimensioned to receive at least one coin of a given denomination in face-to-face relation therein, at least two peripheral cut outs formed in said coin carrier, and an actuator means for coupling the coin carrier to the vending linkage of the vending machine to cause said vending machine to vend an item only upon 180 degree rotation of said coin carrier;

(d) at least one spring biased coin pawl equal in number to the number of coins required to meet the vend price pivotally affixed to said front plate;

(e) a first spacer plate means for engaging the coins upon rotation of said knob and coin carrier in a first direction to force each of said coins against its associate spring biased coin pawl to permit 180 degree rotation of said coin carrier in said first direction only when the number of coins of the given denomination equal to the vend price are present in one of said coin chambers;

(f) coin ejector means affixed to said front plate for ensuring that all coins exit said coin chamber of said coin carrier when the coin carrier is rotated approximately 180; and

(g) a spring loaded backup pawl for mating with the peripheral cut outs formed in said coin carrier to prevent 180 rotation of the coin carrier in a second direction opposite said first direction.

4,899,865

PRODUCTION LINE ARRANGEMENT WITH SELECTABLE TRANSPORT PATHS

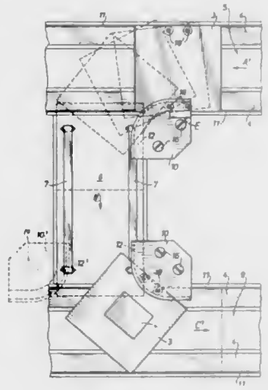
Bernd Keil, Reinach, Switzerland, assignor to Mat Menziken Automation AG, Menziken, Switzerland

Filed Nov. 15, 1988, Ser. No. 271,939

Claims priority, application Switzerland, Nov. 20, 1987, 4522/87

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—351 **21 Claims**



1. Production line arrangement for transporting transport plates (3) adapted for holding workpieces (2) along a transport path (5) and, selectively, along a diversion path (6) extending at an angle with respect to said transport path, having

transport belt means (4, 7) positioned along both the transport path and the diversion path for frictional engagement with the transport plates,

and comprising

at least one deflection plate (10) located at an intersection of the transport path (5) and the diversion path (6),

wherein said transport plates define at least one lateral edge extending in the direction of said transport path (5); and

wherein at least some of the transport plates (3) and the deflection plate (10) are formed with interengaging interfitting guide means comprising a groove (12) formed in the deflection plate and defining at least an arcuate path, and projecting means (13, 18) having spaced projecting portions loosely engageable in said groove (12) extending from at least some of the transport plates at spaced positions along said at least one lateral edge for engagement in said groove.

4,899,866

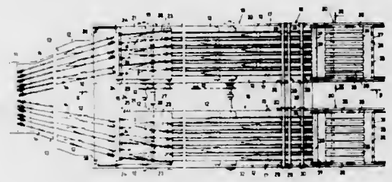
APPARATUS FOR THE ORDERED ARRANGEMENT AND CREATION OF A FEED STOCK IN BOXING PLANTS FOR CONES AND/OR CONOIDS

Arturo Colamussi, Ferrara, Italy, assignor to Vortex Systems S.r.l., Fossalta di Copparo, Italy

Filed Jul. 1, 1988, Ser. No. 214,390

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—418.1 **6 Claims**



1. An apparatus for the ordered arrangement and creation of a feed stock in boxing plants for cones and/or conoids, for positioning after first conveyor means which feed a stream of individual cones one after another, characterised by comprising a frame in which means are disposed for splitting in two the stream of the cones flowing from said first conveyor means towards second conveyor means which follow said splitting means, an escapement mechanism disposed at the other end of said second conveyor means and a pusher and positioning unit for transferring the cones towards containing means, said escapement mechanism comprising a set of three transverse elements which are mobile essentially vertically to halt and release sets of a predetermined number of the cones, a first and second of said transverse elements being spaced apart by a distance less than the distance between two successive cones and the second and third of said transverse element being spaced apart by a distance higher than said distance between two successive cones.

4,899,867

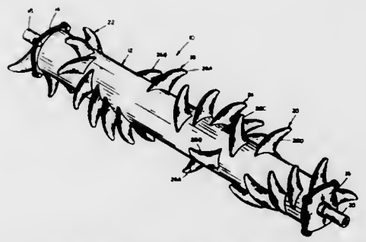
ROTOR FOR AN AGRICULTURAL FEED BAGGER

Kelly P. Ryan, P.O. Box 488, Blair, Nebr. 68008

Filed Jan. 25, 1988, Ser. No. 148,335

Int. Cl.[4] B65G *3/04*

U.S. Cl. 198—513 **2 Claims**



1. A rotor for an agricultural bagging machine, comprising,

an elongated cylindrical member having opposite ends,

a first set of rotor teeth mounted on the periphery of said cylindrical member extending from the center thereof to one end thereof,

the rotor teeth of said first set being radially offset from one another and arranged in a first helical pattern,

a second set of rotor teeth mounted on the periphery of said cylindrical member extending from the center thereof to the other end thereof,

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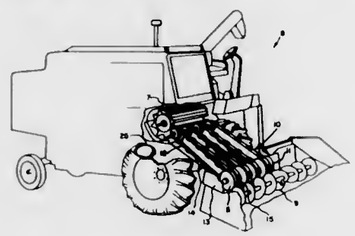
the rotor teeth of said second set being radially offset from one another and arranged in a second helical pattern,
said first and second helical patterns being opposed to one another,
a first set of auxiliary rotor teeth mounted on said cylindrical member inwardly of said one end and adjacent the center of said cylindrical member and being arranged in a helical pattern with the helical pattern of said first set of auxiliary rotor teeth being radially offset from said first helical pattern,
a second set of auxiliary rotor teeth mounted on said cylindrical member inwardly of said other end adjacent the center of said cylindrical member with said second set of auxiliary rotor teeth being arranged in a helical pattern with the helical of said second set of auxiliary rotor teeth being radially offset from the said second helical pattern,
said first and second sets of auxiliary rotor teeth being disposed on said cylindrical member within said first and second helical patterns defined by said first and second sets of said rotor teeth respectively whereby said rotor will have a larger number of rotor teeth positioned adjacent the center portion thereof than that adjacent its ends so that silage material delivered to the center of the rotor will be subjected to a greater number of rotor teeth than silage delivered to the ends of the rotor.

4,899,868

CONVEYOR FOR A CROP HARVESTER

David W. Johnson, Bennet, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 206,901, Jun. 15, 1988, abandoned, which is a continuation of Ser. No. 903,521, Sep. 4, 1986, abandoned. This application Apr. 19, 1989, Ser. No. 341,244
Int. Cl.[4] B65G *65/06*
U.S. Cl. 198—520 **6 Claims**



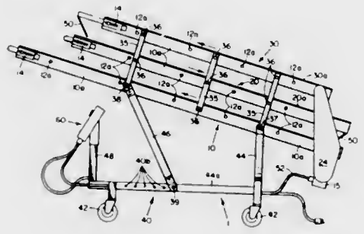
1. A crop conveying assembly comprising:
a plurality of side by side, transversely spaced, flexible belts free of transverse connecting links and having a width which is narrower than said transverse spacing; each of said belts having an elastomeric body with a top surface, a bottom surface, a high modulus tensile member disposed within said elastomeric body, a plurality of longitudinally spaced lugs integrally molded to the elastomeric body to form the bottom surface, a plurality of longitudinally spaced raised cleats integrally molded to the elastomeric body to form the top surface; and a conveyor bottom surface which traps the crop to be conveyed by the belts.

4,899,869

CONVEYOR FOR FOOD ARTICLES

Gregg E. Johnson, Boerne, Tex., assignor to Bakery Equipment & Service Co., Inc., San Antonio, Tex.

Filed Jan. 3, 1989, Ser. No. 293,051
Int. Cl.[4] B65G *37/00*
U.S. Cl. 98—603 **7 Claims**



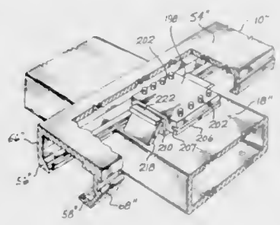
1. A conveyor for cooling hot baked food articles comprising:
(1) a first conveyor flight comprising:
a pair of elongated, stainless steel side rails disposed in laterally spaced, horizontally extending parallel relationship, each rail having a plurality of longitudinally spaced holes therein respectively aligned with the holes in the other rail;
a plurality of lubricious plastic support rods having their end portions respectively mounted in each aligned pair of said holes;
a pair of sealed bearings respectively secured to one end of said side rails in laterally aligned relationship;
a drive shaft journalled in said sealed bearings and having one end projecting therethrough; first sprocket means secured to said projecting end of said drive shaft for rotating said drive shaft;
second stainless steel sprocket means secured to said drive shaft intermediate said side rails;
a stainless steel wiremesh endless belt encircling said support rods and said drive shaft intermediate said side rails, thereby defining a conveyor having an input and a discharge end;
(2) a second conveyor flight substantially identical to said first conveyor flight except in length; means for mounting said second conveyor flight in substantially parallel, overlying relationship to said first conveyor flight, but having its discharge end overlying the input end portion of said first conveyor flight;
(3) motor driven means mounted on one end of said side rails of said first conveyor flight for rotating said drive shaft of said first conveyor flight; means interconnecting said first sprocket means of said first and second conveyor flights to drive said wiremesh endless belt of said second conveyor flight in reverse direction relative to said wire mesh endless belt of said first conveyor flight, whereby the baked food articles discharged from the discharge end of said second conveyor flight are received by the input end of said first conveyor flight and moved to the other end for discharge therefrom; and
(4) a floor engaging support for said first conveyor flight having a pair of laterally spaced, upstanding posts respectively secured to said side rails of one of said conveyor flights at a non-medial location; a pair of support links respectively bolted to said side rails of one of said conveyor flights and depending therefrom; and means for securing the bottom ends of said support links to a selected one of a plurality of longitudinally spaced positions on said floor engaging support relative to said support posts, thereby varying the angular position of both said first and second conveyor flights relative to the horizontal.

4,899,870

RECIPROCATING FLOOR CONVEYOR WITH SNAP-ON FLOOR MEMBERS

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Continuation-in-part of Ser. No. 68,932, Jul. 1, 1987. This application Jan. 29, 1988, Ser. No. 150,384
Int. Cl.[4] B65G *25/04*
U.S. Cl. 198—750 **7 Claims**



1. A reciprocating floor conveyor, comprising:
a plurality of floor members;
a support and guide means for each floor member on which the floor member is supported for back and forth longitudinal travel;
drive means for longitudinally moving the floor members in one direction for advancing a load and for longitudinally retracting the floor members in the opposite direction;
said drive means having engageable means for longitudinally pushing and pulling said floor members integral therewith; and
said floor members having longitudinally engageable abutment means integral therewith,
wherein said pushing/pulling means and said abutment means are sized to plug together vertically and to engage snugly in the longitudinal direction when each floor member is moved downwardly onto its support and guide means, and said engagement causes the back and forth directional motion of the drive means to be transferred to corresponding floor members,
wherein each floor member is of a channel form and has a top panel, a pair of opposite sides projecting downwardly from the top panel, and a pair of bottom flanges projecting inwardly from the sides and defining a space between said flanges, and wherein said abutment means includes a block having transversely straight end boundaries, being located, at least in part, vertically, between said bottom flanges and said top panel, and having a width extending substantially between said opposite sides, said block being attached to the floor member by a plurality of pins which pass substantially vertically through corresponding openings formed in the block and the top panel and one of said bottom flanges of the floor member.

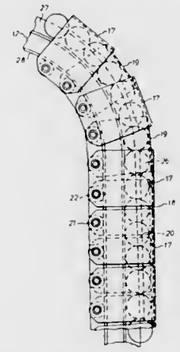
4,899,871

STORING INSTALLATION, PRIMARILY FOR AN ENDLESS CONVEYOR BELT TRAVELLING HELICALLY IN A NUMBER OF TURNS LAID UPON ONE ANOTHER IN A PILE

Lennart Olsson, Nyhamnsläge, Sweden, assignor to Frigoscandia Contracting AB, Helsingborg, Sweden

PCT No. PCT/SE87/00340, § 371 Date Jan. 11, 1989, § 102(e) Date Jan. 11, 1989, PCT Pub. No. WO88/00566, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 20, 1987, Ser. No. 300,016
Claims priority, application Sweden, Jul. 24, 1986, 8603202
Int. Cl.[4] B65G *13/02*
U.S. Cl. 198—778 **9 Claims**

1. A storing installation which comprises two endless chains (9, 10) supporting a load for the conveyance thereof along a conveyance path and travelling in opposition to said conveyance path in a return path (13, 14) having more tightly curved portions than said conveyance path, to form closed chain paths, and a frame (11, 12) for supporting said chains via at least one series of rolling elements (26) arranged between said frame and the respective chain (9, 10), characterised in that each chain (9, 10) comprises links (17, 19) overlapping one another along the upper side and one edge side of the chain and



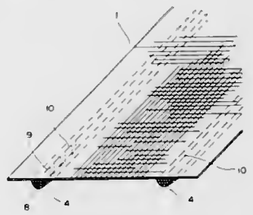
hingedly interconnected at the other edge side of the chain along axes perpendicular to the longitudinal direction and the lateral direction of the chain, such that the chain (9, 10) and the frame (11, 12) form an essentially closed channel for the rolling elements (26) also throughout the tighter return path (13, 14) where the links are swung out from one another about said axes.

4,899,872

ANTI-WEAVING CONVEYOR BELT

Naomi Hokao, Yokohama, Japan, assignor to Honda Sangyo Co., Ltd., Yokohama, Japan

Filed Feb. 23, 1989, Ser. No. 314,107
Claims priority, application Japan, Mar. 24, 1988, 63-38719[U]; Jul. 27, 1988, 63-99586[U]
Int. Cl.[4] B65G *15/38*
U.S. Cl. 198—840 **6 Claims**



1. An anti-weaving conveyor belt comprising a belt body which is composed of a heat-resistant, fluoroplastic-impregnated and calcinated sheet and a guide means fixed to the belt body in its longitudinal direction, characterized in that said guide means comprises a number of cords twisted together to form a round or square elongation, each cord comprising a number of heat-resistant, fluoroplastic-impregnated and calcinated fibers twisted together, said round or square elongation being joined to the back of said belt body by stitches of heat-resistant, fluoroplastic-impregnated and calcinated strands.

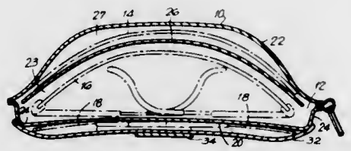
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4,899,873

CASE FOR SUNGLASSES

Maurice Bollè, Rue Tacon, Boite Postle 139, 01104 Oyonnax, Cedex, France, and Dean Bassett, 9033 W. Wisconsin Ave., Lakewood, Colo. 80226

Filed Feb. 29, 1988, Ser. No. 161,853
Int. Cl.[4] A45G *11/04*
U.S. Cl. 206—5 **10 Claims**



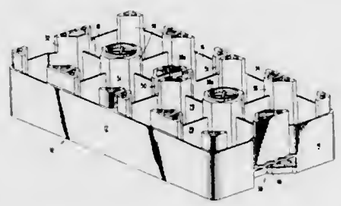
1. A protective carry case for eyeglasses comprising:
a container body for receiving and protectively enclosing eyeglasses, said container body having a curved front wall and a substantially straight rear wall, the front wall joined about its bottom and side peripheral portions to the bottom and side peripheral portions of the rear wall;
a contoured flexible partition having a length and width less than that of the front wall interposed between the front and rear walls of the container body and angled towards the front wall, a lower central peripheral portion of the partition fixedly attached to the bottom peripheral portions of the front and rear walls of the container body, the partition and the front wall of the container body defining a recess for receiving and protectively enclosed a replacement pane for said eyeglasses, the rear wall and the partition forming an opening into which a pair of eyeglasses is inserted into the case for storage therein;
a pocket for receiving replacement members for said eyeglasses and means for releaseably securing said pocket to said external rear wall of the container body;

4,899,874

STACKABLE LOW DEPTH BOTTLE CASE

William P. Apps, Anaheim, and James B. Rehrig, Rancho Palos Verde, both of Calif., assignors to Rehrig-Pacific Company, Inc., Los Angeles, Calif.

Filed Apr. 26, 1988, Ser. No. 186,140
Int. Cl.[4] B65D *21/00*
U.S. Cl. 206—201 **59 Claims**



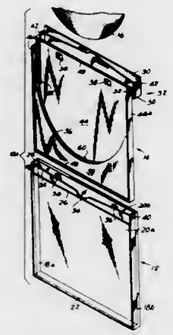
39. A stackable low depth case for retaining and transporting bottles comprising:
a plurality of outer side walls forming an outer shell having a low depth;
a case bottom disposed substantially within said outer shell; and
a plurality of columns, generally disposed within said outer shell, extending at least above a top surface of one of said side walls and defining, in combination with said case bottom and said outer shell, a plurality of bottle retaining pockets with at least one column per pocket;
said case bottom includes:
an upper surface which is substantially flat across the bottle retaining pockets; and
means for resting the case bottom on closures of bottles in a subjacent case and for aligning each closure with said case bottom for stacking said case.

4,899,875

ARTICLE FOR STORING OPTICALLY READABLE AND RECORDABLE DISC DEVICES

Arthur Herr, New York, N.Y.; Toby S. Welles, Norwalk, and Robert W. Johnson, Westport, both of Coun., assignors to Reynard CVC, Inc., New York, N.Y.

Continuation of Ser. No. 237,581, Aug. 26, 1988, and a continuation-in-part of Ser. No. 143,097, Jan. 13, 1988, Pat. No. 4,771,883. This application Jun. 2, 1989, Ser. No. 360,575
The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—313 **6 Claims**



1. An insertable drawer member configured and dimensioned for receiving and storing optically readable and recordable disc means within an outer housing in a manner so as to ensure that information bearing areas on said disc means are not damaged during insertion or removal therefrom, said insertable drawer member comprising:
(a) a base portion having upon one surface thereof a semicircular groove, said groove configured and dimensioned for receiving said optically readable and recordable disc means by pressure contact with non-information bearing areas of said disc means so as to releasably retain said disc means within said groove;
(b) a lid integrally formed with an upper portion of said base portion, said lid configured and dimensioned to include a V-shaped lower edge for contact relation with a corresponding V-shaped upper edge of said outer housing, which V-shaped housing edge ensures insertion and removal of said disc means in a manner which avoids damage to information-bearing areas thereof; and
(c) means for retaining said insertable drawer member and said disc means within said housing.

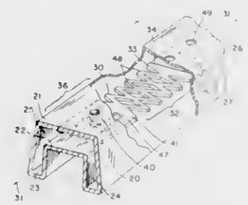
4,899,876

LOCKING SPRING FOR TUBULAR IC CARRIERS

Robert H. Murphy, Amherst, N.H.; Thomas C. Evans, LaPorte, and Demetrios E. Kapnias, Colorado Springs, both of Colo., assignors to R. H. Murphy Co., Inc., Amherst, N.H.

Filed Apr. 21, 1989, Ser. No. 341,692
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—334 **17 Claims**

1. A device for insertion in the end of a tubular carrier for integrated circuits to secure the same from sliding and chipping them during transport, said device comprising:
an elongated one piece longitudinally compressible spring which is slidable forward into the tubular carrier channel, having a longitudinally forward end abutting the circuit chip and another, longitudinally rearward end,



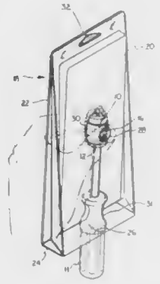
the rearward end having a rearwardly extending longitudinal extension, the extension having a portion transversely upwardly resilient tongue carrying an upwardly projecting pin resiliently biased against the top wall by the resilience of the tongue and forming with the top wall a latch when the spring is compressed with its forward end abutting the chip, thereby to hold the spring in compression against the circuit chip.

4,899,877

PACKAGING OF TOOLS

Vincent J. Kiernan, Hudson, Ohio, assignor to Bares Group, Chagrin Falls, Ohio

Filed Feb. 13, 1989, Ser. No. 310,306
Int. Cl.[4] B65D *75/02*
U.S. Cl. 206—349 **10 Claims**



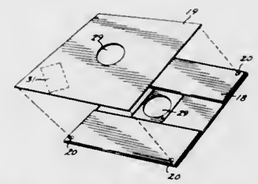
1. In combination a tool having a rotatable member and a non-rotatable member, said rotatable member being generally tubularly shaped and axially rotatable on said non-rotatable member, and a package enclosing said tool,
said package having at least one transparent section to reveal at least a portion of said tool,
said package having a pair of access openings, said access opening being configured and circumferentially spaced around the package with respect to each other to allow manual digital access to circumferentially spaced portions of said rotatable member of said tool;
and means to restrain said non-rotatable member from rotation upon rotation of said rotatable member;
whereby a person can rotatively manipulate a tool while said tool remains enclosed in its package.

4,899,878

CHRISTMAS TREE DISPOSAL BAG

Hugh Lofton, 3565 Linden Ave., Long Beach, Calif. 90807

Filed Jan. 30, 1989, Ser. No. 303,244
Int. Cl.[4] B65D *65/04*
U.S. Cl. 206—423 **13 Claims**



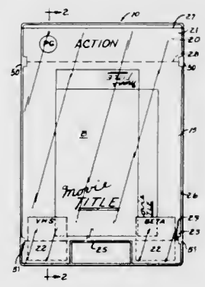
1. A combination disposal bag and underlay for a Christmas tree and the like, comprising:
flat sheeting material having a centrally located hole therein, said hole dimensioned to accept the trunk of such tree, said material extending outwardly in all directions from said hole a distance slightly greater than the height of such tree and further having fold lines therein to permit said sheeting to be folded in a regular compact flat configuration about the trunk of such tree;
a drawstring disposed about the periphery of said sheeting material to enable said periphery to be gathered up by pulling on said drawstring; and
an easily removable attached overlay for covering and maintaining said sheeting material as folded in its flat, compact configuration about the trunk of such tree, said overlay having a hole therein coinciding with the hole in said sheeting material contained thereunder;
whereby said sheeting in its covered state as disposed about the trunk of such tree stows easily and unobtrusively beneath such tree and upon removal of said overlay and unfolding of said sheeting material, allows such tree to be readily disposed of without littering the surroundings .

4,899,879

DISPLAY PACKAGE

Howard Rosen, 401 W. Superior St., Chicago, Ill. 60610

Continuation-in-part of Ser. No. 67,318, Jun. 26, 1987, Pat. No. 4,813,534. This application Aug. 15, 1988, Ser. No. 227,186
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—445 **16 Claims**



I. An indexing unit for audio-visual materials comprising:
a plurality of like display packages each for holding a folded box having indicia thereon,
each such display package comprising an envelop at least a portion of which is transparent to display such box indicia,

each said envelop comprising sheets of plastic material secured together on their edges, at least one end of said envelop being open to permit said folded box to be admitted into and withdrawn from said envelop, at least one of said sheets being rigid for holding said envelop upstanding,

each said envelop having a stop seam spaced apart from one edge of said envelop for holding said folded box away from said edge, and

a bin for containing said display packages upright arranged one display package behind another display package,

said bin being of a height less than the height of said display packages to reveal an upper portion of said display packages in said bin,

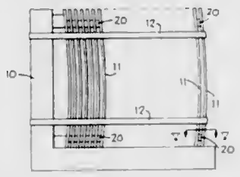
said display packages being removably seated in said bin and packed loosely in said bin to allow one such package to be flipped away from another of said packages for selective browsing through said plurality of packages.

4,899,880

FOAM PACKAGING SEPARATOR

Alan T. Carter, Village of White Pigeon, Mich., assignor to Carter Associates, Inc., Sturgis, Mich.

Filed Feb. 28, 1989, Ser. No. 316,490
Int. Cl.[4] B65D *85/48, 81/08;* **B32B** *3/30*
U.S. Cl. 206—448 **15 Claims**



1. In a packaging arrangement including rack means adapted to support a plurality of windshields thereon, a plurality of windshields mounted on said rack means, the windshields being disposed in upright condition and horizontally sidewardly adjacent one another, and a thin packaging separator sandwiched between each adjacent pair of windshields, the improvement wherein said packaging separator comprises:

a supporting sheet having generally parallel first and second side surfaces which define the thickness of the supporting sheet therebetween, said supporting sheet being of a generally nonresilient plastic foam material;

said supporting sheet having at least one shallow recess opening inwardly thereof from said first side surface, said recess being defined by a bottom wall which extends generally parallel with said first side surface and is located between said first and second side surfaces;

a sheet-like gripping member positioned within said recess and fixedly secured to said supporting sheet, said gripping member being constructed of a resilient plastic foam having adhering properties when compressed against a said windshield, said gripping member having a thickness when in a noncompressed condition which is substantially greater than the depth of said recess so that said gripping member defines thereon an outer gripping surface which is generally parallel with but spaced outwardly from said first side surface; and

said separator when engaged between an adjacent pair of said windshields having said first side surface engaged with one windshield of said pair, said second side surface engaged with the other windshield of said pair, and said gripping members grippingly engaged with and compressed by said one windshield with the compression being limited to the extent that the gripping surface assumes a position generally flush with said first side surface.

6. A packaging separator adapted to be disposed between first and second articles for permitting transmission of force therebetween while maintaining said first and second articles in spaced relationship, said separator comprising:

a sheet-like supporting member having generally parallel first and second side surfaces which are spaced apart and define therebetween the thickness of the supporting member, said supporting member being constructed of a generally noncompressible and generally rigid plastic foam;

said supporting member having at least one formed shallow recess therein and opening inwardly thereof from said first side surface, said shallow recess terminating in a generally flat bottom wall which extends approximately parallel with said first side surface but is located between said first and second side surfaces, said recess having length and width cross-sectional dimensions which are substantially greater than the depth dimension as measured between said first side surface and said bottom wall;

a sheet-like gripping member positioned within said recess, said sheet-like gripping member having length and width cross-sectional dimensions which are no greater than the respective length and width cross-sectional dimensions of said recess, said sheet-like gripping member having a back surface maintained in contact with and fixedly secured to the bottom surface of said recess, said sheet-like gripping member defining thereon a front surface which is adapted to grippingly engage one of said articles, said gripping surface being generally parallel with said first side surface; and

said gripping member being constructed of a resilient foam material, said sheet-like gripping member when in a noncompressed condition having a thickness which substantially exceeds the depth of said recess so that said gripping surface is spaced outwardly a substantial distance from said first side surface.

4,899,881

SIMULATED FOOD PRODUCT CARRIER

Leland K. Girard, 693 Madelyn Dr., Des Plaines, Ill. 60016, and Robert L. Hinchcliffe, 715 Daventry Dr., Baton Rouge, La. 70808

Filed Sep. 2, 1987, Ser. No. 92,406
Int. Cl.[4] B61D *73/00*
U.S. Cl. 206—457 **31 Claims**



1. A simulated food product carrier comprising:

a transparent wall element formed of a synthetic resin adapted to support edible foodstuffs without adverse physiological effect on one eating such supported foodstuffs, said wall element defining a rear surface;

a first representation of a front surface of a food product carrier on said rear surface to be viewable through said wall element; and

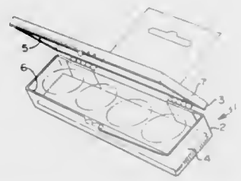
a second representation of a rear surface of said food product carrier underlying said first representation to be viewable from rearwardly of said wall element.

4,899,882

HANGING TAG PACKAGE ASSEMBLY

Cecilia Benner, 121 Elm Park, Pleasant Ridge, Mich. 48069

Filed May 18, 1989, Ser. No. 353,745
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—470 **17 Claims**



1. A combination container and hanging tag comprising:

a box-like container having a lid and a base;

said lid being selectively removable from a covering engagement with said base;

a foldable tag;

said tag folded so as to form a first portion of said tag in a size which fits within said container; and a second portion of said tag extending exteriorly of said container between said base and said lid when the lid and the base are engaged;

said tag first portion having a plurality of folded panels which oppose each other in stacked layers;

said tag second portion having a means for suspending the container;

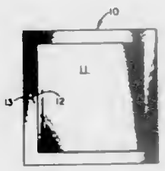
said tag first portion being further folded so as to place a part of said tag first portion in a position to support said container when said container is suspended by said tag second portion.

4,899,883

PACKAGE FOR AND METHOD OF PACKAGING POWDER AND OTHER FLUENT MATERIAL

Paul Weber, and Michael A. Tannenbaum, both of Ivyland, Pa., assignors to Delvco Industries, Inc., Ivyland, Pa.

Filed Oct. 27, 1988, Ser. No. 263,565
Int. Cl.[4] B65D *85/84*
U.S. Cl. 206—434 **7 Claims**



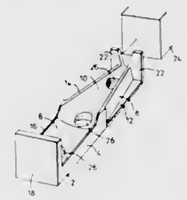
1. A package for powder and other fluent material, said package comprising a receptacle for the fluent material including a bottom wall and a peripheral side wall upstanding from the bottom wall to a generally planar upper extremity, a first frangible covering spaced over said bottom wall and sealing engaging the planar upper extremity of said side wall, said first covering having a material feed opening for receiving and engaging a material feed conduit for the discharge of the fluent material to the interior of said receptacle and a separate vent opening for receiving and engaging a vent tube for the removal of air and entrained fluent material from the receptacle when the fluent material is discharged from the material feed conduit, and a second imperforate frangible covering generally the same size as the first covering and sealingly engaging said first covering to hermetically enclose the contents of said receptacle.

4,899,884

SHIPPING AND SALES PACKING FOR STACKED WAFFLE CORNETS

Fritz V. F. Madsen, Grimhöjvej 7, DK-8220 Brabrand, Denmark

Filed Sep. 7, 1988, Ser. No. 241,192
Claims priority, application Denmark, Sep. 7, 1987, 4636/87
Int. Cl.[4] B65D *85/62, 81/16;* **A21D** *13/00*
U.S. Cl. 206—499 **10 Claims**



1. A shipping and sales packing for laterally stacked conical waffle cornets, the packing comprising at least a block member of light-weight material, at least one carrying and supporting groove means for carrying and supporting wide end parts of the laterally stacked cornets when received therein, a conical groove means for accommodating an outer exposed cornet in the laterally stacked cornets when received therein, at least one upright portion provided at least at one end of the block member and protruding to a level immediately above a top level of the laterally stacked cornets when supported by the block member, a plurality of through-hole means provided at base of the block member for a cooling ventilation of the cornets when placed in the carrying and supporting groove means of the block member in a newly-baked warm condition, and wherein each said hole means has a diameter smaller than a diameter of a larger conical section of an individual one of the stacked cornets but larger than a diameter of a smaller conical section of the individual cornets whereby each said hole means is adapted to carry or support a vertically oriented cornet therein when the block member is placed in an inverted carrying position supported by said at least one upright portion.

4,899,885

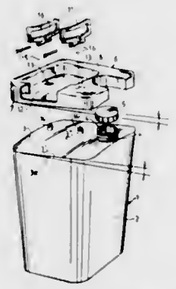
PLASTIC CONTAINER WITH STACKING ATTACHMENT PIECE

Cornelis G. Van Koert, Oosterhout, Netherlands, assignor to Wiva Verpakkingen B.V., Netherlands

PCT No. PCT/NL87/00030, § 371 Date Jun. 23, 1988, § 102(e) Date Jun. 23, 1988, PCT Pub. No. WO88/03504, PCT Pub. Date May 19, 1988
PCT Filed Nov. 6, 1987, Ser. No. 221,512
Claims priority, application Netherlands, Nov. 6, 1986, 8602812
Int. Cl.[4] B65D *21/00, 23/00*
U.S. Cl. 206—512 **12 Claims**

1. A plastic container for pourable material comprising a hollow body having a bottom surface, upstanding side walls extending upwardly from the bottom surface, a top wall connected to and closing the side walls, and a pouring/filling neck protruding upwardly from the top wall, a stacking attachment piece fitted onto the top of the hollow body and presenting an

upper surface lying above the pouring/filling neck which is complementary to the bottom surface, and carrying handle



means for detachably connecting the stacking attachment piece to the hollow body.

4,899,886

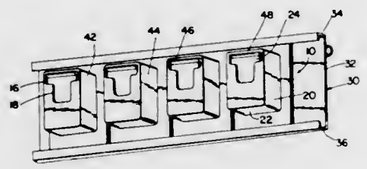
CARD BOX FOR DISPENSING AND DISPLAYING CARDS

Norman A. Johansen, North Ridgeville, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Dec. 30, 1988, Ser. No. 293,151

Int. Cl.[4] A45C *11/18*

U.S. Cl. 206—555 **10 Claims**



1. A package for displaying and dispensing cards, comprising:

a front panel and a back panel forming a recess therebetween in which cards may be placed, the front panel having an opening therein through which the cards may be seen and through which a finger may touch and push on the card;

a resilient biasing means in the recess positioned between the cards and one of the panels in order to hold the card firmly in the recess;

a cam surface along the edge of the recess and projecting through the opening in the front panel so that when a card is to be pushed toward the opening, the card engages the cam surface and part of the card moves out of the recess so that the card may be readily grasped and removed from the recess.

4,899,887

TOTE BAG AND ATTACHED WEIGHTLIFTER'S BELT

Curtis J. G. Cachero, 1911 Halakau Pl., Honolulu, Hi. 96821

Filed Apr. 28, 1989, Ser. No. 345,027

Int. Cl.[4] A45C *3/00, 13/00, 13/30;* **A63B** *71/12*

U.S. Cl. 206—579 **7 Claims**

1. A tote bag comprising:

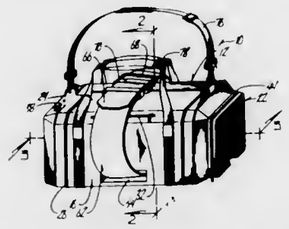
a container having a top wall, a bottom wall, opposite end walls, a front wall and a rear wall which combine to enclose a compartment therein;

an openable door flap in said container for permitting access to said compartment;

carrying strap means attached to said container;

said front and rear walls of said container each having a slot opening therein;

a tubular tunnel member extending between said slot openings of said front and rear walls and also extending through said compartment to form a tunnel therethrough;



a belt having first and second opposite ends and buckle means, said belt passing through said tunnel and said buckle means detachably securing said first and second opposite ends of said belt together so as to form said belt into a continuous loop passing through said tunnel and above said top wall.

4,899,888

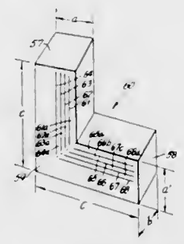
ADJUSTABLE PACKING CARTON FOR TRANSPORTATION OF RECTILINEAR ARTICLES

Ralph H. Shawler, Prospect, Ky., assignor to Packaging Service Corporation of Kentucky, Louisville, Ky.

Filed Jun. 27, 1988, Ser. No. 212,265

Int. Cl.[4] B65D *5/42, 85/30*

U.S. Cl. 206—586 **28 Claims**



1. A universal protective shipping container for transporting fragile rectilinear articles of various sizes which have generally planar front and rear surfaces comprising:

a rectangular carton adapted to enclose the article,

resilient material positioned between the walls of the carton and the adjacent front and rear surfaces of the article to cushion and support the surfaces of the article in a spaced apart relation from the carton walls, and

segmented, resilient, L-shaped corner inserts, each of the inserts comprising a plurality of readily detachable nested sections forming a pair of essentially perpendicular integral legs, the inserts adapted to be modified in size to be securely fitted between the inside corners of the carton and the exterior corners of the article to thereby support the exterior edges of the article.

4,899,889

DEVICE FOR MONITORING THE QUALITY OF CIGARETTES IN A PACKAGING MACHINE

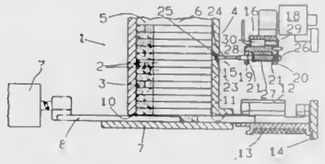
Antonio Gamberini, Bologna, and marco Brini, San Lazzaro di Savena, both of Italy, assignors to G. D. Societa Per Azioni, Bologna, Italy

Filed Dec. 4, 1987, Ser. No. 128,884

Claims priority, application Italy, Dec. 17, 1986, 3611 A/86

Int. Cl.[4] B07C *5/00;* **A24C** *5/343*

U.S. Cl. 209—535 **2 Claims**



1. A control device for monitoring at a control station on a cigarette packaging machine whether individual cigarettes are fully packed with a filling, at which control station each individual cigarette, while being monitored, is disposed with its longitudinal axis aligned in a given direction, arranged with an end oriented toward the control device, and supported in a way which prevents bodily movement of the cigarette away from the control device during monitoring, so that said end is disposed in an imaginary plane, normal to said axis and of known location;

said control device comprising:

a plunger having a longitudinal axis aligned in said given direction;

a frame;

an actuator; said frame being mounted to said actuator and said actuator being operable to move said frame a predetermined distance in said given direction between an extended position and a retracted position;

said plunger having an end arranged to contact a said end of a single cigarette at said imaginary plane in one said position of said frame, and to be spaced in said given direction form said end of said cigarette in the other said position of said frame;

longitudinally resiliently urged lost-motion permitting means mounting said plunger to said frame;

a trigger means rigidly fixed to the plunger and projecting therefrom in a direction normal to said given direction;

a proximity-sensing transducer oriented in said given direction in alignment with said trigger means, so that as said plunger is moved in said given direction, said trigger means is changed in proximity to said proximity-sensing transducer;

said predetermined distance which said actuator moves said frame, in use, being greater than the distance in said given direction between said end of said plunger and said imaginary plane when said frame is in said other position, so that as said frame is moved in said given direction, in use, from said other position to said one position, either said end of said plunger is prevented by a sufficiently fully-pack filling of said cigarette from entering said end of said cigarette, thereby preventing said trigger means from activating said proximity-sensing transducer, or is permitted by an insufficiently fully-packed filling of said cigarette to enter said end of said cigarette sufficiently to cause said trigger means to activate said proximately-sensing transducer; and

a control module for a kick-out device, said control module being operatively connected with said proximity-sensing transducer for providing an activation signal for the kick-out device in response to each activation of said proximity-sensing transducer, for kicking-out each cigarette sensed to be insufficiently fully packed.

4,899,890

SEPARATING APPARATUS WITH WOBBLING TAKE-UP ROLLER

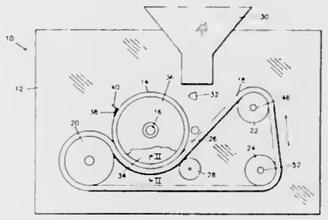
Richard C. Ewing, Box 654, Assonet, Mass. 02702; Walter V. Kuczewski, 244 Belleville, New Bedford, Mass. 02745; Gerald A. Thurber, 22 Hertiage Rd., Rehobeth, Mass. 02769, and Helmut Kunig, windberg 21, Bad Schwartau, Fed. Rep. of Germany

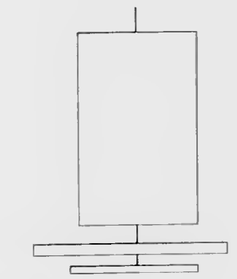
Continuation-in-part of Ser. No. 95,666, Sep. 14, 1987, Pat. No. 4,819,811. This application Sep. 9, 1988, Ser. No. 242,137

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[4] B07C *9/00;* **A22C** *17/00*

U.S. Cl. 209—699 **3 Claims**





1. A separating machine comprising:

a separating drum;

a plurality of foramina penetrating said separating drum;

a resilient belt reeved over said separating drum;

a pressure roller applying pressure through said resilient belt to a surface of said separating drum, whereby material to be separated disposed between said resilient belt and said pressure roller is urged through said plurality of foramina into an interior of said separating drum and a remainder of material remains on a surface of said separating drum;

at least one take-up roller;

said at least one take-up roller being disposed upstream of said separating drum and being effective for shaping said resilient belt to form a nip with said surface of said separating drum;

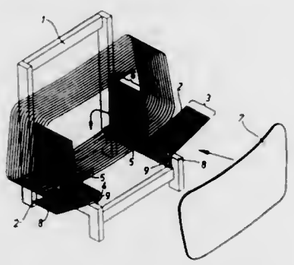
means for wobbling said at least one take-up roller with respect to an axis thereof, whereby said resilient belt is caused to wobble approaching said nip and a tendency for bridging said nip is overcome;

said means for wobbling including a wobbling roller; and

said wobbling roller including an axis rotation parallel to, and displaced from, a central axis of said wobbling roller.

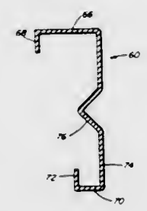
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4,899,891
METHOD OF AND STORAGE RACK FOR STORING GLASS SHEETS
Eero S. K. Sipilä, and Erkki P. J. Yli-Vakkuri, both of Tampere, Finland, assignors to Tamglass Oy, Tampere, Finland
Filed Jul. 1, 1988, Ser. No. 214,403
Claims priority, application Finland, Aug. 25, 1987, 873663
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—41 14 Claims



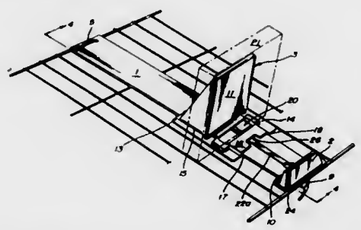
1. A storage rack for glass sheets comprising:
a framework having at least two carrier beams for bearing glass sheets and a plurality of intermediate supports for holding glass sheets in a substantially equally spaced, upright position on said at least two carrier beams, said plurality of intermediate supports being mounted on said at least two carrier beams;
a plurality of means for lifting said plurality of intermediate supports according to the weight of said glass sheets so as to hold said glass sheets in a substantially equally spaced, upright position, each of said plurality of means for lifting being disposed below the edges of said glass sheets.

4,899,892
EARTHQUAKE-RESISTANT ELECTRONIC EQUIPMENT FRAME
Denis J. A. Rheault, Brossard, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Mar. 8, 1988, Ser. No. 165,318
Int. Cl.[4] A47G *19/08*
U.S. Cl. 211—41 7 Claims



1. An earthquake-resistant electronic equipment frame comprising:
a base;
two elongate substantially parallel side members, secured to and extending upwardly from the base, including means for supporting electronic equipment therebetween; and
a top member secured to and extended between upper ends of the side members;
each side member having a cross-section consisting of a front flange, a rear flange, and a central portion extending therebetween, the central portion including an inverted-V portion extending from a general plane of the central portion of each side member on the same side thereof as the front and rear flanges, along substantially the entire length of the side m ember, and the front and rear flanges of each side member extending a substantially different distance from the central portion of each respective side member.

4,899,893
ADJUSTABLE SPACE SAVING DEVICE
J. David Robertson, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Feb. 21, 1989, Ser. No. 312,441
Int. Cl.[4] A47F *1/00*
U.S. Cl. 211—59.3 7 Claims

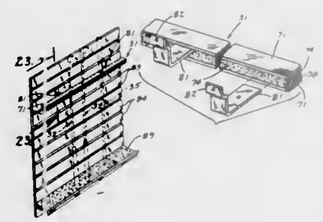


1. An adjustable device for holding a variable number of articles of similar size and shape in a compact space saving interrelationship, said device comprising an elongated base element having a flat planar upper surface, an abutment element fixed in position on said base element at one end thereof and projecting upwardly from and having an article engaging surface disposed in substantially normal relation with said flat planar upper surface of said base element, a sled slidably mounted on said elongated base element and having an article engaging panel projecting upwardly and disposed in generally parallel relation with said article engaging surface of said abutment element, said article engaging panel and said article engaging surface being arranged to hold one or more articles disposed therebetween in flat face contacting relation with said article engaging surface and with said article engaging panel and having a transverse portion overlying said base element and remote from said abutment element and an integral transverse connecting strip on the side of said sled adjacent said abutment element and disposed below and in closely spaced relation with said base, a pair of strips integral with said sled and angularly inclined so that the ends thereof which are nearest said abutment element are disposed at a level below said base element and integral with said transverse connecting strip and the opposite ends thereof are disposed at a level above said base element and are interconnected with opposite ends of said transverse portion so that a horizontal force imparted to said article engaging panel in a direction away from said abutment element forces said transverse portion of said sled mounting portion downwardly into frictional contact with said flat planar surface of said base and forces said transverse connecting strip upwardly into contact with said base thereby to impede sliding movement of said sled in a direction away from said abutment element.

4,899,894
MAGNETIC GOLF CLUB HOLDING APPARATUS
Gregory A. Crump, 4100 - 65th St., Urbandale, Iowa 50322
Filed May 15, 1989, Ser. No. 351,478
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—70.2 8 Claims

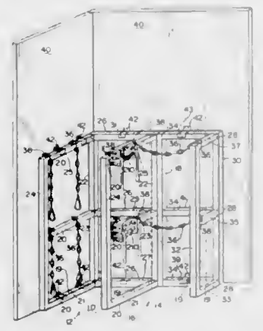
1. A magnetic golf club holding apparatus comprising:

a first elongated bar constructed of a material attracted by magnetic forces;
a second elongated bar constructed of a material attracted by magnetic forces;
magnetic means disposed between said first and second elongated bars for holding said first and second bars together and including magnetic forces into said first and second elongated bars;



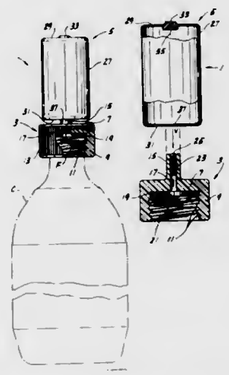
means for holding said first and second elongated bars above the floor; and
a golf club having a head with a metal shaft attached thereto, said metal shaft being held in an upright position substantially against said first and second elongated bars by magnetic forces from said magnetic means and said shaft being constructed of a material which is attracted by magnetic forces.

4,899,895
SUPPORT BRACKET SYSTEM FOR THE STORAGE OF GAS CYLINDERS
Timothy M. Espasandin, and James E. Greenburg, both of Hayward, Calif., assignors to Safe-T-Rack Systems, Inc., Sunnyvale, Calif.
Filed Feb. 17, 1988, Ser. No. 157,465
Int. Cl.[4] F17C *13/08*
U.S. Cl. 211—71 7 Claims



1. A modular gas cylinder support device, comprising:
at least one gas cylinder support structure being defined by a plurality of frame members, said frame members including a plurality of vertically disposed beam-like structural members and a plurality of horizontally disposed beam-like structural members; said vertical and horizontal members being fixedly engaged together to form at least one free standing three-sided gas cylinder storage bay wherein gas cylinders are stored in a floor-standing, vertical orientation;
at least one gas cylinder storage basket removably engaged within said storage bay, said basket being formed from a plurality of wire segments that are joined together to define four vertically disposed basket faces, said basket faces being arranged in opposing pairs, and said basket having a bottom face which is joined to lower portions of each of said vertically disposed faces;
said basket having at least one horizontally disposed level, said level being formed from at least one wire segment disposed in the plane of said level and engaged to vertical wire segments disposed in the plane of each of said faces; said level also including wire segments disposed in the plane of said level and oriented such that ends of said wire segments are joined to wire segments disposed in opposing vertical faces of said basket; and
each said face including a horizontally disposed wire segment forming a top edge of said face; and wherein a support structure engagement means is engaged to said basket proximate said top edge wire segment, each said support structure engagement means projecting laterally from said vertical face and supported by said horizontally disposed beam-like structural members of said support structure.

4,899,896
CONTAINER PRESSURIZING APPARATUS
David A. Metzger, 146 Hickory Lake, Belleville, Ill. 62223
Filed Apr. 6, 1988, Ser. No. 178,329
Int. Cl.[4] B65D *51/24*
U.S. Cl. 215—228 6 Claims



1. A cap in combination with a pressurizing device for pressurizing the interior of a container for carbonated beverages, the container having a threaded finish defining an opening therein, the cap comprising
a generally cylindric body having a top wall and a depending side wall, and internal threads for screwing the body onto the container, the body being formed for releasable connection of said pressurizing device thereto,
a seal underlying the top wall of the body adapted for sealing engagement with the finish of the container when the cap is screwed onto the container,
a passage in the body for providing communication between said pressurizing device and the interior of the container when the body is on the container, said body having a relatively long slender boss projecting up from the top wall of the body, and wherein the passage is of generally uniform diameter and extends axially of the boss and through the top wall of the body, said pressurizing device being adapted for releasable connection with the boss and being operable to introduce gas via said passage into the interior of the container to pressurize it, and
a single check valve member in said passage adapted for permitting flow of gas from said pressurizing device into the interior of the container via said passage, for blocking

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flow of gas out of the container via said passage when the pressure in the container is below a predetermined limit, and for permitting flow out of the container via said passage when said pressure reaches or exceeds said predetermined limit.

4,899,897

TAMPER-PROOF CONTAINER CLOSURE

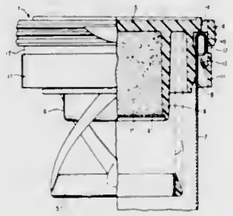
Jean-Pierre Büttiker, Witterswil, and Max Klaiber, Liestal, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 186,680, Apr. 21, 1988, abandoned, which is a continuation of Ser. No. 82,757, Aug. 6, 1987, abandoned, which is a continuation of Ser. No. 866,850, May 23, 1986, abandoned. This application Aug. 3, 1989, Ser. No. 389,247

Claims priority, application Switzerland, May 24, 1985, 2216/85

Int. Cl.[4] B65D *41/32*

U.S. Cl. 215—228 **8 Claims**



1. A container and stopper, comprising:

a. a container having an upper edge which defines an opening, and flange means formed at the upper edge of the container around the opening; and

b. a stopper having a cover plug, a tamper-proof ring, and attachment means for attaching the tamper-proof ring having an inner surface and tabs attached to said inner surface, said tabs being formed from a resilient material and being directed obliquely inwardly and in the direction of opening but not engaging said flange means for retaining the tamper-proof ring on the container when the cover plug is removed for the first time and the attachment means connecting the cover plug and the tamper-proof ring is broken.

4,899,898

CLOSURES FOR CONTAINERS

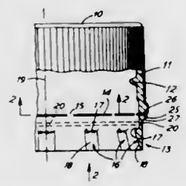
Nigel Thompson, Stourbridge, England, assignor to Metal Closures Limited, West Midlands, England

Filed Aug. 31, 1988, Ser. No. 238,862

Claims priority, application United Kingdom, Sep. 3, 1987, 8720683

Int. Cl.[4] B65D *41/34*

U.S. Cl. 215—252 **16 Claims**



1. A container closure molded from plastics material and comprising a top, an annular skirt depending from the top and formed with a screw-thread on its internal surface, a tamper-evidence ring, a series of frangible bridges extending across an axial gap between the ring and the skirt and connecting the ring to the end of the skirt remote from the top, and a series of radially inwardly projecting protrusions on the radially inner surface of the ring each having an end surface generally facing the top but inclined radially inwardly, the ring extending continuously between each adjoining pair of protrusions, so that outward deflection of the protrusions produces a hoop stress in the ring, and the ring having an annular groove formed in one of its radially facing surfaces at a location axially between the protrusions and the bridges.

4,899,899

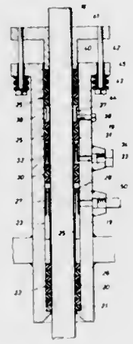
PRESSURE VESSEL

Marius R. Junier, Houston, Tex., assignor to Triten Corporation, Houston, Tex.

Filed Jun. 21, 1989, Ser. No. 370,233

Int. Cl.[4] F16J *15/14*

U.S. Cl. 220—3 **8 Claims**



1. A pressure vessel, comprising

a body in which fluid may be contained under pressure, and

a movable rod extending through a stuffing box mounted on the body to seal about the rod, said stuffing box including

a first packing assembly at its inner end,

a second packing assembly at its outer end,

a third packing assembly intermediate the first and second packing assemblies and including axially spaced, inner and outer packing sections,

a bleed ring intermediate the first and second packing assemblies and surrounding the rod with small clearance,

means for yieldably engaging the outer end of the second packing assembly in order to axially compress the packing assemblies,

means for limiting axially outward movement of the outer section of the third packing assembly section and injecting sealant between the sections in order to permit removal of the second packing assembly while the vessel is in service, and

means for injecting purge fluid into the clearance between the bleed ring and the rod at a pressure above that of the fluid contained in the body.

4,899,900

SWITCHING BOX

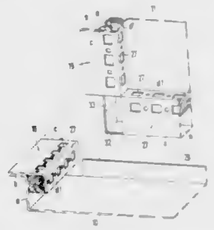
Jürgen Debus; Hans-Georg Koch, both of Dietzholztal; Jürgen Zachrei, Dillenburg, and Helmut Bütergerds, Eschenburg, all of Fed. Rep. of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 19, 1988, Ser. No. 246,224

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731547

Int. Cl.[4] B65D *6/34*

U.S. Cl. 220—4 R **22 Claims**



1. A switching box comprising: a framework support formed by framework side units, said framework support being closed by a bottom wall, a top wall and two side walls, said framework support having open sides which can be closed by at least one of a cabinet door and a rear wall, said framework side units each having a hollow profile, each side of said framework side units extending perpendicular to one another and oriented toward an internal space of said switching box having an equal series of holes on two perpendicular said framework side units oriented toward said internal space, and a protruding sealing bar extending from said side of said framework side unit facing an external side of said switching box, said framework side units comprising at least a portion of each said framework side unit attachable to another said framework side unit by having a multiple bending of a one piece plate (B) to at least one of said bottom wall (**10**), said top wall (**12**) and said side walls (**11**, **13**), each said framework side unit having a first section formed perpendicular to an internal side of said plate (B), said first section having a first transition into a second section formed outwardly from said first section parallel to said plate (B), said second section making a second transition into a third section which extends back along said second section and projects inward beyond said first section, said third section having a first series of holes (**27**), said third section making a third transition into a fourth section extending perpendicular from said third section toward said internal side of said plate (B), said fourth section having a second series of holes (27).

4,899,901

CONTAINER ARRANGED WITHIN A STACKING FRAME

Klaus-Dietrich Nickel, Frankfurt am Main, Fed. Rep. of Germany, assignor to KASA-TECHNOPLAN GmbH and INNOPLAN-Ingenieurgesellschaft Braas und Co. mbH, both of Frankfurt am Main, Fed. Rep. of Germany

Filed May 2, 1988, Ser. No. 189,305

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714394

Int. Cl.[4] B67D *5/64*

U.S. Cl. 220—5 A **43 Claims**

1. A tubular container for bulk materials, preferably finally comminuted powders, rotatable about its longitudinal axis and supported in a stacking frame, comprising:

a rotary drive for rotating the container;

a pair of quadrilateral roller frames each having four rollers arranged so that one roller is in each corner of each of the frames, the roller frames being arranged so as to form a primary structural component of the stacking frame;

a container outer peripheral surface;

a container inner peripheral surface;

two roller rings for the rollers fastened on the outer peripheral surface each of the roller rings being arranged so as to coact with the four rollers in one of the roller frames;

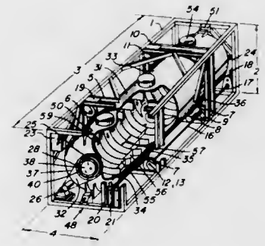
a container emptying bottom having a central aperture therein;

an emptying system combined with the emptying bottom and including a passage through the central aperture of the emptying bottom the emptying system including one of a suction nozzle and paddle arrangement combined with a torque support;

a spiral worm fastened to the inner peripheral surface so as to transport the bulk material to the emptying system during rotation of the container;

at least one filling stub provided at the outer peripheral surface; and

another container bottom opposite to the emptying system formed as a pressure-equalization base with gas passages of a pressure-equalization system located at an outer edge thereof.



4,899,902

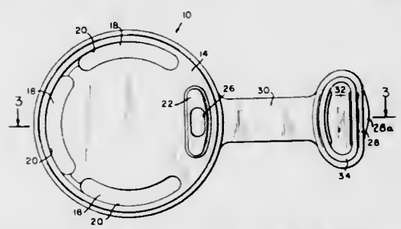
NO SPILL LID

Robert A. DeMars, 6145 Shoup, Woodland Hills, Calif. 91367

Filed May 15, 1989, Ser. No. 351,374

Int. Cl.[4] B65D *41/22*

U.S. Cl. 220—254 **6 Claims**



1. A one-piece, flexible plastic molded lid for a liquid container having a substantially circular opening comprising:

a substantially circular solid main body portion having a slightly greater diameter than said container opening and a flexible and downwardly extending peripheral portion, said main body portion further including peripheral spaced, recessed portions of an arcuate configuration extending downwardly from said main body portion, a portion of the inner wall of said downwardly extending peripheral portion and the outer wall of said peripheral recessed portions cooperatively engaging the uppermost portion of said wall of said container in friction-fit relationship to thereby seal said container;

a low profile, drinking spout positioned on said main body portion adjacent the periphery of said lid, and integral therewith, said spout comprising an upwardly extending, tapered, hollow member having a general arcuate configuration with an unobstructed interior and provided with an unobstructed opening; and

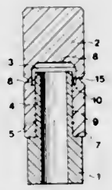
a low profile, cover integrally connected to a portion of said downwardly extending peripheral portion by means of a planar connecting member at least as wide as said drinking spout opening and being flexibly attached to the base of said downwardly extending peripheral portion adjacent said spout and having a length sufficient to permit sealing and removal of said cover with respect to said drinking spout by use of a person's thumb for unobstructed drinking, said cover being congruently shaped to said spout and provided with an inner peripheral ridge for sealing said cover to said drinking spout in friction-fit relationship and having an encircling flange to facilitate removal of said cover as set forth above.

4,899,903

TUBE ASSEMBLY PROVIDED WITH A BREAKAWAY PLUG

Eiichi Miyasaka; Tetsuro Nishimura, and Nobukazu Tanokura, all of Shizuoka, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 212,185
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—266 **3 Claims**



1. A tube assembly with a breakaway plug of a relatively rigid material comprising:

a tubular body having at least two open ends at least one of said ends having an end surface and an outer surface portion; and

a plug member having an open end and a closed end, said plug member being mounted on said one open end of said tubular body,

said plug member including on its inner surface;

an inner closing surface closing off said closed end,

a first inner-wall portion extending from the open end toward the closed end a predetermined distance, said first inner-wall portion being fixedly secured to said one open end of said tubular body, and

a second inner-wall portion extending from the first inner-wall portion to the closed end to define a space between the plug member and the tubular body, said space including two portions:

a first space portion extending circumferentially between the second inner-wall portion of said plug member and the outer surface portion of the open end of said tubular body, and

a second space portion extending between said inner closing surface of the plug member and the end surface of the open end of said tubular body,

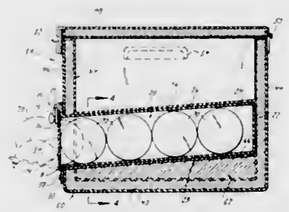
said plug member including on its outer surface a thin-walled frangible portion, which is breakable to allow separation of said plug member from said tubular body, said thin-walled frangible portion being located on the outer surface of said second inner-wall portion and located radially outside said first space portion, said one open end of the tubular body extending in said space beyond the thin-walled frangible portion toward the closed end of the plug member.

4,899,904

BEVERAGE CAN CARTRIDGE

Leslie T. Dooley, 2825 Whitener, Apt. A2, Cape Girardeau, Mo. 63701, and Stephen L. Perry, 302 Harrison, Sikeston, Mo. 63801

Filed Oct. 3, 1988, Ser. No. 251,837
Int. Cl.[4] B65D *81/18*
U.S. Cl. 220—413 **18 Claims**



1. A storage device for beverage cans comprising:

a cooler having an interior compartment adapted to receive therein a quantity of ice and a side opening; and

a removable cartridge for storing a plurality of beverage cans received within the opening of the cooler in detachable engagement therewith, the removable cartridge comprising an enclosure having an opening and a cover and comprising a box-like structure having a rear section, a pair of side sections, a top sections, a bottom section, and a front face plate comprising means for attaching the front face plate to the side of the cooler.

14. A storage device for beverage cans comprising:

a cooler having an interior compartment adapted to receive therein a quantity of ice and a side opening; and

a removable cartridge for storing a plurality of beverage cans received within the opening of the cooler in detachable engagement therewith, the removable cartridge comprising an enclosure having an opening and a cover comprising a front panel and a pair of side guards which are adapted to guide the beverage cans out of the enclosure onto the front panel.

15. A storage device for beverage cans comprising:

a cooler having an interior compartment adapted to receive therein a quantity of ice and a side opening, the cooler comprising an outer shell, an insulated liner fitted within the outer shell and an inner shell fitted within the liner, the liner comprising a sloped section which is downwardly inclined from the back of the cooler toward the front of the cooler; and

a removable cartridge for storing a plurality of beverage cans received within the opening of the cooler in detachable engagement therewith.

4,899,905

DISPENSING CONTAINER WITH SMALL PREMOISTURIZED CLOTHS

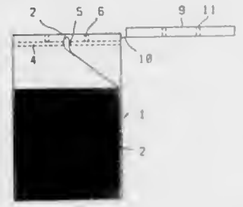
Ernst P. Holtsch, Taunusstein-Wingsback, Fed. Rep. of Germany, assignor to Holtsch Metallwarenherstellung, Taunusstein-Wingsbach, Fed. Rep. of Germany

Filed Aug. 27, 1987, Ser. No. 90,227
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 8701838
Int. Cl.[4] B65H *1/00*
U.S. Cl. 221—63 **10 Claims**

1. A dispenser comprising:

a continuous strip of liquid impregnated swabs formed as adjacent rectangles each having two corners diagonally opposite each other, said adjacent rectangles interconnecting with each other only at said two corners, said rectangles being symmetrical relative to a line extending through said two corners of all of said rectangles in an unfolded position of said strip, every adjacent two of said adjacent rectangles being folded only in a region of said corners between said adjacent rectangles so as to form a stack of said adjacent rectangles one on top of each other;

a dispensing container housing said stack and having an inner size corresponding to a size of each of said rectangles, said container having an end face with peripheral edges, said end face being formed with an opening spaced inwardly away from said peripheral edges and located



centrally of said end face, said stack including an uppermost one of said rectangles with a corner portion extending through said opening, said opening having a width approximately the size of a corner region of said adjacent rectangles immediately adjacent to the corners and being narrower than a diagonal width of said adjacent rectangles so as to resist passage of said adjacent rectangles from being pulled through said opening and thereby cause said adjacent rectangles to separate from each other at said region of said corners; and

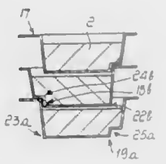
means for protecting said corner portion from contamination, said protecting means including a lid hinged to said container to removably enclose said corner portion entirely.

4,899,906

AUTOMATIC DISPENSER, PARTICULARLY FOR PACKAGES OF FOOD PRODUCTS

Luigi D. Bella, Viale Vittorio Veneto, 39, 31100 Treviso, Italy, assignor to Luigi D. Bella, Treviso Tv, Italy

Filed Apr. 22, 1988, Ser. No. 184,866
Int. Cl.[4] B65G *59/02*; G07F *11/14*
U.S. Cl. 221—67 **20 Claims**



1. Automatic dispenser particularly for packages of food comprising;

at least one box-like structure,

at least one exhibitor associated with said box-like structure,

at least one rotary magazine located within said box-like structure,

a plurality of radial sectors defined by said rotary magazine,

a plurality of plates each containing food and having a bottom, said plurality of plates being stacked on top of each other in at least one of said sectors whereby said bottom of one plate does not contact food contained in an underlying plate,

means for moving at least at least one of said plurality of plates outside said box-like structure, and

at least one elevator adapted for conveying said at least one of said plurality of plates from said one of said sectors to said means for moving,

wherein said plurality of plates are all identical to each other, and wherein each plate in said plurality of plates comprises;

three first alternate sides defining alternate sides of a first regular hexagon,

three remaining sides defining sides of a second regular hexagon, said second regular hexagon having greater dimensions than said first regular hexagon,

a perimetral contour having a regular hexagonal shape,

at least one bottom, and

a plurality of recessed seats, said recessed seats being formed in said bottom adjacent said first three alternate sides, each recessed seat in said plurality of recessed seats extending parallel to an adjacent one of said three first alternate sides.

4,899,907

DEVICE FOR AUTOMATICALLY DISPENSING TERMINALS FOR ELECTRIC CONDUCTING CABLES

André Benani, Seurre, France, assignor to La Telemecanique Electrique, France

Filed Jan. 19, 1988, Ser. No. 144,978
Claims priority, application France, Feb. 19, 1987, 87 02426
Int. Cl.[4] G07F *11/16*
U.S. Cl. 221—194 **7 Claims**



1. A terminal dispensing device for automatically dispensing, one by one connection terminals for electric conducting cables each having a conductor covered by an insulating sheath and a bared end, said terminals each having a tubular metal element intended to receive the bared end of the cable, and an insulating sleeve which extends the tubular element on one side thereof and which delimits an inner volume wherein the insulating sheath as well as a tubular element of an adjacent terminal may be engaged, which device comprises:

i. a body at least partially tubular-shaped, so as to contain at least first and second terminals disposed end to end, with the tubular element of the second terminal being engaged into the sleeve of the first terminal, said body having an end provided with a dispensing orifice,

ii. a reception part provided with a hollow receptacle having the shape at least partially complementary to that of the terminal,

iii. means for causing a relative movement of the said body and of the reception part, so as to bring the body into a position of cooperation in which the dispensing orifice is in line with and at a small distance from said hollow receptacle,

iv. at least one closure member comprising a resilient gripper formed by cylindrical sleeve engaging on said body and which is extended axially by at least two flexible tongues having, opposite said sleeve, an end provided with at least

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two respective jaws which project radially one towards the other so as to close the dispensing orifice at least partially in a rest position wherein no external action is exerted on said tongues, each of said jaws having an end provided with two successive slanted surfaces forming an angular narrowing, namely an end surface which converges towards the inside of the closure member and an internal surface which converges towards the outside of the closure member,

v. an abutment surface provided on a flange of the reception part which projects axially around the receptacle, said abutment surface bearing on the end surface and causing a flexure of the tongues for releasing the dispensing orifice when the reception part and the body reach said position of cooperation, so as to cause the transfer of the first terminal into the receptacle, said distance being determined so that the first terminal, once lodged in the receptacle, maintains the second terminal partially engaged in the body so as to be retained by the jaws when subsequently the body is spaced from the reception part and hence the closure member returns into its rest position.

4,899,908

VENDING MACHINE FOR DISPENSING HEATED PEANUTS

Dale Kardiak, 17454 Winemast, Fountain Valley, Calif. 92708

Filed Dec. 30, 1988, Ser. No. 292,325
Int. Cl.[4] B67B *7/00*
U.S. Cl. 222—1 **22 Claims**

1. A vending machine for dispensing heated peanuts comprising:

a substantially enclosed housing, having an upper, a lower and a front portion thereof;

an upper reservoir within the upper portion of said housing for containing a quantity of peanuts, and including a bottom thereof having a small planar outlet for permitting peanuts to fall from said upper reservoir when the outlet is not covered;

an actuator means having a proximal portion extending outside of the front of said housing and a distal segregator portion supported near the outlet of said upper reservoir and moveable within said housing for segregating a desired relatively small quantity of peanuts from said upper reservoir;

a lower reservoir enclosed within said housing and displaced from said upper reservoir for receiving the small quantity of peanuts from said segregator portion of said actuator;

means for heating only the small quantity of peanuts within said lower reservoir; and

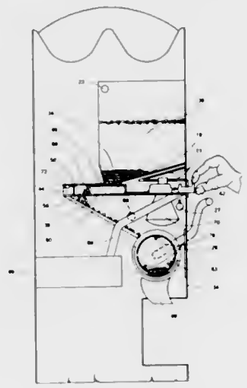
means for dispensing the heated peanuts from said lower reservoir to an exterior outlet in the front of said housing.

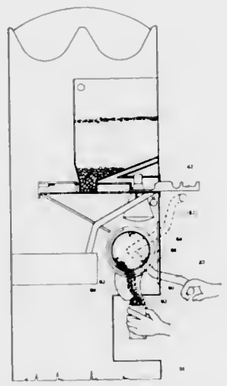
21. A method for dispensing heated peanuts from a vending machine comprising:

providing a bulk quantity of peanuts in an upper reservoir;

pushing a coin responsive actuator which has a distal portion which segregates a desired small portion of peanuts from said upper reservoir, and further releases the segregated portion to a lower reservoir which is displaced from said upper reservoir;

heating only the small portion of peanuts within said lower reservoir; and





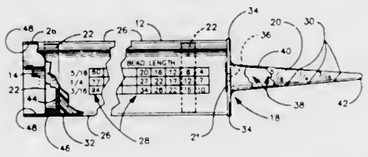
dispensing the heated peanuts from said lower reservoir into a container.

4,899,909

MATERIALS CONTAINER WITH INDEX MARKINGS

Wayne L. Summons, 10778 Polar La., Littleton, Colo. 80125, and Lester G. Burch, 8950 W. 87th Pl., Arvada, Colo. 80005

Division of Ser. No. 895,128, Aug. 11, 1986, Pat. No. 4,776,458; This application Sep. 9, 1988, Ser. No. 242,363
Int. Cl.[4] B67D *5/06, 5/38*
U.S. Cl. 222—25 **7 Claims**



1. A container for highly volatile viscous materials adapted to be applied as a bead onto a surface, said container adapted to permit visual monitoring of the contents thereof, comprising:

an elongated housing having a hollow interior and a tubular sidewall fabricated entirely out of a transparent material, an innermost portion of said sidewall radially facing the interior of the housing completely around said sidewall being composed of a high barrier plastic substance;

a nozzle member secured at a downstream end of said tubular housing and including an elongated snout having a passageway therethrough in fluid communication with the viscous materials contained in the interior of said tubular housing, said passageway varying in cross-section along its length whereby said snout may be selectively severed to form a downstream outlet for the viscous materials, said outlet thereby having a selectively variable size;

a piston member enclosing an upstream end of said tubular housing said piston member being slideably received in said interior so that the piston member may be pressed against the viscous materials to force the materials out of said outlet as said piston member is moved downstream through said tubular housing whereby the position of said piston member and the viscous material in said tubular housing may be visually perceived through said sidewall;

first index markings on said snout for indicating the size of the outlet formed when the snout is severed at a selected first index marking, and

second index markings on said sidewall, said second index markings correlated to said first index markings whereby, for a selected first index marking, the second index marking and said piston of the piston member cooperate to indicate the linear length of the bead which maybe applied by the viscous material remaining in the housing.

4,899,910

SEALANT INJECTOR

Kazuhiko Tabei, Ashikaga; Sadao Saito, and Shunichi Kai, both of Kitamoto, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 323,972
Int. Cl.[4] F03G *7/06;* **F24J** *1/00*
U.S. Cl. 222—54 **10 Claims**



1. A portable sealant injector for use in repair of cracks in concrete structures, comprising:

an injector body having a forward end formed with a sealant nozzle and having a rearward open end;

a piston releasibly fitted in said injector body by sliding movement relative thereto, said piston cooperating with the forward end of said injector body to define therebetween a sealant chamber capable of being filled with sealant;

a coil spring of a shape-memory alloy releasibly arranged within said injector body, for biasing said piston means toward the forward end of said injector body, when heated, to inject the sealant within said sealant chamber through said sealant nozzle;

a heating unit releasibly associated with said injector body, for heating said coil spring; and

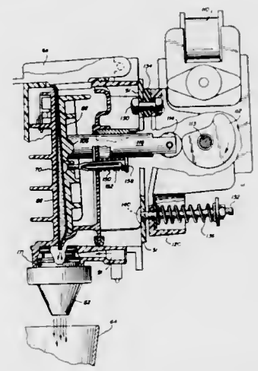
a cap detachably mounted on said rearward open end of said injector body.

4,899,911

APPARATUS AND METHOD FOR DISPENSING AN INDIVIDUAL BEVERAGE SERVING

William A. Robde, Lake Bluff; Joseph J. Pletka, Downers Grove; Brian R. Hochstatter, Sterling; Olaf Kivioja, Villa Park, all of Ill., and Thomas Otto, Gower, Mo., assignors to Multimix Systems, Inc., Oak Brook, Ill.

Filed Aug. 2, 1988, Ser. No. 227,243
Int. Cl.[4] B65D *35/28*
U.S. Cl. 222—103 **24 Claims**



23. A system for dispensing an individual serving of a beverage containing both a liquid flavoring constituent and a base liquid, said system comprising:

a rupturable packet containing a predetermined volume of said flavoring constituent and a predetermined volume of gas;

means for delivering said base liquid to a nozzle;

a packet rupturing mechanism including a wall and a platen adapted to receive and rupture said packet thereby discharging said flavoring constituent into said nozzle; and

platen control and drive means for continuously controlling the movement of said platen toward said wall in a preselected manner dependent upon the predetermined volumes of said flavoring constituent and gas within said packet to thereby obtain a predetermined flow rate of said flavoring constituent from said packet and a substantially uniform mixture of said flavoring constituent and said base liquid in said individual beverage serving.

4,899,912

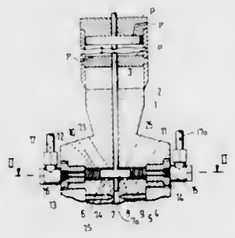
DEVICE FOR PREPARING AND EJECTING A CHEMICALLY REACTING MIXTURE

Klaus Pontius, Hermeskeil, and Manfred Settinger, Ockten, both of Fed. Rep. of Germany, assignors to Klockner Ferromatik Desma GmbH, Malterdingen, Fed. Rep. of Germany

Filed Aug. 21, 1987, Ser. No. 87,821
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3529021
Int. Cl.[4] B67D *1/08*
U.S. Cl. 222—145 **5 Claims**

1. A device for preparing a chemically reacting mixture, and for ejecting the mixture into a mold, the mixture comprising at least two components, in particular a mixture of isocyanate and a polyol that reacts completely to form polyurethane, the device comprising a mixing head having an outwardly open

first bore, a reciprocable ram coupled to said head, said ram having an ejector rod axially movable in said bore for ejecting the mixture from said chamber when in an extended position, said rod defining with said bore a mixing chamber in a retracted position of said rod, said head having inlet passages for inletting the respective components into said chamber for preparing the mixture, means associated with said ram for axially moving said rod between said positions for ejecting the mixture out of said chamber, said mixing head having an outwardly open second bore intersecting with said first bore, ceramic body means located in said second bore and comprising a pair of stripper elements having abutting end walls shaped to together form an opening of substantially the same shape and size as that of said rod, said second bore being so positioned relative to said passages that said rod extends through said opening in said retracted position of said rod, whereby any film or residue of the mixture adhering to said rod is stripped from said rod by said ceramic body means as said rod is retracted from said extended position.

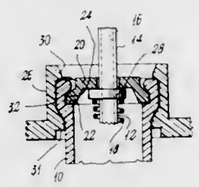


4,899,913

HAND PUMP FOR DELIVERING THICK OR LIQUID SUBSTANCES CONTAINED IN BOTTLES

Tommaso Ruscitti, Milan; Davide Cutilli, Penne, and Demetrio Del Leonardis, Spoltore, all of Italy, assignors to S.A.R. S.p.A., San Giovanni Teatino, Italy

Filed Aug. 5, 1988, Ser. No. 228,516
Claims priority, application Italy, Apr. 12, 1988, 20174 A/88
Int. Cl.[4] B67D *5/40*
U.S. Cl. 222—385 **16 Claims**



1. A hand pump comprising:
(a) a hollow main body having a first end and a second end;
(b) a cap snap-engaged in the first end of said hollow main body, said cap having:
(i) a through hole passing therethrough;
(ii) an outer surface and an inner surface relative to the interior of said hollow main body; and
(iii) a protuberance sized, shaped, and positioned to extend radially outwardly of said hollow main body and to be received in a first recess in an enclosure for a substance to be pumped;
(c) an operating stem slidably received in said through hole;
(d) a collar carried by said operating stem in position to abut against said inner surface of said cap to define one limit of travel of said operating stem; and
(e) means for biasing said collar against said inner surface of said cap.

4,899,914

METHOD FOR PRODUCING A STERILE PRESERVATIVE-FREE AEROSOL SALINE SOLUTION

Erwin Schweigl, Bramalea; Thomas P. Hayes, Waterdown; Dusan Kljajic, Etobicoke, and Rolf Jellositz, Mississauga, all of Canada, assignors to CIBA-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 4, 1988, Ser. No. 267,025
Int. Cl.[4] B65B *31/02;* **B65D** *83/14*
U.S. Cl. 222—394 **10 Claims**

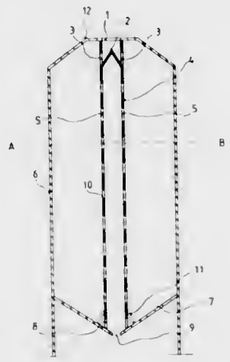
1. A method for producing a sterile preservative-free aerosol product comprising:
(a) aseptically filling a presterilized aerosol container with a solution preserved with sufficient hydrogen peroxide, said solution containing or mixed with the product to be dispensed;
(b) aseptically introducing into the aerosol container means for converting the hydrogen peroxide into inert substances one of which is a propellant; and
(c) sealing and storing the aerosol container for a time sufficient to allow complete inactivation of the hydrogen perixode and creation of sufficient propellant to dispense the product from said aerosol container.

4,899,915

SILO FOR BULK GOODS

Fritz Toepel, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Zement AG, Heidelberg, Fed. Rep. of Germany

Filed Sep. 6, 1984, Ser. No. 647,997
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332226
Int. Cl.[4] B65D *8/26*
U.S. Cl. 222—459 **10 Claims**



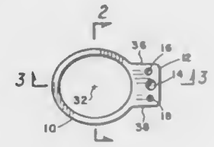
1. A substantially upright container for bulk goods in substantially solid form, having a frame, a base and support members to maintain the container in a substantially upright position, an inlet opening for filling the container and an outlet opening for emptying the container, and a generally-cylindrical conduit inside the container, extending between the inlet opening and the outlet opening, for emptying the container, said conduit having openings in its wall for connection with the body of the container, said container having a sound-absorbing layer adhering to the inside wall of the conduit, for direct contact with the bulk goods in the conduit.

4,899,916

RING NEEDLE PUSHER

Blue H. Townsend, Bartlesville, Okla., assignor to John D. Gassett and Paul H. Johnson, both of Tulsa, Okla.

Continuation of Ser. No. 155,120, Feb. 16, 1988, abandoned, and Ser. No. 36,105, Apr. 8, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 271,333
Int. Cl.[4] D05B *91/04*
U.S. Cl. 223—101 **1 Claim**



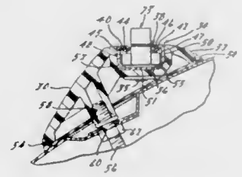
1. A ring needle pusher comprising:
a ring for wearing on a finger and having a finger receiving opening of a size to fit between the end and first joint of said finger, said ring having a circumference, ring plane, a diameter and width in which the diameter is at least two times the width, said ring having a front side and a back side and being uniform in cross section of planes parallel to said ring plate from said front to said back;
a needle pushing head with a forward face, said head being a raised blocklike portion of said ring along only a part of the circumference of said ring, said head having only three needle receiving indentations in its face thereof of which one constitutes a main needle receiving indentation and others constitute secondary needle pushing indentations, one on each side of said main needle receiving indentation, each said indentation having an axis substantially perpendicular to said ring plane, said head having a width which is no greater than the width of the ring.

4,899,917

VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236, assignor to John A. Bott, Madison Heights, Mich.

Continuation of Ser. No. 213,899, Jun. 30, 1988, Pat. No. 4,877,168, which is a continuation of Ser. No. 3,134, Jan. 14, 1987, Pat. No. 4,754,905, which is a continuation of Ser. No. 778,385, Sep. 20, 1985, Pat. No. 4,684,048. This application Nov. 23, 1988, Ser. No. 276,356
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[4] B60R *9/04*
U.S. Cl. 224—326 **13 Claims**



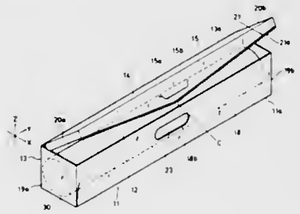
1. An article carrier slat adapted to be permanently secured to a motor vehicle adjacent to a generally horizontal extending body surface of said vehicle having arcuate edges arcuately transverse to and extending along the longitudinal length thereof, said slat extending generally longitudinally of the motor vehicle, comprising:
at least one substantially flat upper article supporting surface extending substantially the length of said slat, said slat having major and minor transverse dimensions with said major dimension being parallel to said body surface and said supporting surface, said supporting surface being disposed in a location off set from the longitudinal centerline of the slat and having inner and outer edges,
means for attaching article securing devices to said slat including an elongated channel in said supporting surface and extending substantially the length thereof and having elongated means within the channel to secure said article securing devices to said channel and said slat;
an upper external surface having a first edge contiguous with the outer edge of said support surface and aerodynamically conformable to the arcuate edge of the vehicle surface such that said upper external surface has a transverse curvature substantially coinciding with the curvature the arcuate edge of the vehicle surface, said upper external surface having an opposite second edge; and
a bottom surface extending between said inner edge and said second edge and complimentarily contoured to and adapted to rest on the arcuate edge of the vehicle surface; and
means for fixedly securing said slat to said vehicle.

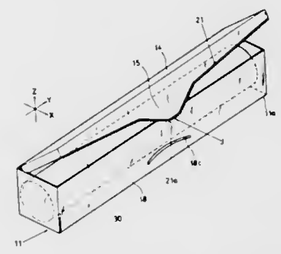
4,899,918

DISPENSING CARTON FOR A ROLL FILM

Isao Oketani, and Yorio Takemura, both of Tokyo, Japan, assignors to Kurbeha Chemical Industry Company Limited, Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,127
Claims priority, application Japan, Apr. 20, 1987, 62-60179[U]
Int. Cl.[4] B65D *85/67*
U.S. Cl. 225—43 **5 Claims**





3. A dispensing carton in which a roll of film is contained comprising a box including a bottom panel, a rear panel, a front panel, both side panels and an opening formed in an upper portion of the front panel, a lid member which is hingedly joined to the rear panel, a front flange joined to an end of said lid member to overlap said front panel when said lid member is closed, said front flange formed into a triangle with an intermediate portion on the form of a trapezoid which protrudes

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downwardly to a base of said box and a tear strip provided continuously on and integrally with an edge of said front flange with said tear strip separated from the front flange by a perforation line, a cutting member provided on said edge of said front flange along said triangle and said intermediate trapezoidal portion and including a saw tooth edge which is lined up along said edge of said front flange and said tear strip and said saw tooth edge are arranged and configured such that when said tear strip is separated from said front flange, the teeth of said saw tooth edge are exposed along said edge of said front flange.

4,899,919

SELF ENERGIZING FASTENER SYSTEM

Thomas E. Clumb, 5505 N. Illinois, Indianapolis, Ind. 46208

Filed Apr. 1, 1988, Ser. No. 176,449
Int. Cl.[4] B25C *1/10*
U.S. Cl. 227—9 **3 Claims**



1. A fastener assembly comprising a fastener having a shaft portion, and a head portion of relatively larger diameter than said shaft portion, said head portion having a surface contiguous to said shaft portion and a free surface remote from said shaft portion, and a deflagratable propellant pellet comprising a cylindrical body of substantially the same diameter as said head portion, said body having a first or affixing surface and a second or impact surface, said first surface, of said pellet being affixed to said free surface of head portion, said body of said pellet extending axially from said head portion and affixed to said free surface of said head portion thereby forming a unitary fastener assembly.

4,899,920

APPARATUS FOR REMOVAL AND INSTALLING ELECTRONIC COMPONENTS WITH RESPECT TO A SUBSTRATE

Louis A. Abbagnaro, Silver Spring; Robert G. Brown, Annapolis; William J. Siegel, Silver Spring; William J. Kautter, Columbia, and Robert S. Quasney, Sr., Pasadena, all of Md., assignors to Pace Incorporated, Laural, Md.

Division of Ser. No. 158,724, Feb. 22, 1988. This application Apr. 20, 1989, Ser. No. 340,772
Int. Cl.[4] B23K *3/00*
U.S. Cl. 228—11 **13 Claims**

1. A heater assembly or removing or attaching electronic components with respect to a substrate, solder being associated with the components, comprising:

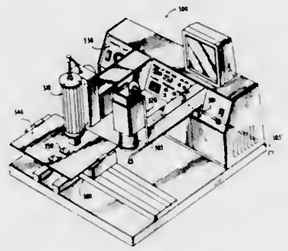
means for delivering a gas;

heater means for heating the gas;

nozzle means for directing the heated gas to said solder applied to the leads of said electronic component and/or lands of said substrate where said component is:

first temperature sensing means for sensing the temperature of said heater means;

second temperature sensing means for sensing the temperature of said heated air;



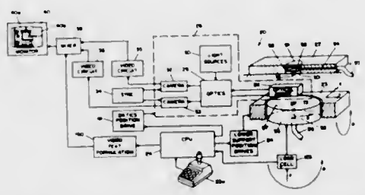
temperature control means responsive to said first and second temperature sensing means for controlling the temperatures of said heater means and said heated air substantially independently of one another; and the solder applied to the leads of an electronic component and/or lands or a substrate is heated to effect removal or attachment of the component with respect to said substrate via said leads and lands.

4,899,921

ALIGNER BONDER

Zvi Bendat, East Brunswick, and David A. Leggett, North Plainfield, both of N.J., assignors to The American Optical Corporation, Southbridge, Mass.

Filed Oct. 28, 1988, Ser. No. 263,709
Int. Cl.[4] H01L *21/68, 21/58*
U.S. Cl. 228—105 **24 Claims**



1. An aligning and bonding tool for use in aligning and bonding locations on facing surfaces of parts of a miniaturized electronic component, comprising a first support means for supporting a first of said parts, second support means for supporting a second of said parts with the surface thereof facing the surface of the first part, means for controlling relative positioning of the first and second support means, an optical probe for movement into a position between the facing surfaces of the parts, illumination means for lighting each of the facing surfaces, optical means for directing an optical image of each of the facing surfaces away from the probe, and video means responsive to the optical images for combining the optical images of the facing surfaces into a single video image, whereby the means for controlling relative positioning of the first and second support means effects relative positioning of the video representation of the facing surface locations to be aligned to enable visual alignment of locations of the facing surfaces.

4,899,922

BRAZED THERMALLY-STABLE POLYCRYSTALLINE DIAMOND COMPACT WORKPIECES AND THEIR FABRICATION

David E. Slutz; Paul D. Gigl, both of Worthington; Gary M. Flood, Canal Winchester, and Gary W. Smith, New Albany, all of Ohio, assignors to General Electric Company, Worthington, Ohio

Filed Feb. 22, 1988, Ser. No. 158,575
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—121 **13 Claims**

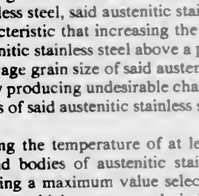
1. In a method for fabricating a brazed implement comprised of a compact of self-bonded diamond particles having a network of interconnected empty pores dispersed throughout the compact bonded to itself or to a cemented carbide support by a brazing filler metal, the improvement which comprises brazing said compact to another compact or to a cemented carbide support using a brazing alloy having a liquidus above about 700° C. and containing an effective amount of chromium.

4,899,923

HIGH PRESSURE BONDING PROCESS

Shane J. Findlan, Concord, N.C., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 144,537, Jan. 14, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 307,228
Int. Cl.[4] B23K *20/00, 20/22, 20/24*
U.S. Cl. 228—193 **4 Claims**



1. A method of forming a bond along a common junction between abutting surfaces of at least first and second bodies of austenitic stainless steel, said austenitic stainless steel having at least the characteristic that increasing the temperature of said bodies of austenitic stainless steel above a predetermined value causes the average grain size of said austenitic stainless steel to change thereby producing undesirable changes in the metallurgical properties of said austenitic stainless steel, comprising the steps of:

(a) controlling the temperature of at least one of said first and second bodies of austenitic stainless steel within a range having a maximum value selected to be below the temperature which causes undesirable changes in the metallurgical properties of said first and second bodies of austenitic stainless steel to produce a temperature differential therebetween, said temperature differential causing the relative dimensions of said first and second bodies of austenitic stainless steel to change;

(b) positioning said second body in a cavity in said first body;

(c) reducing said temperature differential and maintaining the temperature of said first and second bodies below the temperature which causes undesirable changes in the metallurgical properties of said first and second bodies of austenitic stainless steel to selectively change the relative dimensions of said first and second bodies of austenitic stainless steel thereby causing selected adjacent surfaces of said first and second bodies of austenitic stainless steel to contact to form said common junction and produce sufficient force across said common junction to cause cold working of the contacting surfaces forming said common junction thereby reducing the average grain size of said first and second bodies in regions adjacent said common junction;

(d) applying pressure to selected exterior surfaces of said first and second bodies of austenitic stainless steel, said force being directed to increase the force across said common junction; and

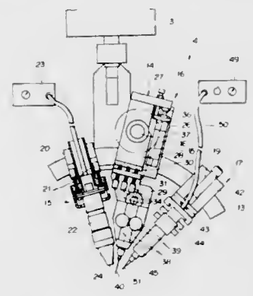
(e) increasing the temperature of said first and second bodies of austenitic stainless steel to a selected value thereby causing the grain structure of said cold worked portions of said first and second bodies of austenitic stainless steel to recrystallize to produce a substantially uniform grain structure and substantially uniform metallurgical properties throughout said first and second bodies of austenitic material and also producing a bond along said common junction, said bond and all other portions of said first and second bodies of austenitic material having metallurgical properties equivalent to the metallurgical properties of said first and second bodies of austenitic material prior to the formation of said bond.

4,899,924

AUTOMATIC SOLDERING METHOD AND DEVICE

Seiji Kawaguchi, Tokyo, Japan, assignor to Apollo Seiko Ltd., Japan

Filed Jul. 22, 1988, Ser. No. 223,445
Claims priority, application Japan, May 30, 1986, 61-123507
Int. Cl.[4] B23K *3/04, 3/06*
U.S. Cl. 228—242 **11 Claims**



1. A method of automatic soldering of a first component to a second component in an area, comprising the steps of:

heating the area directly by irradiation of said area with a light beam;

activating flux on said area by direct irradiation of said flux with said light beam;

directly melting a tip of string solder with said light beam by placing the tip of said string solder in the path of radiation from said light beam; and

applying said melted string solder to said area so as to solder said area with said melted string solder.

4,899,925

CROWNED MEAT TRAY

Thomas A. Bowden, Tinley Park, and Brian L. Wilt, Frankfort, both of Ill., assignors to Mobil Oil Corporation, New York, N.Y.

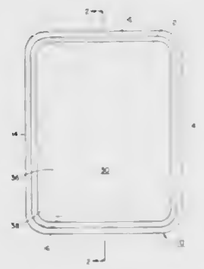
Continuation-in-part of Ser. No. 175,076, Mar. 30, 1988, abandoned. This application Sep. 6, 1988, Ser. No. 240,306
Int. Cl.[4] B65D *1/42*
U.S. Cl. 229—2.5 R **12 Claims**

1. In a molded packaging tray for the packaging of meat, fish, poultry, comestibles or non-food commodities for use with a transparent overwrap film extending thereabout, said tray comprising upwardly and outwardly inclined side walls forming sides for said tray; bottom wall means for supporting

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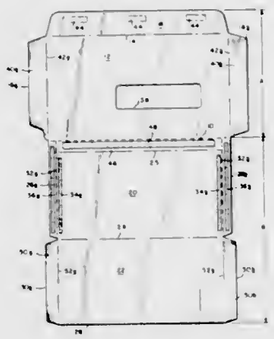
said meat, fish, poultry, comestibles or commodities including a flat peripheral bottom wall portion; and a curvilinear wall portion extending between and joining said bottom wall and lower ends of said sidewalls so as to provide a smoothly contoured transitional surfaces therebetween of a thickness which is at least equal to the thickness of the adjoining bottom wall and sidewalls, the improvement wherein:

(a) said inclined sidewalls have a radially outwardly extending lip portion extending about said side walls proximate the upper ends thereof; and



(b) said bottom wall portion of said tray including a high-crowned central portion of a generally ellipsoid, oval or circular configuration having continually upwardly curving walls, the highest point of said upwardly curving walls being at the center of said tray bottom, and crowned central portion of said tray bottom having an elevated height above the tray, bottom plane of at least 40 to 50% the maximum internal depth of said tray for the raised support of a product in said tray encompassed by a peripheral tray bottom surface forming a support surface for said packaging tray.

4,899,926
TWO WAY MAILER
Lincoln B. Spaulding, Weston, Mass., assignor to Sheppard Envelope Company, Worcester, Mass.
Filed Apr. 4, 1989, Ser. No. 333,014
Int. Cl.[4] B65D *27/06, 27/38*
U.S. Cl. 229—73 **7 Claims**



1. A two way mailer formed from a single blank of sheet material, comprising:

first and second sections;

means including a first perforated line for separately interconnecting said first and second sections;

said first section including a front panel having bottom, top and side edges, with a front closure flap extending outwardly from the top edge of said front panel;

said second section including rear and return panels, each having bottom, top and side edges, with a return closure flap extending outwardly from the top edge of one of said rear or return panels, and with second perforated lines located substantially exclusively in said second section, said second perforated lines being perpendicular to said first perforated line and being spaced inwardly from and parallel to the side edges of said rear panel, the bottom edges of said rear and return panels coincidentally defining a fold line parallel to said first perforated line and about which said return panel may be folded onto said rear panel;

first adhesive means for adhering the thus folded return panel to said rear panel at locations inside of said second perforated lines to thereby form a return envelope, the thus formed return envelope being foldable about said first perforated line onto said front panel;

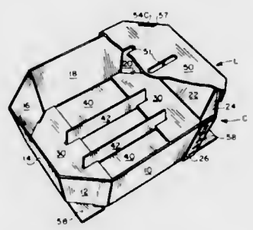
second adhesive means for adhering the thus folded return envelope to said front panel at locations outside of said second perforated lines to thereby form a forwarding envelope;

said front closure flap being foldable about the top edge of said front panel and being dimensioned to close said forwarding envelope by overlapping said rear panel and said second perforated lines;

third adhesive means for securing the thus folded front closure flap to said rear panel, whereupon following opening said front closure flap, said return envelope may be separated from said front panel along said first and second perforated lines, with said return flap being foldable about its respective top edge to close the thus separated return envelope; and

fourth adhesive means for securing the thus folded return flap in the closed position.

4,899,927
COLLAPSIBLE CONTAINER
Gustave O. Straub, Milwaukee, and Charles W. Kurth, Cedarburg, both of Wis., assignors to Container Corporation of America, Clayton, Mo.
Filed Feb. 24, 1989, Ser. No. 315,125
Int. Cl.[4] B65D *5/10*
U.S. Cl. 229—109 **12 Claims**



1. A collapsible, octagonal container formed from foldable paperboard, comprising:

(a) first, second, third, fourth, fifth, sixth, seventh, and eight side panels foldably joined to each other along parallel vertical fold lines to form a tubular structure open at the ends;

(b) said first and fifth side panels extending parallel to each other and normal to said third and seventh side panels, and said second, fourth, sixth, and eighth side panels extending diagonally between adjacent side panels;

(c) inner closure flaps foldably joined to lower edges of said third and seventh side panels and folded inboardly therefrom and normal thereto toward each other;

(d) said inner closure flaps each having:

(i) a width greater than that of the panel to which it is joined and having side portions extending outboardly beyond the panels adjacent the panel to which it is joined;

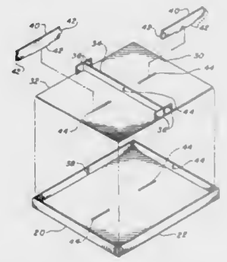
(ii) a pair of outer closure flap receiving slots extending part way thereinto from an inboard edge thereof and being parallel to and spaced from each other;

(iii) a pair of side panel receiving slots extending diagonally thereinto from side edges thereof and adapted to receive lower portions of related diagonally extending side panels to help the container maintain its octagonal shape;

(e) outer closure flaps foldably joined to lower edges of said first and fifth side panels and folded inboardly therefrom and normal thereto toward each other;

(f) lock flaps foldably joined to inboard edges of said outer closure flaps and folded upwardly therefrom and normal thereto and received within related outer closure flap receiving slots of said inner closure flaps.

4,899,928
DRAWING STORAGE CABINET DRAWER DIVIDER
W. G. Korff, 12153 Gerald Ave., Granada Hills, Calif. 91344
Filed Jan. 17, 1989, Ser. No. 314,759
Int. Cl.[4] B65D *5/48*
U.S. Cl. 229—120.36 **8 Claims**



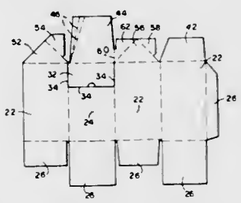
1. A divider for storing master drawings in drawers of a flat storage file cabinet comprising:

(a) a flat base having four sides of equal height with each side formed upwardly, inwardly, and downwardly into an interlocking contiguous juncture with said sides engaging said base defining an equal height borders on the base periphery;

(b) a center separation having a sub-base with a central portion thereof formed upwardly into a "U" shape, fitting snugly and contiguously within the base, such that the top of the central portion is planar relative to said base sides; and,

(c) a plurality of partitions having a top and a bottom formed in "U" shape interlinked simultaneously into said flat base and center separation while concurrently interfacing with a base side on one end and the center separation central portion on the other with the partition in planar relationship with the base sides defining a plurality of individual and removable compartments within the divider for storing various sizes of said master drawings preventing the bottom-most master drawings from sliding into adjacent compartments and allowing order to be maintained within a storage file cabinet drawer.

4,899,929
SELF-ERECTING CONTAINER WITH REMOVABLE SECTION
Jack D. Grollman, Merion, Pa., assignor to Triangle Container Corporation, Philadelphia, Pa.
Filed May 24, 1989, Ser. No. 348,267
Int. Cl.[4] B65D *5/36*
U.S. Cl. 229—122.1 **20 Claims**



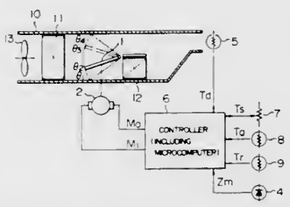
1. A self-erecting container, comprising:

a plurality of sidewall panels foldably attached to one another along corners of the container, one of the sidewall panels being a front sidewall panel having a removable section at an end of the container;

a plurality of end panels foldably attached to respective ones of the sidewall panels at said end of the container, the end panels folding up when the container is erected and holding the sidewall panels apart to define an inner volume of the container, one of the end panels being a flap panel attached to said removable section of said front sidewall panel, and an adjacent one of the end panels being a bellows fold panel, the bellows fold panel having a back-folded tab fixed to the flap panel such that the flap panel and the bellows fold panel rest over one another when the container is erected, the end panels drawing one another open when the sidewall panels are folded apart; and,

a permanently attached web disposed between the bellows fold panel and the flap panel adjacent the removable section, whereby the flap panel remains fixed to the container when the removable section is separated from said front sidewall panel.

4,899,930
TEMPERATURE CONTROLLER FOR AUTOMOBILE AIR CONDITIONER
Tsuneo Kagohata, and Toshikazu Ito, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 18, 1989, Ser. No. 353,702
Claims priority, application Japan, May 20, 1988, 63-122056
Int. Cl.[4] B60H *3/00*
U.S. Cl. 236—91 F **5 Claims**



1. A temperature controller for automobile air conditioner comprising target delivered air temperature computation means which calculates a target delivered air temperature from signals of at least an exterior ambient temperature, cabin inte-

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rior temperature and setup temperature, delivered air temperature detection means which detects the temperature of air delivered by the air conditioner and heat exchange output control means which controls the heat exchange output to vary the delivered air temperature so that the detected value of the delivered air temperature is brought convergently to the target value, wherein said controller comprising first computation means which calculates, in correspondence to each delivered air temperature, a unit variation of heat exchange output required to vary the delivered air temperature by a unit temperature difference; a second computation means which calculates the amount of variation of heat exchange output, which is required to bring the delivered air temperature close to the target temperature, from the target delivered air temperature, the detected delivered air temperature and the unit variation, and control means which controls the heat exchange output intermittently in compliance with the amount of variation evaluated by the second computation means.

4,899,931

GOLF CART HEATER

Richard W. Isley, 1204 W. 19th Pl., Kennewick, Wash. 99337

Filed Aug. 4, 1989, Ser. No. 389,686
Int. Cl.[4] B60H *1/02*
U.S. Cl. 237—12.3 C **3 Claims**



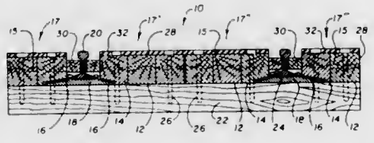
1. A golf cart heater which comprises:
a gas fuel burning heating element;
a gas reservoir being operatively attached to said heating element for supplying the same with fuel; and
a golf cart adapter bracket being securely attached to a golf cart and having said heating element attached thereto, said adapter bracket further having means for removably attaching said gas reservoir.

4,899,932

CAPPED HIGHWAY GRADE CROSSING

Dale K. Beachy, Finleyville; Robert B. Dehls, McMurray, both of Pa.; S. Hudson Owen, Marshfield, Wis., and James H. Simpson, Sewickley, Pa., assignors to Koppers Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 409,079, Aug. 18, 1982, abandoned. This application Apr. 19, 1988, Ser. No. 183,055
Int. Cl.[4] E01B *25/28*
U.S. Cl. 238—8 **11 Claims**



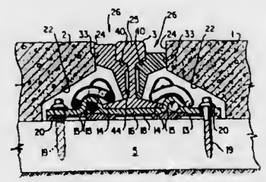
1. A highway railroad grade crossing for railroad tracks with rails affixed to crossties having exposed upper surfaces between said rails and upper surfaces outwardly extending beyond the outer edge of each rail, comprising
a plurality of panel means adapted to be permanently fixed to at least one of the upper surfaces of said crossties and being of a predetermined height; and
a removable and replaceable wear surface means capped on said panel means, comprised of a polymer having a solid planar base with a planar metal reinforcing plate imbedded therein and with treads extending upwardly from said base, said wear surface means being of a predetermined height such that the upper surface of the wear surface means is co-planar with the top of the rails, and where the height of said wear surface means is substantially smaller than the height of said panel means.

4,899,933

RAILWAY CROSSING INSERT

John K. Martin, 419 Oakside Cir. SW., Calgary, Alberta, Canada (T2B 4V3)

Filed Mar. 25, 1987, Ser. No. 40,011
Int. Cl.[4] E01C *9/04*
U.S. Cl. 238—8 **20 Claims**



1. A railway crossing structure for use in a railway crossing of the type defined by center planks between the rails and outside planks on the outer sides of the rails and the rails being retained in place by rail clips, said structure comprising:
(a) first elongated body means for insertion between a plank and one side of a rail,
(b) second elongated body means for insertion between another plank and the other side of the rail,
(c) each of said body means including a head portion having one straight side edge for engaging one side edge of a plank and a shoulder extending outwardly from the other side edge of said head portion for insertion beneath the head of a rail,
(d) said head portion of said first elongated body means extending from a top edge of the rail to a top edge of the plank when inserted between the rail and the side edge of the plank,
(e) said head portion of said second elongated body means having a portion for providing a recess below the top edge of the rail when inserted between the rail and the side edge of the other plank,
(f) both first and second elongated body means having an inclined bottom portion extending downwardly from said head portion to a foot portion for resting on an inner top edge of a bottom flange of the rail; and,
(g) whereby, said head portions provide a cover over the rail clips and provide an open space around the rail clips permitting the rail clips to flex when said first and second elongated body means are inserted.

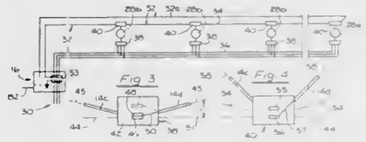
4,899,934

IRRIGATION MONITOR

Kenneth R. Krisle, HCR 82, Box 69, Lemmon, S. Dak. 57638

Filed Nov. 21, 1988, Ser. No. 273,926
Int. Cl.[4] A01G *25/09*
U.S. Cl. 239—1 **5 Claims**

1. Monitoring means for use in conjunction with irrigation apparatus having a plurality of jointed sections arranged in a line, and towers between adjacent sections supporting adjacent ends of the corresponding sections, individual electrical drive means in the towers for moving the towers, and thereby the sections, in direction generally transverse to said line, an electrical drive circuit operably connected to the drive means, and the drive means being operable for operation at individual speeds, and when operating at predetermined said speeds being operable for maintaining the sections in a line, and when any one of the drive means operates at a speed less than its own said predetermined speed, that drive means tends to produce an angular relation between the sections adjacent to that drive



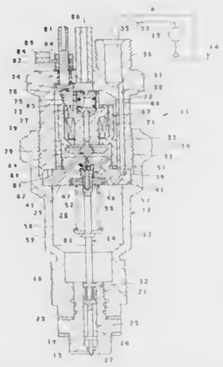
means, and the apparatus including switch means at individual towers operable by the corresponding adjacent sections moving into a predetermined angle therebetween,
the monitoring means comprising,
a signal transmitter operably connected in said circuit, and operable for transmitting signals to a distance,
a battery charged by the drive circuit, and
control means responsive to the drive circuit and operable thereby for maintaining the signal transmitter inactive when the drive circuit is energized and for connecting the battery with the signal transmitter for energizing the latter, when the drive circuit is de-energized.

4,899,935

VALVE SUPPORT FOR ACCUMULATOR TYPE FUEL INJECTION NOZZLE

Takeo Yoshida, and Hajime Kishida, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 7, 1989, Ser. No. 319,999
Claims priority, application Japan, Mar. 14, 1988, 63-58177
Int. Cl.[4] F02M *47/02*
U.S. Cl. 239—91 **3 Claims**



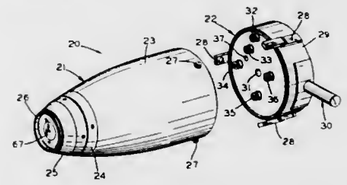
1. An accumulator type of injection nozzle comprised of an outer housing defining an accumulator chamber adapted to be supplied with high pressure fuel, a nozzle port leading from said accumulator chamber, an injector valve moveable between a closed position and an opened position for controlling the discharge of fuel from said accumulator chamber through said nozzle port, a control chamber for receiving pressurized fuel, an actuating member supported for movement within said control chamber and associated with said injector valve for retaining said injector valve in its closed position when said control chamber is pressurized and for movement of said injector valve to its opened position when pressure is relieved in said control chamber, and relief valve means moveable between a closed position for maintaining pressure in said control chamber and an opened position for relieving said control chamber for effecting fuel discharge through said nozzle port, the improvement comprising said control chamber being defined by a portion of said outer housing defining a bore, said actuating member comprising an enlarged diameter portion of said injection valve slidably supported within said bore, a supporting member slidably engaged with a face of said housing at the end of said bore facing said accumulator chamber and closing said bore, said supporting member having a supporting bore slidably supporting a smaller diameter portion of said injection valve adjacent said enlarged diameter portion.

4,899,936

ROTARY ATOMIZER WITH PROTECTIVE SHROUD

Richard Weinstein, Toledo, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio

Division of Ser. No. 879,082, Jun. 26, 1986. This application Jun. 21, 1989, Ser. No. 369,255
Int. Cl.[4] B05B *3/10, 5/04*
U.S. Cl. 239—224 **7 Claims**



1. A rotary atomizer for coating a workpiece with a coating fluid comprising, in combination, a housing including a hollow shroud having a first and second ends and a rear cover plate attached to said first shroud end, a rotary fluid atomizing device rotatably supported on an interior surface of said cover plate with said device extending from said second shroud end, passageway means extending through said housing for supplying coating fluid to said atomizing device, said passageway means having an inlet adjacent an exterior surface of said cover plate and having an outlet adjacent said atomizing device, a manifold including first and second surfaces with inlet means at said first manifold surface adapted to be connected to a source of coating fluid and outlet means at said second manifold surface connected to said passageway means inlet, and fastener means on said housing for releasably securing said housing to said manifold with said cover plate adjacent said second manifold surface.

4,899,937

CONVERTIBLE SPRAY NOZZLE

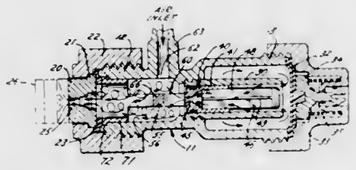
James Haruch, Naperville, Ill., assignor to Spraying Systems Co., Wheaton, Ill.

Continuation of Ser. No. 940,290, Dec. 11, 1986, abandoned. This application May 4, 1988, Ser. No. 191,844
Int. Cl.[4] B05B *1/14, 7/00*
U.S. Cl. 239—289 **33 Claims**

1. A liquid spray nozzle which may be converted from an air assisted nozzle to a non-air assisted nozzle, said spray nozzle comprising an elongated hollow nozzle body having first and second ends, a chamber defined in said body, means in said body defining an air inlet port through which a pressurized stream of air may be injected transversely into said chamber, selectively actuatable means for directing pressurized air

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through said air inlet port, means in said body defining a liquid inlet port for introducing liquid into said body, means for directing pressurized liquid through said liquid inlet port, means defining a tube disposed within and extending longitudinally of said body for receiving liquid from said liquid inlet port and for directing a longitudinally flowing stream of liquid into said chamber, an insert member removably positioned in said tube, said insert member being formed with an internal liquid flow passageway through which liquid received in said tube passes and an impingement surface located in fixed relation to said liquid passageway in line with the direction of passage of said liquid through said insert member liquid passageway, means securing said insert member in said body with said impingement surface in fixed relation to said liquid inlet port so that a liquid flow stream introduced into said body from said inlet port continuously strikes said impingement



surface without relative movement between said impingement surface and said liquid inlet port and passageway and is continuously deflected and mixed with a pressurized stream of air introduced into said chamber from said air inlet port upon actuation of said pressurized air direction means whereby the liquid is preliminarily atomized in said chamber, spray tip means defining a discharge orifice in fluid communication with said chamber and through which liquid from said chamber is directed, and means on one of said ends of said body and removable therefrom to permit said insert member to be taken axially out of said body so that upon deactuation of said pressurized air directing means a stream of liquid introduced into said body from said liquid inlet port flows through said chamber without engaging an impingement surface and without significant preliminary atomization and is dispensed directly by said spray tip into predetermined spray pattern of liquid droplets.

4,899,938

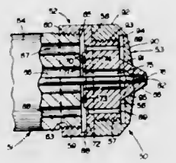
LIQUID SPRAY NOZZLE ADAPTER

John W. Havrilla, Jr., 2048 Eastlawn Ave., Akron, Ohio 44305

Filed Oct. 28, 1987, Ser. No. 113,499

Int. Cl.[4] B05B *1/28*

U.S. Cl. 239—294 **10 Claims**



1. A nozzle adapter for a liquid material sprayer of the type having a material discharge control needle valve extending outwardly through a liquid material discharge passage formed in an end of the sprayer, and in which pressurized air inlet and outlet passages are formed in the end of the sprayer which are adapted to communicate with a source of pressurized air, said nozzle adapter including, in combination:

(a) a unitary liquid material discharge member having a cone-shaped nozzle projecting outwardly forwardly from a front wall, said front wall extending generally transversely to a longitudinally extending axis of the nozzle;

(b) an internal generally axially extending bore formed in the liquid material discharge member terminating in an outer liquid material discharge opening in the nozzle, said bore being adapted to communicate with the liquid material discharge passage of a sprayer and to receive the material discharge control needle for selectively opening and closing the outer liquid material discharge opening of said discharge member when the discharge member is mounted on the sprayer;

(c) pressurized air opening means formed in the liquid material discharge member rearwardly of and extending coaxially about the outer liquid material discharge opening of the nozzle, said pressurized opening means being adapted to communicate with the pressurized air passages of the sprayer whereby the pressurized air is discharged from the discharge member rearwardly of the material discharge opening;

(d) a pressurized air adjustment member of one-piece construction adjustably mounted on the unitary liquid material discharge member for regulating the pressurized air opening means, said adjustment member having a generally flat front wall which extends generally transversely to the longitudinally extending axis of the nozzle of the discharge member, said front wall having only a single rearwardly extending conical-shaped air passageway formed therein;

(e) attachment means formed on the liquid material discharge member for removably attaching said discharge member on a sprayer and for removably attaching the pressurized air adjustment member on the discharge member, with the nozzle of said discharge member being located within and extending through the air passageway of the adjustment member and forming an annular pressurized air opening therebetween, with said annular air opening being coaxial with and rearwardly of the outer liquid material discharge opening of the nozzle; and

(f) an elastomeric annular boss protruding from a rearward wall of the liquid material discharge member opposite to the direction of the nozzle and forming a first pressurized air chamber between the rearward wall of said discharge member and the end of a sprayer when the discharge member is mounted on the sprayer end.

4,899,939

DEVICE FOR THE APPORTIONING OF WASHING AGENTS IN HAND HELD SHOWER HEADS

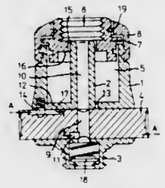
Nordfried Czeczerski, Freinsheimer Strasse 88, 6710 Frankenthal 4, Fed. Rep. of Germany

Filed Aug. 24, 1988, Ser. No. 235,659

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1987, 8711446[U]

Int. Cl.[4] B05B *1/18*

U.S. Cl. 239—310 **3 Claims**



1. A device for apportioning washing agents in hand held shower heads, including a container casing (**1**) with an open end,

a water inlet (**3**) to the container casing (**1**),

a water flow sleeve (**2**) extending through the container casing (**1**),

an annular washing agent cavity (**5**) located between the container casing (**1**) and the flow sleeve (**2**),

an outlet cap assembly attached to the container casing (**1**) to close said open end thereof, said outlet cap assembly having a first member (**7**) with a cylindrical passage which surrounds said water flow sleeve and is spaced from said sleeve to create a gap (**15**) which provides an outlet for the washing agent cavity,

a water inlet passage (**13**) for the washing agent cavity (**5**) leading to said container casing water inlet (**3**),

a bolt (**4**) positioned between the water flow sleeve (**2**) and the water inlet (**3**), said bolt having a bore (**9**) extending therethrough with a wider entrance portion (**11**) adjacent the said water inlet, said bolt (**4**) being slidable between a first position in which said bore (**9**) connects the water inlet (**3**) with said water flow sleeve (**2**) and a second position in which the wider entrance portion (**11**) of the bore connects the casing water inlet (**3**) with said water inlet passage (**13**) for the washing agent cavity (**5**), and

detent means (**14**) to hold the bolt selectively in its first and second positions.

4,899,940

SPRAY WASHING DEVICE FOR MOTOR VEHICLES AND THE LIKE

Gardner A. Leaver, P.O. Box 835, Montauk, N.Y. 10514

Continuation of Ser. No. 857,351, Apr. 30, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 125,718

Int. Cl.[4] B05B *7/02*

U.S. Cl. 239—526 **2 Claims**



1. A spray washing appliance for motor vehicles and the like, which comprises

(a) a primary hand held support member including a gripping handle of a size and configuration to be held conveniently in one hand,

(b) an elongated tubular wand of lightweight tubular construction having a first portion mounted by and extending through said support member and a second portion, integral with said first portion, projecting a long distance forward of said support member,

(c) rotatable connecting means for connecting a hose to said first wand portion for supplying water under pressure thereto,

(d) said support member having bearing means supporting the first portion of said wand for rotation about a predetermined axis,

(e) said wand having a third portion adjacent its forward end disposed at an angle to said axis and mounting nozzle means,

(f) said first and third portions of said wand defining a plane and defining an interior included angle of substantially less than 180° and an exterior angle of substantially than 180°,

(g) said discharge nozzle means comprising an elongated wand section disposed in said plane and having a plurality of nozzle openings spaced along its length for discharge of a fan-like array of spray jets generally in said plane, and generally in the direction of said interior included angle and at least partially directed back toward the first wand portion and the operator of the appliance,

(h) said second portion of said wand being generally coaxial with said axis and mounting a manipulating grip adjacent said gripping handle for rotating said wand relative to said gripping handle,

(i) said manipulating grip forming a support means and being of a size and shape adapted for convenient gripping one hand of an operator for both holding and movably guiding and manipulating the appliance as a whole and controllably rotationally orienting said wand relative to said support member.

4,899,941

APPARATUS FOR GRINDING

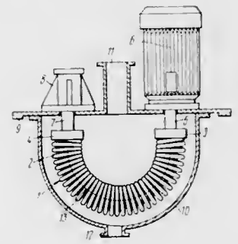
Leonid A. Sivachenko, Pereulok, 1.Franko, 7, kv. 1; Alexandr M. Kurguzikov, Slavgorodskoe shosse, 21, both of Mogilev; Vladimir V. Moiseenko, Mogilevsky raion, stantsia Buinichi, 10, kv. 26, Mogilevskaya oblast; Sergei L. Bochkov, ulitsa Artjukhinoi, 6/10, kv. 69, Moscow; Evgeny G. Golban, ulitsa Kosmanavtov, 20, kv. 46, and Maria V. Lescheva, Slavgorodskoe shosse, 127, both of Mogilev, all of U.S.S.R.

PCT No. PCT/SU87/00009, § 371 Date Sep. 29, 1988, § 102(e) Date Sep. 29, 1988, PCT Pub. No. WO88/05343, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 27, 1987, Ser. No. 271,954

Int. Cl.[4] B02C *19/22*

U.S. Cl. 241—134 **63 Claims**



1. An apparatus for grinding comprising a drive (**6**); at least one grinding working member (**1**) kinematically associated with said drive (**6**), said working member **1** being made in the form of at least one helical winding formed of spiral adjacent coils defining a center line curved along an arc and associated with said drive (**6**) for rotation about said center line (**13**), adjacent coils of said working member (**1**) being contiguous with one another on an inside radius of curvature of the working member (**1**) at least on one portion of the length thereof.

4,899,942

JAW CRUSHER

Paul Böhringer, Heuchlingerstrasse 35, D-7101 Oedheim, Fed. Rep. of Germany

Filed Jan. 31, 1989, Ser. No. 303,918

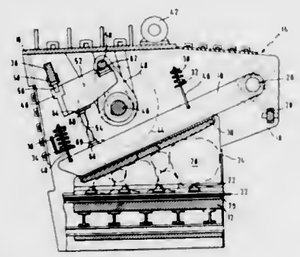
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803496

Int. Cl.[4] B02C *1/10*

U.S. Cl. 241—200 **2 Claims**

1. A jaw crusher device adaptable to provide both a vertical and a horizontal crushing chamber comprising a housing including spaced pairs of generally vertical side walls, end walls linking said side walls, a crushing jaw mounted in said housing, pivot means adjacent an upper end portion of one said pair of said walls supporting said jaw for movement about a horizontal pivot axis, an anvil detachably connected to said housing and disposed perpendicular to said side and end walls, said anvil defining with said crushing jaw a progressively narrowing crushing chamber, said chamber being generally horizontally arrayed when said anvil is in a horizontal plane and narrowing in a downward direction when said housing is bodily rotated 90° whereby said anvil is generally vertically disposed, transport means removably mounted over and supported on said anvil in the horizontal position thereof, said transport means including triangular crushing strips, drive means for shifting said transport means across the surface of said anvil in

the narrowing direction of said crushing chamber, jaw drive means for pivoting said crushing jaw toward and away from said anvil, said side walls including first support surface means for supporting said housing with said anvil in a horizontal disposition and second support surface means for supporting



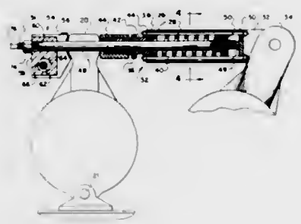
said housing in said bodily rotated position whereby said device is adapted to provide a horizontal and a vertical crushing chamber selectively in accordance with which of said first and second support surface means is disposed in supporting relation of said housing.

4,899,943

MANUAL CYLINDER FOR ROLLS

Ray M. Wood, Dalhart, Tex., assignor to Dalhart R & R Machine Works, Inc., Dalhart, Tex.

Filed Feb. 22, 1989, Ser. No. 313,741
Int. Cl.[4] B02C *4/38*
U.S. Cl. 241—232 **12 Claims**



1. In a roller mill having:
a. a frame,
b. a stationary roll and
c. a moveable roll,
d. each roll having two ends,
e. a frame bearing mounted to the frame upon each end of the stationary roll,
f. a moving bearing on each end of the moveable roll, and
g. an arm pivoted to the frame at each end of the moveable roll having one of said moving bearings mounted thereon;
the improved structure for locking the arms in an engaged position comprising:
h. a pair of two ended spring holders, each one having
i. a clevis end attached to the frame near one of the frame bearings, and
ii. a nut end,
j. a two ended helical compression spring in each spring holder,
k. one end of each spring bearing against the nut end of the spring holder,
l. a tension shaft having a spring end and a distal end telescoped in each spring,
m. a spring nut on a spring end of each tension shaft bearing against the other end of each spring,
n. a pair of lock means for moving and locking the arms in the engaged position,
o. one of said lock means on a distal end of each tension shaft,
p. a connecting shaft extending from one lock means to the other, and
q. a handle on the connecting shaft for rotating the connecting shaft which operates said lock means,
r. a clearance adjustment nut on the nut end of each of the spring holders bearing against the arm in the engaged position,
s. said clearance adjustment nut has a bore therethrough, and
t. said tension shaft extends through said bore in said adjusting nut.

4,899,944

YARN WINDING APPARATUS AND PROCESS

John S. Dickins, III, Wilmington, N.C., and Thomas D. Williamson, Lugoff, S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 15, 1988, Ser. No. 284,586
Int. Cl.[4] B65H *54/20, 54/30, 57/04*
U.S. Cl. 242—35.5 R **14 Claims**



1. A windup, including a source of at least two yarns, a fixed guide through which said yarns advance in a plane from said source to a transverse guide from which the yarns advance as they are being wound in a reciprocating stroke on respective package supports, said traverse guide being adapted to reciprocate within first and said second limits defining a traversing zone and comprising: a base, a guide plate embedded in and projecting outwardly from the base, said plate having a peripheral edge that comprises a first convexly curved section, a generally straight section that is generally parallel to said plane, and a second convexly curved section, the curved sections being separated from the straight section by open-ended guide-slots that open into the curved sections; means for feeding a yarn from beyond said first limit into the slot adjacent said first limit; and means for transferring a yarn from said slot adjacent said first limit to the other slot.

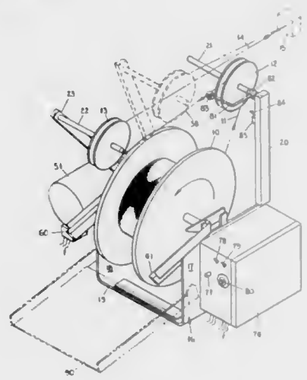
11. A traverse guide comprising: a base, a guide plate embedded in an projecting outwardly from the base, said plate having a peripheral edge that comprises a first convexly curved section, a segment with a generally straight section that is generally parallel to said base, and a second convexly curved section, the curved sections being separated from the said segment with the generally straight section by open-ended guide slots that open into the curved sections, said segment projecting outwardly from said base beyond said curved sections.

4,899,945

AUTOMATIC WIRE DISPENSER

Johnnie L. Jones, 5600 - 10 Mile Rd. NE., Rockford, Mich. 49341-9552

Continuation-in-part of Ser. No. 881,849, Jul. 3, 1986, abandoned. This application May 2, 1988, Ser. No. 189,422
Int. Cl.[4] B65H *49/00, 49/34, 59/38, 79/00*
U.S. Cl. 242—45 **34 Claims**



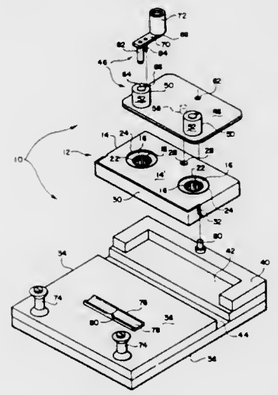
1. A variable speed, motorized wire dispenser for automatically dispensing wire from a coil of wire to a wire using machine under variable wire feed rate conditions comprising:
a frame including support means for rotatably supporting the wire for dispensing wire to the wire using machine in a predetermined direction;
an electric motor mounted in the frame so as to rotate the coil of wire;
a regenerative controller that produces an electrical output that controls the operation of the electric motor and causes the motor to both accelerate and decelerate the wire coil, the regenerative controller producing forward and reverse torques in the electric motor that automatically vary such that the speed of the motor is changed at predetermined acceleration and deceleration rates;
wire accumulation means mounted in the frame for producing an accumulation loop of wire to supply or store wire under rapidly changing demand conditions, the wire accumulation means comprising a wire engaging guide movably positioned in the frame such that wire extends over the guide in extending from the wire coil to the predetermined direction, the guide being movable in relation to the predetermined direction so as to produce an accumulation loop in the wire, the guide being biased to increase the accumulation loop between predetermined limits; and
control means responsive to the position of the guide for generating a continuously variable electric control signal representative of guide position, the control means changing the control signal gradually as the loop size increases and decreases, the control signal being transmitted to the regenerative motor controller so as to produce a change in motor speed at a rate representative of the rate of change of the control signal, the control means causing the motor to decrease the rate of wire feed as wire supply requirements decrease and increase the rate of wire feed as wire supply requirements increase, the rate of change in the control signal resulting from guide movement being more gradual than the rate of change in wire feed from the wire dispenser, the accumulation loop being sufficiently large that the rate of motor acceleration and deceleration caused by the regenerative controller is gradual enough to minimize damage to the drive components and to restrain the wire from jumping off the guide.

4,899,946

APPARATUS FOR INSPECTION AND REPAIR OF RECORDING TAPE CASSETTES

Mario W. Espin; Helen P. Espin; Thomas P. Senn, and Harry M. Joyner, Jr., all of Charlotte, N.C., assignors to Multi-Video, Inc., Charlotte, N.C.

Filed Jun. 3, 1988, Ser. No. 202,474
Int. Cl.[4] B65H *18/08*
U.S. Cl. 242—55 **18 Claims**



11. Apparatus for performing inspection and repair of recording tape cassettes of the type having a cassette housing, a pair of tape reels rotatably mounted within the housing and exposed at one side thereof, and a length of recording tape would about the reels with one tape end attached to one reel and the other tape end attached to the other reel for traveling movement of the tape between the reels, said apparatus comprising a base for supporting the housing of a cassette stationarily during inspection and repair procedures and means for selectively actuating rotation of the reels of the supported cassette to cause the tape to travel between the reels, said actuating means including a body, a pair of hubs rotatably mounted to the body for driving engagement repectively with the reels at the one side of the cassette housing, and crank means for selectively actuating driving rotation of one said hub for causing rotation of the reels and attendant traveling movement of the tape for inspection and repair thereof.

4,899,947

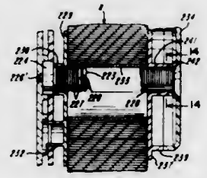
REEL FOR MOUNTING RECORD MEMBER ROLL

Ikuzo Sugiura, Sagamihara; Mitsuo Uchimura, Numazu; Kouichi Kawamura, Mishima, all of Japan; Ronald L. Fogle, Lebanon, and Orville C. Huggins, Dayton, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 885,886, Jul. 15, 1986, Pat. No. 4,776,714.
This application Aug. 15, 1988, Ser. No. 232,244
Int. Cl.[4] B65H *16/04*
U.S. Cl. 242—68.3 **5 Claims**

1. A reel adapted to mount a roll of record members, comprising: first and second side plates, a hub for mounting the first and second side plates, a first hub member connected to the first side plate, the first hub member being positonable in a first position and extending toward the second side plate or in a second position and extending away from the second side plate, a second hub member, and means for releasably connecting the second hub member either to the second side plate in opposition to the first hub member in its first position so that the first and second hub members support a roll of record

members or to the first hub member when the first hub member is in its second position so that the hub is adapted to support a



roll of record members between the first and second side plates.

4,899,948

FILM CASSETTE

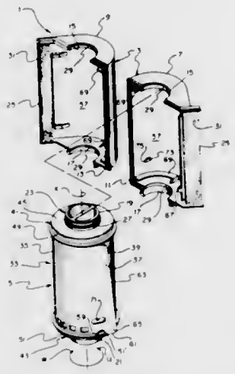
John J. Niedospial, Jr., and Christopher T. Mattson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 8, 1989, Ser. No. 320,439

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[4] G03B *17/26*

U.S. Cl. 242—71.1 **3 Claims**



1. An improved film cassette wherein (a) a film spool is rotatable within the cassette shell in film unwinding and rewinding directions, (b) a convoluted film roll whose outermost convolution is a film leader is coiled about said spool, (c) a pair of flanges are coaxially arranged on said spool to radially confine said film leader to prevent the leader from substantially contacting an interior wall of said cassette shell, and (d) a film stripper-guide is received between a leading end of said film leader and the next-inward convolution of said film roll succeeding the leader to remove the leader from said flanges and guide the leader through a film passageway to the exterior of said cassette shell responsive to rotation of said spool in the film unwinding direction, and wherein the improvement comprises:

said cassette shell and said film leader include mutual engagement means for securing the leader substantially proximate its leading end responsive to rotation of said spool in the film rewinding direction to prevent the leading end from coming to rest between said stripper-guide and said next-inward convolution.

4,899,949

AUTOMATIC SAFETY-BELT REELING DEVICE

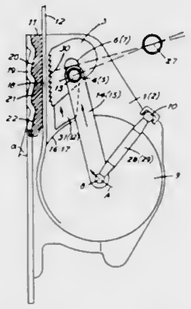
Rudolph Meyer, Odelzhausen, and Martin Specht, Munich, both of Fed. Rep. of Germany, assignors to BSRD Limited, Carlisle, United Kingdom

Filed Dec. 2, 1988, Ser. No. 278,909

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 3740796

Int. Cl.[4] B60R *22/40, 22/42*

U.S. Cl. 242—107.2 **8 Claims**



1. An automatic safety belt reeling device having a frame with a back and two side parts within which a belt reel is carried rotatable about a first axis of rotation and being effective to permit pay-out or reel-in of the belt, a multi-function sensor mechanism operable to effect blocking of the reel rotation during pay-out from said reel between said side parts of said frame, said first axis being displaceable about a second axis parallel thereto to initiate locking of the belt characterised in that for said locking of the belt there is provided a moveable belt clamping member guided for movement in the frame about a third axis parallel to the first axis, said clamping member having a first clamping surface and said belt passing between said first clamping surface and a second opposing clamping surface carried by the frame and a link directly pivotally linking the first axis of the reel to a further axis of the clamping member at a point which is nearer to said first surface than is the third axis whereby movement of the reel about said second axis during pay out of the belt results in angular movement of the clamping member about the third axis moving said clamping surface into engagement with the belt to effect clamping thereof between said surfaces.

4,899,950

CASSETTE CASE FOR MAGNETIC TAPE AND THE LIKE FEATURING IMPROVED TAPE TENSION CONTROL ARRANGEMENT

Shuichi Matsuzaki, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 12, 1988, Ser. No. 180,814

Claims priority, application Japan, Apr. 24, 1987, 62-101551

Int. Cl.[4] G11B *23/084*

U.S. Cl. 242—198 **14 Claims**

1. In a tape cassette

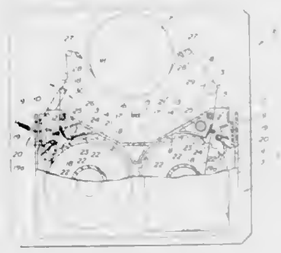
a reel;

tape wound on said reel;

a device for controlling the tension in said tapel; and

an arrangement associated with said tension control device for preventing said device from being excited to its resonant frequency;

said resonance-excitement-preventing arrangement takes the form of a projection, said projection being arranged to cooperate with said device in a manner which limits the amount by which said tension controlling device can be distorted and the amount by which said tape can be moved away from a first tape guide member upon which said tape slides, and said projection extends from a structural member which forms part of said cassette, said structural member being formed integrally with said cassette.



4,899,951

BRAKING MECHANISM FOR USE IN A MAGNETIC RECORDING APPARATUS

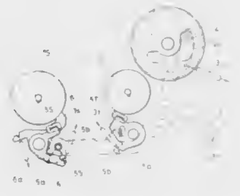
Hitoshi Okada, Shinichiro Terada, and Katsuya Nozawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 262,432

Claims priority, application Japan, Oct. 30, 1987, 62-273517; Oct. 30, 1987, 62-273518

Int. Cl.[4] G11B *15/32, 15/00, 19/02*

U.S. Cl. 242—204 **10 Claims**



1. A braking mechanism for use in a magnetic recording apparatus comprising:

a take-up reel base;

a releasable take-up reel base clamping brake;

a supply reel base;

a releasable supply reel base clamping brake;

a releasable preload drag brake configured for engagement with said supply reel base;

a brake-releasing member operable to first, second, third, and fourth member means positions;

first means responsive to member movement to said first member position for operating only said supply reel base clamping brake to a releasing condition for tape loading and unloading;

second means responsive to member movement to said second member position for operating said supply reel base and takeup reel base clamping brakes to a releasing condition;

third means responsive to member movement to said third member means position for operating all of said brakes to a releasing condition for normal playing;

fourth means responsive to member movement to said fourth member means position for operating all of said brakes to an unreleased condition for tape stopping;

a cam gear operable over a plurality of positions and coupled to move said brake-releasing member to said first, third, and fourth member positions according to the various positions of said cam gear.

4,899,952

DOUBLE BEARING TYPE FISHING REEL

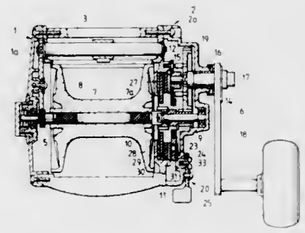
Atsuhito Aoki, Fuchu, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Jul. 28, 1988, Ser. No. 225,370

Claims priority, application Japan, Aug. 3, 1987, 62-119630[U]; Aug. 3, 1987, 62-119631[U]

Int. Cl.[4] A01K *89/015, 89/62*

U.S. Cl. 242—260 **9 Claims**



1. A double bearing type fishing reel comprising:

a pair of side frames having cover members provided thereover;

a spool shaft rotatably supported by said side frames through bearings provided in each of said side frames;

a spool concentrically fixed to said spool shaft;

a handle shaft rotatably supported to one of said side frames, said handle shaft having end portions;

a handle fixed to one end portion of said handle shaft;

a master gear fixed to the other end portion of said handle shaft;

a pinion meshingly engaged with said master gear and provided coaxially with said spool shaft, said pinion being movable in an axial direction of said spool shaft;

a drag support member secured to one of said side frames;

a clutch mechanism disposed in said one of said side frames and provided between said handle and said spool for selectively engaging said pinion with said spool shaft;

a drag mechanism provided between said drag support member and one of said cover members of said one of said side frames which secures said drag support member and coaxial with said spool shaft and said pinion;

a drag control mechanism connected to said drag mechanism for controlling drag force of said drag mechanism; and,

a one-way clutch mechanism provided between said drag mechanism and said pinion for selectively connecting said pinion and said drag mechanism upon rotation of said handle shaft in a first direction but disconnecting said pinion and said drag mechanism upon rotation of said handle shaft in a second direction, said selective connection and disconnection of said one-way clutch mechanism being through the engagement between at least one pawl and a ratchet, said ratchet and said pinion comprising a single monolithic element movable together both rotationally and axially.

4,899,953

DOUBLE BEARING FISHING REEL

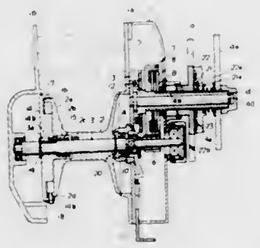
Junichi Toda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed May 20, 1988, Ser. No. 196,553

Claims priority, application Japan, May 23, 1987, 62-77883[U]; Oct. 9, 1987, 62-155384[U]; Oct. 9, 1987, 62-155385[U]

Int. Cl.[4] H01K *89/015*

U.S. Cl. 242—268 4 Claims



1. A double bearing fishing reel, comprising:

a reel body having a pair of side frames,

a spool shaft supporting a spool and journalled to said reel body, said spool shaft being provided with a rotary member positioned opposite to said spool, one of said rotary member and said spool being rotatable with respect to said spool shaft and the other of said rotary member and said spool being non-rotatable with respect to said spool shaft,

a drive mechanism for winding a fishing line onto said spool, and

a drag mechanism for applying a braking force against rotation of said spool with respect to said drive mechanism, said drag mechanism comprising an adjuster for adjusting said braking force and a braking force measuring mechanism for measuring said braking force, said braking force measuring mechanism comprising an elastic member interposed between said spool and said rotary member, a pointer provided at one of said spool and said rotary member, and a display provided at the other of said spool and said rotary member at a position at which said pointer points to said display to thereby display the magnitude of the braking force of said drag mechanism.

4,899,954

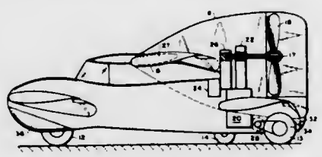
GROUND-AIR-WATER CRAFT

Anthony Pruszenski, Jr., No. 3, 44th St., Plum Island, Mass. 01951

Filed May 11, 1988, Ser. No. 192,544

Int. Cl.[4] B64C *37/00, 39/08, 39/12*

U.S. Cl. 244—2 44 Claims



1. A land, air and water ("LAW") craft having a center of gravity and comprising, in combination:

(a) a fuselage having a front end, a rear end, and a passenger compartment therebetween, said fuselage defining a central, longitudinal and vertical plane between said front and rear ends;

(b) a box-type, main wing connected to said fuselage and extending outwardly, on both sides of said fuselage, approximately equal distances from said longitudinal plane, said main wing including

(i) an upper main wing and a lower main wing which are substantially horizontal and have substantially the same wingspan, between opposite lateral ends, said lower main wing extending from a leading edge, which is rearward of the driver's position in said passenger compartment, to a trailing edge which substantially coincides, in longitudinal position, with said rear end of said fuselage, said upper main wing having a leading edge which is forward of said leading edge of said lower main wing; and

(ii) a right side member and a left side member, each side member extending substantially vertically and connected between said lateral ends of said upper and lower main wings on a respective right and left side of said craft;

(c) a control wing connected to said fuselage and extending outwardly, on both sides of said fuselage, approximately equal distances from said longitudinal plane, said control wing and said main wing being located, with respect to each other, such that their centers of lift are on opposite sides of said center of gravity as viewed in the direction of said longitudinal plane;

(d) front wheel means mounted on said craft forward of said center of gravity;

(e) rear wheel means mounted on said craft to the rear of said center of gravity and beneath said lower main wing at such longitudinal position that it prevents said lower main wing from contacting the ground when said craft is flying at an extreme upward pitch;

(f) prime mover means mounted on said craft;

(g) air propelling means mounted on said craft between said two side members and above said lower main wing; and

(h) first coupling means for selectively coupling said prime mover means to:

(i) at least one of said wheel means, and

(ii) said air propelling means.

4,899,955

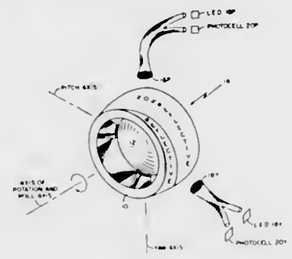
ANGLE ENCODER

Jean A. Fattal, Lexington; David J. Dugas, Westford, and Louis L. Tella, Holden, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 23, 1989, Ser. No. 300,635

Int. Cl.[4] F41G *7/22*; G01C *19/28*

U.S. Cl. 244—3.21 4 Claims



1. In a guided missile incorporating a guidance system wherein a gyroscopic mass with a periphery in the form of a zone of a sphere rotatable about a rotational axis and a gyroscopically stabilized platform are supported on at least one set of gimbals to permit angular movement between such platform and the body of such missile about a reference axis defined by at least one set of gimbals, such arrangement comprising:

(a) an optical encoder pattern disposed on the periphery of the gyroscopic mass, such encoder pattern providing substantially equally-sized first and second portions separated by a spiral line, the reflectivity of the first and second portions differing; and

(b) optical sensing means including a sensor assembly affixed to the guided missile adjacent to the reference axis near the optical encoder pattern to produce, during each revolution of the gyroscopic mass, an output signal indicative of any angular movement between the gyroscopically stabilized platform and the body of the guided missile about the reference axis, the sensor assembly comprising:

(i) a first optical transmission means including a first optical fiber having a first end disposed adjacent to the reference axis near the optical encoder pattern and a second end spaced from the first end within the body of the guided missile; and

(ii) a light emitting diode disposed near the second end of the first optical fiber whereby light from such diode is directed to a limited area on the periphery of the gyroscopic mass.

4,899,956

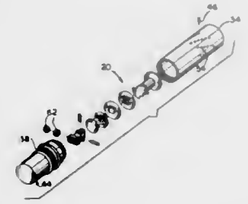
SELF-CONTAINED SUPPLEMENTAL GUIDANCE MODULE FOR PROJECTILE WEAPONS

Maurice E. King, Rancho Palos Verdes, Calif., and Gregory M. Katucki, Harleysville, Pa., assignors to Teleflex, Incorporated, King of Prussia, Pa.

Filed Jul. 20, 1988, Ser. No. 221,933

Int. Cl.[4] F41G *7/22*; F42B *15/033*

U.S. Cl. 244—3.21 22 Claims



1. A self-contained supplemental guidance apparatus for use with a projectile weapon having a body, at least one payload attachable to the body and means for propelling the body and payload towards a target, the apparatus comprising:

a supplemental guidance module to be fitted to at least one of the body and the payload, the supplemental guidance module being self-contained and having on-board a power supply, whereby the guidance apparatus is operable apart from electrical connection to the body and the payload;

sensing means in the module, including position sensing means operative to sense at least one of a starting orientation of the projectile weapon and an instantaneous orientation of the projectile weapon;

actuation means including a plurality of individually controllable incremental charges angularly spaced around a periphery of the module; and,

a control processor in the module, operable to monitor an output of said sensing means, to calculate deviation from a nominal flight path, and to actuate at least one of the incremental charges when said deviation exceeds a threshold and said at least one of the incremental charges is in a position to reduce said deviation.

4,899,957

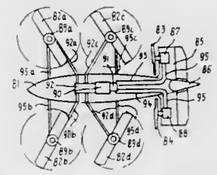
AIR BORNE CRAFT, FOR EXAMPLE HELICOPTER, AND RELATED DEVICES

Karl Eickmann, 2420 Ishiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 943,220, Dec. 17, 1986, abandoned, Ser. No. 621,638, Jun. 18, 1984, Pat. No. 4,703,906, Ser. No. 610,871, Sep. 8, 1975, Pat. No. 3,790,105, and Ser. No. 610,872, Sep. 8, 1975, abandoned, said Ser. No. 943,220, is a continuation-in-part of Ser. No. 619,958, Jun. 12, 1984, Pat. No. 4,630,528, which is a division of Ser. No. 243,324, Mar. 13, 1981, Pat. No. 4,456,430, which is a continuation-in-part of Ser. No. 110,157, Jan. 7, 1980, and Ser. No. 954,555, Oct. 25, 1978, Pat. No. 4,358,073, which is a continuation-in-part of Ser. No. 800,756, May 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 465,413, Apr. 30, 1974, abandoned, said Ser. No. 110,157, is a continuation-in-part of Ser. No. 895,687, Apr. 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 760,006, Jan. 17, 1977, Pat. No. 4,136,845, which is a continuation-in-part of Ser. No. 104,676, Mar. 8, 1971, Pat. No. 3,823,898, said Ser. No. 621,638, is a continuation-in-part of Ser. No. 243,324, , said Ser. No. 610,871, and Ser. No. 610,872, each is a division of Ser. No. 416,237, Nov. 15, 1973, abandoned, which is a division of Ser. No. 131,782, Apr. 6, 1971, Pat. No. 3,790,105. This application Oct. 7, 1987, Ser. No. 105,848

Int. Cl.[4] B64C *27/04*

U.S. Cl. 244—17.11 1 Claim



1. A vehicle capable of travel in air, comprising, in combination, a body, at least one main propeller for the provision of vertical lift, at least one tail propeller for the provision of a forwardly directed thrust, a power plant and a transmission,

wherein said transmission includes transfer means for the transfer of power from said power plant to said propellers to drive said propellers at least indirectly for rotary movement,

wherein said transfer means include rate of power varying control means for the division of the entirety of the power which is supplied by said power plant into individual variable fractions of said entirety of power with each of said fractions defining a separate rate of power,

wherein said at least one tail propeller is directed to drive said vehicle foreward,

wherein said rate of power control means subjects said at least one main propeller to said entirety of power for vertical lift and landing, while it subjects said at least one tail propeller to said entirety of power at times of high speed foreward drive when it reduces the rate of power to said at least one main propeller to zero whith said rate of power control means provided with rate of power variation means which are steplessly variable to vary said individual rates of power to said propellers, and thereby the ratio of power between said rates of power, selectively, and;

wherein said transmission is a hydrostatic transmission including a variable pump with at leat one variable fluid flow outlet and at least a second fluid flow outlet, fluid lines from said outlets individually to individual flow motors which have rotors which are provided with revolvable shafts which carry said propellers, respectively, while said variable outlet controls by its variability the

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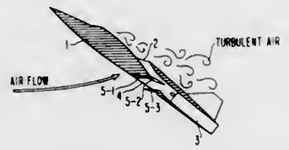
rotary velocity of one of said propellers relatively to the other of said propellers.

4,899,958

AIR INTAKE SYSTEM OF AN AIRCRAFT

Makoto Horikawa, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1988, Ser. No. 280,156
Int. Cl.[4] B64B *1/24*
U.S. Cl. 244—53 B **7 Claims**



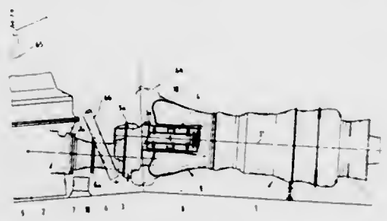
1. In an air intake system for use in an aircraft having an airframe, said air intake system including a main air intake port at an upper surface of the airframe, whereby during normal cruising flight suitable air intake will be through said main air intake port and a lower surface of the airframe will have low reflectiveness of radar beam irradiation from below, but whereby during flight at a large angle of attack and at high maneuverability air turbulence at said main air intake port will prevent suitable air intake therethrough, the improvement comprising means for ensuring suitable air intake at flight at said large angle of attack and at high maneuverability and for maintaining said low reflectiveness during normal cruising flight, said means comprising:
an auxiliary air intake port at the lower surface of the airframe intake of air therethrough; and
closure means mounted on said air frame for movement between an open position, whereat said closure means opens said auxiliary air intake port and allows suitable air intake therethrough during flight at said large angle of attack and at high maneuverability, and a closed position, whereat said closure means closes said auxiliary air intake port and thereby maintains said low reflectiveness during normal cruising flight.

4,899,959

GAS TURBINE POWER PLANT ARRANGEMENT

Wolfgang Weiler, Dachau, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,165
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1987, 3708596
Int. Cl.[4] B64D *35/00*
U.S. Cl. 244—54 **16 Claims**



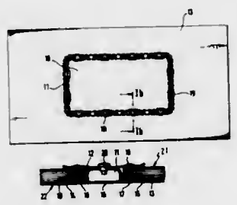
1. A gas turbine power plant, especially for a helicopter, comprising a main engine (1, 1') including fresh air intake means (10) and exhaust gas discharge means (62), a power transmission train including reduction gear transmission means (3, 3') for reducing an engine r.p.m., main gear drive means (2, 2') for transmitting engine power, shaft means forming part of said power transmission train, and compensating means (4, 4') for compensating any position disalignments between said main engine (1, 1') and said main gear drive means (2, 2'), means attaching said reduction gear transmission means (3, 3') directly to said main gear drive means (2, 2'), and means mounting said compensating means (4, 4') directly between an output of said main engine (1, 1') and an input of said reduction gear transmission means (3, 3') substantially axially and radially within one of said fresh air intake means (10) and said exhaust gas discharge means (62) for effectively reducing an installed length of said power plant so that a distance between said main engine (1, 1') and said main gear driving means (2, 2') is reduced substantially by the axial length of said compensating means (4, 4').

4,899,960

DECOMPRESSION PANEL FOR AIRCRAFT PARTITION

Mohamad Hararat-Tehrani, Bremen; Frank Schwarz, Bremerhaven, and Michael Taddiken, Bassum, all of Fed. Rep. of Germany, assignors to MBB GmbH, Bremen, Fed. Rep. of Germany

Filed May 9, 1988, Ser. No. 191,412
Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715328
Int. Cl.[4] B64C *1/14*
U.S. Cl. 244—118.5 **5 Claims**



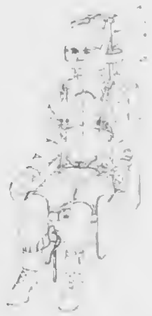
1. Decompression structure in a partition or the like, separating a passenger compartment from a freight or cargo compartment in an aircraft, there being a particular opening in the partition, comprising:
a decompression panel;
a frame of U-shaped cross section and, as a whole, circumscribing the decompression panel and having an outer contour to be inserted into said opening, end portions of legs of the U-shape of said frame being fastened to a flange;
sealing means for that flange to obtain sealing as against the decompression panel as well as against the partitions adjacent said opening; and
the bottom side of the U-shape of said frame being provided with and connected to a plurality of bolding springs engaging the partition as well as the decompression panel, each of the springs being provided with predetermined fracture points.

4,899,961

INFLATABLE, LATERAL HEAD RESTRAINT

Gerald F. Herndon, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 28, 1988, Ser. No. 212,572
Int. Cl.[4] B64D *25/04*
U.S. Cl. 244—122 AG **16 Claims**



1. A lateral head restraint comprising:
a seat having a headrest portion, said headrest portion having a right side and a left side corresponding to a right side and a left side of a user's head;
two inflatable bladders, each having a rear face attached to said headrest portion and a movable front face, one of said bladders being attached on each of said sides of said headrest portion, said bladders having threads therein causing said bladders to assume a predetermined shape when fully inflated;
means for simultaneously and rapidly inflating said bladders, causing said front faces to be positioned adjacent respective opposite sides of said user's head; and
a pivot means for reach of said respective bladders for permitting said bladder to pivot as it is inflated, said pivot means being coupled to said headrest portion and positioned aft of a user's eyes, said front face of said bladder being positioned aft of said pivot means and adjacent said rear face when said bladders are not inflated, said front face pivoting about said pivot means during inflation, said front face being spaced from said rear face and being positioned forward of said pivot and adjacent the side of said user's head when said bladder is inflated.
12. The method of restraining a user's head, comprising:
providing a seat including a headrest portion;
providing two air-inflatable bladders, each having a rear face securely attached to said headrest portion and a front face movable with respect to said headrest portion; and
inflating said bladders simultaneously thereby, causing said front face of said bladders to move from a position adjacent said headrest portion to a position adjacent a temple region of said user's head to provide restraining support to said user's head.

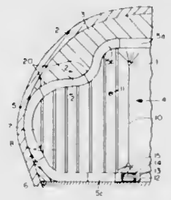
4,899,962

PORTABLE FIRE RETARDANT SEPARATION WALL ESPECIALLY FOR AIRCRAFT

Hans J. Mueller, Hennstedt Ulzburg, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 303,286
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 3802331
Int. Cl.[4] B64C *1/34*
U.S. Cl. 244—129.2 **19 Claims**

1. A portable fire retardant wall for separating a space portion where a fire started from the remainder of an enclosed space, comprising foldable wall means made of a gas-tight, flame resistant material, inflatable ring hose means also made of a foldable, gas-tight, flame resistant material, said ring hose means being secured all around said foldable wall means for forming a frame around said foldable wall means when said ring hose means are inflated, means for inflating said ring hose



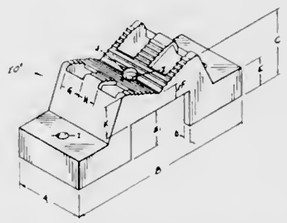
means when said fire retardant wall is to be installed, and a portable base plate (12) substantially shorter than a width of said enclosed space, said ring hose means and said inflating means being permanently mounted to said portable base plate to form an easily storable unit that is transportable to any desired location within said enclosed space.

4,899,963

SUPPORT SADDLE FOR ELONGATE ARTICLES AND INTERPOSITIONING DEVICE FOR DISSIMILAR SURFACES

Patrick J. Murphy, 9011 Lloyd La., Stockton, Calif. 95212

Filed Feb. 6, 1989, Ser. No. 305,552
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—65 **43 Claims**



1. A support saddle comprising, in combination: first and second support walls inclined such that said walls define a substantially "V" shaped trough so that articles can be placed within said trough,
means for attaching said trough to a support surface,
and means for removeably attaching a tether around said trough and over the articles to constrain the articles thereto,
wherein said removable tether attaching means includes a plurality of openings at portions of said trough remote from the lower crotch portion of said "V" shaped trough,
wherein said trough is formed from a pair of inclined surfaces forming a "V", a pair of rear walls extending from edges of said inclined surfaces remote from said crotch portion, and side walls extending between said rear walls and side edges of said inclined surfaces,
wherein a peak is defined by the juncture of said inclined surface and said rear walls, and said openings extend down on said rear wall allowing unobstructed tethering of much larger diameter articles,
and wherein said side walls include a cutaway portion on said walls defining an access area to a portion of the un-

derside of said saddle, allowing manual directing and other manipulation of the tethering means, regardless of saddle being secured or unsecured to the mounting surface.

4,899,964

PLASTIC PIPE LINE HOLDER

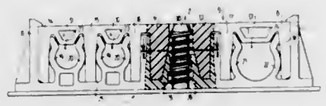
Hans-Hermann Sick, Kaiserslantern, Fed. Rep. of Germany, assignor to TRW United Carr GmbH & Co., Enkenbach-Alsenborn, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 302,423

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802698

Int. Cl.⁴ F16L *3/22*

U.S. Cl. 248—68.1 **16 Claims**



1. A plastic holding device for mounting and holding elongated members such as pipelines comprising:

a holding member including fastening means for connecting the holding member to a support, said holding member further including at least one holding element for resiliently receiving and holding a pipeline; and,

a locking means for releasably engaging said holding element and preventing removal of a pipeline positioned therein, said locking means including at least one first wedge element for engaging said holding element and at least one second wedge element for engaging said fastening means and preventing disconnection of said fastening means from said support.

4,899,965

APPARATUS FOR COLLECTIVELY FIXING PIPES

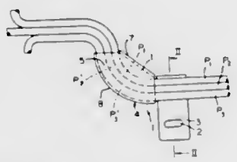
Masayoshi Usui, Nomazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Nagasawa, Japan

Filed Jan. 27, 1989, Ser. No. 302,837

Claims priority, application Japan, Feb. 16, 1988, 63-19161[U]

Int. Cl.⁴ F16L *3/22*

U.S. Cl. 248—68.1 **8 Claims**



1. An apparatus for collectively fixing pipes to a base member, said apparatus, comprising:

a plurality of pipes with a relatively small diameter each said pipe having a bent portion, said bent portions of said pipes being disposed in side by side relationship in a single plane; and

a clamp member having a clamping wall portion comprising first and second side walls disposed on opposite respective sides of the bent portions of the pipes and generally parallel to the plane thereof, an inner wall extending between the side walls and disposed radially inwardly of the bent portion of the pipes, a curved wall portion extending from the side walls and disposed radially outwardly of the bent portion of the pipes and snuggly engaged therewith, said clamp member further comprising a mounting wall portion extending from one of said side walls for mounting said apparatus to the base, whereby the engagement of the curved wall with bent portion of the pipes prevents axial and circumferential displacement of the pipes.

4,899,966

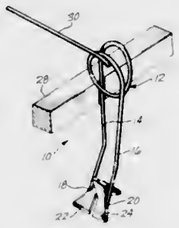
RACK CLIP FOR ANODIZING AND PAINTING

Thomas Antos, Gig Harbor, Wash.; Jon Rosner, Chicago, Ill., and David J. Wirth, Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 10, 1988, Ser. No. 269,580

Int. Cl.⁴ C25D *17/06*

U.S. Cl. 248—74.4 **4 Claims**



1. A clip for holding a workpiece during an alodining, anodizing and painting operation, and like operations, said clip comprising:

a single, electrically conductive wire-like member, said member having a coiled portion and first and second elongated tine portions, said tine portions extending away from said coiled portion in generally the same direction and in a manner so that the termini thereof are normally positioned opposite each other, with each terminus havir·g a contact portion, said coiled portion being biased so that said tine portions and their termini are normally forced toward each other for gripping a workpiece between the contact portions therof; and

an elongated handle member, welded to said coiled portion of said electrically conductive member, said handle member extending outwardly away from said coiled portion, said handle member being moveable about said coiled portion in a manner so as to oppose the bias of said coiled portion, to cause said termini to spread apart for releasing said workpiece.

4,899,967

PORTABLE FLEXIBLE BAG HOLDER

Austin E. Johnson, 6800 W. 16th Ave., Lakewood, Colo. 80215

Filed Jan. 17, 1989, Ser. No. 297,107

Int. Cl.⁴ A63B *55/04*

U.S. Cl. 248—97 **20 Claims**

1. Apparatus for holding a flexible bag comprising:

an annular member having an inner and an outer peripheral surface;

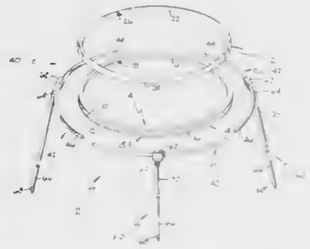
said outer peripheral surface comprising two spaced apart rim portions integral with a central body portion;

said central body portion extending radially inwardly from said rim portions to form an annular recess;

an air impervious flexible annular tubular member positioned in said annular recess and is at least partially inflated with a sufficient amount of air to form an annular cavity therein and said air impervious flexible annular tubular member having inner and outer peripheral surfaces so that the open end portion of a flexible bag may be passed through said annular member and be folded back over said annular member so that an annular portion thereof is radially outwardly opposite to said air impervious flexible annular tubular member;

clamping means for contacting said annular portion of said open end portion of said flexible bag so that said annular portion is located between said air impervious flexible annular tubular member and said clamping means;

force applying means for applying radially inwardly directed forces on said clamping means so as to clamp said annular portion of said open end portion of said flexible



bag between said clamping means and said outer peripheral surface of said air impervious flexible annular tubular member; and

support means for holding said open end portion of said flexible bag at a relatively fixed position spaced a distance above a support surface and the bottom closed end of said flexible bag.

4,899,968

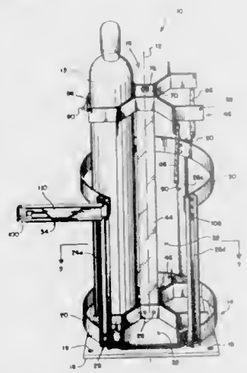
STORAGE AND ACCESS APPARATUS FOR CYLINDERICAL OBJECTS

David Eaglin, San Jose, and Carlos O. F. Hinds, Hayward, both of Calif., assignors to SCES Enterprises, Inc., San Jose, Calif.

Filed Nov. 16, 1988, Ser. No. 272,494

Int. Cl.⁴ A47F *5/02*

U.S. Cl. 248—131 **19 Claims**



12. A storage and access apparatus adapted to support industrial gas cylinders, comprising:

an open stationary frame including a fixed base plate, central axis rotational support means, and radially surrounding frame means, said radially surrounding frame means including an occludable opening therein and gate means for selectively closing said occludable opening; and

a rotating carousel member situated radially within said surrounding frame means, the carousel member including a center pillar extending vertically about said central axis, a first tier of discrete individual cylinder support chambers secured to the lower end of said center pillar, and upper cylinder restriction means for restricting lateral movement of the upper portion of cylinders having the bottoms thereof situated within said support chambers.

4,899,969

LOCKABLE ELEVATING MECHANISM FOR THE CONTINUOUS ADJUSTMENT OF FURNITURE AND GUIDE SLEEVE FOR SUCH AN ELEVATING MECHANISM

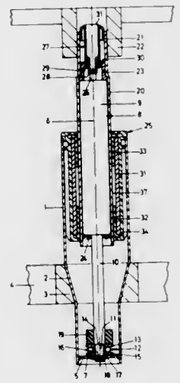
Hans-Peter Bauer, and Hans J. Bauer, both of Altdorf, Fed. Rep. of Germany, assignors to Fritz Bauer and Sohne oHG, Altdorf, Fed. Rep. of Germany

Filed Dec. 29, 1988, Ser. No. 291,693

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 880976[U]

Int. Cl.⁴ F16M *11/00*

U.S. Cl. 248—161 **11 Claims**



1. A lockable elevating mechanism for continuous adjustment of a unit such as a seat, table top or the like comprising:

a guide tube having means for connecting the guide tube to a pedestal;

a length-adjustable lockable gas spring;

a piston rod of the gas spring being axially, with respect to a central longitudinal axis of the mechanism, firmly but removably connected to a bottom plate of the guide tube;

a housing of the gas spring being axially firmly but removably connected to the unit in the area opposite the piston rod;

a guide sleeve held in the guide tube and guiding laterally firmly supports an outer tube of the housing, which outer tube axially slides, with respect to the said guide sleeve along the central longitudinal axis, an outer tube of the housing; and

an activating rod for length-adjustment of the gas spring and protruding axially, with respect to the central longitudinal axis, from the housing opposite the piston rod wherein the guide sleeve has a central carrying tube, a pair of slide sleeves arranged spaced apart from one another within said central carrying tube and a carrying sleeve surrounding said central carrying tube and held in the guide tube.

4,899,970

PAINT CAN HANGER

James Berzina, 2812 Kingston Cir., Grand Island, Nebr. 68803

Filed Dec. 28, 1988, Ser. No. 291,264

Int. Cl.⁴ E06C *7/14*

U.S. Cl. 248—210 **13 Claims**

1. A bracket for adjustably supporting a paint can having an arcuate bail pivotally connected to bail sockets protruding

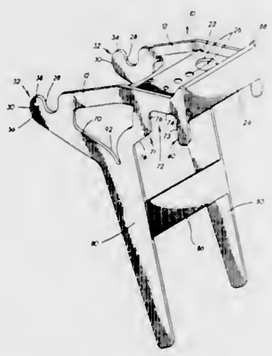
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from opposite sides of the can, on a ladder including a pair of spaced apart side rails and a plurality of rungs connected to and extended between said side rails in vertically spaced apart relation, said bracket comprising,

a pair of outwardly extending paint can support arms having free ends adapted to receive a paint can in close fit relation there between,

a cross member connected to and extending between said paint can support arms for securing said arms in generally stationary relation to one another,

each support arm having a top opening slot adjacent the free



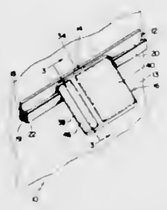
end thereof for pivotally receiving a bail socket of a paint can whereby a paint can is supportable on said arms for pivotal movement about an axis through said bail sockets, open bottom hook means operatively associated with opposite ends of said support arms for removable support of said arms on a rung of a ladder, and

at least one stabilizer leg connected to and extended downwardly from said support arms for abutment against the rung of a ladder which is next adjacent and lower than that on which said hook means are supported to thereby stabilize said support arms against downward rotation about said rung on which said hook means are supported.

4,899,971
DISPLAY ASSEMBLY

Alfred A. Elkin, Pawtucket, R.I., assignor to Plastic Development, Inc., Pawtucket, R.I.

Filed Aug. 1, 1988, Ser. No. 227,067
Int. Cl.[4] A47F *5/08*
U.S. Cl. 248—225.1 **12 Claims**



1. A display assembly comprising:

(a) a channel member adapted to be mounted in a substantially horizontal, upwardly facing disposition on a substantially vertical supporting surface, said channel member including spaced inner and outer walls and an inner lip on the inner side of one of said inner or outer walls which cooperates with the other of said inner or outer walls to define a reduced mouth of said channel member;

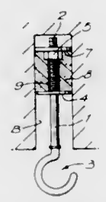
(b) a hanger member including an engagement portion and an arm portion, said engagement portion being detachably snap received in said channel member and including a downwardly extending resilient leg and a downwardly extending resilient latch element adjacent said leg, said latch element engaging said lip to retain said engagement portion in releasable interlocking engagement in said channel member, said downwardly extending leg engaging the one of said inner or outer walls which is opposite from said lip to retain said latch element in engagement with said lip, said arm portion being attached to said leg and extending outwardly from said channel member and said supporting surface when said channel member is mounted on said supporting surface; and

(c) a package member received on said arm portion and operative for containing an item for display in front of said supporting surface.

4,899,972
ANCHORING

Ernest Cranko, P.O. Box 3850, Alrode, Transvaal 1451, South Africa, and Roger K. Moore, 18 Chandlers Close, Crabs Cross, Redditch, Worcestershire, B97 5HU, England

Filed Jan. 28, 1987, Ser. No. 7,685
Claims priority, application United Kingdom, Jan. 31, 1986, 8602471; May 3, 1986, 8610924; May 3, 1986, 8610925; Oct. 17, 1986, 8624882
Int. Cl.[4] E21D *21/00*
U.S. Cl. 248—231.91 **10 Claims**

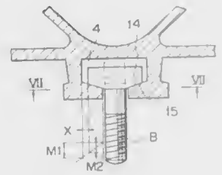


1. An anchor element to be anchored in a borehole in a substrate, the element comprising an elongate bolt, the bolt having a threaded end portion, a threaded nut being in engagement with the threaded end portion of the blot, the nut including a head of a diameter substantially equal to that of the borehole, a plate being mounted on the bolt towards the threaded portion thereof, a generally cylindrical body being mounted on the bolt and extending between the plate and the nut, the body comprising particles of a particulate material having a high resistance to crushing, the particles being held together by weak bonding forces, whereby on rotation of the bolt relative to the nut the body is subjected to axial compression between the head and the plate to that the weak bonding forces are overcome and the body loses its integrity and the particles of the body are moved closer together to form a load bearing annulus between the wall of the borehole and the bolt.

4,899,973
MOUNTING MEMBER

Takeshi Ishida, and Kazuhiko Kawazoe, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation-in-part of Ser. No. 38,114, Apr. 14, 1987, Pat. No. 4,752,055. This application Jun. 20, 1988, Ser. No. 208,916
Claims priority, application Japan, Apr. 16, 1986, 61-085882
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—298 **8 Claims**



1. A mounting member for supporting a fastening member, comprising:

a substantially horizontal support surface;

a pair of elongate webs depending from said support surface;

a pair of flanges extending inwardly toward each other from, and transversely to, free ends of said pair of webs so as to define a slot between inner opposed extremities thereof;

said fastening member having in a plan view a rectangular head portion which has a pair of longer sides and a pair of shorter sides;

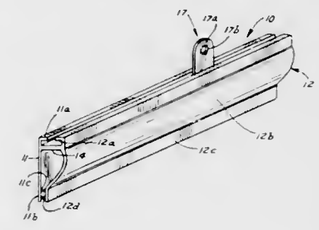
said support surface, inner side surfaces of said pair of webs, and said pair of flanges defining therebetween a groove which has a width greater than said slot defined between said opposed extremities of said flanges in such a manner as to allow insertion of said head portion of said fastening member into said groove when said longer sides of said head portion are oriented substantially along said slot, said width of an upper portion of said groove allowing rotational movement in a horizontal plane of said head portion of said fastening member therebetween; and

a pair of enlargements formed within a lower portion of said groove and within transversely spaced corner portions of said groove defined between said inner sidewall surfaces of said pair of webs and said flanges extending therefrom, said pair of enlargements extending longitudinally along said groove and including a pair of sloped portions, and allowing longitudinally opposite end portions of said head portion of said fastening member to rest within said lower groove portion when said fastening member is orientated with said shorter sides being disposed substantially parallel to said inner sidewall surfaces of said pair of webs along said lower portion of said groove but preventing said rotational movement of said fastening member within said lower portion of said groove as a result of said longitudinally opposite end portions of said head portion of said fastening member having respective undersurface inclined, sloped surfaces which are complementary to said pair of sloped portions portions of said enlargements while providing increased mechanical strength to said corner portions of said groove so as to withstand bending moments impressed thereon by means of loads attached to said fastening member due to the inward disposition of said head portion of said fastening member relative to said inner sidewall surfaces of said pair of webs.

4,899,974
DISPLAY CLIP STRUCTURE

Philip A. Wear, Minnetonka, and Stuart C. W. Wear, Minneapolis, both of Minn., assignors to Popco Inc., Eden Prairie, Minn.

Filed May 18, 1989, Ser. No. 353,537
Int. Cl.[4] A47F *7/14*
U.S. Cl. 248—467 **3 Claims**



1. a self-gripping poster holder formed as a resilient unitary body clip structure comprising

a back wall and a front wall in closed spaced relation,

an upper portion of each of said walls being angled to have facing edges,

a plate member horizontally disposed below said upper portions and being integral with said front and back wall,

said front wall being curved outwardly and tapering inwardly downwardly,

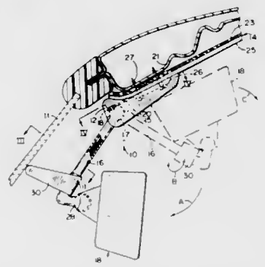
a bottom portion of said front wall being parallel with and opposite a facing bottom portion of said back wall, and

said bottom portions having an inter-gripping engagement.

4,899,975
FOLDABLE MOUNT

Michael J. Suman, Holland, Mich., assignor to Prince Coporation, Holland, Mich.

Filed Oct. 5, 1988, Ser. No. 253,490
Int. Cl.[4] B60R *1/04*
U.S. Cl. 248—481 **10 Claims**



7. A foldable mount for securing a vehicle accessory to a vehicle comprising:

a base member for attachment to the panel and including means for pivotally receiving a mounting stem thereto;

a stem pivotally mounted to said base at one end thereof and including an opposite end for receiving a vehicle accessory; and

a flat spring and a ball having a flat formed thereon defining locking means cooperatively coupled between said one end of said stem and said base to allow said stem to be pivoted between a position in which said accessory is closely adjacent the panel for shipment of the panel and

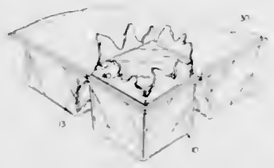
for locking said stem into a single use position with said opposite end extended away from said panel.

4,899,976

ICE CUBE TRAY

Sture C. Cederroth, New York, N.Y., and Bruce B. Zutler, Stamford, Conn., assignors to Arctic Icewater, Inc., New York, N.Y.

Filed Apr. 29, 1988, Ser. No. 188,278
Int. Cl.[4] F25C *1/22*
U.S. Cl. 249—61 **9 Claims**



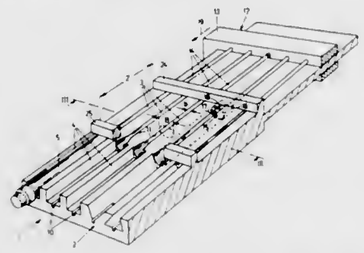
1. An ice cube tray for containing a liquid which forms into a plurality of ice cubes, said tray comprising:
a base having a plurality of cavities each for receiving a portion of the liquid, each of said plurality of cavities having a bottom and a plurality of side walls, wherein each of said plurality of cavities has said bottom of a thickness greater than the thickness of each of said plurality of walls, said bottom having a surface in said cavity and having a protuberance formed on the surface, wherein the protuberance of one of said plurality of cavities creates an embossment in the ice cube formed in the one cavity;
a cover permanently secured to said base; and
means for permanently securing said base to said cover,
wherein the liquid is entirely enclosed in said ice tray and therefore cannot be contaminated by matter outside of said ice tray when said base is secured to said cover, and wherein once a formed ice cube is removed from a cavity that cavity cannot be reused to form a new ice cube.

4,899,977

METHOD AND APPARATUS FOR THE MANUFACTURE OF FILLER STICKS FOR COSMETIC STICKS AND THE LIKE

Matthias Hempel, Groesgeschaidt 243, D-8501 Heroldsberg, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,748
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726996
Int. Cl.[4] B28B *13/06*
U.S. Cl. 249—68 **3 Claims**



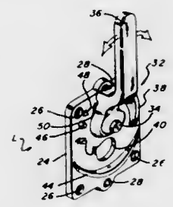
1. An apparatus for producing round or elliptic filler sticks for cosmetic sticks, comprising
a mold for casting the filler sticks in the form of a plate having a plurality of mold recesses disposed horizontally beside one another and parallel to one another, the mold recesses having an essentially round or elliptic cross section, wherein a longitudinal filling slot is provided in the mold plate along the length of each recess on its upper side, the width of the filling slot being considerably smaller than the maximum width of the mold recess, each mold recess being comparatively long and thin in relation to its maximum width;
expulsion means for demolding the hardened, cast filler sticks in the longitudinal direction of the mold recesses, wherein the direction of movement of the expulsion means runs parallel to a longitudinal extension of the filling slot, an end of the expulsion means facing the mold recess forming a transverse end wall of said mold recesses, said expulsion means being commonly driven;
and application frames disposed in the vicinity of the ends of the mold recesses extending at right angles to them.

4,899,978

LOCKING BRACKET FOR HOLDING TIE ROD ENDS

H. Gordon Gates, Lakewood, Colo., assignor to Gates & Sons, Inc., Denver, Colo.

Filed Dec. 16, 1988, Ser. No. 285,406
Int. Cl.[4] E04G *17/08*
U.S. Cl. 249—219.2 **4 Claims**



1. A form tie lock for use with form panels, reinforcing walers and a form tie, said lock comprising;
a base plate, mountable on a reinforcing waler on a form panel, having an opening with a peripheral edge for receiving the loop end of a form tie;
attachment means on said base plate for attaching said base plate to the waler;
a post extending from said base plate and spaced from said opening;
a latch member pivotally mounted on said post having a tapered claw with a tip which is movable across said opening from an open position on a first side of said opening to a closed position on a second side of said opening to grippingly engage a loop end of a form tie to hold the form tie in position between the form panels; and
a ramp surface formed in said peripheral edge of said second side of said opening and inclined away from said opening for guiding said tip of said claw up onto said plate after said tip passes through the loop end and is deflected thereby toward said opening.

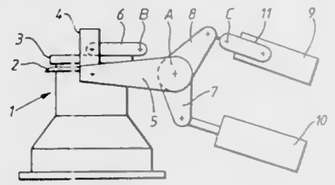
4,899,979

BLEEDER VALVE ASSEMBLY

George W. Stamp, Hartlepool, England, assignor to Davy McKee (Stockton) Limited, Stockton-on-Tees, England

Filed Apr. 7, 1988, Ser. No. 179,032
Claims priority, application United Kingdom, Apr. 10, 1987, 8708653
Int. Cl.[4] F16K *31/122*
U.S. Cl. 251—58 **4 Claims**

1. A valve assembly comprising a valve seat, a lid structure including a valve lid which can be fitted in sealing relation on the valve seat, a lever arm, said lid structure being secured towards one end on said arm, said arm being mounted to rotate on a rotatable shaft longitudinally remote from the lid structure, an over-center spring device having an over-center position and being arranged to apply a force to the shaft to rotate the shaft, and drive means arranged to rotate the shaft; the arrangement of said valve assembly being such that, with the valve lid fitted on the seat, the spring device urges the shaft in a direction to seal the lid on the seat and, when the shaft is rotated in a direction to displace the lid from the seat, the



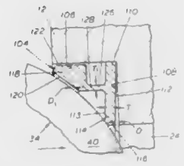
rotation of the shaft is opposed by said spring device until said over-center position is exceeded whereupon the spring device assists in the rotation of the shaft; and in which the lid structure is secured to the arm by first pivot means and is further secured to an elongate link by second pivot means at a point spaced from the first pivot means, said link being mounted to rotate about a fixed pivot axis spaced from the shaft so that during displacement the lid structure is raised essentially upwardly from the valve seat and upon continued rotation of the lever arm the lid structure is then pivoted away from the valve seat.

4,899,980

BALL VALVE

Willard E. Kemp, Houston, Tex., assignor to Kemp Development Corporation, Houston, Tex.

Filed Jan. 10, 1989, Ser. No. 295,744
Int. Cl.[4] F16K *5/06*
U.S. Cl. 251—175 **9 Claims**



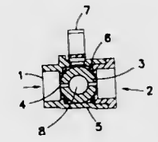
1. In a ball valve having a valve body chamber with a floating ball valve member mounted therein for movement between open and closed positions, and an annular recess about a flow passage in the valve body adjacent the flow chamber defining an outer circumferential surface and an adjacent planar shoulder extending in a generally radial direction;
an improved one piece annular metal seat fitting within said annular recess about said flow passage adapted for contacting the adjacent spherical surface of the floating ball valve member, said metal seat comprising:
a body portion of a generally uniform thickness extending in a generally radial direction in opposed relation to the adjacent planar shoulder and defining an inner low pressure lip about its inner circumference contacting the adjacent spherical surface of the floating ball member in sealing relation during the entire operation of said ball valve; and
a bearing portion integrally connected to said body portion and extending therefrom in a direction generally parallel to the longitudinal axis of the flow passage, said bearing portion having a seat adjacent the spherical surface of the floating ball member, said seat being spaced from said spherical surface under low pressure operation of said ball valve and contacting said spherical surface in bearing relation under high pressure operation of said valve.

4,899,981

IN-RUN CLEANABLE ORIFICE TRAP

Roy S. Thomas, Jr., Hopewell, Va., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 16, 1985, Ser. No. 809,603
Int. Cl.[4] F16K *5/08*
U.S. Cl. 251—207 **3 Claims**



1. An assembly for removing liquid from a pressurized gaseous system comprising
housing means having an upstream flow opening adapted to be mounted to the pressurized gaseous system and a downstream flow opening adapted for the discharge of the liquid,
a stopper member rotatably mounted within the housing means between the upstream flow opening and the downstream flow opening, said stopper member comprising a restriction orifice extending through the stopper member and a blow-down port of substantially greater diameter than the restriction orifice, said port extending through the stopper member substantially at right angles to and intersecting with the restriction orifice,
whereby said stopper member is rotatable from a first position wherein said stopper member is sealably engaged with the housing means and said restriction orifice provides substantially all communication between said upstream flow opening and said downstream flow opening to a second position substantially 180° from said first position wherein said stopper member is sealably engaged with the housing means and said restriction orifice is reversed from said first position, and to a blow-down position intermediate said first position and said second position wherein said blow-down port provides substantially all communication between said upstream flow opening and said downstream flow opening.

4,899,982

UPPER VALVE COMPONENT

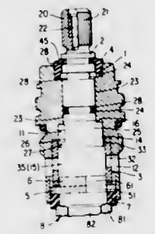
Peter Lange, Lüdenscheid, Fed. Rep. of Germany, assignor to Flühs Drehtechnik GmbH, Lüdenscheid, Fed. Rep. of Germany

PCT No. PCT/DE87/00491, § 371 Date Jul. 7, 1988, § 102(e) Date Jul. 7, 1988, PCT Pub. No. WO88/03625, PCT Pub. Date May 19, 1988
PCT Filed Oct. 30, 1987, Ser. No. 236,353
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1986, 3638180
Int. Cl.[4] F16K *41/08, 43/00*; F16J *15/32*
U.S. Cl. 251—214 **8 Claims**

1. Upper valve component for sanitary fixtures including:
a sleeve-type head fastenable in a valve housing
a spindle which penetrates the center of the sleeve head and is equipped with a socket head, the exterior of said spindle being provided with annular faces with which the spindle is radially guided in the sleeve head and with grooves

which interrupt the annular faces, some of them accommodating sealing rings, wherein at a first end proximate the socket head, the sleeve head is provided with an annular internal recess and

an essentially sleeve-shaped, pre-tensioned bearing of limited elasticity for insertion into and removal from said annular recess between said spindle and said sleeve head, without



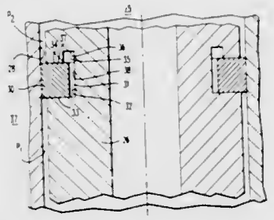
disassembly of said spindle from said bearing with a first portion of said bearing radially bulged into contact with one of the annular faces of the spindle and a second portion seated in a locking engagement with one of the grooves with an opposite portion bulged into contact with the sleeve head wall of the annular recess, thereby inhibiting rotation of the spindle with respect to the sleeve head during application of torque thereto.

4,899,983

ANTI-WEDGING PRESSURE SEAL RING APPARATUS

David B. Berrong, Oviedo, and Thomas L. Schuchart, Casselberry, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 18, 1989, Ser. No. 298,443
Int. Cl.[4] F16K *41/00*; F16J *9/00, 15/16*
U.S. Cl. 251—214 **4 Claims**



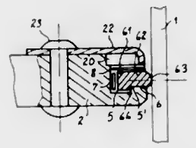
1. A valve plug having a valve plug housing shaped to fit in a bonnet cylinder of a steam control valve of a steam turbine and having a pressure seal ring groove for holding a pressure seal ring therein, said pressure seal ring groove having a pair of walls and a bottom surface, the improvement comprising: a relief groove formed in one wall of said pressure seal ring groove adjacent the bottom surface, the relief groove defining a reduced width wall surface in said one wall to reduce wedging of said pressure seal ring between the valve plug and bonnet cylinder bore as the groove wall wears away at least to the depth of seised relief groove during movement of the valve plug with a pressure seal ring therein.

4,899,984

OBTURATOR RING FOR BUTTERFLY VALVE

Philippe Strickler, and Jean-Michel Renaux, both of Toulouse, France, assignors to ABG Semca, Toulouse, France

Filed Sep. 30, 1988, Ser. No. 251,392
Claims priority, application France, Oct. 2, 1987, 87 13659
Int. Cl.[4] F16K *1/226*
U.S. Cl. 251—306 **8 Claims**



1. An obturator ring providing imperviousness between a flap and a valve body of a butterfly valve for a wide range of pressures and temperatures, wherein said obturator ring comprises:

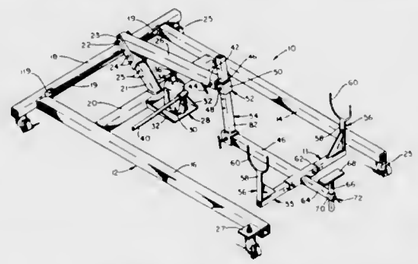
a split ring-shaped seal, mounted in a groove made on the edge of the flap, and which comprises a first refractory material, said split ring-shaped seal working together with first elastic means for radially biasing the seal against the valve body and second elastic means, separate from said first elastic means, for biasing the seal axially against the groove, wherein the first and second elastic means each also comprise a second refractory material having a relatively high fatigue strength.

4,899,985

LOW-PROFILE HYDRAULIC LIFT

Dave Good, 1607 Sixth Ave., Grinnell, Iowa 50112

Filed Aug. 15, 1988, Ser. No. 231,951
Int. Cl.[4] B60P *1/48*
U.S. Cl. 254—8 B **12 Claims**



1. A low-profile lift assembly comprising:

(a) a ground supported framework including a plurality of frame members coupled to one another and from ones of which frame members pivotally extend a plurality of strut members having an opposite end pivotally coupled to an overlying yoke member, said yoke member slidably mounted along a riser member acutely extending from said framework and including means for securing said yoke member to said riser member at a desired mounting position whereby the relative height of said primary lift arm to the ground may be raised without varying the mounting position of said hydraulic lift means;

(b) hydraulic lift means mounted to said frame work;

(c) an elongated primary lift arm pivotally mounted at one end to said yoke member and including means along its length securing an upper end of said lift means thereto;

(d) a plurality of transition arms slidably mountable to one another and to the outer end of said primary lift arm, wherein pairs of said transition arms mate with one another and include means for length adjustably securing one to the other and wherein an outermost one of said transition arms includes a longitudinal slotted channel; and

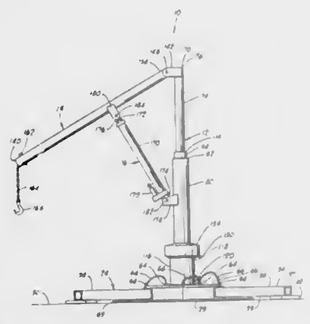
(e) a lift head having a shouldered slide stem mountable along said slotted channel and including means for securing a workpiece to said lift arm, whereby the workpiece may be raised from above or lifted from below.

4,899,986

ROTARY HOIST

James E. Tweedy, 419 NW. 53rd, Lawton, Okla. 73505

Filed Dec. 16, 1988, Ser. No. 285,628
Int. Cl.[4] B60D *1/48*
U.S. Cl. 254—8 B **14 Claims**



1. A rotary hoist for hoisting an object, comprising:

a generally vertically extending stationary guide shaft having an upper end and a lower end said lower end being attached to a base;

an outer tubular housing rotatably supported on the shaft, the outer tubular housing having an upper end and a lower end;

an inner tubular housing having an upper end and a lower end, the inner tubular housing lower end being telescopingly and rotatably received within the outer tubular housing upper end, the inner tubular housing being rotatably and slideably mounted along said shaft,

a boom pivotally secured at one end thereof to the inner tubular housing adjacent the upper end of the inner tubular housing, wherein the boom is capable of securing the object to be hoisted;

a jack having one end pivotally secured to the outer tubular housing below the connection of the boom to the inner tubular housing and having its opposite end pivotally secured to an intermediate portion of the boom for raising and lowering the boom, wherein the inner tubular housing with the boom secured thereto is capable of 360 degree rotation about the shaft while the object is secured to the boom.

4,899,987

VEHICLE SCISSOR LIFT

Thomas A. Craig, Milwaukee, Wis., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Dec. 8, 1988, Ser. No. 281,489
Int. Cl.[4] B66F *3/22*
U.S. Cl. 254—122 **6 Claims**

1. A hydraulically operated scissor lift comprising:

a base;

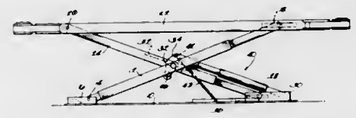
a platform supported for vertical movement with respect to the base;

a first leg having opposite ends, one end pivotally connected to the base and the other end slideably connected to the platform,

a second leg having opposite ends, one end of the second leg being pivotally connected to the platform and the opposite end of the second leg being slideably connected to the base,

a pivot interconnecting the mid portion of the first leg to the mid portion of the second leg;

a crank which rotates independently of said first and second legs, said crank being mounted on the pivot, the crank having opposite ends, and including a roller on open end of the crank, and the crank being pivotable on the pivot



between a first position in which the crank is generally horizontal and a second position in which the crank is generally vertical; and

a hydraulic ram having opposite ends, one end of the hydraulic ram being connected to the base and the other end of the hydraulic ram being connected to the other end of the crank, the hydraulic ram being extendable and adapted to cause pivotal movement of the crank between the first position and the second position during initial extension of the hydraulic ram;

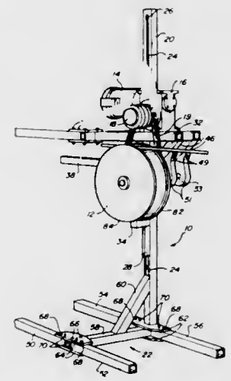
whereby initial movement of the hydraulic ram pivots the crank about the pivot to force the roller against the base, thereby elevating the pivot vertically to provide initial lift, and whereby further movement of the hydraulic ram lifts the crank out of engagement with the base as the hydraulic ram continues to raise the platform.

4,899,988

FIBER OPTIC CABLE PLACING EQUIPMENT

Jeffrey L. Mills, Northville, Mich., assignor to Madison lightwave Systems, Inc., Warren, Mich.

Continuation of Ser. No. 770,316, Aug. 28, 1985, abandoned. This application Dec. 23, 1987, Ser. No. 139,127
Int. Cl.[4] B65H *59/00*; B66D *1/30*
U.S. Cl. 254—292 **16 Claims**



1. A system for pulling a cable comprising:

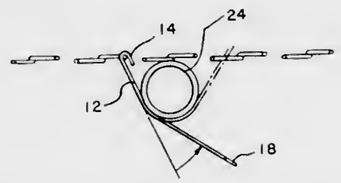
a first generally vertically arranged column;
a first means for holding said first column in an upright position;
a first platform means carried on said first column having means for adjustably securing said first platform at various positions along the length of said first column;
a first cable pulling capstan carried on said first platform for rotation about an axis, said first capstan having a conically tapered body, said body being of a dimension enabling axial migration of a cable situated on said first capstan upon a change in tension of said cable, to thereby change the rate of travel of said cable as it is pulled;
a first means supported by said first column for rotationally driving said capstan about said axis;
a second generally vertically arranged column;
a second means for holding said second column in an upright position;
a second platform means carried on said second column having means for adjustably securing said second platform at various positions along the length of said second column;
a second cable pulling capstan carried on said second platform for rotation about an axis, said second capstan having a conically tapered body, said body being of a dimension enabling axial migration of said cable situated on said second capstan upon a change in tension of said cable, to thereby change the rate of travel of said cable as it is pulled; and
a second means supported by said second column for rotationally driving said capstan about said axis;
wherein said first and second capstans are so constructed and arranged such that the rate of travel of said cable is substantially uniform as said cable is pulled by said capstans.

4,899,989
SAFETY ARRANGEMENT FOR STAIRS
Michael J. Kitson, and David Williams, both of 21 Ditchbury, Lymington Meadows, Lymington, Hampshire, S041 9FJ, United Kingdom
Filed Nov. 21, 1988, Ser. No. 274,285
Claims priority, application United Kingdom, Nov. 23, 1987, 8727430
Int. Cl.[4] E04H *17/00*
U.S. Cl. 256—1 **6 Claims**



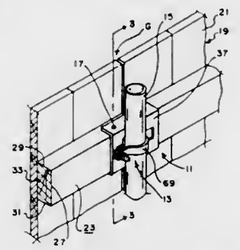
1. A safety arrangement for stairs, said safety arrangement comprising an elongate rail and a handle engaged on said rail and longitudinally slidable therealong, the engagement of said handle on said rail being such that any force applied to said handle other than in a direction parallel to the longitudinal extent of said rail causes jamming of said handle with respect to said rail thereby to prevent sliding movement of said handle along said rail, wherein said head portion is coated with high friction material.

4,899,990
FENCE-TIE
Gerald W. Winders, 2115 Camwood Ave., Rowland Heights, Calif. 91748, and Michael S. LeBlanc, 15950 Padova Dr., Hacienda Heights, Calif. 91745
Filed Jan. 10, 1989, Ser. No. 295,772
Int. Cl.[4] B21F *27/00*
U.S. Cl. 256—57 **8 Claims**



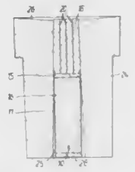
1. A fence-tie for securing a fence to a post or rail, said fence-tie having two free ends and formed of rigid yet deformable material and comprising,
a shaft having first and second terminal ends,
a hook member formed at said first end to provide one free end of said fence-tie, and
a substantially linear arm member formed at said second end to provide a second free end of said fence-tie, wherein the angle between said arm member and said shaft is between approximately 90° and approximately 135° and wherein the plane formed by said arm member and said shaft is at approximately a right angle to the plane formed by said hook member and said shaft.

4,899,991
FENCE PANEL BRACKET
B. J. Brunkan, Memphis, Tenn., assignor to Hackney wholesale, Memphis, Tenn.
Filed May 8, 1989, Ser. No. 349,047
Int. Cl.[4] E04H *17/14*
U.S. Cl. 256—69 **18 Claims**



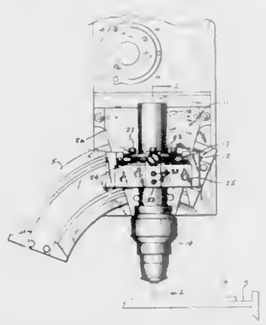
1. A bracket for use in combination with clamp means for securing said bracket to a fence post and fastener means for securing said bracket to a fence assembly; said bracket comprising: body means for being fastened to said fence assembly by said fastener means, said body means including a face panel for being positioned adjacent to said fence assembly, said face panel having first and second slots therethrough and having bridge portions adjacent to the ends of said first and second slots; said clamp means including a ring portion for extending about said fence post and through said at least one of said slots and about at least one of said bridge portions of said face panel of said body means of said bracket to secure said fence post to said bracket.

4,899,992
DEVICES AND APPARATUS FOR INJECTING GAS INTO HIGH TEMPERATURE LIQUIDS, E.G. MOLTEN METALS
Anthony Thrower, and John R. Gelsthorpe, both of Sheffield, England, assignors to Injectall Limited, Sheffield, England
PCT No. PCT/GB88/00091, § 371 Date Mar. 14, 1989, § 102(e) Date Mar. 14, 1989, PCT Pub. No. WO88/06191, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 15, 1988, Ser. No. 246,850
Claims priority, application United Kingdom, Feb. 18, 1987, 8703717
Int. Cl.[4] C22C *5/48;* **B22D** *37/00*
U.S. Cl. 266—44 **31 Claims**



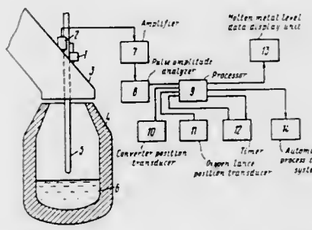
1. An injection cartridge, for use in injecting gas through the wall of a vessel into a high temperature liquid contained therein, the cartridge comprising an open-ended gasimpermeable sleeve blocked adjacent each of its opposite ends closed by a compressible wad of fibrous refractory material, and containing a filling of particulate refractory matter, the cartridge being permeable to gas flow from one end to the other and impermeable to liquid flow therethrough.

4,899,993
BREAKAWAY TOOL ASSEMBLY
Harley R. Habermann, Hartford, and Gerald D. Karow, Bayside, both of Wis., assignors to Messer.Griesheim Industries, Inc., Valley Forge, Pa.
Filed Dec. 14, 1988, Ser. No. 284,240
Int. Cl.[4] B23K *7/10*
U.S. Cl. 266—77 **14 Claims**



1. In an apparatus for mounting a noncontact tool for movement with a carriage mechanism relative to a workpiece normally spaced from the tool, a breakaway tool mounting assembly comprising:
an annular mounting collar supporting the tool generally on the axis of the collar, said collar having a downwardly facing outer frustoconical surface;
a support ring attached to the carriage mechanism and having an annular opening defined by an upwardly facing inner frustoconical surface;
said outer and inner frustoconical surfaces each defining the same cone angle such that the mounting collar is received in the annular opening in the support ring with said surfaces in direct bearing contact and with the tool depending generally downwardly through said annular opening; and,
resiliently biased retaining means attached to the support ring and in engagement with an outer circumferential portion of the mounting collar to maintain direct bearing contact between said surfaces and to allow the collar to be dislodged from said bearing contact in response to unintended contact between the tool and an object in its path of movement.

4,899,994
DEVICE FOR MONITORING THE LEVEL OF MOLTEN METAL IN A CONVERTER
Vasily D. Zhidkov; Nikolai A. Kudrin; Vladimir I. Sokolov; Stanislav N. Karelin; Igor A. Bulavintsev, and Vladimir N. Churakov, all of Chelyabinsk, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Okhrany I Tekhniki Bezpasnosti Chernoi Metallurgii
Filed Aug. 4, 1987, Ser. No. 81,714
Int. Cl.[4] C21C *5/30*
U.S. Cl. 266—94 **10 Claims**



1. Apparatus for monitoring the level of molten metal in a converter having a nose with an oxygen lance comprising:
(a) a γ-radiation source directing a γ-radiation flux onto the surface of said molten metal, said source being disposed above said nose of said converter;
(b) a γ-radiation receiver means to receive pulses of γ-radiation scattered by the surface of said molten metal, said receiver being disposed above said nose of said converter;
(c) first sensor means for indicating when said converter is in a substantially horizontal position;
(d) second sensor means for indicating when an oxygen lance is lowered into said converter whereby the substantially vertical position of said converter is detected;
(e) means for determining the dynamic range of an output signal of said receiver means between a maximum level and a minimum level of molten metal in said converter and for generating factors a_{11} and b_{11} for linearizing said output signal, said means for determining comprising means coupled to said first and second sensor means and to said receiver means for determining said maximum value by measuring said output signal when said first sensor means indicates that said converter is in said horizontal position and for determining said minimum value by measuring said output signal when said second sensor means indicates that said converter is in said vertical position, and processor means for producing said linearization factors from said maximum and minimum values, whereby said factors are corrected for variations in said output signal for each operation of said converter.

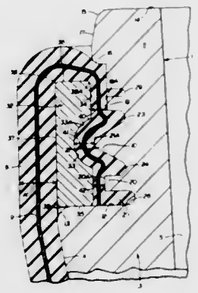
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4,899,995

CLAMP RING ASSEMBLY FOR AIR SPRING

Keith E. Hoffman, Atlanta; Wayne H. Geno, Cicero, both of Ind., and David A. Weitzenhof, Akron, Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Dec. 29, 1988, Ser. No. 291,908
Int. Cl.[4] F16F *9/36*
U.S. Cl. 267—64.27 **28 Claims**



1. An improved air spring including:

(a) A piston member for mounting the air spring on a supporting structure, said piston member having a piston body formed with an annular axially extending sealing surface terminating in an inner radially outwardly extending shoulder, said sealing surface being formed with a radially outwardly extending intermediate annular projection and a pair of radially extending inner and outer annular projections;

(b) A flexible sleeve formed of an elastomeric material containing reinforcing cords and having open ends sealingly engaged with the piston member and an end cap spaced axially from the piston member and forming a pressurized fluid chamber therebetween; and

(c) a continuous annular clamp ring located concentrically about the annular sealing surface of the piston member and clamping one end of the flexible sleeve therebetween, said clamp ring having an axially extending inner clamping surface formed with a concave recess which radially aligns with the intermediate projection of the piston member and a pair of adjacent surfaces each of which aligns with a respective one of the inner and outer piston member projections for positionally locating the clamp ring with respect to the piston member and for forming a generally air-tight seal therebetween.

4,899,996

HYDRAULICALLY DAMPING ELASTIC BEARING

Jürgen Maassen, Erftstadt, and Klaus Hafner, Kretzhaus, both of Fed. Rep. of Germany, assignors to Boge AG, Eltorf, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,660
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3721866
Int. Cl.[4] F16F *13/00;* **B60K** *5/12*
U.S. Cl. 267—140.1 **18 Claims**

1. Hydraulically damping elastic motor mount bearing for a motor vehicle, said bearing comprising:

a body having first end means for fastening said bearing to a first structure and a second end means for fastening said bearing to a second structure;

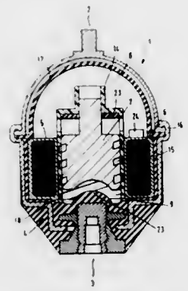
elastomeric means joining said first end means and said second end means;

said elastomeric means also forming cavity means within said body;

partition means dividing said cavity means into two chambers;

damping fluid being contained in said two chambers;

throttle means connecting said first and second chamber, said throttle means comprising a helical passage; and



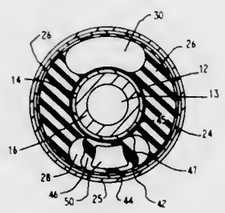
controllable electromagnetic means for varying a helical portion of said helical passage and thus for changing at least one suspension characteristic of said bearing, said controllable electromagnetic means being disposed to form at least a part of said partition means.

4,899,997

FLUID FILLED RESILIENT BUSHING

Richard P. Thorn, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Sep. 30, 1988, Ser. No. 251,269
Int. Cl.[4] F16F *13/00;* **B60G** *15/04, 15/12;* **B60K** *5/12*
U.S. Cl. 267—140.1 **2 Claims**



1. A fluid filled resilient bushing assembly for vibration isolation and control comprising:

an elongate inner rigid member;

an elongate outer rigid sleeve member disposed about and radially spaced from said inner rigid member to define a space therebetween;

a resilient means disposed about said inner rigid member between said inner rigid member and said outer rigid sleeve member for sealingly connecting said inner rigid member to said outer rigid sleeve member, said resilient means defines at least two circumferentially spaced chambers;

a restricted passageway fluidly interconnecting said at least two circumferentially spaced chambers;

a separate molded elastomeric enclosed channel disposed in one chamber to radially preload said bushing assembly, whereby said inner rigid member is deflected nonconcentrically of said outer rigid sleeve member by said molded elastomeric enclosed channel and

an incompressible fluid filling said chambers and said restricted passageway;

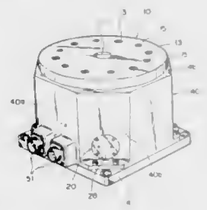
wherein during vibratory motion between inner rigid member and said outer rigid sleeve member at least one of said spaced chambers is contracted and another of said spaced chambers is expanded causing said incompressible fluid to flow through said restricted passageway from said contracting chamber to said expanding chamber.

4,899,998

ROTATIONAL POSITIONING DEVICE

Hiroshi Teramachi, 34-8, Higashitamagawa 2-chome, Setagaya-ku, Tokyo, Japan

Filed Nov. 9, 1988, Ser. No. 268,925
Claims priority, application Japan, Nov. 10, 1987, 62-170757[U]
Int. Cl.[4] B25Q *3/18*
U.S. Cl. 269—63 **4 Claims**



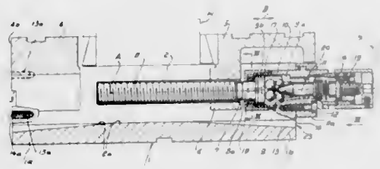
1. A rotational positioning device, comprising a rotary table for supporting a work piece ; a servo motor including a rotor which secures said rotary table ; a rotational angle detecting means for detecting the rotational position of said rotary table, wherein said rotational angle detecting means has a first portion coupled to said rotor and a second portion having a detector which detects a mark on said first portion; and a brake means for braking the rotation of said rotary table, wherein said servo motor, said rotational angle detecting means, and said brake means are accommodated in a casing.

4,899,999

MACHINE VICE WITH FORCE AMPLIFIER

Franz Arnold, Kempten, Fed. Rep. of Germany, assignor to Freamak S.A., Zarauz, Spain

Filed Sep. 30, 1988, Ser. No. 252,509
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733849
Int. Cl.[4] B25B *1/10*
U.S. Cl. 269—240 **6 Claims**



1. A machine vice with force amplifier means, comprising:

an elongated base member having a lengthwise extending, substantially U-shaped cross-section with an upwardly open, elongated recess;

a fixed jaw arranged at one end of and being formed in one piece with the base member and bridging across the recess;

a movable jaw mounted on the base member and having guide means thereon for guiding movement of the movable jaw on the base member, said movable jaw being movable along the length of the base member toward and away from the fixed jaw and having formed in one piece therewith on its underside a projection extending into the recess and having a nut therein;

a tightening device arranged in the recess and extending in a longitudinal direction thereof, said tightening device including a screw spindle engaging in the nut and operable, along with the force amplifier means, by a common handle;

a plurality of first threaded bores in a first fixing surface extending perpendicular to the spindle axis and located at an end of the base member remote from the one end thereof, the base member having at said one end a second fixing surface extending perpendicular to the spindle axis and which second fixing surface has a plurality of second threaded bores therein; and

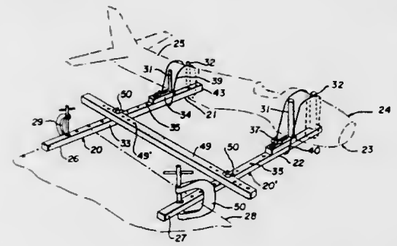
a single reaction plate adapted to be releasably fixed to the base member at either one of the first fixing surface or the second fixing surface by means of a plurality of screws engaging the first threaded bores or the second threaded bores, the tightening device and force amplifier means being supported on said reaction plate, whereby the reaction plate can be releasably mounted on a selected one of the ends of the base member by the plurality of screws.

4,900,000

SUPPORT FOR MINATURE OBJECTS

Dean C. Solberg, 628 24th Ave., N.W., Minot, N. Dak. 58701

Filed Sep. 1, 1988, Ser. No. 240,094
Int. Cl.[4] B25B *1/00*
U.S. Cl. 269—152 **4 Claims**



1. In a device for assisting in support and assembly of minature objects such as model airplanes, an apparatus comprising a table, a pair of elongated base members each having an upright post fixed at one end, means to secure the other ends of the base members to the tabke with their other ends projecting horizontally from the table in spaced relation, a slidable member for each base member, an upright post fixed to a portion of each of said slidable members, said base members each having a bolt extending upward from the base member, said slidable member having an elongated slot to receive said bolt in an adjusted position in said slot toward and away from said post on said base member, so as to engage a minature object at spaced intervals from opposite sides, means to tighten said bolts to said slidable member and base member to secure said object to said table in a manner to provide access to the object to facilitate working on the object.

4,900,001

APPARATUS FOR PRINTING ON BOTH SIDES OF CONTINUOUS WEBS IN A FORMAT PRODUCING COLLATED STACKS OF ORDERED PAGES

James M. Lapeyre, P.O. Box 50699, New Orleans, La. 70150

Filed Jun. 27, 1988, Ser. No. 211,703
Int. Cl.[4] B41F *13/54*
U.S. Cl. 270—1.1 **20 Claims**

1. An electronically controlled computerized printer system for printout on both sides of continuous webs to produce

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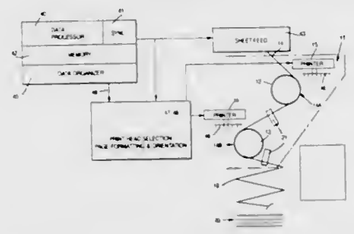
therefrom collated stacks of ordered pages, comprising in combination;

two printing heads with corresponding interconnected data processing means for producing from stored data printed text on opposite sides of a printable medium;

a continuous printable web representing a series of similar sized stacked sheets positioned together into said continuous web, said web including two multiple fold line portions to delineate said series of similar sheets, each multiple fold-line portion substantially perpendicular to the opposite edges of said web;

means for feeding said web in a path past the two said printer heads so as to print onto opposite sides of the web sheets;

means for storing data and feeding to each printing head a sequence of page data batches to be printed in ordered format in registration on both sides of the web on successive sheets along the web and arranged in a sequence for



presentation of successive pages in a sequentially page numbered format counting both sides of the sheets when the sheets are stacked in a fan-folded order; and

means for synchronizing and locating data to be printed on the successive sheets of the web in said ordered format with the presentation of the sheets of the web to the respective printer heads, including means for presenting and printing data on both sides of the web alternately printing pages right side up and upside down on the same side of the web;

thereby to print out on the web for arrangement into a fan-folded order in a stacked array of properly oriented sheets, numbered consecutively on both sides of the sheets, and which can be bound at one of the boundaries of the stacked sheets to form a booklet with individual accessible sheets by separating said sheets at, at least one of said multiple fold line portions.

4,900,002

SHEET FOLDING APPARATUS

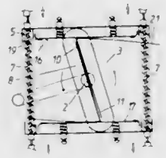
Karl Zechner, Wiener Strasse 25, A-8630 Mariazell, Austria

Filed Dec. 16, 1988, Ser. No. 285,770

Claims priority, application Austria, Dec. 22, 1987, 3399/87

Int. Cl.[4] B42C *1/00*

U.S. Cl. 270—45 **12 Claims**



1. An apparatus for folding sheet material, which comprises

(a) a rotatable magazine comprising

(1) two folding plates having end edges extending parallel to each other for holding the sheet material with portions thereof projecting beyond the end edges of the folding plates, and

(b) two folding rams wherebetween the rotatable magazine is mounted and which are displaceable with respect to each other, each folding ram having a substantially planar guide face facing the magazine and for guiding the projecting sheet material portions and cooperating with the end edges of the folding plates for bending the sheet material along the end edges upon rotation of the magazine,

(1) the magazine being rotatable 180° from a receiving position for the sheet material wherein the guide faces extend adjacent and substantially parallel to the folding plates, to a middle position wherein the guide faces extend substantially perpendicularly to the folding plates, and to a discharge position for the folded sheet material wherein a respective one of the projecting sheet material portions is bent about a respective one of the folding plate edges and the guide faces again extend adjacent and substantially parallel to the folding plates, the folding rams being in contact with the magazine in the receiving and discharge positions and rotation of the magazine causing the folding plates to be pressed apart.

4,900,003

SHEET CONVEYING APPARATUS

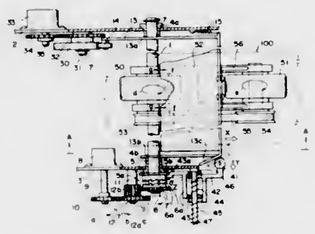
Kenichiro Hashimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1988, Ser. No. 267,098

Claims priority, application Japan, Nov. 9, 1987, 62-280998; Nov. 9, 1987, 62-170058[U]

Int. Cl.[4] B65H *3/06*

U.S. Cl. 271—114 **5 Claims**



1. A sheet conveying apparatus for conveying a sheet comprising:

a separation rotary member for separating a single sheet from a plurality of sheets and feeding the sheet;

a supply rotary member for supplying the sheets toward said separation rotary member;

driving means for generating a driving force to rotate said separation rotary member;

intermission means for intermitting the transmission of the driving force from said driving means;

operating means for shifting said supply rotary member between a supplying operation position and retracted position retracted from said supplying operation position;

driving force transmitting means for performing the intermission of said intermission means, in synchronism with the shift of said supply rotary member between said supplying operation position and said retracted position by said operating means.

4,900,004

SHEET FEEDER

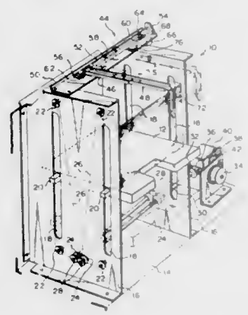
Yoshiaki Ushirogata, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,369

Claims priority, application Japan, Jul. 15, 1987, 62-176597[U]

Int. Cl.[4] B65H *9/12*

U.S. Cl. 271—121 **4 Claims**



1. A sheet feeder for feeding a large amount of paper sheets one at a time from a predetermined draw-out position of said sheet feeder comprising:

a housing having a pair of side walls which are positioned parallel to an intended direction of sheet feed of said sheet feeder;

a tray supported by said side walls by means for elevating and lowering, said tray being loaded with a stack of paper sheets; and

aligning means movable to an operative position which corresponds to the trailing edges of the sheets for aligning the trailing edges of the sheets on said tray when said tray is elevated and to an inoperative position for enabling the sheets to be loaded on said tray when said tray is lowered, and drive means for selectively moving said aligning means to the operative position and the inoperative position thereof in a direction perpendicular to the intended direction of sheet feed and in synchronization with a start of elevation and a start of lowering of said tray, respectively, and at a higher rate than the elevation and the lowering of said tray.

4,900,005

SHEET FEED APPARATUS

Richard C. Blyth, Lymington; Jeffrey J. Masters, St. Albans; Ian Hirst, Royston, and Leonard V. Gates, Widford, all of England, assignors to Xerox Corporation, Stamford, Conn.

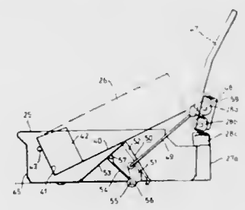
Filed Jun. 22, 1988, Ser. No. 209,825

Claims priority, application United Kingdom, Jun. 26, 1987, 8715009; Jun. 26, 1987, 8715010

Int. Cl.[4] B65H *1/08*

U.S. Cl. 271—127 **16 Claims**

1. Sheet feed apparatus for a copying machine comprising a cassette for holding a stack of sheets to be fed, wherein the cassette comprises an open-topped housing containing a base plate for supporting the stack of sheets, characterised by a manually operable actuator coupled to means for raising at least part of the base plate out of the cassette housing to facilitate loading sheets in the cassette, and wherein the actuator is movable between a first position in which the at least part of the base plate is in its operative position for sheet feeding, and



a second position in which the at least part of the base plate is in its fully raised position for sheet loading.

4,900,006

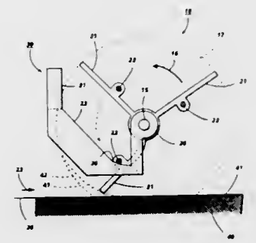
TANGENTIAL APPROACH, LOW NOISE PADDLE WHEEL DRIVE

Barry P. Mandel, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1988, Ser. No. 280,080

Int. Cl.[4] B65H *29/40*

U.S. Cl. 271—178 **12 Claims**



1. A finisher apparatus, comprising:

compiling tray means:

paddle wheel means having blades thereof positioned with respect to said compiling tray means for driving sheets within said compiling tray means;

pin means positioned within each of said blades of said paddle wheel means; and

deflector means positioned for riding each of said pins during a portion of rotation of said paddle wheel means such that said blades are deflected before contacting the surface of said compiling tray means, whereby noise generated by said blades of said paddle wheel contacting sheets within said compiling tray is diminished.

4,900,007

DEVICE FOR CHANGING THE DIRECTION OF A PRODUCT FLOW, PARTICULARLY OF PAPER PRODUCTS SUPPLIED IN SHINGLED FORMATION

Gunter Gämmerler, Sudetenstrasse 31, D-8190 Wolfratshausen, Fed. Rep. of Germany

Filed Oct. 3, 1988, Ser. No. 252,853

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733906

Int. Cl.[4] B65H *29/60*

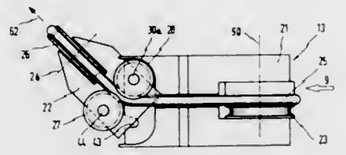
U.S. Cl. 271—185 **7 Claims**

1. A device for changing the direction of a product flow, particularly of paper products supplied in shingled formation comprising:

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an inflow element having at least two pairs of spaced-apart pressure belts guided about respective guide rollers aligned in a first conveying direction, the respective axes of said guide rollers being perpendicular to said first conveying direction;

an outflow element having further guide rollers respectively mounted on upper and lower carriers, the carriers connected to the inflow element by respective swivel axes, including means for swiveling said carriers about said



swivel axes to align said further guide rollers along a second conveying direction; at least a pair of diverter sheaves mounted to said carriers about said respective swivel axes;

wherein each said respective pressure belt is guided about a guide roller in said inflow element, at least one of said diverter sheaves, and one of said further guide rollers whereby to direct said pressure belt from said first conveying direction to said second conveying direction.

4,900,008

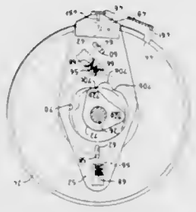
SHEET CLAMPING ARRANGEMENT FOR ROTATABLE DRUMS

June C. Fichter, Canton, and Kenneth A. McAuley, Boston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 945,287, Dec. 22, 1986, abandoned. This application Apr. 6, 1987, Ser. No. 34,665

Int. Cl.[4] B65H *5/12*

U.S. Cl. 271—277 31 Claims



1. In a sheet clamping system for a rotatable drum having a leading edge clamping bar movable between retracted and clamping positions, a trailing edge clamping bar movable between radially displaced retracted and clamping positions, and means for operating said leading edge clamping bar, said trailing edge clamping bar and said drum so that a sheet passed between said drum and said trailing edge clamping bar in the retracted position thereof is clamped to said drum at its leading edge by said leading edge clamping bar, drawn through said trailing edge clamping bar while same is retained in a stationary retracted position during drum rotation with said leading edge clamping bar until the trailing edge of the sheet registers with and is clamped to the drum by said trailing edge clamping bar, the improvement comprising:

means for releasing said leading edge clamping bar to allow the leading edge of the sheet to spring free of said drum;

said trailing edge clamping bar having a major web portion adapted to lie against and clamp the trailing end of a sheet to the periphery of said drum and an inwardly directed radial flange portion in a position to extend past the trailing edge of the same sheet; and

means including said trailing edge clamping bar in the retracted position thereof for delivering the sheet from said drum by the action of said radial flange pushing against the trailing edge of the sheet while the trailing end of the sheet underlies said major web portion free of clamping retention against the periphery of said drum.

4,900,009

SORTER

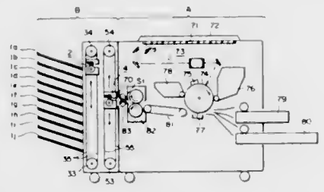
Makoto Kitahara, Tokyo; Masataka Naito, Kawasaki, and Yuji Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,705

Claims priority, application Japan, Apr. 20, 1987, 62-096944; Apr. 20, 1987, 62-096945; Apr. 20, 1987, 62-096946; Apr. 20, 1987, 62-096947

Int. Cl.[4] B65H *39/10*

U.S. Cl. 271—296 14 Claims



1. A sheet material distributing apparatus, comprising:

a plurality of bins for accommodating sheet materials, each of said bins having a sheet material inlet;

a first sheet material gripping and conveying means movable to be opposed to the sheet material inlet of each of said bins;

second sheet material gripping and conveying means linearly movable to receive one of the sheet materials from a sheet material discharging device to transfer the sheet material to said first sheet material gripping and conveying means.

4,900,010

ATHLETIC FIELD AND PLAYGROUND

Bernd Wengmann, Niederwiesstrasse 17c, CH-5417 Untersiggenthal, and Ernst Habegger, Kirchbühlstrasse 2, CH-3515 Oberdiessbach, both of Switzerland

Filed Oct. 21, 1988, Ser. No. 261,168

Claims priority, application Switzerland, Oct. 29, 1987, 4242/87

Int. Cl.[4] E01C *13/00*

U.S. Cl. 272—3 17 Claims

1. An athletic field or playground having an essentially planar and water-permeable surface consisting, at least in part, of tree bark particles consolidated to form an essentially tread-resistant top layer of said field or playground; said top layer consisting, at least predominantly, of a mixture of said tree bark particles having an average largest dimension and of flexible fibers dispersed in said mixture; and wherein an at least predominant portion of said fibers has a fiber length that is at least as great as the average largest dimension of said tree bark particles.

4,900,011

EXERCISER AND PLAYPEN STRUCTURE HAVING A TRAMPOLINE LIKE BOTTOM

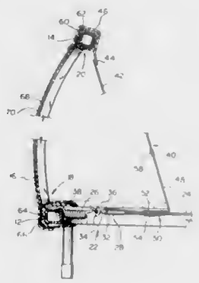
Leopold Nolet, 813 Brock Rd., Suites 3 & 4, Pickering, Ontario, Canada (L1W 3L8)

Filed Nov. 30, 1987, Ser. No. 126,838

Claims priority, application Canada, Dec. 30, 1986, 526493

Int. Cl.[4] A63B *5/16*

U.S. Cl. 272—65 19 Claims



1. An exercise and play zstructure comprising

a lower peripheral frame section having a resilient surface supported therein,

an upper frame section,

a series of rigid support members extending from said lower frame member for supporting said upper frame member, and

a curtain extending around the interior of said upper frame section and secured continuously at the top thereof to said upper frame section and at the bottom thereof to said resilient surface, said curtain having a portion of an elastical material to stretch in response to a bounce-like movement of said resilient surface.

4,900,012

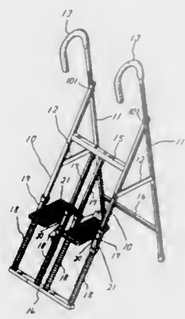
LEG EXERISING SYSTEM

Yeh H. Fu, No. 9, Lane 148, Pu Yi Road, Chung Li, Taiwan

Filed Dec. 12, 1988, Ser. No. 282,731

Int. Cl.[4] A63B *32/06, 5/00, 21/02*

U.S. Cl. 272—55 1 Claim



1. A leg exercising system comprising:

a base support member;

a first pair of tubular members having a pair of handles secured to respective upper ends of said first pair of said tubular members;

a second pair of tubular members secured to an upper section of said first pair of tubular members, said second pair of tubular members extending in a parallel direction and displaced each from the other;

a pair of parallel displaced tubular rods mounted between said second pair of tubular members;

a first pair of I-shaped sleeve members slidingly engageable respectively on each of said second pair of tubular members;

a second pair of I-shaped sleeve members slidingly engageable respectively on each of said pair of tubular rods;

a first pair of helical spring members respectively mounted on each of said second pair of tubular members between said base support member and respective I-shaped sleeve members;

a second pair of helical spring members respectively mounted on each of said second pair of tubular rods between said base support member and respective I-shaped sleeve members;

a pair of connecting rods respectively secured on opposing ends to an I-shaped sleeve on one of said second pair of tubular members and and I-shaped sleeve on one of said pair of tubular rods; and

a pair of pedals fixedly secured on each of said pair of connecting rods respectively, whereby a user may stand on said pedals and produce a reciprocating displacement.

4,900,013

EXERCISE APPARATUS

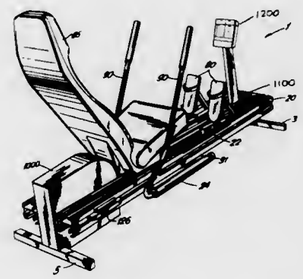
Robert E. Rodgers, Jr., 8011 Meadow Croft, Houston, Tex. 77063

Filed Jan. 27, 1988, Ser. No. 149,173

The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.

Int. Cl.[4] A63B *21/00, 1/00*

U.S. Cl. 272—70 28 Claims



1. An improved exercise apparatus for use in exercising one or more of the limbs of a user comprising:

a generally horizontally rail mounted on a supportive frame of the apparatus;

a first and second traveller mounted on the rail, the first traveller and the second traveller adapted to engage the limbs of the user during exercise, the first traveller and the second traveller being supported on the rail one above the other for movement in opposite relative directions;

endless chain means deployed in a loop;

first means for coupling the first traveller to the endless chain means;

second means for coupling the second traveller to the endless chain means;

force resisting means; and

means for connecting the endless chain means to the force resisting means wherein the user of the apparatus encounters resistance from the force resisting means when the user applies a force to the first traveller.

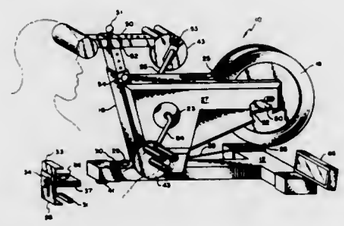
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4,900,014

CONVERTIBLE EXERCISE CYCLE

Alfred H. DeGraff, 6 Birch St., Saratoga Springs, N.Y. 12866-3834

Filed Sep. 27, 1988, Ser. No. 249,425
Int. Cl.[4] A63B *21/00*; A61H *1/02*
U.S. Cl. 272—73 **5 Claims**



1. A stationary seatless bicycle-like assembly having a base and a frame; rotation means including a transverse axle journaled in the frame and pedals rotatably mounted on each end of the axis, and means for varying the resistance of said rotational motion of the axle including a tension control wherein the improvement comprises:

a front support rod for supporting said rotation means and said pedals on said base and a vertically telescoping rear support rod extending upwardly from the base;

a bar slidably secured to the telescoping rear support rod for horizontal movement;

a forehead rest secured to the bar and extending outwardly therefrom, said rest being adjustable both horizontally and vertically by means of said vertically telescoping rear support rod and horizontally slidable bar; and

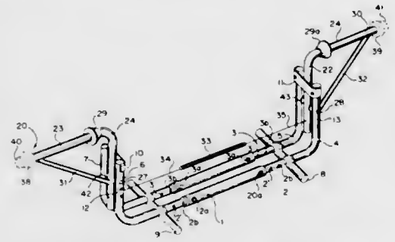
a clamp mounted on the base for securing the base to a tabletop.

4,900,015

EXERCISE DEVICE

Thomas E. Dissinger, 104 Roberts La. - 300, Alexandria, Va. 22314

Filed Mar. 17, 1988, Ser. No. 169,600
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—116 **9 Claims**



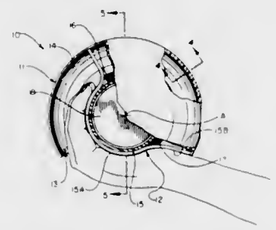
1. An exercise device for the upper torso comprising a stabilized base assembly with separated upstanding end members and a hand gripping assembly pivotally mounted to each of said upstanding end members, said base assembly comprising a pair of parallel and spaced apart, longitudinally extending U-shaped members with said upstanding end members, wherein said base assembly further includes lateral support means extending outwardly and perpendicularly of said pair of U-shaped members to stabilize said U-shaped member, each upstanding end member of said pair of U-shaped members having at least one opening therethrough in a horizontal plane in alignment with a similar opening in its opposing end member to receive a shaft; said hand gripping assembly comprising a pair of inverted L-shaped members, each member having a downwardly extending vertical leg pivotally mounted between said respective upstanding upstanding end member on said shaft extending through said at least one opening in each upstanding end member, said shaft being adapted for insertion into any other opening in each said upstanding end member of said base assembly, said other leg of said L-shaped member extending perpendicularly to said vertical end member and outwardly of each said upstanding legs of said U-shaped members whereby the weight of an user of said device will rotate said hand gripping assembly downwardly outside said base assembly about said shaft unless said user applies an upwardly and inwardly directed force.

4,900,016

METHOD OF USE OF EXERCISE DEVICE

Scott Caruthers, Glen Burnie, Md., assignor to DAR Products Corporation, Baltimore, Md.

Division of Ser. No. 94,794, Sep. 14, 1987, Pat. No. 4,813,669. This application Oct. 14, 1988, Ser. No. 257,525
Int. Cl.[4] A63B *11/00*
U.S. Cl. 272—122 **2 Claims**



1. The method of using an exercise device, comprising the steps of providing an exercise device having a relatively thin-walled housing having a diametral axis, a weight means disposed within the housing substantially coincident with the diametral axis thereof, the housing having a cut-away portion, and the housing further having an opening formed therein substantially tangentially of the housing and communicating with the cut-away portion thereof, whereby the hand of the user is inserted through the opening in the housing and at least partially around the weight means radially thereof, the user's hand being disposed at least partially between the weight means and the wall of the housing, and the user moving the exercise device alternately between a stressed position and an at rest position wherein the user does not employ a forceful grip on the exercise device, thereby the necessity for employing the user's conjunctive adjoining muscles is substantially reduced, which substantially reduces the tendency to detract from the development of the user's targeted muscle, and wherein the exercise method has a beneficial effect on the targeted muscle which is substantially improved over a conventional exercise method using an exercise device of the same weight.

4,900,017

INERTIAL FORCE, ACCOMMODATING RESISTANCE EXERCISE DEVICE AND METHOD

Thomas P. Bold, Jr., P.O. Box 1564, Springfield, Va. 22151

Filed Jul. 20, 1984, Ser. No. 632,824
Int. Cl.[4] A63B *21/22*
U.S. Cl. 272—127 **33 Claims**

1. An inertial force, accommodating resistance exercise device for exercising the body through effort required to overcome the inertia of a mass being accelerated and translated during surface oscillations, said exercise device comprising:

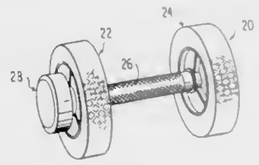
an axle means having at least one portion operable to be releasably controlled by a user;

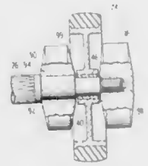
at least one wheel means rotatably mounted upon said axle means and being operable to engage, roll and be accelerated upon a surface during an accommodating resistance exercise routine;

said at least one wheel means including a peripheral surface for engagement with a surface during the exercise routine;

bearing surface means between said axle means and said at least one wheel means for facilitating smooth rotation of said at least one wheel means about said axle means in order to accelerate said exercise device during an exercise routine;

at least one inertial mass structure, said at least one inertial mass structure having a mass exceeding the mass of said at least one wheel, said at least one inertial mass structure





being connected to said axle means for acceleration and translation with said axle and without substantial rotation with respect to said axle means for providing an inertial resistance through essentially non-rotational translation when said at least one wheel is rolled and accelerated upon a surface during an accommodating resistance exercise routine; and

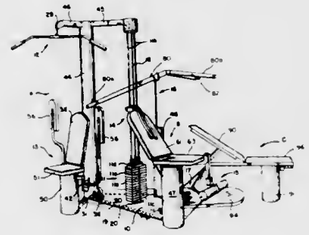
said one of said at least one inertial mass structure being operably mounted on said axle means independent of any other inertial mass structure; whereby a combination of relatively free rotational movement of said at least one wheel means with respect to said axle means and concomitant essentially non-rotational translation of said at least one inertial mass structure along with said axle means advantageously permits a user to accelerate said exercise device to perform inertial force accommodating resistance exercise routines to exercise a user's body and provide overall fitness.

4,900,018

EXERCISE MACHINE WITH MULTIPLE EXERCISE STATIONS

Arthur B. Ish, III, 17526 NE. 88th Pl., and Jeffrey B. Johnson, 9301 Avondale Rd. NE., #M1069, both of Redmond, Wash. 98052

Continuation-in-part of Ser. No. 97,549, Sep. 16, 1987, Pat. No. 4,809,972. This application Sep. 16, 1988, Ser. No. 245,684
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **11 Claims**





1. An exercise machine having an exercise station comprising:

a pedestal;

a back rest and a seat mounted on said pedestal;

a pair of handles at opposite sides of said seat and arranged to swing forwardly to an upright active position from a retracted position;

a dual-purpose unit of generally inverted T-shape swingably hanging adjacent the front of said seat for forward swinging movement from a lowered position;

locking means for selectively locking said handles in their said active position and said dual-purpose unit in its said lowered position;

a load;

an exercise element positioned adjacent the top of said back rest;

a cable and pulley system connected to said load and including a first cable end located adjacent the top of said back rest and connected to said exercise element, and including a second cable end connected to said dual-purpose unit, whereby pulling on said exercise element is yieldingly resisted by said load via said first cable and whereby forward swinging movement of the dual-purpose unit is yieldingly resisted by said load via said second cable when said dual-purpose unit is not locked.

10. A yoke assembly for connecting to a cable having a terminal ball and located on an exercise machine, said yoke assembly comprising:

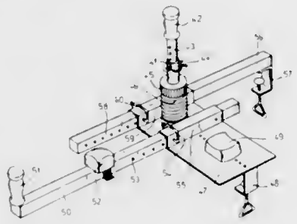
a flexible padded yoke element;

a central fitting with a keyhole slot having an eye portion for receiving such a ball of a size to pass through said eye

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portion and not through the remainder of said slot, said central fitting also having a second slot;
a pair of handle grips remote from said fitting; and
a strap passing through said second slot and connected along a major part of its length to said padded yoke element, said strap having a pair of loops at its opposite ends which interfit with said handle grips.

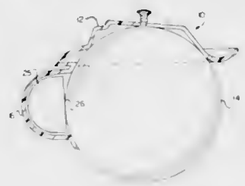
4,900,019
ARM WRESTLING APPARATUS
Yechiel Shamir, Harav Amiel 6, Tel Avid 62 263, Israel
Filed Dec. 27, 1988, Ser. No. 290,576
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—138 **2 Claims**

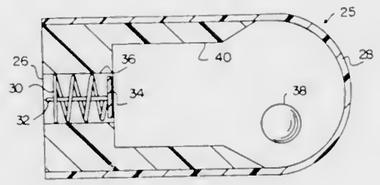


1. An arm wrestling apparatus comprising:
a handle for a user's primary hand and having means for adjusting its length and connected at one end to a base plate,
the handle provided with biasing means for resisting its being displaced,
a saddle adjustably positionably on the base plate for receiving an elbow associated with the user's primary hand,
a first push bar connected to the base plate adjustably on a user's side of the handle,
the first push bar provided with a grip for grasping by the user's secondary hand and a pad to protect the user's primary hand coming down,
a screw mounted on the base plate,
the handle being screwably engagable into the screw,
the biasing means comprising an outer helical spring positioned about the screw in compression between the handle and the base plate,
whereby the engagement of the handle relative to the screw presets the force of the spring.

4,900,020
BALLOON POPPING MECHANISM
Steven Rehkemper, and Denni Rivette, both of Chicago, Ill., assignors to C&s Distributing Co., Santa Monica, Calif.
Division of Ser. No. 167,575, Mar. 14, 1988. This application Mar. 16, 1988, Ser. No. 168,874
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—1 R **8 Claims**

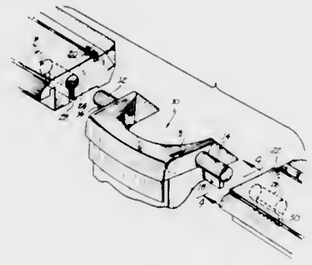
1. A game device for puncturing an expandable article by making contact with said article in response to an impact of said device during a game, said device comprising:
an expandable article which ruptures when punctured;
an enclosed container associated with said expandable article;
spring biased means within said container for puncturing said article; and

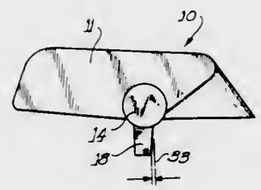




freely moving means captured within the enclosure of said container for randomly activating said means for puncturing said article when said device is tossed.

4,900,021
POCKET INSERT FOR POOL TABLE ASSEMBLY
Michael J. Lalick, 3700 W. 97th St., Evergreen Park, Ill. 60642
Filed Dec. 14, 1988, Ser. No. 284,297
Int. Cl.[4] A63D *15/00*
U.S. Cl. 273—12 **10 Claims**

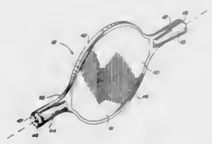




1. A pocket structure for assembly between adjacent horizontal rail members of a pool table comprising: a pocket insert including a body portion defining a pocket outline and opposed pin means extending laterally from opposite ends of said body portion for insertion into substantially conforming complementary aperture means axially formed in said adjacent rail members; said pin means comprising a shaft portion and planar abutment surfaces thereon projecting from said shaft portion for axial insertion into and engagement with said aperture means of said rail members for binding the pocket insert in a predetermined position with respect to the rail members.

4,900,022
TABLETOP BALL GAME AND EQUIPMENT
Carlo Maggio, Rossweidweg 4, 3052 Zollikofen/Bern, Switzerland
Filed Aug. 18, 1987, Ser. No. 86,682
Int. Cl.[4] A63B *39/00*
U.S. Cl. 273—30 **3 Claims**

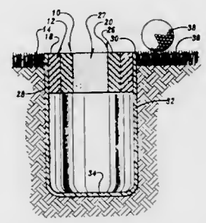




1. In a tabletop ball game in which a ball is stroked back and forth between first and second horizontal, coplanar, end zone ball playing surfaces of a rectangular tabletop ballfield across a laterally extending central ballfield partitioning element by opposing players respectively stationed adjacent said end zone surfaces, each using a hand-held paddle having a flat, rounded ball striking portion and a first elongated handle having a major axis extending radially outward from said ball striking portion, the improvement comprising a table tennis-like ball game in which:
said rectangular ballfield is smaller in scale than a standard table tennis tabletop ballfield;
said central ballfield partitioning element is a horizontally disposed rectangular ball bounce-deadening element of soft material which deforms when struck to spoil the bounce of the ball; and
each of said paddles further comprises a second elongated handle having a major axis extending radially outward from said ball striking position at a diametrically opposite position to said first handle, each said paddle to be gripped one handle in each hand by said players for stroking said ball across said horizontally disposed ball bounce-deadening element.

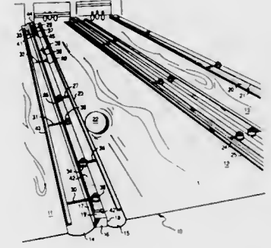
4,900,023
GOLF PUTTING AID
Anthony L. Gelina, 6511 Del Matro Ave., Des Moines, Iowa 50311
Filed Feb. 13, 1989, Ser. No. 322,177
Int. Cl.[4] A63B *69/36, 57/00*
U.S. Cl. 273—34 B **7 Claims**

1. An insert for a golf putting cup, comprising,
a hollow cylindrical first body member having an outer diameter and an inner diameter,
the outer diameter being complementary to the inside diameter of a conventional golf putting cup,
the inner diameter being greater than the diameter of a conventional golf ball,
said first body member having a vertical length of sufficient magnitude to permit said body member to be frictionally held within the top portion of said golf putting cup through the engagement of said outer diameter of said



body member frictionally engaging the inside diameter of said golf putting cup and said first body member being comprised of a resilient sponge rubber material, and wherein said frictional engagement of said body member within said golf putting cup is created by the partial compression of the outer diameter of said first body member within said golf putting cup.

4,900,024
BOWLING ALLEY BUMPER SYSTEM
John Chandler, 7641 Dentcrest, Dallas, Tex. 75240, and Bobby R. Beene, 9919 Ila Dr., Dallas, Tex. 75220
Filed Feb. 22, 1989, Ser. No. 313,710
Int. Cl.[4] A63D *5/00*
U.S. Cl. 273—37 **20 Claims**



1. A bumper mechanism for guarding the gutter of a first bowling alley having a longitudinal guide surface adjacent and positioned alongside said gutter, said longitudinal guide surface being mounted on the opposite side of said gutter from said alley, said bumper mechanism comprising: guarding means including a first elongated bumper separated from and disposed alongside said gutter and having a major axis parallel to the major axis of said gutter, and extending and retracting means for mounting, extending and retracting said bumper, said extending and retracting means being interconnected between said bumper and said longitudinal guide surface; said extending and retracting means being effective when in its extended condition to position said guarding means for deflecting bowling balls that may be directed toward said gutter, and said extending and retracting means being effective when in its retracted condition to position said guarding means for exposing said gutter and permitting balls directed toward said gutter to fall thereinto.

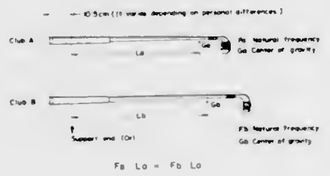
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4,900,025

MATCHED SET OF GOLF CLUBS AND METHOD OF PRODUCING THE SAME

Noriyuki Saganuma, 2-9-17, Nigata-Minami, Minami-Ku, Yokohama-Shi, Kanagawa-Ken, Japan

Filed Aug. 18, 1987, Ser. No. 86,550
Claims priority, application Japan, Aug. 27, 1986, 61-198947
Int. Cl.[4] A63B *53/00*
U.S. Cl. 273—77 A **4 Claims**



1. A dynamically correlated, matched set of golf clubs which comprises a plurality of golf clubs each of which has a shaft having one ends with a grip and the other end with a head, each said grip having a substantially uniform weight, said plurality of shafts each having a different shaft length and the shaft deflection characteristics of each shaft being substantially similar such that the deflection of eahc shaft at a given distance from a reference point on said shaft substantially uniform when a given torque is applied to each club about said reference point, moments of force at the head end sides of said golf clubs are standardized with reference to a portion of said grip central to both hands of a golf player who holds the golf club grip such that the base of one hand is at the top of the grip during swing as a rotating axis, and when natural frequencies at the head end side of said golf clubs in said set are measured with reference to said central portion as a support end so that natural frequencies of arbitrary clubs A and B arbitrarily selected from said set are given as Fa and Fb and lengths from the support end to the centers of gravity extending from the support ends to head ends of said selected clubs are given as La and Lb, each shaft has a stiffness characteristic satisfying a substantial relation Fa·La=Fb·Lb.

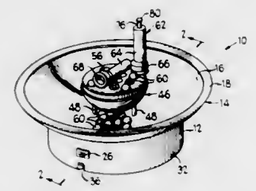
4. A method of producing a dynamically correlated, matched set of golf clubs each of which has a shaft having one end with a grip and the other end with a head, said shafts having different lengths and said shafts having shaft flexure characteristics which are suostantially similar such that the deflection of each shaft at a given distance from a reference point on said shaft is substantially uniform when a given torque is applied to each club about said reference point comprising the steps of predetermining a portion on a grip central to both hands of a golf player who hold a golf club grip such that the base of one hand is at the top of the grip during swing as a common reference, standardizing the moments of force of said set of golf clubs based on the determined reference as a rotating axis, and selecting a stiffness characteristic for each of said shafts wherein natural frequencies of clubs A and B arbitrarily selected from said set are given Fa and Fb measured with the common reference as a support end and distances extending to the head ends of said clubs from the support ends to the centers of gravity are given La and Lb such that each shaft has a stiffness characteristic satisfying a substantial relationship Fa·La=Fb·Lb, thereby producing a dynamically correlated, matched set of golf clubs.

4,900,026

WHIRLING BALL COLLECTING GAME

Ralph J. Kulesza, Chicago; Walter J. Wozniak, Addison, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 21, 1987, Ser. No. 135,388
Int. Cl.[4] A63D *3/02;* **A63B** *71/00, 67/00*
U.S. Cl. 273—119 A **14 Claims**



1. A game comprising in combination:
a housing supporting a bowl providing an upwardly facing concave playing surface having a central, lowermost point;
a plurality of spherical balls;
means mounted for rotation about an axis generally coincident with the center of the concave playing surface;
means for driving the rotation means so that the rotation means will upon contacting a ball cause the ball to whirl about the concave playing surface;
means for retaining the whirling balls within the concave playing surface;
means for collecting the balls; and
the balls collecting means being tubular with a resilient open bottom.

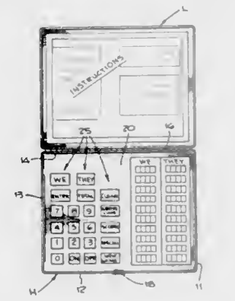
4,900,027

GAME SCORING METHOD

John Sberidan, 2459 Century Hill, Los Angeles, Calif. 90067

Continuatioo-in-part of Ser. No. 140,048, Dec. 31, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 259,883
Int. Cl.[4] G06F *15/44;* **A63F** *1/18;* **A63B** *71/06*
U.S. Cl. 273—148 R **3 Claims**

3. The method of scoring a card game utilizing an electronic computer that has WE, THEY, ENTER, and digit 0 through 9 keys, which consists of assigning to each player an identifying digital number within the range 1 through 9, entering in conjunction with the WE key the identifying numbers of a pair of players who have been assigned to the WE team, entering in conjunction with the THEY key the identifying numbers of a pair of players who have been assigned to the THEY team, thereafter entering in conjunction with the WE and THEY keys digital numbers indicating scores earned by the WE and THEY teams, respectively, and finally causing the computer to add up and display a total score for each individual player in





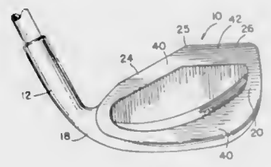
conjunction with the particular identifying digit 1 through 9 which had been assigned to that individual player.

4,900,028

IRON TYPE GOLF CLUB HEAD WITH AN INTEGRAL SIGHTING MEANS

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Filed Sep. 14, 1987, Ser. No. 95,675
Int. Cl.[4] A63B *69/36, 53/04*
U.S. Cl. 273—164 **14 Claims**



1. An iron type golf club head comprising:
a main body including a heel, a hosel proximate said heel, a toe, a rear surface, an upper surface, a lower surface including a sole, a ball striking face to hit the ball along an intended line of flight, a center of percussion, and a top ridge extending from the hosel to the toe, said top ridge being characterized by a first section extending upwardly and outwardly from said hosel toward said toe at an angle and a second section extending in a straight line in the heel to toe direction from a first point adjacent said toe to a second point located substantially remote from said toe between said toe and said hosel and substantially spaced from said hosel, said second section forming a sighting and aligning means to facilitate proper alignment of the club head to the intended line of flight, and a rearward projecting peripheral weighting moss located on said rear surface of said club head defining a cavity therein generally coextensive in length with said first and second section and being further characterized by providing substantial peripheral weight located adjacent said toe, said heel and said lower surface of said club head, and also adjacent generally parallel to, and below said first and second sections.

4,900,029

GOLF CLUB HEAD WITH AERODYNAMIC UPPER SURFACE

Hugh J. Sinclair, 30 Palmer Green, Baltimore, Md. 21210

Filed Mar. 16, 1989, Ser. No. 324,466
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—167 E **4 Claims**

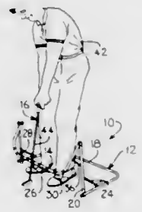
1. An aerodynamic golf club head for increasing club head speed for a given force when swinging the club head, said club head including a ball striking face, heel, toe, hosel, upper surface, bottom and rear surface wherein the improvement comprises:
a vertical airfoil having a front surface and a rear surface and formed below said upper surface of said club head, said airfoil being substantially parallel to said ball striking face; said airfoil being characterized by said front surface being an upwardly extending rear wall of a cavity formed in said upper surface of said club head; said cavity being further defined by a planar surface, sloping downwardly and rearwardly from adjacent to and behind said ball striking face toward said rear surface; said cavity extending substantially the entire width of the club head in the heel to toe direction; and, said front surface of said airfoil extending to a depth at least one-half of the distance between said upper surface and said bottom of said club head.

4,900,030

PUTTING STROKE TRAINING DEVICE

Bradley L. Hontz, 1305 Park Pl., Marysville, Kans. 66508

Filed May 6, 1988, Ser. No. 191,012
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 E **5 Claims**



1. In a practice putting device for use by a golfer holding a golfing putter by the handle thereof for aiding the golfer in developing a pendulum-like putting stroke, the putter having a putter head and a shank portion adjacent thereto, said device comprising:

a frame including

a base portion configured for supportive contact with a planar support surface,

a pair of elongated, upright, support portions and means pivotally coupling said upright portions with said base for selective, relative, pivotal shifting of said upright portions and said base portion;

a shank portion-engaging guide member presenting a generally C-shaped configuration and presenting a pair of arcuate sections and a straight section for engaging the putter shank portion in order to guide said portion and thereby the putter head along a path defined by said member;

means pivotally coupling said guide member with said upright portions for selective, relative, pivotal shifting of said guide member and said upright portions;

means shiftably coupling said base portion, upright portions, and guide member including means for shifting movement relative to one another for shifting between a storage position in which said base, upright portions, and guide member are pivotally shifted to lie generally in a common plane for compact storage of said device, and a golf practice position in which said shank portion guide member is disposed in a spaced relationship relative to the support surface and in which said guide member defines the sole path for contact with and guiding of the golfing putter shank portion while the golfer holds the handle of the putter; and

a plurality of indicia pairs defined on said guide member with the respective indicia of each of said pairs lying equiidistant from and on opposed sides of a center portion defined on said straight section thereby defining the limits of a respective, corresponding plurality of pendulum - like putting strokes.

4,900,031

BOARD GAME

Kenneth A. Wohl, 14911 Ben Ali, San Antonio, Tex. 78248

Filed Jun. 1, 1989, Ser. No. 302,989
Int. Cl.[4] A63F *3/00, 9/18*
U.S. Cl. 273—243 **4 Claims**

1. A method of playing a board game comprising the steps of:

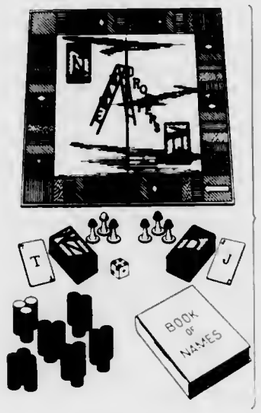
providing a playing board having a playing path having a start square and a plurality of game squares;

providing a first deck of cards and a second deck of cards, the cards in each deck having indicia distinguishing said first deck of cards from said second deck of cards, each card in said first deck further comprising a letter representing a first initial of a name, each card in said second deck further comprising a letter representing a last initial of a name;

providing a plurality of differently colored player tokens, one for each player, a plurality of scoring disks corresponding in color to said player tokens, and a die;

allocating a player token and a plurality of similarly colored scoring disks to each player;

placing said player token on said start square;



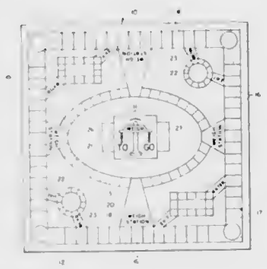
each player's turn including, rolling the die, moving the token the indicated number of game squares, drawing one card from each deck, attempting to name a famous person having the initials on the drawn cards, if a player succeeds in a naming a famous person, that player controls the square occupied by the successful player's token, controlling said square by placing a scoring disk of said successful player on said square.

4,900,032

BOARD GAME APPARATUS

Peggy E. Erickson, 21452 Peggy Joyce La., Saugus, Calif. 91350, and Kenneth L. Peterson, 819 Talley La., Lake Havasu City, Ariz. 86403

Filed Apr. 11, 1988, Ser. No. 179,831
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—243 **1 Claim**



1. A dietary board game apparatus comprising the combination of:

a flat board having planar surfaces wherein a selected planar surface carries a playing layout;

said playing layout defined as having a plurality of endless traacks or courses arranged in predetermined locations on said board planar surface in spaced-apart relationship;

player tokens adapted to move along each of said tracks or courses between said start and said completion position;

chance determining means for effecting the movement of said tokens so as to determine the length of travel of each token along said playing spaces of said track;

penalty means associated with said chance determining means for modifying the advancement of said player tokens along said track or course playing spaces;

said plurality of tracks or courses comprise at least two continuous tracks of playing spaces arranged in squares having an inner oval surrounded by an outer square track of four segments in spaced relationship thereto;

endless special event tracks of playing spaces interconnecting said playing spaces of said tracks;

said special event tracks of playing spaces arranged in at least four locations in substantially equal distance apart so that entry and exit spaces of one special event track extends between portion of said outlet square segments across each corner of said square track; and

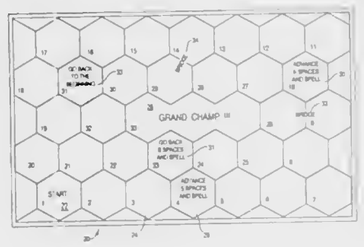
selective ones of said playing spaces are designated by dietary caloric values.

4,900,033

SPELLING GAME APPARATUS

Samuel Campos, and Raoul Campos-Kreutzer, both of 3810 King St., Alexandria, Va. 22302

Filed Sep. 12, 1988, Ser. No. 242,972
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—249 **30 Claims**



29. A spelling game apparatus to be played by at least first and second players, comprising:

a gameboard having a playing surface depicting a starting location, a finishing location, a first path from said starting location to said finishing location, and a second path from said starting location to said finishing location, said first path being defined by a first plurality of steps at least one of said steps of said first path defining a designated step, said second path being defined by a second plurality of steps, which is fewer than said first plurality of steps;

a first game piece for a first player;

a second game piece for a second player;

a chance means for directing the movement of said first and second game pieces along said steps of at least one of said first and second paths;

a list of words at least one of the words of said list is to be spelled by the first or second players, depending on which of said steps of said first or second paths said first or second game pieces land; and

an indicating means associated with said designated step for indicating, when said first game piece lands on said designated step and the first player correctly spells at least one of the words, of said list, associated with said designated step, that said first game piece can then advance along said second path towards said finishing location;

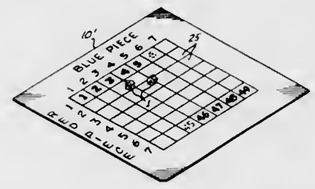
wherein said chance means directs the movement of said first game piece along at least one said first and second paths such that said first game piece moves backwards from the step on which it lands along said path towards said starting location if the first player does not correctly spell the word of said list associated with said step on which said first game pieces lands.

4,900,034

RANDOM GAMBLING PLAYING PIECES AND LAYOUT AND GAME TABLE FOR USE WITH THE SAME

Bernard Bereuter, 1604 - 1155 Beach Avenue, Vancouver, B.C. V6E 1B2, Canada

Filed Nov. 30, 1988, Ser. No. 278,132
Int. Cl.[4] A63F *9/04*
U.S. Cl. 273—274 **18 Claims**



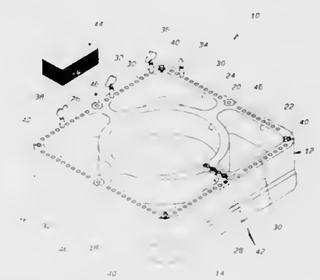
12. A gambling kit comprising a pair of seven-sided rollable playing pieces constructed so that the probability of each piece landing on any side is approximately equal to the probability of such piece landing on any other side, said pieces being marked with indicia to indicate uniquely the particular side on which each piece is resting, the indicia of one piece being distinguishable from the indicia of the other piece, and a layout including a substrate positionable so as to have an exposed surface, said exposed surface having a portion divided into forty-nine separate areas, each of said forty-nine separate areas having a legend corresponding to one and only one combination of indicia of said two pieces, respectively.

4,900,035

APPARATUS AND METHOD FOR PLAYING A CARD TOSS GAME

Robert A. Carmo, 407 Michel Pl., Placentia, Calif. 92670

Filed Jun. 6, 1988, Ser. No. 202,592
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—401 **1 Claim**



1. A game comprising:

at least one card means, said card means for providing a hand tossed element with potential highly unstable aerodynamic flight; and

board means for providing a plurality of targets for said card means, each target arranged and configured to receive said card means upon predetermined conditions with

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respect to said toss of said card means toward said board means,

wherein said card means comprises a plurality of thin planar cards having a predetermined shape and size, wherein each of said targets provided by said board means provides at least one predetermined orientation of said planar card wherein said planar card may be disposed within said target, other ones of said orientation prohibiting disposition of said card within said target,

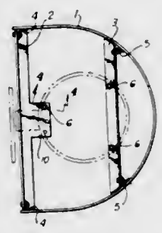
whereby play and scoring combinations between said card means and said board means is substantially enhanced.

4,900,036

CURVED FRONTBOARD GAME

Richard H. Morgan, 134 S. Gain St., Anaheim, Calif. 92804

Filed Jan. 30, 1989, Ser. No. 303,300
Int. Cl.[4] A63B *63/04*
U.S. Cl. 273—402 **6 Claims**



1. Apparatus for a game to be played with a spherical ball, the apparatus being attached to a conventional basket hoop as used in basketball and having a backboard, comprising:

a convex arcuate frontboard having a multiplicity of holes extending from the backboard on one side of the basket hoop, around the front of the basket hoop, and back to the backboard on the other side of the basket hoop, said holes being located on the sides and front of said frontboard and of a size larger than the basketball,

whereby the rebound angle of a ball not striking said frontboard squarely is larger, due to the curvature of said frontboard, than the rebound angle of a flat backboard.

4,900,037

ACCELERATING ARROW

Gordon R. Miller, 1016 Oleadner, Lake Jackson, Tex. 77566

Filed May 8, 1986, Ser. No. 860,855
Int. Cl.[4] F41B *5/02*
U.S. Cl. 273—416 **6 Claims**



1. An elongate arrow having a tip, an elongate shaft behind the tip, and comprising a rearward arrow nock for engaging the string of a bow, internal resilient means within the arrow shaft compressed momentarily on launch of the arrow after engaging the arrow with a bow string in the nock, wherein said resilient means is a compressed coil spring having two opposite ends, and one end is received at a transverse wall and said arrow nock is formed immediately adjacent to said transverse wall, and wherein said resilient means in said shaft momentarily receives and stores energy from the bow string release.

4,900,038

ARROWED PROJECTILE STRUCTURE

Paul Czetto, 163 Cocoa Dr., and David Woods, P.O. Box 1494, both of Tavernier, Fla. 33070

Filed Mar. 7, 1988, Ser. No. 164,684
Int. Cl.[4] A63B *65/02;* **F41B** *5/02*
U.S. Cl. 273—416 **13 Claims**



12. An arrow device adapted to be propelled from a bow or like propelling device, said arrow device comprising:

an elongate, substantially straight body member including a point at one end thereof; said body member including an inner wall which defines a hollow interior portion extending along at least a majority of the length of the body member between said one end and the opposite end of said body member;

at least one energy transfer member disposed within said hollow interior portion of said body member so as to be slidably displaceable therealong between a rest position and an impact position;

retaining means, mounted at least partially within said body member, for retaining said energy transfer member in the rest position thereof when said arrow device is propelled by the propelling device and for releasing said energy transfer member upon impact of the point of the arrow with a target so that energy transfer member is slidably displaced along the hollow interior portion of the body member to the impact position thereof thereby creating a further impact against the target and thus increasing the penetration of the arrow into the target;

said energy transfer member comprising an elongate weight element including at least one longitudinal side wall portion substantially spaced from said inner wall of said body member so as to define an air passage along the length of the weight element to thereby prevent trapped air from hindering movement of said weight element,

said device further comprising spacer means including a plurality of elongated angularly spaced fin elements extending along the length of said element for slidably engaging said inner wall.

4,900,039

TWIN FACE SEAL

Brian D. Klecker, and Thomas H. Koenig, both of Raleigh, N.C., assignors to The Pullman Company, Princeton, N.J.

Filed Jul. 27, 1988, Ser. No. 224,693
Int. Cl.[4] F16J *15/34, 15/40*
U.S. Cl. 277—27 **6 Claims**

1. A sealing apparatus adapted for sealing a rotary fluid member having a rotor adapted for selective rotation about an axis in a housing comprising:

a generally annular first seal member having a first portion sealingly engaging said rotor;

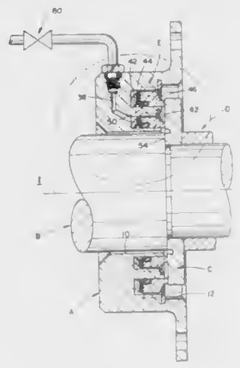
first means for biasing said first seal member toward said rotor, said first biasing means being interposed between said housing and first seal member;

a generally annular second seal member located in an annular cavity in said housing having a first portion sealingly engaging said rotor, said second seal member disposed radially inward said axis from said first seal member;

second means for biasing said second seal member toward said rotor and away from said cavity, said second biasing means being interposed between said housing and second seal member;

a flow passage in said housing communicating with a region defined between said first and second seal assemblies and within said cavity, said flow passage adapted to receive fluid that leaks past said first seal assembly; and

a restriction means disposed in said flow passage, said restriction means selectively restricting flow in said flow passage in response to a change in pressure in said region



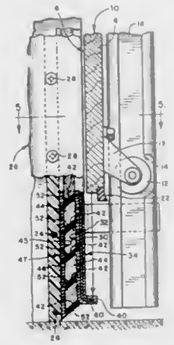
upon failure or said first seal member thereby providing pressure needed in said cavity for effective operation of said second seal member.

4,900,040

SEALING DEVICE

Richard E. Miller, 6618 W. 174th Pl., Tinley Park, Ill. 60477

Filed May 11, 1988, Ser. No. 192,780
Int. Cl.[4] F16J *15/16*
U.S. Cl. 277—30 **13 Claims**



1. A sealing device adapted to seal one side of a door or barrier which is slideable along a linear path between open and closed positions, the combination comprising:

a moveable seal member having an outer side adapted to face away from the slideable barrier and an inner side adapted to face toward the slideable barrier,

a stationary wall member having an inner face, being spaced outwardly from the outer side of said moveable seal member and adapted to be mounted stationary relative to said seal member,

deformable, resilient link means mounting said moveable seal member on said stationary wall member,

said seal member being moveable on deformation of said link means in a first direction along said linear path with a movement having an inward lateral component and in a second direction along said linear path with a movement having an outward lateral component,

said link means when moved in the first direction biasing said seal member in the second direction,

a striker member adapted to be moved in said first direction by said slideable barrier when said slideable barrier is moved toward the closed position,

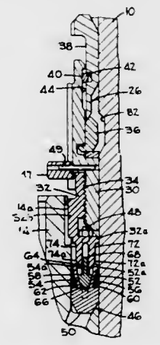
said moveable seal member being connected to said striker member whereby as said striker member is moved by said slideable barrier then said sealing element is moved generally inwardly on said link means in said first direction and as said striker member is released by said slideable barrier then said sealing element is moved in said second direction by said link means.

4,900,041

SUBSEA WELL CASING HANGER PACKOFF SYSTEM

Bob C. Hopkins, Nassau Bay; Randy J. Wester, Spring, both of Tex., and Don C. Underwood, Rio de Janeiro, Brazil, assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 186,993, Apr. 27, 1988, abandoned. This application Dec. 6, 1988, Ser. No. 283,047
Int. Cl.[4] F16J *15/08;* **F21B** *33/04*
U.S. Cl. 277—30 **8 Claims**



1. An annular packoff for establishing a higher pressure metal barrier between adjacent surfaces of concentric tubular elements, said packoff comprising an assembly including:

(a) a two-piece annular body having an upper component rotatably interconnected to a lower component for relative axial movement of the components in opposite directions;

(b) a lock ring surrounding said upper component and expandable therefrom;

(c) an annular lock ring expander mandrel surrounding said upper component above said lock ring, said mandrel having means to expand said lock ring response to an axial force exerted thereon;

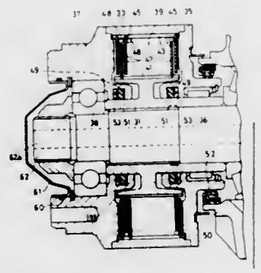
(d) anti-rotation means releasably secured to said lower component for preventing undesired relative rotation of said upper and lower components;

(e) Annular metal seal means secured to said lower component for establishing a metal-to-metal seal between said concentric tubular elements, said seal means comprising an annular metal base having a pair of annular metal sealing lips extending upwardly therefrom; and

(f) Energizer means extending from said lower component into operational position between said lips, said energizer means comprising a pair of annular legs for wedging said lips apart into pressure tight contact with said tubular element surfaces in response to an axial force exerted thereon, said legs acquiring bending energy during said wedging movement and applying said energy to said lips to maintain said pressure tight metal-to-metal contact

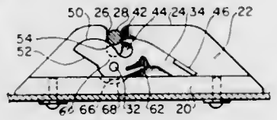
thereof with said surfaces over extreme fluctuations in pressure to which said seal means is exposed.

4,900,042
FLUID SEALING STRUCTURE
Toshinobu Genda, Tochigi, Japan, assignor to Tochigifujisangyo Kabushiki Kaisha, Tochigi, Japan
Filed Sep. 16, 1988, Ser. No. 245,663
Claims priority, application Japan, Sep. 24, 1987, 62-144439[U]
Int. Cl.[4] F16J *15/44*
U.S. Cl. 277—70 **5 Claims**



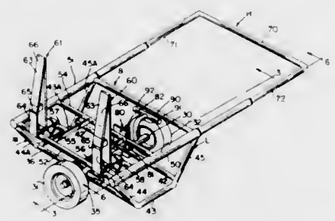
5. A fluid sealing structure, comprising:
(a) an inner shaft;
(b) an outer shaft rotatably coupled coaxially with said inner shaft so as to provide a fluid working chamber in cooperation with said inner shaft;
(c) an annular sealing member disposed between said inner shaft and said outer shaft, for rotatably sealing said inner and outer shafts; and
(d) a back-up ring arranged adjacent to said annular sealing member, for axially supporting said annular sealing member along a common interface, said back-up ring and said sealing member being cooperatively configured to define an annular cavity at said interface, said back-up ring being formed with discharge means leading from said annular cavity to the exterior of said working chamber, whereupon fluid penetrating between said inner and outer shafts from the exterior of said working chamber to said interface will be received in said annular cavity and discharged therefrom via said discharge means back to the exterior of said working chamber, so that the sealing member is not deformed or damaged due to thermal expansion of fluid received at said interface.

4,900,043
WHEEL HOLDING BRACKETS ATTACHED TO SUITCASES
Dick T. Kho, P.O. Box 34454, West Los Angeles, Calif. 90034
Filed May 5, 1988, Ser. No. 190,394
Int. Cl.[4] B62B *1/12*
U.S. Cl. 280—37 **10 Claims**



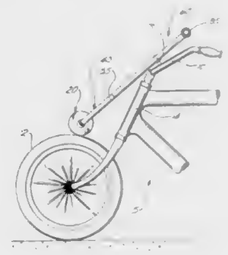
1. A rod retaining bracket comprising a support, said support having an upper edge surface, a first rod receiving slot extending downwardly from said edge surface into said support and terminating in a base, a rod retaining member formed from a resilient material pivotally mounted on said support, said rod retaining member comprising an upper lever and a lower body, said upper lever having opposed ends and having an upper edge and a lower edge, one end of said lever terminating in a resilient distal portion, the opposite end of said lever serving as a handle to pivot said lever to release said rod from said slot, a narrow resilient connecting strip integral with said lever and said body positioned between the ends of the lever and connected to said lower body to permit said lever to bend with respect to said body, said body having an upper edge and a lower edge, one part of said upper edge of such body shaped to form a cam spaced from a distal edge of said lever and extending toward and connected to a generally transverse edge of said narrow resilient connecting strip, said transverse edge curving upward and then reversing direction to form the lower edge of said resilient distal portion of said lever defining thereby a second rod receiving slot transverse to said first rod receiving slot, said cam positioned so it extends into said first rod receiving slot and in such a position that when said rod is inserted in said first rod receiving slot it engages said cam, the pivot of said rod retaining member positioned so when said rod engages said cam it causes said lever to pivot in a direction such that the resilient distal portion of said lever moves against the side of said rod, the space between said resilient distal portion of said lever and said cam slightly less than the diameter of said rod whereby further downward pressure by said rod against said cam bends said resilient distal portion and said narrow resilient connecting strip in such a way that said lever pivots further and the separation between the resilient distal portion of the lever and the cam is increased permitting said rod to pass by said distal portion of the lever and reach the base of said first slot thereby releasing the pressure exerted by said rod on said distal portion, so that the resilience of said distal portion of said lever and said narrow connecting strip permits said resilient distal portion to snap back its original position nearer said cam thereby locking said rod in said second rod receiving slot.

4,900,044
SIDE LOADING HAND TRUCK AND METHOD
Phillip D. Whitley, Rte. 5, P.O. Box 948, Charlotte, N.C. 28208
Filed Apr. 20, 1987, Ser. No. 40,277
Int. Cl.[4] B62B *1/14*
U.S. Cl. 280—47.21 **14 Claims**



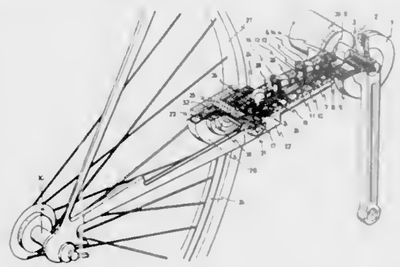
2. In a hand truck having a wheeled axle extending between two sides of the truck which are parallel to the direction of travel, the truck including a loading fork extending perpendicularly from one of said sides of the truck which is parallel with the direction of travel, means for turning the truck from an original position on its wheels to a second position with the loading fork on a supporting surface and with the wheels off of the supporting surface, means for loading an article on the truck including an auxiliary axle journaled on a lower support frame attached to said parallel side frames in a transverse direction to said wheeled axle.

4,900,045
ALTERNATIVE BICYCLE DRIVE DEVICE
Raymond T. Myers, Sr., 1536 Dominion Ave., Pasadena, Calif. 91104
Filed Oct. 28, 1988, Ser. No. 264,155
Int. Cl.[4] B62M *1/16*
U.S. Cl. 280—233 **7 Claims**



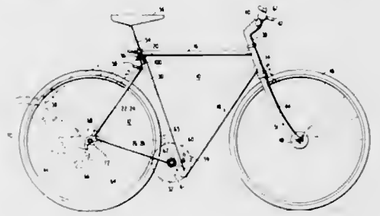
1. An alternate drive device for a standard bicycle without mechanical modification to the bicycle comprising:
a drive wheel assembly adapted for rotatably frictionally engaging a bicycle front wheel;
means for supporting the drive wheel assembly;
means for removably attaching the support means to a bicycle;
a bar attached to the support means, having at least one handle slidably mounted thereon for reciprocal motion along an axis of the bar; and,
dynamic interconnection means linking the said at least one handle with the drive wheel assembly;
wherein the interconnection means converts reciprocal motion of the at least one handle along the bar into rotary motion of the drive wheel assembly, thereby driving the bicycle.

4,900,046
TRANSMISSION FOR BICYCLES
Inaki Arancet-Angoitia, Caserio, Anzuola, Spain
Filed Oct. 6, 1988, Ser. No. 254,408
Claims priority, application Spain, Oct. 6, 1987, 8702849
Int. Cl.[4] F16H *3/44*; **B62M** *1/02*
U.S. Cl. 280—260 **2 Claims**



1. Transmission for a bicycle having a nucleus assembly supporting a pedal shaft and a chassis connecting said pedal shaft to a rear wheel of the bicycle, the transmission comprising a first rimcarrier plate rigidly connected to the pedal shaft of the bicycle, a first set of concentric guiding rims fixed to said rimcarrier plate, a drive shaft positioned in said chassis, a first set of pinions permanently engaging said rims and mounted with freedom of rotation on said drive shaft which is radially extended from the pedal shaft to the rear wheel of the bicycle, said drive shaft being a hollow transmission shaft, first means positioned in said hollow transmission shaft for selectively connecting each one of said pinions to said transmission shaft, second selecting means provided on the other end of said transmission shaft, a second rimcarrier plate mounted with freedom of rotation on an additional shaft rigidly connected to the chassis and extending perpendicular to said transmission shaft, a second set of guiding rims rigidly connected to said second rimcarrier plate, a second set of pinions permanently engaging said respective rims of said second set, a multiplying planet assembly including said second rimcarrier plate and pawls provided thereon, said additional shaft having thereon an outlet pinion which plays on an engaging tack of said rear wheel, and said second selecting means selectively connecting one of said pinions of said second set to said transmission shaft and via said second rimcarrier plate, said multiplying planet assembly and said pawls transmitting a movement of said transmission shaft to said additional shaft and thereby to said outlet pinion, said chassis serving as one of the two arms of a fork connecting the rear wheel to said nucleus.

4,900,047
FOLDABLE BICYCLE
Harry Montague, 3042 Newark St. NW., Washington, D.C. 20008, and David Montague, 87 Cowell St., Somerville, Mass. 02143
Filed Oct. 28, 1988, Ser. No. 263,946
Int. Cl.[4] B62K *15/00*
U.S. Cl. 280—278 **29 Claims**



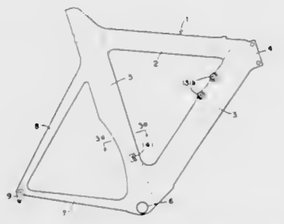
1. A foldable bicycle frame comprising:
a complete closed front frame having a first hollow member to accommodate a seat post,
a complete rear frame having a second hollow member to accommodate said seat post, said first and second hollow members being concentric to define a joining section, whereby said front and rear frames are foldable about said hollow members,
a means to automatically align said first and second hollow members comprising a spring biased alignment member to secure said front and rear frames members in an open position, a housing located on said joining section, said housing containing said alignment member and a track mounted on one of said concentric members to provide a guide for said alignment member and, means to lock said first and second members into a rigid orientation.

4,900,048
INTEGRAL SEAMLESS COMPOSITE BICYCLE FRAME
Gleb Derujinsky, 31505 U.S. Highway 160, Durango, Colo. 81301
Filed Oct. 2, 1987, Ser. No. 105,121
Int. Cl.[4] B60K *19/16*
U.S. Cl. 280—281.1 **40 Claims**

1. A bicycle frame comprising a top tube member composed essentially of resin-impregnated carbon fibers, a down tube

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member composed essentially of resin-impregnated carbon fibers, a head tube member, means for securing said tube members together at said head tube member as an integral high strength structure consisting essentially of a plurality of integrally bonded strips of unidirectional carbon fibers, each of said strips overlying at least a portion of one of said carbon fiber tubes and said head tube and being bonded in said structure by a high strength resin.

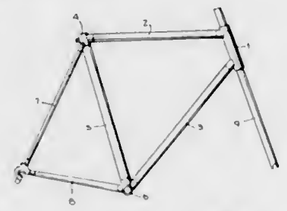


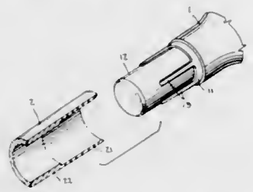
4,900,049

BICYCLE FRAME

Ike Diing-Huang Tseng, P.O. Box 56, Yuanlin, Taiwan (510)

Filed Jan. 13, 1987, Ser. No. 2,864
Int. Cl.[4] B62K *19/22*
U.S. Cl. 280—281.1 **3 Claims**





1. A bicycle frame comprising a plurality of tubular frame sections wherein one tube section having an inner lug is joined to an end of another tube section having an outer lug;

said inner lug having an axis and comprising a first external portion having a first external circumference defined by a first external diameter, said first external portion comprising at least two flange members extending along said inner lug axis; and said inner lug further comprising a second external portion having a second external circumference defined by a second external diameter; said first external diameter being greater than said second external diameter, said flange members and said second external portion having an axial length with the axial length of said second external portion being greater than the axial length of said flange members;

said outer lug being located at said end of said another tube section with said outer lug having a free end; said outer lug comprising a first aperture portion and a second aperture portion; said first aperture portion being at the free end of said outer lug and having a first internal circumference defined by a first internal diameter; said second aperture portion having a second internal circumference defined by a second internal diameter; wherein said first internal diameter of said outer lug is greater than said first external diameter of said inner lug and said second internal diameter of said outer lug; and wherein said second internal diameter of said outer lug is greater than said second external diameter of said inner lug; with said first aperture portion of said outer lug having an axial length greater than or equal to that of said first external portion of said inner lug;

said outer lug receiving said inner lug thereby forming a space therebetween with an adhesive disposed in said space.

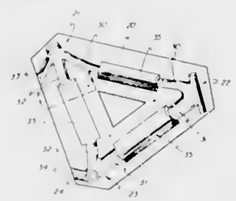
4,900,050

MANUFACTURE OF BICYCLE FRAMES

Stephen J. Bishop, West Carrollton, and Michael D. Melton, Farmersville, both of Ohio, assignors to Huffy Corporation, Miamisburg, Ohio

Filed Oct. 18, 1988, Ser. No. 259,383
Int. Cl.[4] B62K *19/22*
U.S. Cl. 280—281.1 **14 Claims**







1. In a bicycle frame wherein a plurality of frame members are selectively joined together at the ends thereof, and wherein portions of at least two of said joined frame members adjacent

said joined ends thereof are in converging relation and thereby define a wedge shaped space therebetween, means forming a lug joint between said end portions of said joined two frame members, comprising:

(a) a plurality of individual organic fiber layers located in superimposed relation on each side of said space,

(b) said layers including portions in partially wrapping relation with said end portions of said frame members and web portions connecting said wrapping portions and extending across the portion of said space between the resulting wrapped portions of said frame members, and

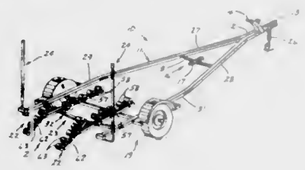
(c) said layers being impregnated with resin which has hardened to secure said layers together and to said frame members.

4,900,051

BOAT TRAILER FRAME ASSEMBLY

Byron L. Godbersen, Lake LaJune Estates, Ida Grove, Iowa 51445

Filed Dec. 21, 1988, Ser. No. 287,165
Int. Cl.[4] B60P *3/10*
U.S. Cl. 280—414.1 **6 Claims**



1. In a trailer for hauling a boat and having a wheel and axle supported frame including a pair of diverging frame members extended rearwardly from a tongue connection, the frame members each having an upper surface, a frame assembly for supporting a hull portion of a boat, the frame assembly comprising:

cross member means supported on and rockably engageable with the upper surface of said frame members and extended transversely between said frame members; and

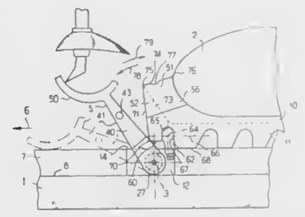
means mounted on said cross member means in transversely spaced relation thereon and on both sides of the longitudinal axis of the frame for engageably supporting the boat hull portion.

4,900,052

CROSS-COUNTRY SKI BINDING

Marc Provence, Annecy le Vieux; Didier Rousset, Lescheraines, and Josiane Dunand, Cran Gevrier, all of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Nov. 17, 1987, Ser. No. 122,857
Claims priority, application France, Nov. 17, 1986, 86 15946
Int. Cl.[4] A63C *9/18*
U.S. Cl. 280—615 **66 Claims**



1. A binding for connecting a forward portion of a boot to a ski and for permitting rotation of said boot about a predetermined axis, said binding comprising:

(a) means for retaining said forward portion of said boot to said binding and for permitting said boot to be removed therefrom, said retaining means comprising (i) a transverse member for engagement with said forward portion of said boot and (ii) at least one first arm for extending laterally adjacent said forward portion of said boot and being connected to said transverse member;

(b) a pin positioned along said predetermined axis and connected to said first arm, said pin having (i) at least one section for substantially radial engagement and removable engagement with said forward portion of said boot through substantially complementarily shaped portions of said pin and said forward portion of said boot, and (ii) at least one guidance bearing portion for enabling rotation of said pin about said predetermined axis within a guidance bearing; and

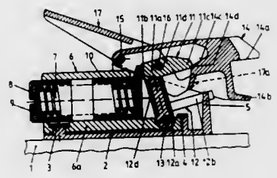
(c) means for elastically urging said pin and said boot toward a position corresponding to a support position of said boot substantially flat upon said ski.

4,900,053

HEEL-HOLDER FOR A SAFETY SKI BINDING INCLUDING A SNAP-IN DEVICE

Henry Freisinger; Karl Stritzl, both of Wien, and Franz Luschnig, Traisksirchen, all of Austria, assignors to TMC Corporation, Switzerland

PCT No. PCT/EP87/00230, § 371 Date Dec. 18, 1987, § 102(e) Date Dec. 18, 1987, PCT Pub. No. WO87/06485, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 28, 1987, Ser. No. 153,835
Claims priority, application Austria, Apr. 30, 1986, 1163/86
Int. Cl.[4] A63C *9/084*
U.S. Cl. 280—628 **11 Claims**



1. A heel-holder for a safety ski binding comprising:

a base plate adapted to be mounted to the upper surface of a ski, the base plate including a raised pin at a first end and at least one extension at a second end thereof;

a housing horizontally pivotable about the raised pin, the housing including a cross-pin disposed outside an upper wall thereof;

a sole-holder vertically pivotable about the cross-pin, the sole holder including a hollow portion forming a control cam on an upper wall of the hollow portion;

a snap-in device for releasing the binding provided in the housing, the snap-in device comprising a snap-in rocker pivotably mounted in the housing about a pivot pin arranged parallel to the cross pin and a control member pivotably mounted on the snap-in rocker and perpendicular to the pivot pin, the control member being substantially U-shaped in configuration and including a pair of horizontal legs and a vertical leg joining the horizontal leg, the snap-in rocker engaging the control cam of the sole-holder and the control member engaging the at least one base-plate extension; and

a spring for loading the snap-in device, the spring being capable of applying a force for releasing the binding, wherein the snap-in device reduces the spring force re-

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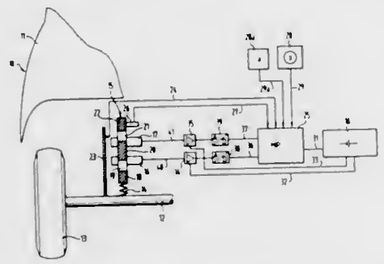
quired for releasing the binding during both vertical pivoting of the sole-holder and horizontal pivoting of the housing.

4,900,054

ELECTROMAGNETIC SUPPORT ARRANGEMENT

Manfred Kessler, Im Hofacker 17, Urmitz/Rhein, Fed. Rep. of Germany (5401)

Filed Oct. 7, 1988, Ser. No. 255,181
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734287
Int. Cl.[4] B60G *11/00*
U.S. Cl. 280—688 **14 Claims**



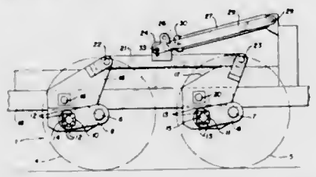
12. Electromagnetic support arrangement for wheel suspensions of a vehicle chassis or running gear comprising at least two stators having current excited windings and a runner for rectilinear movements having a least two high-permeability runner iron sections, the runner being movable perpendicularly to the magnetic field direction built up by the windings, and the exciting current being controllable for each stator winding, wherein in each wheel suspension the exciting current for each stator winding is controllable in dependence upon the speed and/or level position and/or the acceleration condition of the vehicle, and wherein are provided for the speed-dependent control a speed sensor, for the level position of the vehicle a displacement sensor and for the load-dependent control of the level position of the vehicle in curves and positive and negative acceleration processes at least one central acceleration sensor.

4,900,055

HYDRAULIC RETRACTABLE AND EXTENSIBLE WHEEL SUSPENSION

Clem B. Wright, South Fulton, Tenn., assignor to Waymatic, Inc., Fulton, Ky.

Filed Mar. 28, 1989, Ser. No. 329,560
Int. Cl.[4] B60G *25/00*
U.S. Cl. 280—704 **6 Claims**



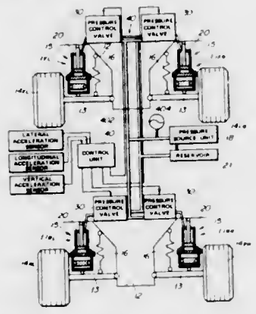
1. A hydraulic retractable and extensible wheel suspension for a trailer for raising the trailer to a transporting position and lowering the trailer to a ground level position comprising, a pair of tandem wheels, a torsion arm for each wheel, each wheel being rotatably mounted on one end of a respective torsion arm, torsion spring means connected to the opposite end of each torion arm, a pair of levers pivotally mounted on the trailer frame, said torsion spring means being connected to each lever, a link extending between said levers and being pivotally connected at each end to a respective lever, and hydraulic cylinder means connected between the trailer frame and the link, whereby upon extension of said hydraulic cylinder means, the pair of levers are caused to pivot simultaneously in a direction to raise the tandem wheels, to thereby lower the trailer to the ground level position, and upon retraction of said hydraulic cylinder means the pair of levers are caused to pivot simultaneously in the opposite direction to lower the tandem wheels, to thereby raise the trailer from the ground level position.

4,900,056

HYDRAULIC CYLINDER ASSEMBLY FOR AUTOMOTIVE SUSPENSION SYSTEM AND ACTIVELY CONTROLLED SUSPENSION SYSTEM UTILIZING SAME

Naoto Fukushima, Kamakura; Yukio Fukunaga, Zushi; Yosuke Akatsu; Sunao Hano, both of Yokohama, and Masaharu Sato, Kanagawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 26, 1988, Ser. No. 199,347
Claims priority, application Japan, May 29, 1987, 62-134497
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—708 **29 Claims**



1. A hydraulic cylinder assembly for damping relative displacement of relatively movable first and second members, said hydraulic cylinder assembly comprising:

a cylinder housing defining an internal space filled with a working fluid and connected to said first member, said internal space connected to a fluid pressure source via a hydraulic circuit;

a piston disposed within said internal space of said cylinder housing and dividing said internal space into said first and second fluid chambers, said first fluid chamber in fluid communication with said hydraulic circuit, said piston connected to said second member via a piston rod extending from said cylinder housing, and said piston including a first fluid flow path for permitting a limited flow rate of fluid between said first and second fluid chambers;

a pressure control value means, disposed within said hydraulic circuit, for controlling introduction and draining of pressurized fluid into and from said first fluid chamber in order to adjust damping characteristics;

a pressure accumulating unit having a body connected to said cylinder housing, said body defining a space in communication with said second fluid chamber via a flow restricting fluid path; and

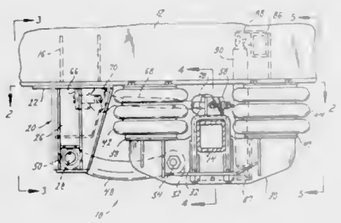
a free piston assembly disposed within said space of said body for dividing said space into a third fluid chamber and a pneumatic chamber, said third fluid chamber in communication with said second fluid chamber via said flow restricting fluid path, said free piston assembly movable depending upon a pressure difference between said third fluid chamber and said pneumatic chamber, for receiving pressurized fluid in said third fluid chamber when the fluid pressure in said second fluid chamber is higher than that in said third fluid chamber, for accumulating pressure and supplying pressure to said second fluid chamber when the fluid pressure in said second fluid chamber is lower than that in said third fluid chamber.

4,900,057

SUSPENSION SYSTEM WITH PIVOTALLY CONNECTED A-FRAME PARALLELOGRAM

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Filed Jul. 18, 1988, Ser. No. 220,088
Int. Cl.[4] B60G *11/28*
U.S. Cl. 280—713 **7 Claims**



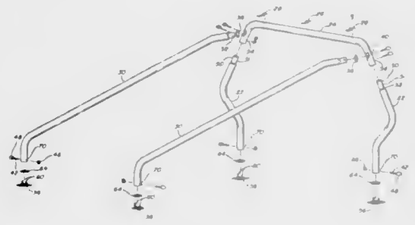
1. A vehicle suspension system for a vehicle having a chassis with opposed sides and an axle comprising: a hanger depending downwardly from a side of the chassis, an axle seat assembly rigidly connected to the axle, a lower torque rod having a forward end pivotally connected to the hanger and a rearward end pivotally connected to the axle seat assembly, a mounting bracket connected to the chassis at a location substantially equidistant between the sides thereof, an upper torque rod having a forward end pivotally connected to the bracket and having a rearward end pivotally connected to the axle whereby the upper torque rod is oriented at an angle to a longitudinal plane, and spring means mounted between the axle seat assembly and the chassis.

4,900,058

ROLLGUARD

Alvin J. Hobrecht, 6521 Crista Palma Dr., Huntington Beach, Calif. 92647

Filed Jun. 6, 1988, Ser. No. 202,370
Int. Cl.[4] B60R *21/13*
U.S. Cl. 280—756 **9 Claims**



1. A vehicle rollguard comprising:

one or more members in combination selected from struts, stanchions, and cross members;

each member having parts for interconnecting said members;

means for detachably securing one member to another member;

means for detachably securing said rollguard to a vehicle comprising;

a plate having a pair of upwardly extending opposed tabs interiorly thereof;

each tab having an aligned aperture therein;

the attachable ends of said rollguard members having aligned opposed apertures spaced from the end thereof so that the apertures in said rollguard ends and the aligned apertures in the projecting tabs are aligned when a rollguard end overlies the plate;

a thin plastic layer disposed between said plate and said ends of the rollguard so that said rollguard ends rest on said plastic layer; and,

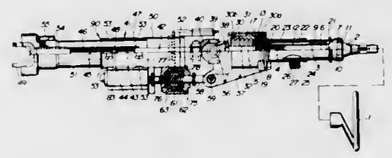
securement means for passing through said aligned apertures.

4,900,059

TILTING AND TELESCOPE TRAVELING STEERING COLUMN ARRANGEMENT

Satoshi Kinoshita, and Hiroyuki Kume, both of Kosai, Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Fuji Kiko Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 261,874
Claims priority, application Japan, Oct. 26, 1987, 62-270020; Oct. 26, 1987, 62-163481[U]; Mar. 23, 1988, 63-37894[U]; Mar. 23, 1988, 63-37895[U]; Jun. 29, 1988, 63-86550[U]
Int. Cl.[4] B62D *1/18*
U.S. Cl. 280—775 **27 Claims**



1. A steering column arrangement for a vehicle, comprising a telescope traveling mechanism which includes:

a steering shaft on which a steering wheel is fixedly mounted, said steering shaft being axially movable relative to a stationary member which is movable relative to a vehicle body;

a plurality of balls movably fixed on an outer peripheral surface of said steering shaft and positioned along a helical line on the steering shaft peripheral surface;

means for allowing each ball to rotate and disabling said ball from displacing;

a sleeve disposed around said steering shaft and formed at its inner peripheral surface with a helical groove in which said balls are fitted, said sleeve being rotatable around its axis and axially fixed to a side of said stationary member;

an annular gear coaxially formed on the outer peripheral surface of said sleeve;

a drive gear in mesh with said annular gear; and

means for driving said drive gear by an electric motor.

4,900,060

OUTER TUBE WITH AT LEAST ONE BRACKET

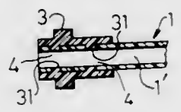
Kazuo Yamamoto, Sagamihara, and Hiroyuki Saito, Chigasaki, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,140

Claims priority, application Japan, Dec. 28, 1987, 62-199228[U]

Int. Cl.[4] B60R *21/00*

U.S. Cl. 280—804 **11 Claims**



1. An outer tube for guiding a drive member adapted to drive a slider to which an occupant-restraining webbing is fastened, comprising:
a resin-made cylindrical tube main body;
two resin-made slip-out preventing portions formed at both ends of the tube main body respectively; and
at least one resin-made bracket provided on the tube main body at a point between the slip-out preventing portions;
said slip-out preventing portions and bracket being formed as unitary members with the tube main body.

4,900,061

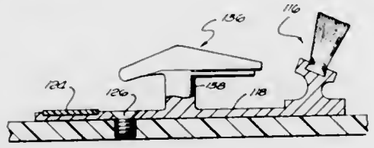
SNOW REMOVAL DEVICE

William Kozma, Jr., 2811 Stokes Canyon Rd., Calabasas, Calif. 91302

Continuation-in-part of Ser. No. 161,394, Feb. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 135,726, Dec. 21, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 267,751

Int. Cl.[4] A63C *11/18*

U.S. Cl. 280—813 **5 Claims**



5. A snow removal device for use in conjunction with a runner of a ski assembly, said runner having a pair of generally parallel side edges, a toe piece thereto and a heel piece, said device comprising, in combination:
(a) a pedestal which is secured fixedly and arranged transverse to the runner and integral with said toe piece, said pedestal being made of polyethylene material;
(b) a plurality of upright bristles of thermoplastic material which are attached to said pedestal;
(c) said pedestal being disposed in a predetermined arrangement along the runner within, and not extending beyond said side edges and including an upright wall that extends transversely relative to a flat lower base transversely disposed relative to said runner for securing said device to said runner wherein said bristles have their upper free ends at least the same height as the toe piece, an upper base for securing said bristles to said pedestal; and
(d) means for securing said pedestal to the runner including a base plate integral with said pedestal and said toe piece and means for mounting said base plate to said runner.

4,900,062

PROCESS FOR PERFUMING BOOKS, DEVICE FOR CARRYING OUT SAID PROCESS, SO-OBTAINED PERFUMED BOOK

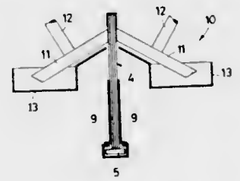
Dario Maggi, Milan, Italy, assignor to Ugo Mursia Editore S.p.A., Milan, Italy

Filed Jul. 29, 1988, Ser. No. 225,765

Claims priority, application Italy, Sep. 17, 1987, 21945 A/87

Int. Cl.[4] B42D *5/00, 15/00;* **B32B** *25/00;* **B42C** *11/00*

U.S. Cl. 281—15.1 **8 Claims**



1. Process for perfuming books comprising:
printing at least one sheet of paper;
folding said sheet of paper in order to form a signature;
securing a pluarlity of said signatures in an ordered arrangement, said external front and back portions of said signature each being covered with a flyleaf;
glueing a back on to one side of said signature whereby said signature and said flyleaf form a volume block;
applying at least one type of perfumed essence to at least one external surface of said flyleaf of said volume block; and
glueing a cover to said external surfaces of said flyleaves of said volume block in order to obtain a book.

4,900,063

CLAMPING CONNECTION UNIT

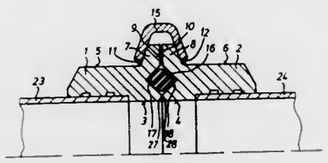
Johann Baarfüsser, Munich; Clemens Beck, Groebenzell; Herbert Ganz, and Günther Kuntz, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-GEVAERT Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 16, 1989, Ser. No. 311,984

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1988, 3806630

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—24 **3 Claims**



1. In a clamping connection unit for releasably clamping together two hollow cylindrical pipes, having two abutting coupling halves, one at each pipe end, an elastic sealing ring (O-ring) placed between them and a clamp pressing the two coupling halves together,
the improvement comprising
two hollow cylindrical coupling halves (1,2) which are identical in structure and are provided with a cylindrical internal wall surface having a diameter substantially equal to the internal diameter of the pipes, said wall surface being provided with a cylindrical recessed portion having a diameter substantially equal to the outer diameter of the pipes so that said cylindrical wall surface and internal surface of the pipes form a smooth connection when the pipes are positioned in said recessed portion,
each coupling half having a radial surface extending from the cylindrical internal wall surface, an annular recess (17,18) situtated between the internal surfaces of the coupling and external surface of the coupling, said recess being on the radial surface adjacent to the corresponding radial surface of the other coupling half, which annular recess is V-shaped in the axial direction so that an annular gap approximately rectangular in cross-section is formed between the two coupling halves to receive an elastic O-ring (16),
ends of the coupling having annular ridges (7,8) on their outer surfaces, said ridges having adjacent and remote surfaces, said adjacent surfaces (9,10) of the two ridges extending perpendicularly to the axis of the pipes and parallel to said radial surfaces and axially displaced therefrom, said surfaces (11, 12) of said coupling halves remote from one another being chamfered off,
a clamp having jaws, internal surfaces of said jaws which are chamfered off under the same angle as the chamfered off surfaces of said coupling halves so constructed and arranged that the chamfered off internal surfaces of the clamp slide down the chamfered off surfaces of said coupling halves in the radial direction of said pipes whereby said adjacent radial wall surfaces are pressed toward each other against the force of the O-ring,
said coupling halves being engaged in contact with each other solely at said radial surfaces of the coupling between said annular recess and said internal wall surface.

4,900,064

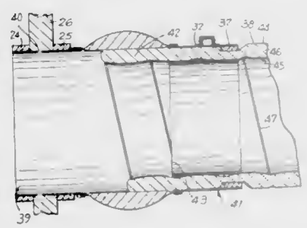
CONNECTOR FOR FIBER DUCT SYSTEMS

John Lyons, Levittown, and Paul K. Thompson, Brentwood, both of N.Y., assignors to Duro Dyne Corporation, Farmingdale, N.Y.

Filed Jun. 26, 1989, Ser. No. 371,056

Int. Cl.[4] F16L *11/12*

U.S. Cl. 285—53 **4 Claims**



1. A connector member for coupling a cylindrical flexible tubular duct to a wall of a fiber duct installation comprising an elongate band including a flexible central web assembly, a pair of sheet metal strips clampingly connected to the side marginal edges of said web assembly, said strips having an upper surface, an under surface and distal ends, said strips being disposed in parallel spaced relation, one said strip including on an upper surface thereof a spaced parallel pair of compressible gasket members extending upwardly beyond said surface, the spacing between said gasket members corresponding substantially to the thickness of said wall of said fiber duct, said one of said strips including at its distal ends interengageable complemental slip joint means for slidably connecting said distal ends in overlapping relation, the combination including complementary clamp means adjacent the distal ends of the other said strip for retaining said connector member in a cylindrical configuration.

4,900,065

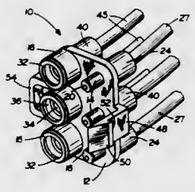
QUICK-CONNECT FLUID COUPLING

Douglas L. Houck, Canton, Ohio, assignor to DLH Industries, Inc., Canton, Ohio

Filed Oct. 31, 1988, Ser. No. 264,347

Int. Cl.[4] F16L *39/00*

U.S. Cl. 285—73 **11 Claims**



1. A coupling for simultaneously joining a plurality of fluid conduits including:
(a) first and second identical bodies, each of said bodies being an integral one-piece member having a base and at least two parallel hollow barrel portions extending outwardly in a first direction from a first side of said first base and at least two hollow sleeve portions formed on said base and having barrel accepting recesses on said first side of the base whereby on joining of the first and second bodies each of the barrel portions of said first body are accepted by a slip-fit engagement into a respective barrel accepting recess of said second body and each of said barrel portions of said second body are accepted into a respective barrel accepting recess of said first body by a slip-fit engagement for individually placing each of a first plurality of fluid conduits adapted to be connected to the base of the first body, in fluid connection through said coupling to individual fluid conduits of a second plurality of fluid conduits adapted to be connected to the base of the second body;
(b) a plurality of individual conduit accepting means formed on a second side of each of he bases of the first and second bodies, each of which is formed with an individual bore communicating with the respective barrel portion and sleeve portion on said base, to provide individual fluid paths through said bodies for each of the conduits;
(c) latching means formed integrally with the first and second bodies for holding the bodies together in interfitting relationship; and
(d) separate sealing means for sealing the barrel portions in their respective barrel accepting recesses in a fluid type relationship.

4,900,066

PIPE CONNECTOR

Norman Brammer, Fyvie Turriff, Scotland, and Philippe C. Nobileau, Paris, France, assignors to Vetco Gray Inc., Houston, Tex.

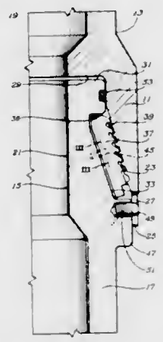
Filed Nov. 1, 1988, Ser. No. 265,736

Int. Cl.[4] H16L *55/00*

U.S. Cl. 285—92 **7 Claims**

1. A connection means for connecting two tubular elements, comprising in combination:
pin and box mateable members, each connected to one of the tubular elements;
one of the members having a right-hand threaded section formed thereon;
a sleeve;
means for mounting the sleeve on the other of the members and for preventing axial movement of the sleeve relative to said other of the members, the sleeve having a right-hand threaded section formed thereon for mating with the

threaded section of said one member to connect the members together;
means including a split in the sleeve for allowing the sleeve to retract to cause the threaded sections to snap into each other as the members are inserted together without rotation;
means for preventing rotation of the sleeve on the member on which the sleeve is carried; and



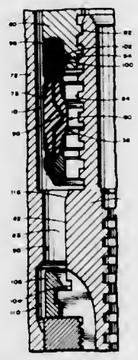
locking means for preventing left-hand rotation of the members relative to each other once the threaded sections have engaged each other, the locking means being actuable automatically once the threaded sections snap into each other, the locking means being selectively releasable to allow one of the threaded sections to rotate in left-hand rotation to unscrew from the other.

4,900,067

RETRIEVABLE PACKOFF WITH AN EMBEDDED FLEXIBLE, METALLIC BAND

Martin B. Jansen, Agoura Hills, and John Pettit, Camarillo, both of Calif., assignors to Vetco Gray Inc., Houston, Tex.

Continuation of Ser. No. 727,492, Apr. 26, 1985, abandoned. This application Jul. 21, 1989, Ser. No. 384,070
Int. Cl.[4] F16L *21/00*
U.S. Cl. 285—140 **6 Claims**



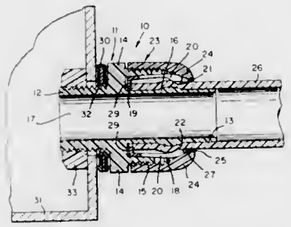
1. A packoff for an annular space between a casing hanger cylindrical wall and a wellhead housing cylindrical bore wall, comprising in combination:
an upper metallic seal ring;
a lower metallic seal ring;
an elastomeric seal ring having an upper end secured to the upper metallic seal ring and a lower end secured to the lower metallic seal ring, the elastomeric seal ring having an inner wall portion which initially protrudes radially inward past the metallic seal rings prior to entry into the annular space, the inner wall portion having an initial diameter that is less than the diameter of the casing hanger cylindrical wall prior to entry into the annular space, so as to cause deformation and sealing engagement of the elastomeric seal ring in the annular space, said deformation causing elongation of the elastomeric seal ring, forcing the metallic seal rings axially apart from each other; and
a metallic band embedded within the elastomeric seal ring, having upper and lower ends connected to the metallic seal rings, the metallic band having a curved section intermediate its ends which curves in vertical cross-section radially inward, the band having vertical slots extending around its circumference and being sufficiently thin so as to flex and elongate when the metallic seal rings move apart from each other as the packoff enters the annular space, the metallic band retaining the lower metallic seal ring and the elastomeric seal ring with the upper metallic seal ring in the event that the packoff is removed from the annular space.

4,900,068

LIQUID TIGHT CONNECTOR FOR FLEXIBLE NON-METALLIC CONDUIT AND FLEXIBLE NON-METALLIC TUBING

Joseph P. Law, Scotch Plains, N.J., assignor to Heyco Molded Products, Inc., Kenilworth, N.J.

Filed Dec. 19, 1988, Ser. No. 286,272
Int. Cl.[4] F16L *3/04*
U.S. Cl. 285—161 **6 Claims**



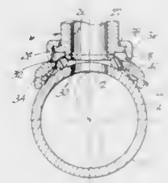
1. A liquid tight connector adapted to connect a non-metallic conduit in liquid tight engagement to a housing, said liquid tight connector including a body, said body including an end portion and a ferrule, said end portion and ferrule including an opening therethrough forming a passage, said end portion and ferrule including a shoulder therebetween, said ferrule including a radially outwardly protruding annular ring, said annular ring having an outer surface which is sloped from said ferrule, means to connect said end portion to said housing, a collar, said collar mounted on said shoulder, said collar spaced away from said ferrule, said collar including thread means, clip means, said clip means adapted to fit between said collar and said ferrule and adapted to receive said ferrule therethrough, said clip means including a plurality of discrete radial fingers, at least some of said fingers including a protrusion adjacent said ferrule and overlying said annular ring, interposable on said ferrule between said ferrule and said clip a compression nut, said compression nut including thread means, said compression nut's thread means interactive with said collar's thread means, said compression nut including a sloped inner portion, said non-metallic conduit interposable on said ferrule between said ferrule and said clip means and over said annular ring when said compression nut is in threaded engagement with said collar threads and said sloped inner portion adapted to interactively engage said fingers on said clip means to engage said protrusions on said fingers with said non-metallic conduit proximate said annular ring.

4,900,069

SELF-ADJUSTING BRANCH PIPING SEAL

R. Clark Lucas, P.O. Box 4124, Santa Barbara, Calif. 93103

Filed Feb. 10, 1989, Ser. No. 309,326
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—197 **8 Claims**



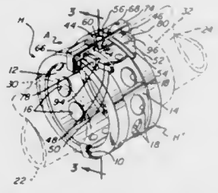
1. A self-adjusting branch piping seal device for connecting a branch pipe to a main pipeline having a hole in the wall, the sealing device comprising:
an adaptor having a longitudinal bore for axial alignment with the hole in the main pipeline and further having a circumferential sealing surface;
a plurality of retaining fingers flexibly attached to and extending radially outward in circumferentially spaced relation from the adaptor adjacent the sealing surface, the retaining fingers each being deformable in a plane including the axis of the adapter bore;
a compression seal ring axially aligned with the adaptor and engaged between the retaining fingers and the wall of the pipeline the inner diameter of the compression seal ring sized to contact the sealing surface of the adapter when under compression; and
means for constraining the adaptor in alignment with the hole and exerting force on the fingers radially inwardly with respect to the main pipeline thereby deforming the fingers to compress the seal ring between the fingers and the wall of the pipeline compressing the seal ring in contact with the adaptor sealing surface effectuating a seal between the adaptor and the pipeline wall.

4,900,070

CONDUIT COUPLING DEVICE WITH REDUNDANCY FEATURES

Richard R. Runkles, Englewood, and John A. Dyer, Westminster, both of Colo., assignors to Stanley Aviation Corporation, Aurora, Colo.

Filed Feb. 21, 1989, Ser. No. 312,713
Int. Cl.[4] F16L *21/06*
U.S. Cl. 285—233 **6 Claims**



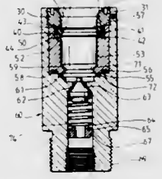
1. A coupling assembly for releasably interconnecting confronting ends of first and second fluid carrying conduit members wherein a pair of annular flanges are fixedly attached to each of the confronting ends, each flange having an outside shoulder and an inside shoulder spaced from the outside shoulder to define a groove therebetween and a sealing ring positioned in each of the flange grooves, said assembly comprising:
a sleeve for circumferentially surrounding the sealing rings and the flanges;
a pair of symmetrical arcuate coupling halves pivotally joined together at first adjacent ends for circumferentially surrounding said sleeve, each of said coupling halves including an arcuate circumferential wall having a pair of spaced ribs extending inwardly from opposite circumferential edges thereof adapted to engage the outside shoulders;
a pair of raised locking surfaces each spaced inwardly from said opposite circumferential edges, respectfully, located on and extending generally longitudinally of the outer surface of the opposite end of one of said halves;
a pair of locking tines extending longitudinally from the outer surface of the opposite end of said other of said coupling halves, said locking tines being engageable with said locking surfaces; and
resilient biasing means urging said locking tines laterally outwardly so that said locking tines snap into engagement with said respective locking surfaces to releasably hold said coupling halves in closed position around said sleeve.

4,900,071

UNDERSEA HYDRAULIC COUPLING WITH DOVETAIL SEAL

Robert E. Smith, III, Stafford, Tex., assignor to National Coupling Company, Inc., Stafford, Tex.

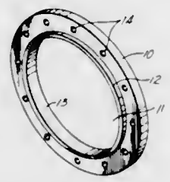
Filed Aug. 24, 1988, Ser. No. 236,026
Int. Cl.[4] F16L *29/00*
U.S. Cl. 285—379 **15 Claims**



1. An undersea hydraulic coupling comprising:
(a) a body having a central axis and a first longitudinal bore concentric with the axis and having a circumferential shoulder intermediate the bore;
(b) a two-piece retainer adapted to be inserted into a first end of the first longitudinal bore and to seat on the shoulder, the retainer having a second longitudinal bore concentric with the axis;
(c) a probe having an outer circumference, the probe adapted to be inserted through the second longitudinal bore and into the first longitudinal bore;
(d) a first annular elastomeric seal adapted to be inserted between each piece of the two-piece retainer, the first annular seal having a wedge-shaped cross-section mating with a corresponding wedge-shaped shoulder on at least one piece of the two-piece retainer, the first annular seal configured to engage the circumference of the probe as the probe is inserted through the second bore and into the first bore;
(e) a second annular metal seal insertable into the first longitudinal bore to be interposed between the shoulder and the two-piece retainer, the second seal configured to engage the first bore and the circumference of the probe as the probe is inserted through the second bore and into the first bore.

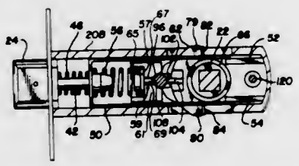
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4,900,072
FIBER-REINFORCED PIPE FLANGE
Dalton W. Bordner, Fullerton, Calif., assignor to Ameron, Inc., Monterey Park, Calif.
Filed Nov. 6, 1987, Ser. No. 119,387
Int. Cl.[4] F16L 47/00
U.S. Cl. 285—405 14 Claims



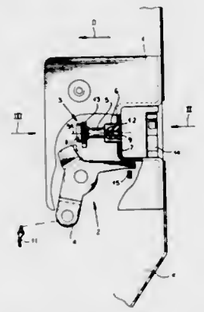
1. A fiber-reinforced, nominally flat plate having a circle of bolt holes through the plate, at least a portion of the fibers following a U-shaped path, the ends of such fibers extending outwardly in a generally radial direction adjacent to each face of the plate across the circle of bolt holes and the central portion of such fibers extending between the faces of the plate.

4,900,073
PRIVACY DOOR LATCH
Martin P. Doolan, Duncanville, Tex., assignor to TCI International Inc., DeKalb, Tex.
Continuation of Ser. No. 141,351, Jan. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 48,049, May 15, 1987, Pat. No. 4,720,127. This application Apr. 17, 1989, Ser. No. 339,947
Int. Cl.[4] E05C 1/16
U.S. Cl. 292—169.22 10 Claims



1. A privacy door latch comprising an elongated case, a latch bolt mounted to reciprocate longitudinally in said case between outwardly extended and inwardly retracted positions,
an operator rotatable about an axis extending transversely through said case,
a driver operable to move said latch bolt longitudinally in response to rotation of said operator,
a helical spring having one end engaging said driver,
said operator comprising a first cam and a second cam, each having top and bottom portions engaging said driver to enable said driver by rotation of said operator in either a clockwise or counterclockwise direction to compress said spring,
a push button key moveably mounted through a sidewall of said case and moveable in direction into and out of said case without engaging said second cam,
said first cam having a portion for receiving at least a part of said push button key for locking said first cam against rotation when said key is in said receiving portion,
said second cam having a camming means formed in a surface of said second cam adjacent said side wall of said case,
said push button key including a pin mounted transversely of the movement of said key and extending beyond an end of said second cam for engagement with said camming means, whereby rotation of said second cam will move said push button key out of said receiving portion of said first cam to enable rotation of said first cam, and
detent means in said case having one end in contact with an opposite end of said spring and an opposite end in contact with said push button key.

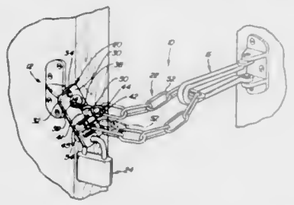
4,900,074
MOTOR-VEHICLE DOOR LATCH WITH CHILD-SAFETY CUTOUT
Frank Kleefeldt, Heiligenhaus, and Johannes T. Menke, Velbert, both of Fed. Rep. of Germany, assignors to Kiekert GmbH & Co. Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany
Filed May 12, 1989, Ser. No. 351,623
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 8809256
Int. Cl.[4] E05C 3/26
U.S. Cl. 292—216 6 Claims



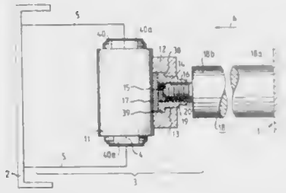
1. In a motor-vehicle door latch including:
a latch housing adapted to be secured to a motor-vehicle door adjacent an edge thereof that is substantially only exposed when the door is open;
an opening lever adapted to be coupled to an inside door handle and pivoted on the housing; and
door opening mechanism on the housing actuatable by the lever to unlatch the door,
a child-safety cutout comprising:
a shaft pivotal in the housing between a freeing position and a locking position and having an outer end exposed through the housing at the door edge and an inner end; and
means including an element on the inner end operatively engageable with the opening lever for preventing actuation of the door-opening mechanism by the opening lever in the locking position and for permitting such actuation in the freeing position.

4,900,075
AUXILIARY SAFETY CHAIN LOCKING DEVICE
William C. Smith, 1540 Millrace, Rochester Hills, Mich. 48064
Filed Aug. 9, 1988, Ser. No. 230,068
Int. Cl.[4] E05C 17/36
U.S. Cl. 292—263 11 Claims

1. An auxiliary door safety latch device comprising:
means adapted for securing to a stud means;
means adapted for coupling said securing means with a door stud retainer;
means adapted for locking and unlocking said coupling means with said securing means such that said auxiliary door safety latch device when secured to a door stud means and stud retainer enables the door to open without providing access through the door until said locking means is decoupled from said securing means and coupling means enabling limited access through the door; and
said securing means, coupling means and locking means being readily removable from one stud means and stud retainer to another stud means and stud retainer so that said auxiliary door safety latch device is portable enabling a user to travel with said auxiliary door safety latch device to enable said auxiliary door safety latch device to be associated with a plurality of stud means and door stud retainers.

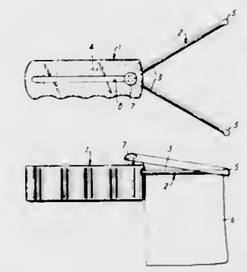


4,900,076
IMPACT ABSORBING CONSTRUCTION FOR A VEHICLE
Wolfgang Kolb, Sennfeld, and German Schmitt, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany
Filed Jun. 29, 1988, Ser. No. 212,869
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723467
Int. Cl.[4] B60R 19/02
U.S. Cl. 293—132 18 Claims



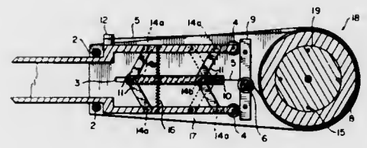
1. An impact absorbing construction for a vehicle comprising at least one impact damping cylinder unit (18) having a cylinder axis and two ends (18*a*, 18*b*), one (18*a*) of said two ends being adapted for being fastened to a vehicle structure (1) and the other (18*b*) of said two ends being connectable with a bumper element (2) by adjustable connection means (3),
said adjustable connection means (3) comprising a sleeve member (11) having a sleeve member axis substantially perpendicular to said cylinder axis, a core member (40) within said sleeve member (11), which core member (40) is adjustable along said sleeve member axis by thread engagement means, said bumper element (2) being fixable to said core member (40), a sleeve support member (12) being fastened to said sleeve member (11), an annular connecting member (14) being rotatably mounted within said sleeve support member (12) about a connecting member axis perpendicular to said sleeve member axis, said annular connecting member (14) being rotatable but axially and radially fixed with respect to said sleeve support member (12) along said connecting member axis, said annular connecting member (14) having internal thread means (15), said internal thread means (15) of said annular connecting member (14) being in engagement with external thread means (20) provided at said other end (18*b*) of said damping cylinder unit (18) thereby allowing said damper cylinder unit to be horizontally adjustable with respect to said sleeve support member and sleeve member.

4,900,077
DOG LITTER CLEANUP DEVICE
Warren R. Beck, 1567 Atlantic St., St. Paul, Minn. 55106
Filed Sep. 29, 1988, Ser. No. 250,533
Int. Cl.[4] A01K 29/00
U.S. Cl. 294—1.3 9 Claims



1. A device for cleanup of dog litter comprising a handle containing an extendable fork that comprises two prongs that are biased apart by spring tension when withdrawn from the handle to the extended position such as to form a "V" shape, said fork prongs having a nubble at each tip, and there being a nubble at the apex of the "V" shape so that, in the extended position, a bag can be stretchably attached to the nubbles and over the prongs and thereby held in the open position to receive said litter when pushed into the bag.

4,900,078
GRIPPING DEVICE UTILIZING A SHAPE MEMORY ALLOY
Joseph T. Bloch, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Dec. 23, 1986, Ser. No. 946,480
Int. Cl.[4] B66C 1/10; B25J 15/00
U.S. Cl. 294—86.4 29 Claims



1. A gripping device comprising:
(a) a plurality of jaw bars;
(b) a first and second electrical terminal;
(c) a first shape memory alloy wire having a characteristic of contracting when heated, said shape memory alloy wire being attached at a first end thereof to said first electrical terminal, a second end of said wire being electrically connected to a second terminal;
(d) movement transmitting means, separate and distinct from said first shape memory alloy wire, connected to the second end of said wire for transmitting the contracting movement of said first shape memory alloy wire to said jaw bars so as to bias said jaw bars in a given direction

being one of (1) toward one another and (2) away from one another when said shape memory alloy wire is heated; and

(e) means for biasing said jaw bars in a direction opposite to said given direction.

4,900,079

CONTROL SYSTEM FOR VEHICLE EQUIPMENT

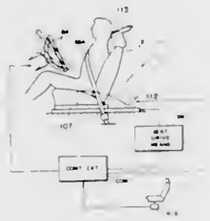
Hideo Obara, Tokyo; Akira Kimitsuka, Yokohama, and Takayuki Yanagishima, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 26, 1988, Ser. No. 186,253

Claims priority, application Japan, Jun. 9, 1987, 62-88099[U]

Int. Cl.⁴ A47C *15/00*

U.S. Cl. 296—65.1 **12 Claims**



1. In vehicle

a front seat;

a rear seat;

means for detecting the presence of a passenger on said rear seat;

means for selectively moving the front seat forward and aft within said vehicle;

a switch, said switch being associated with the operation of said vehicle, said switch having a first state and a second state, said first state being automatically assumed when the vehicle is conditioned to be driven, and said second state being automatically assumed when said vehicle is conditioned so that a passenger can ingress or egress from said vehicle; and

a circuit including a memory, said memory being arranged to be conditioned to retain a first predetermined seat position and a first selectable seat position, said circuit being operatively connected with said seat moving means, said circuit being arranged to induce said seat moving means to automatically move said seat to said first predetermined position from the first selected seat position when said rear seat passenger detecting means indicates the absence of a passenger thereon and said switch assumes said second state.

4,900,080

PARTIAL COVER FOR PICK-UP TRUCK BED

Clark W. Morris, II, Sacramento, Calif., assignor to Gisele R. Kranjack-Morris, Sacramento, Calif., a part interest

Filed Feb. 27, 1989, Ser. No. 316,146

Int. Cl.⁴ B60P *7/02*

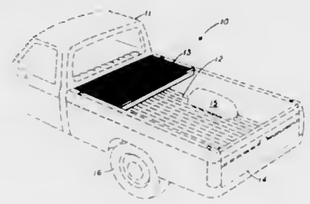
U.S. Cl. 296—100 **16 Claims**

1. A cover for use on the open bed of a truck for partially covering the same comprising:

a generally flat planar main body portion having a front end and a rear end, and having a flange at the front end with at least one aperture therethrough;

a plurality of spaced elongated linearly extending grooves on the upper surface of said main body portion extending in a direction normal to the longitudinal axis of said aperture; and

a plurality of spaced drip lips extending downwardly from the undersurface of said main body portion spaced from each other and extending linearly in the same direction as said grooves, said grooves being generally vertically aligned with the spacing between adjacent lips whereby said main body portion can be cut along said grooves



generally vertically through the spacing between adjacent lips providing for variation in the overall width of said cover,

and an elongated spoiler extending along the rear of said cover.

4,900,081

COVER FOR A CAR WITH MULTIPLE USE

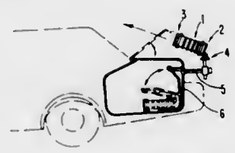
Nam S. Lee, Kansuk JonKong Apt. 72-401, Kansuk-Dong 344-1, Namdong-Ku, Inchon, Rep. of Korea

Filed Jul. 22, 1988, Ser. No. 223,159

Claims priority, application Rep. of Korea, Jul. 23, 1987, UM-1987-11985

Int. Cl.⁴ B60J *7/20*

U.S. Cl. 296—136 **12 Claims**



1. A multipurpose car cover, which stores in a trunk of a car when not in use, comprising:

a means for attaching the car cover to the trunk;

a means for rotating the car cover out of the trunk;

a rear support beam, connected to the means for rotating;

two flexible major trusses, each having a scissors-like structure, the trusses being disposed in parallel and each being slidably connected on one end to the rear support;

a front support beam, slidably connected to the end of the flexible trusses opposing the rear support;

means for connecting the front support to the front of the car; and

a sheet, carried by the flexible trusses, for covering the car.

4,900,082

FRONT SECTION FOR A MOTOR VEHICLE, ESPECIALLY A PASSENGER MOTOR VEHICLE

Norbert Schwuchow, and Gerhard Burk, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

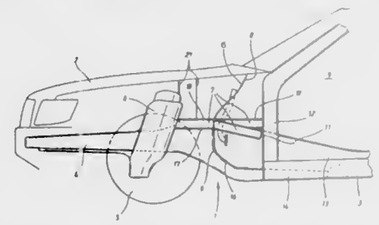
Filed Jun. 24, 1988, Ser. No. 210,980

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720847

Int. Cl.⁴ B62D *25/08*

U.S. Cl. 296—194 **11 Claims**

1. A front section for a motor vehicle, especially passenger motor vehicle, comprising two longitudinal bearer means provided at a distance to the center longitudinal axis of the vehicle, a fork bearer means constructed as hollow profile and connecting a respective longitudinal bearer means with an end wall means of the passenger cell, the end wall means being



divided substantially horizontally into an upper part and a lower part, the fork bearer means being made of an upper shell means and a lower shell means, and at least one shell means of the fork bearer means being made in one piece with one of the two parts of the end wall means.

4,900,083

MODULAR VEHICLE BODY AND METHOD OF BUILDING SAME

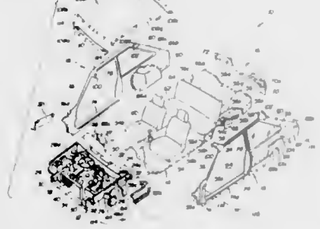
Hideyaki Kumasaka, Yokohama; Taroo Haiwara, Sagamihara; Katsumi Nakamura, Fujisawa; Kenichi Miyazaki, Sagamihara; Hiroshi Kuriyama, Yokohama; Kouji Takao, Atsugi, and Keizo Inoue, Sagamihara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 22, 1988, Ser. No. 171,813

Claims priority, application Japan, Mar. 27, 1987, 62-46112[U]; Mar. 31, 1987, 62-78046

Int. Cl.⁴ B62D *25/00*

U.S. Cl. 296—197 **1 Claim**



1. A vehicle structure comprising:

an engine compartment module having an engine compartment assembly and equipment including an engine, suspension and an electronic control system therefor, said engine compartment assembly constituting an independent vehicle body section and having a cowl box and a dash lower panel at the rear end thereof;

a floor module having a floor assembly and equipment including a rear axle and suspension, said floor assembly constituting an independent vehicle body section and having a front floor panel and rear floor panel;

a rear end module having a rear end assembly and equipment, said rear end assembly constituting an independent vehicle body section and having a rear end panel;

a pair of body side modules each having, though symmetrical about a vehicle body longitudinal axis, a vehicle body side assembly and equipment, said body side assembly constituting an independent body section and having a front pillar, rear pillar, side sill and a roof side rail;

a roof module having a roof assembly and equipment, said roof assembly constituting an independent vehicle body section and having a roof panel; and

mechanical fastening means for mechanically fastening said engine compartment assembly, floor assembly, rear end assembly, body side assemblies and roof assembly together;

said engine compartment assembly having a hood ledge panel at each lateral end thereof, said body side assembly having a dash side member projecting forwardly from a lower end of said front pillar end fastened to said hood ledge panel by said mechanical fastening means;

each of said body side assemblies further having a flange projecting laterally from said lower end of said front pillar, said engine compartment assembly further having a reinforcement member fastened at an upper end to said cowl box and at the lower end to said dash side member by said fastening means, said reinforcement member having at a rear end a flange fastened to said flange of said body side member by said mechanical fastening means.

4,900,084

MOTOR VEHICLE SEAT

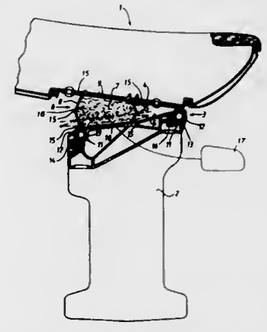
Alfred Förster, Weinstadt; Johann Kotzab, Notzingen, and Willi Geyer, Oberboihingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,086

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1987, 3727671

Int. Cl.⁴ A47C *7/02*; B60N *1/00*

U.S. Cl. 297—216 **13 Claims**



1. Motor vehicle seat having a seat backrest, comprising a pivoting support device for accommodating forward pivotal movement of the seat with respect to a support base about a rear axis running in transverse direction of a vehicle, and a front deformation element arranged at a distance from the rear axis, and supporting the seat on the support base, the deformation element being configured to only permit forward pivoting of the seat when a given load is exerted as the result of an accident, wherein the deformation element is designed as an energy-absorbing foamed material block at least partially surrounded by a shell having a forward facing end and a rearward facing end, wherein a seat facing surface and a support base facing surface of the shell are provided with fastening means for fixing to a rear and front end of the support base, respectively, and wherein the shell has predetermined bending points which form folding lines at the forward facing end and the rearward facing end of the shell during compression of the deformation element resulting from pivoting of the motor vehicle seat caused by an accident, each folding line extending substantially parallel to the rear axis, whereby the deformation

element is deformed at least when a passenger sitting in an adjacent seat at the rear of the seat impacts the seat backrest as a result of the accident.

4,900,085

CHAIR CONSTRUCTION ARRANGEMENT, PARTICULARLY FOR OFFICE CHAIRS, TYPING CHAIRS, AND THE LIKE

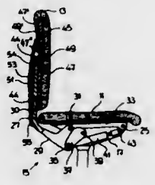
Peter Tobler, Rheineck, Switzerland, assignor to Equus Marketing AG, Wald, Switzerland

Filed Jul. 1, 1988, Ser. No. 214,604

Claims priority, application Switzerland, Jul. 24, 1987, 2839/87

Int. Cl.[4] A47C *7/00*

U.S. Cl. 297—219 **13 Claims**



1. A modular system for assembling from stock components, selected models of pluralities of chairs,

wherein some of the pluralities of chairs form first selected models, and others of the pluralities of chairs form other selected models; and

in which each one of the chairs of all models includes a seat (11);

a back (13) having a surface directed towards the seat and defining a forward surface and a back surface opposite said forward surface,

wherein the perimetrical contour of the backs of the chairs of different models differ in shape;

a back support element or brace (27) supporting the back;

a covering (47) covering the forward surface of the back;

the back support element or brace (27) being coupled to said seat (11);

said modular systems comprising

a plurality of cover shell elements (51, 54) of identical shape and of selected colors and including a downwardly extending portion;

attachment means (53) for attaching the cover shell elements (51, 54) to the back surface of said back; wherein the downwardly extending portion extends over at least part of said back support element or brace and below the level of the seat; and

said covering (4) of all the chairs of all the models including extending covering portions (47') unitary with said covering (47) extending over at least part of the back surface of the back (13) and coverable by any one of said identical cover shell elements,

said identical cover shell elements being dimensioned and shaped to leave uncovered a substantial part of said extending covering portions (47');

and wherein said covering (47) and extending covering portions (47') of the chairs of the first selected models and said other selected models differ from each other in shape.

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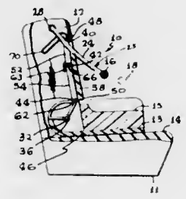
INTEGRAL FOLDING CHILD RESTRAINT SYSTEM

Royce E. Steward, 2624 Corinth Ave., Los Angeles, Calif. 90064

Continuation-in-part of Ser. No. 80,813, Aug. 3, 1987. This application Sep. 16, 1988, Ser. No. 245,039

Int. Cl.[4] A47C *15/00*

U.S. Cl. 297—238 **12 Claims**



1. A child restraint system comprising:

an adult seat mounted in a vehicle by a seat frame, said adult seat having a padded seat bottom and a padded seat back, and having an opening in said adult seat back;

a child seat mounting frame made integral with said adult seat frame, said child seat mounting frame being set within said opening in said adult seat;

a child seat pivotally mounted onto said child seat mounting frame, wherein said child seat will fold into said adult seat to form a comfortable, smooth, and flush area on said adult seat back;

a back support for said child seat, said back support pivotally attached to said child mounting frame and pivotally attached in the middle of said back support such that said back support will fold inwardly when said child seat is folded into said adult seat;

a rump support and a back support formed on said child seat and pivotally attached to said child seat mounting frame wherein the unfolding of said rump support will simultaneously cause the unfolding of said back support;

a padded restraint bar pivotally attached to said child seat frame wherein said padded restraint bar is folded into said opening in said adult seat when said child seat is folded and is moved out of its folded position when said child seat and said back support are simultaneously unfolded;

a restraining harness attached to said child seat mounting frame wherein said restraining harness restrains the shoulder portion of a child's anatomy.

4,900,087

AUTOMOBILE SEAT WITH BUILT IN CHILD SEAT

Nadine Z. Crisp, P.O. Box 301, Seymour, Mo. 65746

Continuation-in-part of Ser. No. 147,502, Jan. 25, 1988, abandoned. This application Apr. 13, 1989, Ser. No. 337,382

Int. Cl.[4] A47C *15/00*

U.S. Cl. 297—238 **20 Claims**

1. In a motor vehicle seat having a seating surface and a seat back, the improvement comprising:

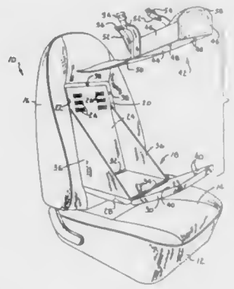
first and second panels each having a cushion side and an opposite side;

first hinge means connecting said panels to the seat back;

second hinge means connecting said panels to one another, said first and second hinge means mounting the first and second panels for hinged movement between a first position wherein the panels are arranged one above the other in a common plane extending along the seat back with said cushion sides facing forwardly to provide a cushion on the seat back, and a second position wherein the panels are arranged with said opposite sides against one another and extend forwardly from the seat back each in substantially horizontal orientation spaced above the seating surface with said cushion surface of the second panel facing upwardly to provide a child seat surface for receiving a child thereon;

a pair of flexible sides extending from opposite sides of the child seat surface and acting to hold said panels in the second position; and

releasable belt means for restraining a child seated on the child seat surface.



4,900,088

BACK REST FOR A VEHICLE SEAT

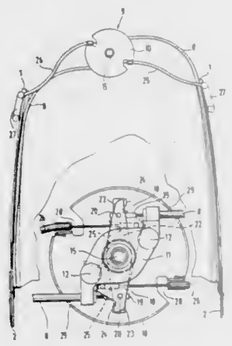
Rudolf Bechtle, Lichtenstein; Jörg Resag, Filderstadt, and Norbert Sommer, Remscheid, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 308,623

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 8801833 [U]

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—379 **11 Claims**



1. A back rest for a vehicle seat, particularly a motor vehicle seat, which is adjustable in its angle of inclination about a pivot axis running in the direction lateral to the back rest and which can be folded about a folding axis lying parallel to the pivot axis and is provided on its two sides with respective folding locks that must be released for a folding movement, each of said folding locks having a locking member which is movable between a locking position and a release position, and each of said folding locks being connected with one end of a cable for activation purposes, comprising: an activating device arranged on the supporting portions of the back rest, said activating device being connected with the other end of said cable wherein said activating device has a support for a bolt, which support is immovable relative to the back rest, wherein a double-armed pivot lever is arranged on the bolt, the two arms of which lever being connected with respective cores of the two cables at a distance from the rotational axis of said lever, wherein the covers of said cables are supported on the support and wherein the double-armed pivot lever is connected with an activating member, further comprising;

at least one additional cable, one end of which is coupled with the double-armed pivot lever, and the other end thereof is connected with a pulling member that is provided on the side of the back rest and is gripped by hand.

4,900,089

HEADREST

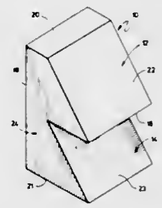
Daniel R. Alexander, 7493 Cedar Knolls Dr., Warrenton, Va. 22186

Continuation-in-part of Ser. No. 118,954, Nov. 10, 1987, Pat. No. 4,807,933. This application Feb. 27, 1989, Ser. No. 315,482

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[4] A47C *7/36*

U.S. Cl. 297—391 **10 Claims**



1. A headrest for use with a seatback located adjacent a substantially vertical surface, comprising:

upper means for supporting the head of a user at a selected position above the seatback and cushioning the head of the user against direct impact with the vertical surface,

lower means for maintaining the position of the upper means during use and providing for quick and easy placement and removal of said headrest with respect to said seatback,

said upper and lower means each consisting essentially of a resilient foam body having a rounded edge truncated right triangle cross section.

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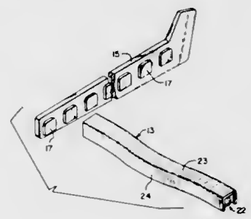
SLAT ASSEMBLED CHAIR AND METHOD OF ASSEMBLY THEREOF

Douglas W. Davis, Brighton, Australia, assignor to Roplas Sales Pty. Ltd., Collingwood, Australia

Filed Oct. 8, 1987, Ser. No. 106,523

Int. Cl.[4] A47C *7/00*

U.S. Cl. 297—440 **4 Claims**



1. A multi-piece chair comprising side rails each having an opposed inner surface, transverse slats providing load bearing surfaces, the ends of said stats and said side rails being detach-

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ably interconnected to form interlocked joints at the ends of said stats with their respective inner surface of the side rail, each of said joints including a plug formed integrally with said side rail and having a front face spaced from said inner surface to form a socket in the spaced defined between said inner surface and said front face,

said slats including an interfitting socket formed integrally at each end thereof, said socket having a back wall at each end being bounded by an outwardly extending top wall and two opposing side walls each having ribs, thereby defining an open end and a slot between said back wall and said ribs, said slot being sized to receive said plug, a cam rib extending outwardly from said back wall at a point opposite but distant from said top wall,

whereby said slats may be attached to said rails by sliding said plug into the slot over the resistance of the cam rib and whereby said slats may be removed by like reverse action, and wherein said back wall is constructed from a material having greater resilience than said front face on said plug.

4,900,091

ELECTROHYDRAULIC COAL-MINING SYSTEM

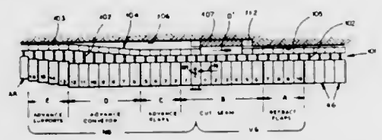
Gustav Neu, Bochum; Ernst-Günter Nerlich, Essen, and Karl-Heinz Berger, Gelsenkirchen-Resse, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 243,066

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1987, 3730711

Int. Cl.[4] E21D *23/12*

U.S. Cl. 299—1 **6 Claims**



1. A process for operating a mining system comprising:

a laterally deflectable segmented conveyor extending longitudinally along a longitudinal face from which material is to be cut;

a mining machine displaceable longitudinally along the conveyor and engageable with the face to cut material therefrom and deposit it in the conveyor; and

a longitudinal succession of support frames each having a respective actuator connected to a respective segment of the conveyor and each also having a respective retractile roof-engaging flap, the process comprising the steps of:

(a) bracing the frames and conveyor in a safety zone extending longitudinally past a plurality of the frames immediately adjacent the mining machine against the roof with their flaps retracted;

(b) advancing the machine in the safety zone while cutting the face in the safety zone;

(c) sequentially retracting the flaps of the frames one frame at a time in a zone immediately downstream of the safety zone as the machine is advanced;

(d) sequentially advancing the flaps of the frames one frame at a time in a zone immediately upstream of the safety zone as the machine is advanced;

(e) pushing the conveyor segments toward the face by extension of the actuators of the frames one frame at a time in a second zone immediately upstream of the upstream zone;

(f) drawing the frames toward the face by contraction of the actuators of the frames one frame at a time in a third zone immediately upstream from the second zone; and

(g) selecting the number of frames in the upstream and downstream zone in accordance with the stability of the material of the mine roof.

4,900,092

BARREL FOR ROCK BREAKING TOOL AND METHOD OF USE

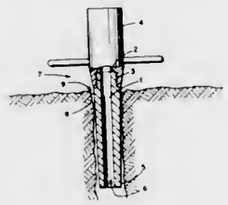
Hermanus Q. Van Der Westhuizen, Pretoria, and Thomas M. Muller, Boksburg, both of South Africa, assignors to Boutade Worldwide Investments NV, Netherlands Antilles

Continuation of Ser. No. 55,427, May 28, 1987, Pat. No. 4,829,900. This application Nov. 28, 1988, Ser. No. 276,786

Claims priority, application South Africa, Sep. 15, 1986, 86/6991

Int. Cl.[4] F42D *3/04*; **E21C** *37/12*

U.S. Cl. 299—13 **3 Claims**



1. A method of breaking up rock, comprising the steps of;

substantially filing a hole in a rock with a liquid;

inserting a barrel of a rock breaking tool into the hole, the barrel having an open distal end and the tool being operable to discharge a cartridge from a firing chamber down the barrel;

positioning a blast absorbing mat over the tool to retain it substantially in position in the hole during discharge of the cartridge; and

discharging the cartridge down the barrel to cause an impulsive energy shock in the liquid to break up the rock.

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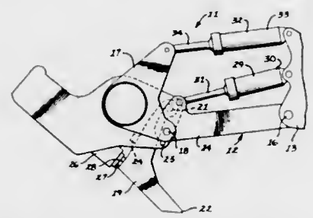
IMPACT RIPPER AND CONTROL

John J. Krone, Dunlap, and Jerry D. Fidler, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 10, 1986, Ser. No. 929,025

Int. Cl.[4] A01B *11/00, 13/08, 35/00*

U.S. Cl. 299—37 **3 Claims**



1. An impact ripper and control therefor comprising:

a ripper frame;

a ripper shank connected to the ripper frame;

a ripper tip connected to the ripper shank;

a hydraulically activated impactor connected to the ripper frame and having an impact element positioned to direct impact energy to the tip;

a pump;

a pilot operated valve connected to the pump and to the hydraulically activated impactor, said valve being movable between a first position at which fluid flow between the pump and the impactor is blocked and a second position at which pressurized fluid from the pump is directed to the impactor;

a source of pressurized pilot fluid; and

means for directing pressurized pilot fluid to the pilot operated valve for shifting the valve to the second position when a force greater than a preselected level is applied to the tip, said means including a pilot valve disposed between the source of pilot fluid and the pilot operated valve.

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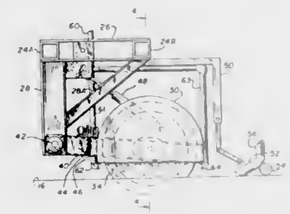
ADJUSTABLE PLUNGE-CUT ROAD SAW MECHANISM

Mark R. Sergeant, 73 Tower Hill Ave., Red Bank, N.J. 07701

Filed Feb. 2, 1989, Ser. No. 305,844

Int. Cl.[4] E01C *23/09*

U.S. Cl. 299—39 **8 Claims**



1. A machine for cutting holes in a road surface for mounting reflective safety units comprising a vehicle to be moved along a road way, for supporting said mechanism; at least one lateral, fixed support member extending across said vehicle substantially perpendicular to the direction of said road way; at least one movable support member supported by said fixed support member and movable with respect to and in the direction of said fixed support member;a rigid brace secured to the end of said movable support member; a circular cutting tool pivoted to said rigid brace and movable up and down with respect to said road surface; means for moving said circular cutting tool up and down with respect to said road surface for cutting said road surface; means for directing a stream of water at said cutting tool as it cuts said road surface; and means for directing a stream of compressed air at a newly-cut hole in said road surface to clear it of debris and water.

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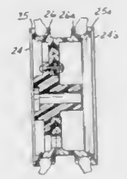
MINIATURE VEHICLE WHEEL MOUNTS

Thomas J. Brubaker, 5775 John R, Troy, Mich. 48098

Filed Nov. 14, 1988, Ser. No. 270,686

Int. Cl.[4] A63H *17/26*

U.S. Cl. 301—63 PW **10 Claims**



1. A wheel assembly for miniature vehicles which enables adaptation of various wheel arrangement on any one of a variety of miniature vehicles, the wheel assembly comprising, in combination:

a series of adaptor hubs having mounting means specifically arranged for mounting each hub on the axle of a series of different specific miniatures vehicles;

each adaptor hub of said series also having identical standardized rim-mounting elements with apertures for mounting a rim thereon;

a series of rims having peripheral surfaces of varying axial width and each including a pair of radially extending circumferential shoulders for embracing the bead of a tire;

each rim having a spider with apertures therein corresponding to said standardized apertures in each of said adaptor hubs;

said spider projecting radially of said peripheral surface; and

fasteners for mounting any pair of rims from said series in a spider-to-spider arrangement on any hub of said series to provide wheel assemblies having pairs of tire-embracing beads spaced apart axially varying distances to accommodate varying width tires.

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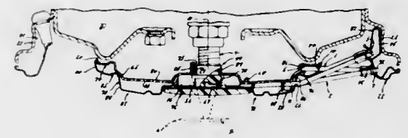
WHEEL TRIM

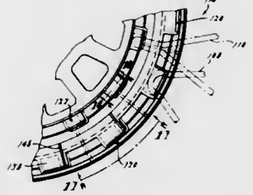
Heinrich J. Hempelmann, Livonia, and Thomas J. Mack, Union Lake, both of Mich., assignors to NI Industries, Inc., Novi, Micb.

Continuation-in-part of Ser. No. 145,513, Jan. 19, 1988. This application Nov. 18, 1988, Ser. No. 272,815

Int. Cl.[4] B60B *7/04*

U.S. Cl. 301—37 SS **21 Claims**





1. A simulated wire wheel trim for a motor vehicle wheel comprising:

an outer ring member having a plurality of axially and radially spaced apertures,

a center hub assembly;

a plurality of spoke members extending generally radially between and interconnecting said outer ring and said center hub assembly,

said center hub assembly including

a one piece decorative outer cover member having a plurality of circumferentially spaced openings, said plurality of spoke members extending through respective ones of said openings;

a spoke retainer member including means defining a plurality of circumferentially spaced pockets for receiving the radial inner ends of said plurality of spokes, each of said pockets being operative to restrict movement of said spoke members so as to aid in retaining said plural-

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ity of spoke members, said center hub assembly and said outer ring in assembled relationship; and

means securing said spoke retainer and said outer cover member together.

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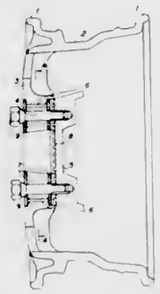
CAR WHEEL MADE OF POLYMER MATERIAL

Georgi D. Kostov; Bogoya G. Gargov; Chavdar L. Gitchev, and Sophya G. Kostova, all of Sofia, Bulgaria, assignors to Technologitchen Center "IPOMA", Sofia, Bulgaria

Filed Aug. 23, 1988, Ser. No. 236,059

Int. Cl.[4] B60B *5/02*

U.S. Cl. 301—63 PW **4 Claims**



1. A car wheel made of engineering polymer material, comprising a rim which has a shaped well on which a tire is adapted to be mounted, the wheel including a disc which has a hub portion, the hub portion being provided with holes for receiving fixing components, and heat insulating plate means mounted between the disc and a car hub, wherein in the region of each hole for each fixing component there are disposed a pair of supporting plates and a plurality of pins disposed between each pair of supporting plates and made of steel having a high limit of elasticity, each pin having a pair of opposite end faces, the opposite end faces of said pins being in contact with said pair of supporting plates which are disposed on opposite sides of the hub portion, and the coefficient of linear expansion of the pins being equal to that of the fixing components.

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ELECTRO-PNEUMATIC TRACTOR-TRAILER BRAKE SYSTEM

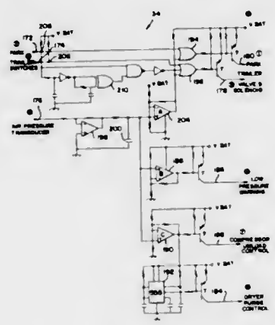
Lawrence H. Kuhn, New Haven, and Michael B. Durant, Fort Wayne, both of Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Division of Ser. No. 268,426, Nov. 8, 1988, Pat. No. 4,877,294. This application Aug. 11, 1989, Ser. No. 392,814

Int. Cl.[4] B60T *17/00*

U.S. Cl. 303—1 **2 Claims**

1. In an automotive tractor which comprises a powertrain-containing chassis including a powerplant which powers the tractor for automotive over-the-road travel and said chassis contains pneumatic-operated components which are powered from a pneumatic power supply, said pneumatic power supply comprising a tank for compressed air, a compressor which is driven by said powerplant and is operated to loaded and unloaded conditions such that when loaded, it draws and compresses air to charge said tank, said pneumatic power supply also comprising a dryer connected in pneumatic circuit with said compressor and said tank to remove condensed moisture from air compressed by said compressor, said dryer having a purge port at which condensed moisture is purged from said dryer, the improvement which comprises an electrically-responsive means associated with said compressor for controlling the loading and unloading of said compressor, further electrically-responsive means associated with said dryer for controlling purging of moisture from said dryer, an electric pressure transducer for providing a pressure signal representative of the pressure of air compressed into said tank by said compressor, and an electric circuit which comprises an input



which receives the pressure signal from said electric pressure transducer, and output means connected to both said electrically-responsive means, said electric circuit comprising means for operating both said electrically-responsive means in accordance with the pressure signal of said electric pressure transducer.

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METHOD OF CONTROLLING THE BRAKE PRESSURE IN AN ANTI-LOCK VEHICLE BRAKE SYSTEM

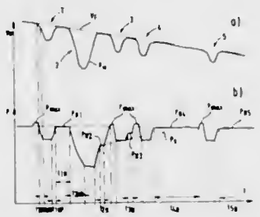
Volker Braschel, Neuwied, Fed. Rep. of Germany, assignor to Lucas Industries public limited company, Birmingham, England

Filed Mar. 23, 1989, Ser. No. 327,836

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1988, 3810020

Int. Cl.[4] B60T *8/64*

U.S. Cl. 303—95 **3 Claims**



1. A method of controlling the brake pressure in an anti-lock vehicle brake system, wherein the rotational behavior of a braked wheel is measured and the brake pressure is lowered in response to the slip and/or rotational retardation of the wheel if a given threshold value is exceeded, and is subsequently raised again and then kept constant during a phase of steady pressure, characterized in that the duration (t1H, t2H . . . t5H) t5 H) of the pressure stability phase is adjusted in response to a comparison of the pressure reduction period (t1DOWN, t2DOWN . . .) and/or the pressure build-up period (t1UP, t2UP . . .) of the present control cycle with a pressure reduction period or a pressure build-up period in a previous control cycle such that the duration of the phase of steady pressure becomes longer if the periods of pressure reduction or pressure build-up compared are in agreement than if they differ.

4,900,100

ANTI-SKID BRAKE CONTROL SYSTEM WITH CAPABILITY OF ELIMINATING INFLUENCE OF NOISE IN DERIVATION OF WHEEL ACCELERATION DATA

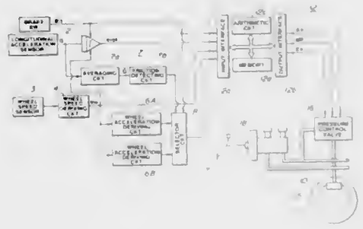
Akira Higashisata, Kanagawa; Yasuki Ishikawa, Tokyo; Yoshiki Yasuno, and Takeshi Fujishiro, both of Kanagawa, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 28, 1989, Ser. No. 316,742

Claims priority, application Japan, Feb. 29, 1988, 63-46695; Feb. 29, 1988, 63-46696

Int. Cl.[4] B60T *8/58*

U.S. Cl. 303—100 **19 Claims**



1. An anti-skid brake control system for an automotive vehicle comprising:

a fluid circuit including a fluid pressure source and a wheel cylinder for generating a braking force for decelerating a wheel;

a pressure control valve means disposed in said fluid circuit for controlling braking pressure to be generated in said wheel cylinder, said pressure control valve means operating to increase said braking pressure in said wheel cylinder in a first mode position and to decrease said braking pressure in said wheel cylinder in a second mode position;

a first sensor means for monitoring a rotation speed of said wheel for producing a wheel speed indicative signal;

a second sensor means for monitoring a road friction indicative parameter for producing a friction indicative signal;

first arithmetic means for deriving first wheel acceleration indicative data, said first arithmetic means being provided a first higher sensitivity with respect to variation of said wheel speed indicative signal value;

second arithmetic means for deriving second wheel acceleration indicative data, said first arithmetic means being provided a second lower sensitivity with respect to variation of said wheel speed indicative signal value;

third arithmetic means detecting the friction condition on the road surface to select one of said first and second wheel acceleration indicative data for outputting selected wheel acceleration indicative data; and

fourth arithmetic means, receiving said wheel speed indicative signal and said selected wheel acceleration indicative data, for processing the input data for selecting one of a first mode in which said pressure control valve means is operated in said first mode position and a second mode in which said pressure control valve means is operated in said second mode position.

4,900,101

BRAKE SYSTEM WITH SLIP CONTROL

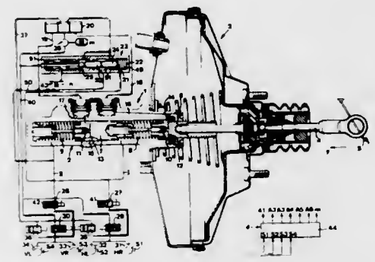
Horst-Peter Becker, Holbeinstrasse 12, 6000 Frankfurt/Main 70, and Ruediger Horne, Beckstrasse 7, 6100 Darmstadt, both of Fed. Rep. of Germany

Filed Nov. 4, 1987, Ser. No. 117,163

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638510

Int. Cl.[4] B60T *8/32, 8/44*

U.S. Cl. 303—110 **1 Claim**



1. A brake system with slip control, comprising a master cylinder, two pair of wheel brakes, each pair connected to a one of two controllable main valves, each said main valve connected to said master cylinder, an auxiliary-pressure supply system including a hydraulic pump connected to a regulating and pressure-monitoring valve, a pressure-compensating and pressure-fluid supply reservoir connected to said pump, said supply system connected to the wheel brake pairs by one inlet and one outlet electromagnetically actuatable valve at each pair of wheel brakes, the outlet valves being closed in an inactive condition, each one pair of wheel brakes communicating directly with one inlet valve and one outlet valve, wheel sensor means and electronic circuitry means for determining wheel rotational behavior and for detecting brake slip and for generating electric braking-pressure control signals for operating the inlet and outlet valves solely during brake slip control, each inlet valve being closed in an inactive condition and operable to assume an opened position upon actuation, an inlet side of each inlet valve communicates directly with the auxiliary-pressure supply system and an outlet side of each inlet valve communicates directly with a respective one of the main valves and wherein during brake slip control said electronic circuitry means closes said main valves to isolate said wheel brakes from said master cylinder and wherein slip control braking pressure variation in said wheel brakes is solely controlled by actuation of said inlet and outlet valves.

4,900,102

ANTI-SKID AND TRACTION CONTROL SYSTEM

Wolf-Dieter Jonner, Beilstein-Schmidhausen, and Lothar Kirstein, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 29, 1989, Ser. No. 330,322

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816073

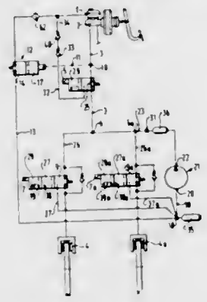
Int. Cl.[4] B60T *8/32, 8/34, 8/44, 13/16*

U.S. Cl. 303—110 **30 Claims**

1. An anti-skid and traction control system for vehicles including driven wheels, each of the wheels of which is assigned a wheel brake cylinder, a multi-circuit master cylinder, a brake line which communicates between said multi-circuit master cylinder and each of said wheel brake cylinders, at least one pressure fluid container connected with said master cylinder, at least one first valve assembly assigned to one of the driven wheels and located in the brake line, control means for

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switching said valve assembly in an anti-skid and traction control situation to different switching positions for at least pressure buildup and pressure reduction at a wheel brake, a second valve assembly, associated with at least one of the brake circuits, said second valve assembly located between said mutli-circuit master cylinder and said first valve assembly, said second valve assembly controls a brake fluid communication between said multi-circuit master cylinder and said first valve assembly in one of the brake circuits only in the traction control situation, at least one self-priming pump, said pump includes an inlet side and an outlet side, said inlet side upon pressure reduction is connectable by said first valve assemblies to the wheel brake cylinders, and by means of which pump, pressure fluid can be pumped from the outlet side into the brake line between the first and second valve assembly, a third



valve assembly secured in said brake line between said pressure fluid container and said first valve assemblies, said third valve assembly existing between the pressure fluid container and the first valve assemblies of one brake circuit is openable and closable and the inlet side of the at least one self-priming pump also communicates with the third valve assembly via a line segment (13), which is open in the traction control situation, a first pressure-controlled valve (33) which opens in the direction of the pressure fluid container (1) is disposed in a return line (32) originating at said second valve assembly (5) and communicates with the pressure fluid container (1), said second valve assembly (5) in the anti-skid control situation shuts off the return line (32) toward the brake line (3) and in the traction control situation opens the return line (32) toward the brake line (3) between the second valve assembly (5) and the first valve assemblies (7, 7a).

4,900,103

BRAKE SYSTEM WITH ANTI-SKID CONTROL FOR MOTOR VEHICLES

Alwin Stegmaier, N. Charleston, S.C., assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

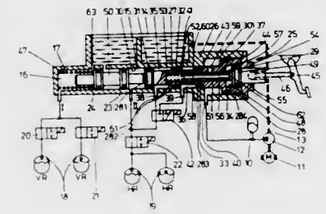
Filed Apr. 3, 1989, Ser. No. 332,194

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817180

Int. Cl.⁴ B60T *8/32, 8/44*

U.S. Cl. 303—114 **21 Claims**

1. A brake system including anti-skid control for motor vehicles, having a brake booster, a brake valve that is controllable by a brake pedal, an emergency brake piston that is displaceable by the brake pedal at least in an event of pressure failure, having a master brake cylinder that is combined in one housing with the brake booster, said master brake cylinder has at least one master brake piston which defines two brake chambers disposed in one dynamic brake circuit and one static brake circuit, respectively, for feeding a brake pressure into the brake circuits, said first brake chamber is located in the dynamic brake circuit and can be made to communicate via the brake valve with a pressure source (10) or a relief point, said emergency brake piston (28; 128) and the master brake piston (50) are accommodated in a continuous housing bore (30) in such a manner that said emergency brake piston (28; 128) forms a second defining wall (281) for said first brake chamber (15) and the master brake piston (50) rests with force on the emergency brake piston (28; 128); means are provided that at least upon



the onset of an anti-skid control keep said emergency brake piston (28; 128) in its undisplaced basic position or returns said emergency brake piston to its basic position; and at least one switching valve (42) is connected to the first brake chamber (15) for pressure modulation in the first brake chamber (15).

4,900,104

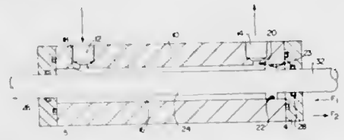
PRESSURE MODULATION VALVE

Gary Clifford, 1601 NW. 38th Ave., Lauderhill, Fla. 33311

Filed Sep. 28, 1987, Ser. No. 101,809

Int. Cl.⁴ B60T *8/42, 8/02*

U.S. Cl. 303—115 **4 Claims**



1. A fluid pressure modulation valve, comprising:

(a) a housing having a fluid inlet port adapted to receive a force having a related pressure Pi; a fluid outlet port adapted for a force output having a related pressure Po; and an axial channel in fluid communication with radially inwardly apertured ends of said inlet and outlet ports, said axial channel having a radius R2;

(b) a piston, having a radius R2, radially centered about an integral with a piston rod, said piston rod having a radius R1, said piston slidably mounted in said axial channel, said piston rod having an axial range of travel extending from downstream of said apertured end of said outlet port to upstream of said apertured end of said outlet port, said piston rod being fluidly sealed within said axial channel at the upstream and downstream ends thereof;

(c) a fluid disposed in fluid tight communication between said inlet and outlet ports and said axial channel therebetween; and

(d) a selective reciprocating means including a linear motor for selectively reciprocating with a particular force F1 applied to said upstream end of said piston rod, said selective reciprocating means being responsive to external control signals, said piston rod radius R1 and said axial channel radius R2 are selected to substantially match said force F1 in accordance with the formula:

$$F1=(Pi-Po)[(R2^2-R1^2)]$$

in which (Pi—Po) is the difference between said inlet port pressure and outlet port pressure,

whereby upstream movement of said piston by said linear motor will co-act with said fluid to diminish the volume of said fluid available to said inlet port, and will increase the volume of fluid available to said outlet port and, further whereby, said linear motor will act to directly oppose fluidly transmitted force applied from said inlet port through said axial channel, said effects acting to reduce the fluid pressure and resultant force at said outlet port.

4,900,105

PRESSURE FLUID-ACTIVATED BRAKE SYSTEM INCLUDING AN ANTI-LOCKING TRACTION SLIP CONTROL

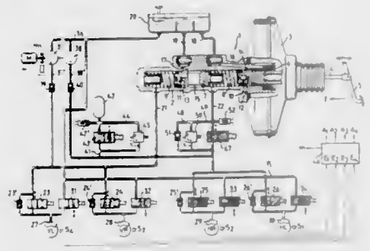
Jochen Burgdorf, Offenbach-Rumpenheim; Hans D. Reinartz, Frankfurt am Main; Helmut Steffes, Hattersheim; Peter Volz, Darmstadt, all of Fed. Rep. of Germany, and André Goossens, Ruisat, Belgium, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 1, 1989, Ser. No. 305,303

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803363

Int. Cl.⁴ B60T *8/32, 8/44, 11/20, 13/16*

U.S. Cl. 303—116 **6 Claims**



1. An anti-locking, pressure fluidactuated brake system including traction slip control, comprising a pedal-operated, auxiliary force-supported brake pressure generator including a master cylinder connected to wheel brake cylinders through master brake conduits branching into a conduit system, auxiliary pressure pumps having pump outlets in communication with the master brake conduits and pump inlets in communication with a pressure fluid reservoir through an inlet conduit, wheel sensors for determining wheel rotating patterns, electronic circuits for generating electrical brake pressure control signals capable of controlling electromagnetically actuable pressure fluid inlet and outlet valves in the conduit system for slip control, an accumulator having a single connection in communication with at least one of the master brake conduits, and a first electromagnetic valve including a pressure monitoring switch and a bypass with a release valve disposed between the single connection and the accumulator permitting assembly and disassembly of a small number of connections for high-speed and normal-speed anti-traction slip control.

4,900,106

POWER TRANSMISSION OF A TURNING-TRACK TRACK-LAYING VEHICLE

Jorma Pohjola, Oulu, Finland, assignor to Rets-Myynti Ky, Finland

PCT No. PCT/FI86/00152, § 371 Date Aug. 16, 1988, § 102(e) Date Aug. 16, 1988, PCT Pub. No. WO88/04627, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 18, 1986, Ser. No. 235,874

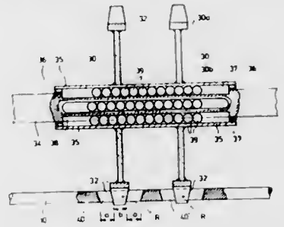
Int. Cl.⁴ B62D *55/12*

U.S. Cl. 305—57 **15 Claims**

1. Power transmmission of a turning-track, track-laying vehicle, said track-laying vehicle comprising a closed-loop type track belt arranged between end rolls, in a manner such that one edge of the track belt can be stretched and the other edge of the track belt contracted in order to cause the vehicle to execute a turn,

said vehicle comprising a motor, at least one traction sprocket, and power transmission equipment between said at least one traction sprocket and the motor,

said at least one sprocket positioned above a top run of the track belt and being provided with drive cogs, which are in driving contact with openings or grooves in the track belt, such that traction force can be transmitted from said at least one traction sprocket to the track belt,



wherein a drive fit between the upper run of the track belt and said at least one traction sprocket is such that said fit allows the at least one traction sprocket and the track belt to interactively take a driving position which is principally determined by curvature of the track belt,

said drive fit being a cog fit, and

lateral width of the traction openings or grooves in the track belt being considerably wider than width of the traction cogs at the openings or grooves thereof, such that the track belt can laterally move with respect to the traction cogs.

4,900,107

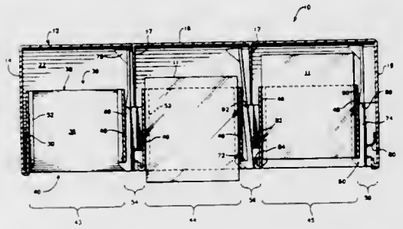
COMPACT DISK CONTAINER STORAGE DEVICE

Jerry M. Long, Pleasanton, and Peter J. Palmer, San Jose, both of Calif., assignors to Creative Point, Inc., Fremont, Calif.

Continuation of Ser. No. 795,072, Nov. 4, 1985, abandoned. This application Jun. 27, 1989, Ser. No. 371,921

Int. Cl.⁴ A47B *81/06*

U.S. Cl. 312—15 **15 Claims**



1. A storage device for storing a plurality of discrete objects, comprising:

A hollow exterior frame member having one open side;

an interior frame member contained within the exterior frame member, the interior frame member including dividing means for dividing the interior of the device into a plurality of slots for receiving the objects, each of said slots being in the general shape of and slightly larger than the objects and being accessible from said open side; and

securing/release means associated with each of said slots to secure one of the objects therein and, upon manipulation, to release and eject the object therefrom such that the

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ejected object is manually accessible from the exterior of the device, the securing/release means including a securing surface for abutting against the front of the object a lever, extending along one side of the object, a fulcrum, and a solid triangular wedge member for abutting against a rear corner of the object and forcing the object both against said securing surface and laterally against said dividing means situated on the opposite side of the object; and

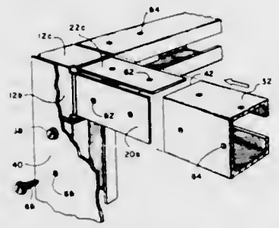
means for rotating the lever about said fulcrum, and further including urging means to continually urge said securing surface to a position overlapping said front opening.

4,900,108

SELF-FIXTURING CABINET CORNER MEMBER

James C. Tischer, La Crescent, Minn., assignor to American Standard Inc., New York, N.Y.

Filed Jun. 20, 1989, Ser. No. 368,620
Int. Cl.[4] A47B *49/00*
U.S. Cl. 312—265.3 **14 Claims**



1. An enclosure for housing heating, ventilating and air conditioning equipment and the like comprising:

a plurality of corner members, each of said corner members having three sides and six legs, each of said three sides lying in a plane which is generally perpendicular to the planes in which the other two of said three sides lie and two of said three sides cooperating to define an open seam therebetween, each respective one of said six legs extending from one of said sides and pairing with a different one of said six legs, said different one of said six legs extending in the same direction as said respective one of said six legs but from one of said three sides other than the side from which said respective one of said legs extends, said respective and different ones of said six legs being disposed in perpendicular planes and cooperating to define a pair of attachment legs between which an open seam is defined;

a plurality of connecting members, each of said connecting members having at least two sides, said two sides lying generally in perpendicular planes and being disposed so as to abut and overlie individual ones of said pairs of attachment legs of said corner members;

a plurality of cover panels; and

means for rigidly connecting said corner members, said plurality of connecting members and said plurality of cover panels to form a box-like housing.

4,900,109

VERSATILE DISHWASHER FRONT CONSTRUCTION

Ray W. Boston, Jr.; Neil K. McDonald, and LeRoy J. Herbst, all of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Apr. 4, 1989, Ser. No. 332,970
Int. Cl.[4] A47B *81/00*
U.S. Cl. 312—276 **4 Claims**

1. A dishwashing machine comprising:

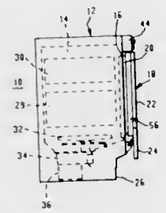
a housing defining a chamber to receive items to be washed and an access opening for insertion and removal of the items;

a rectangular door pivotally mounted to said housing for selective movement generally about its lower edge between a generally horizontal position permitting access to said chamber and a generally vertical position closing the opening;

a rectangular outer panel sized to substantially cover said door;

a pair of brackets removably secured to said door and to said outer panel adjacent their respective lateral edges for mounting said outer panel on said door;

a rectangular lower panel;



hinge means connected to said outer panel adjacent its lower edge and to said lower panel adjacent its upper edge so that said lower panel is positioned below said outer panel for pivotal movement about said lower edge of said outer panel as said door pivots about its lower edge;

a support panel attached to the lower portion of said housing behind said lower panel;

spring means connected to and extending between said lower panel and said support panel, said spring means providing the sole connection between said lower panel and the lower portion of said housing, said spring means biasing said lower panel toward said housing while permitting said lower panel to pivot relative to said outer panel as said door moves between its generally vertical and generally horizontal positions.

4,900,110

CHEMICAL VAPOR DEPOSITION OF A REFLECTIVE FILM ON THE BOTTOM SURFACE OF A FLOAT GLASS RIBBON

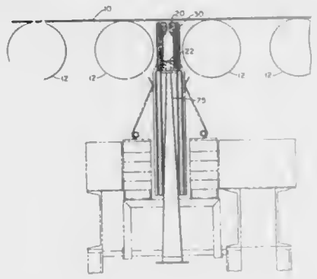
George E. Sleighter, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 636,039, Jul. 30, 1981, Pat. No. 4,584,206. This application Dec. 16, 1985, Ser. No. 809,646
The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.
Int. Cl.[4] G02B *5/24*
U.S. Cl. 350—1.7 **12 Claims**

1. A coated glass article produced by a process comprising the steps of:

a. coating a transparent glass substrate on one surface thereof with an infrared reflective film which alone exhibits interference color effects in reflectance; and

b. substantially simultaneously depositing by chemical vapor deposition on the opposite surface of said glass substrate a nonadjacent, nonabsorbing second film with sufficiently uniform visible reflectance sufficiently higher than the visible reflectance of the infrared reflective film to mask



the interference color effects of said infrared reflective film.

4,900,111

EMBOSSED HOLOGRAMS FORMED ON HARD METAL SURFACES

Salvatore F. D'Amato, Floral Park, and Edward H. Weitzen, Lawrence, both of N.Y., assignors to American Bank Note Holographics, Inc., Elmsford, N.Y.

Filed Feb. 15, 1989, Ser. No. 312,068
Int. Cl.[4] G03H *1/18*
U.S. Cl. 350—3.85 **14 Claims**

1. A method of forming an embossed hologram on a first metal surface having a first hardness from a metal master surface relief pattern having a second hardness comparable or significantly less than said first hardness comprising the steps of:

forming a layer of a second metal on said first metal surface, said second metal having a thickness in excess of a maximum depth of said master surface relief pattern, and having hardness much less than that of metal master, and

compressing said second metal layer with said first metal layer and said metal master sufficient to cause second layer outside surface to substantially conform to surface relief pattern.

4,900,112

INTEGRATED OPTICAL DEVICE AND METHOD FOR MANUFACTURING THEREOF

Masao Kawachi, Mito; Norio Takato, Katsuta; Kaname Jinguji; Akio Sugita, both of Mito, all of Japan, and Shin Sumida, Columbus, Ohio, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

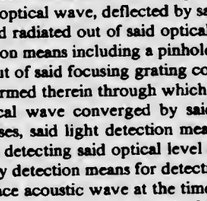
Filed Jun. 24, 1988, Ser. No. 211,556
Claims priority, application Japan, Jun. 29, 1987, 62-162164; May 16, 1988, 62-116938
Int. Cl.[4] G02B *6/12*
U.S. Cl. 350—96.12 **3 Claims**

1. An integrated optical device comprising:

a substrate;

a single-mode optical waveguide having a cladding layer disposed on said substrate and a core portion embedded in said cladding layer for transmitting light therethrough; and

a stress applying film, disposed on a predetermined portion



of said cladding layer so that said stress applying film exhibits residual stress, for adjusting stress-induced birefringence of said single-mode optical waveguide by irreversibly changing the stress exerted on said core portion by trimming said stress applying film.

4,900,113

OPTICAL SPECTRUM ANALYZER

Masami Hatori, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 20, 1988, Ser. No. 221,970
Claims priority, application Japan, Jul. 20, 1987, 62-180779
Int. Cl.[4] G02B *6/10*; G01J *3/40*
U.S. Cl. 350—96.13 **5 Claims**

1. An optical spectrum analyzer comprising:

(i) an optical waveguide formed of a material allowing propagation of surface acoustic waves therethrough,

(ii) a surface acoustic wave generating means for generating a surface acoustic wave, including means for changing a frequency of said surface acoustic wave continuously, wherein said surface acoustic wave advances in a direction intersecting an optical path of a guided optical wave as light-to-be analyzed entered to said optical waveguide and advancing inside of said optical waveguide and diffracts and deflects said guided optical wave, in said optical waveguide,

(iii) a focusing grating coupler for converging and radiating said diffracted and deflected guided optical wave,

(iv) a light detection means for detecting the optical level of said guided optical wave, deflected by said surface acoustic wave and radiated out of said optical waveguide, said light detection means including a pinhole plate for receiving an output of said focusing grating coupler and having a pinhole formed therein through which at least a portion of the optical wave converged by said optical grating coupler passes, said light detection means receiving said portion and detecting said optical level accordingly, and

(v) a frequency detection means for detecting the frequency of said surface acoustic wave at the time said light detection means detects the optical level of said optical wave guided, deflected by said surface acoustic wave and radiated out of said optical waveguide.

4,900,114

TECHNIQUE FOR REDUCING FIBRE JOINT LOSS

David B. Mortimore, Felixstowe, and David B. Payne, Wickham Market, both of England, assignors to British Telecommunications, plc., London, England

PCT No. PCT/GB87/00109, § 371 Date Sep. 29, 1987, § 102(e) Date Sep. 29, 1987, PCT Pub. No. WO87/05118, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 13, 1987, Ser. No. 116,078

Claims priority, application United Kingdom, Feb. 14, 1986, 8603672

Int. Cl.⁴ G02B *6/26*

U.S. Cl. 350—96.15 **12 Claims**



9. A method of forming a low loss optical fibre joint between first and second mono-mode optical fibers having respectively different refractive index profiles defining their respective cores and claddings and therefore exhibiting respectively different fundamental modes of optical propagation via their cores, said method comprising:

fusing a free end of said first optical fiber coaxially to a free end of said second optical fiber; and

thereafter drawing apart the fused ends of said fibers so as to simultaneously taper the joined ends to reduced diameter waist sections at the joint sufficiently to cause optical energy passing through the joint to be guided by the claddings of each fibre rather than by the cores of each fibre in said waist sections whereby optical signal propagation in a first mode along the core of said first fibre is transformed during passage along said waist regions into optical signal propagation in a different second mode along the core of said second fibre.

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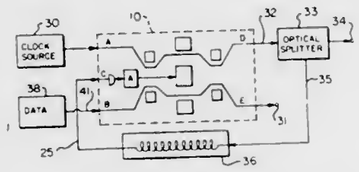
OPTICAL LOGIC CIRCUIT USEFUL FOR BIT SERIAL OPTIC COMPUTING

Vincent P. Heuring, Boulder; Harry F. Jordan, Jamestown, and Jonathan P. Pratt, Boulder, all of Colo., assignors to University of Colorado Foundation, Inc., Boulder, Colo.

Filed Jan. 31, 1989, Ser. No. 305,893

Int. Cl.⁴ G02B *6/26, 6/28*

U.S. Cl. 350—96.15 **3 Claims**



1. Apparatus for performing optical logic functions comprising

a source of light pulses,

an optical switch including first and second input terminals with said first terminal coupled for receiving light pulses from said source, at least one optical waveguide establishing an optical output terminal, and an electrode responsive to light at said second input terminal for directing light at said first input terminal into said optical waveguide, and

an optical delay line coupled to receive light pulses from said waveguide and to deliver said light pulses at said second input terminal after passage of a predetermined time period,

whereby introduction of a light pulse to said delay line results in continual rejuvenation of said light pulse by gating subsequent pulses from said source into said optical delay line.

4,900,116

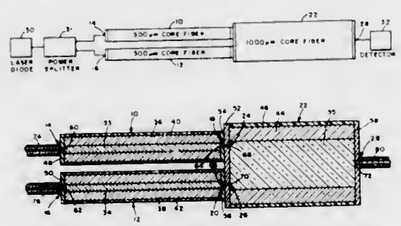
MULTIPLE POLE OPTICAL FILTER

Ronald F. Mathis, Romona, Calif., assignor to General Dynamics Corporation, Electronics Division, San Diego, Calif.

Filed Dec. 30, 1988, Ser. No. 292,398

Int. Cl.⁴ G02B *6/26*

U.S. Cl. 350—96.15 **4 Claims**



1. A multipole pole optical bandpass filter, comprising:

at least two input filter elements, each having an input mirror at one end and an output mirror at the opposite end, each input mirror having an input hole and each output mirror having an output hole;

a single output filter element of a diameter larger than each of the input filter elements and having an input mirror at one end and an output mirror at the opposite end, the input mirror having at least two input holes at one end aligned with and coupled to the respective output holes of the input filter elements and an output hole in the output mirror at the opposite end;

input means connected to the input holes of said input filter elements for providing an intensity modulated signal at one of the inputs and the same signal shifted by exactly 180 degrees at the other input;

each of said filter elements comprising a segment of multimode optical fiber of predetermined length.

4,900,117

ROTARY OPTICAL COUPLER UTILIZING CYLINDRICAL RINGSHAPED MIRRORS AND METHOD OF MAKING SAME

Linus T. Chen, 479 Hillsborough St., Thousand Oaks, Calif. 91361

Filed Feb. 21, 1989, Ser. No. 312,823

Int. Cl.⁴ G02B *6/26*

U.S. Cl. 350—96.15 **26 Claims**

1. A rotary optical coupler comprising:

first and second members coupled together by bearing means which permit relative rotation between the members about a central axis,

each of said members having a generally cylindrical cup-shaped housing closed at one end remote from the bearing means by a transverse base plate;

sealing means mounted adjacent the bearing means between the open ends of the respective cylindrical housings for sealing the juncture between the two members adjacent the bearing means;

a first plurality of optical radiation source elements mounted at selected positions in the base plate of the first member, said optical radiation source elements being directed inwardly to transmit optical radiation toward the base plate of the second member;

a second plurality of optical radiation source elements mounted at selected positions in the base plate of the second member, said optical radiation source elements being directed inwardly to transmit optical radiation toward the base plate of the first member;

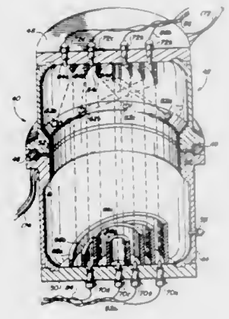
a first plurality of reflective ring elements mounted at selected positions in the base plate of the first member;

a second plurality of reflective ring elements mounted at selected positions in the base plate of the second member;

a first plurality of optical receivers mounted at selected positions displaced from each other about an inner peripheral wall portion of the housing of the first member; and

a second plurality of optical receivers mounted at selected positions displaced from each other about an inner peripheral wall portion of the housing of the second member;

each individual ring element of the first and second pluralities of reflective ring elements being disposed to reflect optical radiation from a corresponding optical radiation source element to a corresponding receiver, regardless of the extent of relative rotation between the two members.



23. The method of fabricating a set of ring reflectors having the capability of directing reflected light from an incident beam to different point locations for each different ring comprising the steps of:

cutting a series of rings from a geometric figure having a concave reflective surface such that each of said rings constitutes a right circular cylinder having a reflective edge at one end of the cylinder, said edge being beveled at a continuously variable angle about the circumferential edge of said cylinder, the angle at any point on said edge being such as to direct light reflected from that ring to the same point location; and

orienting the rings of said set on a base member with an orientation such that light from an incident beam is reflected toward a plurality of point locations generally positioned at different selected rotational angles about the periphery of said base member with said selected angles being different for the respective rings.

4,900,118

MULTIPLE-FIBER OPTICAL COMPONENT AND METHOD FOR MANUFACTURING OF THE SAME

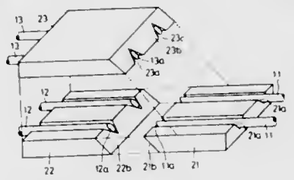
Hisaharu Yanagawa; Hirokazu Hayakawa; Mikio Ogai; Toshihiro Ochiai, and Hidehisa Miyazawa, all of Ichihara, Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,525

Claims priority, application Japan, May 22, 1987, 62-124053; Aug. 11, 1987, 62-199150; Jan. 14, 1988, 63-6306; Jan. 14, 1988, 63-6307; Feb. 2, 1988, 63-21263; Feb. 10, 1988, 63-27608; Mar. 11, 1988, 63-56360

Int. Cl.⁴ G02B *6/26; H04B 9/00; B65H 69/02*

U.S. Cl. 350—96.15 **38 Claims**



1. An optical component comprising:

first, second and third blocks formed at their surfaces with first, second and third groups of guide grooves, respectively, said guide grooves of each group extending in parallel with each other, said first and second blocks being arranged to have respective one end faces facing each other, said third block being arranged to have the surface thereof on which the guide grooves are formed facing the surfaces of said first and second blocks on which the guide grooves are formed; and

first to third groups of optical fibers being respectively placed and secured in said first through third groups of guide grooves, each of the optical fibers having an inclined face at one end, at least one of opposed optical fibers of said first and second groups of optical fibers being formed at the inclined face with a first optical film, each of said third group of optical fibers being formed at its inclined face with a second optical film;

said opposed optical fibers of said first and second groups of optical fibers being jointed at said inclined faces to each other through an associated one of the first optical films in such a way that optical axes of said jointed optical fibers are aligned with each other;

each of said third group of optical fibers being disposed so that its optical axis is aligned with optical axes of associated ones of said first and second groups of optical fibers and an optical signal incident to an associated one of said first group of optical fibers and then successively reflected at said first and second optical films is propagated along an optical axis of said each third group of optical fibers.

6. A method for manufacturing an optical component, comprising the steps of:

forming a plurality of parallel fiber guide grooves and at least one alignment-pin guide groove in each of surfaces of at least first through third block members, to obtain at least first to third blocks;

placing and securing optical fibers in said fiber guide grooves of said at least first to third blocks;

obliquely polishing one end of each of said at least first to third blocks together with said optical fibers placed thereon to thereby form an inclined face;

forming a first optical film on said inclined face of at least one of said first and second blocks and then arranging said first and second blocks in such a way that when an optical signal incident to a respective one of said optical fibers of said first block passes through said first optical film, said optical signal is propagated to a corresponding one of said optical fibers of said second block along an optical axis thereof;

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forming a second optical film on said inclined face of said third block and then arranging said third block in such a way that an optical axis of each optical fiber of said third block is in parallel to optical axes of associated ones of said optical fibers of said first and second blocks and when an optical signal incident to a respective one of said optical fibers of said first block is successively reflected at said first and second optical films, said optical signal is propagated to said each optical fiber of said third block along an optical axis thereof; and

disposing a common alignment pin in said alignment-pin guide grooves respectively formed in said first to third blocks and bringing said first to third blocks into one piece by said common alignment pin.

4,900,119

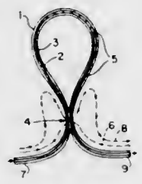
WAVELENGTH SELECTIVE OPTICAL DEVICES USING OPTICAL DIRECTIONAL COUPLER

Kenneth O. Hill, Kanata; Derwyn C. Johnson; Francois Bilodeau, both of Nepean, and Sylvain Faucher, Hull, all of Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Apr. 1, 1988, Ser. No. 176,683

Int. Cl.[4] G02B 6/26, 6/42

U.S. Cl. 350—96.15 **10 Claims**



1. A wavelength selective optical device, comprising:

a first input port,

a first output port, and

a first 3 dB optical directional coupler which introduces $\pi/2$ phase shift on light crossover, connecting the said first input and the said first output ports, and wavelength selective resonance circuit means connected symmetrically to the said first 3 dB optical directional coupler, the said resonance circuit means comprising wavelength selecting means capable of reflecting back light having resonant wavelengths and transmitting through light having all other wavelengths so that when singularly polarized light is applied to the said first input port, the light having the said resonant wavelengths and being reflected back from the said wavelength selecting means propagates to the said first output port.

4,900,120

DEVICE FOR COUPLING SINGLE-MODE OPTICAL FIBERS

Francesco Caviglia, and Piergiorgio Ricaldone, both of Turin, Italy, assignors to Cselt Centro Studi E Laboratori Telecomunicazioni S.P.A., Turin, Italy

Filed Nov. 3, 1988, Ser. No. 266,724

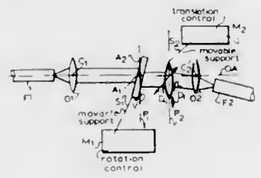
Claims priority, application Italy, Nov. 5, 1987, 67943 A/87

Int. Cl.[4] G02B 6/32

U.S. Cl. 350—96.18 **11 Claims**

1. In a device for coupling single mode optical fibers through a collimated beam, wherein the light radiating outgoing from a first optical fiber (F1) is collimated by a first lens (02) on an end face of a second fiber (F2), the improvement wherein between said first and second lenses (01, 02) there are inserted:

a glass plate (V) with plane and parallel surfaces adapted to be rotated around two perpendicular axes in a plane perpendicular to an optical axis of the device formed by a straight line traversing centers of said first and second collimating lenses (01, 02); and



a positioning lens (L) adapted to be translated in a plane perpendicular to the optical axis above in to two mutually orthogonal directions.

4,900,121

METHOD FOR ESTABLISHING A CONNECTION BETWEEN TWO OPTICAL LINES AND A DEVICE FOR IMPLEMENTATION OF THIS METHOD

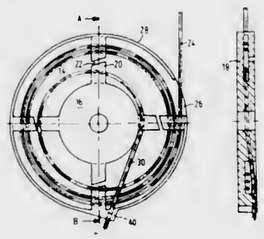
Johann A. Becker, Overath, and Werner V. Zell, Cologne, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 902,738, Sep. 2, 1986, abandoned. This application Feb. 13, 1989, Ser. No. 311,365

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532312

Int. Cl.[4] G02B 6/36

U.S. Cl. 350—96.20 **6 Claims**



1. A storage container for receiving a detachable connecting fibre, both ends of said connecting fibre being connectable with an optical line, comprising a substantially cylindrical core having a diameter of at least 40 mm, arranged centrally between two lateral guide walls the distance h between the guide walls being in the range $d_o < h < 1.3$, where d_o is the diameter of the connecting fibre, the connecting fibre being wound spirally in at least two turns in a plane around the core, the end of the outermost turn being detachable through an opening in a side wall surrounding the core at a distance, and the end of the innermost turn being detachable and being led obliquely from the winding space between the lateral guide walls and over the turns to a guide eyelet located radially outside the winding space.

4,900,122

DEVICE FOR A FIBER-OPTIC GUIDE

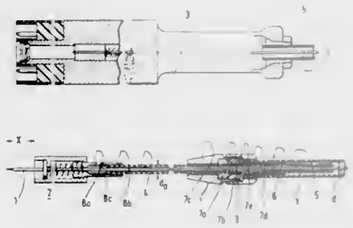
Frank Frank, Ebersberg; Thomas Hengst, Haar, and Andreas Hahn, Sauerlach, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 289,929

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1988, 3807437

Int. Cl.[4] G02B 6/36

U.S. Cl. 350—96.20 **3 Claims**



1. A device for a fiber optic waveguide to attach the fiber optic waveguide to a medical laser and to an endoscope, the operating end of the endoscope having a longitudinal feed device for the fiber optic waveguide, the device comprising:

first rigid fiber optic waveguide casing means having a preset inner diameter;

second rigid fiber optic waveguide casing means having a preset outer diameter smaller than the preset inner diameter of the first casing means so that the second casing means can slide concentrically in the first casing means at a predetermined point;

fiber optic waveguide means disposed within the first and second waveguide casing means;

first detachable and adjustable clamping means for clamping the first and second casing means together at the predetermined point, said first detachable clamping means comprising collar means disposed around said second waveguide casing means and sleeve means surrounding said collar means and said first and second waveguide casing means for applying a force to said collar means thereby clamping said first and second waveguide casing means together at said predetermined point; and

second detachable and adjustable clamping means for clamping the fiber optic waveguide means to the second casing means at the longitudinal feed device, whereby to adjust the amount of said fiber optic waveguide extending from said longitudinal feed device, said first and second detachable clamping means are loosened, the amount of said fiber optic waveguide extending from said longitudinal feed device desired is selected and said first and second detachable clamping means are then retightened to secure the adjustment.

4,900,123

1550 NM FIBER DISTRIBUTION PANEL

Robert W. Barlow, Canton, and David A. Cooper, Loganton, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 29, 1988, Ser. No. 237,477

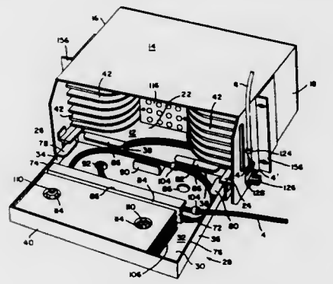
Int. Cl.[4] G02B 6/36, 7/26

U.S. Cl. 350—96.20 **20 Claims**

1. Apparatus for selectively interfacing first optical fibers with second optical fibers comprising:

a housing comprising a base and an opposing top, first and second opposing side walls extending vertically from said base to said top, a rear wall extending vertically from said base to said top and extending from said first opposing side wall to said second opposing side wall, a forward opening opposite said rear wall, and means associated with said first and second side walls for slideably supporting a drawer within said housing so that said drawer can be slid relative to said rear wall into said housing and out of said housing at said forward opening;

a drawer for so sliding upon said slideably supporting means, said drawer forming an enclosure including a bottom, first and second opposing side panels extending vertically from said bottom, a rear panel extending vertically from said bottom, and a front panel opposite said rear panel and extending vertically from said bottom and extending from said first opposing side wall to said second opposing side wall;



first means positioned within said housing for storing said second optical fibers;

second means positioned within said enclosure for storing said first optical fibers and for storing a plurality of pigtails;

third means positioned within said enclosure for splicing an end of respective of said first optical fibers to a corresponding first end of respective pigtails of said plurality of pigtails; and,

fourth means positioned within said housing for optically connecting an end of respective of said second optical fibers to a corresponding second end of respective pigtails of said plurality of pigtails.

4,900,124

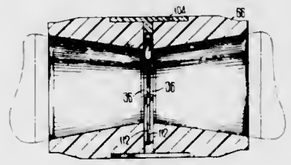
BICONIC OPTICAL FIBER CONNECTING DEVICE HAVING ATTENUATOR

Norman R. Lampert, Norcross, and Naif T. Subb, Lawrenceville, both of Ga., assignors to American Telephone & Telegraph Company, AT&T Bell Laboratories, Murray Hill and AT&T Technologies, Inc., Berkeley Heights, both of, N.J.

Filed Dec. 12, 1988, Ser. No. 283,335

Int. Cl.[4] G02B 6/38

U.S. Cl. 350—96.21 **29 Claims**



1. A biconic connector which provides attenuation for connecting two optical fibers, each having a core and a cladding,

in a manner which results in relatively low reflected power, said connector comprising:

two plugs each having a truncated conically shaped end portion and a passageway extending therethrough for receiving an end portion of an optical fiber to be connected by said plugs;

a sleeve which includes two truncated conically shaped cavities with small diameter portions of each of said cavities being adjacent to each other and with a longitudinal axis of said sleeve extending through said cavities, each of said cavities being adapted to receive one of said plugs in a manner so that when said two plugs are seated fully in said cavities with surfaces of said plugs engaging conformable surfaces of walls which define said cavities, ends of said plugs are spaced apart by a predetermined distance; and

a plate-like element which is mounted in said sleeve perpendicular to said longitudinal axis between said ends of said plugs that are seated in said sleeve and which has an index of refraction equal about to that of the core of the optical fibers, said plate-like element being mounted in said sleeve and the mating of the conformable surfaces of said sleeve and of said plugs being such as to cause said plugs when seated in said sleeve to be in engagement with said plate-like element.

4,900,125

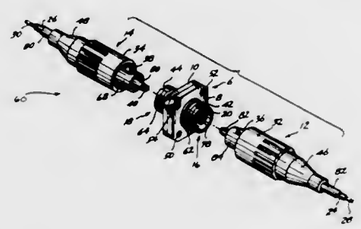
OPTICAL COUPLING METHOD

Lokanathan M. Iyer, Seattle, Wash., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Jul. 21, 1988, Ser. No. 222,145

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 **23 Claims**



21. A fiber optic connector comprising:

(a) a first body part for receiving and retaining at least one longitudinal primary optical waveguide, the first body part having a longitudinal axis and a fore and an aft end and the primary optical waveguide having a first and a second end, the first end of the primary optical waveguide terminating proximate the fore end of the first body part;

(b) a second body part for receiving and retaining at least one secondary optical waveguide, the second body part having a longitudinal axis and a fore and an aft end and the secondary optical waveguide having a first and a second end, the first end of the secondary optical waveguide terminating proximate the fore end of the second body part, the second body part capable of mating with the first body part such that the first ends of the optical waveguides are proximate each other and are longitudinally aligned; and

(c) an elastomeric composition adhered to at least the first end of the primary optical waveguide.

4,900,126

BONDED ARRAY OF TRANSMISSION MEDIA

Kenneth W. Jackson, Snellville; Gregory A. Lochkovic, Lawrenceville; Parbhubhai D. Patel, Dunwoody; Michael L. Pearsall, Duluth, and James R. Petisce, Norcross, all of Ga., assignors to American Telephone & Telegraph Co., Murray Hill and AT&T Bell Laboratories, AT&T Technology, Inc., Berkeley Heights, both of, N.J.

Filed Jun. 30, 1988, Ser. No. 213,876

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—46.23 **29 Claims**



1. A bonded array of transmission media, which comprises:

a plurality of longitudinally extending optical fibers which are disposed in an array with longitudinal axes thereof being substantially parallel to one another, each of said optical fibers including at least one layer of a coating material; and

a curable matrix bonding material which fills interstices between adjacent fibers of said array and which extends to a periphery than envelops said array with the thickness of the matrix bonding material contiguous to the optical fibers and extending to the periphery as measured along radii of the optical fibers not exceeding a predetermined value, the modulus of said matrix bonding material at room temperature and its bonding to each optical fiber being such as to hold together said array while allowing interfiber movement and to facilitate the exposure of each fiber by the application of peeling forces between the matrix bonding material and an optical fiber while providing suitable mechanical properties for said array.

4,900,127

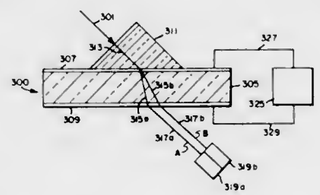
OPTICAL ARTICLE CONTAINING A LINEAR POLYMER EXHIBITING A HIGH LEVEL OF SECOND ORDER POLYMERIZATION SUSCEPTIBILITY

Douglas R. Robello, Webster; Abraham Ulman, and Craig S. Willand, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 101,884, Sep. 28, 1987, abandoned, and a continuation-in-part of Ser. No. 101,888, Sep. 28, 1987, Pat. No. 4,720,208. This application Sep. 8, 1988, Ser. No. 241,740

Int. Cl.[4] G02B *6/00*; G02F *1/03*; C08G *63/62*

U.S. Cl. 350—96.34 **20 Claims**



1. An optical article containing, for the transmission of electromagnetic radiation, a medium exhibiting a second order polarization susceptibility greater than 10^{-9} electrostatic units comprised of a linear polymer containing as pendant groups polar aligned noncentrosymmetric molecular dipoles having an electron donor moiety linked through a conjugated π bonding system to an electron acceptor moiety to permit oscillation of the molecular dipoles between a ground state exhibiting a first dipole moment and an excited state exhibiting a differing dipole moment,

characterized in that

the linear polymer contains repeating units derived from vinyl addition polymerization,

at least 5 percent of the repeating units incorporate the molecular dipoles as pendant groups, and

the molecular dipoles include a sulfonyl electron acceptor moiety.

4,900,128

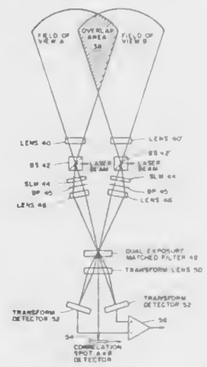
THREE DIMENSIONAL BINOCULAR CORRELATOR

Kwok-kelm Lom, Bethpage, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 1, 1988, Ser. No. 265,521

Int. Cl.[4] G02B *27/46*; G06K *9/28*

U.S. Cl. 350—162.13 **5 Claims**



1. A three dimensional binocular optical correlator in which inputs provide additive/differential discrimination by combining optical inputs of left and right aspect angular views of a target onto one matched filter, comprising;

a. at least one dual exposure matched filter which has recorded thereon holograms of left and right aspect angular views of a target with an overlapping target area therebetween, to allow better and more effective target discrimination and also to provide three dimensional information on the target;

b. an optical correlator for directing left and right views of a target area superimposed on reference optical beams onto the dual exposure matched filter and for providing left and right correlation signals representative of the optical correlation outputs therefrom; and

c. means for differentially monitoring the signal amplitudes of the left and right correlation signals to provide a control output signal.

4,900,129

DUAL GROOVED FRESNEL LENS FOR OVERHEAD PROJECTION

Dennis F. Vanderwerf, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

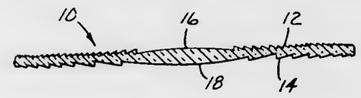
Filed Dec. 16, 1988, Ser. No. 285,531

Int. Cl.[4] G02B *3/08*

U.S. Cl. 350—167 **3 Claims**

1. An improved dual-grooved Fresnel lens wherein a single sheet of lens material includes grooved Fresnel elements on each major surface, the improvement comprising:

the groove frequency of the Fresnel elements on one major surface of said lens is at least four times the groove frequency of the Fresnel elements on the other major surface of said lens and not an integral multiple of the groove



frequency of said Fresnel elements on said other major surface, whereby Moire fringes are reduced.

4,900,130

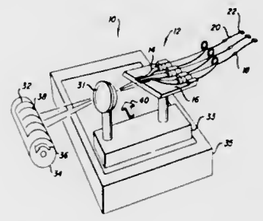
METHOD OF SCANNING

Daniel D. Haas, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1988, Ser. No. 254,745

Int. Cl.[4] G02B *27/00*; G01D *9/42*

U.S. Cl. 350—321 **11 Claims**



1. A method of scanning for use in a device having an array of operative elements which interact with an image storage medium, said method comprising the steps of:

moving said medium and said array relative to each other to produce successive sets of raster lines, at least some of the raster lines in one set being interleaved with raster lines in another set; and

producing relative movement between said array and said medium for a constant predetermined distance in a direction transverse to said raster lines after each set of lines is produced.

4,900,131

ADJUSTABLE PHOTOGRAPHIC DEVICE

Volker W. Bahnemann, Greenwich, Conn., and Stanislaw Loth, Nanuet, N.Y., assignors to Arriflex Corporation, Blauvelt, N.Y.

Filed Jun. 11, 1987, Ser. No. 61,870

Int. Cl.[4] G02B *27/00*; G03B *7/099*

U.S. Cl. 350—321 **29 Claims**

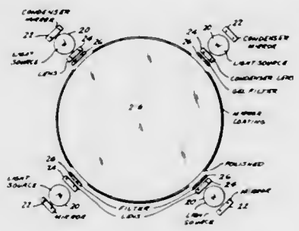
1. An adjustable photographic device, comprising:

light transmission means for allowing light from an object to be photographed to pass through a front surface and a rear surface thereof, said light transmission means having a peripheral portion; and

means for introducing a variable amount of light into said peripheral portion of said light transmission means so that rays of said variable amount of light meet said front and rear surfaces at angles greater than the critical angle of

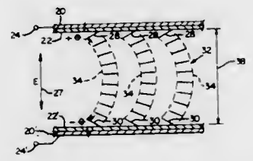
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said light transmission means and are thereby internally reflected by said front and rear surfaces within said light



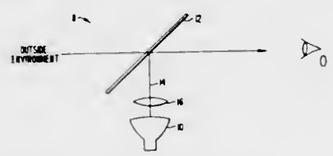
transmission means so as to adjust contrast of the object to be photographed without affecting resolution thereof.

4,900,132
CHIRAL LIQUID CRYSTAL CELL
Philip J. Bos, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Continuation of Ser. No. 38,567, Apr. 13, 1987, abandoned. This application Aug. 19, 1988, Ser. Nn. 236,335
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—346 **27 Claims**



1. A method for fabricating a chiral smectic liquid crystal cell, the steps comprising:
applying an electrically conductive layer to a surface of each of two dielectric members to form a pair of electrode structures, at least one of the dielectric members being optically transparent;
conditioning the conductive layer on each of the pair of electrode structures so that in the chiral nematic phase the directors of liquid crystal material coming in contact therewith align in a predetermined direction;
positioning the pair of electrode structures so that the conductive layers thereof are in spaced-apart and face-to-face relation and so that in the chiral nematic phase the directors of liquid crystal material in contact with the conditioned layers align substantially uniformly to form tilt bias angles relative to the layers, the tilt bias angles of the directors in contact with the conditioned layer of one electrode structure being defined in a rotational sense opposite that of the tilt bias angles of the directors in contact with the conditioned layer of the other electrode structure;
introducing between the electrode structures a chiral liquid crystal material of a type which exhibits chiral nematic, smectic A, and chiral smectic phases at successively lower temperatures; and
controlling the temperature of the liquid crystal material so that it enters in consecutive order the chiral nematic, the smectic A, and the chiral smectic phases, thereby to form a chiral smectic liquid crystal cell in which the liquid crystal material in the chiral smectic phase has molecules arranged in smectic layers of similar shape and intersecting the conditioned layers of the electrode structures at angles whose values correspond to those of the tilt bias angles.

4,900,133
HEADS-UP DISPLAY COMBINER UTILIZING A CHOLESTERIC LIQUID CRYSTAL ELEMENT
Arthur L. Berman, Milpitas, Calif., assignor to Kaiser Electronics, San Jose, Calif.
Filed Oct. 27, 1988, Ser. No. 263,149
Int. Cl.[4] G02F *1/13*; G02B *27/14*
U.S. Cl. 350—346 **9 Claims**



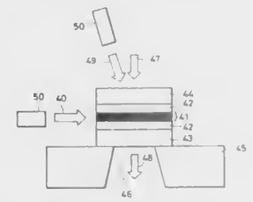
1. An apparatus for positioning images in an observer's line-of-sight, wherein projected images from an image source are reflected by a liquid crystal element acting as a combiner to combine the projected images with images in the line-of-sight of the observer, comprising:
an image source, having selected primary wavelengths, for projecting symbology; and
a liquid crystal element reflective to images at said selected primary wavelengths, and transmissive to images at all other wavelengths.

2. An apparatus for positioning an image in an observer's line-of-sight, wherein a projected image, from an image source, having a first rotary sense if projected in an image source plane, and reflected by a liquid crystal element placed at the intersection of a line-of-sight plane and said image source plane, the liquid crystal element acting as a combiner to combine the projected image with an image in the line-of-sight plane, comprising:
an image source, having a primary wavelength range, for projecting an image; and
a first liquid crystal element reflective to an image having said first rotary sense within said primary wavelength range, and transmissive to an image having a second rotary sense, opposite said first rotary sense within said primary wavelength range and to an image at all wavelengths outside said primary wavelength range.

4,900,134
OPTICAL DEVICE
Hiroaki Inoue; Toshio Katsuyama, both of Hachioji; Hiroyoshi Matsumura, Saitama; Shinji Sakano, Hachioji, and Hitoshi Nakamura, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 29, 1987, Ser. No. 138,874
Claims priority, application Japan, Jan. 19, 1987, 62-8028
Int. Cl.[4] G02F *1/17*
U.S. Cl. 350—354 **28 Claims**

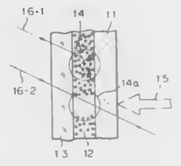
5. An optical device comprising:
a semiconductor substrate;
semiconductor layers formed on said semiconductor substrate, having an optical rectification layer which is polarized by a control light, wherein said optical rectification layer has an excitonic absorption wavelength which is smaller than the wavelength of said control light;
a first surface of said semiconductor layers which accepts said control light;
a second surface of said semiconductor layers which accepts

incident light that is modulated at said optical rectification layer by said control light; and



a third surface of said semiconductor layers which delivers output light that is the modulated incident light.

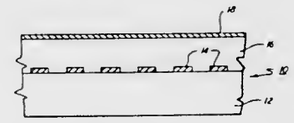
4,900,135
OPTICAL ELEMENT
Satoshi Yuasa, Yokohama; Yukuo Nishimura, Sagamihara; Yoko Yoshinaga, Machida; Hirohide Munakata, Yokohama, and Masahiro Haruta, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 10, 1986, Ser. No. 850,171
Claims priority, application Japan, Apr. 13, 1985, 60-077569; Apr. 30, 1985, 60-091023; Jun. 18, 1985, 60-130699; Jul. 2, 1985, 60-143972; Jul. 3, 1985, 60-144500
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[4] G02F *1/01*
U.S. Cl. 350—354 **11 Claims**



1. An optical element comprising: a pair of plates between which an optical modulation liquid layer is sandwiched, the optical modulation liquid layer exhibiting a light scattering property caused by suspension of fine particle polymer when not heated and exhibiting transparency caused by dissolution of fine particle polymer when heated, the change of such light scattering property to transparency being reversible, wherein the optical modulation liquid layer contains a light-absorbing heat-generating agent.

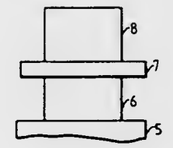
4,900,136
METHOD OF METALLIZING SILICA-CONTAINING GEL AND SOLID STATE LIGHT MODULATOR INCORPORATING THE METALLIZED GEL
Efim S. Goldburt; Richard E. Hemmer, both of Briarcliff Manor, N.Y.; James K. McKinlay, Ridgefield, Conn., and Robert L. Bronnes, Irvington, N.Y., assignors to North American Philips Corporation, New York, N.Y.
Continuation of Ser. No. 84,262, Aug. 11, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 292,632
Int. Cl.[4] G02F *1/17, 1/23*
U.S. Cl. 350—360 **4 Claims**

1. A solid state light modulator structure comprising:
(a) a solid state charge storage device comprising an array of charge storage elements formed in a semiconductor substrate, each element associated with at least one display electrode on the surface of the substrate,
(b) a deformable elastomer layer disposed on the solid state device, the layer covering the electrode array, and
(c) a flexible, adherent and light reflective conductive layer disposed over the elastomer layer,



characterized in that the elastomer layer is polydimethyl siloxane gel, the conductive layer consists of a single sputtered metal layer, and the metal layer is bonded directly to the gel layer.

4,900,137
MIRRORS
Walter S. Carter, Bracknell, United Kingdom, assignor to British Aerospace Public Limited Company, London, England
Filed Aug. 26, 1987, Ser. No. 89,399
Claims priority, application United Kingdom, Sep. 6, 1986, 8621510
Int. Cl.[4] G02B *5/30*
U.S. Cl. 350—395 **7 Claims**



1. A mirror comprising a multi-layer dielectric (MLD) reflective stack and a dielectric layer which acts as a half-wave spacer for a specific wavelength of light at a predetermined angle of incidence so as to enhance the absorption or transmission, or both, of s-polarized light relative to that of p-polarized thereby to enhance the reflection of p-polarized light relative to that of s-polarized light further comprising a metal layer underlying said half-wave spacer.

4,900,138
COMPOSITE GRADIENT INDEX AND CURVED SURFACE ANAMORPHIC LENS AND APPLICATIONS
Leland G. Atkinson, III; Duncan T. Moore, and J. Robert Zinter, all of Rochester, N.Y., assignors to Gradient Lens Corporation, Rochester, N.Y.
Filed Jul. 1, 1988, Ser. No. 214,412
Int. Cl.[4] G02B *13/08, 26/10*
U.S. Cl. 350—413 **36 Claims**



1. An anamorphic lens comprising:
a body of optical material having at least one curved surface and characterized by an optical axis;
said body characterized by a gradient index of refraction in

which the planes of equal index are parallel to said optical axis.

4,900,139

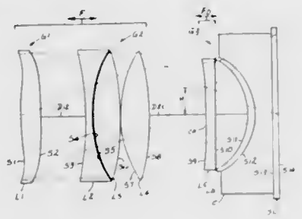
COLOR CORRECTED PROJECTION LENS

Melvyn H. Kreitzer, Cincinnati, Ohio, assignor to U. S. Precision Lens, Inc., Cincinnati, Ohio

Continuation of Ser. No. 48,026, May 11, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 266,234

Int. Cl.[4] G02B *13/18, 9/00, 3/00*

U.S. Cl. 350—432 **59 Claims**



1. A projection lens for use in combination with a cathode ray tube where the projection lens is closely coupled to the cathode ray tube, said lens comprising from the image end a first lens unit of positive optical power having at least one aspheric surface and contributing to correction of aperture dependent aberrations, a second lens unit providing a majority of the positive power of said lens, and a third lens unit having a strongly concave image side surface which provides correction for field curvature and Petzval sum of other units of said lens, said second lens unit consisting from the image end of a biconcave element, a biconvex element and a positive component, said biconcave element and said biconvex element forming a color correcting doublet and being of overall meniscus shape concave to the image end, said color correcting doublet being axially spaced from said positive component a distance less than 0.01 of the equivalent focal length of said lens.

4,900,140

REAR MONITORING DEVICE FOR VEHICLE

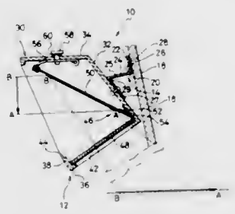
Makoto Okamura, 1567-4 Sakata, Okegawa-shi, Saitama-ken, Japan

Filed Oct. 16, 1987, Ser. No. 109,823

Claims priority, application Japan, Oct. 27, 1986, 61-164892

Int. Cl.[4] G02B *3/08, 17/00;* **B60R** *1/04, 1/08*

U.S. Cl. 350—452 **17 Claims**



1. A rear monitoring device for a vehicle adapted to permit a driver to observe therethrough area to a rear of the vehicle, comprising:

an optical mechanism for forming an image of the area to the rear of the vehicle and transferring the image to the driver; and

mounting means for mounting on an inner surface of a rear window glass of the vehicle to arrange said optical mechanism through said mounting means and on the inner surface of the rear window glass inside the vehicle;

wherein said mounting means comprises a bendable mounting member for fixedly holding said optical mechanism, and an adhesive element for securely mounting said bendable mounting member on the inner surface of the rear window glass;

said bendable mounting member being formed to allow an angle of said optical mechanism with respect to the rear window glass to be variably set.

4,900,141

REAR CONVERSION LENS

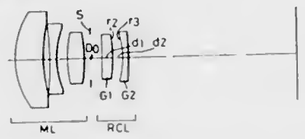
Koichi Ohshita, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Mar. 24, 1989, Ser. No. 328,490

Claims priority, application Japan, Apr. 1, 1988, 63-80376

Int. Cl.[4] G02B *15/10, 9/60*

U.S. Cl. 350—465 **8 Claims**



1. A rear conversion lens to be mounted in rear of a main lens for expanding a resultant focal distance to a longer one than a focal distance of the main lens, comprising:

a first lens unit having a positive refractive power; and

a second lens unit having a negative refractive power;

said first lens unit and said second lens unit being arranged in this order when viewed from an object;

said first lens unit and said second lens unit meeting condition of:

$$0.5 < f_1/|f_{RCL}| < 0.6, \; f_{RCL} < 0$$

$$1.2 < r_2/r_3 < 1.4$$

where f_{RCL} is a focal distance of said rear conversion lens, f_1 is a focal distance of said first lens unit, r_2 is a radius of curvature of a plane of said first lens unit facing an image, and r_3 is a radius of curvature of a plane of said second lens unit facing an object.

4,900,142

REMOTELY CONTROLLED REAR VIEW MIRROR

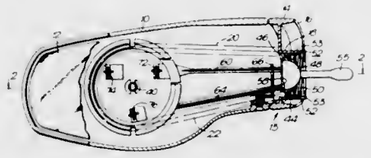
Bernard Duroux, Garancieres, France, assignor to Britax (Geco) SA, France

Filed Jan. 25, 1989, Ser. No. 301,660

Claims priority, application United Kingdom, Jan. 29, 1988, 8802060

Int. Cl.[4] B60R *1/06;* **G02B** *7/18*

U.S. Cl. 350—634 **10 Claims**



1. A remotely controlled rear view mirror assembly for a motor vehicle comprising a base adapted to be mounted on a vehicle body, a casing mounted on the base, a reflective member mounted in the casing for angular movement relative to the casing about two mutually perpendicular axes, a control member on the base and two thrust-transmitting units responsive to the control member for selectively applying a thrust to the reflective member at two locations, each of which is offset relative to a respective one of the two mutually perpendicular axes, wherein each thrust-transmitting unit comprises guide means mounted in the casing and an elongate member slidably mounted in the guide means, the elongate member having two end portions of cross section adapted to resist bending about first and second mutually perpendicular transverse directions, said end portions being interconnected by an intermediate portion having a cross-section adapted to permit bending in the first transverse direction, and the guide means being arranged to direct one end of each elongate member into abutment with a surface of the reflective member facing the interior of the casing and to direct the other end of each elongate member through an opening in the casing facing the base so as to abut against the control member.

4,900,143

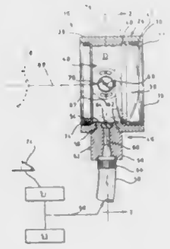
OPHTHALMOSCOPE HANDPIECE WITH LASER DELIVERY SYSTEM

Michael Bessler, and Donald P. Hutchinson, both of Knox County, Tenn., assignors to Electro-Optics Laboratory, Inc., Anderson County, Tenn.

Filed Mar. 9, 1988, Ser. No. 165,718

Int. Cl.[4] A61B *3/10*

U.S. Cl. 351—205 **7 Claims**



1. An ophthalmoscope handpiece for viewing the fundus of the eye and for selectively delivering a laser beam and a laser targeting beam to said fundus, said laser beam being generated by laser generating means provided with an actuator for firing said laser, said laser beam and said laser targeting beam being communicated to said handpiece by an optical fiber, said ophthalmoscope handpiece comprising:

a body having first and second end portions and defining a viewing aperture therethrough so as to define a first opening at said first end portion and a second opening at said second end portion, said body being further provided with a third opening accessing said viewing aperture, said third opening defining a threaded receptor;

magnifying means, including a magnifying lens mounted in said viewing aperture at a position intermediate said second opening and said third opening for providing a magnified view of said fundus;

a fiber coupling assembly for connecting said optical fiber to said handpiece whereby said laser and said laser targeting beam are communicated through said third opening into said viewing aperture, said coupling assembly including a housing having a first threaded end portion and a second end portion, and defining a beam passage therethrough from said first end portion of said housing to said second end portion of said housing, said first end portion of said housing being threadably received by said receptor of said body so as to place said beam passage in communication with said viewing aperture, said second end portion of said housing being provided with a fiber optic connector for connecting said optical fiber in communication with said beam passage, said coupling assembly further comprising a fiber focusing lens mounted within said beam passage proximate said first end portion of said housing for focusing said laser beam, whereby said laser beam and said laser targeting beam selectively enter said viewing aperture on a first path; and

beam deflecting means including a transparent member pivotally mounted in said viewing aperture, said transparent member defining a forward surface provided with a reflective surface portion for intercepting said laser beam and said laser targeting beam on said first path and redirecting said laser beam and said laser targeting beam to a second path exiting said viewing aperture through said first opening of said body to thereby deliver said laser beam and said laser targeting beam to said fundus.

4,900,144

THREE-DIMENSIONAL SHAPE MEASUREMENT APPARATUS

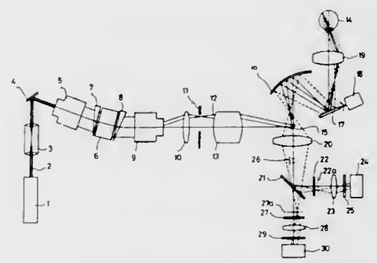
Koji Kobayashi, Hino, Japan, assignor to Kowa Company Ltd., Japan

Filed Oct. 25, 1988, Ser. No. 262,525

Claims priority, application Japan, Oct. 28, 1987, 62-270442

Int. Cl.[4] A61B *3/14;* **G01B** *11/24*

U.S. Cl. 351—206 **32 Claims**



16. A three-dimensional shape measurement apparatus which directs a laser beam at an object, detects the light reflected back from the object, photoelectrically converts the light and subjects it to signal processing to obtain three-dimensional information about the object, comprising:

a laser light source that generates a laser beam;

an optical system for projecting the laser beam from the laser light source at the object;

two detection apertures mutually displaced by a prescribed distance in the vicinity of a position that is optically conjugate with the object;

two photosensors for detecting light reflected from the object passing through the respective detection apertures;

a divider circuit for dividing the output of one photosensor by that of the other; and

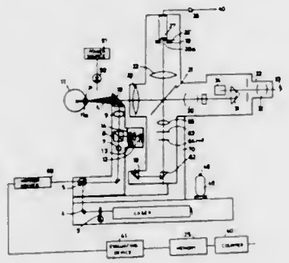
a correction means for correcting prescribed nonlinearity in the output of the divider.

4,900,145

OPHTHALMIC DISEASE DETECTION APPARATUS

Koichi Akiyama, Hino, Japan, assignor to Kowa Company Ltd., Japan

Filed Apr. 11, 1988, Ser. No. 180,211
Claims priority, application Japan, Apr. 9, 1987, 62-85806
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—221 **6 Claims**



1. An apparatus for detecting ophthalmic diseases in a patient's eye comprising:
a laser source for producing a laser beam;
a laser beam projector for projecting said laser beam;
means for focusing said laser beam at a selected spot in said patient's eye;
means for deflecting said laser beam in a predetermined direction to scan an area including said selected spot in the patient's eye;
photoelectric converting means for receiving light scattered from said patient's eye and photoelectrically converting it into an electrical signal for use in detecting ophthalmic diseases in the patient's eye; and
a mask disposed in the front of said photoelectric converting means and formed thereon with a slit having a predetermined width to limit the impinging of the scattered light on said photoelectric converting means;
wherein said laser beam is so deflected that it scans an area in the patient's eye except for a plane which is perpendicular to the scanning direction and includes the corneal vertex of the patient's eye.

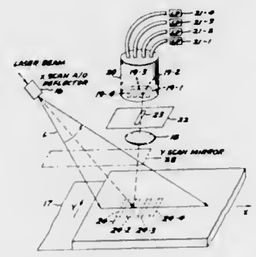
4,900,146

MULTIPLE CHANNEL OPTICAL FLYING SPOT TRIANGULATION RANGER SYSTEM

Carl M. Penney, Schenectady; Nelson R. Corby Jr., Scotia, and Nancy H. Irwin, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 18, 1988, Ser. No. 169,707
Int. Cl.[4] G01C *3/00*; **G01B** *11/24*
U.S. Cl. 356—1 **11 Claims**

1. An improved swept aperture flying spot triangulation ranger system comprising:
means for providing a narrow spot of light beam and rapidly sweeping said beam across a surface in a given direction;
multiple adjacent linearly arrayed light detection channels optically coupled to separate detectors, one detector per channel, each of said channels having a rectangular entry face, lens means for focusing images of a light spot onto said detection channels entry faces, which respectively receive light scattered from the surface at different rectangular sensitive zones along a line that forms the intersection of said light beam with said surface, and aperture stop means disposed between said lens means and said detection channels having a rectangular slit;
said detectors each generating a signal pulse at a time that is a function of range to the surface so that for every sweep of said light beam a plurality of range points are measured equal to the number of said detection channels; and



means for parallel processing said signal pulses and calculating multiple range values.

4,900,147

DIAMOND MAPPING

Heather J. Bowley, Middlesex, and Donald L. Gerrard, Surrey, both of England, assignors to The British Petroleum Company, p.l.c., England

PCT No. PCT/GB88/00188, § 371 Date Nov. 15, 1988, § 102(e) Date Nov. 15, 1988, PCT Pub. No. WO88/07189, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 10, 1988, Ser. No. 275,145
Claims priority, application United Kingdom, Mar. 18, 1987, 8706422
Int. Cl.[4] G01J *3/44*; **G01N** *21/65, 21/87*
U.S. Cl. 356—30 **17 Claims**

1. A method for mapping the crystal structure of a diamond, the method comprising the steps of (a) placing the diamond in a beam of monochromatic laser radiation capable of causing Raman radiation to be scattered from the diamond, (b) passing the scattered Raman radiation from the diamond through a filter adapted to pass only scattered Raman radiation characteristic of diamond, and (c) measuring the intensity of the filtered Raman radiation at one or more different orientations of the diamond.

4,900,148

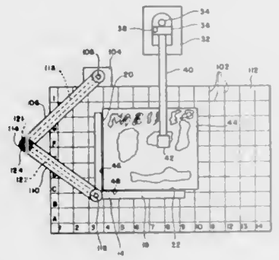
APPARATUS AND PROCESS FOR MEASURING AN OPTICAL CHARACTERISTIC OF A PREDETERMINED PORTION OF A FLAT OBJECT

Stephen Doerr, Closter, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Dec. 9, 1985, Ser. No. 806,784
Int. Cl.[4] G01N *21/01*
U.S. Cl. 356—244 **17 Claims**

1. Apparatus for measuring an optical characteristic of a portion of an object having a first edge and a second edge not parallel to the first edge, the apparatus comprising:
a support member having a substantially flat support surface;
a stop member capable of lying adjacent the support surface and movable relative thereto along first and second non-parallel translation axes, the stop member comprising:

a first arm pivotally mounted for rotation about a pivot axis which is fixed relative to, and substantially perpendicular to, the support surface;
a second arm mounted on the first arm and pivotable relative thereto about a second arm axis spaced from, but substantially parallel to, the pivot axis;
a stop section secured to the second arm at a point spaced from the pivot arm axis, the stop section being provided with first and second stop surfaces which are not parallel to one another, the first and second stop surfaces being arranged on the stop section such that, when the stop section lies adjacent the support surface, the first and second stop surfaces both extend in one direction away from the plane of the support surface, thereby enabling the object to rest upon the support surface with its first and second edges in contact with the first and second stop surfaces respectively; and



the stop member further comprising angular control means for controlling the pivoting of the first and second arms about their respective axes, such that as the first and second arms pivot about their respective axes, the first and second stop surfaces extend in fixed directions;
the apparatus further comprising locking means for releasably securing the stop member in any one of at least first, second and third positions relative to the support surface, movement from the first position to the second position requiring a translation along the first translation axis and movement from the first position to the third position requiring a translation along the second translation axis; and
metering means for measuring the optical characteristic of the portion of the object overlying a predetermined point on the support surface.

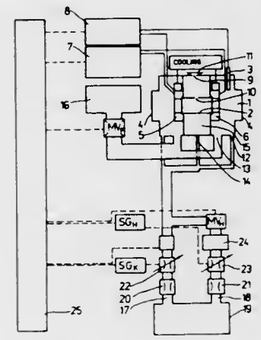
4,900,149

METHOD FOR THE SIMULTANEOUS ANALYSIS OF SEVERAL ELEMENTS

Joachim Mohr, Jena, and Holger Gerecke, Oebisfelde, both of German Democratic Rep., assignors to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed Jul. 5, 1988, Ser. No. 215,015
Claims priority, application German Democratic Rep., Sep. 7, 1987, 306719
Int. Cl.[4] G07J *3/30*
U.S. Cl. 356—311 **2 Claims**

1. In a method for the simultaneous analysis of several elements, in which an analyte, after thermal vaporization, is excited in the same volume athermally by a hollow cathode discharge and the athermal excitation of the elements to be detected, which is essentially divided into two sections, is determined, the improvement comprising assigning the discharge pressure ranges, in which the pressure increases steadily with the atomization temperature, to each of the two sections, and providing a transition from one range to the other suddenly with a pressure change rate of at least **40** Pa/°K.

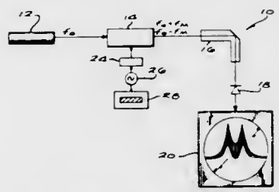


4,900,150

MULTIPLE INPUT SOURCE TECHNIQUE FOR DERIVING CAVITY LINEWIDTH

David B. Hall, LaCrescenta, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 27, 1988, Ser. No. 199,858
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—349 **9 Claims**



1. A method of measuring cavity linewidth of a passive cavity, comprising the steps of:
periodically modulating an output coherent radiation signal from a swept frequency laser, deriving a periodically modulated output coherent radiation signal;
separating said periodically modulated output coherent radiation signal into a series of sideband coherent radiation signals;
injecting said sideband signals into a passive cavity;
detecting cavity output radiation signals from said passive cavity;
processing said detected cavity output radiation signals for analysis on a display terminal;
whereby, the cavity linewidth may be derived.

4,900,151

DEVICE FOR MEASURING THE DISTANCE BETWEEN THE DEVICE AND A MEASURING SURFACE

Gerd Ulbers, Wellersbach, Fed. Rep. of Germany, assignor to Hommelwerke GmbH, Schwenningen, Fed. Rep. of Germany

Filed Apr. 15, 1988, Ser. No. 182,097
Claims priority, application Fed. Rep. of Germany, May 11, 1987, 3715627
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—358 **14 Claims**

1. In an apparatus for measuring the distance between the

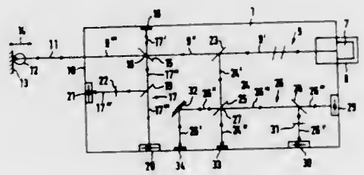
apparatus and a measuring surface comprising a scanning means on the measuring surface, a converting transformer for converting the position of the scanning means into corresponding electrical signals and an indicator for said signals, the improvement in which

said scanning means is an optical measuring reflector positioned on or connected to said measuring surface;

said converting transformer comprises a first optical interferometer having a laser, a first measuring wave guide, one end of which is directed to said laser and the other end of which is directed to said measuring reflector which reflects the light into said first measuring wave guide;

said first interferometer having a first reference wave guide coupled with said first measuring wave guide, a mirror on one end of said first reference wave guide and a first photoelectrical transformer on the other end of said first reference wave guide, an indicator connecting to said first photoelectric transformer for indicating the electrical output signal thereof;

said converting transformer further comprises a second



optical interferometer having a second measuring wave guide one end of which is directed to said laser, the other end of which is directed to a reference reflector fixed to said apparatus, and having a second reference wave guide coupled to said second measuring wave guide at a connecting point, said second reference wave guide having a mirror at one end and a second photoelectrical transformer at its other end;

the length of said second measuring wave guide is different from the length of second reference wave guide, said lengths being measured from said connecting point to said mirror and from said connecting point to said reference reflector, respectively;

a comparing device is positioned between said first photoelectric transformer and said indicator, and between said second photoelectric transformer and said indicator, for receiving the output signals of said transformers, said comparing device producing an output signal the value of which depends upon the difference between the signals received;

said apparatus includes a correcting device to correct the wave length of the light emanating from said laser.

4,900,152

APPARATUS FOR MEASURING FOREIGN SUBSTANCE CONTENT IN A FLOWING LIQUID

Gerhard Wiegleb, Geiselbach, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany

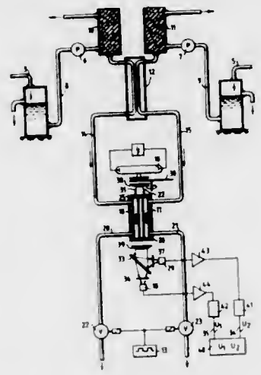
Filed Feb. 2, 1988, Ser. No. 151,444

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 3739589

Int. Cl.[4] **G01N** *21/11, 21/15*

U.S. Cl. 356—411 **2 Claims**

1. In an apparatus for measuring the foreign matter content in a flowing liquid, wherein a reference stream and a sample stream of liquid are each shunted through respective separate conduits (14, 15) and uniformly advanced by means of pumps (6, 7) to cells (16, 17) and thence to discharge lines (20, 21), a light source (18) being associated with said cells (16, 17), the beams (31, 32) from said light source penetrating said cells (16, 17) and traveling to detectors (19, 29) whereupon electrical signals are formed, said electrical signals of said detectors (19, 29) being then processed and compared by electrical circuits 941 to 44) to a recognition signal, the improvement comprising use of a pressure pulse pumping closed system wherein electrically and/or pneumatically controlled valves (22, 23) are in-



serted into the respective discharge lines (20, 21) for the reference stream and the sample stream, both valves independently opening and closing in rapid succession, the flow in said cells (16, 17) being interrupted at the rate of actuation based upon a signal produced by a frequency generator.

4,900,153

OPTICAL SURFACE INSPECTION APPARATUS

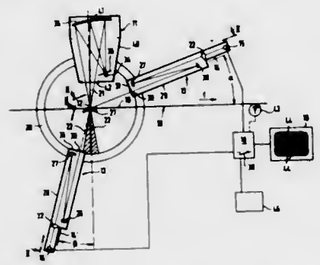
Klaus Weber, Königsbrunn, and Klaus Ostertag, Münich, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Oct. 6, 1988, Ser. No. 254,331

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734294

Int. Cl.[4] **G01N** *21/89*

U.S. Cl. 356—430 **19 Claims**



1. Optical surface inspection apparatus for material webs the apparatus comprising an illuminating means for generating a strip of light on the surface of the material web to be inspected and a photoelectric light receiving means which receives the light remitted or diffusely reflected from the surface region illuminated by the strip of light and which directs it to a photoreceiving arrangement, with the photoreceiving arrangement delivering a signal representative of web faults to an electronic processing circuit, characterized in that the light receiving device (13) includes at least one row camera (14) having a diode row (15) and serving as a photoreceiving arrangement, with the row camera (14) receiving remitted light from a line on the surface which is illuminated by the light strip (12) and forming an image of the line on the diode row (15) and with the row camera also being arranged at such a shallow observing angle α to the tangential plane to the surface at the location of the light strip (12) that faults (20) of low height which project out of the surface (19) of the material web (18) appear to the row camera (14) as a shadow outline against the bright background of the light strip (12), so that a corresponding electrical signal is transmitted from the diode row (15) to the electronic processing circuit (16).

4,900,154

CONCRETE MIXER HAVING MEANS FOR DETERMINING THE CONSISTENCY OF CONCRETE MIXING THEREIN

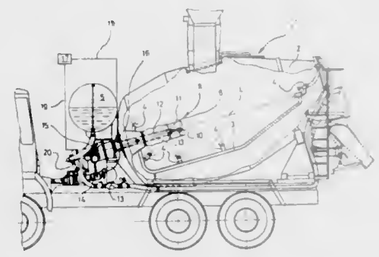
Franz Waitzinger, Nersingen, and Gerhard Hudelmaier, Ulm-/Donau, both of Fed. Rep. of Germany, assignors to Ingrid Hudelmaier, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 246,868

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732231

Int. Cl.[4] **B28C** *5/32, 7/12;* **G01N** *11/10, 11/16*

U.S. Cl. 366—56 **3 Claims**



1. A concrete mixer for determining the consistency of concrete mixed therein during a measuring phase in a concrete mixing operation comprising: a mixing drum (2); a drag body (8, 9) mounted in said drum to be completely immersed in the concrete at least during the measuring phase and having a drag surface (6, 7) positioned to at least partially come into contact with concrete in said drum during said measuring phase; a hydraulic driving circuit (11–14) operatively connected to oscillate said drag body; and a pressure sensor (16, 16') connected to said hydraulic driving circuit for measuring the actual pressure value in said hydraulic driving circuit indicative of flow resistance on said drag surface during said measuring phase.

4,900,155

METHOD OF METERING AN ADDITIVE INTO AND MIXING IT WITH A THERMOPLASTIFIED SYNTHETIC RESIN

Wilfried Schwarz, Königswinter, and Peter Stommel, Hennef, both of Fed. Rep. of Germany, assignors to Reifenhäuser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Apr. 5, 1989, Ser. No. 333,981

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811785

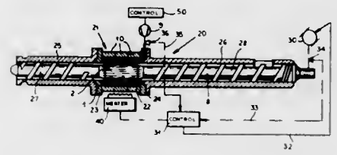
Int. Cl.[4] **B29B** *1/06;* **B01F** *15/02*

U.S. Cl. 366—76 **10 Claims**

1. A method of blending a pumpable additive with a flow of a thermoplastified synthetic resin, comprising the steps of:

(a) generating a flow of a thermoplastified synthetic resin by rotatably driving a plastifying screw in a cylinder of a synthetic-resin-displacing worm press and feeding the synthetic resin to said worm press whereby said synthetic resin is thermoplastified therein and displaced in a flow along said worm press;

(b) along the path of said flow rotating a rotor with and connected to said screw and having an outer peripheral surface juxtaposed with an inner peripheral surface of a stator surrounding said rotor and connected with said cylinder so that said surfaces define an axially extending annular gap between them, each of said surfaces being formed with a plurality of angularly equispaced axially extending rows of axially elongated mixing chambers of identical outline each with semicircular ends of a given radius, the mixing chambers of said inner surface being axially offset from the mixing chambers of said outer surface by substantially half the length of said mixing



chambers, said mixing chambers being troughs of circular arc segmental cross section with radii of curvature equal to said given radius and depths less than said given radius, the length of each mixing chamber being three to four times said given radius, the mixing chambers of successive rows of each surface being separated by webs having a thickness less than half of said given radius and said gap having a gap width generating a shear velocity gradient sufficient to effect intimate mixing in said gap;

(c) passing said flow through said gap; and

(d) pumping into said gap at at least one location around said rotor and at an upstream end of said gap, at least one pumpable additive miscible with said thermoplastified synthetic resin, thereby blending said additive with said thermoplastified synthetic resin.

4,900,156

TWIN SCREW EXTRUDER WITH THREAD-FREE MIXING ZONES

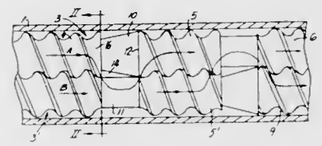
Fritz Bauer, Vaihingen, Fed. Rep. of Germany, assignor to Werner & Pfleiderer GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 19, 1988, Ser. No. 259,881

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1987, 3738700

Int. Cl.[4] **B29B** *7/48*

U.S. Cl. 366—85 **9 Claims**



1. A twin screw extruder comprising a housing, two extruder screws supported in said housing for rotation in the same direction about parallel, longitudinal axes of rotation, each of said screws including a shaft and a screw section having threads secured on the associated shaft for rotation therewith, the threads of the screw section of one shaft interengaging with the threads of the screw section of the other shaft to advance a product longitudinally along the screws, the threads of said screw section having inner and outer diameters, said

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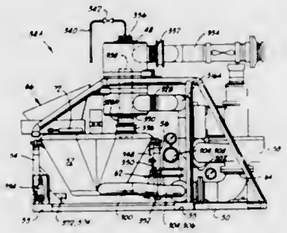
screws including adjoining sections devoid of said screw sections to define a zone free of threads, one of said shafts including a cylindrical section in said zone free of threads and a baffle element on the other of said shafts in the zone free of threads, said baffle element being of conical shape which increases uniformly in diameter in the direction of advance of the product, said baffle element having one end of smaller diameter which is substantially equal to the inner diameter of the threads of said screw section and a seciond end of larger diameter which is substantially equal to the outer diameter of the threads of said screw section.

4,900,157

BLENDER SYSTEM WITH CONCENTRATOR

Calvin L. Stegemoeller, and Loanie R. Walker, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 27, 1988, Ser. No. 199,560
Int. Cl.[4] B01F *15/02*
U.S. Cl. 366—132 **8 Claims**



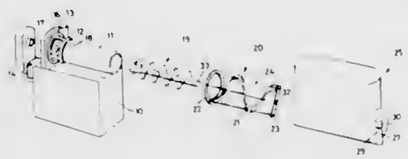
1. A blending method, comprising:
blending a solid particulate material with a liquid in a blender tub;
pumping, with one and only one pump, a tub outlet stream from said tub and an initially separate liquid supply stream from a liquid supply so that said tub outlet stream and said liquid supply stream are mixed when they reach a suction inlet of said pump;
separating a pump discharge stream from said pump into a lower density recirculating stream and a higher density discharge stream; and
directing said recirculating stream to said blender tub.

4,900,158

GRANITA PRODUCTION MACHINE

Giancarlo Ugolini, Milan, Italy, assignor to Ugolini S.P.A., Milan, Italy

Filed Jun. 12, 1989, Ser. No. 364,842
Claims priority, application Italy, Jun. 24, 1988, 21100 A/88
Int. Cl.[4] B01F *7/08, 15/06;* **A23G** *9/12*
U.S. Cl. 366—143 **11 Claims**



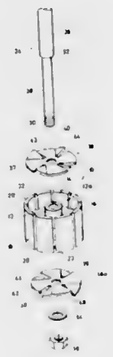
1. A machine for the production of granita and in particular of the type called Sicilian granita comprising a container with a predominately horizontal development in which rotate motorized means for stirring the mixture contained therein in contact with a wall chilled by a refrigerating circuit and means of delivering said mixture from said container characterized in that said chilled wall is cylindrical in form and that said stirring means for the mixture comprise a first rotating cylindrical screw propeller placed inside and axially with said chilled wall and a second rotating cylindrical screw propeller placed axially with and wound externally to said chilled wall, said screw propellers being rotated by a motor to impart opposed thrusts to the mixture.

4,900,159

HIGH SHEAR MIXING APPARATUS

Dale E. Jamison, Humble, Tex., assignor to NL Industries, Tex.

Continuation of Ser. No. 97,859, Sep. 17, 1987, abandoned. This application Jun. 29, 1989, Ser. No. 373,625
Int. Cl.[4] B01F *7/26*
U.S. Cl. 366—343 **10 Claims**



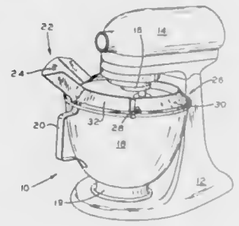
1. An apparatus for high shear mixing of materials comprising:
a hub having a rotation axis;
a flange operatively attached to said hub for rotation therewith and extending radially outwardly from said hub;
a first impeller means operatively attached to said hub for rotation therewith and axially spaced from said flange;
an annular skirt operatively attached to said flange for rotation therewith said skirt having a fluid-barrier perimeter surface area said skirt having a plurality of openings therethrough defining a second perimeter surface area, the second perimeter surface area being substantially less than the fluid-barrier perimeter surface area, said hub, said flange, said first impeller means and said skirt at least partially defining a first annular chamber, said first impeller means having blade means adapted to force said materials into said first annular chamber and out through one or more first openings of said plurality of openings when said apparatus is rotated about said rotation axis;
a second impeller means operatively attached to said hub for rotation therewith, said second impeller means being axially spaced from said flange and on the opposite side of said flange from said first impeller means;
the annular skirt having a first axially extending portion extending from said flange toward said first impeller means and a second, axially extending portion extending from said flange toward said second impeller means, each of said first and second portions of said annular skirt having at least one of said plurality of openings, said first annular chamber being at least partially defined by said hub, said flange, said first portion of said skirt and said first impeller means;
said hub, said flange, said second impeller means and said second portion of said skirt defining a second annular chamber axially spaced from said first annular chamber, said second impeller means having blade means adapted to force said materials into said second annular chamber and out through one or more second openings of said plurality of openings when said apparatus is rotated about said rotational axis; and
said flange at least substantially prohibiting fluid communication between said first annular chamber and said second annular chamber to increase efficiency of mixing of materials.

4,900,160

POURING SHIELD FOR A FOOD MIXER

Timothy L. Brooks, New Carlisle, and Brian K. Linstedt, Dayton, both of Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 19, 1988, Ser. No. 221,281
Int. Cl.[4] B01F *15/00, 15/02;* **B65D** *25/42*
U.S. Cl. 366—347 **12 Claims**



1. A detachable combination pouring trough and splash shield for use with a mixing bowl, comprising:
a generally planar ring having first and second faces, said ring having an upstanding splash flange mounted on said first face, said ring and splash flange being formed of a plurality of separable portions which are adapted to be assembled and interlocked, said plurality of separable portions comprising a first separable portion having two first ends, and a second separable portion having two second ends, each first end including a projection with a protrusion near an outward edge of said projection, each second end including a socket adapted to receive a said protrusion, one of said separable portions being pivotable on a second said separable portion to release said protrusions from said sockets for separating said separable portions, each said first end including an out-turned flange which forms a shoulder with said associated splash flange, each said second end being configured to permit pivoting movement of said first separable portion through a predetermined arc without engagement of said second ends of said second separable portion with said shoulders; and
a pouring trough secured to one of said separable portions, whereby said combination pouring trough and splash shield may be placed on a mixing bowl while said mixing bowl is mounted on a mixer.

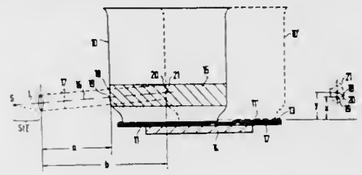
4,900,161

SYSTEM FOR MEASURING TEMPERATURE OF A FILLED VESSEL ON A HOT PLATE

Kurt Wolf, and Wolfram Andre, both of Wildbad, Fed. Rep. of Germany, assignors to Fissler GmbH, Idar-Oberstein, Fed. Rep. of Germany

Filed Dec. 4, 1987, Ser. No. 128,682
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642182
Int. Cl.[4] G01J *5/00*
U.S. Cl. 374—123 **8 Claims**

1. In a method for measurement of the temperature of the contents of a filled vessel on a hot plate, of the type including sensing the extent of radiated heat by means of a remote radiation pick-up which is pointed toward and positioned at varying distances from the side of the vessel, said pick-up receiving radiation from a radiation measurement field extending at an angle of taper from said vessel side to said pick-up, and giving a signal corresponding to radiation received from an area on the side of the vessel, in situations in which varying placements of the vessel on the hot plate causes varying extents of spurious radiation available for sensing, the improvement comprising



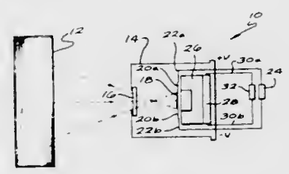
providing a radiation pick-up having a sensor and a lens, adjustably setting the angle of taper of the radiation measurement field to an angle diverging from said vessel side to said pick-up, said setting of said angle of taper being by moving the position of said sensor with respect to the position of said lens interposed between said pick-up and said vessel, said setting of said angle of taper thereby adjusting the magnitude of the area from which radiation is detected.

4,900,162

INFRARED THERMOMETRY SYSTEM AND METHOD

Kenneth A. Beckman, La Mesa, and John A. Graham, San Diego, both of Calif., assignors to IVAC Corporation, San Diego, Calif.

Filed Mar. 20, 1989, Ser. No. 325,929
Int. Cl.[4] G01J *5/20, 5/12, 5/16*
U.S. Cl. 374—132 **17 Claims**

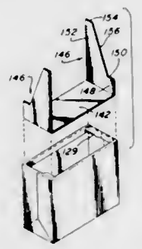


1. An apparatus for measuring electromagnetic radiation emitted from a target, comprising:
(a) radiation detector means for receiving radiation from said target, adapted to generate a first electrical signal proportional to the difference between the temperature of said target and the temperature of said radiation detector means;
(b) a temperature detector for measuring the temperature of said radiation detector means, and adapted to generate a second electrical signal indicative of the temperature of said radiation detector means; and
(c) means for changing the temperature of said radiation detector means, said means for changing the temperature of said radiation detector means being responsive to said first signal, and further including means for controlling said means for changing the temperature to reduce the absolute value of said first signal to substantially zero.

7. A method for measuring radiation emitted from a target, utilizing an apparatus including a radiation detector having an output proportional to the difference in temperature of said radiation detector and said target, a temperature detector, and means for changing the temperature of said radiation detector, comprising the steps of:
(a) measuring the output from said radiation detector;

(b) changing the temperature of said radiation detector to cause said radiation detector to generate a signal having a substantially zero absolute value; and
(c) measuring the temperature of said radiation detector to determine the temperature of said target when absolute value of said signal generated by said radiation detector is substantially zero.

4,900,163
DISPOSABLE TRASH RECEPTACLE
Judith M. Mack, 84 James St., Kingston, Pa. 18704
Filed Sep. 21, 1988, Ser. No. 247,180
Int. Cl.[4] B65D *33/02*
U.S. Cl. 383—119 **7 Claims**



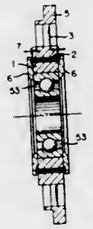
1. A disposable, single use trash receptacle comprised essentially of:
a hollow body member which is closed at one end thereof and open at the other end thereof, the open end having a surrounding rim with at least one slot therein; and
a stiffening member, having at least a base and two vertically extending members integrally connected with said base, positioned within said body member with the base immediately adjacent to said closed end with at least one vertically extending member in said slot.

4,900,164
AXIAL RETAINER FOR A CUTTER IN A ROTARY DRILL BIT
Osamu Nakamura, Tokyo, Japan, assignor to Tsukamoto Selki Co., Ltd., Tokyo, Japan
Filed Feb. 25, 1988, Ser. No. 162,676
Claims priority, application Japan, Nov. 17, 1987, 62-290360
Int. Cl.[4] F16C *17/12;* **E21B** *10/22*
U.S. Cl. 384—96 **2 Claims**



1. A retainer for axial retention of a cutter on a rotary drill bit having a bit body provided with a journal pin on which the cutter is rotatably mounted, the journal pin having a first annular groove formed in an outer peripheral wall surface thereof, a portion of one wall of said groove adjacent said outer peripheral wall forming an inclined surface portion, and the cutter having a second annular groove corresponding to said first annular groove formed in an inner peripheral wall surface thereof, said second annular groove including a shoulder portion corresponding to, and in spaced substantially opposed relation with, said inclined surface portion, said first and second annular grooves being substantially registered when the cutter is mounted on the journal pin, said retainer comprising:
a plurality of sliding keys accommodated in said first annular groove; and
an initial tensioning ring accommodated in said first annular groove in a compressed state inwardly of said sliding keys;
said second annular groove receiving said sliding keys when said first and second grooves substantially register, thereby allowing said initial tensioning ring to assume an expanded state to urge said plurality of sliding keys toward said second annular groove, and displacement of said sliding keys axially of said journal pin being guided and limited by said shoulder portion and said inclined surface portion.

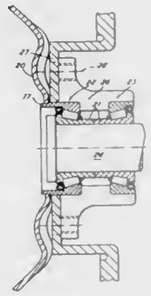
4,900,165
BEARING SUPPORT SYSTEM
Leslie C. Kun, Grand Island, and Nenо T. Nenov, Williamsville, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Aug. 15, 1988, Ser. No. 232,173
Int. Cl.[4] F16C *27/02*
U.S. Cl. 384—220 **18 Claims**



1. A bearing support system for high-speed rotating machinery comprising:
(A) an inner ring for retention of one or more bearings in support of a rotating element of the machinery, said inner ring having at least two radially spaced slots therein said slots having a width within the range of from 0.002 to 0.100 inch and a depth within the range of from one to two times the width of the bearing;
(B) an outer ring, radially spaced from the inner ring, and attachable to a stationary element of the machinery; and
(C) at least two circumferentially spaced structural members between and in contact with the inner and outer rings, and serving to support the inner ring on the outer ring, said structural members being stiff in the radial direction but flexible in the axial direction.

4,900,166
TAPER ROLLER BEARINGS FOR VEHICLE WHEELS
Rene Candiard, Ribeauville, France, assignor to The Timken Company, Canton, Ohio
Filed Sep. 29, 1988, Ser. No. 250,374
Claims priority, application United Kingdom, Oct. 1, 1987, 8723032
Int. Cl.[4] F16C *33/58*
U.S. Cl. 384—560 **13 Claims**

1. A tapered roller bearing comprising a bearing cone, a bearing cup encircling the bearing cone, said cone and said cup respectively having radially outer and radially inner faces formed with bearing raceways, tapered rollers mounted radially between the cone and the cup and in rolling engagement with said raceways, each roller having a larger diameter end and a smaller diameter end, said bearing cup having at its end adjacent the larger diameter ends of the rollers means defining an axial extension portion projecting axially beyond the cone

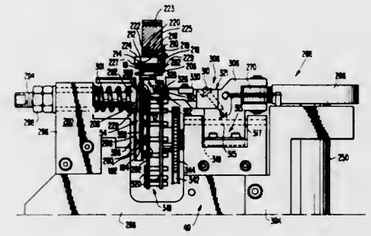


and adapted to provide an axial sliding fit for a vehicle wheel rim, thereby to operate as a centering support for the wheel rim.

4,900,167
MATRIX PIN PRINTER WITH ADJUSTABLE PRINT PIN GUIDE
Clemens Kaufmann, Ulm, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany
Filed Oct. 25, 1988, Ser. No. 262,889
Claims priority, application European Pat. Off., Nov. 6, 1987, 87730139.0
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **20 Claims**

1. A matrix pin print head for disposal opposite to a print counter support and having a center axis comprising a print pin drive device group; a print pin guide device group disposed facing a print counter support, connected to the print pin drive device group and including:
an adjustable print pin guide;
print pins associated with a print direction, where the center axis of the print head is running in the print direction of the print pins;
a casing guiding the print pins;
a guide for a magnet core;
a magnet core disposed in the area of the print pin guide device group and movable in the guide for the magnet core;
a set screw coordinated to the magnet core;
an electrical lifting magnet having a coil center axis and coordinated to the set screw for the magnet core and disposed in the area of the print pin guide device group perpendicular to the center axis of the matrix print head;
a parallel adjustable pin guide carrier, where the magnet core together with the pin guide carrier forms an adjustable magnetic discontinuity air gap within the electric lifting magnet and whereby the pin guide carrier is movable back and forth between two fixedly adjustable positions and wherein the magnet core is connected to the pin guide carrier so that the pin guide carrier and print pin guide move along a linear path between the two fixedly adjustable positions.

4,900,168
CREDIT CARD TRANSPORTING EMBOSSING AND RECORDING SYSTEM
Richard J. LaManna, Whippany; James L. Hinton, Short Hills, both of N.J.; Edward L. Cuckscy, Upper Nyack, N.Y., and Leo Kull, West Caldwell, N.J., assignors to National Business Systems, Inc., Moonachie, N.J.
Division of Ser. No. 878,664, Jun. 23, 1986, Pat. No. 4,755,069.
This application Feb. 25, 1988, Ser. No. 160,334
Int. Cl.[4] B41J *3/38*
U.S. Cl. 400—130 **6 Claims**



1. A card transporting system for transporting a plurality of cards which are to be embossed past a plurality of in line card embossing means each disposed at a separate embossing position with each card embossing means being vertically positioned with respect to a transport path to emboss a different one of a plurality of horizontally disposed lines of characters on each card comprising:
a card transporting channel extending from a ready station along the transport path past each of the plurality of embossing means to a discharge station for conveying cards past each of the plurality of separate embossing positions, the card transporting channel comprising a fixed guideway for engaging the bottom edge of cards in the channel extending from the ready station along the transport path past each of the separate embossing positions for establishing a vertical reference position of the cards in the channel with respect to each of the plurality of card embossing means disposed at the embossing positions and a plurality of vertically movable edge guiding means for engaging a top edge of the card to force the bottom edge of the card into the fixed guideway, a vertically movable edge guiding means being associated with each of the card embossing means to force the bottom edge of any card within the channel to the vertical reference position; and
a rotatably driven belt movable in a direction along the transport path having a plurality of card engaging means each for engaging a blank card to be embossed which are spaced apart by a uniform distance equal to the spacing between the card embossing means, rotation of the belt causing successive card engaging means to engage a card at the ready station and to move the cards through the card transporting channel to the discharge station,
wherein each of the vertically movable card edge guiding

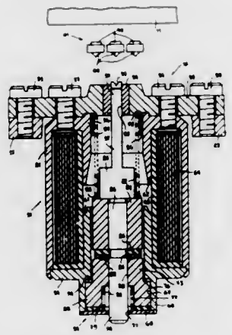
means is pivotally mounted at a support member with an axis parallel to the transport path.

4,900,169

PRINT HAMMER DAMPING MECHANISM FOR TYPEWRITERS AND LIKE PRINTING MACHINES

Remo Falconieri, S. Giorgio C.SE, and Ester G. Gianotti, Albiano, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 871,384, Jan. 6, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 208,788
Claims priority, application Italy, Jun. 28, 1985, 67590 A/85
Int. Cl.[4] B41J *9/38*
U.S. Cl. 400—157.2 **15 Claims**



1. A print device for typewriter and like printing machines comprising a platen roller defining a point of printing; a character-carrying element having flexible spokes provided at the periphery with a series of characters which can be selectively positioned in front of the point of printing; a print hammer assembly movable frontwardly from a rest position to a printing position for moving a selected character against the platen roller; a solenoid including an actuating armature fixed to the print hammer assembly, a winding, a return coil spring for rapidly returning backwardly the print hammer assembly to the rest position after printing of each character, and an internal housing having an intermediate stop and a travel limit stop; and wherein said winding is energizable for moving frontwardly said armature against the action of said return coil spring; and damping means for reducing the time for damping of the print hammer assembly after printing of each character, wherein said damping means comprise:

a counteracting weight movable for a small amount in the same direction as the actuating armature between the intermediate stop and the travel limit stop, a first elastomeric member for damping purposes disposed between the actuating armature and the counteracting weight, a counteracting coil spring disposed between the counteracting weight and the travel limit stop and a second elastomeric member for damping purposes disposed between the counteracting weight and the travel limit stop,

wherein the counteracting spring provides a force which is opposite and less than the force of the return spring in the rest position of the hammer assembly;

wherein the first elastomeric member is provided to be compressed at rest between said armature and said counteracting weight under the urging of the return spring on the print hammer assembly, while said counteracting weight is spaced apart a pre-set gap from said intermediate stop in the rest position of said print hammer and under the urging of said return coil spring;

wherein said second elastomeric member is provided to be compressed between said counteracting weight and said travel limit stop and to define the rest position of the print hammer under the urging of said return coil spring and less the action of said counteracting coil spring;

wherein said counteracting coil spring is provided to move frontwardly the counteracting weight through said pre-set gap upon a frontward movement of the print hammer, thereby releasing the second elastomeric member;

wherein said print hammer assembly is provided to strike against the counteracting weight through the first elastomeric stop for a rearward movement of said counteracting weight upon returning of the print hammer assembly to said rest position; and

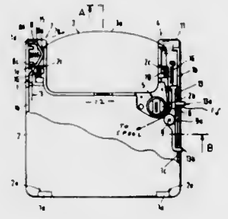
wherein said damping means are provided to produce a first damping phase by the first elastomeric member upon the striking of said print hammer assembly against the counteracting weight through the first elastomeric element, a second damping phase by the rearward movement of the counteracting weight through said pre-set gap and compression of said counteracting spring by the counterating weight and a third damping phase by the second elastomeric member compressed between the counteracting weight and the travel limit stop.

4,900,170

RELOADABLE ENDLESS RIBBON CASSETTE

Dieter Beck, Setzingen, and Gerhard Lohrmann, Elchingen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 693,177
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1984, 3402662
Int. Cl.[4] B41J *32/02*
U.S. Cl. 400—196 **3 Claims**



1. A ribbon cassette having a casing with a releasable cover comprising:

a pulley mounted for rotation in said casing there being key-means projecting beyond the casing of the cassette for engagement with external drive means;

a rotatably mounted pressure roller;

a slide for movably mounting the pressure roller to obtain a first position of engagement with said pulley and a second retracted position;

a projection on said slide and being externally accessible for shifting the slide from the first to the second position and vice versa, there being an opening in said casing through which the projection is externally accessible;

an additional projection on said slide running in an opening in said casing for guiding movement of said slide along a long wall of the cassette casing;

brake means disposed in said cassette; and

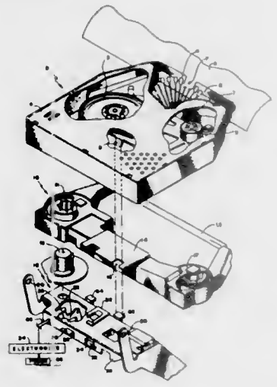
a removable endless ink ribbon insertible and inserted in said casing and filling the casing essentially in its entirety, the ribbon running through a gap between the pulley and said pressure roller on one hand and said brake means on the other.

4,900,171

INK RIBBON AND CORRECTION TAPE CASSETTE COMPATIBILITY

Hans W. Mueller, Cortland, and Samuel D. Cappotto, Syracuse, both of N.Y., assignors to Smith Corona Corporation, Cortland, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,152
Int. Cl.[4] B41J *32/00*
U.S. Cl. 400—208 **23 Claims**



1. In a system utilizing a first and second cassette, said system comprising in combination:

a device in which a first and second cassette are inserted for operation of the device;

a switch mounted on said device and connected to a power source for controlling the flow of electricity to said device;

a first cassette for use in said device, said first cassette having an ink ribbon;

a second cassette for use in said device, said second cassette having a correction tape; and

means for assuring that the ink ribbon in the first cassette and the correction tape in the second cassette are functionally compatible with each other and for conditioning the switch to permit the flow of electricity from the power source to said device to activate said device only when the functional compatibility of said ink ribbon in the first cassette and the correction tape in the second cassette is assured.

4,900,172

PRINTER ASSEMBLY WITH PAPER GUIDE

Rudolf Svoboda, Bretschneiderstrasse, A-3100 St. Pölten, Niederösterreich, Austria

Continuation of Ser. No. 108,193, Oct. 13, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 346,291
Claims priority, application Austria, Oct. 13, 1986, 2721/86
Int. Cl.[4] B41J *15/04, 15/18*
U.S. Cl. 400—605 **17 Claims**



1. A printer assembly, comprising:

a printer having an inlet opening adapted to receive a paper web to be printed, an outlet opening for discharging the paper web following printing, and means between said openings forming a paper path therebetween along which the paper web is printed;

a horizontal support receiving said printer and provided with a supply of said paper web, said printer being spaced inwardly from an edge of said support;

a paper guide carried by said support and defining a path for said paper web having at least one bend, said paper guide comprising a pair of mutually juxtaposed guide members, each of said members having a width at least equal to the width of the paper web and being spaced apart by a gap in which the paper web travels over a length of said guide between a paper-inlet slit and a paper-outlet slit,

said paper-inlet slit being located in a region of said edge and such that a major portion of the length of said paper guide is horizontal and extends between said edge and said printer,

one of said slits being aligned with a corresponding one of said openings of said printer for selectively receiving the paper web from said printer and feeding the paper web to the printer,

both of said mutually juxtaposed guide members having a pair of ends that form said other of said slits wherein both of said ends are located no further than a fingers length inwards of an end of said support so that the other of said slits being freely and directly accessible to fingers of a person for manual feed of the paper web to said guide, said guide members being of about equal length and each member being parallel to the other over substantially their full length;

means for varying the length of said straight portion,

said means for varying the length of said straight portion including at least two mutually telescoping portions of said guide forming said straight portion; and

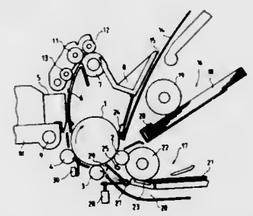
means for adjusting the height of said gap between said members.

4,900,173

METHOD AND APPARATUS FOR FEEDING SHEET

Shigeru Okamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,092
Claims priority, application Japan, Feb. 5, 1988, 63-25362; Feb. 5, 1988, 63-25363
Int. Cl.[4] B41J *11/50*
U.S. Cl. 400—606 **7 Claims**



1. A method for feeding a sheet in a sheet feeding apparatus used with a recording system, comprising the steps of:

discriminating whether a sheet being fed is a transparent plastic sheet or not;

when said sheet is the transparent plastic sheet, advancing said sheet by a predetermined amount, and then retracting said sheet by a predetermined amount into a waiting passage;

supplying a plain sheet; and

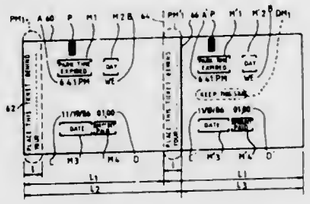
recording images or characters on said transparent plastic sheet, while feeding said transparent plastic sheet and said plain sheet altogether in an overlapped condition.

4,900,174

SYSTEM FOR PROVIDING TICKETS WITH OR WITHOUT A STUB

Pierre Didiergeorge, Besancon, France, assignor to Schlumberger Industries, Montrouge, France

Filed Dec. 18, 1987, Ser. No. 135,094
Claims priority, application France, Dec. 19, 1986, 86 17801
Int. Cl.[4] B41J *11/70*
U.S. Cl. 400—621 **4 Claims**



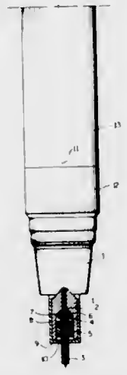
1. A system for issuing tickets with or without a stub, wherein said tickets are required to include a first message and not to include a second message and wherein said stub is required to include said second message and not to include said first message, the system comprising a strip of paper consisting of portions having a predetermined length L1, including said first message preprinted on each of said portions and a dispensing device, said dispensing device comprising:
- means for advancing said strip of paper;
- means printing on said strip of paper;
- means for cutting said strip;
- selector means for selecting between having a ticket issued without a stub and having a ticket issued with a stub; and
- control means including a microprocessor and responsive to said selector means, to:
  - in response to the selection of a ticket without a stub, cause specific items to be printed on a portion of said strip of paper, and cause said strip to be cut to issue a piece of paper that includes said first message preprinted;
  - in response to the selection of a ticket with a stub, print said specific items on two consecutive portions and print said second message on the second of said two consecutive portions, and cause said strip of paper to be cut a first time to issue a first piece of paper which includes said first message preprinted thereon and cut the strip a second time so as to issue a second piece of paper which includes said second message, whereby said first piece of paper constitutes said ticket and said second piece of paper constitutes said stub corresponding to said ticket and wherein said first piece of paper includes said first message preprinted twice over while said second piece of paper does not include said first message preprinted at all.

4,900,176

PIVOTABLE PEN TIP

Peter Felgentreu, Hamburg-Harburg, and Klaus-Joachim Meinert, Itzehoe, both of Fed. Rep. of Germany, assignors to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Aug. 26, 1988, Ser. No. 236,765
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728564
Int. Cl.[4] B43K *1/06, 1/10;* **G01D** *15/16*
U.S. Cl. 401—258 **13 Claims**



1. In a tubular writing pen of the type having a pen body (1) comprising a writing tube (3) adapted to permit ink to flow therethrough and a drop weight body, whereby a front section of the writing tube has a cleaning wire (2) extending from said drop weight body and along a center axis (11) and into the writing tube (3), the improvement which comprises a writing tube (3) clamped against a resilient pressure means and pivotable in a limited way in all directions around a point located on said center axis (11) and inside the pen body (1), wherein further a writing tube (3) rear end has means to movably brace said writing tube against axial displacement through sliding contact with a guide surface (6) that is provided centrosymmetrically in the pen body (1) and about said center axis (11) of the unpivoted writing tube (3).

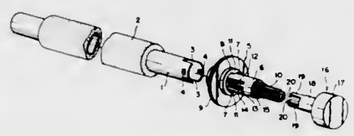
4,900,175

PLATEN ASSEMBLY

Hiroshi Ikeda; Takashi Sawada, both of Saitama, and Mitsuo Bansho, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 334,882
Claims priority, application Japan, Apr. 6, 1988, 63-45753[U]
Int. Cl.[4] B41J *11/04*
U.S. Cl. 400—659 **7 Claims**

1. A platen assembly comprising:
- a pipe shaft having an elastomeric layer therearound, an end of said pipe shaft having cutouts therein extending parallel to the axis thereof and having locking holes therein between said cutouts; and
- a power transmission member connected to said end of said pipe shaft, said power transmission member having first convexities removably engaged in said cutouts for holding said member against rotation relative to said pipe shaft,



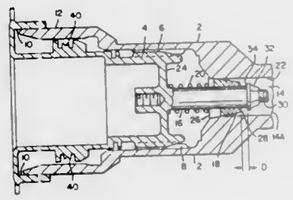
and second convexities resiliently removably engaged in said locking holes for holding said member against disengagement from said pipe shaft.

4,900,177

SPLINE CENTERING DEVICE

John H. Ferguson, Sauquoit, N.Y., assignor to Lucas Aerospace Power Transmission Corp., Utica, N.Y.

Filed Aug. 2, 1989, Ser. No. 388,348
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—13 **11 Claims**



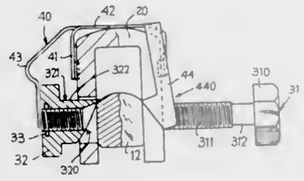
1. A mechanical coupling including a first member having an internal spline, and a second member having an external spline in mating engagement with the internal spline and having a spline centering device, comprising:
- the first member having a longitudinally extending internal hole on one end thereof, said hole not otherwise having diameter and location tolerances suitable for spline centering purposes;
- the second member disposed within the first member so that the internal and external splines are in mating engagement, and the second member having a longitudinally extending shaft portion extending into the hole in the first member; and
- the longitudinally extending shaft portion carrying a spring biased tapered member for engaging the hole, the tapered member being longitudinally displaceable along the shaft portion for picking up the inside diameter of the hole as a pilot to provide the spline centering device for the coupling.

4,900,178

COUPLING DEVICE AND THE APPLICATION THEREOF IN PARTICULAR IN AN AUTOMOBILE STEERING DEVICE

Bernard Haldric; Pascal Feucht, and Christian Fernand, all of Vendome, France, assignors to NACAM, Vendome, France

Filed Dec. 15, 1988, Ser. No. 288,553
Claims priority, application France, Dec. 31, 1987, 87 18490
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—24 **22 Claims**



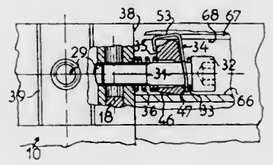
1. A rapid coupling device for interconnecting a driving shaft and a driven shaft, comprising:
- a rod for connection to one of the shafts, said rod defining a stem portion having a longitudinal axis and a non-circular section;
- a shackle for connection to the other of the shafts, said shackle comprising a U section defined by two spaced-apart confronting branches and a bridge portion connecting said branches and defining a passage between said branches, said shackle being pivotable about an axis orthogonal to said longitudinal axis of said stem and to said branches of said shackle;
- locking means extending through said branches for trapping and clamping said stem in said passage of said shackle; and
- a clip made of an elastically yieldable material, said clip having a substantially U shaped configuration for straddling said shackle with two substantially parallel legs cooperative with respective said confronting branches of said shackle, said clip further comprising means on said parallel legs for fixing and maintaining said legs on said respective branches and an arm disposed on said clip adjacent to one of said legs and cooperative with said locking means.

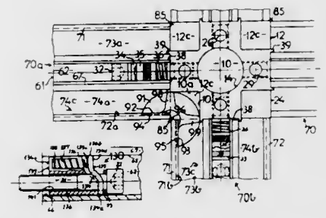
4,900,179

MOUNTING CROSS-PIECE ASSEMBLY AND MOUNTING CROSS-PIECE THEREOF

Walter Kundert, Dietikon, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Jan. 25, 1988, Ser. No. 147,740
Claims priority, application Switzerland, Jan. 30, 1987, 00324/87
Int. Cl.[4] F16D *1/04;* **F16B** *7/04*
U.S. Cl. 403—174 **24 Claims**





20. A mounting cross-piece for use in a mounting cross-piece assembly, comprising:
- at least two joining surfaces for the adjoinment of cut surfaces of profile sections thereat;
- each of said at least two joining surfaces being provided with means intended for receiving a connection element for securing the profile sections at the region of each said at least two joining surfaces;
- said connection element comprising a tilting element pivotally seated upon a support element, said tilting element being movable from a neutral position into a position frictionally engaged with a wall of the profile sections;
- said mounting cross-piece comprising a multi-part mounting cross-piece;
- said multi-part mounting cross-piece comprising:
  - a lower portion;
  - seal means cooperating with said lower portion; and
  - an upper portion;
- said upper portion being provided at least at two sides with guide means; and
- each said guide means at each of said at least two sides of

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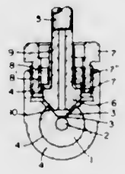
said upper portion coacting with a respective one of said at least two joining surfaces as well as with a cut surface of the profile section coacting therewith.

4,900,180

STRUCTURE FOR CONNECTING BRANCH PIPE IN HIGH-PRESSURE FUEL MANIFOLD

Kazunori Takikawa, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Santo, Japan

Filed Jan. 27, 1988, Ser. No. 211,581
Claims priority, application Japan, Jan. 29, 1987, 62-99725[U]
Int. Cl.⁴ F16B *7/08, 9/00*
U.S. Cl. 403—233 **9 Claims**



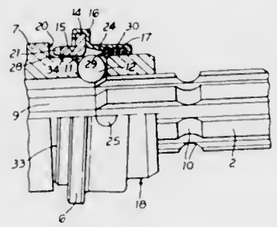
1. A structure for connecting branch pipes in a high-pressure fuel manifold in which each branch pipe is connected to a main pipe for supplying fuel under high pressure through one of a plurality of through-holes which are provided in the peripheral wall of said main pipe in such a manner that said through-holes are spaced apart from each other in the longitudinal direction of said main pipe and are communicated with a flow passage defined inside said main pipe, wherein the improvement comprises: a recessed pressure bearing surface provided at the outer end of each of said through-holes so as to open outward divergently; a coupled member having an engagement bore axially extending therethrough, and a threaded bore extending laterally into the coupling member to intersect the axial bore, said coupling member being secured to the outer peripheral wall of said main pipe such that said pressure bearing surface is surrounded by said threaded bore; said branch pipe having at its end an enlarged pressing top portion and a neck portion contiguous with said enlarged pressing top portion, said enlarged pressing top portion of said branch pipe defining a shoulder adjacent said neck and a converging tip conforming to the shape of the outwardly divergent pressure bearing surface and being seated against said pressure bearing surface, a collar member having an inner cylindrical surface slidably fitted around the neck of the branch pipe, and an end engaged against the shoulder of the branch pipe, said collar member further having a threaded surface defined by its outer periphery; and a nut provided around the collar member and the branch pipe, said nut having threaded surfaces respectively provided on its inner and outer peripheries which are threaded in the directions opposite to each other, the inner and outer threaded surfaces of said nut respectively being in thread engagement with the threaded surface of said collar member and said threaded bore provided in said coupling member, whereby rotation of the nut moves the collar relative to the coupling member and against the shoulder of the branch pipe thereby fastening the tip of said branch pipe tightly against the pressure bearing surface of said main pipe.

4,900,181

LOCKING DEVICE FOR CONNECTING A DRIVESHAFT TO A POWER TAKE-OFF SHAFT

Hubert Geisthoff, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Jan. 31, 1989, Ser. No. 304,660
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1988, 38028492
Int. Cl.⁴ F16B *7/00*
U.S. Cl. 403—322 **9 Claims**



1. A locking device for connecting a driveshaft to a power take-off shaft, the locking device comprising:

a coupling sleeve mounted on the driveshaft and arranged so as to slide on the power take-off shaft, said coupling sleeve defining a plurality of radially-extending apertures;

a plurality of locking members guidable in the apertures for inward movement so as to lock said coupling sleeve against axial movement relative to the power take-off shaft and outward movement to allow such axial movement;

a locking sleeve on said coupling sleeve which is movable between a locking position thereof in which it embraces said locking members so as to prevent outward movement thereof and a release position thereof in which said locking sleeve allows outward movement of said locking members;

resilient biasing means for biasing said locking sleeve into the locking position; and

latch means operable for holding said locking sleeve in the release position and releasable by outward movement of said locking members as said coupling sleeve is slid on to the power take-off shaft, said resilient biasing means acting between a first stop on said coupling sleeve adjacent to the apertures and a second stop on said locking sleeve, and said latch means including a third stop on said coupling sleeve and a fourth stop on said locking sleeve and which extends radially inwardly and, by tilting said locking sleeve on said coupling sleeve when said locking sleeve is in the release position, engages with said third stop to thereby hold said locking sleeve in the release position.

4,900,182

LOCK AND RELEASE APPARATUS

Woodrow C. Stillwagon, Dunwoody, Ga., assignor to Stillwagon Applied Techonology Incorporated, Columbus, Ohio

Filed Mar. 22, 1989, Ser. No. 327,250
Int. Cl.⁴ F16B *7/00*
U.S. Cl. 403—325 **1 Claim**

1. The A bar and collar, lock and release apparatus, comprising:

A. a collar portion comprising, at least:

a. a cylindrical shell defining an axial passage for receipt of a bar, and a plurality of radial openings in said shell;

b. a radially movable ball located within each of said openings in said shell; and

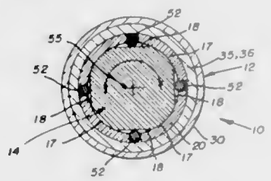
c. a tension ring positioned outside and coaxial with said cylindrical shell and being axially slidable with respect to said collar body alternately in a first axial direction and in a second axial direction, said tension ring including, at least, a tapered portion defining a tapered inner surface adjacent said movable balls, said tapered portion being tapered to urge said movable balls radially inwardly into said axial passage of said shell as said tension ring moves in said first axial direction relative to said shell and to accommodate radial movements of said ball out of said passage as said tension ring moves in said second axial direction relative to said shell; and

B. a rigid, elongated bar member comprising, at least:

a. an axially extending arcuate surface segment, said curved surface segment defining a surface representing, in profile, an arc of a circle; and

b. an axially extending flat surface segment, said flat surface segment defining a surface representing, in profile, a straight line;

c. said arcuate surface segment and said flat surface segment being arranged in succession circumferentially about said bar member,



C. said bar member being insertable into said passage of said collar portion, and said collar portion and said bar member being capable of relative angular movement when said bar member is within said passage;

D. said arcuate surface segment cooperating with said collar portion to create a gripping action which resists axial movement of said collar portion relative to said bar member in at least one axial direction; and

E. said flat surface segment cooperating with said collar portion to weaken said gripping action;

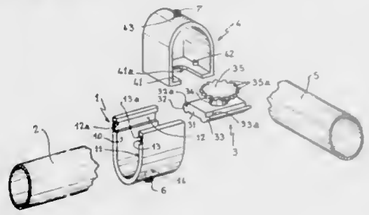
F. whereby alignment of each said radially movable ball with said arcuate surface segment of said bar enhances said gripping action while allowing relative angular movement between said bar member and said collar portion, and whereby alignment of at least one said radially moveable ball with said flat surface segment of said bars at least weakens said gripping action.

4,900,183

ASSEMBLY DEVICE

Alexandre Sorochko, 16 Rue Danièle Cazanova, Roanna, France (42300)

Filed Dec. 27, 1988, Ser. No. 289,666
Claims priority, application France, Dec. 28, 1987, 87 18505
Int. Cl.⁴ B25G *3/36*
U.S. Cl. 403—385 **9 Claims**



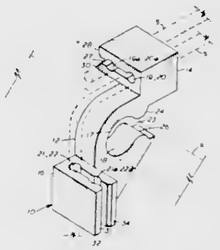
1. A device for assembling space structural elements comprising a first generally U-shaped collar having an intermediate portion and leg portions, said leg portions having opposing inner surfaces, opposing grooves formed along said inner surfaces of said leg portions so as to extend longitudinally with respect to said first collar, each of said grooves having a beveled face which is undercut with respect to said inner surfaces of said leg portions, a first of the structural elements being selectively receivable within said first collar and intermediate said leg portions, first securing means carried by said first collar for securing the first structural element thereto, an intermediate sole plate having upper and lower surfaces and a pair of outer edges which are of a shape to be cooperatively seated with said opposing grooves in said first collar, an assembly member secured to said upper surface of said sole plate, a second generally U-shaped collar having opposing leg portions having outermost ends, said assembly member being selectively mounted intermediate said leg portions of said second collar and adjacent said outermost ends thereof, a second structural element being selectively receivable within said second collar, and second securing means carried by said second collar for securing the second structural element to said second collar.

4,900,184

STIRRUP CLIP

William G. Cleveland, P.O. Box 1671, Vidor, Tex. 77662-1671

Filed Feb. 10, 1989, Ser. No. 308,601
Int. Cl.⁴ F16B *2/20*; A44B *21/00*
U.S. Cl. 403—397 **13 Claims**



1. In a concrete reinforcing system, a clip for securing together a reinforcing bar and the pair of legs forming one corner of a wire stirrup, such clip being of resilient material and having a central web portion in the general shape of a split sleeve adapted to receive said reinforcing bar, said web portion having an opening extending therethrough along a first axis defining a first line of action, and two split sleeve extensions integrally secured to the web and extending therefrom with through openings extending along second and third axes defining second and third lines of action which are perpendicular to each other said second and third lines of action being coplanar whereby the legs of the stirrup received therein will also be coplanar, each split sleeve extension being conformed and disposed to encircle and receive one of the legs of the stirrup.

4,900,185

ASPHALT SPREADER

Gary L. Foertsch, P.O. Box 204, Cabot, Pa. 16023

Filed Feb. 10, 1989, Ser. No. 308,547
Int. Cl.⁴ E01C *19/48*
U.S. Cl. 404—104 **12 Claims**

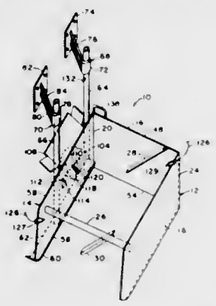
1. An asphalt spreading device for use with a vehicle having a side delivery conveyor, said spreading device comprising;

a. a spreader box comprising a first side wall, a second side wall spaced apart from the first side wall and substantially parallel thereto, and a back wall connecting the first side wall and the second side wall;

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b. a road wheel,

c. means for attaching the road wheel to the side of the first side wall away from the second side wall in such a manner that the elevation of the bottom of the road wheel in



relation to the bottom of the back wall can be adjusted, and

d. means for holding the spreader box in fixed horizontal relation and variable vertical relation to the discharge opening of a side delivery conveyor.

4,900,186

THREE-TRACK ZERO CLEARANCE PAVER

George W. Swisher, Jr., 1500 Dorchester Dr., Oklahoma City, Okla. 73120; Craig R. Gustin, 6208 Ridgecrest Dr., Edmond, Okla. 73034, and Stuart W. Murray, 201 Darwin, Edmond, Okla. 73034

Filed Oct. 31, 1988, Ser. No. 265,419
Int. Cl.[4] E01C *19/12*
U.S. Cl. 404—105 12 Claims



1. A slip form paving apparatus for applying a concrete slab onto a substantially horizontal surface and against a substantially vertical surface at one side of the horizontal surface, comprising:

a rigid, rectangular frame having a front end, rear end and first and second sides;

paving means secured to the frame extending from the first side of the frame to a point outwardly of the second side of the frame, the side of the paving means extending beyond the second side of the frame being open;

a slip form on the side of the paving means at said first side of the frame;

first mobile ground support means secured to and supporting the frame at said first side; and

second mobile ground support means secured to and supporting the second side of the frame, said second mobile ground support means disposed ahead of the paving means;

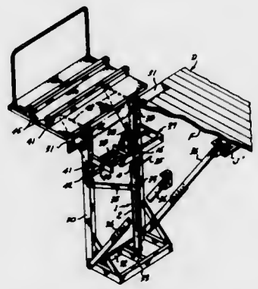
said ground support means operable for moving the open end of the second side of the paving means alongside the vertical surface, whereby the concrete laid by the apparatus will abut the vertical surface.

4,900,187

HYDRAULIC ACTUATOR AND LIFT APPARATUS

Jack Uchida, and Christopher J. Michaelsen, both of Seattle, Wash., assignors to Nyman Pile Driving, Inc., Issaquah, Wash.

Filed Oct. 23, 1987, Ser. No. 113,089
Int. Cl.[4] B63C *3/06*
U.S. Cl. 405—3 4 Claims



4. Apparatus for lifting a small watercraft from the water adjacent to a dock having a top horizontal surface above the surface of the water, said apparatus comprising a frame mounted stationarily relative to the dock, said frame including at least one stationary upright rail disposed adjacent to the dock, a lift carriage movable along said rail and including a lifting platform for raising and lowering the watercraft and supporting structure below said lifting platform, said lifting platform having a top horizontal watercraft-supporting surface and opposite sides adjacent to and remote from said dock, respectively, said lifting platform being movable between a lowered position below the surface of the water and a raised position in which its top surface is disposed above the surface of the water at a level at least as high as the top surface of the dock, said side of said lifting platform adjacent to said dock being open and unobstructed and said stationary rail extending no higher than said top surface of said lifting platform in its raised position, and actuator means disposed entirely below said top surface of said lifting platform in its raised position and having a portion connected to said supporting structure below said lifting platform of said lift carriage for moving said lifting platform between its lowered and raised positions for loading and unloading of the small watercraft between the dock and said lifting platform without obstruction.

4,900,188

DEVICE FOR LOCAL REDUCTION OF WAVE AMPLITUDE

Thomas Haselton, Christiansholmsvej 39, DK-2930 Kampenborg, Denmark, and Frederick R. Haselton, 1025 N. Maple Ave., Cookeville, Tenn. 38501

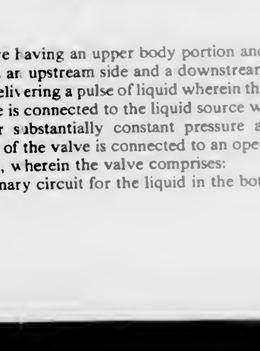
Filed Apr. 21, 1989, Ser. No. 341,387
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—27 18 Claims

1. Means for effecting local reduction of sea wave amplitude comprising:

a grid plate member adapted to be supported in the sea at a predetermined depth ensuring that said grid plate member remains submerged below the trough of the highest wave expected to be encountered in use of said wave reduction means, said grid plate member including a plurality of interconnected elongate supporting members;

at least some of said supporting members hingedly supporting flapper valve plates which are operable between respective substantially open and substantially closed positions, each said flapper valve in its said open position permitting sea water to flow substantially unimpeded through the flapper valve and in its said closed position substantially blocking the flow of sea water through the flapper valve;

means effective on each flapper valve to operate it to its open position in response to vertically downward movement of water as the wave amplitude decreases and to its closed position in response to vertically upward movement of the sea water as the wave amplitude increases;



means for providing positive buoyancy to said grid plate member;

anchoring means adapted to be supported on the sea bottom; and

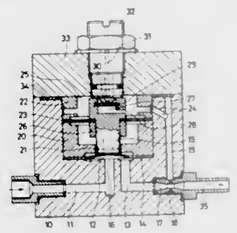
means connected between said anchoring means and said grid plate member for maintaining said grid plate member at said predetermined depth.

4,900,189

IRRIGATION DEVICE AND FACILITIES FOR THE PULSED DELIVERY OF AN IRRIGATION LIQUID

Emilio Barosso, Santa Maria Maddalena, and Aldino Rivi, Ferrara, both of Italy, assignors to Enichem Agricoltura S.p.A., Palermo, Italy

Continuation of Ser. No. 258,218, Oct. 14, 1988, abandoned.
This application Jun. 22, 1989, Ser. No. 372,213
Claims priority, application Italy, Oct. 29, 1987, 22449 A/87
Int. Cl.[4] B05B *15/00*
U.S. Cl. 405—39 7 Claims



2. A valve having an upper body portion and a lower body portion and an upstream side and a downstream side for automatically delivering a pulse of liquid wherein the upstream side of the valve is connected to the liquid source which is under a constant or substantially constant pressure and the downstream side of the valve is connected to an open loop distribution system, wherein the valve comprises:

(a) a primary circuit for the liquid in the bottom portion of the valve body including an inlet duct, an outlet duct, a connecting port which can be closed connecting said ducts, and a venturi wherein said venturi is located downstream of said outlet duct;

(b) a vent to the atmosphere positioned in the upper body portion of the valve;

(c) a secondary circuit for the liquid in the bottom portion of the valve including an intermediate chamber connecting said vent to said constricting region of said venturi;

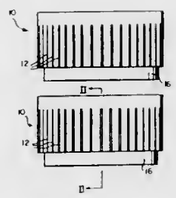
(d) a piston-like sliding member positioned in the lower body portion of the valve reciprocating between an upper position and a lower position wherein when said sliding member is in said upper position said sliding member closes said vent and opens said connecting port of said primary circuit and when said sliding member is in said lower position said sliding member opens said vent and closes said connecting port of said primary circuit.

4,900,190

APERTURED PIPE SEGMENT

Antonius B. Kothman, 4 Haarbof St, Somerset West, 7130 Cape Province, South Africa

Filed May 31, 1989, Ser. No. 359,398
Claims priority, application South Africa, Jun. 7, 1988, 884049
Int. Cl.[4] E02B *11/00*
U.S. Cl. 405—43 9 Claims



1. An apertured pipe segment having a pipe wall and apertures in the pipe wall for the ingress of water into the pipe segment, the apertures each being formed by a recess in the outside of the pipe wall and an inner slot defined by opposed slot walls which diverge from the bottom of the recess inwardly to the inside of the pipe segment, the recess being in flow communication with the inner slot via a slot mouth at the bottom of the recess, which slot mouth is narrower than the smallest transverse dimension of the recess.

4,900,191

METHOD FOR REMOVAL OF BROKEN GROUND

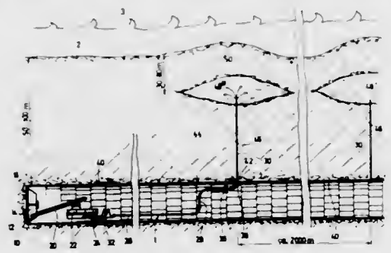
Karl Schlecht, Blumhardtstrasse 9, 7000 Stuttgart 70, Fed. Rep. of Germany

Filed Dec. 24, 1987, Ser. No. 138,560
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1986, 3644818
Int. Cl.[4] E02D *29/00;* E21D *9/12*
U.S. Cl. 405—138 13 Claims

11. A method for the disposal of broken ground in the construction of tunnels comprising

excavating a tunnel and thereby generating broken ground;

pumping generated broken ground under pressure through at least one channel penetrating substantially in a radial



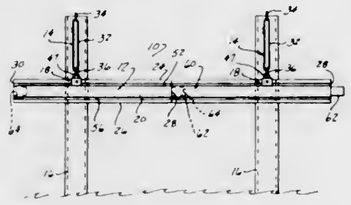
direction the tunnel wall into a region close to the tunnel located under the earth's surface.

4,900,192

DOCK BOAT WELL PROTECTIVE BUMPER

James E. Wood, 24744 Orchid, Mt. Clemens, Mich. 48043

Filed Sep. 28, 1988, Ser. No. 250,217
Int. Cl.[4] E02B *3/22*
U.S. Cl. 405—215 **16 Claims**



1. A protective bumper comprising:
an elongated, resilient planar member;
suspension means for suspending the planar member at a predetermined position with respect to a stationary support;
connector means fixedly connected at a predetermined position along the length of the planar member for connecting the planar member to the suspension means;
means for initially slidably mounting the connector means on the planar member; and
means for locking the connector means in the fixed position on the planar member.

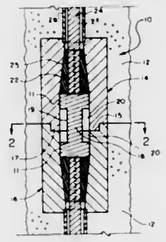
4,900,193

CONCRETE STRUCTURAL MEMBER SPLICING DEVICE

Alan G. MacKinnon, New Philadelphia, Ohio, assignor to The Foundation Equipment Corporation, Dover, Ohio

Filed Feb. 16, 1989, Ser. No. 311,968
Int. Cl.[4] E02D *5/10*
U.S. Cl. 405—252 **16 Claims**

1. A concrete structural member splicing device comprising:
a male connector;
a female connector;
a locking key member; and
locking means,
said male connector comprising a first elongated block, a first end of which is shaped, said block having an axial first hole passing therethrough, a portion of said first hole defining the shape of a frustum whose larger end lies toward said first end of said first block, while another portion of said first hole adjacent the larger end of the frustum-shaped portion, defines a first shaped chamber whose end lying opposite said frustum-shaped portion is provided with opposed ledge members transversely positioned relative to the longitudinal axis of said first hole;
said female connector comprising a second block with an axial second hole passing therethrough, a second shaped end of said second hole having dimensions adapted to receive the first end of said first block, while the portion of said second hole adjacent said second end defines a second shaped chamber whose end lying adjacent said second end is provided with opposed ledge members transversely positioned relative to the longitudinal axis of said second hole, while the other end of said second shaped chamber adjoins a portion of said second hole defining the shape of a frustum whose smaller end lies opposite said second end;
each of said first and second blocks being provided with a



keyway extending through opposite walls thereof, one end of said keyway being defined by the spacing between said opposed ledge members, while the other end of said keyway is defined by the cross-sectional shape of the shaped chamber adjacent said ledge members;
said locking key member comprising an elongate member that includes transverse end portions that are wider than a center portion connecting said end portions, said center portion being adapted to be inserted between said opposed ledge members of said male and female connectors, and said end portions being adapted to be inserted into the portion of said first and second shaped chambers adjacent said ledge members when the ledge members of said male and female connectors are positioned adjacent each other so that said first and second holes are co-axial, and
said locking means to grip prestressing elements of a concrete structural member so as to fasten said elements to said connectors.

4,900,194

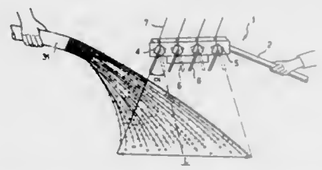
PORTABLE MACHINE AND PROCESS FOR FORMING GROUND STRUCTURES REINFORCED WITH TEXTILE THREADS

Michel Audouin, 06, Parc de Bearn, 92210 Saint Cloud, France

Filed Nov. 30, 1988, Ser. No. 278,184
Claims priority, application France, May 16, 1988, 88 06529
Int. Cl.[4] E02D *3/00, 17/20*
U.S. Cl. 405—258 **11 Claims**

1. Portable machine intended for spraying textile threads, in particular for constructing reinforced ground areas consisting of a three-dimensional mixture of such threads suitably entangled in the mixture and of a granular material delivered onto the area of ground in an accelerated jet with the aid of separate supply means, said machine being characterized in that it comprises a tube provided with a handle and ending in a head equipped with ejectors each of which has an ejection nozzle

fed with threads and receiving a supply of pressurized fluid intended to spray the threads out of the nozzles towards the



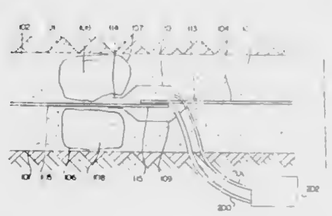
area of ground being formed, said ejectors being disposed on at least one distributor row with oscillating mounting.

4,900,195

METHOD AND APPARATUS FOR USE IN A SLURRY FILLED TRENCH FOR PROVIDING A SEALING SHIELD THEREIN

Aloys Schlütter, Kempen; Klaus Kaewert, Düsseldorf; Christian Witolla, Duisburg; Bernd Kopp, Wachtendonk, and Hans-Jürgen Rösler, Kerken, all of Fed. Rep. of Germany, assignors to Niederberg-Chemie GmbH, Neukirchen-Vluyn, Fed. Rep. of Germany

Filed May 31, 1988, Ser. No. 201,493
Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3717999; Jun. 23, 1987, 3720670
Int. Cl.[4] E02D *5/20*
U.S. Cl. 405—267 **37 Claims**



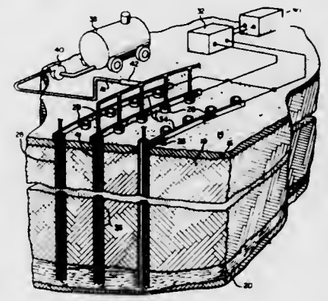
1. Method for use in an underground trench containing a slurry material, said method being for preparing for fastening of sealing strips placed in the underground trench, the underground trench having contained therein at least the slurry material for stabilizing the walls of the underground trench, said method comprising the steps of:
(a) digging an underground trench;
(b) at least partially filling the underground trench with a slurry material therein;
(c) lowering housing means into the slurry in the underground trench;
(d) lowering sealing strips vertically into the underground trench to locate the edges of adjacent strips in position to join adjacent edges of the adjacent strips to one another;
(e) placing said housing means on both sides of the sealing strips adjacent at least one of the adjacent edges of the adjacent strips to be joined; and
(f) pumping out the slurry material from within said housing means.

4,900,196

CONFINEMENT IN POROUS MATERIAL BY DRIVING OUT WATER AND SUBSTITUTING SEALANT

Jack E. Bridges, Park Ridge, Ill., assignor to IIT Research Institute, Chicago, Ill.

Filed Nov. 20, 1987, Ser. No. 123,603
Int. Cl.[4] E02D *27/00*
U.S. Cl. 405—267 **24 Claims**



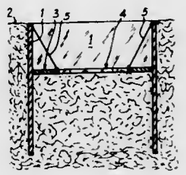
1. A method for providing confinement of material in a porous medium in the earth comprising
electrically heating a limited region of the porous medium by applying electric power between electrodes disposed in the earth to heat said region to temperature above that at which there is a substantial decrease in the conductivity of the material between the electrodes and below 300° C. to drive substantially all of the free water from open spaces of said medium in said region,
thereafter introducing into said open spaces in said medium hydrocarbonaceous material in a liquid state which will set into a substantially impermeable, substantially solid structure, and
setting said liquid material in said open spaces to form a substantially impermeable, substantially solid structure in said medium in said region.

4,900,197

PROCESS FOR HOLDING UP THE LATERAL WALLS OF DEEP DITCHES

Jacob Ward, Courbevoie, France, assignor to Soletanche, Nanterre, France

Filed Aug. 5, 1988, Ser. No. 229,224
Claims priority, application France, Aug. 7, 1987, 87 11308
Int. Cl.[4] E02D *29/04*
U.S. Cl. 405—273 **3 Claims**



1. A method for supporting and reinforcing support walls of deep excavations of predetermined cross-section including the steps of:
(a) securing support walls within the ground;
(b) freely removing earth from the ground within said support walls to establish a ditch of a predetermined first

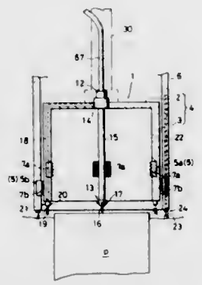
depth compatible with a predetermined resistance of said support walls;
(c) providing a generally ring-shaped plate having a substantial central opening and mounting said plate at the bottom of said ditch in a manner bearing against said support walls;
(d) connecting a series of braces from the top of said walls to said plate;
(e) further removing earth from the ground through said central plate opening to deepen said ditch to a predetermined second depth.

4,900,198

METHOD AND APPARATUS FOR REMOVING OLD PILE

Kouji Hoaki, Tokyo, Japan, assignor to Seisan Gijutsu Center Co., Ltd. and NKS Corporation, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,938
Claims priority, application Japan, Dec. 1, 1987, 62-301463; Feb. 13, 1988, 63-30080; Feb. 13, 1988, 63-30081
Int. Cl.[4] E02D *5/00*
U.S. Cl. 405—303 **7 Claims**



1. A method of removing an old pile comprising the steps of setting a casing to surround an upper end portion of the old pile embedded in the ground with a setting unit, setting a pile removal apparatus including a bucket capable of rotation in said casing and a chuck mechanism capable of being secured to said old pile so as to surround said pile upper end portion, radially substantially cutting a portion of said old pile with water jetted from said pile removal apparatus, chucking a portion of said old pile above said cut portion to said bucket with said chuck mechanism, securing said casing and bucket to each other, severing said pile portion above said cut portion by stress produced by causing swinging of said casing with said setting unit and removing said separated pile portion by raising said pile removal apparatus.

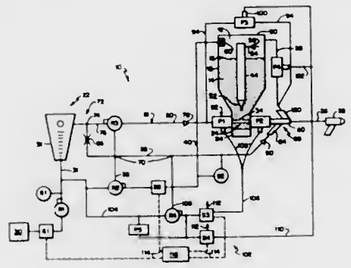
4,900,199

HIGH PRESSURE POWER FEED SYSTEM

Mark F. Spaulding, Rockville Centre, and Richard A. Goehring, Huntington Station, both of N.Y., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Oct. 21, 1988, Ser. No. 260,625
Int. Cl.[4] B65G *53/66*
U.S. Cl. 406—14 **30 Claims**

1. A powder feeding system useful for feeding powder to a thermal spray gun susceptible of producing substantial changes in back pressure to the feeding system, comprising, in combination:
an enclosed hopper for a powder;
carrier conduit means for conveying the powder in a carrier gas stream from a powder entrainment location in the hopper to a powder utilization device;
entrainment means for discharging a feed gas into the hopper at a regulated pressure such as to effect entrainment of the powder into the carrier gas stream at the entrainment location at a feed rate responsive to the regulated pressure;
hopper pressure means for pressurizing the hopper before feeding powder and exhausting the hopper after feeding powder;



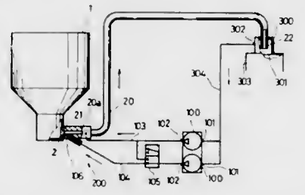
detection means for detecting carrier gas pressure in the carrier conduit mean and;
feed regulator means responsive to the carrier gas pressure for effecting the regulated pressure equal to the carrier gas pressure increased by a selected feed pressure increment.

4,900,200

METHOD FOR TRANSPORTING POWDERED OR GRANULAR MATERIALS BY PNEUMATIC FORCE WITH A TRANSPORT PIPE OF SMALLER DIAMETER RELATIVE TO PARTICALE SIZE

Kimura Harumoto, Hirakata, and Tanigawa Toyoaki, Takatsuki, both of Japan, assignors to Matsui Manufacturing Co., Ltd., Osaka, Japan

Filed Jan. 22, 1988, Ser. No. 210,078
Int. Cl.[4] B65G *53/04*
U.S. Cl. 406—93 **29 Claims**



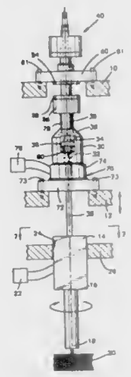
1. A method for transporting powdered or granular materials by pneumatic force with a transport pipe of small diameter relative to particle size, in use for an apparatus for transporting powdered or granular materials by the pneumatic power wherein the powdered or granular materials in a storage vessel are transported through the transport pipe to a destination by the pneumatic force from a pneumatic force source, characterized in that the transport pipe of smaller diameter, having a bore 2–6 times as long as maximum length of particle of the powdered or granular materials to be transported, is used, and the powdered or granular materials, being kept to float at an inlet or in the vicinity of the inlet of transport pipe, are transported through the transport pipe.

4,900,201

DRILL SPINDLE DEPTH ADJUSTMENT

John L. Dantoa, Endicott; Albert F. Klaiber, III, Chenango Forks, and Richard A. Terboss, Binghamton, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 6, 1989, Ser. No. 318,880
Int. Cl.[4] B23B *41/00*
U.S. Cl. 408—129 **12 Claims**



1. In a drilling device for drilling blind holes to a preselected depth in a work piece, which drilling device has a drill member rotatably driving a spindle, which spindle secures a drill bit, a mechanism for adjusting the depth to which a hole is drilled comprising,
guide means mounting said drill member for axial movement to perform a drilling operation;
a rod member secured to and extending from said drill member and movable axially therewith,
an adjustable member mounted on said rod member and selectively movable thereon to provide relative axial movement of said rod member and said adjustable member,
adjusting means connected to said adjustable member and said rod member to move said adjustable member with respect to said rod member to thereby cause said relative axial movement of said rod member and said adjustable member,
and actuating means connectable to said adjustable member to reciprocally drive said adjustable member between a retracted position and a fully actuated position to thereby provide drive actuation for said rod member,
whereby relative movement of the adjustable member and the rod member changes the fully actuated position of said drill bit upon actuation.

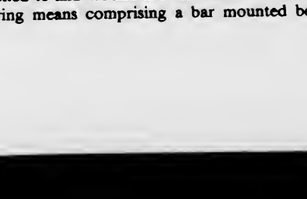
4,900,202

CHUCK ASSEMBLY FOR TOOL BITS

James L. Wienhold, 11800 Briar La., Minnetonka, Minn. 55343

Filed Sep. 8, 1988, Ser. No. 241,710
Int. Cl.[4] B23B *31/04*
U.S. Cl. 408—240 **6 Claims**

1. A quick release chuck assembly for a tool bit having a shank and a groove extending circumferentially about the shank with a radiused portion, the chuck assembly comprising:
a spindle including,
a forward face,
a longitudinal bore into the spindle from the forward face having an inner end for receiving the shank of the tool bit,
a plurality of radial bores communicating with the longitudinal bore, and
a detent ball disposed in each radial bore and extendible into the longitudinal bore and against the groove of the shank of the tool bit;
a sleeve disposed around the spindle including,
a forward bore disposed around the spindle for receiving the detent balls when the balls are moved out of the longitudinal bore,
a radially inwardly extending shoulder adjacent the forward bore for engaging and urging the balls into the longitudinal bore and against the groove of the shank,
a rear bore with the shoulder being disposed between the forward bore and the rear bore,
the shoulder further including a substantially minimum diameter center bore permitting free translation of the sleeve around the spindle and a concentrically graduated portion between the forward bore and the center bore, and



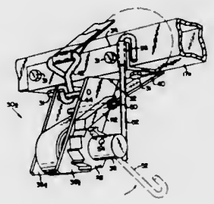
the concentrically graduated portion further including a first intermediate bore between the center bore and the forward bore which is larger in diameter than the center bore and smaller in diameter than the forward bore; and
a spring for biasing the sleeve against the detent balls causing the shoulder to contact the balls to urge the detent balls forward against the interior walls of the radial bores generating responsive tangential forces through the detent balls against the radiused portion of the groove and further to urge the detent balls into the longitudinal bore and against the shank whereby the detent balls are positionally locked between the shoulder, the shank and the radial bores;
whereby the shank of the tool bit is locked in position with substantially no end play between the detent balls and the inner end of the longitudinal bore.

4,900,203

LOAD-TIE-DOWN SYSTEM AND WINCH ASSEMBLY

Ronald W. Pope, 6287 Firwood Dr., West Linn, Oreg. 97068

Filed Sep. 22, 1988, Ser. No. 247,629
Int. Cl.[4] B61D *45/00*; A44B *11/25*; B60R *9/00*
U.S. Cl. 410—36 **9 Claims**

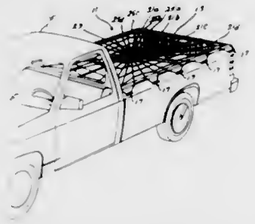


8. A winch assembly comprising:
a winch frame having a crosspiece and two struts projecting downward from the crosspiece;
a winch drum rotatably mounted between the two struts of the winch frame;
a belt having a hook attached to one end and a second end attached to and wound around the winch drum;
anchoring means comprising a bar mounted between the

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two struts of the winch frame around which the hook may attach;
locking means to restrain the rotation of the winch drum; and
the winch drum and anchoring means located so that the belt may extend around the crosspiece and then anchor on the winch frame.

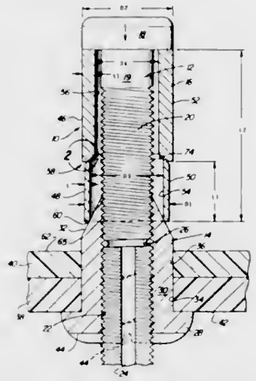
4,900,204
ELASTIC SPIDER WEB CARGO RESTRAINT DEVICES
Robert M. Summers, Redmond, Wash., assignor to Spidy Gear International, Inc., Woodinville, Wash.
Filed Apr. 14, 1989, Ser. No. 338,807
Int. Cl.[4] B61D *45/00*
U.S. Cl. 410—97 **14 Claims**



1. An elastic, spider web shaped, cargo restraint device, comprising:
a center device;
at least two spaced-apart concentric loops formed of tough, elongate, stretchable material surrounding said center device;
a plurality of radial arms also formed of tough, elongate, stretchable material affixed to and extending outwardly from said center device; and
attachment means for attaching said radial arms to said loops where said radial arms cross said loops.

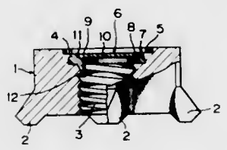
4,900,205
BLIND FASTENER FORMING A BLIND HEAD WITH A LARGE EFFECTIVE AREA
Shahriar M. Sadri, El Torro, Calif., assignor to Huck Manufacturing Co., Irvine, Calif.
Filed Aug. 15, 1988, Ser. No. 232,593
Int. Cl.[4] F16B *13/04, 13/06*
U.S. Cl. 411—38 **10 Claims**

1. A blind fastener for securing a plurality of workpieces at a desired clamp load with the workpieces having aligned openings therein and having an accessible surface and a blind side surface, said fastener comprising:
a pin member having an elongated pin shank terminating at one end in an enlarged pin head;
a main sleeve member having an elongated sleeve shank terminating at one end in an enlarged head adapted to engage the accessible surface on one of the workpieces, said sleeve shank portion terminating at its opposite end in a nose portion, said sleeve shank portion adapted to be located in the aligned bores in the workpieces, said main sleeve member having a first central through bore adapted to receive said pin shank,
a stop surface located generally at the blind side surface on one of the workpieces,
an expandable sleeve member having a second central through bore and being located on said pin shank adjacent said pin head,
said expandable sleeve member having a primary sleeve portion located adjacent said pin head and a secondary sleeve portion located adjacent said nose portion of said main sleeve member,
a frangible section connecting said primary and secondary sleeve portions,
said fastener adapted to be set by a relative axial force applied between said pin member and said expandable sleeve,
said frangible section constructed to fracture and to separate said primary and secondary sleeve portions at a first preselected magnitude of relative axial force after said secondary sleeve portion has moved axially over said nose portion and has engaged said stop surface,



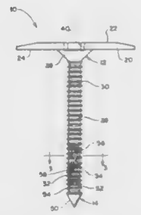
said secondary sleeve portion initiating buckling at a second preselected magnitude of said relative axial force and thereafter being generally flattened as said relative axial force increases to define an enlarged flattened blind head bearing against the blind side surface over substantially the full area of said flattened blind head, said first preselected magnitude of said relative axial force being less than that required to set said fastener at the desired clamp load and generally no less than said second preselected magnitude whereby said primary sleeve section operates on said secondary sleeve portion through said frangible section generally until buckling begins.

4,900,206
NUT WITH COVER
Hiroshi Kazino, Komaki, and Masaaki Ide, Aichi, both of Japan, assignors to K. K. Aoyama Seisakusho, Nagoya, Japan
Filed Feb. 22, 1989, Ser. No. 313,501
Claims priority, application Japan, Feb. 27, 1988, 63-25494[U]
Int. Cl.[4] F16B *37/14*
U.S. Cl. 411—377 **2 Claims**



1. A nut with a cover, comprising: a main nut body having an internally threaded portion, and a stepped recess formed in the body adjacent the upper end of the internally threaded portion, the wall of the stepped recess being shaped to define an inward ledge; and a cover of synthetic resin formed within the stepped recess by injection molding, the cover including a ring-like mounting frame, and a covering plate connected to the mounting frame by means of an integral hinge portion.

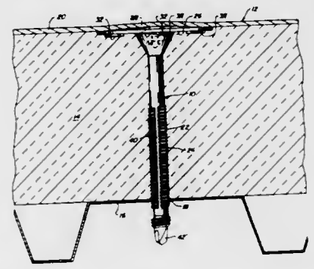
4,900,207
SELF-DRILLING FASTENER
Hubert T. McGovern, Westfield, Mass., assignor to Arthur Jacobson, West Springfield, Mass.
Filed Feb. 6, 1989, Ser. No. 306,552
Int. Cl.[4] F16B *25/00, 35/02*
U.S. Cl. 411—383 **3 Claims**



1. A self-drilling fastener for fastening a material to a metallic structure comprising:
fastener body means having a one piece molded construction comprising a head portion and an integral shank axially projecting from said head portion and terminating at a distal end, said head portion comprising a radially extending retaining plate nd torque coupling means for rotatably coupling an applied torque to said head portion comprising an axially extending polygonally shaped first socket having a first maximum diameter, said shank comprising a threaded portion and defining a second socket opening through said distal end, said second socket having a maximum diameter substantially less than said first diameter; and
self-drilling means for tapping into the metallic structure for threadable penetration thereof, said self-drilling means being constructed of a hardened metallic material and comprising a tapered point, an axially extending threaded body having a diameter generally commensurate with the diameter of said shank and extending from said point to a proximal end, and axially extending lug means integrally projecting from said proximal end for close reception in said second socket,
so that said fastener body means and said self-drilling means are rotatably drivable as a unit upon application of a torque to said torque coupling means.

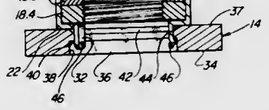
4,900,208
ROOFING FASTENER
Norbert O. Kaiser, 1627 S. Ridge Dr., Arlington Heights, Ill. 60005, and Eric W. Balinski, 62 Hemlock Hill, Dalton, Mass. 01226
Filed Jun. 9, 1988, Ser. No. 204,360
Int. Cl.[4] F16B *25/00*
U.S. Cl. 411--387 **15 Claims**

1. A fastener for insulated roofing which comprises a nonmetallic, screw-threaded shank, a penetrating point at one end of said shank, and a transverse plate carried at the other end of said shank, said shank and transverse plate being integrally molded out of a polyetherimide resin formulation which has a tensile strength of at least 15,000 psi as tested by ASTM D638, in which the penetrating point of said nonmetallic, screw-threaded shank comprises a core of said resin formulation



integral with the remainder of said shank, said core being coated with metal plating.

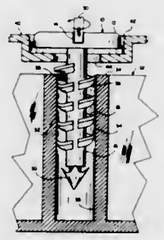
4,900,209
NUT AND WASHER SINGLE ASSEMBLY STRUCTURE
Richard L. Reynolds, Grosse Pointe Shores, Mich., assignor to Pac-Fasteners, Southfield, Mich.
Filed Aug. 4, 1988, Ser. No. 228,165
Int. Cl.[4] F16B *37/04, 37/08*
U.S. Cl. 411—432 **47 Claims**



1. A nut and washer combination for providing a connectable assembly comprising:
a nut structure including a heat treated nut member and an external cage,
said nut member having a threaded bore,
a washer member heat treated separately from said nut member and having a washer bore at least as large as said threaded bore,
said washer bore having first and second bore portions,
gripping means on said cage for gripping said nut member,
connecting means on said cage and said washer member for connecting said nut structure to said washer member with said washer bore being generally concentric with said threaded bore after said nut member and said washer member have been heat treated as separate elements,
said connecting means including holding means at said first bore portion of said washer bore and resilient means on said cage having an engaging portion defining an interference with said second bore portion of said washer bore and being radially resilient to permit radial deflection past said interference allowing axial movement of said engaging portion into said washer bore and in engagement with said holding means to connect said nut structure and said washer member for free spinning relative to each other.

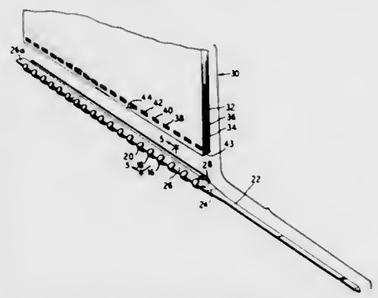
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4,900,210
PUSH IN-SCREW OUT FASTENING SYSTEM
Jeffery J. Buchanan, Lexington, and Terrance A. Cassity, Paris, both of Ky., assignors to Square D Company, Palatine, Ill.
Filed Jul. 19, 1989, Ser. No. 384,607
Int. Cl.[4] F16B *19/00*
U.S. Cl. 411—508 **7 Claims**



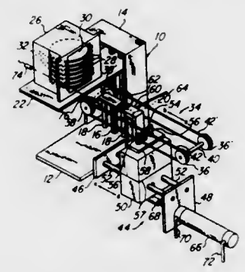
1. A fastening system comprising:
a fastener means having a drive head and a threaded shank means, said threaded shank means including a plurality of resilient thread segments;
receptacle means defining an orifice that is smaller than the greatest distance across said thread segments such that said resilient thread segments are deformed when said fastening means is inserted in said receptacle means; and
thread engaging means in said receptacle means for engaging said thread segments and imparting a removal force to said fastener means upon rotation thereof.

4,900,211
APPARATUS FOR BINDING MATERIALS USING A CURLED-FINGER RING-TYPE BINDER
Alfredo J. Vercillo, Harwood Heights, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed May 3, 1989, Ser. No. 346,919
Int. Cl.[4] B42B *5/08*
U.S. Cl. 412—38 **8 Claims**



1. A tool for use in opening a edge-type curled-finger ring-binder having an elongated spine and a plurality of spaced transversely extending binding fingers, each of said fingers having an end integral with one side of the spine and being curled so that the free end thereof can resiliently engage the other edge of the spine, wherein the tool comprises:
a leading section having a length at least as long as a binder spine and a width less than the distance from said spine to an opposed portion of a finger;
a trailing section having a length at least as long as a binder spine and a width greater than the distance between said spine and an opposed portion of a finger;
an intermediate section for joining said leading section and trailing section;
whereby when said tool is axially pulled through said binder, the finger free ends are spread from said spine so as to permit binding of apertured sheets.

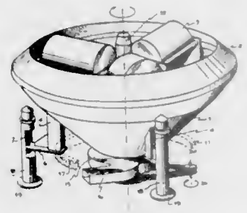
4,900,212
WAFER PICK OUT APPARATUS
Takanori Mikahara, Tachiura, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 91,303, Aug. 26, 1987, abandoned, which is a continuation of Ser. No. 826,935, Feb. 6, 1986, abandoned. This application Dec. 12, 1988, Ser. No. 284,802
Claims priority, application Japan, Feb. 15, 1985, 6027707
Int. Cl.[4] B65G *1/06*
U.S. Cl. 414—416 **6 Claims**



1. An apparatus for storing a plurality of articles, each having a surface portion, and conveying selected ones of the articles to a desired position, said apparatus comprising:
means for storing said plurality of articles in a vertical columnar arrangement, successive articles being spaced from each other to define a gap between adjacent articles;
means for conveying said articles to said desired position, said conveying means including a pair of endless conveyance members running between the storing means and the desired position; and
means operative to at least partially enter said storing means for moving any one of said plurality of articles as a selected one of said articles from the storing means to a predetermined position with respect to said conveying means, said operative means being positioned and shaped to fit between the pair of endless conveyance members.
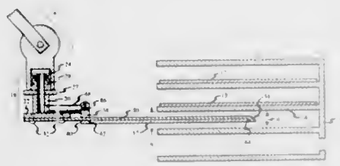
4,900,213
CENTRIFUGAL MACHINE FOR DISCHARGING VISCOUS PRODUCTS FROM CYLINDRICAL CONTAINERS
Amadeo A. Rossi, Mendoza, Argentina, assignor to Industrias Arquimides Rossi S.A., San Jose, Argentina
Filed Dec. 14, 1988, Ser. No. 284,406
Int. Cl.[4] B65G *65/00*
U.S. Cl. 414—416 **3 Claims**

1. Centrifugal machine for discharging viscous products from containers, wherein said products are wastes from juices or pulps of vegetables, fruits or the like, which remain adhered to the inner surfaces of generally cylindrical containers having variable capacity ; said machine being comprised by a hanging structure supporting a large inverted bin rigidly connected thereto and having a vertical axis, in the interior of which a coaxial axle rotates coupled to an electrical engine the housing of which is rigidly joined to the same structure; said axle being mounted through bearing means preventing relative displacements, except rotations, with respect to said structure, said axle being rigidly connected to a rotary support having at least two supporting formations for respective containers arranged with their longitudinal axes at radial, horizontal positions, and oriented for balancing their weights, having their access openings without the cover and oriented outwardly, such as to drive by



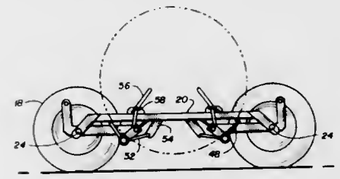
centrifugal force the separated products towards the higher diameter edge of the bin, from which a frusto-conical flange projects upwardly and inwardly which also receives the exhausted products, all of which slide through the cited bin downwardly up to a final exhaust centrifugal turbine.

4,900,214
METHOD AND APPARATUS FOR TRANSPORTING SEMICONDUCTOR WAFERS
Jan I. Ben, Lawrenceville, assignor to American Telephone and Telegraph Company, New York, N.Y.
Filed May 25, 1988, Ser. No. 198,347
Int. Cl.[4] B65G *1/06*
U.S. Cl. 414—416 **7 Claims**



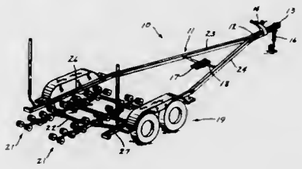
4. Apparatus for releasably engaging a wafer, characterized by:
a frame;
an elongated arm mounted to said frame and extending outwardly therefrom, said arm having a longitudinally extending slot which extends therethrough;
a first jaw depending from said arm at a point distant from said frame, said first jaw adapted to engage a portion of the edge of the wafer;
a second jaw extending entirely through said slot so as to extend above said arm and having a jaw portion depending below said arm, said second jaw slidably mounted for movement in the slot with said depending jaw portion movable along the underside of said arm to and from the first jaw for engaging a portion of the edge of the wafer opposite to the portion engaged by said first jaw; and
fluid cylinder means connected between said frame and said portion of said second jaw which extends above said arm for displacing said second depending jaw portion towards said first jaw to capture the wafer therebetween.

4,900,215
POWERED TOWING DOLLY FOR VEHICLES
Charles P. Nowell, 1302 Adams St., Salinas, Calif. 93906
Filed Nov. 9, 1988, Ser. No. 268,787
Int. Cl.[4] B60B *29/00*
U.S. Cl. 414—428 **8 Claims**



1. A lifting dolly for vehicle towing, said dolly comprising:
a pair of spaced parallel members, each member in said pair being positionable on the ground and adjacent the periphery of tires on a vehicle axle;
a pair of substantially identical dolly wheel assemblies, at least one of said assemblies including:
a substantially horizontal base member positioned perpendicular to the longitudinal axes of said parallel members;
a crank member located at each end of said base member and having an upper extending arm joined to a downward depending arm;
pivoting means connecting each end of said base member with said crank member at a point near the joining of said arms, said pivoting means enabling said crank member to rotate about an axis parallel with the longitudinal axes of said spaced parallel members, said pivoting means also being an axle for a dolly wheel;
socket means attached to the end of each of said downward depending arms for receiving an end of one of said pair of spaced parallel members; and
linearly extendible means coupled between the ends of the upper extending arms of said crank members, the extension of said extendible means causing the depending arms of said crank members to pivot inward and to raise said pair of spaced parallel members.

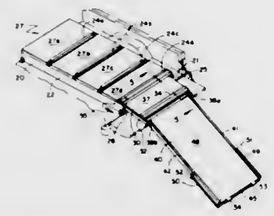
4,900,216
BOAT TRAILER HULL SUPPORT SWIVEL ROLLER CLUSTER
Byron L. Godbersen, Lake LaJune Estates, Ida Grove, Iowa 51445
Filed May 15, 1989, Ser. No. 351,926
Int. Cl.[4] B60P *3/10*
U.S. Cl. 414—534 **8 Claims**



1. In a wheel trailer for boats adapted to be connected to a prime mover, having a pair of frame members converged at one end of each member and diverged at the other ends, a cross member extended between and connected to the frame members at the diverged ends, the improvement of a roller assembly comprising:
elongated means having opposed aligned ends;
means mounting said elongated means on the cross member

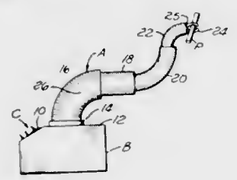
whereby said elongated means extend in a direction parallel the longitudinal axis of the trailer;
a non-metallic block rotatably mounted on each of said opposed ends for rotation in a generally vertical plane extended transverse the longitudinal axis, and with opposed flat faces on either side thereof, said faces disposed in planes generally parallel to the trailer longitudinal axis;
first and second roller assemblies each having a mounting element with at least one roller mounted thereon for rotation about a generally horizontal axis disposed normal to the trailer longitudinal axis and having a non-metallic plate on said mounting element with a flat surface for mating engagement with one of said block faces;
first pin means pivotally mounting each of said roller assemblies to opposite faces of said block off-center thereof; and
second pin means connecting each said block and said roller assemblies as a unit on each opposed end of said elongated means and providing lost-motion movements between said plates and said block, whereby said roller assemblies are pivotal relative to said block about generally horizontal axes extended normal to the trailer longitudinal axis.

4,900,217
STOWABLE, MULTIPLE GRADE RAMPING DEVICE
Jon N. Nelson, Rte. 1, Box 1000, Stewartville, Minn. 55976
Filed Jul. 15, 1988, Ser. No. 219,920
Int. Cl.[4] B65G *67/02*
U.S. Cl. 414—537 **11 Claims**



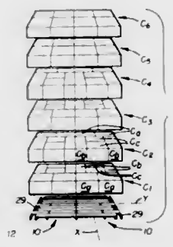
1. A retractable and extendable cargo bearing ramping device adapted to provide a plurality of ramping grades for the ramping of cargo onto a vehicle equipped with a cargo bed and an adjustable cargo access entryway which may be adjustably positioned to provide an extended cargo bed, said device comprising an elongated carrier frame member with said member including a cargo bearing platform for emplacement within said bed, a first longitudinally extending track guide and a second longitudinally extending track guide positioned in a substantially parallel relationship to said first guide, with said first track guide including a first adjacently positioned tracking guide portion having an access opening for receiving and guiding a track following guide thereupon and said second track guide including a second adjacently positioned tracking guide portion having an access opening for receiving and guiding a track following guide thereupon; an entryway extension unit adapted to telescopically engage onto and extend from said member onto an extended cargo bed of a vehicle, with said unit including a pair of longitudinal and parallel track guides and a pair of track following guides which correspondingly slideably engage and register onto said first track guide and said second guide of said member; a ramp end section fitted with a rearwardly pair of track following guides which respectively correspondently register onto said first adjacently positioned portion of said first guide and said second adjacently positioned portion with said section cooperatively engaging and contacting onto said unit and said member in a telescopically slideably relationship therebetween so as to respectively permit the unit and the section to telescopically extend from the member for the ramping of cargo thereupon and retract to a stowable position within said member; and means within said member for elevating the unit in a telescopically extended position to an intermediate ramping grade in relationship to the ramping grade afforded by the telescopically extended ramp end section to provide a cargo bearing ramping device wherein the ramping grade differential between the cargo bearing platform, the intermediate ramping grade of the unit and the ramping grade of the end section form a plurality of gradational ramping grades so as to permit a wheeled cargo of a low clearance to more effectively traverse and clear the ramping grades thereof.

4,900,218
ROBOT ARM STRUCTURE
Ivan E. Sutherland, 5139 Penton Rd., Pittsburgh, Pa. 15213
Continuation of Ser. No. 483,021, Apr. 7, 1983, abandoned. This application Jun. 18, 1985, Ser. No. 746,222
Int. Cl.[4] B25J *18/06*
U.S. Cl. 414—729 **4 Claims**



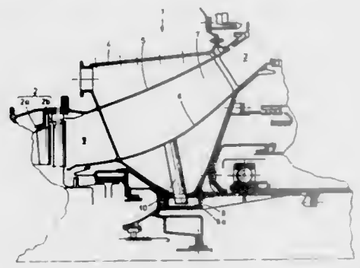
1. An elongate flexible load structure comprising:
a first helical member of plural turns and comprising flexible material;
a second helical member of plural turns and comprising flexible material, said first and second helical members being matingly interleaved;
means for interconnecting plural turns of said first helical member with plural turns of said second helical member; and
plural force means for driving said means for interconnecting whereby to attain specific space relationships between said interleaved turns.

4,900,219
CARTON LOADING AND UNLOADING METHOD WITH ADJUSTABLE PALLET
Michael J. Azzopardi, 14154 Reservation Rd., Salinas, Calif. 93908, and John W. Skelton, 46 Nacional St., Salinas, Calif. 93901
Filed Jul. 29, 1988, Ser. No. 226,045
Int. Cl.[4] B65G *57/24, 63/00*
U.S. Cl. 414—786 **14 Claims**



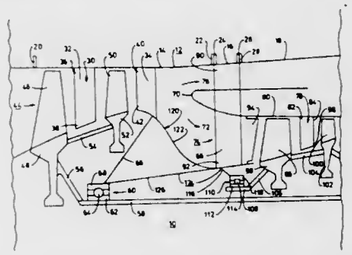
14. A method for transferring cartons filled with produce from a field to a loading dock and loading said cartons into the cargo space of a transport vehicle comprising the steps of
filling a plurality of erected cartons with produce harvested at a field site and closing said cartons, each of said cartons having a standard height, width and length,
stacking and filled cartons in layers to a predetermined composite height and in fully supported relationship on a pallet to form a palletized carton stack, the width of said pallet being preadjusted to fully support said cartons thereon and said pallet disposed on a longitudinal axis thereof,
first moving said palletized carton stack to a cooling facility to maintain said produce at a predetermined low temperature for preservation purposes,
second moving said palletized carton stack to said loading dock,
squeezing the cartons of an adjacent pair of palletized carton stacks simultaneously to reduce the composite width of said cartons to fit the width of said cargo space, and
loading said palletized carton stacks into the cargo space of said transport vehicle, including simultaneously loading said adjacent pair of palletized carton stacks into the cargo space of said transport vehicle by a single lift truck.

4,900,220
TURBO-ENGINE EXHAUST GAS HOUSING WITH TEMPERATURE CONTROL DEVICE
Michel S. Guimier, Mormant; Patrick Kapala, Claye Souilly, and Philippe Paris, Le Mee sur Seine, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France
Filed Apr. 10, 1989, Ser. No. 335,954
Claims priority, application France, Apr. 13, 1988, 88 04860
Int. Cl.[4] F01D *19/02*
U.S. Cl. 415—136 **3 Claims**



1. A temperature control device in a unitary exhaust gas housing for a turbo-engine comprising an outer ring, two intermediate rings defining the flow path for the hot gases, shaped struts interconnecting said intermediate rings, and an inner ring forming a hub of said housing, said hub defining a closed annular chamber, said temperature control device comprising a bleed tube for drawing off gas from the gas stream in said gas flow path, said tube extending into said closed annular chamber formed by said hub, said tube having a fixed first end in communication with said gas flow path and a second end disposed in said annular chamber, and a wall of said hub spaced from said second end of said tube by a clearance j whereby the flow of gas entering said annular chamber from said gas stream is regulated by variations in said clearance j resulting from radial movements of the tube and the hub relative to one another caused by their thermal state.

4,900,221
JET ENGINE FAN AND COMPRESSOR BEARING SUPPORT
John J. Clokajlo, Cincinnati, Ohio, and Henry B. Ritchie, Ft. Pierce, Fla., assignors to General Electric Company, Cincinnati, Ohio
Filed Dec. 16, 1988, Ser. No. 285,570
Int. Cl.[4] F04D *29/60*
U.S. Cl. 415—142 **8 Claims**



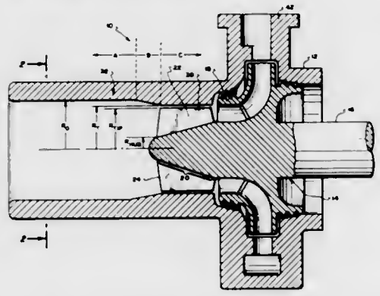
1. A bypass turbofan jet engine subassembly comprising:
(a) an engine outer duct;
(b) a row of structural fan stators each having a radially outermost end attached to said engine outer duct and each having a radially-innermost end;
(c) a fan rolling element bearing assembly having a fan outer race;
(d) fan-related means for attaching said stator innermost ends to said fan outer race, said fan-related means radially disposed generally entirely inward of said stators;
(e) a row of structural compressor guide vanes each having a radially outermost end extended and attached to said engine outer duct and each having a radially innermost end;
(f) a compressor rolling element bearing assembly having a compressor outer race;
(g) compressor-related means for attaching said guide vane innermost ends to said compressor outer race, said compressor-related means radially disposed generally entirely inward of said guide vanes; and
(h) inter-bearing support means for structurally supporting an axial load between said fan outer race and said compressor outer race, said inter-bearing support means radially disposed generally entirely inward of said stators.

4,900,222
ROTARY PUMP INLET VELOCITY PROFILE CONTROL DEVICE
Sen Y. Meng, Reseda, Calif., and Raymond B. Furst, Vernon, France, assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Dec. 23, 1988, Ser. No. 289,123
Int. Cl.[4] F04D *13/12*
U.S. Cl. 415—143 **2 Claims**

1. A rotary pump, comprising:
a housing;
a rotor rotatably attached to said housing having an upstream end with a hub surface of revolution thereon;
a plurality of rotor blades extending radially from said hub surface, each rotor blade having a leading edge, each leading edge intersecting said hub surface at substantially the same axial position, said intersections defining a first circle with a radius being the leading edge hub radius, R_{HUB}, each rotor blade terminating in a tip, said tips defining a second circle having a radius, R_{TIP}; and
a flow duct attached to said housing for introducing flow into said rotor, said flow duct having a first section upstream said rotor with a substantially constant radius, R_o,

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a convergent second section downstream said first section but upstream said tips, and a third section downstream

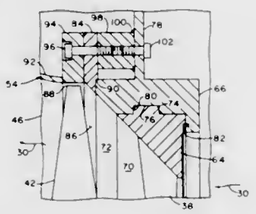


said second section having a radius R_T being approximately equal to R_{TIP}, said flow duct having a geometry defined by the relationship,

$$R_o = R_T\left\{\frac{(n+1)(2n+1)}{2n^2}\cdot\frac{(1-\sigma^2)}{K}+\sigma^2\right\}^{\frac{1}{2}}, \text{ where}$$

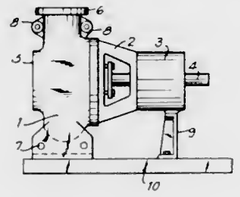
$n=2$ where $Re \leqq 2300$,
$n=2+0.00432\ (Re-2300)$ where $2300<Re<3200$, and
$n=3Re^{1/12}$ where $Re>3200$;
$\sigma=R_{HUB}/R_T$, and,
$0.8 \leqq K \leqq 1$.

4,900,223
STEAM TURBINE
John C. Groenendaal, Jr., Winter Springs, Fla., assignor to Westinghouse Electric Corp, Pittsburgh, Pa.
Filed Feb. 21, 1989, Ser. No. 312,282
Int. Cl.[4] F01D *9/04, 3/02*
U.S. Cl. 415—190 **11 Claims**



1. A steam turbine wherein steam axially flows along a path through stationary blades and rotatable blades radially extending in the steam flow path and then through an exhaust guideway, the steam turbine having:
- a casing;
- an outer blade ring supporting a row of radially extending stationary blades, the outer blade ring having a generally conical flow-guiding surface for outwardly guiding the steam as it flows through the row of stationary blades;
- a carrier ring fixedly mounted in the casing and radially juxtaposed around the outer blade ring for supporting the outer blade ring, the carrier ring having a flow-guiding surface axially adjacent to and extending outwardly from the flow-guiding surface of the outer blade ring;
- a spacer ring axially adjacent to the carrier ring, the spacer ring having a flow-guiding surface adjacent to and extending outwardly from the flow-guiding surface of the carrier ring;
- a row of rotatable blades, each rotatable blade having a tip adjacent the spacer ring flow-guiding surface, the tips radially extending beyond the outer blade ring; and
- an exhaust flowguide axially adjacent the spacer ring.

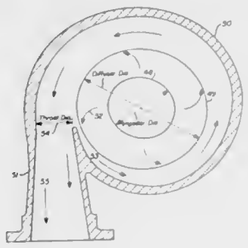
4,900,224
CENTRIFUGAL PUMP STRUCTURE
Jukka Timperi, Kasilanpolku 18 A 7, SF-48400 Kotka, and Reijo Vesala, Lohniementie 29, SF-48300 Kotka, both of Finland
Filed Mar. 14, 1989, Ser. No. 323,342
Claims priority, application Finland, Mar. 15, 1988, 881203
Int. Cl.[4] F04D *29/62;* **F16M** *7/00*
U.S. Cl. 415—213.1 **16 Claims**



1. A centrifugal pump structure comprising an impeller casing (1) with a suction inlet opening (5) and a pressure outlet opening (6), a pump body (2), a bearing housing (3), and a longitudinally extending shaft (4) for rotatably mounting an impeller within said impeller casing, wherein the impeller casing (1) is provided with legs (7, 17) for mounting the pump on a bed (10), characterized in that the legs (7, 17) are situated spaced apart at the opposite side of the pump to the pressure outlet opening (6) and on opposite sides of a longitudinal plane passing through the pump shaft (4) and the pressure outlet opening (6); said legs (7, 17) each having first and second planar surfaces (27, 37) extending in different directions for mounting of the pump; and further including on opposite sides of the pressure outlet opening (6) brackets (8) with planar mounting surfaces (18, 28) lying substantially in said longitudinal plane.

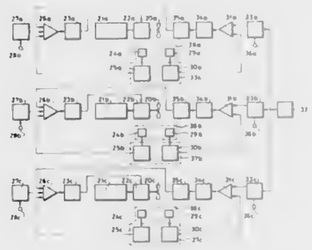
4,900,225
CENTRIFUGAL COMPRESSOR HAVING HYBRID DIFFUSER AND EXCESS AREA DIFFUSING VOLUTE
James B. Wulf, Williamsville; Timothy D. Craig, Buffalo; Alfred P. Evans, Orchard Park, and Ross H. Seatz, Williamsville, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Mar. 8, 1989, Ser. No. 320,605
Int. Cl.[4] F04D *29/42*
U.S. Cl. 415—224.5 **6 Claims**

1. A centrifugal compressor comprising:
(A) a rotatable shaft;
(B) an impeller wheel mounted on the shaft;
(C) a diffuser extending radially from a diffuser entrance at the impeller wheel to a diffuser exit at a volute, said diffuser having a tapered section extending from the diffuser entrance to an intermediate point and a straight section extending from the intermediate point to the diffuser exit, said tapered section having a constant diffusing area along its radial length and said straight section having an increasing diffusing area along its radial length; and



(D) a volute throat area within the range of from 70 to 90 percent of the area of the diffuser exit.

4,900,226
CONTROL SYSTEM FOR SYNCHROPHASING AIRCRAFT PROPELLERS
Luitzen de Vries, Amstelveen, Netherlands, assignor to Fokker Aircraft B.V., Netherlands
Filed Nov. 19, 1987, Ser. No. 122,944
Claims priority, application United Kingdom, Oct. 28, 1987, 8725268
Int. Cl.[4] B64C *11/50*
U.S. Cl. 416—34 **18 Claims**

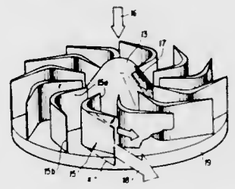


1. Control system for synchrophasing the propellers of an aircraft, each propeller provided with a blade pitch controller for controlling the blade angle of the propeller, the system containing for each propeller a control loop, comprising:
- a revolution rate controller, generating an output signal to the blade pitch controller,
- means for determining the blade passing frequency of the propeller,
- an adjustable propeller revolution rate reference source supplying a revolution rate setpoint control signal,
- comparator means for comparing the blade passing frequency with said setpoint to generate an error signal for said revolution rate controller,

the control system furthermore comprises for each propeller:
- means for determining the position of the propellor blades,
- a reference signal source,
- adjustable means for deriving a selected phase reference signal from said reference signal source by changing the phase thereof,
- a comparator to compare the sensed position of the propeller blades with said phase reference signal, providing a control signal to be combined with the output signal of the revolution controller,

and that the system furthermore comprises means to adjust said propeller revolution rate reference source and said phase reference signal deriving means such that for each revolution rate setpoint a predetermined mutual phase relationship between the propellers are maintained.

4,900,227
WIND POWER OF HYDRAULIC POWER MACHINE WITH AXIAL FEED, RADIAL OUTFLOW, AND VARIABLE GEOMETRY VANES, AND PROJECTILES FITTED WITH WIND POWER OR HYDRAULIC POWER MACHINES OF THIS TYPE
Claude Trouplin, La Ferte St Aubin, France, assignor to Thomson-Brandt-Armements, Boulogne Billancourt, France
Filed Jun. 13, 1989, Ser. No. 365,411
Claims priority, application France, Jun. 14, 1988, 88 07907
Int. Cl.[4] F01D *7/02*
U.S. Cl. 416—132 B **4 Claims**



1. A wind power or hydraulic power machine with axial feed, radial outflow and variable geometry vanes, of the type having an inflow, a separator creating a driving flow for the vanes, wherein a base solidly joined to the unit is placed beneath the vanes, each formed by a part fixed to the base and extended by a deformable and movable fin on this very same base, to fulfil at least three functions, namely:
- providing for channelling the outflow from the wind power or hydraulic power machine in limiting the risks of escape flow;
- providing for a regulation of the speed of the wind power or hydraulic power machine by means of the deformation of the fins of the vanes;
- providing mechanical protection to the vanes while, at the same time, enabling their deformation.

4,900,228
CENTRIFUGAL FAN WITH VARIABLY CAMBERED BLADES
Martin G. Yapp, Needham, Mass., assignor to Airflow Research and Manufacturing Corporation, Watertown, Mass.
Filed Feb. 14, 1989, Ser. No. 310,664
Int. Cl.[4] F04D *29/20*
U.S. Cl. 416—183 **8 Claims**



1. A centrifugal blower comprising an impeller mounted to rotate on an axis, said impeller comprising a plurality of rearwardly curved, radially extending blades, said blades being characterized in that:
(a) the blades have a positive camber at a radially inwardly

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region of the blade, said positive camber being 2-5% of the blade chord;

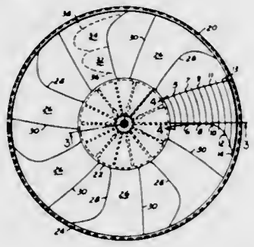
(b) the blades have a negative camber at a radically outward region of the blade; whereby boundary layer separation is controlled to improve blower efficiency.

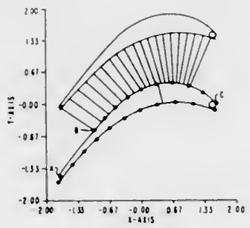
4,900,229

AXIAL FLOW RING FAN

Stephen E. Brackett, Bleasheim, and Herbert N. Charles, Chatham, both of Canada, assignors to Siemens-Bendix Automotive Electronic Limited, Chatham, Canada

Filed May 30, 1989, Ser. No. 359,241
Int. Cl.[4] F04D *29/38*
U.S. Cl. 416—189 **2 Claims**





1. In an axial flow ring fan that has a plurality of forwardly skewed blades extending between a central hub and an outer ring, the improvement which comprises each blade having a characteristic wherein the pitch ratio to average pitch ratio as a function of the blade's non-dimensional radius is substantially constant for non-dimensional radii between 0.4 plus or minus 0.03 and 0.495 plus or minus 0.03, is decreasing for non-dimensional radii between 0.495 plus or minus 0.03 and 0.55 plus or minus 0.03, is substantially constant for non-dimensional radii between 0.55 plus or minus 0.03 and 0.675 plus or minus 0.03, is increasing for non-dimensional radii between 0.675 plus or minus 0.03 and 0.850 plus or minus 0.03 and is decreasing for non-dimensional radii greater than 0.850 plus or minus 0.03, wherein the pitch ratio at any particular non-dimensional radius is 6.28 times the non-dimensional radius times tangent Q where Q is the acute angle between a first line extending between the leading and trailing edge points of a planar projection of the cross section of the blade along the particular non-dimensional radius and a second line that extends through the trailing edge point and is perpendicular to the direction of projection, and wherein the average pitch ratio of the blade is an average of the pitch ratios at a number of non-dimensional radii of the blade sufficient to at least approximate the actual average.

4,900,230

LOW PRESSURE END BLADE FOR A LOW PRESSURE STEAM TURBINE

Ashok T. Patel, Orlando, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1989, Ser. No. 344,136
Int. Cl.[4] F01D *5/14*
U.S. Cl. 416—223 A **2 Claims**

1. Blading for a steam turbine formed in accordance with the following table:

	POSITION (IN. FROM ROOT)				
	0.0000	2.0010	5.0000	8.0000	11.0000
WIDTH (IN)	4.25000	3.98599	3.59000	3.19487	2.80004
CHORD (IN)	4.27696	4.06846	3.80152	3.57532	3.38230
STAGGER ANGLE (DEG)	5.99407	11.14957	18.87216	26.44029	34.00799
MAXIMUM THICKNESS (IN)	.49309	.49336	.47970	.44171	.36554
MAXIMUM THICKNESS/CH	.11528	.12127	.12619	.12354	.10807
EXIT OPENING ANGLE (IN)	37.00990	37.01522	36.77622	36.01430	34.88362
INLET METAL ANGLE (DEG)	44.17650	47.84891	51.44978	55.15249	61.38140
INLET INCL. ANGLE (DEG)	11.40081	16.53943	22.84699	25.47453	25.91233
EXIT METAL ANGLE (DEG)	36.81575	36.88426	36.67086	35.98107	34.85368
EXIT INCL. ANGLE (DEG)	−.36321	−.26176	−.21057	−.06632	−.05841
SUCTION SURFACE TURN AREA (IN**2)	.01252	.00007	.00007	.00006	.00072
INLET	1.59755	1.46661	1.24542	1.02627	.75902

-continued

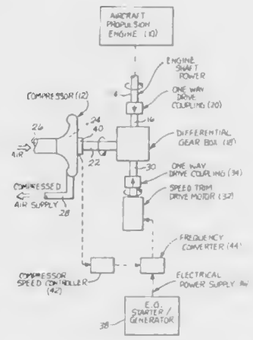
	POSITION (IN. FROM ROOT)				
	13.0000	15.0000	17.0000	20.0000	23.5000
WIDTH (IN)	2.53499	2.27502	2.02001	1.63994	1.22000
CHORD (IN)	3.27467	3.18522	3.11362	3.02030	2.98616
STAGGER ANGLE (DEG)	39.25621	44.50158	49.74360	57.49909	66.50863
MAXIMUM THICKNESS (IN)	.30734	.27120	.25398	.23791	.19786
MAXIMUM THICKNESS/CH	.09385	.08514	.08157	.07877	.06626
EXIT OPENING ANGLE (IN)	33.54951	31.98439	30.03656	26.06724	20.73475
INLET METAL ANGLE (DEG)	68.72656	84.54536	101.66240	131.52230	156.12210
INLET INCL. ANGLE (DEG)	24.68350	22.48244	21.19228	17.00538	12.38879
EXIT METAL ANGLE (DEG)	33.53928	31.97012	30.03510	26.05414	20.72697
EXIT INCL. ANGLE (DEG)	−.02031	−.01361	−.00290	−.00751	−.01513
SUCTION SURFACE TURN AREA (IN**2)	.00007	.00746	.00002	.00920	.00020
	.64368	.54398	.49238	.44678	.38695

4,900,231

AUXILIARY COMPRESSOR AIR SUPPLY FOR AN AIRCRAFT

Norman J. Kennedy, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 30, 1986, Ser. No. 869,391
Int. Cl.[4] F04D *13/02*
U.S. Cl. 417—16 **11 Claims**



1. An air supply system for an aircraft, comprising:

a propulsion engine having an output shaft;

an air compressor separate from said engine having an inlet, an outlet and a rotor;

differential gearing means having an output connected to the compressor rotor, a first input drivenly connected to the output shaft of the aircraft engine, and a second input;

an electric motor drivingly connected to the second input; and

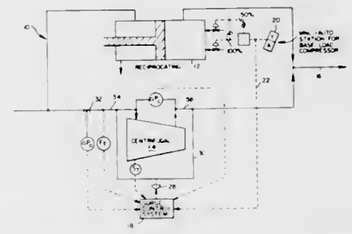
means responsive to a condition of the compressor for operating the electric motor in an amount sufficient to provide a predetermined desired amount of input drive to the differential gearing, for helping to drive the compressor rotor during periods of low output from the engine shaft, for the purpose of establishing a desired output from the air compressor.

4,900,232

COMPRESSOR SURGE CONTROL METHOD

Donald J. Dziubakowski, Seven Hills; Marion A. Keyes, IV, Chagrin Falls, and Jeremiah J. Shaffer, Mentor, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 192,807, May 11, 1988, Pat. No. 4,861,233, which is a continuation of Ser. No. 539,773, Oct. 7, 1983, abandoned. This application Mar. 16, 1989, Ser. No. 324,492
Int. Cl.[4] F04B *27/02*
U.S. Cl. 417—53 **3 Claims**



1. A method of controlling surge in a centrifugal compressor having a predetermined surge condition line and providing a combined output with a base load means comprising the steps of:

establishing a main surge control line offset from the centrifugal compressor surge condition line according to a function of pressure differentials across the centrifugal compressor and across an orifice in the inlet line of the centrifugal compressor;

establishing a feed forward control signal which is a function of a variable associated with the base load means which may cause the surge condition in the centrifugal compressor; and

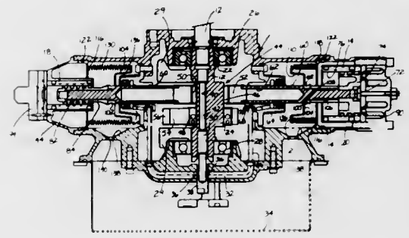
establishing an anticipatory surge control line offset from the main surge control line as a function of the established main surge control line and the established feed forward control signal.

4,900,233

RECIPROCATING COMPRESSOR PROVIDING A LUBRICANT FREE COMPRESSED GAS

David L. Ripley, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 2, 1988, Ser. No. 201,627
Int. Cl.[4] F04F *7/02*
U.S. Cl. 417—266 **8 Claims**



1. A reciprocating compressor comprising:

a housing including means defining at least one cylinder;

a piston reciprocally received in said cylinder;

a drive shaft journaled in said housing;

a piston rod connected to said piston and extending toward said drive shaft;

a rotary to reciprocating motion converting mechanism interconnecting said piston rod and said drive shaft so that rotation of said drive shaft will cause reciprocation of said piston;

means for providing liquid lubricant to said converting mechanism to lubricate the same;

means for positively isolating said cylinder from said liquid lubricant for all positions of said piston within said cylinder including a bellows having opposed ends and surrounding said piston rod between said piston and said converting mechanism; and an imperforate cup-like web carried by said rod and having a peripheral lip displaced away from one of said cylinder and said converting mechanism;

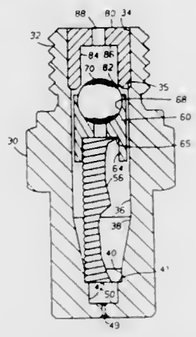
one of said bellows ends being sealed to said lip and the other of said bellows ends being sealed to the other of said cylinder and said converting mechanism.

4,900,234

REFRIGERANT INJECTION INTO OIL FOR SOUND REDUCTION

douglas A. Schrank, Baldwinsville, and Russell G. Lewis, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 2, 1988, Ser. No. 265,965
Int. Cl.[4] F04B *21/02*
U.S. Cl. 417—312 6 Claims



1. A method for reducing radiated sound levels in low side hermetic compressors comprising the steps of:

supplying pressurized refrigerant to a muffler which is in fluid communication with a discharge line;

diverting a small portion of the pressurized refrigerant supplied to the muffler when the pressure in the muffler is at least 100 p.s.i. above the low side pressure;

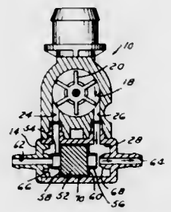
injecting the diverted pressurized refrigerant into an oil sump at a point beneath the surface of the oil whereby a supersaturated solution of refrigerant in oil is created in the upper level of the oil in the sump which drives the refrigerant out of the oil in the upper level to create a froth without disturbing the lower level of the oil in the sump; and preventing the flow of oil from the sump to the muffler.

4,900,235

REVERSIBLE PUMP ASSEMBLY

Jimmie G. Perkins, Monroe, and James W. Grim, Cookeville, both of Tenn., assignors to McCord Winn Textron Inc., Winchester, Mass.

Continuation-in-part of Ser. No. 164,833, Mar. 7, 1988, Pat. No. 4,824,332. This application Feb. 9, 1989, Ser. No. 308,059
Int. Cl.[4] F04B *39/10;* **F04D** *18/00*
U.S. Cl. 417—315 2 Claims



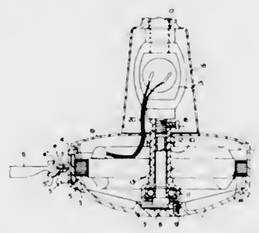
1. A windshield washer pump assembly comprising an impeller chamber, a reversible impeller rotatably mounted in the impeller chamber, and inlet for windshield washer fluid communicating with the impeller chamber, an outlet chamber, dual outlets communicating between the impeller chamber and opposite ends of the outlet chamber, a piston slidably mounted in the outlet chamber, axially aligned tubular discharge passages extending from the outlet chamber, oppositely disposed substantially cylindrical projections formed on said piston for being alternatively urged into engagement with said tubular discharge passages for alternatively pumping fluid through the tubular discharge passages, and chamfered ends formed on the inner ends of the respective tubular discharge passages for cooperation with said oppositely disposed substantially cylindrical projections.

4,900,236

CEILING FAN

Hendrikus J. Kapaan, Nieuwegein, Netherlands, assignor to SKF Industrial Trading and Development Co., Nieuwegein, Netherlands

Filed Mar. 8, 1988, Ser. No. 165,295
Claims priority, application Netherlands, Mar. 11, 1987, 8700586
Int. Cl.[4] F04B *17/02*
U.S. Cl. 417—354 7 Claims



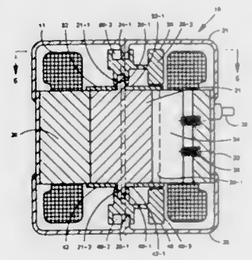
1. Ceiling fan comprising a stationary assembly adapted to be connected to a suspension means and a rotary assembly including a series of fan blades, the rotary assembly including a rotor and the stationary assembly including a stator of an electric motor, a unitary mounting assembly supporting said rotatable assembly relative to the stationary assembly including an elongated tubular member extending coaxially with the common center line of the rotor and stator, a shaft mounted in the tubular member and two spaced bearings located at a distance spaced axially distance from one another between the shaft member and the tubular member, at least one of the bearings comprising a rolling bearing and the other one comprising a journal bearing, a housing including an end dish having a peripheral flange, means defining a series of circumferentially spaced indentations adjacent the lower edge of the flange and a plurality of slotted openings in the upper peripheral edge of the flange aligned with said indentations and hook shaped mounting brackets having portions engaging in said openings and indentations respectively and means for clamping a fan blade between said bracket members.

4,900,237

ROLLING ROTOR MOTOR BALANCING MEANS

Wayne R. Reedy, Monticello, Ind., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 2, 1988, Ser. No. 266,425
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—356 6 Claims



1. A rolling rotor motor means comprising:

housing means;

stator means within said housing means and having a plurality of windings and a cylindrical opening therein;

said housing means having a pair of shafts axially spaced from said cylindrical opening and coaxial therewith;

cylindrical rotor means located within said cylindrical opening and defining therewith a chamber;

said rotor means having a pair of axially extending shafts;

a pair of counterweight means each coacting with one of said pair of shafts of said housing means and a corresponding one of said pair of shafts of said rotor means whereby said pair of counterweight means and said rotor means move as a unit responsive to the sequential actuation of said plurality of windings.

4,900,238

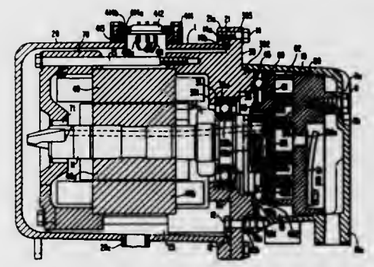
SCROLL TYPE COMPRESSOR WITH RELEASABLY SECURED HERMETIC HOUSING

Shimizu Shigeru, Sakai; Kikuchi Kazuto, Honjo, and Terauchi Kiyoshi, Isesaki, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Mar. 18, 1988, Ser. No. 169,983
Claims priority, application Japan, Mar. 20, 1987, 62-67354; Mar. 20, 1987, 62-67335
Int. Cl.[4] F04B *35/04;* F04C *18/04*
U.S. Cl. 417—410 31 Claims

1. In a scroll type compressor with a hermetically sealed housing, the compressor comprising a fixed scroll fixedly disposed within said housing and having an end plate from which a first wrap extends into the interior of said housing, an orbiting scroll having an end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to form a plurality of line contacts which define at least one pair of sealed off fluid pockets, a driving mechanism including a motor supported in said housing, said driving mechanism being operatively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll, rotation preventing means for preventing the rotation of said orbiting scroll during orbital motion whereby the volume of the fluid pockets changes during orbital motion to compress the fluid in the pockets, the improvement comprising:

said housing including a first shell, a separate second shell and a center block, said center block being formed as a single piece element having a peripheral portion extending



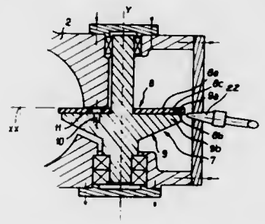
around the periphery of the compressor and an interior portion for rotatably supporting a portion of said drive mechanism, said peripheral portion including fastening means for releasably and hermetically securing said first shell to a first side of said peripheral portion of said center block and said second shell to a second side of said peripheral portion of said center block, at least a portion of said fastening means securing one of said first and second shells to said center block element being disposed within the other of said first and second shells.

4,900,239

METHOD AND A SCREW MACHINE FOR PROCESSING FLUID UNDER HIGH PRESSURES, WITH LIQUID INJECTION BETWEEN A SEALING PORTION AND A SUPPORT PORTION OF THE GATE-ROTOR

Bernard Zimmern, 6 New St., East Norwalk, Conn. 06855

Filed Nov. 30, 1988, Ser. No. 277,850
Claims priority, application France, Dec. 3, 1987, 87 16774
Int. Cl.[4] F01C *1/20, 5/02, 21/04*
U.S. Cl. 418—1 8 Claims



1. A method of supporting sealing teeth of a gate-rotor in a positive displacement machine having a screw rotatable inside a casing and provided with at least one thread groove successively and sealingly meshing with said sealing teeth of said gate-rotor, comprising the step of injecting liquid between a back face of said sealing teeth and a front face provided adjacent said back face on a support portion of said gate rotor.

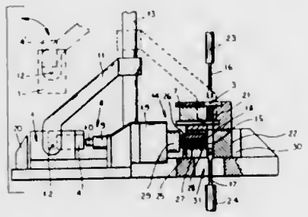
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4,900,240

APPARATUS FOR PRESSING CURVED BRAKE LININGS, ESPECIALLY FOR DRUM-TYPE BRAKES

Johann Leinweber, Wiener Neustadt, Austria, assignor to Ing. Johann Leinweber Anstalt fur Mechanik, Wiener Neustadt, Austria

Filed Dec. 15, 1988, Ser. No. 284,902
Claims priority, application Austria, Dec. 15, 1987, 3308/87
Int. Cl.[4] B29C *43/20*
U.S. Cl. 425—110 12 Claims



1. An apparatus for the production of curved brake shoes for drum-type brakes, said apparatus comprising:

an intermediate die including:

an intermediate ram formed with a generally cylindrically segmental surface,

an intermediate body having a generally cylindrically segmental surface confronting said surface of said intermediate ram, and

means defining with said surface an intermediate-die cavity, said ram being displaceable in a direction normal to generatrices of said surfaces to precompress a brakeshoe composition in said cavity to a precompacted blank;

a metering and filling device positioned to charge said intermediate-die cavity with said brakeshoe composition prior to displacement of said ram in said direction;

a prepress removably receiving said intermediate die and provided with means for displacing said ram in said direction;

a hot press provided with:

a hot-press ram, and hydraulic piston means for actuating said ram;

means defining a hot-pressing cavity shaped to receive said blank and a preform backing plate, said hot-press ram including heating means to bond said blank to said backing plate, whereby said precompacted blank undergoes further compression by said hot-press ram;

a pair of opposed sliders arranged vertically above and below said intermediate die, said sliders being provided with actuation means to engage said blank between them and being displaceable generally parallel to said generatrices for transferring said blank from said intermediate die to said hot-pressing cavity while receiving said blank between said sliders, at least one of said sliders being displaceable to eject a formed brakeshoe from said cavity subsequent to actuation of said hot-press ram; and

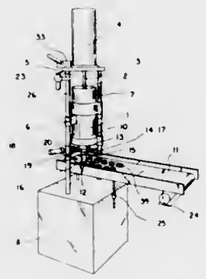
a manipulator engageable with said intermediate die for carrying out intermediate die from said prepress to said hot press and including means for vertically aligning said intermediate-die cavity with said hot-pressing cavity whereby said sliders are actuated to transfer said blank from said intermediate-die cavity to said hot-pressing cavity.

4,900,241

MACHINE FOR PORTIONING AND CUTTING DOUGH

Alexander Sigurdsson, Sogavegur 138, 108 Reykjavik, Iceland

Filed Dec. 13, 1988, Ser. No. 283,775
Claims priority, application Iceland, Dec. 12, 1987, 3296
Int. Cl.[4] B29C *47/92*
U.S. Cl. 425—140 5 Claims



1. A machine for portioning and cutting dough, said machine including:

at least one hollow main cylinder being vertically aligned and having powered means to vertically extrude said dough through an aperture disposed at a bottom portion of said cylinder;

a frame having two arms parallel and spaced apart on opposite sides of said aperture;

a cutting wire stretched between said two arms, said cutting wire being just below said aperture;

a piston rod to which said frame is connected, said piston rod being part of a pneumatic cylinder wherein said pneumatic cylinder is capable of moving said piston rod and said frame in a direction normal to said vertically aligned main cylinder such that said cutting wire travels just beneath said aperture from an extended outer position to a retracted inner position, said positions being on opposite sides of said aperture;

a straight steering means attached to said frame to prevent said piston and said frame from rotating;

a photocell detection unit having a light beam, between an emitter and a receiver, below a lower edge of said frame, said photocell detection unit triggering, upon blockage of said light beam by extruded dough, said pneumatic cylinder to move said piston and said frame from said outer position to said inner position or from said inner position to said outer position, thereby cutting a portion of the dough into a cake;

adjustment means including a spring disposed below said receiver to push said receiver up toward a fixed arm, thickness patterns being insertable between said receiver and said fixed arm to control the thickness of said cakes; whereby

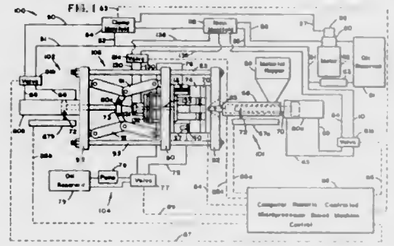
said machine allows substantially uniform thickness cakes to be cut due to the high constant speed of the pneumatically driven piston, frame, and wire cutter and photocell detection unit.

4,900,242

APPARATUS FOR INJECTION MOLDING ARTICLES

Steven M. Maus, 16220 Territorial Rd., Osseo, Minn. 55369, and George J. Galic, 5140 St. Moritz Dr., NE., Columbia Heights, Minn. 55421

Division of Ser. No. 860,006, May 5, 1986, Pat. No. 4,828,769.
This application Sep. 20, 1988, Ser. No. 246,872
Int. Cl.[4] B29C *45/77*
U.S. Cl. 425—149 9 Claims



1. An Apparatus for forming an article from a molten plasticized thermoplastic resin comprising:

a. an injection molding machine system comprising:

a plasticating and injecting unit,

a clamp system including a fixed platen and a movable platen capable of producing a main clamp force exerted between said fixed platen and said movable platen whereby said main clamp force is driven by a hydraulic cylinder supplied by a hydraulic fluid system, said hydraulic fluid system including at least one control valve in fluid communication with said hydraulic cylinder,

a cavity enlargement system, and

a molding machine control system for programmably coordinating sequence and motions of the clamp system;

b. the cavity enlargement system comprising

a moldset disposed between said movable and fixed platens with clamp plates of said moldset fixedly mounted onto said platens,

an opposing pair of parting line mold plates between said clamp plates within said moldset, and within at least one parting line mold palte is at least one slidably mounted insert upon which a molded plastic article will be formed, and

on one side of the moldset at least one resilient member is mounted between one of said parting line mold plates and said clamp plate, whereby said at least one insert is slidably mounted within said one of said parting line mold plates,

wherein a pre-enlarged mold cavity can be formed by changing relative positions of said one of said parting line mold plates and said at least one insert mounted therein, with a pressing stroke thereby being defined as zero when said resilient member is in a retracted position and a pressing stroke of at least 0.060 inch and not greater than 0.350 inch being defined when said resilient member is in an extended position, and before injection has started said at least one insert being initially separated within the pre-enlarged mold cavity to form a cavity volume greater than a maximum volume occupied at atmospheric pressure by the molten plastic resin to be injected into the cavity wherein the volume of said pre-enlarged cavity is determined by a distance between said fixed and movalbe platens;

c. clamp system hydraulic isolation means for moving said at least one insert slidably within one of said parting line mold plates, wherein such relative insert motion is driven by corresponding motion of the movable platen, said movable platen being driven by the hydraulic cylinder supplied by a hydraulic fluid passing through at least one control valve dependent only upon programmable control sequences of the molding machine controller whereby compressive clamping force and motions commence before rapid injection fill is completed;

d. means for injecting into said pre-enlarged mold cavity a volume of the plasticized resin slightly larger than the volume of the article to be formed but insufficient to fill said pre-elarged mold cavity, said injected resin volume being of at least equal mass as a final molded article of desired dimensions;

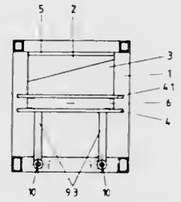
e. molding machine control system means for controllably pre-enlarging said mold cavity before starting injection, for plasticizing and injecting molten plastic resin, for controllably applying the main clamp force of the injection molding machine before completion of said injection so as to reduce the volume of the mold cavity and driving out gases through vents provided, for controllably maintaining the appied main clamp force until final clamp lock-up position is reached thereby compressing the resin until any slight excess resin is forced into pressure relief means provided and the resin within the further reduced volume mold cavity solidifies and for controllably opening said moldset.

4,900,243

MOLDING APPARATUS

Guenter Moellmann, Hagan, Fed. Rep. of Germany, assignor to Fritsche, Moellman GmbH & Co. KG, Lotte, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 275,742
Claims priority, application European Pat. Off., Dec. 15, 1987, 87118612.8
Int. Cl.[4] B28B *3/00*
U.S. Cl. 425—406 7 Claims



1. In molding apparatus for producing a molding from a multi-component plastic, such as polyurethane, said apparatus including a stand; two mold holders arranged on said stand; two mold parts each affixed, respectively, to one of said mold holders; at least one mold holder being movable with respect to the other so as to bring its associated mold part to a first position in which the two mold parts are at a short distance apart; said mold holders having back surfaces provided on their sides facing away from their respective mold parts and extending substantially transversely to the direction of the closing movement of said movable mold holder; a propping system mounted movably in the stand comprising propping elements which can be brought into engagement with said back surfaces when said mold parts are in said first position; and jacking means arranged on at least one mold holder, by which the mold parts can be brought closer together and pressed together in a second position with the propping system engaged,

the improvement wherein said propping elements are levers which are affixed to at least one pair of contrarily rotatable shafts that are journaled in said stand on the side of a movable mold holder that faces away from said mold parts, such that said levers can be laid down in said stand substantially transversely to the direction of closing movement and can be rotated such that their end faces are

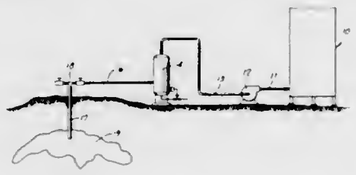
brought into engagement with at least one of said back surfaces.

4,900,244

GAS FLARING METHOD AND APPARATUS

Michael R. Keller; Roger K. Noble, both of Tulsa, and Dale W. Pressnall, Sapulpa, all of Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Aug. 29, 1984, Ser. No. 645,343
Int. Cl.[4] F23D *14/00*
U.S. Cl. 431—5 **7 Claims**



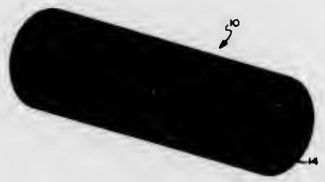
1. A method of flaring a gas mixture formed in a landfill comprising the steps of:
withdrawing said gas mixture from said landfill;
conducting said gas mixture to an annular burner comprised of an annular channel having sides and a bottom and a continuous top structure having a plurality of elongated flow passages therein configured such that said gas mixture can flow through said passages but the backward propagation of flame therethrough at low pressure and low or static flow rate conditions is retarded;
flowing said gas mixture through said passages in said burner structure whereby the gas mixture is jetted therefrom and caused to mix with air surrounding said burner;
igniting the resulting gas mixture; and
confining said ignited gas mixture within a vertical stack configured to allow the admission of additional air around said burner structure and to discharge combustion products into the atmosphere above said stack.

4,900,245

INFRARED HEATER FOR FLUID IMMERSION APPARATUS

Farshid Ahmady, Rochester, Mich., assignor to Solaronics, Rochester, Mich.

Filed Oct. 25, 1988, Ser. No. 262,516
Int. Cl.[4] F23D *14/12*
U.S. Cl. 431—328 **18 Claims**



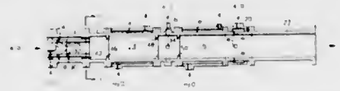
1. A ceramic foam radiant gas burner, comprising a cylindrical gas combustion burner including a burner element made from a reticulated ceramic foam having a porosity of about 40 to about 100 pores per linear inch with a density of from about 0.36 to about 0.5 grams per cubic centimeter and being coated with a composition to substantially decrease the likelihood of back flashing.

4,900,246

APPARATUS FOR BURNING NITROGEN-CONTAINING FUELS

Robert M. Schirmer; Henry E. Alquist, and Ellsworth H. Fromm, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 272,442, Jun. 10, 1981, Pat. No. 4,721,454, which is a continuation-in-part of Ser. No. 932,820, Aug. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,361, May 25, 1977, abandoned. This application Nov. 9, 1987, Ser. No. 118,826
Int. Cl.[4] F23D *15/02*
U.S. Cl. 431—352 **4 Claims**



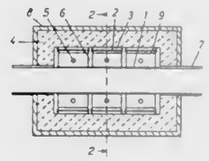
1. A combustor, for combustion of a fuel and production of a fuel-lean combustion effluent having a moving fuel-lean flame front, comprising:
a first combustion chamber having a closed upstream end and an open downstream end, wherein said first combustion chamber has a volume sufficient to burn a substantial portion of said fuel under fuel-rich combustion conditions and without further addition of air to produce a fuel-rich combustion effluent comprising a moving fuel-rich flame front, unburned fuel, and partially burned fuel, wherein the length of said first combustion chamber is such that the minimum first combustion chamber retention time of said fuel is at least about 35 milliseconds when said fuel is flowing at a velocity ranging from about 1 foot/second to about 500 feet/second;
a second combustion chamber having an open upstream end and an open downstream end, wherein said second combustion chamber has a volume sufficient to burn a portion of said fuel under fuel-lean combustion conditions to produce a fuel-lean combustion effluent comprising a moving fuel-lean flame front, wherein the length of said second combustion chamber is such that the minimum second combustion chamber retention time of said fuel is at least about 15 milliseconds when said fuel is flowing at a velocity ranging from about 1 foot/second to about 500 feet/-second;
a combustion mixture introduction means for introducing and intimately mixing said fuel and at least one stream of a first volume of primary air, in proportions sufficient to produce a fuel-rich combustible mixture, having a fuel/air ratio greater than the stoichiometric ratio, said combustible mixture introduction means, located adjacent said upstream end of said first combustion chamber, including: (1) a mixing chamber, a plurality of primary air introduction means spaced about the periphery of said mixing chamber and adapted to introduce a first stream of said first volume of primary air in a generally circular direction tangential to an inner wall of said mixing chamber, and (2) another plurality of primary air introduction means spaced about the periphery of said mixing chamber and adapted to introduce a second stream of said first volume of primary air in a generally circular direction tangential to the inner wall of said mixing chamber downstream from the introduction means adapted to introduce the said first stream of the first volume of primary air; wherein the second stream of said first volume of primary air will be introduced so as to swirl in a direction opposite the first stream of said first volume of primary air, such that as one of the plurality of means is introducing air in a clockwise direction, the other introduces air in a counterclockwise direction; and
a fuel-rich combustion region termination means for abruptly terminating said fuel-rich combustion region at a location adjacent said downstream end of said first combustion chamber, wherein said fuel-rich combustion region termination means includes a means for reducing the cross-sectional area of fuel-rich combustion effluent leaving said first combustion chamber and introducing and intimately mixing at least one stream of a second volume of secondary air with said fuel-rich combustion effluent, immediately adjacent said downstream end of said first combustion chamber, in an amount sufficient to produce a fuel-lean combustible mixture having a fuel/air ratio less than the stoichiometric ratio, said second combustion chamber being in communication with said fuel-rich combustion termination means and being of an increased cross-sectional area so as to expand the combustion effluent and air leaving said fuel-rich combustion termination means.

4,900,247

HIGH-TEMPERATURE HEATING FURNACE

Susumu Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo K.K., Japan

Filed Apr. 27, 1989, Ser. No. 343,575
Claims priority, application Japan, May 26, 1988, 63-69683[U]
Int. Cl.[4] F27B *9/08*
U.S. Cl. 432—153 **1 Claim**



1. A high-temperature heating furnace, which comprises;
a central enclosure passage for accommodating therein articles to be treated, extending along the longitudinal central axis of the furnace, and an enclosure support surrounding the central passage with a space therebetween, in which space heaters are accommodated, and outside of which and between which and an outer shell of the furnace insulators being filled;
said central passage and said support being cuboidal coaxially to each other and being consisted of a plurality of plates of a comparatively thin thickness made of carbon fiber reinforced carbon or graphite compounds which are assembled to have a rectangular cross section and joints of which are hermetized by carbon or graphite adhesives.

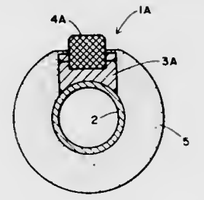
4,900,248

SKID RAIL

Kazuto Terai, Ohmiya; Susumu Isobe, Nagoya; Kenji Tsukuda, Chita; Hisao Inoue, Nagoya, and Hiroshi Kobayashi, Nishio, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Aichi, Japan and Inco Alloys International, Inc., Hunnington, W. Va.

Filed Jan. 24, 1989, Ser. No. 300,985
Claims priority, application Japan, Jan. 26, 1988, 63-15345
Int. Cl.[4] F27D *3/02*
U.S. Cl. 432—234 **4 Claims**

1. A skid rail comprising metal saddles welded on a water-cooled skid pipe, skid members attached to the saddles and refractory insulator covering all the members except for the skid members; the material of the skid members being an oxide-dispersion reinforced type super alloy which consists essentially of 18–40% (by weight) Cr, up to 5% Fe, up to 5% Al, up to 5% Co and up to 5% Ti, and the balance of Ni, and contains



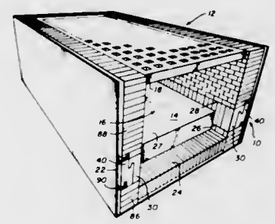
fine particles of 0.1–2% high melting point metal oxide dispersed in the austenite matrix.

4,900,249

ALUMINUM REVERBERATORY FURNACE LINING

John M. McCollum, Wexford, and John N. Snyder, Bentleyville, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 12, 1987, Ser. No. 2,325
Int. Cl.[4] F27B *14/08*
U.S. Cl. 432—248 **11 Claims**



1. A lining for use in an aluminum reverberatory furnace or the like for heating molten aluminum in a cavity formed by a roof, sidewalls and a bottom to be lined with refractory material, said lining comprising:
a. a band of hot face refractory material around the interior periphery of said cavity sidewalls for contacting molten aluminum in said furnace at the normal operating levels of the upper surface of said molten aluminum; and
b. a layer of backup refractory material interposed between the sidewalls and the band of hot face refractory material.

4,900,250

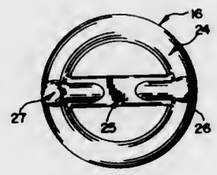
ELASTIC ORTHODONTIC APPLIANCE FOR AN EDGEWISE-TYPE BRACKET

Peter C. Kesling, and Dennis B. Henderlong, both of LaPorte, Ind., assignors to TP Orthodontics, Inc., Westville, Ind.

Continuation-in-part of Ser. No. 44,908, Apr. 30, 1987, abandoned. This application Apr. 14, 1988, Ser. No. 176,256
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—11 **26 Claims**

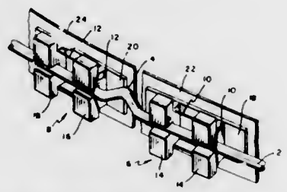
23. An elastic orthodontic appliance in an overlying relation with and retaining an archwire on an edge-wise bracket and applying a tipping force between the archwire and bracket to induce movement or control between the archwire and the bracket, wherein said bracket includes at least one tie wing with occlusal and gingival tips and a horizontally opening archwire slot in said tie wing having diagonally disposed tipping surfaces and diagonally disposed uprighting surfaces, said appliance comprising an endless strand for hooking over and

behind said tips and having portions extending along the mesial and distal sides of said bracket and over an archwire disposed



in said slot, and a cross member extending between said strand portions.

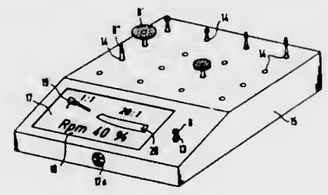
4,900,251
ORTHODONTIC ARCHWIRE, APPARATUS, PACKAGE AND METHOD
George F. Andreasen, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa
Filed Apr. 29, 1988, Ser. No. 187,735
Int. Cl.[4] A61C 7/00
U.S. Cl. 433—20 **23 Claims**



1. An orthodontic archwire, comprising,
a single piece of wire, said wire having a generally parabolic shape and having a slip-preventing lateral protrusion thereon, said lateral protrusion being located approximately midwayalong the length of the wire so as to lie between brackets mounted on the central incisors of an orthodontic patient, said lateral protrusion having a direction and size which is incapable of slipping through slots in orthodontic brackets.

4,900,252
RECOGNITION SYSTEM FOR TOOLS INSERTABLE INTO DENTAL TREATMENT INSTRUMENTS
Johannes Liefke, Bensheim; Bernd Nickel, Lorsch; Josef Pabst, Heddesheim, and Otto Fleer, Bensheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 11, 1988, Ser. No. 217,716
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 3724586; Apr. 22, 1988, 3813714
Int. Cl.[4] A61C 1/00, 3/00
U.S. Cl. 433—27 **37 Claims**

1. In a dental treatment station having a drive unit, a plurality of tools for dental treatment, each tool operable at a respective optimum rotational speed, and means for coupling a selected one of said tools to said drive unit to rotate said selected tool, a tool speed recognition system comprising:
coding means on each tool for identifying the respective optimum rotational speed associated with the tool by encoded data;
means for reading said encoded data on said selected tool and generating an output signal corresponding to said encoded data; and
evaluation means for converting said output signal from said means for reading into a control signal for said drive unit



to operate the selected tool at its optimum rotational speed.

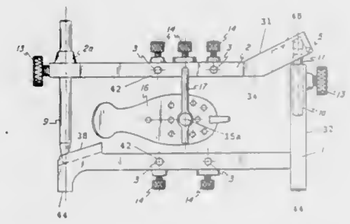
4,900,253
DENTAL MIRROR HAVING ULTRAVIOLET FILTER
Timothy J. Landis, 4532 Las Encinitas, Fair Oaks, Calif. 95628
Filed Jul. 15, 1987, Ser. No. 73,700
Int. Cl.[4] A61B 1/24
U.S. Cl. 433—30 **3 Claims**



1. A hand-held dental mirror for use both as a mirror and as a filter of light in the ultra violet range comprising a handle, a rim at a first end of said handle, mirror means held by said rim, said mirror means comprising a blank, a coating on at least one surface of said blank characterized by its ability to transmit a portion of light and to reflect a portion of light and filter means incorporated in said blank absorbing transmission of a portion of said ultra-violet range through said mirror means, said coating and said filter means being substantially congruous with said mirror means.

4,900,254
UNIVERSAL ARTICULATOR
Jose M. Gama, Conde de Linhares 809, Bairro Cidada Jardim, Belo Horizonte/Minas Garais, Brazil
Continuation-in-part of Ser. No. 937,224, Dec. 3, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,438
Claims priority, application Brazil, Oct. 15, 1986, 6601914
Int. Cl.[4] A61C 11/00
U.S. Cl. 433—65 **13 Claims**

1. An odontological articulator comprising an upper frame having and upper branch, a lower frame having a lower branch, and the upper frame branch and the lower frame branch both being substantially horizontal and being and extending parallel to one another;
the upper branch having a rear end portion; a pair of spaced articulator wings spaced outwardly from the rear end portion of the upper branch, the wings also being inclined upwardly at a slight angle from the horizontal upper branch; the wings each having a front part and a rear part, the rear part being in the rear direction with respect to the rear end portion of the upper branch; the upper branch also having a front end portion opposite the rear end portion thereof; means at the front end portion of the upper branch for adjustably receiving and holding an incisal pin;
the lower frame having a rear end portion toward the rear end portion of the upper branch and having a front portion toward the front end portion of the upper branch; a pair of uprights mounted on the lower frame and extending upwardly therefrom toward, and being spaced a distance below, the wing at the upper branch;
an incisal tray attached at the front end portion of the horizontal branch of the lower frame, the incisal tray sloping downwardly forwardly away from the lower branch at an angle from the horizontal;
a plurality of incisal pins, each incisal pin having a bottom end for being received on the downwardly sloping incisal tray, the incisal pin also being adjustably supported in the adjustable holding means therefor in the upper branch;
each wing having an underside facing down toward the lower frame and the wing underside having a slot defined therein for receiving an end of one articulator pin therein;
a plurality of articulator pins, a respective articulator pin being supported on each of the uprights on the lower frame; extending above the upright, each articulator pin

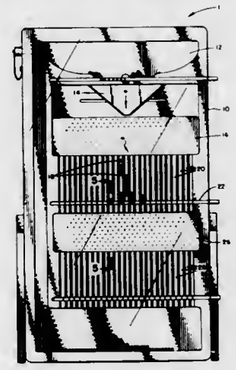


having an upper end which is received in the slot of the respective wing above the articulator pin for being retained therein;
a respective arm extending laterally from the rear end portion of the upper branch and connecting to one of the respective wings at the side of the upper branch at the front end of the wing, which is the end portion of the wing that is lower in height with respect to the incline of the wing;
both the articulator pins and the incisal pins being removable from the articulator and being removably secured to the upper branch and to the lower frame of the articulator; the plurality of articulator pins being in pairs of articulator pins, each pair being of a respective length, and the plurality of incisal pins each being of a respective length; the articulator pins of different length being exchangeable on the articulator and the incisal pins of different length being exchangeable on the articulator for enabling the upper branch and the lower frame to be spaced at selected varying distances apart, and a set of articulator pins of a selected length being used with an incisal pin of a respective length selected so that the upper branch and the lower frame remain parallel as the distance between the upper branch and the lower frame is selected.

4,900,255
FOR TWO-STAGE QUINCUNX
Aldo A. Laghi, P.O. Box 431, Clifton Park, N.Y. 12065
Filed Jan. 6, 1989, Ser. No. 294,108
Int. Cl.[4] G09B 19/00, 23/02
U.S. Cl. 434—188 **18 Claims**

1. A training device for use in the teaching and the studying of statistics comprising:
a support board having a top portion, middle portion and a bottom portion;

a ball reservoir located on the top portion of the board;
a conduit means operatively connected to a bottom portion of the ball reservoir;
a first plurality of spaced pins mounted on said board below said conduit means, said pins extending outwards from a front face of said board, said pin spacing being greater than the diameter of a ball to be used in said device;
a first plurality of compartments located on said board below said pins whereby a ball can pass through said plurality of pins and fall into one of said compartments;
a stop means located at a bottom portion of said compartments capable of stopping the downward movement of a



ball to be used in said device, said stop means being movable to allow an opening to be formed in at least one of said compartments whereby a ball could exit said at least one compartment;
a second plurality of spaced pins mounted on said board similarly spaced and extending in the same manner as the first plurality of pins; and
a second plurality of compartments, said compartments located on a bottom portion of said board below the second plurality of pins whereby a ball can pass through said second plurality of pins and fall into one of said second plurality of compartments.

4,900,256
OBJECT-DIRECTED EMOTIONAL RESOLUTION APPARATUS AND METHOD
Benay P. Dara-Abrams, 961 Andover Way, Los Altos, Calif. 94022
Filed Jan. 12, 1989, Ser. No. 296,479
Int. Cl.[4] G09B 19/00
U.S. Cl. 434—236 **22 Claims**

1. A method for resolving emotional problems and reducing stress with the use of a manipulable object comprising:
providing at least one recorded script with each script including instructions about carrying out a respective psychological exercise, manipulating the object to select one of said scripts and thereby a respective psychological exercise to be performed by the user;

listening to the selected script for the instructions associated with the respective psychological exercise; and



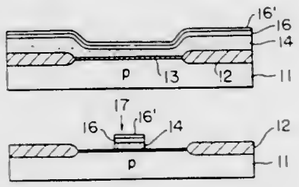
carrying out the instructions using the object as instructed by the selected script to thereby resolve the emotional problems of the user and reduce the stress of the user.

4,900,257

METHOD OF MAKING A POLYCIDE GATE USING A TITANIUM NITRIDE CAPPING LAYER

Takeo Maeda, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 845,250, Mar. 28, 1986, abandoned. This application Apr. 14, 1988, Ser. No. 181,392
Claims priority, application Japan, Mar. 30, 1985, 60-67813
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—200 **9 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

forming a polysilicon layer on a silicon substrate through a gate oxide film;

implanting impurity ions into said polysilicon layer and diffusing said impurity ions;

removing a self oxidation film formed on said polysilicon layer after diffusing said impurity ions;

sequentially forming, on said polysilicon layer with said self oxidation film removed, a refractory metal layer and a nitride layer of the refractory metal;

patterning said polysilicon layer, said refractory metal layer and said nitride layer of the refractory metal into a desired shape;

silicifying said refractory metal layer through a heat process; and

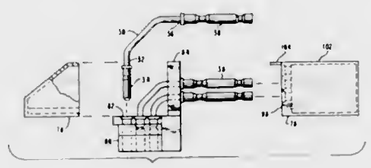
removing said nitride layer after said silicifying.

4,900,258

MULTI-PORT COAXIAL PRINTED CIRCUIT BOARD CONNECTOR

Robert J. Hsatuck, Mechanicsburg; Thomas S. Cohen, and Dimitry G. Grabbe, both of Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 12, 1989, Ser. No. 365,069
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—63 **22 Claims**



1. An assembly (28) for providing coaxial connections between first and second pluralities of contact positions, said first plurality of contact positions being arranged in a first substantially planar two dimensional array defined by the intersections of a first set (58) of parallel lines and a second set (60) of parallel lines transverse to said first set (58), said second plurality of contact positions being arranged in a second substantially planar two dimensional array defined by the intersections of a third set (62) of parallel lines and a fourth set (64) of parallel lines transverse to said third set (62), with the planes of said first and second pluralities of contact positions being substantially orthogonal to each other, said assembly (28) comprising:

a housing (74) having a base portion (80) and a wall portion (84), said base portion (80) being formed with throughbores (82) in a two dimensional array corresponding to said first array, said wall portion (84) being substantially planar and extending from said base portion (80) from a region outside said array of throughbores (82) parallel to said through-bores (82) and parallel to said first set (58) of lines, said wall portion (84) having a plurality of parallel slots (86) open at the distal end of said wall portion (84), each of said slots (86) being aligned with a respective line in said second set (60) of lines;

a plurality of coaxial cable subassemblies (30) each terminated at both ends with a respective coaxial contact assembly (34, 38), the contact assemblies (34) at the first ends (32) of said cable subassemblies (30) each being disposed in a respective one of said through-bores (82) and the second ends (36) of said cable subassemblies (30) each being disposed in a respective slot (86) aligned with the line of the second set (60) of lines corresponding to the through-bore (82) in which the contact assembly (34) at the first end (32) of that cable subassembly (30) is disposed;

a faceplate member (76) including a wall (98) formed with a plurality of apertures (100) arranged in a two dimensional array corresponding to the positions of the second cable subassembly ends (36) disposed in the slots (86) of the housing wall portion (84);

a cover member (78) including means (90) for holding the cable subassemblies (30); and

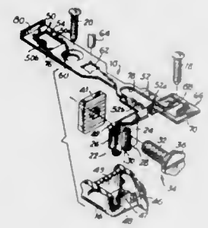
means (106, 108, 110, 112, 114, 116) for securing said faceplate member (76) to said cover member (78) with said housing wall portion (84) therebetween so that the contact assemblies (38) at the second ends (36) of the cable subassemblies (30) extend through respective ones of the apertures (100) in the faceplate member wall (98).

4,900,259

DUPLEX ELECTRICAL RECEPTACLE WITH ONE-PIECE MULTI-FUNCTION GROUNDING STRIP AND CHOICE OF GROUNDING WIRE TERMINATION

Melvin Ludwig, Great Neck, and Neal Kluger, Rye, both of N.Y., assignors to Eagle Electric Manufacturing Co., Inc., Long Island City, N.Y.

Filed Mar. 6, 1989, Ser. No. 318,847
Int. Cl.[4] H01R *13/652, 4/38*
U.S. Cl. 439—107 **16 Claims**



1. A dual mode grounding arrangement assembled within an electrical receptacle of the type mounted in a junction box and covered by a wall plate, said arrangement comprising:

(A) a one-piece, multi-function, grounding strip including

(a) a wiper means integral with the strip, for wipingly contacting ground prong of an electrical plug to be plugged into the receptacle,

(b) box fastener contact means integral with the strip, for contacting a box fastener operative for mounting the receptacle in the junction box,

(c) wall plate fastener means integral with the strip, for supportably engaging a wall plate fastener operative for mounting the wall plate over the receptacle,

(d) means integral with the strip, for holding the strip at a predetermined position within the receptacle during assembly, and

(e) screw terminal means integral with the strip, for electrically grounding the strip, including a pair of spaced-apart electrically conductive grounding plates having juxtaposed slots;

(B) a grounding screw having a head and a threaded shaft extending with clearance through and past the juxtaposed slots;

(C) a nut having a plurality of threads for threadedly engaging the shaft of the grounding screw to resist axially directed forces tending to pull the grounding screw from the strip; and

(D) biasing means for urging the screw and the nut to a selected one of a first, wrap-around, grounding position in which a grounding wire is wrapped about the screw shaft and clamped between the screw head and one of the grounding plates, and a second, push-in, grounding position in which the grounding wire is clamped between the nut and the other of the grounding plates.

4,900,260

ELECTRICAL CONDUCTOR

Pierre L. M. Drogo, Le Verdier Dampierre en Burly, 45570 Ouzouer Sur Loire, France

Continuation of Ser. No. 37,692, Apr. 13, 1987, abandoned. This application Aug. 4, 1988, Ser. No. 228,299
Claims priority, application France, Apr. 11, 1986, 86 05203
Int. Cl.[4] H01R *4/38*
U.S. Cl. 439—921 **6 Claims**

1. An electrical connector comprising:

a coupling including a coupling body having a shoulder with an electrically insulative insert therein;

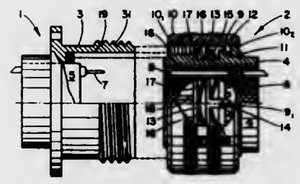
a plug each including a plug body and an electrically insulative insert therein;

male convertor pins provided in the electrically insulative insert for one of said coupling body and said plug body and female connector pins provided in the other insert;

complementary ribs and grooves on said coupling and plug body to permit relatively axial displacement when angularly positioned;

a threaded coupling nut rotatably mounted on said shoulder of the coupling nut for threadedly engaging complementary threads on the coupling body;

locking means between said coupling nut and said plug for limiting threaded advancement of the coupling nut along



threads of the coupling body and preventing unexpectedly unthreading thereof, said locking means including a ring having at least one dog forming a catch orientated and complementary to a circular alignment of catches, said ring being axially movable on said plug body; and

elastic means including two elastic members at opposite sides of said ring, one elastic member urging said dog away from engagement with said catches before the coupling and plug are connected, said elastic members and said ring being disposed in the path of travel of the coupling body when connecting the coupling and plug, the other elastic member elastically pushing the dog between said catches.

4,900,261

ELECTRICAL CONNECTOR SYSTEM

John T. Gentry, and Mark R. Martin, both of Springfield, Mo., assignors to Positronic Industries, Inc., Springfield, Mo.

Filed Feb. 23, 1989, Ser. No. 315,346
Int. Cl.[4] H01R *13/627*
U.S. Cl. 439—353 **19 Claims**



1. An electrical connector system with a discriminating latching feature, said system comprising:

a first electrical connector having female contacts and first latching means;

a second electrical connector having male contacts and second latching means;

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a third electrical connector having female contacts and third latching means; and

a fourth electrical connector having male contacts and fourth latching means;

said second and fourth connectors with male contacts each being adapted to plug into either of said first and third connectors with female contacts so that respective male and female contacts make electrical contact with one another,

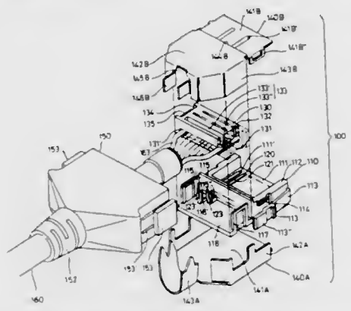
said latching means of each said connector being cooperable with the latching means of other of said connectors to latch said first and second connectors to one another when plugged together, to latch said first and fourth connectors to one another when plugged together, and to latch said second and third connectors to one another when plugged together, but not to latch said third and fourth connectors to one another when plugged together.

4,900,262

LOCK MECHANISM FOR ELECTRICAL CONNECTOR

Shuichi Matsuzaki, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 319,338
Claims priority, application Japan, Mar. 7, 1988, 63-29883[U]
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—354 **3 Claims**



1. A lock mechanism for an electrical connector including an insulating housing, contact elements arranged in said insulating housing, and an insulating cover case for covering at least a rear portion of said insulating housing, which comprises:

a pair of flexible lock arms extending backwardly from front ends of opposite side walls of said insulating housing;

a lock member provided on a middle portion of each said lock arm for engagement with a mating connector lock member;

an operational portion provided at a free end of each said lock arm, said operational portion being covered by said insulation cover case; and

a pair of flexible control members provided on opposite side walls of said insulating cover case such that each said control member is positioned over said operational portion, whereby said lock members are released from said mating lock members by pressing said control members.

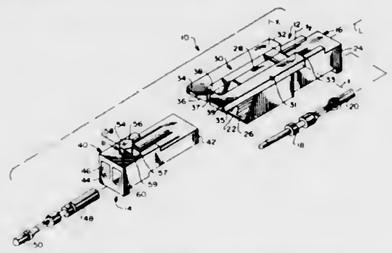
4,900,263

POSITIVE CONNECTOR LATCH

Lorenzo G. Manassero, Turin, and Roberto Martucci, Padua, both of Italy, assignors to Molex Incorporated

Filed Feb. 6, 1989, Ser. No. 306,718
Int. Cl.[4] H01R *13/627*
U.S. Cl. 439—358 **19 Claims**

1. A pair of mateable electrical connectors for achieving positive latching in a fully mated condition of said connectors, said pair comprising first and second connectors, the first connector comprising at least one latch resiliently and alternatively deflectable about each of two angularly aligned axes of deflection, the second connector comprising a cam disposed for engagement with said latch during mating of said connectors, at least one of said latch and said cam comprising a leading ramp surface for deflecting said resilient latch about said first axis of deflection thereof and for developing stored energy



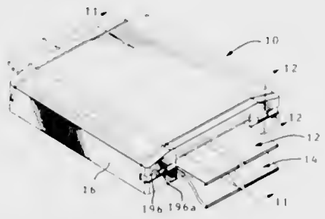
in said resilient latch, a trailing ramp surface for employing the stored energy of the resiliently deflected latch and urging said connectors into a fully mated condition and a locking surface for lockingly retaining said connectors in a fully mated condition, said latch being deflectable about said second axis of deflection lying substantially in a root which unitarily connects said watch to said first connector disengagement of said latch from said cam for facilitating unmating of said connectors.

4,900,264

ELECTRICAL CONNECTOR AND METHOD OF INTERCONNECTING FLAT POWER CABLES

Glenn E. Bennett, Glendale; Bermier, Jr. Frank H., Tempe; John K. Daly; Robert K. Grebe, both of Scottsdale; Earl R. Kreinberg, Phoenix, and Dean A. Puerner, Maricopa, all of Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 21, 1989, Ser. No. 341,864
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—391 **29 Claims**



1. An interconnection of two flat power cables each having at least one flat conductor therein, comprising:

a first flat power cable having at least one flat conductor therein, and a second flat power cable having a corresponding at least one flat conductor therein;

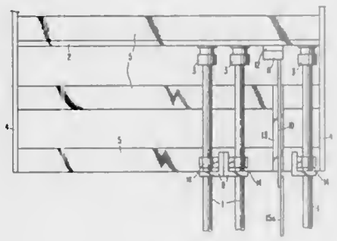
at least one interconnecting structure assembly corresponding to each said at least one conductor, each said assembly having an upper structure and a lower structure joined together with selected sections of said first and second cables disposed therebetween, each said assembly having a plurality of shearing wave shapes alternating with relief recesses along a cable-proximate surface of said upper structure, and a cooperating plurality of shearing wave shapes and alternating relief recesses along a cable-proximate surface of said lower structure, each said wave shape being opposed by a said relief recess, and said shearing wave shapes of said upper and lower structures having vertical shearing edges which cooperate upon being pressed together with said first and second cables therebetween to shear strips of said conductor and extrude said sheared strips into said opposing relief recesses so that thus-sheared edges of said extruded conductor strips are disposed against metal surfaces defining side edges of adjacent ones of said wave shapes for electrical connection therewith.

4,900,265

ARRANGEMENT FOR ORDERLY GUIDANCE OF CABLE ENDS

Michael Gridley, and Hans-Ulrich Kalweit, both of Germantown, Md., assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Dec. 21, 1988, Ser. No. 287,256
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—449 **14 Claims**



1. In a device for the orderly guidance of cable ends to plug-in contacts in a plug-in contact plate, with pull relief being provided for the cable ends, the improvement comprising:

comb-like cable guide elements having recesses, each recess for guiding a corresponding row of cable ends, said comb-like cable guide elements being disposed in a plane spaced in a first direction from the plug-in contact plate and spaced from one another in said plane;

fastening means fixing said guide elements relative to the plug-in contact plate; and

resilient clamping devices, respectively adjacent to the recesses, for absorbing a pull on the cable ends.

4,900,266

STRAIN RELIEF SYSTEM FOR CONNECTING CABLES

John D. Sainsbury, Unionville, Canada, and Edward Karkow, Glen Arm, Md., assignors to GSI Corporation, Timonium, Md.

Filed Mar. 8, 1989, Ser. No. 320,423
Int. Cl.[4] H01R *13/58*
U.S. Cl. 439—451 **9 Claims**

1. A cable and connector assembly comprising:

(a) a longitudinally elongated cable assembly comprising;

(i) a sheath having a free end,

(ii) a conductor extending within said sheath and having a free end portion projecting from the free end of said sheath,

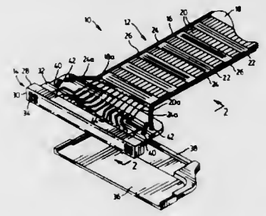
(iii) a pair of strain bearing cables extending within said sheath, said strain bearing cables having a substantially higher modulus of elasticity than that of the conductor, each strain bearing cable having a free end portion projecting from the free end of said sheath, the free end portions of the strain bearing cables being located laterally outwardly from and arranged one on either side of the free end portion of the conductor,

(b) a connector member having first connector means located thereon adapted to cooperate with complimentary second connector means to form an electrical connection therebetween in use,

a first conductor connection point on said connector member at which an end of the free end portion of said conductor is connected to the connector member and through which it communicates with said first connector means,

a pair of strain bearing cable connection points on said connector member, each of said strain bearing cable connection points being located laterally outwardly from and one on either side of said first connection point,

the free end portions of the strain bearing cables being connected, one at each strain bearing cable connection point,



to the connector member in a manner such that any slack whch is provided in the free end portions of the strain bearing cables is less than that provided in the free end portion of the conductor such that substantially all of a tensile load applied to the connector member by a load applied to the cable assembly will be transmitted to the connector member through the strain bearing cables at the strain bearing cable connection points,

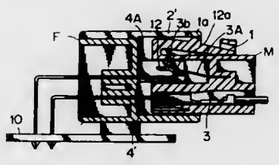
wherein said cable assembly is a flat cable which has oppositely disposed side edges and said connector member is a flat connector member, said strain bearing cables being embedded in said flat cable and arranged one adjacent each of said oppositely disposed side edges.

4,900,267

HARNESS CONNECTOR HAVING AN ENGAGEMENT CHECK STRUCTURE

Yasuhiro Nagasaka; Hiromichi Shigesobu; Kazuyuki Shiraki, all of Aichi, and Akira Maeda, Shizuoka, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,113
Claims priority, application Japan, May 30, 1988, 63-70298[U]
Int. Cl.[4] H01R *13/71*
U.S. Cl. 439—489 **4 Claims**



1. An engagement check structure is a harness connector assembly in which detachable mating first and second housings are respectively accommodated with plural pairs of mating terminals, said first and second housings being adapted to be locked with each other, said atructure comprising:

at least one pair of a first terminal and a second terminal provided in addition to said plural pairs of mating terminals, said first terminal being accommodated within said first housing in generally secured fashion, said second

terminal being accommodated within said second housing rearwardly supported in cantilever fashion; and

a tapered guide member secured to said first housing, said second terminal having an ear portion adapted to ride over said guide member to raise said second terminal when the first and second housings are incompletely engaged and to release said second terminal from said guide member and bring said second terminal into elastic contact with the first terminal when the first and second housings are completely engaged, said first and second terminals engaging after the pairs of mating terminals engage.

4,900,268

ELECTRIC CONNECTOR FOR FLAT FLEXIBLE CABLES

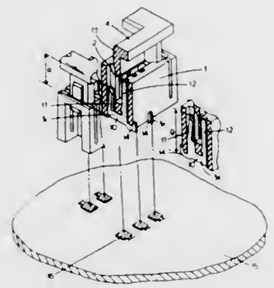
Shinsuke Kunishi, Yamato, Japan, assignor to Molex Incorporated

Filed Dec. 8, 1988, Ser. No. 281,578

Claims priority, application Japan, Dec. 8, 1987, 62-187085[U]

Int. Cl.⁴ H01R *23/04*

U.S. Cl. 439—493 **1 Claim**



1. An electric connector for connecting to an electric circuit a flat flexible cable 5 having a plurality of conductors 6*a*–6*n* arranged at regular intervals P, the exposed terminal ends of these conductors 9*a*–9*n*, having enlarged contact areas S staggered with each other in forward and backward transverse lines X and Y, said electric connector comprising a connector housing 1 having a terminal contact mounting space 2; forked terminal contacts 3*a*, 3*b*, 3*c* . . . as many as the flat conductors of the cable 5, said forked terminal contacts being arranged at the same intervals as the flat conductors of the cable 5 and being mounted in the terminal contact mounting space 2 of the connector housing 1, alternate terminal contacts 3*a*, 3*c*, 3*e* . . . having a terminal projection 14 appearing at one side of the connector housing 1 for connecting a corresponding conductor of the electric circuit, a rear leg 12 and a relatively short front leg 11 adequate to reach each exposed terminal end 9*a*, 9*c*, 9*e*, 9*g*, 9*i*, 9*k* or 9*m* arranged in the forward transverse line, whereas the other alternate terminal contacts 3*b*, 3*d* . . . having a terminal projection 14 appearing at the other side of the connector housing 1 for connecting a corresponding conductor of the electric circuit, a rear leg 12 and a relatively long front leg 11 adequate to reach each exposed terminal end 9*b*, 9*d*, 9*f*, 9*h*, 9*j*, 9*l* or 9*n* arranged in the backward transverse line Y.

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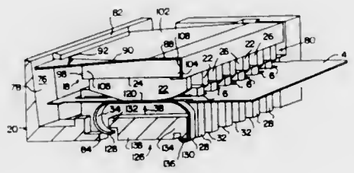
CONNECTOR HOUSING

Thomas M. Lynch, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 27, 1988, Ser. No. 290,656

Int. Cl.⁴ H01R *13/58;* **H05K** *7/12*

U.S. Cl. 439—499 **19 Claims**



1. A connector housing for electrically coupling to a flex board having a plurality of spaced openings extending therethrough, each opening being completely surrounded by said flex board, said flex board further having a respective conductor of a plurality of conductors on at least one side of said flex board and positioned between respective spaced openings of said plurality of spaced openings, comprising:

a top portion including a plurality of spaced first ribs extending therefrom;

a bottom portion removably coupled to said top portion and including a plurality of spaced second ribs extending therefrom, said first ribs of said plurality of first ribs being interleaved with said second ribs of said plurality of second ribs when said top portion is coupled to said bottom portion;

a plurality of contacts, individual of said contacts being positioned between respective second ribs of said plurality of spaced second ribs and having a contact area extending towards a respective first rib of said plurality of spaced first ribs; and

means associated with said top portion and said bottom portion for removably coupling said top portion to said bottom portion so that when said flex board is inserted between said top portion and said bottom portion a respective second rib of said plurality of spaced second ribs can extend through a respective spaced opening of said plurality of spaced openings, and a respective conductor of said plurality of conductors can be urged into electrical contact with a respective contact of said plurality of contacts by a respective first rib of said plurality of spaced first ribs, and wherein said top portion is pivotally coupled to said bottom portion for pivoting to an open position to insert said flex board between said top portion and said bottom portion and to a closed position to electrically couple a respective conductor of said plurality of conductors to a respective contact of said plurality of contacts, said coupling means including (1) a first hinge pin extending from one end of said top portion and a second hinge pin extending from an opposite end of said top portion, and (2) a corresponding first bore into which said first hinge pin is insertable at one end of said bottom portion and a corresponding second bore into which said second hinge pin is insertable at an opposite end of said bottom portion.

4,900,270

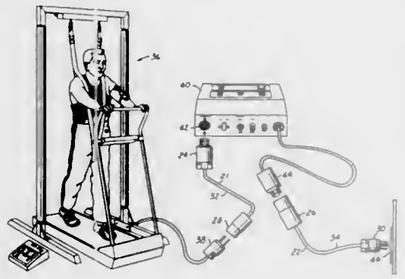
CABLE ADAPTOR ASSEMBLY

Mary S. Edwards, Grand Blanc, and Max M. Dubrinsky, West Bloomfield, both of Mich., assignors to Safe Stress, Inc., Grand Blanc, Mich.

Filed Feb. 24, 1989, Ser. No. 303,617

Int. Cl.⁴ H01R *11/00*

U.S. Cl. 439—502 **21 Claims**



1. A combination comprising:

a first cable member comprising an electric plug and an electric socket, said first cable plug and said first cable socket being connected by an electric cord, said first cable plug being of a first configuration and said first cable socket being of a second configuration distinct from said first configuration and not compatible therewith; and

a second cable member comprising an electric plug and an electric socket, said second cable electric plug and said second cable electric socket being connected by an electric cord, said second cable electric plug being of said second configuration and said second cable electric socket being of said first configuration.

4,900,271

ELECTRICAL CONNECTOR FOR FUEL INJECTOR AND TERMINALS THEREFOR

Stephen A. Colleran, Lisle; Lawrence E. Geib, Bartlett; Robert J. Gugelmeyer, Aurora, and Bill B. Wilson, Montgomery, all of Ill., assignors to Molex Incorporated

Filed Feb. 24, 1989, Ser. No. 314,992

Int. Cl.⁴ H01R *13/422*

U.S. Cl. 439—595 **19 Claims**

1. An electrical connector including an insulator housing having a forward mating end and an opposed rearward wire mounting end, at least first and second terminal receiving cavities and a locking means for retaining terminals in the respective cavities, the improvement in the locking means comprising:

forwardly extending deflectable locking levers cantilevered from said insulator housing and extending into each said terminal cavity for lockingly engaging the terminal inserted therein, each said forwardly extending deflectable locking lever including a rearwardly facing cam surface aligned to cause said forwardly extending deflectable locking lever to be deflected by the insertion of the terminal into the mounting end of the insulator housing;

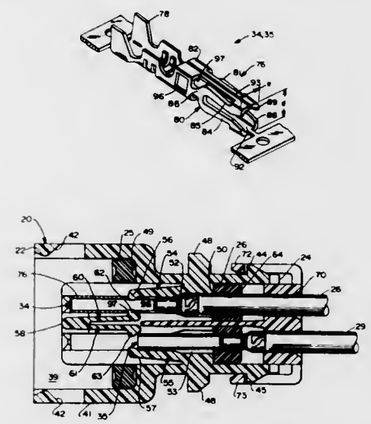
rearwardly extending deflectable locking levers cantilevered from said insulator housing and extending into each said terminal cavity for lockingly engaging the terminal inserted therein, each said rearwardly extending deflectable locking lever including a rearwardly facing cam surface aligned to cause said rearwardly extending deflectable locking lever to be deflected by the insertion of the terminal into the mounting end of the insulator housing;

one said locking lever of said first terminal cavity being disposed in spaced relationship to one said locking lever of said second terminal cavity in undeflected conditions of said locking levers; and

a TPA component urgeable into a position between the spaced apart locking levers of said first and second terminal cavities respectively,

whereby an inability to urge said TPA component intermediate the spaced apart locking levers is indicative of at least one of said locking levers being in a deflected condition corresponding to an improper insertion of one of said terminals in said insulator housing; and

whereby the forwardly and rearwardly extending locking levers alternately exert compressive and tensile forcers on the terminals mounted in said insulator housing for securely positioning the terminal in the housing and preventing unintended withdrawal thereof.



4,900,272

CONTACT FRAME FOR AN IC CARD READER

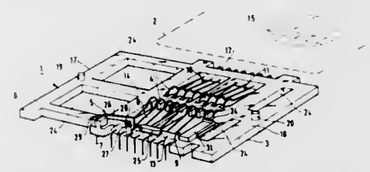
Francois Langé, Pontarlier, and Michel Pernet, Doubs, both of France, assignors to Societe Anonyme dite: ALCATEL CIT, Paris, France

Filed Nov. 14, 1988, Ser. No. 270,925

Claims priority, application France, Nov. 13, 1987, 87 15739

Int. Cl.⁴ H01R *23/70*

U.S. Cl. 439—630 **11 Claims**



1. A contact frame for contact with an IC card of an IC card reader, said IC card having opposite side edges, said contact frame comprising, in particular, guide means for guiding or positioning the IC card, together with contact elements for providing electrical connection with the conducting pads on the IC card via which circuits are established to the apparatus including the IC card reader, the improvement wherein the contact frame comprises an inner frame portion of insulating material molded over the contact elements for providing elec-

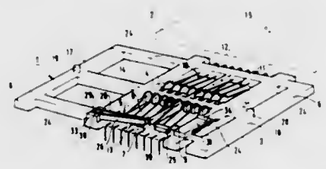
trical connection to the IC card, said inner frame portion being a hollow structure comprising at least two side members and two beams supported between the two side members, said two beams each carrying a contact set, with said contact sets mainly extending from one beam in the direction of the other, and two extensions extending said inner frame portion sideways towards said side edges of the card and beyond said side edges, each of said two extensions carrying means for defining the portion of a corresponding one of two card-guiding slideways.

4,900,273

CONTACT FRAME FOR AN IC CARD READER, SAID FRAME HAVING AN END-OF-STROKE CONTACT

Michel Pernet, Doubs, France, assignor to Societe Anonyme dite: ALCATEL CIT, Paris, France

Filed Nov. 10, 1988, Ser. No. 269,406
Claims priority, application France, Nov. 13, 1987, 87 15740
Int. Cl.[4] H01R *13/54*
U.S. Cl. 439—630 **6 Claims**



1. A contact frame for an IC card reader comprising a slot for receiving an IC card, guide means for guiding the IC card through an end-of-stroke position up to a fully inserted position, contact elements carried by a molded frame of said contact frame and providing electrical connection to conducting pads on the main surface of the IC card, and an end-of-stroke contact comprising: a resilient "fixed" contact blade and a resilient moving contact blade, means for fixedly coupling one end of said "fixed" blade and one end of said moving blade to said molded frame of the contact frame, means causing the other end of the "fixed" blade to rest on a part of the contact frame due to its resilient force, and thus to be arrested in a well defined stationary position, the other end of said moving blade being positioned in the path of the inserted IC card such that the IC card comes into abutment against the other end of the moving blade and pushes said moving blade against its own resilient force, thereby operating the end-of-stroke contact precisely from the point said moving blade and said "fixed" blade just contacts each other, which point is defined by said part of said molded frame upon which the other end of said "fixed" blade comes to rest.

4,900,274

KEYING SYSTEM FOR ASSURING PROPER ARRAY CONFIGURATION OF CABLE CARDS

Fernand J. Dorleans, Wappingers Falls, N.Y.; Robert O. Norton, Susquehanna, Pa., and Robert S. Pokrzywa, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1988, Ser. No. 284,578
Int. Cl.[4] H01R *9/28*
U.S. Cl. 439—680 **9 Claims**

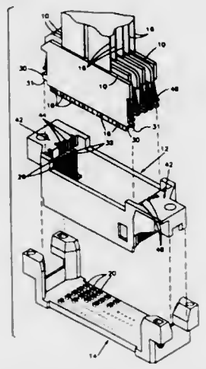
1. A keying system for providing the proper array sequence of cable cards within a card grouper, and wherein each of said cable cards has a plurality of cables mounted thereon and extending from one end thereof and the other end of the card has electrical connection means extending therefrom,

and wherein said card grouper includes support means to retain a plurality of said cards in a side by side array with the connection means of said cards being aligned and projecting from one end of said support means,

and wherein said support means includes first and second sets of a plurality of parallel slots on opposite sides thereof to engage the opposite ends of said cards and retain said cards in said array;

the improvement which comprises;

tab means formed at one end of each of said cards on at least one edge thereof,



said tab mean being selectable to extend to at least two different distances from the respective edge of the card,

said card grouper including template means associated therewith and positioned to coact with the tab means of said cards,

said template means having a plurality of sets of notches, each set of notches being configured to coact with the tab configuration of one and only one cable card;

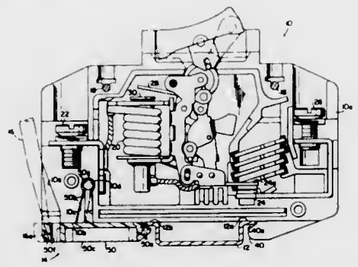
whereby the cards can be uniquely arrayed in one and only one pattern in said card grouper.

4,900,275

DIN RAIL MOUNTABLE CIRCUIT BREAKER

Michael A. Fasano, Watertown, Conn., assignor to Carlingswitch, Inc., Plainville, Conn.

Filed May 18, 1989, Ser. No. 353,971
Int. Cl.[4] H01R *9/26*
U.S. Cl. 439—716 **3 Claims**



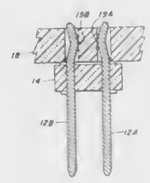
1. Means for mounting a split case circuit breaker or the like to an elongated channel shaped rail having laterally spaced oppositely projecting abutment flanges, said case comprising at least two complementary shells for housing the circuit breaker mechanism, at least one of said shells defining abutment means for engaging one of these abutment flanges, a one piece plastic latch member of T-shape having an integrally formed stem and base, said base having one end for engaging the other of said rail abutment flanges, said T-shaped member stem projecting at a substantial angle from and integrally connected to said base, said stem having a root end and said stem further having a free end opposite said root end, said free end defining an integrally formed rock shaft, said circuit breaker case shells as defining aligned sockets for loosely receiving segments of said rock shaft at said free end of said stem, said circuit breaker case shell also defining a clearance opening for said stem, said base including an opposite said one end and defining a tool opening for receiving tool for moving said T-shaped member thereby deforming said stem and disengaging said one end of said base from said other abutment flange.

4,900,276

ELECTRICAL CONNECTOR WITH PIN RETENTION FEATURE

Ray C. Doutrich, Lebanon, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 53,550, May 26, 1987, Pat. No. 4,847,588, which is a continuation of Ser. No. 836,534, Mar. 5, 1986, abandoned. This application Jul. 11, 1989, Ser. No. 378,544
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[4] H01R *13/428*
U.S. Cl. 439—751 **20 Claims**



1. An electrical connector with retention means for maintaining the connector in place during soldering of said connector to a printed circuit board, comprising:

a header having a plurality of terminal pins mounted therein, said pins being relatively inflexible and extending from the header for insertion through respective holes of the printed circuit board;

at least one pair of said pins having at the insertion end of each pin an offset in the form of a crimp, the crimp of one pin extending in a direction opposite to the crimp of the other pin of said pair, each said crimp being shaped so that each pin of said pair contacts the printed circuit board only within its respective hole and only on one side of the hole and only at its crimp, each said crimp thereby exerting a relatively high normal force against said board only at said one side of the hole, the rest of said plurality of pins being straight;

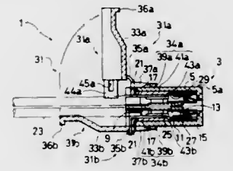
whereby when the pins of the header are inserted through the holes of the printed circuit board and positioned for soldering, the header is retained in position for soldering solely by the normal forces exerted by each said crimp at its contact with the printed circuit board within its repsective hole, said normal forces being opposite and complementary in that the crimp on one of said pair of pins exerts a normal force against said board which is opposite to the normal force exerted by the crimp of the other pin of said pair, said opposite and complementary normal forces and the resulting frictional contact between each said crimp and the board thereby providing the only means for retaining the header in position for soldering, the rest of said plurality of pins being free from contact with the board in said holes until soldered thereto.

4,900,277

CONNECTOR

Shigemitsu Inaba, and Kazuto Ootaka, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Oct. 19, 1988, Ser. No. 259,712
Claims priority, application Japan, Oct. 19, 1987, 62-261734
Int. Cl.[4] H01R *13/514*
U.S. Cl. 439—752 **14 Claims**



1. A connector, comprising:

a connector housing having a rear portion thereof;

a plurality of terminal accommodating compartments formed inside said connector housing, each of said terminal accommodating compartments having an aperture therein; and

a plurality of terminals connected to wires, respectively, said terminals being inserted into said terminal accommodating compartments; and

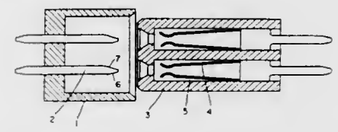
cover means removably attached to said rear portion of said connector housing said cover means having formed integrally thereon means for bundling said wires therein and means for securing said terminals in said terminal accommodating compartments when said terminal securing means is inserted into said apertures.

4,900,278

ELECTRIC CONNECTOR OF LOW-INSERTION FORCE

Shoji Yamada, Tokyo; Masami Sasao, Kawasaki, and Yoshihisa Yamamoto, Yamato, all of Japan, assignors to Molex Incorporated, Lisle, Ill.

Filed Aug. 4, 1989, Ser. No. 389,444
Claims priority, application Japan, Aug. 4, 1988, 63-103657
Int. Cl.[4] H01R *13/00*
U.S. Cl. 439—857 **3 Claims**



1. An electrical connector of low insertion force comprising a male plug **1** having at least one pin terminal **2** and a female socket **3** having at least one contact comprising a pair of symmetrical contact pieces **4** and **5**, which are adapted to come into resilient contact with the opposite sides **8**, **10** of the corresponding pin terminal **2**, each of said pin terminals being so designed that the insertion force to be applied between one side **8** of the corresponding pin terminal **2** and one of the contact pieces **5** reaches its peak value at a time different from when the insertion force to be applied between the other side **10** of the corresponding pin terminal **2** and the other contact piece **4** reaches its peak value, characterized in that: each of said pin terminals has a tapered end A ending with a flat nose B, said tapered end A comprising a first slant surface **6** extending from one end D of said flat nose B to said one side **8** of pin terminal **2** and a second slant surface **7** extending from the other end E of said flat nose B to said the other side **10** of pin terminal **2**, said first and second slant surfaces **6**, **7** being inclined at a same

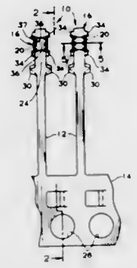
angle with respect to the center axis C of said pin terminal 2, and the center or equi-divisional point of said flat nose B being positioned somewhat beyond the center axis C of said pin terminal 2, thereby positioning said first and second slant surfaces asymmetrical with respect to the center axis C of said pin terminal 2 so as to put at different places, the intersections at which said first and second slant surfaces 6 and 7 intersect with said one and the other sides 8 and 10 of pin terminal 2, thus causing the insertion forces on said first and second slant surfaces reach their peak values at different times.

4,900,279

SOLDER TERMINAL

Richard K. Dennis, Etters, Pa., assignor to Die Tech, Inc., York Haven, Pa.

Filed Apr. 24, 1989, Ser. No. 342,102
Int. Cl.[4] H01R 4/02
U.S. Cl. 439—876 **20 Claims**



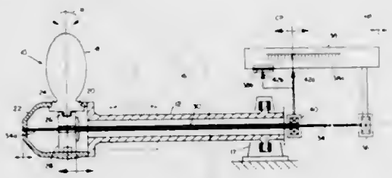
1. A solder terminal including a contact element and a contact arm joined to the element, the arm having a base with a central contact extending above the base and a solder layer overlying the base, the first solder layer including a thin coating overlying the contact forming the high point of the arm and having an increased thickness away from the contact to provide a mass of solder for forming a soldered joint at the contact when the arm is heated.

4,900,280

APPARATUS FOR DETECTING THE PITCH OF A MARINE CONTROLLABLE PITCH PROPELLER

Ole H. Midttun, 56 Lewis Ave., Walpole, Mass. 02081

Filed Aug. 16, 1988, Ser. No. 232,793
Int. Cl.[4] B63H 3/00
U.S. Cl. 440—50 **1 Claim**



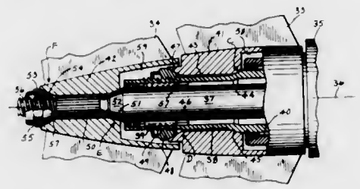
1. In a marine controllable pitch propeller system that includes a hub and blade assembly having a plurality of blades mounted on a hub to pivot about axes disposed generally radially of the propeller shaft axis, means including a translating member extending from the hub through the shaft and into the hull of the vessel for changing the pitch settings of the blades in response to and correspondence with fore-and-aft movements of the translating member, and means for detecting the pitch setting of the propeller by monitoring the fore-and-aft position of a portion of the translating member within the vessel hull, the improvement wherein the pitch-detecting means comprises a non-translating member affixed adjacent one end to the hub and extending essentially free of axial loads through the shaft into the vessel hull, means for detecting the fore-and-aft position of an inboard portion of the non-translating member, means for detecting the fore-and-aft position of an inboard portion of the translating member, and means for comparing the respective positions of said inboard portion of the translating member with the position of said inboard portion of the non-translating member and producing an output representing such comparison.

4,900,281

MARINE DRIVE WITH IMPROVED PROPELLER MOUNTING

Daniel F. McCormick, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 23, 1988, Ser. No. 197,620
Int. Cl.[4] B63H 1/14
U.S. Cl. 440—78 **7 Claims**



1. In a marine drive, the combination comprising:
(a) a generally vertical drive housing (6) terminating in a lower torpedo housing (9, 35),
(b) a propeller shaft (17, 37, 38) disposed within and extending longitudinally rearwardly from said torpedo housing in a generally fore-to-aft direction, and with said shaft being rotatable on a longitudinal drive axis (11, 36),
(c) a propeller (10, 33, 34) disposed on the rearward portion of said shaft, and with said propeller having a hub (18, 41, 42),
(d) and means mounting said propeller to said shaft,
(e) said mounting means including a pair of longitudinally spaced fore and aft sets (A-B; C-D; E-F) of generally longitudinally facing mating conical surfaces disposed on said shaft and said hub, each set in said pair of sets facing oppositely from the other said set in said pair; said mating conical surfaces providing a piloting effect to prevent orbiting of said propeller (10) and a centering effect for said hub (18).

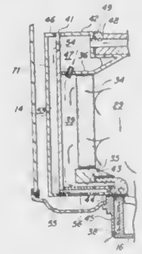
4,900,282

EXHAUST GAS PURIFYING DEVICE FOR MARINE ENGINE

Masanori Takahashi, and Tatsuki Uchida, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 13, 1987, Ser. No. 107,932
Claims priority, application Japan, Oct. 13, 1986, 61-242243
Int. Cl.[4] B63H 23/32
U.S. Cl. 440—89 **15 Claims**

1. A catalytic exhaust treatment system for a liquid cooled internal combustion engine having a cooling jacket comprising an exhaust passage formed at least in part within the body of said engine for receiving exhaust gases, a catalyzer supported within the portion of said exhaust passage formed in the body of said engine and at a position to be contracted by the exhaust gases in said exhaust passage, said catalyzer being supported by a support member formed from a heat conductive material in direct heat engaging relation with the part of the engine body defining the exhaust passage portion, said cooling jacket being



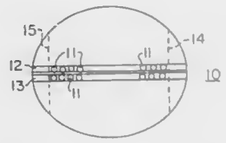
in heat-exchanging relationship with said support member and means for discharging coolant from said cooling jacket directly into said exhaust passage in proximity to said catalyzer for mixing with the exhaust gases in said exhaust passage.

4,900,283

METHOD FOR ARRANGING CHIPS EACH HAVING AN ARRAY OF SEMICONDUCTOR LIGHT EMITTING ELEMENTS

Kensuke Fukue, Monsey, N.Y., assignor to Kentek Information Systems, Inc., Allendale, N.J.

Continuation of Ser. No. 674,592, Nov. 26, 1984, Pat. No. 4,721,977. This application Jul. 30, 1987, Ser. No. 79,678
Int. Cl.[4] H01J 9/00
U.S. Cl. 445--22 **7 Claims**



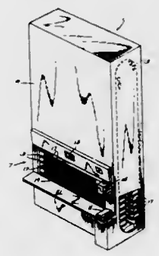
1. A method of forming a linear array of semiconductor chips having semiconductor light emitting elements disposed thereon for use in connection with a photosensitive element for the formation of images, comprising the steps of:
placing first and second cutting wheels in juxtaposition against first and second surfaces on opposite sides of a semiconductor wafer, said first and second cutting wheels each having a two-sided bevel cutting edges,
bringing said first and second cutting wheels into contact with said first and second surfaces thereby cutting said semiconductor wafer into chips with a two-sided bevel at at least one end, each of said chips having a linear array of semiconductor light emitting elements disposed thereon, each of said semiconductor light emitting elements being characterized by a dimension X and being separated from each other by a separation distance S along said linear array, and
positioning said cut chips along a common axis with their two-sided bevels abutting each other so that a semiconductor light emitting element at an end of one chip is separated by said separation distance S from a semiconductor light emitting element at an adjoining end of an adjoining chip.

4,900,284

METHOD OF PROVIDING A LIGHT BAR FOR STORAGE APPARATUS

Dean L. Dahnert, Fort Atkinson, Wis., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Division of Ser. No. 931,184, Nov. 17, 1986, Pat. No. 4,810,044. This application Jan. 30, 1989, Ser. No. 302,770
Int. Cl.[4] H01J 9/00
U.S. Cl. 445—22 **4 Claims**



1. A method of providing a light bar for visually indicating a selected location along an elongated path comprising the steps of:
a. providing an electric energy source and an electric energy sink;
b. providing a housing with openings therein;
c. cutting the housing to a length corresponding to the elongated path;
d. providing a plurality of electric modules, each electric module having an array of parallel circuits, each parallel circuit containing a light emitting diode and being energizable independent of all the other parallel circuits, the light emitting diodes being spaced to suit the housing openings;
e. connecting the electric modules in end-to-end connection to create a first end module and a second end module;
f. severing the second end module such that the overall combined length of the modules is approximately equal to the bousing length;
g. inserting the electric modules in the housing; and
h. connecting the first end module to the electric source and the electric sink.

4,900,285

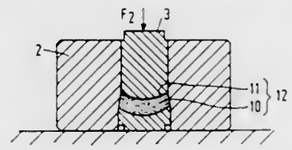
METHOD OF MANUFACTURING A DISPENSER CATHODE; DISPENSER CATHODE MANUFACTURED ACCORDING TO THE METHOD, AND DEVICE INCORPORATING SUCH A CATHODE

Johannes van Esdonk, and Jacobus Stoffels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1988, Ser. No. 215,699
Claims priority, application Netherlands, Jul. 6, 1987, 8701584
Int. Cl.[4] H01J 9/04
U.S. Cl. 445—50 **11 Claims**

1. A method of manufacturing a dispenser cathode having a curved emitting surface comprising a porous cathode body predominantly comprising a refractory metal or refractory metal alloy and having a top layer which differs from the rest of the cathode body, the method comprising pressing the powder to form a body, characterized in that in a first step a first powder is pressed in a first pressing operation at a first pressure to form a coherent moulding, the first pressure being insufficient to break powder grains to a significant extent, the

moulding thereafter in a second step is coated with a top layer of a second powder, whereafter in a third step the whole



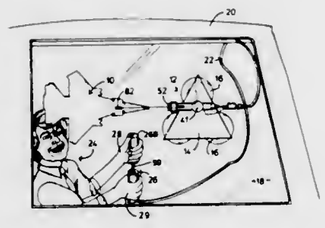
assembly is compressed at a second, higher pressure, whereby the powder grains are broken to a significant extent.

4,900,286

MODEL AIRPLANE HOLDER TOY

Vann M. Buffalo, 53 Tally Ho La., Little Rock, Ark. 72207

Filed Dec. 5, 1988, Ser. No. 279,782
Int. Cl.[4] A63H *27/04*
U.S. Cl. 446—30 **9 Claims**



1. A toy for mounting a model airplane or the like to a vehicle so that a child or other user of said toy may play with the model airplane to simulate flying as the vehicle moves, said system comprising:
   - a mounting plate adapted to be at least temporarily secured to said vehicle;
   - a manually-controlled coupling system operationally associated with and spaced apart from said mounting plate by an elongated stanchion and adapted to be coupled to said model airplane; and,
   - an elongated cable assembly having a handle adapted to be disposed within said vehicle for operation by said user, a cable having an exterior sheath and an inner element coaxially surrounded by said sheath, said handle comprising means adapted to be grasped by said user to twist the cable inner element relative to said sheath to effectuate twisting of said coupling system and thus movement of said model airplane, and an outer terminal end of said inner element adapted to be attached to said coupling system for manipulating said model airplane as said vehicle moves, whereby to simulate flight of said model airplane in response to movement of said handle from within said vehicle.

4,900,287

TEARING EYE DOLL

John C. Fusi, New Providence, and Robert M. Jensen, Bloomfield, both of N.J., assignors to View-Master Ideal Group, Inc., New York, N.Y.

Filed Jul. 10, 1989, Ser. No. 377,264
Int. Cl.[4] A63H *3/24, 3/38*
U.S. Cl. 446—183 **12 Claims**

1. A tearing eye doll comprising:
   (a) a head having a pair of synthetic eyes socketed therein, each being formed by an eye-shaped porous block having a face which simulates the white of a human eye and an impermeable disc seated in a recess in the face, said disc having an outward fall and being colored to simulate an iris and a pupil therein;
   (b) a nozzle received in a cavity in said block behind the disc for injecting water into the block, the water passing



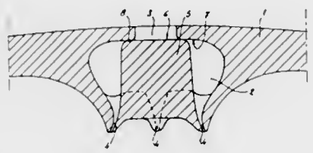
through pores of the block and emerging from the face thereof to form a water film thereon from which tears drop; and
   (c) means including an actuator to force water from a reservoir disposed in said doll to said nozzle only when said actuator is operated.

4,900,288

ONE-PIECE VALVE FOR A CLOSED ENCLOSURE, ITS PRODUCTION PROCESS, AND MEANS FOR USING THIS PROCESS

Jacques Verlier, Geneva, Switzerland, assignor to Monneret Jouets, S.A., Jura, France

Filed Jul. 14, 1987, Ser. No. 73,446
Claims priority, application Switzerland, Jul. 17, 1986, 2857/86; Jul. 22, 1986, 2929/86
Int. Cl.[4] A63H *3/06;* **F16K** *15/14*
U.S. Cl. 446—224 **7 Claims**



1. A one-piece valve in combination with an enclosure, said enclosure comprising a continuous molded wall forming an interior and an exterior and having one opening therein, said valve molded within said opening in said wall, said valve including a molded, integral sealing element which is larger than said opening and adapted to seal against said opening, and having at least one cavity extending from an opening around the said sealing element;
   said cavity further including an element communicating with the interior of said enclosure, whereupon pressure applied internally of the enclosure causes said sealing element to seal against said opening as said at least one cavity communicating element is forced closed by tension in said molded wall.

4,900,289

MECHANISM FOR ANIMATING A DOLL'S FACIAL FEATURES

Richard L. May, Manhattan Beach, and Keaneth J. Curran, Thousand Oaks, both of Calif., assignors to Cal R&D, Inc., Culver City, Calif.

Filed Jan. 29, 1988, Ser. No. 149,712
Int. Cl.[4] A63H *3/36, 3/40*
U.S. Cl. 446—312 **14 Claims**



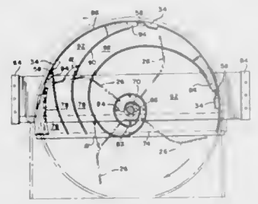
1. In an animated figure designed for movement of certain parts thereof, a mechanism contained therein for moving said parts in a seemingly independent manner, said mechanism comprising:
   - a bidirectional motor capable of continuous rotation in either direction upon selection;
   - a first moveable part;
   - a second moveable part;
   - means interconnecting said bidirectional motor to said first and second moveable parts for moving said first and second moveable parts in directions independent from each other in response to said bidirectional motor rotating in either direction;
   - said interconnecting means including:
     - a specific friction drive coupling of establishable limits rotated by said motor;
     - a means for linking said friction coupling with said second moveable part; and
     - a means for impeding motion of said friction drive coupling after a certain number of rotations in either direction, at which point slippage in the coupling allows the motor to continue rotating,
   - whereby the second moveable part only moves upon a change in direction of rotation of the motor.

4,900,290

CROP DELIVERY SYSTEM FOR AN AXIAL-FLOW COMBINE

Dale R. Tanis, Naperville, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Aug. 24, 1988, Ser. No. 236,029
Int. Cl.[4] A01F *12/10*
U.S. Cl. 460—70 **5 Claims**



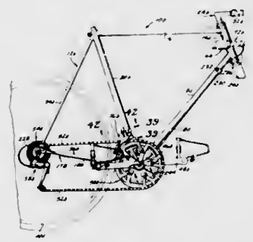
1. A crop delivery system for an axial-flow combine having a crop harvesting apparatus at a forward end of said combine, a threshing apparatus including a threshing cage with an elongated rotor rotatably mounted by bearing means at opposite ends, said rotor being driven about a rotational axis and has a series of blades defining an impeller at is forward end, with said crop delivery system being interposed between said crop harvesting apparatus and said threshing apparatus, said crop delivery system comprising:
   - means for feeding crop materials from said crop harvesting apparatus toward said threshing apparatus;
   - a transition housing which surrounds the impeller and defines an inlet end and an outlet end, said inlet end opening to the front end of the combine and to the feeding means and said outlet end opening to the threshing apparatus;
   - one or more spiral transport vanes secured to an internal surface of said housing for directing crop material rearwardly toward said threshing apparatus in response to impeller rotation; and
   - a crop delivery vane assembly arranged at a forward end of and within said transition housing in crop receiving relationship with said feeding means, said vane assembly including a plurality of delivery vanes defining a series of hollow channels which open rearwardly toward a rear end of said combine, said channels extending outwardly and spaced at different radial distances from the rotational axis of said rotor for positively moving crop material rearwardly and peripherally outward toward said transport vanes and wherein each channel includes a rearwardly projecting ramped surface at a terminal end thereof for directing crop rearwardly toward said threshing apparatus and with adjacent ramped surfaces being angularly positioned with respect to each other within said transition housing.

4,900,291

BICYCLE GEAR SHIFTING METHOD AND APPARATUS

Sam H. Patterson, Chicago, Ill., assignor to Sram Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 291,359, Dec. 29, 1988, abandoned, which is a continuation of Ser. No. 141,625, Jan. 6, 1988, abandoned. This application Jan. 5, 1989, Ser. No. 293,521
Int. Cl.[4] F16H *9/24*
U.S. Cl. 474—80 **26 Claims**



1. A bicycle derailleur gear shifting system, which comprises:
   - derailleur shifting means having return spring means operatively associated with the rear wheel of the bicycle;
   - handgrip shift actuator cam means rotatably mounted on the bicycle handlebar generally coaxially of the handlebar;
   - control cable means having one end operatively associated with said cam means and the other end operatively connected to said derailleur shifting means, said cable means being biased toward said derailleur shifting means by said return spring means;
   - said cam means being configured so that rotational movement thereof in one direction will cause said cam means to pull said cable means against the biasing force of said spring means so as to cause down-shifting of said shifting means, and rotation thereof in the opposite direction will

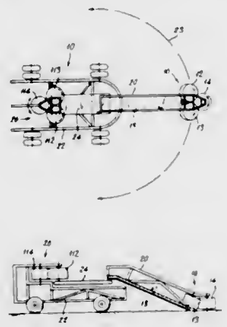
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release said cable means in the direction of the biasing force of said spring means so as to cause up-shifting of said shifting means.

4,900,292
ROTOR ASSEMBLIES

Paul S. Berry, Bedford; Derek J. Frost, North Brickhill, and Peter F. Inskip, Haynes, all of England, assignors to National Research Development Corporation, London, England

Filed May 4, 1988, Ser. No. 190,141
Claims priority, application United Kingdom, May 5, 1987, 8710610
Int. Cl.[4] F16H *7/00*; A27C *21/02*
U.S. Cl. 474—84 **11 Claims**



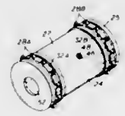
1. A rotor assembly for use in a poultry harvester, the assembly comprising first and second rotors U.S. Appln. 07/190,141—Berry et al arranged side by side about a center line of the assembly for rotation about a vertical or predominantly vertical axes, a third rotor equispaced from the first and second rotors in a direction along the center line of the assembly, and drive means for rotating the third rotor around a vertical axis in a clockwise or counterclockwise sense, as desired, during operation of the assembly, the drives for the first and second rotors being derived from the motion of the third rotor and being operative to counter-rotate the first and second rotors in rotational senses which remain unaltered irrespective of the direction of rotation of the third rotor at any given moment, each rotor providing a continuous array of radially-extending guide elements closely adjacent and/or abutting and/or intermeshing with the guide elements of the other rotors.

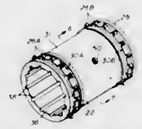
4,900,293
4:3 PERF CONVERSION SPROCKET

Donald C. McLendon, 502 Jackson Hill, Houston, Tex. 77007

Filed May 26, 1989, Ser. No. 358,550
Int. Cl.[4] F16H *55/02*; G03C *3/02*
U.S. Cl. 474—152 **25 Claims**

1. A sprocket assembly for converting a film projector or other film handling device having at least one rotatable shaft to make it compatible with either 3-perf or 4-perf film, such films having a predetermined spacing between perfs that is the same for both films, comprising:
- an inner cylindrical sleeve having first means disposed around its circumference at each end for sequentially engaging the perfs when said inner sleeve is rotated;
- mounting means disposed on said inner cylindrical sleeve for nonrotatably mounting said sleeve on the projector shaft;
- an outer cylindrical sleeve insertable over said inner cylindrical sleeve and having second means disposed around its circumference at each end for sequentially engaging the perfs when said outer sleeve is rotated;
- interengageable locking means, disposed on said inner sleeve and said outer sleeve for antirotationally locking the inner sleeve within the outer sleeve;



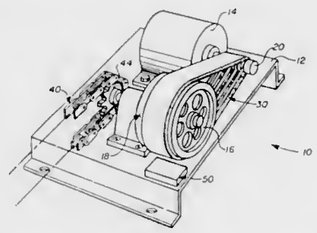


the outside diameter of said second means for sequentially engaging the perfs being substantially 4/3 that of the outside diameter of said first means for sequentially engaging the perfs.

4,900,294
GARAGE DOOR OPENER DRIVE MECHANISM

Erich Gottfried Schneeberger, Dorfrebenstrasse No. 32, CH-8165 Schoefflisdorf, Switzerland

Filed Apr. 11, 1989, Ser. No. 336,234
Int. Cl.[4] F16H *55/32*
U.S. Cl. 474—167 **3 Claims**

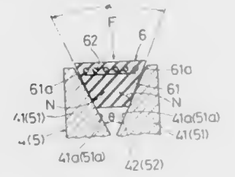


1. An automatic garage door opener mechanism having improved safety, comprising:
- (a) an electrically-operated motor capable of turning an internal shaft, said shaft having at one end thereof a plurality of annular grooves and ribs cut directly into said shaft and suitable for engagement with a rib-and-groove tractive face belt;
- (b) a driven wheel interconnecting with a drive mechanism capable of opening or closing a garage door; and,
- (c) a rib-and-groove tractive face belt wherein the ribs and grooves are parallel to the length of the belt, said belt being in mating engagement with the plurality of annular grooves and ribs of the internal shaft of said motor, in tractive engagement with the surface of said driven wheel.

4,900,295
BELT TRANSMISSION DEVICE FOR MOTORCAR ENGINES AND AUXILIARY DEVICES

Kazuyoshi Tani, and Masaki Ochiai, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan

Filed Sep. 29, 1988, Ser. No. 251,092
Claims priority, application Japan, Sep. 30, 1987, 62-150754[U]; Jun. 6, 1988, 63-074894[U]
Int. Cl.[4] F16H *7/02, 5/00*
U.S. Cl. 474—167 **6 Claims**

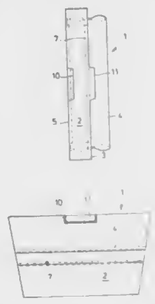


1. A belt transmission device for use in an engine of a motorcar, said belt transmission device comprising:
- a driving pulley for mounting on a crankshaft of an engine, said driving pulley having a first V-shaped pulley groove with a first pulley groove angle θ of 45°–60°;
- a driven pulley for mounting on a driving shaft of an auxiliary device of the engine, said driven pulley having a second V-shaped pulley groove with a second pulley groove angle θ of 45°–60°; and
- a belt trained between said driving pulley and said driven pulley, said belt having a pair of inclined sidefaces in a V-shape, said inclined sidefaces having a predetermined angle therebetween, to engage said V-shaped pulley grooves of said driving pulley and said driven pulley.

4,900,296
ARTICULATED BELT FOR CONTINUOUSLY VARIABLE CONICAL PULLEY, BELT-DRIVE TRANSMISSION

Vinzenz Schmidt, Pulheim, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1988, Ser. No. 290,059
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805182
Int. Cl.[4] F16G *1/22*
U.S. Cl. 474—242 **8 Claims**

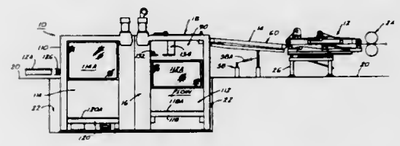


1. A link of a longitudinally continuous drive chain, comprising:
- means for mutually connecting consecutive links along a longitudinal axis and permitting articulation among the links about a transverse axis perpendicular to and intersecting the longitudinal axis;
- a first substantially planar surface facing longitudinally and in the direction the belt moves when transmitting power; and
- second and third surfaces facing longitudinally and opposite the direction the first surface faces, the second and third surfaces being inclined with respect to the first surface and offset laterally on opposite sides of the longitudinal axis from the location of the connecting means; and
- means for preventing displacement of the link along the transverse axis relative to the other links of the chain.

4,900,297
DOWNSTACKER ASSEMBLY WITH OFFLOADING STACKER

Terry Frost, Rockford, Wash.; Terry B. Smith, Coeur d'Alene, Id., and Jennings A. Jones, Mead, Wash., assignors to ASC Machine Tools, Inc., Spokane, Wash.

Continuation-in-part of Ser. No. 909,557, Sep. 19, 1986, Pat. No. 4,740,193. This application Apr. 25, 1988, Ser. No. 185,760
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] B31B *1/14*
U.S. Cl. 493—82 **18 Claims**



1. An improved downstacker assembly for stacking paperboard blanks in which plural rows of blanks are sequentially passed for stacking each paperboard blank having a forward portion with a leading edge and a rear portion with a rear edge, the downstacker assembly comprising:
- a. vacuum conveyor means for holding and advancing the rows of blanks beneath lower runs of the conveyor means to be disposed over a drop chute, the drop chute comprising a pit disposed below the vacuum conveyor means, the pit having sufficient depth below the floor level elevation of the downstacker assembly to permit the forming of stacks of blanks beneath the vacuum conveyor means;
- b. impacting means for applying appropriately directioned forces to the blanks above the drop chute to cease forward advancement of the blanks and to separate the blanks from the vacuum conveyor means so that the blanks of each row are caused to fall in the drop chute, the impacting means comprising:
  - (1) a striking surface disposed in the advancing path of the blanks to be struck by the leading edges of the blanks when the blanks are advanced to be over the drop chute; and
  - (2) blank striker means for impacting the forward and rear portions of the blanks so as to knock the blanks away from the vacuum conveyor means just prior to impact of the leading edges of the blanks so that the rear edges of blanks are caused to be below the leading edges thereof to avoid interference with succeeding blanks advanced to above the drop chute by the vacuum conveyor means;
- c. stacking means disposed in the drop chute beneath the vacuum conveyor means for receiving the falling blanks from each row and for forming a stack of blanks for each row of blanks, such stacks being formed in adjacent disposition, and the stacking means comprising:
  - (i) platform means having a platform surface for receiving the blanks falling in the drop chute in stacked disposition, the platform means comprising:
    - (a) first elevator means supporting the platform surface and disposed beneath the vacuum conveyor means

for selectively lowering the platform surface as the blank stacks are formed thereupon; and

(b) a first power conveyor having a plurality of conveyor rollers which provide the platform surface of the platform means, the first power conveyor supported for selected ascent and descent by the first elevator means; and

(2) tamper means for tamping the edges of the blanks as the stacks are forming to provide substantially uniform sides to the stacks being formed on the platform means, the tamper means comprising:

(a) curtain means disposed to hang between adjacent stacks being formed on the platform means for providing flexible backup means between such stacks while being tamped so that the adjacent stacks are disposed in near touching engagement with substantially no gap between adjacent stacks; and

d. stack retrieval means for receiving the blank stacks from the platform means after same is lowered in the pit and for elevating the blank stacks to at least floor level elevation for disposition therefrom via a selected material handling device, the stack retrieval means comprising:

(1) a second power conveyor having a plurality of conveyor rollers which receive the blank stacks thereupon;

(2) second elevator means supporting the second power conveyor for selectively ascending and descending the second power conveyor in the pit, the conveyor rollers of the first and second power conveyors being selectively rotatable to move the blank stacks from the first power conveyor to the second power conveyor when aligned in the pit;

(3) dunnage holding means for selectively gripping a dunnage sheet at a selected height; and

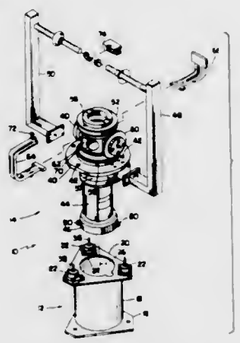
(4) stack pusher means for moving the blank stacks offloaded from the second power conveyor onto the dunnage sheet grippingly held by the dunnage holding means.

4,900,298

CENTRIFUGE DRIVE AND SUPPORT ASSEMBLY

Robert W. Langley, Westminster, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Aug. 21, 1987, Ser. No. 88,084
Int. Cl.[4] B04B *9/14, 9/00*
U.S. Cl. 494—82 11 Claims



1. Centrifuge drive apparatus comprising

a support including a plurality of resilient mounting members that are spaced around a rotation axis and are intersected by a mounting plane that is perpendicular to said rotation axis,

a centrifuge bowl and drive motor assembly including a rotatable centrifuge bowl and a drive motor supported by said mounting members, said drive motor being operable to rotatably drive said bowl about a rotation axis, said rotating bowl including a recess for receiving a channel and an opening permitting passage therethrough for inflow and outflow tubes,

said centrifuge bowl and drive motor assembly having a combined center of gravity in the vicinity of said mounting plane to reduce vibration, and

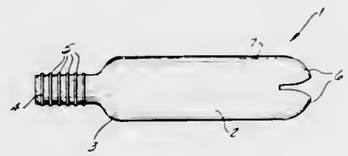
a disposable tube set including a separation channel received in and carried by said bowl said inflow and outflow tubes having one end attached to said channel, passing through said opening and the another end fixed to said bowl rotating means, and a midsection that is rotated by said assembly at one-half of the rotation of said bowl.

4,900,299

BIODEGRADABLE TAMPON APPLICATION COMPRISING POLY(3-HYDROXYBUTYRIC ACID)

Andrew Webb, Yarm, assignor to McNeil-PPC, Inc., Milltown, N.J.

Filed May 11, 1987, Ser. No. 48,338
Int. Cl.[4] A61F *13/20*
U.S. Cl. 604—11 22 Claims



1. A biodegradable tampon applicator comprising a molded, hollow cylindrical body of polymeric material enclosing a tampon therein and having a first flexible open end through which said tampon is expelled and a second open end for receiving means for expelling said tampon, said body comprising a moldable poly 3-hydroxybutyric acid composition.

4,900,300

SURGICAL INSTRUMENT

David A. Lee, 2868 Nicada Dr., #48, Los Angeles, Calif. 90077

Continuation of Ser. No. 70,325, Jul. 6, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 315,190
Int. Cl.[4] A61B *17/20*
U.S. Cl. 604—22 24 Claims



1. A surgical instrument designed for cutting and removing intact an elongated strip of internal tissue greater in length than the width of the instrument cutting edge, said instrument comprising:

(a) a hollow shaft with rounded sides having a central, longitudinal axis, a handle at the rear end thereof and, at the forward end, a generally parabolic-shaped cavity which forms a bowl;

(b) said bowl having closed sides, a closed forward wall, a closed bottom, and an open mouth such that the sides, forward wall and bottom form a continuous inner wall integral with the adjacent sides of said hollow shaft except for an opening in said bowl which communicates with the interior of said hollow shaft; and,

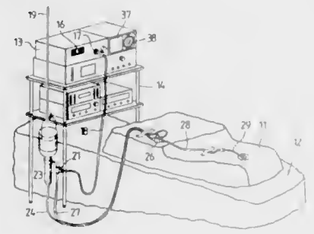
(c) further wherein said open mouth is defined by a generally U-shaped rim integral with the adjacent sides of said hollow shaft and said rim is sharpened so as to form a cutting blade having side cutting edges and a distal tip.

4,900,301

METHOD FOR OCULAR PERFUSION

Robert E. Morris; Clark D. Witherspoon, both of Birmingham, and William E. Goggans, Jr., Pinson, all of Ala., assignors to Vitreoretinal Development, Inc., Birmingham, Ala.

Continuation-in-part of Ser. No. 99,533, Sep. 22, 1987, Pat. No. 4,813,927. This application May 23, 1988, Ser. No. 197,567
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—23 8 Claims



1. A method of ocular perfusion using Gas Forced Liquid Infusions (GFLI) comprising:

(a) supplying pressurized gas at a selected output pressure from a gas pump;

(b) pressurizing the contents of a liquid infusate bottle with the output pressure of said gas pump;

(c) supplying the contents of said liquid infusate bottle to a surgical infusion instrument for infusion into a selected anterior or posterior ocular chamber as an infusate;

(d) selectively varying the pressure of the infusate within the ocular chamber by controlling the output pressure of said gas pump, and

(e) providing a human sensible indication of the output pressure of said gas pump and providing means for detectable audible commands;

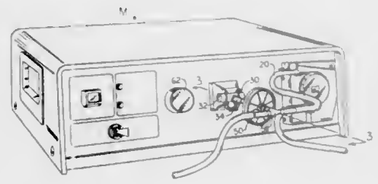
wherein said varying step comprises detecting audible commands to vary the pressure and adjusting the output pressure of said gas pump in accordance with the detected audible signal.

4,900,302

SURGICAL IRRIGATION/ASPIRATION SET-UP KIT

Walter A. Newton, Chandler Mill Road, Ruffin, N.C. 27326

Continuation-in-part of Ser. No. 568,435, Jan. 5, 1984. This application Nov. 19, 1984, Ser. No. 674,064
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—30 5 Claims



1. An aspiration apparatus for use with and releasably connected to an irrigation/aspiration machine of the type in which a suction pump continuously draws fluids into a surgical instrument away from a surgical site and along an aspirant path, said machine including a fitting receptacle on the front wall of the machine containing an air passageway into the pressure control portion of said machine through which air from the aspirant path is withdrawn to monitor suction pressure and further through which air may be selectively injected back into the aspirant path to decrease suction pressure therein; said aspiration apparatus including:

(a) an aspiration tube selectively attachable at one end to said surgical instrument and at the other end to said pump for establishing said aspirant path which delivers aspirated fluids from the surgical site to a collection receptacle;

(b) a T-shaped coupling means comprising a pair of opposed tubular arms colinear with and connected in line with said aspiration tube and a tubular leg depending perpendicularly therefrom, said T-shaped coupling means being positioned in an interruption in said aspiration tube upstream of said suction pump for establishing and connecting a branch path from an intermediate portion of said aspiration tube to said fitting receptacle;

(c) said coupling means further including a fitting received in said fitting receptacle and means for releasably connecting said aspiration tube to said fitting; said fitting including a conduit therein providing communication between a first outlet registrable with said air passageway and a second outlet in communication with releasable connecting means for the passage of air therethrough; and a nozzle member detachably connected to said fitting; said nozzle having a hexagonal exterior shape and further including a non-rotatable snaplock bracket removably attached thereto to prevent loosening of said nozzle from said body portion;

(d) the depending leg of said T-shaped coupling means including a filter means interposed therein between said fitting receptacle on said irrigation/aspriation machine and said aspiration tube for preventing flow of aspirated liquid and microorganisms from said aspiration tube into the pressure control portion of said irrigation/aspiration machine and for preventing any residual microorganic growth and liquid being transmitted from within the pressure control portion of said irrigation/aspiration machine into said aspirant path;

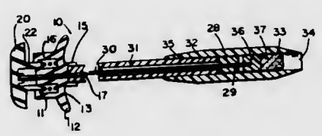
(e) said filter means comprising a housing having means for passage of air in either direction therethrough; a hydrophobic filter medium disposed within said housing in the fluid passageway; said hydrophobic filter medium having the characteristics of passing air and blocking the passage of liquids in both directions and having a pore size sufficiently small as to block the flow of contaminating or infectious microorganisms in both directions.

4,900,303

DISPENSING CATHETER AND METHOD

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 636,239, Jul. 31, 1984, Pat. No. 4,578,061, which is a continuation of Ser. No. 201,531, Oct. 28, 1980, Pat. No. 4,588,395, which is a continuation-in-part of Ser. No. 885,263, Mar. 10, 1978, abandoned. This application Mar. 25, 1986, Ser. No. 843,990
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—54 10 Claims



1. A method for treating a living being with a medical material delivered to the body of said living being by means of a catheter, said method comprising:

(a) disposing a select quantity of an encapsulated medical material along with a biodegradeable adhesive in the

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operating head of a catheter, which catheter includes means for controllably moving said encapsulated medical material and said adhesive from said operating head,

(b) manipulating said catheter into and through a body duct of the body of said living being to dispose said operating head at a select location in the body of said living being,

(c) operating said catheter after said operating head has reached said select location to move said encapsulated medical material and said adhesive a distance from said operating head and to dispose said medical material adhesively bonded by said adhesive against a select portion of the surface of said body duct aligned with said operating head,

(d) removing said catheter from said body duct while leaving said encapsulated medical material adhered to said select portion of said body duct,

(e) retaining said medical material bonded against the wall of said body duct while allowing said medical material to slowing release from encapsulation and flow to the body of said living being and effect medical treatment within the body of said living being.

4,900,304

SOLID PREPARATION ADMINISTERING INSTRUMENT

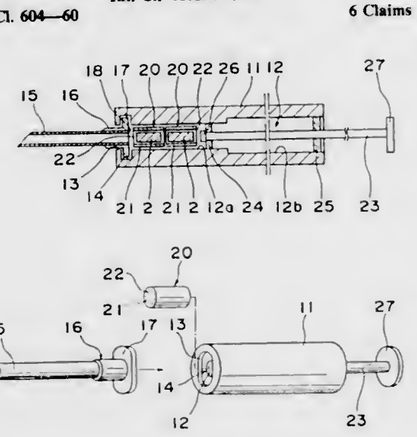
Keiji Fujioka, Amagasaki; Shigeji Sato, Ibaraki; Nobuhiko Tamura, Toyonaka; Yoshihiro Takada, Takatsuki, and Yoshio Sasaki, Toyonaka, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

Filed Jul. 30, 1987, Ser. No. 79,429

Claims priority, application Japan, Jul. 30, 1986, 61-180398; Jul. 30, 1986, 61-180399; Jul. 30, 1986, 61-180400

Int. Cl.⁴ A61M *5/00*

U.S. Cl. 604—60 **6 Claims**



1. A device for subcutaneously administering solid or semisolid preparations to the human body, comprising a hollow cylindrical member having a stepped hole which is longitudinal to the cylindrical member of which the front portion that is positioned at the proximal end of the cylindrical member has a diameter smaller than that of the rear portion which is positioned at the distal end of the cylindrical member to form a capsule loading chamber, a plunger slidably mounted in said cylindrical member, and a hollow needle member removably mounted on the proximal end of said cylindrical member, said cylindrical member being provided at its proximal end with an oblong opening for attachment of said needle member and for loading of one or more capsules containing solid or semisolid preparations, said oblong opening being communicated with said chamber through a disk-like hole formed therebetween, said hollow needle member having an inside diameter smaller than the outside diameter of the capsule to form a stopper for a capsule and being provided at its rear end with a fixing member having an oblong flange insertable in the disk like hole through said oblong opening.

4,900,305

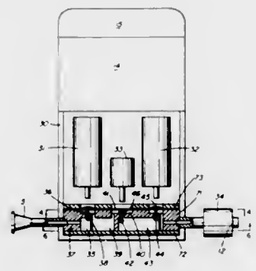
AMBULATORY INFUSION PUMP

Timothy J. N. Smith; Alois J. van Eyken, and Charles A. Mulvenna, all of Kingston, Canada, assignors to Queen's University at Kingston, Kingston, Canada

Filed Jun. 27, 1988, Ser. No. 212,177

Int. Cl.⁴ A61M *5/00*

U.S. Cl. 604—65 **19 Claims**



1. A pulsed liquid injection device comprising:

liquid storage container for storing liquid under a pressure greater than that required for making an injection;

a liquid metering chamber, having a predetermined capacity, for storing liquid under a pressure which is greater than that for making an injection but lower than the pressure in said first storage container;

liquid dispensing means;

a first liquid flow path between said storage container and said metering chamber;

a second liquid flow path between said metering chamber and said liquid dispensing means;

first valve means in said first liquid flow path movable between a first operating position in which said first liquid flow path is blocked and a second operating position which said first liquid flow path is open;

second valve means in said second liquid flow path movable between a first operating position in which said second liquid flow path is blocked and a second operating position in which said second liquid flow path is open;

timing means arranged, repeatedly at predetermined intervals, to (a) open said first valve means for just sufficient time to permit said liquid to flow into and fill said metering chamber and then return said first valve means to its first operating position, and subsequentially (b) open said second valve means for at least sufficient time to permit a predetermined volume of said liquid in said metering chamber to flow to said liquid dispensing means and then return said second valve means to its first operating position; and

means intermediate said first and second valve means arranged to block said second liquid flow path in the event that liquid in excess of said predetermined capacity of said metering chamber is delivered thereto.

4,900,306

DEVICE FOR INTUBATION OF PERCUTANEOUS ENDOSCOPIC OSTOMY

David G. Quinn, Grayslake; Robert B. Edwards, II, Libertyville, and Erik Andersen, Vernon Hills, all of Ill., assignors to Corpak, Inc., Wheeling, Ill.

Continuation-in-part of Ser. No. 144,527, Jan. 15, 1988, Pat. No. 4,795,430. This application Dec. 28, 1988, Ser. No. 291,115

The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.

Int. Cl.⁴ A61M *29/02*

U.S. Cl. 604—97 **17 Claims**



1. A device for intubating an ostomy, such as a gastrostomy, formed by a percutaneous endoscopic technique, comprising:

a tube having at least a fluid lumen and an inflation lumen, the tube having a port near one end to dispose the inflation lumen to ambient air and an outlet at an other end to convey fluid from within the fluid lumen into the patient;

a retention member joined near the other end of the tube, the member being inflatable through the inflation lumen, the member in a deflated state having a generally edge-free outer configuration to facilitate intubation, the member in an inflated state defining at least one generally flat retention and anchoring surface;

a tapered sleeve joined to and sealing the one end of the tube, the sleeve having an edge-free outer configuration for gently parting gastroenteral tissues during intubation;

means for sealing the ambient air port of the tube;

wherein prior to intubation, the retention member is compressed to deflate the member by expelling air out of the inflation lumen through the port, the sealing means is used to seal the port to prevent re-inflation of the member, the one end of the tube is drawn through the patient in a retrograde manner until the deflated retention member abuts against inner tissue surfaces of the ostomy, air is introduced into the inflation lumen to re-inflate the member and anchor the device against the inner tissue surfaces of the ostomy, and the sealing means re-seals the inflation lumen to prevent deflation of the retention member.

4,900,307

SAFETY RETRACTING NEEDLE FOR USE WITH SYRINGE

John C. Kulli, 1920 Spruce St., South Pasadena, Calif. 91030

Continuation-in-part of Ser. No. 43,691, Apr. 29, 1987, Pat. No. 4,747,831. This application May 31, 1988, Ser. No. 200,863

The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.

Int. Cl.⁴ A61M *5/24*

U.S. Cl. 604—110 **44 Claims**

1. A safety device for use with a syringe in injecting a substance into a patient or withdrawing a substance from a patient and for thereafter protecting people from contact with portions of the device that have been within the patient; said device comprising:

a needle for piercing such a patient and for carrying such a substance into or out from such a patient, said needle having a hollow shaft with at least one sharp end;

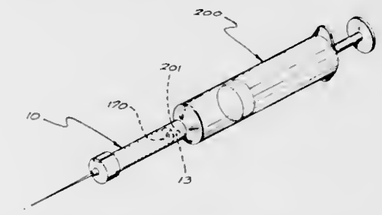
a hollow handle adapted to enclose at least the sharp end of the needle beyond reach of such people's fingers;

means for establishing communication between such a syringe and the hollow needle, for passage of such a substance between the syringe and the needle;

means for securing the shaft to the handle, with the sharp end projecting from the handle; and

means for releasing the securing means and for substantially permanently retracting the sharp end of the needle into the handle and beyond reach of such people's fingers;

said releasing and retracting means being manually actuable by a simple unitary motion, of amplitude that is substantially shorter than the shaft of the needle.



4,900,308

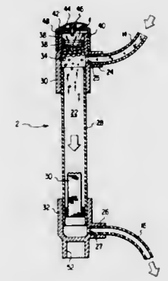
GAS ELIMINATION DEVICE

Wesley H. Verkaart, Duxbury, Mass., assignor to Level 1 Technologies, Inc., Marshfield, Mass.

Continuation of Ser. No. 54,979, May 27, 1987, abandoned. This application Aug. 23, 1988, Ser. No. 235,964

Int. Cl.⁴ A61M *5/14*

U.S. Cl. 604—126 **15 Claims**



1. Apparatus for eliminating a gas from a cellular fluid comprising plenum means and mounting means, said plenum means comprising means for separating said gas from said cellular fluid, said means for separating consisting of a chamber for producing a vertical flow rate in a fluid flowing therethrough adequate to release said gas in the form of bubbles which rise to the top of said chamber when said chamber is vertical, said chamber having a fluid inlet, a fluid outlet below said fluid inlet, and a hydrophobic membrane above said fluid inlet when said chamber is in an operational orientation for freely receiv-

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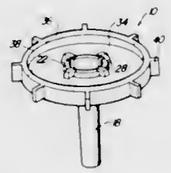
ing said bubbles and for passing said gas of said bubbles directly to the atmosphere through said membrane while preventing passage of said fluid, and wherein said mounting means comprises means for engaging support means for supporting said plenum only when said chamber is substantially vertical and for preventing rotating of said chamber about a horizontal axis.

4,900,309

NEEDLE SHIELD

Fred Netherton, 4250 Roseland Drive, W., Windsor, Ontario, Canada (N9G 1Z9), and Steven Z. Livneh, 5120 Halford Drive, R.R. #1, Windsor, Ontario, Canada (N9A 6J3), assignors to Fred Netherton and Steven Z. Livneh, both of Windsor, Canada

Filed Jun. 2, 1988, Ser. No. 201,533
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—192 **12 Claims**



1. A protective shield for use with a hypodermic needle comprising:
- a tubular needle cover having an open end for receiving said needle and having a flange near the open end;
- a generally planar and rigid shield means having a central opening for receiving said tubular needle cover, and having a planar surface perpendicular to the longitudinal axis of the tubular needle cover; and
- means for permanently fastening said flange within said central opening when said tubular needle cover is inserted into said central opening comprising
- a portion of said central opening having a smaller diameter than said flange, wherein said planar surface forms a seat that contacts the bottom surface of said flange when said needle cover is inserted into said central opening; and
- at least one moveable tab member extending from said planar surface partially over said central opening, for engaging the top surface of the flange when the bottom surface of the flange is positioned over said seat.

4,900,310

PROTECTIVE DEVICE FOR CANNULA USED TO DRAW BLOOD

George B. Ogle, II, Alta Loma, Calif., assignor to International Medication Systems Limited, South El Monte, Calif.

Filed Oct. 7, 1988, Ser. No. 255,129
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—198 **14 Claims**

1. A protective device for a cannula used to draw blood, the device comprising:
- an elongated sheath open at one end and including a longitudinal slot;
- stop means at the other end of the sheath;
- a piston disposed in the sheath to be longitudinally slidable between an extended position against the stop means and a retracted position away from the stop means, the piston having a bore extending through it in the direction in which the piston slides;
- means for securing an elongated cannula in the piston bore so the cannula extends longitudinally through the bore with one end of the cannula in the sheath and the scarf end of the cannula extending outwardly away from the sheath when the piston is in the extended position; and
- a slidable sleeve disposed around the sheath and connected to the piston through the slot so that as the sleeve slides



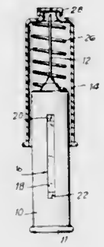
relative to the sheath and away from the stop means, the piston is moved longitudinally within the sheath to the retracted position and thus moves the scarf end of the cannula to a safely enclosed position within the sheath.

4,900,311

HYPODERMIC SYRINGE

Lawrence Stern, 5 Malcolm St., Morristown, N.J. 07960, and Thomas Stern, 550 Harold St., Staten Island, N.Y. 10314

Filed Dec. 6, 1988, Ser. No. 280,637
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—198 **8 Claims**



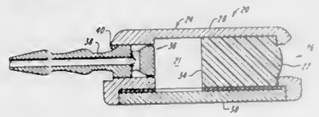
1. A hypodermic syringe, including:
- a syringe barrel of circular cross-section having a hypodermic needle attached to an otherwise closed end thereof and extending coaxially of the longitudinal axis of said syringe barrel;
- a retractable and extendable needle guard of elliptical tubular cross-section, said guard being slidably mounted on said syringe barrel for movement axially of said syringe barrel between a retracted position and an extended position;
- locking means provided on one of said syringe barrel and said needle guard, said locking-means including a locking projection on one of said barrel and guard which is received within an axially extending guideway formed in the other of said barrel and guard, said guideway including a retaining notch at each axial end of said guideway, said locking projection being positioned on the minor axis of said elliptical cross-section;
- whereby, compression of said needle guard along its major axis will cause retraction of said locking projection from said retaining notch and permit movement of said needle guard axially of said syringe barrel under the guidance of said locking projection travelling within said guideway, said needle guard being lockable in a selected one of said retracted and extended positions by engagement of said locking projection by the engagement of said locking projection with a selected one of said retaining notches.

4,900,312

INFUSION DEVICE FILTER

Michael A. Nadeau, North Attleboro, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 2, 1988, Ser. No. 151,407
Int. Cl.[4] A61M *5/005*
U.S. Cl. 604—246 **18 Claims**



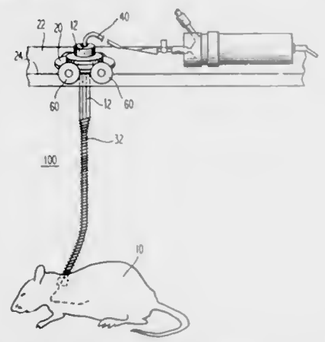
1. An implantable subcutaneous infusion device comprising,
- a housing with a rigid wall having an inside surface and a chamber,
- a filter for preventing particles introduced into said chamber from leaving said chamber, said filter including an opening through said wall of said housing, said opening defining a surface, a shaft secured within said opening, a first portion of said shaft sized to sealingly mate with said surface defined by said opening and a second portion of said shaft having a cross-sectional area less than the cross-sectional area of said opening at and close to the inside surface of said wall, said second portion of said shaft and said opening defining a space through which fluid may flow and a bore through said shaft communicating with said space.

4,900,313

MOBILE SWIVEL AND TETHER DEVICE FOR ATTACHMENT TO LABORATORY ANIMALS

James N. MacLeod, Philadelphia, and Bernard H. Shapiro, Melrose Park, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 69,839, Jul. 6, 1987, Pat. No. 4,756,707. This application Apr. 28, 1988, Ser. No. 190,959
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[4] A61M *5/185*
U.S. Cl. 604—261 **16 Claims**



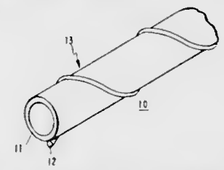
1. A swivel tethering system for attaching to a cage of a laboratory animal, comprising:
- (a) a track disposed on a top surface of said cage;
- (b) a carriage means disposed on said track for extended lateral movement along said track;
- (c) a tether means rotatably mounted on said carriage and connected to said animal for tethering said animal to said carriage; and
- (d) conduit means disposed within said tether means for communicating with said animal.

4,900,314

COLLAPSE-RESISTANT TUBING FOR MEDICAL USE

John Quackenbush, Hoover, Ala., assignor to FBK International Corporation, Birmingham, Ala.

Filed Feb. 1, 1988, Ser. No. 151,030
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—282 **6 Claims**



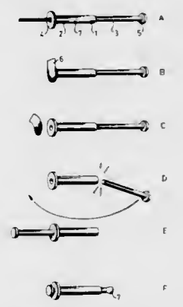
1. A collapse-resistant catheter comprising a central tube, said tube having a second tube integral with its exterior surface, said second tube having a hollow spiral geometry of a configuration open at both ends and providing a collapse-resistant function by its geometry alone, said central and said second tube being coextruded.

4,900,315

DISPOSABLE APPLICATOR

Mona K. Lundqvist, Brandsberga, Pl. 223, S-26070 Ljungbyhed, and Bengt E. Malmborg, Skånegatan 47, S-252 52 Helsingborg, both of Sweden

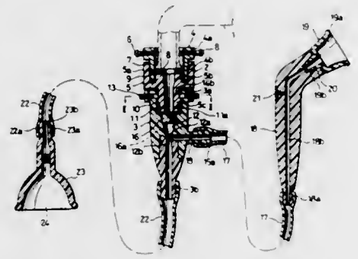
Continuation of Ser. No. 169,153, Mar. 8, 1988, abandoned, which is a continuation of Ser. No. 873,399, Jun. 12, 1986, abandoned. This application Mar. 31, 1989, Ser. No. 332,446
Claims priority, application Sweden, Jun. 13, 1985, 8502933
Int. Cl.[4] A61M *35/00*
U.S. Cl. 604—311 **20 Claims**



1. A body for a disposable syringe type substance applicator, comprising:
- a body having a hollow barrel section and a plunger section, said body being initially a single piece,
- said hollow barrel section having one end sealed by integrally joining thereto said plunger section which is separable to unseal said barrel end by breaking of the integral joint, one end portion of said plunger section for insertion into said barrel section, said one end portion being closed, having an exterior surface shape substantially congruent to a portion of the interior surface of said barrel section and sized to be slidable within the entire length of said barrel section.

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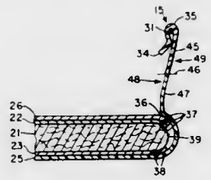
4,900,316
VACUUM SKIN CLEANER
Masuo Yamamoto, Habikino, Japan, assignor to Azz International Co., Ltd., Osaka, Japan
Filed Oct. 16, 1987, Ser. No. 109,831
Claims priority, application Japan, Oct. 18, 1986, 61-247850
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—313 **15 Claims**



1. A vacuum skin cleaner comprising:
a negative pressure generator having an internal water passage and a suction passage;
said water passage being connected at one end to a tap water faucet and having a discharge opening at the other end;
said water passage having a cross-sectionally reduced intermediate portion;
said suction passage communicating with said intermediate portion;
an applicator cap communicating with said suction passage and having an opening mouth for contact with human skin; and
a mounting attachment for removably connecting said negative pressure generator to said faucet;
said mounting attachment including,
a first annular seal interposed between said mounting attachment and said faucet,
a second annular seal interposed between said mounting attachment and said negative pressure generator,
an upper portion removably fixed to said faucet by a plurality of radially extending set screws, and
a lower portion removably fitted into said negative pressure generator,
said lower portion being formed with an annular projection; and
a releasable lock mechanism positioned between aid mounting attachment and said negative pressure generator to engage with and disengage from said annular projection.

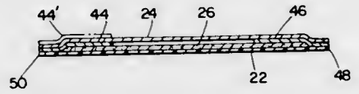
4,900,317
DISPOSABLE GARMENT WITH BREATHABLE LEG CUFFS
Kenneth B. Buell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 921,796, Oct. 17, 1986, abandoned, which is a continuation of Ser. No. 522,438, Aug. 11, 1983, Pat. No. 4,636,207, which is a continuation-in-part of Ser. No. 441,825, Nov. 15, 1982, abandoned. This applicatioo Jul. 20, 1988, Ser. No. 222,329
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—370 **32 Claims**

1. A disposable diaper comprising:
a liquid impermeable backsheet;
a liquid pervious topsheet secured to said backsheet;
an absorbent element interposed between said topsheet and said backsheet;
a longitudinally extending breathable cuff positioned in each longitudinal side margin of the diaper, each of said cuffs having a fixed edge and a distal edge spaced from said fixed edge, each of said cuffs having said fixed edge attached to the diaper, said distal edge being unsecured to at least a portion of the diaper, wherein each of said cuffs is permeable to vapor over at least a portion of its extent; and



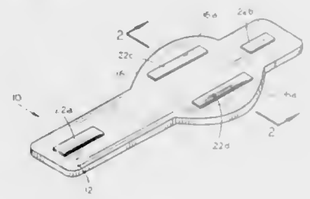
an elastic element operatively associated with said distal edge of each of said cuffs and affixed in an elastically contractable condition to said cuff to render said distal edge of said cuff elastically contractable so that said elastic element effectively contracts or gathers the cuff material adjacent said elastic element so that said distal edge is displaced inwardly from said absorbent element and said fixed edge.

4,900,318
ABSORBENT PAD WITH MOISTURE BARRIER
Michael R. Toth, Andover, Mass., assignor to The Kendall Company, Boston, Mass.
Filed Jun. 8, 1987, Ser. No. 59,657
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.1 **7 Claims**



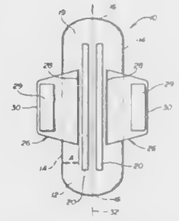
1. A disposable absorbent pad assembly for use on humans comprising:
(1) a fluid-impervious backing sheet;
(2) a fluid-pervious top sheet;
(3) an absorbent pad disposed between said backing and top sheets; and
(4) a pair of fluid-impervious barriers arranged between said pad and said top sheet, each said barrier being disposed longitudinally along a longitudinal side portion of said absorbent pad assembly, each said barrier being of undivided, single layer construction to present a barrier structure of minimum thickness and bulk, said barriers thus defining a centrally disposed longitudinally directed fluid-pervious area between said barriers, said barriers, backing sheet and top sheet being bonded together along their common periphery whereby to form sealed edges blocking the escape of fluid along the entire side periphery of said absorbent pad assembly, said barriers and said backing sheet further being characterized as providing a pair of pockets for fluid retention extending longitudinally along the length of said absorbent pad on each side thereof.

4,900,319
SANITARY NAPKIN
Mark H. Richwine, 7921 Stockwell St., Lincoln, Nebr. 68506
Filed Sep. 29, 1988, Ser. No. 250,509
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.1 **3 Claims**



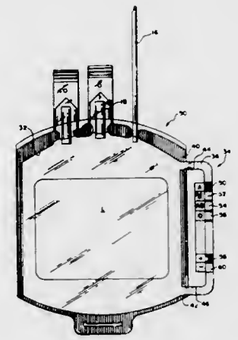
1. A sanitary napkin, comprising:
an elongated napkin formed of a single, uniform-thickness layer of soft, absorbent material throughout the entire napkin;
said napkin having a forward elongated portion, a rearward elongated portion and an intermediate portion;
said forward and rearward portions being rectangular, non-tapering and equal in width;
said forward portion having a length, measured longitudinally from said intermediate portion, greater than the length of the rearward portion, such that the forward portion will extend forwardly of a user's vaginal area and the rearward portion will extend over the lower buttock area of a user;
said intermediate portion having a width greater than the width of said forward and rearward portions; and
means on said napkin for removably mounting said napkin to an undergarment.

4,900,320
SANITARY NAPKIN WITH PANTY GATHERING FLAPS
Sherilyn S. McCoy, Monmouth Junction, N.J., assignor to McNeil-PPC, Inc., Milltown, N.J.
Filed Jun. 16, 1986, Ser. No. 874,978
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—387 **7 Claims**



1. An improved sanitary napkin comprising a central absorbent element and having generally longitudinally extending edges, a body facing side and a garment facing side;
said napkin provided with two flaps, each affixed at one end thereof to the garment facing side of the napkin with the remainder of the flaps freely extending laterally in a direction tranverse to the longitudinal edges of the napkin, said flaps adapted to encircle the crotch portion of the undergarment and provided with means for affixing said flaps in said encircling portion;
said flaps being affixed to the garment facing side of the napkin at an affixation point which is inward from the longitudinal edge of the napkin;
whereby when said flaps are affixed in said encircling position, the edges of the undergarment are gathered toward the longitudinal centerline of the napkin and are shielded from body fluids by the garment facing side of the napkin.

4,900,321
SET WITH INTEGRALLY FORMED SAMPLE CELL
Stephen B. Kaufman, Gurnee; Robert Patterson, Riverwoods; David V. Bacehowski, Wildwood; Arnold C. Bilstad, Deerfield, and Patrick N. Huehls, Highland Park, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.
Continuation of Ser. No. 940,816, Dec. 12, 1986, Pat. No. 4,820,297. This application Dec. 22, 1988, Ser. No. 288,522
Int. Cl.[4] A61B *19/00*
U.S. Cl. 604—409 **31 Claims**



1. A fluid delivery and test system comprising:
a flexible, sealable container defining a volume for accumulating a quantity of a pre-selected fluid; and
a fluid receiving specimen cell affixed to a selected region of said container, said specimen cell in fluid flow communication with said container and isolatable from said container while still affixed thereto such that the contents of said specimen cell can be selectively tested while said cell remains affixed to said container.

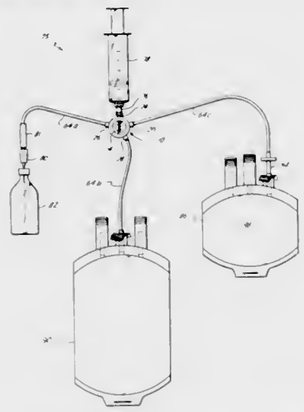
4,900,322
BLOOD COMPONENT POOLING VALVE AND KIT
James D. Adams, 4708 Creek Bend Dr., Austin, Tex. 78744
Division of Ser. No. 910,367, Sep. 22, 1986, abandoned. This application Oct. 5, 1988, Ser. No. 254,440
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—410 **23 Claims**

1. A method of producing a blood component pooling device for pooling platelets or cryoprecipitates, the method comprising:
(a) providing a valve comprising: a valve housing having a bore extending partly therethrough that is bounded by a surface of revolution that is defined by a side wall of the housing, said housing having four ports opening into its bore through the side wall of the housing; and a valve plug rotatably mounted in the bore of said housing, and having two non-intersecting channels extending therethrough, said channels being arranged to that by rotation of the valve plug a first port, with a syringe fitting, may be brought into exclusive communication with each of the other ports so that fluids may flow only between the first port and the port in communication therewith;
(b) connecting a syringe to the first port;
(c) connecting a first hose to a second port, said first hose

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being connected at its second end to a terminal hypodermic needle;

(d) connecting a second hose to a third port said second hose being connectable at its second end to a blood component pooling bag; and



(e) connecting a third hose to a fourth port, said third hose being connected at its second end to a plastic bag needle insertable into a blood component bag containing platelets or cryoprecipitates.

4,900,323

CHEMICAL AND METHOD FOR BLEACHING TEXTILES

Glen A. Dickson, and Donnie R. Gray, both of Dilley, Tex., assignors to Ocean Wash, Inc., Dilley, Tex.

Filed Nov. 5, 1987, Ser. No. 117,664
Int. Cl.[4] D06L *3/02*
U.S. Cl. 8—111 12 Claims

1. A non-aqueous method for fading a previously dyed denim fabric comprising the steps of:

(a) placing the previously dyed denim fabric in a tumbler;

(b) adding particulate diatomaceous earth as a carrier for a potassium permanganate therewith;

(c) tumbling the denim fabric in the tumbler for an interval sufficient to obtain a desired color fading;

(d) rinsing after tumbling to obtain the faded denim fabric after having a desired color fade; and p1 (e) drying the color faded denim fabric.

4,900,324

AGENTS FOR NON-FORMALDEHYDE DURABLE PRESS FINISHING AND TEXTILE PRODUCTS THEREFROM

Leon H. Chance; Gary F. Danna, and Bethlehem K. Andrews, all of New Orleans, La., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

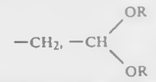
Continuation-in-part of Ser. No. 50,436, May 18, 1987, Pat. No. 4,818,243. This application Aug. 8, 1988, Ser. No. 229,420
Int. Cl.[4] C07C *43/30, 43/303;* C08B *11/02, 11/193*
U.S. Cl. 8—116.4 15 Claims

1. A composition for crosslinking cellulosic material comprising: a hydroxy acetal of the structure $(RO)_2$—CH—CHOH—CHOH—$CH(OR)_2$, wherein R is alkyl and a catalyst capable of inducing a crosslinking reaction between said cellulosic material and said acetal.

7. A process for producing wrinkle-resistant cellulosic fabric comprising: applying a hydroxy acetal of the formula:

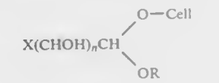


wherein R is alkyl, n is 1 to 4, and X is selected from:

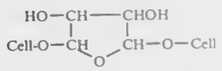


applying a catalyst to said fabric; and treating said fabric under conditions to cause crosslinking between said fabric and said acetal.

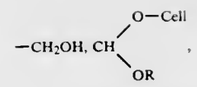
14. A cellulosic composition having a plurality of crosslinks selected from the structures



and



wherein "cell" is cellulose, R is selected from the group consisting of alkyl and cellulose, n is 1 to 4, and X is selected from



provided that when X is $—CH_2OH$ or hydrogen, R is cellulose.

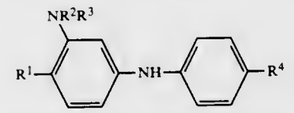
4,900,325

HAIR-DYEING PREPARATIONS

David Rose, Hilden; Edgar Lieske, Duesseldorf; Norbert Maak, Neuss, and Horst Hoeffkes, Duesseldorf-Hellerhof, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 236,959
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728748
Int. Cl.[4] A61K *7/13*
U.S. Cl. 8—408 20 Claims

1. A hair dyeing composition containing as oxidation dye precursors, in a total amount between about 0.2 to about 5% by weight of the total composition, a developer component and a coupler component in amounts such as to give a molar ratio between said developer component and said coupler component in the range between about 0.5:1 to about 2:1, both of said oxidation dye precursors being dispersed in an aqueous-based carrier, said coupler component comprising between about 0.05 and about 10 millimoles per 100 grams of total composition of molecules having the formula:



wherein R^1 is selected from the group consisting of hydrogen, a C_1–C_4 alkyl group and a halogen atom; R^2 and R^3 independently of one another are selected from the group consisting of hydrogen, C_1–C_4 alkyl groups and C_2–C_4 hydroxyalkyl groups or, together with the nitrogen atom, form a morpholine, piperidine, pyrrolidine or piperazine ring; and R^4 is selected from the group consisting of hydrogen or a $—NR^2R^3$ group; and salts thereof.

4,900,326

DYE COMPOSITION FOR HUMAN KERATINOUS FIBRES IN THE FORM OF FOAM, BASED ON 5,6-DIHYDROXYINDOLE

Jean F. Grollier, Paris, France, assignor to L'Oreal, Paris, France

Filed Jun. 16, 1987, Ser. No. 62,687
Claims priority, application Luxembourg, Jun. 16, 1986, 86474
Int. Cl.[4] A61K *7/13*
U.S. Cl. 8—409 19 Claims

1. A dye composition for human keratinous fibers comprising at least 5,6-dihydroxyindole present in an amount effective to dye said human keratinous fibers and at least 0.1 percent by weight of a foam generator in a cosmetically acceptable aqueous medium, said composition being packaged, under pressure, in an aerosol device in the presence of a propellant agent, under such conditions so as to form a dyeing foam having a density below or equal to 0.4 g/cm^3 when dispensed from said aerosol device.

VOL 1111 ISS 2 FE 13 1990 UMI

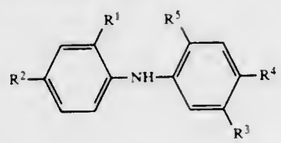
4,900,327

PREPARATIONS CONTAINING SUBSTANTIVE NITRODIPHENYLAMINE DERIVATIVE HAIR DYES

David Rose, Hilden; Edgar Lieske, Duesseldorf, and Norbert Mask, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 26, 1988, Ser. No. 160,723
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706223
Int. Cl.[4] A61K *7/13*; C07C *87/54, 143/56*
U.S. Cl. 8—429 22 Claims

1. In a hair dye aqueous preparation comprising a hair dye effective amount of a first substantive hair dye in a suitable cosmetic carrier, the improvement wherein said first substantive hair dye comprises at least one of the formula:



(I)

wherein:

one of R^1 or R^2 is nitro and the other is $-SO_3H$;

one of R^4 or R^4 is $-NR^6R^7$ and the other is hydrogen, chlorine, or a C_{1-4} alkyl, and R^6 and R^7 are independently hydrogen, C_{1-4} alkyl, or C_{2-4} hydroxyalkyl; and

R^5 is hydrogen, chlorine, or a C_{1-4} alkyl;

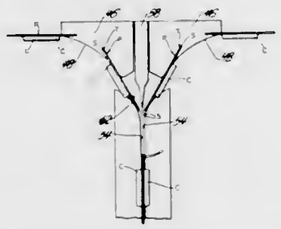
or a water soluble salt thereof.

4,900,328

METHOD FOR ASSEMBLING HEAT EXCHANGER PLATE PAIR BY SNAP FIT

Michael A. Breda, Amherst, and George K. Snyder, Lockport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1989, Ser. No. 314,002
Int. Cl.[4] B21D *53/04*; B23P *11/02*
U.S. Cl. 29—890.039 2 Claims



1. In a process of forming heat exchanger tubes, the method of repetitively assembling separate pairs of elongated metal plates having side edges comprising the steps of:

arranging the plates into two groups each group comprising a plurality of plates,

selecting a plate from each of the groups,

positioning the two selected plates in spaced relation on opposite sides of a mating plane with their proximal edges parallel,

moving the positioned plates simultaneously, through respective arcs that are tangential to the mating plane so that the proximal edges touch at the mating plane, and

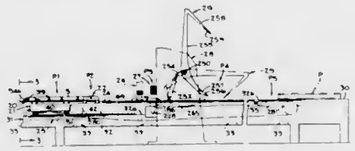
continuing the arcuate movement of the plates while maintaining the proximal edges in the mating plane by restraining one plate with the other plate thereby causing the plates to snap together as an assembled pair.

4,900,329

METHOD FOR MAKING PALLETS

Joseph Richardelli, Fredericksburg, Va., assignor to The Salk Institute for Biological Studies, San Diego, Calif.

Division of Ser. No. 863,926, May 15, 1986, Pat. No. 4,757,605.
This application Jul. 15, 1988, Ser. No. 219,739
Int. Cl.[4] B21J *5/00*
U.S. Cl. 29—430 3 Claims



1. A method of manufacturing wooden pallets comprising the steps of:

(a) placing a plurality of stringers in parallel with one another at predetermined spacing on a stringer loading station;

(b) gripping forward ends of the stringers with a plurality of grippers disposed on a gripper carriage;

(c) pulling the stringers forward longitudinally to a deckboard installation station and positioning the stringers in a predetermined position for receiving a first deckboard;

(d) positioning a deckboard transversely on said stringers;

(e) lowering a transversely-oriented chuck assembly to said deckboard so that said chuck assembly abuts the upper surface of that deckboard without contacting any others;

(f) feeding a plurality of nails into said chuck assembly;

(g) lowering a plurality of punches into contact with said nails to drive said nails through said deckboards and into said stringer, with said nails being guided by said chuck assembly;

(h) sensing when said punches reach a predetermined position with respect to the upper surface of said deckboard;

(i) reversing said punches upon said punches reaching said predetermined position with respect to said upper surface of said deckboard, thereby determining a lower end of each stroke individually for each deckboard so that said nails are driven reliably to a predetermined depth in each deckboard;

(k) advancing said stringers to additional predetermined positions and attaching additional transversely-oriented deckboards thereto by repetition of steps d–j to produce a half-pellet;

(l) advancing said half-pellet forwardly, then reversing the direction thereof to invert said half-pallet through the use of a turnover assembly which rotates said half-pallet about a transverse axis;

(m) pulling said half-pallet back through said deckboard installation station to a predetermined position rearwardly thereof;

(n) advancing said half-pallet through said deckboard installation station for installation of a second set of deckboards in accordance with steps c–k to produce a completed pallet; and

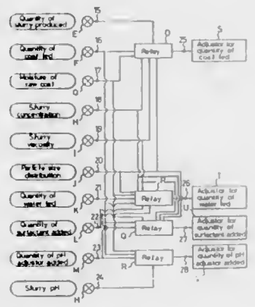
(o) advancing the completed pallet to a delivery station.

4,900,330

PROCESS FOR PRODUCING A HIGH CONCENTRATION COAL-WATER SLURRY

Kazunori Sboj; Yoshinori Ohtani, both of Kure; Hirofumi Kikkawa; Hiroshi Terada, both of Hiroshima; Masayasu Murata, Hasuda, and Nobuyasu Meguri, Kure, all of Japan, assignors to Babcock-Hitachi Kabushiki-Baisha, Tokyo, Japan

Continuation-in-part of Ser. No. 760,626, Jul. 30, 1985, abandoned. This application Feb. 4, 1987, Ser. No. 11,394
Claims priority, application Japan, Jul. 30, 1984, 59-159717
Int. Cl.[4] G10L *1/32*
U.S. Cl. 44—51 18 Claims



1. A process for continuously producing by high coal concentration wet grinding a coal-water slurry having the desired uniform properties of a viscosity of 2,000 cp or less, a pH of 7 or more, and a coal particle concentration of at least 60% by weight with about 70 to 90% by weight of the coal particles sized so as to pass through a 200 mesh opening wherein said process comprises:

a. continuously wet grinding raw coal under conditions of high coal concentration to produce a coal-water slurry with broad coal particle size distribution;

b. continuously monitoring the viscosity, pH, coal particle concentration and the coal particle size distribution of the coal-water slurry;

c. continuously monitoring the quantity of coal fed, the moisture of coal fed, the quantity of water fed, the quantity of surfactant added and the quantity of pH adjustor added to the coal-water slurry;

d. continuously detecting the variations in the viscosity, pH, coal particle concentration and particle size distribution of the coal-water slurry from the desired properties; and

e. continuously adjusting the quantity of coal fed, the quantity of water fed, the quantity of surfactant added and the quantity of pH adjustor added to the coal-water slurry to produce a coal-water slurry having the desired properties.

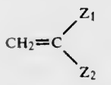
4,900,331

OIL COMPOSITIONS CONTAINING ALKYL AMINE OR ALKYL MERCAPTAN DERIVATIVES OF COPOLYMERS OF AN ALPHA OLEFIN OR AN ALKYL VINYL ETHER AND AN UNSATURATED ALPHA, BETA-DICARBOXYLIC COPOUND

Hanh T. Le, Wilmington, Del., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 31, 1988, Ser. No. 265,614
Int. Cl.[4] C10L *1/18, 1/22*
U.S. Cl. 44—62 17 Claims

1. An oil composition which comprises a major amount of an oil selected from a crude oil or fuel oil and a minor amount of an alkyl amine or alkyl mercaptan derivative of an alpha olefin or alkyl vinyl ether and an unsaturated alpha, beta-dicarboxylic compound copolymer having pour point depressant properties said copolymer comprising the reaction product of (a) an alpha olefin having from about 2 to about 30 carbon atoms or mixtures of alpha olefins having from about 2 to about 30 carbon atoms or an alkyl vinyl ether or mixture of alkyl vinyl ethers having the formula:



wherein Z_1 and Z_2 are the same or different, H, R_1 or OR_1 and R_1 is an alkyl group having 1 to 30 carbon atoms, (b) maleic anhydride; and (c) an alkyl sulfide having the formula:

$$X(R_2)_y$$

wherein X is S and R_2 is an alkyl group having from about 3 to about 30 carbon atoms and y is either 1 or 2.

4,900,332

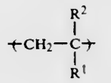
NITROGENOUS COPOLYMERS, THEIR PREPARATION AND USE AS ADDITIVES FOR IMPROVING THE POUR PROPERTIES OF HYDROCARBON MIDDLE DISTILLATES

Jacques Denis, Charbonniere les Bains; Bernard Sillion, Lyon; Bernard Damin, Oullins, and Robert Leger, Grigny, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Elf France, Courbevoie, both of, France

Filed Mar. 31, 1988, Ser. No. 176,064
Claims priority, application France, Apr. 1, 1987, 87 04602
Int. Cl.[4] C10L *1/18*
U.S. Cl. 44—62 17 Claims

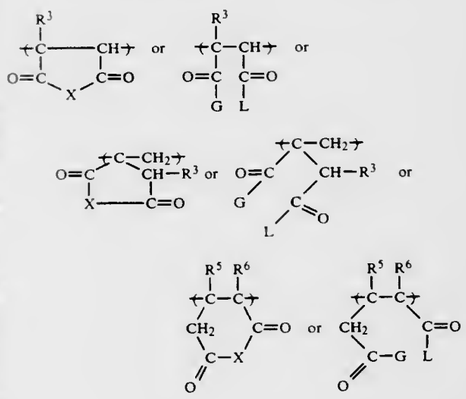
1. A copolymer of average number molecular weight of about 400 to 50,000 comprising:

(a) 5–60% by mole of recurrent units (A) deriving from alpha olefins of 2–36 carbon atoms complying with the general formula:



wherein R^1 is a hydrogen atom or a lower alkyl group of 1–4 carbon atoms and R^2 is a hydrogen atom or an alkyl group of 1–30 carbon atoms,

(b) 10–70% by mole of recurrent units (B) deriving from unsaturated dicarboxylic compounds complying with one of the general formulas:

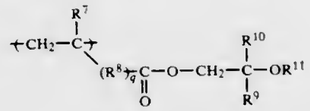


wherein R^3 is a hydrogen atom or a lower alkyl group of 1–4 carbon atoms, X is an oxygen atom or an $=N-R^4$ group in which R^4 is a monovalent organic radical deriving from a compound containing a primary amine group complying with one of the general formulas:

$$R-Z\{CH_2\}_n NH\}_m H \quad \text{or} \quad HO-R^{14}-NH_2$$

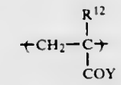
wherein R is a monovalent aliphatic radical of 1–30 carbon atoms, Z is selected from the oxygen atom —O— and $-NR^{15}-$ groups wherein R^{15} is a hydrogen atom or a monovalent aliphatic radical of 1–30 carbon atoms, n is an integer from 2 to 4, m is an integer from 1 to 4 or may be zero when Z is —NH—, R^{14} is a divalent aliphatic radical of 2–30 carbon atoms, each of G and L, identical or different, is an —OH, $-OR^1$ or $-NHR^4$ group, in which R^1 and R^4 are defined as precedingly, and each of R^5 and R^6, identical or different, is a hydrogen atom or a lower alkyl group of 1–4 carbon atoms, at least one of them being a hydrogen atom,

(c) 10–70% by mole of recurrent units (C) deriving from unsaturated esters of 1,2-diols, complying with the general formula:



wherein each of R^7 and R^{10}, identical or different, is hydrogen atom or a lower alkyl group of 1–4 carbon atoms, R^8 is a divalent aliphatic radical of 1–30 carbon atoms, q is zero or 1, R^9 is a monovalent aliphatic radical of 2–30 carbon atoms, and R^{11} is a hydrogen atom, a lower alkyl group of 1–4 carbon atoms or a lower acyl radical of 1–4 carbon atoms, and

(d) 0–60% by mole of recurrent units (D) deriving from acrylic compounds complying with the general formula:



wherein R^{12} is a hydrogen atom or a lower alkyl radical of 1–4 carbon atoms, Y is a —OH, $-NHR^4$ or $-OR^{13}$ wherein R^4 is defined as above and R^{13} is an alkyl radical of 1–30 carbon atoms, at least one of the recurrent units (A), (B), (C) and/or (D) of said copolymer containing at least 12 carbon atoms, and at least 10% of the recurrent units of said copolymer being recurrent units (B) of imide type, conforming with the above general formulas wherein X is an $=N-R^4$ group.

4,900,333

METHOD OF CARRYING OUT A GAS COMBUSTION PROCESS WITH RECOVERY OF A PART OF THE HEAT PRESENT IN THE COMBUSTION GASES

Hugo T. P. Bos, Zutphen, Netherlands, assignor to VEG-Gasinstituut N.V., Wilmersdorf, Netherlands

Filed Sep. 18, 1987, Ser. No. 98,524

Claims priority, application Netherlands, Sep. 23, 1986, 8602404

Int. Cl.⁴ C01B *3/36*

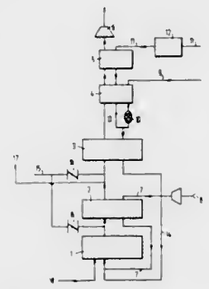
U.S. Cl. 48—197 R **4 Claims**

1. A method of carrying out a gas combustion process having stationary and non-stationary conditions in a combustion chamber to which gas and air are supplied wherein heat from flue gas generated during the combustion process is recovered, comprising the steps of:

extracting heat from the flue gas by passing the flue gas through a recuperator;

heating the air supplied to the combustion chamber with the extracted heat;

extracting further heat from the flue gas by passing the flue gas through a reformer;



converting in said reformer, with said further extracted heat, a combustible gas and steam into a resulting gas to be supplied to the combustion chamber for use in combustion; and

supplying, during non-stationary conditions of the combustion process, a cooling medium to the flue gas before passing the flue gas through said reformer.

4,900,334

PROCESS FOR TREATING A LIQUID-WET POLYCARBONATE MEMBRANE TO IMPROVE ITS GAS SEPARATION PROPERTIES

Wudneh Admassu, Concord; John A. Jensvold, and Daniel O. clark, both of Benicia, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 9, 1988, Ser. No. 269,922

Int. Cl.⁴ B01D *53/22*

U.S. Cl. 55—16 **15 Claims**

1. A process for treating a liquid-wet polycarbonate membrane comprising the steps of:

A. contacting at least one side of a polycarbonate membrane with water at a temperature which does not deleteriously affect the integrity of the membrane under conditions such the water removes substantially all of the residual solvent and non-solvent from the membrane;

B. contacting at least one side of the membrane with air, an inert gas, or vacuum at a temperature under conditions such that substantially all of the water is removed from the membrane without deleteriously affecting the integrity of the membrane; and

C. simultaneously or consecutively heat treating the membrane under conditions such that the membrane subsequently exhibits a decrease in gas flux of less than about 2 percent over 30 days under an operating temperature of less than about 25° C. and an operating pressure of less than about 200 psig with an increase in gas selectivity of at least about 5 percent compared with a membrane which is not heat treated.

12. The process of claim 11 wherein the polycarbonate membrane possesses a separation factor for oxygen/nitrogen of at least about 4.

4,900,335

CENTRIFUGAL PUMP WHEEL AND METHOD OF PUMPING GAS CONTAINING LIQUID BY MEANS OF A CENTRIFUGAL PUMP

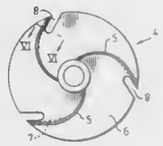
Bengt Algers, Kvarndalen, Sweden, assignor to Scanpump AB, Molndal, Sweden

Filed Sep. 6, 1988, Ser. No. 241,042

Claims priority, application Sweden, Sep. 3, 1987, 8703426

Int. Cl.⁴ B01D *19/00*

U.S. Cl. 55—21 **13 Claims**



1. A centrifugal pump wheel comprising:

a disk defining a covering plate having a center and a peripheral edge;

a plurality of pump wheel vanes mounted to said covering plate; and

a plurality of gas evacuation openings defined in said covering plate and located leeward of said vanes, at least the majority of said openings being comprised of longitudinal slots opening into the peripheral edge of the pump wheel disk.

4,900,336

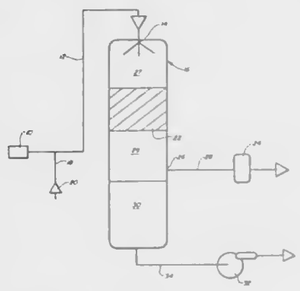
METHOD OF PREFERENTIALLY REMOVING OXYGEN FROM OZONATED WATER

Gregory A. Pittner, Yorba Linda, Calif., and Larry L. Crabtree, Lincolnshire, Ill., assignors to Arrowhead Industrial Water, Inc., Lincolnshire, Ill.

Filed Apr. 3, 1989, Ser. No. 332,161

Int. Cl.⁴ B01D *19/00*

U.S. Cl. 55—55 **15 Claims**



1. The method of preferentially removing oxygen from water which contains a mixture of oxygen and ozone as dissolved gases, which method comprises agitating said water while exposed to a gas phase at less than atmospheric pressure, to remove the dissolved gases from the water, whereby substantially more oxygen is removed from the water than ozone.

4,900,337

METHOD AND APPARATUS FOR WORKING MOLTEN GLASS

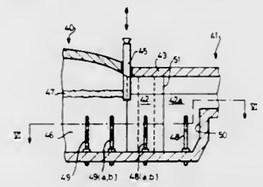
Michel Zortea, Chalon-sur-Saone; Robert Noiret, Mantes-la-Jolie, and Gerard Dossier, Lesigny, all of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Aug. 18, 1988, Ser. No. 233,638

Claims priority, application France, Aug. 18, 1987, 87 11666

Int. Cl.⁴ C03B *5/20*

U.S. Cl. 65—135 **42 Claims**



1. In a continuous process for working glass in a tank furnace of a generally elongated shape having a plurality of compartments through which passes, in series, a molten glass bath, a first upstream compartment having a cover of a pulverulent vitrifiable material and a second compartment located between said first upstream compartment and a downstream compartment and having a reduced section compared thereto, wherein the vitrifiable pulverulent material is brought to a molten state in said first compartment and is transported to successive downstream compartments allocated to other phases of the glass working process and ultimately withdrawn from said tank furnace, the improvement which comprises generating a return current of molten glass directed from downstream to upstream in an upper portion of said second compartment to form a return current to said first upstream compartment, said return current being generated at least in part by an electric current applied to at least one electrode located in said reduced section second compartment.

9. A device for the continuous working of molten glass comprising: a tank furnace of a generally elongated shape having a plurality of compartments through which passes, in series, a molten glass bath; a first upstream compartment having a cover of pulverulent vitrifiable material; a second compartment located between said first upstream compartment and a downstream compartment, said second compartment having a reduced section compared to said upstream and downstream compartments and having no cover of pulverulent vitrifiable material, and means for generating in an upper portion of said second compartment a current of molten glass directed from downstream to upstream to form a return current to said upstream compartment, said means comprising at least one electrode located in said reduced section second compartment to which an electric current is applied.

4,900,338

GAS SEPARATION/EXTRACTION APPARATUS FOR SEPARATING AND EXTRACTING A DESIRED GAS FROM A GAS MIXTURE AND A BALANCE VALVE THEREFOR

Iwaji Shiomi, and Haruki Nakao, both of Tokyo, Japan, assignors to Nikki Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 340,691

Claims priority, application Japan, Jun. 29, 1988, 63-86343[U]

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—161 **4 Claims**

1. A gas separation/extraction apparatus comprising:

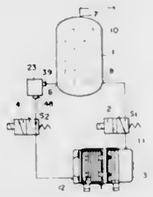
tank means for separating and extracting a specific gas element from a gas mixture, said tank means having an suction port, an exhaust port, and adsorption means for adsorbing the gas element from the gas mixture;

pump means having a suction port, a discharge port, a cylin-

der, and a piston housed in the cylinder, for alternately pressurizing and decompressing the inside of the tank means as the piston reciprocates;

a first three-way solenoid valve connected between the exhaust port of the tank means and the suction port of the pump means;

a second three-way solenoid valve connected between the



discharge port of the pump means and the suction port of the tank means; and

pressure balance means connected between the second three-way solenoid valve and the suction port of the tank means, for gradually eliminating a difference in pressure between the tank means and the pump means as the tank means is switched from a decompressed state to a pressurized state.

4,900,339

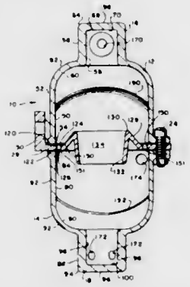
AMMONIA FLOW DIVIDER

David P. Ward, 1528 Stemmons Ave., Dallas, Tex. 45208, and James S. Jones, 45 Crown Pl., Richardson, Tex. 75080

Filed Mar. 20, 1989, Ser. No. 325,397

Int. Cl.[4] B01D *45/12*

U.S. Cl. 55—204 **23 Claims**



1. Apparatus for dividing the gas and liquid components of a two phase flow of anhydrous ammonia, comprising:

an upper chamber having an upper flange surface and a top;

a lower chamber having a lower flange surface and a bottom;

partition member interposed between said upper and lower flange surfaces, said partition member including walls defining a central aperture between said upper and lower chambers;

the partition member having a plurality of transfer apertures between interiors of said upper and lower chambers; and

at least one vapor outlet extending through said top of said upper chamber, at least one liquid outlet extending through said bottom of said lower chamber, and at least one two-phase inlet extending through said lower chamber disposed to admit two-phase flow in tangential relation to an internal surface of said lower chamber.

4,900,340

CONTACTING DEVICE FOR GAS AND SOLID PARTICLES

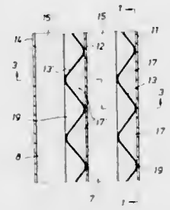
Pieter L. Zaideveld, and Michiel J. Groeneveld, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 31, 1988, Ser. No. 200,157

Claims priority, application Netherlands, Jun. 5, 1987, 8701320

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—208 **10 Claims**



1. Contacting device for gas and solid particles comprising a housing containing an inlet space, an outlet space and at least one contacting element, which contacting element comprises a first wall, a second wall parallel to the first wall, and a plurality of channels connecting the inlet space to the outlet space, which channels are defined between the first wall and a permeable corrugated sheet mounted on the side of the first wall facing the second wall, and a plurality of spacers mounted between the second wall and the permeable corrugated sheet.

4,900,341

PURIFICATION SYSTEM

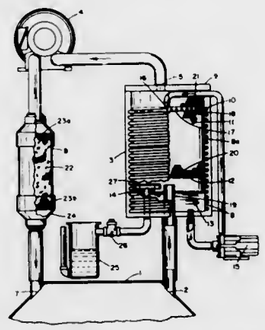
Julius S. Csabai, Normandy, Canada, assignor to Metatron Investments, Inc., Quebec, Canada

Filed Jun. 29, 1988, Ser. No. 213,235

Claims priority, application Canada, Jun. 30, 1987, 541061

Int. Cl.[4] B01D *47/00*

U.S. Cl. 55—222 **16 Claims**



1. A purification system for removing contaminants including particles and gases from fumes generated from a cooking area, said system comprising:

a container having an upper portion and a lower portion, said container including an inlet in said lower portion and an outlet in said upper portion;

a plurality of stationary filter elements disposed in said container;

means for cooling said filter elements, said cooling means used to increase the condensation of said fumes;

means for holding said filter elements, said holding means used to keep said filter elements at a certain distance from said inlet of said container;

means for cleaning and wetting said filter elements, a portion of said filter elements being disposed above said cleaning and wetting means;

means for collecting liquid, contaminant particles, and condensed gases, said collecting means disposed in said lower portion of said container; and,

means for inducing negative pressure, said inducing means connected to said outlet of said container.

4,900,342

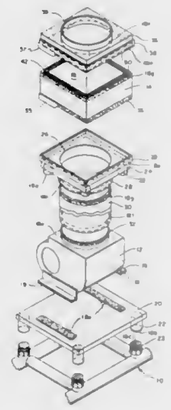
BLOWER-FILTER ASSEMBLY

Charles W. Spengler, 3310 Deforest Dr., Cincinnati, Ohio 45209

Filed Aug. 26, 1988, Ser. No. 236,709

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—275 **13 Claims**



1. An air flow system including air flow conductors secured together in end to end axial relationship, each of said conductors being provided with a strip of axially aligned VELCRO surrounding an end portion thereof, and a VELCRO tape covering surrounding each adjoining end of said air flow conductors and covering each aligning strip of VELCRO.

4,900,343

INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Shunji Minami, Fukuroi; Yasoo Nakao, and Kazuhiko Nomura, both of Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

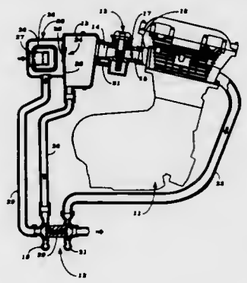
Division of Ser. No. 312,679, Oct. 19, 1981, Pat. No. 4,760,703. This application May 9, 1988, Ser. No. 191,420

Claims priority, application Japan, Oct. 25, 1980, 55-149936; Dec. 26, 1980, 55-188950; Dec. 26, 1980, 55-188951; Apr. 16, 1981, 56-57751

Int. Cl.[4] B01D *50/00*

U.S. Cl. 55—318 **8 Claims**

1. An air inlet device for an internal combustion engine comprising housing means defining an internal cavity, wall means as part of said housing means for dividing said cavity into a plenum chamber and an air cleaner chamber, an inlet to said air cleaner chamber, an outlet from said air cleaner chamber, means for supporting an air cleaner element in said air cleaner chamber between said inlet and said outlet, means defining an intake to said plenum chamber, means communicating said air cleaner chamber outlet with said plenum chamber intake, means defining a discharge from said plenum chamber adapted to communicate with an inlet passage of the internal combustion engine and check valve means in said wall means for providing a direct flow path from said air cleaner



chamber downstream of said air cleaner element with said plenum chamber.

4,900,344

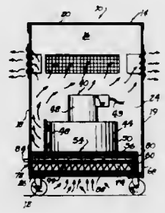
PORTABLE ROOM AIR FILTER

James P. Lansing, St. Cloud, Minn., assignor to JVJ Enterprises, Inc., St. Cloud, Minn.

Continuation-in-part of Ser. No. 237,512, Aug. 26, 1988, which is a division of Ser. No. 119,785, Nov. 10, 1987. This application Mar. 14, 1989, Ser. No. 323,446

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—322 **6 Claims**



1. A portable room air filter comprising:

a cabinet having opposed bottom and top ends and at least one sidewall therebetween, forming an enclosure defining an opening at the bottom end for air flow communication with the enclosed interior of the cabinet;

aperture means in the cabinet sidewall remote from the opening for air flow communication with the enclosed interior of the cabinet;

an air filter chamber enclosing the opening at the bottom end of the cabinet and defining a passageway for air flow therethrough into the cabinet interior;

blower means between the air filter chamber and the cabinet interior having an intake at the air filter chamber passageway and a discharge below said aperture means directed toward the cabinet interior;

an air filter in the air filter chamber including at least one filter media layer having opposed major surfaces facing the blower means and the cabinet opening respectively; and

said air filter further comprising baffle plates on either side of the filter media layer facing the opposed major surfaces thereof, being imperforate except for defining air flow openings through the filter, said baffle plates directing air inducted by said blower means along a path through said filter media, said path having major portions extending in

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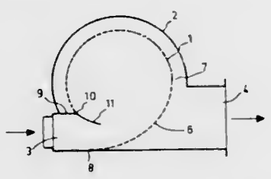
directions generally parallel to the filter media major surfaces.

4,900,345

SEPARATOR FOR USE IN INSTALLATIONS FOR CONVEYING OBJECTS OVER DISTANCES BY MEANS OF A FLOW OF AIR

André le Jeune, Torcy, France, assignor to G.Mouson S.A. Air et Techniques, Paris, France

Filed Oct. 21, 1988, Ser. No. 260,715
Claims priority, application France, Oct. 23, 1987, 87 14727
Int. Cl.⁴ B01D *45/12*
U.S. Cl. 55—337 **4 Claims**



1. A separator for separating objects from air which moves over a distance to transport the objects, the separator comprising:

(a) a cylindrical casing,

(b) an inlet for a stream of air and objects transported thereby, said inlet being substantially tangential to said casing, and having an outside wall,

(c) an air outlet extending substantially tangentially from said casing,

(d) an outlet for solids at the bottom of said casing,

(e) means for separating solids from the air comprising

(i) a generally cylindrical separator grid within and spaced from said casing, and

(ii) a spiral grid portion tangential to the outside wall of said inlet and to the generally cylindrical grid,

said grid and grid portion comprising means for passing air therethrough and for preventing the passage of objects therethrough, said spiral grid portion having a non-smooth inner surface,

(f) said generally cylindrical grid and said inlet intersecting along a line of intersection substantially parallel to the axis of said generally cylindrical grid, and

(g) adjustable flap means pivotally secured at an edge thereof substantially along said line of intersection for controlling the flow of air and objects entering the separator.

4,900,346

PORTABLE AIR FILTRATION DEVICE

Thomas G. Lutz, 23723 E. 1st Ave., Liberty Lake, Wash. 99019

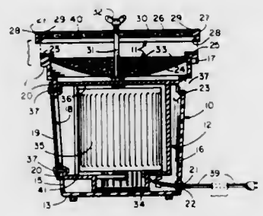
Filed Mar. 20, 1989, Ser. No. 325,858
Int. Cl.⁴ B01D *53/04*
U.S. Cl. 55—387 **1 Claim**

1. A portable air filtration device comprising, in combination:

a rigid five-sided peripheral container defining an internal chamber and having larger horizontally orientated upper input orifice and a smaller vertically orientated output orifice;

a filter member, carried in the input orifice, having a first filter screen of a lenticular shape with an outwardly extending planar rim for support in the input orifice of the peripheral container and a second cooperating substantially planar filter screen having a peripheral rim adjacent the rim of the first filter screen to define a lenticular chamber between said first and second screens, said chamber being of size sufficient to contain at least ten pounds of particulated charcoal, each said filter screen defining an area of at least approximately 384 square inches with defined orifices comprising at least seventy-five percent of said area and no orifice having a major dimension greater than about 0.06 inch, and releasable means for mechanically fastening the first filter screen with its rim in adjacency to the rim of the second filter screen in the aforesaid input orifice;

particulate activated charcoal, having a particle size larger than the orifices defined in the screen elements, carried in the chamber defined between said first and second filter



screens in a lenticularly shaped mass to cause substantially uniform air flow through all portions of said charcoal mass; and

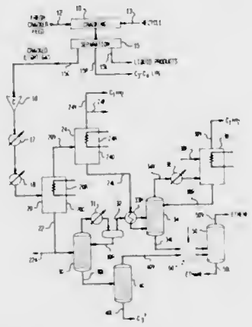
a fan member carried within the internal chamber defined by the peripheral container to receive air from the internal chamber and force that air at a rate of at least about 465 cubic feet per minute through the output orifice defined in said container to create a flow of air from about the peripheral container through the filter member in the input orifice and out of the output orifice defined in the peripheral container.

4,900,347

CRYOGENIC SEPARATION OF GASEOUS MIXTURES

Richard H. McCue, Jr., Houston, and John L. Pickering, Jr., Kingwood, both of Tex., assignors to Mobil Corporation, New York, N.Y.

Filed Apr. 5, 1989, Ser. No. 333,214
Int. Cl.⁴ F25J *3/02*
U.S. Cl. 62—24 **23 Claims**



1. A cryogenic separation method for recovering C_1^+ hydrocarbons from cracked hydrocarbon feed gas comprising methane, ethene and ethane, wherein cold pressurized gaseous streams are separated in a plurality of dephlegmator units, each of said dephlegmator units being operatively connected to accumulate condensed liquid in a lower dephlegmator drum vessel by gravity flow from an upper dephlegmator heat exchanger comprising a plurality of vertically disposed indirect heat exchange passages through which gas from the lower drum vessel passes in an upward direction for cooling with refrigerant fluid by indirect heat exchange within said heat exchange passages, whereby gas flowing upwardly is partially condensed on vertical surfaces of said passages to form a reflux liquid in direct contact with the upward flowing gas stream to provide a condensed stream of cooler liquid flowing downwardly and thereby enriching condensed dephlegmator liquid gradually with C_2^+ hydrocarbon components; comprising the steps of:

introducing dry feed gas into a primary dephlegmation zone having a plurality of serially connected, sequentially colder dephlegmator units for separation of feed gas into a primary methane-rich gas stream recovered at low temperature and at least one primary liquid condensate stream rich in C_2^+ hydrocarbon components and containing a minor amount of methane;

passing at least one primary liquid condensate stream from the primary dephlegmation zone to serially connected demethanizer fractionators, wherein a moderately low cryogenic temperature is employed in a first demethanizer fractionator unit to recover substantially all of the methane from the primary liquid condensate stream in a first demethanizer overhead vapor stream and to recover a first C_2^+ liquid demethanizer bottoms stream substantially free of methane, wherein said demethanizer overhead vapor stream is cooled with moderately low temperature coolant to provide liquid reflux for recycled to a top portion of the first demethanizer fractionator;

further separating at least a portion of the first demethanizer overhead vapor stream in an ultra-low temperature final demethanizer fractionator unit to recover a liquid ethene-rich predominantly C_2 hydrocarbon crude product stream and a final demethanizer ultra-low temperature overhead vapor stream substantially free of C_2^+ hydrocarbons, wherein a major amount of total demethanization heat exchange duty is provided by moderately low temperature refrigerant and overall energy requirements for refrigeration utilized in separating C_2^+ hydrocarbons from methane and lighter components are decreased; and

fractionating said second crude ethene stream and said first ethene-rich C_2 hydrocarbon crude product stream to obtain a pure ethene product.

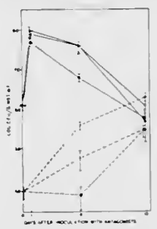
4,900,348

PRODUCTION OF DISEASE SUPPRESIVE COMPOST AND CONTAINER MEDIA, AND MICROORGANISM CULTURE FOR USE THEREIN

Harry A. Hoitink, Wooster, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 757,389, Jul. 12, 1985, Pat. No. 4,642,131, which is a continuation-in-part of Ser. No. 519,691, Aug. 2, 1983, abandoned. This application Feb. 6, 1987, Ser. No. 11,831
The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.
Int. Cl.⁴ C05F *11/08*
U.S. Cl. 71—6 **16 Claims**

1. A method for producing a container medium which is suppressive to at least *Rhizoctonia solani* and *Pythium ultimum* and/or diseases caused thereby, which method comprises: amending the container medium so that each 100 parts thereof includes about 2.5 to 70 parts by volume of compost and at least one Trichoderma fungus antagonistic to *Rhizoctonia solani* and suppressive to plant disease caused thereby and at least one bacterium antagonistic to *Pythium ultimum* and suppressive to plant disease caused thereby with the amending



including at least 100 colony forming units each of the fungus and the bacterium for each gram dry weight of the compost.

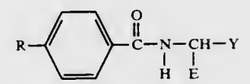
4,900,349

AMIDE DERIVATIVES AND THEIR USE AS FUNGICIDES AND PLANT GROWTH REGULATORS

Stephen P. Heaney, Maidenhead; Patrick Crowley, Crowthorne, and Lawrence G. Reynolds, Camberley, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 932,102, Nov. 18, 1986, Pat. No. 4,752,321.
This application Apr. 5, 1988, Ser. No. 178,010
Claims priority, application United Kingdom, Dec. 5, 1985, 8530015
Int. Cl.⁴ A01N *31/04, 31/095, 31/165;* **C07C** *153/05*
U.S. Cl. 71—76 **5 Claims**

1. A compound of the formula (I):



(I)

wherein

R is C_2–C_4 alkenyl or C_2–C_4 alkynyl, both optionally substituted for lower alkyl, halogen or trialkylsilyl;

E is CN or $CSNH_2$; and

Y is C_1–C_4 alkoxy, C_3–C_4 alkenyloxy or C_3–C_4 alkynyloxy.

4. A fungicidal or plant growth regulatory composition comprising as an active ingredient, an effective amount of a compound according to claim 1 and a carrier or diluent therefor.

5. A method of combating fungi or regulating plant growth which comprises applying to a plant, to the seed of a plant or to the locus of the plant or seed an effective amount of a compound according to claim 1.

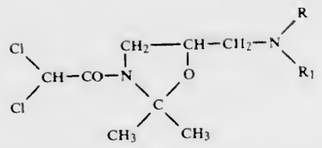
4,900,350

5-IMINOMETHYL-HALO-ACYLOXAZOLIDINES HAVING AN INHIBITING ACTION ON THE PHYTOTOXICITY OF HERBICIDES

Nello Ronchi, Milan, Italy, assignor to Oxon Italia S.p.A., Pero-Milano, Italy

Filed Jul. 10, 1987, Ser. No. 72,240
Claims priority, application Italy, Jul. 16, 1986, 21152 A/86
Int. Cl.⁴ A01N *43/36, 43/40, 43/76;* **C07D** *263/04*
U.S. Cl. 71—88 **9 Claims**

1. Compounds of the formula:



wherein R is alkyl having from 1 to 8 carbon atoms, allyl having from 3 to 8 carbon atoms or cyclohexyl;

R1 is alkyl having from 1 to 8 carbon atoms, allyl having from 3 to 8 carbon atoms or cyclohexyl, or

R and R_1 together form a $-(CH2)-_n$ group in which n is an in teger from 4 to 6.

7. A method for the selective deweeding of corn cultivations, comprising using in quantities varying from 1 to 17 kg/ha of active substance a herbicide composition as claimed in claim 2.

4,900,351

IMINOOXAZOLIDINES AND HERBICIDAL METHOD OF USE

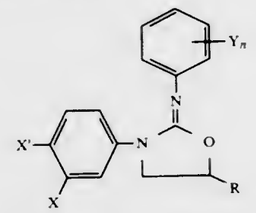
Raymond A. Felix, Richmond, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 920,014, Oct. 17, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 167,934

Int. Cl.[4] **A01N** *43/76;* **C07D** *263/08*

U.S. Cl. 71—88 **24 Claims**

1. A compound having the formula



in which X and Y are the same or different and are selected from the group consisting of cyano, halogen, alkyl, alkylthio, haloalkyl, trihalomethylthio, alkylsulfenyl, alkoxy, carboalkoxy, and trihalomethoxy, in which the alkyl groups have from one to five carbon atoms; X' is hydrogen or halogen; n is 0,1, or 2; and R is hydrogen or an alkyl group having from 1–3 carbon atoms, and herbicidally effective salts thereof.

4,900,352

2-PHENOXYPYIMIDINE DERIVATIVE AND HERBICIDAL COMPOSITION

Nobuhide Wada; Yoshihiro Saito, both of Iwata; Shoji Kusano, Hamamatsu; Yasuhumi Toyokawa; Takeshige Miyazawa, both of Ogasa; Ikuo Kajiwara, Nagaokakyo, and Satoru Takahashi, Ogasa, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

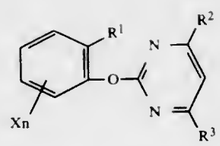
Continuation of Ser. No. 37,323, Apr. 13, 1987, abandoned. This application Dec. 29, 1988, Ser. No. 291,353

Claims priority, application Japan, Jun. 6, 1986, 60-131285

Int. Cl.[4] **A01N** *43/54;* **C07D** *239/34, 239/52, 239/60*

U.S. Cl. 71—92 **11 Claims**

1. A 2-phenoxypyrimidine derivative having the formula:



(A)

wherein R^1 is $-COOR^4$, wherein R^4 is hydrogen, lower alkyl or benzyl, each of groups R^2 and R^3 is methoxy, and X is lower alkyl, lower alkoxy, halogen or nitro, and n is 1 or 2.

4,900,353

HERBICIDAL PYRIDINE N-OXIDE SULFONYLUREAS

William E. Barnette, West Chester, Pa.; Thomas R. Dean, Wilmington, Del.; Wallace C. Petersen, Hockessin, Del., and Barry A. Wexler, Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 91,497, Jul. 31, 1987, Pat. No. 4,789,465, which is a continuation-in-part of Ser. No. 929,980, Nov. 12, 1986, abandoned. This application Sep. 9, 1988, Ser. No. 242,114

Int. Cl.[4] **A01N** *43/66, 43/68;* **C07D** *401/12, 401/14*

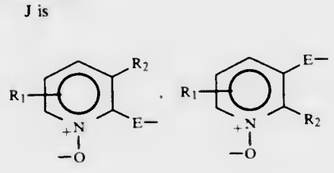
U.S. Cl. 71—93 **25 Claims**

1. A compound of the formula:

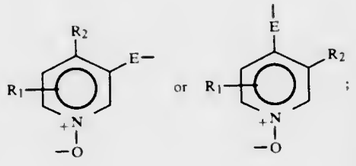
I

wherein

J is



J-1 J-2



J-3 J-4

wherein

R is H or CH_3;

E is a single bond or CH_2;

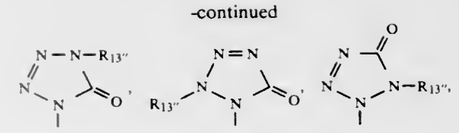
W is O, S or NR_x;

R_x is H, C_1–C_3 alkyl or C_1–C_3 alkoxy;

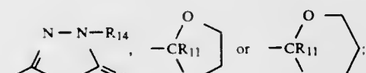
R_1 is H, F, Cl, Br, C_1–C_3 alkyl, C_1–C_3 haloalkyl, C_1–C_3 alkoxy, C_1–C_3 haloalkoxy or C_1–C_3 thioalkyl;

R_2 is H, Cl, Br, F, C_1–C_4 alkyl, C_1–C_4 haloalkyl, cyclopropyl optionally substituted by 1–4 halogen, cyclobutyl optionally substituted by 1–4 halogen, C_2–C_4 alkenyl optionally substituted by halogen, C_2–C_4 alkynyl optionally substituted by halogen, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, NO_2, CO_2R_3, NR_4R_5, $S(O)_nR_6$, $SO_2NR_7R_8$, $C(O)NR_9R_{10}$,

-continued



R_2-AB R_2-AC R_2-AD



R_2-AE R_2-AF R_2-AG

n is 0, 1 or 2;

R_3 is C_1–C_3 alkyl, C_2–C_3 haloalkyl, C_1–C_3 alkoxy, C_3–C_4 alkenyl, $CH_2(C_3$–C_5 cycloalkyl) or C_3–C_4 alkynyl;

R_4 is H or C_1–C_2 alkyl;

R_5 is C_1–C_2 alkyl;

R_6 is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_2–C_4 alkoxyalkyl or C_1–C_3 haloalkyl;

R_7 is H or C_1–C_2 alkyl;

R_8 is C_1–C_2 alkyl or C_1–C_2 alkoxy;

R_8 is C_1–C_2 alkyl or C_1–C_2 alkoxy;

R_9 is H or C_1–C_3 alkyl;

R_{10} is C_1–C_3 alkyl;

R_{11} is H or CH_3;

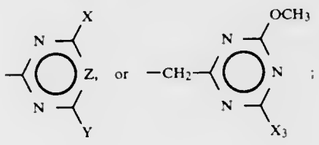
R_{12} is H or CH_3;

R_{13} is H, C_1–C_3 alkyl, allyl, C_1–C_3 haloalkyl or C_1–C_3 alkyl substituted with C_1–C_2 alkoxy;

R_{13}' is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, allyl, C_1–C_2 alkoxy, C_1–C_2 haloalkoxy or C_1–C_2 alkylthio;

R_{13}'' is H, C_1–C_3 alkyl, allyl or C_1–C_3 haloalkyl;

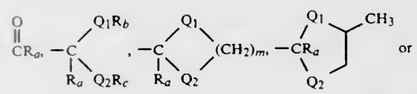
R_{14} is C_1–C_3 alkyl, CH_2OCH_3 or CH_2CN;



A-1 A-6

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino:

Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_2–C_5 alkylsulfinylalkyl, C_2–C_5 alkylsulfonylalkyl, C_1–C_4 haloalkyl, C_2–C_4 alkynyl, C_3–C_5 cycloalkyl, azido, cyano.



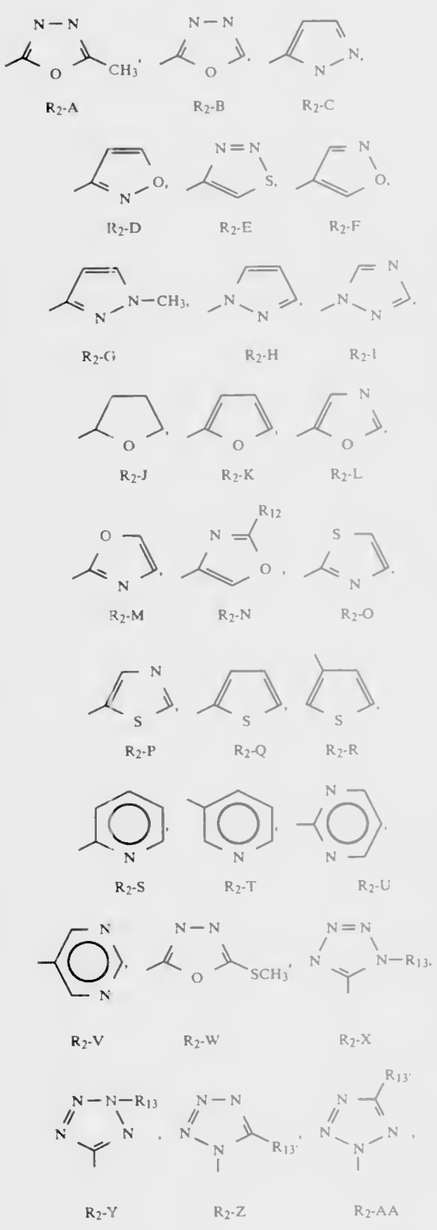
or

$N(OCH_3)CH_3$;

m is 2 or 3;

Q_1 and Q_2 are independently O or S;

R_a is H or C_1–C_3 alkyl;



R_2-A R_2-B R_2-C

R_2-D R_2-E R_2-F

R_2-G R_2-H R_2-I

R_2-J R_2-K R_2-L

R_2-M R_2-N R_2-O

R_2-P R_2-Q R_2-R

R_2-S R_2-T R_2-U

R_2-V R_2-W R_2-X

R_2-Y R_2-Z R_2-AA

R_b and R_c are independently C_1-C_3 alkyl;
Z is N; and
X_3 is CH_3 or OCH_3;
and their agriculturally suitable salts; provided that
(1) when W is S, then R is H, E is a single bond, A is A-1, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or



and
(2) when the total number of carbon atoms of X and Y is greated than four, then the combined number of carbons of R_1 and R_2 is less than or equal to six.

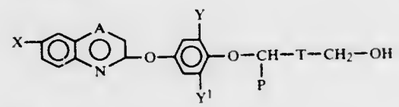
19. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of the compound of claim 1.

4,900,354
(QUINOLINYL AND QUINOXALINYLOXY)PHENOXY ALKENOLS AND THEIR USE AS POST EMERGENT HERBICIDES

James A. Turner, Pittsburg, Calif.; Paul S. Zorner, Durham, N.C., and Wendy S. Jacks, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1986, Ser. No. 901,844
Int. Cl.[4] C07D *241/44, 215/22;* A01N *43/60, 43/42*
U.S. Cl. 71—94 **27 Claims**

1. A compound or an optical isomer thereof corresponding to the formula



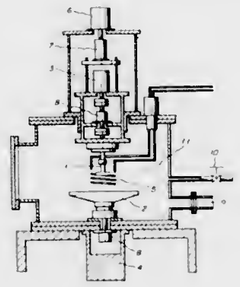
wherein
Y and Y^1 each independently represent —H or —F;
P represents methyl or ethyl;
T represents $-CH_2-CH_2-_a\ CH{=}CH-_b$ and the cis (Z) or trans (E) stereoisomers thereof or $-CH_2-CH_2-_aC{\equiv}C$;
A represents =CH;
a represents the integer 0, 1 or 2;
b represents the integer 1 or 2; and
X represents —Br, —Cl, —F or $—CF_3$.

4,900,355
METHOD FOR MAKING HIGH-PURITY METAL POWDER BY JET-COOLING

Koichi Tanno, and Masaaki Yagi, both of Sendai, Japan, assignors to Miyagi National College of Technology, Natori, Japan

PCT No. PCT/JP88/00504, § 371 Date Jan. 19, 1989, § 102(e) Date Jan. 19, 1989
PCT Filed May 25, 1988, Ser. No. 309,727
Claims priority, application Japan, Nov. 30, 1987, 62-299900
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—0.5 C **1 Claim**

1. A method of making high-purity metal powder by jet-quenching, comprising steps of melting metal in a melting vessel by high-frequency induction, lowering the melting vessel to a jetting position where a rotary cooling board is disposed along outer periphery of the melting vessel, centrifugally jetting the molten metal from the melting vessel by rotating the melting vessel in a direction while rotating the rotary cooling board in an opposite direction, and simultaneously quenching and splitting the centrifugally jetted molten metal droplets by causing the molten metal droplets to collide with

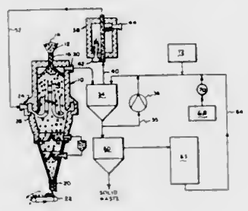


the rotary cooling board, said steps from the melting of metal to the simultaneous quenching and splitting being effected in vacuo or in an inert gas atmosphere.

4,900,356
PROCESS AND APPARATUS FOR PRODUCING METALLIZED PELLETS AND SCRUBBING SPENT REDUCING GAS

Thomas W. Hoffman, Charlotte, N.C., assignor to Midrex International B.V., Zurich, Switzerland

Continuation-in-part of Ser. No. 853,275, Apr. 17, 1986, abandoned. This application Mar. 1, 1988, Ser. No. 162,438
Int. Cl.[4] C21B *13/02;* F27B *1/18*
U.S. Cl. 75—35 **6 Claims**



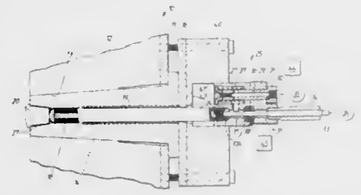
1. In a process for producing metallized iron pellets by direct reduction of iron oxide, the method including the steps of passing a reducing gas through a furnace having a reducing zone containing sulfur-bearing iron oxide material therein, reacting said reducing gas with said iron oxide material to produce metallized pellets, a sulfur-containing spent reducing gas, and iron-rich partially reduced process dust carried by said spent reducing gas, removing said sulfur-containing spent reducing gas and said dust from said furnace, introducing said spent reducing gas, dust and scrub water into a cooler-scrubber to cool and scrub said spent reducing gas to produce cooled spent reducing gas and dust-laden waste scrub water, removing waste scrub water from the cooler-scrubber, introducing removed waste scrub water into a clarifier to produce substantially dust-free scrub water, reforming said cooled spent reducing gas into an effective reducing gas, and introducing said reducing gas into said reducing zone; the improvement comprising:

upon removal from the cooler-scrubber, dividing said dust-laden waste scrub water into first and second portions, and combining the second portion with the output of the clarifier to control the process dust content of said scrub water, thereby selectively introducing iron-rich partially reduced process dust into said scrub water to produce dust-laden scrub water, whereby said dust-laden scrub water interacts with sulfur-containing components in said spent reducing gas, thereby reducing the sulfur content of said reducing gas.

4,900,357
INJECTION OF SUBSTANCES INTO HIGH TEMPERATURE LIQUIDS

Kenneth W. Bates, Calow, England, assignor to Injectall Limited, Sheffield, England

Continuation of Ser. No. 126,109, Oct. 13, 1987, abandoned. This application Jun. 17, 1988, Ser. No. 210,216
Claims priority, application United Kingdom, Feb. 20, 1986, 8604219
Int. Cl.[4] C21C *7/00*
U.S. Cl. 75—51.1 **13 Claims**



1. A method of injecting gas into a high temperature melt via a passage through the wall of a vessel containing the melt, the passage initially having a dislodgeable stopper closing its inner end, comprising the steps of:

(a) from outside the vessel (10), inserting a delivery pipe (24) into the passage (18) and disposing an inner end of the pipe adjacent the stopper (20), the pipe being smaller transversely than the passage by a predetermined amount;
(b) cooling the pipe (24) and passage (18) in the vicinity of the stopper (20) by passing gas along the pipe and exhausting the gas to the exterior of the vessel (10);
(c) immediately before injecting gas into the melt, establishing gas pressure and flow rate in the pipe (24) of sufficient magnitudes that, upon injection, the gas velocity leaving the pipe is great enough to ensure the gas enters the melt as a jet rather than as bubbles;
(d) forcibly thrusting the pipe (24) at the stopper (20), dislodging the stopper into the melt and thereby commencing injection of gas into the melt;
(e) maintaining substantially undiminished the gas pressure and flow rate during the ensuing injection; and
(f) when the injection is adjudged complete, reducing the gas pressure/flow rate and allowing the melt to enter and freeze in the pipe (24) thereby closing it,

the amount by which the pipe (24) is smaller than the passage (18) affording a space therebetween large enough for the melt to intrude for a limited distance, before freezing, as soon as the stopper (20) is dislodged.

4,900,358
WATER SOLUBLE CORROSION INHIBITING COMPOSITIONS AND PROTECTIVE COATINGS PREPARED THEREFROM

Lawrence V. Gallacher, Norwalk, Conn., assignor to King Industries, Inc., Norwalk, Conn.

Filed Mar. 30, 1988, Ser. No. 175,067
Int. Cl.[4] C04B *9/02*
U.S. Cl. 106—14.13 **12 Claims**

1. A composition dilutable in all proportions with water to form a true solution and adapted to form a clear corrosion-inhibiting coating on a metal substrate normally susceptible to corrosion, said composition consisting of either:

(I)
(A) a salt of
(i) an alkylaromatic sulfonic acid and
(ii) an alkanolamine;
(B) a half acid ester of an alkyl- or alkenylsuccinic acid; and
(C) an aqueous liquid diluent therefor; or,
(II)
(A) a salt of
(i) an alkylaromatic sulfonic acid and
(ii) an alkanolamine;
(B) a half acid ester of an alkyl- or alkenylsuccinic acid;
(C) an aqueous diluent therefore; and
(D) "an effective amount of an alkanolamine which is the same or different from that defined for (A) (ii) to maintain miscibility of the composition.

4,900,359
CELLULAR CONCRETE

Lawrence F. Gelbman, Yonkers, N.Y., assignor to Lisa Concrete Inc., Belvidere, N.J.

Continuation of Ser. No. 55,725, May 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 824,059, Jan. 30, 1982, Pat. No. 4,673,437, which is a continuation-in-part of Ser. No. 623,989, Jun. 25, 1984, Pat. No. 4,568,390. This application Jun. 1, 1989, Ser. No. 361,827
Int. Cl.[4] C04B *24/08, 28/26*
U.S. Cl. 106—86 **37 Claims**

1. A cellular concrete mix for the preparation of cellular concrete comprises
(a) a cement mix,
(b) water,
(c) an additive comprising a colloidal solution or sol-gel composition selected from the group consisting of suspensions of water-sodium bentonite, water-peptized calcium bentonite, water-attapulgite and a gelled silica based sol-gel, and
(d) a stable small-celled foam composition comprising a foam-making agent,
the water being present in an amount to hydrate the cement mix and sustain the foam and the additive being present in an amount sufficient to substantially eliminate setting-shrinkage of the cellular concrete and prevent cell coalescing.

4,900,360
PROCESS FOR USING SLUDGE FROM GEOTHERMAL BRINE TO MAKE CONCRETE AND CONCRETE COMPOSITION

Olin D. Whitescarver, Indian Wells; Jouathan T. Kwan, Santa Maria; M. Kenneth Chan, Los Angeles, and Daniel P. Hoyer, Palm Desert, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

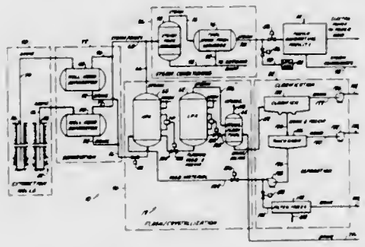
Continuation-in-part of Ser. No. 35,922, Apr. 8, 1987, Pat. No. 4,761,182, which is a continuation of Ser. No. 838,537, Mar. 11, 1986, abandoned. This application Jul. 29, 1988, Ser. No. 226,286
The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.
Int. Cl.[4] C04B *18/04*
U.S. Cl. 106—97 **33 Claims**

1. A process for using siliceous sludge precipitated from a silica-rich geothermal brine to produce a structural concrete material, the process comprising:

a. disposing a layer consisting essentially of siliceous sludge precipitated from silica-rich geothermal brine onto ground soil;
b. disposing a layer consisting essentially of Portland type cement onto said ground soil;
c. mixing said layers of siliceous sludge and Portland type cement and adding a sufficient amount of activating media to cause the Portland

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d. compacting the mixed layers of siliceous sludge and Portland type cement; and



e. permitting the mixed, compacted layer of siliceous sludge and Portland type cement to cure into a structural concrete material.

4,900,361

DESTRUCTURIZED STARCH ESSENTIALLY CONTAINING NO BRIDGED PHOSPHATE GROUPS AND PROCESS FOR MAKING SAME

Jean-Pierre Sachetto; Robert F. T. Stepto, both of Riehen, and Heinz Zeller, Basel, all of Switzerland, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 20, 1988, Ser. No. 209,151

Claims priority, application United Kingdom, Jul. 7, 1987, 8715941

Int. Cl.[4] C08L *3/00, 89/00*

U.S. Cl. 106—213 **22 Claims**

1. A process for obtaining a melt of destructurized starch containing a finite amount of electrolytes comprising:

A. providing a unwashed natural starch containing free electrolytes and/or bound phosphate salts,

B. removing partially or wholly the free electrolytes and/or the metallic cations from the phosphate groups of the starch,

C. optionally replacing a part or all of the free H^+-ions of the phosphate groups with metallic monovalent and/or polyvalent cations,

D. conditioning the obtained starch material to a water content of 10 -25% by weight calculated on the basis of starch and water, and

E. heating said starch/water composition at an elevated pressure to a temperature sufficient to essentially destructure the starch while maintaining said water content until a melt of destructurized starch is formed.

4,900,362

PRIMER COMPOSITION

Hironao Fujiki, Takasaki; Takehide Okami, and Yuji Hinoto, both of Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 323,025

Claims priority, application Japan, Mar. 16, 1988, 63-62760

Int. Cl.[4] C09K *3/00*

U.S. Cl. 106—287.14 **8 Claims**

1. A primer composition, comprising:

(A) an organosilicon compound having in its molecule

(i) at least one hydrogen atom bonded to a silicon atom, and

(ii) at least one silicon-bonded and epoxy-group-containing organic group; and

(B) an organic titanium compound.

4,900,363

METHOD AND LIQUID PREPARATION FOR REMOVING RESIDUES OF AUXILIARY SAWING MATERIALS FROM WAFERS

Gerhard Brehm, Emmerting; Manuela Knipf, Burghausen; Rudolf Mayrhuber, Ostermiething; Jürgen Schuhmacher, and Max Stadler, both of Haiming, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe m.b.H., Burghausen, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,259

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711262

Int. Cl.[4] B08B *3/08*

U.S. Cl. 134—3 **16 Claims**

1. A process for removing a residue of auxiliary sawing materials from wafers which are obtained by sawing rod-shaped workpieces, in particular, crystalline rods, comprising the step of:

bringing the wafers having the residue of the auxiliary sawing material adhesively bonded to the wafer edge into contact with an aqueous solution of one or more carboxylic acids containing two to six carbon atoms, wherein formic acid is included as one of said carboxylic acids, and keeping the wafers in contact with said aqueous solution of one or more carboxylic acids until the bond between the wafers and the residue of the auxiliary sawing material is separated.

4,900,364

PAINT REMOVAL SYSTEM

James G. Diedrich, 1030 Upper Ridgeway, Elm Grove, Wis. 53122

Continuation-in-part of Ser. No. 175,771, Mar. 31, 1988, abandoned. This application Aug. 31, 1988, Ser. No. 238,897

Int. Cl.[4] C11D *10/00, 3/14;* **B08B** *7/00*

U.S. Cl. 134—4 **3 Claims**

1. A method for stripping a cured surface coating of paint from a surface, said method comprising the steps of:

applying a potassium hydroxide stripper composition to the cured surface coating of paint,

spraying a clear liquid-vinyl film over the surface of the stripper composition to form a thin vinyl coating on the surface of the stripper composition to prevent drying of said composition,

permitting said stripper composition to reaction with and decompose said surface coating of paint,

peeling the vinyl coating from the surface of said stripper composition, and

removing the stripper composition and coating of paint from the surface by scraping or spraying water under pressure on said stripper composition.

4,900,365

AZEOTROPE-LIKE COMPOSITIONS OF TRICHLOROFLUOROMETHANE, DICHLOROTRIFLUOROETHANE AND ISOPENTANE

Earl E. A. Lund, West Seneca; Robert G. Richard, Cheektowaga, and Ian R. Shankland, Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 6, 1988, Ser. No. 240,655

Int. Cl.[4] C08G *18/14;* **C08J** *9/14*

U.S. Cl. 134—12 **13 Claims**

1. Azeotrope-like compositions comprising from about 66 to about 80 weight percent trichlorofluoromethane, from about 17 to about 15 weight percent of a dichlorotrifluoroethane selected from the group consisting of 1,1-dichloro-2,2,2-trifluoroethane and 1,2-dichloro-1,1,2-trifluoroethane.

4,900,366

METHOD FOR CLEANING CONTACT LENS WITH DISSOLVING ABRADANT

Murray J. Sibley, Berkeley, and Rebecca F. Nite, Cupertino, both of Calif., assignors to Pilkington Visioncare Holdings, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 14,756, Feb. 13, 1987, abandoned. This application Feb. 8, 1988, Ser. No. 153,156

Int. Cl.[4] B08B *7/00;* **C11D** *3/04*

U.S. Cl. 134—42 **4 Claims**

1. The method of removing surface deposits from a contact lens comprising

(a) rubbing the lens surface with a composition that comprises an effective amount of particles of a water soluble non-toxic physiologically acceptable inorganic abradant component where said abradant is boric acid or borate salts or mixtures thereof soluble in water in an amount less than about 30 weight percent at 40° C. and less than about 10 weight percent at 20° C. having a particle size from about 10 to less than about 210 microns where at least 98 percent are about 105 microns or smaller and a hardness up about 6 (Mohs); said composition also comprising a surfactant component and an amount of liquid less than that required to dissolve at 25° C. the entire amount of said abrandant; and then

(b) removing said composition and removed deposits from the lens surface.

4,900,367

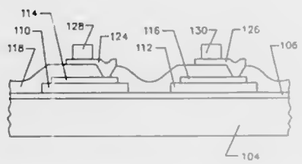
METHOD OF MAKING A RETICULATED TEMPERATURE SENSITIVE IMAGING DEVICE

Isoris S. Gergis, Thousand Oaks, Calif., assignor to Rockwell International, El Segundo, Calif.

Division of Ser. No. 892,539, Aug. 1, 1986, abandoned. This application Nov. 2, 1988, Ser. No. 266,174

Int. Cl.[4] H01L *35/34*

U.S. Cl. 136—201 **6 Claims**



1. A method of making a fully reticulated pyroelectric detector array, comprising the steps of:

affixing a first major surface of a layer of poled pyroelectric material to a substrate;

depositing an electrically conductive electrode layer on a second major surface of the pyroelectric layer;

selectively removing portions of the electrode layer to define a two dimensional array of front side electrodes on the pyroelectric layer;

selectively removing portions of the pyroelectric layer to define a two dimensional array of pyroelectric detector elements on the substrate, with one of the front side electrodes disposed on the second major surface of each detector element;

depositing a polymer layer over the arrays of front side electrodes and detector elements; and

removing the substrate.

4,900,368

FOAMED ENERGY CELL

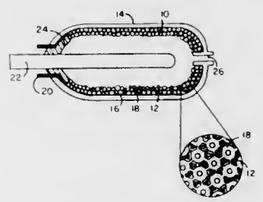
Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Continuation-in-part of Ser. No. 891,582, Aug. 1, 1986, Pat. No. 4,746,458, which is a division of Ser. No. 588,344, Mar. 12, 1984, Pat. No. 4,628,143. This application Apr. 15, 1988, Ser. No. 182,131

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[4] H01L *31/04*

U.S. Cl. 136—253 **7 Claims**



5. An electric current generating cell comprising:

a container;

an open-cellular foamed material held within said container;

a coating on the interior of the cells of said foam of a semiconductor or other type photoelectric junction material;

a first pole electrode interconnected to said coating, said pole extending out of said container;

a fluid or gaseous activating material entered into said open cells in said foam adapted to interact therewith for the production of an electric current; and

a second pole electrode in said container in contact with said activating material, said pole extending out of said container.

4,900,369

SOLAR CELL

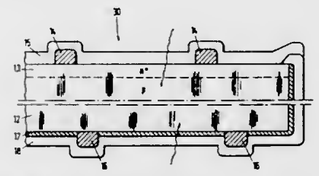
Rudolf Hezel, Spardorf, and Karl G. Hackstein, Hanau, both of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 59,264, Jun. 10, 1987, Pat. No. 4,828,628. This application Dec. 14, 1988, Ser. No. 284,420

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536299

Int. Cl.[4] H01L *31/06*

U.S. Cl. 136—255 **11 Claims**



1. A solar cell comprising:

a substrate layer of semiconductor material of a first conductivity type, in which energy from a radiation source generates minority and majority charge carriers, the substrate layer having a first surface facing the front of the cell and a second surface facing the rear of said cell;

a highly doped semiconductor layer of second conductivity type formed on said first surface of said substrate layer, said second conductivity type being opposite to said first conductively type;

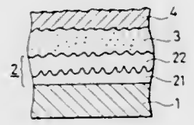
a plurality of spaced first ohmic contacts formed on said highly doped layer;
a plurality of spaced second ohmic contacts formed directly on said second surface of said substrate layer,
an insulation, passivation, and antireflection layer formed over and between said second ohmic contacts,
said highly doped semiconductor layer of second conductivity type forming junction means for providing an electrical field for separating the minority and majority charge carriers in the region of the first surface of said substrate layer so that the majority charge carriers diffuse to said second ohmic contacts and are collected by them, the thickness of said substrate layer being less than or equal to the diffusion length of the minority charge carriers in said substrate layer.

4,900,370

SOLAR BATTERY

Kazusue Itoga, and Takeshige Ichimura, both of Yokosuka, Japan, assignors to Fuji Electric Corporate Research and Development Ltd., Japan

Continuation of Ser. No. 930,457, Nov. 14, 1986, abandoned. This application Apr. 22, 1988, Ser. No. 186,732
Claims priority, application Japan, Feb. 25, 1986, 61-39788
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—256 **2 Claims**



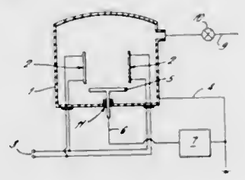
1. A solar battery comprising a transparent electrode formed on a substrate and a semiconductor film and a metal electrode formed on said transparent electrode in the stated order, characterized in that said transparent electrode comprises an impurity undoped tin oxide layer of a thickness from 0.08 to 0.2 μm formed on said substrate and an impurity doped tin oxide layer formed on said undoped layer.

4,900,371

METHOD AND APPARATUS FOR THERMOCHEMICAL TREATMENT

Amos C. Dexter, Liverpool; Michael I. Lees, Tarvin, and Barry J. Taylor, Mold, all of United Kingdom, assignors to The Electricity Council, United Kingdom

Filed Oct. 16, 1987, Ser. No. 109,078
Claims priority, application United Kingdom, Oct. 29, 1986, 8625912
Int. Cl.[4] C21D *1/06*
U.S. Cl. 148—20.3 **8 Claims**



1. A method of thermochemical treatment of a workpiece having first surface portions less accessible for treatment than other portions in a gas comprising the steps of bombarding a workpiece with ions for a series of time periods to provide a desired surface treatment to the workpiece, separating the steps of active bombardment by an interval of substantially no active ionic bombardment, the duration of the steps and the intervals between them being timed to provide a substantially even distribution of the gas over all the surface portions to be treated of the workpiece.

4,900,372

III-V ON SI HETEROSTRUCTURE USING A THERMAL STRAIN LAYER

Jhang W. Lee, Mansfield, and Richard E. McCullough, Wrentham, both of Mass., assignors to Kopin Corporation, Taunton, Mass.

Division of Ser. No. 120,024, Nov. 13, 1987, Pat. No. 4,835,116. This application Mar. 2, 1989, Ser. No. 318,169
Int. Cl.[4] H01L *29/12, 29/06*
U.S. Cl. 148—33.4 **12 Claims**

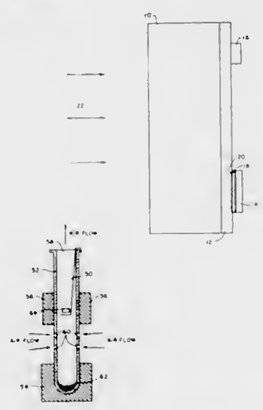
4. A wafer comprising:
a. a substrate;
b. a nucleation layer comprising a III-V material;
c. a first buffer layer comprising a III-V material;
d. a second buffer layer comprising a III-V material;
e. a thermal strain layer comprising a III-V material; and
f. a device layer.

4,900,373

SENSITISATION PRETREATMENT OF PB-SALT EPITAXIAL FILMS FOR SCHOTTKY DIODES BY SULFUR VAPOR EXPOSURE

Tak-Kin Chu, Bethesda, and Francisco Santiago, Elkridge, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 224,958, Jul. 27, 1988. This application Jul. 19, 1989, Ser. No. 381,880
Int. Cl.[4] H01L *21/44, 27/14, 31/02, 31/18*
U.S. Cl. 148—33.4 **10 Claims**



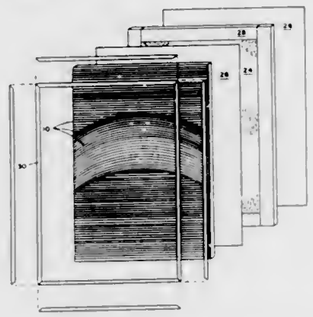
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4,900,378

METHOD FOR MAKING A DECORATIVE PANEL

Daniel D. Wistehuff, Hickory, N.C., assignor to Ladd Furniture, Inc., High Point, N.C.

Filed Mar. 19, 1987, Ser. No. 28,106
Int. Cl.[4] B44C *3/12*
U.S. Cl. 156—63 **6 Claims**



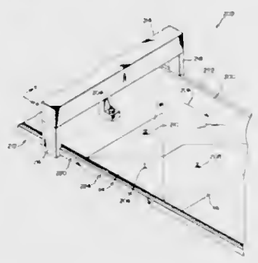
1. A process for making furniture panels including the steps of: aligning a plurality of roundcore members of substantially equal diameter in a side by side and contiguous relationship, each having an outer surface and inner surface, in a fixed relationship to form a predetermined design; affixing the inner surfaces of the aligned members to a substantially flat holding member; and joining the aligned members and holding member to a flat straightening member with a moisture content from 6% to about 12% having an inner and outer surface; first and second veneer coverings affixed to the inner and outer member surfaces; and cutting the roundcore members, the holding member and the straightening member to a predetermined size after they are joined to form a furniture article component of a predetermined size and configuration.

4,900,379

METHOD FOR PRODUCING COMPOSITE MATERIALS

Michael R. Chapman, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 20, 1988, Ser. No. 196,388
Int. Cl.[4] B29D *5/20*
U.S. Cl. 156—64 **33 Claims**



1. A method for producing high-performance composite structures wherein the composite structure consists of a plurality of fibrous plies, said method comprising the steps of:
(a) providing a first computer representation of the manner in which the plurality of plies can be cut from a common elongate sheet of fibrous tape to maximize use of the tape, the first computer representation including the orientation and configuration of the plies to be cut and the identity of the plies;
(b) storing the first computer representation in the memory of a first processor;
(c) providing a second computer representation of the manner in which the plurality of plies are to be combined to create the composite structure, the second representation including the relative positioning and orientation of the plurality of plies as well as the sequence in which the plies must be combined to produce the composite structure;
(d) storing the second computer representation in the memory of a second processor;
(e) cutting the plies from the common elongate sheet of fibrous tape using a water-jet cutting gantry, the water-jet cutting gantry being controlled by the first processor and the first processor being controlled by the first computer representation;
(f) identifying the plies by marking them using a first ink-jet marking gantry, the first ink-jet marking gantry also being controlled by the first processor;
(g) marking a partial composite to indicate the positioning and orientation of the ply to be placed using a second ink-jet marking gantry, the second ink-jet marking gantry being controlled by the second processor and the second processor being controlled by the second computer representation;
(h) placing the ply on the partial composite in the position and orientation marked; and
(i) repeating steps (g) and (h) until all plies have been placed to thereby provide the desired high-performance composite structure.

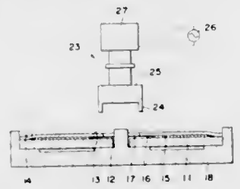
13. A method for producing high-performance composite structures wherein the composite structure includes a plurality of fibrous plies, said method comprising the steps of:
(a) providing a representation of the composite structure to be produced, wherein the representation includes the manner in which the plurality of fibrous plies are configured to produce the composite structure;
(b) using the representation of the composite structure to control an ink-jet marking gantry to mark the location of the next ply to be placed;
(c) placing the next ply in the location marked; and
(d) repeating steps (b) and (c) until all plies have been placed to thereby provide the high-performance composite structure.

4,900,380

PROCESS FOR PRODUCING INFORMATION RECORDING MEDIUM

Hideki Matsuzawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 21, 1988, Ser. No. 260,606
Claims priority, application Japan, Oct. 23, 1987, 62-269015
Int. Cl.[4] B29C *65/08;* **B32B** *31/20;* **G11B** *7/26*
U.S. Cl. 156—73.1 **3 Claims**



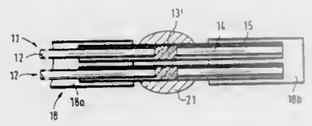
1. A process for producing an information recording medium which comprises the steps:
putting a disc-shaped resin film having a hole at a central part thereof upon a surface of a recording layer-side of a disc-shaped resin substrate having such a structure that a hole is provided at a central part thereof, an inner-side non-recording zone is provided around the pheriphery of the hole, an outer-side non-recording zone is provided inside the outer periphery of the substrate and a recording layer is provided between said inner-side non-recording zone and said outer-side non-recording zone on the substrate; and
joining said resin film to said resin susbstrate by thermal welding in the outer-side non-recording zone of the substrate, and by ultrasonic welding in the inner-side non-recording zone of the substrate.

4,900,381

METHOD FOR MANUFACTURING A MEASURING PROBE

Martin Guenther, Wildberg, and Lothar Rupp, Aldingen, both of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 17, 1988, Ser. No. 157,204
Claims priority, application European Pat. Off., Feb. 17, 1987, 87102263.8
Int. Cl.[4] B32B *31/12, 31/14*
U.S. Cl. 156—90 **8 Claims**



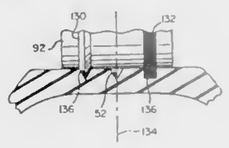
1. A method for manufacturing an optical probe for invasive measurement of blood parameters with at least one sensor having a selective membrane covering an indicator dye containing gel, and a sheath partially covering said sensor such that a portion of the selective membrane covering said gel is not covered by said sheath, said sheath being fastened on said sensor by a glue, said method comprising:
(1) covering said portion of the selective membrane covering said gel with a cover material which is: hardenable, resistant to said glue; and soluble in a dissolvent which neither attacks said glue nor components on said probe;
(2) fastening the sheath to the sensor by said glue; and
(3) dissolving the cover material from the portion of the selective membrane by said dissolvent such that the portion of the selective membrane covering said gel is free from said glue.

4,900,382

METHOD FOR MONITORING APPLICATION OF TREAD STOCK TO A TIRE CARCASS

Karl W. Klose, Findlay, Ohio, assignor to Cooper Tire & Rubber Company, Findlay, Ohio

Division of Ser. No. 911,595, Sep. 25, 1986, abandoned. This application Sep. 7, 1988, Ser. No. 241,519
Int. Cl.[4] B29D *30/58*
U.S. Cl. 156—128.6 **15 Claims**



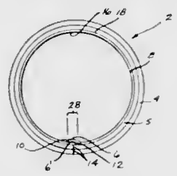
1. A method of monitoring the alignment of a length of tread stock applied to the periphery of an annular green tire carcass to form a green tire assembly, the tread stock having sufficient length to permit the opposite ends to be spliced so as to define an exposed outer face and an inner face, wherein the inner face defines an inner circumference, the green tire carcass having an outer circumference substantially equal to the inner circumference of the tread stock to engage the inner face of the tread stock, the outer face of the tread stock including a centering mark defined along the length of the tread stock, said method comprising the steps of:
supporting and rotating the green tire assembly while forming an alignment mark about the entire circumference of the outer face of the tread stock;
wherein the alignment mark is in axially spaced relationship to the centering mark already thereon, whereby spacing between the centering mark and the alignment mark provides an indication of the positioning and accurate circumferential alignment of the tread stock on the green tire carcass.

4,900,383

CONVOLUTELY LINED AND WRAPPED COMPOSITE TUBES

Harry W. Dursch, Seattle; Donald A. Anderson, Renton, and Robert F. Collins, Ravensdale, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 19, 1988, Ser. No. 183,680
Int. Cl.[4] B29C *53/42*
U.S. Cl. 156—184 **29 Claims**



1. A method of making a tube lined with a metal foil lining material having a first and second end, comprising the steps:
(a) anchoring the first end of the lining material to a support means using an adhesive composition;
(b) convolutely wrapping the lining material at least once around the support means;
(c) anchoring the second end of the lining material to the lining material;
(d) convolutely wrapping an adhesive material around the anchored lining material;
(e) convolutely wrapping a tubing precursor material which comprises a matrix of reinforcing fibers around the adhesive material and butting the ends of said precursor material together without overlaps; and,
(f) subjecting the support means, lining material, adhesive material and tubing precursor material to curing conditions to cure said adhesive material and tubing precursor material.

4,900,384

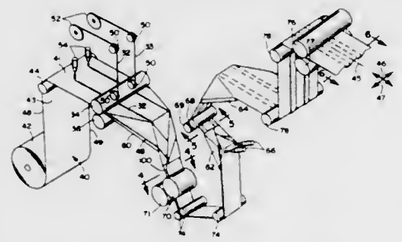
METHOD AND APPARATUS FOR MAKING ELASTICIZED CONTAINMENT FLAPS

Donald J. Sanders, Menasha; Keith G. Bellin, Green Bay, and Karl R. Dehn, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 15, 1988, Ser. No. 207,358
Int. Cl.[4] B31D *5/04*
U.S. Cl. 156—204 **15 Claims**

8. A method for forming at least one elasticized flap section on a substantially continuous web, comprising the steps of:
a. delivering a substantially continuous web having first and second oppositely facing major surfaces, and having first and second side edges;

b. delivering at least one elastic member into contact with said web at a selected position;
c. securing said elastic member in contact with said web;
d. bending said web along a primary foldline located inboard from said first side edge of said web to define at least one primary panel portion of said web, and operably moving said primary panel portion to overlie said first major web surface with said elastic member located between said primary panel portion and said first major web surface;



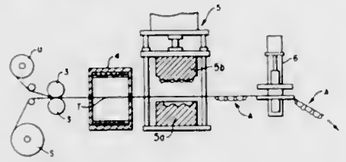
e. bending said web along a flap foldline, which is located substantially inboard from said primary foldline and substantially inboard from said elastic member, to define at least one flap panel portion of said web, and moving said flap panel portion to overlie said second major surface of said web;
f. bending a marginal section of said primary panel portion to move said marginal section away from its overlying position relative to said first major web surface, thereby forming said elasticized flap section on said web.

4,900,385

METHOD FOR FORMING CONTAINER

Katsutoshi Ochi, Gunma; Tokitaro Suzuki, Tochigi; Hisao Ogawa, Ibaraki; Hideo Shibata, and Masaru Takada, both of Nara, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Continuation of Ser. No. 50,663, May 18, 1987, abandoned. This application May 18, 1989, Ser. No. 355,117
Claims priority, application Japan, Mar. 26, 1987, 62-73907
Int. Cl.[4] B32B *31/16*
U.S. Cl. 156—245 **3 Claims**



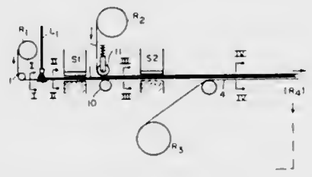
1. An improved method of forming a double wall container, comprising the steps of: laminating a thermoplastic resin sheet for a container mainbody and a water-absorbing breathable non-woven fabric sheet for an inner body with a low-melting adhesive, said non-woven fabric sheet being formed of bonded fibers having a length longer than 5 mm and a basic weight in the range of from 15 to 50 g/m^2, heating the laminate sheet at a forming temperature, feeding the heated laminate sheet between a male mold and a female mold arranged with a certain space therebetween in a forming zone with the container main body sheet facing the female mold and the inner body sheet facing the male mold, clamping the edges of said laminate sheet with the female mold and the male mold, and separating the container main body sheet and the breathable inner body sheet to a prescribed distance from each other by the combination of the application of vacuum suction through the female mold and the application of air pressure through the male mold, said air pressure passing through said breathable non-woven fabric sheet.

4,900,386

METHOD OF PRODUCING LABELS EACH HAVING A CIRCUIT FORMING AN OSCILLATING CIRCUIT

Poul Richter-Jörgensen, Almunecar, Spain, assignor to Durgo AG, Lucerne, Switzerland

Filed May 20, 1988, Ser. No. 196,265
Claims priority, application Switzerland, May 22, 1987, 2003/87
Int. Cl.[4] B32B *31/16*
U.S. Cl. 156—250 **13 Claims**



1. A method of producing a plurality of oscillatory circuits located consecutively on a web, each circuit including a respective inductive element and at least one capacitive element having at least two surfaces, thus forming the oscillatory circuit, and including further an insulating support web having two faces, on a first face of which said inductive element formed of flat electrical conductors and one surface of said capacitive element connected thereto are located according to a predetermined pattern, while a second surface of said capacitive element is located on a second face of said insulating support and is electrically connected to the circuit at the first face, comprising the following steps:
providing a web of electrically conductive material;
depositing a heat-sealing adhesive onto a first face of the web of electrically conductive material;
punching at a center area of said conductive web including said adhesive one portion of a first circuit part to be located thereat, including one surface of a capacitive element;
thereafter depositing continuously a substantially electrically non-conductive web of an electrically insulating material onto the side of the punched center area provided with said adhesive and bonding said substantially electrically non-conductive web to an electrically conductive part of said center area of the electrically conductive web;
punching at an outer area of the conductive web adjacent to the center area another portion of the first circuit part to be located on the conductive web;
covering the entire conductive web at the face opposite from the substantially electrically non-conductive web with a covering foil of substantially electrically non-conductive material and bonding the conductive web to said foil after punching the first circuit part located on the conductive web; and
placing a second circuit part to be located at an outwardly facing side of said substantially electrically non-conductive web, said second circuit part including a counter surface of the capacitive element of electrically conducting material for each circuit, and connecting said second circuit part electrically to the first circuit part located at the first face of the electrically conductive web.

4,900,387

METHOD OF BONDING VIA ELECTRORHEOLOGICAL ADHESIVES

Joseph C. Johnson, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 24, 1988, Ser. No. 159,755
Int. Cl.[4] B32B *31/28*
U.S. Cl. 156—272.2 **23 Claims**

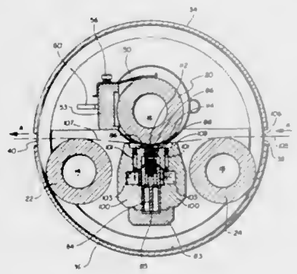
1. A method for bonding a first surface to a second surface by applying a curable adhesive composition containing a fluid adhesive component to at least one surface wherein the improvement comprises:
(a) using an adhesive composition containing an electrorheological material, said electrorheological material present in an amount serving to increase the viscosity of the adhesive composition to a gel state when an electric field is applied to the adhesive composition;
(b) applying the adhesive composition to at least one surface;
(c) positioning the first surface immediately adjacent to the second surface such that said adhesive composition contacts both surfaces;
(d) applying the electric field to the adhesive composition, said electric field cooperating with the electrorheological material to increase the viscosity of the adhesive composition to a gel state; and
(e) curing the fluid adhesive component.

4,900,388

METHOD FOR LAMINATING POLYMERIC SHEET MATERIAL

Ihor Wysiotsky, Chicago, Ill., assignor to Biflex Development Partners, Ltd., Grand Rapids, Mich.

Division of Ser. No. 41,874, Apr. 22, 1987, Pat. No. 4,791,303, which is a continuation-in-part of Ser. No. 662,570, Oct. 19, 1984. This application Sep. 16, 1988, Ser. No. 226,668
Int. Cl.[4] B32B *31/28*
U.S. Cl. 156—272.6 **18 Claims**



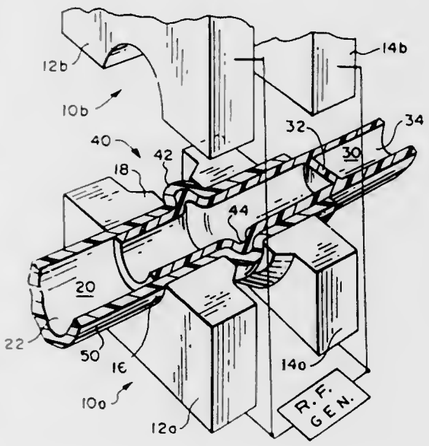
1. A method for laminating at least two polymeric sheets into a composite having improved properties, said method comprising the steps of:
providing a first sheet of polymeric material;
exposing a surface of such first sheet of polymeric material to cold plasma to activate the surface thereof, such cold plasma generated by application of at least approximately between 18,000–500,000 volts of electromagnetic energy onto a stream of gaseous material for application to such first sheet of polymeric material; and
disposing such activated surface of such first sheet into intimate proximity with a second sheet of polymeric material to effect adhesion therebetween to form a laminated composite in the absence of any substantial heating of either of such sheets and without application to either of such sheets of a separate adhesive.

4,900,389

METHOD OF SEALING AN ARTICLE VIA RADIO FREQUENCY

William J. Schneli; John M. Munsch, both of Libertyville; Robert W. Flagler, Barrington; Eugene Fabisiewicz, Mount Prospect, all of Ill., and Pierre Soubrier, Brussels, Belgium, assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 918,169, Oct. 10, 1986, abandoned. This application Aug. 9, 1988, Ser. No. 231,647
Int. Cl.[4] B32B *31/28*
U.S. Cl. 156—273.7 **2 Claims**



1. A method of radio frequency sealing the bore of a port with a previously sealed member without the use of an electrode or mandrel within said bore, said method comprising the steps of
assembling said sealed member to an end portion of the port forming a junction therebetween having an axial bore,
locating at least a portion of the junction between external first and second sets of radio frequency dies, each set having first and second die elements, the first die elements of the sets being generally oppositely radially spaced relative to axis of the junction bore, the second die elements of the sets being each generally equally spaced from the associated first die element axially along the axis of the junction bore with the region of the junction intended to be sealed lying in the axial space defined between the first and second die elements,
moving the first and second external die sets into compression contact with the junction to radially compress the region of the junction lying within the axial space without compressing the bore of the junction closed, thereby forming an outwardly extending annular ring on the exterior of the junction and between the respective first and second dies of each set, and a corresponding outwardly extending annular depression on the interior of the junction bore, and
sealing the sealed member to the and portion of the port by applying a selected energy potential between the elements of the external die sets, without the use of an electrically energizable mandrel in the bore of the junction, to create a heating field that melts and fuses the junction in the region of the annular exterior ring and annular interior depression.

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QUASI-RANDOM DOT PATTERN ADHESIVE JOINING METHOD

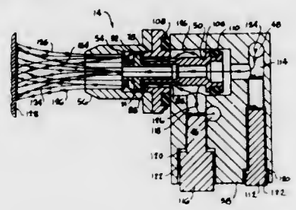
Douglas E. Colton, Salinas, and Fred A. Slautterback, Carmel Valley, both of Calif., assignors to Slautterback Corporation, Monterey, Calif.

Continuation of Ser. No. 36,802, Apr. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 863,088, May 14, 1986, Pat. No. 4,721,252. This application Dec. 21, 1988, Ser. No. 291,409

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.⁴ B32B *7/14*

U.S. Cl. 156—291 **16 Claims**



1. A method of adhesively joining two surfaces comprising,

directing a fluid stream of hot-melt adhesive toward a first surface,

breaking the fluid stream into irregular molted globules sufficiently massive as to remain molten even after contact with the first surface, said breaking of the fluid stream occurring prior to contact with said first surface in a non-misting manner,

covering a portion of the first surface with a stripe of said molten globules in the form of a quasi-random dot splatter pattern, said splatter pattern having voids between said globules, and

bringing a second surface into pressure contact with the stripe while said globules are still molten.

4,900,391

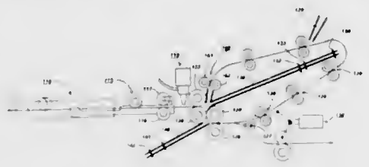
RECIRCULATING FOLDER FOR DIRECT MAIL APPLICATION

Barry P. Mandel, and William R. Burger, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 19, 1988, Ser. No. 286,104

Int. Cl.⁴ B32B *31/00*

U.S. Cl. 156—364 **15 Claims**



8. An on-line recirculating folder apparatus for a direct mail application comprising: means for forming first and second folds in a sheet at a first and second fold location, respectively; and recirculating path means for recirculating the sheet away form said second fold location to said first fold location.

4,900,392

SLIDABLE INDICIA ALIGNMENT AND TRANSFER DEVICE

Franklin C. Bradshaw, and Jeffery C. Saxton, both of Scottsdale, Ariz., assignors to Product Search, Inc., Scottsdale, Ariz.

Filed Sep. 30, 1988, Ser. No. 251,314

Int. Cl.⁴ B65C *1/00, 9/20*

U.S. Cl. 156—541 **9 Claims**



1. An alignment and transfer device for applying selected indicia to a substrate to form a composition of indicia, said indicia being releasably attached to a backing with a low-tack adhesive, said device comprising:

(a) a longitudinally extending track adapted to rest on a working surface;

(b) a protector sheet having an upper surface secured to said track at a marginal edge thereof and adapted to be placed on a working surface;

(c) a slide engaging and movable along said track and being disengageable therefrom;

(d) a transparent grid sheet attached to said slide having an upper and lower surface and at least partially overlying said protector sheet when said slide and track are engaged with the lower surface of said grid sheet and the upper surface of said protector sheet being adjacent one another, said lower surface of said grid sheet having a low-tack adhesive thereon, said grid sheet having reference markings thereon, whereby selected indicia may be aligned and transferred to the underside of said grid sheet by application of pressure through said grid sheet and thereafter moved to overlie said protector sheet by manipulation of said slide and upon completion of the composition of indicia said slide and grid sheet are disengageable from said track and protector sheet and are transferable to said substrate to permit said indicia to be permanently applied to said substrate.

4,900,393

PROCESS FOR PRODUCING SINGLE-CRYSTAL CERAMICS

Koichi Kugimiya; Ken Hirota, both of Toyonaka, and Keiichi Matsuyama, Miyazaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 62,520, Jun. 17, 1987, abandoned. This application May 26, 1989, Ser. No. 361,774

Claims priority, application Japan, Jul. 1, 1986, 61-154503

Int. Cl.⁴ C30B *1/02*

U.S. Cl. 156—600 **9 Claims**

1. A process for producing single-crystal ceramics, consisting essentially of the steps of placing a smooth face of a single-crystal ceramic to a corresponding smooth face of a single-crystal ceramic having the substantially same composition as said polycrystal ceramic, and joining said polycrystal and single-crystal ceramics with an adhesive layer placed therebetween, said layer containing at least one abnormal grain growth promoting element in an amount which exceeds that of said abnormal grain growth element in said polycrystal ceramic; heating the assembly to a bonding temperature at which said adhesive layer begins to diffuse to let said opposing smooth faces of said polycrystal and single-crystal ceramics to come into contact and to be bonded to each other; and further heating the assembly while maintaining it at a diffusion and solid-phase growth equilibrating temperature which is lower than the abnormal grain growth temperature—the temperature at which the abnormal grain growth of said polycrystal ceramic begins—and which is higher than said bonding temperature to thereby effect solid-phase growth of crystal.

4,900,394

PROCESS FOR PRODUCING SINGLE CRYSTALS

William L. Mankins, Huntington, W. Va., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Aug. 22, 1985, Ser. No. 768,160

Int. Cl.⁴ C30B *1/08*

U.S. Cl. 156—603 **5 Claims**



1. A process for producing a single crystal object made of a dispersion strengthened, gamma prime strengthened nickel-base alloy comprising providing a recrystallizable polycrystalline, dispersion strengthened gamma prime strengthened, gamma phase nickel-base alloy mass at least as large as the single crystal object to be produced, providing a single crystal seed object made of a gamma phase nickel-base alloy closely matching in gamma phase lattice parameters the gamma phase lattice parameters of said dispersion strengthened, gamma prime strengthened gamma phase nickel-base alloy in the solution treated condition, fusion welding said seed object to said alloy mass along faying surfaces on said seed object and said alloy mass, zone annealing said welded object to epitaxially grow a single crystal from said welded joint into said alloy mass, said zone annealing being characterized by relative motion between said welded object and a localized steep gradient thermal energy source having an intensity sufficient to raise the local temperature of said welded object above the solvus temperature of the gamma prime phase in said alloy mass to thereby provide a single crystal at the expense of the existing polycrystalline structure and thereafter, if necessary, discarding the seed single crystal and excess metal of said mass to provide a single crystal dispersion strengthened, gamma prime-containing, gamma phase nickel-base alloy object.

4,900,395

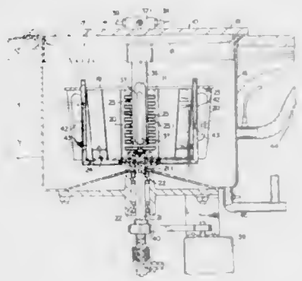
HF GAS ETCHING OF WAFERS IN AN ACID PROCESSOR

Daniel J. Syverson, Robbinsdale, and Richard E. Novak, Plymouth, both of Minn., assignors to FSI International, Inc., Chaska, Minn.

Filed Apr. 7, 1989, Ser. No. 334,343

Int. Cl.⁴ B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—629 **26 Claims**



1. In the art of gas phase etching of semiconductor wafers for removing portions of the oxide films on such wafers, the method consisting in

mounting a multiplicity of such semiconductor wafers into a wafer carrier wherein the wafers are in spaced and confronting relation with each other, and supplying etchant gas including anhydrous hydrogen fluoride gas to flow between the wafers and expose portions of the wafers to the etchant gas for etching portions of the oxide films thereon.

4,900,396

METHOD OF FORMING MODIFIED LAYER AND PATTERN

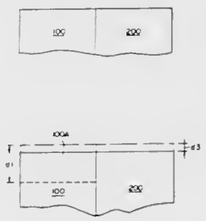
Yutaka Hayashi; Kenichi Ishii, both of Ibaraki, and Shunsuke Fujita, Kanagawa, all of Japan, assignors to Agency of Industrial Science and Technology, Ibaraki and Ricoh Company, Ltd., Tokyo, both of, Japan

Filed Aug. 18, 1988, Ser. No. 233,585

Claims priority, application Japan, Aug. 19, 1987, 62-205836; Aug. 19, 1987, 62-205837; Aug. 3, 1988, 63-193740

Int. Cl.⁴ B44C *1/22;* **C03C** *15/00, 25/06;* **H01L** *21/306*

U.S. Cl. 156—651 **9 Claims**



1. A method of forming a modified layer in a silicon semiconductor device structure, comprising:

forming a two-dimensional pattern of a silicon oxide film on a silicon surface of a substrate, thereby to form a material, said two-dimensional pattern being represented by the presence and absence of the silicon oxide film;

nitriding at least a side of said material with said silicon oxide film thereon to form a modified layer on the silicon oxide film and the silicon surface of said substrate, said modified layer including a thicker portion on said silicon oxide film and a thinner portion on said silicon surface of said substrate; and

removing said thinner portion of the modified layer from said silicon surface while leaving said thicker portion of the modified layer on said silicon oxide film, for thereby forming the modified layer on said silicon oxide film substantially in the same shape as said silicon oxide film.

4,900,397

PRODUCTION OF MAGNETIC RECORDING MEDIA

Arend Werner, Bad Durkheim; Hartmut Hibst, Ludwigshafen; Erich Haedicke, Hirschberg, and Johann Kronenbitter, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 228,724

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1987, 3726464

Int. Cl.⁴ C23F *1/00;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **9 Claims**

1. A process for the production of a magnetic recording medium consisting essentially of a disk-shaped aluminum substrate bearing a lower non-magnetic (Ni-P) film, a chromium film and an upper ferromagnetic metal film, which comprises:

(1) removing material from the surface of the (Ni-P) film, by RF sputter etching to a depth of from 1 to 20 nm,
(2) oxidizing the etched (Ni-P) surface with an oxygen-containing gas for from 10 seconds to 12 hours, and
(3) thereafter depositing the chromium film and the ferromagnetic metal film in succession on the (Ni-P) film.

4,900,398

CHEMICAL MILLING OF TITANIUM

Yu-Lin Chen, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1989, Ser. No. 368,008
Int. Cl.[4] C23F *1/00, 1/02;* **B44C** *1/22;* **C03C** *15/00*
U.S. Cl. 156—664 **5 Claims**

1. In the method of chemically milling titanium comprising the principle steps of contacting a surface of said titanium to be milled with aqueous milling solution for a time sufficient to corrode said surface a predetermined amount, the improvement wherein said solution, by weight, consists essentially of 1% to about 5% hydrofluoric acid, about 1.5% to about 4% chlorate ion, and, optionally, up to about 20% of an acid selected from the group consisting of H_2SO_4, HCl, and HNO_3.

4,900,399

METHOD OF MANUFACTURING BLEACHED CHEMI-MECHANICAL AND SEMICHEMICAL FIBRE PULP BY A TWO-STAGE IMPREGNATION PROCESS

Goran Bengtsson, Liljegangen 5, S-44005 Nodinge; Rune Simonson, Sotenasvagen 64, S-43364 Partille, and Roland Agnemo, Ornskoldsvik, all of Sweden, assignors to Eka AB, Surte; Goran Bengtsson, Nodinge and Rune Simonson, Partille, all of, Sweden

Continuation of Ser. No. 839,024, Mar. 12, 1986, abandoned. This application May 16, 1988, Ser. No. 196,796
Claims priority, application Sweden, Mar. 13, 1985, 8501247
Int. Cl.[4] D21B *1/02*
U.S. Cl. 162—26 **12 Claims**

1. In a method of manufacturing chemimechanical pulp with improved brightness and minimization of the peroxide consumption, comprising steaming, impregnation and refining chips of a lignocellulose material, the improvement comprising the further steps of:
impregnating said steamed chips with a aqueous alkali in the absence of added peroxide, in an amount balanced to give optimal pH in the following steps,
removing excess unreacted said aqueous alkali from said chips,
further impregnating said chips with a peroxide solution in the absence of added alkali in an amount sufficient for peroxide to be present during the refining step, the chips subsequent to said further impregnation having a pH of 7–11,
preheating said chips at a temperature of 50°–100° C., and refining the chips to pulp in an atmospheric refiner.

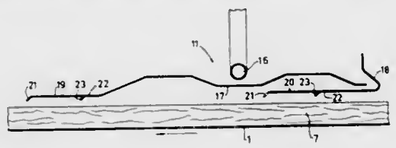
4,900,400

ARRANGEMENT FOR LIQUID TREATMENT OF PULP

Per E. W. Gudmundsson, Sörberge; Alf I. Lindström, Sundsbruk, and Jan-Erik Berg, Sundsvall, all of Sweden, assignors to Sunds Defibrator Aktiebolag, Sweden

PCT No. PCT/SE87/00192, § 371 Date Sep. 14, 1988, § 102(e) Date Sep. 14, 1988, PCT Pub. No. WO87/06962, PCT Pub. Date Nov. 19, 1987
PCT Filed Apr. 15, 1987, Ser. No. 249,569
Claims priority, application Sweden, May 13, 1986, 8602150
Int. Cl.[4] D21C *9/06;* **B01D** *33/38*
U.S. Cl. 162—308 **10 Claims**

1. An apparatus for treating a pulp suspension with a treatment liquid comprising a continuous pervious belt for receiving said pulp suspension and moving said pulp suspension through a treatment zone in a predetermined direction, treatment liquid supply means located above said continuous belt in said treatment zone for supplying said treatment liquid onto said pulp suspension as it travels through said treatment zone in said predetermined direction, and collection means located below said continuous belt for receiving liquid passing through said pulp suspension on said belt, said treatment liquid supply means comprising a treatment liquid feed pipe for supplying a flow of said treatment liquid, distribution means for dividing said flow of treatment liquid from said treatment liquid supply means into first and second flow components, said first flow component being in said predetermined direction and said



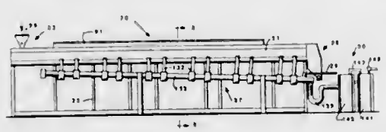
second flow component being counter to said predetermined direction, deflecting means for deflecting said second flow component into said predetermined direction, and application means comprising first and second plate members for applying said first and second flow components onto said pulp suspension, wherein each of said first and second plate members includes at least one gap for supply of at least a portion of said first and second flow components therethrough to control the amount of said treatment liquid supplied to said pulp suspension.

4,900,401

CONTINUOUS PYROLYSIS SYSTEM FOR TIRE SHREDS

Norman P. Horton, 6918 Greenback La., Citrus Heights, Calif. 95610

Filed Jun. 20, 1988, Ser. No. 209,054
Int. Cl.[4] C10B *1/00, 7/00, 31/00*
U.S. Cl. 202—117 **4 Claims**



1. A continuous pyrolysis system for pyrolyzing tire shreds, comprising:
an anaerobic pyrolyzing chamber in which tire shreds are pyrolyzed to form solid, liquid, and gas pyrolysate,
infeed means for feeding tire shreds to be pyrolyzed into the pyrolyzing chamber without introducing a substantial amount of air into the pyrolyzing chamber, and without allowing a substantial amount of gas pyrolysate to escape from the chamber into the atmosphere,
fluid pyrolysate output means for removing fluid pyrolysate from the pyrolyzing chamber without introducing a substantial amount if air into said chamber,
said fluid pyrolysate output means including:
a gas outlet line for removing gas pyrolysate form the pyrolysis system,
liquid pyrolysate output means for removing liquid pyrolysate from the pyrolysis system, and
fluid pyrolysate drain means for draining gas pyrolysate from the pyrolyzing chamber to the gas outlet line, and for draining liquid pyrolysate from the pyrolyzing chamber to the liquid pyrolysate output means,
solid pyrolysate output means for removing solid pyrolysate from the pyrolyzing chamber without introducing a substantial amount of air into said chamber, and without

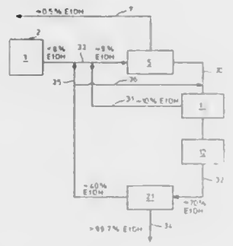
allowing a substantial amount of gas pyrolysate to escape from the chamber into the atmosphere,
heating means for heating tire shreds in the pyrolyzing chamber to a temperature sufficient for pyrolyzation, and
conveyor means located within the pyrolyzing chamber for receiving tire shreds to be pyrolyzed that are fed into the pyrolyzing chamber by the infeed means, for conveying the received tire shreds through the pyrolyzing chamber where they are pyrolyzed to form fluid and solid pyrolysate, and for delivering solid pyrolysate to the solid pyrolysate output means so that said solid pyrolysate can be removed from the pyrolyzing chamber,
whereby tire shreds to be pyrolyzed are fed into the pyrolyzing chamber, and solid and fluid pyrolysate is removed from the pyrolyzing chamber simultaneously with pyrolyzation of tire shreds being conveyed through the pyrolyzing chamber by the conveyor means,
said liquid pyrolysate output means including:
an output tank from which liquid pyrolysate is removed from the pyrolysis system,
an intermediate tank connected to the output tank by a liquid pyrolysate transfer line and a gas equalizing line, and
a U-section connecting the lower end of the collection tube to an intermediate tank, said U-section being filled with a U-section liquid having substantially the same specific gravity as liquid pyrolysate, said U-section liquid blocking gas from flowing into or out of the collection tube through the U-section,
whereby liquid pyrolysate may flow from the collection tube of the fluid drain means through the U-section to the intermediate tank, and through the liquid pyrolysate transfer line into the output tank for removal from the pyrolysis system.

4,900,402

PERVAPORATION PROCESS OF SEPARATING A LIQUID MIXTURE

Jürgen Kaschemekat, Geesthacht; Frank Schütt, Grossenaspe, and Axel Wenzlaff, Escheburg, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 25, 1987, Ser. No. 29,911
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1986, 3610011
Int. Cl.[4] B01D *13/00*
U.S. Cl. 203—19 **17 Claims**



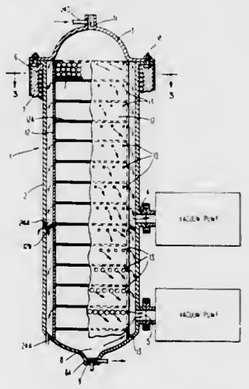
1. A pervaporation membrane process for separating at least one component from a mixture of liquids, comprising:
separating a mixture of liquids by a first pervaporation membrane to form a first permeate vapor once enriched in at least one component to be separated, and a first retentate liquid deriched in said at least one component to be separated;
fractionating said first permeate vapor to form a high concentration fraction twice enriched in said at least one component to be separated, and a low concentration fraction deriched in said at lest one component to be separated;
separating said high concentration fraction by a second pervaporation membrane to form a second permeate vapor deriched in said at least one component to be separated, and a second retentate liquid thrice enriched in said at least one component to be separated; and
recovering said at least one component to be separated from said second retentate liquid.

4,900,403

RECOVERY OF GAS DISSOLVED IN FLUE CONDENSATE

Arthur F. Johnson, Boulder, Colo., assignor to Energy Conservation Partnership, Ltd., Boulder, Colo.

Division of Ser. No. 96,770, Sep. 11, 1987, Pat. No. 4,781,797, which is a continuation of Ser. No. 743,137, Jun. 10, 1985, abandoned. This application Oct. 31, 1988, Ser. No. 264,721
Int. Cl.[4] B01D *3/10, 19/00*
U.S. Cl. 203—78 **5 Claims**



1. A method for removing volatile gas from a liquid, comprising the steps of:
providing a double wall chamber, the walls of the chamber being formed of thermally conductive material, the outer surface of the outer wall being directly contacted by refrigerant conduit means and the inner wall forming an inner chamber within said outer chamber, said inner chamber being divided by a plurality of perforated horizontal members into a vertically extending array of sub-stages, each of said sub-stages communicating with an annular space formed between the inner wall and the outer wall by a plurality of holes in the inner wall, the number of the holes in the inner wall forming the inner chamber varying from one sub-stage to the next such that the overall area for gas flow from each sub-stage provided by the holes in the inner wall increases progressively from the top to the bottom of the array of sub-stages, an aperture being formed in the top of the inner chamber for introducing the liquid having a volatile gas dissolved therein, a drain at the bottom of the inner chamber for removing liquid therefrom and a drain at the bottom of the annular space between the inner and outer walls for removing condensed volatile gas therefrom;
supplying a refrigerant to said refrigerant conduit means to chill the outer wall of the vessel;
introducing the liquid with volatile gas dissolved therein through said inlet at the uppermost portion of said vessel;
allowing said liquid to flow gradually downwardly through said sub-stages;
applying a vacuum to the annular space between the inner

and outer walls, such that the volatile gas is removed from the liquid in each of the sub-stages, the aggregate area of the holes in the inner wall varying from one sub-stage to the next in a manner such that essentially equal amounts of volatile gas are withdrawn through the holes in each of the sub-stages; and

withdrawing the condensed volatile material from the drain at the bottom of the annular space between the inner and outer walls of the vessel.

4,900,404

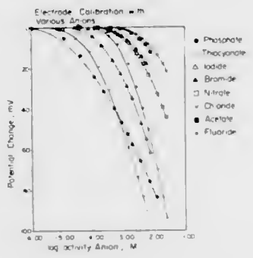
PHOSPHATE SELECTIVE MEMBRANE ELECTRODE

Mark A. Arnold, Coralville, and Scott A. Glazier, Iowa City, both of Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Aug. 15, 1988, Ser. No. 232,006

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—1 T **12 Claims**



1. A phosphate ion selective membrane electrode comprising:

a body member having an opening therein;

a membrane sealably attached to said body member over said opening, said membrane including

a disubstituted aryl tin compound, and

a strong complexing agent for tin compounds;

a reference solution contained within said body member; and

a reference electrode disposed within said body member in contact with said reference solution.

4,900,405

SURFACE TYPE MICROELECTRONIC GAS AND VAPOR SENSOR

Takaaki Otagawa, Fremont, and Marc J. Madou, Palo Alto, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jul. 15, 1987, Ser. No. 73,712

Int. Cl.[4] G01N *27/26*

U.S. Cl. 204—1 T **88 Claims**

1. A voltammetric microsensor structure, comprising:

a substrate having an active area on a surface thereof;

a sensing electrode having a portion thereof on said active area;

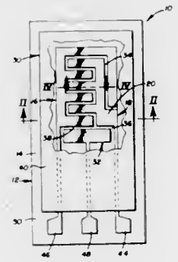
a counter electrode having a portion thereof on said active area;

a reference electrode having a portion thereof on said active area;

said sensing electrode, said counter electrode and said reference electrode defining respectively therebetween a sensing-counter gap, a sensing-reference gap and a counter-reference gap;

a solid polymer electrolyte bridging said gaps;

a barrier covering said solid polymer electrolyte electrolyric medium, said barrier being permeable to an analyte gas; and



an aqueous reservoir internal of said substrate in flow contact with said electrolyte.

4,900,406

METHOD OF ELECTROLYTIC METAL COATING OF A STRIP-SHAPE METAL SUBSTRATE AND APPARATUS FOR CARRYING OUT THE METHOD

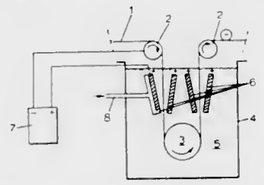
Leonard J. J. Janssen, Nuenen, and Gijsbertus C. Van Haastrecht, Heemskerk, both of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Jun. 12, 1989, Ser. No. 364,169

Claims priority, application Netherlands, Jun. 14, 1988, 8801511

Int. Cl.[4] C25D *7/06, 17/00*

U.S. Cl. 204—28 **11 Claims**



1. Method of electrolytic metal coating of a strip-shape metal substrate, comprising the steps of

(a) passing the substrate in a continuous process as cathode through an electrolytic coating apparatus having an insoluble anode, a catalyst at the anode, and an acidic electrolyte between the anode and the substrate,

(b) applying a voltage to the anode and the substrate as cathode so that metal ions are electrolytically deposited from the electrolyte onto the substrate to form the coating,

(c) supplying to the anode a hydrogen-providing gas so that, in the electrolytic process, under the influence of said catalyst electrons and hydrogen ions are formed at the anode from the hydrogenproviding gas, the hydrogen ions passing into the electrolyte.

4,900,407

METHOD FOR DEOXYGENATION OF ALCOHOLS

Isao Saito, Kyoto; Teruo Matsuura, Kyoto, and Hideyuki Ikehira, Osaka, all of Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Chiba, Japan

Continuation of Ser. No. 58,228, Jun. 22, 1987, abandoned. This application May 17, 1989, Ser. No. 355,814

Claims priority, application Japan, Oct. 3, 1985, 60-220961

Int. Cl.[4] B01J *19/08;* **C25B** *3/04*

U.S. Cl. 204—73 R **9 Claims**

1. A method for deoxygenation of an alcohol, wherein said alcohol has a secondary OH group, a tertiary OH group or both a secondary OH group and a tertiary OH group, by selectively deoxygenating said OH groups, which comprises subjecting the alcohol, whose OH groups to be deoxygenated have been esterified with substituted or unsubstituted benzoic acid, to a photocatalytic reaction in a hydrous or anhydrous hydrogen-donating solvent in the presence of an electron donor, said electron donor serving as a catalyst in the photocatalytic reaction which is not consumed during the reaction, or to an electrode reaction in the presence of an electrolyte for deoxygenation.

4,900,408

MEMBRANE ELECTROLYTIC PROCESS FOR PRODUCING CONCENTRATED CAUSTIC

Johnny D. Powers, Fayetteville, N.C., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 151,303, Feb. 1, 1988, abandoned. This application May 17, 1989, Ser. No. 355,448

Int. Cl.[4] C25B *1/16, 13/08*

U.S. Cl. 204—98 **15 Claims**

1. In a process for the manufacture of sodium hydroxide by electrolysis at a temperature of about 70° to 110° C. of an aqueous solution of sodium chloride in an electrolysis cell comprising an anode compartment and a cathode compartment separated from each other by a cation exchange membrane, wherein a more concentrated sodium chloride solution is continuously introduced into the anode compartment; a less concentrated sodium chloride solution is continuously withdrawn from the anode compartment; and the resulting sodium hydroxide solution is continuously recovered from the cathode compartment,

wherein the improvement of operating the process in a sustained manner, tolerant of upsets in sodium hydroxide concentration, by using as the cation exchange membrane a membrane consists of at least one layer, in which the material of at least the layer closest to the cathode is a copolymer of tetrafluoroethylene with a monomer Z of the general formula

$$CF_2=CF(OCF_2CF)_nOCF_2CF_2COONa,$$
$$\quad\quad\quad

providing a roll of a flexible sheet of valve metal mesh consisting of a network of valve metal strands connected at a mltiplicity of nodes providing a redundancy of current-carrying paths through the mesh which ensures effective current distribution throughout the mesh even in the event of possible breakage of a number of individual strands, the surface of the rolled valve metal mesh carrying an electrochemically active coating;

unrolling the coated valve metal mesh roll onto said current distributor member and thereby into conformity with the concrete structure to be protected;

firmly fixing the unrolled mesh to said current distributor member;

fixing the valve metal mesh to the concrete of said structure; and

embedding the fixed valve metal mesh, with current distributor member bonded thereto, in an ion-conductive overlay.

4,900,411

METHOD OF PREPARING A HIGH-PURITY POLYCRYSTALLINE SILICON USING A MICROWAVE HEATING SYSTEM IN A FLUIDIZED BED REACTOR

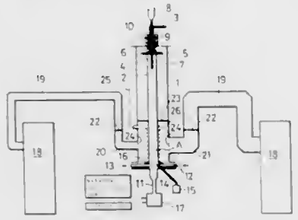
Yoon Poong, Seoul, and Song Yongmok, Chungnam, both of Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Chungnam, Rep. of Korea

Filed Oct. 30, 1986, Ser. No. 925,775

Claims priority, application Rep. of Korea, Dec. 28, 1985, 9938/1985

Int. Cl.⁴ C01B *33/02;* **B05D** *7/00*

U.S. Cl. 204—157.43 **14 Claims**



1. A method for preparing polycrystalline silicon comprising:

supplying silicon seed to a single-column fluidized bed reactor to form a bed of silicon seed particles;

introducing and dispersing a silicon-containing reacting gas into the reactor through a gas distribution means arranged below said bed to fluidize the silicon seed;

heating the silicon seed above said gas distribution means by introducing microwave energy from at least one side of the reactor into a lower reaction zone of the reactor to deposit silicon from the silicon-containing reacting gas onto the silicon seed to form polycrystalline particles;

introducing a coolant fluid into said gas distribution means; and

cooling said gas distribution means with said coolant fluid to maintain said gas distribution means at a temperature to prevent substantial deposition of silicon on said gas distribution means.

4,900,412

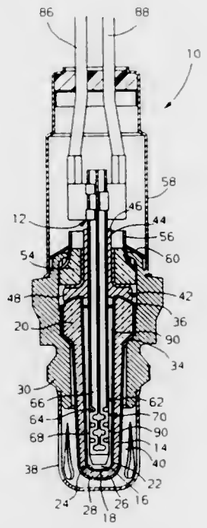
HEATED SOLID ELECTROLYTE OXYGEN SENSOR HAVING UNIQUE HEATER ELEMENT

Eric L. Ker, Grand Blanc, Mich., and Theodore R. Vasilow, Monroeville, Pa., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1988, Ser. No. 235,420

Int. Cl.⁴ G01N *27/58*

U.S. Cl. 204—427 **4 Claims**



1. An oxygen sensing device, comprising:

a substantially tubular solid electrolyte body having an elongated bore centrally and axially located, with a first end closed by said solid electrolyte body and a second end open, said solid electrolyte body having a reference electrode provided on an inner surface thereof and a measuring electrode provided on an outer surface thereof;

a housing, said housing supports said solid electrolyte body so that said measuring electrode of said solid electrolyte body contacts the external gas to be measured and so that said reference electrode of said solid electrolyte body is gas tight to the external gas to be measured; and

an elongated rod-like heater element having a substantially non-circular cross section defined by a polygon, and comprising an alumina base and a heating resistor having a positive coefficient of resistance, said heating resistor is convoluted in at least one region so as to provide a primary heating portion of said heater element in said convoluted region, said elongated heater element being inserted within said elongated bore of said solid electrolyte body so that said convoluted region of said heating resistor is located at an end of said heater element which extends into said solid electrolyte body; and

self-aligning means for rigidly securing at a plurality of non-continuous points defined by said polygonal cross section and centering said elongated heater element within said solid electrolyte body so that a gap exists everywhere therebetween said heater element and said solid electrolyte body, while also electrically coupling the galvanic output signal generated between said reference electrode and said measuring electrode to external electronic measuring equipment.

4,900,413

PROCESS FOR DIRECT CARBONYLATION OF HYDROCARBONS

Toshiyasu Sakakura, and Massato Tanaka, both of Yatabemachi, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 30,540, Mar. 27, 1987, abandoned. This application Nov. 24, 1987, Ser. No. 124,649

Claims priority, application Japan, Sep. 16, 1986, 61-217587; Oct. 1, 1986, 61-233704

Int. Cl.⁴ B01J *19/08*

U.S. Cl. 204—157.87 **10 Claims**

1. A process for the direct carbonylation of a hydrocarbon which comprises reacting a hydrocarbon, selected from the group consisting of an aliphatic, an alicyclic, and an aromatic hydrocarbon, with carbon monoxide under irradiation with light in the presence of a complex of a metal of Group VIII of the periodic table, wherein a ligand in said complex is a phosphine selected from the group consisting of a monophosphine of the formula $R^1R^2R^3P$ and a bisphosphine of the formula $R^4R^5P\text{-}A\text{-}PR^6R^7$, wherein R^1, R^2, R^3, R^4, R^5, R^6 and R^7, which are the same or different, are each a member selected from the group consisting of alkyl, aralkyl, and cycloalkyl; and A is a member selected from the group consisting alkylene, cycloalkylene, arylene, aralkylene and ferrocenylene.

4,900,414

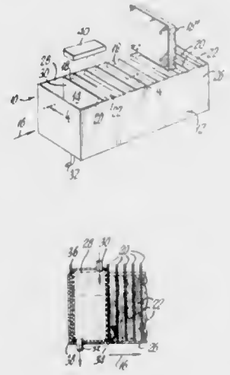
COMMERCIAL SEPARATION SYSTEM AND METHOD USING ELECTROKINETIC TECHNIQUES

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Filed Aug. 19, 1988, Ser. No. 234,258

Int. Cl.⁴ G01N *27/26*

U.S. Cl. 204—180.1 **36 Claims**



1. A commercial electrokinetic separation system for separating charged particles of different types and charges one from the other, said charged particles being separated from an inputted fluid, comprising:

a plurality of layers of electrokinetic material;

a plurality of column electrodes, said column electrodes being spaced apart one from the other in a first direction, one said electrokinetic material layer being positioned between each pair of said column electrodes, each said column electrode being in electrical contact with said adjacent electrokinetic material layers and subject to connection to a power source, said column electrodes and associated layers forming an electrokinetic column, a first column electrode at one end of said column being exposed to said fluid, an electric field being created in said electrokinetic column causing one of attraction and repulsion between selected ones of said column electrodes and respective types of said charged particles when said selected column electrodes are connected to said power source;

a fluid chamber adjacent to said first column electrode at said one column end, said chamber being adapted to receive said fluid for contacting with said first column electrode; and

a chamber electrode within said fluid chamber for contact with said fluid, said fluid being positioned between said chamber electrode and said first column electrode.

4,900,415

LOW CURE CATHODIC ELECTRODEPOSITION COATINGS

Ding Yu Chung, Rochester Hills, and Tapan K. DebRoy, Utica, both of Mich., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 23, 1988, Ser. No. 275,357

Int. Cl.⁴ C25D *13/06;* **C08L** *63/00*

U.S. Cl. 204—181.7 **7 Claims**

1. A resin composition for use as the film forming component in a cathodic electro-deposition process, comprising the reaction product of (A) a polyepoxide amine adduct and (B) a trimerized cross-linking agent, said crosslinking agent being formed by bringing into contact about three moles of tetramethyl xylene diisocyanate and about one mole of trimethylolpropane under conditions that will cause a reaction and then blocking the reaction product with about three moles of an oxime, wherein the resin composition can be cured at temperatures below 275° C.

4,900,416

ELECTROPHORETIC METHOD

Yoshihiko Makino, and Masashi Ogawa, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 13, 1988, Ser. No. 243,975

Claims priority, application Japan, Sep. 14, 1987, 62-230592

Int. Cl.⁴ G01N *27/26*

U.S. Cl. 204—182.8 **9 Claims**

1. An electrophoretic method comprising the steps of:

(i) positioning a sample, which contains nucleic acid fragments having different numbers of bases, in an electrophoresis medium composed of an electrophoresis gel medium containing an aqueous poly(meth)acrylamide gel prepared by the cross-linking polymerization of a (meth)acrylamide compound and a cross-linking agent in the presence of water and a compound having at least one carbamoyl group as a denaturing agent, and

(ii) applying pulsed electric fields to said electrophoresis medium in two directions, the electric field strength in each direction being from about 10 V/cm to 150 V/cm, and the duration of each pulse being from about 0.1 msec to 100 msec, to move thereby said nucleic acid fragments in the presence of a molecular sieve effect and to separate said nucleic acid fragments.

4,900,417

NICHROME RESISTIVE ELEMENT AND METHOD OF MAKING SAME

Charles T. Plough, Jr., Norfolk, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Division of Ser. No. 47,112, May 8, 1987. This application Apr. 25, 1988, Ser. No. 185,507

Int. Cl.⁴ C23C *14/06*

U.S. Cl. 204—192.21 **15 Claims**

1. The method of making an electrical resistor including an insulating substrate having a supporting surface a resistance element on said supporting surface, said resistance element

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containing 30% by weight to 70% by weight nickel and 30% by weight to 70% by weight chromium;

adding a substance selected from the group of elements consisting essentially of aluminum, a transitional element, and a rare earth element in a small but effective amount;

whereby said resistance element provides a barrier against impurities, inhibits corrosion and provides electrical stability to said electrical resistor.

4,900,418

ELECTROLYTIC CHLORINE GENERATOR WITH COVER ELEMENT

Robert E. Maddock, 1417 E. Secretariat Dr., Tempe, Ariz. 85284

Filed Dec. 27, 1988, Ser. No. 290,464
Int. Cl.[4] C25B *9/00*
U.S. Cl. 204—266 **1 Claim**



1. Apparatus for electrolytically generating chlorine gas from a salt solution, comprising

(a) hollow housing means for holding a volume of water and including

(i) an outer wall having an upper portion and a lower portion,

(ii) a base connected to said lower portion, and

(iii) cover means mounted on said upper portion of said housing means and including

a cylindrical aperture, and

a cover including a cylindrical neck slidably inserted in said aperture;

(b) an elongate hollow salt cell spaced apart from said outer wall and having a window formed therein;

(c) a first aqueous solution of sodium ions intermediate said salt cell and said outer wall;

(d) a second aqueous salt solution inside said hollow salt cell and having an upper surface;

(e) an elongate hollow salt spacer having a bottom portion and carried in said housing means inside and spaced apart from said salt cell, and including a plurality of spaced apart perforations formed therein, said second solution being both intermediate said spacer and salt cell and being inside said spacer;

(f) a volume of salt particles inside said salt spacer and having an upper surface;

(g) anode means mounted in said housing means adjacent said window and intermediate said salt cell and said salt spacer, said salt spacer extending upwardly from said anode means to a point above said upper surface of said second solution and said upper surface of said salt, said perforations in said spacer being intermediate said anode and said upper surface of said salt;

(h) cathode means mounted in said housing means adjacent and spaced apart from said anode and intermediate said anode and said housing; and,

(i) membrane means intermediate said anode and cathode means and covering said window to generally separate said second solution in said salt cell from said first solution, said membrane permitting sodium ions to migrate outwardly from said second solution through said membrane means into said first solution intermediate said salt cell outer wall;

salt ions from within said salt spacer moving outwardly through said perforations and downwardly intermediate said salt spacer and salt cell through said second solution to contact said anode means to produce chlorine gas rising upwardly intermediate said salt cell and spacer through said second aqueous solution and traveling near said perforations and through said salt ions moving outwardly from said perforations to said upper surface of said second aqueous solution, and said perforations permitting chlorine gas collecting inside said salt spacer when said upper surface of said salt is solid to outwardly escape through at least one of said perforations into said second aqueous solution intermediate said spacer and salt cell and rise to said upper surface of said second aqueous solution.

4,900,419

CATHODE FOR ELECTROLYSIS AND PROCESS FOR PRODUCING THE SAME

Yoshinori Nishiki; Shuji Nakamatsu, both of Kanagawa, and Takayuki Shimamune, Tokyo, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Filed Jun. 29, 1988, Ser. No. 213,047
Claims priority, application Japan, Jun. 29, 1987, 62-159685; Jul. 17, 1987, 62-177086
Int. Cl.[4] C25B *11/04*
U.S. Cl. 204—290 R **10 Claims**

1. A cathode for electrolysis comprising a conductive base having a nickel surface and a coating layer provided thereon, said layer comprising (a) at least one platinum group component selected from the group consisting of a platinum group metal, a platinum group metal oxide, and a platinum group metal hydroxide, and (b) at least one cerium component selected from the group consisting of cerium, cerium oxide, and cerium hydroxide.

4,900,420

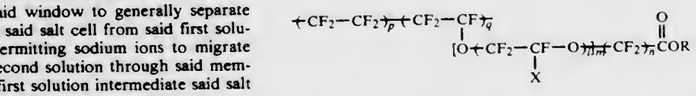
PROCESS FOR PREPARING A HIGHLY SELECTIVE FLUORINATED ANION EXCHANGE MEMBRANE

Yasuhiro Kurauchi; Toru Seita, both of Shin-nanyo; Kiyohide Matsui, Sagamihara, and Kikuo Sugimoto, Kanagawa, all of Japan, assignors to Tosoh Corporation, Shin-nanyo, Japan

Continuation of Ser. No. 918,061, Oct. 14, 1986, abandoned.
This application Mar. 28, 1988, Ser. No. 177,844
Claims priority, application Japan, Oct. 14, 1985, 60-228290; Oct. 14, 1985, 60-228291
Int. Cl.[4] B01D *13/02*; C08D *5/20*; C08F *226/00*
U.S. Cl. 204—296 **21 Claims**

1. A process for preparing a heterogeneous anion exchange membrane having enhanced current efficiency and reduced reverse diffusion of protons, which comprises:

(a) treating from about 1 to 80% of the thickness of a carboxylate membrane made of a copolymer having repeating units of the formula;

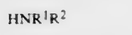


wherein X is F or CF_3, l is an integer of from 0 to 5, m is 0 or 1, n is an integer of from 1 to 5, and p/q is from 4 to

16, and R is a lower alkyl group, with a mineral acid which is effective as an acid catalyst for hydrolysis; or a base which is effective as a base catalyst for hydrolysis; and

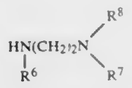
(b) reacting the treated membrane with

(i) a lower dialkylamine of the formula:



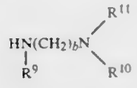
wherein R^1 and R^2 are lower alkyl groups; or

(ii) a diamine of the formula:



wherein R^6 is a hydrogen atom or a lower alkyl group, each of R^7 and R^8 is a lower alkyl group, or R^6 and R^7 together form a polyethylene group of the formula $(CH_2)_a$, wherein a is an integer of 2 or 3; or

(iii) a diamine of the formula:



wherein R^9 is a hydrogen atom or a lower alkyl group, each of R^{10} and R^{11} is a lower alkyl group, or R^9 and R^{10} together form a polymethylene chain of the formula $CH_2)_2$, wherein c is an integer of 2 or 3, and b is an integer of from 3 to 7; to thereby form a carboxylic acid amide membrane, which is treated with a reducing agent to form a corresponding amine membrane, which is then alkylated with a lower alkyl group to form a quaternary ammonium group-containing membrane.

4,900,421

VORTEX STABILIZED ELECTROPHORETIC SEPARATION APPARATUS

John B. Grutzner, and Perry J. Pellechia, both of W. Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

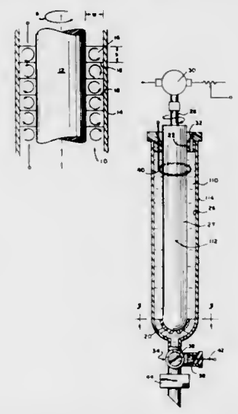
Filed Sep. 2, 1988, Ser. No. 239,938
Int. Cl.[4] G01N *27/26*
U.S. Cl. 204—299 R **21 Claims**

1. A separation apparatus comprising

a substantially uninterrupted annular chamber defined by walls of an outer cylinder and a substantially coaxial rotatably mounted inner cylinder, said annular chamber adapted to contain a support fluid and separation substrates capable of migrating relative to said fluid under the influence of an electrical field,

means for applying an electrical field to said chamber to generate an anodic region and an axially remote cathodic region in the annular chamber,

means for rotating the inner cylinder relative to the outer cylinder at a rotational frequency (F) where F is at least as high the critical frequency (F_c) for onset of Taylor vortex flow in the annular chamber, and



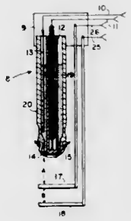
means for separating fluid in axially discrete portions of the annular chamber from fluid in other axially discrete portions of the annular chamber.

4,900,422

SYSTEM FOR MONITORING AND REPORTING THE OPERABILITY AND CALIBRATION STATUS OF A DISSOLVED OXYGEN SENSOR

Avron I. Bryan, 26 Country Club Rd., Cocoa Beach, Fla. 32931, and Michael R. Cushman, 521 Brandonwood Rd., Kingsport, Tenn. 37662

Filed Jul. 5, 1988, Ser. No. 215,784
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—401 **17 Claims**



1. In a dissolved oxygen measuring system having an oxygen ion sensor disposed in a process solution, said sensor including an oxygen electrode for producing a first dc signal proportional to the oxygen ion concentration in said solution and a reference electrode for producing a dc reference signal, an electrolyte contacting the oxygen electrode and the reference electrode, and a permeable membrane separating the electrolyte from said solution, a test and monitoring subsystem comprising:

(a) an electrode disposed in said process solution adjacent said sensor membrane;

(b) time varying electrical signal generator means for producing a time varying signal, said generator having a first output lead connected to a ground, and a second output lead connected to said electrode, said generator thereby producing a time varying electrical current through said solution, said sensor membrane, said electrolyte, and said

reference electrode to said ground, said current producing an output time varying signal proportional to an impedance value of said sensor membrane superimposed on said dc reference signal;

(c) cross-correlation means for cross correlating said time varying current with said output time varying signal and said dc reference signal to separate said output time varying signal therefrom; and

(d) means for measuring the value of said separated output time varying signal, said value thereby being proportional to said membrane impedance.

4,900,423

ENZYME SENSOR USING IMMOBILIZED GLUCOKINASE

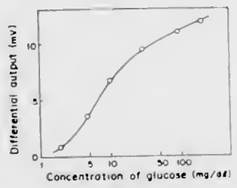
Takeaki Iida, Niiza, and Takeshi Kawabe, Sumida, both of Japan, assignors to Unitika Ltd., Hygo, Japan

Continuation of Ser. No. 32,719, Apr. 1, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 212,104

Claims priority, application Japan, Apr. 2, 1986, 61-76127

Int. Cl.[4] C12Q *1/00, 1/54*

U.S. Cl. 204—403 **4 Claims**



1. An enzyme sensor comprising an immobilized glucokinase acting specifically on a substrate and a transducer for converting the quantitative change of hydrogen ions produced or consumed during an enzyme reaction to an electrical signal.

4,900,424

ELECTROCHEMICAL MEASUREMENT CELL

Brian J. Birth, Chelveston, and Ian W. Burns, Huntingdon, both of England, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

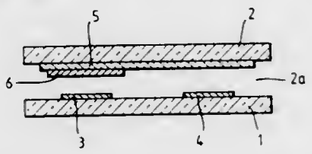
PCT No. PCT/GB87/00857, § 371 Date Sep. 28, 1988, § 102(e) Date Sep. 28, 1988, PCT Pub. No. WO88/04048, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 30, 1987, Ser. No. 225,751

Claims priority, application United Kingdom, Nov. 28, 1986, 8628531; Nov. 2, 1987, 8725601

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—409 **11 Claims**



1. An electrochemical device comprising two electrodes, wherein one of said electrodes is suitable for use as a reference electrode in electrochemical measurements, said device comprising (a), a capillary fill cell capable of receiving a small volume of aqueous sample liquid, said cell incorporating (b) a redox electrode which may be the reference electrode located within said capillary fill cell, and (c) a reagent layer comprising quinhydrone located in said cell in a dry adherent water-soluble layer adherent to an inner surface of said cell opposite to or overlying said redox electrode and capable of dissolving during use in aqueous sample liquid in the region of said redox electrode.

4,900,425

OXYGEN SENSOR

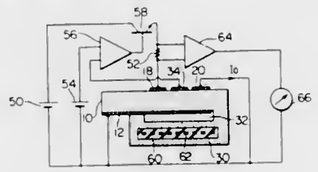
Takao Sasayama, Hitachi; Seikoh Suzuki, Hitachiota; Toshitaka Suzuki, Hitachi; Masayuki Miki, and Sadayasu Ueno, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 597,030

Claims priority, application Japan, Apr. 6, 1983, 58-59310

Int. Cl.[4] G01N *27/58*

U.S. Cl. 204—426 **7 Claims**



1. An oxygen sensor comprising:

a solid electrolyte;

a first active electrode provided on one of a pair of main surfaces of said solid electrolyte and having gas permeability;

enclosing means for forming a reference chamber, said reference chamber being airtight to be isolated from a surrounding space, said reference chamber including therein at least a portion of said first electrode;

a second active electrode and a third active electrode each provided on the other main surface of said solid electrolyte at a place opposite that portion of said first electrode which is included in said reference chamber, each of said second and third electrodes having gas permeability;

a current path formed between said first electrode and said third electrode for continually supplying oxygen to said reference chamber in such a manner that oxygen in said surrounding space is ionized and then passes through said solid electrolyte;

power supply means for continually supplying a current between said first electrode and said second electrode to continually pump out oxygen from said reference chamber in such a manner that oxygen in said reference chamber is ionized and then passes through said solid electrolyte, said power supply means and said current path being connected to the electrodes such that oxygen supplied from said surrounding space to said chamber is continually pumped out from said chamber, simultaneously with the supply of oxygen from the surrounding space, to maintain the oxygen partial pressure to be always far smaller in the chamber than the oxygen partial pressure in a space existing on the other main surface side of said solid electrolyte; and

means for detecting the oxygen concentration in the space existing on the other main surface side of said solid electrolyte, on the basis of said current supplied by said power supply means.

4,900,426

TRIPHENYLPHOSPHINE OXIDE AS AN ETHYLENE FURNACE ANTIFOULANT

John C. Kisalus, Houston, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 3, 1989, Ser. No. 332,649

Int. Cl.[4] C07C *11/04*

U.S. Cl. 208—48 AA **1 Claim**

1. A method for reducing fouling in ethylene cracking furnaces using petroleum feed stock which comprises the petroleum feed stock with an anti-fouling amount of triphenylphosphine oxide.

4,900,427

ANTIFOULANT COMPOSITIONS AND METHODS

Jerry J. Weers, Ballwin; Thomas J. Falkler; George G. Duggan, both of Fenton, and Robert J. Garrecht, St. Louis, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jul. 21, 1989, Ser. No. 383,941

Int. Cl.[4] C10G *9/16, 9/21*

U.S. Cl. 208—48 AA **12 Claims**

1. A process of inhibiting fouling of heat exchangers in chemical processing or oil refining systems comprising incorporating into a petroleum derived stock an effective antifouling amount of a composition comprising

(a) a condensation product of an alkylphenol and/or alkoxyphenol, an aldehyde and an amine; and

(b) a diaminomethane;

the weight ratio of component (a) to component (b) being in the range of 1:100 to 100:1.

4,900,428

PROCESS FOR THE CATALYTIC CRACKING OF VANADIUM-CONTAINING FEEDSTOCKS

Zoltan C. Mester, Laguna Niguel, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 759,161, Jul. 26, 1985, abandoned. This application Sep. 11, 1986, Ser. No. 906,327

Int. Cl.[4] C10G *11/05*

U.S. Cl. 208—121 **21 Claims**

1. A process for the catalytic cracking of a vanadium-containing hydrocarbon feedstock which process comprises contacting said hydrocarbon feedstock with a cracking catalyst under cracking conditions in the substantial absence of added molecular hydrogen in a cracking zone to convert components of said feedstock into lower molecular weight constituents, said cracking catalyst comprising:

(a) a crystalline aluminosilicate zeolite dispersed in a matrix; and

(b) a vanadium passivating agent selected from the group consisting of cerium and neodymium and compounds thereof, said passivating agent being present in said catalyst in an amount greater than about 1.0 weight percent, calculated as the oxide of said vanadium passivating agent and based on the carbon-free weight of said catalyst, and in an amount such that the weight ratio of said passivating agent to any lanthanum present in said catalyst, calculated based on the respective oxides, is greater than about 1.0, and wherein the total weight of all rare earths present in said catalyst is greater than about 2.0 weight percent, calculated based on the respective rare earth oxides and on the carbon-free weight of said catalyst, and wherein after said vanadium passivating agent is added to the dispersion of said crystalline aluminosilicate zeolite in said matrix to form said catalyst there is no subsequent treatment of said catalyst to induce precipitation of said passivating agent.

4,900,429

PROCESS UTILIZING PYROLYZATION AND GASIFICATION FOR THE SYNERGISTIC CO-PROCESSING OF A COMBINED FEEDSTOCK OF COAL AND HEAVY OIL TO PRODUCE A SYNTHETIC CRUDE OIL

Reginald D. Richardson, 57 Widdicombe Hill Blvd., Apt. 1504, Weston, Ontario M9A 1Y4, Canada

Filed Jun. 13, 1986, Ser. No. 873,925

Claims priority, application Canada, Jul. 29, 1985, 487723

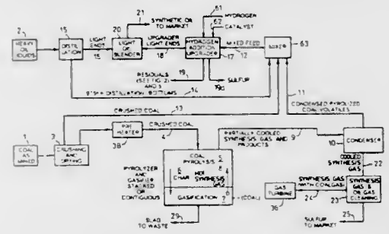
Int. Cl.[4] C10G *1/00*

U.S. Cl. 208—418 **37 Claims**

1. A process for the production of a synthetic crude oil by co-processing non-coal heavy oil and coal comprising the steps of:

(1) producing coal volatiles and a hydrocarbon residual by thermal pyrolysis of a first allotment of crushed coal using temperatures that avoid thermal degradation of the coal volatiles;

(2) gasifying said hydrocarbon residual to produce a synthesis gas in first gasifiers moderated by one or more of the group consisting of air, oxygen or oxygen enriched air;



(3) utilizing the sensible heat in said synthesis gas to effect the said thermal pyrolysis of said crushed coal and produce said coal volatiles;

(4) condensing the condensible coal volatiles from the synthesis gas and mixing the coal volatiles with a second allotment of crushed coal and a non-coal heavy oil to produce an upgrader feedstock;

(5) upgrading said feedstock by hydrogen addition comprising hydrogenation and catalytic hydrocracking to produce an upgrader lighter crude oil, an upgrading residual, and an upgrading off gas.

4,900,430

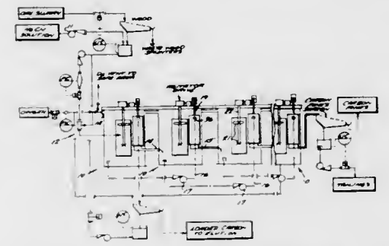
SCREEN CLEANING IN CIL AND CIP SYSTEMS

Carl L. Elmore, and Phillip Mitchell, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Sep. 20, 1985, Ser. No. 778,265

Int. Cl.[4] B01D *33/00*

U.S. Cl. 209—17 **7 Claims**



1. Apparatus for use in separating metal and other values from a slurry by adsorption with particles comprising:

a tank for holding a slurry containing the values to be separated and a number of particles on which the values are to be adsorbed, said tank having a slurry outlet and a slurry inlet;

screen means including a screen operatively connected to said slurry outlet for screening the slurry flowing into said outlet to permit slurry to flow into said outlet, but to prevent the particles from flowing into the slurry outlet, the screen having screen openings dimensioned so as to prevent the passage of a significant number of the particles therethrough, said slurry outlet comprising a generally linearly extending member having an opening along a wall

thereof, bearing means carried by and along another wall of said member, said screen means including a screen body carrying said screen and having bearing means adjacent one end for engagement with said bearing means carried by said member; and

means for linearly reciprocating said screen so as to provide a back flushing, self-cleaning, action thereto.

4,900,431

PROCESS FOR UPGRADING ANDALUSITE

Cariou F. Volpi; Jean-Jacques Predali, and Philippe Raveneau, all of Elancourt, France, assignors to Denain-Anzin Mineraux Refractaire Ceramique S.A., Longueville, France

Filed Dec. 21, 1988, Ser. No. 287,164

Claims priority, application France, Dec. 24, 1987, 87 18135

Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 **17 Claims**



1. Process for upgrading andalusite present in an ore containing said andalusite and other silicates by separation of said andalusite from the other silicates by froth flotation to obtain a concentrate whose content of andalusite is higher than 90%, said process comprising at least the following steps:

(a) grinding and pulping said ore containing the andalusite;

(b) preconditioning said ore pulp containing the andalusite by maintaining the pH of the aqueous phase of the pulp at a value less than 3.50, the solids ratio in the pulp being higher than 30%;

(c) adding a sufficient amount of alkyl sulfonate to the preconditioned ore pulp to act as a collector for said andalusite and conditioning said preconditioned ore pulp for at least 10 minutes after addition of said alkyl sulfonate;

(d) dilution of said conditioned ore pulp to bring it to a solids ratio comprised between 15 and 30%;

(e) subjecting the diluted ore pulp to froth flotation by bubbling calibrated air bubbles therethrough, the froth flotation proper lasting at the most 10 minutes; and

(f) recovering the andalusite concentrate from the froth of the said froth flotation.

4,900,432

POOL SURFACE CLEANER

Aaron L. Arnold, 15393 70th Trail N, Palm Beach Gardens, Fla. 33418, and Daniel A. Woodward, 807 Briarwood Dr., West Palm Beach, Fla. 33415

Filed Jan. 24, 1989, Ser. No. 301,015

Int. Cl.[4] E04H *3/20*

U.S. Cl. 210—91 **13 Claims**

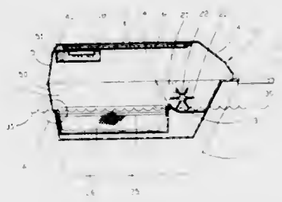
1. A self-propelled pool surface cleaner for self generated floating movement on a surface of a pool, comprising:

a main body having a central chamber and including a float member extending on each side of said central chamber;

a front surface extending across said body forward of said central chamber, said front surface extending below said surface of a pool;

a barrier extending across said body, said barrier positioned at a rear edge of said front surface and at a front edge of said central chamber;

an impeller extending across said body above said front surface and adjacent to said barrier for propulsion of water from said surface of said pool rearward over said barrier into said central chamber to produce forward



reaction action for movement of the cleaner on said surface of said pool;

a screen mounted in said central chamber and an exit from said central chamber, water flowing through said screen and from said central chamber;

drive means on said body for rotating said impeller, said drive means including an electric motor;

a self-contained power source in said body for supplying power to said electric motor and including a solar cell array on said body.

4,900,433

VERTICAL OIL SEPARATOR

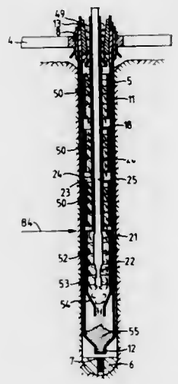
Alan J. Dean, Skene, and Hans P. Hopper, Whiterashes, both of Scotland, assignors to The British Petroleum Company p.l.c., London, United Kingdom

Filed Mar. 23, 1988, Ser. No. 173,332

Claims priority, application United Kingdom, Mar. 26, 1987, 8707306

Int. Cl.[4] B01D *45/02*

U.S. Cl. 210—170 **6 Claims**



1. A vertical separator capable of separating crude oil from an underwater well into liquid and gas phases comprising;

(i) an outer casing forming the outer shell of the separator,

(ii) two sets of concentric tubing within the outer casing, giving with the outer casing, two annuli and a central passage, one annulus having an inlet to receive crude oil, the other annulus having an outlet for separated gas and the central passage having an outlet for product oil, and

(iii) an electrical or hydraulic pump at the base of the central passage, and a pump drive pipe extending from the pump up within the central passage to a source of power supplied to the top of the separator, and

(iv) said crude oil inlet and outlets for separated gas and product oil all being at the top of the separator, and

(v) said vertical separator being itself underwater extending at least partially into a sea-bed and having an external casing, outside the separator outer casing, said external casing being cemented into the sea-bed.

4,900,434

APPARATUS FOR CONTINUOUS FILTRATION OF FLUIDS

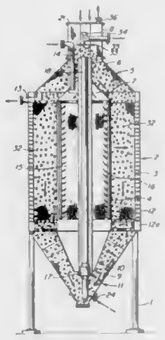
Horst Schade, In der Marpe 16, 4320 Hattingen, Fed. Rep. of Germany

Division of Ser. No. 193,349, May 12, 1988, Pat. No. 4,842,744. This application Jan. 6, 1989, Ser. No. 294,760

Claims priority, application European Pat. Off., May 14, 1988, 88109976.1

Int. Cl.[4] B01D *29/26, 29/38*

U.S. Cl. 210—189 **10 Claims**



1. In an apparatus for the continuous filtration of liquids, said apparatus having a central receiving area and an upstanding outer area of substantial height;

means for introducing a liquid to be filtered into said central receiving area,

an upstanding liquid-permeable wall having a microfilter arranged between said central area and said outer area to allow the liquid to pass through said microfilter from said central receiving area to said outer area,

particulate filter-media particles arranged in said outer area adapted to receive liquid passing through said microfilter, said particles forming an upstanding filter bed,

means for collecting said filter particles at the bottom of said filter bed,

means for introducing during said collection a liquid into said filter particles at the bottom of said filter bed to produce a vortex action on the particles,

means for transporting the particles inwardly through said central receiving area to the upper portion of said outer area for recirculation downwardly through said outer area, and

means for applying a liquid to said microfilter during the filtration to cause a removal of the relatively heavy and flocculated impurity particles deposited on said microfilter in a manner to cause the removing liquid to carry said impurity particles to the bottom of said filter bed.

4,900,435

CENTRIFUGAL FAST CHROMATOGRAPH

Norman Anderson, Rockville, Md., assignor to Large Scale Biology, Rockville, Md.

Continuation of Ser. No. 210,160, Jun. 9, 1988, abandoned, which is a continuation of Ser. No. 65,590, Jun. 23, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 332,436

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—198.2 **31 Claims**



1. A centrifugal fast chromatograph for automatically performing, monitoring, and comparing multiple sample elutions, comprising:

a chromatograph rotor;

a rotor drive for rotating said chromatograph rotor;

a plurality of chromatographic columns equiangularly mounted on said chromatographic rotor, said chromatographic columns each comprising an optical flow cell having transparent windows disposed at one end of said chromatographic column;

a sample holding transfer disk located at the center of said chromatographic rotor, said transfer disk having a plurality of sample wells equiangularly disposed around the periphery of said transfer disk, each of said sample wells corresponding to a respective said chromatographic column;

first and second distributor rings coaxially mounted on said chromatograph rotor;

a fluid carrying center line extending from said transfer disk via said first distributor ring to the inner end of said chromatographic column and having a center line valve to direct fluid to an exit drain;

a fluid carrying edge line extending from said outer end of said chromatographic column to said second distributor ring and having an edge line valve to direct fluid to an exit drain;

a gradient maker in fluid communication with said chromatographic columns through both said center line and said edge line to provide a liquid gradient for column elution and a regenerating solution for column regeneration;

stream apportioning blades equiangularly disposed on the inner periphery of said chromatograph rotor for directing solution from said sample wells and a liquid gradient stream from said gradient maker to said chromatographic columns;

a valve system for reversing flow through the column while maintaining centrifugally-generated pressure and flow;

a light source mounted on one side of said chromatograph rotor oriented to shine a light beam through said optical flow cells;

a photodetector mounted on the side of said chromatograph rotor opposite said one side, and opposite said light source to detect light shone through said optical flow cells; and

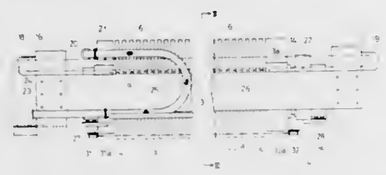
a microprocessor type computer for controlling said gradient maker, and said chromatograph rotor through said rotor drive, for controlling the chromatographic process, for monitoring the chromatographic process, and for providing real time CRT display of all chromatograph columns.

4,900,436

APPARATUS FOR CAKE REMOVAL IN A FILTER PRESS

Akitoshi Iwatani, Marugame, Japan, assignor to Ishigaki Kiko Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1988, Ser. No. 284,176
Claims priority, application Japan, Dec. 26, 1987, 62-330661
Int. Cl.[4] B01D *25/32*
U.S. Cl. 210—225 5 Claims



1. For use in a filter press including a pair of parallel guide rails supported by machine frames at a predetermined level, each guide rail having an upper surface, a multiplicity of filter plates suspendedly supported on the rails for movement in the longitudinal directions of the rails, each filter plate having a lower end portion, a pair of clamping heads disposed in such a way that the filter plates are entrained between the heads so as to form an entrained assembly of filter plates, the filter plates individually having their both surfaces covered with separate filter cloths, an apparatus for cake removal comprising:

(i) the filter plates, as well as each outermost one of the filter plates and both of the clamping heads, are separably interconnected, at a level adjacent the upper surface of the guide rails, by loose connecting means which permit individual adjacent ones of the filter plates to be equally spaced from one another when the clamping heads are moved in opposite directions until they are apart a predetermined distance from each other, means for separating and assembling the filter plates together being connected to both of the two clamping heads;

(ii) the filter plates, when separated from one another, are individually swingable about their interconnections with the loose connecting means, while being supported on the guide rails; and

(iii) the filter plates entrained between the clamping heads are equipped with jolting means for causing selected filter plates to swing so that the lower end portions thereof are caused to strike against the lower end portion of a preceding or succeeding adjacent filter plate when the filter plates are separated in equally spaced apart relation via said loose connecting means, whereby all the filter plates and associated filter cloths are jolted.

4,900,437

DEVICE FOR THE INTRODUCTION OF A FLUID IN A RECEIVING MEDIUM, SUCH AS THAT OF AN APPARATUS USED FOR THE TREATMENT OF LIQUIDS, NOTABLY WATER

Monsieur V. Savall, Velizy Vallacoublay, France, assignor to Societe Degremoot, Rueil Malmaison Cedex, France

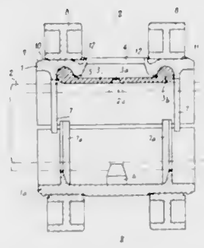
Filed Nov. 30, 1987, Ser. No. 126,854
Claims priority, application France, Dec. 18, 1986, 86 17741
Int. Cl.[4] B01D *35/00*
U.S. Cl. 210—232 23 Claims

1. A device for use with a duct, said duct having at least one duct orifice, said device comprising:

(a) a membrane having a bead along its periphery and at least one membrane orifice for communicating with said duct orifice;

(b) two half shells adapted to substantially surround said duct, at least one of said two half shells comprising:

(i) means for housing said membrane including a groove within which said bead of said membrane is seated and from which said bead projects toward said duct when said half shells are positioned to substantially surround said duct, and



(ii) a shell orifice for communicating with said duct orifice and said membrane orifice; and

(c) means for clamping said two half shells and membrane onto said duct.

4,900,438

PUMP MOUNTING FOR A FILTRATION SYSTEM

Stephen N. McEwen, Bowling Green, Ohio, assignor to Henry Filters, Inc., Bowling Green, Ohio

Continuation-in-part of Ser. No. 144,058, Jan. 15, 1988. This application Jun. 6, 1988, Ser. No. 202,584
Int. Cl.[4] B01D *29/00*; F04B *17/00*
U.S. Cl. 210—236 19 Claims



10. Apparatus for mounting a pump in a liquid filtration tank, comprising:

a tank for containing liquid and having an outlet conduit;

a filter in said tank and a suction conduit in communication with said filter for applying a suction to said filter;

a pump having a vertical axis;

means mounting said pump for movement between an operative position in said tank for pumping liquid filtrate from said filter through said suction conduit and into said outlet conduit and an inoperative position removed from said tank;

said mounting means including means carried by said tank and said pump cooperable to guide said pump for rotational movement in said tank toward its operative position; and

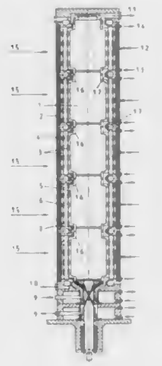
means for positively rotating in a horizontal plane said pump about its vertical axis in said tank toward said operative position.

4,900,440

DYNAMIC PRESSURE FILTER

Heinrich Ziegler, Rutschwil, and Jan R. P. de Fries, Wallisellen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 14, 1988, Ser. No. 206,510
Claims priority, application Switzerland, Jun. 24, 1987, 2374/87
Int. Cl.[4] B01D *13/00, 33/02*
U.S. Cl. 210—321.68 19 Claims



1. A dynamic pressure filter comprising

a cylindrical rotor drum;

a cylindrical stator drum mounted coaxially about said rotor drum;

a first filter surface mounted on said rotor drum to define an annular collecting chamber for a filtrate;

a second filter surface mounted on said stator drum to define an annular collecting chamber for a filtrate and concentrically spaced from said first filter surface to define an annular filter chamber for receiving a suspension to be filtered under pressure; and

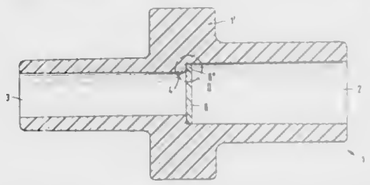
at least one vortex breaker subdividing said annular chamber into longitudinal sections and disposed for destroying the flow structure of the suspension in an upstream longitudinal section to allow a new flow structure to form in the suspension in a downstream longitudinal section.

4,900,441

SMALL FILTER AND METHOD OF ITS MANUFACTURE

Andreas Graus, Nörten-Hardenberg, and Michael Schützler, Göttingen, both of Fed. Rep. of Germany, assignors to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 306,619
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804344
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—321.84 6 Claims



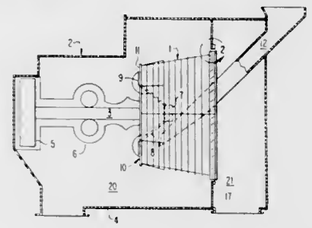
1. A small one-piece sterile, leakproof filter consisting of a membrane filter with housing manufactured by injection molding, said filter membrane being located between an inlet and an outlet of said housing, and connected to the housing in its edge area in a sterile and leakproof manner, characterized in that housing (1) is one-piece and the filter membrane (6) is covered on at least one side on the edge area (6') by a liquid plastic seal added during injection molding at about 230° C. and which has hardened after injection molding to anchor said membrane in said hardened plastic.

4,900,442

AIR SEAL CENTRIFUGE SCREEN BASKET

James D. Connolly, and Richard L. McCormick, Jr., both of Hillcrest Subdivision, assignors to Conn-Weld Industries, Inc., Princeton, W. Va.

Filed Jan. 25, 1988, Ser. No. 147,939
Int. Cl.[4] B01D *33/06*
U.S. Cl. 210—380.3 5 Claims



1. In apparatus for centrifugally separating material, the combination with a centrifuge machine having a housing, a wall internally dividing said housing into front and rear compartments, and a machine seal ring inwardly bounding said opening in and mounted on said wall for limited relative movement in any direction parallel thereto for centering said ring on a basket in said opening, of a centrifuge screen basket removably inserted in said machine through said machine ring and mounted in said machine for rotation about a horizontal axis, a basket ring encircling an outer end portion of said basket and surrounded by and substantially coplanar with said machine seal ring, and a plurality of airfoil blades on and radially outstanding from said basket ring and interposed therebetween and said machine ring, said blades being uniformly tilted in the direction of rotation of said basket for generating a force of air opposing and sealing against leakage of material between said rings.

4,900,443

POROUS ARAMID MEMBRANES AND EMULSIONS USEFUL FOR THE CASTING THEREOF

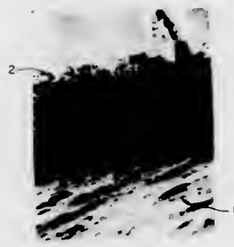
Wolfgang J. Wrasidlo, LaJolla, Calif., assignor to Memtec North America Corporation

Continuation-in-part of Ser. No. 932,372, Nov. 19, 1986, Pat. No. 4,774,039, which is a division of Ser. No. 291,927, Aug. 11, 1981, Pat. No. 4,629,563, which is a continuation-in-part of Ser. No. 130,566, Mar. 14, 1980, abandoned. This application May 6, 1987, Ser. No. 46,387
The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.
Int. Cl.[4] B01D *13/00, 13/04*
U.S. Cl. 210—490 8 Claims

1. An integrally skinned, porous, fully aromatic polyamide membrane having a porous skin portion having a pore diameter within the range of 0.05 to 3 μ and a support portion containing pores interconnecting with the skin pores, the pores in the

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support portion increasing in size as their distance from the skin portion increases, such that the average diameter of the



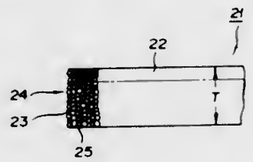
largest pores is from 10 to 300 times the diameter of the skin pores.

4,900,444

A POROUS MEMBRANE FOR BLOOD COMPONENTS AND METHOD FOR MANUFACTURING THEREOF

Yukio Seita, and Makoto Onishi, both of Fuji, Japan, assignors to Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 900,774, Aug. 26, 1986, abandoned. This application Aug. 12, 1987, Ser. No. 85,316
Claims priority, application Japan, Aug. 29, 1985, 60-188480
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—500.36 **10 Claims**



10. A flat permeable membrane having a thickness of 10 to 500μm and having in one surface thereof as a filtering surface a compact layer formed from intimately bound fine polyolefin particles possessed of fine pores and in the interior and other surface thereof a layer formed of an aggregate of fine discreet polyolefin particles of an average diameter on the range of 0.01 to 5μm so adjoined so as form fine labyrinthically continuing through pores and which, therefor, establish communication between the surfaces of said membrane, obtained by:

mixing a polyolefin, an organic filler uniformly disbursed and said polyolefin in the molten state thereof, and a crystal seed-forming agent, discharging the resultant mixture in the molten state thereof through a die;

contacting one surface of the thus discharged molten membrane with a cooling roll thereby cooling and solidifying said membrane;

placing the cooled solidified flat membrane into contact with an extractant incapable of dissolving said polyolefin thereby extracting and removing said organic filler from the said membrane; and

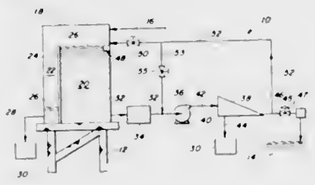
affixing said membrane into a prescribed length and maintaining said membrane in said condition while subjecting the thus formed membrane to a heat treatment at a temperature of 20° C. to 50° C. lower than the melting point of said polyolefin.

4,900,445

LOW PRESSURE HYDROCYCLONE SEPARATOR

David A. Flanigan, Cleveland; Elwyn Shimoda, and James E. Stolhand, both of Ponca City, all of Okla., assignors to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 213,196, Jan. 29, 1988, Pat. No. 4,844,817. This application Feb. 22, 1989, Ser. No. 314,609
Int. Cl.[4] B01D *45/12*
U.S. Cl. 210—512.1 **21 Claims**



1. A sampler apparatus, comprising means for cooperating with a hydrocyclone including:

a primary flow conduit having an inlet and an outlet defining a direction of fluid flow therethrough from said inlet to said outlet;

a Pitot tube disposed in said primary flow conduit and aligned substantially parallel to a longitudinal axis of said primary flow conduit, said Pitot tube having an open end facing into said direction of fluid flow;

a sample flow conduit extending from said Pitot tube to a junction with said primary flow conduit downstream of said Pitot tube;

a differential pressure measuring means for comparing a fluid pressure inside said Pitot tube with a fluid pressure in said primary flow conduit near said open end of said Pitot tube; and

a flow restriction means, disposed in said primary flow conduit between said Pitot tube and junction, for creating a pressure drop sufficient to flow a sample stream of fluid through said sample flow conduit, said flow restriction means having a variable restriction so that said restriction can be adjusted to provide a suitable pressure drop over a range of fluid flow rates through said primary flow conduit.

4,900,446

CENTRIFUGAL FAST CHROMATOGRAPH

Norman G. Anderson, Rockville, Md., assignor to Large Scale Biology, Rockville, Md.

Division of Ser. No. 210,160, Jun. 9, 1988, abandoned, which is a continuation of Ser. No. 65,590, Jun. 23, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 331,357
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—657 **11 Claims**

1. A method of simultaneously conducting gradient-elution of a plurality of solutions using a centrifugal fast chromatograph having a valve system for reversing flow through columns while maintaining centrifugally-generated pressure and flow comprising the steps of:

placing a sample in a transfer disk of a chromatograph rotor;

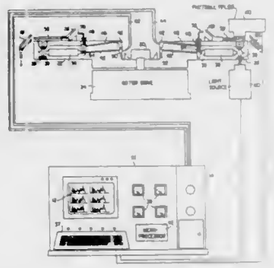
placing gradient solutions in a gradient maker;

transferring a gradient from said gradient maker through gradient feed lines, distributor rings, and feed lines, and into chromatographic columns;

eluting the samples by the gradient and by rotating said chromatographic columns;

monitoring the separated solutions with a photodetector and a light source which detect the state of the solutions

through an optical flow cell disposed in each said chromatographic column; and



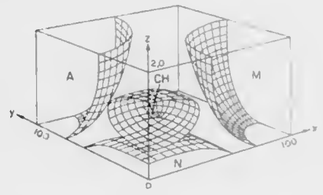
simultaneously controlling, monitoring and recording all aspects of the chromatographic process for said chromatographic columns.

4,900,447

METHOD FOR DETERMINATION OF MUCOPROTEIN VECTOR

Jaroslav Jansa, Slusovice; Peter Urbänek, Trencin; Milos Cesal, Trencin, and Karel Bitto, Trencin, all of Czechoslovakia, assignors to Jednotne zemedelske druzstvo, Abrokombinat Slusovice, Czechoslovakia

Filed Jun. 18, 1987, Ser. No. 64,150
Claims priority, application Czechoslovakia, Jun. 18, 1986, 4514-86
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—635 **1 Claim**



1. A method for determining a mucoprotein vector of blood serum mucoproteins, and its eluates obtained through separation, by means of ion-exchanger, comprising the steps of

separating the blood serum mucoproteins in the mucoprotein components of blood into at least two subgroups by means of gel ion-exchanger chromatography;

determining individual mucoprotein polarographical indexes in the two subgroups and in the whole serum; and then

transferring each individual mucoprotein polargraphical index Bl, E_{300}, and E_{500} to x, y, and z axes, wherein on one of said axes is plotted one subgroup, on a second one of said axes is plotted another subgroup, and on a third one of said axes is plotted the whole serum;

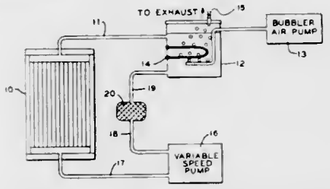
wherein a point corresponding to the mucoprotein vector, specific for the given blood, is otained, and wherein the mucoprotein vector values are classified according to the state of health of donors of the above mentioned blood serum so that diagnostic decisions may be taken.

4,900,448

MEMBRANE DEHUMIDIFICATION

Ulrich Bonne, Hopkins, Minn.; David W. Deetz, Wexford, Pa.; Juey H. Lai, Burnsville, Minn.; David J. Odde, Minneapolis, Minn., and J. David Zook, Burnsville, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 174,920, Mar. 29, 1988. This application Dec. 21, 1988, Ser. No. 289,467
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—637 **7 Claims**



1. A system for removing water vapor from the ambient atmosphere of a conditioned space comprising:

a transfer medium further comprising a bundle of microporous organic hollow fibers disposed in parallel spaced relation, each fiber being further characterized by a radial microporous matrix structure and a hollow central axial capillary interior;

and means for providing a concentration gradient across the transfer medium sufficient to cause continuous sorption of water on one surface and continuous removal of water from the opposite surface including, a hygroscopic collecting liquid stabilized in the pores of the microporous matrix, said liquid characterized by transport properties favoring the attraction and migration of water vapor molecules and having the ability to wet the material of the pores;

means for establishing a low partial pressure of water vapor in the hollow interior of said fibers such that when the outer surfaces of said fibers are exposed to the ambient atmosphere water vapor molecules are transported through the pores via the collection liquid; and means for removing said water vapor from the hollow interior of said fibers.

4. A system for removing water vapor from the ambient atmosphere of a conditioned space comprising:

a transfer medium further comprising a bundle of organic microporous hollow fibers disposed in parallel spaced relation, each such fiber being further characterized by a radial microporous matrix structure and a hollow central axial capillary interior;

and means for providing a concentration gradient across the transfer medium sufficient to cause continuous sorption of water on one surface and continuous removal of water from the opposite surface including, a hygroscopic collecting liquid stabilized in the pores of the microporous matrix, said liquid characterized by transport properties favoring the attraction and migration of water vapor molecules and having the ability to wet the material of the pores.

means for establishing a vacuum in the hollow interior of said fibers such that when the outer surfaces of said fibers are exposed to the ambient atmosphere water vapor molecules are transported through the pores via the collection liquid and removed from the collection liquid in the interior of said fibers by the vacuum.

6. A method of removing water from ambient atmosphere comprising the steps of:

exposing the ambient atmosphere to the outside surfaces of a bundle of hollow porous organic fibers each characterized by a radial porous matrix structure and a hollow central axial capillary core; providing a concentration gradient across the transfer medium sufficient to cause continuous

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sorption of water on one surface of the fibers and continuous surface of said fibers by further providing a hygroscopic transport liquid stabilized in the pores of such fibers, said liquid characterized by attraction and transport properties favoring the migration of water vapor molecules and having the ability to wet the material of said pores; and

exposing the inside surface of said plurality of hollow porous fibers to a medium having a low partial pressure of water vapor to remove migrating water vapor molecules to effluent.

4,900,449

FILTRATION MEMBRANES AND METHOD OF MAKING THE SAME

Menahem Kraus, Ann Arbor; Mark Heisler, Saline; Inessa Katsnelson, Ann Arbor, and Diosie Velazques, Saline, all of Mich., assignors to Gelman Sciences, Ann Arbor, Mich.

Filed May 20, 1987, Ser. No. 52,699
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—651 **45 Claims**

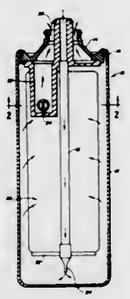
21. A process for filtering matter from a solution comprising flowing said solution through a microporous, inherently water wettable membrane comprising a polymer and a polymer additive, which polymer in bulk form is hydrophobic and has a water absorption equilibrium ranging from about 2% to about 4%, the polymer additive in the membrane being in an amount effective to make the membrane when formed and dried inherently water wettable, with a pore size range such that the membrane does not retain or reject dissolved proteins or salts from aqueous feed solutions.

4,900,450

REMOVING RESIDUAL ALKALI METAL IONS FROM DEMINERALIZED WATER

Kenneth A. Schmidt, Clarendon Hills, Ill., assignor to Culligan International Company, Northbrook, Ill.

Filed Jul. 1, 1988, Ser. No. 214,388
Int. Cl.⁴ C02F *1/42*
U.S. Cl. 210—679 **8 Claims**



1. The method which comprises:

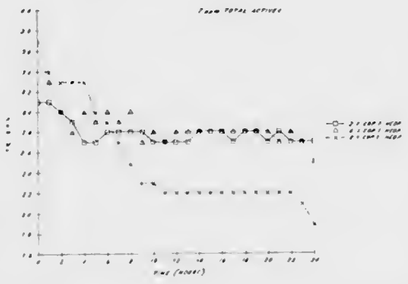
passing water through a strong base demineralizer unit, and thereafter removing residual alkali metal ions from said water by passing said water through a housing having a water inlet and a water outlet, and a water-permeable septum positioned within said housing to interdict water flow therein between the inlet and outlet, said septum having an upstream side, and a layer of weak acid cation exchange resin carried on said upstream side having a particle size distribution in which at least 90 weight per cent of said resin has a particle size of at least 15 microns and at least 90 weight per cent of said resin has a particle size of no more than 150 microns.

4,900,451

METHOD OF CONTROLLING MANGANESE DEPOSITION IN OPEN RECIRCULATING AQUEOUS SYSTEMS

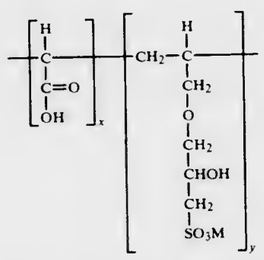
Brown J. Michael; Stevn P. Sberwood, both of The Woodlands, and E. Paul Holder, Austin, all of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Feb. 1, 1989, Ser. No. 305,232
Int. Cl.⁴ C02F *5/14*
U.S. Cl. 210—699 **3 Claims**



1. A method of inhibiting deposition of manganese in open, recirculating aqueous systems containing at least about 0.1 ppm manganese comprising adding an effective amount for the purpose to said aqueous system:

a. a water soluble acrylic acid/allyl hydroxy propyl sulfonate ether copolymer or water salts thereof, said copolymer having the formula:



wherein, M is a water soluble cation; wherein the molar ratio x:y is from about 3:1 to about 6:1 and wherein the number average molecular weight of said copolymer is from about 5,000 to 10,000; and

b. an organic phosphonate at a ratio of copolymer to phosphonate of about 1:1 to about 3:1.

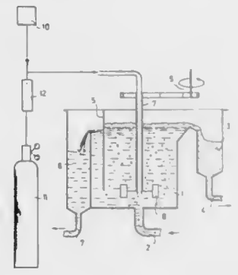
4,900,452

SEPARATION PROCESS FOR A LIQUID PHASE DISPERSED IN A CONTINUOUS LIQUID PHASE

Michel Angles, Lescar; Jean Blazejczak, Billere; Henry Roques, Garonne, and Yves Aurelie, Aucamville, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Continuation of Ser. No. 912,096, Sep. 29, 1986, abandoned. This application Aug. 24, 1988, Ser. No. 237,622
Claims priority, application France, Sep. 27, 1985, 85 14969
Int. Cl.⁴ C02F *1/24*
U.S. Cl. 210—706 **9 Claims**

1. A process for the separation of a dispersed liquid phase dispersed in a more dense continuous liquid phase by means of dispersed gas flotation, comprising introducing gas bubbles into the continuous phase for assuring an ascending entrainment of the dispersed phase, and further comprising forming said gas bubbles by introducing into and dispersing in the continuous phase a gaseous mixture containing at least one base gas slightly soluble in the continuous phase and at least one transfer gas having a higher solubility in the continuous phase,



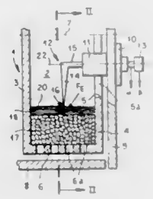
said gaseous mixture containing said transfer gas in a lesser proportion than said base gas and at a concentration greater than 1% by volume, and said transfer gas being selected from the group consisting of carbon dioxide, ammonia, methane and camphor vapor, and said base gas comprising air, whereby the transfer gas contained in each bubble is able to diffuse across the gas/liquid interface of the said bubble.

4,900,453

FILTER CENTRIFUGE CONTROL

Peter Sedlmayer, Munich, Fed. Rep. of Germany, assignor to Krause-Maffei Aktiengesellschaft, Munichen, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 230,276
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726227
Int. Cl.⁴ B01D *45/12*
U.S. Cl. 210—712 **19 Claims**



17. A filter centrifuge, comprising:

a housing

a filter drum rotatable in said housing to centrifuge a suspension in said drum;

a feeler arm pivotally mounted in said housing and having means defining a contact surface for contact with the contents of said drum and having means for signalling a degree of filling of said drum in terms of position of said arm; and

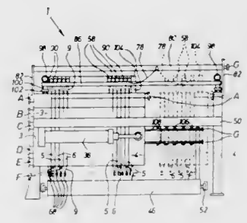
sensor means at said contact surface for detecting at least one physical characteristic of the contents of said drum contacted by said feeler arm for signalling the nature of said contents, said arm in the region of said contact surface having a knife-edge shape with a narrow front edge turned in a direction opposite the direction of movement of the drum.

4,900,454

METHOD AND MEANS FOR PRESSURE FILTERING

Hans-Göran Hedlund, and Lennart Bäckström, both of Sala, Sweden, assignors to Sala International AB, Sala, Sweden

PCT No. PCT/SE87/00321, § 371 Date Jan. 6, 1989, § 102(e) Date Jan. 6, 1989, PCT Pub. No. WO88/00495, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 6, 1987, Ser. No. 299,329
Claims priority, application Sweden, Jul. 10, 1986, 8603070
Int. Cl.⁴ B01D *37/00*
U.S. Cl. 210—770 **10 Claims**



1. A method for filtering on a press filter (1), which comprises a number of press plates (3, 4, 5, 6), which can be pressed against each other and are provided with drain conduits (10, 12), said press plates two and two between themselves forming at least one pressure chamber (8), two substantially vertical filter cloths having suspension means (18) being suspended in each pressure chamber (8), and means to introduce a suspension of solid particles in liquid into each pressure chamber (8) to cause the liquid to pass through the filter cloths (9) and to be evacuated through said drain conduits, the solid particles remaining in each pressure chamber, said particles forming a filter cake (40) between the two filter cloths, comprising the steps of:

separating the press plates, and

discharging the filter cake from said pressure chamber (8), the filter cloths (9) being vibrated during said discharge,

moving said filter cloths (9) with their suspension means (58) in a horizontal direction during the pressing against each other and the bringing apart of said press plates, and

during the filter cake (40) discharge, vibrating all of the filter cloths (9) and their suspension means (58) simultaneously.

4,900,455

FINISHES FOR STABLE FIBERS OF SYNTHETIC POLYMERS

Joachim Kolbe; Ferdinand Kümmeler, both of Leverkusen; Rudolf J. Klee, and Ralf Miessen, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 243,496
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732378
Int. Cl.⁴ D06M *13/36*
U.S. Cl. 252—8.8 **12 Claims**

1. Finishing mixtures for synthetic fibers characterized in that the dry residue of said mixtures contains at least 30% by weight phosphoric acid alkyl ester,

0 to 30% sulfuric acid alkyl ester,

10 to 30% monoalkyl polyglycol ether or monoacyl polyglycol ester or mixtures thereof and

10 to 50% fatty acid monoalkanolamides corresponding to the following general formula

$$R_1—CO—NH—R_2—OH$$

in which

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R_1—CO— represents acyl radicals of saturated C_{14}–C_{22} fatty acids or mixtures thereof and
R_2— represents —CH_2—CH_2—; —CH_2—CH_2—CH_2—; —CH_2—$CH(CH_3)$—.

4,900,456
WELL BORE FLUID

Norman Ogilvy, Camberley, England, assignor to The British Petroleum Company p.l.c., London, United Kingdom

Continuation of Ser. No. 52,886, May 22, 1987, abandoned. This application Dec. 1, 1988, Ser. No. 279,261
Claims priority, application United Kingdom, May 30, 1986, 8613222; Oct. 24, 1986, 8625543
Int. Cl.[4] C09K *3/00;* **F21B** *43/16*
U.S. Cl. 252—8.551 **22 Claims**

1. A method for the completion or work-over a well which method comprises the steps of injecting or pumping a solids-free, non-aqueous, well-bore fluid into the well and maintaining a hydrostatic pressure on the formation to control formation pressure, said well-bore fluid comprising a halogenated organic compound as a completion or work-over fluid, the fluid having a specific gravity in the range 0.9 to 2.3.

4,900,457
AQUEOUS POLYSACCHARIDE COMPOSITIONS

Anthony J. Clarke-Sturman, Faversham, and Phillip L. Sturla, Gillingham, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 4, 1987, Ser. No. 94,249
Claims priority, application United Kingdom, Sep. 12, 1986, 8622032
Int. Cl.[4] C09K *7/02*
U.S. Cl. 252—8.514 **11 Claims**

1. An aqueous polysaccharide composition comprising 0.03 to 5% w/v of a water-soluble microbial polysaccharide selected from Succinoglycan or Xanthan polysaccharides, 5 to 120% w/v of at least one sodium or potassium salt, wherein at least 0.05% w/v, based on the composition, of said sodium or potassium salt is formate, the balance of said sodium or potassium salt, if any, being at least one halide.

4,900,458
POLYALKYLENEPOLYAMINES AS CORROSION INHIBITORS

Albert H. Schroeder, Richmond; Ta Y. Ching, Novato; Shigeto Suzuki, San Francisco, and Kiyoshi Katsumoto, El Cerrito, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 1,929, Jan. 8, 1987, abandoned. This application Jan. 11, 1988, Ser. No. 142,612
Int. Cl.[4] E21B *41/02;* **C23F** *11/04*
U.S. Cl. 252—8.555 **46 Claims**

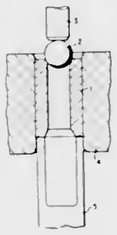
1. A polyalkylenepolyamine composition comprising a mixture of
(a) at least one C-alkyl-ethylene diamine, and
(b) at least one di-(C-alkyl)-diethylenetriamine or at least one di-(C-alkyl)-piperazine or a mixture thereof; wherein each C-alkyl group on the ethylene diamine, diethylenetriamine and piperazine independently contains from 10 to 28 carbon atoms; and wherein the composition contains greater than 1% of component (b), relative to component (a).

31. A method of inhibiting corrosion of a corrodible metal material in or around a well through which a corrosive fluid is produced, which comprises contacting the metal material with an effective amount of a corrosion inhibiting composition comprising the polyalkylenepolyamine product obtained by the reaction of a 1,2-dichloroalkane having from 12 to 30 carbon atoms and ammonia.

4,900,459
METAL PROCESSING LUBRICATING OIL COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Toshihide Ohmori; Kazuhiko Kitamura; Masuhiko Kawamura; Atsushi Danno, all of Nagoya; Tokuo Shirai, Aichi; Yukio Sugiura, Toyota, and Mitsuru Nakane, Okazaki, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi; Nippondenso Co., Ltd., Kariya and Toyota Chemical Engineering Co., Ltd., Nagoya, all of, Japan

Filed Oct. 21, 1988, Ser. No. 260,619
Claims priority, application Japan, May 7, 1988, 63-111257
Int. Cl.[4] C10M *105/74*
U.S. Cl. 252—32.5 **22 Claims**



1. A metal processing lubricating oil composition, comprising an oil selected from the group consisting of mineral oil, synthetic oil and a mixture thereof, an effective amount of one or more phosphoric esters and orthophosphoric acid, wherein said phosphoric esters and said orthophosphoric acid form associations between each other.

12. A process for producing a metal processing lubricating oil composition, comprising:
(a) forming a mixture comprising one or more phosphoric esters in the amount of 0.1 weight % or more in phosphorus concentration, orthophosphoric acid in the amount of 0.1 weight % or more in phosphorus concentration and an oil selected from the group consisting of mineral oil, synthetic oil and a mixture thereof;
(b) heating said mixture to a temperature sufficient to form associations of said phosphoric esters and orthophosphoric acid; and
(c) cooling the resulting composition to room temperature to obtain said metal processing lubricating oil composition.

4,900,460
SULFURIZED OLEFIN ADDUCTS OF DIHYDROCARBYL PHOSPHATES AND PHOSPHITES AND LUBRICANT COMPOSITIONS CONTAINING SAME

Angeline B. Cardis, Florence, N.J., assignor to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 228,815, Aug. 2, 1988, abandoned, which is a continuation of Ser. No. 105,988, Oct. 6, 1987, abandoned, which is a continuation of Ser. No. 796,131, Nov. 8, 1985, abandoned. This application Mar. 1, 1989, Ser. No. 317,329
Int. Cl.[4] C10M *135/02*
U.S. Cl. 252—46.6 **24 Claims**

1. A product obtained by reacting the components of a mixture consisting essentially of:
(a) a dihydrocarbyl phosphorus-oxygen compound selected from the group consisting of:

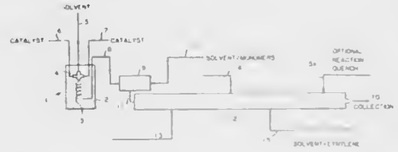


wherein R and R' are the same or different C_1–C_{30} hydrocarbyl groups and
(b) a sulfurized olefin containing no reactive olefinic bonds.

4,900,461
VISCOSITY MODIFIER POLYMERS (E-98)

Gary Ver Strate, Atlantic Highlands; Ricardo Bloch, Scotch Plains; Mark J. Struglinski, Bridgewater; John E. Johnston, Westfield, and Roger K. West, Montclair, all of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 72,825, Jul. 13, 1988, Pat. No. 4,804,794. This application May 13, 1988, Ser. No. 194,431
Int. Cl.[4] C10M *161/00, 133/16*
U.S. Cl. 252—49.6 **90 Claims**

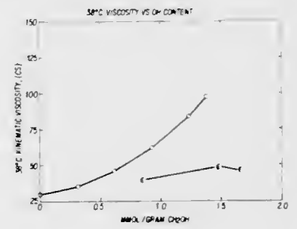


1. A lubricating oil composition comprising a major amount of lubricating oil; a viscosity modifying effective amount of viscosity modifier comprising copolymer of ethylene and at least one other alpha-olefin monomer, wherein said copolymer has a molecular weight distribution characterized by at least one of a ratio of $\overline{M}_w/\overline{M}_n$ of less than 2 and a ratio of $\overline{M}_z/\overline{M}_w$ of leas than 1.8, and wherein said compolymer comprises intramolecularly heterogeneous polymeric chains containing at least one crystallizable segment of methylene units and at least one low crystallinity ethylene-alpha-olefin copolymer segment, wherein said at least one crystallizable segment comprises at least about 10 weight percent of said copolymer chain and contains an average ethylene content of at least about 57 weight percent, and wherein said low crystallinity segment contains an average ethylene content of from about 20 to 53 weight percent, and wherein at least two portions of an individual intramolecularly heterogeneous chain, each portion comprising at least 5 weight percent of said chain, differ in composition from one another by at least 7 weight percent ethylene; and ashless dispersant.

4,900,462
POLAR LUBRICATING FLUID AND A METHOD FOR ITS SYNTHESIS

Werner O. Haag, Lawrenceville, N.J., and Robert E. Palermo, New Hope, Pa., assignors to Mobil Oil Corp., New York, N.Y.

Filed Jan. 13, 1988, Ser. No. 143,439
Int. Cl.[4] C10M *145/00*
U.S. Cl. 252—52 R **19 Claims**



1. A polar lubricating fluid comprising a mixture of primary aliphatic alcohols having at least 20 carbon atoms and having at least 0.2 mmol of oxygenate per gram of fluid, a viscosity of at least 123.6 cs at 38° C. and a viscosity index greater than 44.

4,900,463
REFRIGERATION LUBRICANT BLENDS

Raymond H. P. Thomas, Amherst; Hillel Magid, Buffalo; David P. Wilson, Williamsville, and John W. Pelava, Buffalo, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 23, 1989, Ser. No. 355,951
Int. Cl.[4] C01M *129/04*
U.S. Cl. 252—54 **22 Claims**

1. A lubricating composition comprising a single phase blend of (i) at least one polyoxyalkylene glycol which has a molecular weight between 300 and 2000, a viscosity of about 10–157 centistokes at 37° C. and a viscosity index of at least 20 and (ii) a chlorotrifluoroethylene oil having a viscosity of about 0.8–1000 centistokes at 25° C. wherein said blend is miscible in combination with tetrafluoroethane in the range of 0° C. to at least +5° C.

5. A composition for use in compression refrigeration comprising:
(a) tetrafluoroethane; and
(b) a sufficient amount to provide lubrication of a single phase blend of (i) at least one polyoxyalkylene glycol which has a molecular weight between 300 and 2000, a viscosity of about 10–157 centistokes at 37° C., and a viscosity index of at least 20 and (ii) a chlorotrifluoroethylene oil having a viscosity of about 0.8–1000 centistokes at 25° C. wherein said blend is miscible in combination with said tetrafluoroethane in the range between 0° C. and at least +5° C. and said composition has a viscosity of about 60 to about 120 centistokes at 37° C.

4,900,464
PARTICLES CONTAINING IRON CARBIDE

Takuya Arase, Settsu; Yoshiyuki Shibuya, and Shigeo Daimon, both of Osaka, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Dec. 22, 1986, Ser. No. 944,163
Claims priority, application Japan, Dec. 24, 1985, 60-290989; Jul. 4, 1986, 61-158369; Sep. 8, 1986, 211200
Int. Cl.[4] C01B *31/30;* **C04B** *35/56*
U.S. Cl. 252—62.55 **3 Claims**

1. A particle consisting essentially of nickel and iron carbide, said iron carbide comprising Fe_5C_2 as a main component, said nickel being present in an amount of 0.2 to 30 atomic % based

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on the iron and which exhibits a lower coercive force than said particle absent nickel.

4,900,465

PROCESS FOR PREPARING MAGNETIC CARBON BLACK

Toshio Nakada; Fumio Takemura; Yoshihito Sema, and Kazuhito Katsuka, all of Gotenba, Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1988, Ser. No. 154,259

Claims priority, application Japan, Feb. 13, 1987, 62-29543; Feb. 23, 1987, 62-37886; Aug. 12, 1987, 62-199906; Oct. 7, 1987, 62-251699

Int. Cl.⁴ C04B *35/52*

U.S. Cl. 252—62.55 **13 Claims**

1. A process for preparing magnetic carbon black comprising carbon black and a magnetic fine particle dispersed and immobilized therein, which comprises the steps of:

(A) burning a fuel to form a high temperature combustion gas;

(B) feeding, as a starting material for producing said carbon black, a hydrocarbon and at least one organometallic compound of at least one metal selected from the group consisting of iron, cobalt and nickel into a stream of said high temperature combustion gas travelling at a velocity of at least about 150 m/sec.;

(C) feeding an oxygen gas from a position that is circumferential to the hydrocarbon feed to promote the thermal decomposition of the hydrocarbon and the production of small particulate carbon black; and

(D) cooling the resultant reaction mixture and separating particulate magnetic carbon black therefrom.

6. A process for preparing magnetic carbon black comprising carbon black and a magnetic fine particle dispersed and immobilized therein, which comprises the steps of:

(A) burning a fuel to form a high temperature combustion gas stream containing free oxygen;

(B) feeding, as a starting material for producing said carbon black, a hydrocarbon into the stream of said high temperature combustion gas to form carbon black;

(C) at a point downstream of step B, feeding a gas comprising hydrogen and at least one transition metal compound of at least one of iron, cobalt and nickel into said high temperature combustion gas stream containing carbon black to form particulate magnetic carbon black; and

(D) cooling the resulting reaction mixture and separating the particulate magnetic carbon black therefrom.

10. A process for preparing magnetic carbon black comprising carbon black and a magnetic fine particle dispersed and immobilized therein, which comprises the steps of:

(A) burning a fuel to form a high temperature combustion gas stream;

(B) feeding, as a starting material for producing said carbon black, a hydrocarbon into said high temperature combustion gas stream at two downstream locations, the hydrocarbon being converted to carbon black at these locations;

(C) feeding at least one transition metal compound of at least one of iron, cobalt and nickel into said high temperature combustion gas stream at a location intermediate said two downstream locations to effect formation of particulate magnetic carbon black; and

(D) cooling the resulting reaction mixture and separating the particulate magnetic carbon black therefrom.

4,900,466

PROCESS FOR PREPARING NEEDLE-SHAPED CRYSTAL GROWTH MODIFIED BURKEITE DETERGENT ADDITIVE

Colin Atkinson, Barnston; Michael J. Heybourne, Potters Bar; William J. Iley, Bebington; Peter C. Knight, Neston; Peter J. Russell, Eastham; Thomas Taylor, Northwich, and David P. Jones, Chester, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 921,666, Oct. 21, 1986, abandoned. This application Sep. 20, 1988, Ser. No. 248,341

Claims priority, application United Kingdom, Nov. 1, 1985, 8526996; May 22, 1986, 8612459

Int. Cl.⁴ C11D *3/10, 7/12, 3/37*

U.S. Cl. 252—174.14 **15 Claims**

1. A process for the production of a powder suitable for use as a granular detergent composition or a component thereof, which comprises the steps of

(i) preparing an aqueous slurry comprising from about 5 to 70% sodium carbonate, and from 0 to about 50% sodium sulphate,

(ii) drying the slurry to form a powder,

the total amount of sodium carbonate and sodium sulphate being at least 10% by weight based on the dried powder, the weight ratio of sodium carbonate to sodium sulphate in the slurry being at least 0.37:1, the process being characterised in that an effective amount of a crystal growth modifier which is a polymeric polycarboxylate selected from the group consisting of acrylic acid homopolymers, acrylic acid/maleic acid copolymers, acrylic phosphinates and mixtures thereof, is incorporated in the slurry not later than the sodium carbonate, whereby needle-shaped crystal-growth-modified Burkeite is formed in the slurry.

4,900,467

VISCOELASTIC CLEANING COMPOSITIONS WITH LONG RELAXATION TIMES

William L. Smith, Pleasanton, Calif., assignor to The Clorox Company, Oakland, Calif.

Filed May 20, 1988, Ser. No. 196,907

Int. Cl.⁴ C11D *1/92, 17/00, 3/395*

U.S. Cl. 252—95 **14 Claims**

1. A thickened cleaning composition having a viscoelastic rheology comprising, in aqueous solution

(a) an active cleaning compound, present in a cleaning effective amount; and

(b) a viscoelastic thickening system consisting essentially of a betaine or sulfobetaine having a C_{14-18} alkyl group, or a C_{10-18} alkylamino or alkylamido group; and an anionic organic counterion, selected from the group consisting of C_{2-6} alkyl carboxylates, aryl carboxylates, C_{2-10} alkyl sulphonates, aryl sulphonates, sulfated C_{2-10} alkyl alcohols, sulfated aryl alcohols, and mixtures thereof; and wherein the betaine and counterion are present in an amount to thicken and result in a viscoelastic rheology.

4,900,468

STABILIZED LIQUID HYDROGEN PEROXIDE BLEACH COMPOSITIONS

James D. Mitchell, and James P. Farr, both of Pleasanton, Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 745,617, Jun. 17, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,616

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.⁴ C01B *15/037;* **C11D** *7/54;* **D06L** *3/02*

U.S. Cl. 252—95 **11 Claims**

1. A stabilized liquid peroxide bleaching composition comprising a liquid hydrogen peroxygen component, an organic component selected from fluorescent whiteners, dyes and mixtures thereof, and a stabilizing system comprising 0.02–5.0 wt.% of an amino polyphosphonate as a chelating agent selected for chelating polyvalent heavy metal cations and an effective amount of a partially hindered substituted hydroxybenzene as a free radical scavenging agent, said stabilizing system synergistically increasing stability of said organic component while allowing the peroxygen component to retain most of its initial oxidation potential.

4,900,469

THICKENED PERACID PRECURSOR COMPOSITIONS

James P. Farr, Pleasanton, and Daniel T. Carty, Danville, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 928,281, Oct. 21, 1986, Pat. No. 4,764,302, and a continuation-in-part of Ser. No. 838,148, Mar. 10, 1986, Pat. No. 4,772,290. This application Jun. 29, 1988, Ser. No. 212,831

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.⁴ C11D *3/39, 3/42*

U.S. Cl. 252—96 **18 Claims**

1. A thickened cleaning composition comprising, in aqueous solution

(a) a surfactant, present in an amount of about 1 to 20 percent by weight and selected from the group consisting of nonionics, betaines, alkyl aryl sulfonates and mixtures thereof;

(b) an acid-insoluble fluorescent whitening agent, selected from the group consisting of stilbene disulfonic acid FWA's substituted with a protonizable group, substituted biphenyl diazo dyes, and mixtures thereof, and having a molecular weight of between about 500–1500, a potential for a zwitterionic charge distribution in an acid medium and which is an insoluble colloidal sized particle in an acid medium, the fluorescent whitening agent being present in an amount of between about 0.1 and 10 weight percent;

(c) a pH adjusting agent in an amount sufficient to result in a pH of about 6 or below and precipitate the fluorescent whitening agent as a colloidal particle and whereby a homogeneous composition results; and

(d) a peracid precursor, insoluble at a neutral or acidic pH, and soluble at an alkaline pH.

4,900,470

AZEOTROPE-LIKE COMPOSITIONS OF 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, METHANOL, NITROMETHANE AND 1-CHLOROPROPANE

Earl A. E. Lund, West Seneca; Ellen L. Swan, Ransomville; Rajat S. Basu, and David P. Wilson, both of Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 1, 1988, Ser. No. 278,405

Int. Cl.⁴ C11D *7/50, 7/30*

U.S. Cl. 252—171 **11 Claims**

1. Azeotrope-like compositions consisting essentially of about 70.7 to about 74.0 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane, from about 5.9 to about 6.3 weight percent methanol, from about 0.03 to about 0.2 weight percent nitromethane, and from about 18.6 to about 23.0 weight percent 1-chloropropane.

4,900,471

SURFACE TREATMENT OF PEROXYACIDS

Paul L. Baxter, Warrington, and Michael J. L. Whiting, Liverpool, both of England, assignors to Interox Chemicals Limited, London, England

Filed Mar. 23, 1987, Ser. No. 38,365

Claims priority, application United Kingdom, Mar. 22, 1986, 8607164

Int. Cl.⁴ C11D *3/39, 3/30*

U.S. Cl. 252—186.26 **9 Claims**

1. A process for treating a particulate water-soluble peroxyacid so as to ameliorate dye damage caused by contact between a particulate water-insoluble peroxyacid and a damp fabric, in which the particulate water-soluble peroxyacid is surface-treated with an effective amount of an amine which melts or softens at a temperature of from about 35° C. to 60° C., said amine being selected from hydrogenated tallow amine, dihydrogenated tallow amine, methyl dihydrogenated tallow amine and dicocoamine.

4,900,472

2,5-DIPHENYL PYRIMIDINE COMPOUNDS AND LIQUID CRYSTAL COMPOSITIONS

Kazutoshi Miyazawa, Yokohama; Makoto Ushioda, Kawasaki; Hiromichi Inoue, Yokohama; Shinichi Saito, Yokohama, and Kouji Ohno, Yokohama, all of Japan, assignors to Chisso Corporation, Osaka, Japan

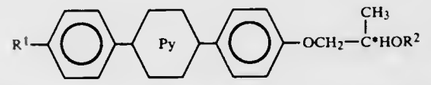
Filed Oct. 20, 1988, Ser. No. 260,519

Claims priority, application Japan, Oct. 20, 1987, 62-262819; Oct. 20, 1987, 62-262821

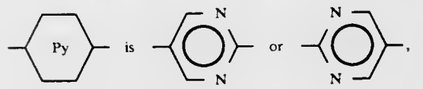
Int. Cl.⁴ G02F *1/13;* **C09K** *19/34;* **C07D** *239/02*

U.S. Cl. 252—299.61 **11 Claims**

1. An optically active compound represented by the formula:



wherein R^1 is alkyl or alkoxy having 4–12 carbon atoms, R^2 is alkyl, acyl or alkoxyacyl having 4–8 carbon atoms,



and * indicates an asymmetric carbon atom.

4,900,473

OPTICALLY ACTIVE ALKANOYLOXY 2,5-DIPHENYL PYRIMIDINE AND LIQUID CRYSTAL COMPOSITIONS

Kazutoshi Miyazawa; Hiromichi Ioue; Shinichi Saito; Kouji Ohno, all of Yokohama, and Makoto Ushioda, Kawasaki, all of Japan, assignors to Chisso Corporation, Osaka, Japan

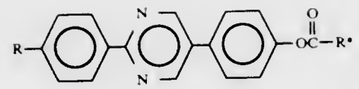
Filed Oct. 20, 1988, Ser. No. 260,520

Claims priority, application Japan, Oct. 20, 1987, 62-262820

Int. Cl.⁴ G02F *1/13;* **C09K** *19/34;* **C07D** *239/02*

U.S. Cl. 252—299.61 **8 Claims**

1. A 2,5-diphenyl pyrimidine derivative represented by the formula:



wherein R is alkyl of 5–15 carbon atoms, and R* is optically active alkyl of 5–11 carbon atoms.

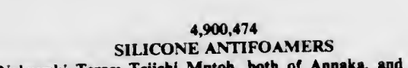
4,900,474

SILICONE ANTIFOAMERS

Nobuyuki Terae; Teiichi Mutoh, both of Annaka, and Akira Yoshida, Tokyo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

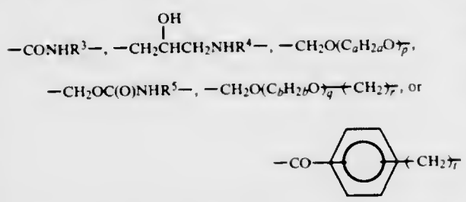
Filed Jul. 15, 1988, Ser. No. 219,400
Claims priority, application Japan, Jul. 17, 1988, 62-177082
Int. Cl.[4] B01D *19/04*
U.S. Cl. 252—358 **16 Claims**

1. An antifoamer which comprises a polyperfluoroether group-containing organopolysiloxane comprising from 20 to 100 mole % of the polyperfluoroether group-containing organosiloxane units of the following formula (1)



(1)

wherein Q represents a divalent organic group having from 1 to 40 carbon atoms and is



wherein R^3, R^4 and R^5 independently represent a divalent hydrocarbon group having from 1 to 10 carbon atoms, a and b are independently an integer of from 1 to 5, p and q are independently an integer of from 1 to 10, and r and t are independently an integer of from 2 to 5, R^1 is selected from the group consisting of a hydrogen atom, an unsubstituted monovalent hydrocarbon group having from 1 to 8 carbon atoms, a substituted monovalent hydrocarbon group having from 1 to 8 carbon atoms in which part or all of the hydrogen atoms bonded to the carbon atoms are substituted with a halogen atom, a cyano group, a chloromethyl group, a 3,3,3-trifluoropropyl group or a 2-cyanoethyl group, and a —OX group in which X represents a hydrogen atom or a monovalent hydrocarbon group having from 1 to 8 carbon atoms, m is an integer of from 1 to 14, n is an integer of 1 to 10, and x and y are $0<x\leqq 3$ and $0\leqq y\leqq 3$ provided that $0<x+y\leqq 3$, the content of fluorine atoms in the polyperfluoroether group-containing organopolysiloxane being in the range of from 20 to 70% by weight.

4,900,475

STABILIZED BUILT LIQUID DETERGENT COMPOSITION CONTAINING ENZYME

Pallassanna Ramachandran, Robbinsville, and Jan E. Shulman, Old Bridge, both of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.

Continuation of Ser. No. 892,020, Aug. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 759,528, Jul. 26, 1985, abandoned. This application Oct. 13, 1988, Ser. No. 257,182
Int. Cl.[4] C11D *1/29, 3/386*
U.S. Cl. 252—532 **22 Claims**

1. A stabilized enzyme-containing built liquid detergent composition comprising:
(a) from about 5 to 20%, by weight, of one or more active detergent compounds selected from the group consisting of anionic, nonionic and amphoteric detergent compounds;
(b) from about 5 to 30%, by weight, of builder salts consisting essentially of a mixture of an alkali metal tripolyphosphate and an alkali metal carbonate;
(c) an effective amount of an enzyme or an enzyme mixture for stain removal selected from the group consisting of alkaline protease enzymes and alpha-amylase enzymes;
(d) an enzyme-stabilizing system containing, based on the weight of the detergent composition, (i) from about 1% to 10% glycerine; (ii) from about 1 to 8% of a boron compound selected from the group consisting of boric acid, boric oxide and alkali metal borates and; (iii) from about 0.5 to 8% of a carboxylic acid compound selected from the group consisting of, di and/or polycarboxylic acids selected from the group consisting of oxalic acid, malonic acid, maleic acid, succinic acid, malic acid, tartaric acid, aspartic acid and citric acid and watersoluble salt thereof; and
(e) the balance comprising water.

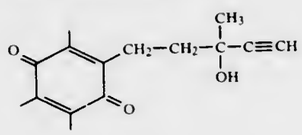
4,900,476

QUINONE INTERMEDIATES FOR ASYMMETRIC SYNTHESIS OF NATURAL VITAMIN E

Ka-kong Chan, Hopatcong, N.J., and Gabriel G. Saucy, Vero Beach, Fla., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 135,128, Dec. 18, 1987, Pat. No. 4,831,185.
This application Jan. 30, 1989, Ser. No. 303,701
Int. Cl.[4] C07C *50/28*
U.S. Cl. 552—309 **3 Claims**

1. A compound of the formula:



4,900,477

NOVEL INTERMEDIATES AND AN IMPROVED PROCESS FOR PRODUCING THE COMPOUND (3β,5α)-3-HYDROXYCHOLEST-8(14)-EN-15-ONE

William D. Dean, Congers, N.Y.; Robert F. R. Church, Cos Cob, Conn., and David N. Ridge, Upper Nyack, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 28, 1988, Ser. No. 174,273
Int. Cl.[4] C07J *0/00;* **A61K** *31/56*
U.S. Cl. 260—397.4 **17 Claims**

3. A process for producing (3β,5α)-3-hydroxycholest-8(14)en-15-one, which comprises the steps of:
(a) dissolving 5,7-cholestadien-3β-ol benzoate in chloroform, purging with nitrogen as the solution is e cooled to —-65° C. in dry ice-acetone, adding an acid for an effective time while maintaining the below —60° C., then treating the solution with ice and ammonium hydroxide, separating the chloroform layer and adding it to pyridine, washing the chloroform layer with water, collecting the compound (3β,5α) cholesta-7,14-dien-3-ol benzoate by filtration, which is then washed with water and dried, then
(b) treating a suspension of (3β,5α)cholesta-7,14-dien-3-ol benzoate and sodium bicarbonate in t-butyl methyl ether with a solution of a peracid in an organic solvent at 0° C. to 20° C. for an effective time, then treating the organic mixture with water and collecting the compound (3β,5α,15α)-14,15-epoxycholest-7-en-3-ol benzoate by filtration at about 10° C., washing the solid with an effective amount of methanol and recrystallizing the crude product from toluene:heptane (1:2) at an effective temperature, then
(c) the recrystallized epoxide is stirred in acetone at 22° C. to 26°0 C., under nitrogen, and is treated with a catalytic amount of a protic acid for an effective time, then the mixture is treated with excess water at about 19° C. for an effective time and the crude product (3β,5α)-3-(benzoyloxy)cholest-8(14)en-15-one is collected by filtration, washed with water and dried in vacuo, then
(d) a stirred mixture of the preceding crude product is treated for an effective time with (1) potassium carbonate in a protic solvent and heated at reflux, or (2) perchloric acid in n-propanol or ethanol at reflux, or (3) potassium hydroxide or sodium hydroxide in methanol at room temperature to give the desired product (3β,5α)-3-hydroxycholest-8(14)en-15-one which is recrystallized from methanol, water and heptane at an effective chilling temperature for an effective time and is collected by filtration and washed with methanol.

4,900,478

NOVEL RETINOIDS

Günter Gross, Weil a/Rhein, Fed. Rep. of Germany, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 30, 1987, Ser. No. 102,935
Claims priority, application Switzerland, Oct. 6, 1986, 3987/86; Aug. 21, 1987, 3216/87
Int. Cl.[4] C11C *3/00, 3/12*
U.S. Cl. 260—408 **27 Claims**

1. Compounds of formula

(I)

wherein
Ret is the acyl residue of a retinoid carboxylic acid, A is a residue $(—CHR)—CH_2O)_nR^1$, $—C(R^4)_2oC(O)R^3$, $—CH_2—CH(OR^2)CH_2OR^2$ or $—CH(CH_2OR^2)_2$;
R is hydrogen or methyl,
R^1 is hydrogen, C_{1-6}-alkyl or C_{1-6}-alkanoyl,
R^2 is C_{1-6}-alkyl,
R^3 is straight chain C_{1-6}-alkyl,
R^4 is hydrogen, C_{1-6}-alkyl or phenyl; n is a whole number of 3–40.

4,900,479

PREPARATION OF CARBONYL HALIDES OF MORE THAN 7 CARBON ATOMS

Enrique Freudenberg, Limburgerhof; Peter Wittmer, Frankenthal; Andreas Hohmann, Ludwigshafen, and Hans-Heinrich Bechtolsheimer, Dittelsheim-Hessloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

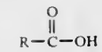
Filed Jun. 10, 1988, Ser. No. 205,160
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719640
Int. Cl.[4] C11C *3/00*
U.S. Cl. 260—408 **17 Claims**

1. In a process for preparing a carbonyl halide of the formula



(I)

where R is an organic radical of more than 7 carbon atoms and X is chlorine or bromine, by chlorinating or brominating a carboxylic acid of the formula



(II)

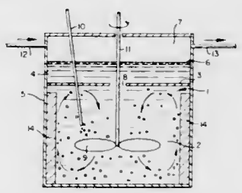
where R has the abovementioned meaning, in a reaction with a phosphorus chloride or bromide, the improvement which comprises:
treating the reaction mixture obtained by said chlorination or bromination with a carboxamide/hydrochloride or hydrobromide mixture which is not homogeneously miscible with the carbonyl halide I, and then separating off the carboxamide hydrochloride or hydrobromide phase.

4,900,480

GAS-LIQUID MIXING

Lawrence M. Litz, Pleasantville, N.Y.; Mark K. Weise, North Haledon, N.J., and Mitchell Adis, North White Plains, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 921,198, Oct. 21, 1986. This application May 30, 1989, Ser. No. 358,084
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—36.1 **41 Claims**



1. An improved process for the introduction of a gas into a body of liquid without appreciable loss of gas into an overhead gas phase comprising:
(a) maintaining a portion of said body of liquid in a recirculating flow condition within a container vessel, said recirculating portion of the body of liquid having no gas-liquid interface with an overhead gas phase, said recirculating portion of the body of liquid being separated by mechanical means, but in fluid communication with, a relatively quiescent portion of said body of liquid, said quiescent portion of the body of liquid having a gas-liquid interface with an overhead gas phase and being adapted to accommodate a change in liquid level in response to a change in the volume of said body of liquid between the condition in which no gas bubbles are in said body of liquid and the condition that exists when a desired gas bubble concentration is developed within said body of liquid; and
(b) introducing a feed gas stream directly into the recirculating portion of said body of liquid and not into said quiescent portion thereof, the recirculation flow path and flow velocity of said recirculating portion of the body of liquid being such, relative to the fluid communication between said recirculating and quiescent portions of the body of liquid, that the bubbles of gas formed upon the introduction of feed gas into said recirculating portion of the body of liquid are maintained in dispersed form in the recirculating liquid, for gas dissolution in, or reaction with, said recirculating portion of the body of liquid, without any appreciable passage of said gas bubbles through the fluid communication between the recirculating portion of the

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body of liquid and the quiescent portion thereof and through the quiescent portion itself to the gas-liquid interface and thus without loss of gas to the overhead gas phase,

whereby the gas and liquid are advantageously mixed and recirculated in said recirculation portion of the body of liquid without appreciable loss of gas to the overhead gas phase.

4,900,481

OZONIC BUBBLE WATER GENERATOR

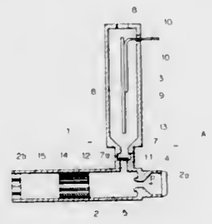
Takashi Kishioka, 5-7-9,, Teraikedai, Tondabayashi-shi, Osaka, Japan

Filed Oct. 25, 1988, Ser. No. 261,930

Claims priority, application Japan, Oct. 29, 1987, 62-165769[U]

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—64.4 **3 Claims**



1. An ozonic bubble water generator for generating ozonic bubble water by mixing ozone into water, said generator comprising:

(a) a body being provided with:

(a-1) a water flow pipe having an inlet for receiving said water, an outlet for discharging said ozonic bubble water, a small diameter part defined between said inlet and said outlet and a decompression chamber provided in an outlet side of said small diameter part, and

(a-2) an ozonizer part having an ozonizer chamber integrally connected with said water flow pipe to communicate with said decompression chamber and an ozonizer electrode pair provided in said ozonizer chamber, ozone generated in said ozonizer chamber being attracted into said decompression chamber by a venturi effect caused upon flow of said water from said small diameter part into said decompression chamber; and

(b) a check valve provided between said decompression chamber and said ozonizer chamber for preventing said water in said decompression chamber from flowing into said ozonizer chamber upon stoppage of water-supply to said inlet, said check valve having an outlet connected to said decompression chamber, the outlet having passage grooves connected thereto so that ozone flows to said decompression chamber when the outlet is blocked.

4,900,482

METHOD AND APPARATUS FOR BUCKLING CONTACT LENSES

Penrhyn F. Thomas, 3rd Floor 149 Castlereagh Street, Sydney NSW 2000, Australia

Filed Jul. 29, 1987, Ser. No. 79,662

Claims priority, application Australia, Jul. 29, 1986, PH07175

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—2.7 **42 Claims**

1. A lens buckling machine comprising:

a lens mounting tool having a contoured surface adapted to receive and support a lens,

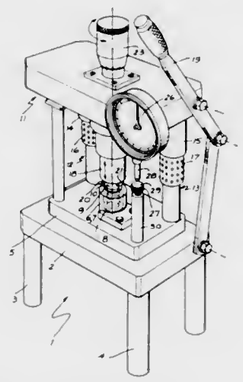
a descending and ascending device having means for engaging at least a portion of the said lens by touch contact when said device is on a descending stroke,

a means to manually adjust the altitude of said device relative to said lens mounting tool, and

a means for setting and adjusting the bottommost position of the travel of said device relative to said mounting tool and to a datum point, wherein when a lens is mounted on said contoured surface of said lens mounting tool for buckling, said engagement means engage said portion of said lens by touch contact when said descending and ascending device descends, thereby buckling said lens about said contoured surface of said lens mounting tool according to a predetermined and preset bottom most position of travel of said device.

23. A method for buckling contact lenses comprising the steps of:

(a) mounting a lens blank to be buckled on a lens mounting tool such that the lens adopts a datum position,



(b) bringing a protruding element or elements into touch contact with said lens, such that the contact point is coincident with the datum level,

(c) setting an indicator gauge to a setting to indicate the position of the contact point,

(d) moving the said element or elements away from touch contact with the lens,

(e) setting a new elevation of the protruding elements by displacing the protruding elements over a distance commensurate with the predetermined degree of buckling of the lens required, and

(f) bringing said protruding element or elements into descending engagement with a portion of the lens, thereby buckling the lens until the protruding elements have been displaced the predetermined distance relative to the datum.

4,900,483

METHOD OF PRODUCING ISOTROPICALLY REINFORCED NET-SHAPE MICROCOMPOSITES

Horst Witzke, Flemington, and Bernard H. Kear, Whitehouse Station, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 29, 1987, Ser. No. 113,986

Int. Cl.[4] D01D *5/00*; **D01F** *9/12*

U.S. Cl. 264—29.2 **10 Claims**

1. A method for producing an isotropically reinforced net-shape microcomposite structures by contacting one or more hydrocarbons which will catalytically decompose to form a filamentary carbon with a metallic catalyst, consisting of a solid solution of nickel and copper, for growing multidirectional carbon fibers in a mold at a temperature sufficient to form filamentary carbon and insufficient to cause the pyrolytic deposition of carbon, introducing a matrix material to fill the mold, converting the matrix material to a solid and releasing the structure from the mold.

4,900,485

METHOD AND APPARATUS FOR TRANSFER MOLDING

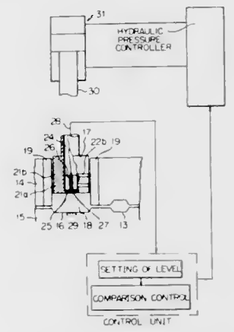
Yoji Murakami, Fukushima, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 884,885, Jul. 11, 1986, abandoned, which is a continuation of Ser. No. 592,069, Mar. 22, 1984, abandoned. This application Jul. 21, 1988, Ser. No. 222,391

Claims priority, application Japan, Mar. 31, 1983, 58-055861

Int. Cl.[4] B29C *45/02*

U.S. Cl. 264—40.1 **18 Claims**



4,900,484

CERAMIC WELDING COMPOSITION AND PROCESS

Frank Zlamal, Eureka Springs, Ark., assignor to Northlake Marketing and Supply Company, Hobart, Ind.

Filed Oct. 8, 1987, Ser. No. 105,861

Int. Cl.[4] F27D *1/16*

U.S. Cl. 264—30 **7 Claims**

1. In a ceramic welding process for the repair of a hot oven wall having an initial temperature of not higher than about 3500° F. wherein a finely divided welding composition containing a refractory material intimately admixed with an exothermically oxidizable metal is transported and sprayed onto the wall by an oxygen-containing gas to ignite the composition and fuse it to said wall, the improvement which comprises:

transporting and applying to said wall a welding composition containing in intimate admixture—(A) a substantially noncombustible refractory material in a major proportion with reference to the total weight of the composition-,—(B) exothermically oxidizable metal components consisting essentially of (1) a granular aluminum powder having a size range of about 70 to 150 microns in a proportion of about 8 to 12% by weight with reference to the total composition and (2) a finely grained aluminum powder or aluminum flake in which the powder has a size range of less than 5 microns and the flake has an equivalent size by volume, in a proportion of about 2 to 6% by weight with reference to the total composition, and—(C) a group of control components consisting essentially of (1) iron oxide of the formula Fe_2O_3 with a particle size of about 80 microns or less in a proportion of about 2 to 10% by weight with reference to the total composition, (2) a dross obtained as the byproduct of aluminum smelting, containing about 15–25% Al, 60–70% Al_2O_3 and 10–15% NaCl or KCl, said dross having a particle size of about 70 microns or less and being used in a proportion of about 1 to 7% by weight of the total composition, and (3) a fluorspar having a fluoride content of at least about 70%, said fluorspar having a particle size of about 150 microns or less and being used in a proportion of about 2–7% by weight with reference to the total composition.

1. A transfer molding method for molding resin articles in a mold having a plurality of cavities. and a pot communicating with said cavities via a runner, said method comprising the steps of:

(a) charging a thermosetting resin into said pot;

(b) transferring said thermosetting resin from said pot to each of said cavities by applying pressure to said thermosetting resin by plunger means movable in said pot;

(c) before said resin reaches said cavity, detecting internal pressure within the area defined by said pot and the end surface of the plunger directly by detecting means and controlling the pressure applied to said plunger means in response to the internal pressure detected by the detecting means so that friction between the plunger and the wall of the pot is compensated for and said internal pressure in said pot is maintained constant during said transferring step; and

(d) repeating steps (a)–(c) a plurality of times, wherein the inner pressure is detected every time the transfer step is carried out and the pressure applied to the plunger is controlled so that the inner pressure during each transfer step is maintained constant.

7. A transfer molding apparatus comprising:

(a) a mold having a plurality of cavities;

(b) a pot communicating with each of said plurality of cavities via a runner;

(c) plunger means movable in said pot and having an end surface for pressing a thermosetting resin charged into said pot a plurality of times;

(d) driving means for applying a pressure to said plunger means to move said plunger, causing said resin to be transferred out of the pot, along the runner and into the plurality of cavities;

(e) means for detecting, before said resin reaches the plurality of cavities, internal pressure within the area defined by said pot and the end surface of the plunger directly, and for generating a signal corresponding to said internal pressure; and

(f) means for controlling the pressure applied to said plunger means by said driving means in response to said signal from said detecting means;

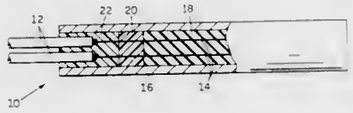
wherein friction between the plunger and the wall of the pot is compensated for and said internal pressure is maintained constant each time said thermosetting resin is transferred from said pot to each of said plurality of cavities by the plunger.

4,900,486

MULTI-LEVEL SEALING METHOD

Felora Derakhshani, and Ricky Gotcher, both of Round Rock., Tex., assignors to Weed Instrument Company, Inc., Round Rock, Tex.

Filed Oct. 3, 1988, Ser. No. 252,544
Int. Cl.[4] B29C *39/10*
U.S. Cl. 264—40.1 **12 Claims**



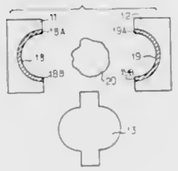
8. A multi-level sealing method comprising the steps of:
A. heating an element to be sealed;
B. testing said element to ensure moisture is absent;
C. selecting an epoxy means that adheres to metal, plastics, and ceramics;
D. mixing said epoxy means with a curing catalyst so that a resultant first sealant means cures quickly at room temperature and more quickly when heated;
E. applying said first sealant means to said heated elements so that said element is sealed before moisture is drawn past said first sealant means into said element;
F. selecting a high temperature epoxy means that adheres to metals, plastics, and ceramics;
G. mixing said high temperature epoxy means with a curing catalyst so that a resultant second sealant means cures slowly at high temperature;
H. applying said second sealant means over said first sealant means so that two sealant boundaries are formed and any moisture that passes said second sealant means is prevented from entering said element by said first sealant means;
I. retesting said element to ensure moisture is still absent.

4,900,487

METHOD OF PRODUCING A HOLLOW-BODIED COMPONENT

Guy Lalloz, Froideconche Luxeuil Les Bains, and Gabriel Joly, Luxeuil Les Bains, both of France, assignors to Saplest S.A., Faucogney, France

Continuation of Ser. No. 805,093, Dec. 4, 1985, abandoned. This application Nov. 12, 1987, Ser. No. 119,786
Claims priority, application France, Dec. 5, 1984, 8418523
Int. Cl.[4] B29C *65/02, 39/26, 67/22*
U.S. Cl. 264—45.2 **4 Claims**



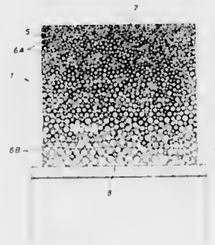
1. A method of making a hollow object comprising the steps of:
forming at least two preliminary sections with sides by introducing appropriate quantities of expandable polystyrene material in beadform into hollow spaces between a solid core member and an outer mold having at least two separable mold parts and,
heating the expandable polystyrene material until the beads have sufficiently agglomerated to form said at least two preliminary sections which are thereby stabilized to facilitate removal of said core member;
opening said mold by spacing the two separable mold parts apart while each mold part carries one of said preliminary sections; removing said core member from between the separated mold parts; moving said mold parts into an abutting relationship to thereby position said sides of said preliminary sections against each other;
placing an inflatable core into a hollow interior formed by said preliminary sections;
inflating said inflatable core to hold said preliminary sections against said mold parts to thereby exactly match said sides placed against each other;
completing heating said preliminary sections to join together without adhesive said preliminary sections along said sides in a perfectly homogeneous way to form a unitary hollow object having a smooth and faultless surface on both the interior and exterior thereof;
terminating said heating;
deflating said inflatable core; and,
removing said inflatable core and separable mold parts from the hollow object.

4,900,488

METHOD OF MANUFACTURING A SYNTACTIC SLEEVE FOR INSULATING A PIPELINE

Michael H. Collins, and Alan R. Lyle, both of Chester, England, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 21, 1988, Ser. No. 247,189
Claims priority, application United Kingdom, Sep. 25, 1987, 8722605
Int. Cl.[4] B29C *41/04, 67/20*
U.S. Cl. 264—45.7 **8 Claims**



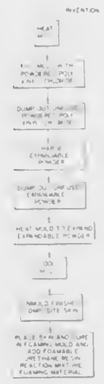
1. A method for manufacturing a syntactic sleeve for insulating a pipeline, said method comprising the steps of:
providing a drum having a generally cylindrical shape,
injecting into said drum components for forming a syntactic insulation material containing microspheres of different densities,
rotating the drum about a central longitudinal axis thereof, thereby inducing said components to form an annular layer alongside an inner wall of the drum and simultaneously creating a concentration of microspheres having a comparatively low density in an area near an inner surface of said annular layer, and a concentration of microspheres having a comparatively high density in an area near an outer surface of said annular layer, the comparative density of said microspheres varying from said inner surface to said outer surface of said annular layer, and
allowing said components to cure to a sleeve of syntactic material.

4,900,489

METHOD FOR FORMING A SKIN FOAM ARTICLE

Takashi Nagase, Aichi, and Yoshio Taguchi, Nagoya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation of Ser. No. 923,607, Oct. 27, 1986, abandoned. This application Aug. 29, 1988, Ser. No. 239,029
Int. Cl.[4] B29C *41/18, 41/22, 67/20;* **B32B** *15/08*
U.S. Cl. 264—46.5 **9 Claims**



1. A method for forming a skin foam article containing a core member, which method comprises:
preparing a preformed and fused skin from a resinous material;
forming on a surface of said preformed skin an expanded and fused layer of the same resinous material used to prepare said preformed skin; and
producing a resinous foam between a core member and said expanded and fused layer to make said preformed skin integral with said core member.

4,900,490

FOAM MATERIAL

Matthew L. Kozma, Osterville, Mass., assignor to Packaging Industries Group, Inc., Hyannis, Mass.

Continuation of Ser. No. 51,141, May 15, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 361,761
Int. Cl.[4] C08J *9/10;* **B29C** *67/22*
U.S. Cl. 264—54 **4 Claims**

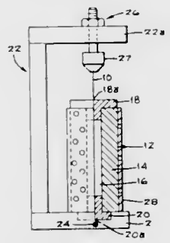
1. A method of making a foam material comprising:
fusing a mixture comprising ethylene-propylene diene terpolymer, low density polyethylene and a chemically decomposing blowing agent in a dispersion mixer;
sheeting the material;
cooling the sheet material;
press molding the sheet material in a hydraulic press;
curing the material during the press molding step, and
expanding the cured molded material immediately on opening the press to form a foam material having a density of about 7 to 10 lb/cu. ft. and tear resistance of about 18 to 22 lb/in.

4,900,491

METHOD FOR FORMING MINIATURE CERAMIC ARTICLES WITH SMALL BORES

Harry J. Odink, Morgan Hill, and Walt D. Carbonell, San Jose, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Jan. 29, 1987, Ser. No. 8,515
Int. Cl.[4] C04B *33/32*
U.S. Cl. 264—59 **11 Claims**



1. A method of forming parts, each part formed from a ceramic moldable material and having a central bore, the diameter of the central bore being relatively small with respect to the cross-section of the part, the part formed in a mold mounted on a suitable support structure, the method comprising:
mounting a relatively thin flexible member on the support structure under tension;
mounting a mold on the support structure with the flexible member extending therethrough, said mold having a body cavity for receiving the ceramic moldable material, said body cavity defining a body part having a cross-section substantially larger than the cross-section of the then flexible member passing therethrough;
enclosing the mold in a perforated cage provided on the support structure, said cage enclosing and supporting the mold;
inserting the ceramic moldable material into the mold to surround the tensioned flexible member along the length of the member within the mold; and
removing the flexible member from the formed part.

4,900,492

HIGH-STRENGTH AND TEMPERATURE-STABLE FORMED BODIES OF ZIRCONIUM DIOXIDE

Nils Claussen; Helmut Schubert, both of Leonberg; Manfred Rühle, Ditzingen, and Günter Petzow, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Continuation of Ser. No. 722,299, Apr. 11, 1985, abandoned. This application Feb. 9, 1988, Ser. No. 157,101
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1984, 3415803
Int. Cl.[4] C04B *35/48*
U.S. Cl. 264—65 **7 Claims**

1. A process for the production of a formed body comprising: pressing a powder consisting essentially of ZrO_2 powder alloyed with 0.5 to 4 mole % rare earth oxide or SrO, which contains about 0.1 to 5% by volume of Al_2O_3, in the presence of MgO to form a pressed body; and sintering the pressed body in an MgO containing atmosphere at a temperature of from 1400° to 1600° C.

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4,900,493

METHOD FOR PRODUCING A SYNTHETIC RESIN SKIN

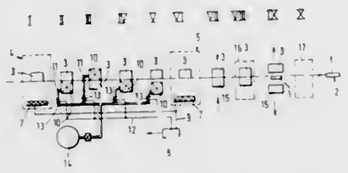
Hermann A. Bartels, Muehlheim; Erich M. Christoph, Obertshausen, and Ruediger Leipnitz, Darmstadt, all of Fed. Rep. of Germany, assignors to YMOS Aktiengesellschaft Industrieprodukte, Obertshausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 621,870, Jun. 18, 1984, Pat. No. 4,606,868. This application Jun. 2, 1986, Ser. No. 869,576

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520152

Int. Cl.[4] B29C *41/18*

U.S. Cl. 264—71 11 Claims



1. A method for producing a synthetic material skin for structural components which are to be at least partially encased in said synthetic material skin, comprising the following steps: preparing at least two separate mold means each including a mold section for holding a respective skin portion and a container section for holding synthetic material for forming at least two separate skin portions, preheating said mold sections, filling said container sections, with a flowable synthetic material in powder form, and locking the respective mold section to its container section in a pressure sealed manner to form locked mold means, rotating or tilting said locked mold means sufficiently into such a position that said flowable synthetic material in powder form in the previously filled container section falls into the respective mold section to cover inner surfaces of said mold sections for producing said two separate skin sections by causing at least a partial melting or fusing of said flowable synthetic material powder in form on said inner surfaces of said mold sections, vibrating said mold means, establishing a reduced pressure in said mold means, permitting a residence time in the rotated or tilted inverted position, rotating or tilting said mold means back into the original position, separating said mold sections from their container sections, providing said separate skin sections with joining margins as part of said producting steps, and assembling said separate mold sections into a cooperating position for joining said separate skin sections to each other along said joining margins by applying pressure to said joining margins to form a seam.

4,900,494

EXTRUSION METHOD AND APPARATUS

Hans Wobbe, Burgdorf, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

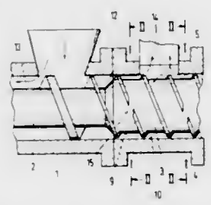
Filed Feb. 15, 1989, Ser. No. 310,641

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805748

Int. Cl.[4] B29C *47/60, 47/76*

U.S. Cl. 264—102 7 Claims

1. A method of extruding a fused molten mass of a thermoplastic material in a single screw extruder comprising a hollow barrel, a single screw rotatable within said hollow barrel, inlet means for introducing said melt into said barrel and melt discharge means disposed in said barrel downstream of said inlet means, said extruder including a return delivery section upstream of said inlet means, said screw including a return delivery flight in said return delivery section, said barrel means defining a degassing aperture in said return delivery section and vacuum source means communicating with said return delivery section through said degassing aperture, comprising the steps of introducing said melt into said barrel through said inlet means, extruding said melt in said barrel by rotating said screw, actuating said vacuum source means to degas said melt whereby said gas is caused to enter said return delivery section by the reduced pressure produced by said vacuum source, is



caused to pass through said aperture and is discharged, said method including the additional step of mechanically separating said gas from any fused mass entrained therewith at at least one location in said return delivery section.

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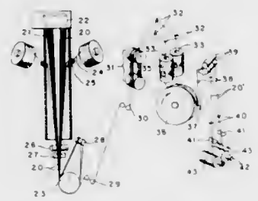
PROCESS FOR PRODUCING ANTI-STATIC YARNS

Perry H. Lin, Seaford, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 8, 1988, Ser. No. 179,015

Int. Cl.[4] D02G *3/12*

U.S. Cl. 264—103 8 Claims



1. In a process for producing anti-static yarns by the steps of combining at least one spin-oriented, conductive filament spun at 1400 yards per minute or greater, said filament having a nonconductive polymeric component coextensive with a component of electrically conductive carbon dispersed in a polymeric matrix with freshly spun, undrawn, nonconductive filaments, drawing and cobulking the combined filaments to form a yarn, the improvement for reducing the tendency of the conductive filaments to break during drawing wherein the nonconductive polymeric component of the spin-oriented, conductive filaments is a melt-blend containing a major amount of a nonconductive, fiber-forming polymeric material and a minor amount of a polystyrene.

4,900,496

PROCESS FOR MAKING A TIRE CORD USING YARNS CONTAINING A DIP PENETRATION REGULATOR

Walter R. Andrews, Jr., Richmond, Va., and Fleming H. Day, Greenville, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 911,678, Sep. 26, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 224,209

Int. Cl.[4] B29C *67/00;* B29D *28/00;* D02G *1/20;* D01H *13/26*

U.S. Cl. 264—103 10 Claims

1. In a process for making a tire cord from synthetic polymer that includes the steps of spinning, applying a finish to, drawing and twisting a singles yarn from said polymer, then cabling

the twisted singles yarn to a cord and dipping the cord in a bath containing a rubber adhesive, the improvement comprising: applying to the singles yarn prior to said dipping a hydrophobic organic ester dip penetration regulator having a melting point greater than 27° C. selected from the group consisting of hydrogenated coconut oil, hydrogenated palm oil and pentaerythritol tetralaurate in the amount of at least 0.05 percent by weight of the singles yarn whereby penetration of said dip adhesive is substantially limited to an area near the surface of the cord whereby said cord has a stiffness of less than 40 grams and an air permeability as measured by wicking of at least 0.4 liters/30 min.

4,900,497

PROCESS FOR PRODUCING ELECTRIC RESISTORS HAVING A WIDE RANGE OF SPECIFIC RESISTANCE VALUES

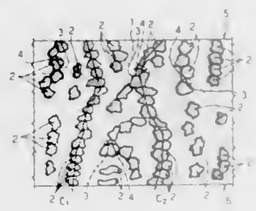
Paolo Lodini, Turin, Italy, assignor to LEDA Logarithmic Electrical Devices for Automation S.r.l., Turin, Italy

Filed Jan. 19, 1988, Ser. No. 145,612

Claims priority, application Italy, Feb. 5, 1987, 67072 A/87

Int. Cl.[4] B29C *45/14;* C04B *35/52*

U.S. Cl. 264—104 13 Claims



1. A method of producing an electric resistor for use as an electric conducting element in an electric circuit, and which is capable of varying the electrical resistance as a function of pressure exerted thereon, said method comprising the steps of:

providing an electrically conductive homogeneous material comprising a plurality of conductive particles;

placing said electrically conductive material in a closed vessel;

compacting said electrically conductive material in said closed vessel by subjecting said electrically conductive material to a first predetermined pressure, wherein said first predetermined pressure is exerted by means of a thrust element for a surface of said electrically conductive material;

injecting a liquid material into said closed vessel so as to uniformly mix with said electrically conductive material under pressure and so as to fill gaps between said particles of said electrically conductive material, wherein said injecting includes feeding said liquid material through a channel in said thrust element while gradually withdrawing said thrust element from said surface so as to form a layer of a desired height of said liquid material over said electrically conductive material and then exerting a second predetermined pressure on said layer by means of said thrust element such that said liquid material fills gaps between said particles;

solidifying said liquid material so as to form a flexible and electrically insulating matrix for supporting said particles; and

producing triaxial precompression of said liquid material during solidification thereof by applying a third predetermined pressure during said solidification.

4,900,498

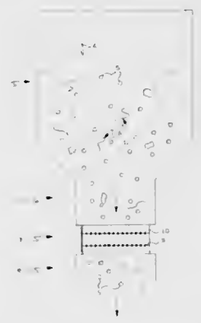
METHOD FOR SEPARATING ELONGATED CONTAMINANTS FROM A STREAM OF MATERIAL

Sanford N. Smith, Spartanburg, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 25, 1988, Ser. No. 173,509

Int. Cl.[4] B07B *13/00*

U.S. Cl. 264—169 4 Claims



1. A method of removing an elongated contaminant comprising thin strips of polymeric material from a contaminated stream of material comprising pellets and said contaminant, said method comprising the following steps:

passing said contaminated stream through a snagging zone, said snagging zone comprising an area immediately around and between a plurality of finger-like projections which are positioned in said passing contaminated stream for snagging said elongated contaminant from said contaminated stream; and

removing said elongated contaminant from said contaminated stream by snagging said elongated contaminant in said snagging zone.

4,900,499

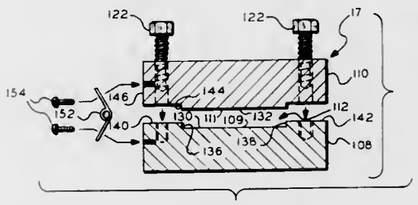
MOLDING PROCESS FOR FORMING A TAPE OF LONG REINFORCEMENT

Stuart D. Mills, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 14, 1988, Ser. No. 144,298

Int. Cl.[4] B29C *41/24, 41/36*

U.S. Cl. 264—257 8 Claims



1. A process for forming a tape comprising long fiber reinforcement in a continuous thermoplastic matrix, said process comprising:

providing at least one roving of long fibers carrying a dispersion of thermoplastic resin;

introducing said at least one roving into an inlet of a converging wedge-shaped passage defined between the tongue and the groove of a tongue-in-groove die, which passage converges from the inlet to an outlet and is bounded by sidewalls for the entire length of the groove,

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said sidewalls being separated by a predetermined distance;

pulling said at least one roving through said wedge-shaped passage of said tongue-in-groove die;

applying sufficient heat and pressure in the wedge-shaped passage to the roving carrying the dispersion of the thermoplastic resin to consolidate the dispersion of the thermoplastic resin and form the tape comprising said long fiber reinforcement in said continuous thermolastic matrix; and

adjusting the pressure on said roving and dispersion of thermoplastic resin by adjusting inlet and outlet clearances between the tongue and groove at said inlet and said outlet respectively while said roving is being pulled through said wedge-shaped passage.

4,900,500

POINT-OF-USE INFECTIOUS WASTE DISPOSAL SYSTEM

Travis W. Honeycutt, Irvine, Calif., assignor to Isolyser Co., Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 4,593, Jan. 20, 1987, Pat. No. 4,816,307. This application Mar. 28, 1989, Ser. No. 329,827

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[4] B65D *85/24*

U.S. Cl. 264—263 **20 Claims**

1. In a method for containing potentially infectious devices comprising depositing the potentially infectious devices in a container, the improvement comprising adding to said container a sufficient quantity of a hardenable composition to at least partially envelop said potentially infectious devices, said hardenable composition comprising an acrylate monomer-containing liquid capable of polymerizing in an exothermic reaction to immobilize said potentially infectious devices.

4,900,501

METHOD AND APPARATUS FOR ENCAPSULATING SEMI-CONDUCTORS

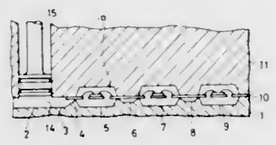
Junichi Saeki; Aizo Kaneda, both of Yokohama; Masakazu Ozawa, Yonezawa; Takashi Nakagawa, Takasaki, and Kunihiko Nishi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 30, 1986, Ser. No. 924,773

Claims priority, application Japan, Nov. 8, 1985, 60-248715

Int. Cl.[4] B29C *45/14, 45/26*

U.S. Cl. 264—272.17 **4 Claims**



1. In a method for producing resin-encapsulated semiconductors the steps comprising; providing a mold having a plurality of pots from which a molding resin is fed under pressure, mutually independent runners extending from each pot, and a plurality of cavities serially disposed at an end of each runner, wherein a first cavity in each series located at the nearest position from a pot is connected to a runner through a gate, and each further cavity in each series is connected to each adjacent cavity in each series only through a slit formed as a flow channel in a lead frame interposed between a top part and a bottom part of said mold; discharging said resin from said pots into said runners such that said resin is fed only to said first cavity of each series through said gate; and discharging said resin from a cavity to an adjacent cavity only through said slit sequentially up to the last cavity in each series.

4,900,502

HOLLOW FIBER ANNEALING

Walter C. Babcock; Scott B. McCray; Edward D. LaChapelle, all of Bend, and Kris A. Krichko, Hubbard, all of Oreg., assignors to Bend Research, Inc., Bend, Oreg.

Continuation-in-part of Ser. No. 770,857, Aug. 29, 1985. This application Nov. 7, 1988, Ser. No. 267,979

Int. Cl.[4] B29C *35/04*

U.S. Cl. 264—346 **2 Claims**

1. A process for increasing both the internal burst pressure and the gas and water permeability of a lumen-side feed microporous polymeric hollow fiber made from a polymer selected from polysulfones, polyethersulfones and polyetherimides, said process comprising heating said hollow fiber in water at a temperature from 70° C. to 160° C.

4,900,503

METHOD AND APPARATUS FOR PRODUCING A FINNED TUBE FROM SYNTHETIC PLASTICS MATERIAL

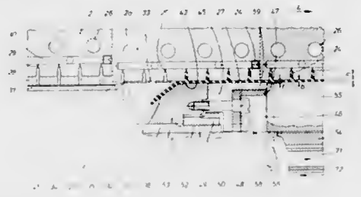
Wilhelm Hegler, and Ralph-Peter Hegler, both of Goethestrasse 2, D-8730 Bad Kissingen, Fed. Rep. of Germany, assignors to Wilhelm Hegler, Bad Kissingen, Fed. Rep. of Germany

Filed Jul. 29, 1988, Ser. No. 227,424

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725286

Int. Cl.[4] B29C *47/20*

U.S. Cl. 264—508 **14 Claims**



1. A method for producing a finned tube from synthetic plastics material in a moulding chamber moving in a direction of production, comprising the steps of a molten plastics charge entering the moulding chamber having fin forming vented slots therein, fins provided one after another in the direction of production each being completely moulded and a tube being formed which is integral with the fins, wherein the fins are moulded one after another, whereby a fin is formed only after a fin which leads it in the direction of production has already been completely formed and wherein raised portions having flanks which are shallow pitched in the direction of production and having conveyor faces trailing in the direction of production are constructed in a surface of a moten plastics charge which is present in the moulding chamber, said conveyor faces being disposed substantially at a right angle to the axis of production and said raised portions having a height equal to about 0.12–0.16 times the minimum wall thickness of said tube.

4,900,504

METHOD OF EXTRUSION BLOW MOLDING FLAT BOTTLES

Rainer Fischer, Postrasse 39, 3530 Warburg 2, Fed. Rep. of Germany

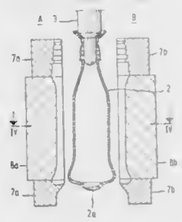
PCT No. PCT/DE87/00033, § 371 Date Nov. 30, 1987, § 102(e) Date Nov. 30, 1987, PCT Pub. No. WO87/04661, PCT Pub. Date Aug. 13, 1987

PCT Filed Jan. 30, 1987, Ser. No. 130,230

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602990

Int. Cl.[4] B29C *49/64, 49/18, 49/50*

U.S. Cl. 264—529 **7 Claims**



1. A method of making a flat bottle with a broad side and a narrow side and defined by a height and having a flat or concave bottom; comprising the steps of:

extruding a plastic tube;

blow-molding the plastic tube in an intermediate mold to provide an intermediate form at a length corresponding to about the height of the flat bottle, wherein the intermediate form has a body with a circumference being smaller than a corresponding circumference of the flat bottle by 1% to about 10% and a bottom area with a circumference effectively exceeding a corresponding circumference of the flat bottle by up to about 15%, and wherein the intermediate form has at the junction of the body and the bottom a radius of curvature which approximately corresponds to about a radius of curvature at the junction of the body of the broad side of the flat bottle and the bottom thereof; and transferring said intermediate form to a final blow mold and shaping the intermediate form to a finished flat bottle without any substantial material stretching and pinching off a bottom part of said intermediate form during said shaping step.

4,900,505

SPENT FUEL STORAGE RACK

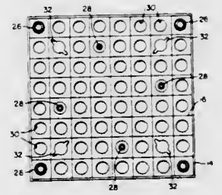
Octavio J. Machado, Pensacola, Fla.; Clifford W. Henry, Metairie, La.; Ray L. Congleton, Cantonment, and William M. Flynn, Pensacola, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 728,141, Apr. 26, 1985, Continuation of Ser. No. 570,406, Jan. 12, 1984, abandoned, Continuation of Ser. No. 333,544, Dec. 22, 1981, abandoned. This application Jan. 29, 1988, Ser. No. 149,982

Int. Cl.[4] G21C *19/00;* **G21F** *7/00*

U.S. Cl. 376—272 **7 Claims**

1. For use in a nuclear fuel assembly storage pool containing a coolant and having a pool floor; a fuel-rack module comprising a baseplate to be disposed generally horizontally on said floor, a plurality of cells mounted on said baseplate, each said cell having elongated wall means defining a transverse cross-sectional area to receive a fuel assembly and having a volume to accommodate said received fuel assembly, the area of the baseplate over which said each cell is mounted having a first substantially circular hole to seat the bottom nozzle of said received fuel assembly, and means, connected to the underside of said baseplate, to receive and to lock the mechanism for engaging an object to be lifted of a lifting tool to lift said module by exerting lifting force under said baseplate, said receiving-and-locking means including second substantially circular holes in said baseplate at predetermined positions of its surface, each said second hole subtending a cell supported over the area surrounding said each second hole and additionally having cutout portions which are uniquely shaped to selectively pass said mechanism to the underside of said baseplate to lift said module and also to seat the bottom nozzle of a fuel assembly received in said subtended cell, said each second hole permitting the rotation of said mechanism after it is passed to the underside of said baseplate to a different orientation in



which, because of the shaping of said each second hole, said mechanism cannot be removed from the underside of said baseplate, and additional plate means, connected to the underside of said baseplate, said additional plate means having, at each of said positions, a third hole substantially coincident with the second hole in said baseplate, and also having cutout portions uniquely shaped to pass said mechanism to the underside of said additional plate means, said additionai plate means also having at each of said positions on the underside of said addi-.ional plate means, means for locking said mechanism in said different orientation.

4,900,506

HIGH-TEMPERATURE REACTOR

Rainer Moormann; Klaus Hilpert, and Karl Verfondern, all of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Juelich GmbH, Juelich, Fed. Rep. of Germany

Filed Dec. 7, 1987, Ser. No. 129,179

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1986, 3641993

Int. Cl.[4] G21C *9/00, 19/30*

U.S. Cl. 376—314 **12 Claims**

1. A malfunction filter for a high temperature reactor having a ceiling reflector and a reactor core containing fuel elements crossed by a cooling gas circuit, the filter comprising:

(a) a filtering element for metal fission products emitted by the fuel elements during a reactor core heating malfunction;

(b) said filtering element for being disposed above the ceiling reflector; and,

(c) said filtering element comprising binder coke comprised of carbon which is incompletely graphitized or at least 5% non-graphitized.

4,900,507

NUCLEAR FUEL ASSEMBLY DEBRIS FILTER BOTTOM NOZZLE

John M. Shallenberger, and Stephen J. Ferlan, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 46,219, May 5, 1987, abandoned. This application Jun. 22, 1988, Ser. No. 211,150

Int. Cl.[4] G21C *19/30, 15/06*

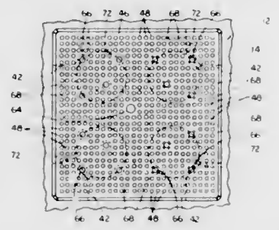
U.S. Cl. 376—352 **6 Claims**

1. In a fuel assembly for a nuclear reactor, said fuel assembly including a plurality of nuclear fuel rods, at least a lowermost

grid supporting said fuel rods in an organized array and having unoccupied spaces defined therein adapted to allow flow of liquid coolant therethrough and past said fuel rods when said fuel assembly is installed in the nuclear reactor, said spaces each having a predetermined maximum cross-sectional dimension lying in a plane extending transverse to the direction of liquid coolant flow through the spaces, an instrumentation tube extending along said fuel rods and through said grid, and a plurality of guide thimbles extending along said fuel rods through and supporting said grid, a debris filter bottom nozzle disposed adjacent to and below said grid, below lower ends of said fuel rods, supporting said guide thimbles and said instrumentation tube and adapted to allow flow of liquid coolant into said fuel assembly, said debris filter bottom nozzle comprising:

(a) support means adapted to support said fuel assembly when installed in the nuclear reactor; and

(b) a rigid plate fixed at its periphery on said support means and facing toward said lowermost grid, said plate having defined therethrough only three different types of holes, the first type being a plurality of non-flow holes receiving lower ends of said guide thimbles where they are attached



to said plate, the second type being another non-flow hole receiving a lower end of said instrumentation tube where it is attached to said plate, and the third type being a plurality of circular flow holes all of which are packed in a density of about 16 per square inch and are individually 0.190+/−0.008 inch or less in diameter which is smaller than said predetermined maximum cross-sectional dimension of each of said unoccupied spaces through said lowermost grid, said plate also having sections extending between said flow holes of said third type which sections have a maximum dimension of one-tenth inch, said flow holes of said third type being the only holes of the three types allowing flow of liquid coolant through said plate and upwardly along said fuel rods and through said lowermost grid such that most debris being carried by the liquid coolant which is narrow enough in width to pass through said flow holes will also be capable of passing through said unoccupied grid spaces, whereas debris being carried by the liquid coolant which is wide enough to not pass through said unoccupied grid spaces and collect in said grid will not pass through said flow holes.

4,900,508

HIGH STRENGTH NUCLEAR FUEL GRID

Andrew J. Anthony, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 24, 1984, Ser. No. 685,415

Int. Cl.[4] G21C *3/34*

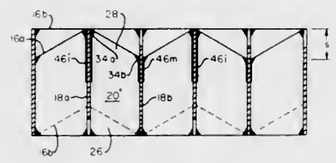
U.S. Cl. 376—438 **5 Claims**

1. A nuclear fuel assembly grid comprising:

a plurality of elongated, perpendicularly intersecting strips rigidly joined to form rows and columns of vertical cells, each cell having entry and exit openings;

each of said strips having upper and lower edges, at least one of said upper or lower edges having a plurality of spaced-apart slots, each slot engaging a mating slot on a perpendicularly oriented strip, such that at each strip intersection, the upper edges of the intersecting strips are at substantially the same elevation to form a cell exit corner and the lower edges of the intersecting strips are at another elevation to form a cell entrance corner:

each of the row-oriented strips having at least one nonlinear saw-toothed upper or lower edge such that at least one of



the corners in each cell entrance and exit is at a different elevation from the other corners of said entrance or exit; and

at least half of all said corners include weld material joining the intersecting strips.

4,900,509

PROCESS FOR MANUFACTURING CAST IRON CONTAINING VERMICULAR GRAPHITE

Werner Menk, Schaffhausen, and Urs Brandenberger, Dachsen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Apr. 15, 1985, Ser. No. 723,041

Claims priority, application Switzerland, Apr. 13, 1984, 1868/84

Int. Cl.[4] C22C *33/08*

U.S. Cl. 420—31 **10 Claims**

1. A process for the manufacture of cast iron containing vermicular graphite comprising:

(a) providing a GGG melt; and

(b) adding to said GGG melt a sulphur-containing substance in accordance with the equation:

$S = A \times Mg - B$ wherein

S represents the amount of sulphur in weight percent present in the sulphur containing substance,

Mg represents the amount of magnesium in weight percent present in the GGG melt,

A is a factor which depends on the magnesium content of the GGG melt and which is in the range of 0.9 to 1.2, and

B is a constant which depends on the sulphur content of the GGG melt and which is in the range of about −0.02 to 0.05,

whereby the ratio of magnesium to sulphur in the resulting melt is in the range of from about 2:1 to 1:1, and

wherein A is about 1.08.

4,900,510

HIGH STRENGTH AND CORROSION RESISTANT TITANIUM ALLOY HAVING EXCELLENT CORROSION-WEAR PROPERTIES

Misao Ishikawa; Yohji Kohsaka; Chiaki Ouchi, and Katsumi Masamura, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

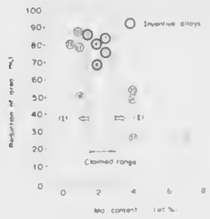
Filed Apr. 13, 1988, Ser. No. 181,215

Claims priority, application Japan, Apr. 22, 1987, 62-97575

Int. Cl.[4] C22C *15/00*

U.S. Cl. 420—418 **1 Claim**

1. A high strength and corrosion resistant titanium alloy having excellent corrosion-wear properties, consisting of Al: 4.0 to 6.0 wt%, Mo: more than 1.5 wt% to less than 3.0 wt%,



Zr: 2.0 to 6.0 wt% and the balance being Ti and unavoidable impurities.

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NICKEL-BASED MONOCRYSTALLINE SUPERALLOY, IN PARTICULAR FOR THE BLADES OF A TURBOMACHINE

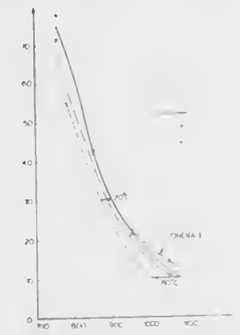
Tasadduq Khan, Jouy En Josas; Pierre Caron, and Jean-Louis Raffestin, both of Les Ulis, all of France, assignors to Office National d'Etudes et de Recherche Aerospatiales, Chatillon Cedex, France

Continuation of Ser. No. 55,465, May 28, 1987, Pat. No. 4,837,384. This application Dec. 6, 1988, Ser. No. 280,616

Claims priority, application France, Jun. 4, 1986, 86 08068

Int. Cl.[4] C22C *19/05*

U.S. Cl. 420—448 **2 Claims**



1. A nickel-based superalloy intended in particular for monocrystalline solidification of turbomachine parts, said superalloy consisting essentially of:

Co: 5.0 to 6.0% by weight
W: 4.8 to 5.2%
Cr: 7.8 to 8.3%
Al: 5.8 to 6.1%
Ta: 3.3 to 3.7%
Mo: 2.1 to 2.4%
Ti: 1.8 to 2.2%
B: ≦10 ppm
Zr: ≦50 ppm
Ni: balance to 100%.

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APPARATUS FOR PHOTOMETRICALLY ANALYSING LIQUID SAMPLES

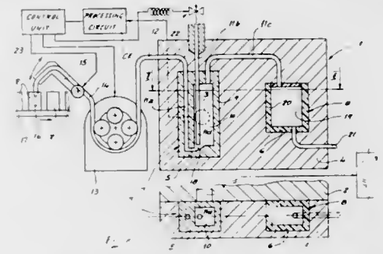
Pierre-André Meyrat; Alain Oppliger, both of La Chaux-de-Fonds, and Denis Steiner, St-Imier, all of Switzerland, assignors to Nivarox-Far S.A., Le Locle, Switzerland

Filed Dec. 22, 1987, Ser. No. 136,668

Claims priority, application France, Dec. 24, 1986, 86 18255

Int. Cl.[4] G01N *21/00*

U.S. Cl. 422—63 **13 Claims**



1. Apparatus for photometrically analysing successive liquid samples, which comprises measurement cell means disposed in a light-proof enclosure and adapted to successively receive liquid samples to be analyzed, photometric detector means in said enclosure to receive a luminescent light signal representing a property of each sample and to supply an electrical signal corresponding to said light signal, and measurement processing means connected to said detector means to convert the electrical signal supplied by the detector means into data providing a visual display of said property, wherein said measurement cell means is disposed in a liquid flow circuit for successive liquid samples, said flow circuit comprising: input means for successively receiving said samples; pump means, coupled between said input means and said measurement cell means, for pumping said samples through said flow circuit; and control means, connected to said pump means, for controlling said pump means, each time a sample is to be pumped, during at least such a time interval that each sample has a volume large enough both to flush from said cell means any residue from a previous analysed sample and also to fill said cell means.

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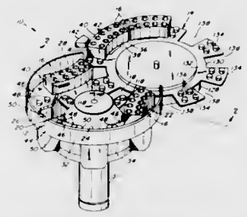
SAMPLE LOADING APPARATUS

Stephen F. Barker, Pomona, and Harold F. Fechtner, Claremont, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 132,720, Dec. 11, 1987, abandoned, which is a continuation of Ser. No. 884,463, Jul. 11, 1986, abandoned. This application Jul. 3, 1989, Ser. No. 373,690

Int. Cl.[4] G01N *35/04*

U.S. Cl. 422—64 **18 Claims**



1. A sample loading and unloading apparatus for use with sample carrying sectors each adapted to carry one or more samples, the apparatus comprising:

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an at least partly circular stationary loading tray including a plurality of locations each adapted to receive a sample carrying sector;

a sample carousel disposed proximate the loading tray and including a plurality of locations each adapted to receive a sample carrying sector, the portion of the sample carousel proximate the loading tray defining a sole transfer position; and

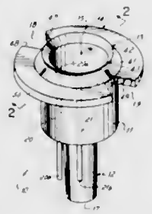
means for transferring a sample carrying sector positioned at the transfer position from the sample carousel to the loading tray and simultaneously transferring a sample carrying sector from the loading tray to the transfer position on the sample carousel.

4,900,514

BREATH ANALYZER MOUTHPIECE SYSTEM

Kip L. Fuller, Denver, Colo., assignor to Guardian Technologies, Inc., Cincinnati, Ohio

Filed May 1, 1987, Ser. No. 45,827
Int. Cl.[4] G01N *1/00*
U.S. Cl. 422—84 **17 Claims**



1. A breath test mouthpiece system, comprising:

(a) a mouthpiece having an inlet for receiving a breath sample;

(b) an electrode at least a portion of which communicates with the surface of said mouthpiece near enough to said inlet to contact the mouth of a user when receiving a breath sample from the user;

(c) an impedance monitor circuit connected to said electrode for monitoring the impedance across said electrode; and

(d) breath tester means connected to said mouthpiece for detecting a component in said breath sample.

4,900,515

ARRANGEMENT FOR DETERMINING BLOOD CELL SEDIMENTATION RATE

Fernando Xalabarder Miramanda, Pau Casals 8-10,, 08140-Caldes de Montbui (Barcelona), Spain

Filed Dec. 11, 1986, Ser. No. 940,618
Claims priority, application Spain, Dec. 19, 1985, 291.154
Int. Cl.[4] B01L *3/02*
U.S. Cl. 422—100 **1 Claim**

1. An arrangement for determining the blood cell sedimentation rate, comprising:

a standardized graduated pipette having a volume V_1, with a free lower end and an upper end;

a levelling device of volume V_2 including one-way valve means for connecting the upper end of the pipette to the levelling device, for receiving and retaining blood from the pipette and for preventing the flow of blood from the levelling device to the pipette;

a resilient plunger sealingly engaged with the outside of the pipette and having an active edge and an outside diameter; and

a tube having a closed bottom end, a height h and an inside diameter d, the inside diameter d of the tube being generally the same as the outside diameter of said active edge of the plunger, such that the latter is slidable within said tube while being sealingly engaged therewith, the distance a between the active edge of the plunger and the free lower end of the pipette inserted in the tube satisfies the following relationship:

$$V_1 \leq \pi/4d^2 (h-a) \leq V_1 + V_2$$



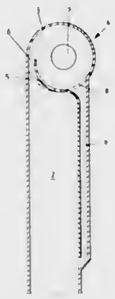
and wherein a cylindrical space of height e, generally equivalent to h−a and covered inside the tube until the free lower end of the pipette abuts the closed bottom end of the tube, corresponds to a volume of blood expelled from the tube, through said valve means and into said levelling device, capable of filling the pipette without overfilling the unit formed by said pipette and the levelling device.

4,900,516

FLUIDIZED BED REACTOR

Folke Engström, Nagu, and Seppo Ruottu, Karhula, both of Finland, assignors to A. Ahlstrom Corporation, Karhula, Finland

Continuation-in-part of Ser. No. 773,756, May 14, 1985, Pat. No. 4,664,887. This application Sep. 15, 1986, Ser. No. 907,857
The portion of the term of this patent subsequent to Oct. 13, 2004, has been disclaimed.
Int. Cl.[4] B01J *8/24*
U.S. Cl. 422—147 **19 Claims**



1. A circulating fluidized bed reactor comprising:

(a) a reactor chamber for containing fluidizing gas having entrained particulate material therein;

(b) a horizontal cyclone having a circumferential wall defining a separator chamber operatively connected at said reactor chamber for separating said material from said gas;

(c) a return pipe connected to said separator chamber of said cyclone at the circumference of said chamber for returning said separated material from said separator chamber to said reactor; and

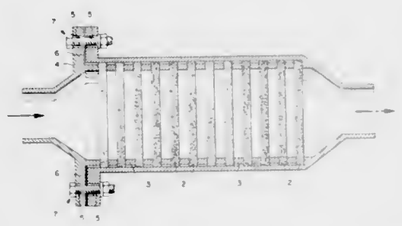
(d) means for discharging the purified gas located in at least one end of said separator chamber of said cyclone.

4,900,517

APPARATUS FOR THE PURIFICATION OF EXHAUST GAS FROM DIESEL MOTORS

Rainer Domesle, Maintal; Bernd Engler, Hanau; Edgar Koberstein, Alzenau, and Herbert Völker, Hanau, all of Fed. Rep. of Germany, assignors to Degussa AG, Fed. Rep. of Germany

Division of Ser. No. 147,603, Jan. 22, 1988, Pat. No. 4,828,807, which is a continuation of Ser. No. 914,416, Oct. 2, 1986, abandoned, which is a division of Ser. No. 703,005, Feb. 19, 1985, abandoned. This application Sep. 23, 1988, Ser. No. 248,355
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407172
Int. Cl.[4] F01N *3/28*
U.S. Cl. 422—171 **12 Claims**



1 An apparatus for cleaning diesel engine exhaust gases containing soot particulates and other pollutants, comprising:

exhaust conduit means for transporting diesel engine exhaust;

a housing located in said exhaust conduit means;

a filter system installed within an interior of said housing, said filter system including a series of filter elements wherein said series of filter elements includes at least one first filter element, said at least one first filter element carrying a first catalyst material that lowers the ignition temperature and assists in the burn off of solid soot particulates filtered out of the exhaust gases travelling in said exhaust conduit means;

at least one second filter element, said at least one second filter element carrying a second catalyst material which enhances the combustion of gaseous pollutants travelling in the exhaust conduit means, said first and second catalyst materials having separate and distinct compositions;

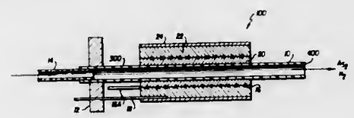
and said at least one first filter element and said at least one second filter element being arranged in a sequence which ensures that one filter element carrying one of the two distinct catalyst material compositions is between a pair of filter elements carrying the other of the two distinct catalyst material compositions.

4,900,518

GASEOUS ORGANIC/INORGANIC THERMAL CRACKER FOR VACUUM CHEMICAL EPITAXY

Paul M. McLeod, Berkeley; Lewis M. Fraas, El Sobrante, and Robert E. Weiss, San Francisco, all of Calif., assignors to DaidoSanso K. K., Osaka, Japan

Continuation of Ser. No. 941,003, Dec. 12, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 279,273
Int. Cl.[4] F27D *11/02*
U.S. Cl. 422—199 **6 Claims**



1. An apparatus for disassociating organic and/or inorganic gases by thermal means in a vacuum chamber comprising:

a straight, hollow, empty open-ended graphite tube,

flange means connected to one end of said graphite tube for mounting said apparatus substantially within the vacuum chamber,

means for introducing gas to be cracked into said one end of said graphite tube so that the gas passes straight through the graphite tube while being disassociated,

a first insulating tube surrounding a portion of said graphite tube,

a heating coil of a heating wire for heating the gas to be cracked surrounding said first insulating tube,

a second insulating tube surrounding said heating, and

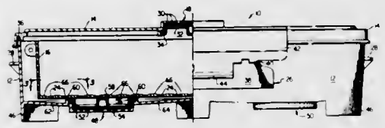
heat shield means surrounding said second insulating tube for maximizing inward temperature profile and minimizing the amount of heat radiated to the vacuum chamber.

4,900,519

MEDICAL INSTRUMENT STERILIZATION CONTAINER

Robert L. Nichols, 808 Fort Worth, Jacksonville, Tex. 75766

Continuation of Ser. No. 208,730, Jun. 17, 1988, which is a continuation of Ser. No. 821,136, Jan. 22, 1986, Pat. No. 4,752,453, which is a division of Ser. No. 668,090, Nov. 5, 1984, Pat. No. 4,617,178. This application Apr. 10, 1989, Ser. No. 335,361
Int. Cl.[4] A61L *2/26*
U.S. Cl. 422—292 **4 Claims**



1. A medical instrument sterilization container, comprising:

a housing having a bottom and sidewalls for receiving a tray containing medical instruments for sterilization;

a removable lid for sealingly fitting over said housing, said lid having an aperture therethrough;

a filter disposed in said aperture to allow the passage of condensable, sterilizing gases therethrough while inhibiting the passage of contaminants;

said housing bottom sloping to at least one location, said location having an opening to drain condensate from said housing, said opening being laterally spaced from said aperture in said lid when said lid is fitted over said housing such that an axis of said aperture is spaced apart from said opening; and

a filter disposed in said opening in said housing bottom, said

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filter passing air therethrough but preventing passage of contaminants into said housing.

4,900,520

PROCESS FOR REMOVAL OF SOLUBLE PLATINUM GROUP METAL CATALYSTS FROM LIQUID PRODUCT MIXTURES

Basil A. Behnam, Mississauga, and Rastko Vukov, Toronto, both of Canada, assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Oct. 31, 1988, Ser. No. 265,167
Int. Cl.[4] C01G *55/00;* **C22B** *11/00*
U.S. Cl. 423—22 **17 Claims**

1. The process for removing a platinum group metal compound from a liquid product mixture containing from about 1 to about 5,000 ppm of an acidic platinum group metal compound which comprises (a) contacting and agitating said liquid with basic macroreticular anionic exchange resin particles having a particle size of from about 60 to about 1,000 mesh, a moisture content less than 15% and an ion exchange capacity of from about 0.5 to about 40 meq/ml for a period and at a temperature sufficient to react said acidic platinum metal group compound with said ion exchange resin and (b) separating a clear colorless liquid product from said reacted ion exchange resin particles.

4,900,521

PROCESS FOR PURIFYING ALUMINUM CHLORIDE

Jacques Dugua, Charly par Vernaison, France, assignor to Atochem, Paris, France

Filed Jan. 19, 1988, Ser. No. 145,455
Claims priority, application France, Jan. 21, 1987, 87 00668
Int. Cl.[4] C01F *7/62*
U.S. Cl. 423—130 **5 Claims**

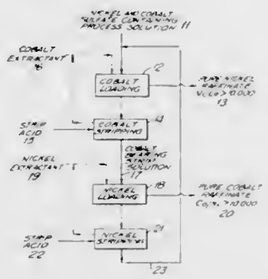
1. A process for purifying anhydrous aluminum chloride containing organochlorine impurities, comprising contacting said impure aluminum chloride with a bath containing at least one chloroaluminate for a time sufficient to completely destroy said organochlorine impurities and recovering the purified aluminum chloride in the vapor phase of the chloroaluminate bath.

4,900,522

SEPARATION OF NICKEL AND COBALT FROM SULFATE SOLUTIONS BY SOLVENT EXTRACTION

Eddie C. Chou, and Leo W. Beckstead, both of Arvada, Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Jul. 22, 1986, Ser. No. 888,310
Int. Cl.[4] C01G *51/00, 53/00*
U.S. Cl. 423—139 **5 Claims**



1. The process for separating nickel and cobalt contained in aqueous sulfate solution which comprises treating said solution with an organic extractant for cobalt from the group consisting of organic phosphonic and phosphinic acids to provide a loaded organic solution containing the cobalt and a nickel raffinate having a nickel:cobalt ratio exceeding 10,000, stripping the cobalt loaded organic with aqueous sulfuric acid solution to regenerate said cobalt extractant and provide a cobalt strip solution containing cobalt and nickel as sulfate, treating said cobalt strip solution with an organic extractant for nickel essentially consisting of a non-chelating oxime with or without a compound from the group consisting of di(2-ethylhexyl) phosphoric acid and alpha-bromolauric acid to provide a cobalt raffinate having a cobalt:nickel ratio exceeding 10,000 and a loaded organic solution containing nickel, stripping said nickel-loaded organic with aqueous sulfuric acid solution to regenerate said nickel extractant and an aqueous sulfate solution containing nickel and cobalt which may be recycled to said cobalt extraction step to provide a solvent extraction process for separating nickel and cobalt in which no scrubbing operations are employed and in which cobalt recycle is minimized.

4,900,523

PROCESS FOR REMOVING CYANOGEN HALIDES AND PHOSGENE FROM WASTE GASES

Richard Bicker, Liederbach; Manfred Schrod, Weiterstadt, and Hans Militzer, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 77,319, Jul. 24, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,296
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1986, 3625378
Int. Cl.[4] C01C *3/00*
U.S. Cl. 423—236 **7 Claims**

1. A process for removing cyanogen halides and/or phosgene from waste gases containing said cyanogen halides and/or phosgene, by washing with aqueous solutions of bases, wherein the waste gas is brought into intimate contact with a wash liquid which contains as active components 2 to 20% by weight of dimethylaminoethanol or diethylaminoethanol or a combination of both and an alkali metal hydroxide in a concentration of up to about 25% by weight.

4,900,524

METHOD FOR SEPARATION OF SULFUR DIOXIDE FROM GASES

Jörg Füllermann, Mastrils, Switzerland, assignor to VTH AG Verfahrenstechnik für Heizung, Vaduz, Switzerland

Filed Jun. 13, 1988, Ser. No. 206,204
Claims priority, application Switzerland, Jun. 29, 1987, 2 440/87-4
Int. Cl.[4] G01B *17/00*
U.S. Cl. 423—242 **6 Claims**

1. Method of separating sulfur dioxide from gases, particularly combustion exhaust gases and flue gases, comprising the steps of

in an effectively gas-tight housing (10),

contacting the gases which are free, or essentially free, of oxygen with a washing liquid which contains an alkaline earth compound, while effectively excluding oxygen from said gases, whereby, upon chemical reaction between the gases and said washing liquid, solid particles will be formed;

circulating, together with the washing liquid, solid particles formed in the washing liquid upon contacting of the gases with the alkaline earth compound containing washing liquid;

maintaining the washing liquid at a pH value in the range of from 6 to 6.8; and

maintaining the washing liquid at a temperature of between 0° to 40° C.

4,900,525

CHEMICAL VAPOR DEPOSITION REACTOR FOR PRODUCING METAL CARBIDE OR NITRIDE WHISKERS

Charles D'Angelo, Southboro; Joseph G. Baldoni, II, Norfolk, and Sergej-Tomislav Buljan, Acton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 25, 1986, Ser. No. 899,834
Int. Cl.[4] C30B *29/62, 35/00*
U.S. Cl. 422—245 **10 Claims**



1. A reactor for producing metal carbide, nitrde, or carbonitride single crystal whiskers comprising:

A. a reaction vessel having outer walls generally enclosing a reaction chamber, sealed from the ambient atmosphere and adapted to cooperate with heating means for heating of the reaction chamber to an operating temperature suitable for whisker growth;

B. gas inlet means; and

C. gas outlet means; and

D. wherein at least one of the outer walls, inlet means, and outlet means provides surfaces facing the reaction chamber formed from one or more substrate materials suitable for providing catalyzing and supporting substrates for nucleation and growth of the whiskers, the substrate materials are selected from the group consisting of nickel, an alloy containing at least 50% by weight nickel, and graphite impregnated with about 0.1–1.0 mole % nickel, and the surface area of the substrate material surfaces comprises at least a major portion of the total surface area of surfaces defining the reaction chamber.

4,900,526

POLYCRYSTALLINE RHOMBOHEDRAL BORON NITRIDE AND METHOD OF PRODUCING THE SAME

Toshitsugu Matsuda, Yokohama; Hiroyuki Nakae, Kawasaki, and Toshio Hirai, 4-91, Takamori 3-chome, Izumi-shi, Miyagi 981-31, all of Japan, assignors to Research Development Corporation of Japan; Japan Metals & Chemicals Co., Ltd.; The Furukawa Electric Company, Ltd., all of Tokyo and Toshio Hirai, Yokohama, all of, Japan, a part interest

PCT No. PCT/JP86/00095, § 371 Date Jul. 3, 1986, § 102(e) Date Jul. 3, 1986, PCT Pub. No. WO86/05169, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 27, 1986, Ser. No. 887,096
Claims priority, application Japan, Mar. 4, 1985, 60-41019
Int. Cl.[4] C01B *21/064*
U.S. Cl. 423—290 **10 Claims**

1. A polycrystalline rhombohedral boron nitride of a bulk density ranging from 1.90 to 2.24 g/cm^3 and obtained as a self supporting massive material or as a thin film, consisting essentially of rhombohedral crystals in which the 3-fold rotation



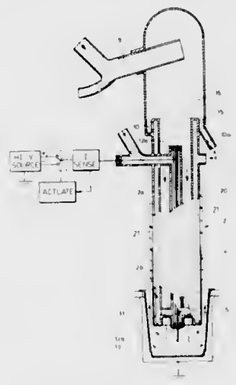
axes (parallel to the c-axis in the notation of the hexagonal crystal system) of said crystals have a preferred orientation.

4,900,527

APPLIANCE FOR STERILIZING CONTAINERS

Ernst G. Lierke, Schwalbach, Fed. Rep. of Germany, assignor to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany

Filed Dec. 24, 1987, Ser. No. 137,660
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644486
Int. Cl.[4] A61L *2/18, 2/26*
U.S. Cl. 422—302 **20 Claims**



1. In apparatus for sterilizing containers, the apparatus utilizing a liquid sterilizing agent and comprising an aerosol generator for producing droplets of the sterilizing agent, the apparatus further comprising a deposition head assembly in which the produced droplets, entrained in a stream of carrier gas, are directed to and charged by a corona discharge and are subsequently electrostatically deposited onto the surfaces of a container, the deposition head assembly comprising a deposition head which extends into the container, the deposition head defining a first flow passage for the carrier gas with entrained droplets, the first flow passage having an inlet which communicates with the exterior of the deposition head, the deposition head also comprising a centrally disposed point electrode energized by a high voltage to thereby produce the corona discharge and an auxiliary electrode which is provided on the end portion of the deposition head, said first flow passage extending linearly between said inlet and the region of the corona discharge, the head assembly further comprising an outer electrode which at least in part surrounds the container, a potential difference which produces an electrostatic field for causing the deposition of the charged droplets of sterilizing

agent being established between the outer electrode and the auxiliary electrode and point electrode, the improvement comprising:

means defining a chamber disposed upstream of an in communication with said first flow passage inlet, said chamber being provided at its lower point and along the outer wall thereof with a circumferentially continuous trap bead for collecting liquid; and

nozzle means for discharging the stream of carrier gas with entrained sterilizing agent droplets into said chamber along an axis which is not aligned with the first flow passage.

4,900,528

ZEOLITE SYNTHESIS

Barrie M. Lowe, and Abraham Araya, both Edinburgh, Scotland, assignors to Imperial Chemical Industries PLC, London, England

Filed Oct. 14, 1982, Ser. No. 434,228

Claims priority, application United Kingdom, Oct. 21, 1981, 8131767

Int. Cl.⁴ C01B *33/28*

U.S. Cl. 423—328 **4 Claims**

1. In a method for the preparation of zeolite Nu-10 having the molar composition expressed by the formula: 0.5 to $1.5R_2O:Y_2O_3$:at least $20XO_2$ $_{b\ 0}$ to $4{,}000H_2O$ wherein R is a monovalent cation or 1/n of a cation of valency n, X is silicon and/or germanium, Y is one or more of aluminum, iron, chromium, vanadium, molybdenum, arsenic, antimony, manganese, gallium or boron, and H_2O is water of hydration additional to water notionally present when R is H, said zeolite having the X-ray pattern as set out in Table 1 in the specification, said method comprising reacting an aqueous mixture containing sources of at least one oxide XO_2 and at least one oxide Y_2O_3;

the improvement wherein said mixture is free of organic compounds, the reaction mixture has the molar composition;

$XO_2/Y_2O_3 = 10$ to 1500

$M^1OH/XO_2 = 10^{-8}$ to 1.0

$H_2O/XO_2 = 10$ to 200

$M^2Z/XO_2 = 0$ to 4.0

wherein each M^1 and M^2 represents an alkali metal selected from the group consisting of sodium, potassium, rubidium and caesium, ammonium or hydrogen, X and Y have the meanings given above, Z represents an acid radical, the reaction is carried out at 130° to 220° C. and the composition of the reaction mixture and the reaction conditions are selected to produce said Nu-10.

4,900,529

PROCESS FOR MAKING CRYSTALLINE SILICEOUS MATERIALS

Moises G. Sanchez, Severna Park; Charles C. Chang, Columbia; Norman R. Laine, Rockville, and Sandra M. Waters, Ellicott City, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 647,177, Sep. 4, 1984, abandoned, and a continuation of Ser. No. 646,977, Sep. 4, 1984, abandoned. This application Dec. 23, 1985, Ser. No. 812,163

Int. Cl.⁴ C01B *33/28, 33/113*

U.S. Cl. 423—328 **43 Claims**

1. Small crystallites of ZSM-5

(a) having a SiO_2 to Al_2O_3 mole ratio R greater than 5,

(b) having crystallites with their smallest dimension below about 0.3 micrometer,

(c) having a crystallinity of greater than 71% as measured by X-ray diffraction,

(d) having an average unit cell as synthesized and water washed represented by the formula

$$M_{x-y}Si_{96-x}Al_xO_{192}\square_{4-y}\boxed{Q}_y$$

where

$$R = \frac{2(96-x)}{x}$$

x is the average number of Al atoms in the unit cell,

M represents an alkali metal cation,

y is less than 0.8 but greater than zero,

□ represents the intersections of the channels inside the ZSM-5 porous framework free of tetrapropyl ammonium ions, and

Q represents the intersections of the channels inside the ZSM-5 porous framework having occluded tetrapropyl ammonium ions, said crystallites being ion-exchangeable without requiring a preliminary calcination step and without prior removal of the occluded tetrapropyl ammonium ions.

4,900,530

PROCESS FOR THE PRODUCTION OF SILICON TETRAFLUORIDE

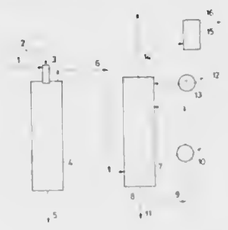
Guido Anania, Gela; Angelo Bianchi, Ravenna; Vito Cultrera, Gela; Francesco Russo, Monza, and Giovanni Spagna, Vittoria, all of Italy, assignors to Enichem Agricoltura S.p.A., Palermo, Italy

Filed Jul. 23, 1987, Ser. No. 76,736

Claims priority, application Italy, Jul. 23, 1986, 21226 A/86

Int. Cl.⁴ C01B *33/08*

U.S. Cl. 423—342 **7 Claims**



4. A process for the preparation of silicon tetrafluoride comprising:

(a) contacting an 8–30% (w/w) aqueous solution of fluorosilicic acid with 90–100% (w/w) of an aqueous solution of sulphuric acid at a contact time of greater than 1 second, in a reaction zone, said reaction zone operating at a temperature of from 90° C. to 120° C. and under a pressure greater than 30 kPa, said contacting resulting in the liberation of a gaseous stream of silicon tetrafluoride;

(b) separating said gaseous stream of silicon tetrafluoride from a liquid stream of a diluted aqueous solution of sulphuric acid produced in a separation zone, said separation zone operating at a temperature of from 70° C. to 120° C. and connected directly with said reaction zone;

(c) washing said gaseous stream of silicon tetrafluoride with cold sulphuric acid having a concentration of at least 96% (w/w), in a washing zone; and

(d) contacting said stream of gaseous silicon tetrafluoride with activated charcoal.

4,900,531

CONVERTING A CARBON PREFORM OBJECT TO A SILICON CARBIDE OBJECT

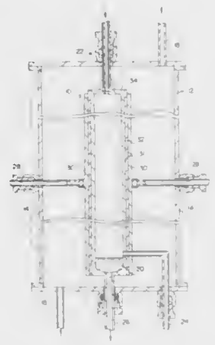
Harry Levin, 19831 Friar St., Woodland Hills, Calif. 91367

Division of Ser. No. 932,029, Nov. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 749,661, Jun. 28, 1985, Pat. No. 4,668,493, and a continuation-in-part of Ser. No. 618,712, Jun. 8, 1984, Pat. No. 4,737,348, which is a division of Ser. No. 390,920, Jun. 22, 1982, abandoned, said Ser. No. 749,661, is a continuation-in-part of Ser. No. 390,920,. This application Feb. 8, 1988, Ser. No. 153,126

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.⁴ C01B *31/36*

U.S. Cl. 423—345 **7 Claims**



1. A process for converting a carbon or graphite object partially or entirely to a silicon carbide object, by contacting said carbon or graphite object with silicon liquid and vapor in a reaction chamber for a selected period of time said process comprising the steps of:

(a) passing a stream of gaseous precursor material through a hole within a high emissivity, thin, insulating septum into said reaction chamber, said gaseous precursor material comprised of silicon-containing material in a gaseous phase below the decomposition temperature of said gas and selected from the group consisting of silane, halosilane, and halosilicon, and accompanying gas that has at least one of the properties of a co-reactant, a carrier and a diluent, said reaction chamber being maintained at a temperature above the melting point of silicon of at least 1412° C., said thin septum having one face below the decomposition temperature of said gas and an opposite face exposed to said reaction chamber, so that said silicon containing gaseous precursor material is decomposed directly to silicon in said reaction chamber;

(b) removing a stream of any decomposition gas, unreacted precursor gas and diluent gas from said reaction chamber;

(c) contacting said carbon or graphite object in said reaction chamber with said silicon liquid for a period of time depending upon temperature, concentration of said gaseous precursor material, flow rate and porosity of said carbon or graphite object to convert said carbon or graphite object partially or entirely to silicon carbide;

(d) controlling the quantity of silicon containing precursor material and co-reactant gas passing into the reaction chamber so that an excess of free silicon can remain, and voids in said object can be filled, thereby forming a non-porous body; and

(e) recovering the resulting converted carbon or graphite object.

4,900,532

CONTINUOUS PROCESS FOR REFINING SILICON

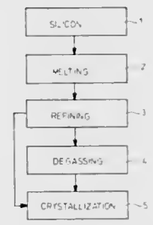
Günter Kurz, Duesseldorf; Ingo Schwirtlich, and Klaus Gebauer, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 9, 1988, Ser. No. 229,984

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1987, 3727646

Int. Cl.⁴ C01B *33/02*

U.S. Cl. 423—348 **11 Claims**



1. In a continuous process for purifying and refining silicon containing impurities,

the improvement comprises continuosuly melting silicon to form a film of silicon melt, continuously treating the silicon melt film with reactive gas comprising steam, silicon tetrahalide, halogen silane, hydrogen chloride, mixtures thereof, or mixtures thereof with hydrogen, then continuously crystallizing the treated silicon melt.

4,900,533

ALKALINE EARTH METAL CARBONATES

Peter J. Malden, Lostwithiel, United Kingdom, assignor to English Clays Lovering Pochin & Company, United Kingdom

Continuation-in-part of Ser. No. 350,235, Feb. 19, 1982, abandoned. This application May 14, 1984, Ser. No. 609,726

Claims priority, application United Kingdom, Feb. 24, 1981, 8105785

Int. Cl.⁴ C01F *5/21, 11/18*

U.S. Cl. 423—430 **6 Claims**

1. In a process for producing a precipitated alkaline earth metal carbonate which process comprises the steps of (a) calcining a raw alkaline earth metal carbonate under conditions such that substantially all the chemically combined carbon dioxide is driven off to form an oxide, (b) slaking the oxide in water to form an aqueous suspension of the corresponding alkaline earth metal hydroxide, (c) carbonating the aqueous suspension of the hydroxide with substantially pure carbon dioxide under conditions which result in the formation of a precipitate of an alkaline earth metal carbonate and (d) separating the precipitate from the aqueous medium, the improvement which comprises allowing the product of step (b) to cool to about 45° C. or below, and then carrying out step (c) at an alkaline pH and in the presence of a dithionite bleaching agent whereby there is obtained a precipitate of an alkaline earth metal carbonate of increased brightness and purity.

4,900,534

PREPARATION OF ANTIPERSPIRANTS

Peter W. Inward, Wirral, United Kingdom, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 5, 1987, Ser. No. 82,024

Claims priority, application United Kingdom, Aug. 11, 1986, 8619553

Int. Cl.⁴ C01B *9/02, 9/04, 9/06*

U.S. Cl. 423—463 **11 Claims**

1. Process of making an aluminium zirconium halohydrate having an aluminium:zirconium molar ratio of from 2:1 to 7:1

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and having a metal:halogen molar ratio of from 0.9:1 to 2.1:1, which process comprises dissolving metallic aluminium in an aqueous starting solution of:

(i) zirconium oxyhalide, zirconium hydroxyhalide, zirconium carbonate or a mixture thereof, and

(ii) aluminium halide or a basic aluminium halide of formula $Al_2\ Hal_x\ (OH)_{6-x}$ where Hal is halogen of chlorine, bromine or iodine and x is from 1 to 6,

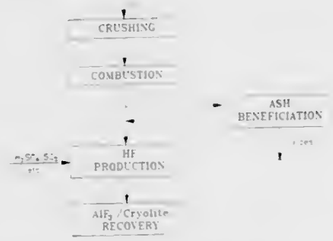
by heating the aqueous starting solution at about 50° C. to about 105° C. for a time just long enough to dissolve sufficient aluminium to produce an aqueous solution of a final aluminium zirconium halohydrate having an aluminium:zirconium molar ratio in the range 2:1 to 7:1 and a metal:halogen molar ratio of from 0.9:1 to 2.1:1, and the concentration of metal (aluminium and zirconium) in the starting solution and the amount of aluminium dissolved being such that the metal concentration in the solution of the final aluminium zirconium halohydrate is from 0.5 to 1.5 moles/kg and said final aluminium zirconium halohydrate having a size exclusion chromatogram of which the Band III proportion is at least 20%.

4,900,535

RECOVERY OF FLUORIDE VALUES FROM WASTE MATERIALS

Christopher G. Goodes; Grant A. Wellwood, both of Mill Park, Australia, and Howard W. Hayden, Jr., Oak Ridge, Tenn., assignors to Comalco Aluminum Limited, Melbourne, Australia

Filed Nov. 18, 1987, Ser. No. 121,956
Claims priority, application Australia, Dec. 22, 1986, PH 9614
Int. Cl.⁴ C01B *7/19, 17/96*
U.S. Cl. 423—484 **15 Claims**



1. Process for recovery of fluoride values from material containing fluoride salts together with combustible components, said process comprising combustion of the said components and sulpholysis of the fluoride salts, characterized in that the material is subjected to combustion in a first step, and the combustion product is subjected to sulpholysis in a separate step, without an intermediate leaching step, wherein the sulpholysis produces a gaseous product containing fluoride values.

4,900,536

PREPARATION OF PRECURSORS FOR YTTRIUM-CONTAINING CERAMIC SUPERCONDUCTORS

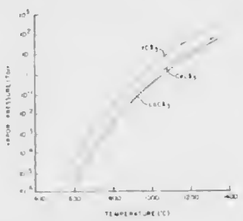
Thomas S. Snyder, Oakmont, and Richard A. Stoltz, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1987, Ser. No. 121,016
Int. Cl.⁴ C01F *17/00*
U.S. Cl. 423—593 **6 Claims**

1. A process for extracting a yttrium component from a rare earth ore, or rare earth ore concentrate, containing rare earth values and using said yttrium component to prepare a composite for use in fabrication of a metal oxide ceramic superconductor containing yttrium oxide, said process comprising:

a. feeding said rare earth ore or ore concentrate to a fluidized bed chlorinator to produce a chloride of said yttrium component and chlorides other rare earths contained in said ore;

b. separating said yttrium chloride by differential condensation from said other rare earth chlorides at 725–1200 C.;



c. anhydrously reacting said separated said yttrium chloride with at least one alkoxide reactant selected from the group consisting of the alkali metal alkoxides to produce yttrium alkoxide and separating said yttrium alkoxide from reaction by-products and excess reagents; and

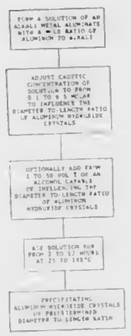
d. mixing said yttrium alkoxide with alkoxides of other non-oxygen constituents of said metal oxide cermic superconductor, thereby producing an alkoxide composite, whereby said composite is useful for fabrication of a metal oxide ceramic superconductor.

4,900,537

CONTROL OF FORM OF CRYSTAL PRECIPITATION OF ALUMINUM HYDROXIDE USING COSOLVENTS AND VARYING CAUSTIC CONCENTRATION

Richard B. Wilhelmy, Apollo, Pa., assignor to Biotage, Inc., Cambridge, Mass.

Filed Dec. 11, 1986, Ser. No. 940,354
Int. Cl.⁴ C01F *7/02, 7/06, 7/14*
U.S. Cl. 423—629 **19 Claims**



1. A process for the control of the crystal form of aluminum hydroxide crystals precipitated from a solution of alkali metal aluminate dissolved in an alkali metal hydroxide which comprises controlling the alkali metal hydroxide concentration of the alkali metal aluminate solution by preselecting an alkali metal hydroxide concentration in a range of from 0.1 to 6.5 molar, whereby crystal forms can be produced which range from principally comprising acicular to principally comprising lamellar form, depending upon said alkali metal hydroxide concentration, said crystals becoming more lamellar in shape when the caustic concentration is increased.

4,900,538

COMPOSITION FOR INCREASING POTENCY OF ADRIAMYCIN OR DAUNOMYCIN AND REDUCING TOXICITIES THEREOF

Yoshibide Suwa; Noriko Kiyota; Hajime Yoshizumi, and Shiro Senoh, all of Osaka, Japan, assignors to Suntory Limited, Osaka, Japan

PCT No. PCT/JP83/00457, § 371 Date Aug. 27, 1984, § 102(e) Date Aug. 27, 1984, PCT Pub. No. WO84/02527, PCT Pub. Date Jul. 5, 1984
PCT Filed Dec. 27, 1983, Ser. No. 70,155
Claims priority, application Japan, Dec. 27, 1982, 57-229322
Int. Cl.⁴ A61K *33/04, 31/70*
U.S. Cl. 424—10 **4 Claims**

1. A pharmaceutical composition comprising an antitumorigenically effective amount of adriamycin or daunomycin, a sulfite compound selected from the groups consisting of sulfite, acid sulfite pyrosulfite, dithionite and sulfurous anhydride and a pharmaceutically acceptable carrier wherein the weight ratio of adriamycin or daunomycin to the sulfite compound is 1:1.8 –100.

4,900,539

RADIOHALOGENATED THIENYLETHYLAMINE DERIVATIVES FOR EVALUATING LOCAL CEREBRAL BLOOD FLOW

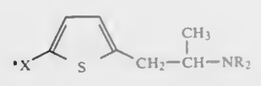
Mark M. Goodman, Knoxville, and Furn F. Knapp, Jr., Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 22, 1988, Ser. No. 288,349
Int. Cl.⁴ A61K *49/02;* **C07D** *333/12*
U.S. Cl. 424—1.1 **12 Claims**



7. A process for radioimaging comprising:

mixing with a suitable administering medium a radiohalogenated thienylmonoamine having the structure



wherein *X is a radiohalogen and R is H or alkyl or aryl;

injecting an effective amount of said mixture into a warm blooded animal;

allowing said mixture to cross the blood-brain barrier; and

recording a radioimage.

4,900,540

LIPISOMES CONTAINING GAS FOR ULTRASOUND DETECTION

Patrick J. Ryan, Worcester; Michael A. Davis, Westwood, and Donald L. Melchior, Framingham, all of Mass., assignors to Trustees of the University of Massachusetts, Amherst, Mass.

Filed Jun. 20, 1983, Ser. No. 505,697
The portion of the term of this patent subsequent to Jan. 1, 2002, has been disclaimed.
Int. Cl.⁴ A61K *49/00;* **G01N** *31/00*
U.S. Cl. 424—9 **3 Claims**

1. Phospholipid liposomes, for use as an ultrasound contrast medium, comprising an outer phospholipid layer and, confined by said layer a gas precursor selected from the group consisting of aqueous sodium bicarbonate and aqueous aminomalonate in an amount effective to form a gas under physiological pH conditions.

4,900,541

SUNSCREEN COMPOSITION

William C. Govier, 16575 Park Lane Dr., Los Angeles, Calif. 90049

Filed May 6, 1988, Ser. No. 191,192
Int. Cl.⁴ A61K *7/021, 7/40, 9/12, 35/14*
U.S. Cl. 424—47 **3 Claims**

1. A sun screen composition comprising an effective amount of at least one activated platelet factor and at least one sun screen agent in a cosmetically acceptable carrier in the form of a cream, lotion, emulsion, oil or film, foam, or mousse.

4,900,542

MANUFACTURING PROCESS FOR MICROCRYSTALLINE EMULSIONS

Umberto V. Parrotta, Jr., Hamilton Township, Mercer County; Gianluigi Soldati, Edison, and Frederick P. Sisbarro, Wayne, all of N.J., assignors to Carter-Wallace Inc., New York, N.Y.

Continuation-in-part of Ser. No. 713,933, Mar. 20, 1985, Pat. No. 4,673,570. This application Jun. 15, 1987, Ser. No. 62,742
Int. Cl.⁴ A61K *7/32, 7/34, 7/38*
U.S. Cl. 424—66 **6 Claims**

1. A process for preparing uniform, clear, microcrystalline emulsion antiperspirant compositions of gel-like consistency comprising:

mixing the antiperspirant active material with water, charging said aqueous phase into an oil-alcohol phase containing a volatile silicone, a silicone emulsifier, a non-volatile emollient and a coupling agent, heating the resultant mixture with agitation until a uniform mixture is obtained, homogenizing said mixture and passing said homoginized mixture to a holding tank or directly to a filter.

4,900,543

CATIONIC POLYMERS AS ANTISTATIC ADDITIVES FOR HAIR PREPARATIONS

Wolfgang Ritter, Hilden; Rolf Tenhaef, Dusseldorf; Horst Hoffkes, Dusseldorf-Hellerhof, and Kurt Seidel, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 667,383, Nov. 1, 1984, abandoned, which is a continuation of Ser. No. 525,972, Aug. 24, 1983, abandoned. This application Jul. 17, 1986, Ser. No. 885,387
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1983, 3305964
Int. Cl.⁴ A61K *7/08*
U.S. Cl. 424—70 **20 Claims**

1. An aqueous hair rinse antistatic composition consisting essentially of: a hair treatment substance and a cationic antistatic agent present in an antistatic effective amount, which agent is an epoxidized, aminated, 1,3-diene salt cationic polymer that is the reaction product of:

(1) a 1,3-diene homopolymer or predominantly 1,3-diene copolymer, having at least 10 1,3-diene units per molecule,

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in which at least 10% of the double bonds present have been epoxidized, and which contains about 3-6% by weight of epoxide oxygen; which has been aminated with (2) amine of the formula $R^1NR^2R^3$ wherein: R^1 is a C_{1-4} alkyl, or a C_{2-4} hydroxyalkyl; and R^2 and R^3 are the same or different and are hydrogen, C_{1-4} alkyl, or a C_{2-4} hydroxyalkyl; or an amine selected from the group consisting of morpholine, piperidine, and piperazine; and converted to a salt by

(3) (a) reacting the aminated epoxidized 1,3-diene polymer with an acid which is a C_{1-7} carboxylic acid or a mineral acid; or (b) alkylating the aminated epoxidized 1,3-diene polymer with 3-chloro-2-hydroxypropyl trimethyl ammonium chloride or with RCl, RBr, or R^2SO_4 wherein R is methyl or ethyl, to form a quarternary ammonium salt; or (c) quaternizing the aminated epoxidized 1,3-diene polymer with ethylene oxide, propylene oxide, glycidol, or glycidyl trimethylammonium chloride; and then further reacting the resulting quaternary ammonium salt with an acid which is a C_{1-7} carboxylic acid or a mineral acid.

4,900,544

CATIONIC POLYMERS AS ANTISTATIC ADDITIVES FOR HAIR PREPARATIONS

Wolfgang Ritter, Hilden; Rolf Tenhaef, Dusseldorf; Horst Hoffkes, Dusseldorf-Hellerhof, and Kurt Seidel, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 665,253, Oct. 26, 1984, abandoned, which is a division of Ser. No. 525,972, Aug. 24, 1983, abandoned. This application Jul. 8, 1986, Ser. No. 883,024

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1983, 3305964

Int. Cl.[4] A61K *7/075*

U.S. Cl. 424—70 **19 Claims**

1. An aqueous shampoo composition for human hair consisting essentially of:

(A) anionic surfactant present in an anionic surfactant effective amount;

(B) amphoteric or zwitterionic surfactant present in an amphoteric or zwitterionic surfactant effective amount; and

(C) cationic antistatic agent present in an antistatic effective amount, which agent is a cationic polymer that is the reaction product from:

(1) a 1,3-diene homopolymer or predominantly 1,3-diene copolymer, having at least 10 1,3-diene units per molecule, in which at least 10% of the double bonds present have been epoxidized and which contains about 3-6% by weight of epoxide oxygen and which has been aminated with

(2) amine selected from the group consisting of morpholine, piperidine, piperazine, and amines of the formula $R^1NR^2R^3$, wherein R^1 is a C_{1-4} alkyl or a C_{2-4} hydroxyalkyl; and R^2 and R^3 are the same or different and are each hydrogen, a C_{1-4} alkyl, or a C_{2-4} hydroxyalkyl; and then converted to a salt by

(3)

(a) reacting the aminated epoxidized 1,3-diene polymer with a C_{1-7} carboxylic acid or a mineral acid; or

(b) alkylating the aminated epoxidized 1,3-diene polymer with 3-chloro-2-hydroxypropyl trimethylammonium chloride, RCl, RBr, or R_2SO_4 wherein R is methyl or ethyl, to form a quaternary ammonium salt; or

(c) quaternizing the aminated epoxidized 1,3-diene polymer with ethylene oxide, propylene oxide, glycidol, or glycidyl trimethylammonium chloride; and then further reacting the resulting product with a C_{1-7} carboxylic acid or a mineral acid.

4,900,545

HAIR SPLIT-END REGENERATION COMPOSITION

Klaus-Dieter Wisotzki, Erkrath; Horst Hoeffkes, Duesseldorf, and Detlef Hollenberg, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 6, 1988, Ser. No. 177,748

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711841

Int. Cl.[4] A61K *7/075, 31/70, 7/08*

U.S. Cl. 424—70 **27 Claims**

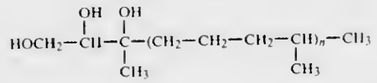
1. A composition for the regeneration of hair split-ends in an aqueous or aqueous/alcoholic, solution or emulsion carrier, consisting essentially of:

(A) panthenol; and

(B) at least one mono- or di-saccharide; the ingredients (A) and (B) being together present minimally in a hair split-end regenerative effective amount; and optionally also consisting essentially of:

(C) at least one polyvinyl pyrrolidone polymer; and/or

(D) at least one triol of the formula:



wherein n is an integer from 1 to 3;

the ingredients (C) and (D), if present, individually being in a hair split-end regenerative enhancing effective amount.

4,900,546

BONE CEMENT FOR SUSTAINED RELEASE OF SUBSTANCES

Jessica D. Posey-Dowty, Bogota; Paul A. Higham, Ringwood; Nestor Arroyo, East Windsor, and Casper F. Stark, Pompton Lakes, all of N.J., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Jul. 30, 1987, Ser. No. 79,627

Int. Cl.[4] A61K *31/74, 31/78;* **A61F** *2/00*

U.S. Cl. 424—81 **7 Claims**

1. A bone cement composition comprising the combination of components A and B wherein:

Component A comprises a powdered polymer or copolymer of an acrylic ester and, component B comprises a liquid monomer of an acrylic ester containing (a) erythromycin or pharmaceutically acceptable salts thereof, an emulsifying agent for erythromycin, or pharmaceutically acceptable salts thereof, whereby the incorporation of erythromycin, or pharmaceutically acceptable salts thereof, is substantially in component B.

4,900,547

METHOD TO IMMUNIZE MAMMALS AGAINST TUMORS

Julia G. Levy, Vancouver; J. Kevin Steele, Victoria, and Anthea T. Stammers, Port Coquitlam, all of Canada, assignors to University of British Columbia, Vancouver, Canada

Filed Oct. 23, 1987, Ser. No. 112,974

Int. Cl.[4] A61K *39/00;* **C07C** *103/52*

U.S. Cl. 424—88 **5 Claims**

1. A method to enhance the nonspecific immune response of a mammal to tumors which comprises administering to a subject in need of such enhancement, at a time prior to exposure to tumors to which response is desired, said time effective to enhance said immune response an amount of a TsF_1 immunoreactive with a specific tumor effective to enhance said immune response,

said administering in the presence of an amount of an adjuvant effective to enhance said immune response.

4,900,548

USE OF DIETHYLCARBAMAZINE TO ENHANCE ANTIGEN-ANTIBODY AND ANTIGEN-HOST IMMUNE CELL INTERACTIONS

Lynn W. Kitcher, New Orleans, La., assignor to Harvard University, Cambridge, Mass.

Filed Nov. 13, 1987, Ser. No. 120,561

Int. Cl.[4] A61K *39/02, 45/02;* **G01N** *33/531*

U.S. Cl. 424—88 **40 Claims**

1. A method for treatment of viral infection which comprises administering to a host in need of such treatment an effective amount of diethylcarbamazine, or its therapeutically useful homologs, or pharmaceutically acceptable salts.

4,900,549

PROCESS FOR PREPARING IMMUNOGENIC COMPLEXES AND PHARMACEUTICAL COMPOSITION CONTAINING THESE COMPLEXES

Petra De Vries, Almere; Antonius L. van Wezel, deceased, late of Bilthoven (by Cornelia M. van Wezel-Berendse, administratrix), and Eduard C. Beuvery, Vianen, all of Netherlands, assignors to De Staat der Nederlanden Vertegenwoordigd door de Minister van Welzion, Volksgezondheid en Cultuur, Leidschendam, Netherlands

Filed Jan. 14, 1987, Ser. No. 3,070

Claims priority, application Netherlands, Jan. 14, 1986, 8600066

Int. Cl.[4] A61K *9/66, 9/64, 37/22, 39/39*

U.S. Cl. 424—88 **15 Claims**

1. A method for preparing immunogenic complexes in the form of particles having an average diameter of about 35 nm and a three-dimensional cage structure comprising

(a) mixing an immunogenically effective amount of an amphipathic antigenic protein or peptide with a solution comprising a detergent, a glycoside, and a lipid component consisting essentially of a sterol and a phospholipid whereby a protein complex is formed, said lipid component being present in an amount by weight at least 2.5 times greater than the amount of protein, said glycoside having both hydrophobic and hydrophilic regions and being present in at least the critical micelle forming concentration, and said glycoside and said lipid component being present in relative amounts effective to produce three dimensional cage particles of 35 nm diameter; and

(b) removing the detergent from the resulting protein.

4,900,550

SKIN CARE COSMETIC REGIME

Edwina A. Lowry, Ada, Okla., assignor to Amy Allene Cosmetiques, Inc., Ada, Okla.

Filed Aug. 19, 1987, Ser. No. 87,108

Int. Cl.[4] A61K *35/78, 31/355, 31/23*

U.S. Cl. 424—195.1 **8 Claims**

1. A method of accelerating cell renewal cycles of skin without causing irritation which comprises sequentially applying to the skin in a regime:

(a) initially, and in a first application step, a softener component consisting essentially of, in weight percent:

Ingredients	Percentage
Aloe Concentrate	8.75–10.50
Propyl p-Hydroxybenzoate	0.09–0.11
Trotopet	75.00–80.00
Octyl Palmitate	2.20–3.30
Safflower Oil	0.90–1.30
Cetyl Alcohol	2.25–2.75
Glyceryl Stearate & PEG 100 Stearate	3.00
Soluble Collagen	0.40–0.55
Methyl p-Hydroxybenzoate	0.09–0.11
Squalene	1.35–1.65
Jojoba Oil	0.18–0.22

-continued

Ingredients	Percentage
Vitamin E	0.04–0.06
Vitamin A & D	0.04–0.06
Colorant	qs
Fragrance	0.01–0.03;

(b) second, and in a second application step, a cell penetrating component consisting essentially of, in weight percent:

Ingredients	Percentage
Water	0.45–0.55
Aloe Concentrate	50.00–62.00
Triethanolamine	0.70
Propylene Glycol	2.70–3.30
Polysorbate 80	0.50
Tetrasodium Ethylenediaminetetra acetate	0.09–0.11
Lanolin	4.50–5.50
Stearic Acid	3.00
Isopropyl Palmitate	1.80–2.20
Glyceryl Sterate	1.50
Cetyl Alcohol	0.45–0.55
Safflower Oil	2.45–3.00
Methyl p-Hydroxybenzoate	0.18–0.22
Propyl p-Hydroxbenzoate	0.09–0.11
Cetyl Lactate	0.40–0.55
Sweet Almond Oil	0.09–0.11
Sunflower Oil	0.09–0.11
Apricot Kernel Oil	0.09–0.11
Sodium Pyroglutamic Carboxylic Acid	0.45–0.55
Vitamin E	0.04–0.06
Allantoin	0.04–0.06
Carbopol 1.5% Collagen	0.18–0.22
Elastin	0.09–0.11
Hydrolyzed Mucopolysaccharides	0.09–0.11
Hyaluronic Acid	0.09–0.11
Colorant	qs
Fragrance	0.01–0.10; and

(c) third, and as a third application step, a nourishment and protectant component consisting essentially of, in weight percent:

Ingredients	Percentage
50% Aloe Vera Solution	57.00–60.00
Methyl p-Hydroxybenzoate	0.18–0.22
Iniduzolidinyl Urea	0.18–0.22
Propyl p-Hydroxybenzoate	0.09–0.11
Stearic Acid	10.00
Propylene Glycol	15.25–16.00
Safflower Oil	4.00–4.50
Homo Salicylate	3.00
Apricot Kernel Oil	0.10–0.50
70% Sorbitol Solution	3.45–4.20
Ceteth-4	2.00
White Protepet	0.18–0.22
Wheat Germ Oil	0.09–0.11
Jojoba Oil	0.01–0.03
Panthenol (vitamin F)	0.04–0.06
Vitamin A & D	0.01–0.02
Vitamin E	0.01–0.02
Triethanolamine 85%	.76
Fragrance	0.02–0.10
Cetyl Lactate	0.09–1.01
Sodium Pyroglutamic Carboxylic Acid	0.40–0.60
Hydrolyzed Mucopolysaccharides	0.09–0.11
Hyaluronic Acid	0.05–0.10
Hydrolastin	0.40–0.55

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-continued

Ingredients	Percentage
Liquid Collagen	0.45–0.55
Colorant.	

4,900,551

METHOD FOR PREVENTING TERMITES AND MICROENCAPSULATED ORGANOPHOSPHORUS TERMITE CONTROLLING COMPOSITION

Toshiro Ohtsubo, Osaka; Shigenori Tsuda, Kyoto; Yukio Manabe, Osaka; Takaaki Itoh, Hyogo; Hitoshi Kawada; Goro Shinjo, both of Osaka, and Kozo Tsuji, Nara, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 1,113, Jan. 7, 1987, abandoned. This application Mar. 10, 1988, Ser. No. 166,346
Claims priority, application Japan, Jan. 7, 1986, 61-1912; Feb. 17, 1986, 61-32647
Int. Cl.[4] A01N *25/28, 57/14;* B01J *13/02*
U.S. Cl. 424—408 9 Claims

1. A method for preventing termites by applying 5–100 g of at least one organophosphorus insecticidal compound per m^2 to a soil surface under a floor of a building, a foundation, etc., at least one of said compounds being encapsulated in a microcapsule having a polyurethane or polyurea wall, said microcapsule having an average particle diameter of not more than 80μm, a wall thickness of 0.1–1 μm, and a value of the average particle diameter/wall thickness of 20–400.

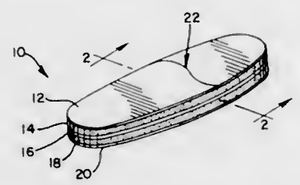
6. A microencapsulated organophosphorus termite controlling composition comprising at least one of organophosphorus insecticidal compounds encapsulated in a microcapsule formed of a polyurea or polyurethane wall which has an average particle diameter of not more than 80 μm, a wall thickness of 0.1–1 μm, and a value of the average particle diameter/wall thickness of 20–400.

4,900,552

MUCOADHESIVE BUCCAL DOSAGE FORMS

Dilip R. Sanvordeker, Irvine, and Sau-Hung S. Leung, Corona, both of Calif., assignors to Watson Laboratories, Inc., Corona, Calif.

Filed Mar. 30, 1988, Ser. No. 175,075
Int. Cl.[4] A61F *7/02*
U.S. Cl. 424—422 10 Claims



1. A buccal dosage form suitable for delivery of an active ingredient in a buccal cavity and comprising:
a hydratable mucoadhesive base layer;
a non-adhesive reservoir layer; and
a water-impermeable barrier sandwiched between and bonded to said base layer and said reservoir layer;
said reservoir layer comprising a plasticized filmforming cellulose ester, a dehydrated hydrogel and said active ingredient to be dispersed directly into the buccal cavity; and
said water-impermeable barrier comprising a cellulose ester film.

4,900,553

METHOD OF REDUCING GLIAL SCAR FORMATION AND PROMOTING AXON AND BLOOD VESSEL GROWTH AND/OR REGENERATION THROUGH THE USE OF ACTIVATED IMMATURE ASTROCYTES

Jerry Silver, Lyndhurst; George M. Smith, Cleveland, and James W. Jacobberger, Chesterland, all of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed Sep. 11, 1987, Ser. No. 96,373
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—422 57 Claims

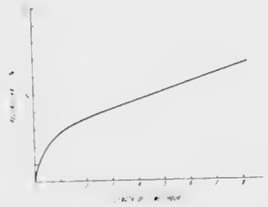
1. A method for promoting directed axon regeneration which comprises the steps of:
(a) providing activated immature astrocytes;
(b) seeding an effective amount of said activated immature astrocytes on to an implant; and,
(c) inserting said seeded implant near the ends of damaged axons to promote directed axon regeneration.

4,900,554

ADHESIVE DEVICE FOR APPLICATION TO BODY TISSUE

Norio Yanagibashi, Tokyo; Setsuo Iwasaki, Saitama; Takafumi Mizobuchi, Kagawa; Ryoji Konishi, Kagawa; Tatsuya Konishi, Kagawa, and Takahiko Wato, Kagawa, all of Japan, assignors to Teikoku Seiyaku Co., Ltd., Kagawa, Japan

Filed Dec. 23, 1987, Ser. No. 137,034
Claims priority, application Japan, Dec. 24, 1986, 61-310993
Int. Cl.[4] A61F *13/02*
U.S. Cl. 424—448 12 Claims



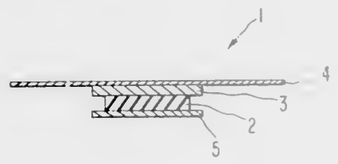
1. An oral cavity adhesive device for application to a mucous membrane or oral cavity tissue of an individual, comprising:
an adhesive layer including a mixture of at least one acrylic acid polymer, a water-insoluble cellulose derivative, and a pharmaceutical preparation, said adhesive layer having an adhesive surface adherable to a mucous membrane or oral cavity tissue; and
a water-insoluble or sparingly water-soluble backing layer secured over said adhesive layer on a side opposite the adhesive surface;
wherein said acrylic acid polymer exhibits adhesiveness upon dissolution or swelling when applied to the mucous membrane or oral cavity tissue, and wherein the weight ratio of acrylic acid polymer to water-insoluble cellulose derivative is within a range which provides sustained adhesiveness of the adhesive layer with substantially no foreign body sensation.

4,900,555

SKIN PERMEATION ENHANCER COMPOSITIONS USING SUCROSE ESTERS

Yu-Ling Cheng, Cupertino; Robert M. Gale, Los Altos; Edna Sugihara, Mountain View, and Harold F. Sanders, San Jose, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 19,442, Feb. 26, 1987, Pat. No. 4,865,848.
This application Oct. 13, 1988, Ser. No. 257,481
Int. Cl.[4] A61F *13/02*
U.S. Cl. 424—449 6 Claims



1. A device for the transdermal administration of a biologically active agent comprising, in combination:
(a) a composition comprising a biologically active agent and a skin permeation enhancing amount of a material selected from the group consisting of sucrose monolaurate and mixtures of sucrose esters of coconut fatty acids which are predominantly sucrose monolaurate;
(b) an occlusive backing behind the skin distal surface of said composition; and
(c) means for maintaining said composition in agent and said material transferring relationship to intact skin.

4,900,556

SYSTEM FOR DELAYED AND PULSED RELEASE OF BIOLOGICALLY ACTIVE SUBSTANCES

Margaret A. Wheatley, Arlington; Robert S. Langer, Somerville, and Herman N. Eisen, Waban, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 727,802, Apr. 26, 1985, abandoned.
This application Feb. 23, 1988, Ser. No. 161,198
Int. Cl.[4] A61K *37/22*
U.S. Cl. 424—450 24 Claims

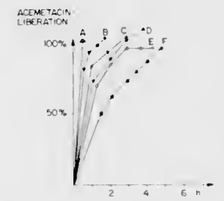
1. A microencapsulated system for controlled release of entrapped biologically active substances prepared by the process comprising:
entrapping a first substance within liposomes, wherein the liposomes have a predetermined rigidity, permeability, stability, and sensitivity to specific stimuli,
encapsulating the liposomes within microcapsules permeable to solutions and the substance to be released but impermeable to scavenging components of the reticuloendothelial system, having a predetermined diameter, rigidity, stability, and being non toxic to the encapsulated liposomes and host if implanted, wherein the substance in the liposomes is released by exposure of the encapsulated liposomes to a specific stimulus selected from the group consisting of pH, sonication, temperature, high ionic strength solutions, bivalent metals, detergents, phospholipases, and light.

4,900,557

PELLET FORMULATION

Hans-Dieter Dell, Bergisch-Gladbach; Reinhold Kraus, Koeln, and Detlef Schierstedt, Augustin, all of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co. KG, Koeln, Fed. Rep. of Germany

Continuation of Ser. No. 919,744, Oct. 16, 1986, abandoned, which is a division of Ser. No. 765,907, Aug. 14, 1985, abandoned. This application Dec. 19, 1988, Ser. No. 286,421
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431861
Int. Cl.[4] A61K *9/22, 9/52*
U.S. Cl. 424—452 7 Claims



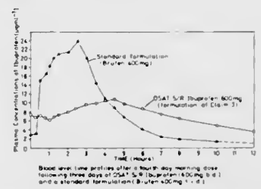
1. A sustained release formulation comprising pellets
(a) containing acemetacin and at least, one binder, one weighting agent and one disintegrant,
(b) coated with a lacquer which is resistant to gastric juice or granulated in the presence of a lacquer which is resistant to gastric juice, and
(c) having an apparent density of 1.4 to 2.4 and having a diameter of 0.2 to 1.8 mm and an initial dose of acemetacin which comprises 10 to 60% by weight, based on the total weight of the acemetacin of the pellet in free form.

4,900,558

SUSTAINED RELEASE IBUPROFEN FORMULATION INCLUDING A CORE OF IBUPROFEN AND A MICROCRYSTALLINE CELLULOSE AND A COVERING OF ACRYLIC POLYMER AND HYDROXYLATED CELLULOSE DERIVATIVE

Brian W. Barry, Guiseley; Bryan A. Mulley, Bradford, and Peter York, Ilkley, all of United Kingdom, assignors to APS Research Limited, Cleckheaton, United Kingdom

Filed Jul. 30, 1987, Ser. No. 79,206
Claims priority, application United Kingdom, Aug. 1, 1986, 8618811
Int. Cl.[4] A61K *9/16, 9/24*
U.S. Cl. 424—461 10 Claims



1. A sustained release α-methyl-4-(2-methylpropyl)benzene acetic acid (Ibuprofen) formulation comprising sufficient granules to provide a dose or number of doses of Ibuprofen, each granule having a diameter between 0.5 and 2.0 mm and comprising:
(a) a core containing 100 parts of Ibuprofen and from 10 to 70 parts of a microcrystalline cellulose; and
(b) a coating covering substantially the whole surface of the core and comprising 100 parts of a water insoluble but

water swellable acrylic polymer and 20 to 70 parts of a water-soluble hydroxylated cellulose derivative, the weight of the coating being from 5 to 20% of the weight of the core.

4,900,559

STABILIZED ENTERIC COATED ASPIRIN GRANULES AND PROCESS OF PREPARATION

Mahesh K. Patell, Edison, N.J., assignor to Briston-Myers Company, New York, N.Y.

Continuation of Ser. No. 808,403, Dec. 12, 1985, abandoned. This application Aug. 29, 1988, Ser. No. 237,654

Int. Cl.[4] A61K *9/26*

U.S. Cl. 424—470 **11 Claims**

1. A unit dosage form consisting essentially of enteric coated aspirin granules commingled with an amount of glutamic acid hydrochloride powder sufficient to reduce hydrolysis of the aspirin in the enteric coated granules, wherein the glutamic acid hydrochloride is present in an amount of from about 1% to about 5% by weight, based on the total weight of the enteric coated aspirin granules, wherein the aspirin granules are enteric coated with an enteric material selected from the group consisting of polyvinyl acetate phthalate, ethyl cellulose, cellulose acetate phthalate, hydroxypropyl methylcellulose phthalate, copolymers of methacrylic acid and acrylic acid esters, and mixtures thereof.

4,900,560

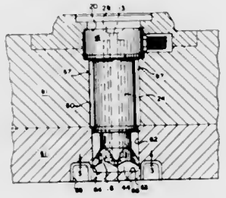
MULTI-GATE MOLDING HEATER ASSEMBLY

Panos Trakas, 21 W. Wrightwood, Glendale Heights, Ill. 60139

Filed Mar. 1, 1989, Ser. No. 317,614

Int. Cl.[4] B29C *45/20*

U.S. Cl. 425—549 **9 Claims**



1. An injection molding heater assembly for heating melt which is injected into a mold bore having a plurality of mold gates leading to a plurality of mold cavities, the heater assembly comprising:

an elongated heated member providing a heated passage for the flow of melt to said plurality of mold gates, the heated member having a body portion extending between an inlet end and a discharge end of the heated member, the body portion being dimensioned to extend within the mold bore and,

the discharge end of the heated member having an enlarged portion positioned in melt flow communication with said plurality of mold gates for directing the flow of melt into said plurality of mold gates, said enlarged portion having a plurality of melt flow directing members extending from a nozzle face disposed on said enlarged portion and having gate tips thereon, the gate tips corresponding in number to the plurality of multiple mold gates in said mold bore, said melt flow directing members being peripherally disposed on said enlarged portion of the discharge end of said heated member and extending radially downwardly and outwardly therefrom, each of said gate tips having an outer wall which is dimensioned to be closely spaced to said mold gates when said heater asesmbly is inserted into said mold bore, each of said gate tips further having an arcuate inner wall extending from said enlarged portion to define a recess between said gate tips and said mold bore for accumulation of injected melt therein, whereby the accumulated melt solidifies and forms an insulating layer between the discharge end of said heated member and said mold bore to minimize heat loss from the injected melt to said mold bore.

4,900,561

COPPER COMPLEXES OF ALPHA-AMINO ACIDS THAT CONTAIN TERMINAL AMINO GROUPS, AND THEIR USE AS NUTRITIONAL SUPPLEMENTS

Mahmoud M. Abdel-Monem, Moscow, Id., and Michael D. Anderson, Minnetonka, Minn., assignors to Zinpro Corporation, Bloomington, Minn.

Filed Jan. 3, 1989, Ser. No. 293,225

Int. Cl.[4] A23L *1/304*

U.S. Cl. 426—2 **7 Claims**

1.

In solid form, copper complex salts of the formula:

wherein "n" is from 1 to 5, and "Z" is an inorganic anion and "Y" is the number required to electrostatically balance the salt.

4,900,562

FEED INTAKE LIMITING COMPOSITION COMPRISING CALCIUM HYDROXIDE FOR CATTLE

Bill L. Miller, Fort Dodge, Iowa, assignor to Cooperative Research Farms, Charlottesville, N.Y.

Filed Jul. 11, 1988, Ser. No. 216,968

Int. Cl.[4] A23K *1/00*

U.S. Cl. 426—2 **13 Claims**

1. A method of self-feeding animals a feed supplement consisting essentially of:

feeding the animals calcium hydroxide with a feed supplement in meal form in an amount that is effective in limiting intake of the feed supplement.

4,900,563

FRUCTOSE SWEETENED CHEWING GUM COMPOSITIONS

Subraman R. Cherukuri, Towaco, and Krishna P. Raman, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 29, 1988, Ser. No. 291,708

Int. Cl.[4] A23G *3/30*

U.S. Cl. 426—5 **15 Claims**

1. An anhydrous chewing gum composition comprising:

soft PVA gum base in an amount from about 5% to about 75% by weight of said composition;

powdered fructose having a particle size capable of passing through a 70 mesh screen, in an amount from about 25% to about 75% by weight of said composition; and

one or more flavoring agents.

4,900,564

STABILIZATION OF WINE WITH HONEY AND SO_2

Chang Y. Lee, Ithaca, and Robert W. Kime, Romulus, botb of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 68,596, Jul. 1, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 287,550

Int. Cl.[4] C12G *1/00*

U.S. Cl. 426—15 **5 Claims**

1. In a process for making wine from grapes comprising crushing the grapes, cold pressing, adding active yeast culture and fermenting, the improvement comprising adding both honey and SO_2 in a total amount effective to inhibit browning discoloration, said honey being added before or during fermentation, said SO_2 being added in an amount less than 50 ppm.

4,900,565

WATER-SOLUBLE EXTRACT WITH BREAD-LIKE FLAVOR

Gerhard Spies, Ludwigsburg, Fed. Rep. of Germany, assignor to Nestec S.A., Vevey, Switzerland

Filed Sep. 21, 1987, Ser. No. 99,089

Claims priority, application Switzerland, Oct. 7, 1986, 4003/86

Int. Cl.[4] A23L *2/26*

U.S. Cl. 426—28 **14 Claims**

1. A process for preparing a product having a bread-like flavor comprising:

baking bread;

size reducing the baked bread;

mixing water with the size-reduced baked bread for preparing an aqueous mash;

adding to the aqueous mash at least one enzyme selected from the group consisting of alpha-amylase and beta-glucanase and enzymatically treating the aqueous mash for up to 30 minutes, said at least one enzyme being present in an amount effective to liquefy the bread of the aqueous mash;

subjecting the enzymatically-treated aqueous liquefied bread to slurry extraction for inactivating the enzymes and for transferring water-soluble aromatic and flavoring substances of the bread to the aqueous phase of the slurry-extracted liquefied bread;

steam distilling the aqueous slurry-extracted liquefied bread to obtain a distillate and a steam-distilled extract containing undissolved solids residue;

separating the steam-distilled extract from the residue;

concentrating the separated steam-distilled extract by evaporation;

mixing the distillate with the concentrated extract; and

drying the mixture to obtain the product.

4,900,566

CONFECTIONARY PRODUCT AND A PROCESS FOR PRODUCING THE SAME

Alan N. Howard, Cambridge, England, assignor to The Howard Foundation, Leeds, England

Continuation of Ser. No. 12,511, Feb. 9, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 277,438

Claims priority, application United Kingdom, Feb. 8, 1986, 8603171

Int. Cl.[4] A23L *3/08*

U.S. Cl. 426—72 **13 Claims**

1. A smooth and chewy, low calorie confectionery bar comprising:

fat;

proteinaceous material; and

carbohydrate material including digestible carbohydrate and indigestible carbohydrate, said indigestible carbohydrate being polydextroxe or maltitol, said proteinaceous material and said carbohydrate material being present in a weight ratio of from about 1:1 to about 1:10.

4,900,567

PROCESS FOR PREPARING A CEREAL

Arvid D. King, Lakeville, Minn., assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 23,568, Mar. 9, 1987. This application Jan. 11, 1989, Ser. No. 295,851

Int. Cl.[4] A23L *1/08, 1/182*

U.S. Cl. 426—93 **10 Claims**

1. A process for preparing a non-sticky, free-flowing grain cereal impregnated with honey, comprising:

coating a quantity of starch-containing grain cereal containing from about 4 to about 5% moisture with honey up to the maximum amount of honey that will be absorbed by said grain cereal to make an enrobed intermediate;

drying the enrobed intermediate at a temperature from about 255° to about 26520 F. for about 5 to about 7 minutes while blowing air over said enrobed intermediate at from about 3 to about 5 cubic feet per minute to make an impregnated intermediate; and

cooling said impregnated intermediate.

4,900,568

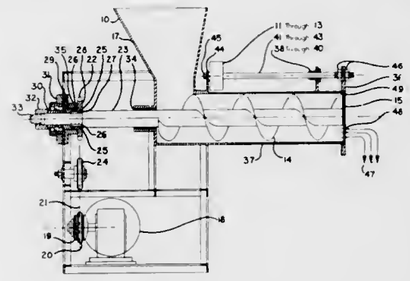
PROCESS AND APPARATUS FOR EXTRUSION UTILIZING FORCE MEASUREMENT MEANS

Michael F. Kozempel, Hatfield, and Wolfgang K. Heiland, Trevose, botb of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 6, 1988, Ser. No. 240,304

Int. Cl.[4] A23P *1/12;* **G01N** *33/02*

U.S. Cl. 426—231 **31 Claims**



16. A process comprising,

providing a housing,

providing choke means cooperating with said housing to provide restriction to passage of material from said housing,

conveying material through at least a portion of said housing and to said choke means, and

measuring the magnitude of force applied to said choke means by passage of material through said restriction.

31. The process of claim **16** wherein said material is potatoes.

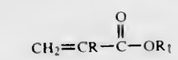
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4,900,569
TERPOLYMERS OF ALKYL ACRYLATES OR METHACRYLATES, AN OLEFINICALLY UNSATURATED HOMO OR HETEROCYCLIC-NITROGEN COMPOUND AND AN ALLYL ACRYLATE OR METHACRYLATE OR PERFLUOROALKYL ETHYL ACRYLATES OR METHACRYLATES

Hanh T. Le, Wilmington, Del., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 31, 1988, Ser. No. 265,602
Int. Cl.[4] C08F *18/20*
U.S. Cl. 526—245 **21 Claims**

1. An alkyl ester of unsaturated monocarboxylic acid, an olefinically unsaturated homo or heterocrycylic-nitrogen compound and allyl acrylate or methacrylate or a perfluoroalkyl ethyl acrylate or methacrylate terpolymer having pour point depressant properties, said terpolymer comprising the reaction product of (a) a monomeric alkyl ester of carboxylic acid or a mixture of alkyl esters of carboxylic acid having the formula:



wherein R is H or CH_3 and R_1 is alkyl having from about 1 to about 30 carbon atoms; (b) vinyl pyridine; and (c) allyl acrylate or methacrylate or a perfluoroalkyl ethyl acrylate or methacrylate or a mixture of perfluoroalkyl ethyl acrylates or methacrylates, said perfluoroalkyl ethyl acrylates or methacrylates having the formula:

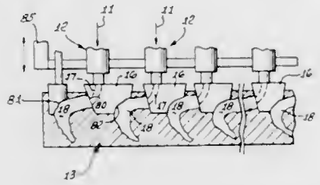


wherein R_2 is H or CH_3, and K is an integer of from about 1 to about 20.

4,900,570
SHRIMP FORMING PROCESS

Hiro Matsubara, Monterey Park, Calif., assignor to JAC Creative Foods, Inc., Los Angeles, Calif.

Filed Jun. 20, 1988, Ser. No. 208,592
Int. Cl.[4] A23L *1/27, 1/325;* A23P *1/00*
U.S. Cl. 426—250 **25 Claims**



1. The process of forming an imitation crustacean product in the of a shrimp having a curved back portion and an end portion toward which said curved back portion extends, and using a shrimp paste mix, said process including the steps

(a) providing a mold having at least two cavities therein, each cavity shaped in the form of said shrimp product, each cavity having a first opening adjacent to the shrimp end portion, and a second opening adjacent to the shrimp curved back portion,

(b) injecting the shrimp paste mix into both cavities via said first openings while maintaining said second openings closed,

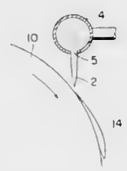
(c) and gaining access to the curved back portion of the shrimp paste mix in the cavities, via said second openings, and forming simulated vein grooves in each curved back portion, in response to said injecting of the shrimp paste into both cavities.

(d) the process including providing nozzle bodies which have portings, and displacing said nozzle bodies into position in the mold and carrying out said paste mix injecting through said portings, and simultaneously utilizing said nozzle bodies to effect said closing of the second openings and said forming of the simulated vein grooves.

4,900,571
PROCESS FOR PRODUCING A SHARK FIN ANALOG

Youichi Kammuri, Tokyo; Eizoh Nagahisa, Sagamihara, and Sumio Kamikawa, Tokyo, all of Japan, assignors to Nippon Suisan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 918,657, Oct. 14, 1986, abandoned, which is a continuation of Ser. No. 814,180, Dec. 24, 1985, abandoned, which is a continuation of Ser. No. 571,529, Jan. 17, 1984, abandoned. This application Jun. 8, 1988, Ser. No. 204,970
Claims priority, application Japan, Jan. 28, 1983, 58-12243
Int. Cl.[4] A23J *3/00;* A23L *1/325;* A23P *1/12*
U.S. Cl. 426—276 **9 Claims**



1. A process for producing a shark fin analog, which comprises heating a starting material mixture comprising (a) 5-50% of gelatin, (b) 1-10% of alginic acid, an alginate or a mannan, and (c) water, based on the weight of the starting material mixture, to produce a gelatin sol, extruding the gelatin sol through a spinneret having an orifice of approximately 0.5 to 5.0 mm in diameter, dropping the extruded sol onto a descending portion of a surface of a roller rotating at a rotation speed of 100 to 200 rpm and wetted with a coagulating solution comprising a divalent or trivalent metal salt, thereby to elongate and tear off the sol under rotational action of said roller and form the sol into a piece of a streamlined profile in cross-section with one end being relatively thick and pointed at its leading tip and the other end being relatively slenderly extended as a tail, further immersing the sol in the coagulating solution, and wasing the resultant product with water.

4,900,572
MULTI-ORIFICE COEXTRUSION METHOD

Kenneth M. Repholz, Crystal Lake, and Pradeep G. Kanade, Algonquin, both of Ill., assignors to Quaker Oats Company, Chicago, Ill.

Filed Aug. 28, 1987, Ser. No. 90,699
Int. Cl.[4] A23P *1/12;* A23K *1/00*
U.S. Cl. 426—282 **15 Claims**

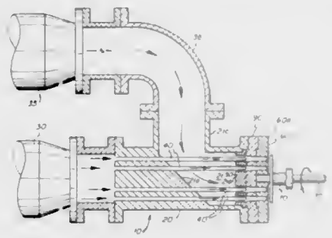
1. A method of producing a center-filled food product with a coextrusion apparatus comprising:

a plurality of tubes;

a manifold including a chamber through which said plurality of tubes extend and a port for introduction of material into the chamber and around said plurality of tubes; and

a first spacer plate mounted on said manifold which comprises a plurality of spacer passages, each having an inner diameter greater than the outer diameter of each of said plurality of tubes, wherein one of said plurality of tubes is positioned within each of said plurality of spacer passages to form an annulus between each tube and its respective spacer passage, said method comprising:

extruding a first food material through each of said plurality of tubes and beyond its respective spacer passage; and



extruding a second food material through the manifold port, into the chamber, around said plurality of tubes, through the annuli, and beyond the spacer passages, wherein the annuli are configured so that the second food material discharged from them flows coaxial with and around the first food material in a circumferentially uniform fashion.

perature, said caseinate being added in an amount constituting from 10 to 40 percent by weight of the liquor/caseinate mixture on a dry weight basis, the liquor/caseinate mixture having a pH of from 5 to 6.5 and being allowed to adjust to a temperature at which in the absence of the caseinate tea cream would otherwise have formed, and concentrating the liquor/caseinate mixture to a liquor of higher solids content.

27. A method of producing a liquid concentration or dry tea product, which comprises

forming a tea liquor by extraction of leaf tea with water,

allowing said liquor to adjust to a temperature sufficiently low to result in the formation of tea cream,

adding a water-soluble caseinate to the liquor after tea cream formation, the caseinate being added in an amount constituting from 5 to 50% by weight of the liquor/caseinate mixture on a dry weight basis and in an amount sufficient to provide a solution which is substantially clear at room temperature,

the liquor/caseinate mixture having a pH of from 4.5 to 7.5, and

concentrating the liquor/caseinate mixture to a liquor of higher solids content.

4,900,573
METHOD OF INHIBITING OIL ADSORPTION IN COATED FRIED FOODS USING HYDROXYPROPYL METHYL CELLULOSE

Marc A. Meyers, and Jerry R. Conklin, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 17, 1988, Ser. No. 208,956
Int. Cl.[4] A23B *4/10*
U.S. Cl. 426—302 **11 Claims**

1. A method of inhibiting oil absorption of a food product which comprises, coating the food product with a wet batter composition which contains an essentially prehydrated form of hydroxypropyl methylcellulose that has a methoxyl substitution of about 27 to about 30 percent and a hydroxypropyl substitution of about 4 to about 12 percent in an amount sufficient to inhibit oil adsorption by the food product upon frying.

4,900,574
SOLUBLE OR DISSOLVED TEA PRODUCT

Karen C. Smallwood, Dulcote, and William J. Adams, Basingstoke, both of England, assignors to Mars G.B. Limited, London, United Kingdom

Continuation of Ser. No. 154,441, Feb. 8, 1988, abandoned, which is a continuation of Ser. No. 812,120, Dec. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 784,701, Oct. 4, 1985, abandoned, which is a cootinuation of Ser. No. 634,811, Jul. 26, 1984, abandoned. This application Feb. 21, 1989, Ser. No. 317,054
Claims priority, application United Kingdom, Jul. 29, 1983, 8320580; Dec. 21, 1984, 8432509
Int. Cl.[4] A23F *3/14*
U.S. Cl. 426—330.3 **28 Claims**

1. A liquid concentrate or solid tea product which consists essentially of the solids contents of a tea liquor which is formed by extraction of leaf tea with water and contains the components forming tea cream in an amount sufficient for the formation thereof, and water-soluble caseinate to inhibit tea cream formation sufficiently to provide a solution which is substantially clear at room temperature, the pH of said liquor/caseinate mixture being from 5 to 6.5 and the amount of caseinate constituting from 10 to 40 percent by weight of the liquor/caseinate mixture on a dry weight basis.

7. A method of producing a soluble or a dissolved tea product, which consists essentially of forming a tea liquor by extraction of leaf tea with water, adding a water-soluble caseinate to provide a solution which is substantially clear at room tem-

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4,900,575
AROMA RECOVERY FROM THE THERMAL HYDROLYSIS OF SPENT GROUNDS

Kenneth W. Cale, Marlboro, N.J.; Naoto Imura, Yokkaichi, Japan; George A. Jasovsky, Bayonne, N.J., and Saul N. Katz, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 17, 1989, Ser. No. 339,290
Int. Cl.[4] A23F *5/16, 5/48*
U.S. Cl. 426—387 **12 Claims**

1. A process for the recovery of aromatic components from an aroma stream generated by thermal hydrolysis of a partially extracted roasted and ground coffee which comprises:

passing the aroma stream as a condensate over a bed of non-polar microporous adsorbent, and

collecting the effluent until breakthrough of furfural occurs.

4,900,576
PROCESS FOR PREPARING PARFRIED AND FROZEN POTATO PRODUCTS

John H. Bonnett, 868 Rimview La. E.; Thomas H. Cromwell, 109 Brooklane W., and Rick Norton, 609 Buchanan St., all of Twin Falls, Id. 83301, assignors to Universal Foods Corporation, Milwaukee, Wis.

Filed Nov. 4, 1988, Ser. No. 267,255
Int. Cl.[4] A23L *1/217*
U.S. Cl. 426—438 **17 Claims**

1. A process for parfrying and freezing potato strips for subsequent microwave reconstitution or finish frying, prior to consumption, comprising the steps of:

a. parfrying the potato strips a first time in hot oil;

b. first freezing the once-parfried potato strips below 32° F.;

c. thawing the once-parfried, frozen potato strips to a temperature above 32° F.;

d. parfrying the thawed potato strips a second time in hot oil at a temperature of about 360° F. to about 385° F. for a period of about 150 seconds to about 240 seconds; and

e. finally freezing and storing the twice-fried potato strips.

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4,900,577

LEAVENING COMPOSITION FOR CRACKERS

Henry E. Arciszewski, Franklin Lakes; Linda A. Porzio, Kinnelon; Bin Y. Chiang, Cedar Knolls; Clyde E. Spotts, Jr., Ridgewood; Kevin McHugh, Oakland, and Joseph A. Szwerc, Mahwah, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Continuation of Ser. No. 923,000, Oct. 24, 1986, abandoned, which is a division of Ser. No. 773,127, Sep. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 584,868, Feb. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 480,431, Mar. 30, 1983, abandooed. This application Sep. 12, 1988, Ser. No. 244,630

Int. Cl.[4] A21D *2/00*

U.S. Cl. 426—563 **6 Claims**

1. A leavening composition for chemically leavening crackers, the leavening composition comprising from about 40 to about 80 percent by weight of ammonium bicarbonate, from about 30 to about 10 percent by weight of potassium carbonate, and from about 30 to about 10 cent by weight of an edible acidic component, the percentages being based upon the weight of the bicarbonate, potassium carbonate and the acidic component on an anhydrous basis.

4,900,578

PROCESS FOR MAKING FROZEN REHYDRATED LEGUMES

James L. Bakker, Strongsville, Obio; Mark A. Uebersax, Perry, Mich.; Anthony P. Kowal, Brunswick, Ohio; Richard K. McGinnis, Cleveland, Ohio, and David Williams, Berea, Ohio, assignors to Great Lakes Frozen Foods, Inc., North Royalton, Ohio

Filed Mar. 30, 1988, Ser. No. 176,050

Int. Cl.[4] A23L *1/36*

U.S. Cl. 426—634 **4 Claims**

1. A process for preparing legumes, comprising the steps of:
(a) firstly, soaking dried legumes in water for about 16–18 hours at atmospheric pressure and an ambient temperature of about 45°–80° Fahrenheit;
(b) secondly, cooking the legumes for about 1¼ to 1¾ hours in water at atmospheric pressure and about 195°–210° Fahrenheit, but below its boiling point, to achieve a moisture content of abcut at least 68 percent by weight; and
(c) thirdly, freezing the legumes, whereby tender, rehydrated, completely cooked legumes of well-formed appearance are economically provided.

4,900,579

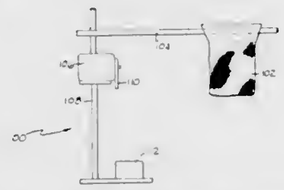
PROCESS FOR APPLYING AND BONDING A SOLID LUBRICANT ON A SUBSTRATE

Kyu Y. Lee, Pusan, Rep. of Korea; Walajabad S. Sampath, Fort Collins, and Samuel C. Wu, Lakewood, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Feb. 18, 1988, Ser. No. 158,169

Int. Cl.[4] B05D *1/12, 3/02*

U.S. Cl. 427—11 **11 Claims**



1. A process for applying and bonding a solid lubricant on a substrate whose surface has depressions and pores, said process comprising the sequential steps of:
(a) suspending fine solid lubricant particles in a fluid medium in which the lubricant particles are insoluble and in excess of a quantity sufficient to fill the depressions and pores on the surface of the substrate to thereby provide a lubricant particle suspension;
(b) positioning the substrate in the lubricant particle suspension to permit the lubricant particles to become deposited by gravitation on the surface of the substrate; and
(c) burnishing the surface of the substrate having the lubricant particles deposited thereon to thereby distribute and bond the lubricant particles on the substrate.

4,900,580

PROCESS FOR THE ELECTROSTATIC LACQUERING OF PRINTED CIRCUIT BOARDS

Klaus Grah, Klingenstr. 70a, D-5650 Solingen 1; Günter Korsten, Richrather Str. 206, D-4010 Hilden, and Werner Schauf, Melanchthonstr. 43, D-5650 Solingen 1, all of Fed. Rep. of Germany

Filed Oct. 20, 1988, Ser. No. 260,147

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735798; Jun. 24, 1988, 3821278

Int. Cl.[4] B05D *1/04*

U.S. Cl. 427—33 **3 Claims**



1. A process for the electrostatic lacquering of printed circuit boards formed with continuous holes as soldering places for connecting wires, comprising continuously conveying the printed circuit boards in a suspended position to a first lacquering station, a turning station, a second lacquering station and a drying station, lacquering the printed circuit boards in the first lacquering station on one side thereof, turning the printed circuit boards over in the turning station, lacquering the printed circuit boards in the second lacquering station on the other side thereof, and simultaneously drying the two lacquered sides in the drying station.

4,900,581

METHOD FOR PRODUCING METAL FILMS

Michael Stuke, Göttingen; Hilmar Esrom, Heidelberg, and Georg Wahl, Eppelheim, all of Fed. Rep. of Germany, assignors to ASEA Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

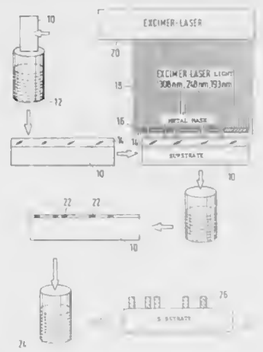
Filed Aug. 17, 1988, Ser. No. 233,241

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727422; Jul. 30, 1988, 3826046

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—531 **9 Claims**

1. Method for producing full-surface or partial films on a substrate, which comprises preparing a solution from a group consisting of metal acetates, metal acetyl acetonates and metal formiates of a metal from which a metal film is to be made, and forming a coating on a substrate by applying the solution to the substrate and then irradiating the coating sheetwise to produce a full-surface or textured metal film by emitting radiation with



excimer laser at seven discrete wavelengths in the UV range between 157 nm and 351 nm depending on the gas filling.

4,900,582

METHOD FOR IMPROVING FILM QUALITY OF SILICA-BASED FILMS

Muneo Nakayama, Tokyo; Akira Hashimoto, Kanagawa; Toshihiro Nishimura, Kanagawa; Eiichi Kashiwagi, Kanagawa, and Isamu Hijikata, Kanagawa, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Filed May 20, 1988, Ser. No. 197,021

Claims priority, application Japan, May 22, 1987, 62-125193

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—54.1 **22 Claims**

1. A method of improving the quality of a silica-based film, which comprises:
forming a silica-based film by coating on a substrate a film forming coating solution, wherein said coating solution comprises an organic solvent solution of a silicon compound; and
exposing said silica based film to ultraviolet radiation in an atmosphere containing ozone in an amount of not less than 1% by weight.

4,900,583

METHOD OF PRODUCING CAST COATED PAPER USING NEAR-INFRARED RADIATION

Tetsuya Hirabayashi, and Mikio Takahashi, both of Amagasaki, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

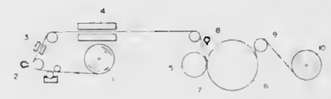
Filed Apr. 19, 1988, Ser. No. 183,659

Claims priority, application Japan, Apr. 30, 1987, 62-108086

Int. Cl.[4] B05D *3/06, 3/12*

U.S. Cl. 427—55 **3 Claims**

1. In a method of producing cast coated paper in which a wet coating layer containing as its main components pigment and adhesive applied to a web of paper is heated to permit a gel state to be formed in said layer or is dried after which it is rewetted, and said heated coating layer is then pressed against the surface of a heated drum having a highly polished finishing surface and is dried in contact with said drum surface to there by produce a glazed finish on the surface of said coating layer,



the improvement which comprises heating said wet coating layer by means of near-infrared radiations generated by electrically heating a light source filament to a temperature of from about 1600° K. to about 3,800° K. so as to emit near-infrared radiations having wave lengths of 1.8 μm to 0.75 μm at the peak wave lengths of their ranges.

4,900,584

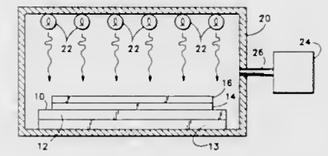
RAPID THERMAL ANNEALING OF TFEL PANELS

Richard T. Tuenge, Hillsboro, and Richard E. Coovert, Portland, both of Oreg., assignors to Planar Systems, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 2,565, Jan. 12, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 249,782

Int. Cl.[4] B05D *5/06, 5/12*

U.S. Cl. 427—66 **9 Claims**



1. A rapid thermal annealing process for a thin-film electroluminescent panel, said panel having thin-film layers deposited on a glass substrate, said thin-film layers including a light emitting thin-film phosphor layer, comprising the steps of:
(a) placing the thin-film electroluminescent panel on a support member, said support member having a high coefficient of energy absorption in the peak portion of the spectral energy range of a radiant heating element;
(b) placing the panel on the support inside a radiant heating chamber utilizing said radiant heating element and uniformly radiantly heating the substrate and thin-film layers to a temperature which exceeds 500° C. at a rate that exceeds 20° per second;
(c) maintaining the temperature achieved during step (b) for a time period of between 15 and 240 seconds; and
(d) cooling the substrate and thin-film layers at a rate exceeding 10° C. per second.

4,900,585

CATHODE AND PROCESS FOR THE MANUFACTURE THEREOF

Francis Leroux, Brignais, and Dominique Ravier, Lyon, both of France, assignors to Atochem, Paris, France

Division of Ser. No. 844,709, Mar. 27, 1986, abandoned. This application Jan. 15, 1988, Ser. No. 145,722

Claims priority, application France, Mar. 29, 1985, 85 04738

Int. Cl.[4] B05D *5/12;* **C25B** *11/04*

U.S. Cl. 427—77 **6 Claims**

1. The process for the manufacture of a cathode having an

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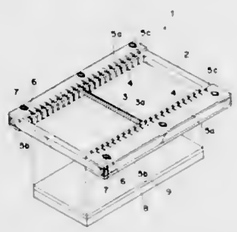
electrically conductive substrate bearing a coating consisting essentially of at least two oxides of a metal of Group VIII of the Periodic Classification of the Elements, at least one of which is a platinum group metal and at least another of which is a nonprecious metal; comprising depositing in the form of scales onto a nonetched electrically conductive substrate at least one layer of said Group VIII metal salts from a solution or suspension, and then subjecting the whole to a heat treatment to oxidize said metal salts to the oxide form.

4,900,586

ELECTRODE APPLICATION TOOL

Isamu Kanamori, Takefu; Kiyota Nakai, Fukui, and Masami Yamaguchi, Takefu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 3, 1988, Ser. No. 202,481
Claims priority, application Japan, Jun. 4, 1987, 62-87105
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—125 **6 Claims**



4. A method for applying an electrode on an end surface of an electronic component or a collective body of electronic components comprising the steps of:

accommodating the electronic component or the collective body between the confronting pairs of longitudinal grooves formed on side surfaces facing each other across a central aperture of a frame-like main body, by shifting a pair of movable elastic members mounted on said main body which close said grooves when in a closed position, to open the longitudinal grooves so that said electronic component or collective body may be inserted,

returning the pairs of elastic members back to the original closed position to close the longitudinal grooves so that the electronic component or the collective body is held within the longitudinal grooves surrounded by the main body and the pairs of elastic members,

pressing a first end plane of the electronic component or the collective body onto a surface plate on which electrode paste is provided to apply said paste to said first end plane, and

separating the electronic component or the collective body from the surface plate.

4,900,587

METHOD FOR PRODUCING ALUMINUM OXIDE COATED IRON-ALUMINUM ALLOY POWDER

Joseph E. Ritsko, Towanda, Pa.; Walter A. Johnson, Houghton, Mich., and Nelson E. Kopatz, Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 3, 1989, Ser. No. 292,714
Int. Cl.[4] B05D *7/00*
U.S. Cl. 427—216 **6 Claims**

1. A method for producing aluminum oxide coated iron-aluminum alloy powder, said method comprising:

(a) contacting iron-aluminum alloy powder of fine particle size with a liquid aluminum compound wherein the aluminum is hydrolyzable and adding water to said compound and said iron-aluminum alloy powder to form a slurry;

(b) removing essentially all of the liquid from said slurry to produce iron-aluminum alloy powder with a coating of hydrolyzed aluminum oxide; and

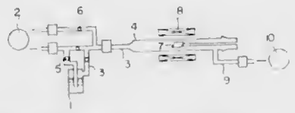
(c) firing said iron-aluminum alloy powder with said hydrolyzed aluminum oxide coating in a non-oxidizing atmosphere to produce iron-aluminum alloy powder with a coating of aluminum oxide.

4,900,588

METHOD FOR THE PRODUCTION OF A CARBON ELECTRODE

Yoshimitsu Tajima; Motoo Mohri, both of Nara, and Hideaki Tanaka, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 10, 1987, Ser. No. 119,115
Claims priority, application Japan, Nov. 11, 1986, 61-269426
Int. Cl.[4] B05D *5/12; C23C 16/26*
U.S. Cl. 427—122 **3 Claims**



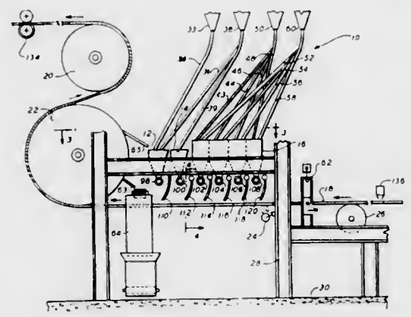
1. A method for the production of a carbon electrode comprising disposing an electroconductive and flexible electrode substrate within a reaction tube to which a gaseous hydrocarbon is supplied, directly depositing a carbon material on said electrode substrate by chemical vapor deposition at 1500° C. or less so as to coat said electrode substrate with the carbon material, and rolling said electrode substrate coated with the carbon material, resulting in a thin-plate shaped carbon electrode having a high density.

4,900,589

GRANULE APPLICATION DEVICE AND PROCESS

Donald Montgomery, Mount Vernon, Ind., assignor to GAF Building Materials Corporation, Wayne, N.J.

Filed Sep. 7, 1988, Ser. No. 241,284
Int. Cl.[4] B05D *1/12*
U.S. Cl. 427—188 **8 Claims**



1. A process for applying granules to a moving sheet having a headlap area and a butt area for making a shingle roofing product including:

applying a sticky material to the headlap area and the butt area of the moving sheet;

dispensing blended granules over the butt area at a rate in proportion to a rate of movement of the sheet;

dispensing headlap granules over the blended granules on the headlap area at a rate as set by an operator and independent of the rate of movement of the sheet;

dispensing recycled headlap granules over the headlap granules on the headlap area at a rate in proportion to the rate of movement of the sheet;

dispensing backfall granules over the blended granules on the butt area at a rate in proportion to the rate of movement of the sheet; and

cutting the moving sheet into shingle pieces at a rate in proportion to the rate of movement of the sheet.

4,900,590

METHOD FOR PRODUCING ALUMINUM OXIDE COATED IRON POWDER

Joseph E. Ritsko, Towanda, Pa.; Walter A. Johnson, Houghton, Mich., and Nelson E. Kopatz, Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 3, 1989, Ser. No. 292,713
Int. Cl.[4] B05D *7/00*
U.S. Cl. 427—216 **6 Claims**

1. A method for producing aluminum oxide coated iron powder, said method comprising:

(a) contacting iron powder of fine particle size with a liquid aluminum compound wherein the aluminum is hydrolyzable and adding water to said compound and said iron powder to form a slurry;

(b) removing essentially all of the liquid from said slurry to produce iron powder with a coating of hydrolyzed aluminum oxide; and

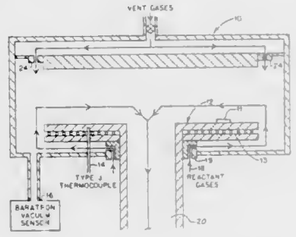
(c) firing said iron powder with said hydrolyzed aluminum oxide coating in a non-oxidizing atmosphere to produce iron powder with a coating of aluminum oxide.

4,900,591

METHOD FOR THE DEPOSITION OF HIGH QUALITY SILICON DIOXIDE AT LOW TEMPERATURE

Brian R. Bennett, Redford; Joseph P. Lorenzo, Stow, and Kenneth Vaccaro, Medford, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 20, 1988, Ser. No. 146,072
Int. Cl.[4] C23C *16/40*
U.S. Cl. 427—255 **20 Claims**



1. A method of depositing silicon dioxide on a substrate comprising the steps of:

placing the substrate in a reaction chamber;

heating the substrate to between 80° C. and 330° C.;

evacuating the reaction chamber containing the substrate to 2–12 torr; and

subjecting the substrate to a non-excited gas flow mixture comprising silicon and oxygen bearing compounds in order to deposit a near-stoichiometric silicon dioxide layer upon said substrate.

4,900,592

ION-EXCHANGED, CROSSLINKING LATEX PAINTS

Kenneth G. Hahn, Jr., Hinckley, and Gary P. Craun, Berea, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Filed Feb. 6, 1989, Ser. No. 306,680
Int. Cl.[4] B05D *7/24, 7/26*
U.S. Cl. 427—375 **5 Claims**

1. In a process for producing an ambient dry painted substrate, including the step of producing an emulsion polymer binder by copolymerizing ethylenically unsaturated monomers in an aqueous polymerization medium, and in the presence of surfactants and initiators, the improvement comprising:

compolymerizing ethylenically unsaturated monomers, including beta-hydroxy ester monomer, but excluding amine monomers, to produce a functionally reactive, self-curing emulsion polymer containing pendant beta-hydroxy ester chains, where the functionally reactive emulsion polymer copolymerized monomers comprising on a weight basis between 1% and 50% beta-hydroxyl ester monomers, between 1% and 99% acrylic monomer, with the balance being other ethylenically unsaturated monomers which are in ert to the curing reaction as defined below

treating the functionally reactive emulsion polymer by contact with an ion exchange resin to remove cations from the functional emulsion polymer and produce a pH less than about 2. 5, where said functionally reactive emulsion polymer is adapted to be self-curing by transesterification reaction between hydroxyl groups and beta-ester groups on said pendant beta-hydroxy ester chains upon application of said paint coating to a substrate; and

applying the paint coating to a substrate and coalescing the coating into a film and at ambient temperature curing the film by self-crosslinking the hydroxyl groups and the beat-ester groups on said beta-hydroxy ester chains on the self-curing emulsion polymer.

4,900,593

PROCESS AND DEVICE FOR APPLYING A FREE-FLOWING REACTION MIXTURE

Kurt Krippl, Monheim, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Aug. 24, 1988, Ser. No. 236,061
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729266
Int. Cl.[4] B05D *1/00;* **B05C** *5/00, 11/10*
U.S. Cl. 427—420 **3 Claims**

1. A process for applying a free-flowing reaction mixture in the form of a curtain onto a moving base comprising distributing the reaction mixture which forms the curtain within an elongated pipe-like applicator vessel extending laterally across the base, which vessel has output orifices facing said base and maintaining a minimum level of reaction mixture and above that a cushion of compressed air in said applicator vessel.

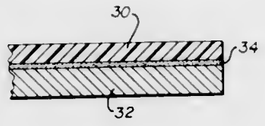
3. A device for applying a free-flowing reaction mixture onto a moving base comprising a hollow, elongated applicator vessel provided with at least one outlet orifice, said vessel arranged downstream of a mixing device, wherein said applicator vessel is connected via a compressed air main to a compressed air source, and wherein a control valve is arranged in the compressed air main, which, together with a level indicator in the applicator vessel and a pressure regulator, forms a control circuit, whereby the pressure in said vessel is adjusted depending upon the level of reaction mixture in said vessel.

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4,900,594
PRESSURE FORMED PAPERBOARD TRAY WITH ORIENTED POLYESTER FILM INTERIOR

James R. Quick, Warwick, and James W. Mitchell, Newburgh, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Sep. 17, 1987, Ser. No. 97,763
Int. Cl.[4] B32B *27/10;* **B65D** *85/00*
U.S. Cl. 428—34.2 **18 Claims**



1. An ovenable food tray comprising a food contacting inner layer of a biaxially-oriented polyethylene terephthalate and an outer layer of paperboard, said layers secured together by and sandwiching a layer of cross-linkable adhesive including a crosslinking agent, whereby the tray exhibits improved resistance to delamination and cracking upon exposure to oven temperatures to about 400 degrees Fahrenheit.

4,900,595
PRECIOUS PEBBLE VASE

Colleen K. Kettle, 19755 Highway 550, Montrose, Colo. 81401

Filed Apr. 28, 1989, Ser. No. 344,808
Int. Cl.[4] B65D *23/10*
U.S. Cl. 428—34.4 **10 Claims**



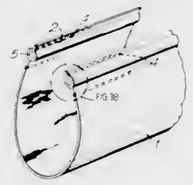
1. A precious pebble vase for the holding of and viewing of pebbles which comprises:
a stable support base;
a transparent, hollow vessel adapted for the reception of or removal of one or more pebbles; and
a pair of hands connected to the support base and adapted to securely hold the vessel.

4,900,596
WRAPAROUND FABRIC ARTICLE AND METHOD OF MAKING THE SAME

Donald Peacock, Gloucestershire, England, assignor to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 21, 1986, Ser. No. 934,599
Claims priority, application United Kingdom, Nov. 25, 1985, 8528966
Int. Cl.[4] B32B *31/12;* **B29C** *61/06*
U.S. Cl. 428—34.5 **20 Claims**

1. A method of producing a wrap-around article comprising a fabric and having a first closure member fixed with respect to the fabric at an edge of the article by means of which member, edge portions of the article can be held together to maintain the article in a wrapped around configuration, which method includes:
(a) positioning said first closure member at said edge thereby forming a region of the article of increased thickness, wherein said positioning is carried out by a positioning selected from the group consisting of interweaving said first closure member into the fabric during the production of the fabric, inserting the first closure member into a pocket woven into the fabric, or mixtures of said positioning procedures, said region of increased thickness formed without turning back the fibres of the fabric around the closure member towards the edge opposite thereto;
(b) affixing the fibres of the fabric to one another adjacent said first closure member, said affixing occurring on the side of the closure member closest to the edge adjacent to

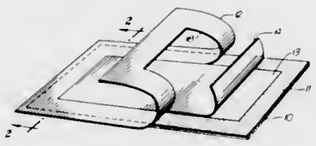


which the closure member is positioned, and wherein said affixing is selected from the group consisting of welding, bonding, or mixtures thereof; and
(c) optionally the step consisting of cross-linking the weld or bond or mixtures of the weld or bond; thereby steps (b) and (c) locating said first closure member at said edge by preventing or reducing relative movement of fibres at said edge.

4,900,597
IMAGE TRANSFER LABEL

Stephen Kurtin, 3835 Kingswood Rd., Sherman Oaks, Calif. 91403

Filed Dec. 28, 1987, Ser. No. 138,348
Int. Cl.[4] A61F *13/02;* **E04F** *15/16;* **B32B** *3/26;* **B44C** *1/16*
U.S. Cl. 428—41 **9 Claims**



1. A label comprising:
(a) a transparent substrate, the surface area on one side of said substrate being divided into first and second areas;
(b) a coating of adhesive on said first area;
(c) means comprising a first removable protective sheet covering said first area but not said second area to permit handling of said label without touching either said first or second area; and
(d) means comprising a layer of adhesive and micro-encapsulated solvent disposed on said second area for lifting toner off a carrier sheet.

4,900,598
INFORMATION STORAGE MEDIUM

Katsumi Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 6, 1988, Ser. No. 240,202
Claims priority, application Japan, Sep. 22, 1987, 62-237787; Oct. 16, 1987, 62-261186
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—64 **15 Claims**

1. An information storage medium comprising:
a substrate; and
a recording layer supported on said substrate and subjected to reversible phase transformation between different phases by changing conditions under which a light beam is radiated, said recording layer containing an In_{50}-



$_xSb_{50}Te_yAu_z$ alloy (wherein x, y, and z are in atomic %, $x=y+z$, $y \geqq 2z$, and $1 \leqq x \leqq 6$).

4,900,599
FILAMENT REINFORCED ARTICLE

Gordon S. Doble, Shaker Heights, Ohio, assignor to Airfoil Textron Inc., Lima, Ohio

Division of Ser. No. 933,436, Nov. 21, 1986, Pat. No. 4,782,992.
This application Feb. 1, 1988, Ser. No. 151,177
Int. Cl.[4] B32B *3/02, 15/04;* **B23P** *17/00*
U.S. Cl. 428—65 **6 Claims**

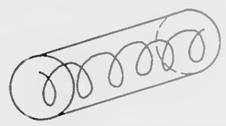


1. A filament reinforced article having a central axis, comprising an axially consolidated metallic matrix and a helical tape of a plurality of side-by-side spaced apart reinforcing filaments extending helically through the matrix, said filaments being of relatively high strength, low ductility compared to the matrix and being bonded in the matrix with each filament being continuous from one end to the other end thereof along said central axis and substantially free of plastic deformation evidenced by cracking or buckling along the length of the filament.

4,900,600
FILLED PLASTIC GRANULATE

Hans W. Depcik, Duesseldorf, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 16, 1985, Ser. No. 787,966
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, 3437947
Int. Cl.[4] B44C *1/26*
U.S. Cl. 428—67 **7 Claims**

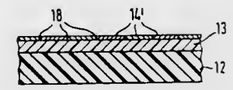


1. Filled granulate, in particular plastic granulate, for further processing in machines with plasticizing devices containing one or more plastic materials in combination with inserts, characterised in that at least a portion of the inserts have an extended length, measured after unwinding, which is at least 1.2 times greater than the greatest internal spatial dimension of the plastic granulate and in that these inserts, compacted three-dimensionally in one or more directions, are combined with the plastic granulate.

4,900,601
MULTI-LAYER BODY STRUCTURE FOR THE REINFORCEMENT OF A PANEL AND A METHOD OF REINFORCING A PANEL

Paul Hälg, Richterswil, and Paul Rohrer, Herrliberg, both of Switzerland, assignors to Gurit Essex AG, Freienbach, Switzerland

Filed Jun. 10, 1988, Ser. No. 205,449
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720267
Int. Cl.[4] B32B *1/04*
U.S. Cl. 428—68 **15 Claims**

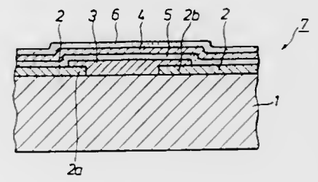


1. A multi-layer body structure for the reinforcement of a panel, comprising:
an essentially flat reinforcing body member consisting of one layer or a plurality of layers;
a layer of adhesive material applied to one surface of said reinforcing body member;
a protective sheet or foil applied to the free surface of said adhesive material;
said protective sheet or foil consisting of a material shrinking under the influence of heat applied thereto and thereby laying open at least a part of said free surface of said adhesive material upon shrinking.

4,900,602
PRINTED WIRING BOARD

Shin Kawakami; Satoshi Haruyama; Hirotaka Okonogi; Katsutomo Nikaido, and Junichi Ichikawa, all of Saitama, Japan, assignors to Nippon CMK Corp., Saitama, Japan

Filed May 9, 1988, Ser. No. 192,588
Claims priority, application Japan, Dec. 18, 1987, 62-320611
Int. Cl.[4] B32B *1/04*
U.S. Cl. 428—76 **8 Claims**



5. A printed wiring board according to claim 4; wherein the heat-conductive particles comprise copper particles coated with silver.

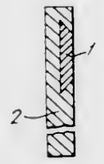
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4,900,603

REFRACTORY, HEAT INSULATING ARTICLES

Michel S. Boily, Solihull, and James Flood, Lichfield, both of United Kingdom, assignors to Foseco Trading A.G., Chur, Switzerland

Filed Jan. 6, 1984, Ser. No. 568,708
Claims priority, application United Kingdom, Jan. 20, 1983, 8301543
Int. Cl.[4] B05D *5/12*; C21D *8/02*
U.S. Cl. 428—77 20 Claims



1. A preformed, shaped, refractory heat insulating article for use as an expandable sidewall lining of a molten metal handling vessel, said article having first and second major faces, and a plurality of edge faces defining collectively said major faces, the area of each of said major faces being much larger than that of said edge faces; and said first major face adapted to contact molten metal, while said second major face, and most portions of said edge faces, are not adapted to contact molten metal; said first major face including a first part formed of a low specific heat and low thermal conductivity material, and a second part formed of a different material than the material of the first part, said material of the second part having a higher erosion resistance to molten metal and slag than the material of the first part.

4,900,604

ADHESIVE WALL DECORATING SYSTEM

Angel R. Martinez, and Frances M. Martinez, both of Calabasas, Calif., assignors to Decorate-It!, Inc., Woodland Hills, Calif.

Filed Dec. 22, 1988, Ser. No. 289,628
Int. Cl.[4] B32B *31/20*; E04F *13/00*
U.S. Cl. 428—79 17 Claims



1. A wall decorating system, comprising:
at least one substrate sheet including a first side positioned adjacent to a wall, and a second side having either a decorative pattern or solid colored imagery;
means for attaching the first side of the at least one substrate sheet onto the wall in a reusable, non-permanent press-on/peel-off manner; and
a plurality of pre-cut, self-adherent appliques, each having a reusable, non-permanent adhesive on a first side and decorative imagery on a second side, wherein the adhesive adheres the applique onto the second side of the at least one substrate sheet in a reusable non-permanent, press-on manner which permits detachment of the applique therefrom, and wherein the imagery on the appliques and the pattern or imagery on the at least one substrate sheet cooperate to create a decorative scene which can be rearranged by peeling off the appliques from the at least one substrate sheet and repositioning the appliques thereon.

4,900,605

BRISTLE PILE TEXTILE FOR GARMENT APPLICATIONS

Harold Thorgersen, 44 Heritage Dr., Woodbury, Conn. 06798, and Fred Olsen, Biskop Grimelunds, v. 21, Oslo, Norway

Filed Sep. 16, 1988, Ser. No. 245,345
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—88 8 Claims



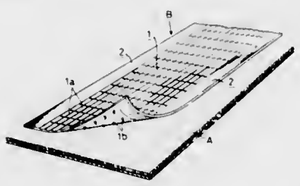
1. An improved bristle pile textile for application in articles of clothing for causing preferential movement thereof, said textile comprising a woven fabric having a plurality of weft and/or warp yarns and having a pile yarn providing a plurality of straight relatively rigid bristles extending at a preselected acute angle with respect to the surface of said textile, and retaining means causing said bristles to retain said preselected angle.

4,900,606

RUNNER FOR COVERING A CARPET

Katsunori Sakaki, Nara, Japan, assignor to Eidaikako Kabushiki Kaisha, Osaka, Japan

Filed Oct. 17, 1988, Ser. No. 258,900
Claims priority, application Japan, Jul. 11, 1988, 63-92247[U]
Int. Cl.[4] B32B *5/14*
U.S. Cl. 428—99 11 Claims



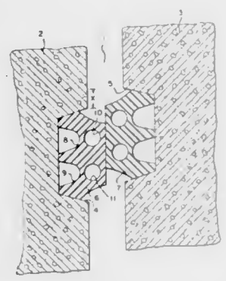
1. A runner for temporarily covering a carpet to prevent it from becoming soiled, the runner comprising:
a walking zone in the center having a rugged face on the top surface and spikes on the bottom surface; and
edge zones at either side of the walking zone, the edge zones being heavier per unit area than the walking zone.

4,900,607

SEALING PROFILE

Siegfried Glang, Hamburg, and Werner Grabe, Winsen/Luhe, both of Fed. Rep. of Germany, assignors to Phoenix Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Aug. 30, 1988, Ser. No. 238,723
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729794; Apr. 16, 1988, 3812751
Int. Cl.[4] B32B *3/10*; E21D *11/00*
U.S. Cl. 428—131 14 Claims



1. A sealing profile formed of an elastomeric material for sealing tunnel segments which have a circumferential recess, said sealing profile comprising:
(a) a base side adapted to be accepted in the recesses of said tunnel and a profile body;
(b) a plurality of slotted parallel grooves running in the lengthwise direction on the base side of said sealing profile; and
(c) a plurality of parallel channels spaced from said parallel grooves and arranged in a plane substantially parallel to the base side of the sealing profile and running in the lengthwise direction in said profile body, the number of channels being no greater than the number of grooves and at least one of said plurality of channels being in alignment with a corresponding groove.

4,900,608

FLEXIBLE EPOXY-COATED FABRIC

Richard W. Stamper, Lambertville, Mich., assignor to GenCorp Inc., Fairlawn, Ohio

Filed Apr. 4, 1988, Ser. No. 177,200
Int. Cl.[4] B32B *7/12, 27/08, 27/12, 27/38, 33/00*
U.S. Cl. 428—151 21 Claims



1. An epoxy coated fabric, comprising:
a fabric support coated with a flexible epoxy resin, said resin consisting essentially of an epoxy resin having an apparent bending modulus of from about 20 to about 2,000 psi as measured by ASTM D47-86 or an admixutre of said epoxy resin with up to 10% by weight of a rigid epoxy resin.

4,900,609

TWO-PLY BELTING MATERIAL

Brink Arnold, Anthony, Kans., assignor to Morrison Company, Inc., Anthony, Kans.

Filed Jun. 9, 1988, Ser. No. 204,577
Int. Cl.[4] A01D *39/00*; B30B *5/06*; B32B *25/10*; B65G *15/34, 15/44*
U.S. Cl. 428—163 15 Claims



1. Two-ply belting material comprising:
a first high coefficient of friction outer rubber skim;
a first ply comprising a first synthetic fabric bonded to said first outer rubber skim;
an inner rubber skim bonded to the said first ply opposite said first outer rubber skim;
a second ply comprising a second synthetic fabric bonded to said inner rubber skim said first ply having a greater flex fatigue life and modulus of elongation than said second ply and second ply having a greater load bearing capacity than said first ply ; and
a second outer rubber skim bonded to said second ply.

4,900,610

POLYESTER MOLDING COMPOSITION

Arie A. Hochberg, Montclair; Varkki P. Chacko, Summit, and Paul DeStio, Bound Brook, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Feb. 19, 1988, Ser. No. 157,951
Int. Cl.[4] C08L *67/02*
U.S. Cl. 428—195 19 Claims

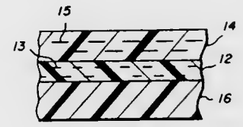
1. A composition comprising a polyester blend of 50 to 90% by weight of said blend of polybutylene terephthalate consisting essentially of recurring 1,4-butylene terephthalate units, and 10 to 50% by weight of said blend of a copolyester consisting essentially of condensed units of ethylene glycol, cyclohexane dimethanol and terephthalic acid, said copolyester containing about 70 mol% of said ethylene glycol units relative to the total glycol content.

4,900,611

PAINT COATED ARTICLE

John F. Carroll, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 7, 1988, Ser. No. 267,906
Int. Cl.[4] B32B *5/14, 5/16, 19/02*
U.S. Cl. 428—216 8 Claims



1. A paint-coated article having excellent distinctness of image, flop and covering power which comprises:
a substrate,

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coated on the substrate an outer paint layer and an inner paint layer, each of said layers comprising a polymeric binder and reflective flakes dispersed therein, the flakes of said outer layer being of relatively large average size and present in a concentration such that the layer is light transmissive, the flakes of said inner layer being of relatively smaller average size, and the coverage of said inner layer being sufficient that the total paint coating is opaque and wherein the flake concentration in the outer layer is from about 0.3 to 5.0 weight percent, and wherein the average dimension across a major flake axis of flake in the outer layer is from about 10 to 100 μm, and the average dimension across a major flake axis of flake in the inner layer is from about 1 to 20 μm, with the proviso that the average dimension across a major flake axis of flake in the outer layer is at least three times that of flake in the inner layer.

4,900,612

LAMINATED STRUCTURE

Koichiro Sato, Waki; Mikio Nakagawa, Hiroshima; Kuniaki Kanemoto, Iawkuni, and Akito Nishimura, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 867,136, May 27, 1986, abandoned. This application Jan. 6, 1987, Ser. No. 898

Claims priority, application Japan, May 24, 1985, 60-110546; Jan. 7, 1986, 61-254

Int. Cl.⁴ B32B *27/32*

U.S. Cl. 428—216 **24 Claims**

1. A laminated structure comprising, laminated in the order stated,

(A) a layer of polycarbonate,

(B) a layer of a modified ethylene/alpha-olefin random copolymer, the modified copolymer containing about 0.01 to 10% by weight, based on the trunk ethylene/alpha-olefin random copolymer, of an unsaturated carboxylic acid or its derivative grafted thereto, and having an ethylene content of 75 to 95 mole %, a melt flow rate of 0.1 to 50 g/10 min., a density of 0.850 to 0.905 g/cm^3 and a crystallinity of less than 10%, and

(C) a layer of a saponified olefin/vinyl acetate copolymer.

4,900,613

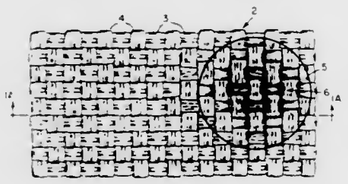
COMFORTABLE FABRICS OF HIGH DURABILITY

James R. Green, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Continuation-in-part of Ser. No. 93,490, Sep. 4, 1987, abandoned, and a continuation-in-part of Ser. No. 273,716, Nov. 7, 1988. This application Apr. 28, 1989, Ser. No. 343,391

Int. Cl.⁴ D03D *25/00*

U.S. Cl. 42—225 **21 Claims**



1. A highly durable woven fabric made from yarns of discrete staple fibers having good textile aesthetics comprising 8–70% high modulus organic staple fibers having a modulus of greater than 200 g/dtex and a linear density of less than 10 decitex per fiber and 30–92% low modulus organic staple fibers having a modulus of less than 100 g/dtex and a linear density of less than 10 decitex per fiber and the fabric having a Specific Wyzenbeek Abrasion Resistance on at least one face of the fabric at least 25% greater than the Specific Wyzenbeek Abrasion Resistance on the same face of a greige fabric of the same basis weight and construction made from 100% of the high modulus staple fibers, the warp yarns of said fabric containing at least 15% of the high modulus organic staple fibers and at least 30% of the low modulus organic staple fibers.

4,900,614

GLASS FIBER BASE MATERIAL FOR PRINT WIRING SUBSTRATE

Keita Miyazato, and Kouichi Yamaki, both of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Aug. 16, 1988, Ser. No. 232,779

Claims priority, application Japan, Aug. 24, 1987, 62-208187

Int. Cl.⁴ B32B *7/00*

U.S. Cl. 428—251 **6 Claims**

1. A glass fiber base material suitable for forming a print wiring substrate, wherein said base material comprises a glass fiber sheet which has been impregnated with an aqueous solution of a fluorescent whitening agent and then dried.

4,900,615

TEXTILE MATERIALS AND COMPOSITIONS FOR USE THEREIN

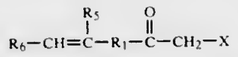
Charles L. Kissell; Jay C. Selover, both of Anaheim, and David M. Ingle, Temple City, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 11, 1986, Ser. No. 838,532

Int. Cl.⁴ B32B *7/00;* **D03D** *3/00, 15/00;* **B27B** *27/00*

U.S. Cl. 428—262 **50 Claims**

1. A textile material comprising an assembly of fibers bonded together with a polymer binder comprising at least about 10 weight percent olefinically unsaturated carboxylic acid ester monomers and at least one polymerizable functional monomer of the formula:



in which R_1 is a divalent organic radical of at least 3 atoms in length, R_5 and R_6 are independently selected from hydrogen, hydroxy, halo, thio, amino or monovalent organic radicals, and X is —CO—R_4 or —CN wherein R_4 is hydrogen or a monovalent organic radical having up to about 10 atoms other than hydrogen.

4,900,616

PHENOLIC FOAM ROOF INSULATION OF IMPROVED DIMENSIONAL STABILITY

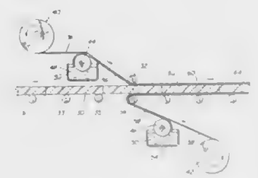
Charles R. Weir, Sarnia, and Paul E. Metcalfe, Corunna, both of Canada, assignors to Fiberglas Canada, Inc., Willowdale, Canada

Filed May 31, 1989, Ser. No. 358,802

Int. Cl.⁴ B32B *3/26*

U.S. Cl. 428—316.6 **11 Claims**

7. An assembly comprising a laminar insulating foam material the opposing surfaces of which are covered with a facing material consisting essentially of a flexible web material substantially uniformly coated on one surface thereof with a heat absorbing and bonding material, said heat absorbing and bonding material being in contact with said insulating foam material, said facing material serving as a heat sink which minimizes thermal stresses in said laminar insulating foam material due to temperature differentials in said foam material when a hot coating material is applied to one surface thereof, and thereby imparting increased flexural strength to said foam material,



said assembly being resistant to warpage when said hot coating material is applied to one surface thereof.

4,900,617

MASKING COMPOSITIONS

Jonathan H. Smith, London, England, assignor to Sericol Group Limited, London, England

Filed Apr. 14, 1988, Ser. No. 181,421

Claims priority, application United Kingdom, Apr. 15, 1987, 8709043

Int. Cl.⁴ C08J *9/32;* **C08L** *31/02, 27/00*

U.S. Cl. 428—325 **9 Claims**

1. A composition adapted for forming an abrasion-removable mask on a lottery ticket, the composition including a coating material is selected from group consisting of a heat-gellable plastisol, a pigmented polymer solution and a pigmented aqueous emulsion said coating material being of the type which can be applied to the lottery ticket to cover at least a portion thereof and said coating being removable after being coated on to the ticket by means of abrasion whereby the covered portion of the card may be exposed upon rubbing; and said coating further including a texture-modifying amount of microspheres in the amount of from 2 to 60 weight percent based on the gelled or dried weight of the composition and said microspheres are selected from the group consisting of glass and ceramic material.

4,900,618

OXIDATION-RESISTANT METAL COATINGS

Michael T. O'Connor, Springfield, Mass.; James D. Capistran, Suffield, Conn.; James P. Brozek, Ludlow, and Albert W. Morgan, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 928,499, Nov. 7, 1986. This application Jun. 19, 1987, Ser. No. 64,898

Int. Cl.⁴ B32B *5/16*

U.S. Cl. 428—328 **23 Claims**

1. An article having a coating comprising an oxidatively-resistant layer of electrolessly-deposited copper, wherein such copper remains tarnish free and bright for at least one day, has a substantially smooth surface and substantially no pores of a volume greater than a 250 nanometer sided cube.

4,900,619

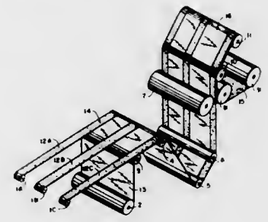
TRANSLUCENT HOUSEWRAP

Henry S. Ostrowski; Roy D. Goodwin, both of Greenville; William C. Jackson, Travelers Rest, and Jay D. Gillespie, Greenville, all of S.C., assignors to James River Corporation, Richmond, Va.

Filed Oct. 17, 1988, Ser. No. 371,156

Int. Cl.⁴ B32B *27/00*

U.S. Cl. 428—284 **13 Claims**



1. A translucent nonwoven fabric composite suitable for use as a housewrap comprising a meltblown web of generally discontinuous microfibers formed from a first thermoplastic polymer and having a basis weight in the range of from about 0.5 through about 2.0 oz/yd^2, to which is bonded a textile fiber web composed primarily of randomly-deposited molecularly-oriented filaments of common textile denier spun from a second, compatible, thermoplastic polymer and having a basis weight in the range of from about 0.5 through 1.25 oz/yd^2.

4,900,620

INK JET RECORDING SHEET

Makiko Tokita, Chiba; Masahiro Nakagawa, Hokkaido; Akira Kobayashi, Aichi, and Kenji Yasuda, Chiba, all of Japan, assignors to OJI Paper Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 254,081

Claims priority, application Japan, Oct. 8, 1987, 62-254287

Int. Cl.⁴ B41M *5/00*

U.S. Cl. 428—330 **11 Claims**

1. An ink jet recording sheet comprising a substrate in the form of a sheet composed mainly of 70 to 100 wt% wood pulp and 10 to 25 wt% precipitated calcium carbonate selected from the group consisting of (1) a calcite having a particle size distribution such that not less than 80% of the particles as measured by the natural precipitation method range from 0.5 to 1.5 μm in size, a specific surface area ranging between 10 to 30 m^2/g and an oil absorption ranging between 30 and 80 ml/100 g; and (2) a calcite having a mean particle size ranging between 1 and 5 μm, a specific surface area ranging between 1 and 10 m^2/g and an oil absorption ranging between 30 and 50 ml/100 g, and having a Stöckigt sizing degree of not less than 5 seconds and not more that 15 seconds when formed as a sheet having a basis weight of 64 g/m^2, and a coating layer composed mainly of white pigment, said coating layer being formed on al least one side of said substrate at a weight of 1 to 10 g/m^2.

4,900,621

ULTRATHIN BLENDED CELLULOSE NITRATE POLYMER FILMS AND THEIR PREPARATION

Rachel S. Kohn, Springfield, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 917,425, Oct. 10, 1986, Pat. No. 4,746,473. This application Jan. 29, 1988, Ser. No. 150,162

Int. Cl.⁴ B01D *13/00;* **B29C** *41/12*

U.S. Cl. 428—333 **13 Claims**

1. A blended, cellulose nitrate polymer film containing no macroscopic holes and having a thickness of about 400 ang-

stroms or less and randomly oriented molecules prepared according to the process comprising:

(a) preparing a casting solution containing a cellulose nitrate polymer at about the two to about the eight percent by weight level and a methacrylate polymer at about the one to about the five percent by weight level, based on the total weight of the casting solution, in about a 4:6 to about a 6:4 by volume ratio of a C_1–C_4 lower alkyl and a C_5–C_{10} higher alkyl acetate, respectively;

(b) depositing the casting solution on water to form a free-standing film; and

(c) removing the film from the water.

4,900,622

MAGNETIC RECORDING MEDIUM

Masatoshi Nakayama; Koji Kobayashi; Kunihiro Ueda; Mitsuru Takai, and Shigeo Kurose, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

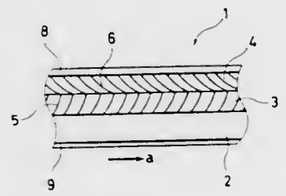
Filed Sep. 16, 1987, Ser. No. 97,607

Claims priority, application Japan, Sep. 18, 1986, 61-220522; Sep. 25, 1986, 61-226689; Sep. 29, 1986, 61-231035

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

Int. Cl.⁴ G11B *5/64*

U.S. Cl. 428—336 **24 Claims**



1. In a magnetic recording medium comprising a plastic substrate and a ferromagnetic metal thin film comprised predominately of cobalt on the substrate,

the improvement wherein said ferromagnetic metal thin film has a multi-layered structure including at least two layers, a lowermost layer adjoining the substrate and an uppermost layer remote from the substrate, at least one of which contains carbon, wherein the quotient C2/C1 is up to 0.3 provided that the lowermost layer has an oxygen concentration C2 at its interface with said substrate and the uppermost layer has an oxygen concentration C1 at its surface remote from said substrate.

4,900,623

ULTRATHIN POLYMETHYLMETHACRYLATE POLYMER FILMS

Rachel S. Kohn, Springfield, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 917,806, Oct. 10, 1986, Pat. No. 4,765,939. This application Apr. 14, 1988, Ser. No. 181,629

Int. Cl.⁴ B32B *27/30;* **B29C** *39/02;* **C08F** *120/18*

U.S. Cl. 428—336 **17 Claims**

1. A pinhole-free, polymethylmethacrylate polymer film having a thickness of about 400 angstroms or less prepared according to the process comprising:

(a) preparing a casting solution containing a polymethylmethacrylate polymer in a mixture of alkyl acetates;

(b) depositing the casting solution on water to form a free-standing film; and

(c) removing the film from the water.

4,900,624

NOVEL ADHESIVES AND TAPES INCLUDING SAME

Samuel J. Chen, Lexington, Mass., assignor to Kendall Company, Lexington, Mass.

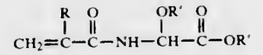
Filed Mar. 25, 1987, Ser. No. 30,756

Int. Cl.⁴ C09J *7/02;* **B32B** *15/08*

U.S. Cl. 428—343 **13 Claims**

1. A metal foil tape meeting Underwriters Laboratories criteria for use with rigid fiberglass air ducts, said tape comprising a metal foil backing sheet carrying a layer of an adhesive composition comprising a crosslinked copolymer of:

(1) an activated ester-containing vinyl monomer of the formula:



wherein R is hydrogen or methyl; and R′ is alkyl having one to six carbon atoms, or 2-hydroxyalkyl having two to six carbon atoms;

(2) at least one ethylenically unsaturated carboxylic acid containing 3-5 carbon atoms;

(3) at least one acrylic or methacrylic acid ester of a non-tertiary alcohol having 1-14 carbon atoms; and

(4) at least one vinyl ester of a saturated carboxylic acid.

4,900,625

DEEP-COLORED FIBERS AND A PROCESS FOR MANUFACTURING THE SAME

Yoshikazu Kondo; Toshihiro Yamamoto, both of Hofu; Shunya Ida, Nara, and Atsushi Yamamoto, Hikone, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,584

Claims priority, application Japan, Mar. 3, 1987, 62-49534; Apr. 13, 1987, 62-90485; Apr. 18, 1987, 62-95766; Oct. 19, 1987, 62-263262

Int. Cl.⁴ B32B *27/00*

U.S. Cl. 428—383 **31 Claims**



1. A deep-colored fiber having on its surface a film coating of a resin mixture comprising at least two kinds of resins that are incompatible with each other and are in phase-separated condition in said film coating, and an abrasion resistant resinous film covering said film coating.

4,900,626

HOLLOW COMPOSITE FIBERS SELECTIVELY PERMEABLE TO WATER VAPOR

Albert Fabre, Venissieux, France, assignor to Rhone-Poulenc Recherches, Courbevoie, France

Filed Jul. 28, 1987, Ser. No. 79,298

Int. Cl.⁴ D01D *39/08;* **D02G** *3/00*

U.S. Cl. 428—398 **10 Claims**

1. A hollow composite fiber which comprises:

(a) an asymmetric, hollow, polymeric fiber comprising poly(vinylidene fluoride), sulfonated polysulfone, polysulfone, cellulose ester, or mixtures thereof having no selectivity of the water vapor in air or carbon dioxide, and having an inside diameter of from 130 to 900 microns and an outside diameter of from 450 to 1,500 microns, said asymmetric hollow fiber comprising (i) a porous layer including a plurality of intercommunicating cells, the largest dimensions of which are less than 125 microns, with at least 80% of said cells having dimensions ranging from 0.5 to 20 microns and the pore volume of said cells constituting from 30 to 70% of the total volume of said asymmetric hollow fiber and (ii) a dense layer defining either the external or internal wall member of the asymmetric hollow fibers having pores, the diameters of which are less than 0.5 micron and the thickness thereof ranging from 0.1 to 1 micron;

(b) a polymer layer coated onto the dense layer (ii) of said asymmetric hollow fiber; and

(c) said hollow composite layer having a permeability relative to water vapor greater than to air or carbon dioxide and, thus, essentially no selectivity for airborne oxygen or to nitrogen.

4,900,627

PRODUCING POLYMERIC FILMS FROM A SURFACTANT TEMPLATE

Jeffrey H. Harwell, and Edgar A. O'Rear, both of Norman, Okla., assignors to The Board of Regents for the University of Oklahoma, Norman, Okla.

Continuation of Ser. No. 725,007, Apr. 19, 1985, Pat. No. 4,770,906. This application Jun. 15, 1988, Ser. No. 207,276

Int. Cl.⁴ B32B *5/16;* **C08K** *3/10*

U.S. Cl. 428—403 **53 Claims**

21. A particle coated with a polymeric film characterized by at least one polymer network disposed within a surfactant template comprising molecules of an ionic surfactant.

4,900,628

GASEOUS PHASE SYNTHESIZED DIAMOND AND METHOD FOR SYNTHESIZING SAME

Akihiko Ikegaya. and Masaaki Tobioka, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 22, 1987, Ser. No. 76,721

Claims priority, application Japan, Jul. 23, 1986, 61-173365; Mar. 27, 1987, 62-75282; May 13, 1987, 62-116598

Int. Cl.⁴ B24D *3/02;* **C04B** *31/16*

U.S. Cl. 428—408 **3 Claims**

1. A diamond film coated on a substrate, wherein an average particle size of the diamond is less than 2 microns, a half-width of a peak of 1344 cm^{-1} measured by the Raman spectrometric method is 50 cm^{-1} or less, and the coated diamond has an electric resistance of 10^8 ohm-cm or more.

4,900,629

HIGH COMPRESSIBILITY GASKET MATERIAL

Stefan Pitolaj, Paymyra, N.Y., assignor to Garlock Inc., Palmyra, N.Y.

Filed Oct. 4, 1988, Ser. No. 253,185

Int. Cl.⁴ B32B *27/06, 5/16*

U.S. Cl. 428—422 **9 Claims**



1. A highly compressible gasket assembly comprising a unitary body having opposite, spaced first and second outer surfaces defining a thickness dimension therebetween, said body being formed essentially of a single binder material and including at least a first area adjacent to and bounded by one of said outer surfaces and a second area unitary with said first area, said second area being less compressible in response to force and of greater tensile strength than said first area, said first area containing fully embedded, hollow collapsible particles dispersed therein within said binder material and bonded thereto, said second area being free of said collapsible particles, said first and second areas each having a thickness which constitutes a portion of said thickness dimension, said second area being at least twice as thick as said first area.

4,900,630

GLASS PLATE WITH REFLECTIVE MULTILAYER COATINGS TO GIVE GOLDEN APPEARANCE

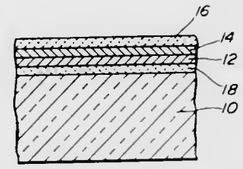
Junichi Suzuki, Matsusaka; Masato Nakamura, Mie; Nobuyuki Takeuchi, Ise; Yasunobu Iida, Matsusaka, and Hiroyuki Nishii, Ise, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 26, 1988, Ser. No. 199,178

Claims priority, application Japan, May 29, 1987, 62-131283

Int. Cl.⁴ C03C *17/22*

U.S. Cl. 428—432 **8 Claims**



1. A coated glass plate, comprising a transparent or semi-transparent glass plate and a multilayer coating film which is provided on one side of the glass plate and comprises a TiN layer adjacent to the glass plate surface and a layer of a metal selected from the group consisting of Ti and Cr which overlies said TiN layer, said multilayer coating film being formed such that the transmittance of the coated glass plate for visible light is not more than 40%.

4,900,631

MAGNETIC RECORDING MEDIA

Masahiro Yamakawa, Takaoka, and Eitaro Nakamura, Tokyo, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Division of Ser. No. 931,876, Nov. 17, 1986, Pat. No. 4,851,465, which is a continuation of Ser. No. 729,183, May 1, 1985, abandoned. This application Sep. 2, 1988, Ser. No. 239,683

Claims priority, application Japan, May 8, 1984, 69-91684

Int. Cl.⁴ B32B *27/36*

U.S. Cl. 428—483 **15 Claims**

1. A magnetic recording media comprising a polyester substrate and a magnetic layer coated on said substrate, said magnetic layer comprising a polyisocyanate cross-linked vinyl chloride copolymer binder and a magnetic powder dispersed in said binder, said vinyl chloride copolymer comprising

(1) at least 60% by weight of vinyl chloride subunits,

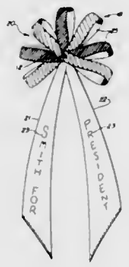
(2) 0.1 to 4.0% by weight, as a sulfur- or phosphorus-containing strong acid group, of strong acid group-containing monomer subunits,

(3) at least 0.1% by weight, as the hydroxyl groups, of subunits of a monomer which gives a side chain represented by the formula —X—OH wherein X is an organic group selected from the group consisting of C_nH_{2n}, OC_nH_{2n}, $COOC_nH_{2n}$ and $CONHC_nH_{2n}$, where n is an integer of 1 to 4, and

(4) 0 to 20% by weight of subunits of another monomer selected from the group consisting of vinyl esters of carboxylic acids, vinyl ethers, vinylidene halides, unsaturated carboxylic acids, unsaturated carboxylic acid anhydrides, esters of unsaturated carboxylic acids, olefins, unsaturated nitriles and aromatic vinyl compounds.

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4,900,632
DECORATIVE MULTI-LOOP DEVICE
Paul F. McGrath, Overland Park, Kans., assignor to Hallmark Cards, Inc., Kansas City, Mo.
Filed Mar. 7, 1989, Ser. No. 320,118
Int. Cl.[4] D04D *7/10*
U.S. Cl. 428—542.8 21 Claims



1. A decorative multi-loop device comprising at least one blank of foldable sheet material, said blank including a central section and at least three loop-forming segments integral with and projecting laterally outwardly from said central section; and loop-retaining means on said blank; a predetermined number of said loop-forming segments being independently adjustable relative to said central section and defining decorative loops, each of said predetermined segments having a distal end portion in securing engagement with said loop-retaining means.

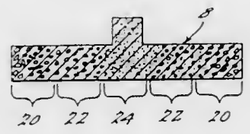
4,900,633
HIGH PERFORMANCE MULTILAYER COATINGS
Frank H. Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Mar. 26, 1987, Ser. No. 31,317
Int. Cl.[4] G02B *1/10;* **B32B** *17/06;* **B05D** *5/06*
U.S. Cl. 428—432 20 Claims

1. An article of manufacture for the reflectance of solar energy comprising:
a. a transparent substrate;
b. a transparent film of titanium oxynitride;
c. a first transparent metal film of a highly infrared reflective metal; and
d. a second transparent metal film of a neutral metal.

4,900,634
METHOD OF COATING GLASS AND COATED FLAT GLASS
Robert Terneu, Thiméon, and Albert Van Cauter, Charleroi, both of Belgium, assignors to Glaverbel, Brussels, Belgium
Filed Dec. 4, 1987, Ser. No. 129,961
Claims priority, application United Kingdom, Dec. 23, 1986, 8630791
Int. Cl.[4] E04B *1/62*
U.S. Cl. 428—432 20 Claims

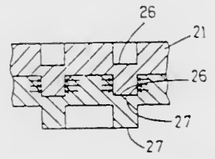
1. Flat glass bearing a pyrolytic tin oxide coating, comprising:
a pyrolytic tin oxide coating comprised of at least two adjuvants, which at least two adjuvants include fluorine together with at least one other adjuvant selected from the group consisting of antimony, arsenic, vanadium, cobalt, zinc, cadmium, tungsten, tellurium, molybdenum and manganese, the nature and amount of such adjuvants in the coating, and the thickness of the coating, being effective to provide a pyrolytic tin oxide coating having an emissivity in respect of infra-red radiation having wavelengths greater than 3 micrometers of at most 0.3 and having a specific internal haze factor of at most 1.5.

4,900,635
MULTI-ALLOY TURBINE ROTOR DISK
Kim E. Bowen, Whitehall; Steven M. Foster, Wixom, both of Mich., and Said Izadi, San Diego, Calif., assignors to Williams International Corporation, Walled Lake, Mich.
Division of Ser. No. 78,396, Jul. 27, 1987, Pat. No. 4,851,190.
This application Feb. 9, 1989, Ser. No. 307,923
Int. Cl.[4] B22F *3/00*
U.S. Cl. 428—547 3 Claims



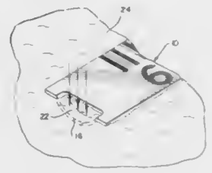
1. A turbine disk comprising a first grain structure exhibiting relatively high creep strength and moderate tensile strength on the radially outer perimeter thereof, a second grain structure exhibiting relatively high tensile strength and moderate creep strength at the center thereof, and a transition zone between said first grain structure on the radially outer perimeter of said disk and the second grain structure at the center of said disk, said transition zone comprising both said first and second grain structures and exhibiting a gradual change from said first grain structure radially inwardly to said second grain structure without significant stratification.

4,900,636
METAL PLATE LAMINATED BODY
Syoishi Takenouchi, Toyota; Kazuhiro Morita, Anjo; Shinichi Ezaka, Kariya, and Yoshitaka Kuroda, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Jun. 20, 1988, Ser. No. 208,571
Claims priority, application Japan, Sep. 8, 1987, 62-224927; Sep. 11, 1987, 62-228969
Int. Cl.[4] H01F *27/26*
U.S. Cl. 428—571 10 Claims



1. A metal plate laminated body comprising: a plurality of contiguous metal plates each including a recess formed in an upper surface thereof by embossing an arbitrary plane configuration encircled by inner and outer closed curves and a projection formed on a lower surface thereof and having inner and outer diameters, wherein said contiguous metal plates being so laminated as to be secured to each other by press-fitting said projection into said recess.

4,900,637
TAG FOR LABELING AN ARTICLE CAST FROM MOLTEN MATERIAL, METHOD THEREFORE AND ARTICLE
James L. Darovec, Bettendorf, Iowa, assignor to Aluminum Company of America, Alcoa Center, Pa.
Filed Oct. 7, 1988, Ser. No. 254,702
Int. Cl.[4] B22D *19/00;* **G09F** *3/04*
U.S. Cl. 428—577 24 Claims



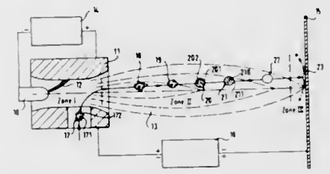
1. A tag for labeling an article formed by solidification of a molten material in a molten material bath, comprising:
a structural sheet having a portion including a surface with machine or human readable markings thereon, and at least one article attachment projection extending outwardly from said portion and defining with said portion a passage for flow therethrough of molten material,
whereby upon contact of each attachment projection with the molten material bath each attachment projection sinks into the molten material bath exposing its passage to the molten material for flow therethrough and bringing said portion into contact with the surface of the molten material, which contact is maintained while the molten material solidifies, thereby adhering each attachment projection to the solidifed material.

4,900,638
NICKEL-BASE SOLDER FOR HIGH-TEMPERATURE SOLDER JOINTS
Kurt Emmerich, Alzenau, Fed. Rep. of Germany, assignor to Vacuumschmelze GmbH, Fed. Rep. of Germany
Filed Mar. 14, 1988, Ser. No. 167,964
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712271
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—606 3 Claims

1. A nickel-base solder for producing high temperature solder joints in steel and nickel-base superalloys containing aluminum and chromium, said nickel-base alloy having substantially uniform amorphous composition throughout and consisting essentially of from approximately 0 to about 4 atomic percent iron, from approximately 0 to about 21 atomic percent chromium, from approximately 0 to about 19 atomic percent boron, from approximately 0 to about 12 atomic percent silicon, from approximately 0 to about 22 atomic percent carbon, and from approximately 0 to about 5 atomic percent of at least one of the metals niobium, zirconium, or titanium, the balance being essentially nickel, the sum of the boron, carbon, silicon and phosphorus contents being in the range of from approximately 16 to about 24 atomic percent.

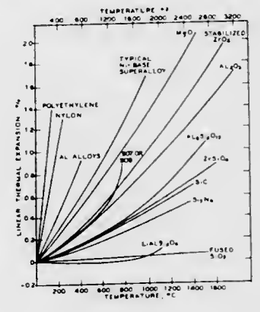
2. A solder according to claim 1 in the form of a uniform ductile foil of amorphous composition having a thickness of 10 to 50 um.

4,900,639
CLADDING OF BEARING METAL AND PROCESS FOR PRODUCTION THEREOF
Erich Hodes, v.d. Höhe; Ulrich Engel, Bad Schwalbach, and Heiko Gruner, Beinwil am See, all of Fed. Rep. of Germany, assignors to 501 Glyco-Metall-Werke Daelen, Wiesbaden, Fed. Rep. of Germany and Loos GmbH, Zug, Switzerland
PCT No. PCT/EP87/00334, § 371 Date Apr. 22, 1988, § 102(e) Date Apr. 22, 1988, PCT Pub. No. WO88/00251, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 25, 1987, Ser. No. 163,092
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621184
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—610 21 Claims



1. Bearing metal layer applied by vacuum plasma spraying to a support member directly or over an interlayer, comprising a dispersion alloy having at least two metallic components in a mixture leading to miscibility gaps, selected from the group consisting of aluminum-lead, aluminum-tin, and copper-lead dispersion alloys, said components, in the region of the miscibility gaps, forming a homogeneous alloy layer substantially free from pores, lamellae and stalk crystals, having uniformly dispersed fine particles comprising precipitation crystallites of one of said metallic components of a size substantially less than 5 microns and having a porosity of about 0% to 1%.

4,900,640
LOW COEFFICIENT OF EXPANSION ALLOYS HAVING A THERMAL BARRIER
James A. E. Bell, Oakville, Canada, and John J. deBarbadillo, Barboursville, W. Va., assignors to Inco Limited, Toronto, Canada
Filed Apr. 19, 1988, Ser. No. 183,675
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—633 7 Claims



1. An improved coated article of manufacture having a thermal barrier coating system including a substrate, an intermediate bond coating registered with the substrate, and a thermal barrier coating over the intermediate bond coating, the improvement comprising the substrate made from an iron-nickel containing alloy having a low linear coefficient of ex-

pansion of about 10 μm/m/° C. at about 649° C., the linear coefficient of expansion of the iron-nickel containing alloy approximating the linear coefficient of expansion of the thermal barrier coating.

4,900,641

RADIOGRAPHIC INTENSIFYING SCREEN

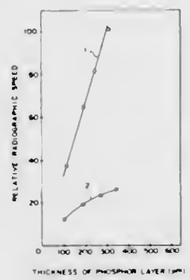
Katsuhiro Kohda, Kanagawa, and Kenji Takahashi, Odawara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 12,010, Feb. 6, 1987, abandoned. This application May 17, 1987, Ser. No. 196,768

Claims priority, application Japan, Feb. 7, 1986, 61-25572; Apr. 19, 1986, 61-90619

Int. Cl.[4] G01J *1/58;* **C09K** *11/46;* **G01N** *21/52*

U.S. Cl. 428—690 **9 Claims**



1. A radiographic intensifying screen comprising a support and a phosphor layer provided on the support which comprises a binder and a phosphor dispersed therein, characterized in that said phosphor is a phosphor selected from the group consisting of divalent europium activated alkaline earth metal fluorohalide phosphors containing iodine and alkali metal iodide phosphors and that said phosphor layer contains a compound having an epoxy group and/or at least one compound selected from the group consisting of phosphites, organotin compounds and metal salts of organic acids.

4,900,642

CATALYTIC RECOMBINATION OF EVOLVED OXYGEN IN GALVANIC CELLS

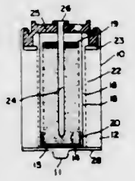
Klaus Tomantschger, Mississauga, Canada, and Karl Kordesch, Graz, Austria, assignors to Battery Technologies Inc., Mississauga, Canada

Continuation of Ser. No. 234,922, Aug. 22, 1988, abandoned. This application Sep. 11, 1989, Ser. No. 405,309

Claims priority, application Canada, Oct. 27, 1987, 550335

Int. Cl.[4] H01M *10/52*

U.S. Cl. 429—59 **6 Claims**



1. A rechargeable electrochemical cell having a cylindrical metal oxide cathode, a cylindrical zinc anode, a current collector extending into said anode and an aqueous alkaline electrolyte contacting the anode and cathode, in which cell oxygen may evolve on charge, overcharge, or any reversal of cell polarity; the cell including an auxiliary transfer electrode provided for the anode and physically separated therefrom by a separator sheet but in electronic and ionic contact with said anode, said auxiliary transfer electrode being at least partially wetted by said electrolyte and thereby establishing said ionic contact between said auxiliary transfer electrode and said anode; said auxiliary transfer electrode comprising porous carbon bonded with polytetrafluoroethylene; wherein said current collector pierces said auxiliary transfer electrode and thereby establishes said electronic contact between said auxiliary transfer electrode and said anode; whereby oxygen evolved within said cell is recombined by said auxiliary transfer electrode.

4,900,643

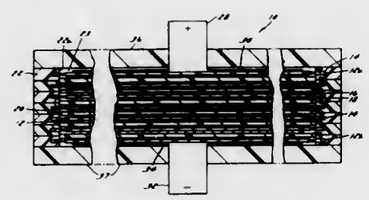
LEAD ACID BIPOLAR BATTERY PLATE AND METHOD OF MAKING THE SAME

Michael D. Eskra, Fredonia; William C. Delaney, Saukville, and Gerald K. Bowen, Cedarburg, all of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Apr. 8, 1988, Ser. No. 179,068

Int. Cl.[4] H01M *4/74*

U.S. Cl. 429—241 **19 Claims**



1. A plate for a bipolar battery comprising:

(a) a planar substrate of plastic conductive material;

(b) a mesh of metallic wire disposed within the surface of said substrate on both sides thereof so that a portion of the surfaces of said metallic wire is exposed above said substrate surface thereby dividing said substrate surface into discrete surface areas;

(c) positive active material adhered to one of said sides of said substrate in contact with said discrete surface areas and said exposed surfaces of metallic wire; and

(d) negative active material adhered to the other of said sides of said substrate in contact with said discrete surface areas and said exposed surfaces of said metallic wire.

4,900,644

UNSHARP MASKING OF DIAGNOSTIC RADIATION INTENSIFYING SCREENS

Jeffrey H. Bell, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jun. 10, 1988, Ser. No. 205,245

Int. Cl.[4] G03F *1/00*

U.S. Cl. 430—6 **17 Claims**

1. A masked intensifying screen, comprising, in order, a sheet support, a fluorescent layer on the support, and a masking layer adhered to the fluorescent layer, wherein the masking



layer comprises a photosensitive layer bearing a toned, anatomically correct, unsharp halftone image.

4,900,645

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER COMPRISES STYRYL COMPOUND AS TRANSPORT MATERIAL

Hideaki Ueda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

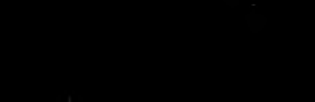
Filed Apr. 25, 1988, Ser. No. 185,871

Claims priority, application Japan, Apr. 27, 1987, 62-105427; Apr. 27, 1987, 62-105428; Apr. 27, 1987, 62-105433

Int. Cl.[4] G03G *5/14*

U.S. Cl. 430—58 **10 Claims**

1. A photosensitive member comprising a styryl compound as a charge transporting material which is represented by the following formula (I),



[I]

wherein Ar_1 is a halogen atom or a cyano group; or a condense polycyclic group, an aromatic heterocyclic group, an alkyl group or an alkyl group, each of which may have substituents; Ar_2 is an aromatic hydrocarbon group, a condensed polycyclic group or an aromatic heterocyclic group, each of which may have substituents; Ar_3 and Ar_4 are independently an aromatic hydrocarbon group, a condensed polycyclic group, or a heterocyclic group, each of which may have substituents; n is 0 or 1; One of Ar_1, Ar_2, Ar_3 and Ar_4 is an aromatic hydrocarbon group which may have substituents.

4,900,646

ELECTROPHOTOGRAPHIC RECORDING MATERIAL AND METHOD OF PRODUCING IT

Wilhelm Senske, Eschborn; Ekkehard Niemann, Maintal; Roland Herkert, Frankfurt am Main, and Guido Blang, Braunoberg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 24, 1988, Ser. No. 201,432

Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717727

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—64 **17 Claims**

1. A method of producing an electrophotographic recording material, comprising:

a first step of coating an aluminum substrate with a blocking layer which is a member of the group consisting of SiO_x, SiC_x, amorphous carbon and doped, amorphous silicon;

a second step of coating said blocking layer with a layer of amorphous silicon by direct current magnetron cathode sputering using at least one sputter target containing silicon, wherein a power density of from about 2.0 W/cm^2 to about 30 W/cm^2 is used for said sputtering, and wherein said second step is performed in an atmosphere containing hydrogen and at least one inert gas, wherein the total pressure of inert gas and hydrogen lies in a range from about 1×10^{-3} to about 10×10^{-3} mbar; and

a third step of coating said amorphous silicon layer with a cover layer.

4,900,647

PROCESS FOR PRODUCING ELECTROPHOTOGRAPHIC TONER COMPRISING MICROPULVERIZATION, CLASSIFICATION AND SMOOTHING

Norio Hikake; Hitoshi Kanda, both of Yokohama, and Yoshihiko Hyosu, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1988, Ser. No. 174,895

Claims priority, application Japan, Mar. 31, 1987, 62-78016

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—137 **20 Claims**

1. A process for producing a toner for developing an electrostatic latent image comprising the steps of:

pulverizing a resinous material comprising a binder resin using micro-pulverizing means to prepare resinous particles;

classifying the resinous particles using classifying means to obtain classified particles having a predetermined particle size;

removing surface inequalities of irregularities of the classified particles to yield smoothed base particles (A) having a ratio of the smallest diameter to the largest diameter thereof of 0.70–0.90;

mixing the base particles (a) with modifier particles (B), thereby to attach the modifier particles (B) to the surfaces of the base particles (A); and

using a mechanical impact force to fix modifier particles (B) to the surfaces of the base particles (A).

4,900,648

OPTICAL INFORMATION RECORDING MEDIUM

Takanori Hioki; Yoshio Inagaki, both of Minami-Ashigara, and Masao Yabe, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 26, 1988, Ser. No. 161,475

Claims priority, application Japan, Feb. 27, 1987, 62-44869

Int. Cl.[4] G03C *1/72, 5/16;* **G11B** *7/24;* **B41M** *5/26*

U.S. Cl. 430—270 **20 Claims**

1. An optical information recording medium for carrying out recording and reproduction with laser beams which comprises a support having carried thereon at least one methine dye which comprises an azulene nucleus, at least one of the two carbon atoms at the 1 and 3 positions of which is replaced by a chalcogen atom or a nitrogen atom, and further whose 7-membered ring part is substituted with a methine bond having at the terminal an auxochrome which forms a conjugated resonance chromophore together with a 10 π electron system of the nucleus.

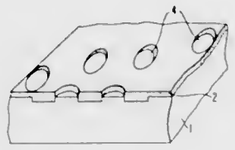
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4,900,649

METHOD OF PRODUCING AN OPTICAL RECORDING MEDIUM AND AN OPTICAL RECORDING MEDIUM PRODUCED THEREBY

Hideaki Mochizuki, Higashiosaka; Tooru Tamura, Ikeda; Keoichi Takahashi, Kyoto, and Mitsuaki Oshima, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 19, 1986, Ser. No. 932,641
Claims priority, application Japan, Nov. 19, 1985, 60-258928; Dec. 9, 1985, 60-276337
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—311 **7 Claims**



1. A method of producing an optical recording medium, said method comprising:

forming an optical recording film comprising an organic pigment which substantially absorbs only light having a wavelength within a predetermined range of wavelengths on a transparent substrate;

forming a series of pits in said recording film by only subjecting the outer surface of said recording film to a laser beam having a wavelength within said predetermined range so that said outer surface is perforated under the absorption of the laser beam by said optical recording film to record signals thereon; and

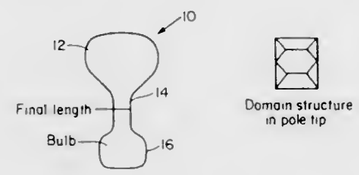
forming a reflection layer on the perforated recording film that extends over said surface of the recording film and into said pits to conform to said series of pits so that the recorded signals are reproducible by a laser beam having a wavelength outside of said predetermined range and directed on said reflection layer through the substrate and the recording film.

4,900,650

METHOD OF PRODUCING A POLE PIECE WITH IMPROVED MAGNETIC DOMAIN STRUCTURE

Shyam C. Das, Sudbury, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed May 12, 1988, Ser. No. 193,417
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—319 **9 Claims**



1. Method of producing a thin film head made of a magnetic alloy having a pole tip region with desired magnetic domain structure comprising:

forming a mask having a yoke region, a narrower pole tip region, and a bulb region adjacent the pole tip region; and through mask plating of the thin film head.

4. The method of claim 1 or claim 2 or claim 3 wherein the mask is formed using photoresist and photolithographic techniques.

4,900,651

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS USING A DEVELOPER COMPRISING CHELATIN AGENTS, BRIGHTENING AGENTS AND NO BENZYL ALCOHOL

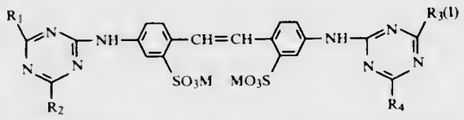
Takatoshi Ishikawa, and Hiroshi Fujimoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1988, Ser. No. 158,972
Claims priority, application Japan, Feb. 20, 1987, 62-37350
Int. Cl.[4] G03C *7/30, 5/24*
U.S. Cl. 430—380 **17 Claims**

1. A method for processing a silver halide color photographic material, which comprises developing said silver halide color photographic material with a color developer that does not contain a substantial amount of benzyl alcohol, said color developer comprising:

(a) an aromatic primary amine color developing agent;

(b) at least one brightening agent represented by formula (I)



wherein R_1, R_2, R_3 and R_4 each represents a hydroxyl group, an alkoxy group, an amino group, an alkylamino group, an aryloxy group or an arylamino group; provided that R_1 is not the same as R_3 when R_2 is the same as R_4, and R_1 is not the same as R_4 when R_2 is the same as R_3; and M represents a monovalent cation; and

(c) at least one organic phosphonic acid series chelating agent.

4,900,652

RADIOGRAPHIC ELEMENT

Robert E. Dickerson, Rochester; James E. Kelly, Pittsford; Donald R. Diehl, and Ronda E. Factor, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 73,256, Jul. 13, 1987, Pat. No. 4,803,150. This application Jul. 11, 1988, Ser. No. 217,727
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.[4] G03C *1/46*
U.S. Cl. 430—502 **14 Claims**

1. A radiographic element comprised of

a film support capable of transmitting radiation to which said radiographic element is responsive having opposed major surfaces, and, coated on said opposed major surfaces,

processing solution permeable hardenable hydrophilic colloid layers including

at least one silver halide emulsion layer comprised of

silver bromide or bromoiodide grains including tabular grains having a thickness of less than 0.3 μm which have an average aspect ratio of greater than 5:1 and account for greater than 50 percent of the total grain projected area and

spectral sensitizing dye adsorbed to the surface of said grains in an amount sufficient to substantiality optimally spectrally sensitize said emulsion layer and

a layer interposed between said silver halide emulsion layer and said support containing a dye capable of absorbing radiation to which said emulsion layer coated on the opposite of said major surfaces is responsive to reduce crossover,

characterized in that

said dye in said interposed layer is, prior to processing, in the form of particles and present in an amount sufficient to reduce crossover to less than 10 percent and is capable of being substantially decolorized during processing,

said interposed layer contains at least 10 mg/dm^2 of hardenable hydrophilic colloid,

said emulsion layers contain a combined silver coating coverage sufficient to produce a maximum density on processing in the range of from 3 to 4,

a total of from 35 to 65 mg/dm^2 of processing solution permeable hardenable hydrophilic colloid is coated on each of said opposed major surfaces of said support, and

said processing solution permeable hydrophilic colloid layers are forehardened in an amount sufficient to reduce swelling of said layers to less than 300 percent, percent swelling being determined by (a) incubating said radiographic element at 38° C. for 3 days at 50 percent relative humidity, (b) measuring layer thickness, (c) immersing said radiographic element in distilled water at 21° C. for 3 minutes, and (d) determining the percent change in layer thickness as compared to the layer thickness measured in step (b),

whereby said radiographic element exhibits high covering power, reduced crossover without emulsion desensitization, reduced wet pressure sensitivity, and can be developed, fixed, washed, and emerge dry to the touch in a 90 second 35° C. process cycle consisting of

development	24 seconds at 40° C.,
fixing	20 seconds at 40° C.,
washing	10 seconds at 40° C., and
drying	20 seconds at 65° C.,

where the remaining time is transport between processing steps, the development step employs the following developer:

Hydroquinone	30 g
1-Phenyl-3-pyrazolidone	1.5 g
KOH	21 g
$NaHCO_3$	7.5 g
K_2SO_3	44.2 g
$Na_2S_2O_5$	12.6 g
NaBr	35 g
5-Methylbenzotriazole	0.06 g
Glutaraldehyde	4.9 g
Water to 1 liter at pH 10.0, and	

the fixing step employs the following fixing composition:

Ammonium thiosulfate, 60%	260.0 g
Sodium bisulfite	180.0 g
Boric acid	25.0 g
Acetic acid	10.0 g
Aluminum sulfate	8.0 g
Water to 1 liter at pH 3.9 to	4.5.

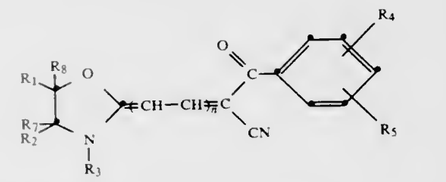
4,900,653

PHOTOGRAPHIC ELEMENTS CONTAINING FILTER DYE PARTICLE DISPERSIONS

Ronda E. Factor, and Donald R. Diehl, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 137,491, Dec. 23, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 290,602
Int. Cl.[4] G03C *1/84*
U.S. Cl. 430—522 **6 Claims**

1. A photographic element comprising a support having thereon a radiation-sensitive silver halide emulsion layer and a hydrophilic colloid layer, which is the same as or different from the silver halide layer, comprising from 1 to 1000 mg/m^2 of a solid particle dispersion of a compound having the formula:



wherein

R_1 and R_2 are each independently substituted or unsubstituted alkyl or substituted or unsubstituted aryl, or together repesent the atoms necessary to complete a substituted or unsubstituted 5- or 6-membered ring, and R_1 is H if R_7 is substituted or unsubstituted alkyl,

R_3 is substituted or unsubstituted alkyl or aryl,

R_4 and R_5 each independently represents H, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, secondary or tertiary amino, CO_2H, or $NHSO_2R_6$, with the proviso that at least one of R_4, R_5, or a substituent on an aryl ring in R_3, on an aryl ring in R_4 or R_5, on an aryl ring in R_1 or R_2, or on an aryl ring formed by R_1 and R_2 is CO_2H or $NHSO_2R_6$,

R_6 is substituted or unsubstituted alkyl or substituted or unsubstituted aryl, and

R_7 is substituted or unsubstituted alkyl, or together with R_8 forms a double bond,

R_8 is H or together with R_7 forms a double bond, and

n is 1 or 2,

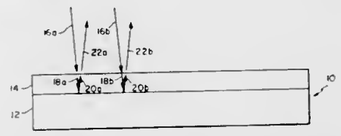
the particles in said dispersion having a mean diameter of from about 0.01 to 10 μm.

4,900,654

PHOTOGRAPHIC ELEMENTS CONTAINING REFLECTIVE OR DIFFUSELY TRANSMISSIVE SUPPORTS

Mark A. Pollock, Johnson City; William J. Stowell, and James J. Krutak, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 47,821, May 5, 1987, Pat. No. 4,770,931. This application Sep. 9, 1988, Ser. No. 243,523
Int. Cl.[4] G03C *1/78*
U.S. Cl. 430—533 **8 Claims**



1. A photographic element comprised of a reflective or diffusely transmissive support, and coated on said support,

at least one radiation-sensitive silver halide emulsion layer,

characterized in that said support is comprised of a continuous polyester phase having dispersed therein microbeads of cellulose acetate which are at least partially bordered by void space, said microbeads of cellulose acetate being present in an amount of 10–30% by weight based on the weight of said polyester, said void space occupying 2–50% by volume of said support, said polyester having an I.V. of at least 0.55 and said cellulose acetate having an acetyl content of about 28–44.8% by weight, a viscosity of about 0.02–90 seconds and the microbeads thereof having an average diameter of about 0.1–50 microns.

4,900,655

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kiyoshi Nakazyo; Takeshi Hirose; Genichi Hurusawa; Osamu Takahashi; Nobuo Furutachi, and Hidetoshi Kobayashi, all of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

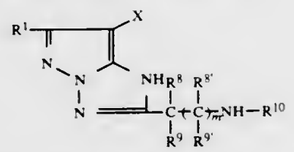
Continuation-in-part of Ser. No. 865,694, May 22, 1986, abandoned. This application Nov. 27, 1987, Ser. No. 125,796

Claims priority, application Japan, May 22, 1985, 60-110044; Oct. 11, 1985, 60-226374

Int. Cl.[4] G03C *7/38*

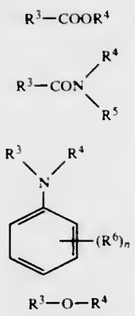
U.S. Cl. 430—546 **7 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having provided thereon at least one silver halide emulsion layer, wherein at least one magenta coupler represented by the formula (VIII):



(VIII)

wherein R^1 represents a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, a cyano group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a substituted or unsubstituted heterocyclic oxy group, a substituted or unsubstituted acyloxy group, a substituted or unsubstituted carbamoyloxy group, a substituted or unsubstituted silyloxy group, a substituted or unsubstituted sulfonyloxy group, a substituted or unsubstituted acylamino group, a substituted or unsubstituted anilino group, a substituted or unsubstituted ureido group, a substituted or unsubstituted imido group, a substituted or unsubstituted sulfamoylamino group, a substituted or unsubstituted carbamoylamino grou, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group, a substituted or unsubstituted heterocyclic thio group, a substituted or unsubstituted alkoxycarbonylamino group, a substituted or unsubstituted aryloxycarbonylamino group, a substituted or substituted sulfonamido group, a substituted or unsubstituted carbamoyl group, a substituted or unsubstituted acyl group, a substituted or unsubstituted sulfamoyl group, a substituted or unsubstituted sulfonyl group, a substituted or unsubstituted sulfinyl group, a substituted or unsubstituted alkoxycarbonyl group or a substituted or unsubstituted arylkoxycarbonyl group; and X represents a hydrogen atom or a group releasable by coupling with an oxidized product of an aromatic primary amine developing agent, R^8, $R^{8'}$, R^9 and $R^{9'}$ each represents a hydrogen atom, a cyano group, a halogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a substituted or unsubstituted acylamino group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group, a substituted or unsubstituted sulfonamido group, a substituted or substituted carbamoyl group, a substituted or unsubstituted sulfamoyl group or a substituted or unsubstituted sulfonyl group, with proviso that R^8, $R^{8'}$, R^9 and $R^{9'}$ do not simultaneously take the same atom or group unless otherwise represents the hydrogen atom, the cyano group, the halogen atom and the substituted or unsubstituted alkyl group; m represents 0 or an integer of from 1 to 5; and R^{10} represents a substituted or unsubstituted acyl group, a substituted or unsubstituted sulfonyl group, a substituted or unsubstituted alkoxycarbonyl group, a substituted or unsubstituted carbamoyl group or a substituted or unsubstituted sulfamoyl group, is dispersed in the silver halide emulsion layer in the presence of at least one high-boiling organic solvent represented by one of the formulae (II), (III), (IV) and (V):



(II) (III) (IV) (V)

wherein R^3, R^4 and R^5 each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; R^6 represents R^3, $—OR^3$ or $—SR^3$ is as defined above; n represents an integer of from 1 to 5; when n is 2 or more each R^6 may be the same or different; R^3 and R^4 in the formula (V) may together form an oxirane ring, an oxorane ring or an oxane ring, which may be substituted or form a fused ring; and the high boiling point organic solvent has a dielectric constant of not less than 4.00 at 25° C. and 10 KHz.

4,900,656

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Tadaaki Tani; Mikio Ihama, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

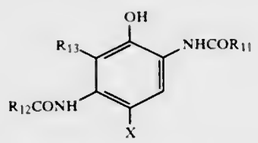
Continuation of Ser. No. 899,140, Aug. 22, 1986, abandoned. This application Sep. 26, 1988, Ser. No. 249,197

Claims priority, application Japan, Aug. 22, 1985, 60-184485

Int. Cl.[4] G03C *1/14, 7/34*

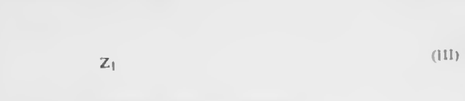
U.S. Cl. 430—550 **19 Claims**

1. A silver halide color photographic material comprising a support and at least one silver halide emulsion layer on the support, wherein the emulsion layer contains a silver halide emulsion which has been spectrally sensitized by adding a spectral sensitizing dye prior to the completion of formation of silver halide particles, and at least one cyan coupler represented by formula (I)



(I)

wherein R_{11} and R_{12} each represents an alkyl group, an aryl group, a heterocyclic group, an alkyloxy group, an aryloxy group, a heterocyclic oxy group, an alkylamino group, an arylamino group, or a heterocyclic amino group; R_{13} represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxyl group, an aryloxy group, an acyloxy group, or an acylamino group; X is a group capable of being released upon the oxidative coupling reaction with a developing agent; or R_{12} and R_{13} together form a 5- and 6-membered ring, and wherein the sensitizing dyes are dyes having the maximum value of spectral sensitivity at from 650 to 750 nm and are compounds represented by formula (III):



(III)

wherein in formula (III) Z_1 and Z_2 each represents an atomic group forming a 5- or 6-membered heterocyclic ring which may be substituted;

L_1, L_2 and L_3 each represents a methine group, which may be substituted;

R_{21} and R_{22} are each selected from the group consisting of an alkyl group, a carboxyalkyl group, a sulfoalkyl group, a fluorinated alkyl group, a hydroxyalkyl group, an alkoxyalkyl group, an aralkyl group, an aryloxyalkyl group, and an acylaminoalkyl group, each of which groups may be substituted;

$X_1^{\ominus}$ represents a counter ion;

l and n are each 0 or 1 and m is 0, 1, or 2, provided that $l+m+n=2$;

p is 0 or 1; and when $p=1$, the compounds of formula (III) form an intramolecular salt.

4,900,657

NOVEL PYRAZOLONE PHOTOGRAPHIC COLOR COUPLERS AND PHOTOGRAPHIC ELEMENTS CONTAINING THEM

Michael W. Crawley, Kingswood, and Paul Louis R. Stanley, Wealdstone, both of Great Britain, assignors to Eastman Kodak Company, Rochester, N.Y.

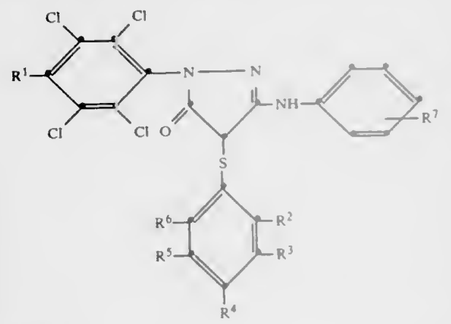
Filed May 30, 1989, Ser. No. 358,047

Claims priority, application United Kingdom, Jun. 21, 1988, 8814677

Int. Cl.[4] G03C *7/38*

U.S. Cl. 430—555 **5 Claims**

1. A photographic recording material comprising a support and a photosensitive silver halide emulsion layer which has associated therewith a magenta dye-forming coupler compound having the structural formula:



wherein:

R^1 is H or Cl;

R^2 is $NHSO_2R^9$, $NHCOR^9$, $—NHCONHR^9$, $—CONHR^9$, $—NR^8R^9$, $—R^9$ or $—OR^9$, or together with R^3 forms a fused ring system;

R^3, R^4, R^5 and R^6 are each H, Cl or R^2;

R^7 is H, $—COOR^8$ or $—CONHR^8$;

R^8 is alkyl or substituted alkyl; and

R^9 is H or as defined for R^8.

4,900,658

CHROMOPHORIC PEPTIDES FOR DETECTING PEPTIDYLGLYCINE-α-AMIDIZING MONOOXYGENASE

Wolfgang König, Hofheim am Taunus; Hubert Müllner, Kelkheim, and Jan Glauder, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 9, 1987, Ser. No. 36,468

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, 3612302

Int. Cl.[4] C12Q *1/00, 1/34;* C07K *5/08, 5/06*

U.S. Cl. 435—4 **5 Claims**

1. A peptide of the formula V

DIS—D—Ala—Pro—Q (V)

and salts thereof in which

DIS denotes 5-dimethylaminonaphthalene-1-sulfonyl,

Q denotes Gly—OH, NH_2 or Gly—R^2 and

R^2 denotes a carboxyl protective group.

4,900,659

NUCLEOTIDE SEQUENCE COMPOSITION AND METHOD FOR DETECTION OF *NEISSERIA GONORRHOEAE* AND METHOD FOR SCREENING FOR A NUCLEOTIDE SEQUENCE THAT IS SPECIFIC FOR A GENETICALLY DISTINCT GROUP

Andrew Lo, New York, N.Y., and Huey-Lang Yang, Tenafly, N.J., assignors to Enzo Biochem, Inc., New York, N.Y.

Filed Jan. 30, 1986, Ser. No. 823,921

Int. Cl.[4] C12Q *1/68*

U.S. Cl. 435—6 **6 Claims**

1. A composition of matter that is specific for *Neisseria gonorrhoeae* comprising at least one nucleotide sequence for which the ratio of the amount of said sequence which hybridizes to chromosomal DNA of *Neisseria gonorrhoeae* to the amount of said sequence which hybridizes to chromosomal DNA of *Neisseria meningitidis* is greater than about five, said ratio being obtained by a method comprising the folllowing steps;

(a) providing a radioactively labeled form of said nucleotide sequence;

(b) providing a serial dilution series of purified chromosomal DNA from each of the *N. gonorrhoeae* strains; (1) ATCC 53420, (2) ATCC 53421, (3) ATCC 53422, (4) STCC 53423, (5) ATCC 53424, (6) ATCC 53425, and forming test dots from each of said dilution series on a matrix;

(c) providing a serial dilution series of purified nucleotide sequences from each of the *N. meningitidis* strains: (1) ATCC 53414, (2) ATCC 53415, (3) ATCC 53416, 1 (4) ATCC 53417, (5) ATCC 53418, (6) ATCC 53419, and forming test dots from each of said dilution series on a matrix;

(d) hybridizing equal portions of the labeled nucleotide sequences to the matrix provided in step (b) and (c), respectively; wherein the hybridization is conducted in a solution having a slat concentration of 2X SSC at (i) 65° C. in cases in which the sequence has greater than 50 base pairs or (ii) at Tm (°C.) minus 30° C. in cases in which the sequence has less than 50 base pairs, wherein Tm is the denaturation temperature of the sequence;

(e) quantifying the labeled nucleotide sequence hybridized in step (d) to each test dot;

(f) subtracting from the data of step (a) an averaged amount of radioactivity attributable to background to obtain a corrected amount of hybridized radioactivity at each test dot;

(g) normalizing the data of step (f) by multiplying the amount of corrected radioactivity at each test dot by a factor which adjusts the amount of radioactivity to equal amounts of chromosomal DNA at each test dot;

(h) selecting two normalized values that are most nearly the

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same and that correspond to adjacent members of the dilution series for each of the above strains of *N. gonorrhoeae* and obtaining the average of the selected values;

(i) selecting two normalized values that are most nearly the same and that correspond to adjacent members of the dilution series for each of the above strains of *N. meningitidis* and obtaining the average of the selected values;

(j) dividing the lowest average obtained in step (h) by the highest average obtained in step (i) to obtain said ratio.

4,900,660

STREPTOCOCCAL FC RC

Michael D. P. Boyle; Kathleen J. Reis, and Elia M. Ayoub, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Nov. 25, 1985, Ser. No. 801,201
Int. Cl.[4] G01N *33/53*; C07K *15/04*
U.S. Cl. 435—7 **24 Claims**

1. In an immunoassay method wherein a bacterial Fc receptor is reacted with a mammalian IgG to bind to a site within the Fc region thereof, the improvement wherein said bacterial Fc receptor is a proteinaceous, antigenic factor derived from a group C streptococcus which is a receptor for the Fc region of IgG and which exhibits four major diffuse protein bands on polyacrylamide gel electrophoresis having apparent molecular weights of 48,000 (band I), 64,000 (band II), 90,000 (band III) and 110,000 (band IV) daltons, respectively.

16. Purified proteinaceous, antigenic factor derived from a group C streptococcus which is a receptor for the Fc region of IgG and which exhibits four major diffuse protein bands on polyacrylamide gel electrophoresis having apparent molecular weights of 48,000 (band I), 64,000 (band II), 90,000 (band III) and 110,000 (band IV) daltons, respectively.

4,900,661

METHOD FOR IMMUNOLOGICAL DETERMINATION OF AMINES, MONOCLONAL ANTIBODIES AND KIT OF REAGENTS FOR CARRYING OUT THE METHOD

Jean-Luc Guesdon; Stratis Avrameas, and Jean-Claude Mazie, all of Paris, France, assignors to Institut Pasteur Paris and Centre National de la Recherche Scientifique (CNRS), both of Paris, France

Filed Feb. 12, 1986, Ser. No. 828,854
Claims priority, application France, Feb. 14, 1985, 85-02130
Int. Cl.[4] G01N *33/53, 33/566*; C12N *15/00*
U.S. Cl. 435—7 **24 Claims**

1. A method for immunological determination of amines in biological media, wherein:

(a) the amine suspected of being present in the sample is reacted with a quinone;

(b) a monoclonal antibody which specifically recognizes the amine-quinone reaction product formed is then introduced into the medium; and

(c) determination is carried out for either a free or immobilized form of the monoclonal antibody present as an indication of the presence of an amine.

4,900,662

CK-MM MYOCARDIAL INFARCTION IMMUNOASSAY

Vipin D. Shah, Saratoga; Shing-Erh Yen, Foster City, and Gerald M. Anchin, Santa Cruz, all of Calif., assignors to International Immunoassay Laboratories, Inc., Santa Clara, Calif.

Filed Jul. 21, 1987, Ser. No. 76,038
Int. Cl.[4] G01N *33/00, 33/53*
U.S. Cl. 435—7 **26 Claims**

1. A method for determined the level of CK-MM_4 in a serum or plasma sample comprising interacting said sample with anti-(CK-MM_4) antibody, and determining the level of CK-MM_4 bound with anti-(CK-MM_4) antibody.

4,900,663

TEST KIT FOR DETERMINING THE PRESENCE OF ORGANIC MATERIALS AND METHOD OF UTILIZING SAME

Siong I. Wie, Irvine, and Arden A. Kelton, Fountain Valley, both of Calif., assignors to Environmental Diagnostics, Inc., Burlington, N.C.

Filed Sep. 13, 1985, Ser. No. 775,991
Int. Cl.[4] G01J *33/543, 33/558*
U.S. Cl. 435—7 **14 Claims**

1. In a colorimetric indicator testing device for determining the presence of at least on specific substance in a liquid medium, the combination of: a housing, said housing including a top wall, a bottom wall and side edges, said top wall having at least one control port and at least one test port therein and said housing incorporating a filter chamber; a flat, planar, elongated unitary filter located in said chamber, said filter having at least one control portion, at least one test portion, and a body portion for common wicking of liquid from said control and test portions; said control and test portions juxtaposed, respectively, to said control and test ports and liquid impervious means located in the plane of the filter between said filter control and test portions.

4,900,664

REAGENT FOR DETECTION AND MEASUREMENT OF ACETALDEHYDE-PROTEIN CONDENSATES IN A FLUID, TOGETHER WITH ITS PREPARATION AND METHOD OF USE

Yedy Israel, Toronto, Canada, and Ruth Arnon, Rehovot, Israel, assignors to Alcoholism and Drug Addition Research Foundation, Toronto, Canada

Filed Oct. 2, 1986, Ser. No. 914,326
Claims priority, application Canada, Oct. 4, 1985, 492334
Int. Cl.[4] G01N *33/55*
U.S. Cl. 435—7 **7 Claims**

1. A method for the detection and quantification of an acetaldehyde-protein condensate comprising reacting said condensate with an antibody specific to an acetaldehyde-protein condensate antigen which antibody is characterized by being cross-reactive with a reactant selected from the group consisting of:

an acetaldehyde-first protein condensate;

an acetaldehyde-second protein condensate; and

an acetaldehyde-modified protein, wherein said acetaldehyde-first protein condensate comprises a first protein moiety corresponding to the protein moiety of said antigen; and

said acetaldehyde-second protein condensate comprises a second protein moiety different from the protein moiety of said antigen; and

said acetaldehyde-modified protein corresponding to said protein moiety of said antigen, in order to form a complex; and

measuring said complex, wherein the amount of said complex is a function of the concentration of the acetaldehyde-protein condensate present.

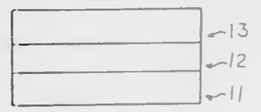
4,900,665

INTEGRAL MULTILAYER ANALYTICAL ELEMENT FOR USE IN THE MEASUREMENT OF ALKALINE PHOSPHATASE ACTIVITY

Kaoru Terashima; Shigeki Kageyama, and Harumi Katsuyama, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 794,110, Nov. 1, 1985, abandoned. This application Apr. 19, 1988, Ser. No. 185,294
Claims priority, application Japan, Nov. 2, 1984, 59-230239
Int. Cl.[4] C12Q *1/42*; G01N *31/22*
U.S. Cl. 435—21 **7 Claims**

1. An integral multilayer analytical element for use in the measurement of alkaline phosphatase activity, which comprises in sequential order a porous spreading layer of woven fabric or knitted fabric containing an alkaline phosphatase-sensitive self-developing substrate, a buffer layer containing a compound functioning as a phosphoric acid acceptor and a buffering agent and a support layer in a laminated form.



4,900,666

COLORIMETRIC ETHANOL ANALYSIS METHOD AND TEST DEVICE

Roger C. Phillips, Palo Alto, Calif., assignor to Lifescan, Inc., Mountain View, Calif.

Continuation of Ser. No. 624,774, Jun. 26, 1984, Pat. No. 4,734,360, which is a continuation-in-part of Ser. No. 513,505, Jul. 12, 1983, abandoned. This application Feb. 18, 1988, Ser. No. 157,932
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] C12Q *1/26*
U.S. Cl. 435—25 **36 Claims**

1. A dry room-temperature-stable test device for detecting ethanol in a aqueous fluid, which comprises an inert support pad containing stabilized alcohol oxidase in a dry form, wherein said stabilized alcohol oxidase comprises alcohol oxidase in intimate admixture with an effective alcohol oxidase stabilizing amount of a stabilizer comprising a solid aliphatic polyhydroxyl compound having from 5 to 8 carbon atoms and 5 to 7 hydroxyl groups, a substance having peroxidative activity, and a substance which will react with hydrogen peroxide in the presence of said substance having peroxidative activity to give a compound of changed color, wherein ethanol in said aqueous fluid reacts with the alcohol oxidase to yield hydrogen peroxide which reacts with the substance having peroxidative activity and the substance which gives the compound of changed color

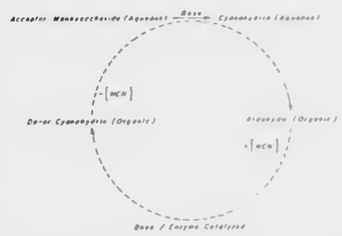
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4,900,667

ONE CARBON HOMOLOGATION OF CARBOHYDRATES BY TRANSCYANOHYDRINATION

Blaise J. Arena, Des Plaines, Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 810,627, Dec. 19, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 73,259
Int. Cl.[4] C12P *19/26*
U.S. Cl. 435—84 **23 Claims**



1. A method of transcyanohydrination of a monosaccharide comprising mixing a solution of a water-insoluble donor cyanohydrin in an organic solvent immiscible with water, said donor cyanohydrin being the adduct of the elements of hydrogen cyanide and a water-insoluble aldehyde, with an aqueous solution at a pH between about 7 and about 9 containing at least one monosaccharide so as to effect transfer of the elements of hydrogen cyanide from said donor cyanohydrin to the monosaccharide with formation of the cyanohydrins of the monosaccharide in the aqueous phase and regeneration of the water-insoluble aldehyde in the organic phase, and recovering the monosaccharide cyanohydrins.

4,900,668

PREPARATION OF PYRUVIC ACID

Brian Cooper, Mannheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,363
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1987, 3733157
Int. Cl.[4] C12P *19/04*; C12R *1/01*; C07G *17/001, 17/00*
U.S. Cl. 435—101 **9 Claims**

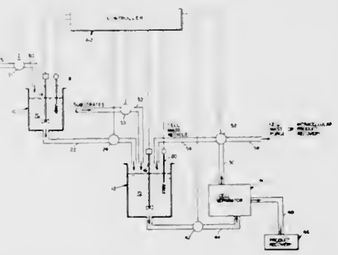
2. The process of claim 1, wherein said lactic acid is an aqueous lactic acid solution having a concentration of about 1-100 g/l.

4,900,669

DUAL-STAGE FERMENTATION

Randolph T. Hatch, Wellesley, and Keith C. Backman, Bedford, both of Mass., assignors to Biotechnica International, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 605,488, Apr. 30, 1984, Pat. No. 4,673,640. This application Jul. 31, 1985, Ser. No. 760,819
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.[4] C12P *13/22, 21/00*; C12N *9/00, 15/00*
U.S. Cl. 435—108 **5 Claims**



1. A method for continuously fermenting bacterial cells to form a product, said method comprising:

(a) providing at least a first and a second continuous fermentation unit and a means connected between said units to communicate therebetween;

(b) providing a strain of recombinant bacterial cells capable of being induced to undergo genetic rearrangement from a first genetic configuration to a second genetic configuration, said genetic rearrangement being lambdoid bacteriophage site-specific recombination mediated by lambdoid bacteriophage xis and int genes in response to an environmental shift from a first environmental condition, which is non-permissive for said genetic rearrangement, to a second environmental condition, which permits genetic rearrangement to form said second genetic configuration, said genetic rearrangement juxtaposing two inactive DNA segments to create an actively-expressed gene encoding a protein or polypeptide which is said product, or an intermediate or enzyme in a synthetic pathway of said product, said two inactive DNA segments being heterologous with respect to said lambdoid bacteriophage xis and int genes;

(c) continuously growing said bacterial cells in said first

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fermentation unit under said first environmental condition to establish a microorganism mass;

(d) transferring at least a portion of said microorganism mass from said first continuous fermentation unit through said means connecting said units to said second continuous fermentation unit;

(e) continuously culturing said bacterial cells in said second fermentation unit under production-favoring conditions, said second fermentation unit being maintained at said second environmental condition, whereby said bacterial strain in said second unit is subject to said genetic rearrangement effecting expression of said actively-expressed gene and production of said desired product in said second unit;

(f) removing an exudate of said microorganism mass from said second unit and removing said product from said exudate; and

(g) recycling at least a portion of the cell mass of said exudate of step (f) into said second unit, said portion being sufficient to maintain a desired cell density in said second unit.

4,900,670

MICROBIOLOGICAL PRODUCTION OF ACETALDEYDE

Robert R. Zall, Ithaca, N.Y., and Matthew Wecker, Bellevue, Wash., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Feb. 23, 1988, Ser. No. 159,153
Int. Cl.[4] C12R *1/01*; C12P *7/24*
U.S. Cl. 435—147 **5 Claims**

1. A method of obtaining an acetaldehyde producing strain of *Z. mobilis* which comprises (a) selecting a strain having decreased alcohol dehydrogenase activity by growing a first strain of *Z. mobilis* in the presence of consecutively higher concentrations of allyl alcohol sufficient to kill a majority of the starting number of cells and selecting an acetaldehyde producing strain from the remaining viable microorganisms and further processing the resulting acetaldehyde producing *Zymomonas mobilis* strain to select an aldehyde tolerant mutant by chemical mutagenesis wherein said selection is effected in the presence of vapor phase acetaldehyde.

4,900,671

BIOCATALYTIC PROCESS FOR PREPARING PHENOLIC RESINS USING PEROXIDASE OR OXIDASE ENZYME

Alexander R. Pokora, Reynoldsburg, and William L. Cyrus, Jr., Ray, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 16,964, Feb. 24, 1987, which is a continuation-in-part of Ser. No. 820,861, Jan. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 797,585, Nov. 13, 1985, Pat. No. 4,647,952. This application Jul. 8, 1987, Ser. No. 70,594
Int. Cl.[4] C08G *65/38*; C12P *7/32*
U.S. Cl. 435—156 **41 Claims**

1. A process for preparing a phenolic dimer or trimer which comprises reacting a phenol at a concentration of at least 1 g/100 ml with a peroxidase or an oxidase enzyme and a peroxide or oxygen in a medium containing an organic solvent and water in a volumetric ratio of 1/10 to 10/1 to produce a dimer or a trimer of said phenol wherein said phenol is dissolved in said organic solvent, and recovering said dimer or trimer.

4,900,672

METHOD FOR PRESERVATION OF NITRILE HYDRATION ACTIVITY

Hideaki Yamada, Kyoto; Kanehiko Enomoto, Tokyo; Koitchiro Ryuno, and Hitoshi Shimizu, both of Yokohama, all of Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1987, Ser. No. 45,870
Claims priority, application Japan, May 2, 1986, 61-101043
Int. Cl.[4] C12N *9/96*
U.S. Cl. 435—188 **5 Claims**

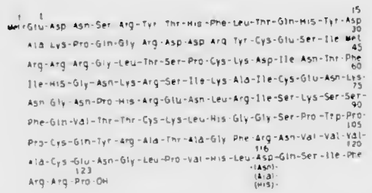
1. A method for preservation of the nitrile hydration activity of nitrile hydratase produced by a microorganism of the genus Pseudomonas, of cells of microorganisms of said genus Pseudomonas, or of immobilized forms thereof, all having nitrile hydration activity, said method comprising admixing as a stabilizer at least one compound selected from the group consisting of nitriles, amides, and organic acids and salts thereof with a suspension or solution of said nitrile hydratase, of said microorganism cells, or of said immobilized forms thereof, and the concentration of nitrile, amide and organic acid or the salt thereof in the suspension or solution being in the range of from 0.01 to 50 g/l.

4,900,673

MUTANT HUMAN ANGIOGENIN (ANGIOGENESIS FACTOR WITH SUPERIOR ANGIOGENIN ACTIVITY) GENES THEREFOR AND METHODS OF EXPRESSION

Jeffrey W. Harper, Newton Highlands, and Bert L. Vallee, Brookline, both of Mass., assignors to President and Fellows of Harvard College, Boston, Mass.

Filed Mar. 28, 1988, Ser. No. 173,760
Int. Cl.[4] C12N *15/00, 9/22, 1/20*; C07H *15/12*
U.S. Cl. 435—199 **9 Claims**



1. A mutant angiogenin protein wherein the aspartic acid at position 116 as shown in FIG. 5 has been replaced with another amino acid, the mutant angiogenin protein having increased angiogenic and ribonucleolytic activity.

4,900,674

ANTIBODY COMBINING SITES THAT EXHIBIT AMIDE OR ESTER SYNTHASE ACTIVITY

Stephen Benkovic, State College, Pa.; Richard A. Lerner, La Jolla; Alfonso Tramontano, San Diego, both of Calif., and Andrew D. Napper, State College, Pa., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed May 28, 1987, Ser. No. 55,177
Int. Cl.[4] C12N *9/88, 9/00*; C12P *17/06*; C07K *15/00*
U.S. Cl. 435—232 **6 Claims**

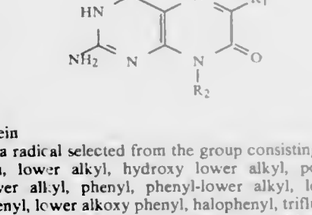
1. An amide or ester synthase comprising a monoclonal receptor molecule containing an antibody combining site capable of catalyzing the formation of a preselected carboxylic amide or ester bond, said combining site binding:

(a) to a ligand containing (i) a carbonyl carbon atom and (ii) an amine or alcohol group that are structurally capable of forming said preselected carboxylic amide or ester bond; and

(b) to an analog-ligand wherein the analog-ligand is structurally analogous to said preselected amide or ester, said analog-ligand having a tetrahedrally bonded phosphorus atom located at the position occupied by said carbonyl carbon atom of said preselected carboxylic amide or ester bond of said ligand, said tetrahedrally bonded phosphorus atom being bonded directly to:

(i) the alpha-carbon atom of the acid portion of said ligand by a single bond;

(ii) a first oxygen atom that is doubly bonded to said phosphorous;



(iii) a second oxygen atom that is bonded to said phosphorous atom by a single bond, and is singly bonded to a radical selected from the group consisting of C_1–C_6 lower alkyl, benzyl and phenyl; and

(iv) a third oxygen atom or a nitrogen atom singly bonded to said phosphorous atom, and is also singly bonded to the alpha-carbon atom of the amine or alcohol portion of said ligand.

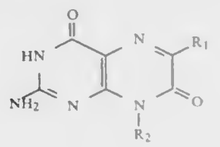
4,900,675

MODULATION OF ANIMAL CELLULAR RESPONSES WITH COMPOSITIONS CONTAINING ISOXANTHOPTERIN-8-(1'-β-ALDOGLYCOSIDYL) DERIVATIVES

Michael G. Goodman, Rancho Santa Fe, Calif., assignor to Scripps Clinic and Research Foundation, La Jolla, Calif.

PCT No. PCT/US86/02716, § 371 Date Jan. 27, 1988, § 102(e) Date Jan. 27, 1988, PCT Pub. No. WO87/03617, PCT Pub. Date Jun. 18, 1987
Continuation-in-part of Ser. No. 808,886, Dec. 13, 1985, which is a continuation-in-part of Ser. No. 798,629, Nov. 15, 1985, Pat. No. 4,746,651, which is a continuation of Ser. No. 546,679, Nov. 1, 1983, Pat. No. 4,643,992. This PCT application Dec. 12, 1986, Ser. No. 154,991
Int. Cl.[4] A61K *31/70*
U.S. Cl. 435—240.27 **18 Claims**

1. A method of modulating an animal immune response comprising contacting animal cells with a composition containing a diluent amount of a physiologically tolerable carrier admixed with an immune response-modulating effective amount of an active ingredient that is an isoxanthopterin derivative whose structure conforms to that of the formula



wherein

R_1 is a radical selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl, polyhydroxy lower alkyl, phenyl, phenyl-lower alkyl, lower alkyl phenyl, lower alkoxy phenyl, halophenyl, trifluoromethyl phenyl, hydroxy, oxo, lower alkoxy, phenyl-lower alkoxy, halo, mercapto, thioxo, lower alkylthio, lower alkyloylthio, phenyl-lower alkylthio, lower alkanoyl, carboxy, lower alkoxy carbonyl, lower alkylcarboxy, lower alkylene lower alkylcarboxylate, lower alkoxy lower alkyl carbonyl, and carboxamido and lower alkyl carboxamido in which the carboxamido group has the formula $CONR_3R_4$ wherein R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen and lower alkyl or NR_3R_4 together form a heterocyclic ring having five or six atoms in the ring;

R_2 is a beta-bonded aldoglycoside radical selected from the group consisting of 1'-aldopentosidyl, 1'-aldonexosidyl, mono-deoxygenated 1'-aldopentosidyl, and mono-deoxygenated 1'-aldohexosidyl and their O-substituted lower alkyl, lower alkanoyl, benzyl and benzoyl derivatives wherein an O-substituent, if present on one oxygen, is present on all available ring substituent oxygens;

the tautomers of said isoxanthopterin derivative; and

the pharmaceutically acceptable salts of said isoxanthopterin derivative; and

maintaining said contact for a time period sufficient for said cells to modulate their immune response.

4,900,676

METHOD OF PRODUCING HERBICIDE RESISTANT PLANT VARIETIES AND PLANTS PRODUCED THEREBY

Jonathan Gressel, Havazelet; Dvora Aviv, Rehovot, and Avihai Perl, Rishon-Le-Zion, all of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 704,416, Feb. 22, 1985, Pat. No. 4,795,705. This application Feb. 24, 1987, Ser. No. 17,870
Claims priority, application Israel, Feb. 23, 1986, 77962
Int. Cl.[4] C12N *5/00*
U.S. Cl. 435—240.49 **10 Claims**

1. A method of producing triazine-resistant *Solanum tuberosum* cv. Mirka plants which comprises:

(a) vegetatively propagating calli or *Solonum tuberosum* cv. Mirka Tri-R C-165 (ATCC Accession No. 40164) in a first growth medium comprising the modified Murashige and Skoog basal medium of Table 1 to which has been added about 0.1 mg/l gibberellic acid, about 0.2 mg/l abscissic acid, about 10 mg/l zeatin (trans-isomer) and about 10 mg/l kinetin under suitable conditions to generate plantlets having shoots and roots; and

(b) transferring the plantlets having a sufficient root system to a suitable second growth medium, wherein the rooted plantlets are propagated under suitable conditions to produce mature triazine-resistant *Solanum tuberosum* cv. Mirka plants.

4,900,677

PROCESS FOR RAPID ISOLATION OF HIGH MOLECULAR WEIGHT DNA

Peter L. Hewitt, Andover, Mass., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 26, 1986, Ser. No. 911,808
Int. Cl.[4] C12N *1/06, 1/08*
U.S. Cl. 435—259 **8 Claims**

1. A method of isolating nucleic acids from their source organism comprising the steps of:

(A) forming a suspension of said organism containing or suspected of containing the desired nucleic acid;

(B) treating said organism with a cocktail of lytic enzymes;

(C) treating said organism with surfactant prior to, simultaneously with or subsequent to step (B);

(D) degrading unwanted classes of nucleic acids by treatment with nucleases specific for the unwanted nucleic acids; then

(E) degrading proteins by digestion with at least one broadly active protease;

(F) denaturing remaining proteins and dissociating them

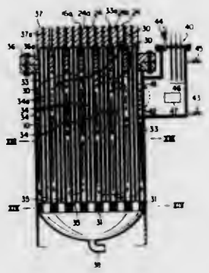
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from the nucleic acid by adding at least one chaotropic agent; and then
(G) dialyzing and concentrating the nucleic acid.

4,900,678
APPARATUS FOR PHOTOSYNTHESIS

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 445,642, Nov. 30, 1982, abandoned, and Ser. No. 455,692, Jan. 5, 1983, Pat. No. 4,724,214. This application Jul. 21, 1987, Ser. No. 76,422
Claims priority, application Japan, Dec. 3, 1981, 56-194921; Dec. 10, 1981, 56-199873; Dec. 10, 1981, 56-199874; Dec. 10, 1981, 56-199875; Jan. 16, 1982, 57-005261; Jul. 13, 1982, 57-121401
The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.
Int. Cl.[4] C12M *1/04, 1/06, 1/00;* **A01G** *33/00*
U.S. Cl. 435—313 **3 Claims**



1. Apparatus for photosynthesis comprising bath means containing a photosynthetic reaction bath, a plurality of tubular photoradiatiors arranged upright in said bath means in parallel array, said tubular radiators comprising a transparent tubular sheath and a quartz or plastic optical rod extending through said tubular sheath, upper support means and lower support means in said bath means for supporting the upper and lower end positions respectively of said tubular photoradiators, said tubular photoradiators being spaced from one another so as to define a plurality of upright passages between said tubular photoradiators, said upper support means closing off the upper ends of said upright passages, said bath means having a lower chamber underlying said lower support means, said lower support means having a flow-through portion which provides communication between said chamber and a first plurality of upright passages and a stopped-up portion which blocks communication between said chamber and a second plurality of upright passages, conduit means leading to said chamber for supplying CO_2-containing air, said flow-through portion and said stopped-up portion of said lower support means being constructed and arranged such that said air passes from said chamber through said flow-through portion into said first plurality of upright passages, said air passing upwardly in said first plurality of upright passages and subsequently being directed generally laterally by said upper support means such that the air then passes downwardly in said second plurality of upright passages to subsequently again be directed generally laterally by said stopped-up portion of said lower support means to once again pass upwardly in said first plurality of upright passages, whereby the air circulates in said bath means between said tubular photoradiators.

4,900,679
METHOD FOR DETERMINING THE EXISTENCE AND/OR THE MONITORING OF A PATHOLOGICAL CONDITION IN A MAMMAL AND A TEST KIT THEREFOR

Charles R. Spillert, West Orange; William A. Suval, Liberty Corners, and Eric J. Lazaro, Jersey City, all of N.J., assignors to University of Medicine and Dentistry of New Jersey, Newark, N.J.

Division of Ser. No. 34,101, Mar. 16, 1987, Pat. No. 4,814,247, and a continuation-in-part of Ser. No. 703,120, Feb. 19, 1985, abandoned, which is a continuation of Ser. No. 538,783, Oct. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 440,540, Jan. 26, 1983, abandoned. This application Aug. 23, 1988, Ser. No. 236,039
Claims priority, application PCT Int'l Appl., May 16, 1986, PCT/US86/01075
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[4] G01N *33/86*
U.S. Cl. 436—69 **14 Claims**

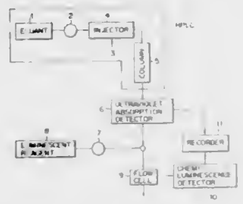
1. A prepackaged diagnostic kit for analyzing the blood of a mammal to determine the presence or development of pathology suspected of causing abnormalities in the immune response, system and/or the blood coagulated of the mammal comprising:
A. at least one first container having a predetermined anticoagulant disposed therein, for receiving whole blood and rendering the same anticoagulated;
B. at least one second container serving for the preparation of a control sample when an aliquot portion of the anticoagulated blood from said first container is introduced therein;
C. at least one third container having a predetermined quantity of a modulator for reception of a further aliquot of said anticoagulated blood from said first container;
D. means for initiating the clotting of said control sample and said activated sample to facilitate a subsequent measurement of the reaction parameters of each of said samples; and
E. a diagnostic protocol for the determination of the pathological state of said mammal by the analysis of said control and said activated blood sample by the comparison of the respective reaction parameters thereof.

14. A method for analyzing the blood of a mammal to determine the presence or development of pathology suspected of causing abnormalities in the immune response system and/or the blood coagulation of the mammal consisting essentially of:
A. preparing a quantity of anticoagulated whole blood from a sample of whole blood taken from a mammal;
B. taking an aliquot portion of said anticoagulated blood and introduing said aliquot portion into a first container and thereby preparing a control sample;
C. taking a further aliquot portion of said anticoagulated blood and introducing said further aliquot portion into a second container having therein a modulator and thereby preparing an activated sample;
D. incubating said control sample and said activated sample at a predetermined suitable incubation temperature from about 1 to about 4 hours;
E. initiating clotting activity and measuring a reaction parameter for each of said control sample and said activated sample; and
F. identifying the presence of pathology by comparing the reaction parameters measured in Step E. with similar reaction parameters measured from a mammal in a healthy state.

4,900,680
METHOD AND APPARATUS FOR MEASURING LIPID PEROXIDE

Teruo Miyazawa; Keiichi Yasuda; Kenshiro Fujimoto, and Akio Saeki, all of Sendai, Japan, assignors to Tohoku Electronic Industrial Co., Ltd., Sendai, Japan

Filed Mar. 14, 1988, Ser. No. 167,817
Claims priority, application Japan, Mar. 20, 1987, 62-67242
Int. Cl.[4] G01N *33/92*
U.S. Cl. 436—71 **9 Claims**

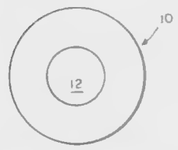


1. A method of detecting a lipid hydroperoxide, comprising:
subjecting a sample containing lipids to a liquid chromatography to separate the lipids into lipid classes;
bringing the lipid classes into contact with a luminescent reagent which specifically reacts with lipid hydroperoxide contained in the lipid classes to generate a light in an amount corresponding to a content of the hydroperoxide; and
optically detecting said light by photodetecting means.

4,900,681
HYDRAZINE DETECTION

Patricia A. Taffe, 8085 Steeple Chase Ct., Springfield, Va. 22153, and Susan L. Rose-Pehrsson, 3808 Stonebridge Rd., Alexandria, Va. 22306

Filed Jun. 2, 1988, Ser. No. 201,767
Int. Cl.[4] G01N *21/78*
U.S. Cl. 436—106 **15 Claims**



1. A method for real-time colorimetric detection of hydrazine and its derivatives comprising the step of exposing vanillin to hydrazine, said vanillin providing a colorimetric indication of the presence of hydrazine and its derivatives.

4,900,682
METHOD AND REAGENT FOR THE DETERMINATION OF PERACIDS

Wolfgang Fischer, Darmstadt; Edda Arlt, Nieder-Ramstadt, and Barbara Brabander, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

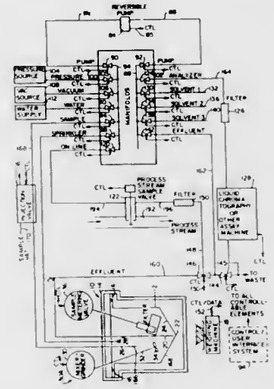
Filed Dec. 16, 1988, Ser. No. 285,700
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 3743224
Int. Cl.[4] G01N *33/00*
U.S. Cl. 436—129 **15 Claims**

1. A method for the determination of the concentration of a peracid in a sample solution, comprising mixing said sample solution with reagent containing a chromogen and an iodide and comparing the resultant color of the mixture with a standard to determine the amount of peracid in the sample solution.

4,900,683
PROCESS FOR PREPARATION OF SAMPLES FOR ANALYSIS

Andre Metzger, Le Verger, France; Peter Grimm, Frenkendork, Switzerland; Andre J. Nohl, Menlo Park, and Vance J. Nau, Cupertino, both of Calif., assignors to Ciba-Geigy Corporation, Basel, Switzerland

Division of Ser. No. 942,353, Dec. 16, 1986. This application Oct. 14, 1987, Ser. No. 89,858
Int. Cl.[4] G01N *1/28*
U.S. Cl. 436—179 **1 Claim**



1. A method of preparing a sample having gas bubbles entrained therein or foam on its surface for assay, comprising the steps of:
(a) placing an aliquot of said sample into a sealed sample preparation chamber;
(b) applying subatmospheric pressure to said sample preparation chamber to draw off the gas bubbles or foam from said sample;
(c) isolating a known volume of the sample to obtain a non-isolated volume of sample in the sample preparation chamber and an isolated volume of sample which is isolated from the sample preparation chamber;
(d) removing the non-isolated volume of sample from the sample preparation chamber;
(e) placing a predetermined amount of a diluent into the sample preparation chamber and releasing the isolated volume of sample back into the sample preparation chamber to form a diluted sample;
(f) homogenizing the diluted sample;
(g) repeating steps (c)–(f) until a predetermined sample concentration is reached; and
(h) delivering a predetermined volume of said homogenized diluted sample to an assay system.

4,900,684
CEA IMMUNOASSAY FREE OF HUMAN ANTI-MOUSE ANTIBODY FALSE POSITIVES

Hans J. Hansen, Flemington, N.J., assignor to Immunomedics, Inc., Warren, N.J.

Filed Jun. 1, 1987, Ser. No. 56,571
Int. Cl.[4] G01N *33/543, 33/53*
U.S. Cl. 436—518 **26 Claims**

1. An immunoassay for determining carcinoembryonic anti-

gen (CEA) in a human serum or plasma sample which may also contain interfering human antibodies that bind non-human species antibodies, comprising the steps of:

(a) heating a serum or plasma sample, buffered at a pH of about 4.5–5.5, at a temperature of about 90°–105° C., for about 10–30 minutes, separating insoluble material and recovering the resultant solution:

(b) incubating the recovered solution with a capture monoclonal anti-CEA antibody bound to a solid phase, and with a probe monoclonal anti-CEA antibody carrying a detectable label, each of said capture and probe antibodies being an antibody which binds to a different heat-stable epitope on CEA, the incubation being effected such that the CEA in the sample binds to the capture antibody, and the bound CEA binds labeled probe antibody, and separating unbound sample components and unbound labeled probe antibody from the solid phase; and

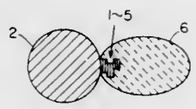
(c) determining the amount of CEA in the sample as a function of the amount of labeled probe bound to the solid phase or the amount of unbound labeled probe separated from the solid phase.

4,900,685

ANALYTE DETECTION IN PARTICULATE-CONTAINING SAMPLES

Nathan L. Smith, III, North Andover, Mass., assignor to Cytosignet, Inc., North Andover, Mass.

Filed Jan. 29, 1987, Ser. No. 8,571
Int. Cl.⁴ G01N *33/554, 33/555*
U.S. Cl. 436—519 **52 Claims**



1. A method of determining a analyte of interest in a particulate-containing sample, comprising the steps of:

a. contacting the sample with a construct comprised of a first moiety which binds to particulate present in the sample as obtained, but not to the analyte of interest and a second moiety which binds to the analyte of interest, under conditions appropriate for binding of particulate to the first moiety of the construct and binding of analyte to the second moiety of the construct, thereby resulting in formation of complexes comprised of analyte, construct and particulate; and

b. detecting the presence of complexes comprised of analyte, construct and particulate.

39. A composition for detecting an analyte of interest in a particulate-containing sample, comprising a construct consisting essentially of two moieties joined together: a first moiety which binds to selected particulates present in the sample as obtained, but not to the analyte of interest and a second moiety which binds to the analyte of interest.

45. A construct for detecting an analyte of interest in a whole blood sample, consisting essentially of two moieties joined together: a first moiety which binds to red blood cells but not to the analyte of interest and a second moiety which binds to the analyte of interest.

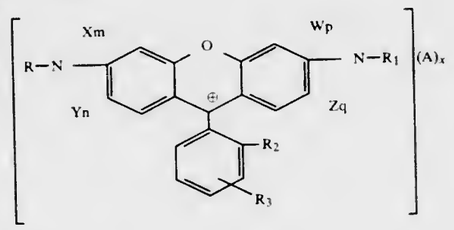
4,900,686

FLUORESCENT CONJUGATES AND BIOLOGICAL DIAGNOSTIC ASSAY

Michael J. Arnost, Andover; Frank A. Meneghini, Arlington; Paul S. Palumbo, West Newton, and Stephen G. Stroud, Medford, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 2, 1987, Ser. No. 34,225
Int. Cl.⁴ G01N *33/533*
U.S. Cl. 436—546 **30 Claims**

1. A fluorescent diagnostic assay comprising combining in an assay medium: a sample suspected of containing an analyte; a binding partner for said analyte; and a conjugate of said analyte or an analogue thereof and a fluorescent compound, said conjugate represented by the formula



wherein

W, X, Y and Z each independently is $-(-CH2)_d(CHR_4)(C-H_2-)-_b$;

R, R_1, R_3 and R_4 each independently is hydrogen, a hydrophilic group or a substituent including said analyte or an analogue thereof;

R_2 is $-CO_2\ominus$, $SO_3\ominus$ or a substituent including said analyte or an analogue thereof;

provided that one of R, R_1, R_2, R_3 and R_4 is a substituent including said analyte or an analogue thereof and at least one of the remaining of R, R_1, R_3 and R_4 is a hydrophilic group;

a and b each independently is an integer of from 0 to 4, provided that the sum of a + b is an integer of from 1 to 4;

m and n each is 0 to 1 provided that one of m and n is 0 and the other is 1;

p and q each is 0 or 1 provided that one of p and q is 0 and the other is 1;

A is a counterion or the counterions to balance the overall charges on the conjugate moiety; and x is 0 or 1;

separating bound conjugate from free conjugate;

measuring the level of the fluorescent signal of said bound or free conjugate; and

relating said level of said signal to the amount of said analyte in said sample.

4,900,687

PROCESS FOR FORMING A MAGNETIC FIELD SENSOR

Dale L. Partin, Sterling Heights, and Joseph P. Heremans, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

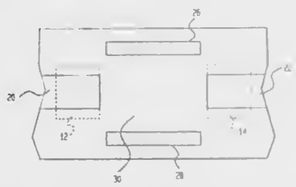
Continuation of Ser. No. 181,758, Apr. 14, 1988, Pat. No. 843,444. This application Apr. 3, 1989, Ser. No. 331,720
Int. Cl.⁴ H01L *27/22*
U.S. Cl. 437—27 **2 Claims**

1. A process for forming a magnetic sensor comprising the steps of:

preparing a semiconductive monocrystalline element of relatively high resistivity and low recombination velocity;

forming spaced apart on a surface of said element a pair of localized regions of relatively low resistivity and of opposite conductivity types;

forming at least one groove on said surface along a side of the portion of said surface that extends directly between said localized regions; and



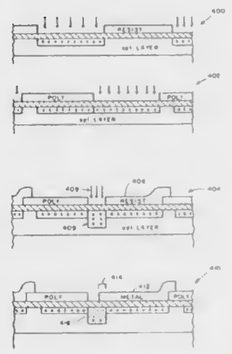
implanting ions selectively in the element in the region adjacent said groove for damaging the crystal lattice in the surrounding portion of the groove for making such portion of high recombination velocity.

4,900,688

PSEUDO UNIPHASE CHARGE COUPLED DEVICE FABRICATION BY SELF-ALIGNED VIRTUAL BARRIER AND VIRTUAL GATE FORMATION

James Halvis, Arnold, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 66,292, Jun. 25, 1987. This application Apr. 3, 1989, Ser. No. 332,856
Int. Cl.⁴ H01L *21/265, 29/78;* **G11C** *19/28*
U.S. Cl. 437—21 **19 Claims**



19. A method of charge coupled device cell fabrication comprising the steps of:

forming a plurality of ion implanted clock well loci in the doped surface layer charge flowpath of a semiconductor substrate member;

disposing conductive polysilicon gate electrodes over the combination of each clock well loci and a charge free barrier area preceding each said clock well loci;

embedding the flowpath region intermediate said gate electrodes with second doses of implanted impurity ion of predetermined type, quantity and energy level;

depositing second areas of conductive gate material in the flowpath regions intermediate said polysilicon gate electrodes, said deposited second area gate material extending from a flowpath point predetermined spaced apart from the trailing edge of each preceding polysilicon gate electrode to a region of electrically insulated overlap substantially covering the charge free barrier area of the next adjacent polysilicon gate along said flowpath;

impregnating said predetermined spaced apart substrate flowpath areas with a third dose of virtual barrier forming impurity ions of predetermined type, quantity and energy level, said predetermined polysilicon gate together with said second area of conductive gate material determining, as self-aligning masks, the substrate region extent of said impregnating impurity ions in each spaced apart flowpath area; and

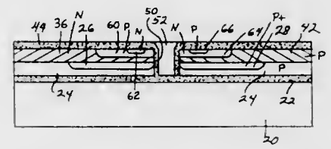
instilling said predetermined spaced apart substrate flowpath areas with a fourth dose of virtual gate forming impurity ions of predetermined type, quantity and energy level, and electrical polarity opposite of said impregnated ions, said preceding polysilicon gate together with said second area of conductive gate material also determining, as self-aligning masks, the substrate region extent of said instilled impurity ions in each spaced apart flowpath area.

4,900,689

METHOD OF FABRICATION OF ISOLATED ISLANDS FOR COMPLEMENTARY BIPOLAR DEVICES

George Bajor, Melbourne, and Hugh C. Nicolay, Melbourne Village, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Dec. 8, 1988, Ser. No. 281,546
Int. Cl.⁴ H01L *29/72, 27/02*
U.S. Cl. 437—31 **17 Claims**



1. A process for fabricating complementary isolated islands on a substrate having at least first and second semiconductor regions isolated by horizontal isolation comprising:

forming a first buried region of a first conductivity type and impurity concentration in said first region of said substrate;

forming a second buried region of a second conductivity type and impurity concentration in said second region of said substrate;

epitaxially forming a third region of said first conductivity type having a smaller impurity concentration than said first buried region and having a first thickness at least on said first region;

forming a first mask over said third region and exposing said second region;

epitaxially forming a fourth region of said second conductivity type, having a smaller impurity concentration than said second buried region and having a thickness equal to said third region; and

forming a dielectric isolation region at adjacent lateral portions of said third and fourth regions and said first and second buried regions.

4,900,690

MOS SEMICONDUCTOR PROCESS WITH DOUBLE-LAYER GATE ELECTRODE STRUCTURE

Hiroyuki Tamura, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 240,729
Claims priority, application Japan, Sep. 7, 1987, 62-221840
Int. Cl.⁴ H01L *21/316*
U.S. Cl. 437—43 **8 Claims**

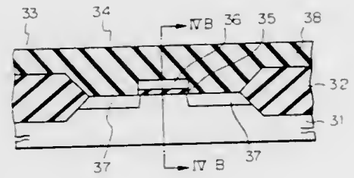
1. A method of fabricating a MOS semiconductor device, comprising the steps of:

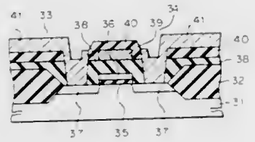
(a) preparing a silicon substrate;

(b) selectively forming a field oxide layer on one of opposite

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major surfaces of said substrate in such a manner as to surround an active region;
(c) forming a first silicon oxide layer in said active region;
(d) forming a polycrystalline silicon layer on said first silicon oxide layer;
(e) selectively removing a part of said first silicon oxide layer and polycrystalline silicon layer such that said layers are left in a region of a gate electrode of said device and in a portion which extends from said region of said gate electrode to above said field oxide layer;
(f) forming source and drain diffusion regions in said major surface of said substrate;
(g) depositing a second silicon oxide layer doped with an impurity on an entire surface of a laminate which is produced by step (f), and flattening a surface of said second silicon oxide layer;





(h) etching said flattened entire surface until a surface of that portion of said polycrystalline silicon layer which overlies said field oxide layer becomes bare;
(i) forming a conductive layer on an entire surface of a laminate which is produced by step (h);
(j) selectively removing a part of said conductive layer such that said layer is left in a region associated with said gate electrode and a portion associated with that portion of said polycrystalline silicon layer which extends to above said field oxide layer;
(k) depositing a third silicon oxide layer doped with an impurity on an entire surface of laminate which is produced by step (j); and
(l) forming contact holes in said third silicon oxide layer and forming a wiring which connects to said source and drain diffusion regions and said gate electrode via said contact holes.

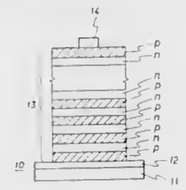
4,900,691

METHOD OF FABRICATION FOR OPTICAL STORAGE APPARATUS

Takada Jun, Kobe, Japan, assignor to Kanegafuchi Chemical Industry Company, Limited, Japan

Division of Ser. No. 40,190, Apr. 17, 1987, Pat. No. 4,855,950. This application Jun. 9, 1989, Ser. No. 366,865
Int. Cl.[4] H01L *21/46*
U.S. Cl. 437—52 **17 Claims**

1. A method of fabrication of an optical memory comprising the steps of:
forming at least one electrode on a substrate;
forming a reversible, doping modulated multilayer of amorphous semiconductor such that a first side is in electrical contact with the electrode; and



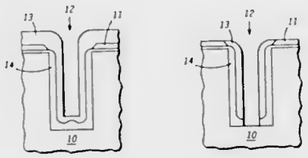
forming at least one electrode on the semiconductor such that the electrode is in electrical contact with a second side of the semiconductor opposite the first side.

4,900,692

METHOD OF FORMING AN OXIDE LINER AND ACTIVE AREA MASK FOR SELECTIVE EPITAXIAL GROWTH IN AN ISOLATION TRENCH

F. J. Robinson, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 24, 1989, Ser. No. 342,156
Int. Cl.[4] H01L *21/82*
U.S. Cl. 437—67 **4 Claims**



1. A method of fabricating a trench isolation structure, comprising the steps of:
providing a semiconductor substrate having a surface;
providing a mask made of an oxide layer disposed on the semiconductor substrate;
removing portions of the mask to provide at least one opening to the semiconductor substrate;
removing portions of the substrate through the mask opening to form a trench in the substrate, wherein the trench is at least approximately 10 microns in depth from the surface of the substrate;
depositing a first oxide layer such that the first oxide layer is thicker on the mask than in the trench;
growing a second oxide layer to densify and level out the first oxide layer; and
removing the first and second oxide layers at the bottom of the trench and removing a portion of the first oxide layer at the surface of the substrate.

4,900,693

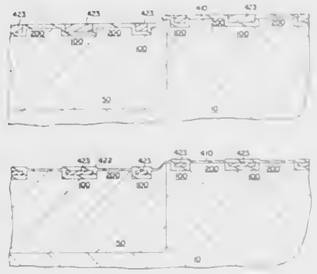
PROCESS FOR MAKING POLYSILICON FIELD PLATE WITH IMPROVED SUPPRESSION OF PARASITIC TRANSISTORS

Robert W. Manning, Colorado Springs, Colo., assignor to United Technologies, Hartford, Conn.

Filed Dec. 21, 1987, Ser. No. 135,809
Int. Cl.[4] H01L *21/316*
U.S. Cl. 437—78 **3 Claims**

1. A method of forming an integrated circuit comprising the steps of:
preparing a silicon substrate region doped a predetermined manner and containing future active areas and future field areas;

etching said substrate to form trenches of a predetermined depth in said future field areas;
growing a thin barrier layer of high quality oxide on said substrate above said future active and field areas;
forming a plate layer of high conductivity polysilicon above said thin layer of oxide to form a conductive polysilicon plate extending downwardly below the surface of said substrate and insulated from said substrate in said future field areas by said thin layer of oxide and having a substantially planar top surface;
etching said plate layer until said barrier layer lying above



said future active areas is exposed, whereby the top surface of said barrier layer and said plate layer are substantially planar and said conductive plate is buried below said top surface;
growing a gate oxide layer above said active areas;
forming FETs in selected locations in said active areas;
connecting said polysilicon plate to a potential source terminal having a predetermined magnitude and polarity such that said polysilicon plate can apply a predetermined electric field to said substrate to suppress the formation of parasitic transistors in said future field areas; and
connecting said FETS to form an integrated circuit.

4,900,694

PROCESS FOR THE PREPARATION OF A MULTI-LAYER STACKED JUNCTION TYPED THIN FILM TRANSISTOR USING SEPERATE REMOTE PLASMA

Katsumi Nakagawa, Nagahama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,465
Claims priority, application Japan, Mar. 23, 1987, 62-68302
Int. Cl.[4] H01L *21/20, 21/306*
U.S. Cl. 437—109 **5 Claims**



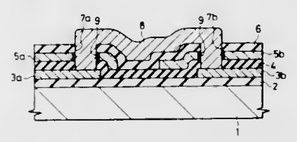
1. A process for preparing a multi-layers stacked junction type thin film transistor having a base region of at least approximately 1000 Å in thickness comprising a polycrystal silicon-containing film having grains of at least 1000 Å in size, comprising forming said polycrystal silicon film by the steps of:
(a) generating a precursor (A) by activating a gaseous raw material in a first activation space using activating energy, said gaseous raw material selected from the group consisting of compounds represented by the general formula: Si_nX_{2n+2} and compounds represented by the general formula: $(SiX_2)_n$, wherein n is an integer of 1 to 3 and X is F;
(b) generating a precursor (B) using activating energy in a second activation space which is separate from said first activation space said precursor (B) being chemically reactive with said precursor (A) so as to cause the formation of a film, and formed by activating a gaseous hydrogen-containing raw material selected from the group consisting of H_2 gas, compounds represented by the general formula: Si_nH_{2n+2} and compounds represented by the general formula: SiH_nX_{4-n}, wherein n is an integer of 1 to 3 and X is F, Cl, Br or I, said precursor (B) including H_α^* species having a luminescence intensity $I[H_\alpha^*]$;
(c) introducing said precursor (A) and said precursor (B) into a film forming space separate from said first and second activation spaces, said film forming space having a substrate maintained at a temperature of at least 150° C. while regulating the amount said precursor (A) and the amount of said precursor (B) such that $I[H_\alpha^*]/I[SiF^*]$ is at least 6×10^{-3} in said film forming space wherein SiF^* is a species formed by the reaction of said precursor (A) and said precursor (B) having a luminescence intensity of $I[SiF^*]$; and
(d) chemically reacting said precursor (A) and said precursor (B) in space surrounding the surface of the substrate so as to thereby form said polycrystal silicon film.

4,900,695

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND PROCESS FOR PRODUCING THE SAME

Takahiko Takahashi, Tokyo; Funikazu Itoh, Fujisawa; Akira Shimase, Yokohama; Hiroshi Yamaguchi, Fujisawa; Mikio Hongo, and Satoshi Haraichi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 17, 1987, Ser. No. 134,460
Claims priority, application Japan, Dec. 17, 1986, 61-298731; Dec. 22, 1986, 61-303719
Int. Cl.[4] H01L *21/441, 21/469*
U.S. Cl. 437—195 **31 Claims**



1. A process for producing a semiconductor integrated circuit device having a multilayer wiring structure in which a first insulating film is interposed between an upper-level wiring and a lower-level wiring and the surface of said upper-level wiring is protected by a second insulating film, said method comprising the steps of:
preparing a semiconductor substrate having an integrated circuit formed thereon, said integrated circuit including a semiconductor element having a PN junction, said substrate further having a multilayer wiring structure formed on its surface, said wiring structure being electrically connected to said integrated circuit;
selectively removing successively the second insulating film, the upper-level wiring under said insulating film and the first insulating film under said upper-level wiring in said multilayer wiring structure by machining with a focused ion beam to form a contact hole through which a surface

of said lower-level wiring is exposed, said contact hole exposing a surface of the upper-level wiring;

changing a region of said upper-level wiring whose surface is exposed through said contact hole into an insulator; and

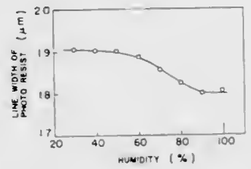
forming a connecting wiring by an optically pumped CVD method so as to extend over from the inside of said contact hole to a selective region on the surface of said second insulating film, said connecting wiring being electrically connected to said lower-level wiring the surface of which is exposed through said contact hole.

4,900,696

METHOD FOR PATTERNING PHOTO RESIST FILM

Yasushi Ito, Kawasaki, and Kazuhiko Urayama, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 14, 1988, Ser. No. 284,413
Claims priority, application Japan, Dec. 14, 1987, 62-315813
Int. Cl.[4] H01L *21/47, 21/312*
U.S. Cl. 437—229 **5 Claims**



1. A method for patterning a photo resist film comprising the steps of coating a photo resist onto a semiconductor substrate, exposing the photo resist coated and thereafter developing it, thereby to form a pattern of the photo resist film,

wherein said semiconductor substrate on which said photo resist is coated, and exposed is left in an atmosphere of a higher relative humidity than that at which the patterning exposure has been conducted for a time period before development.

4,900,697

GLASS POWDERS FOR DENTAL GLASS IONOMER CEMENTS

Shoji Akahane, Higashikurume; Satoshi Tosaki, Omiya; Kazuo Hirota, Tokyo, and Kentaro Tomioka, Chofu, all of Japan, assignors to G-C Dental Industrial Corporation, Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,299
Claims priority, application Japan, Feb. 13, 1987, 62-29788
Int. Cl.[4] C03C *3/23, 3/247*
U.S. Cl. 501—57 **6 Claims**

3. A fluoroaluminosilicate glass powder for dental glass ionomer cements, which has a specific gravity of 2.4 to 3.5 and a mean particle size of 0.02 to 10 μm and which, in its components, consists essentially of 20 to 50% by weight of SiO_2, 20 to 40% by weight of Al_2O_3, 15 to 40% by weight of SrO, 1 to 20% by weight of F_2 and 0 to 15% by weight of P_2O_5 on the converted oxide basis, and free from Li, Na, K, Rb Cs, Be, Mg and Ba ions, wherein 100 parts by weight of said glass powder are treated on its surface with an acid and/or a fluoride so as to leave 0.01 to 5 parts by weight of a residue.

4,900,698

CERAMIC PRODUCT AND PROCESS

Christian B. Lundsager, Ashton, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 26, 1987, Ser. No. 54,470
Int. Cl.[4] C04B *38/06, 35/10, 35/02*
U.S. Cl. 501—80 **38 Claims**

1. Homogeneous precursor composition for forming a sintered porous ceramic article comprising

(a) 5 to 90 wt. % of a finel divided solid metal capable of forming an oxide by heating in air and selected from the group consisting of Al, Zn, Fe, Cu, Si, Ti, Mg, Ba, Ta, U, Cr, Co, V, Mn, Ni, Sn, Zr, Th, Ge, Tl, Pb, Mo, W, the rare earth metals and mixtures thereof,

(b) 5 to 90 wt. % of a finely divided ceramic filler which is an oxide of a metal selected from the group listed in part (a), and

(c) remainder of a particle binding effective amount of a nonaqueous polymer binder system which is capable of being removed when the composition is heated in the pressure of air or oxygen, said binder being present in at least 4% by weight of the composition and comprising a mixture of

(1) a polymer which is capable of being oxidized away when the composition is heated and

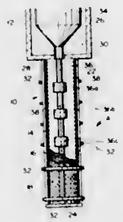
(2) a plasticizer for the polymer.

4,900,699

RESERVOIR FEED METHOD OF MAKING CERAMIC COMPOSITE STRUCTURES AND STRUCTURES MADE THEREBY

Marc S. Newkirk, Newark; H. Daniel Lesher; Ratnesh K. Dwivedi, both of Wilmington, and Robert C. Kantner, Newark, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Sep. 16, 1986, Ser. No. 908,067
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[4] C04B *35/02*
U.S. Cl. 501—94 **27 Claims**



1. A method for producing a self-supporting ceramic composite structure comprising a ceramic matrix obtained by an oxidation reaction of a parent metal with an oxidant to form a polycrystalline material, the method comprising:

(a) orienting a first source of parent metal and a permeable mass of filler material relative to each other so that formation of an oxidation reaction product of the first source of parent metal will occur in a direction towards and into said mass of filler, wherein the quantity of said first source of parent metal provided is insufficient to embed substantially completely said permeable mass;

(b) heating said first source of parent metal to temperature region above its melting point but below the melting point of its oxidation reaction product to form a body of molten parent metal from said first source and reacting said first source of molten parent metal with an oxidant to form said oxidation reaction product by maintaining at least a portion of said oxidation raction product in contact with and extending between said first source of molten parent metal and said oxidant to progressively draw molten parent metal through the oxidation reaction product towards the oxidant and into said mass of filler so that fresh oxidation reaction product continues to form within said mass of filler at an interface between said oxidant and previously formed oxidation reaction product; and

(c) providing additional molten parent metal from a second source of parent metal which contacts said first source, wherein said second source of parent metal comprises a reservoir of parent metal such that said second source of parent metal at least partially replenishes said first source of molten parent metal as said reacting continues such that said permeable mass is substantially completely embedded to form said self-supporting ceramic composite structure.

4,900,700

SILICON NITRIDE-TITANIUM NITRIDE BASED CERAMIC COMPOSITES AND METHODS OF PREPARING THE SAME

Choll K. Jun, Franklin, Mich., and Milivoj K. Brun, Saratoga, N.Y., assignors to Carboloy Inc., Warren, Mich.

Filed May 31, 1988, Ser. No. 200,659
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—78 **5 Claims**

1. A ceramic composite comprising more than 0% and less than 90% by weight of a single phase silicon aluminum oxynitride, yttrium aluminum garnet in an amount of at least about 9% by weight, and titanium nitride in an amount of more than 0% and up to about 10% by weight.

4,900,701

ZIRCONIA SINTERED BODY AND PROCESS FOR THE PRODUCTION THEREOF

Junichi Morishita; Nobuo Kimura, and Hiromichi Okamura, all of Odawara, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 939,165, Nov. 3, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 155,862
Claims priority, application Japan, Mar. 7, 1985, 60-43686; Mar. 7, 1985, 60-43687; Mar. 7, 1985, 60-43688
Int. Cl.[4] C04B *35/48*
U.S. Cl. 501—102 **7 Claims**

1. In the production of a partially stabilized zirconia sintered body wherein the tetragonal phase content is sixty-five percent or more, the sintering temperature is 1100° C. to 1400° C. and the grain size is 0.5 μm or less, a process for the production of the sinterable raw material powder used for said production, said process comprising the steps of:

(a) suspending a powder of a zirconium compound containing a stabilizing agent into a solution or slurry containing a compound of a transition metal element other than zirconium, the atomic ratio of said other transition metal element to zirconium being in the range of from 0.0001 to 0.01, the zirconium compound being a compound of at least one material selected from the group consisting of oxide, hydroxide, carbonate, and organic acid salts, the stabilizing agent being at least one compound selected from the group consisting of oxide, hydroxide, carbonate and organic acid salts of at least one element selected from the group consisting of Y, Ca, Mg and Ce, in the range of from 1.3 to 2.0 mol parts as the oxide per hundred of the combination of zirconium compound as zirconia and the stabilizing agent as the oxide, and the other transition metal compound being at least one compound selected from the group consisting of oxide, hydroxide, nitrate, carbonate, chloride, organic acid salts, alkoxide and chelate of at least one transition metal selected from the group consisting of Mn, Fe, Co, Ni, Cu and Zn;

(b) removing the solvent from the slurry and drying the resultant powder to form a sinterable raw material powder coated with said transition metal compound.

4,900,702

DIELECTRIC CERAMIC COMPOSITION

Takashi Tsuboi, and Hitoshi Ueda, both of Tottori, Japan, assignors to Nippon Ferrite, Ltd., Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,426
Claims priority, application Japan, Oct. 27, 1987, 62-271232; Apr. 11, 1988, 63-89647; Apr. 11, 1988, 63-89648
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—134 **4 Claims**

1. A dielectric ceramic composition consisting essentially of calcium oxide, strontium oxide, bismuth oxide and titanium oxide, and having a composition represented by the formula:

$$(CaO)_a\cdot(SrO)_b\cdot(Bi_2O_3)_c\cdot(TiO_2)_d$$

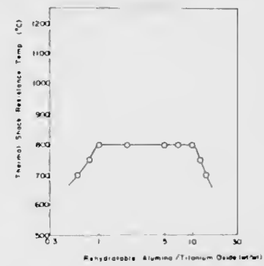
wherein $0 \leqq a \leqq 10$, $5 \leqq b \leqq 15$, $25 \leqq c \leqq 30$, $50 \leqq d \leqq 60$, and $5 \leqq a+b \leqq 20$ by mol %.

4,900,703

METHOD FOR PRODUCING CERAMICS WITH THERMAL SHOCK RESISTANCE

Yukiyoshi Ono, Hirakata; Atsushi Nishino, Neyagawa; Yasuhiro Takeuchi, Hirakata, and Hironao Numoto, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 7,895, Jan. 28, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 267,614
Claims priority, application Japan, Jan. 28, 1986, 61-16101
Int. Cl.[4] C04B *35/10*
U.S. Cl. 501—136 **10 Claims**



1. A method for producing a ceramic which comprises firing a mixture comprising at least one compound selected from the group consisting of the sulfate, nitrate, carbonate, oxide, hydroxide, acetate and oxalate of an alkali metal or an alkaline earth metal, titanium oxide and rehydratable alumina, wherein the mixing ratio of the alkali metal or alkaline earth metal compound and titanium oxide is such that 0.1 to 4 gram atoms of titanium as titanium oxide are present per gram atom of the alkali or alkaline earth metal in the metal compound, and the weight ratio of titanium oxide to the rehydratable alumina is from 1:1 to 1:10, at a temperature in the range of 1,000° C. to 1,300° C. for a time sufficient to produce said ceramic.

4,900,704

PEPTIZED AND PHOSPHATED INORGANIC OXIDES AND CATALYSTS SUPPORTED ON SAID OXIDES

Max P. McDaniel; Emory W. Pitzer, both of Bartlesville, and Floyd E. Farha, Jr., Oklahoma City, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1988, Ser. No. 250,589
Int. Cl.[4] B01J *21/04, 27/188, 32/00*
U.S. Cl. 502—210 **18 Claims**

1. A process to make a phosphated alumina xerogel comprising:

(a) peptizing fine, pure, boehmite alumina crystallites with a

peptizing agent selected from the group consisting of nitric acid, aluminum nitrate, and mixtures thereof to form a clear solution;
(b) adding a phosphating agent selected from the group consisting of phosphoric acid, ammonium phosphates, and mixtures thereof to said clear solution to form a partially precipitated, phosphated alumina;
(c) further hardening said partially precipitated, phosphated alumina by neutralizing the clear solution with a base selected from the group consisting of ammonia, ammonium hydroxide, alkyl ammonium hydroxides, amines, and mixtures thereof; and
(d) removing substantially all water from the thus further hardened precipitate to form a substantially water-free phosphated alumina xerogel.

4,900,705

NOVEL LIGAND CATALYST SYSTEMS FORMED BY REACTION OF CARBONYL COMPOUNDS WITH ORGANOSILICON COMPOUNDS

Robert A. Sawicki, Wappingers Falls, and Harry Chafetz, Glenham, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 505,598, Jun. 20, 1983. This application Oct. 19, 1987, Ser. No. 109,566
Int. Cl.[4] B01J *31/02*
U.S. Cl. 502—158 **1 Claim**

1. The process which comprises reacting in liquid phase at 0° C.–150° C.
(i) one mole of 3-aminopropyl triethoxy silane with
(ii) 0.1–10 moles of ethyl formate thereby forming product

$$(EtO)_3\,Si\,(CH_2)_3\,NHCHO$$

reacting said product with silica or alumina thereby forming functionalized silica or alumina; and
recovering said functionalized silica or alumina.

4,900,706

PROCESS FOR PRODUCING OLEFIN POLYMERS AND CATALYST USED THEREIN

Toshio Sasaki; Takeshi Ebara; Hiroyuki Kora, all of Ichihara; Kiyoshi Kawai; Mitsuharu Yamasaki, both of Chiba, and Syozo Kawamata, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 11, 1988, Ser. No. 167,003
Claims priority, application Japan, Mar. 17, 1987, 62-63094; May 20, 1987, 62-124321; Aug. 4, 1987, 62-195531; Oct. 9, 1987, 62-256015
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—116 **18 Claims**



1. A solid catalyst component for α-olefin polymerization comprising a trivalent titanium compound obtained by reducing a titanium compound represented by the formula $Ti(OR^1)_nX_{4-n}$ (wherein R^1 is a hydrocarbon group of 1 to 20 carbon atoms, X is a halogen atom; and n is a number satisfying $0<n\leqq 4$) with an organomagnesium compound in the presence of an organic porous polymer carrier having a mean particle diameter of 5 to 1000 μm and a pore volume of 0.1 ml/g or above at a pore radius of 100 to 5,000 Å, or in the co-presence of said organic porous polymer carrier and an organo silicone compound having Si-O bonds, of the formula:

$$Si(OR^3)_mR^4{}_{4-m}$$

$$R^5(R^6{}_2SiO)_pSiR^7{}_3$$

or

$$(R^8SiO)_q$$

(wherein R^3 is a hydrocarbon group having 1 to 20 carbon atoms; R^4, R^5, R^6, R^7 and R^8 are each a hydrocarbon group having 1 to 20 carbon atoms or a hydrogen atom; m is a number satisfying $0<m\leqq 4$; p is an integer of 1 to 1,000; and q is an integer of 2 to 1,000) to obtain a solid product, treating the solid product with a mono- or polycarboxylic acid ester, and a mixture of a dialkyl ether and titanium tetrachloride.

4,900,707

METHOD FOR PRODUCING A WAX ISOMERIZATION CATALYST

Ian A. Cody, Clearwater, Canada; Glen P. Hamner, deceased, late of Baton Rouge, La. (by Nita A. M. Hamner, executrix); Willard H. Sawyer, and James J. Schorfheide, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 134,698, Dec. 18, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 283,658
Int. Cl.[4] B01J *27/12, 27/13*
U.S. Cl. 502—230 **13 Claims**

1. A method for producing a catalyst for use in wax isomerization processes, said method comprising the steps of:
(1) depositing a hydrogenation metal component on a refractory metal oxide particle or extrudate support followed by calcination;
(2) fluoriding the metal loaded refractory metal oxide support to a level of 2 to 10 wt % F using an acidic fluorine source;
(3) crushing the fluorided metal loaded refractory metal oxide support to expose inner surfaces thereof, and sizing said crushed fluorided metal loaded refractory metal oxide support to a particle size of 1/32 inch or smaller across the largest continuous cross sectional dimension;
(4) activating said sized catalyst by heating in a hydrogen atmosphere.

4,900,708

ORTHO-ALKYLATION CATALYSTS BASED ON MAGNESIUM AND PREPARED BY CALCINING IN PRESENCE OF FEED MIXTURE OF REACTANTS

James G. Bennett, Delmar, N.Y., and Freddie L. Tungate, Georgetown, Ind., assignors to General Electric Company, Selkirk, N.Y.

Continuation of Ser. No. 303,567, Sep. 18, 1981, Pat. No. 4,418,224. This application Nov. 1, 1983, Ser. No. 547,482
Int. Cl.[4] B01J *21/10*
U.S. Cl. 502—340 **5 Claims**

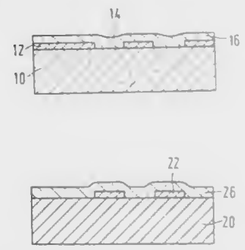
1. A catalyst composition for the ortho-alkylation of a phenol consisting of a calcination residue derived from heating at a temperature sufficient to produce calcination , said temperature being between 400° and 460° C., a magnesium-containing material selected from the group consisting of magnesium carbonate, basic magnesium carbonate, magnesium hydroxide and mixtures of any of the foregoing, in the presence of a vaporized ortho-alkylation feed mixture comprising a phenolic compound and an alkyl alcohol, said heating being carried out in situ in an ortho-alkylation reactor.

4,900,709

METHOD OF PATTERNING SUPERCONDUCTING OXIDE THIN FILMS

Maritza G. J. Heijman, and Peter C. Zalm, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1988, Ser. No. 219,519
Claims priority, application Netherlands, Jul. 21, 1987, 8701718
Int. Cl.[4] B05D *3/06, 5/12*
U.S. Cl. 505—1 **7 Claims**



1. A method of forming a patterned copper oxide based superconductor on a substrate operable at a particular service temperature comprising forming an exposed pattern of a first composition on the exposed surface of a second composition or forming an exposed pattern of said second composition on the exposed surface of said first composition wherein said first composition and said second composition are selected such that upon deposition of copper oxide based material under conditions necessary to form the superconductive properties, the region overlying said first composition forms a superconductive layer while the region overlying said second composition interacts under said depositing conditions in such a manner as to render the deposited copper oxide based superconductor material nonsuperconducting at the desired service temperature, applying said copper oxide based superconductive material to a surface containing both first and second compositions under conditions suitable to form the superconductive properties and obtaining a patterned substrate having a superconductive region overlying said first composition and a nonsuperconducting region overlying said second composition.

4,900,710

PROCESS OF DEPOSITING AN ALKALI METAL LAYER ONTO THE SURFACE OF AN OXIDE SUPERCONDUCTOR

Patrick Soukiassian, Bures-sur-Yvette, France, and Robert V. Kasowski, West Chester, Pa., assignors to E. I. DuPont De Nemours and Company, Wilmington, Del.

Filed Nov. 3, 1988, Ser. No. 266,553
Int. Cl.[4] B05D *5/12*
U.S. Cl. 505—1 **3 Claims**

1. A process for improving the properties of a shaped polycrystalline high temperature copper oxide superconductor, said shaped superconductor having at least one dimension less than about 1 mm, said process comprising;
(a) depositing an alkali metal onto a clean surface of said shaped superconductor, which clean surface is free from contamination by species other than oxygen, by evaporation from an alkali metal source at a pressure below about 10^{-8} torr (1.33×10^{-6} pa), said shaped superconductor maintained at a temperature of from about 0° C. to about 400° C. during the deposition, to produce an alkali metal layer having a thickness of less than about three monolayers,
(b) exposing the superconductor with the deposited alkali metal layer to oxygen at a temperature of from about 0° C. to about 400° C., and at an exposure of at least about 10,000 langmuir (1.33×10^{-4} pa-sec), to thereby produce an improved superconductor.

4,900,711

HYDROTREATING CATALYST

Eugene Nebesh, Parma; Robert A. Plundo, Hudson, and Steven L. McMahon, Macedonia, all of Ohio, assignors to Harshaw/-Filtrol Partnership, Cleveland, Ohio

Filed Mar. 23, 1988, Ser. No. 172,267
Int. Cl.[4] B01J *21/12, 27/02, 27/08*
U.S. Cl. 502—228 **41 Claims**

1. A hydrotreating catalyst comprising at least one Group VI metal, metal oxide, or metal sulfide, at least one Group VIII metal, metal oxide, or metal sulfide, and a halogen supported on a carrier wherein
(A) the catalyst comprises from about 10% to about 35% by weight of combined metal and the atomic ratio of the Group VIII metal to Group VI metal is in the range of from about 0.5:1 to about 2:1;
(B) the catalyst contains from about 0.5 to about 10% by weight of halogen;
(C) the carrier comprises from about 10 to about 40% by weight of silica and from about 40 to about 90% of alumina; and
(D) the catalyst is characterized as having a median pore radius of from about 20 to about 90 Angstroms, and a surface area of from about 90 to about 230 m^2/g.

25. A process for preparing a catalyst support comprising silica and alumina which comprises the steps of
(A) providing an acidic silica sol;
(B) preparing an extrudable mixture comprising the acidic silica sol, alumina and water;
(C) extruding the mixture to form an extrudate; and
(D) calcining the extrudate at an elevated temperature.

4,900,712

CATALYTIC WASHCOAT AND METHOD OF PREPARATION OF THE SAME

Amiram Bar-Ilan, Newton, and Martin E. Morrill, III, Stoughton, both of Mass., assignors to Prototech Company, Newton, Mass.

Filed Sep. 30, 1988, Ser. No. 251,312
Int. Cl.[4] B01J *21/04, 32/00*
U.S. Cl. 502—304 **17 Claims**

1. The method of preparing a washcoating composition for use as a component of a catalytic coating which comprises the steps of preparing an aqueous colloidal solution of particles of one or more catalytically active non-noble metal doping oxide(s), contacting said solution with particles of a preformed washcoat base comprising a high surface area crystalline alumina, thereby uniformly adsorbing said doping particles thereon, limiting the amount of said doping oxide particles to amounts less than about 20% by weight of said doped preformed particles, and drying and calcining said doped preformed particles.

4,900,713

STABILIZING SPENT HYDROTREATING CATALYST FOR REPROCESSING OR STORAGE

Fred D. Brent Jr.; Richard G. Nelson, both of Port Neches, and William A. Ruff, Beaumont, all of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Aug. 19, 1988, Ser. No. 233,799
Int. Cl.[4] B01J *31/34, 31/06, 27/051*
U.S. Cl. 502—439 **8 Claims**

1. A method for stabilizing dry pyrophoric catalyst in a container comprising:
forming an air-tight seal over the catalyst, the seal comprising gelatinized starch.

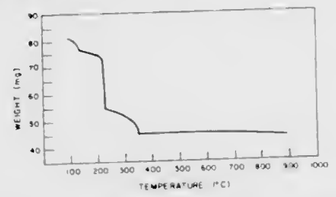
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4,900,714
Patent Not Issued For This Number

4,900,715
METHOD OF PREPARING SUPERCONDUCTING "ORTHORHOMIBIC"-TYPE COMPOUNDS IN BULK USING C_1-C_6 ALKANOIC ACID SALTS

John C. Cooper, Burke, Va.; Ramanathan Panayappan, Potomac, Md., and Joseph T. Gay, East Flatrock, N.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 29, 1988, Ser. No. 161,936
Int. Cl.[4] C01F *17/00;* C01G *3/02;* H01L *39/12*
U.S. Cl. 505—1 12 Claims



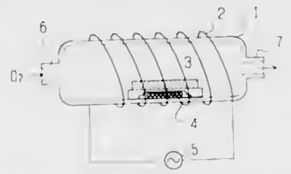
1. A process of making substantially orthorhombic superconducting composition of the formula $A_nQ_mCu_3O_y$ wherein A is a Cuprate Superconducting Facilitating rare earth element, Q is a cuprate Superconducting Facilitating alkaline earth element, m is 1 or 2, n is 1 or 2 and y is $3n+2m+4/2$ comprising the steps of:
(a) mixing together at least two of a salt of A, Q and Cu selected from the group consisting of a carbonate, nitrate and mixtures thereof to form a mixed salt of at least two of A, Q and Cu;
(b) treating said mixed salt with a strong alkali metal base to precipitate and recover a mixed product of at least two of A, Q and Cu;
(c) wet mixing the mixed product of at least two of A, Q and Cu with a lower alkyl carboxylic acid containing 1-6 carbon atoms in the carboxylic acid to form together the respective organic acid salts;
(d) as needed, adding and wet mixing the stoichiometric quantity of the necessary acid salt selected from the group consisting of a carbonate, nitrate and mixtures thereof or oxide of A, Q or Cu to a form mixed compound of A, Q, and Cu;
(e) recovering and air drying said mixture compound; and
(f) heating said wet mixed compounds from ambient temperature at a ratio of about 20° C. or less per minute to a preselected temperature in the range from about 500° C. to about 950° C.;
(g) holding said preselected temperature for at least 30 minutes and recovering the substantially orthorhombic superconducting composition.

4,900,716
PROCESS FOR PRODUCING A COMPOUND OXIDE TYPE SUPERCONDUCTING MATERIAL

Nobuhiko Fujita; Hideo Itozaki; Saburo Tanaka; Shuji Yazu, and Tetsuji Jodai, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 18, 1988, Ser. No. 195,145
Claims priority, application Japan, May 18, 1987, 62-120819
Int. Cl.[4] B05D *5/12, 3/06*
U.S. Cl. 505—1 14 Claims

1. Improvement in a process for producing a compound oxide type superconducting material, characterized in that the compound oxide type superconducting material is treated in oxygen plasma while the compound oxide type superconducting material is heated at a temperature ranging from 500° to 1000° C.



4,900,717
RECOVERY OF 2,6-DIALKYL-NAPHTHALENE ISOMERS

Wilhelm Hültmann, Munster; Robert Zellerhoff, Hamminkeln; Rudolf Oberkobusch, Duisburg; Peter Stäglich, Kempen, and Bernhard Charpey, Mülheim an der Ruhr, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Continuation of Ser. No. 901,182, Aug. 27, 1986, abandoned.
This application Feb. 4, 1988, Ser. No. 152,430
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 3531559
Int. Cl.[4] C07C *7/14*
U.S. Cl. 505—812 8 Claims

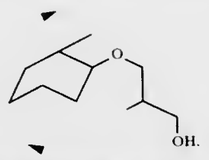
1. In a process for selective crystallization of 2,6-dialkyl-naphthalenes selected from the group consisting of methyl-n-propyl-naphthalene, methyl-isopropyl-naphthalene, methyl-n-butyl-naphthalene, methyl-isobutyl-naphthalene, ethyl-isopropyl-naphthalene, ethyl-n-butyl-naphthalene, di-n-propyl-naphthalene, diisopropyl-naphthalene, di-n-butyl-naphthalene and diisobutyl-naphthalene from their isomeric mixtures from a polar solvent solution at a temperature of 25° to −30° C., the improvement comprising effecting the crystallization with constant stirring to obtain the 2,6-dialkyl naphthalene in a high degree of purity.

4,900,718
3-(2-BORNYLOXY)-2-METHYL-1-PROPANOL AND PERFUMERY USES THEREOF

Richard M. Boden, Ocean; William J. Fylak, Allenhurst; Joseph A. Mc Ghie, South Orange, and Jordi Castells, Westfield, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jul. 28, 1989, Ser. No. 386,146
Int. Cl.[4] A61K *7/46*
U.S. Cl. 512—19 8 Claims

1. The 3-(2-bornyloxy)-2-methyl-1-propanol having the structure:



2. A process for augmenting or enhancing the aroma of a perfume, cologne or perfumed article comprising the step of intimately admixing with said perfume, cologne or perfumed article, an aroma augmenting or enhancing quantity of the 3-(2-bornyloxy)-2-methyl-1-propanol of claim 1.

4,900,719
NITROSOTHIOLS AS HYPOTENSIVE AGENTS

Gary E. Means, Columbus, Ohio, and Jeen W. Park, Albany, Calif., assignors to The Ohio State University, Columbus, Ohio

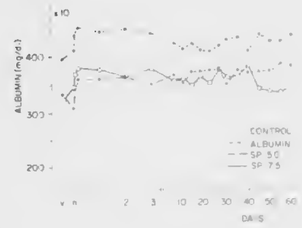
Filed Aug. 5, 1988, Ser. No. 228,441
Int. Cl.[4] C07K *5/08;* A61K *37/02*
U.S. Cl. 514—18 3 Claims

1. A process for decreasing the systemic arterial pressure in an animal which comprises:
administering directly to the animal of an aqueous composition containing S-nitrosoglutathione, which before placing in said aqueous composition had been in a therapeutically pure, relatively stable, solid form, which is characterizable by no change in its characteristic original absorbance at 545 nm upon storage in air for 30 days at 4° C., and whose process of preparation had included reacting in aqueous solution of glutathione with a nitrite and a subsequent freezing with vacuum drying to provide said solid form, in a dosage amount effective for said decreasing and being the amount of at least about 7 μg/kg. animal weight-/minute or more.

4,900,720
REPLACEMENT OF HUMAN PLASMA USING STERILE SOLUTION OF HUMAN PLASMA PROTEINS EXCLUDING BLOOD COAGULATION FACTORS

Ronald Kotitschke, Dreieich, Fed. Rep. of Germany, assignor to Boitest Pharma GmbH, Frankfurt, Fed. Rep. of Germany

Filed Apr. 6, 1987, Ser. No. 34,468
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1986, 3612137
Int. Cl.[4] A61K *37/02, 37/04, 37/62, 35/16*
U.S. Cl. 514—21 1 Claim



1. In the replacement of a patient's plasma with a substitute medium, the improvement which comprises employing as such substitute medium a sterile plasma-exchange medium containing the most essential human serum proteins, wherein said medium does not contain the blood coagulation factors at a concentration of about 75 g/l, and wherein said most essential human serum proteins comprise:

10 to 80%	normal blood content of antithrombin III, and
35 to 50	g/l of albumin,
6 to 12	g/l of IgG,
1.0 to 2.5	g/l of IgA,
0.5 to 2.5	g/l of IgM,
0.1 to 0.3	g/l of α_1-antitrypsin,
0.1 to 0.3	g/l of α_2-macroglobulin, and
0.05 to 0.15	g/l of complement C3.

4,900,721
DISINFECTANTS AND THEIR USE FOR DISINFECTING THE SKIN AND MUCOUS MEMBRANE

Klaus Bansemir, Langenfeld; Karlheinz Disch, Haan; Klaus Hachmann, Hilden; Rudolf Lehmann, Leichlingen; Manfred Biermann, Muelheim, and Harald Schnegelberger, Leichlingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 9, 1987, Ser. No. 60,138
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1986, 3619376; Feb. 2, 1987, 3702983
Int. Cl.[4] A61K *7/48;* A01N *31/02;* A01L *2/16;* C11D *3/48*
U.S. Cl. 514—25 31 Claims

1. A liquid aqueous disinfectant composition comprising:
(a.) from about 8 to about 25% by weight of at least one C_2-C_8 alcohol;
(b.) from about 0.2 to about 0.7% by weight of active substance of hydrogen peroxide and/or a compound that forms peroxide in an aqueous medium;
(c.) from about 0.1 to about 0.05% by weight of at least one carboxlic acid;
(d.) from about 0.05 to about 1.0% by weight of at least one microbicidally active nitrogen-containing organic compound;
(e.) from about 0.01 to about 0.2% by weight of a microbicidally active phenolic compound, and the balance, water.
31. A methed of disinfecting skin or mucous membrane comprising applying thereto a disinfectant effective quantity of the composition of claim 1.

4,900,722
METHODS AND COMPOSITIONS FOR PROPHYLACTIC AND THERAPEUTIC TREATMENT OF INFECTIONS

David L. Williams, River Ridge; I. William Browder, New Orleans, and Nicholas R. DiLuzio, deceased, late of Gretna, all of La. (by Nicholas M. DiLuzio, legal representative), assignors to Bioglucans, L.P., New Orleans, La.

Division of Ser. No. 13,082, Feb. 10, 1987, Pat. No. 4,761,402, and a continuation-in-part of Ser. No. 767,388, Aug. 19, 1985, Pat. No. 4,739,046. This application Aug. 1, 1988, Ser. No. 226,652
The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.
Int. Cl.[4] C08B *37/16, 37/00*
U.S. Cl. 514—54 16 Claims

1. A method for treatment of an infection caused by a parasite in animals or humans, comprising: administering to an animal or a human affected with said infection, a therapeutically effective amount of a soluble glucan which comprises a phosphorylated poly-[beta-(1-3)glucopyranose] chain which is characterized by:
(a) the capability of dissolving in water or an aqueous solution;
(b) being non-toxic, non-immunogenic and substantially non-pyrogenic; and
(c) the capability of exerting a pronounced immunobiological response when administered in vivo to an animal or to a human.

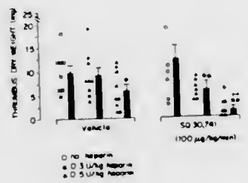
4,900,723
METHOD OF PREVENTING OR REDUCING VENOUS THROMBOSIS USING A THROMBOXANE A_2 RECEPTOR ANTAGONIST IN CONJUNCTION WITH HEPARIN AND COMBINATION

William A. Schumacher, Newtown, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 29, 1988, Ser. No. 188,571
Int. Cl.[4] A01N *43/04;* C08B *37/10;* C12Q *1/56;* G01N *33/86*
U.S. Cl. 514—56 20 Claims

1. A method for preventing or reducing deep vein thrombo-

sis, pulmonary embolism or both in a mammalian species, which comprises administering to a mammalian species in need of such treatment an effective amount of a thromboxane A_2



receptor antagonist and an effective amount of heparin, wherein the thromboxane A_2 receptor antagonist is employed in a weight ratio to the heparin of within the range of from about 0.1:1 to about 50:1.

4,900,724

TUMOR NECROSIS FACTOR INDUCING SUBSTANCE DERIVED FROM ACID-FAST BACTERIA

Yoshiko Kato, Hyogo, and Hiroko Usami, Tokyo, both of Japan, assignors to Sawai Pharmaceutical Co., Ltd and Chugai Selyaku Kabushiki Kaisha, both of Osaka, Japan

PCT No. PCT/JP86/00107, § 371 Date Nov. 3, 1986, § 102(e) Date Nov. 3, 1986, PCT Pub. No. WO86/05204, PCT Pub. Date Sep. 12, 1986
PCT Filed Mar. 4, 1986, Ser. No. 931,690
Claims priority, application Japan, Mar. 4, 1985, 60-42264
Int. Cl.[4] A61K *35/74, 37/00;* C12P *1/00*
U.S. Cl. 514—62 16 Claims

1. An amphipathic substance having TNF inducing activity which is obtained by extraction into an aqueous phase from an acid-fast bacterium, said amphipathic substance comprising hexose as a predominant component, as well as lesser amounts of pentose, fatty acid and amino acid, said amphipathic substance having 0.3–1.7 μmoles organic phosphorus/mg total weight and said amphipathic substance being essentially free of glycerol and essentially free of hydroxy fatty acid.

4,900,725

STEROIDS INCLUDING A SPIRO RING IN POSITION 17, THE PROCESS FOR THEIR PREPARATION AND THEIR USE

Francois Nioue, Les Pavillons sous Bois; Lucien Nedelec, Le Raincy; Daniel Philibert, LaVarenne Saint Hilaire, and Martine Moguilewsky, Paris, all of France, assignors to Roussel Uclaf, Paris, France

PCT No. PCT/FR87/00096, § 371 Date Nov. 25, 1987, § 102(e) Date Nov. 25, 1987, PCT Pub. No. WO87/05908, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 26, 1987, Ser. No. 138,847
Claims priority, application France, Mar. 26, 1986, 86 04355
Int. Cl.[4] A61K *31/58;* C07D *311/96*
U.S. Cl. 514—173 19 Claims

19. A method of inducing contraception or interruption of pregnancy in warm-blooded animals comprising administering to female warm-blooded animals a sufficient amount of at least one compound of claim 1 to interrupt pregnancy or to induce contraception.

4,900,726

20-HYDROPEROXY CHOLESTEROL COMPOUNDS FOR SUPPRESSION OF ATHEROGENESIS

Carl L. Tipton, Ames, Iowa, and Meiling Shih, Taichung, Taiwan, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 26, 1988, Ser. No. 262,613
The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.
Int. Cl.[4] A61K *31/56;* C07J *9/00*
U.S. Cl. 514—182 9 Claims

1. A method of suppressing atherogeneis in a human patient, comprising administering to the patient an amount of a cholesterol 20-hydroperoxide selected from the group consisting of 20(R)-hydroperoxy-25-hydroxycholesterol, 20(S)-hydroperoxy-25-hydroxycholesterol and mixtures thereof effective for reducing aortal deposit of cholesterol, said amount administered being in a dosage range from 0.5 to 25 milligrams of said cholesterol 20-hydroperoxide per kilogram of body weight per 24 hours.

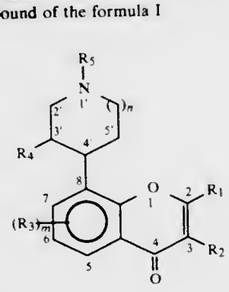
4,900,727

4H-1-BENZOPYRAN-4-ONE COMPOUNDS WHICH HAVE ANTI-INFLAMATORY OR IMMUNODULATING ACTION

Samba L. Kattige; Ramchandra G. Naik; Aftab D. Lakdawalla; Alihussein N. Dohadwalla; Richard H. Rupp, and Noel J. de Souza, all of Bombay, India, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 36,478, Apr. 9, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 302,084
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, 3612337
Int. Cl.[4] A61K *31/445;* C07D *405/04*
U.S. Cl. 514—212 12 Claims

1. A compound of the formula I



in which:

R_1 is hydrogen, unsubstituted C_1–C_6-alkyl, C_1–C_6 alkyl substituted by halogen, hydroxy or carboxy, phenyl-C_1–C_4-alkyl wherein the phenyl is unsubstituted or mono- or polysubstituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro or trifluoromethyl, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl-C_1–C_4-alkyl, C_2–C_6-alkenyl, C_3–C_6-alkynyl, phenyl which is unsubstituted or mono- or polysubstituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, trifluoromethyl, amino or hydroxy, or is carboxyl, an aldehyde or -COO-C_1–C_4-alkyl group, or 2- or 4-pyridyl,

R_2 is hydrogen, C_1–C_6-alkyl, nitro, amino, di-C_1–C_4-alkylamino or di-C_1–C_4-alkylaminomethyl or a halogen atom,

R_3 is unsubstituted C_1–C_4-alkyl, C_1–C_4-alkyl substituted by halogen, hydroxy or carboxy, hydroxyl, C_1–C_4-alkoxy, phenyl-C_1–C_4-alkyl wherein the phenyl is unsubstituted or mono- or polysubstituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro or trifluoromethyl, nitro, halogen, amino, C_1–C_4-alkylamino or di-C_1–C_4-alkylamino,

R_4 is hydrogen, hydroxyl, C_1–C_4-alkoxy, C_1–C_4-alkanoyloxy, C_1–C_4-alkoxycarbonyl, phenoxy which is unsubstituted or mono- or polysubstituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro or trifluoromethyl, amino, C_1–C_4-alkylamino or di-(C_1–C_4-alkyl)-amino,

R_5 is hydrogen, unsubstituted C_1–C_6-alkyl, C_1–C_6-alkyl substituted by halogen, hydroxy or carboxy, phenyl-C_1–C_4-alkyl wherein the phenyl is unsubstituted or mono- or polysubstituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro or trifluoromethyl, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl-C_1–C_4-alkyl, C_1–C_4-alkanoyl or phenylcarbonyl which is unsubstituted or mono- or polysubstituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro or trifluoromethyl,

n is an integer between 0 and 2 and

m is an integer between 0 and 3,

with the exception of the compound 5,7-dihydroxy-2-methyl-8-[4'-(3'-hydroxy-1'-methyl)-piperidinyl]-4H-1-benzopyran-4-one,

or a pharmacologically acceptable acid addition salt or optical isomer thereof.

12. A method for the treatment of a human or animal in need of anti-inflammatory or immunomodulating action which comprises administering to said human or animal an amount effective for said treatment of a compound of the formula I as claimed in claim 1.

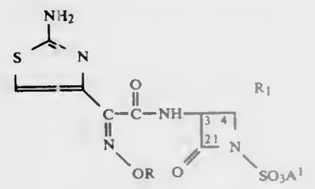
4,900,728

NOVEL 3-AMINO-2-OXO-AZETIDINE-1-SULFONIC ACIDS

Rene Heymes, Vesoul, and Alain Bonnet, Livry-Gargan, both of France, assignors to Roussel Uclaf, Paris, France

Continuation of Ser. No. 855,161, Apr. 23, 1986, abandoned, which is a continuation of Ser. No. 588,139, Mar. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 436,526, Oct. 25, 1982, abandoned. This application Jun. 29, 1987, Ser. No. 68,141
Claims priority, application France, Oct. 23, 1981, 81 19946; Jan. 19, 1984, 84 00799
Int. Cl.[4] A61K *31/425;* C07D *417/12*
U.S. Cl. 514—210 18 Claims

1. A compound selected from the group consisting of syn isomers of racemates and optical isomers of 3-amino-2-oxo-azetidine-1-sulfonic acids of the formula



wherein R is selected from the group consisting of hydrogen, linear or branched optionally mono-substituted alkyl of 1 to 12 carbon atoms and optionally substituted alkenyl and alkynyl of 2 to 12 carbon atoms, said optional substituent being selected from the group consisting of carboxy, pharmaceutically acceptable salified carboxy, alkoxycarbonyl of 2 to 7 carbon atoms, carbamoyl, dimethylcarbamoyl, amino, methylamino, ethylamino, dimethylamino, diethylamino, halogen, alkoxy and alkylthio of 1 to 7 carbon atoms, aryl, arylthio, cyano, tetrazolyl, pyridinyl, tetrazolythio and thiadiazolythio, the latter 4 being optionally substituted with alkyl of 1 to 7 carbon atoms, R_1 is $-(CH_2)_n-X$, n is an integer from 1 to 4, X is fluorine, and A^1 is selected from the group consisting of hydrogen and pharmaceutically acceptable metal cations and their non-toxic, pharmaceutically acceptable acid addition salts, the wavy line indicating the cis form, trans form or cis trans forms.

4,900,729

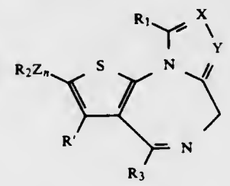
THIENO-1,4-DIAZEPINES

Werner Stransky; Karl-Heinz Weber, both of Ger-Algesheim; Gerhard Walther, Bingen; Albrecht Harreus, Ingelheim am Rhein; Jorge C. Stenzel, Mainz; Gojko Muacevic, Ingelheim am Rhein, and Wolf-Dietrich Bechtel, Appenheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 5,992, Jan. 21, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 255,903
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1986, 3601557; Jul. 22, 1986, 3624646
Int. Cl.[4] A61K *31/55;* C07D *513/14*
U.S. Cl. 514—220 6 Claims

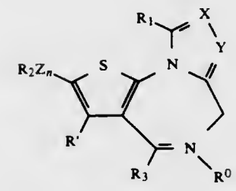
1. A thieno-1,4-diazepine having the following structure

Ia



or

Ib



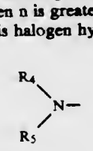
wherein

R_1 is hydrogen, branched or unbranched C_1–C_4 alkyl which may optionally be substituted by hydroxy or halogen, a cyclopropyl group, branched or unbranched C_1–C_4 alkoxy or a halogen, and

n is an integers from 0 to 10 and

when n is greater than zero,

R_2 is halogen hydroxy,



wherein

R_4 and R_5, which may be identical or difference, are hydrogen, branched or unbranched C_1–C_{10} alkyl, alkenyl or alkynyl group with 2 to 10 carbon atoms which may optionally be substituted by halogen, hydroxy, morpholino or a c-linked heterocyclic group selected from the groups furan or indol, whilst the carbon chain may be interrupted by nitrogen, oxygen, oxygen or sulphur,

branched or unbranched C_1–C_6 alkylcarbonyl group, optionally substituted by hydroxy or halogen, or substituted by an amino group which is optionally mono- or di-substituted by branched or unbranched C_1–C_6 alkyl, whilst the alkyl group may be substituted by halogen or hydroxy, phenylcarbonyl, optionally substituted phenylsulphonyl or tolylsulphonyl, wherein the substituents are halogen, C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, amino or acetylamino, an alkylsulphonyl group with 1 to 4 carbon atoms, or R_4 and R_5 together with the nitrogen atom form a saturated or unsaturated 5-, 6- or 7-membered ring optionally mono- or polysubstituted by

branched or unbranched alkyl groups with 1 to 4 carbon atoms, this ring possibly containing nitrogen, oxygen or sulphur as further heteroatoms, such as morpholin, piperazin, imidazol, 1,2,3-triazol, 1,2,4-triazol, pyrazol, imidazolin, imidazolidin, pyrazolin, pyrozolidin, thiomorpholin, or pyrrolidin, imidazol whilst each additional nitrogen atom may optionally be substituted by a branched or unbranched alkyl group with 1 to 4 carbon atoms,;

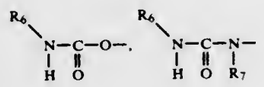
R_2 is an tolylsulphonyloxy or phenylsulphonyloxy, optionally mono- or polysubstituted by branched or unbranched C_1–C_4 alkyl or C_1–C_4 alkoxy groups with 1 to 4 carbon atoms;

R_2 is a branched or unbranched C_1–C_4 alkylsulphonyloxy group with 1 to 4 carbon atoms;

R_2 is phenylcarbonyloxy, optionally mono- or polysubstituted by branched or unbranched C_1–C_4 alkyl or C_1–C_4 alkoxy groups with 1 to 4 carbon atoms;

R_2 is branched or unbranched C_1–C_{12} alkylcarbonyloxy group, whilst the alkyl chain may be interrupted by nitrogen, oxygen or sulphur;

R_2 is

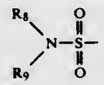


wherein

R_6 is branched or unbranched C_1–C_4 alkyl, alkenyl or alkynyl optionally substituted by halogen, an aryl group optionally mono- or polysubstituted by branched or unbranched C_1–C_4 alkyl or C_1–C_4 alkoxy

R_7 is hydrogen or branched or unbranched C_1–C_4 alkyl

R_2 is



wherein R_8 and R_9, which may be identical or different, are branched or unbranched C_1–C_4 alkyl or R_8 and R_9 together with the nitrogen atom represent a 5- or 6-membered ring optionally mono- or polysubstituted by branched or unbranched C_1–C_4 alkyl groups with 1 to 4 carbon atoms, this group optionally containing as further heteroatoms nitrogen, oxygen or sulphur, such as morpholin, piperazin, triazol, pyrazol, imidazolin, imidazolidin, pyrazolin, pyrazolidin, thiomorpholin,

pyrrolidin, or imidazol, whilst each additional nitrogen atom is substituted by C_1–C_4 alkyl

R_2 is branched or unbranched C_1–C_4 alkoxy group with 1 to 4 carbon atoms or phenyloxy optionally substituted by halogen, hydroxy, C_1–C_4 alkyl or C_1–C_4 alkoxy;

R_2 is an imido group dioxolan optionally substituted by methyl or phenyl

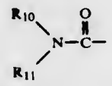
when n is greater than or equal to 0

R_2 is —CH═O, —COOH, of cyano;

R_2 is branched or unbranched C_1–C_4 alkoxycarbonyl with the proviso that if R' is hydrogen, R_3 is ochlorophenyl, X and Y both are nitrogen, R_2Z_n cannot be methoxycarbonylethyl;

R_2 is an aryloxycarbonyl group, preferably phenyloxycarbonyl;

R_2 in the case that X and Y are not both nitrogen is a group of general formula



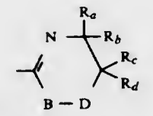
wherein

R_{10} and R_{11}, which may be identical or different, are hydrogen, phenyl optionally substituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or hydroxy, branched or unbranched C_1–C_{10} alkyl C_2–C_{10} alkenyl or alkynyl which may optionally be substituted by halogen, hydroxy, nitro, amino, substituted amino, or

R_{10} and R_{11} are saturated or unsaturated 5-, 6- or 7-membered heterocyclic ring linked by a carbon atom, optionally mono- or polysubstituted by branched or unbranched C_1–C_4 alkyl

R_{10} and R_{11} together with the nitrogen atom are a saturated or unsaturated 5-, 6- or 7-membered ring optionally mono- or polysubstituted by branched or unbranched C_1–C_4 alkyl and optionally containing, as further heteroatoms, nitrogen, oxygen, or sulphur, such as morpholin, piperazin, triazol, pyrazol, imidazolin, pyrazolin, pyrazolidin, imidazolidin, thiomorpholin, pyrrolidine, or imidazol, whilst each additional nitrogen atom may be substituted by branched or unbranched C_1–C_4 alkyl

R_2 is a group of general formula



wherein

B is oxygen, sulphur, NH or NC_1–C_6-alkyl

D is the group (C Re Rf)n', wherein n may be an integer from 0 to 3,

Ra is hydrogen, C_1–C_6 alkyl optionally substituted by hydroxy or C_1 to C_4 alkoxycarbonyl, dialkylaminocarbonyl,

Rb, Rc, Rd, Re, Rf are each hydrogen, C_1–C_6 alkyl optionally substituted by a hydroxy or amino group, or phenyl;

R_3 is phenyl, wherein the phenyl ring, preferably in the 2 position, may be mono or poly-substituted by methyl, halogen, nitro, alkoxy, or trifluoromethyl, or R_3 is pyridyl,

R is hydrogen, alkyl or an acyl group with 1 to 4 carbon atoms in the alkyl chain,;

R' is hydrogen, phenyl optionally substituted by halogen, hydroxy, C_1–C_4 alkyl, or C_1–C_4 alkoxy, or R' is branched or unbranched C_1–C_4 alkyl

X,Y independently of each other are C—R_1 or N but cannot both simultaneously represent C—R_1, or Y is the group C—COOR*, wherein R* is alkyl or hydrogen, and X is nitrogen;

Z is a branched or unbranched alkyl or alkenyl group with n carbon atoms, wherein Z may optionally be substituted phenyl substituted by halogen, hydroxy, C_1–C_4 alkyl, or C_1–C_4 alkoxy or disubstituted by R_2, whilst R_2 may be identical or different;

in the form of its racemates, enantiomers, diastereomers and mixtures thereof, as a free base or as a physiologically acceptable acid addition salt thereof.

6. A method for treating asthma is a warm-blooded animal which comprises administering to said animal a therapeutically effective amount of a compound as recited in claim 1.

4,900,730

PREPARATION WHICH PROMOTES THE ABSORPTION OF PEPTIDES

Yasuyo Miyanchi, Yokohama, Japan, assignor to Toyo Jozo Co., Ltd., Shizuoka, Japan

Continuation of Ser. No. 628,317, Jul. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 342,079, Jan. 25, 1982, abandoned. This application Jun. 18, 1987, Ser. No. 63,744

Claims priority, application Japan, Jan. 14, 1981, 56-3263; Mar. 6, 1981, 56-32951; Nov. 11, 1981, 56-181508; Sweden, Jan. 11, 1982, 8200103; United Kingdom, Jan. 11, 1982, 8200670; France, Jan. 12, 1982, 8200357; Canada, Jan. 13, 1982, 394029; Fed. Rep. of Germany, Jan. 13, 1982, 3200766; Italy, Jan. 13, 1982, 19097 A/82

Int. Cl.[4] A61K *37/30, 37/02, 9/02*

U.S. Cl. 514—12 13 Claims

1. A rectal composition for promoting improved absorption of medicine through the rectum containing a therapeutically effective amount of water soluble peptide hormone, and additionally containing:

(a) from 0.1 to 50 w/w % of at least one water soluble chelating agent selected from the group consisting of oxalic acid, malonic acid, glutaric acid, maleic acid, adipic acid, fumaric acid, trans-asonitic acid, pimelic acid, ethylmalonic acid, iminodiacetic acid, nitrilotriacetic acid, malic acid, lactic acid, glycero-3-phosphoric acid, fructose-1,6-diliphosphoric acid, glucuronic acid, galacturonic acid, glyoxylic acid, oxaloacetic acid, α-ketobutyric acid, pyruvic acid, α-ketoglutaric acid, levulinic acid, 3-phenylacetylacetone and ethylacetoacetate, and their salts and their esters, and

(b) at least 1 w/w % of a water soluble solute selected from the group consisting of halides, sulfates, phosphates, nitrates and carbonates of alkali metals, the total concentration of the dissolved chelating agent and solute in an aqueous medium being sufficient so that the composition exhibits an osmotic pressure of 1.5 to 7 times greater than that of isotonic sodium chloride solution.

4,900,731

ANTIHYPERTENSIVE PHOSPHATE DERIVATIVES

Allan Wissner, Ardsley, N.Y., and Robert E. Schaub, Upper Saddle River, N.J., assignors to American Cyanamid Company, Stamford, Conn.

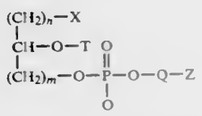
Continuation of Ser. No. 679,791, Dec. 10, 1984, Pat. No. 4,699,996. This application Sep. 15, 1987, Ser. No. 97,100

Int. Cl.[4] A61K *31/685; C07F 9/10*

U.S. Cl. 514—77 18 Claims

1. A method of treating hypertension in a warm-blooded animal which comprises administering to said animal an effective amount of a compound, including the individual R and S enantiomers and racemic mixture, represented by the formula:

FORMULA 1

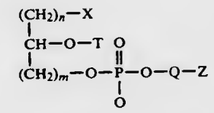


wherein n is an integer 1 or 2; m is an integer 1 or 2, and the sum of n and m must be 3; X is selected from the group consisting of C_1–C_{24} branched or straight chain alkoxy and substituted phenoxy wherein the substituents are selected from one or more of the group consisting of C_1–C_{20} branched or straight chain alkyl, C_1–C_{20} branched or straight chain alkoxy, halogen, phenyl and substituted phenyl; T is selected from the group consisting of hydrogen and

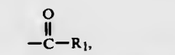
wherein R_1 is selected from the group consisting of hydrogen, C_1–C_4 branched or straight chain alkyl, C_1–C_4 branched or straight chain alkoxy and C_1–C_4 branched or straight chain alkylamino, Q is a bivalent radical selected from the group consisting of $—(CH_2)_p—$ and $—(CHR)_p—$, where p is an integer from 2 to 12 and the moiety $—(CHR)_p—$ represents an alkylene chain which is substituted by one or more C_1–C_{10} alkyl groups or phenyl groups; and Z is selected from the group consisting of

wherein R_2 may be the same or different and is selected from the group consisting of hydrogen and C_1–C_4 branched or straight chain alkyl and q is an integer from 4 to 7.

7. Compounds, including the individual R and S enantiomers and the racemic mixtures, represented by the formula:



wherein n is an integer 1 or 2; m is an integer 1 or 2, and the sum of n and m must be 3; X is selected from the group consisting of C_1–C_{24} branched or straight chain alkoxy and substituted phenoxy wherein the substituents are selected from one or more of the group consisting of C_1–C_{20} branched or straight chain alkyl, C_1–C_{20} branched or straight chain alkoxy, halogen, phenyl and substituted phenyl; t is selected from the group consisting of hydrogen and



wherein R_1 is selected from the group consisting of hydrogen, C_1–C_4 branched or straight chain alkyl, C_1–C_4 branched or straight chain alkoxy and C_1–C_4 branched or straight chain alkylamino; Q is a bivalent radical selected from the group consisting of $—(CH_2)_p—$ and $—(CHR)_p—$, where p is an integer from 2 to 12 and the moiety $—(CHR)_p—$, represents an alkylene chain which is substituted by one or more C_1–C_{10} alkyl groups or phenyl groups; and Z is selected from the group consisting of $—^+N(R_2)_3$ and



wherein R_2 may be the same or different and is selected from the group consisting of hydrogen and C_1–C_4 branched or straight chain alkyl and q is an integer from 4 to 7.

4,900,732

METHOD OF TREATING AMERICAN AND ORIENTAL COCKROACHES

Allen Berester, 700 Sligo Ave., Silver Spring, Md. 20910

Continuation of Ser. No. 114,567, Jan. 23, 1980, which is a continuation-in-part of Ser. No. 58,942, Jul. 19, 1989, abandoned. This application Mar. 28, 1983, Ser. No. 477,598

Int. Cl.[4] A01N *29/04, 57/00*

U.S. Cl. 514—122 **5 Claims**

1. A method for treating a building having an infestation of cockroaches selected from the species *Periplaneta americana, Periplaneta australasiae,* and *Blatta orientalis,* said species being characterized in that a first habitat of these species during early development and reproduction is different from a second habitat of these species during a post-migratory stage, to substantially eliminate said infestation and prevent its spread to beyond the locus thereof, which comprises identifying the locus of said first habitat, drilling holes in blocks, wall, slabs or other portions of the foundation of the infested building to gain access to an area consisting of said first habitat, and inserting a lethally effective amount of pesticide through said holes, whereby to exterminate any cockroaches of said species present in said area and substantially prevent further reproduction thereof.

4,900,733

N-ACYL PHOSPHONAMIDOTHIOATES AND DITHIOATES

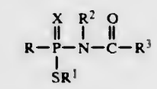
Mohamed A. H. Fahmy, Wilmington, Del., assignor to E. I. DuPont De Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 908,118, Sep. 16, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 106,651 The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.[4] A01N *57/02;* **C07F** *9/44*

U.S. Cl. 514—120 **20 Claims**

1. A compound of the formula



wherein:

X is O or S;

R is selected from the group C_1 to C_{10} alkyl, C_2 to C_{10} alkenyl, phenyl or C_7 to C_{10} phenalkyl;

R^1 is selected from the group C_3 to C_6 alkyl, C_3 to C_6 alkenyl, phenyl or C_7 to C_{10} phenalkyl;

R^2 is selected from the group C_1 to C_{10} alkyl, C_2 to C_{10} alkenyl, C_2 to C_{10} alkynyl, C_1 to C_{10} haloalkyl, C_3 to C_{10} alkoxycarbonylalkyl, C_9 to C_{10} (alkoxycarbonyl)(phenyl) alkyl, phenyl, naphthyl, C_7 to C_{10} phenalkyl and C_8 to C_{10} phenalkenyl; and

R^3 is selected from the group C_1 to C_3 alkyl and C_1 to C_3 haloalkyl.

7. A method for controlling a member from the group insects, acarids and nematodes comprising applying to the locus thereof an effective amount of a composition according to claim 3.

4,900,734

NOVEL PHARMACEUTICAL COMPOSITION CONTAINING ESTRADIOL AND PROGESTERONE FOR ORAL ADMINISTRATION

Wayne S. Maxson, 11181 NW 26th Dr., Coral Springs, Fla. 33065; Joel T. Hargrove, 820 Hatcher La., and Joe H. Delk, 103 Cayce Valley Dr., both of Columbia, Tenn. 38401

Filed Aug. 27, 1987, Ser. No. 90,095

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—171 **34 Claims**

1. A pharmaceutical composition for treating menopausal symptoms in women which comprises estradiol dissolved in a highly unsaturated edible oil containing a suspension of micronized progesterone particles; said oil comprising glycerides of one or more polyunsaturated fatty acids; said estradiol and progesterone being present in a therapeutically effective amount for treating menopause; and said estradiol and progesterone being present in an amount so that the composition can be orally administered to provide a daily dosage rate of 0.9–1.2 mg. estradiol and 150–300 mg. progesterone.

4,900,735

ZOOTECHNICAL COMPOSITIONS

Jean A. Grandadam, Saint-Maur Des Fosses, France, assignor to Roussel Uclaf, Paris, France

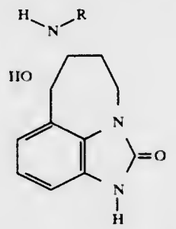
Filed Dec. 11, 1987, Ser. No. 131,729

Claims priority, application France, Dec. 11, 1986, 86 17334; Aug. 13, 1987, 87 11543; Aug. 13, 1987, 87 11542

Int. Cl.[4] A61K *31/56*

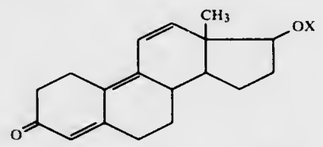
U.S. Cl. 514—171 **24 Claims**

1. A zootechnical composition comprising a weight increasing amount of (a) a zootechnical composition containing a beta adrenergic of at least one compound selected from the group consisting of a compound of the formula



1

wherein R is selected from the group consisting of hydrogen, cycloalkyl of 3 to 7 carbon atoms, piperidinyl with the nitrogen unsubstituted or substituted by alkyl of 1 to 4 carbon atoms and alkyl of 1 to 8 carbon atoms unsubstituted or substituted by —OH or phenyl or phenoxy and the wavy lines indicate that the 7-OH and 6-NH_2 have the trans configuration and their non-toxic, pharmaceutically acceptable acid addition salts and (b) a zootechnical composition containing a steroid of the formula



A

wherein X is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms wherein one of the carbon atoms may be replaced by —O— and acyl of an organic carboxylic acid of 1 to 18 carbon atoms.

4,900,736

SALTS OF ALKYL-2-BENZIMIDAZOLE-CARBAMATE AND FUNGICIDAL COMPOSITIONS THEREOF SUITABLE FOR PAINTS AND PLASTER

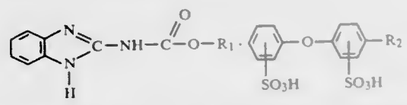
Karl-Heinz Diehl, Norderstedt, Fed. Rep. of Germany, assignor to Schulke Mayr, GmbH, Norderstedt, Fed. Rep. of Germany

Division of Ser. No. 942,230, Dec. 16, 1986, Pat. No. 4,770,705. This application Jun. 10, 1988, Ser. No. 223,531

Int. Cl.[4] A61K *31/45;* **C07D** *235/32*

U.S. Cl. 514—245 **3 Claims**

1. A fungicidal composition comprising an effective amount of a water insoluble compound of formula I



(I)

wherein R_1 is an alkyl group having 1 to 4 carbon atoms and R_2 is a straight-chain or branched-chain alkyl group having from 10 to 16 carbon atoms, a suitable insert carrier and an effective amount of an algicide selected from the group consisting of tetramethylthioramidisufide, N-trichloromethylthiophthalimide, 1-butyl-(carbamoyl)-2-benzimidazole-carbamic acid methyl ester, 2-rhodane methylthiobenzthiazole, 2-(thiazolyl-(4))-benzimidazole, dodecylguanidinoacetate, N-dichlorofluoromethylthio-N',N'-dimethyl-N-phenylsulfuric acid diamide, 2-cyano-N-(ethylaminocarbonyl)-2-(methoxyimino)-acetamide, N-(propyl)-N-(2,4,6-trichlorophenoxyethyl)-N'-imidazolyl-urea, 3-(3,4-dichlorophenyl)-1,1-dimethylurea, 2-methyl-thio-4-t.-butylamino-6-cyclopropylamino-s.-triazine, 2-n-octyl-4-isothiazoline-3-on, 2-cyclohexyl-4-isothiazoline-3-on, 2-dodecyl-4-isothiazoline-3-on, 2-benzyl-4-isothiazoline-3-on and dithiocarbamates and the manganese and zinc salts of said dithiocarbamates.

4,900,737

ISOQUINOLINE DERIVATIVES

Gordon H. Phillipps, Wembley; Esme J. Bailey, Richmond, and Michael G. Lester, Rickmansworth, all of United Kingdom, assignors to Glaxo Group Limited, London, England

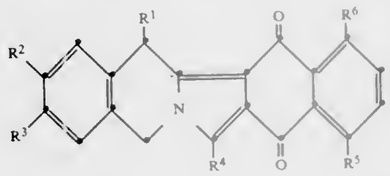
Continuation of Ser. No. 868,071, May 29, 1986, abandoned. This application Sep. 28, 1988, Ser. No. 250,216

Claims priority, application United Kingdom, May 29, 1985, 8513460

Int. Cl.[4] A61K *31/47;* **C07D** *471/04, 471/14*

U.S. Cl. 514—279 **9 Claims**

1. A compound having a formula (1)



wherein

R^1 is a methyl group;

R^2 is a hydrogen atom or a hydroxyl, C_{1-4} alkoxy or C_{2-4} alkanoyloxy group;

R^3 is a hydrogen atom, or when R^2 is other than a hydrogen atom, optionally a hydroxyl, C_{1-4} alkoxy or C_{2-4} alkanoyloxy group, or

R^2 and R^3 together are a methylenedioxy group;

R^4 is a hydrogen or halogen atom or a methyl group;

R^5 is a group $—OCOCH_2NR^7R^8$ where R^7 and R^8, which may be the same or different, each is a hydrogen atom or a straight or branched C_{1-4} alkyl group optionally substituted by a hydroxyl group;

R^6 is a hydrogen atom; and physiologically acceptable salts thereof.

8. A pharmaceutical composition comprising a compound of formula (1) as defined in claim 1, or a physiologically acceptable salt thereof, together with at least one pharmaceutical carrier or excipient.

4,900,738

N-HETEROCYCLIC-N-(4-PIPERIDYL)AMIDES AND PHARMACEUTICAL COMPOSITIONS AND THEIR USE AS ANALGESICS

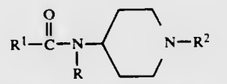
Jerome R. Bagley, North Plainfield, and H. Kenneth Spencer, Chatham, both of N.J., assignors to BOC, Inc., New Providence, N.J.

Division of Ser. No. 9,857, Feb. 2, 1987, Pat. No. 4,791,112. This application Oct. 7, 1988, Ser. No. 255,184

Int. Cl.[4] A61K *31/38, 31/39, 31/435;* **C07D** *417/12*

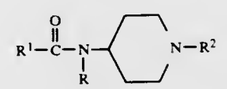
U.S. Cl. 514—322 **6 Claims**

1. A compound having the formula



optically active isomeric forms, or pharmaceutically acceptable acid addition salts thereof, in which formula: R is selected from the group consisting of benzoxazolyl, benzisoxazolyl, benzothiazolyl, benzisothiazolyl and benzothiadazolyl groups which may be unsubstituted or substituted wherein the substituents are selected from the group consisting of halogen, lower alkyl, lower alkoxy, halogenated lower alkyl, lower alkylthio or combinations thereof; R^1 is furanyl or thienyl or a lower alkoxy lower alkyl; and R^2 is a phenyl lower alkyl.

3. A narocotic antagonistic or analgesic composition comprising a non-toxic pharmaceutically acceptable carrier and therapeutically effective amount of a compound of the formula



optically active isomeric forms, or pharmaceutically acceptable acid addition salts thereof, in which formula: R is selected from the group consisting of benzoxazolyl, benzisoxazolyl, benzothiazolyl, benzisothiazolyl and benzothiadiazolyl groups which may be unsubstituted or substituted wherein the substituents are selected from the group consisting of halogen, lower alkyl, lower alkoxy, halogenated lower alkyl, lower alkylthio or combinations thereof; R^1 is furanyl or thienyl or a lower alkoxy lower alkyl; and R^2 is a phenyl lower alkyl.

4,900,739

NOVEL SPIROSUCCINIMIDES AS ALDOSE REDUCTASE INHIBITORS AND ANTIHYPERGLYCEMIC AGENTS

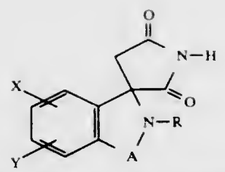
Jay E. Wroel, Lawrenceville, N.J., assignor to American Home Products Corp., New York, N.Y.

Filed Oct. 20, 1988, Ser. No. 260,149

Int. Cl.[4] C07D *513/10;* **A61K** *31/425*

U.S. Cl. 514—373 **9 Claims**

1. A compound of formula (I)



(I)

wherein A is SO_2; R is lower alkyl containing 1 to 6 carbon atoms, benzyl, halogen substituted benzyl, (2-naphthalenyl)-methyl, (1-bromo-2-naphthalenyl)methyl; X is hydrogen, halogen, lower alkyl containing 1 to 4 carbon atoms, lower alkoxy containing 1 to 4 carbon atoms, lower alkylthio containing 1 to 4 carbon atoms, carboalkoxy containing 1 to 4 carbon atoms, phenyl, nitro; Y is hydrogen or chlorine; or X and Y are joined to form CH=CH—CH=CH, and the pharmaceutically acceptable salts thereof.

4,900,740

N,N'-DISUBSTITUTED GUANIDINES CONTAINING A CARBOXYL OR A TETRAZOLYL MOIETY

George W. Muller, Northbrook; Eric Walters, Mundelein, and Grant DuBois, Lake Forest, all of Ill., assignors to The NutraSweet Company, Deerfield, Ill.

Filed Oct. 2, 1987, Ser. No. 104,601
Int. Cl.[4] A61K *31/41;* **C07D** *257/04*
U.S. Cl. 514—381 **43 Claims**

1. A compound corresponding to the formula,



wherein R_1 is an atom of hydrogen or R_1 is a C_1 to C_4 saturated, unsaturated, acyclic, cyclic or mixed hydrocarbyl or modified hydrocarbyl group and wherein, in the modified hydrocarbyl group,

1 to 2 atoms of carbon may be replaced by 1 to 2 of the same or different heteroatoms selected from the group consisting of N, O, S, Cl, Br and I,

and 1 to 3 atoms of hydrogen may be replaced by 1 to 3 atoms of fluorine;

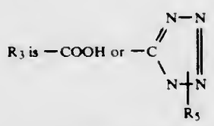
wherein R_2 is a C_1 to C_{13} saturated, unsaturated, acyclic, cyclic or mixed hydrocarbyl or modified hydrocarbyl group and wherein, in the modified hydrocarbyl group,

1 to 4 atoms of carbon may be replaced by 1 to 4 of the same or different heteroatoms selected from the group consisting of N, O, S, Cl, Br and I,

and 1 to 5 atoms of hydrogen may be replaced by 1 to 5 atoms of fluorine;

n is 0, 1, 2, or 3;

wherein R_1 and R_2 can be fused;



wherein R_4 is H or C_1–C_6 alkyl with the proviso that R_4 can only be alkyl on a single carbon atom when n=2 or 3;

R_5 is H or C_1–C_6 alkyl; and

tautomers and physiologically acceptable salts thereof.

26. A process for sweetening edible products including foods, beverages, confections, chewing gums, pharmaceuticals, veterinary preparations and toilet, cosmetic and hygiene products, characterized in that it comprises adding to the substance an effective sweetening amount of a compound of claim 1.

4,900,741

COMBINED CIMETIDINE-PIRENSEPINE FORMULATION FOR TREATING PEPTIC ULCERS AND EROSIONS

Helmut O. Köhler, Oberursel, Fed. Rep. of Germany, assignor to BioMed Researchy Consultants, Ltd., Ariz.

Filed Jun. 30, 1988, Ser. No. 213,359
Int. Cl.[4] A61K *31/415*
U.S. Cl. 514—396 **14 Claims**

6. A method for treating a patient for gastrointestinal dysfunction which comprises orally administering to the patient a pharmaceutical composition in dosage form, consisting essentially of an orally effective amount of cimetidine and an orally effective amount of pirenzepine in proportions effective to treat gastrointestinal dysfunction.

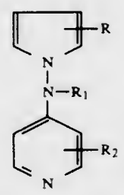
4,900,742

N-(PYRROL-1-YL)PYRIDINAMINE COMPOUNDS HAVING MEMORY ENHANCING PROPERTIES

Richard C. Effland; Joseph T. Klein, and Kevin J. Kapples, all of Bridgewater, N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 804,430, Dec. 4, 1985, Pat. No. 4,752,610. This application Jun. 1, 1988, Ser. No. 200,983
Int. Cl.[4] C07D *401/02;* **A61K** *31/44*
U.S. Cl. 514—343 **22 Claims**

1. A compound of the formula



where R is H, loweralkyl, halogen or cyano; R_1 is H, loweralkyl, arylloweralkyl, phenyl, nitrophenyl, cyanophenyl, trifluoromethylphenyl or aminophenyl; and R_2 is H, NO_2, NH_2, halogen or loweralkyl; or a pharmaceutically acceptable acid addition salt thereof.

22. A method of treating a patient in need of memory enhancement which comprises administering to the patient an effective memory enhancing amount of a compound defined in claim 1.

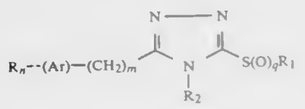
4,900,743

3-ARYL-5-ALKYLTHIO-4H-1,2,4-TRIAZOLES

John M. Kane, Cincinnati, and Francis P. Miller, Loveland, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 7,063, Jan. 27, 1987, abandoned. This application Dec. 4, 1987, Ser. No. 126,191
Int. Cl.[4] A61K *31/41;* **C07D** *249/12*
U.S. Cl. 514—384 **16 Claims**

1. A method for treating muscle spasms to a patient in need thereof which comprises administering a therapeutically effective amount of a compound of the formula



or a pharmaceutically acceptable salt thereof wherein

Ar is phenyl or naphthyl;

R_1 is C_{1-6} alkyl;

R_2 is hydrogen or C_{1-6} alkyl;

R is C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, halogeno, or trifluoromethyl and n is zero, 1 or 2, or R_n-(Ar) is methylenedioxyphenyl; and each of m and q is zero, 1 or 2.

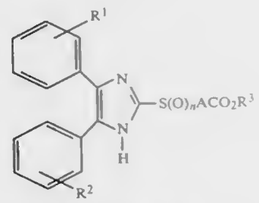
4,900,744

ANTIHYPERCHOLESTEROLEMIC 4,5-DIARYL-2-SUBSTITUTED THIOIMIDAZOLES

Jeffrey T. Billheimer, West Chester, Pa.; Peter J. Gillies, Hockessin, and Wendell W. Wilkerson, New Castle, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 14, 1988, Ser. No. 244,170
Int. Cl.[4] A61K *31/415;* **C07D** *253/84*
U.S. Cl. 514—398 **24 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein

R^1 and R^2 independently are H, F, Cl, CF_3, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms;

A is alkylene of 7–20 carbon atoms or an alkenyl residue thereof with no more than 2 double bonds;

R^3 is H, CH_3 or C_2H_5; and

n is 0, 1 or 2.

17. A method of inhibiting intestinal absorption of cholesterol in a mammal comprising administering to the mammal an ACAT-inhibitory effective amount of a compound of claim 1.

4,900,745

POLY(AMINOALKYL)AMINOCARBONYL AMINODIOL AMINO ACID DERIVATIVES AS ANTI-HYPERTENSIVE AGENTS

Gunnar J. Hanson, Skokie, and John S. Baran, Winnetka, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jul. 1, 1988, Ser. No. 214,700
Int. Cl.[4] A61K *31/415;* **C07D** *233/64*
U.S. Cl. 514—400 **3 Claims**

3. A therapeutic method for treating hypertension, said method comprising administering to a hypertensive patient, or to a patient susceptible to hypertension, a therapeutically-effective amount of the compound

O-{N-[2-{N-[2-(N,N-dimethylamino)ethyl]-N-methylamino}-ethyl]-N-methylaminocarbonyl}-3-L-phenyllactyl-L-histidineamide of (2S,3R,4S)-2-amino-1-cyclohexyl-3,4-dihydroxy-6-methylheptane; or a pharmaceutically-acceptable salt thereof.

4,900,746

ETHEREAL N-TERMINAL AMINODIOL AMINO ACID DERIVATIVES AS ANTI-HYPERTENSIVE AGENTS

Gunnar J. Hanson, Skokie, and John S. Baran, Winnetka, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jul. 1, 1988, Ser. No. 214,698
Int. Cl.[4] A61K *31/415;* **C07D** *233/64*
U.S. Cl. 514—400 **4 Claims**

4. A therapeutic method for treating hypertension, said method comprising administering to a hypertensive patient, or to a patient susceptible to hypertension, a therapeutically-effective amount of a compound selected from the group consisting of

O-[N-methyl-N-(2-methoxyethyl)aminocarbonyl]-3-L-phenyllactyl-L-histidineamide of (2S,3R,4S)-2-amino-1-cyclohexyl-3,4-dihydroxy-6-methylheptane; or a pharmaceutically-acceptable salt thereof; and

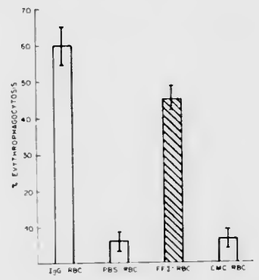
O-[N-methyl-N-(2-ethoxyethyl)aminocarbonyl]-3-L-phenyllactyl-L-histidineamide of (2S,3R,4S)-2-amino-1-cyclohexyl-3,4-dihydroxy-6-methylheptane, or a pharmaceutically-acceptable salt thereof.

4,900,747

METHOD AND AGENTS FOR REMOVING ADVANCED GLYCOSYLATION ENDPRODUCTS

Helen Vlassara; Michael Brownlee, both of New York, and Anthony Cerami, Shelter Island, all of N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 907,747, Sep. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 798,032, Nov. 14, 1985, Pat. No. 4,758,583, which is a continuation-in-part of Ser. No. 590,820, Mar. 19, 1984, Pat. No. 4,665,192. This application Sep. 3, 1987, Ser. No. 91,534
Int. Cl.[4] A61K *31/415*
U.S. Cl. 514—402 **26 Claims**



1. A method for averting the adverse sequelae of the accumulation of advanced glycosylation endproducts in the body of an animal, comprising introducing into said body an effective amount of an agent capable of causing said body to increase its activity of recognizing and removing macromolecules that have undergone advanced glycosylation selected from the group consisting of an advanced glycosylation endproduct, an advanced glycosylation endproduct bound to a carrier, the fluorescent chromophore 2-(2-furoyl)-4(5)-(2-furanyl)-1H-imidazole bound to a carrier, a monokine that stimulates the phagocytic cells in said body to increase said recognizing and removing activity toward said macromolecules, and mixtures thereof.

4,900,748

CARBAMATES RELATED TO (−)-PHYSOSTIGMINE AS CHOLINERGIC AGENTS

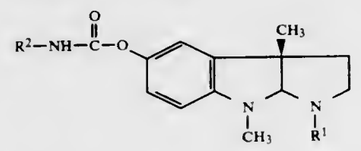
Arnold Brossi, Bethesda, Md.; Qian-Sheng Yu, Washington, D.C.; John R. Atack, Bethesda, Md., and Stanley I. Rapoport, Washington, D.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Mar. 4, 1988, Ser. No. 166,825

Int. Cl.[4] A61K *31/40;* **C07D** *487/00*

U.S. Cl. 514—411 **13 Claims**

1. A compound of the formula:



wherein

R^1=H, R_2=CH_3;

R^1=H, R^2=CH_3;

R^1=Bn, R^2=CH_3;

R^1=Bn, R^2=OH;

R^1=Bn, R^2=OCONH—CH_3;

R^1=H, R^2=CONH—CH_3;

R^1=CH_2=CH—CH_2, R^2=$CONHCH_3$; or

R^1=CH_2—CH_2—Ph, R^2=$CONHCH_3$.

7. A method of inhibiting butyrylcholinesterase activity in a patient comprising administering to a patient in need of such therapy a therapeutically effective amount of a compound according to claim 1.

4,900,749

ISOPRENOIDAMINE COMPOUNDS USEFUL AS ANTIULCER AGENTS

Saichi Matsumoto; Masami Doteuchi, both of Osaka; Takuji Mizui, Hyogo, and Kentaro Hirai, Kyoto, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

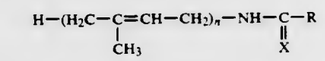
Filed Mar. 10, 1986, Ser. No. 837,192

Claims priority, application Japan, Mar. 15, 1985, 60-52970

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—334 **11 Claims**

1. A compound of the formula:



wherein n is an integer of 1 to 6;

R is a pyridyl group or a pyridyl group substituted by a member selected from the group consisting of C_1–C_5 alkyl, phenylamino, halogenophenylamino, trifluoromethylphenylamino, C_1–C_5 alkoxyphenylamino, C_1–C_5 alkoxy, C_2–C_6 alkoxycarbonyl, phenyl, pyridyl, halogenobenzoyl, halogenobenzyl, and 3,4-methyldioxyphenylmethyl; and

X is sulfur or oxygen; or an acid addition salt thereof.

11. An antiulcer composition, comprising a pharmaceutically effective amount of a compound according to claim 2 for treating ulcers and a suitable carrier therefor.

4,900,750

1,4-DIHYDROPYRIDINES

John L. Archibald, Farnham Royal; Terence J. Ward, and Albert Opalko, both of Maidenhead, all of England, assignors to John Wyeth & Brother, Limited, Maidenhead, United Kingdom

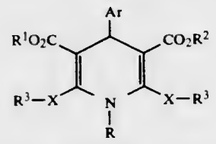
Continuation of Ser. No. 930,973, Nov. 13, 1986, abandoned, which is a continuation of Ser. No. 760,708, Jul. 30, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 81,526

Claims priority, application United Kingdom, Aug. 17, 1984, 8421039

Int. Cl.[4] C07D *401/14;* **A61K** *31/415, 31/44*

U.S. Cl. 514—335 **23 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein

Ar is 2- or 3-nitrophenyl, 2,3-dinitrophenyl, 2-3,dichlorophenyl, 3-chloro-2-nitrophenyl, 2-chloro-3-nitrophenyl, 2-trifluoromethylphenyl, pentafluorophenyl, naphthyl, pyridyl, mono-chloropyridyl, or 4- or 7-benzimidazolyl;

R is hydrogen, methyl, ethyl, n-propyl, isopropyl, benzyl, carbethoxymethyl or carbmethoxymethyl;

R^1 and R^2 are independently, selected from hydrogen, methyl, ethyl, n-propyl, isopropyl, butyl, methoxymethyl, ethoxymethyl, methoxypropyl, aminomethyl, 2-aminoethyl, 3-aminopropyl, dimethylaminoethyl, 2-carboxyethyl, methoxycarbonylmethyl, ethoxycarbonylmethyl, pyridylmethyl, pyridylethyl, imidazolylmethyl or imidazolethyl;

X is —CH_2O—, —CH_2OCH_2—, —$CH_2O(CH_2)_2$—, —CH_2— or —CH_2CH_2—; and

R^3 is 2-, or 3-pyridyl or 1- or 3-imidazolyl.

4,900,751

2-PYRIDINYL-PHENYL-SULPHINYL-AND-PHENYL-THIO-BENZIMIDAZOLES HAVING ANTIFLAMMATORY OR GASTIC ACID SECRETION INHIBITION ACTIVITY

David Cox; Hossein A. Dowlatshahi, both of Loughborough; David E. Hall, Wymeswold; Anthony H. Ingall, and John L. Suschitzky, both of Loughborough, all of England, assignors to Fisons plc, Ipswich, England

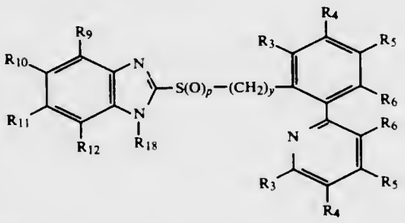
Continuation-in-part of Ser. No. 918,832, Oct. 14, 1986, Pat. No. 4,851,419. This application Sep. 24, 1987, Ser. No. 100,584

Claims priority, application United Kingdom, Sep. 27, 1986, 8623299; Sep. 27, 1986, 8623301; Mar. 4, 1987, 8705017; Aug. 20, 1987, 8719644

Int. Cl.[4] C07D *401/02;* **A61K** *31/44*

U.S. Cl. 514—338 **9 Claims**

1. A compound of formula I,



I

in which R_3 to R_6 and R_9 to R_{12}, which may be the same or

different, are each hydrogen, halogen, phenoxy, alkyl C_1 to C_6, fluoroalkyl C_1 to C_6, alkanoyl C_1 to C_6, benzoyl, $RS(O)_n$—, NO_2, $NR_{16}R_{17}$, NHCOR, —COOH or an ester derived from a C_1 to C_6 alcohol or an unsubstituted or a mono- or dialkyl C_1 to C_6 substituted amide thereof, or alkoxy C_1 to C_6 optionally substituted by phenyl,

y is 0 or 1,

p is 0 or 1,

n is 0, 1, or 2,

R_{18} is hydrogen, COR, COOR, or alkyl C_1 to C_6, said alkyl being optionally substituted by —OCOR or by phenyl,

R, R_{16}, and R_{17}, which may be the same or different, are each hydrogen, phenyl or alkyl C_1 to C_6 optionally substituted by phenyl, the phenyl groups in turn optionally being substituted by alkyl C_1 to C_6,

or a pharmaceutically acceptable salt thereof.

4,900,752

PYRANOBENZOXADIAZOLE DERIVATIVES

Kiyotomo Seto; Hiroo Matsumoto; Yoshimasa Kamikawaji; Kazuhiko Ohrai; Kyoko Nakayama; Ryozo Sakoda, all of Funabashi, and Yukinori Masuda, Saitama, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

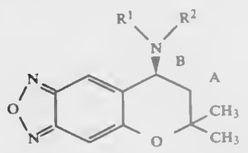
Filed Feb. 1, 1989, Ser. No. 304,641

Claims priority, application Japan, Feb. 3, 1988, 63-23409; Mar. 1, 1988, 63-48458; Mar. 29, 1988, 63-75762; May 25, 1988, 63-127584

Int. Cl.[4] C07D *498/04;* **A64K** *31/41*

U.S. Cl. 514—364 **15 Claims**

1. A compounds of the formula (I):



(I)

wherein

A represents OH or $OC(O)CH_{3-n}X_n$ in which X represents fluorine atom, chlorine atom, bromine atom, a methyl group or a methoxy group and n represents 0 or an integer of 1 to 3, or A and B together represents a bond;

B represents hydrogen atom or a bond together with A;

when R^1 represents hydrogen atom, R^2 represents hydrogen atom, $C(Z)CH_{3-n}X_n$ or $C(Z)NHCH_{3-n}X_n$ in which Z represents oxygen atom or sulfur atom and X has the same meaning as defined above;

when R^1 does not represent hydrogen atom, R^1 and R^2 together represents $(CH_2)_m$, $(CH_2)_{m-}C(Z)$, $N(R^3)(CH_2)_2C(Z)$, $(CH_2)_{m-2}NHC(Z)$ or $(CH_2)_{m-2}OC(Z)$ in which m represents an integer of 4 or 5, R^3 represents hydrogen atom or a methyl group and Z has the same meaning as defined above, or pharmacological acceptable salts of the compounds which can form salts.

4,900,753

MACROLIDE COMPOUNDS

Derek R. Sutherland, Chalfont St. Giles; Michael V. J. Ramsay, South Harrow; Edward P. Tiley, Village Way; Oswy Z. Pereira, Heston; John B. Ward, Bushey; Neil Porter, Pinner; Hazel M. Noble, Burnham; Richard A. Fletton, Ruislip, and David Noble, Burnham, all of England, assignors to American Cyanamid Company, Stamford, Conn.

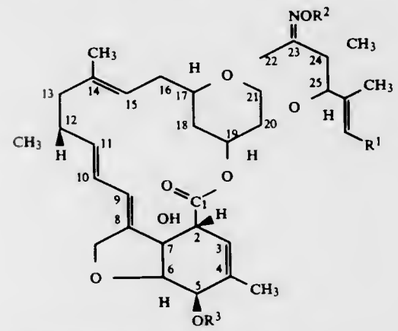
Filed Jun. 5, 1987, Ser. No. 58,856

Claims priority, application United Kingdom, Jun. 6, 1986, 8613790; Oct. 29, 1986, 8625854; Apr. 8, 1987, 8708423

Int. Cl.[4] A61K *31/335;* **C07D** *313/06*

U.S. Cl. 514—450 **13 Claims**

1. A compound of formula (I)



(I)

or a salt thereof, wherein

R^1 represents a methyl, ethyl or isopropyl group;

R^2 represents a hydrogen atom, a C_{1-8} alkyl group or a C_{3-8} alkenyl group and the group =NOR^2 is in the E-configuration;

OR^3 is a substituted hydroxy group which has a formula —$OCSOR^4$, where R^4 is an aliphatic, araliphatic, or aromatic group;

a group —OSO_2R^6, where R^6 is C_{1-4}alkyl or C_{6-10}aryl;

a group $OCO(CH_2)_nCO_2R^7$ where R^7 is a hydrogen atom or an aliphatic, araliphatic or aromatic group, and n represents 0, 1 or 2;

or a group $OCONR^8R^9$, where R^8 and R^9 may each independently represent a hydrogen atom or a C_{1-4} alkyl group.

4,900,754

HMG-COA REDUCTASE INHIBITORS

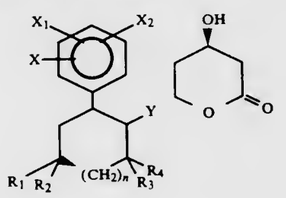
John R. Regan, Princeton, N.J., and Kent W. Neuenschwander, Ambler, Pa., assignors to Rorer Pharmaceutical Corp., Fort Washington, Pa.

Continuation-in-part of Ser. No. 135,805, Dec. 21, 1987, Pat. No. 4,863,957. This application Mar. 27, 1989, Ser. No. 328,836

Int. Cl.[4] A61K *31/365;* **C07D** *309/30*

U.S. Cl. 514—459 **29 Claims**

1. A compound of the formula



wherein Y is:

—CHR—,
—CHRCHR—,
—CHRCHRCHR—, or
—RC=CR—;
X, X_1 and X_2 are independently:
R,
NO_2,
NH(CO)R,
$N(R)_2$,
$S(O)_mR$,
F,
Cl, or
Br;
R_1 is:
OR;
R_2 is:
R;
R_3 and R_4 are independently:
H or lower alkyl;
R is:
H or lower alkyl;
n is:
0–2; and
m is:
0–2i

22. A hypocholesterolemic, hypolipidemic pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

29. A method of inhibiting cholesterol biosynthesis in a patient in need of such treatment comprising administering a pharmaceutical composition defined in claim 22.

4,900,755

CONTROLLED RELEASE COMBINATION OF CARBIDOPA/LEVODOPA

Robert E. Dumpski, Dresher; Edward C. Scholtz, King of Prussia; Donald W. Nibbelink, Lansdale, and Scott A. Reines, New Hope, all of Pa., assignors to Merck & Co., Rahway, N.J.

Division of Ser. No. 223,861, Jul. 25, 1988, Pat. No. 4,832,957, which is a continuation-in-part of Ser. No. 131,601, Dec. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 874,988, Jun. 16, 1986, abandoned. This application Feb. 24, 1989, Ser. No. 315,057

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[4] A61K *9/20, 9/22, 9/26*

U.S. Cl. 424—469 **4 Claims**

1. A controlled release oral dosage formulation comprising a uniform dispersion of 25–100 mg of carbidopa and 100–400 mg of levodopa in a polymer vehicle comprising 5–25 mg of a water-soluble hydroxypropylcellulose polymer and 2–50 mg of a less water-soluble polyvinylacetatecrotonic acid copolymer whereby, following administration, the carbidopa and levodopa are released slowly and simultaneously from the formulation.

4,900,756

(2,2-BIS(AMINOMETHYL)-1,3-PROPRANEDIOLO-N,N')PLATINUM COMPLEXES

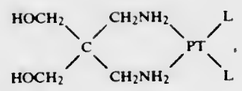
Ralph G. Child, Pearl River; Panayota Bitha, Pomona; Joseph J. Hlavka, Tuxedo, and Yung-I Lin, Nanuet, all of N.Y., assignors to American Cyanamid Company, Wayne, N.J.

Continuation-in-part of Ser. No. 825,023, Jan. 31, 1986, Pat. No. 4,760,157. This application Jul. 15, 1988, Ser. No. 219,536

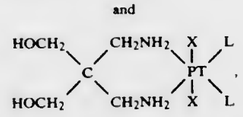
Int. Cl.[4] A61K *31/28, 31/66*

U.S. Cl. 514—492 **12 Claims**

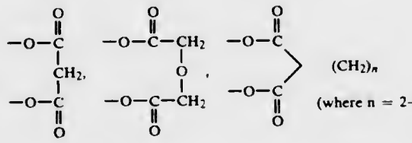
1. A method of treating a warm blooded animal afflicted with tumor cells sensitive to a compound of the formula:



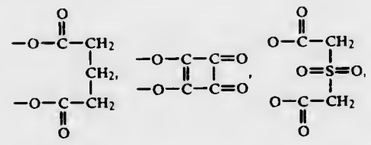
and

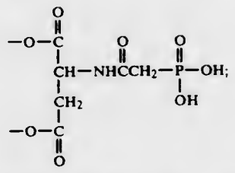


wherein L and L' are selected from the group consisting of halide, nitrate, sulfate and a monobasic carboxylate such as acetate or hydroxy acetate or L and L' taken together are a dibasic carboxylate selected from the group consisting of

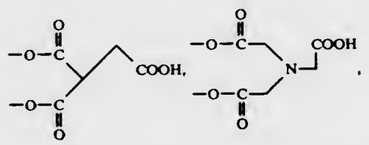


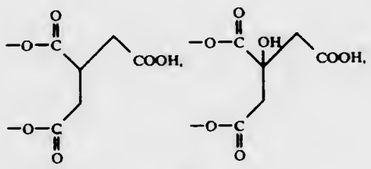
(where n = 2–6),





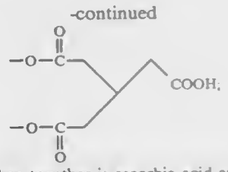
oxalic acid, methylmalonic acid, succinic acid and tartronic acid, or L and L' taken together are a tribasic carboxylate selected from the group consisting of





and

-continued



or L and L' taken together is ascorbic acid and x is selected from the group consisting of halogen and hydroxy; which comprises parenterally administering to said animal an oncolytic amount of said compound of the above formula.

4,900,757

HYPOCHOLESTEROLEMIC AND ANTIATHEROSCLEROTIC USES OF BIX(3,5-DI-TERTIARY-BUTYL-4-HYDROXYPHENYL-THIO)METHANE

Simon J. T. Mao, Loveland, and Richard L. Jackson, Cincinnati, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Dec. 8, 1988, Ser. No. 281,433

Int. Cl.[4] A61K *31/10*

U.S. Cl. 514—712 **3 Claims**

1. A method of inhibiting the progression of atherosclerosis in a patient in need thereof comprising administering to said patient a therapeutically effective antiatherosclerotic amount of bis(3,5-di-tertiary-butyl-4-hydroxyphenylthio)methane.

4,900,758

NOVEL INSECTICIDES

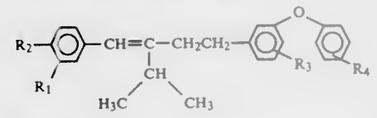
Karl J. Fisher, Petaluma, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Filed May 11, 1989, Ser. No. 350,196

Int. Cl.[4] A01N *29/10;* **C07C** *43/215*

U.S. Cl. 514—717 **7 Claims**

1. A compound having the formula



in which
R_1 is hydrogen, fluoro or trifluoromethyl;
R_2 is
(a) halogen, C_1–C_3 alkyl, C_1–C_3 haloalkyl, C_1–C_2 alkoxy or C_1–C_2 haloalkoxy if R_1 is hydrogen or fluoro; or
(b) hydrogen if R_1 is trifluoromethyl;
R_3 is hydrogen or halogen; and
R_4 is hydrogen or mono- or poly-halogen.

4,900,759

PHENOLIC FOAMS

Robert C. Clark, Somers, Conn., and Dean L. Kavanagh, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 925,515, Oct. 28, 1986, abandoned, which is a continuation of Ser. No. 571,780, Jan. 18, 1984, abandoned, which is a continuation-in-part of Ser. No. 520,363, Aug. 4, 1983, abandoned, which is a continuation of Ser. No. 365,922, Apr. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 265,508, May 20, 1981, abandoned. This application Apr. 1, 1988, Ser. No. 176,463

Int. Cl.[4] C08J *9/14*

U.S. Cl. 521—98 **11 Claims**

1. A phenolic foam derived from a composition comprising a phenolic resole with a formaldehyde to phenol mole ratio of from 1.2:1 to 2.5:1, a blowing agent having a thermal conductivity of less than 0.016 watts/m° C. and from 0.5 to 6 wt.% of a surfactant based on the weight of the resole, said foam possessing:

a. a density of from 30 to 70 kg/m^3, and a closed-cell content of at least 85% as measured by an air pycnometer according to ASTM test method D-2856 (Procedure C);
b. a thermal conductivity after 100 days at 23° C. and 50% relative humidity of less than 0.02 watts/m° C., and a value of $\Delta k/\Delta lnt$ of less than 0.5×10^{-3} where Δk in watts/m° C. is k_{100} minus k_1 and Δlnt in days is lnt_{100} minus lnt_1;
c. an isotropic pressure, required to reduce the closed-cell content of the foam by at least 10 percent, in excess of 1.75 kg/cm^2; and
d. said foam being hardened and having a degree of cure which is at least substantially equal to the degree of cure achieved by heating the hardened foam to a temperature of 60° C. for at least 18 hours.

4,900,760

FLEXIBLE POLYURETHANE FOAM PREPARED FROM A NOVEL POLYISOCYANATE MIXTURE

James R. Jasenak, Sewickley, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Division of Ser. No. 62,933, Jun. 16, 1987, Pat. No. 4,822,517. This application Feb. 7, 1989, Ser. No. 307,651

Int. Cl.[4] C08G *18/73*

U.S. Cl. 521—160 **1 Claim**

1. A flexible polyurethane foam prepared by a process comprising reacting an isocyanate with an active-hydrogen-containing material in the presence of a blowing agent, wherein the isocyanate is a polyisocyanate mixture comprising

(a) from 73 to 77 % by weight of methylene bis(-phenylisocyanate), said methylene bis(phenylisocyaante) having an isomer content of
(i) from about 30 to about 34 % by weight of the 2,4' isomer,
(ii) from about 60 to about 66 % by weight of the 4,4' isomer, and
(iii) from about 3 to about 7 % by weight of the 2,2' isomer, the percent of said isomers totaling 100%;
(b) from 23 to 27 % by weight of higher functional methylene-bridged polyphenyl polyisocyanates, the percents of components a) and b) totaling 100%, and wherein said polyisocyanate mixture has an isocyanate group content of from about 30 to about 33.5 percent by weight.

4,900,761

PRODUCTION OF POLYIMIDE FOAMS

Raymond Lee, Elk Grove Village, and Michael D. O'Donnell, Batavia, both of Ill., assignors to IMI-Tech Corporation, Elk Grove Village, Ill.

Filed Dec. 30, 1988, Ser. No. 292,509

Int. Cl.[4] C08V *9/02*

U.S. Cl. 521—184 **19 Claims**

1. A process for the production of polyimide foams which comprises subjecting a polyimide precursor mixture having a solids content of about 50 to about 75 weight percent by first heating said mixture to a foaming temperature in the range of about 135° to about 170° C. to form a consolidated but friable cellular foam structure and then subjecting said friable cellular foam structure to a temperature of at least about 230° C. to cure the cellular material into a resilient polyimide foam.

4,900,762

PRODUCTION OF FOAMED POLYMER STRUCTURES

H. Eugene Broemmelsiek, Baton Rouge, La.; Raymond Lee, Elk Grove Village, Ill., and Carroll W. Lanier, Baker, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 209,019, Jun. 20, 1988, abandoned. This application Oct. 11, 1988, Ser. No. 255,264

Int. Cl.[4] C08V 9/02

U.S. Cl. 521—184 28 Claims

1. A bun of cured polyimide foam produced by directing upon the top, sides and ends of a body of foamable polyimide precursor and of the foam structure as it is developing therefrom, microwave radiation of intensity sufficient to cause the development of a foamed polymer structure through the generation and evolution of gaseous material within the body of the precursor, but curtailing the extent to which microwave radiation impinges upwardly into the bottom of said body and said foam structure by maintaining a microwave radiation-curtailing shield underneath said body and said foam structure, and thermally curing the developed foam structure to form cured polyimide foam.

4,900,763

ULTRAVIOLET RADIATION CURABLE VEHICLES

Douglas J. Kraushaar, Washington, Pa., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 26, 1988, Ser. No. 160,740

Int. Cl.[4] C08F 2/50, 226/02, 299/04, 299/06

U.S. Cl. 522—14 8 Claims

1. An ultraviolet radiation curable vehicle consisting essentially of (a) 1-25%, by weight, of a blend of a difunctional or trifunctional polyester acrylate or methacrylate and 1-25%, by weight, of a difunctional or trifunctional polyurethane acrylate or methcacrylate; (b) 10-50%, by weight, of at least one monofunctional polyether acrylate or methacrylate; (C) 1-35% by weight, of at least one pentafunctional aliphatic pentaacrylate or pentamethacrylate; and (d) a blend of0.5-5.0%, by weight, of a substituted thioxanthone compound, 0.5-5.0%, by weight, of an ester of an aminobenzoic acid and 0.5-15.0%, by weight, of a 2-phenyl acetophenone derivative.

4,900,764

HYDROPHILIC MATERIALS

Donald J. Highgate, The Wilderness, Holmbury Hill Road, Dorking, Surrey, and John D. Frankland, 89 Redhill Wood, New Ash Green, Dartford, Kent, both of England

Continuation of Ser. No. 934,703, Nov. 25, 1986, Pat. No. 4,764,575. This application May 18, 1988, Ser. No. 195,158

Claims priority, application United Kingdom, Nov. 25, 1985, 8529006

Int. Cl.[4] C08J 3/00

U.S. Cl. 523—106 4 Claims

1. A hydrophilic polymer containing, dispersed therein, a bio-compatible oxygen-permeable material in the form of particles or droplets having a diameter which is small compared with the wavelength of light, such that the interaction between said particles or droplets and incident light is restricted to Mie scattering, the polymer having been formed by polymerisation of an emulsion or dispersion of said particles or droplets in a monomer or pre-polymer system while maintaining said emulsion or dispersion by ultrasonic stimulation at a power density of up to 150 watts/cm^2 and a frequency between 20 kHz and 25 MHz.

4,900,765

DEODORANT AND MILDEWPROOF RESIN SHEET

Katsuyoshi Murabayashi, Sakai; Motoharu Kotani, Himeji, and Keishi Sato, Suita, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 10, 1987, Ser. No. 95,615

Claims priority, application Japan, Jan. 21, 1987, 62-12119

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[4] C08K 5/43, 5/34

U.S. Cl. 523—122 14 Claims

1. A deodorant and mildewproof sheet which comprises:

a vinyl chloride resin,

a deodorant which is hardly soluble in water or insoluble in water and which is present in an amount of from 1 to 30 g per 1 square meter of said sheet, and

an antifungal agent which is hardly soluble in water or insoluble in water and which is present in an amount of from 0.1 to 3 g per 1 square meter of said sheet.

4,900,766

RADIATION-RESISTANT HIGH MOLECULAR COMPOSITION

Masashige Kubo, Tokuyama; Yukihiro Tsutsumi, Kawasaki; Fumio Okisaki, Shin-nanyo; Shunichi Fujimura, and Teruo Fukuka, both of Ichihara, all of Japan, assignors to Toyo Soda Manufacturing Co., Shin-nanyo and The Furukawa Electric Co., Ltd., Tokyo, both of, Japan

Filed Sep. 21, 1987, Ser. No. 98,883

Claims priority, application Japan, Sep. 22, 1986, 61-224356; Jun. 19, 1987, 62-152785

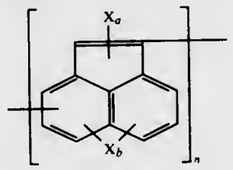
Int. Cl.[4] G21F 1/02

U.S. Cl. 523—136 9 Claims

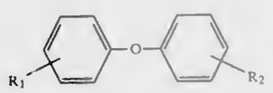


1. A radiation-resistant high molecular composition comprising a high molecular polymer, a halogenated acenaphthylene and/or condensates thereof represented by the following general formula (I):

[I]



wherein, X indicates a chlorine or bromine atom, a indicates 0 to 2, b indicates 1 to 6 and n indicates an integer not less than 1, and a diphenyl ether derivative represented by the following general formula (II):



[II]

wherein R_1 and R_2 independently indicate hydrogen, alkyl, alkoxy, phenyl phenoxy, diphenyloxy or terphenyloxy.

4,900,767

PROCESS FOR THE SURFACE MODIFICATION OF MINERALS IN A REACTIVE ATMOSPHERE

Camilla A. Rice, Sandersville, Ga., assignor to E.C.C. America Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 943,669, Dec. 17, 1986, Pat. No. 4,789,403, and a continuation-in-part of Ser. No. 175,868, Mar. 31, 1988, Pat. No. 4,859,718. This application Oct. 28, 1988, Ser. No. 263,689

Int. Cl.[4] C08K 9/04; C09C 3/08; B32B 5/16

U.S. Cl. 523—205 31 Claims

1. A method of producing a mineral selected from the group consisting of metal carbonates, glass fibers and layered lattice silicates which is surface modified with an organic material, wherein the mineral in substantially dry, particulate form is contacted with an organic monomer, co-monomers, or a pre-polymer, in the presence of gaseous carbon monoxide.

22. A composition comprising a filled polymer system comprising a matrix polymer and a filler, said filler comprising particles of a mineral selected from the group consisting of metal carbonates, glass fibers and layered lattice silicates the surfaces of which have been modified by a polymer synthesized in situ on the mineral in the presence of gaseous carbon monoxide.

4,900,768

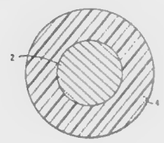
CROSSLINKABLE FLAME RETARDANT COMPOSITION OF POLYPHENYLENE ETHER AND ELASTOMERS

Visvaldis Abolins, Delmar, N.Y.; Joseph E. Betts, Westport, Conn.; Fred F. Holub, Schenectady, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Continuation of Ser. No. 525,785, Aug. 23, 1983. This application Apr. 2, 1986, Ser. No. 847,201

Int. Cl.[4] C08K 5/52, 5/51; C08L 53/00

U.S. Cl. 524—141 26 Claims



1. A heat or radiation curable flame retardant composition which is non-dripping when molded, cured and subjected to a vertical burn test, comprising an admixture of

(a) a polyphenylene ether resin;

(b) an alkenyl aromatic elastomer;

(c) an effective amount of an aromatic phosphate flame retardant agent; and

(d) an effective amount of a crosslinking agent, said polyphenylene ether resin being present in an amount at least sufficient to render said composition non-dripping when said composition is molded, cured and subjected to a vertical burn test.

4,900,769

ACETAL RESIN COMPOSITION

Masaharu Kimura, Toyonaka; Zenpei Mizutani, and Hiroya Fujii, both of Yokkaichi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,492

Claims priority, application Japan, May 27, 1987, 62-127989

Int. Cl.[4] C08K 5/20, 5/10

U.S. Cl. 524—227 4 Claims

1. An acetal resin composition comprising (A) 100 parts by weight of an acetal resin, and (B) 0.01 to 2 parts by weight of a higher fatty acid ester derived from a polyhydric alcohol having 2 to 10 carbon atoms as an alcohol component and a higher fatty acid having 22 to 32 carbon atoms as an acid component.

4. An acetal resin composition comprising (A) 100 parts by weight of an acetal resin, (B) 0.01 to 2 parts by weight of a higher fatty acid ester derived from a polyhydric alcohol having 2 to 10 carbon atoms as an alcohol component and a higher fatty acid having 22 to 32 carbon atoms as an acid component, and (C) 0.01 to 2 parts by weight of an amide selected from the group consisting of ethylene bis-stearamide, methylene bis-stearamide and methylene bis-lauramide.

4,900,770

HOT MELT TYPE SEAL AGENT FOR A LAMP

Atsushi Tomita, Nagoya, and Hidekatsu Sumi, Gifu, both of Japan, assignors to Aica Kogyo Co., Ltd., Aichi, Japan

Filed Jul. 19, 1988, Ser. No. 221,498

Claims priority, application Japan, Feb. 25, 1988, 63-43232

Int. Cl.[4] C08L 91/06, 93/04

U.S. Cl. 524—274 9 Claims

1. A hot melt type seal agent for a lamp comprising butyl rubber, styrene-ethylene-butylene-styrene block copolymer and olefin wax with a softening point higher than 110° C., the seal agent having a softening point higher than 110° C. measured by the ring and ball method, wherein the weight ratio of said butyl rubber to said block copolymer is between 90:10 and 40:60, and the amounts by weight of (1) said butyl rubber plus said block copolymer and (2) said olefin wax are from 20 to 50% and 5 to 30%, respectively, said seal agent further includes 0.5 to 5 weight % of a silane coupling agent.

4,900,771

HOT APPLIED PLASTISOL COMPOSITIONS

Michael J. Gerace, and Janet M. Gerace, both of Dayton, Ohio, assignors to Aster, Inc., Dayton, Ohio

Filed Jan. 26, 1989, Ser. No. 301,702

Int. Cl.[4] C08K 5/09

U.S. Cl. 524—296 13 Claims

1. A hot applied thermally stable plastisol composition having adhesive and sealant qualities useful in the assembly of automobile bodies said composition comprising:

(a) from about 20% to about 35% by weight of a finely divided polyvinyl chloride resin which is capable of being dispersed in a plasticizer;

(b) from about 15% to about 35% by weight of a plasticizer;

(c) from about 2% to about 25% by weight of a thermoplastic polymeric resin which is solid at room temperature and flowable at a temperature of application and which is selected from the group consisting of polyethylene, polyamides, polyvinyl butyrals, polyvinyl acetate, cellulose derivatives, polyesters, polymethyl methacrylates and ethacrylates, polyvinyl ethers, polyurethanes, ethylene vinyl acetate, vinyl acetate ethylene, vinyl acetate, acrylonitrile, acrylonitrile butadiene copolymer, chlorinated ethylene vinyl acetate, poly epsilon caprolactone, methyl methacrylate, polybutylene terephthalate and mixtures thereof; and

(d) from about 3% to about 15% of an adhesion promotion system.

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4,900,772
CURABLE RESIN COMPOSITION
Masayoshi Imanaka; Koji Noda, and Katsuhiko Isayama, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Apr. 11, 1988, Ser. No. 179,783
Claims priority, application Japan, Apr. 13, 1987, 62-90078
Int. Cl.[4] C08K 5/36
U.S. Cl. 524—303 9 Claims

1. A curable resin composition comprising:
(A) 100 parts by weight of an elastomeric organic polymer of a saturated hydrocarbon selected from the group consisting of an isobutylene polymer and a hydrogenated polybutadiene, said organic polymer having at least one silicon-containing group cross-linkable by the formation of a siloxane bond at the molecular ends, and
(B) 0.01 to 10 parts by weight of a sulfur-containing antioxidant selected from the group consisting of a sulfide of carboxylic acid ester and a sulfide of hindered phenol.

4,900,773
JOINT FILLER
Hans-Peter Hartsches, Krefeld, and Gelmut Loth, Essen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany
Continuation of Ser. No. 437,873, Oct. 29, 1982, abandoned.
This application Oct. 11, 1984, Ser. No. 659,652
Claims priority, application Austria, Jan. 4, 1982, 3/1982
Int. Cl.[4] C08J 5/03
U.S. Cl. 524—473 14 Claims

1. A composition useful as a joint filler which comprises (a) an aqueous dispersion of a polymerization product containing silicol groups of (i) two or more monomers selected from the group consisting of vinyl esters, acrylates, butadiene, styrene, and acrylonitrile, (ii) lower alkoxyvinyl silanes, and (iii), optionally, additional copolymerizable monomers, and (b) from about 20 to 120 percent by weight, based upon the weight of the solid polymerization product, of chloroparaffins having a chlorine content of from about 40 to 70 percent by weight, based upon the weight of the chloroparaffins.

4,900,774
AQUEOUS COATING COMPOSITION AND COATING METHOD USING SAME
Masaru Mitsuji, Zama; Mitsugu Endo, Kanagawa; Kaoru Morita, Hiratsuka, and Yasuo Takaya, Kanagawa, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan
Filed Jan. 28, 1988, Ser. No. 149,304
Claims priority, application Japan, Feb. 6, 1987, 62-26650
Int. Cl.[4] C08L 51/00
U.S. Cl. 524—512 5 Claims

1. An aqueous coating composition characterized in that the composition comprises
(A) a water-dispersible film-forming acrylic polymer,
(B) a crosslinking agent prepared by dispersing a hydrophobic melamine resin in water in the presence of a water-soluble resin, the hydrophobic melamine resin being about 18 to about 0.1 in solvent dilution ratio when diluted with a water/methanol solvent mixture (35/65 in weight ratio) and about 500 to about 4000 in weight average molecular weight, and
(C) a pigment.

4,900,775
SOLUBILIZATION OF COMPLEXES OF WATER-INSOLUBLE ORGANIC COMPOUNDS BY AQUEOUS SOLUTIONS OF POLYVINYLPYRROLIDONE
Terry E. Smith, Morristown; James R. Cho, Oakland, and Ian W. Cottrell, Kinnelon, all of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.
Filed Feb. 29, 1988, Ser. No. 161,888
Int. Cl.[4] C08L 37/00
U.S. Cl. 524—548 10 Claims

1. A method for preparing a water-soluble complex of a water-insoluble organic compound selected from the group consisting of furosemide, chlorhexidine and trifluralin, comprising dissolving solid polyvinylpyrrolidone in water, suspending the organic compound in the solution and heating the suspension at a temperature and for a period of time sufficient to dissolve the organic compound.

4,900,776
POTASSIUM CATALYST SYSTEM FOR PREPARING POLYURETHANE BASED PLYWOOD-PATCH COMPOSITIONS
Frank Bock, Crossett, Ark.; Mahfooz Ahmad, Bellaire, Tex., and Frederick C. Dupré, Jr., Altanta, Ga., assignors to Georgia-Pacific Resins, Inc., Atlanta, Ga.
Filed Dec. 1, 1988, Ser. No. 278,517
Int. Cl.[4] C08L 75/04; C08G 18/22
U.S. Cl. 524—700 19 Claims

1. A process for preparing a polyurethane elastomer consisting essentially of the step of reacting a polyol selected from polyether polyols and polyester polyols with an organic polyisocyanate wherein the ratio of NCO groups to hydroxyl groups is from greater than about 1.00 to 1 to about 2.0 to 1 in the presence of a catalytic amount of a substantially anhydrous potassium salt of a carboxylic acid having from 2 to about 20 carbon atoms in the molecule.

4,900,777
PROCESS FOR THE MANUFACTURE OF AQUEOUS COPOLYMER DISPERSIONS AND THEIR USE
Peter Ball, Emmerting; Klaus Marquardt, Burghausen; Manfred Selig, Burghausen, and Klaus Häfener, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany
Continuation of Ser. No. 600,354, Apr. 16, 1984, abandoned, which is a continuation of Ser. No. 423,275, Sep. 24, 1982, abandoned. This application Jun. 3, 1988, Ser. No. 202,225
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1981, 3139721
Int. Cl.[4] C08L 33/00
U.S. Cl. 524—819 25 Claims

1. In the process for the manufacture of fine-particle aqueous copolymer dispersions having a solids content of from 10% to 75% by weight, calculated on the dispersions, by means of the emulsion polymerization of
(a) from 1% to 50% by weight of ethylene and
(b) from 99% to 50% by weight of at least one vinyl monomer by means of radical initiators and in the presence of emulsifiers and/or protective colloids and, optionally further standard additives, the vinyl monomer phase comprising
(b1) from 60% to 100% by weight of vinyl chloride (VC),
(b2) from 0 to 40% by weight of oil-soluble mono-ethylenically-unsaturated monomers copolymerizable with ethylene and vinyl chloride, and
(b3) from 0 to 10% by weight of monomers selected from the group consisting of mono-ethylenically-unsaturated monomers containing at least one functional group, multiple ethylenically-unsaturated monomers, and mixtures thereof, the improvement consisting essentially in that

I the vinyl monomer phase (b) is present at the start in an amount of approximately 1% to 40% by weight, and
II at least one inert organic substance having a water solubility of from 10^{-3} to 200 g/l and a molecular weight of not more than 1000, in an amount of from 0.1% to 15% by weight, calculated in each case on the total weight of component (b), is present at least partly at the start, the said organic substance being selected from the group consisting of (A) esters, partial esters and polyesters of monobasic and polybasic organic carboxylic acids of 1 to 20 carbon atoms and mono-and polyhydric alcohols of 1 to 20 carbon atoms optionally interrupted by up to 3 oxygen atoms and optionally substituted with epoxy, —OH, alkoxy of 1 to 8 carbon atoms and/or phenoxy, (B) esters of phosphoric acid with at least one member of the group of the group consisting of phenols and monohydric alcohols of 1 to 20 carbon atoms optionally interrupted with up to 3 oxygen atoms and both optionally substituted with alkoxy of 1 to 8 carbon atoms, phenoxy or chlorine, (C) ketones of 5 to 20 carbon atoms, (D) chlorohydrocarbons and fluorohydrocarbons of 1 to 20 carbon atoms with no carbon atoms substituted with more that two chlorines, (E) aromatic hydrocarbons of 6 to 20 carbon atoms, (F) esters of organic sulfonic acids of 4 to 20 carbon atoms with monohydric alcohols of 4 to 20 carbon atoms and mixtures thereof,
III polymerization of the initial monomers phase is initiated by addition of at least one peroxide compound,
IV the remainder of component (b) and optionally, of the inert organic substance, is metered in during polymerization over a period of at least 2 hours, and
V polymerization is carried out at temperatures of from 0° to 120° C. under an ethylene pressure of from 10 to 150 bar, which is built up at the latest by the moment when the initial monomer phase has polymerized.

4,900,778
COATING LIQUID COMPOSITION TO FORM HARD COAT FILM ON PLASTICS
Toshikazu Nagashima, Yamaguchi, Japan, assignor to Central Glass Company, Limited, Ube, Japan
Filed Mar. 24, 1987, Ser. No. 29,567
Claims priority, application Japan, Mar. 24, 1986, 61-63899
Int. Cl.[4] C08L 83/06
U.S. Cl. 524—837 6 Claims

1. A coating liquid composition particularly useful to form a hard coating film on plastics articles, comprising:
an aqueous colloidal silica solution;
a partial polycondensate of an organotrialkoxysilane represented by the formula $R^1Si(OR^2)_3$, wherein R^1 is an alkyl group having not more than 2 carbon atoms and R^2 is an alkyl group having more than 3 carbon atoms, said partial polycondensate having a number average molecular weight of from about 1000 to about 2000 and said partial polycondensate of the organotrialkoxysilane being formed by mixing said organotrialkoxysilane with an anhydride of a polybasic cyclic carboxylic acid and then mixing the resultant mixture with said aqueous colloidal silica solution having a pH of from about 8 to 9 to cause hydrolytic condensation of said organotrialkoxysilane; and
a lower alkyl alcohol selected from the group consisting of isopropyl alcohol and n-propyl alcohol;
wherein, the weight ratio of the colloidal silica in said aqueous colloidal silica solution, as SiO_2, to the organotrialkoxysilane is from 1:10 to 5:10;
wherein the content of the acid anhydride remaining in the liquid composition is at least 0.005% by weight when the pH of the liquid composition is adjusted to 6.0 to 7.0; and
wherein the organotrialkoxysilane of the formula $R^1Si(OR^2)_3$ is the sole alkoxysilane used in the liquid coating composition.

4,900,779
ORGANOSILICON POLYMERS
Raymond T. Leibfried, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.
Continuation-in-part of Ser. No. 901,092, Aug. 27, 1986, abandoned. This application Jul. 30, 1987, Ser. No. 79,740
Int. Cl.[4] C08L 83/05; C08G 77/04
U.S. Cl. 524—862 17 Claims

1. An organosilicon polymer comprised substantially of alternating polycyclic hydrocarbon residues and cyclic polysiloxane or siloxysilane residues linked through carbon-silicon bonds, said polymer being hydrosilation reaction product of (a) a cyclic polysiloxane or a tetrahedral siloxysilane containing at least two ≡SiH groups and (b) a polycyclic polyene having at least two nonaromatic carbon-carbon double bonds in its rings, wherein the ratio of carbon-carbon double bonds in the rings of (b) to ≡SiH groups in (a) is in the range of from about 0.5:1 up to about 1.8:1 and at least one of (a) and (b) has more than two reactive sites.

4,900,780
ACELLULAR RESUSCITATIVE FLUID
Lawrence C. Cerny, Utica, N.Y., assignor to Masonic Medical Research Laboratory, Utica, N.Y.
Filed May 25, 1988, Ser. No. 198,291
Int. Cl.[4] C08L 89/00; C08F 16/00; C07G 7/00
U.S. Cl. 525—54.1 20 Claims

1. An acellular resuscitative fluid comprising the reaction product of:
(a) A stroma-free hemoglobin which has been modified to provide reactive gronps selected from the class consisting of oxoyacids and diketones; and
(b) a high molecular weight polymer, having reactive aldehyde constituents, selected from the class consisting of:
(1) hydroxyethyl starch having a molecular weight of from 60,000 to 450,000 daltons; and
(2) a Tetronic polymer having a molecular weight of from 1,650 to 27,000 daltons which is a block copolymer formed by the addition of ethylene and propylene oxide units to ethylene diamine.

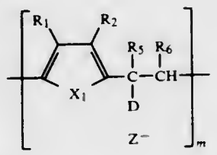
4,900,781
PROCESS FOR MODIFYING ADDITION POLYMERIZATION PLASTICS
Yasuo Hirai, and Toshio Niwa, both of Yamaguchi, Japan, assignors to Kayaku Noury Corporation, Tokyo, Japan
Filed Oct. 7, 1987, Ser. No. 105,227
Claims priority, application Japan, Oct. 17, 1986, 61-245321
Int. Cl.[4] C08F 8/50
U.S. Cl. 525—387 6 Claims

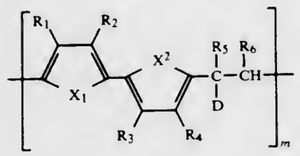
1. A process for increasing the melt flow index of an addition polymerization plastic comprising:
(i) mixing an addition polymerization plastic with an organic peroxide which has been previously adsorbed onto a zeolite to form a mixture;
(ii) heating said mixture;
wherein the melt flow index of said plastic is increased in comparison to its melt flow index prior to mixing with said organic peroxide.

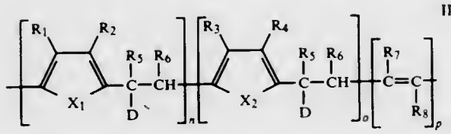
4,900,782
STABILIZED POLYELECTROLYTE PRECURSORS OF POLY(AROMATIC AND HETEROAROMATIC VINYLENES)
Chien-Chung Han, Madison; Kwan-Yue A. Jen, Succasunna, and Ronald L. Elsenbaumer, Morris Twsp., Morris County, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Apr. 4, 1988, Ser. No. 177,247
Int. Cl.[4] C08G 61/02; C08F 283/06
U.S. Cl. 525—398 24 Claims

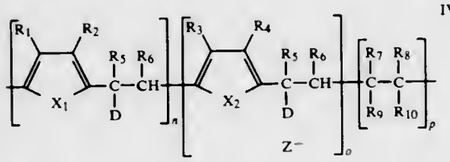
1. A homopolymer, or random or block copolymer having

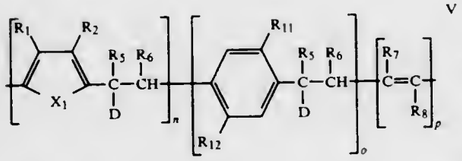
regular or random recurring units of the following Formulas I-VII;

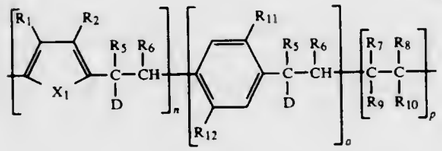
I 

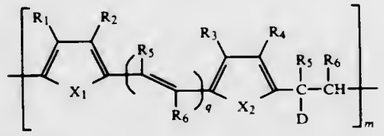
II 

III 

IV 

V 

VI 

VII 

wherein;

m, n, o, and p are the same or different and are integers, and are selected such that m or the sum of n, o and p is greater than about 100; with the proviso that at least one of n or o is not zero;

q is an integer from 0 to about 4;

D is a leaving group selected from the group consisting of halogens, pseudohalogens, or moieties of the formula: $-OR_1$, $-SC(O)OR_1$, $-SC(S)OR_1$, $-SOR_1$, $-SR_1$, $-OSOR_1$, $-SC(S)OR_2$, $-SOR_1$, $-SR_1$, $-OSOR_1$, $-OOR_1$, $-OSO_3R_1$, $-N^+R_1R_2R_3.Z^-$, $-P^+R_1R_2R_3.Z^-$, $-SeR_1$, $-P(OR_1)_2$, $-SiR_1R_2R_3$, $-S^+OR_1R_2.Z^-$, $-^+NOR_1R_2.Z^-$, $-PO(OR_1(OR_2)$, or $-SO_3^-M_+$;

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, are the same or different at each occurrence and are hydrogen or isotopes thereof, alkyl, alkenyl, aryl, alkoxy, cycloalkyl, cycloalkenyl, alkanoyl, alkylthio, aryloxy, alkylsulfinyl, alkoxyalkyl, alkylsulfonyl, arylamino, diarylamino, alkylamino, dialkylamino, alkylarylamino, arylthio, heteroaryl, arylsulfinyl, alkoxycarbonyl, arylsulfonyl, carboxylic acid, halogen, nitro, cyano, sulfonic acid, or alkyl or phenyl substituted with one or more of sulfonic acid, phosphoric acid, carboxylic acid, halo, amino, nitro, cyano or epoxy moieties, or a moiety of the formula:

$$-(OR_{13})_rOR_{14} \text{ or } -R_{13}-(OR_{13})_rOR_{14}$$

wherein;

R_{13} is a divalent alkylene moiety having from 1 to about 7 carbon atoms;

R_{14} is alkyl having from 1 to about 7 carbon atoms; and

r is a natural number from 1 to about 50; or any of

R_1 and R_2, or R_3 and R_4, or R_5 and R_6, or R_7 and R_8, or R_9 and R_{10} or R_{11} and R_{12} or R_{13} and R_{14} or R_{15} and R_{16} substituents taken together are an alkylene or alkenylene group completing a 3, 4, 5, 6 or 7 membered aromatic or alicyclic carbon ring, which ring may optionally include one or more divalent heteroatoms of nitrogen, sulfur, sulfinyl, sulfonyl or oxygen; and

X_1 and X_2 are the same or different and are S, O, Se, NR_{15}, or PR_{15}, wherein R_{15} is hydrogen, R_1, alkylaryl, arylalkyl, alkyl or aryl.

4,900,783

ACETAL COPOLYMERS WITH BACKBONE DOUBLE BONDS AND GRAFT COPOLYMERS THEREOF

Nan-Loh Yang, Staten Island, N.Y.; Andrew Auerbach, Livingston; James L. Paul, Summit, both of N.J.; Rose Pesce, College Point, and Shian S. Wang, New York, both of N.Y., assignors to Hoechst Celanese Corporation, Chatham, N.J.

Filed Apr. 13, 1988, Ser. No. 181,047

Int. Cl.[4] C08F *283/06*; C08G *2/24*

U.S. Cl. 525—412 **3 Claims**

1. A composition comprising a copolymer of trioxane and 1,3-dioxep-5-ene having backbone vinyl groups wherein a dye comatibilizer monomer is grafted to a plurality of the backbone vinyl groups.

4,900,784

PBT-PC-RUBBER-BROMINATED FR HIGH TRACKING RESISTANCE+VO

Farshid M. H. Tabankia, Brasschaat, Belgium, and Jan de Boer, Bergen op Zoom, Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 10, 1988, Ser. No. 269,830

Claims priority, application Netherlands, Dec. 24, 1987, 8703130

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **7 Claims**

1. A polymer mixture which consists of the following constituents:

a. a polybutylene terephthalate;

b. a brominated polystyrene as a flame retardant, characterized in that the polymer mixture moreover consists of the following constituents;

c. an aromatic polycarbonate; and

d. agent to improve the impact strength.

4,900,785

THERMOPLASTIC MOLDING COMPOUNDS CONTAINING SPECIAL COPOLYMERS

Edgar Leitz; Herbert Eichenauer, both of Dormagen; Karl-Heinz Ott; Horst Peters, both of Leverkusen, and Jochen Schoeps, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 319,366

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808839

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **10 Claims**

1. Thermoplastic molding compounds containing

1. thermoplastic aromatic polycarbonates, thermoplastic aromatic polyesters or mixtures thereof,

2. graft polymers obtained by the grafting of

2.1 5 to 90 parts by weight of a mixture of

2.1.1. 50 to 95 parts by weight styrene, α-methyl-styrene, nucleus-substituted styrene, methyl methacrylate or mixtures thereof and

2.1.2. 50 to 5 parts by weight acrylonitrile, methacrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleic imide or mixtures thereof onto

2.2 95 to 10 parts by weight of a rubber having a glass temperature T_g of $<10°$ C.

3. special copolymers and, optionally,

2.a thermoplastic copolymers, characterized in that the special copolymers of component 3. correspond to formula (Ia)

$$+A-X-B\frac{}{}_r \quad \text{(Ia)}$$

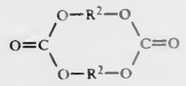
in which r is an integer of 1 to 20,

—A— represents polymers of cyclic carbonates corresponding to formula (V)



(V)

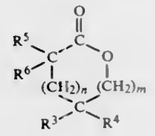
or to formula (VI)



(VI)

or mixtures thereof,

—B— represents polymers of lactones corresponding to formula (VII)



(VII)

and

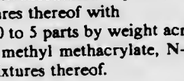
—X— represents polymers containing both the carbonates (V), (VI) or mixtures thereof and the lactones (VII) in polymerized form, the concentration of the polymerized carbonates (V), VI or mixtures thereof decreasing continuously towards the blocks —B— and the concentration of the polymerized lactones (VII) decreasing continuously towards the blocks —A— ("tapered structure") and the sum of the parts by weight of components 1. and 2. amounting to 100 parts by weight;

R^1 in (V) is a linear C_3–C_{10} alkylene radical or a radical corresponding to formulae a) to l)

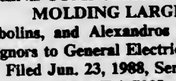
(a) $-CH_2CH_2CH(CH_3)-$

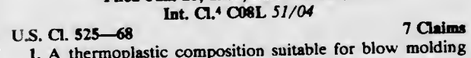
(b) $-CH_2CH_2OCH_2CH_2OCH_2CH_2-$,

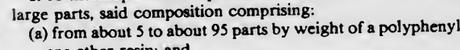
(c) $-CH_2CH(CH_3)CH_2CH_2C(CH_3)_2CH_2-$,

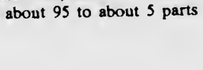
(d) 

(e) 

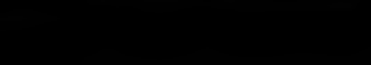
(f) 

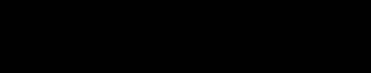
(g) 

(h) 

(i) 

(j)

(k) 

(l) 

R^2 in (VI) is a linear C_4–C_{12} alkylene or a radical corresponding to formulae (m) or (b)

(m) $-CH_2-CH_2-O-CH_2-CH_2-$ or

(b) $-CH_2-CH_2-O-CH_2-CH_2-O-CH_2-CH_2-$

and

R^3, R^4, R^5 and R^6 in (VII) may be the same or different and represent H, C_1–C_6 alkyl, C_3–C_6 alkylene, C_1–C_6 alkoxy and C_2–C_6-alkyleneoxy-$C_1$14 C_6-alkyl and

"m" and "n" in (VII) independently of one another are 0, 1, 2, 3, 4, 5, or 6 and the thermoplastic copolymers of 2.a are obtained by copolymerization of

2.a.1. 50 to 95 parts by weight styrene, α-methylstyrene, nucleus-substituted styrene, methyl methacrylate or mixtures thereof with

2.a.2. 50 to 5 parts by weight acrylonitrile, methacrylonitrile, methyl methacrylate, N-substituted maleic imide or mixtures thereof.

4,900,786

POLYPHENYLENE ETHER/RUBBER MODIFIED POLYSTYRENE COMPOSITION SUITABLE FOR BLOW MOLDING LARGE PARTS

Visvaldis Abolins, and Alexandros Hasson, both of Delmar, N.Y., assignors to General Electric Company, Selkirk, N.Y.

Filed Jun. 23, 1988, Ser. No. 210,733

Int. Cl.[4] C08L *51/04*

U.S. Cl. 525—68 **7 Claims**

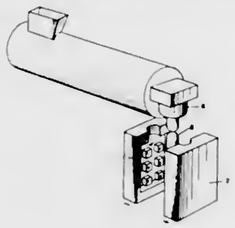
1. A thermoplastic composition suitable for blow molding large parts, said composition comprising:

(a) from about 5 to about 95 parts by weight of a polyphenylene ether resin; and

(b) from about 95 to about 5 parts by weight of a rubber

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modified high impact polystyrene resin having a particulate rubber content of greater than about 12 percent by weight, based on the weight of component (b), the rubber particles having an average diameter of greater than about



3 microns, said composition having an R* value of greater than about 16, the R* value being defined as the ratio of the low shear rate viscosity and the high shear rate viscosity at the optimum processing temperature as determined in a viscometer.

4,900,787

COMPOSITION CONTAINING RUBBER-MODIFIED GRAFT COPOLYMER AND CARBOXYLIC ACID-MODIFIED OLEFIN

Hajime Sakano, Osaka; Akitoshi Ito, Mie; Motoichi Yano; Yasuhiro Honda, both of Osaka, and Takayoshi Fujiwara, Hyogo, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Continuation of Ser. No. 948,427, Dec. 31, 1986, Pat. No. 4,835,215, which is a continuation of Ser. No. 746,689, Jun. 20, 1985, abandoned, which is a division of Ser. No. 549,381, Nov. 7, 1983, Pat. No. 4,554,316. This application Sep. 7, 1988, Ser. No. 241,150

Claims priority, application Japan, Nov. 12, 1982, 57-199583

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[4] C08L *51/04*

U.S. Cl. 525—71 5 Claims

1. A delustered shaped article prepared by molding a thermoplastic resin composition which comprises (A) a rubber-modified copolymer obtained by polymerizing at least two kinds of monomers selected from different members of the group consisting of aromatic vinyl compounds, vinyl cyanides and alkyl unsaturated carboxylates in the presence of at least one of rubbers and (B') an unsaturated carboxylic acid-modified olefin polymer, the weight proportion of the rubber-modified copolymer (A) and the unsaturated carboxylic acid-modified olefin polymer (B') in said composition being 100:0.5–40; said rubber-modified copolymer (A) comprising (a-1) a graft copolymer comprising units of at least one rubber and units of at least two kinds of monomers chosen from aromatic vinyl compounds, vinyl cyanides and alkyl unsaturated carboxylates graft polymerized thereon and (a-2) a copolymer comprising units of at least two kinds of monomers chosen from aromatic vinyl compounds, vinyl cyanides and alkyl unsaturated carboxylates, the contents of the graft copolymer (a-1) and the copolymer (a-2) being respectively from 10 to 100% and from 90 to 0% by weight based on the weight of the rubber-modified copolymer (A).

4,900,788

BLOW MOLDING POLYESTER COMPOSITIONS

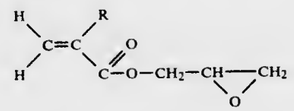
Pallatheri M. Subramanian, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 14, 1987, Ser. No. 132,488

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—166 3 Claims

1. A melt blend of a mixture consisting essentially of
(a) 70–85 parts by weight of a semicrystalline polyester;
(b) 15–30 parts by weight of a copolymer consisting of recurring units provided by
(1) the monomer



wherein R is hydrogen or alkyl of 1–6 carbon atoms; and one or more monomers selected from the group consisting of
(2) CH_2=CHR where R=H, lower alkyl or phenyl,
(3) CH_2=C(RI)$COOR^2$ where R^1=H or lower alkyl and R^2=alkyl of 1–8 carbons,
(4) RCOOCH=CH_2 where R=lower alkyl, and
(5) CO; and
(c) 0.2–3.0 parts by weight of fibrillatable polytetrafluoroethylene.

4,900,789

POLYMER BLEND OF CARBON MONOXIDE/OLEFIN COPOLYMER AND CONJUGATED ALKADIENE

William P. Gergen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1988, Ser. No. 288,367

Int. Cl.[4] C08F *1/58*; C08G *67/02*

U.S. Cl. 525—185 10 Claims

1. A composition comprising:
a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon; and
a second polymer of a vinyl aromatic monomer, an α,β-ethylenically unsaturated alkenyl nitrile, and a conjugated alkadiene, the alkadiene being present in an amount less than about 35% by weight of the second polymer which is present in an amount between about 0.5% and about 50% by weight of the composition.

4,900,790

POLYETHYLENE RESIN COMPOSITION

Akira Sano, Kawasaki; Motohiko Yoshizumi; Hiroki Hirata, both of Omiya; Kazuo Matsuura, Tokyo, and Hisahiko Suyama, Yokohama, all of Japan, assignors to Nippon Oil Company, Limited and Mitsubishi Metal Corporation, both of Tokyo, Japan

Filed Apr. 19, 1989, Ser. No. 340,446

Claims priority, application Japan, Apr. 21, 1988, 63-96764

Int. Cl.[4] C08L *23/28, 23/04*

U.S. Cl. 525—192 6 Claims

1. A polyethylene resin composition which comprises:
(A) 50–99.9 parts by weight of an ethylene polymer and
(B) 0.1–50 parts by weight of a modified ethylene polymer obtained by fluorinating an ethylene polymer having a density in the range of larger than 0.910 g/cm^3 to 0.970 g/cm^3; said ethylene polymer being prepared by polymerizing ethylene in the presence of a catalyst comprising a catalyst component containing at least one member selected from the group consisting of a titanium compound, vanadium compound and chromium compound, and optionally an organoaluminum compound.

4,900,791

COMPATIBLE POLYBLENDS

Werner Siol, Darmstadt-Eberstadt, and Ulrich Terbrack, Reinheim, both of Fed. Rep. of Germany, assignors to Röhm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

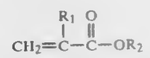
Filed Feb. 25, 1988, Ser. No. 160,313

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708427

Int. Cl.[4] C08L *33/00*; C08G *63/52*

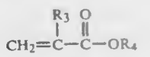
U.S. Cl. 525—228 21 Claims

1. A compatible polymer blend of two disparate polymers, consisting essentially of:
(A) 1–99 wt.% of a first polymer consisting essentially of monomer units of formula (I):



(I)

wherein R_1 is hydrogen or methyl, and R_2 is ethyl or a hydrocarbon group with 4–40 carbon atoms; and
(B) 99–1 wt.% of a second polymer consisting essentially of monomer units of formula (II):



(II)

wherein R_3 is hydrogen or methyl, and R_4 is ethyl or a hydrocarbon group with 4–40 carbon atoms; wherein said polymers are compatible within room temperature to +200° C., and are compatible in a partial range thereof which extends over at least 50° C. and wherein
(a) the sum of (A)+(B)=100 wt.%;
(b) R_1 and R_3 are different; and
(c) the groups R_2 and R_4 have similar van der Waals volumes.

4,900,792

CROSSLINKABLE POLYETHYLENE COMPOSITION

Shu P. Chen; Theodore R. Engelmann, and Harold D. Oltmann, all of Baton Rouge, La., assignors to Allied-Signal Inc., Morris Township Morris County, N.J.

Division of Ser. No. 503,989, Jun. 13, 1983, Pat. No. 4,857,257. This application Dec. 16, 1988, Ser. No. 285,674

Int. Cl.[4] C08F *255/02, 5/14, 5/32*

U.S. Cl. 525—264 17 Claims

1. A composition consisting essentially of a polymer selected from the group consisting of ethylene homopolymers and ethylene copolymers, and mixtures thereof, the polymers having substantially complete terminal saturation:
from 0.1 to 3.0 part by weight based on 100 parts of the polymer of an organic peroxide crosslinking agent;
from 0.5 to 5.0 parts by weight based on 100 parts of the polymer of an allyl crosslinking co-agent or a co-agent selected from the group of dimethacrylate compounds, trimethacrylate compounds, divinyl benzene, vinyl toluene, vinyl pyridine, p-quinone dioxime, acrylic acid, cyclohexyl methacrylate, and 1,2-polybutadiene;
sufficient amount of a metal compound having a cation selected from Group IIA and IIB of the Periodic Table of Elements to substantially neutralize acidic compound in the polymer; and
a peroxide scavenger.

4,900,793

FLUORINATED ELASTOMERIC MATERIALS

Richard J. Lagow, 6204 Shadow Mountain, Austin, Tex. 78731, and Earl T. Dumitru, 10116 Aspen St., Austin, Tex. 78758

Continuation of Ser. No. 908,198, Sep. 17, 1986, abandoned, which is a division of Ser. No. 722,984, Apr. 15, 1985, Pat. No. 4,621,107, which is a continuation of Ser. No. 407,700, Aug. 12, 1982, abandoned. This application May 25, 1989, Ser. No. 358,458

Int. Cl.[4] C08F *8/22*

U.S. Cl. 525—326.3 10 Claims

1. A perfluorinated crosslinked polymer wherein the polymer backbone chains have attached thereto a sufficient number of organic groups to prevent crystallization, and wherein the crosslinking occurs between backbone chain carbon atoms produced by a method comprising the steps of:
a. providing a tetrafluoroethylene-propylene polymer having a fluorine content of about 10 to about 65 mole percent and a molecular weight of about 10,000 to about 10,000,000 daltons;
b. exposing the polymer to electron radiation having an energy level of about 1 Mev, at a dosage of about 1 Mrad/minute thereby crosslinking the polymer by creating crosslinks between carboo atoms of the backbone chains; and
c. perfluorinating the crosslinked polymer by:
(i) placing the polymer obtained in step (b) in a fluorine reactor having means for the introduction of a gas;
(ii) establishing a flow of inert gas into the reactor to provide an inert gas atmosphere;
(iii) introducing a flow of fluorine gas into the reactor to yield a mixture of fluorine gas and inert gas containing about 0.2% fluorine; and
(iv) gradually increasing the proportion of fluorine gas in the mixture until an atmosphere of essentially pure fluorine gas is established under conditions sufficient to perfluorinate the polymer.

4,900,794

STYRENE TERMINATED MULTIFUNCTIONAL OLIGOMERIC PHENOLS AS NEW THERMOSETTING RESINS FOR COMPOSITES

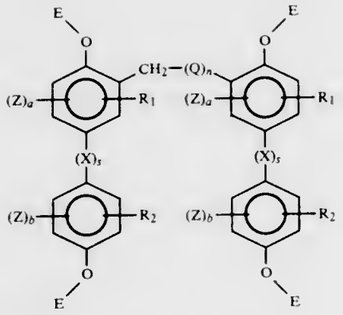
Joseph J. Zupancic, Bensenville; Andrew M. Zweig, Schaumburg, and James A. Wrezel, Buffalo Grove, all of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 276,598, Nov. 28, 1988, Pat. No. 4,855,375, which is a continuation-in-part of Ser. No. 87,921, Aug. 21, 1987, abandoned. This application Jan. 21, 1989, Ser. No. 369,369

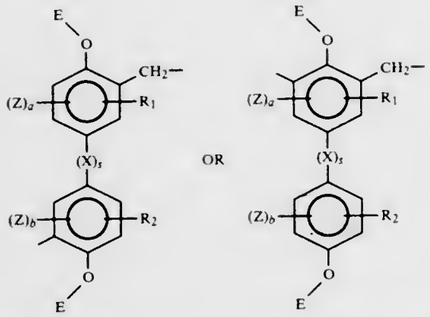
Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—326.3 17 Claims

1. The polymeric product resulting from curing a resin which is a vinylbenzyl ether of the oligomeric condensation product of a dihydric phenol and formaldehyde and with the formula:



where the recurring unit Q has the structure,



and n is an integer from 1 to 10;

s is 0 or 1;

each X is independently selected from the group consisting of CH_2, $C(CH_3)_2$, $C(CF_3)_2$, $S(O)_2$, C(O), and OC_6H_4O;

each R_1 and R_2 is independently selected from the group consisting of hydrogen, alkyl and alkoxy moieties containing 1 to 10 carbon atoms, phenyl, and phenoxy;

a and b are independently 0 or integers from 1 to 4;

Z is Cl or Br;

E is selected from the group consisting of vinylbenzyl moiety, alkyl moieties containing 1 to 10 carbon atoms, or benzyl, subject to the constraint that at least 50% of all E's are the vinylbenzyl moiety.

4,900,795

POLYMER AMMONIUM SALTS

Gerhard Hoffmann, Otterstadt; Wolfgang Huemmer, Limburgerhof; Horst Koch, Gruenstadt, and Dieter Littmann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 200,951

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1987, 3718447

Int. Cl.[4] C08F *8/44*

U.S. Cl. 525—329.9 **8 Claims**

1. A polymer ammonium salt which is formed from a copolymer (A) and from one or more amines (B), the copolymer (A) being obtained by copolymerizing a monomer mixture:

(a_1) ethylene,

(a_2) acrylic acid and/or methacrylic acid and

(a_3) one or more further monomers from the group consisting of vinyl esters, vinyl ethers, acrylates, methacrylates, acrylamides and methacrylamides, for whose weight ratios the following conditions apply:

parts by weight of $(a_1)+(a_2)+(a_3)=100$,

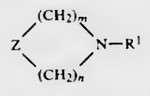
30 parts by weight ≦ parts by weight of (a_1) ≦ 70 parts by weight,

5 parts by weight ≦ parts by weight of (a_2) ≦ 50 parts by weight, and

5 parts by weight ≦ parts by weight of (a_3) ≦ 40 parts by weight,

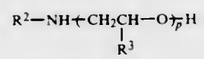
wherein the amines (B) are selected from the group consisting of:

(b_1) cyclic amines of the formula I



where R^1 is hydrogen, C_1–C_6-alkyl, -hydroxy-C_1–C_6-alkyl or (ω-hydroxypolyalkylene oxide)-α-yl, Z is oxygen, sulfur, NH or C_1–C_5-alkylidene and n and m are each an integer from 1 to 4,

(b_2) open-chain amines of the formula II



where R^2 is C_1–C_5-alkyl, phenyl, hydroxyl, ω-amino-or ω-thiolo-C_2–C_{10}-alkyl or a (ω-hydroxypolyalkylene oxide), (ω-aminopolyalkyleneimine) or (ω-thiolopolyalkylene sulfide)-α-yl, R^3 is hydrogen or C_1–c_5-alkyl and p is from 1 to 10, and

(b_3) 1,4-thiazine, N, N',N''-trisvinylmelamine and N,N',N''-trisallylmelamine, or mixtures thereof.

4,900,796

PROCESS FOR PREPARING CHLOROMETHYLATED AROMATIC MATERIALS

Scott A. Berger, Langhorne, Pa.; Robert Stewart, Mt. Laurel, N.J., and Richard B. Wuchter, Rydal, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 2, 1988, Ser. No. 151,355

Int. Cl.[4] C08F *8/18*

U.S. Cl. 525—359.3 **14 Claims**

1. A process comprising introducing in a first closed container a mixture of a vinyl aromatic resin chloromethylation catalyst and chloromethyl methyl ether in proportions to insure chloromethylation of the aromatic material and then:

a. heating and stirring the mixture for sufficient time to substantially complete the chloromethylation reaction,

b. introducing formaldehyde, methanol, and hydrogen chloride in proportions stoichiometrically sufficient to produce at least about as much new chloromethyl methyl ether as that consumed by the chloromethylation reaction in a. above, and reacting the same to produce additional chloromethyl methyl ether within the first closed container,

c. distilling substantially all the chloromethyl methyl ether from said first closed container into a second closed container,

d. removing chloromethylated aromatic product from said first closed container,

e. introducing a new batch of vinyl aromatic resin and catalyst for the chloromethylation reaction to said first closed container, and

f. introducing to said first closed container, as the source of chloromethyl methyl ether for chloromethylation of said new batch of vinyl aromatic resin, said chloromethyl methyl ether from said second closed container.

4,900,797

THERMOPLASTIC POLYCARBONATE MIXTURES CONTAINING ALIPHATIC

Edgar Leitz; Herbert Eichenauer, both of Dormagen, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 318,977

Claims priority, applicatioo Fed. Rep. of Germany, Mar. 17, 1988, 3808836

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—413 **8 Claims**

1. Thermoplastic polycarbonate mixtures containing

1. thermoplastic aromatic polycarbonates and

2. aliphatic polycarbonates having weight average molecular weights Mw (as measured by ultracentrifugation or light scattering) in the range from 15,000 to 500,000.

4,900,798

PREPARATION OF ETHENE POLYMERS USING A ZIEGLER CATALYST SYSTEM

Juergen Kerth, Maxdorf; Rudolf Mueller-Mall, Neuhoren, and Guenther Schweier, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 16, 1987, Ser. No. 97,068

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1986, 3631534

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[4] C08F *4/64, 10/02*

U.S. Cl. 526—152 **2 Claims**

1. In a process for the preparation of finely divided homopolymers of ethene or copolymers of ethene with minor amounts of a C_3–C_8-alpha-mono-alkene by polymerization of the monomer or monomers at from 30° to 150° C. under from 1 to 200 bar using a Ziegler catalyst system consisting of

(1) a titanium-containing catalyst component obtained by

(1.1) first of all producing a precipitate in an initially taken organic liquid by introducing and combining, with vigorous movement,

(1.1.1) a 0.1–10 molar solution of titanium tetrachloride in a liquid saturated aliphatic and/or aromatic hydrocarbon of 5 to 10 carbon atoms,

(1.1.2) a 0.1–10 molar solution of an organoaluminum compound of the empirical formula R_nAlCl_{3-n}, where n is from 1.5 to 3 and R is alkyl of 1 to 12 carbon atoms, in a liquid saturated aliphatic and/or aromatic hydrocarbon of 5 to 10 carbon atoms, and

(1.1.3) a C_2–C_8-alpha-monoalkene,

with the provisos that (i) a total of from 2 to 20 liters of the initially taken organic liquid, a total of from 0.5 to 5 g mol of the organoaluminum compound and a total of from 5 to 500 g mol of the alpha-monoalkene are used per g mol of the titanium tetrachloride employed in total, and (ii) per molar unit of the titanium tetrachloride employed in total, from 0.002 to 0.15 molar unit per minute is converted to a precipitate, and from 0.02 to 1 molar unit per minute of the alpha-monoalkene is introduced into the precipitation system, and

(1.2) then producing a solid-phase product by combining, with thorough mixing, the precipitate obtained according to (1.1), which is present in a liquid saturated aliphatic and/or aromatic hydrocarbon of 5 to 10 carbon atoms, with a 0.1–10 molar solution of an organolithium compound of the empirical formula LiR, where R is alkyl of 1 to 12 carbon atoms, in a liquid saturated aliphatic and/or aromatic hydrocarbon of 5 to 10 carbon atoms,

with the provisos that (i) the substances combined are left at from −10° to 60° C. for from 0.5 to 12 hours and (ii) from 0.1 to 20 g mol of the organolithium compound are used per g mol of titanium in the precipitate, and

an aluminum-containing catalyst component which is a trialkylaluminum which contains 1 to 12 carbon atoms per alkyl group,

with the proviso that the atomic ratio of titanium from the catalyst component (1) to aluminum from the catalyst component (2) is from 1:1 to 1:200,

the improvement which comprises using as the titanium-containing catalyst component (1) one in which the precipitate of stage (1.1) has been produced at from −10° to 10° C. in an initially taken organic liquid which has a viscosity of from 5 to 15 mm^2/s at the precipitation temperature and consists of (a) a liquid saturated aliphatic hydrocarbon of 6 to 8 carbon atoms and (b) relatively small amounts, dissolved therein, of a homopolymer of isobutene.

4,900,799

METATHESIS POLYMERIZATION OF CYCLOOLEFINS

Shigeyoshi Hara, and Zen-ichiro Endo, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

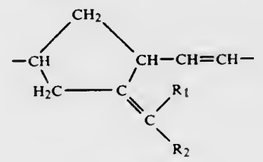
Filed Jun. 24, 1987, Ser. No. 65,738

Claims priority, application Japan, Jun. 24, 1986, 61-146254; Jul. 31, 1986, 61-178884; Aug. 6, 1986, 61-183468

Int. Cl.[4] C08F *4/78, 36/20*

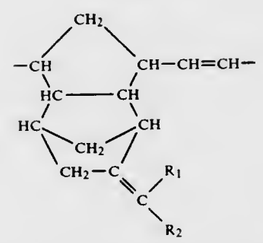
U.S. Cl. 526—282 **87 Claims**

1. A polymer which comprises at least one repeating unit having the formula selected from the group consisting of



(I)

and



(II)

wherein R_1 and R_2 independently represent a hydrogen atom or an alkyl group containing up to three carbon atoms provided that both R_1 and R_2 are not hydrogen atoms.

4,900,800

POWDER LACQUER AND ITS USE FOR COATING HEAT-RESISTANT SUBSTRATES

Reinhard Halpaap; Josef Pedain, both of Koeln; Hans-Joachim Kreuder, Krefeld; Gerhard Klein, Monheim; Walter Schäfer, Leichlingen, and Dieter Arlt, Koeln, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 73,927

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1986, 3624775

Int. Cl.[4] C08G *18/10, 18/32;* C08F *8/00*

U.S. Cl. 528—66 **3 Claims**

1. A composition comprising

(A) a polyisocyanate component in powder form which is solid below about 40° C. and liquid above about 150° C. which

(a) does not contain any blocking agents for isocyanate groups,
(b) has a content of free isocyanate groups (expressed as NCO) attached to tertiary aliphatic or tertiary cycloaliphatic carbon atoms of about 8 to 24% by weight and an average NCO functionality of at least 2.1,
(c) has a content of urethane groups (expressed as —N—H—CO—O—) of about 3 to 30% by weight and
(d) has a content of isocyanurate groups (expressed as $C_3N_3O_3$) of 0 to about 30% by weight and

(B) an organic polyhydroxyl component in powder form which is solid below about 40° C. and liquid above about 150° C.

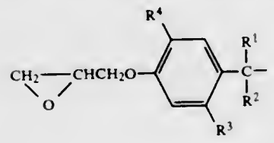
4,900,801

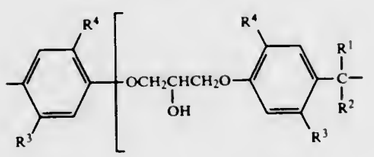
EPOXY COMPOUNDS AND EPOXY RESIN COMPOSITIONS CONTAINING THE SAME

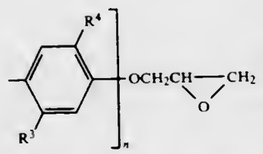
Toshimasa Takata, and Hideo Nakamura, both of Chiba, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,713
Claims priority, application Japan, May 29, 1987, 62-134393
Int. Cl.[4] C08G 59/06
U.S. Cl. 528—87 **12 Claims**

1. An epoxy compound having the general formula:







wherein n is the number of recurring units and has a value in the range of from 0 to 30,
R^1 and R^2 are independently selected from the group consisting of hydrogen and an alkyl radical having 1 to 6 carbon atoms,
R^3 is an alkyl radical having 1 to 6 carbon atoms and
R^4 is a tertiary alkyl radical.

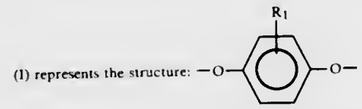
4,900,802

MOLDABLE/EXTRUDABLE THERMOTROPIC AROMATIC COPOLYESTERAMIDES

Jean-Pierre Quentin, Lyons, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 11, 1988, Ser. No. 217,350
Claims priority, application France, Jul. 10, 1987, 87 10178
Int. Cl.[4] C08G 69/44
U.S. Cl. 528—190 **13 Claims**

1. A moldable/extrudable, high molecular weight thermotropic aromatic copolyesteramide comprising recurring structural units of the formulae (I), (III) and (IV), and optionally (II), wherein:

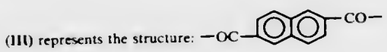


(I) represents the structure: —O— —O—

in which R_1 is a methyl or ethyl radical or a chlorine or bromine atom, with the proviso that the units (I) are identical or different;



(II) represents the structure: —OC— —CO—



(III) represents the structure: —OC— —CO—



(IV) represents the structure: —HN— —CO—

the molar ratio of the units (I) relative to the sum of the units (II)+(III) ranges from 0.95 to 1.05;
the amount of the units (II) in the mixture of (II)+(III) ranges from 0 to 80 mol % and that of the units (III), on the same basis, ranges from 100 to 20 mol %;
the amount of the units (IV), expressed relative to the amount of the units (I), ranges from 5 to 100 mol %; and
said copolyesteramide having a flow temperature ranging from 200° to 350° C.

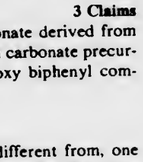
4,900,803

BRANCHED POLYCARBONATE FROM TRI- OR TETRA-HYDROXY BIPHENYL COMPOUNDS

Alberto Petri, Milan, Italy, assignor to Enichem Tecnoresine S.p.A., Palermo, Italy

Filed Jun. 7, 1988, Ser. No. 203,705
Claims priority, application Italy, Jun. 17, 1987, 20928 A/87
Int. Cl.[4] C08G 63/62
U.S. Cl. 528—204 **3 Claims**

1. A blow moldable branched polycarbonate derived from (1) an aromatic dihydroxy-compound and a carbonate precursor and (2) at least one tri- or tetra-hydroxy biphenyl compound having the formula:



wherein:
Z represents O, $—CH_2—$;
R, R_1, R_2, are either the same or are different from, one another, and represent H, OH or CH_3, and at least one thereof is OH; and
R_3 represents H, CH_3.

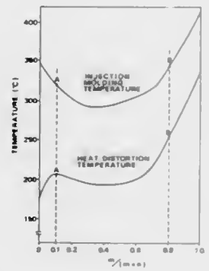
4,900,804

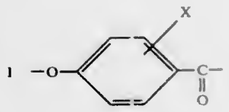
AROMATIC POLYESTERS, POLYESTERAMIDES, AND COMPOSITIONS THEREOF

Tadahiro Wakui; Kenji Yoshino; Masafumi Komatsu; Yumiko Kumazawa; Touru Yamagishi, and Mitsuhiko Izumi, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

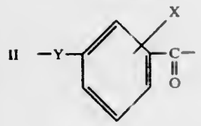
Division of Ser. No. 135,558, Dec. 17, 1987, Pat. No. 4,851,497.
This application Apr. 10, 1989, Ser. No. 335,675
Claims priority, application Japan, Dec. 19, 1986, 61-303228; Dec. 22, 1986, 61-305874
Int. Cl.[4] C08G 69/26
U.S. Cl. 528—332 **6 Claims**

1. An aromatic polyesteramide consisting essentially of units I, II, III, IV, V, and VI of the following formulae:

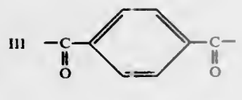




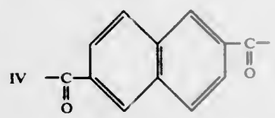
I —O— X —C— O



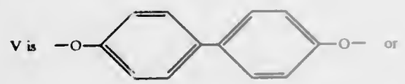
II —Y— X —C— O



III —C— O —C— O



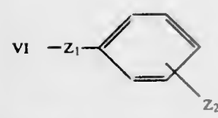
IV —C— O —C— O



V is —O— —O— or



—O— —O—



VI —Z_1— —Z_2—

wherein
X is a radical selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl radical having 1 to 4 carbon atoms, an alkoxy radical having 1 to 4 carbon atoms, and an aryl radical having 6 to 10 carbon atoms,
Y is —O— or



Z_1 is —NH—, and
Z_2 is —NH—, —O— or

Z_1 and Z_2 are in para or meta relation to each other, in the following molar amounts:

unit I	40 to 70 mol %,
unit II	2 to 5 mol %,
units III + IV	6 to 36 mol %,
unit V	10 to 40 mol %,
unit VI	0.1 to less than 5 mol %,

with the molar ratio of unit III/(units III+IV) ranging from 1/10 to 8/10.

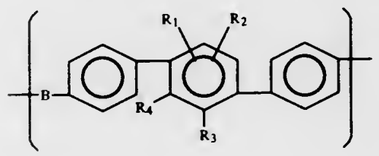
4,900,805

RIGID ROD AROMATIC BENZTHIAZOLE HETEROCYCLIC POLYMER

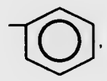
Fred E. Arnold, Centerville, and Jerry L. Burkett, Troy, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 29, 1988, Ser. No. 227,977
Int. Cl.[4] C08G 75/32
U.S. Cl. 528—337 **11 Claims**

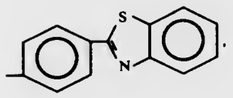
1. An aromatic heterocyclic polymer having repeating units of the formula



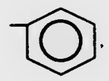
wherein R_1 is —H or



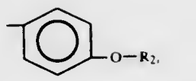
R_2 is



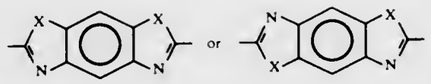
R_3 is



and R_4 is R_2 or



and B is



wherein X is —S—.

4,900,806

RIGID ROD AROMATIC BENTHIAZOLE HETEROCYCLIC COPOLYMER

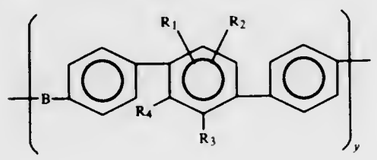
Fred E. Arnold, Centerville, and Jerry L. Burkett, Troy, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

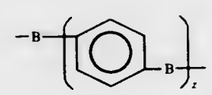
Filed Jul. 29, 1988, Ser. No. 227,979

Int. Cl.[4] C08G *75/32*

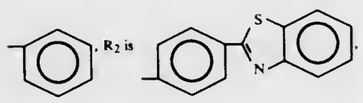
U.S. Cl. 528—337 **11 Claims**

1. An aromatic heterocyclic copolymer having repeating units of the formula





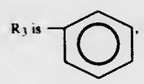
wherein R_1 is —H or



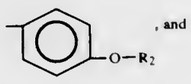
, R_2 is

.

R_3 is

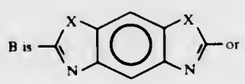


, and R_4 is R_2 or

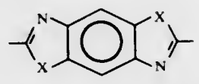


, and

B is



or



wherein X is —S—; and wherein y ranges from about 0.02 to 0.20 and z is 1.0-y.

4,900,807

POLYMER FROM NITRILE TERMINATED COMPOUNDS HAVING SCHIFF BONDS AND PROCESS FOR PREPARING THE SAME

Akio Nishikawa; Toru Koyama, both of Hitachi; Hideki Asano, Mito, and Toshikazu Narahara, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1988, Ser. No. 151,510

Claims priority, application Japan, Feb. 20, 1987, 62-35562

Int. Cl.[4] C08G *83/00, 73/00*

U.S. Cl. 528—362 **22 Claims**

1. A polymer obtained by polymerizing a nitrile-terminated Schiff compound monomer by heating said monomer to a temperature sufficient to cause polymerization but below the temperature at which an exothermic reaction occurs, said monomer represented by the formula:

$$X-(Z-Y-C{=}N)_n$$

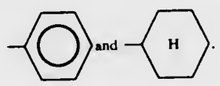
wherein

n is a number of 1 or 2;

Z represents —CH=N— or —N=CH—;

when n is 1, X represents a member of the group consisting of a C_1–C_8 alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, or a C_3–C_6 cycloalkyl group;

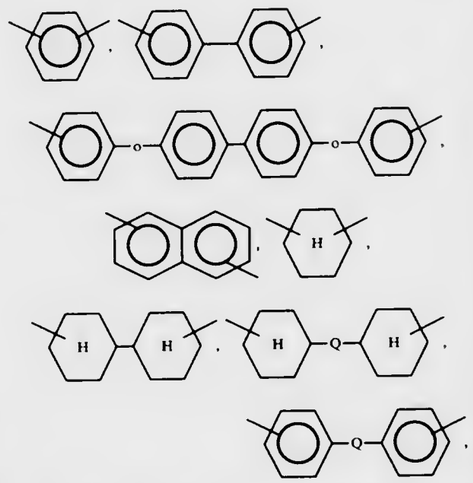
Y represents a member of the group consisting of a straight or branched alkylene group having 2 to 12 carbon atoms, a substituted or unsubstituted phenylene group, a substituted or unsubstituted naphthylene group, a substituted or unsubstituted biphenylene group, a substituted or unsubstituted anthracene group, a substituted or unsubstituted phenathrene group, a substituted or unsubstituted pyrene group, or a divalent organic group represented by the formula



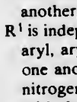
and

.

wherein Q represents O, S, SO_2, $-(CH_2)m-$, CO, $-(CF_2-)_m-$,



m represents a number of 1 to 12, and R^1 and R^2 are the same or different from one another and represent a member of the group consisting of H, CH_3, C_2H_5, CF_3,



and

when n is 2, X represents one of the divalent organic groups specified above wherein X and Y are the same or different from one another and a

first Y the same or different from a second Y.

4,900,808

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT, OPTIONALLY BRANCHED POLYARYLENE SULPHIDES IN POLAR SOLVENT AND LACTAM

Karsten Idel, Krefeld; Edgar Ostlinning, Duesseldorf, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

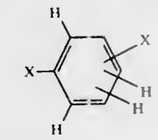
Continuation of Ser. No. 761,370, Aug. 1, 1985, abandoned. This application Nov. 20, 1986, Ser. No. 933,078

Int. Cl.[4] C08G *75/14*

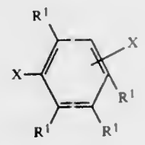
U.S. Cl. 528—388 **21 Claims**

1. A process for the production of high molecular weight polyarylene sulphide or branched polyarylene sulphide which comprises reacting a mixture of components consisting essentially of:

(a) 50 to 100 mole % of an aromatic dihalogen compound corresponding to the following formula:



and 0 to 50 mole % of an aromatic dihalogen compound corresponding to the following formula:



in which

X are halogen atoms in the meta- or para- position to one another; and each

R^1 is independently hydrogen, alkyl, cycloalkyl, aryl, alkylaryl, arylalkyl, or two groups R^1 in the orthoposition to one another attached together to form an aromatic or a nitrogen, oxygen or sulphur containing heterocyclic ring, with the proviso that at least one R^1 in not hydrogen and

(b) 0 to 5 mole %, based on the sum of components (a) and (b), of an aromatic trihalogen or tetrahalogen compound corresponding to the following formula:

$$ArX^1_n$$

in which

Ar is an aromatic or heterocyclic group;

X^1 is a chlorine or bromine; and

n is the number 3 or 4, and

(c) an alkali sulphide, where the molar ratio of (a+b) to c is in the range of from 0.85:1 to 1.15:1;

wherein said reaction is conducted in (1) a polar solvent which additionally contains 0.5 to 100 mole %, based on moles of aromatic dihalogen compounds, of (2) a lactam wherein the nitrogen atom of said lactam has one hydrogen substituent wherein (1) is other than (2).

4,900,809

PROCESS OF RENDERING COPOLYMERS OF MALEIC ANHYDRIDE AND ALKYL VINYL ETHERS PREPARED IN BENZENE SOLVENT SUBSTANTIALLY BENZENE-FREE

Mohammed Tazi, Wayne; Robert B. Login, Oakland, and Nikhil Kundel, Piscataway, all of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Mar. 13, 1989, Ser. No. 322,453

Int. Cl.[4] C08F *6/24, 222/06*

U.S. Cl. 528—497 **20 Claims**

1. A process of rendering a copolymer reaction product of maleic anhydride and an alkyl vinyl ether prepared in benzene solvent substantially benzene-free which comprises treating the copolymer reaction product while in the wet state with an organic liquid which can swell the copolymer and release residual benzene therefrom.

4,900,811

SYNTHETIC POLYPEPTIDES CORRESPONDING TO PORTIONS OF PROTEINOIDS TRANSLATED FROM BRAIN-SPECIFIC MRNAS, RECEPTORS, METHODS AND DIAGNOSTICS USING THE SAME

J. Gregor Sutcliffe, Cardiff, Calif., assignor to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 516,136, Jul. 21, 1983. This application Jun. 3, 1987, Ser. No. 58,620

Int. Cl.[4] C07K *7/10, 7/08, 7/06*

U.S. Cl. 530—324 **11 Claims**

1. An antigenically active synthetic polypeptide constituted by at least six to about 50 amino acid residues and configured to define an epitope that is antigenically the same as determined by Western blotting assay, ELISA or immunocytochemical staining, as that of a neuroactive, mammalian brain proteinoid or a derivative thereof including the same epitope as said proteinoid, said polypeptide, when bound to a carrier as a conjugate and introduced as said conjugate into an animal, being capable of inducing the production of antibodies that bind not only to itself but also to said mammalian brain proteinoid or said derivative thereof, and said proteinoid having an amino acid residue sequence that is translated from a cytoplasmic messenger RNA present in mammalian brain cells but not in the cells of the liver, kidney, gut, lung, heart or skeletll muscle of the same species of mammal.

4,900,812

SULFO GROUP-CONTAINING METAL PHLHALOCYANINE AZO COMPOUND HAVING A 6-HYDROXYPYRID-2-ONE COUPLING COMPONENT RADICALS HAVING A FIBER-REACTIVE GROUP

Helmut A. Moser, Oberwil, Switzerland, and Roland Wald, Huningue, France, assignors to Sandoz Ltd., Basel, Switzerland

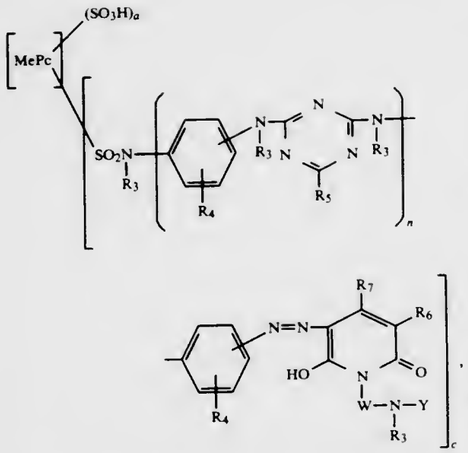
Filed Jan. 29, 1988, Ser. No. 149,813

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702946

Int. Cl.[4] C09B *62/036, 62/10, 62/26, 62/517*

U.S. Cl. 534—627 **21 Claims**

1. A compound of the formula



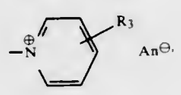
or a water-soluble salt thereof each cation of which is independently a non-chromophoric cation, wherein

Me is cobalt, copper or nickel,

Pc is the phthalocyanine nucleus,

each R_4 is independently hydrogen, halo, hydroxy, C_{1-4}alkoxy, C_{1-4}alkyl, carboxy or sulfo,

R_6 is hydrogen, cyano, carbamoyl or

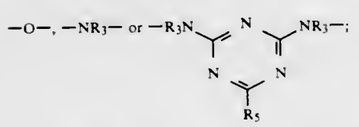


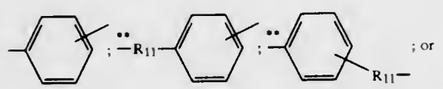
wherein

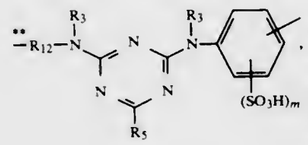
$An^{\ominus}$ is a non-chromophoric anion,

R_7 is hydrogen, C_{1-4}alkyl, C_{5-6}cycloalkyl, phenyl, benzyl, phenylethyl or carboxy,

W is linear or branched C_{2-6}alkylene; linear or branched C_{3-6}alkylene monosubstituted by hydroxy; linear or branched C_{2-6}alkylene interrupted by





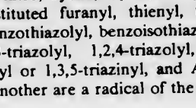


wherein

R_{11} is linear or branched C_{1-4}alkylene,

m is 0 or 1, and

the •• denotes the bond attached to the nitrogen atom of the pyridone ring, or —W—NR_3— is



wherein the •• is as defined above,

Y is a fiber-reactive group,

a is 1, 2 or 3,

c is 1 or 2, with the provisos that the sum of a and c does not exceed 4 and that each of the four units of the phthalocyanine nucleus contains a maximum of one substituent selected from those to which a and c relate, and

n is 0 or 1, wherein

each R_3 is independently hydrogen, C_{1-4}alkyl or C_{2-4}hydroxyalkyl,

each R_5 is independently halo, amino or an aliphatic, cycloaliphatic, aromatic or heterocyclic amino group, and

each R_{12} is independently linear or branched C_{2-4}alkylene,

or a mixture of such compounds or salts.

4,900,813

FIBER-REACTIVE AZO DYES HAVING A 4,6-DIAMINOPYRIDINE COUPLING COMPONENT

Athanassios Tzikas, Pratteln, and Kurt Burdeska, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

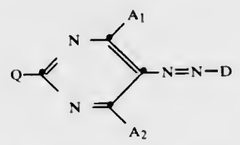
Filed Jun. 23, 1988, Ser. No. 210,537

Claims priority, application Switzerland, Jul. 2, 1987, 2510/87

Int. Cl.[4] C09B *62/08, 62/24, 62/507, 62/523*

U.S. Cl. 534—635 **19 Claims**

1. A reactive dye of the formula



(1)

in which D is the radical of a diazo component, Q is phenyl unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy, halogen, nitro, cyano, C_1–C_4alkoxycarbonyl, C_1–C_4alkylsulfonyl, sulfo or trihalomethyl; 1- or 2- naphthyl; or unsubstituted or C_1–C_4alkyl, nitro, cyano, C_1–C_4alkoxycarbonyl or C_1–C_4alkylthio substituted furanyl, thienyl, thiazolyl, oxazolyl, isothiazolyl, benzothiazolyl, benzoisothiazolyl, pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1,2,4-thiadiazolyl, 1,3,4-thiadiazolyl or 1,3,5-triazinyl, and A_1 and A_2 independently of one another are a radical of the formula



(1a)

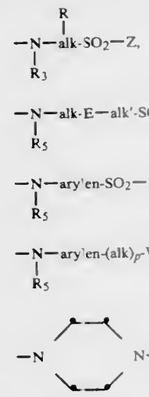
in which R_1 and R_2 independently of one another are hydrogen; C_1–C_6 alkyl unsubstituted or substituted by hydroxyl, sulfo, sulfato, carboxyl, cyano, halogen, C_1–C_4alkoxycarbonyl, C_1–C_4alkanoyloxy or carbamoyl and uninterrupted or with the exception of methyl interrupted by —O— or —NR_4— wherein R_4 is hydrogen or C_1–C_4alkyl; or naphthyl or phenyl each of which is unsubstituted or substituted by sulfo, carboxyl, C_1–C_4alkyl, C_1–C_4-alkoxy, halogen or a group —N=N—K wherein K is a coupling component benzene, naphthalene or heterocyclic radical; or R_1 and R_2 together with the N atom form a piperidinyl, piperazinyl or pyrrolidinyl

radical, with the proviso that at least one of the radicals A_1, A_2 and D is further substituted by a fiber-reactive radical selected from the group consisting of 2,3-dichloroquinoxaline-6-carbonylamino, 2,4-dichloropyrimidine-5-carbonylamino,



(1a)

in which W is —CONH— or —NHCO—, R_1 is hydrogen, C_1–C_4alkyl unsubstituted or substituted by hydroxyl, sulfo, sulfato, carboxyl or cyano or is a radical of the formula



(4)

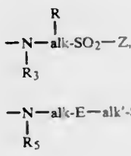
(4a)

(4b)

(4c)

(4d)

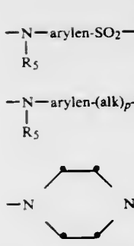
R is hydrogen, hydroxyl, sulfo, sulfato, carboxyl, cyano, halogen, C_1–C_4alkoxycarbonyl, C_1–C_4alkanoyloxy, carbamoyl or is the group —SO_2—Z, Z is —CH=CH_2 or —CH_2—CH_2—Y, Y is —Cl, —Br, —F, —OSO_3H, —SSO_3H, —OC—CH_3, —OCO—C_6H_5, —OPO_3H_2, —OCO—CCl_3, —OCO—$CHCl_2$, —OCO—CH_2Cl, OSO_2—R^*, in which R^* is C_1–C_4alkyl or phenyl unsubstituted or substituted by C_1–C_4alkyl, or —OSO_2—N(C_1–C_4alkyl)$_2$, E is —O— or —NR_4, R_4 is hydrogen or C_1–C_4alkyl, alk and alk' independently of one another are C_1–C_6alkylene, arylene is phenylene or naphthylene unsubstituted or substituted by sulfo, carboxyl, C_1–C_4alkyl, C_1–C_4alkoxy or halogen, R_5 is hydrogen or C_1–C_4alkyl unsubstituted or substituted by carboxyl, cyano, hydroxyl, sulfo or sulfato, X is fluorine, chlorine, bromine, sulfo, C_1–C_4alkylsulfonyl or phenylsulfonyl, T independently has the definition of X or is a non-reactive substituent selected from the group consisting of hydroxy; C_1–C_4alkoxy; C_1–C_4alkylthio; amino; N—C_1–C_4alkylamino or N,N—di—C_1–C_4alkylamino, in which alkyl is unsubstituted or substituted by sulfo, sulfato, hydroxyl, carboxyl or phenyl; cyclohexylamino; morpholino; phenylamino, N—C_1–C_4alkyl-N-phenylamino or naphthylamino, in which phenyl or naphthyl is unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy, carboxyl, sulfo or halogen or is a reactive radical of the formula



(4)

(4a)

-continued



(4b)

(4c)

(4d)

in which R, R_3, R_5, E, W, Z, alk, alk' and arylene are as defined above and p is 0 or 1, one of the radicals X_1 independently has the definition of X and the other radical X_1 has the definition of T, and X_2 is nitro, cyano, C_1–C_4alkylsulfonyl, carboxyl, chlorine hydroxyl, C_1–C_4alkoxysulfonyl, C_1–C_4alkylsulfinyl, C_1–C_4alkoxycarbonyl or C_1–C_4alkanoyl.

4,900,814

SYNTHESIS OF PODOPHYLLOTOXIN DERIVATIVES

Jeffrey Sterling, 156/1 Ramot, Jerusalem; Abraham Nudelman, 15 Miller Street, Rehovot; Jaacov Herzig, 7 Hashiryon Street, Raanana; Ehud Keinan, 30 Efal Street, Holon, and Ben Z. Weiner, 306 Hapartisanim Flat No. 16, Nevo, Jerusalem, all of Israel

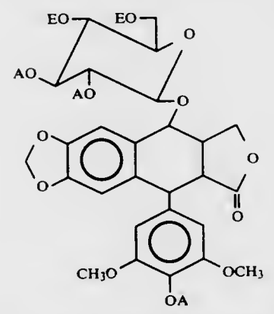
Filed Dec. 15, 1986, Ser. No. 943,203

Claims priority, application Israel, Dec. 16, 1985, 77334

Int. Cl.[4] C07H *15/24*

U.S. Cl. 536—18.1 **9 Claims**

1. A process for the production of podophyllotoxin derivatives of formula III



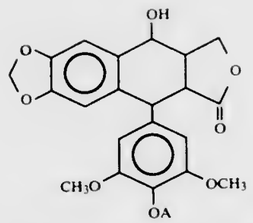
III

which comprises reacting a molar excess of a glucose derivative of formula I



I

with a 4,'-demethylpipodphyllotoxin derivative of formula II



II

in a chlorinated hydrocarbon solvent in the presence of boron trifluoride at a temperature in the range of from −20° C. to 25° C., where:

T designates tri-lower-alkyl tin,

A designates alkanoyl or chloroalkanoyl of 1 to 5 carbon atoms, and

E is identical with A, or both E groups together designate an ethylidene group.

4,900,815

SULFATED POLYSACCHARIDE DS4152

Noriko Tanaka; Kazuhiro Inoue; Hiroshi Korenaga, and Hidemasa Ogawa, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Filed May 20, 1987, Ser. No. 51,754

Claims priority, application Japan, May 23, 1986, 61-118847; Feb. 5, 1987, 62-25437

Int. Cl.⁴ C08B *37/00;* **A61K** *31/715, 31/735*

U.S. Cl. 536—54 **14 Claims**

1. A sulfated polysaccharide DS4152 having, as the sodium salt thereof, the following physicochemical characteristics:

(1) Molecular weight (by the gel filtration method):
29,000±3,000

(2) Elemental analysis:
C:24.42–25.76%
H:3.34–3.98%
N:0.51–0.89%
S:10.6–11.7%
P:0.77–1.06%

(3) Sugar and protein contents:
Sugar content(%): 57±3 (by phenolsulfuric acid method; standard: galactose)
Protein content (%): 1±0.5 (by the Lowry-Folin's method; standard: bovine serum albumin)

(4) Specific rotatory power:
$[\alpha]_D^{25}$: −37°±1° (0.5% aq. solution)

(5) Characteristic absorption bands in infrared absorption spectrum:
1240, 840 (shoulder), 810 (cm^{-1}; KBr)

(6) Solubility:
Freely soluble in water but practically insoluble in organic solvents.

(7) Color reaction:
Positive in the phenol-sulfuric acid reaction, anthrone-sulfuric acid reaction, biuret reaction and Lowry-Folin's reaction, in the form of an acid hydrolyzate, also positive in the Elson-Morgan's reaction and ninhydrin reaction, negative in the carbazole reaction and Sakaguchi reaction.

(8) Distinction of acidic, neutral or basic:
pH 6–8 (3% aq. solution)

(9) Contents of constituent sugar, sulfate groups and phosphorus:
molar ratio of D-glucose: D-galactose:SO_3Na:P(phosphorus) approximately 10:61:73:6.

(10) Constituent amino acids and amino sugars:
analysis of an acid hydrolysate by an amino acid analyzer indicates the existence of alanine, glycine, glutamic acid, diaminopimelic acid, glucosamine and muramic acid.

2. An angiogenesis inhibitor comprising an effective amount of a sulfated polysaccharide DS4152 as the active ingredient and a medicinally-acceptable carrier or excipient.

4,900,816

HEMOGLOBIN COMPLEXES

Jeffrey T. Wong, Don Mills, Canada, assignor to Fisons plc, Leicestershire, England

Filed May 23, 1988, Ser. No. 197,443

Claims priority, application United Kingdom, May 23, 1987, 8712240

Int. Cl.⁴ C07H *15/04;* **C07G** *17/00;* **C08B** *37/02, 33/00*

U.S. Cl. 536—120 **5 Claims**

1. A water soluble compound having a molecular weight of from about 70,000 to about 2,000,000 and having the formula I,

B—X—(PS)—X—(H) I

in which PS is a polysaccharide of molecular weight from about 2,000 to about 2,000,000,

X is a covalently bonded chemical bridging group,

H is a group Hb or Hb-Z,

B is an activating group blocked by a sulphydryl group,

Hb is a haemoglobin residue, and

Z is an oxygen affinity reducing ligand containing two or more phosphate groups.

4,900,817

MULTIRING PHTHALOCYANINE COMPOUNDS

Daniel A. Batzel, Cleveland Heights; Scott E. Rickert, Lakewood, and Malcolm E. Kenney, Cleveland Heights, all of Ohio, assignors to Edison Polymer Innovation Corporation, Broadview Heights, Ohio

Filed May 31, 1988, Ser. No. 200,746

Int. Cl.⁴ C09B *17/30, 17/32*

U.S. Cl. 540—128 **10 Claims**

1. A multiring compound containing from 2 to about 10 rings in which a plurality of adjacent, parallel porphyrin-related rings each selected from the group consisting of porphyrin, substituted porphyrin, phthalocyanine and substituted phthalocyanine rings and having a coordinating atom which is a metal or a metalloid atom located at the center of said rings, are interconnected along an axis perpendicular to the surface of said rings and passing through the center thereof, by means of an oxygen atom located along said axis, said oxygen atom connecting the coordinating atoms in adjacent rings, and in which the outermost ring at a first end of said axis has a hydrophilic group attached to the coordinating atom thereof, while the outermost ring at the other end of said axis has a hydrophobic group attached to the coordinating atom thereof.

4,900,818

LARGE SCALE SYNTHESIS OF TWELVE MEMBER DIAZAMONOCYCLIC COMPOUNDS

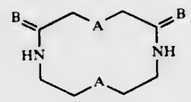
Bronislaw P. Czech, Peekskill, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 132,741, Dec. 14, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,792

Int. Cl.⁴ C07D *273/08*

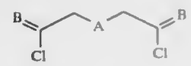
U.S. Cl. 540—454 **13 Claims**

1. A process for preparing a compound of formula I



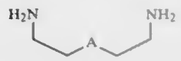
I

wherein a solvent solution of a compound of formula II



II

is mixed with a solvent solution of a compound of formula III



III

under suitable process conditions, wherein A, same or different, is N—R, O, S, CRR′ or P(O)R, and R and R′ are hydrogen, alkyl, alkylidene, aryl, tosyl, allyl or benzyl, and B is O.

4,900,819

METHOD IN THE PRODUCTION OF CRYSTALLINE EXPLOSIVES

Per Ericsson, Kungsängen; Leif Svensson, Karlshamn; Nils-Ingvar Olsson, Uppsala, and Bertil Bergström, Degerfors, all of Sweden, assignors to Nobel Kemi AB, Karlskoga, Sweden

Filed Apr. 21, 1988, Ser. No. 184,131

Claims priority, application Sweden, Apr. 22, 1987, 8701644; Apr. 22, 1987, 8701643

Int. Cl.⁴ C07D *251/06, 257/02*

U.S. Cl. 540—475 **12 Claims**

1. A method of extracting octogen and hexogen crystalline explosives from the acetic acid acidic mother liquor in which they were produced by nitration of hexamine with ammonium nitrate, acetic acid anhydride and nitric acid, characterized in that the mother liquor with said crystalline explosives formed in the reaction and deposited therein is, after the end of the reaction but before the filtering-off of said explosives, heated in a closed vessel to a temperature in excess of 90° C. but less than 200° C. at a pressure of maximum of 5 bar and is held at said pressure and temperature for a period of time of at least 15 minutes but not exceeding 2 hours, whereafter the octogen and hexogen crystalline explosives are filtered off from the mother liquor.

4,900,820

PROCESS FOR PRODUCING CYCLIC UREAS

Nobuyuki Kajimoto; Teruyuki Nagata, and Masaru Wada, all of Fukuoka, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 22, 1987, Ser. No. 53,387

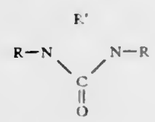
Claims priority, application Japan, Jun. 12, 1986, 61-134888; Jun. 12, 1986, 61-148056

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.⁴ C07D *233/34, 239/10, 243/04*

U.S. Cl. 540—492 **6 Claims**

1. In a process for producing a cyclic urea expressed by the formula (I)



(I)

wherein R represents a lower alkyl group and R′ represents a lower alkyl group-substituted dimethylene group, trimethylene group, a lower alkyl group-substituted trimethylene group, tetramethylene group or a lower alkyl group-substituted tetramethylene group, by reacting a diamine expressed by the formula (II)

R—HN—R′—NH—R (II)

wherein R and R′ are each defined above, with urea, the improvement comprising carrying out the reaction in the ratio of diamine to urea of about equimole in the presence of a non-protonic polar solvent and at a temperature of 180° C. or higher.

4,900,821

METHOD FOR PRODUCING HIGH-PURITY CAPROLACTAM

Kazuo Tan; Takashi Hironaka, and Michio Nakamura, all of Kitakyushu, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 330,695

Claims priority, application Japan, Apr. 9, 1988, 63-87947

Int. Cl.⁴ C07D *201/16*

U.S. Cl. 540—540 **4 Claims**

1. A method for producing high-purity caprolactam from a mixture comprising a melt of crude caprolactam and water, which comprises cooling the mixture in a crystallizer under a reduced pressure of from 1 to 22 Torr while maintaining the water concentration in the mixture at a level of from 0.5 to 10% by weight, to crystallize high-purity caprolactam, and then separating the resulting crystals.

4,900,822

NEW HYDROLASE SUBSTRATES

Herbert von der Eltz; Hans-Joachim Guder, both of Weilheim, and Klaus Mühlegger, Polling, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

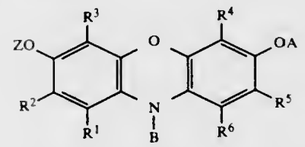
Filed Dec. 21, 1987, Ser. No. 135,843

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644401

Int. Cl.⁴ C07D *265/38*

U.S. Cl. 544—102 **15 Claims**

1. A compound of the formula



wherein

one of Z and A is an orthophosphoric or a pyrophosphoric acid residue or a sulphuric acid residue;

the other of Z and A is an orthophosphoric, pyrophosphoric or a sulphuric acid residue; a saturated or unsaturated (C_1–C_{20})-alkylcarbonyl; an amino acid or an oligopeptide residue bound by their carboxylic acid ends; or, if Z is an orthophosphoric, pyrophosphoric or sulphuric acid residue, A may also be (C_1–C_7)-alkylcarbonyl, optionally unsaturated, which is substituted one or more times by hydroxyl, carboxyl or an ammonium group;

B is a (C_1–C_7)-alkylcarbonyl optionally substituted one or more times by hydroxyl, carboxyl or an ammonium group;

each of R^2 and R^5 is hydrogen, halogen or (C_1–C_5)-alkyl;

each of R^1, R^3, R^4 and R^6 is hydrogen; halogen, cyano; (C_1–C_5)-alkyl; (C_1–C_5)-alkoxy; carboxyl; (C_1–C_5)-alkoxycarbonyl; carboxy-(C_1–C_5)-alkyl; (C_1–C_5)-alkoxycarbonyl-(C_1–C_5)-alkyl; carboxamido optionally substituted once or twice by (C_1–C_5)-alkyl, (C_1–C_5)-alkoxy-(C_1–C_5)-alkyl, carboxy-(C_1–C_5)-alkyl or (C_1–C_5)-alkoxycarbonyl-(C_1–C_5)-alkyl), or in the case of disubstitution, the two substitutents can be joined to form a ring which can be interrupted by oxygen, nitrogen and sulphur atoms; or a radical of the formula

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$$-COO-(CH_2CH_2O)_n-R^7$$

in which R^7 is a hydrogen or (C_1–C_5)-alkyl, and n is a whole number of from 1 to 4; and

R^6 can also be sulpho or nitro.

4,900,823

PHENYL KETONE DERIVATIVES

Rinaldo Hüsler, Basel; Rudolf Kirchmayr, Aesch, and Werner Rutsch, Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

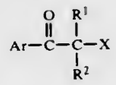
Division of Ser. No. 783,377, Oct. 2, 1985, Pat. No. 4,739,052, which is a division of Ser. No. 579,622, Feb. 13, 1989, Pat. No. 4,559,371. This application Dec. 30, 1987, Ser. No. 139,564

Claims priority, application Switzerland, Feb. 18, 1983, 903/83

Int. Cl.⁴ C07D *265/30;* **C08F** *2/50*

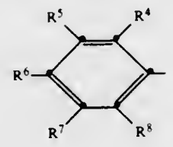
U.S. Cl. 544—174 **6 Claims**

1. A compound of formula I



(I)

in which Ar is an oxygen-containing aromatic radical of formula IV



(IV)

wherein

R^4, R^5, R^6, R^7 and R^8 independently of one another are each hydrogen, halogen, C_1–C_4-alkyl, C_3–C_{12}-alkenyl, C_5–C_6-cycloalkyl, phenyl, —OH or —OR^9, with the proviso that at least one of the radicals R^4 to R^8 is an —OR^9 group,

R^9 is C_1–C_{12}-alkyl, phenyl, C_7–C_9-phenylalkyl or said phenyl substituted by C_1–C_4-alkyl or by C_1–C_4-alkoxy,

X is morpholino or —N(C_2–C_4-alkyl substituted by C_1–C_4-alkoxy)$_2$, and

R_1 and R^2 independently of one another are each C_1–C_8-alkyl, or R_1 and R^2 together are C_{5-C8}-alkylene, or

an acid addition salt of such a compound.

4,900,824

PERFLUORO HEXAMETHYLENETETRAMINE USEFUL IN SYNTHETIC BLOOD

Walter B. Dandliker, La Jolla; W. Keith R. Watson, Alpine, and Thomas C. Drees, Flintridge, all of Calif., assignors to International Therapeutics Inc., Pasadena, Calif.

Continuation-in-part of Ser. No. 899,903, Aug. 25, 1986, abandoned. This application Feb. 17, 1989, Ser. No. 312,038

Int. Cl.⁴ C07D *487/12*

U.S. Cl. 544—185 **2 Claims**

1. The compound prefluorohexamethylenetetramine.

4,900,825

PREPARATION OF 4-NITRO-5-IMIDAZOLYL ETHERS AND THIOETHERS

Hermann Koehler, Beindersheim, and Toni Dockner, Meckenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

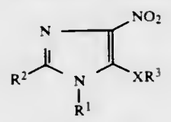
Filed Jan. 1, 1988, Ser. No. 201,051

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718898; Sep. 3, 1987, 3729406

Int. Cl.⁴ C07D *279/00, 401/00, 261/04, 417/00*

U.S. Cl. 544—276 **10 Claims**

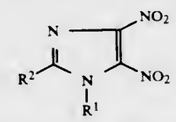
1. A process for the preparation of a 4-nitro-5-imidazolyl ether or thioether of the formula



(I)

where R_1 is C_1–C_{18}-alkyl, C_2–C_8-alkoxyalkyl, C_5–C_8-cycloalkyl, phenyl or naphthyl, unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, C_114 C_4-haloalkyl or C_1–C_4-alkoxymethyl, C_7–C_{12}-aralkyl or C_7–C_{12}-alkylphenyl, R^2 is hydrogen, C_1–C_{18}-alkyl, C_5–C_8-cycloalkyl, phenyl or naphthyl, unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, C_1–C_4-haloalkyl or C_1–C_4-alkoxymethyl, C_7–C_{12}-aralkyl or C_7–C_{12}-alkylphenyl, R^3 is C_1–C_{18}-alkyl, C_2–C_8-alkoxyalkyl, C_5–C_8-cycloalkyl, phenyl or naphthyl, unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, C_1–C_4-haloalkyl or C_1–C_4-alkoxymethyl, C_7–C_{12}-aralkyl or C_7–C_{12}-alkylphenyl, or a saturated, unsaturated, or aromatic 5- or 6-membered heterocyclic with 1 or 2 hetero atoms selected from the group consisting of nitrogen, oxygen and sulfur, or a counter-ion of the corresponding alcoholate or thiolate or, if X is sulfur, R^3 is hydrogen, and X is oxygen or sulfur, and the stated organic radicals may furthermore carry substituents which are inert under the reaction conditions, which process comprises:

reacting a dinitroimidazole of the formula



(II)

with an alcohol or thiol of the formula

$$R^3—XH \quad (III)$$

in a solvent or diluent selected from the group consisting of water, water-miscible inert organic solvents and mixtures thereof, at a pH of from 4 to 16 and at a temperature of 0° to 150° C.

4,900,826

PROCESS FOR PREPARING N6,9-DISUBSTITUTED ADENINE

Yoshiro Nagatsu; Hideo Isozaki; Tooru Shiroshita, and Jiro Suzuki, all of Yatsushiro, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

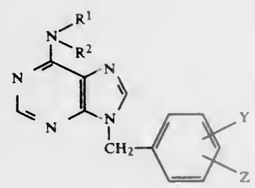
Filed Sep. 17, 1982, Ser. No. 419,317

Claims priority, application Japan, Sep. 24, 1981, 56-149567; Sep. 30, 1981, 56-153878; Oct. 1, 1981, 56-154862

Int. Cl.⁴ C07D *473/34*

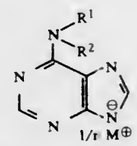
U.S. Cl. 544—277 **9 Claims**

1. A process for preparing a N^6,9-disubstituted adenine having the general formula (I):



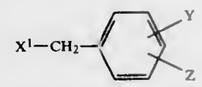
(I)

wherein R^1 is hydrogen, a lower alkyl group having 1 to 4 carbon atoms, benzyl group or furfuryl group, R^2 is a lower alkyl group having 1 to 4 carbon atoms, benzyl group or furfuryl group, Y and Z are the same or different and each is hydrogen, chlorine, bromine or fluorine, which comprises reacting a metal salt of N^6-substituted adenine having the general formula (II):



(II)

wherein R^1 and R^2 are the same as defined above, M is an alkali metal or an alkaline earth metal and n is an integer of 1 or 2, with a benzyl halide compound having the general formula (III):



(III)

wherein Y and Z are the same as defined above, and X^1 is chlorine or bormine, in the presence of a phase transfer catalyst selected from the group consisting of polyethylene glycol or its alkyl ether having the general formula (VII):

$$R^9O(CH_2CH_2O)_mR^9 \quad (VII)$$

wherein R^9 is hydrogen or an alkyl group having 1 to 4 carbon atoms and m is an integer of not less than 3; and diethylene glycol or its alkyl ether having the general formula (VIII):

$$(R^{10}OCH_2CH_2)_2O \quad (VIII)$$

wherein R^{10} is hydrogen or an alkyl group having 1 to 4 carbon atoms, whereby formation of the 3-isomer is suppressed.

4,900,827

PROCESS FOR THE PREPARATION OF PYRIMIDINE DERIVATIVES

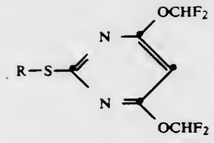
Gottfried Seifert, Magden, and Robert Hänsig, Gipf-Oberfrick, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,751

Int. Cl.⁴ C07D *239/52*

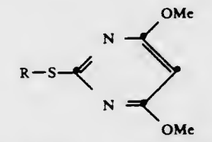
U.S. Cl. 544—303 **21 Claims**

1. A process for the preparation of a 4,6-bis(difluoromethoxy)pyrimidine of formula I



(I)

wherein R is C_1–C_4alkyl, phenyl or benzyl, which process comprises reacting a 4,6-dihydroxypyrimidine dialkali metal salt of formula II



(II)

wherein R is as defined for formula I and Me is an alkali metal, with chlorodifluoromethane in a solvent selected from the group consisting of ketones and alkyl cyanides, in the presence of 0.05 to 1.1 mol of water per mol of dialkali metal salt of formula II.

4,900,828

INTERMEDIATE COMPOUNDS AND AN IMPROVED PROCEDURE FOR THE SYNTHESIS OF 2',3'-DIDEOXYCYTIDINE

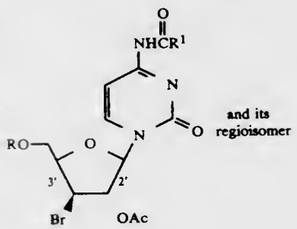
Peter S. Belica, Wanaque; Tai-Nang Huang, Westfield; Percy S. Manchand, Montclair, all of N.J.; John J. Partridge, Chapel Hill, N.C., and Steve Tam, West Caldwell, N.J., assignors to Hoffmann-LaRoche Inc., Nutley, N.J.

Filed May 12, 1988, Ser. No. 192,978

Int. Cl.⁴ C07D *239/02*

U.S. Cl. 544—317 **21 Claims**

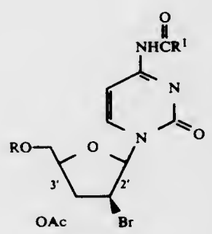
1. A compound of the formula:



and its regioisomer

III(a)

and their sterioisomers,



III(b)

wherein R' is substituted or unsubstituted lower alkyl, aryl, or

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aralkyl with the substituents selected from the group consisting of halogen, alkyl, nitro, or alkoxy; and R is substituted or unsubstituted 2-acetoxy-2-methylpropanoyl, 2-acetoxypropanoyl, or 2-acetoxybenzoyl with the substituents selected from the group consisting of lower alkyl, aryl, or aralkyl.

4,900,829

2,4-DISUBSTITUTED-5-CYANO-1,6-DIHYDRO-6-OXO-1-PYRIMIDINEACETIC ACID ALDOSE REDUCTASE INHIBITORS

Johan F. Bagli; John W. Ellingboe, both of Princeton, and Thomas R. Alessi, Flemington, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

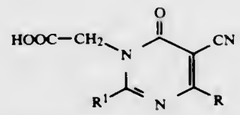
Division of Ser. No. 61,831, Jun. 12, 1987, Pat. No. 4,786,638. This application Jul. 20, 1988, Ser. No. 221,588

Int. Cl.[4] C07D *239/22*

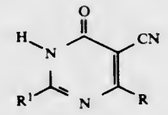
U.S. Cl. 544—319 **1 Claim**

1. The process for producing the compounds of formula (I)

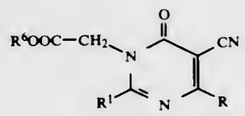
(I)



wherein R^1 is lower alkyl having 1 to 3 carbon atoms, cyclo(lower)alkyl having 3 to 6 carbon atoms, naphthalenyl, or halogen substituted naphthalenyl; R is $-SR^2$ wherein R^2 is lower alkyl having 1 to 6 carbon atoms, phenylmethyl, halogen substituted phenylmethyl, or cyclohexylmethyl or R is R^5 wherein R^5 is lower alkyl having 1 to 3 carbon atoms, phenyl, or naphthalenymethyl; and the pharmaceutically acceptable salts thereof which comprises N-alkylating the compounds of formula



wherein R and R^1 are as defined above with X-CH_2-$COOR^6$, wherein R^6 is lower alkyl having 1 to 4 carbon atoms, and X is bromine or iodine in the presence of the strong base sodium hydride in tetrahydrofuran or dimethoxyethane solvent to produce the compounds of formula



wherein R, R^1 and R^6 are as defined above and hydrolyzing the ester group of said compound with base to produce the desired compounds of formula (I).

4,900,830

PROCESS FOR LABELLING SULFUR-CONTAINING COMPOUNDS

Abraham Fisher, Holon, and Ishai Karton, Nes Ziona, both of Israel, assignors to Israel Institute for Biological Research, Nes Ziona, Israel

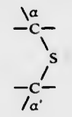
Filed Oct. 28, 1987, Ser. No. 114,479

Int. Cl.[4] C07D *495/10, 497/10*

U.S. Cl. 546—18 **25 Claims**

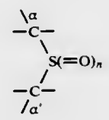
1. A process for obtaining the replacement by isotopes of at least one of the hydrogen atoms selected from the group consisting of those attached to the α- or α′-carbon atom in a heterocyclic compound containing the structural moiety (I)

(I)



as an integral part of a heterocyclic ring selected from the group consisting of 1,3-oxathiolane, 1,3-oxathiane, 1,3-dithiolane and 1,3-dithiane, in preference to isotopic replacement of hydrogen atoms attached to carbon atoms in said compound other than said α- and α′-carbon atoms, which process comprises the steps of oxidizing the compound to the corresponding sulfoxide or sulfone which contains the corresponding structural moiety (II)

(II)



wherein in the sulfoxide n is 1 and in the sulfone n is 2, effecting the isotopic replacement by a known method of said at least one hydrogen atom, and reducing the resultant isotope-labelled sulfoxide or sulfone to the corresponding isotopically labelled compound containing the structural moiety (I), in which labelled compound isotopes of hydrogen are attached to at least one carbon atom selected from the group consisting of said α- and α′-carbon atoms.

19. A process according to claim 1, wherein the starting compound is 2-methylspiro(1,3-oxathiolan-5,3′)quinuclidine (V).

4,900,831

NOVEL BENZOFURAN DYES

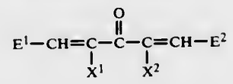
Chin H. Chen, Fairport, N.Y., and John L. Fox, Baltimore, Md., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 9, 1988, Ser. No. 191,948

Int. Cl.[4] C07D *491/147, 519/00*

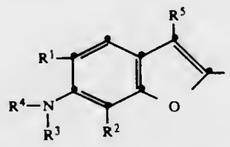
U.S. Cl. 546—66 **6 Claims**

1. A dye which satisfies the formula:



where

E^1 and E^2 are independently selected to satisfy the formula:



R^1, R^2, and R^5 each independently represent hydrogen, alkyl, or aryl;

R^3 and R^4 each independently represent alkyl; or

at least one of the substituent pairs represented by R^1 and R^4, R^2 and R^3, and R^3 and R^4 complete a 5- or 6-membered ring containing the formula nitrogen atom as the sole heteroatom; with the proviso that at least one of E_1 or E_2 are such that R_1–R_4 complete a julolidine ring structure;

X^1 and X^2 are independently hydrogen, alkyl, or aryl or together complete a 5 to 7 membered ring and satisfy the formula:

$$-(CH_2)_n-$$

or

$$-(CH_2-Y-CH_2)-$$

where

n is 2 to 4;

Y is $-NR^{10}-$ or $-O-$; and

R^{10} is lower alkyl of from 1 to 3 carbon atoms or phenyl;

alkyl, with the exception of said lower alkyl, in each occurrence containing from 1 to 8 carbon atoms and aryl in each occurrence being phenyl or naphthyl.

4,900,832

PROCESS FOR THE CATALYTIC ANIMATION OF ALCOHOLS AND DIOLS USING NON-ACIDIC HYDROXYAPATITE CATALYSTS

Gene E. Parris, Revere, and Ronald Pierantozzi, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 2, 1988, Ser. No. 227,569

Int. Cl.[4] C07D *211/14, 401/06; C07C 85/06*

U.S. Cl. 546—186 **13 Claims**

1. A process for the catalytic amination of a 1° or 2° alcohol or diol with a 1° or 2° amine which comprises passing a mixture of the amine and the alcohol or diol at an elevated temperature over a catalyst comprising a non-acidic cationic hydroxyapatite.

10. The process as defined in claim 5 wherein said amine is piperidine and said alcohol is ethylene glycol.

4,900,833

ASYMMETRICAL ESTER DERIVATIVES OF 1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID

Jacques Robin; Didier Pruneau, both of Dijon, and Francois Bellamy, Saulon La Rue, all of France, assignors to Societe de Recherches Industries (S.O.R.I.), Paris, France

Division of Ser. No. 27,262, Mar. 1, 1987, Pat. No. 4,806,544. This application Sep. 22, 1988, Ser. No. 249,402

Claims priority, application France, Apr. 2, 1986, 86 04685

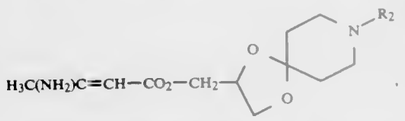
Int. Cl.[4] C07D *491/113, 211/32*

U.S. Cl. 546—19 **4 Claims**

1. A compound selected from the group consisting of:

(a) amino-crotonate compounds of the formula:

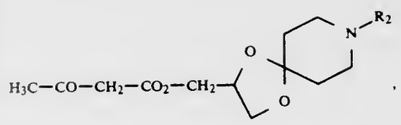
(III)



wherein R_2 is selected from the group of substituents consisting of a C_1–C_4 alkyl group, a benzyl group, a benzoyl group and a phenyl group which can be substituted by one or more C_1–C_4 alkoxy, C_1–C_4 alkyl, cyano, nitro, hydroxyl or trifluoromethyl groups or by one or more halogen atoms;

(b) ketoester compounds of the formula:

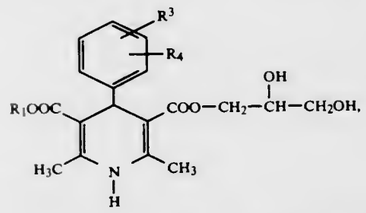
(VI)



wherein R_2 is defined as indicated above; and

(c) diol compounds of the formula:

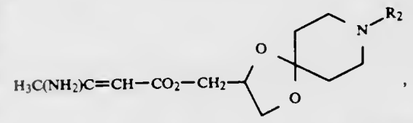
(VII)



wherein R_1 represents a C_1–C_4 alkyl group, R_3 and R_4, which are identical or different, each represent a hydrogen atom, a nitro group or a chlorine atom, and wherein the two OH groups of the diol radical can be protected by a radical selected from the group consisting of methyl, ethyl, acetaniline, cyclopentylidene, cyclohexylidene, and benzylidene.

2. A compound which is an aminocrotonate compound of the formula:

(III)



wherein R_2 is selected from the group of substituents consisting of a C_1–C_4 alkyl group, a benzyl group, a benzoyl group and a phenyl group which can be substituted by one or more C_1–C_4 alkoxy, C_1–C_4 alkyl, cyano, nitro hydroxyl, or trifluoromethyl groups or by one or more halogen atoms.

4,900,834

SUBSTITUTED α,ω-AMINOALCOHOL DERIVATIVES

Bernd-Wieland Krüger, Wuppertal; Klaus Sasse, Bergisch-Gladbach; Franz-Peter Hoever, Cologne; Günther Neatwig, Cologne, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

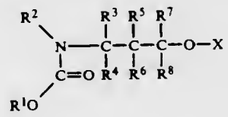
Filed Apr. 20, 1988, Ser. No. 183,941

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714058; Jan. 16, 1988, 3801062

Int. Cl.[4] C07D *211/22*

U.S. Cl. 546—245 **4 Claims**

1. A substituted α,ω-aminoalcohol derivative of the formula



in which

X represents hydrogen, COR^{11} or R^{13},
R^1 represents an optionally substituted alkyl, alkenyl or alkinyl radical said substituents being cycloalkyl, C_1-C_4-alkoxy, halogen and CN,
R^{11} and R^{13} are identical or different and represent optionally substituted alkyl or alkenyl radicals,
R^4 to R^8 are identical or different and represent hydrogen, or represent optionally substituted alkyl radicals,
and wherein
R^2 and R^3 together with the atoms to which they are bonded form an optionally substituted 5 to 7-membered saturated monocyclic ring, with the exception of the following substituent combinations (a) and (b):
(a) X=hydrogen, R^1=ethyl, R^5=ethyl and R^6=ethyl and
(b) R^2 and R^3 together with the atoms to which they are bonded form a 5-membered ring, R^1 is t-butyl and R^4, R^5, R^6, R^7, R^8 and X are H.

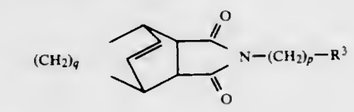
4,900,835

ANTIPSYCHOTIC IMIDES

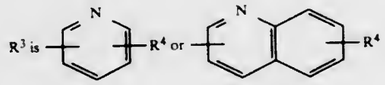
Magid A. Abou-Gharbia, Glen Mills, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 21,952, Mar. 5, 1987, Pat. No. 4,851,533. This application Apr. 7, 1989, Ser. No. 335,076
Int. Cl.[4] C07D *401/06*
U.S. Cl. 546—272 **3 Claims**

1. A compound of the formula:



in which
the dotted lines represent optional unsaturation;
p is one of the integers 2, 3, 4 or 5;
q is one of the integers 1, 2 or 3;
and



where
R^4 is hydrogen, alkyl of 1 to 6 carbon atoms; alkoxy of 1 to 6 carbon atoms or halo;
or a pharmaceutically acceptable salt thereof.

4,900,836

(3-AMINO-1H-PYRAZOL-4-YL) (ARYL)METHANONES

Andrew S. Tomcufcik, Old Tappan, N.J., and John P. Dusza, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 507,317, Jun. 23, 1983, abandoned. This application May 24, 1984, Ser. No. 612,811
Int. Cl.[4] C07D *401/06, 405/06*
U.S. Cl. 546—279 **1 Claim**

1. A compound selected from the group consisting of (3-amino-1H-pyrazol-4-yl)(2-furanyl)methanone, (3-amino-1H-pyrazol-4-yl)(4-pyridinyl)methanone, (3-amino-1H-pyrazol-4-yl)(2-thienyl)methanone, (3-amino-1H-pyrazol-4-yl)(2-pyridinyl)methanone, and (3-amino-1H-pyrazol-4-yl)(3-furanyl)methanone.

4,900,837

BRAIN-SPECIFIC DRUG DELIVERY OF STEROID SEX HORMONES CLEAVED FROM PYRIDINIUM CARBOXYLATES AND DIHYDRO-PYRIDINE CARBOXYLATE PRECURSORS

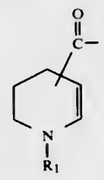
Nicholas S. Bodor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Division of Ser. No. 665,940, Oct. 29, 1984, Pat. No. 4,824,850, which is a continuation-in-part of Ser. No. 379,316, May 18, 1982, Pat. No. 4,479,932, and a continuation-in-part of Ser. No. 461,543, Jan. 27, 1983, abandoned, and a continuation-in-part of Ser. No. 475,493, Mar. 15, 1983, Pat. No. 4,622,218, and a continuation-in-part of Ser. No. 516,382, Jul. 22, 1983, Pat. No. 4,540,564. This application Jul. 21, 1987, Ser. No. 76,191
Claims priority, application Japan, Jun. 14, 1982, 57-101940; Canada, May 16, 1983, 428192; Ireland, May 17, 1983, 1149/83; South Africa, May 17, 1983, 83/3521; Spain, May 17, 1983, 522489; Italy, May 18, 1983, 48327 A/83
The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.
Int. Cl.[4] C07D *213/55*
U.S. Cl. 546—285 **41 Claims**

1. A compound of the formula

D—DHC]$_n$ (Ia)

or a non-toxic pharmaceutically acceptable salt thereof, wherein D is the residue of a steroidal female sex hormone having one or two reactive hydroxyl functional groups, one such hydroxyl group being a 17β-hydroxy substituent, said residue having a hydrogen atom absent from at least one of said reactive hydroxyl functional groups in said drug, said steroidal female sex hormone being selected from the group consisting of estradiol, ethisterone, ethinyl estradiol, mestranol, norgestrel, norethindrone, norethynodrel, norgensterone, norvinisterone and ethynodiol; n is a positive integer equal to the number of said functional groups from which a hydrogen atom is absent; and [DHC] is a radical of the formula

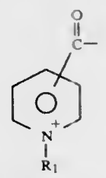


wherein the dotted line indicates the presence of a double bond in either the 4 and 5 position of the dihydropyridine ring; R_1 is C_1-C_7 alkyl, C_1-C_7 haloalkyl or C_7-C_{10} aralkyl; and the carbonyl grouping is attached at the 2, 3 or 4 position of the dihydropyridine ring.

27. A quaternary salt of the formula

D—OC$^+$]$_n$ qX^{-t} (IIa)

wherein D is the residue of a steroidal female sex hormone having one or two reactive hydroxyl functional groups, one such hydroxyl group being a 17β-hydroxy substituent, said residue having a hydrogen atom absent from at least one of said reactive hydroxyl functional groups in said drug, said steroidal female sex hormone being selected from the group consisting of estradiol, ethisterone, ethinyl estradiol, mestranol, norgestrel, norethindrone, norethynodrel, norgesterone, norvinisterone and ethynodiol; n is a positive integer equal to the number of said functional groups from which a hydrogen atom is absent; X^- is the anion of a pharmaceutically acceptable organic or inorganic acid; t is the valence of the acid anion; q is the number which when multiplied by t is equal to n; and [QC$^+$] is a radical of the formula



wherein R_1 is C_1-C_7 alkyl, C_1-C_7 haloalkyl or C_7-C_{10} aralkyl; and the carbonyl grouping is attached at the 2, 3 or 4 position of the pyridinium ring.

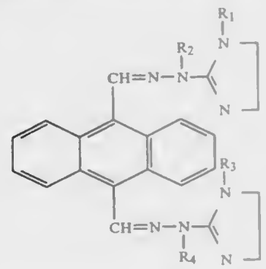
4,900,838

ACYLATION PRODUCTS OF BIS(2-IMIDAZOLIN-2-YLHYDRAZONES) OF 9,10-ANTHRACENEDICARBOXALDEHYDE

Keith C. Murdock, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 91,077, Aug. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 922,220, Oct. 23, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 247,989
Int. Cl.[4] C07D *233/46, 233/44;* C07F *9/65*
U.S. Cl. 548—111 **39 Claims**

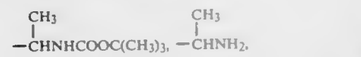
1. A compound selected from those of the formula:



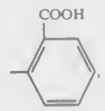
wherein R_1 and R_3 are the same or different and are: hydrogen, alkyl(C_1-C_6),



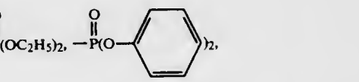
((where R_5 is hydrogen, alkyl(C_1-C_6), cyclohexyl which is further substituted by carboxyl, phenyl, monosubstituted phenyl (wherein the substituent may be ortho, meta or para and is fluoro, nitro, alkyl(C_1-C_6), alkoxy (C_1-C_3) or cyano), pentafluorophenyl, naphthyl, furanyl,

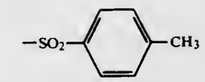


—CH_2CH_2COOH, —$OC(CH_3)_3$, —CH_2OCH_3, —$(CH_2)_3COOH$,



—$(CH_2)_2SO_3H$ or —$CH_2N^{\oplus}$—$(CH_3)_3Cl^{\ominus}$)),





or —SO_3H; with the proviso that only one of R_1 and R_3 may be hydrogen or alkyl(C_1-C_6); R_2 and R_4 are the same or different and are: hydrogen, alkyl(C_1-C_4) or



((where R_6 is hydrogen, alkyl(C_1-C_6), phenyl, monosubstituted phenyl (wherein the substituent may be in the ortho, meta or para position and is fluoro, nitro, alkyl(C_1-C_6), alkoxy (C_1-C_3)) or cyano), pentafluorophenyl, naphthyl, furanyl or —CH_2OCH_3)); or a pharmacologically acceptable salt thereof.

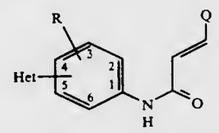
4,900,839

PRECURSORS TO QUINOLONE INOTROPIC AGENTS

Simon F. Campbell, Deal, and David A. Roberts, Sandwich, both of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 125,037, Nov. 23, 1987, Pat. No. 4,837,334, which is a division of Ser. No. 844,448, Mar. 26, 1986, Pat. No. 4,728,653, which is a continuation-in-part of Ser. No. 737,363, May 23, 1985, abandoned. This application Jan. 27, 1989, Ser. No. 302,698
Claims priority, application United Kingdom, May 29, 1984, 8413685; Oct. 26, 1984, 8427167
Int. Cl.[4] C07D *257/04, 231/12, 295/12*
U.S. Cl. 548—250 **4 Claims**

1. An N-(ring-substituted phenyl)propenamide compound of the formula:



or an acid addition salt thereof, wherein (a) "Het" is a pyrrolyl, pyrazolyl, or tetrazolyl group attached by a nitrogen atom of said group to the 3-, 4-, 5- or 6-positions of said phenyl ring, said heterocyclic groups being unsubstituted or substituted with up to three substituents each independently selected from C_1-C_4 alkyl, C_1-C_4 alkoxy, hydroxy, trifluoromethyl, halo, cyano, hydroxymethyl, (C_1-C_4 alkoxy)carbonyl, nitro, —$CONR^1R^2$ and —NR^1R^2 wherein R^1 and R^2 are each independently hydrogen or C_1-C_4 alkyl; and (b) R is hydrogen, C_1-C_4 alkyl, C_1-C_4 alkoxy, hydroxy, trifluoromethyl, halo, cyano or hydroxymethyl, said R being attached to the 3-, 4-, 5- or 6-positions of the aforesaid phenyl ring; and (c) Q is a C_1-C_4 alkoxy group.

4,900,840

3-HALOSUCCINIMIDES

Norman Hilberie, Munich, and Anneliese Reutter, Egiharting, both of Fed. Rep. of Germany, assignors to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/EP87/00563, § 371 Date Jun. 15, 1988, § 102(e) Date Jun. 15, 1988, PCT Pub. No. WO88/02747, PCT Pub. Date Apr. 21, 1988

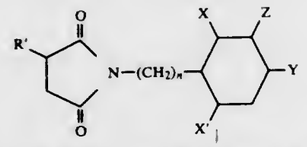
PCT Filed Oct. 1, 1987, Ser. No. 240,763

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635282

Int. Cl.⁴ C07D *207/404*

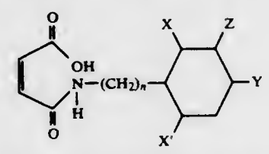
U.S. Cl. 548—545 **2 Claims**

1. A process or the preparation of compounds of the formula



(Ia)

wherein R' signifies a chlorine or bromine atom, n signifies 0, 1, 2 or 3, X, X' and Z are each the same or different, and are namely hydrogen atoms, fluorine atoms or methyl groups and Y signifies a hydrogen, chlorine or bromine atom or a methyl group, with the proviso that when n is 0 and R is simultaneously Cl, at least one of X, X' Y and Z is not hydrogen and when Z does not signify a hydrogen atom, at least one of X, X' and Y is also not hydrogen, characterized in that a compound of the formula



(IX)

is reacted, in the presence of a solvent, at a temperature of from 30° C. up to the reflux temperature of the mixture with a compound of the formula

CH_3COR'

4,900,841

1-[4-[(METHYL-SULFONYL)AMINO]BENZOYL]AZIRIDINE

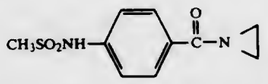
Thomas K. Morgan, Jr., Morris Plains, N.J., assignor to Schering A.G., Berlin, Fed. Rep. of Germany

Filed Apr. 20, 1987, Ser. No. 39,875

Int. Cl.⁴ C07D *203/02*

U.S. Cl. 548—966 **1 Claim**

1. A compound of the formula:



which is 1-[4-[(methylsulfonyl)amino]benzoyl]aziridine.

4,900,842

ORGANIC COMPOUNDS OF THE TETRATHIAFLUVALENE TYPE WHICH CAN BE USED TO MAKE LANGMUIR-BLODGETT CONDUCTING FILMS AND METHOD FOR THEIR MANUFACTURE

Philippe Robin, Le Plessis Robinson; Albert Robert, Rennes; Francoise Bertho, Mun de Bretagne, and Patrick Batail, Paris, all of France, assignors to Thomson-CSF, Paris, France

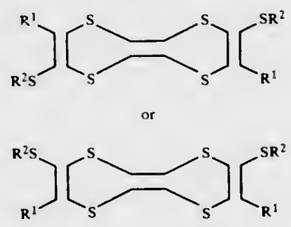
Filed Feb. 9, 1988, Ser. No. 154,013

Claims priority, application France, Feb. 13, 1987, 87 01869

Int. Cl.⁴ C07D *339/06*

U.S. Cl. 549—36 **5 Claims**

1. An organic compound having the formula:



or

which is made amphiphilic by substitution of radicals, wherein R^1 is p—$CO_2HC_6H_4$ and R^2 is $(CH_2)_{17}CH_3$; or R^1 is p—ClC_6H_4 and R^2 is $(CH_2)_{10}CO_2H$; or R^1 is $(CH_2)_{10}CH_3$ and R^2 is CH_2CO_2H; or R^1 is $(CH_2)_{10}CH_3$ and R^2 is $(CH_2)_{10}CO_2H$.

4,900,843

METHOD FOR DIMERIZATION OF AROMATIC HALIDE COMPOUNDS

Mitsumasa Kitai; Yoshio Katsuro; Shigenori Kawamura; Masumi Hino, all of Kitakyushu, and Keiichi Sato, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Japan

Filed May 31, 1988, Ser. No. 200,615

Claims priority, application Japan, Dec. 2, 1987, 62-304981

Int. Cl.⁴ C07D *307/89*

U.S. Cl. 549—252 **25 Claims**

1. A method of dehalogeno-dimerizing, in the presence of a palladium catalyst, water, a reducing agent, and a halogen acceptor, an aromatic halide compound selected from the group consisting of a halogenated phthalic acid, a salt thereof with an alkali metal, a halogenated phthalic acid anhydride, and mixtures thereof, which comprises immersing said palladium catalyst on a support in a hydrohalogenic acid prior to said dehalogeno-dimerizing.

4,900,844

INTERMEDIATES FOR THE PREPARATION OF OXOPHTHALAZINYL ACETIC ACIDS HAVING BENZOTHIAZOLE OR OTHER HETEROCYCLIC SIDE CHAINS

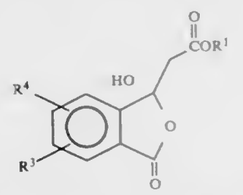
Banavara L. Mylari, Waterford, and William J. Zembrowski, Oakdale, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 165,338, Mar. 8, 1988, Pat. No. 4,868,301, which is a continuation-in-part of Ser. No. 59,899, Jun. 9, 1987, abandoned. This application May 19, 1989, Ser. No. 354,521

Int. Cl.⁴ C07D *493/02*

U.S. Cl. 549—299 **2 Claims**

1. A compound of the formula



II

wherein R^1 is hydrogen or C_1 or C_4 alkyl; and R^3 and R^4 are the same or different and are hydrogen, fluoro, chloro, bromo, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, or nitro, or R^3 and R^4 taken together are C_1–C_4 alkylenedioxy.

4,900,845

MOIETY FOR SELECTIVE SEPARATION

Brian J. Bristow; Richard England, and Sera S. Abed-Ali, all of Bath, England, assignors to National Research Development Corporation, London, England

Filed Jan. 25, 1988, Ser. No. 147,992

Claims priority, application United Kingdom, Feb. 5, 1987, 8702569

Int. Cl.⁴ C07D *323/00*

U.S. Cl. 549—352 **3 Claims**

1. 1,4,7,10-tetraoxa-2-C_3–C_6-alkenyl-cyclododecane.

4,900,846

PROCESS FOR MAKING 1,3-DIOXANE DERIVATIVES

Gregory P. Harris, Macclesfield, United Kingdom, assignor to Imperial Chemical Industries plc, London, England

Division of Ser. No. 670,016, Nov. 9, 1984, Pat. No. 4,723,037. This application Oct. 27, 1987, Ser. No. 113,153

Claims priority, application United Kingdom, Nov. 11, 1983, 8330120

Int. Cl.⁴ C07D *319/06*

U.S. Cl. 549—373 **3 Claims**

1. A process for the manufacture of a (4-phenyl-1,3-dioxan-cis-5-yl)alkenoic acid of the formula I set out herein wherein Ra and Rb are independently hydrogen, (2-6C)alkenyl, (1-8C)alkyl optionally bearing up to three halogeno substituents, pentafluorophenyl, aryl or aryl-(1-4C)alkyl, the latter two of which may optionally bear up to three substituents selected from halogeno, (1-6C)alkyl, 1-6C)alkoxy, (1-4C)alkylenedioxy, trifluoromethyl, cyano, nitro, hydroxy, (2-6C)alkanoyloxy, (1-6C)alkylthio, (1-6C)alkanesulphonyl, (1-6C)alkanoylamino, and oxapolymethylene of 2 to 4 carbon atoms, provided that when both Ra and Rb are alkyl or alkenyl, the total number of carbon atoms in Ra and Rb taken together is 8 or less; or Ra and Rb together form polymethylene of 2 to 7 carbon atoms, optionally bearing one or two (1-4C)alkyl substituents; Rc is hydroxy, (1-6C)alkoxy or (1-6C)alkanesulphonamido; n is 1; A is ethylene or vinylene; Y is polymethylene of 2 to 5 carbon atoms optionally bearing (1-4C)alkyl as a substituent; benzene ring B optionally bears one or two substituents selected from halogeno, (1-6C)alkyl, (1-6C)alkoxy, hydroxy, (1-6C)alkanoyloxy, (1-6C)alkanoylamino, trifluoromethyl and nitro; and the substituents at positions 4 and 5 of the dioxane ring have cis-relative stereochemistry; or for those compounds wherein Rc is hydroxy, a salt thereof with a base affording a physiologically acceptable cation; which is characterised by carrying out the steps of:

(i) reacting an erythro-4-hydroxy-3-hydroxymethyl-4-phenylbutyraldehyde of the formula II, or an alkali metal salt thereof, or the corresponding [2,3-trans]-tetrahydro-5-hydroxy-3-hydroxymethyl-2-phenylfuran of the formula IIa, wherein benzene ring B has the meaning defined above, and the hydroxy and hydroxymethyl groups in formula II have the indicated cis-relative stereochemistry, with an ylid of the formula $(Rd)_3P{=}CH.Y\ CO.Q$ wherein Rd is (1-6C)alkyl or aryl and Q stands for —OM or —$NM.SO_2Re$ in which M is an alkali metal, Re is (1-6C)alkyl and Y has the meaning defined above, to give after acidification an erythrodiol of the formula III wherein benzene ring B has the meaning defined above, and Rf is hydroxy or (1-6)C alkanesulphonamido; and

(ii) reacting the diol of formula III, or a mono (1-6C)alkanesulphonyl or arenesulphonyl ester thereof, with a carbonyl compound of the formula RaRb.CO, or an acetal, hemiacetal or hydrate thereof; whereafter: when a compound of formula I wherein A is ethylene is required, the corresponding compound of formula I wherein A is vinylene is hydrogenated in the presence of a suitable catalyst;

when a compound of formula I wherein Ra or Rb is hydroxyphenyl, or benzene ring B bears a hydroxy substituent is required, the corresponding compound of formula I wherein the hydroxy group is protected by a trimethylsilyl, (1-6C)alkyl, acyl or benzyl protecting group is deprotected;

when an optically active form is required, steps (i) and (ii) above are carried out starting with an optically active aldehyde of formula II or furan of the formula IIa, or a racemic form of a compound of formula I wherein Rc is hydroxy is resolved by reaction with an optically active form of a suitable organic base, by a conventional procedure;

when a pharmaceutically acceptable salt is required, a compound of formula I wherein Rc is hydroxy is reacted with the appropriate base affording a physiologically acceptable cation; or

when a (1-6C)alkyl ester or (1-6C)alkanesulphonamide is required, the corresponding compound of formula I wherein Rc in hydroxy in racemic or optically active form, or a reactive derivative thereof, is reacted with the appropriate (1-6C)alkanol or (1-6C)alkanesulphonamide, or with an alkali metal salt thereof.

4,900,847

CATALYTIC ASYMMETRIC EPOXIDATION

Robert M. Hanson; Soo Y Ko, both of Cambridge, and Karl B. Sharpless, Brookline, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 719,776, Apr. 4, 1985, abandoned. This application Feb. 24, 1986, Ser. No. 833,572

Int. Cl.⁴ C07D *301/19*

U.S. Cl. 549—529 **9 Claims**

1. In a method employing a titanium chiral glycol alkoxide catalyst, an olefinic alcohol, where the olefin is separated from the carbinol carbon atom by from 0 to 1 carbon atom, and an organic hydroperoxide in an inert dry medium under mild conditions below about 30° C., whereby the olefin is asymmetrically epoxidized, the improvement which comprises:

epoxidizing the olefin in the presence of from about 1–25 mol percent based on olefin of said catalyst under conditions where any water formed is continuously removed from the reaction mixture by means of a dehydrating agent.

VOL 1111 ISS 2 FE 13 1990 UMI

4,900,848

LOW-VISCOSITY EPOXY RESIN, AND FIBER-REINFORCED COMPOSITE MATERIAL FROM TRIGLYCIDYL M-AMINOPHENOLS

Yasuhisa Saito, Higashiosaka; Katsuya Watanabe, Takatsuki; Kohichi Okuno, Izumiotsu; Kunimasa Kamio, Suita; Akira Morii, and Hiroshi Nakamura, both of Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 96,210, Sep. 8, 1987, abandoned, which is a continuation of Ser. No. 909,582, Sep. 22, 1986, abandoned. This application Mar. 29, 1988, Ser. No. 174,703

Claims priority, application Japan, Sep. 27, 1985, 60-216044; Jan. 10, 1986, 61-3860; Feb. 7, 1986, 61-26601; Feb. 7, 1986, 61-26602; Feb. 7, 1986, 61-26603

Int. Cl.[4] C07D *301/27, 303/08, 303/36*

U.S. Cl. 549—517 **5 Claims**

5. An epoxy resin according to claim 1, wherein the amount of epihalohydrin is 3 or more moles per 1 mole of the aminophenol.

4,900,849

PROCESS FOR THE PRODUCTION OF DICHLOROHYDRIN

David I. Saletan, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 9, 1988, Ser. No. 242,945

Int. Cl.[4] C07D *301/24;* **C07C** *29/66*

U.S. Cl. 549—521 **7 Claims**

1. In a continuous process for the production of dichlorohydrin an improvement for reducing the level of chloroaliphatic alkanes and chloroaliphatic ethers impurities in the dichlorohydrin product the improvement comprising in sequence:

(a) reacting allyl chloride, water and chlorine in a reaction zone to form an aqueous mixture of dichlorohydrin, together with minor amounts of chloroaliphatic ethers impurities;

(b) contacting in an extraction zone said reaction zone effluent with less than about 8% by volume of a water-immiscible solvent for said impurities having a greater solvency for said impurities than for dichlorohydrin and an atmospheric boiling point from about 40° to about 105° C., to obtain as extract an impurity-enriched solvent, and an aqueous phase containing a major amount of the dichlorohydrin;

(c) separating said extract from said aqueous phase;

(d) contacting in a water wash zone said separated extract from step (c) with water to obtain a water wash stream containing a major portion of dichlorohydrin present in the feed to step (d), and a washed extract stream containing less dichlorohydrin than said feed to step (d);

(e) recycling said water wash stream to at least one of step (a) and step (b);

(f) passing said washed extract stream from step (d) as feed to a distillation zone, and fractionating said feed by fractional distillation to obtain an overhead stream containing impurities boiling at a temperature lower than the boiling temperature of said solvent, a residual fraction containing impurities boiling at a temperature higher than the boiling temperature of said solvent, and an intermediate steam comprising regenerated solvent containing fewer impurities than said feed; and

(g) recycling said regenerated solvent to the extraction zone of step (b).

4,900,850

RECOVERY OF PURIFIED DITERTIARY BUTYL PEROXIDE

John R. Sanderson, Leander, and Robert A. Meyer, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 23, 1986, Ser. No. 945,628

Int. Cl.[4] C00F *301/19*

U.S. Cl. 549—529 **11 Claims**

1. A method for the recovery of ditertiary butyl peroxide from a mixture of a minor amount of ditertiary butyl peroxide with a larger amount of tertiary butyl alcohol which comprises the steps of:

charging said mixture to a distillation zone and separating a lighter distillate ditertiary butyl peroxide/tertiary butyl alcohol azeotrope fraction from said mixture therein, and

resolving said ditertiary butyl peroxide/tertiary butyl alcohol azeotrope by water extraction into a raffinate fraction consisting essentially of ditertiary butyl peroxide and an extract fraction comprising water, ditertiary butyl peroxide and tertiary butyl alcohol.

4,900,851

SYNTHESIS OF AZIDODINITRO COMPOUNDS

Milton B. Frankel, Tarzana, and James F. Weber, Moorpark, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 5, 1987, Ser. No. 82,879

The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.

Int. Cl.[4] C07C *117/00;* **C06B** *25/00;* **C25B** *3/00*

U.S. Cl. 552—12 **2 Claims**

1. 4-azido-4,4-dinitro-1-butyl acetate.

4,900,852

HEAVY METAL SALTS OF DITHIOPHOSPHONATE COMPOUNDS

Terence Colclough, Abingdon, United Kingdom, and Stanley J. Brois, Westfield, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

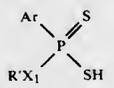
Continuation of Ser. No. 907,194, Sep. 12, 1986, abandoned. This application May 15, 1989, Ser. No. 353,187

Claims priority, application United Kingdom, Sep. 16, 1985, 8522833

Int. Cl.[4] C07F *3/06*

U.S. Cl. 556—19 **10 Claims**

1. Metal salts of dithiophosphonic acid derivatives of the general formula:



wherein Ar is a hindered phenol group, R′ is a hydrocarbyl radical and X_1 is selected from sulphur, oxygen and amino groups NR_2 wherein each R is hydrogen or a hydrocarbyl group, wherein the metal of said metal salts is a transition metal.

4,900,853

SALTS AND RESINOIDS OF 1:4 ORGANOARSONATE MOLYBDENUM POLYOXOANIONS AND PROCESS OF MAKING

Charles J. Berecker, Cleveland, and William A. Marritt, Cleveland Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 5, 1987, Ser. No. 81,842

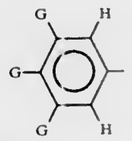
Int. Cl.[4] C07F *7/00;* **C08G** *79/00*

U.S. Cl. 556—30 **6 Claims**

1. Tetraalkylammonium salts of 1:4 organoarsonate molybdenum polyoxoanions, said salts having the formula

$$[R_4N]_2\{[R^1As(OH)O_2]Mo_4O_{13}H\}$$

where R is an alkyl group having from one to about 18 carbon atoms and R^1 is an aryl group having the formula



where G is selected from the group consisting of $—NH_2$, $—NH(CH_3)$, $—N(CH_3)_2$, —OH, $—OCH_3$ and —H and at least one G is $—NH_2$ to form 3-, 4-, 3,4-, 3,5- or 3,4,5-substituted arylarsonic acids.

4,900,854

PROCESS FOR THE PREPARATION OF ASYMMETRICAL ALKALINE EARTH METAL ORGANOBORATES, ORGANOALUMINATES, ORGANOARSENATES, AND ORGANOPHOSPHATES

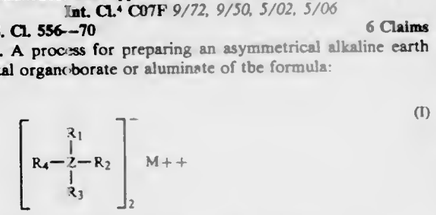
Richard C. Winterton; Ronald J. Hoffman, and Thomas D. Gregory, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 29,124, Mar. 23, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,427

Int. Cl.[4] C07F *9/72, 9/50, 5/02, 5/06*

U.S. Cl. 556—70 **6 Claims**

1. A process for preparing an asymmetrical alkaline earth metal organoborate or aluminate of the formula:



(I)

wherein Z is selected from the group consisting of boron and aluminum, M is an alkaline earth metal, and R_1–R_4 are independently selected from alkyl, aryl, alkaryl, aralkyl, alkenyl, cycloalkyl, and cyano by the steps of:

(1) reacting an organohaloboron or organohaloaluminum of the formula:

$$Z(R)_2W$$

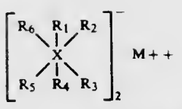
with

(2) an organoalkaline earth metal compound of the formula:

$$M(R')_2$$

wherein Z is as defined above, R and R′ are as defined above for R_1–R_4 with the proviso that R and R′ are not the same, and W is halogen.

2. A process for preparing an asymmetrical alkaline earth metal organoarsenate or organophosphate of the formula:



(II)

wherein X is selected from the group consisting of arsenic and phosphorus, M is an alkaline earth metal, and R_1–R_6 are independently selected from alkyl, aryl, alkaryl, aralkyl, alkenyl, cycloalkyl, and cyano by the steps of:

(1) reacting an organohaloarsorane or organohalophosphorane of the formula:

$$X(R)_4W$$

with

(2) an organoalkaline earth metal compound of the formula:

$$M(R')_2$$

wherein X and R are as defined above, R and R′ are as defined above for R_1–R_6 with the proviso that R and R′ are not the same, and wherein W is halogen.

4,900,855

CHEMICAL PROCESS FOR OBTAINING HIGH PURIFICATION OF MONOALKYLARSINES AND DIALKYLARSINES AND PURIFIED MONO- AND DIALKYLARSINES

Benjamin C. Hui, Peabody; Ravindra K. Kanjolia, North Andover, both of Mass., and Jorg Lorberth, Niederweimar, Fed. Rep. of Germany, assignors to CVD Incorporated, Woburn, Mass.

Filed Dec. 14, 1988, Ser. No. 284,000

Int. Cl.[4] C07F *9/70, 9/72*

U.S. Cl. 556—70 **7 Claims**

1. A method for obtaining a mono- or a dialkylarsine that is highly purified with respect to levels of silicon, germanium and zinc, the method comprising,

in a non-proton donor organic solvent and in the absence of oxygen, reacting a mono- or dialkylarsine with either an alkali metal or a mixture of alkali metals or an alkali metal hydrocarbyl or mixed alkali metal hydrocarbyl to produce an alkali metal mono- or dialkylarsenide,

using heat and/or vacuum, removing by vaporization silicon-containing, germanium-containing and zinc-containing impurities,

in a non-proton donor organic solvent and in the absence of oxygen, regenerating said mono- or dialkylarsine by reacting said alkali metal mono- or dialkylarsenide with a proton donor selected from the group consisting of acids, alcohols and water,

separating said non-proton donor organic solvent which contains said regenerated mono- or dialkylarsine from any solid residue, and

removing said solvent from said regenerated mono- or dialkylarsine.

4,900,856

PREPARATION OF METAL HALIDE-AMINE COMPLEXES

Everett M. Marlett, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 26, 1988, Ser. No. 199,288

Int. Cl.[4] C07F *5/06*

U.S. Cl. 556—176 **10 Claims**

1. Process for the preparation of an organic amine complex of an aluminum trihalide, said process comprising reacting a reactant mixture composed of aluminum metal and an organic amine hydrohalide selected from a primary organic amine

hydrohalide, a secondary organic amine hydrohalide, and a tertiary organic amine hydrohalide.

4,900,857

PHOSPHORUS-CONTAINING ORGANO SILANES

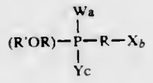
Michael W. Klett, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 31,629, Mar. 30, 1987, abandoned. This application Apr. 29, 1988, Ser. No. 188,234

Int. Cl.[4] C07F 7/18

U.S. Cl. 556—405 **13 Claims**

1. Phosphorus-containing-organo-silane compound of the general formula:



$$4 - (a + b + c)$$

I W is oxygen, sulfur, (R'OR) or a lone pair of electrons, where the
oxygen and sulfur are double bonded to the phosphorus, and where
a is an integer of 0 or 1;
II Y is a hydrogen, alkyl, aryl, hydroxy or an (ROR') group, and where
c is an integer 0 or 1; and
III X is trialkoxy organo functional silane moiety or hydrolysis derivative thereof and where:
R' is hydrogen, or substituted or unsubstituted aliphatic radicals or mixtures thereof; and
R is a bivalent substituted or unsubstituted alkylene or arylene radical; and
a, b, c are integers where b is 1 to 4, a is 0 or 1, c is 0–2, and when C is at least 1 and a is zero and b is 1 or 2, the compound can be in salt form as the cation with anions selected from the group consisting of halides, sulfates, formates, acetates and phosphates.

4,900,858

PROCESS FOR THE PREPARATION OF A 6-HALO-3-METHYL-1-TRIALKYLSILYLOXY-1,3,5-HEXATRIENE

Lucette Duhamel; Pierre Duhamel, both of Mont-Saint Aignan, and Jean-Pierre Lecouve, Caluire, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

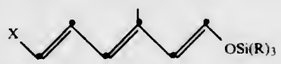
Continuation of Ser. No. 24,524, Mar. 11, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 265,342

Claims priority, application France, Mar. 14, 1986, 86 03669

Int. Cl.[4] C07F 7/18

U.S. Cl. 556—470 **3 Claims**

1. A process for the preparation of a 6-halo-3-methyl-1-trialkylsilyloxyhexatriene of the formula:



in which X denotes a halogen atom and R denotes an alkyl radical of 1 to 4 carbon atoms, which comprises reacting a halosilane of the formula:

$$X-Si(R)_3$$

with a 6-halo-3-methyl-hexadienal of formula:



in which X and R are as hereinbefore defined, in the presence of a tertiary amine and in an inert organic solvent at a temperature of −10° to +30° C.

4,900,859

PROCESS FOR 4-DIMETHYLAMINO-3,5-DIMETHOXYBENZALDEHYDE

Siro Serafini, Vicenza, and Giuseppe Zagotto, Terrossa, both of Italy, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Nov. 17, 1988, Ser. No. 272,366

Claims priority, application Switzerland, Dec. 3, 1987, 4721/87

Int. Cl.[4] C07B 41/06; C07C 121/52

U.S. Cl. 558—418 **6 Claims**

1. A process for the preparation of 4-dimethylamino-3,5-dimethoxybenzaldehyde, which comprises:
(a) converting 4-dimethylaminobenzonitrile into 3,5-dibromo-(or dichloro-)4-methylaminobenzonitrile by treatment with bromine or chlorine;
(b) converting 3,5-dibromo-(or dichloro-)-4-methylaminobenzonitrile, the reaction product of step (a) into 3,5-dimethoxy-4-methylaminobenzonitrile by treating said reaction product with an alkali methoxide in the presence of copper and dimethylformamide or dimethylacetamide; and
(c) methylating 3,5-dimethoxy-4-methylaminobenzonitrile, the reaction product of step (b) to 4-dimethylamino-3,5-dimethoxybenzonitrile and reducing the latter to 4-dimethylamino-3,5-dimethoxybenzaldehyde.

4,900,860

PROCESS FOR PREPARING PHOSPHONYLOXYACYL AMINO ACIDS

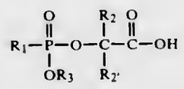
John K. Thottathil, Trenton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 237,490, Aug. 26, 1988, which is a division of Ser. No. 839,256, Mar. 13, 1986, abandoned. This application May 30, 1989, Ser. No. 358,240

Int. Cl.[4] C07F 9/40

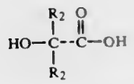
U.S. Cl. 558—87 **6 Claims**

1. A process for preparing a phosphonic acid intermediate of the structure

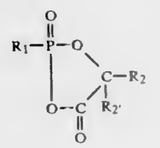


wherein R_1 is lower alkyl, aminoalkyl, haloalkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl; R_2 is H, lower alkyl, aminoalkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl; $R_{2'}$ is H or lower alkyl; and R_3 is lower alkyl or aralkyl, which comprises treating a phosphonic acid dichloride of the structure

with an α-hydroxy acid of the structure



at a temperature of within the range of from about −85° C. to about −65° C., employing a molar ratio of dichloride:acid of within the range of from about 3:1 to about 0.5:1 in the presence of an organic base, to form a cyclic mixed anhydride of the structure

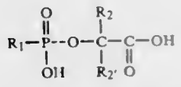


and treating the cyclic mixed anhydride with an alcohol of the structure

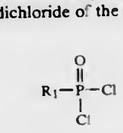
$$R_3OH$$

to form said phosphonic acid intermediate.

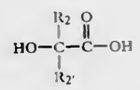
4. A process for preparing a phosphonic acid intermediate of the structure



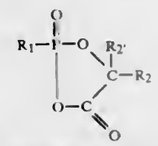
wherein R_1 is lower alkyl, aminoalkyl, haloalkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl; and R_2 is H, lower alkyl, aminoalkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl, and $R_{2'}$ is H or lower alkyl, which comprises treating a phosphonic acid dichloride of the structure



with an α-hydroxy acid of the structure



at a temperature within the range of from about −85° C. to about −65° C., employing a molar ratio of dichloride:acid of within the range of from about 3:1 to about 0.5:1 in the presence of an organic base, to form a cyclic mixed anhydride of the structure



and quenching the cyclic mixed anhydride with water to form said phosphonic acid intermediate.

4,900,861

METHOD OF PRODUCING POLYSILANE COMPOUNDS

Keiichi Yokoyama; Katsuo Taniguchi, and Yoshihisa Kiso, all of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,838

Int. Cl.[4] C07F 7/08

U.S. Cl. 556—430 **6 Claims**

1. A method of producing polysilane compounds which comprises: polymerizing a monomeric silane compound represented by the general formula of



wherein R independently represents hydrogen or hydrocarbon group, but not both R's are hydrogen at the same time, in the presence of an organometallic complex of Ni, Co, Ru, Pd or Ir.

4,900,862

HERBICIDALLY ACTIVE SUBSTITUTED DIPHENYL ETHER OXIME DERIVATIVES

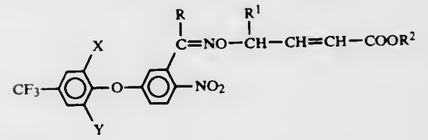
James A. Schwindeman, Canal Fulton, Ohio, assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 28, 1983, Ser. No. 479,602

Int. Cl.[4] C07C 79/46

U.S. Cl. 560—21 **4 Claims**

1. A compound represented by the formula:



wherein:
X and Y are hydrogen or halogen provided that at least one of X or Y is halogen;
R is hydrogen or $—CH_2R^3$ wherein R^3 is hydrogen, halogen, C_1 to C_3 alkyl or haloalkyl, C_1 to C_3 alkoxy or alkylthio, mono or dialkylamino, or cyano;
R^1 is hydrogen or C_1 to C_3 alkyl; and
R^2 is hydrogen, alkali metal, C_1 to C_3 alkyl phenyl up to C_3 alkenyl or alkynyl, ammonium or substituted ammonium.

4,900,863

PROCESS FOR THE PURIFICATION OF N-ACYLASPARTAME

Erwin Schmidt, Kelkheim, and Reinhold Keller, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

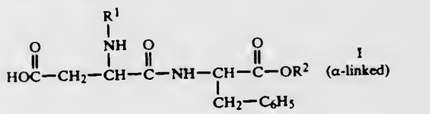
Filed Oct. 16, 1987, Ser. No. 108,954

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1986, 3635582

Int. Cl.[4] C07C 101/102

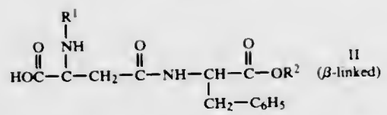
U.S. Cl. 560—41 **7 Claims**

1. A process for the separation of a mixture of compounds of the formulas I and II



I (α-linked)

-continued



(II)
(β-linked)

in which R^1 denotes an amino protective group and R^2 represents an alkyl radical having 1 to 4 carbon atoms, which comprises buffering a mixture of compounds of the formulas I and II to a suitable pH range such that the compounds of one of formulas I and II are at least partially in a solution and the compounds of the other of the formulas are not in the solution, with the proviso that said buffering does not include the use of zinc salts.

4,900,864

MANUFACTURE OF ALKYL GLYOXYLATES WITH FERRIC PHOSPHATE CATALYST

Prakasa R. Anantaneni, 572 Enchanted Pkwy., Manchester, Mo. 63021, and Tao P. Li, 293 Heather Crest Dr., Chesterfield, Mo. 63017

Filed Aug. 9, 1988, Ser. No. 230,289

Int. Cl.[4] C07C *67/38*

U.S. Cl. 560—177 **16 Claims**

1. A process for the preparation of a lower alkyl ester of glyoxylic acid comprising contacting a catalyst, comprising ferric phosphate on a support material selected from the group consisting of alumina and silica containing alumina with a feed composition comprising an oxygen containing gas and a lower alkyl ester of glycolic acid, whereby said ester is oxidized to form the corresponding alkyl glyoxylate ester.

4,900,865

METHOD FOR PRODUCING A DI-(MONO- OR POLY-)CARBOXYARYL ETHER

Gregory P. Hussmann, Batavia; Juergen K. Holzhauer, and George E. Kuhlmann, both of Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 25, 1987, Ser. No. 125,477

Int. Cl.[4] C07C *51/16, 51/255*

U.S. Cl. 562—412 **9 Claims**

1. A method for producing a di-(mono- or poly-) carboxyaryl ether product comprising: oxidizing a di-(mono- or poly-)alkylaryl ether reactant with an oxygen-containing gas in the liquid-phase in a solvent in a reactor at temperatures in the range of from about 120° C. to about 240° C. and elevated pressure and in the presence of an oxidation catalyst comprising cobalt, manganese, and bromine components to form a product mixture comprising a di-(mono- or poly-)carboxyaryl ether product, wherein the solvent is at least one C_2–C_6 monocarboxylic acid, and wherein the weight ratio of cobalt (calculated as elemental cobalt) in the cobalt component of the catalyst-to-the ether reactant in the liquid-phase oxidation is in the range of from about 0.1 to about 10 mga per gram mole of the ether reactant, the weight ratio of manganese (calculated as elemental manganese) in the manganese component of the catalyst-to-cobalt (calculated as elemental cobalt) in the cobalt component of the catalyst is in the range of from about 0.1 to about 10 mga per mga of cobalt (calculated as elemental cobalt) and the weight ratio of bromine (calculated as elemental bromine) in the bromine component of the catalyst-to-total cobalt and manganese (calculated as elemental cobalt and elemental manganese) in the cobalt and manganese components of the catalyst is in the range of from about 0.1 to about 5.0 mga per mga of total cobalt and manganese, wherein the ether product is purified either by:

(a) recrystallization of the ether product from a recrystallization solvent comprising a C_2–C_6 monocarboxylic acid, or

(b) esterifying with methanol or ethanol at 60–325° C. and 0–3000 pounds per square inch gauge to form a crude esterified ether solid product, separating the crude esterified ether product, and dissolving the crude esterified ether product in a recrystallization solvent comprising benzene, toluene, a xylene, an aliphatic hydrocarbon, or a halogenated aliphatic hydrocarbon or a mixture, and containing calcium hydroxide, crystallizing the resulting purified esterified ether product from the recrystallization solvent.

4,900,866

AZAPHOSPHOLENES

Günther Wilke; Jaroslaw Monkiewicz, both of Mülheim/Ruhr, and Herbert Kuhn, Laumersheim, all of, assignors to Studiengesellschaft Kohle mbH, Mülheim/Ruhr., Fed. Rep. of Germany

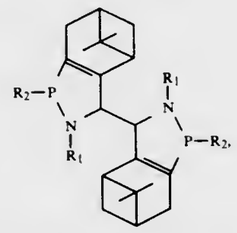
Division of Ser. No. 54,343, May 26, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 246,228

Claims priority, application Fed. Rep. of Germany, May 26, 1986, 3618169

Int. Cl.[4] C07F *9/22*

U.S. Cl. 564—13 **5 Claims**

1. An azaphospholene of the formula



wherein R_1 and R_2 each independently is lower alkyl, aryl or aralkyl.

5. A process for preparing bis-(3R)-3-((1R,5R,8R)-5,9,9-trimethyl-4-[(1R)-1-phenylethyl]-4-aza-5-phosphatricyclo-[6.1.1$^{1.8}$,0$^{2.6}$]-dec-2(6)-enyl), comprising reacting phenylethylamine and myrtenal at about 70° to 80° C. to obtain (1R,5S)-6,6-dimethyl-2-[(1R)-1-N-phenylethyl-azamethino]-bicyclo[3.1.1]hept-2-ene, reacting that compound in a second step with methyldibromophosphane to form 5-bromo-5-5,9,9-trimethyl-4-[(1R)-1-phenylethyl]-4-aza-5-λ^4-phosphoniatricyclo-[6.1.1$^{1.8}$,0$^{2.6}$]-dec-2(6)-ene bromide, and treating such product in the cold with excess active magnesium.

4,900,867

PROCESS FOR PRODUCING FLUOROSULFONAMIDES

Bernd Wilkes, Hanover; Dieter Naumann, Dortmund; Werner Rudolph, Hanover, and Ruediger Sander, Sehnde, all of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 2, 1987, Ser. No. 69,094

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1986, 3623184

Int. Cl.[4] C07C *143/78, 143/74*

U.S. Cl. 564—91 **16 Claims**

1. A process for producing N-fluorosulfonamides comprising reacting a sulfonamide corresponding to the Formula (I):

$$R^1—SO_2—NH—R^2 \quad (I)$$

in which

R^1 represents alkyl with 1 to 10 C-atoms or alkyl with 1 to 10 C-atoms substituted by at least 1 F-atom, or aryl or aryl substituted by 1 to 5 substituents independently selected from the group consisting of F-atoms, CF_3-groups, and CH_3- groups, with the proviso that not more than 2 substituents may be CF_3-groups or CH_3-groups, and

R^2 represents alkyl containing 1 to 6 C-atoms,

with elemental fluorine in a solvent mixture comprising a halogenated hydrocarbon and a nitrile, and recovering the resulting N-fluorosulfonamide from the reaction mixture.

4,900,868

PROCESS FOR PRODUCING N,N'-DISUBSTITUTED PARAPHENYLENE DIAMINE MIXTURES BY SEQUENTIAL REDUCTIVE ALKYLATION

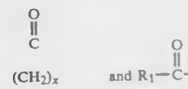
Helmut L. Mertes, Hudson, and Leona M. Baclawski, Akron, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 928,132, Nov. 7, 1986, abandoned, and a continuation-in-part of Ser. No. 836,946, Mar. 6, 1986, abandoned, which is a continuation of Ser. No. 340,568, Jan. 18, 1982, abandoned. This application Apr. 13, 1987, Ser. No. 37,653

Int. Cl.[4] C08F *45/60, 6/00*; C07C *87/58*

U.S. Cl. 564—398 **10 Claims**

1. In the process for preparing a mixture of two or more different N,N'-disubstituted paraphenylenediamines by the reductive alkylation of a nitrogen-containing compound selected from 4-nitrodiphenylamine, 4-aminodiphenylamine, paranitroaniline and phenylene diamine with two or more ketones selected from



wherein x is an integer of from 2 to 9 and R_1 and R_2 are alkyl of 1 to 8 carbon atoms, with the proviso that the total number of carbon atoms in R_1 and R_2 together is nine or less, in the presence of hydrogen and a catalyst, the improvement which comprises charging one ketone and a molar excess of the nitrogen-containing compound to a reaction zione and causing them to react, under hydrogen pressure, until the one ketone is essentially completely consumed, charging a second, different, ketone to the reaction zone in an amount in a molar excess over the amount of unreacted nitrogen-containing compound, causing the second ketone and the remaining nitrogen-containing compound to react, under hydrogen pressure, until the remaining nitrogen-containing compound is essentially completely consumed, separating the mixture of N,N'-disubstituted paraphenylenediamines from the mixture of volatile by-products and unreacted second ketone and recovering the unreacted second ketone by distillation.

4,900,869

PROCESS FOR THE PRODUCTION OF 4-[ETHYL-(2'-HYDROXYETHYL)-AMINO]-1-[(2'-HYDROXYETHYL)-AMINO]-2-NITROBENZENE

Thomas Classen, Alsbach, and Isolde Löwe, Bensheim, both of Fed. Rep. of Germany, assignors to Aktiengesellschaft Wella, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 938,787, Dec. 5, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 120,213

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3543030

Int. Cl.[4] C07C *85/04, 87/60*

U.S. Cl. 564—441 **5 Claims**

1. Process for the production of 4-[ethyl-(2'-hydroxyethyl)-amino]-1-[(2'-hydroxyethyl)-amino]-2-nitrobenzene, comprising converting the primary amino group in 4-amino-1-chloro-2-nitrobenzene with an aryl sulfonic acid chloride into the corresponding sulfonamide, alkylating said sulfonamide with ethyl iodide, converting the reaction product with monoethanolamine into the 4-(N-ethyl-aryl-sulfonamido)-1-[(2'-hydroxyethyl)-amino]-2-nitrobenzene, then splitting off the aryl sulfonyl group with sulfuric acid, and reacting the obtained 4-ethylamino-1-[(2'-hydroxyethyl)-amino]-2-nitrobenzene with 2-chloroethanol into 4-[ethyl-(2'-hydroxyethyl)-amino]-1-[(2'-hydroxyethyl)-amino]-2-nitrobenzene.

4,900,870

PROCESS FOR THE PREPARATION OF CYCLOALIPHATIC KETONES

Charles Fehr, Versoix, and José Galindo, Geneva, both of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

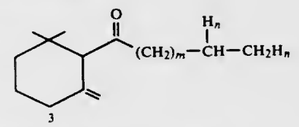
Filed Sep. 1, 1987, Ser. No. 91,640

Claims priority, application Switzerland, Sep. 19, 1986, 3760/86-9

Int. Cl.[4] C07C *45/42*

U.S. Cl. 568—354 **8 Claims**

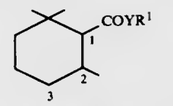
1. A process for the preparation of cycloaliphatic ketones having the formula



(II)

wherein index m designates an integer 0, 1 or 2, n stands for 0 or 1 and the dotted lines represent an optional supplemental bond, which comprises effecting the following subsequent reaction steps:

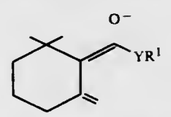
a. deprotonation of an ester having the formula



(III)

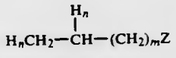
having either an isolated double bond in position 1 or 2 (exocyclic), or two conjugated double bonds in position 1 and 3 or 2 (exocyclic) and 3 as indicated by the dotted lines, and wherein symbol R' represents a linear or branched alkyl radical, preferably a C_1–C_6 alkyl radical, or a substituted or unsubstituted phenyl, and wherein Y designates an oxygen or a sulphur atom by reacting said ester with a strong base;

b. adding to the thus formed enolate having the formula



(IV)

an organo-metallic compound having the formula



(V)

wherein m stands for an integer 0, 1 or 2, n has a value of 0 or 1, Z represents a MgX radical or an alkali metal, with X designating a halogen atom, and the dotted lines represent an optional supplemental bond; and

c. hydrolyzing the resulting product.

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4,900,871

HYDROCARBON OXIDATIONS CATALYZED BY IRON COORDINATION COMPLEXES CONTAINING A HALOGENATED LIGAND

Paul E. Ellis, Jr., Downingtown; James E. Lyons, Wallingford, and Harry K. Myers, Jr., Cochranville, all of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 246, Jan. 2, 1987. This application Jun. 26, 1987, Ser. No. 66,666
Int. Cl.[4] C07C 45/32, 45/33
U.S. Cl. 568—399 3 Claims

1. In a process in which an alkane is selectively oxidized by contact with air or oxygen in the presence of an iron coordination complex catayst, the improvement which comprises introducing halogen into said coordination complex.

4,900,872

PROCESS FOR THE PREPARATION OF FLUOROHALOGENATED ETHERS STARTING FROM FLUOROOXY-COMPOUNDS AND HALOGENATED OLEFINS

Giorgio Guglielmo, Venice, and Gian P. Gamberetto, Padua, both of Italy, assignors to Ausimont S.p.A., Milan, Italy

Continuation of Ser. No. 119,170, Nov. 10, 1987, abandoned. This application May 26, 1989, Ser. No. 361,775
Claims priority, application Italy, Nov. 14, 1986, 22349 A/86
Int. Cl.[4] C07C 41/06
U.S. Cl. 568—684 3 Claims

1. A process for the preparation of fluorohalogenated ethers having the formula:

$$(R)_nC(F)_m—O—CAF—CA^1F_2$$

wherein A and A', alike or different from each other, are chlorine or bromine, R is an alkyl or polyether radical containing from 1 to 20 carbon atoms, wholly halogenated with bromine, chlorine and/or fluorine, n is an integer from 1 to 2, m is an integer equal to 3−n, said process consisting in reacting in liquid phase a fluoroxycompound $(R)_nC(F)_m—OF$ with an olefin CAF=CA'F, at temperature between −150° and 0° C., characterized in that the fluoroxycompound is continuously fed into the reaction phase in the form of a solution having a concentration less than 50% by weight in an inert solvent, the olefin being fed in the liquid state, optionally in an inert solvent, all at the beginning into the reactor or continuously, in such a manner to have always an excess of the olefin in the reaction phase.

4,900,873

METHOD OF MANUFACTURING PHENOLS FROM LIGNIN

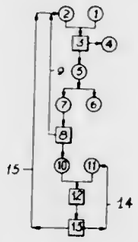
Gohki Kakemoto, Tokyo; Hiroshi Sagara; Noriyuki Suzuki, both of Handa, and Shogo Kochi, Kashiwa, all of Japan, assignors to JGC Corporation and Japan Pulp & Paper Research Institute, Inc., both of Tokyo, Japan

Filed Sep. 19, 1988, Ser. No. 245,803
Claims priority, application Japan, Sep. 21, 1987, 62-234911
Int. Cl.[4] C07C 37/68
U.S. Cl. 568—761 9 Claims

1. A method of manufacturing phenols from lignin which comprises the following steps:

dissolving plant lignin-cellulosic material in an organic or inorganic lignin removing solvent resulting in a lignin-containing material, said lignin-containing material being a lignin solution or by separating said lignin from said solution, a solid lignin-containing residue;

mixing said lignin-containing material with a double ring aromatic hydrocarbon solvent; and



decomposing said mixture at a temperature of 260°-400° C., under a pressure of 5-100 kg/cm^{2}G, for a time period of 5-180 minutes.

4,900,874

METHOD FOR PRODUCING FLUORINE-CONTAINING OLEFIN

Kiyohiko Ihara; Fumihiko Yamaguchi, and Shinichi Yamane, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Feb. 13, 1989, Ser. No. 308,926
Claims priority, application Japan, Feb. 12, 1988, 63-31551
Int. Cl.[4] C07C 17/24, 17/00, 21/18
U.S. Cl. 570—142 9 Claims

1. A method for producing a fluorine-containing olefin represented by formula (I):

$$CH_2=CFR_f \quad (I)$$

wherein R_f represents a perfluoroalkyl group or a fluoroalkyl group

comprising the step of contacting, at a high temperature, hydrogen gas with a 1,1-dihydro-2,2-difluoro alcohol represented by formula (II):

$$HOCH_2CF_2R_f \quad (II)$$

wherein R_f represents a perfluoroalkyl group or a fluoroalkyl group.

4,900,875

POLYMERIC VISCOSITY INDEX ADDITIVE AND OIL COMPOSITION COMPRISING THE SAME

Robert B. Rhodes, and Arthur R. Bean, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 71,845, Jul. 10, 1987, Pat. No. 4,849,481. This application Jan. 23, 1989, Ser. No. 299,387
Int. Cl.[4] C10M 143/10, 143/14; C08L 53/02
U.S. Cl. 585—11 27 Claims

1. A lubricating oil composition comprising a lubricating oil and a selectively hydrogenated star-shaped polymer comprising at least one arm of a block copolymer containing a single monoalkenyl aromatic hydrocarbon block and a single block having conjugated diene monomer units and a plurality of arms of a conjugated diene homopolymer or copolymer and a poly(-polyalkenyl coupling agent) nucleus, said polymer containing from about 6 to about 13 total arms as determined by gel permeation chromatography on a styrene scale and one block copolymer arm, on average, for from about 1 to about 10 conjugated diolefin homopolymer or copolymer arms, the molecular weight of the monoalkenyl aromatic hydrocarbon block being from about 0.65 to about 7.5 times the molecular weight of the conjugated diene block in said block copolymer and the molecular weight of the conjugated diene block of the block copolymer being from about 0.8 to about 1.2 times the molecular weight of the conjugated diene homopolymer or copolymer blocks.

4,900,876

POWDER EMITTING ANIMAL COLLAR AND METHOD OF MAKING

Donald W. Buthman; Marissa A. Klapwald, and John W. Mikkonen, all of County of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jul. 11, 1988, Ser. No. 217,734
Int. Cl.[4] A01K 27/00
U.S. Cl. 119—106 29 Claims



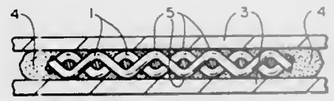
11. An animal collar for containing and emitting a powdered material made from a single sheet of flexible material comprising at least one compartment holding said powdered material, said compartment or compartments having a plurality of pores formed in at least one wall of each of said compartment or compartments, said pores being formed by laser drilling, wherein said powdered material is emitted through said plurality of pores from said collar onto an animal on which said collar is placed.

4,900,877

SHIELDING AND SEALING GASKETS

Robert S. Dubrow, Redwood City; Christine J. Holland, San Mateo; Randolph W. Chan, Palo Alto; Albert R. Martin, Oakland; Dennis C. Siden, Portola Valley, and Paul B. Germeraad, Menlo Park, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 132,641, Dec. 12, 1987, abandoned, which is a continuation of Ser. No. 2,827, Jan. 13, 1987, abandoned. This application Jul. 12, 1988, Ser. No. 218,417
Int. Cl.[4] H05K 9/00
U.S. Cl. 174—35 GC 12 Claims



1. An E.M.I. gasket for electrically shielding and environmentally sealing the space between two surfaces comprising:

(a) a metallic electrically conductive deformable structure adapted for forming electrical contact with said surfaces and for providing electrical shielding in the space between said surfaces; and

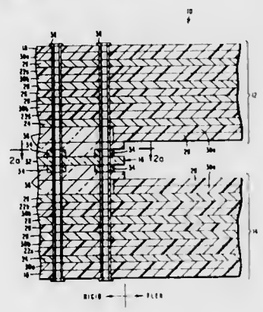
(b) a gel material for sealing the space between said surfaces having a cone penetration value of about 100 to about 350 (10^{-1}mm) and an ultimate elongation of at least 200% and being present in sufficient amount and positioned to provide an environmental seal between said surfaces and to provide environmental protection to said metallic structure; wherein at least a portion of the metallic structure is positioned and exposed outside the gel material and the gel material is positioned so as to deform into sealing contact with the surfaces and deform around the metallic structure to seal exposed portions of the metallic structure when the gasket is compressed between the surfaces.

4,900,878

CIRCUIT TERMINATIONS HAVING IMPROVED ELECTRICAL AND STRUCTURAL INTEGRITY

Elie J. Ichkhan, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 3, 1988, Ser. No. 252,826
Int. Cl.[4] H05K 1/00, 3/00
U.S. Cl. 174—258 23 Claims



1. A termination for an electrical circuit with improved electrical and structural integrity comprising:

joined layers of electrically insulating and conductive material; and

at least one layer including a stiffener material of thermosetting composition,

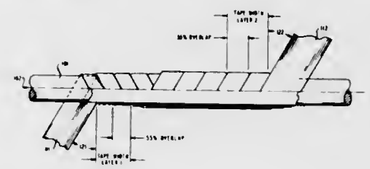
said layers of electrically insulating and conductive materials and said stiffener material layer including at least one substantially planarly arranged longitudinally extending layer consisting of a prepreg sheet and a coverlay sheet.

4,900,879

INSULATION SYSTEM FOR MAGNETIC WINDINGS

Robert J. Buck, Dover, N.J.; Helmut H. Landeck, Kelsterbach, Fed. Rep. of Germany, and Henry J. Laer, Denville, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 3, 1988, Ser. No. 252,961
Int. Cl.[4] H01B 7/02
U.S. Cl. 174—120 R 7 Claims



1. In combination:

a wire;

an insulation system with predefined creepage and clearance distances for the wire, comprising:

a first insulating tape helically would about and contiguous to the wire with a pitch in a first direction selected such that each successive turn of the first insulative tape overlaps a portion of a previous turn of the first insulative tape by a first width equalling at least one half of a width of the first insulative tape,

a second insulating tape helically wound about the wire and on top of the first insulative tape with a pitch in a second direction such that each successive turn overlaps a previous turn of the second insulative tape by a second width

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equalling at least one half of a width of the second insulative tape, and

a third insulating tape helically wound about the wire and on top of the secood insulative tape with a pitch in the first direction such that each successive turn overlaps a previous turn of the third insulative tape by a third width equalling at least one half of a width of the third insulative tape,

the first, second and third insulating tapes being of a common material and

the first, second and third width being sufficient in summation for attaining the predefined creepage and clearance distances.

5. A method of insulating a wire comprising the steps of:

defining a desired creepage and clearance distance:

selecting the first, second and third width amounts to obtain the desired creepage and clearance distance;

winding a first insulative tape of an insulative material helically around the wire so that successive wraps of the first insulative tape overlap a previous wrap of the first insulative tape by a first width amount substantially equaling at least one-half of a width of the first insulative tape;

winding a second insulative tape of the insulative material helically around the wire on top of the first insulative wrapped on the wire so that successive wraps of the second insulative tape overlap a previous wrap of the second insulative tape by a second width amount substantially equaling at least one-half of a width of the second insulaive tape

winding a third insulative tape of the insulative material helically wound the wire on top of the second insulative wrapped on the wire so that successive wraps of the third insulative tape overlap a previous wrap of the third insulative tape by a third width amount substantially equaling at least one-half of a width of the third insulation tape.

4,900,880

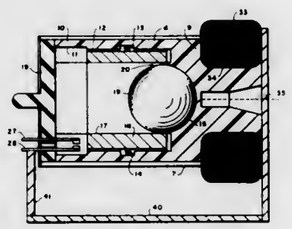
GAS DAMPED CRASH SENSOR

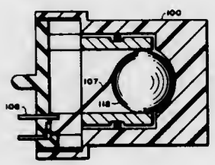
David S. Breed, Boonton Township, Morris County, N.J., assignor to Automotive Technologies International, Inc., Boonton Township, Morris County, N.J.

Continuation-in-part of Ser. No. 232,441, Aug. 15, 1988, abandoned. This application Feb. 21, 1989, Ser. No. 313,630

Int. Cl.[4] H01H *35/14*

U.S. Cl. 200—61.45 M **13 Claims**





1. A crash sensor comprising:

(a) a tubular passage;

(b) a magnetically permeable sensing mass, arranged to move in said passage between a first location and a second location;

(c) a magnet for biasing said sensing mass toward said first location in said passage;

(d) first and second electrical contacts arranged to come in contact with each other when said sensing mass is moved to said second location, both said first and said second contacts being constructed of magnetically permeable material;

(e) means for concentrating magnetic flux from said magnet through said first and second contacts in response to the presence of said sensing mass at said second lcoation, such that said contacts are mutually attracted to each other and tend to remain in contact once closed as long as said flux is present.

9. A sensor for detecting a motor vehicle crash comprising:

(a) a tubular passage;

(b) a sensing mass arranged to move in said passage in response to a vehicle crash, there being a tight clearance between said sensing mass and said passage such that the movement of said sensing mass with respect to said passage is damped by gas flow;

(c) a flexible first electrical contact;

(d) a second more rigid electrical contact in proximity to said first contact;

(e) means responsive to the movement of said sensing mass with respect to said passage for displacing said first contact toward said second contact causing said first and second contact to close an electrical circuit during a crash;

(f) means for biasing said sensing mass so as to maintain said first and second contacts in open relationship in the absence of a vehicle crash.

4,900,881

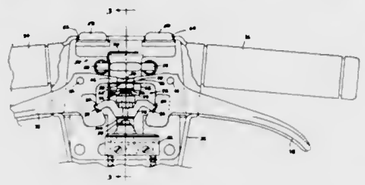
SAFETY INTERLOCK FOR FLOOR MAINTENANCE MACHINE AND METHOD

Ernest J. Fischer, Skokie, Ill., assignor to Breuer Electric Mfg. Co., Chicago, Ill.

Filed Oct. 24, 1988, Ser. No. 261,726

Int. Cl.[4] A47L *11/14;* **H01H** *3/20, 9/06*

U.S. Cl. 200—61.85 **15 Claims**



14. A floor maintenance machine comprising a base; an electric motor on the base for moving a floor treating element; a handle connected to the base; electric switch means, carried by the handle, for controlling connection of electric power to the motor; a pair of hand levers carried by the handle; means for coupling said hand levers to said switch means for operation of said switch means by said hand levers, said hand levers being movable by an operator between deactuated positions whereat said switchmeans does not connect power to the motor and actuated positions whereat said switch means connects power to the motor; and means coupled with said hand levers for controlling movement of said hand levers to enable said hand levers to be simultaneously moved from their deactuated to their actuated positions to operate said switch means to connect power to the motor and to prevent only one of said hand levers from being moved from its deactuated to its actuated position while the other hand lever is in its deactuated position, whereby both hand levers must be simultaneously moved to their actuated positions to connect power to said motor and start said machine.

4,900,882

ROTATING ARC AND EXPANSION CIRCUIT BREAKER

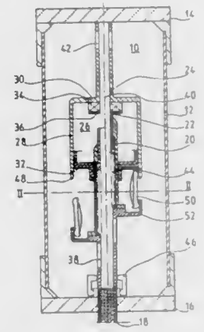
Georges Bernard, St. Egreve; Raymond Bresson, Grenoble; Pierre LeClercq, Moirans; Odile Fileau, St. Nazaire-les-Eymes, and Francois Scarponi, Brignoud, all of France, assignors to Merlin Gerin, France

Filed Jun. 22, 1988, Ser. No. 209,927

Claims priority, application France, Jul. 2, 1987, 87 09524

Int. Cl.[4] H01H *33/18, 9/44*

U.S. Cl. 200--147 R **7 Claims**



1. A circuit breaker with a sealed enclosure filled with a high dielectric strength gas and containing one or more poles of the circuit breaker, each pole comprising:

a breaking chamber having a revolution surface tightly sealed at both its ends by end plates;

a pair of arcing contacts having a contact area in a closed position and an arcing contact separation area in a separated position, at least one of these arching contacts being tubular, coaxially arranged in said breaking chamber and each passing through one of said end plates to make the breaking chamber communicate, in the separated position of the arcing contacts, with said enclosure forming an expansion chamber via gas outflow channels constituted by the tubular arcing contact;

a magnet means supported by one of said end plates inside the breaking chamber so as to create in the arcing contact separation area a magnetic blowout field by rotation of an arc drawn between the separated arcing contacts; and

a pair of main contact disposed outside the breaking chamber and arranged to open before the arcing contacts separate when a circuit breaker opening operation takes place, wherein said revolution surface and the end plate supporting the magnet means are made of metal and electrically connected to the arcing contact passing through this end plate, the other end plate being made of insulation material to provide electrical insulation in the open position of the contacts and wherein said revolution surface has an annular edge which is adjacent to the insulation end plate and is arranged as or supports the stationary main contact, the contact area of the arcing contacts being offset to the side of the metal end plate.

4,900,883

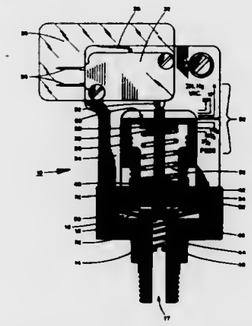
FLUID-OPERATED COMPOUND SWITCH

J. Yancey Brame, West Hartford; Michael F. Horn, Hamden; Jeffrey A. Saucier, Bristol; David L. Siedman, New Britain; Emery G. Thomas, West Hartford, and Robert L. Varnum, Bristol, all of Conn., assignors to Whitman Controls Corporation, Bristol, Conn.

Filed Jun. 14, 1988, Ser. No. 206,293

Int. Cl.[4] H01H *35/40*

U.S. Cl. 200—83 S **7 Claims**



4. A fluid-operated compound switch, comprising:

(a) an upper body member;

(b) a lower body member attached to said upper body member;

(c) a chamber defined within said upper and lower body members;

(d) a diaphragm, having first and second sides, fixedly disposed in said chamber between said upper and lower body members;

(e) a channel defined within said lower body member to permit communication of said fluid with said first surface of said diaphragm so that positive fluid pressure will cause said diaphragm to flex in a first direction and fluid vacuum will cause said diaphragm to flex in a second direction;

(f) switching means fixedly disposed with respect to said upper body member;

(g) rod means to transmit said flexure of said diaphragm to said switch means;

(h) main spring means transmitting force to a shoulder formed on the periphery of said rod means so as to bias said diaphragm in said second direction, said main spring means

(i) counterspring means operatively connected to bias said diaphragm in said first direction;

(j) adjusting means to selectively effect, together, compression and relaxation of said main spring and said counterspring.

4,900,884

COMPOSITE COOKING SYSTEM HAVING MICROWAVE HEATING AND INDUCTION HEATING

Masayuki Aoki, Ichinomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 30, 1988, Ser. No. 238,618

Claims priority, application Japan, Nov. 28, 1987, 62-300417; Nov. 28, 1987, 62-300418; Nov. 28, 1987, 62-300419; Nov. 30, 1987, 62-302662

Int. Cl.[4] F24C *7/08;* **H05B** *6/06, 6/68, 6/12*

U.S. Cl. 219—104.93 **16 Claims**

13. A method of controlling a composite cooking system having an inverter for rectifying an AC input to obtain a DC output end switching the DC output so as to selectively obtain a high-frequency output for microwave or induction heating, a

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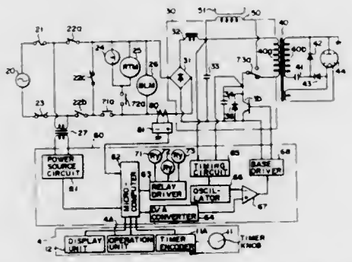
microwave heater, coupled to the inverter, for receiving the high-frequency output for microwave heating and generating a first heating power, an induction heater coupled to the inverter for receiving the high-frequency output for induction heating and generating a second heating power by electromagnetic induction, the method comprising the steps of:

setting an output setting value so as to selectively obtain the first or second heating power;

detecting a current value of the AC input to the inverter;

comparing the output setting value with the current value;

supplying a control signal to the inverter in accordance with a comparison result of the comparing step, to thereby



control the output from the inverter and cause the microwave heater or the induction heater to selectively generate the first or second heating power;

setting a load detection setting value when the output setting value for obtaining the second heating power is set;

comparing the load detection setting value with the current value;

determining whether the load of the induction heating means is proper in accordance with a comparison result; and

supplying an operation interruption signal to the inverter when the determination result represents that the load is improper.

4,900,885

HIGH FREQUENCY HEATING SYSTEM WITH CHANGING FUNCTION FOR RATED CONSUMPTION POWER

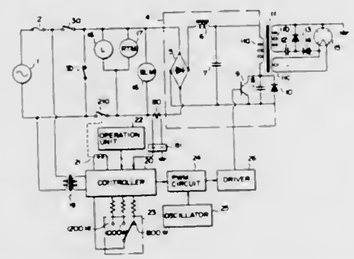
Masato Inumada, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 15, 1989, Ser. No. 310,915

Claims priority, application Japan, Feb. 16, 1988, 63-33425

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—10.55 B **5 Claims**



1. A high frequency heating apparatus comprising:

a high frequency heating source having a predetermined maximum rated high frequency output;

inverter means for receiving an AC input and supplying a predetermined high frequency drive power to said high frequency heating source, said inverter means including rectifying means for rectifying the AC input and a switching element for switching a DC output from said rectifying means;

changing means for manually changing and outputting a plurality of rated consumption power change signals, said changing means including at least two levels corresponding to the maximum rated high frequency output of said high frequency heating source and at least one high frequency output lower than the maximum rated high frequency output, associated with a rated consumption power of said apparatus; and

control means for controlling the high frequency drive power from said inverter means in accordance with the rated consumption change signal from said changing means, the high frequency output from said high frequency heating source and the rating consumption power of said apparatus being linearly, variably set in accordance with the rated consumption power change signal, said control means including an AC input detecting means for detecting the AC input to said inverter means, comparing means for comparing a detection output from said AC input detecting means with a reference signal, control signal output means for outputting a control signal for switching said switching element of said inverter means in accordance with an output from said comparing means, and reference signal generating means for generating the reference signal; and

wherein said changing means changes the level of the reference signal corresponding to one of the plurality of rated consumption power change signals and said changing means further including a plurality of resistors interlocked with said reference signal generating means and a switch for switching the plurality of resistors.

4,900,886

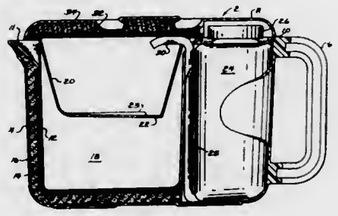
MICROWAVE BEVERAGE MAKER

John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Inc., Nashville, Tenn.

Filed Mar. 21, 1988, Ser. No. 170,778

Int. Cl.[4] A47J *31/00;* **H05B** *6/80*

U.S. Cl. 219—10.55 E **32 Claims**



29. A beverage maker comprising:

(a) a container having a receiver portion for receiving a beverage made by passing hot liquid over a beverage ingredient, said container including means for insulating the interior of said receiver portion;

(b) a basket for holding a beverage ingredient at an upper end of said receiver portion;

(c) means for supplying said hot liquid into said basket to flow over said beverage ingredient, said means for supplying including a reservoir, said reservoir and said receiver portion being positioned adjacent to each other in side-by-side fashion in a non-overlapping relationship;

(d) means for permitting said hot liquid and said beverage ingredient to exit from said basket into said receiver portion; and

(e) said means for insulating include said reservoir.

4,900,887

FLOATING ZONE DRAWING CIRCUITRY FOR SEMICONDUCTOR RODS

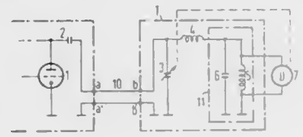
Wolfgang Keller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 48,193, May 11, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 322,749

Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616595

Int. Cl.[4] H05B *6/08*

U.S. Cl. 219—10.77 **4 Claims**



1. A circuit for float zone drawing of semiconductor rods, the circuit comprising:

a high-frequency generator having an output;

a coupling circuit connected to the output of the high-frequency generator, the coupling circuit comprising a variable capacitor connected to the output and a series coupling coil connected between the output and a parallel heating circuit, the series coupling coil inductively coupling the output of the high-frequency generator to the parallel heating circuit, the heating circuit comprising an inductive heating coil and a heating capacitor connected in parallel to each other, the heating coil having an inductance and the series coupling coil having an inductance larger than the inductance of the heating coil, the coupling circuit capacitor being variable in capacitance, and

means for adjusting the variable capacitor responsive to a voltage potential directly across the inductive heating coil to compensate for a change in value of the inductance of the heating coil to avoid a mismatch between the output of the high-frequency generator and the coupling circuit.

4,900,888

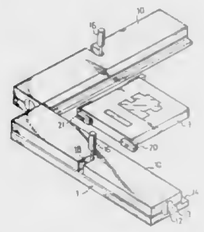
HOLDER FOR WIRE-ARC DISCHARGE CUTTING MACHINERY

Chin-Jen Lee, No. 1-7, Lane 248, Chung Chen Rd., Shu Lin Chen, Taipei Hsien, Taiwan

Filed May 12, 1989, Ser. No. 351,452

Int. Cl.[4] B23H *1/00, 7/02;* **B23Q** *3/154*

U.S. Cl. 219—69.11 **3 Claims**



1. A holder for wire-arc discharge cutting machinery comprising:

two orthogonal rectangular seats, each seat having a respective rectangular flange extending along a length of said seat at a lower edge thereof; each seat having a respective insulating layer disposed therein and extending along a length of each said seat, each said insulating plate being at a height greater than said flange and less than an overall height of said flange and said blocks; each said seat having a respective cylindrical permanent magnetic insert provided between said seat and said flange; each said magnetic insert extending along a length of each said seat and separating each said respective insulating layer into two parts; a bar being attached to each said magnetic insert through a slot provided on a middle portion of each said seat to control an ON/OFF condition of each said magnetic insert;

a plurality of rectangular blocks, respective blocks being fastened to two adjacent sides of a processing material and attaching to said seats and said flanges at one side before processing wherein a bottom surface of the processing material is placed on a same level of a bottom surface of said seat and flange, a bottom surface of each said block being placed on a top surface of said flanges, an opposite side of each respective said side of each said block and each respective said seat having a clearance therebetween for magnetic flux to pass therethrough; the processing material and said blocks being attracted to said flanges by said magnetic inserts when said lever is at an ON position.

4,900,889

CURRENT SUPPLY DEVICE FOR MOVABLE ELECTRODES OF SPARK EROSION MACHINES

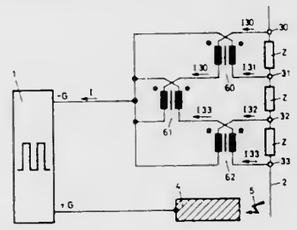
Ernst Buhler, Losone; Peter Wehrli, Versico; Massimo Martignoni, Lumino, and Mauro Erba, Locarno, all of Switzerland, assignors to Ag fur Elektronik Industrielle, AGIE, Losone bei Locarno, Switzerland

Filed Feb. 15, 1989, Ser. No. 311,170

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1988, 3804811

Int. Cl.[4] B23H *7/10, 7/04*

U.S. Cl. 219—69.12 **17 Claims**



1. A current supply device for movable electrodes of spark erosion machines, comprising a plurality of current supply contacts arranged in series in a direction of elongation of a movable electrode and connected by leads to a current supply source; and a plurality of electrical components interconnected in said leads between said current supply contacts and said current supply source, said electrical components being constructed and wired in said leads in such a way that partial currents fed in at individual current supply contacts are of the same magnitude, taking into consideration of a voltage drop along said electrode, wherein the electrical components interconnected in the leads are dimensioned so as to bring about an inductive negative feedback of the partial currents.

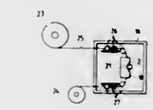
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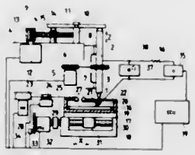
4,900,890

ELECTRIC DISCHARGE MACHINING METHOD AND APPARATUS FOR MACHINING A MICROSHAFT

Takeshi Masaki, Kawasaki; Takeshi Mizutani, Tokyo; Katsutoshi Yonemaochi, Zama, and Akemi Tanaka, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 1, 1988, Ser. No. 239,293
Claims priority, application Japan, Sep. 7, 1987, 62-223479; Oct. 16, 1987, 62-262046; Oct. 16, 1987, 62-262047; Oct. 16, 1987, 62-262059; Mar. 11, 1988, 63-58737; Mar. 11, 1988, 63-58738; Jan. 15, 1988, 63-147462
Int. Cl.[4] B23H *1/00, 7/02, 9/14*
U.S. Cl. 219—69.17 18 Claims





1. An electric discharge machining method of machining a microshaft by means of electric discharge made between said microshaft and a conductive wire through an electric discharge circuit, said microshaft being vertically supported by supporting means to be rotatable about its own axis and movable up and down in directions of the axis by means of microshaft driving means and said wire being arranged to travel in a direction of its own axis and to be movable in directions close to and away from said microshaft by means of wire driving means, whereby said wire is relatively movable with respect to said microshaft in horizontal and vertical directions, comprising the steps of:

(a) determining a first reference point in the horizontal direction that the axis of said wire intersects the axis of said microshaft;

(b) driving said wire driving means so that said wire travels in the direction of its own axis;

(c) rotating said microshaft and machining the lower end surface of said microshaft by said wire so that the lower end surface thereof becomes perpendicular to the axis thereof to determine a second reference point in the vertical direction on the basis of the position of the machined end surface thereof;

(d) shifting said wire up to a predetermined position away from said first reference point in the horizontal direction by a first predetermined distance; and

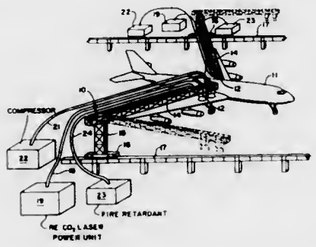
(e) moving said microshaft with respect to said wire in the vertical directions by a second predetermined distance between said second reference point and a predetermined point with said microshaft being rotated and said wire travelling so that said microshaft is machined to have a diameter substantially equal to twice said first predetermined distance and the machined portion of said microshaft has a length corresponding to said second predetermined distance.

4,900,891

LASER ICE REMOVAL SYSTEM

Roger Vega, and Rose M. Vega, both of Saddle Club Rd., R.D. #7, Kittanning, Pa. 16201

Filed Jun. 20, 1988, Ser. No. 208,453
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.6 21 Claims



1. An ice and snow removal system for a surface, comprising:

laser light generating means for generating a heat producing beam to superficially liquify ice on a surface;

ground-based means for supporting and positioning said laser light generating means in a desired orientation relative to said surface and for positioning the laser light generating means in said desired orientation proximate to said surface; and

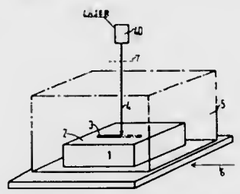
lens means positioned to focus the beam generated by the laser light generating means and for directing the light into a broadened beam width upon said surface to thereby vaporize the ice and snow formed thereupon.

4,900,892

METHOD FOR WORKING MEMBERS COMPOSED OF OXIDE MATERIAL

Dieter Baeuerle, Altenberg; Michael Eyett, Linz, both of Austria; Helmut Thomann, Munich, and Wolfram Wersing, Kirchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,526
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1987, 3718323
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.85 5 Claims



1. A method for working members composed of a perovskite material selected from the group consisting of lead-, calcium-, barium-, titanate, -zirkonate, -tantalate, and high-temperature superconductor material, comprising the steps of:

directing a laser emission having a wavelength in air of less than approximately 350 nm onto a processing zone of a member to be worked;

pulsing the laser emission so that only pulses of laser energy impinge the member to be worked; and

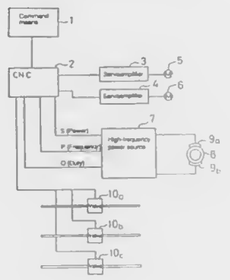
relating a pulse duration, a pulse repetition rate and a pulse energy to one another so that significant harmful heat accumulation is avoided in the member to be worked in a near region of a processing zone.

4,900,893

LASER OSCILLATION CONTROL SYSTEM

Etsuo Yamazaki; Tsuyoshi Nagamine, and Shigeru Isohata, all of Hachioji, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP88/00185, § 371 Date Nov. 3, 1988, § 102(e) Date Nov. 3, 1988, PCT Pub. No. WO88/06938, PCT Pub. Date Sep. 22, 1988
PCT Filed Feb. 19, 1988, Ser. No. 273,516
Claims priority, application Japan, Mar. 20, 1987, 62-65778
Int. Cl.[4] B23K *26/02*
U.S. Cl. 219—121.82 4 Claims



1. A laser oscillation control system including a laser oscillator for performing laser machining by controlling the X-Y table with a numerical control system, an output of the laser oscillator being controlled by a G-code, a power output command, a pulse frequency command and a pulse duty ratio included in a command program of the numerical control system.

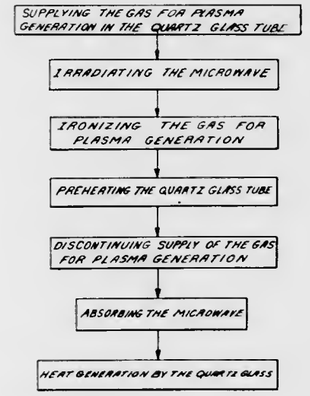
4,900,894

METHOD OF HEATING A QUARTZ GLASS TUBE

Gotaro Tanaka; Hiroshi Suganuma; Akira Urano; Masahiro Takagi, and Shunichi Mizuno, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 13, 1989, Ser. No. 296,778
Claims priority, application Japan, Jan. 18, 1988, 63-7008
Int. Cl.[4] B23K *9/00*; C03B *37/01*
U.S. Cl. 219—121.59 8 Claims

1. A method of heating a quartz glass tube with microwaves, which method comprises supplying a gas for plasma generation in the quartz glass tube, applying microwaves to the quartz glass tube so as to generate a hot plasma in the quartz glass tube and to pre-heat the quartz glass tube to a temperature whereby microwaves are absorbed by the tube, and then discontinuing the supply of the gas for plasma generation while



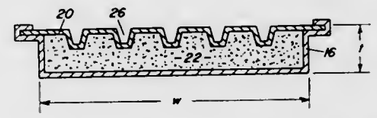
continuing to apply the microwaves, whereby causing the quartz glass tube to absorb the microwaves to heat the tube.

4,900,895

RECTANGULAR ELECTRODE

Claire B. Marshall, York, Pa., assignor to Alloy Rods Global, Inc., Hanover, Pa.

Continuation of Ser. No. 724,041, Apr. 18, 1985, abandoned, which is a continuation of Ser. No. 148,603, May 9, 1980, abandoned. This application Feb. 8, 1989, Ser. No. 309,015
Int. Cl.[4] B23K *35/00*
U.S. Cl. 219—145.22 31 Claims



1. A method of making a generally rectangular continuous electrode, having a width to thickness ratio of at least 4:1, comprising the steps of:

forming sheet metal into a first continuous trough-shaped sheath,

filling the trough-shaped sheath with granular electrode core materials,

enclosing the sheath,

intermittently mechanically depressing a portion of at least one electrode wall which defines the width of the electrode, inwardly toward and spaced apart from the opposing wall of the electrode along the length of the electrode to immobilizedly restrict the electrode core materials within the electrode, and then

coiling the electrode.

4,900,896

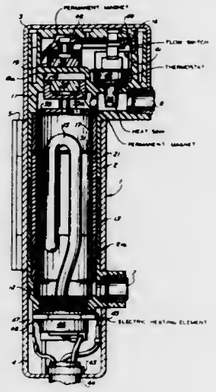
CONTINUOUS FLOW WATER HEATER WITH MAGNETICALLY-ACTUATED FLOW SWITCH

Daryl D. Mass, 3550 Smuggler Cir., Boulder, Colo. 80303

Continuation-in-part of Ser. No. 834,754, Feb. 26, 1986, abandoned, which is a continuation-in-part of Ser. No. 649,467, Sep. 12, 1984, abandoned. This application Jul. 13, 1987, Ser. No. 72,761

Int. Cl.[4] **H04B** *1/02;* **H05B** *3/82;* **F24H** *1/10;* **H01H** *35/34*

U.S. Cl. 219—309 **8 Claims**



1. A continuous flow water heater comprising:

(a) an exterior housing;

(b) a sealed chamber contained within said housing and defining a water flow path, said sealed chamber being defined by:

(1) a central tube;

(2) a top fitting connected to one end of said central tube; and

(3) a bottom fitting connected to the other end of said central tube;

said sealed chamber further including:

(4) a cold water inlet fitting adapted to be connected to a pipe coupled to a source of cold water under pressure; and

(5) a hot water outlet fitting adapted to be connected to a pipe coupled to a hot water utilization device;

(c) an electrical heating element disposed in said sealed chamber;

(d) switch means situated outboard said sealed chamber and within said exterior housing, said switch means including:

(1) an actuator;

(2) a flow switch having contacts actuable in response to travel of said actuator;

(3) a thermostat having contacts actuable in response to said thermostat sensing a temperature in excess of a predetermined value;

(e) electrical-conductor means connecting said flow switch, said thermostat and said heating element in series and to an external source of energy such that said heating element is only energized when said contacts of said flow switch and said contacts of said thermostat are both closed;

(f) a diaphragm situated within and extending across said sealed chamber and oriented for limited translation with respect to the longitudinal axis of said sealed chamber in response to water pressure bearing on said diaphragm as water flows through said sealed chamber, said diaphragm including:

(1) an orifice through which water must pass as it flows through said sealed chamber;

(g) switch actuating means coupled to said diaphragm for moving said actuator to actuate said flow switch in response to axial translation of said diaphragm resulting from water flow through said sealed chamber; and

(h) a heat sink made from a material exhibiting high thermal conductivity and extending from within said sealed chamber proximate said hot water outlet fitting to a position in heat exchanging relationship with said thermostat whereby said thermostat senses and is responsive to the temperature of hot water passing through said hot water outlet fitting such that said contacts of said thermostat open when the temperature of the hot water is sensed to exceed said predetermined value.

4,900,897

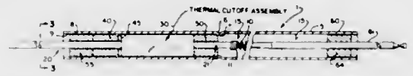
SHEATHED ELECTRIC HEATING ELEMENT ASSEMBLY

Donald M. Cunningham, Pittsburgh, Pa.; Mark A. Bartels, Rockford, Ill., and T. Randall Markum, Vernon, Ala., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 21, 1988, Ser. No. 273,291

Int. Cl.[4] **H05B** *3/48*

U.S. Cl. 219—336 **3 Claims**



1. In a metallic sheathed electric heating element assembly having a resistance element, a sheath surrounding said resistance element, pulverulent electrically insulating material within said sheath and surrounding said resistance element, said insulating material being tightly compacted and extending within said sheath short of an open end thereof, and a terminal pin electrically and mechanically connected to an end of said resistance element within the compass of said sheath, said resistance element contiguous its place of attachment to said pin being surrounded by said compacted insulating material, the improvement comprising said pin having an inner part to which said resistance element is connected, and an outer part spaced from said inner part, and a thermal switch electrically connected to and in series between said inner and outer parts, within said sheath but spaced toward said open end from said compacted insulating material, bushings adjacent ends of said thermal switch, said bushings being of a diameter greater than that of the thermal switch, and a sleeve surrounding said bushings and said thermal switch.

4,900,898

ELECTRIC SPACE HEATER

William E. Kling, 6647 Tanglewood, S. E., Grand Rapids, Mich. 49506

Filed Jan. 20, 1988, Ser. No. 146,241

Int. Cl.[4] **F24H** *3/02, 7/04*

U.S. Cl. 219—339 **40 Claims**

1. In an electric space heater comprising:

a housing having an inlet opening at one side and an outlet opening at another side thereof;

a heat source within the housing;

a heat exchanger adjacent to the heat source for receiving heat from the heat source; and

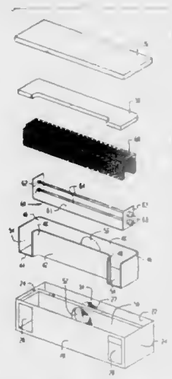
means to drive air from the inlet opening by way of the heat exchanger to absorb heat therefrom and out through the outlet opening of the housing,

the improvement which comprises:

said housing being substantially closed;

said heat source comprising at least one elongated lamp, said elongated lamp having a longitudinal axis which is substantially transverse to the direction of the flow of air from said inlet opening; and

the heat exchanger comprising a foraminous sheet material at least partially surrounding the at least one elongated lamp in closely spaced relationship thereto, said foraminous sheet having at least one face which is substantially transverse to the direction of the flow of air from said inlet opening and between the inlet opening and the elongated lamp, whereby the air from the inlet opening is driven against and through said foraminous sheet material and around said at least one elongated lamp to absorb heat from said elongated lamp and from said foraminous sheet material in turbulent flow.



4,900,899

COOKING UNIT WITH RADIANT HEATERS

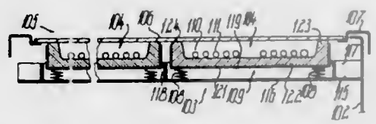
Felix Schreder, and Gerhard Gössler, both of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Division of Ser. No. 18,945, Feb. 25, 1987, Pat. No. 4,778,978. This application Sep. 19, 1988, Ser. No. 246,407

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1986, 3606117; Apr. 24, 1986, 3613902

Int. Cl.[4] **H05B** *3/74*

U.S. Cl. 219—464 **18 Claims**



1. A cooking unit for cookers and especially for industrial kitchen cookers, said cooking unit comprising:

a top plate arranged at a top of the cooking unit and having bottom and top sides, an entire cooking field being defined on said top side and defining a total surface of said entire cooking field;

at least two separate electric radiant heater means arranged on the bottom side of said top plate, said radiant heater means forming a number of separately controllable cooking points positioned adjacent each other in the entire cooking field of said top plate, each radiant heater means having an external border shape defining outer sides;

each said radiant heater means having at least one radiator heating element defining a heating field, said radiator heating element being arranged in a support shell, thereby providing at least two support shells;

an understructure arranged below said top plate, each said radiant heater means resting against said understructure and being pressed against the bottom side of said hotplate, wherein said understructure is provided with a separate receptacle for each of the radiant heater means, each said receptacle being adapted to an external border shape of a corresponding radiant heater means for receiving said radiant heater means and securing said radiant heater means against all lateral movements, all said receptacles substantially directly adjoining each other, thereby rendering the entire cooking field heatable uninterruptedly over an area of substantially at least 85% of its total surface by said electric heater means, said electric heater means being separately inserted.

4,900,900

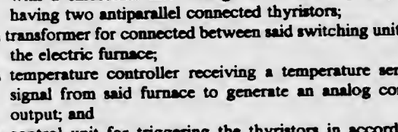
METHOD AND APPARATUS FOR CONTROLLING A-C POWER BY MEANS OF THYRISTORS FOR A RESISTANCE-TYPE ELECTRIC FURNACE

Hiroshi Shirae, and Shinichi Shirae, both of Tokyo, Japan, assignors to Hakko Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 138,497, Dec. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 20,595, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 775,592, Sep. 13, 1985, abandoned. This application Jan. 26, 1989, Ser. No. 302,470

Int. Cl.[4] **H05B** *1/02*

U.S. Cl. 219—501 **7 Claims**



1. An apparatus for controlling the a-c power for an electric furnace comprising:

a switching unit for connected to an a-c power supply line with a sinusoidal line voltage at a line frequency and having two antiparallel connected thyristors;

a transformer for connected between said switching unit and the electric furnace;

a temperature controller receiving a temperature sensing signal from said furnace to generate an analog control output; and

a control unit for triggering the thyristors in accordance with said analog control signal, said control unit including:

a presetting circuit for scaling said analog control signal;

a voltage-frequency converter connected to said presetting circuit for generating pulses with spacing in an inverse proportion to said analog control signal;

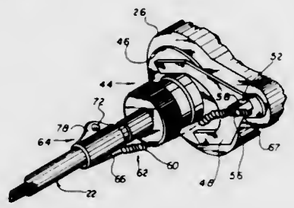
a zero point synchronization unit for generating a first and second series of square pulses corresponding to the positive and negative half-cycles of said line voltage synchronized with the zero cross points of said line voltage;

a cycle synchronization stage connected to said voltage-frequency converter and said zero-point synchronization unit for generating square pulses having a width of ⅛ to ¾ the width of a cycle of the line frequency, and having a start position corresponding to the zero cross point of the line voltage;

a trigger pulse generating stage for generating trigger pulses for said thyristors from said square pulses from the cycle synchronization stage, said trigger pulses being transmitted to the gates of the thyristors.

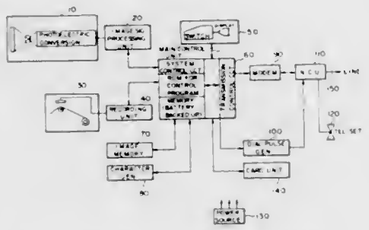
VOL 1111 ISS 2 FE 13 1990 UMI

4,900,901
TAMPER PROOF ASSEMBLY
Iguy Richard, P.O. Box 1295, Miami, Fla. 33261
Filed Jun. 9, 1989, Ser. No. 363,688
Int. Cl.[4] G01C *22/00*
U.S. Cl. 235—95 R **16 Claims**



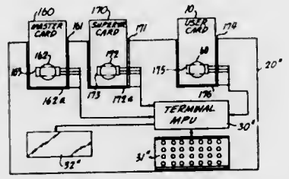
1. A tamper proof protection assembly to prevent unauthorized removal of an odometer cable from a transmission of an automobile or like vehicle, said assembly comprising:
(a) a mounting sleeve attached in surrounding engagement with the odometer cable,
(b) a connector means secured to said mounting sleeve and structured for attachment of said mounting sleeve in an operative position,
(c) a tamper indicator having an elongated configuration with a proximal end attached to said sleeve and an oppositely disposed distal end secured to a mounting structure disposed to normally secure a mounting adaptor securing the cable to the transmission,
(d) attachment means inter-connecting the mounting structure to the transmission, said attachment means structurally adapted to secure said tamper indicator thereto in a blocking disposition relative to removal of said attachment means and mounting structure from the transmission, and
(e) said tamper indicator formed at least in part from a frangible material and disposed and structured to be severed upon removal of said attachment means.

4,900,902
DATA COMMUNICATION APPARATUS
Kenzo Sakakibara, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 16, 1986, Ser. No. 942,208
Claims priority, application Japan, Dec. 19, 1985, 60-286696; Dec. 19, 1985, 60-286697
Int. Cl.[4] G06F *15/20*
U.S. Cl. 235—375 **36 Claims**



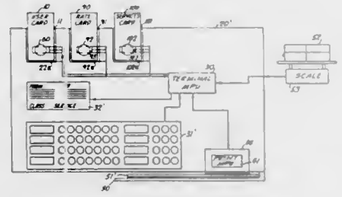
1. A data communication apparatus comprising:
data transmitting means for transmitting data;
reading means for reading data stored in a card having a storage medium, said card being capable of storing character code data and image data therein; and
controlling means for controlling said data transmitting means to transmit the data stored in said card;
wherein said controlling means discriminates a function of a destination apparatus and converts the character code data stored in said card to image data in accordance with the function of said destination apparatus, thereafter effecting data transmission.

4,900,903
AUTOMATED TRANSACTION SYSTEM WITH INSERTABLE CARDS FOR TRANSFERRING ACCOUNT DATA
Christopher B. Wright, San Francisco, and Stephen Bristow, Los Altos Hills, both of Calif., assignors to Wright Technologies, L.P., San Francisco, Calif.
Division of Ser. No. 935,244, Nov. 26, 1986, Pat. No. 4,802,218.
This application Oct. 17, 1988, Ser. No. 258,579
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **7 Claims**



1. An automated transaction system comprising:
(a) a plurality of user cards each issued to a respective user and having a user card microprocessor and a memory incorporated therein for maintaining a history of user account transactions and a user account balance therein, each said user card having data output means connected to said user card microprocessor;
(b) a plurality of master cards each having a master card microprocessor and a memory incorporated therein for maintaining a history of master account transactions and a master account balance therein, each said master card having data output means connected to said microprocessor;
(c) a plurality of terminals each having first receiving means for receiving any one of said plurality of user cards inserted therein and establishing a connection with said user card data output means, second receiving means for receiving one of said plurality of master cards inserted therein and establishing a connection with said master card data output means, operating means for performing a set of desired terminal functions, and first path means for establishing a data communication path between the user card microprocessor of a user card inserted in said first receiving means and the master card microprocessor of a master card inserted in said second receiving means of said terminal;
(e) said user cards and said master cards each having program means for performing an account transfer transaction between a user card and a master card inserted in a terminal wherein value from the account balance of one card is debited and the account balance of the other card is correspondingly credited; and
(f) transaction history recording means for receiving a user card or a master card therein and producing a transaction history record of the account transactions stored in said card.

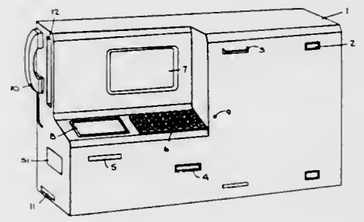
4,900,904
AUTOMATED TRANSACTION SYSTEM WITH INSERTABLE CARDS FOR DOWNLOADING RATE OR PROGRAM DATA
Christopher B. Wright, San Francisco, and Stephen Bristow, Los Altos Hills, both of Calif., assignors to Wright Technologies, L.P., San Francisco, Calif.
Division of Ser. No. 935,244, Nov. 26, 1986, Pat. No. 4,802,218.
This application Oct. 17, 1988, Ser. No. 258,517
Int. Cl.[4] G06F *7/08*
U.S. Cl. 235—381 **20 Claims**



1. An automated transaction system comprising:
a plurality of portable rate cards each having a memory embedded therein for storing rate information corresponding to a respective one of a plurality of different services, and data output means connected to said memory;
a transaction terminal having an external slot for insertion by a user of any one of said plurality of portable rate cards therein;
operating means in said terminal for executing terminal functions including the function of transacting an item of value in accordance with the respective rates of any selected one of said plurality of different services;
said terminal having connecting means in said terminal for establishing a connection between said operating means and the data output means of an inserted rate card, and input means for enabling a user to input a request for an item of value of any selected one of said plurality of different services; and
said operating means of said terminal including rate card verifying means for verifying that the rate card inserted by the user corresponds to the selected one service for which the item of value was requested, and rate calculation means for calculating the value of the requested item using the rate information stored in said memory of said inserted rate card which is verified as to said one service; and
dispensing means associated with said terminal for dispensing the requested item of said one service having the value calculated by said rate calculating means.

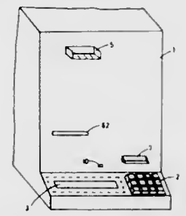
4,900,905
AUTOMATED MAIL COLLECTING AND TELECOMMUNICATION MACHINE
Pavo Pusic, Moluntska 6, 50000 Dubrovnik, Yugoslavia
Filed Aug. 1, 1988, Ser. No. 226,778
Int. Cl.[4] G06F *7/08*
U.S. Cl. 235—381 **15 Claims**

1. Self-contained apparatus for processing and collecting an item to be mailed comprising:
computer means;
display means coupled to said computer means, said display means displaying information associated with the use of the apparatus such as the instructions for using said apparatus;
receiving means coupled to said computer means for receiving the item to be mailed;
data entry means coupled to said computer means and to said display means for entering data relating to the item to be mailed, such as the address to which said item is to be mailed;
weighing means coupled to said computer means and to said receiving means for securely weighing said item to be mailed;
determining means including said computer means and coupled to said data entry means and to said weighing means for determining the required postage for said item to be mailed;



payment means for accepting and verifying payment for said postage including said computer means and coupled to said display means, to said data entry means, and to said determining means;
means coupled to said computer means for providing machine readable information concerning the item to be mailed on the item to be mailed, such as the zip code to which said item is to be mailed; and
transport means coupled to said computer means for transporting the item to be mailed from said receiving means to a storage area for subsequent pick up.

4,900,906
AUTOMATED FUEL PUMP CONTROLLING SYSTEM
Pavo Pusic, Moluntska 6, Dubrovnik, Yugoslavia (50000)
Filed Aug. 4, 1988, Ser. No. 228,028
Int. Cl.[4] G06F *7/08*
U.S. Cl. 235—381 **5 Claims**



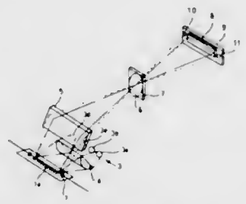
1. An automated system for controlling the operation of an electronically controllable fuel dispensing pump comprising:
automated system's debit card vending apparatus;
automated system's debit card reading and processing apparatus;
both said apparatuses adapted for use by a customer.

4,900,907

OPTICAL INFORMATION READING APPARATUS

Takesi Matsuisa, Nagoya, and Atutosi Okamoto, Chita, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 18, 1987, Ser. No. 28,646
Claims priority, application Japan, Mar. 18, 1986, 61-60376; Sep. 4, 1986, 61-208783
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 **14 Claims**



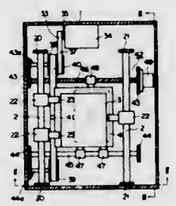
1. Apparatus for reading optically readable information, which reflects light comprising:
a casing having an opening for facing optical information;
optical means, disposed in said casing, for imaging at a predetermined reading position in said casing an image of optically readable information facing said opening by light reflected therefrom;
reading sensor means, disposed at said predetermined reading position and having a light receiving plane, for converting said image into an electrical signal; and
light emitting means, positioned in said casing and substantially the same plane as said light receiving plane of said reading sensor means, for emitting light through at least part of said optical means to allow determination of focus of an image of said emitted light near optically readable information facing said opening.

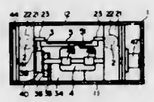
4,900,908

CARD ACCESSING APPARATUS HAVING A HEAD DISPOSED UNDER A CARD FEEDING STAGE

Keiichi Tsutsui, Ibaraki, Japan, assignor to Omron Tateisi Electronics Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 76,500, Jul. 22, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 342,674
Claims priority, application Japan, Jul. 25, 1986, 61-176442
Int. Cl.[4] G11B *25/04*
U.S. Cl. 235—475 **11 Claims**





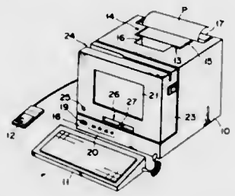
1. A card accessing apparatus, comprising:
stage means for supporting a data storage card with a data storage area of said card facing downwardly;
housing means including a bottom plate, for housing said stage means;
stage feeding means supported on said bottom plate, for reciprocating said stage means;
head means disposed under said stage means, for reading and writing data on said data storage area of said card;
head feeding means supported on said bottom plate, for driving said head means to a position under said stage means to access said data storage area of said card;
a first wall member supporting said stage feeding means, said first well member being connected to said bottom plate of said housing means;
a second wall member supporting said head feeding means, said second wall member being connected to said bottom plate of said housing means.

4,900,909

CARD PRINTING APPARATUS

Masayoshi Nagashima, Chigasaki, and Shin-ichi Kawahara, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 24, 1988, Ser. No. 210,933
Claims priority, application Japan, Jun. 30, 1987, 62-162877
Int. Cl.[4] G06K *19/00*
U.S. Cl. 235—487 **15 Claims**



1. An apparatus for magnetically recording data on a card having a magnetic stripe extending along a long side thereof, comprising:
convey means for conveying the card along a convey path in a convey direction such that shorter sides of the card are aligned with the convey direction;
magnetic recording means, for magnetically recording means having a magnetic head which is provided at a predetermined position position on the convey path and is movable in a direction perpendicular to the convey path; and
locking/unlocking means for interrupting the operation of said convey means when the card reaches the predetermined position at which said magnetic head is provided, and for moving said magnetic head in a direction perpendicular to the convey path so that the magnetic head magnetically records data on the magnetic stripe of the card.

4,900,910

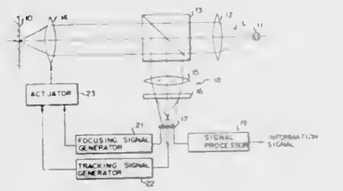
SYSTEM FOR DETECTING THE POSITION OF AN OBJECTIVE LENS

Akihiko Doi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 933,997, Nov. 24, 1986, abandoned. This application Oct. 18, 1988, Ser. No. 259,399
Claims priority, application Japan, Nov. 28, 1985, 60-267660; Dec. 16, 1985, 60-282502; Jun. 23, 1986, 61-146544; Jun. 23, 1986, 61-146545
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **14 Claims**

1. An apparatus for controlling the state of focus of a light beam on an information recording medium, comprising:

first generating means for generating a first light beam;
lens means, having an optical axis, for converging the first light beam to form a beam spot on the information recording medium, a minimum beam spot being formed on the information recording medium when the lens means is in a focused state and a beam spot larger than the minimum beam spot formed on the information recording medium when the lens means is in a defocused state;
means for converting the first light beam transferred from the recording medium into a focus signal representing a focus state of the lens means;
means for movably suspending the lens means, the lens means being movable along the optical axis;
a plane mirror in fixed spaced relation with the lens means and movable with the lens means;
second generating means facing the plane mirror for generating a divergent light beam;



first and second photodetector means for detecting the light rays reflected from the plane mirror, and converting the light rays into electric signals, said first and second photodetector means being arranged along the optical axis and at respective sides of the light emitting means, said plane mirror being disposed facing said first and second photodetector means and substantially parallel thereto and the light rays detected by the photodetector means being varied in accordance with the movement of the plane mirror so that the levels of the electric signals are changed in response to the movement of the plane mirror.
means for converting the electric signals generated from the photodetector means into a positional signal corresponding to the position of the lens means; and
means for driving the lens means along the optical axis in response to the focusing signal and the positional signal to maintain the lens means in the focused state.

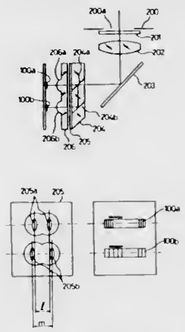
4,900,911

FOCUS DETECTING SYSTEM UTILIZING CORRECTION DATA ON ABERRATIONS OF THE PHOTOGRAPHIC LENS

Toru Matsui, and Toshihiko Karasaki, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 24,346, Mar. 10, 1987, Pat. No. 4,818,865. This application Feb. 7, 1989, Ser. No. 307,903
Claims priority, application Japan, Mar. 12, 1986, 61-52727
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[4] G03B *3/00;* **G02B** *7/11*
U.S. Cl. 250—201 **12 Claims**

1. A focus detecting system for detecting a focusing condition of a photographic lens on a predetermined focal plane, comprising:
means for forming first and second pairs of secondary images of an image formed by the photographic lens on the predetermined focal plane;
means for limiting a light bundle which has passed through the secondary image forming means, said limiting means including a first pair of secondary images and a second pair of aperture masks corresponding to the second pair of secondary images, said first pair of the aperture masks being located closer than said second pair of aperture masks are located with respect to an optical axis of the photographic lens;
means for detecting light intensity distributions of the first and second pairs of secondary images, said light intensity distribution detecting means including a first pair of light receiving elements disposed for receiving the first pair of secondary images and a second pair of light receiving elements disposed for receiving the second pair of secondary images;
means for storing first and second kinds of correction data determined in accordance with spherical aberration generated by the photographic lens, said first kind of correction data corresponding to the first pair of aperture masks while the second second kind of correction data corresponds to the second pair of aperture masks;
means for selecting either of a first combination composed of the first pair of light receiving elements and the first kind of correction data and a second combination composed of the second pair of light receiving elements and the second kind of correction data, and
means for detecting the focusing condition of the photographic lens in accordance with an output of the selected pair of light receiving elements and the selected kind of correction data.

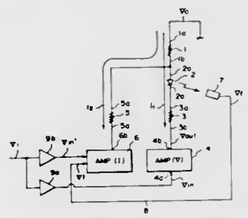


4,900,912

DRIVER CIRCUIT FOR SEMICONDUCTOR LIGHT-EMITTING DEVICE

Takashi Shoji, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 5, 1989, Ser. No. 293,856
Claims priority, application Japan, Mar. 18, 1988, 63-64912
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **7 Claims**



1. A driver circuit for a semiconductor light-emitting device, comprising:
(i) a first current path comprising a first resistor having one end kept at a predetermined voltage level, a semiconductor light-emitting device having an anode connected to

the other end of said resistor, a second resistor having one end connected to the cathode of said semiconductor light-emitting device, and a voltage-controlling amplifier having an output terminal connected to the other end of said second resistor;

(ii) a second current path comprising said first resistor, a third resistor having one end connected to a junction between said other end of said first resistor and said anode of said semiconductor light-emitting device, and a current-controlling amplifier having an output terminal connected to the other end of said third resistor;

(iii) a light detector for monitoring the intensity of light emitted from said semiconductor light-emitting device; and

(iv) a feedback path connecting an output terminal of said light detector to an input terminal of said current-controlling amplifier;

(v) said voltage-controlling amplifier drawing a current which enables said semiconductor light-emitting device to emit light so that an output voltage of said voltage-controlling amplifier is of a prescribed value dependent on an input signal applied to the voltage-controlling amplifier;

(vi) said current-controlling amplifier drawing a current corresponding to the difference between an output signal applied from said light detector to said current-controlling amplifier and a reference signal applied to the current-controlling amplifier so that said intensity of light is maintained at a prescribed intensity level.

4,900,913

OPTICAL POSITION DETECTOR HAVING FIRST AND SECOND SPACED APART SENSORS FOR DETECTING MULTIPLE LIGHT LEVELS

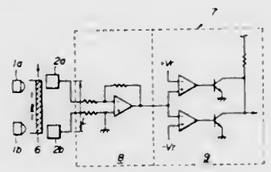
Hideo Muro, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 8, 1988, Ser. No. 269,753

Claims priority, application Japan, Nov. 9, 1987, 62-171059[U]

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—209 **9 Claims**



1. A sensor unit for detecting a moving object which moves along a predetermined path and has a known length in a direction of movement, at a predetermined reference position, comprising:

a first sensor device which is arranged in the vicinity of said path off a moving object and designed to produce a first output signal variable of signal level between a given first level and a given second level, said first sensor device outputting said first output signal with said first level when said object is output of a first detecting range which is defined in the path of said object at a orientation corresponding to the position of said first sensor device, said first detecting range extends in a direction of movement of said object in a width corresponding to the width of said first sensor, and said first sensor outputting said second level of said first sensor signal when all of said first detecting range is occupied by said object;

a second sensor device which is arranged in the vicinity of said path of a moving object, is oriented at a position equal distance from said reference position to the distance between said first sensor device and said reference position and opposite side of said first sensor device, a distance between said first and second sensor devices being slightly shorter than said known length of said object, and designed to produce an second output signal variable of signal level between a given first level and a given second level, and said second sensor device outputting said second output signal with said first level when said object is output of a second detecting range which is defined in the path of said object at a orientation corresponding to the position of said second sensor device, said second detecting range extends in a direction of movement of said object in a width corresponding to the width of said second sensor, and said second sensor outputting said second level of said second sensor signal when all of said second detecting range is occupied by said object; and

a circuit means for receiving said first and second output signals to detect said object at said reference position by detecting said first and second output signals both having third signal level between said first and second signal levels.

4,900,914

WIDE-ANGLE VIEWING WINDOW WITH A PLURALITY OF OPTICAL STRUCTURES

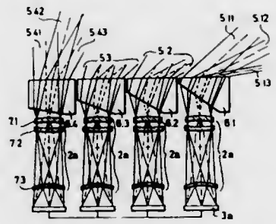
Horst Raff, Oberkochen, and Rolf Traeger, Aalen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,491

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717906

Int. Cl.⁴ H01J *3/14*; **G02B** *13/06*

U.S. Cl. 250—216 **8 Claims**



1. A viewing window for detecting radiation within a wide-angle region entering through the window, the viewing window comprising:

a plurality of optical structures defining respective different individual prisms for receiving said radiation;

said prisms being arranged in a planar array and defining respective entrance angles for said radiation with said angles being different for every viewing angle;

detector means defining a plurality of discrete areas for receiving respective images thereon; and,

a plurality of imaging units arranged behind respective ones of said prisms so as to permit each of said imaging units to image the prism corresponding thereto onto a selected one of said discrete areas.

4,900,915

METHOD OF COUNTING ARTICLES SUPPLIED ON A CONVEYOR TRACK IN A RANDOM PATTERN

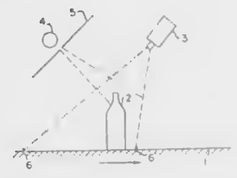
Johannes H. de Hoog, Delft; André Deen, The Hague, and Peter J. Wever, Leiderdorp, all of Netherlands, assignors to Heineken Technisch Beheer B.V., Amsterdam, Netherlands

Filed Nov. 16, 1988, Ser. No. 272,212

Claims priority, application Netherlands, Nov. 17, 1987, 8702738

Int. Cl.⁴ G01V *9/04*

U.S. Cl. 250—222.2 **7 Claims**



1. A method of counting, in real time, articles supplied on a conveyor track in a random pattern, which comprises forming an image of the articles present in a counting zone by means of an image pick-up device, said counting zone corresponding to a periodic, elongated image of the image pick-up device, said image extending essentially transversely to the direction of movement of the conveyor track, converting said elongated image into a binary image composed of a row of image elements, each with its own grey value, which binary image is obtained by assigning a first logic state to image elements having a grey value above a pre-determined threshold value and a second logic state to image elements below said threshold value, characterized by determining whether an article arrives in said counting zone, whether the article subsequently reaches a minimum width in the image, and whether the article leaves the counting zone again, whereby a count signal is produced when the article leaves the counting zone.

4,900,916

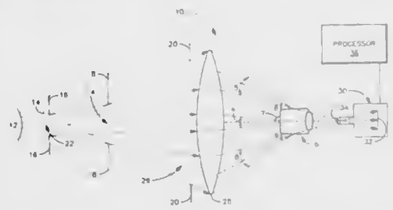
SYSTEM EMPLOYING PRECONDITIONED RADIATION FOR DETECTING DEFECTS IN TRANSPARENT OBJECTS

Robert H. Cormack, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Mar. 2, 1988, Ser. No. 163,277

Int. Cl.⁴ G01N *9/04*

U.S. Cl. 250—223 B **25 Claims**



1. A method for inspecting a substantially transparent object having a complex shape wherein substantially transparent defects having relatively highly refractive surfaces on areas of interest of said object are detected and substantially transparent markings having surfaces which are less refractive on areas of interest of said object are not detected, said method comprising:

(a) illuminating said transparent object with radiation having certain angular spectrum ranges for points of interest on said object;

(b) selecting said angular spectrum ranges in order that radiation which is incident upon said transparent object and which passes through said defects is refracted outside of a limited angle of acceptance to a greater extent than is radiation which is incident upon adjacent non-defect areas;

(c) conditioning said radiation in such a manner that a plurality of rays emanating from a single point on a source of said radiation are non-parallel prior to their incidence on said transparent object in order to provide radiation having average angles of incidence at various points of interest on said complex-shaped transparent object, said average angles of incidence being provided such that non-defect areas of said complex-shaped transparent object which are to be inspected are illuminated when viewed from a position of a means employed to detect the intensity of said radiation;

(d) detecting the intensity of said radiation which falls within said limited angle of acceptance after having passed through said transparent object; and

(e) analyzing the intensity of said radiation to determine whether defects are present.

4,900,917

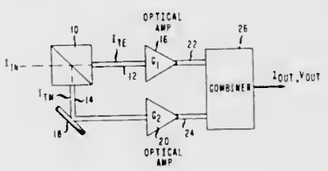
POLARIZATION INSENSITIVE OPTICAL COMMUNICATION DEVICE UTILIZING OPTICAL PREAMPLIFICATION

Melvyn Dixon, Lower Macungie Township, Lehigh County, Pa.; Nils A. Olsson, New Providence, N.J.; Robert E. Tench, and Liang Tzeng, both of Upper Macungie Township, Lehigh County, Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 15, 1988, Ser. No. 219,684

Int. Cl.⁴ G02F *1/01*

U.S. Cl. 250—225 **14 Claims**



1. A polarization insensitive optical communication device for providing optical amplification of an input optical signal comprising an unknown polarization state, said device comprising

a polarization beam splitter responsive to the input optical signal for directing a first component of said input signal, of a first defined polarization state, along a first signal path and directing a second, orthogonal component of a second defined polarization state, along a second signal path;

a first semiconductor laser optical amplifier disposed in the first signal path and responsive to the first component for generating as an output an amplified version thereof, the first optical amplifier aligned with respect to the first polarization state of said first component so as to provide maximum amplification;

a second semiconductor laser optical amplifier disposed in the second signal path and responsive to the second component for generating as an output an amplified version thereof, the second optical amplifier aligned with respect to the second polarization state of said second component so as to provide maximum amplification; and

means responsive to the amplified output signals generated by the first and second semiconductor laser optical amplifiers for combining the amplified first and second orthogo-

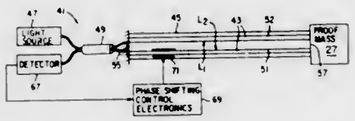
nal components to provide as the output of said communication device an amplified version of the optical input signal.

4,900,918

RESONANT FIBER OPTIC ACCELEROMETER WITH NOISE REDUCTION USING A CLOSED LOOP FEEDBACK TO VARY PATHLENGTH

Kevin M. Killian, Hackensack, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 6, 1987, Ser. No. 82,255
Int. Cl.[4] H01J *5/16*; G01D *5/34*
U.S. Cl. 250—227 **12 Claims**



1. Accelerometer is which a proof mass is suspended by a cantilever beam, and deflection of the beam is proportional to acceleration, characterized by: two resonant light paths, the light paths being rendered unequal in length by the deflection of the beam;

a common light source connected to the light paths;

a means to obtain optical outputs representative of light resonating in each of the light paths;

means to merge the optical outputs;

photodetection means responsive to the merged optical outputs and sensitive to changes in the character of light as a result of said unequal path lengths; and

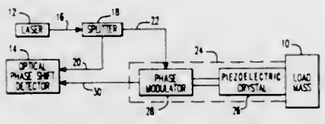
a feedback loop including first means in one of the light paths and second means connected to the first means and to the photodetection means, said first means varying the length of the one light path to equalize the lengths of the two light paths which have been rendered unequal by the acceleration, said second means applying a signal to the first means commensurate with said acceleration.

4,900,919

WIDE BANDWIDTH FIBER OPTIC ACCELEROMETER

Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 20, 1988, Ser. No. 209,124
Int. Cl.[4] G01P *15/09*; G01B *11/00*
U.S. Cl. 250—227 **18 Claims**



1. An accelerometer, comprising:

sensing means for producing an electrical acceleration signal responsive to acceleration of a load; and

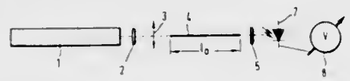
means for electrically changing the propagation characteristics of a light beam responsive to the acceleration signal.

4,900,920

DEVICE FOR AND METHOD OF MEASURING MINUTE ELONGATIONS BY MEANS OF LIGHT WAVE CONDUCTOR SENSORS

Helmut Federmann, Bergisch Gladbach; Friedrich K. Levacher, Brauweiler; Georg Noack, Bergisch Gladbach, and Anton Kraus, Overath, all of Fed. Rep. of Germany, assignors to Felten & Guilleaume Energietechnik Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Nov. 2, 1987, Ser. No. 116,032
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1986, 3638345
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **9 Claims**



1. A device for measuring minute elongations of a light wave conductor, comprising:

a light emitter;

a light wave sending unit assembled of a series arrangement of a polarizer, a light coupler, a single light wave conductor of a round cross-section enclosed in an elliptical sheathing which produces a permanent anisotropic mechanical stress in said light wave conductor to provide a polarization preserving, doubly refracting monomode light wave conductor phase sensor, and a light analyzer;

a light receiver for converting polarized light waves into electrical signals;

light wave conducting means for coupling said light emitter to said polarizer, and said light receiver to said analyzer; and

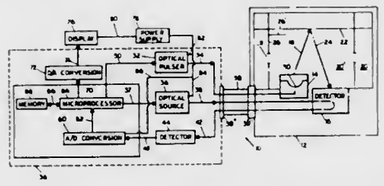
an electronic evaluating circuit for evaluating phase difference change of said electrical signals as a measure of elongation of said single light wave conductor.

4,900,921

SYSTEM AND METHOD FOR OPTO-ACOUSTIC LIQUID QUANTITY MEASUREMENT AND TRANSDUCER THEREFOR

William B. Spillman, Jr., Charlotte, Vt., assignor to Simmonds Precision Products, Inc., Wilmington, Del.

Filed Sep. 19, 1988, Ser. No. 246,103
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **26 Claims**



1. An optically controlled acoustic transmission and reception system, comprising:

a tank,

an electrically passive optically controlled acoustic transmitter,

an electrically passive acoustic receiver,

a first and a second source of electromagnetic radiation,

a first and a second optical fiber,

said transmitter being positioned to transmit acoustic waves into said tank,

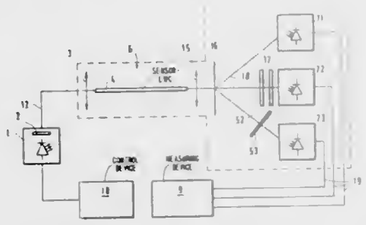
said first optical fiber being connected to said transmitter and to said first source of electromagnetic radiation, said receiver being connected to said second optical fiber, said transmitter being adapted to convert said electromagnetic radiation into acoustic pulses, said receiver being adapted to modulate electromagnetic radiation from said second source passing through said second optical fiber in response to said acoustic pulses, whereby said acoustic pulses from said transmitter are received by said receiver.

4,900,922

ARRANGEMENT OF A LIGHT WAVE CONDUCTOR-PHASE SENSOR FOR THE MEASUREMENT OF MINUTE ELONGATIONS

Helmut Federmann, Bergisch Gladbach; Friedrich K. Levacher, Brauweiler; Georg Noack, Bergisch Gladbach, and Anton Kraus, Overath, all of Fed. Rep. of Germany, assignors to Felten & Guilleaume Energietechnik Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 330,861
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807306
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—227 **7 Claims**



1. An arrangement of a light wave conductor-phase sensor for measuring minute elongations, comprising a series connection of an emitter of polarized light, a light wave conductor-phase sensor, a light beam divider for dividing the measuring light beam at the output of the sensor into three partial light beams, three light receivers for receiving respective partial light beams and generating electrical output signals corresponding to received light intensities, a first partial light beam being transmitted to the first light receiver via a direct transmission channel, a second partial light beam being transmitted to the second light receiver via a transmission channel including a quarter wave length ($\lambda/4$) plate and a light analyzer, and the third partial light beam being transmitted to the third light receiver via a transmission channel including a light analyzer, and electrical measuring means for evaluating said electrical output signals.

4,900,923

REFLECTANCE MEASURING APPARATUS INCLUDING A CYLINDER-SHAPED LIGHT CONDUCTING DEVICE BETWEEN THE MEASURING APERTURE AND THE SPECIMEN

Hermann Gerlinger, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 358,661
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818815
Int. Cl.[4] G01T *1/00*
U.S. Cl. 250—228 **15 Claims**

1. A reflectance measuring apparatus for measuring a specimen, the apparatus comprising:

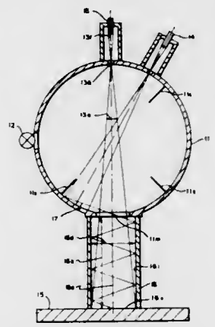
a structure defining a measuring aperture having a center;

light source means for illuminating the specimen from which light radiation is reflected;

receiver means for detecting the radiation reflected from the specimen within a predetermined aperture;

a light-conducting device having a first longitudinal end placed on said measuring aperture and a second longitudinal end facing the specimen;

said light-conducting device having a configuration which is



at least approximately cylinder-shaped and defining a longitudinal axis perpendicular to the area of said measuring aperture so as to extend through the center thereof; and,

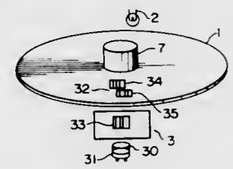
said light-conducting device having a diameter and a length selected so as to not significantly change said predetermined aperture and so as to cause said second longitudinal end to define an enlarged measuring aperture for the specimen.

4,900,924

REFERENCE SIGNAL GENERATION APPARATUS FOR POSITION DETECTOR

Yutaka Masuda, Hirakata, and Norio Okutani, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 3, 1988, Ser. No. 189,788
Claims priority, application Japan, May 13, 1987, 62-116509
Int. Cl.[4] G01D *5/34*; H01J *3/14*
U.S. Cl. 250—231 SE **7 Claims**



1. In a photoelectric position detector with a moving slit plate and a fixed slit plate arranged between a light source and a plurality of light detectors, a reference signal generation apparatus comprising:

at least first and second slit sections spaced from each other and each comprising a plurality of slits of different intervals or different widths formed in said moving slit plate;

a third slit section comprising a plurality of slits formed in said fixed slit plate, said third slit section being positioned to meet said first and second slit sections sequentially as said moving slit plate moves for transmitting light from said light source therethrough with movement of said moving slit plate relative to said fixed plate;

said plurality of light detectors corresponding to said at least first and second slit sections and detecting light transmitted through said slit sections to produce respective detector output signals corresponding to said at least first and second slit sections, each of said output signals respectively having a maximum value at predetermined intervals produces by the the motion of said moving slit plate;

circuit means for producing a difference signal from said detector output signals, said difference signal having one maximum value and one minimum value, said circuit means for producing said difference signal defining maximum and minimum levels for said difference signal; and

circuit means for producing a reference signal having a timing which occurs in a time period defined between timings of said defined maximum and minimum levels of said difference signal.

4,900,925

ACCELERATION SENSOR PICK-UP WITH MAGNETIC BASE STABILIZATION

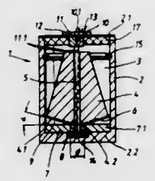
Rudolf Andres, Sindelfingen; Heinz W. Knoll, Stuttgart; Volker Petri, Aidlingen, and Harald Pfistner, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,106

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1987, 3725758

Int. Cl.⁴ G01D *5/34*

U.S. Cl. 250—231 R **16 Claims**



1. Acceleration pick-up for the automatic actuation of passenger safety devices in motor vehicles during an accident, comprising:

a housing with an interior space;

an elongated round and rotationally symmetric inertial body in said housing which functions as a seismic mass;

a transmitter means for sending signals to a receiver means;

said body means having a continuous longitudinal bore providing a signal path from said transmitter to said receiver in a rest position of the inertial body means;

said inertial body means having at an end face, a supporting base by which the body means is supported;

bearing means extending perpendicular to the longitudinal bore of said body means and having a through bore therein which is aligned with longitudinal bore of the body means when the body means is in a normal rest position;

the supporting base of the body means resting on the bearing means;

wherein when a preset amplitude of acceleration is exceeded, the body means is deflected along its supporting base so that an actuation control signal is initiated owing to interruption of the transmission means sending a signal to the receiver means along said signal path;

wherein the inertial body means has soft magnetic properties;

the bearing is constructed in the form of an annular permanent magnet;

the annular permanent magnet has a diameter that corresponds approximately to a diameter of the end face of the inertial body means;

the supporting base having a diameter which is smaller than the diameter of the end face; and

a radially opening annular gap being defined as the area starting from a center of the supporting base which abuts a flat surface on the annular permanent magnet to outwardly located spaces between the end face and the annular permanent magnet.

4,900,926

RADIATION IMAGE READ-OUT APPARATUS

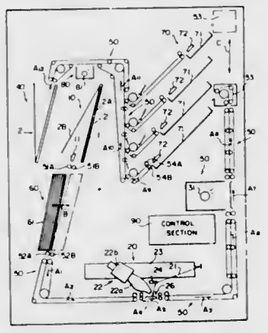
Ryoichi Yoshimura, and Shumpeita Torii, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 10,529, Feb. 3, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,819

Claims priority, application Japan, Feb. 3, 1986, 61-21729

Int. Cl.⁴ G03B *42/08*

U.S. Cl. 250—327.2 **15 Claims**



1. A radiation image read-out apparatus comprising:

(i) a read-out section for reading out a radiation image stored on a stimulable phosphor sheet,

(ii) an erasing section for erasing radiation energy remaining on said stimulable phosphor sheet after image read-out from said stimulable phosphor sheet is finished,

(iii) a sheet feed cassette holding section for releasably holding a sheet feed cassette capable of housing said stimulable phosphor sheet therein, and for taking said stimulable phosphor sheet out of said feed cassette,

(iv) a sheet housing cassette holding section for releasably holding a sheet housing cassette capable of housing said stimulable phosphor sheet, wherein said sheet feed cassette holding section and said sheet housing cassette holding section are arranged adjacently such that sheet feed cassette and said sheet housing cassette are interchangeable,

(v) a sheet stacking section for holding a plurality of the stimulable phosphor sheets having different sizes, selecting said stimulable phosphor sheet having a desired size one at a time from among said stimulable phosphor sheets held at said sheet stacking section, and feeding out said selected stimulable phosphor sheet, and

(vi) a sheet conveyance means for receiving said stimulable phosphor sheet taken out of said sheet feed cassette held at said sheet feed cassette holding section, conveying said stimulable phosphor sheet to said read-out section and said erasing section, thereafter conveying said stimulable phosphor sheet to said sheet stacking section, and conveying said stimulable phosphor sheet fed out of said sheet stacking section into said sheet housing cassette held at said sheet housing cassette holding section.

4,900,927

METHOD OF AND APPARATUS FOR RECORDING AND READING OUT RADIATION IMAGE INFORMATION

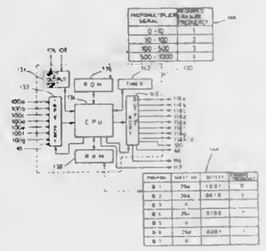
Tsutomu Kimura, and Yukio Watanabe, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 30, 1985, Ser. No. 793,009

Claims priority, application Japan, Oct. 30, 1984, 59-228747; Oct. 30, 1984, 59-228748; Oct. 30, 1984, 59-228749

Int. Cl.⁴ G03C *5/16*

U.S. Cl. 250—327.2 **7 Claims**



1. A method of recording and reading out radiation image information, comprising the steps of:

feeding stimulable phosphor sheets, each capable of recording radiation image information, along a predetermined circulatory feed path;

exposing said stimulable phosphor sheets to radiation through an object to record the radiation image information of the object on the stimulable phosphor sheets in an image recording unit in said circulatory feed path;

reading out said radiation image information from said stimulable phosphor sheets in an image readout unit in said circulatory feed path;

erasing any remaining image from said stimulable phosphor sheets in an image erase unit in said circulatory feed path;

subjecting each of said stimulable phosphor sheets employed for recording radiation image information thereon to said erasing step at least once, until all of said stimulable phosphor sheets have been erased before radiation image information is successively recorded on any of said stimulable phosphor sheets; and

detecting radiation emitted from ones of said stimulable phosphor sheets and determining the number of times said erasing step is required to reduce said radiation image on said sheets before further recording can be conducted on said sheets.

4,900,928

PROCESS AND APPARATUS FOR DETERMINING QUANTITY OF RADIOACTIVE MATERIAL IN A CENTRIFUGE

Masoud Saad, Offenbach, and Bernd D. Hahn, Springe, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Sep. 8, 1988, Ser. No. 242,046

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1987, 3730675

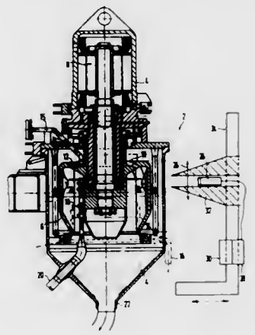
Int. Cl.⁴ G01T *1/167*

U.S. Cl. 250—336.1 **10 Claims**

1. A process for determining the filling and loading of the drum of a clarifying centrifuge being charged with radioactive waste fluids of nuclear facilities comprising

measuring spectroscopically the gamma radiation of said fluids/solids contained in said fluids;

quantitatively determining from said spectroscopic measurement the gamma spectrum for at least one nuclide present; and



calculating from said gamma spectrum of said nuclide the quantity of filling and/or loading of said drum.

4,900,929

RADIATION DETECTION DEVICE

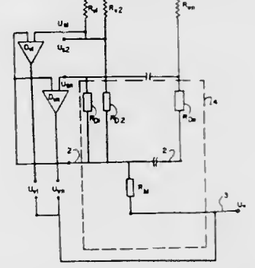
Luis-Dieter Haas, Heilbronn-Biberach, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt, Fed. Rep. of Germany

Filed Nov. 9, 1988, Ser. No. 269,455

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738263

Int. Cl.⁴ G01J *5/30*

U.S. Cl. 250—338.1 **8 Claims**



1. A radiation detector device comprising: a vacuum-tight housing; a plurality of radiosensitive bipolar resistor elements arranged in said vacuum-tight housing, said resistor elements being arranged in parallel with respect to two supply lines with each of said resistor elements having at least one of its respective poles being connected to a signal line, each signal line connected to a pole of a resistor leading out of the housing separately; a mutual ground cable connected to the other pole of each of said resistor elements, said mutual ground cable acting as a further signal line; a plurality of differential amplifiers corresponding to each of said radiosensitive bipolar resistor elements, each differential amplifier including a first input and a second input, the first input of each of said differential amplifiers being connected with one of the signal lines and the respective other signal input being connected to the mutual ground cable, the amplified signal potentials being taken between the respective signal outputs of each differential amplifier and one of the supply lines.

4,900,930

ALPHA-RAY IMAGE DETECTING APPARATUS

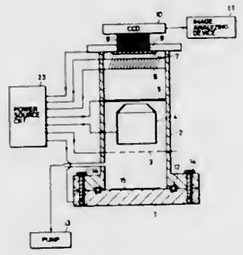
Yoshihiro Takiguchi, and Katsuyuki Kinoshita, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoki, Japan

Continuation of Ser. No. 878,067, Jun. 24, 1986. This application Nov. 8, 1988, Ser. No. 270,459

Claims priority, application Japan, Jun. 25, 1985, 60-138411

Int. Cl.[4] H01J *31/50*

U.S. Cl. 250—361 R **6 Claims**



1. An alpha-ray image detecting apparatus comprising:
a vacuum container for holding in a vacuum within the container a substance including alpha-ray radiating nuclides;
a fluorescent layer formed on an inner surface of the container; and
a system for multiplying electrons emitted from the alpha-ray radiating nuclides in the surface of the substance and for focusing the multiplied electrons on said fluorescent layer.

4,900,931

DEVICE FOR LOCATING NUCLEAR RADIATION AND RADIATION IMAGE FORMATION DEVICE INCORPORATING SUCH A LOCATING DEVICE

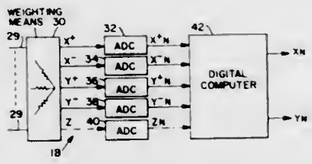
Edmond Tournier, Grenoble, and Michel Tararine, Sceaux, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 11, 1988, Ser. No. 192,777

Claims priority, application France, May 27, 1987, 87 07482

Int. Cl.[4] G01T *1/164*

U.S. Cl. 250—369 **8 Claims**



1. Device for locating a nuclear radiation incorporating a detection head for detecting a nuclear radiation and a position coder for locating said nuclear radiation, said detection head comprising a collimator, a planar layer of a material sensitive to said nuclear radiation for receiving on a first or front face a nuclear radiation transversing said collimator and for supplying on a second or rear face a light radiation which is a function of the nuclear radiation received, a plurality of transducers arranged on the rear face of said layer, each supplying an electric signal which is a function of the light radiation received, each nuclear radiation producing a light radiation seen by a plurality of transducers said locating device being characterized in that the position coder comprises weighting means for supplying analog electrical signals X^+, X^-, Y^+, Y^-, each representing weighted sums of the electric signals supplied by the transducers, the signlas X^+, X^- being a function of the position and the energy of the nuclear radiation received in accordance with an axis X and the signals Y^+, Y^- being a function of the position of the nuclear radiation received in accordance with an axis Y, a digitizing means for receiving the analog signals X^+, X^-, Y^+, Y^- and for supplying corresponding digital signals $X_N{}^+$, $X_N{}^-$, $Y_N{}^+$ and $Y_N{}^-$ and a calculating means or computer for determining the signals of digital coordinates X_N, Y_N of the nuclear radiation received as a function of the digital signals $X_N{}^+$, $X_N{}^-$, $Y_N{}^+$ and $Y_N{}^-$.

4,900,932

CATHODOLUMINESCENCE DETECTOR UTILIZING A HOLLOW TUBE FOR DIRECTING LIGHT RADIATION FROM THE SAMPLE TO THE DETECTOR

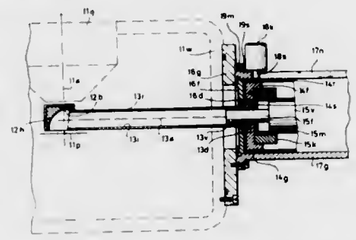
Norbert Schäfer; Eugen Weimer; Herbert Gross, all of Essingen; Bernd Eppli, Königsbronn, and Eberhard Rossow, Oberkochen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,317

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729846

Int. Cl.[4] H01J *37/244*

U.S. Cl. 250—397 **24 Claims**



1. A cathodoluminescence detector for receiving light emitted from a specimen irradiated by an electron beam, the cathodoluminescence detector comprising:
a clear hollow tube having first and second end portions;
a concave mirror mounted at said first end portion for receiving light from the specimen and reflecting the same into said tube;
a vacuum window mounted at said second end portion;
said tube defining a longitudinal axis and having a reflective inner wall surface for conducting the light from said concave mirror to said vacuum window; and,
a photoelectric receiver mounted next to said vacuum window for receiving the light passing through the latter from said tube.

4,900,933

EXCITATION AND DETECTION APPARATUS FOR REMOTE SENSOR CONNECTED BY OPTICAL FIBER

James R. Nestor, Northboro; Jonathan D. Schiff, Billerica, and Benjamin H. Priest, Bolton, all of Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

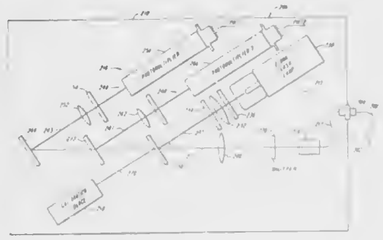
Continuation-in-part of Ser. No. 904,963, Sep. 8, 1986, Pat. No. 4,861,727. This application Mar. 20, 1987, Ser. No. 28,198

Int. Cl.[4] G01N *21/64*

U.S. Cl. 250—458.1 **17 Claims**

4. Sensing apparatus comprising:
an optical fiber;
a phosphorescent material coupled to one end of said optical fiber, said phosphorescent material emitting a long-lived luminescence when exposed to energy in a predetermined wavelength range, said long-lived luminescence including

a measuring wavelength having an intensity responsive to a quantity being sensed and a reference wavelength having a substantially constant intensity as a function of the quantity being sensed;
source means coupled to the other end of said optical fiber for generating an incident pulsed energy signal within said predetermined wavelength range to cause said phosphorescent material to generate said long-lived luminescence;
detector means coupled to the other end of said optical fiber for selectively detecting the long-lived luminescence from said phosphorescent material when said incident pulsed energy signal has substantially ceased and any short-lived background luminescence generated in the apparatus has substantially ceased, said long-lived luminescence having a longer duration than said incident pulsed energy signal and said short-lived luminescence, said detector means including



a first detector channel for detecting the measuring wavelength and providing a first signal representative of the intensity of the measuring wavelength,
a second detector channel for detecting the reference wavelength and providing a second signal representative of the intensity of the reference wavelength, and
signal processing means responsive to the relative values of said first signal and said second signal for providing an output representative of the quantity being sensed; and
calibration source means for supplying a first calibration signal at the measuring wavelength to said first detector channel and a second calibration signal at the reference wavelength to said second detector channel for calibration of said first and second detector channels.

4,900,934

APPARATUS FOR SIMULTANEOUS VISUALIZATION AND MEASUREMENT OF FLUORESCENCE FROM FLUORESCENT DYE-TREATED CELL PREPARATIONS AND SOLUTIONS

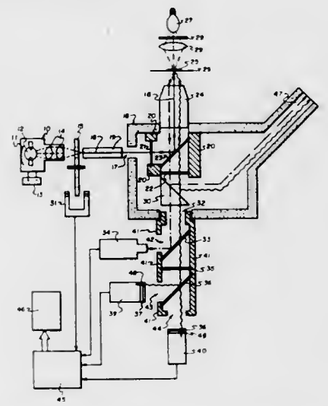
George A. Peeters, Park City, and William H. Barry, Salt Lake City, both of Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Jul. 15, 1987, Ser. No. 73,955

Int. Cl.[4] G01N *21/64*

U.S. Cl. 250—461.2 **9 Claims**

1. An apparatus for measuring fluorescence at multiple wavelengths emitted from fluorescent dye-treated cell or tissue preparations or solutions, comprising in combination:
an optical housing unit means with at least two access ports therein;
An epifluorescence system integrally connected to said optical housing unit through one of said access ports therein;
at least one source of high intensity ultraviolet light for excitation connected to said optical housing unit through one of said access ports therein;
an optical subassembly means with at least two access ports therein, said optical subassembly being connected to said optical housing unit through one of said access ports therein;
means for fluorescence detection based within and connected to said optical subassembly through one of said access ports therein;



means for video monitoring connected to said optical subassembly means through one of said access ports therein; and,
at least one source of illumination whose wavelength is longer than the excitation wavelength.

4,900,935

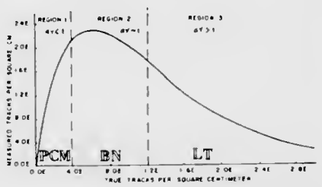
AUTOMATED SCANNING OF TRACK RECORDERS HAVING VARIABLE TRACK DENSITY

James H. Roberts, and Raymond Gold, both of Metrology Control Corp., 2000 Logsdon Blvd., Richland, Wash. 99352

Filed Nov. 22, 1988, Ser. No. 274,850

Int. Cl.[4] G01T *1/02*

U.S. Cl. 250—472.1 **5 Claims**



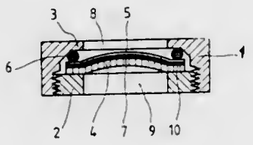
1. The method of determining true track density from an observed track density in solid state track recorders by optically scanning a plurality of areal fields of the recorder in two dimensions, with any connected ray of tracks being considered as a single track, comprising in combination:
determining the functional relationship between the observed number of tracks and the actual number of tracks at a plurality of different track densities by different methods;
determining the true track density in any particular individual areal field by applying the method having least uncertainty in that field; and
summing the so determined true track densities of least uncertainty in the areal fields measured to determine the true track density of the solid state track recorder to be measured.

4,900,936

DOSIMETER CONSTRUCTION

Wolfgang Evers, Läbeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Läbeck, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,063
Int. Cl.[4] G01N *33/52*
U.S. Cl. 250—474.1 **5 Claims**



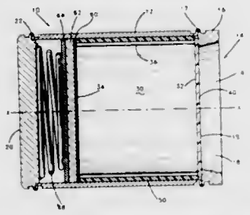
1. A dosimeter for detection of noxious substances, comprising: a substrate collection carrier on which the substance is collected, said substrate collection carrier having a top surface; a diffusion membrane overlying said carrier and closing it off against the outside, said substrate carrier being curved outwardly, said diffusion membrane abutting said top surface and hugging the shape of the curve.

4,900,937

WELL LOGGING DETECTOR WITH DECOUPLING OPTICAL INTERFACE

Roderick R. Dayton, Chesterland; Michael C. Papp, Chardon, and Glenn T. Tokos, Garrettesville, all of Ohio, assignors to Bicron Corporation, Newbury, Ohio

Filed Oct. 20, 1988, Ser. No. 260,246
Int. Cl.[4] G01T *1/202*
U.S. Cl. 250—483.1 **12 Claims**



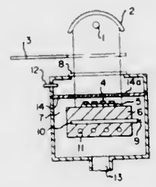
1. In a well logging detector having a housing with a light transparent window portion, a scintillation member contained within the housing, the scintillation member generating light in response to ionizing radiation impinging on the scintillation member, and biasing means applying a biasing force against the scintillation member to hold it against and optically couple it to the window portion wherein the light generated by the scintillation member is transmitted to the exterior of the housing via the window portion, the improvement wherein said biasing force is weak enough to allow the scintillation member to move away from and optically decouple from the window portion in response to shock forces on the detector, the biasing means, subsequent to such shock induced decoupling, moving said scintillation member back against said window portion to re-establish optical coupling therebetween.

4,900,938

METHOD OF TREATING PHOTORESISTS

Shinji Suzuki; Hiroko Suzuki, both of Kawasaki, and Tetsuji Arai, Yokohama, all of Japan, assignors to Ushio Denki, Tokyo, Japan

Division of Ser. No. 149,301, Jan. 28, 1988. This application Apr. 12, 1989, Ser. No. 336,268
Claims priority, application Japan, Mar. 20, 1987, 62-63978; Mar. 20, 1987, 62-63979
Int. Cl.[4] G03F *7/02*; H01L *21/30*
U.S. Cl. 250—442.2 **1 Claim**



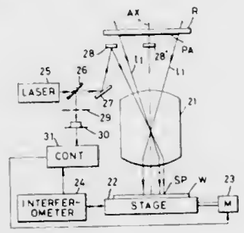
1. An apparatus for treating a developed positive photoresist image on a semiconductor wafer comprising:
an ultraviolet radiation source composed of a metal vapor lamp or a metal halide vapor lamp and a mirror;
a treating chamber having:
a window to permit the radiant light from said ultraviolet radiation source to pass into said treating chamber;
an intake to permit inactive gas to be drawn into said treating chamber;
an exhaust hole to permit said inactive gas to be exhausted from said treating chamber;
a porous plate placed within said treating chamber to separate said window and said intake from said exhaust hole;
a support for a semiconductor wafer having a developed positive photoresist image thereon provided with temperature control mechanism within said treating chamber;
wherein the radiant light is projected to a developed positive photoresist image on a semiconductor wafer through a window and a porous plate and wherein inactive gas is directed from an intake to an exhaust hole through a porous plate.

4,900,939

SYSTEM FOR PROCESSING AND CONVEYING SUBSTRATE

Masaaki Aoyama, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,356
Claims priority, application Japan, Jan. 5, 1988, 63-455
Int. Cl.[4] G01N *21/86*; G01V *9/04*
U.S. Cl. 250—548 **7 Claims**



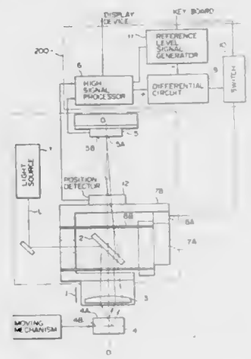
1. A substrate processing system, comprising:
a resist processing apparatus including an applying unit for applying photoresist to a substrate and a developing unit for developing said substrate, which are arranged between a processing start position and a processing end position;
an exposure processing apparatus including means for exposing said substrate and inspection means for inspecting physical condition of the photoresist applied to said substrate;
means forming a first conveying path for conveying said substrate from said processing start position to said exposure processing apparatus through said applying unit;
means forming a second conveying path for conveying said substrate from said exposure processing apparatus to said processing end position through said developing unit;
means forming a bypass conveying path provided for conveying said substrate independently of said second conveying path, between a predetermined position on said second conveying path and said exposure processing apparatus; and
control means for controlling said means forming the bypass conveying path and said inspection means in such a manner that said substrate is conveyed from said second conveying path to said exposure processing apparatus by said bypass conveying path and is inspected by said inspection means.

4,900,940

OPTICAL SYSTEM FOR MEASURING A SURFACE PROFILE OF AN OBJECT USING A CONVERGED, INCLINED LIGHT BEAM AND MOVABLE CONVERGING LENS

Takahiro Nakamura, Sagamihara, Japan, assignor to Anritsu Corporation, Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,461
Claims priority, application Japan, May 21, 1987, 62-122453
Int. Cl.[4] G01B *11/24*; G01V *9/04*
U.S. Cl. 250—560 **9 Claims**



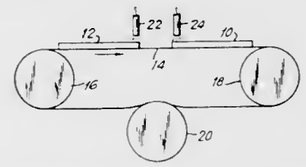
1. An optical system for measuring a surface profile of an object in relation to a reference surface, comprising:
first light source means for generating a first measuring coherent light beam;
converging means having an optical axis, for converging said first measuring coherent light beam onto a measuring point on a surface of said object, and for relaying a light beam reflected from said surface of said object;
said detector means having a detecting surface on which a reference position is defined, for receiving the reflected first light beam which is reflected from said surface of said object and emerged from said converging means such that a beam spot is formed on said detecting surface, and for generating a position signal according to positions of the beam spot on said detecting surface;
means for directing said first measuring coherent light beam generated from said light beam generating means to said converging means and for directing the reflected light beam emerged from said converging means to said detecting means, said first measuring coherent light beam generated from said light beam generating means being guided so as to diverge from said optical axis of said converging means so that the first light beam emerged from said converging means is incident on said object at a predetermined inclined, non-perpendicular incident angle, said beam spot on said detecting surface being formed in said reference position when said measuring point is positioned in said reference surface and said beam spot on said detecting surface being deviated from said reference position when the measuring point is shifted from said reference surface;
first moving means for supporting said converging means and for moving it along said optical axis;
second detector means for detecting a movement of said converging means which is moved by said first moving means, and for generating a first distance signal according to a movement distance of said converging means;
second moving means for moving said object relative to said converging means in a direction substantially perpendicular to said optical axis;
energizing means for generating an actuating signal responsive to said position signal supplied from said first detector means and in accordance with a deviation of said beam spot on said detecting surface, and for energizing said first moving means to move said converging means so as to move said beam spot to said reference position on said detecting surface of said detector means; and
signal processing means for processing said position signal and said first distance signal supplied from said first and second detector means, respectively, for computing the surface profile of said object in relation to said reference surface thereof.

4,900,941

METHOD AND APPARATUS FOR VERIFYING INDICIA CORRECTLY PROVIDED ON AN OBJECT

Maya R. Barton, 336 Barrack Hill Rd., Ridgefield, Conn. 06877; Ronald P. Sansone, 4 Trails End Rd., Weston, Conn. 06883, and Mark E. Sievel, 132 Walnut Hill Rd., Bethel, Conn. 06801

Filed Sep. 18, 1987, Ser. No. 98,581
Int. Cl.[4] G06K *7/10*
U.S. Cl. 250—566 **31 Claims**



1. A system for establishing parameters for use in a verifying the selective presence of indicia in one or more respective zones of an object, said system comprising:
detecting means for detecting at least a leading edge and a trailing edge of an object;
sensing means for sensing the presence of indicia on an object;
motion means for imparting relative movement between the object and at least the detecting means;
measuring means for measuring the interval between the detected leading edge of the object and the beginning of indicia on the object and for measuring the interval over

which said indicia are present, thereby determining a zone in which indicia are expected; and

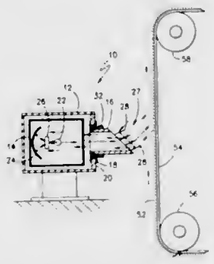
means responsive to said detecting means and said sensing means for measuring the interval between the sensed end of indicia on the object and the detected trailing edge, thereby determining another zone in which indicia are not expected.

4,900,942

FABRIC PILE LAY DETECTOR USING MIRROR SYSTEM WITH MEANS TO ROTATE 360 DEGREES

Joseph E. Rumler, Greenville, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 10, 1988, Ser. No. 154,413
Int. Cl.[4] G01N *21/88*
U.S. Cl. 250—572 **20 Claims**



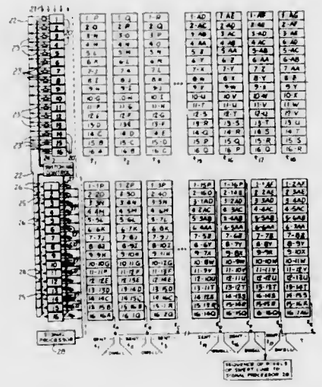
1. A system to measure the pile lay of fibers on the face of a pile fabric comprising: means supplying a moving web of pile fabric, said pile fabric having a plurality of fibers on the face side thereof and an infra red light detector mounted adjacent the face side of said pile fabric, said detector having an infra red light source and a means to direct a light beam from said source onto the fibers of said pile fabrics and to direct reflected light beams from the fibers to a detecting means mounted in said detector, said means to direct the light beam from said source includes a rotating mounted mirror system connected to said light detector between said detector means and the face of the pile fabric and means to rotate said mirror system 360°.

4,900,943

MULTIPLEX TIME DELAY INTEGRATION

Charles M. Marshall, North Andover, and Jeffrey L. McClelland, deceased, late of Somerville, both of Mass. (by Clyde L. McClelland and Joan R. McClelland joint administrators), assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 3, 1989, Ser. No. 293,755
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—578 **16 Claims**



1. A method for providing time-delay integration of each of a plurality of photodetector means signals induced by electromagnetic radiation from a selected field of view impinging on an ordered array of a plurality of photodetector means, said method comprising:

directing electromagnetic radiation from a selected portion of said field of view to move across and impinge successively on each said photodetector means in said array in that order in which said photodetector means occur in said array;

providing at an output of each of said photodetector means a sequence of corresponding photodetector output indicator values with each of said photodetector output indicator values of a said photodetector means representing that amount of said electromagnetic radiation that has impinged on that photodetector means during at least part of that selected dwell duration which has elapsed since that photodetector means provided its immediately previous photodetector output indicator value;

providing during each said dwell duration conductive signal paths alternatively between each of said photodetector means outputs and inputs of a plurality of acceptance means through an input bus interconnection means electrically connected therebetween, said plurality of acceptance means each being capable of receiving over a said conductive signal path through said input bus interconnection means a representation of a said photodetector output indicator value and storing same;

providing a subsample transfer signal path through each of a plurality of subsample transfer interconnection means each electrically connected between an output of a said acceptance means in said plurality thereof and an input of a corresponding one of a plurality of accumulation means after each receipt by that said acceptance means of a said representation of a said photodetector output indicator value, said plurality of accumulation means each being capable of receiving over its subsample transfer signal path through its corresponding subsample transfer interconnection means a transfer representation of each of those said representations of said photodetector output signal indicator values received by its corresponding acceptance means, and each being further capable of combining each said subsample transfer representation received thereby in a selected accumulation number of said dwell durations, forming an accumulation period, with any said subsample transfer representations previously received in that said accumulation period to thereby provide at an output thereof a sequence of photodetector combination indicator values with each of said photodetector combination indicator values in said plurality thereof being provided in a final said dwell duration contained in each said accumulation period; and

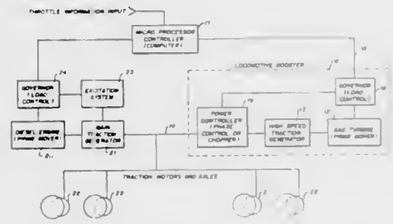
providing in each said final dwell duration in each said accumulation period of each accumulation means a representation of said photodetector combination indicator value at an output of a corresponding one of a plurality of sample transfer interconnection means, said sample transfer interconnection means each having its said output electrically connected to an output bus interconnection means and an input thereof electrically connected to said output of its corresponding said accumulation means.

4,900,944

BOOSTER UNIT FOR DIESEL ELECTRIC LOCOMOTIVE

Frank Donnelly, 1202 Pinewood Crescent, North Vancouver, British Columbia, Canada (V7P 1A6)

Filed Oct. 14, 1988, Ser. No. 257,645
Int. Cl.[4] B60L *11/02*
U.S. Cl. 290—3 **5 Claims**



1. A booster unit for diesel electric locomotive having a frame mounted diesel engine, a main traction generator and a series of traction motors connected to said generators, comprising:

a gas turbine mounted on said frame adjacent said diesel engine;

a high speed alternator connected directly with said turbine;

a series of rectifiers connected at the output of said high speed alternator, said alternator and rectifiers forming a high speed electric generator;

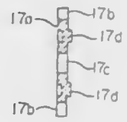
load control means connected at the output of said alternator for controlling the output power thereof, said high speed generator being connected when needed in parallel with said main traction generator such that said traction motors can be supplied with extra electrical power when required.

4,900,945

ENGINE STARTER

Shuzoo Isozumi; Toshinori Tanaka, and Kazuhiro Odawara, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

PCT No. PCT/JP88/00097, § 371 Date Sep. 1, 1988, § 102(e) Date Sep. 1, 1988, PCT Pub. No. WO88/05864, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 3, 1988, Ser. No. 254,937
Claims priority, application Japan, Feb. 5, 1987, 62-265580; Feb. 10, 1987, 62-28625
Int. Cl.[4] F02N *11/00, 15/06*
U.S. Cl. 290—48 **8 Claims**



1. An engine starter comprising

a d.c. motor including a hollow armature rotary shaft having a plurality of cam surfaces composing an over-running clutch mechanism formed on an inner pheripheral surface thereof and having a reduced-diameter portion formed at one end on an outer circumference thereof within an axial length range in which no cam surfaces are provided and having at the other end a radially outwardly extending stopper, a sleeve member having a rolled portion on the outer circumference thereof press fit onto said reduced-diameter portion of said armature rotary shaft, and an armature core placed over the outer circumference of said armature rotary shaft and press fit over the outer circumferential surface of said sleeve member;

a tubular inner member extending within the interior of said armature rotary shaft by at least an axial distance corresponding to the axial length of said cam surfaces;

a roller and a biasing spring disposed within each of wedge-shaped spaces defined between an outer circumferential surface of said inner member and said cam surfaces;

an output rotary shaft disposed within said inner member in a axially slidable engagement therewith by means of splines; and

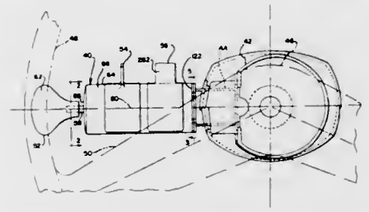
a solenoid switch assembly capable of supplying electric power to said d.c. motor and simultaneously axially sliding said output rotary shaft.

4,900,946

MULTI-FUNCTION SWITCH FOR AUTOMOTIVE VEHICLES

Edward L. Williams, and Donald E. Riley, both of Ft. Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Jun. 3, 1988, Ser. No. 202,722
Int. Cl.[4] B60Q *1/26*; H01H *3/16*
U.S. Cl. 307—10.1 **55 Claims**



1. A multi-function turn signal switch for an automotive vehicle comprising a switch body having a longitudinal axis, a lever that has an exterior end disposed exteriorly of the switch body for operating the lever and an interior end that is disposed interiorly of the switch body, a mount for mounting the lever between its ends on the switch body to enable the interior end of the lever, when operated via its exterior end, to describe a frustoconical zone of motion within the switch body with the apex of the frustoconical zone of motion lying on said longitudinal axis, means acting against the interior end of said lever to create plural discrete positions for the lever circumferentially around the frustoconical zone of motion for giving signals, including right and left turn signals, at each of which discrete positions the lever will be retained when operated to that position, plural electrical switches arranged on said switch body in a circumferentially extending array about said axis and each of said electrical switches being particular to a particular one of said discrete positions of the lever, and switch actuating means on said lever for actuating the particular electrical switch that is particular to the corresponding one of said discrete positions of said lever when the lever is operated to that position.

52. In combination, a right turn signal circuit, a left turn signal circuit, a headlamp dimmer circuit, and a marker lamp interrupt circuit of an automotive vehicle, a multi-function switch for operating said circuits, said switch comprising four sets of contacts, each of which is particular to a particular one of said circuits, said multi-function switch comprising a switch body having a longitudiknal axis, said four sets of contacts

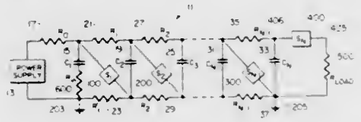
being arranged on said switch body in a circumferential array about said longitudinal axis at 90 degree intervals, and an actuating lever that is pivotally mounted on said switch body such that the pivot point is located on said axis and the lever is pivotable in two opposite directions 180 degrees apart about said axis to respectively actuate the two sets of contacts that are particular to the right turn signal circuit and left turn signal circuit respectively for giving respective right and left turn signals, said lever also being pivotable in an additional two opposite directions that are themselves 180 degrees apart about said axis but at 90 degrees to the pivotable directions for actuating the sets of contacts that are particular to the turn signal circuits, the lever being effective when pivoted in respective ones of said additional two opposite directions to respectively actuate the two sets of contacts that are particular to the headlamp dimmer circuit and the marker lamp interrupt circuit respectively for actuating the headlamp dimmer circuit and the marker lamp interrupt circuit respectively for giving headlamp dinner and marker lamp interrupt signals respectively.

4,900,947

ASYNCHRONOUS MARX GENERATOR UTILIZING PHOTO-CONDUCTIVE SEMICONDUCTOR SWITCHES

Maurice Weiner, Ocean; Anderson H. Kim, and Lawrence J. Bovino, both of Eatontown, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 2, 1988, Ser. No. 188,933
Int. Cl.[4] H02M *3/18*
U.S. Cl. 307—110 **6 Claims**



1. A device comprising:
a plurality of means for electrostatic storage connected in parallel;
a plurality of optically controlled switches having a first optically controlled switch, said switches being connected in series between pairs of said means for electrostatic storage;
means for independently activating the plurality of serially connected, optically controlled switches in a controlled sequential manner beginning with the first switch so that each successive switch is activated upon the arrival of the voltage wavefront which is generated by the activation of the first switch and which propagates in the direction of the remaining switches.

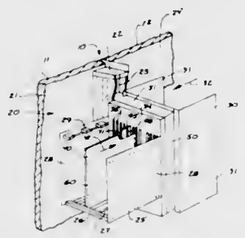
4,900,948

APPARATUS PROVIDING SIGNALS FOR BURN-IN OF INTEGRATED CIRCUITS

Harold E. Hamilton, Minneapolis, Minn., assignor to Micro Control Company, Minneapolis, Minn.

Filed Mar. 16, 1988, Ser. No. 168,875
Int. Cl.[4] H02J *7/00;* **G01R** *15/12;* **H05K** *1/11*
U.S. Cl. 307—149 **10 Claims**

1. A burn-in board assembly for providing signals to electronic circuit package components, said burn-in board assembly being useable in an environmental chamber having a plurality of slots extending through a wall thereof comprising a first planar board of size sufficient to mount a desired number of the components, each of said components having a plurality of signal connection means, said first board having a plurality of edge contacts adjacent one edge thereof and connected to a first plurality of said signal connection means, said first board having a first length extending along the plane of the board in a direction perpendicular to the length of the one edge thereof, and at least one second auxiliary board portion mounted to the first board adjacent the edge of the first board having said contacts thereon and being spaced from the first board by a distance sufficient so that when the first board is passed through a slot in the wall of an environmental chamber, the



auxiliary board passes through an adjacent slot in such wall, the auxiliary board having edge contacts aligning with the contacts of the first board and connected to a second plurality of signal connection means on the first board, the auxiliary board being substantially shorter than the first board in direction of the first length.

4,900,949

DELAY TYPE FLIP-FLOP ARRANGEMENT USING TRANSISTOR TRANSISTOR LOGIC

Hitoshi Saitoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 30, 1988, Ser. No. 238,063
Claims priority, application Japan, Aug. 31, 1987, 62-215100
Int. Cl.[4] H03K *3/284, 19/088, 19/084*
U.S. Cl. 307—272.2 **1 Claim**



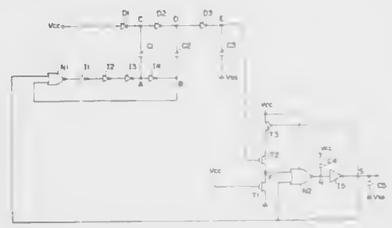
1. A flip-flop arrangement receiving a clock signal and an input data and outputting a logical output in accordance with a logical level of said input data, said flip-flop arrangement comprising:
a master flip-flop for transmitting a pair of output signals having a complementary level corresponding to said logical level of said input data to a pair of output ends when said clock signal is at a first logical level and transmitting a pair of output signals having an in-phase and predetermined level to said pair of output ends regardless of said logical level of said input data when said clock signal is at a second logical level;
a slave flip-flop connected to said master flip-flop and receiving said pair of output signals having a complementary level transmitted to said pair of output ends, said slave flip-flop latching data corresponding to said pair of output signals when said clock signal is brought to said second logical level and outputting an output signal having a level corresponding to said data to an output end thereof;
an output buffer connected to said output end of the slave flip-flop, for effecting a buffering of said data latched in said slave flip-flop, said output buffer including
a first power supply line,
a second power supply line having a lower voltage than said first power supply line,
a first transistor having a base connected to said output end of the slave flip-flop and a collector connected to a side of said first power supply line,
a second transistor having a base connected to an emitter of said first transistor,
a third transistor having an emitter connected to a side of an output terminal, a collector connected to a side of said first power supply line, and a base connected to a collector of said second transistor, and
a fourth transistor having a collector connected to a side of said output terminal, an emitter connected to a side of said second power supply line, and a base connected to an emitter of said second transistor; and
a drive circuit connected between said master flip-flop and said output buffer, for driving said output buffer to output said logical output in response to logical levels of data appearing at said pair of output ends of said master flip-flop, said drive circuit including
a first diode having an anode connected to a base of said second transistor and a cathode connected to one of said pair of output ends of the master flip-flop,
a fifth transistor having a collector connected to said collector of the second transistor, and an emitter connected to said emitter of the second transistor,
a sixth transistor having a collector connected to a base of said fifth transistor and an emitter connected to a side of said second power supply line, and
a second diode having an anode connected to a side of a base of said sixth transistor and a cathode connected to another of said pair of output ends.

4,900,950

POWER ON RESET CIRCUIT FOR A MOS TECHNOLOGY INTEGRATED CIRCUIT

Bruno Dubujet, Palette, France, assignor to SGS Thomson Microelectronics S.A., Gentilly, France

Filed Jun. 1, 1988, Ser. No. 200,959
Claims priority, application France, Jun. 12, 1987, 87 08190
Int. Cl.[4] H03K *17/22, 17/20, 5/153, 17/687*
U.S. Cl. 307—272.3 **20 Claims**



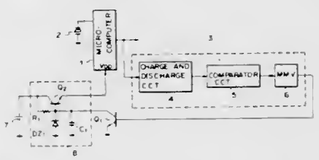
1. A power on reset circuit for starting a MOS technology integrated circuit, comprising voltage-increasing means supplied by a supply voltage, for building a voltage higher than said supply voltage, and comparing means for comparing said higher voltage and said supply voltage and for delivering a powering signal when the difference between said voltages exceeds a given threshold.

4,900,951

LATCH-UP RESTORATION CIRCUIT

Tadashi Saito; Ichiro Sakamoto; Shizuo Ando, and Souhei Yamakawa, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,372
Claims priority, application Japan, Nov. 18, 1987, 62-176294[U]
Int. Cl.[4] H03K *19/003*
U.S. Cl. 307—296.4 **6 Claims**



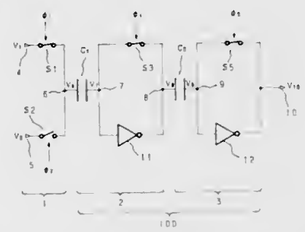
1. A latch-up restoration circuit for an electronic circuit generating a signal having a predetermined operating frequency, comprising:
a latch-up sensing means for sensing a state that the frequency of said signal generated by said electronic circuit is on the outside of a predetermined frequency range and generating a latch-up detection signal; and
a power supply inhibiting means for inhibiting supply of a power current to said electronic circuit for a predetermined time period in response to said latch-up detection signal.

4,900,952

VOLTAGE COMPARISON APPARATUS

Shiro Hosotani; Takahiro Miki, and Toshio Kumamoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 27, 1989, Ser. No. 303,778
Claims priority, application Japan, Oct. 7, 1988, 63-254132
Int. Cl.[4] H03K *5/24*
U.S. Cl. 307—355 **2 Claims**



1. A voltage comparison apparatus comprising:
an input unit which has first and second switch means being complementarily ON/OFF controlled, whose one ends are connected together with each other, and whose other ends are supplied with a first voltage and a second voltage to be compared respectively, and
an amplifier unit having a plurality of amplifier circuits each of whose input terminal is each one end of a coupling capacitor and each of whose other end is connected to each one end of parallel circuits of an inverting amplifier and a feed back route switch means, and each of whose output terminal is each other end of said parallel circuits, in which an input terminal of the first amplifier circuit of said plurality of amplifier circuits is connected to said one end of said input unit, each input terminal of the other amplifier circuits is connected in cascade to output termi-

nals of the amplifier circuits which are located more adjacent said input unit, and the feedback route switch means of at least one of the amplifier circuits is adapted to be ON/OFF controlled in complementary relation to the feedback route switch means of the other amplifier circuits,

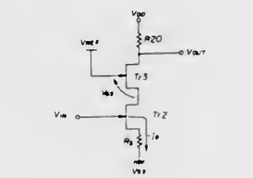
whereby the feedback route switch means of said at least one amplifier circuit is so controlled that the timing for said switch means is turned on (or off) in advance of the timing of turning off (or on) of the feedback route switch means of the amplifier circuit located more adjacent said input unit.

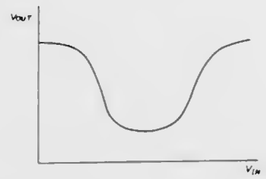
4,900,953

LOGIC CIRCUIT EMPLOYING FIELD EFFECT TRANSISTOR HAVING JUNCTION WITH RECTIFYING CHARACTERISTIC BETWEEN GATE AND SOURCE

Yuu Watanabe, Hadano, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 2, 1988, Ser. No. 163,508
Claims priority, application Japan, Mar. 11, 1987, 62-53952
Int. Cl.[4] H03K *19/094, 19/21*
U.S. Cl. 307—450 **11 Claims**





1. A logic circuit comprising:

a first terminal for receiving a first power source voltage;

a second terminal for receiving a second power source voltage lower than the first power source voltage;

a third terminal for receiving a reference voltage;

an input terminal for receiving an input voltage;

an output terminal for outputting an output voltage;

a load coupled between said first terminal and said output terminal; and

first and second field effect transistors coupled in series between said output terminal and said second terminal,

said first field effect transistor being coupled to said output terminal and having a gate coupled to said third terminal,

said second field effect transistor being coupled to said second terminal and having a gate coupled to said input terminal, said second field effect transistor having a junction with a rectifying characteristic between the gate and source thereof, and

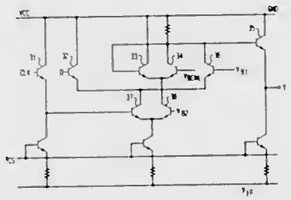
wherein said reference voltage applied to said third terminal is set to such a voltage that a gate-source voltage of said first field effect transistor is greater than a threshold voltage of said first field effect transistor when said second field effect transistor is ON but the gate current of said second field effect transistor does not flow, and the gate-source voltage of said first field effect transistor is smaller than the threshold voltage of said first field effect transistor when the gate current of said second field effect transistor flows.

4,900,954

MIXED CML/ECL MACRO CIRCUITRY

Michael Franz, San Jose, and Tsung C. Whang, Cupertino, both of Calif., assignors to Siemens Components,Inc., Iselin, N.J.

Filed Nov. 30, 1988, Ser. No. 278,093
Int. Cl.[4] H03K *19/086, 5/12;* **G06F** *7/50*
U.S. Cl. 307—455 **20 Claims**



1. A logic network having a plurality of levels including at least one first lower current switching circuit and at least one second upper current switching circuit, each circuit comprising at least one input transistor and a reference transistor, each transistor having a base, an emitter, and a collector, the emitters of transistors in each current switching circuit connected in common together, the collector of an input transistor in each first lower current switching circuit connected to the common of a second upper current switching circuit, means for applying input signals to the bases of input transistors, means for applying first and second reference levels respectively to the base of a reference transistor in each of the at least one first lower current switching circuit and each of the at least one second upper current switching circuit, means for providing an output from at least one collector of a transistor in one second upper current switching circuit the logic network comprising:

a CML logic level including at least one CML current switch above the at least one second upper current switching circuit, each CML current switch including at least one input CML transistor and a reference CML transistor, each CML transistor having a base, an emitter, and a collector, the base of each reference CML transistor being biased at an additional reference level above the second reference level, and each CML transistor in a CML current switch having their emitters connected in common together and to a selected collector of the at least one first lower level current switching circuit, an output of each CML current switch provided at a collector of one of its CML transistors, the base of each input CML transistor in the at least one CML current switch being an input for direct connection to a selected output of the second upper level current switching circuit and the CML current switch whereby multiple CML current switches are cascaded by having inputs and outputs directly connected together.

4,900,955

VOLTAGE SHARING CIRCUIT

Vincent E. Kurpan, Greenfield, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 47,791, May 6, 1987, abandoned. This application Jun. 19, 1989, Ser. No. 369,785
Int. Cl.[4] H03K *17/284, 17/687, 17/08, 17/288*
U.S. Cl. 307—568 **36 Claims**

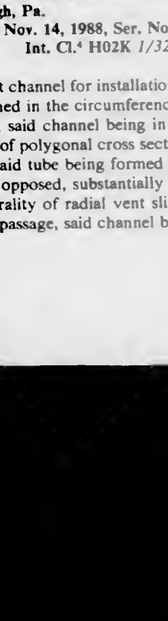
1. A voltage sharing circuit, comprising:

a first active electronic device having at least first, second and third electrodes and having a predetermined voltage rating;

a second active electronic device having at least first, second and third electrodes and having a predetermined voltage rating, said first electrode of said second active electronic device being coupled to said second electrode of said first active electronic device;

means for receiving an input signal only at said third electrode of said first active electronic device;

means for providing an output signal at said second electrode of said second active electronic device, the voltage of said output signal being greater than said voltage rating of said first active electronic device;



a supply voltage source coupled to said second electrode of said second active electronic device;

a first source of fixed reference voltage;

a first impedance device coupling said second and third electrodes of said second active electronic device; and

a first diode intermediate said first source of fixed reference voltage and said third electrode of said second active electronic device to limit the maximum voltage with respect to ground potential on said third electrode of said second active electrode device.

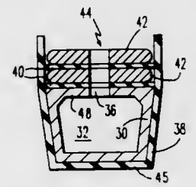
4,900,956

CLOSED CHANNEL AXIAL VENT FOR RADIALLY VENTILATED GENERATOR ROTOR

Carlos A. Gavilondo, Winter Park, and Aleksandar Prole, Winter Springs, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1988, Ser. No. 270,864
Int. Cl.[4] H02K *1/32*
U.S. Cl. 310—61 **11 Claims**

1. An axial vent channel for installation in a generator rotor winding slot formed in the circumference of a rotor having a longitudinal; axis, said channel being in the form of an elongate, closed tube of polygonal cross section enclosing a longitudinal passage, said tube being formed to have a closed bottom wall and an opposed, substantially closed, top wall provided with a plurality of radial vent slits spaced apart along said longitudinal passage, said channel being configured to be installed in the rotor winding slot with said passage extending parallel to the axis of the rotor, said bottom wall facing toward



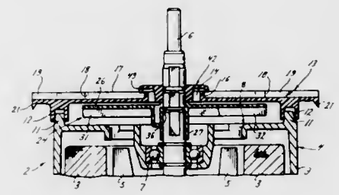
the axis of the rotor and said top wall facing away from the axis of the rotor.

4,900,957

FAN DRIVE WITH WATER SLINGER SEAL

Gerald N. Barker, and Carl R. Fischer, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 29, 1988, Ser. No. 226,415
Int. Cl.[4] H02K *9/06, 5/00*
U.S. Cl. 310—62 **12 Claims**



1. A fan drive with water slinger seal for a vertically mounted electric motor positioned below a liquid sump into which a rotor shaft of the motor extends, comprising;

an electric motor having a front endshield with a central opening through which a rotor shaft passes, said motor being mounted with said rotor shaft vertically disposed, and said rotor shaft having a plurality of pairs of opposed flats extending axially from said front endshield to the end of said shaft;

a means for liquid capture and disposal having a central opening through which said rotor shaft passes in vertical extension from said motor to said liquid sump;

a means for cooling the adjacent end of said motor, said means mounted upon said rotor shaft between said front endshield and said means for liquid capture and disposal; and

means having a central opening through which said shaft extends, said means disposed snugly on said shaft for slinging liquids away therefrom and within said means for liquid capture and disposal, and for sealing said shaft to liquid passage when said means snugly presses radially against said shaft and axially upon said means for cooling.

4,900,958

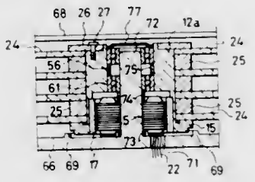
DRIVE MOTOR FOR MAGNETIC DISKS, OPTICAL DISKS, AND MAGNETO-OPTICAL DISKS

Haruo Kitahara, Nagano, and Takeshi Ohshita, Ina, both of Japan, assignors to Shinano Tokki Corporation, Japan

Continuation-in-part of Ser. No. 106,626, Oct. 6, 1987, Pat. No. 4,760,298. This application Jul. 25, 1988, Ser. No. 223,895

Int. Cl.[4] H02K *5/16, 7/08*

U.S. Cl. 310—67 R **50 Claims**



1. A motor, suitable for driving a magnetic disk, an optical disk, or a magneto-optical disk, which comprises:

a. a frame having a planar bottom member;

b. an upstanding shaft on said planar bottom member, said upstanding shaft having a large diameter lower portion, an intermediate diameter middle portion and a small diameter upper portion;

c. an aperture in said planar bottom member;

d. a core mounted on said upstanding shaft on said middle portion and seated against said lower portion proximate said planar bottom member;

e. an armature wound on said core and energizable by receiving electrical energy from wires passing to said armature through said aperture;

f. a pair of spaced apart bearings mounted on said upstanding shaft on said upper portion above said armature;

g. a cup shaped rotor mounted on said bearings to allow said rotor to rotate about said upstanding shaft and armature, said rotor having a cylindrical open bottom encompassing said armature, and said rotor including disk support means for mounting a disk on said rotor in a plane perpendicular to the axis of said upstanding shaft; and

h. a plurality of permanent magnets mounted within said cup shaped rotor proximate to and spaced from said armature in magnetic engagement, whereby said rotor rotates about the upstanding shaft and armature when said armature is energized.

4,900,959

INSULATED OUTER ROTOR FOR BRUSHLESS EXCITER

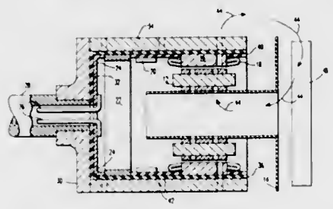
Samuel A. Drinkut, Winter Park; James R. Pipkin, Orlando, and Lon W. Montgomery, Winter Springs, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 6, 1989, Ser. No. 294,097

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—68 D **7 Claims**

1. In a generator exciter comprising a stator for producing a dc field and a rotor mounted to rotate relative to the stator and including armature windings connected to generate ac output currents, said rotor comprising a high strength retaining cylinder located radially outwardly of, and supporting, said armature windings, and an insulating material being interposed



between said retaining cylinder and said armature windings, wherein said rotor is mounted radially outwardly of said stator.

4,900,960

ELECTRIC ACTUATOR WITH OUTPUT SHIELD AND MATING GEAR

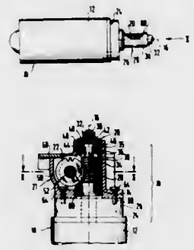
Herbert Becker; Gerhard Schelborn, both of Coburg; Claus Dallwig, Rödenthal/Bld; Dieter Pöschl, Steinbach am Wald, and Hans J. Volk, Ebersdorf OT Frohnlach, all of Fed. Rep. of Germany, assignors to Brose Fahrzeugteile GmbH & Co. Kommanditgesellschaft, Coburg, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 255,547

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733922

Int. Cl.[4] H02K *7/116;* **F16H** *1/16*

U.S. Cl. 310—85 **12 Claims**



1. An electrical actuating motor with a gear unit for use in a motor vehicle, comprising:

a motor housing;

a shaft rotatably supported in said motor housing so that an end section of said shaft is arranged externally of said motor housing, said shaft end having a first toothed part provided so as to be engageable with a second toothed part of the gear unit; and

a bearing shield having a bearing shield attachment flange provided so as to attach said bearing shield to said motor housing, said bearing shield having a bearing shield side wall with a passage arranged therein for said second toothed part and so as to embrace said shaft end section, said bearing shield further including a bearing shield end wall at a side of said first toothed part and facing away from said motor housing, a bearing area for said shaft end section being provided in the region of said bearing shield end wall, said gear unit including a gear unit housing having an opening with a side wall, said bearing shield being insertable into said opening so that said bearing shield side wall engages said housing opening sidewall.

4,900,961

THRUST BEARING ARRANGEMENT FOR CAPSTAN MOTOR

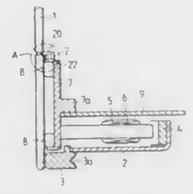
Shinichi Kudo, and Yoshito Hirata, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusbo, Nagano, Japan

Filed Sep. 26, 1988, Ser. No. 248,746

Claims priority, application Japan, Sep. 25, 1987, 62-145349[U]

Int. Cl.[4] H02K *5/16*

U.S. Cl. 310—90 **8 Claims**



1. An electric motor thrust bearing mechanism, comprising:

(a) a bearing holder (7);

(b) a bearing (8) held by said bearing holder;

(c) a vertically oriented shaft (1) rotatably supported by said bearing;

(d) a rotor yoke (2) mounted on one end of said shaft;

(e) a rotor magnet (4) mounted on said yoke and confronting a stator (5, 6);

(f) a locking member (20) mounted on said shaft above said bearing;

(g) a first, upper thrust pad (21) engaged with said locking member for rotation therewith; and

(h) a second, lower thrust pad disposed between said first thrust pad and said bearing, and having an outer periphery disposed in an annular groove formed in an upper end of said bearing holder;

(i) said first and second upper and lower thrust pads being relatively rotatable as said shaft rotates and preventing any downward movement thereof.

4,900,962

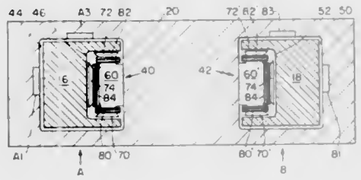
MAGNETIC TRANSLATOR BEARINGS

Richard L. Hockney, Lynnfield; James R. Downer, Canton; David B. Eisenhaure, Hull; Timothy J. Hawkey, Brookline, and Bruce G. Johnson, Nahant, all of Mass., assignors to SatCon Technology Corporation, Cambridge, Mass.

Filed Jan. 18, 1989, Ser. No. 298,644

Int. Cl.[4] F16C *39/06*

U.S. Cl. 310—90.5 **13 Claims**



1. A magnetic bearing system for enabling translational motion comprising:

carriage means;

shaft means for movably supporting said carriage means;

first magnetic bearing means fixed to one of said carriage and shaft means and slidably received in first channel means of the other of said carriage and shaft means; said first channel means being generally "U" shaped with two side walls and a back wall, said magnetic bearing means including a magnetic bearing having a pair of spaced magnetic pole pieces, each pole piece having a pair of electromagnetic coil means mounted on poles on opposite ends of said pole piece proximate said side walls and third electromagnetic coil means mounted on a pole of the pole piece proximate said back wall;

means for sensing motion, translationally along two axes and rotationally about three axes, of the carriage means and shaft means relative to each other; and

means, responsive to said means for sensing, motion for generating correction signals to drive said coils to compensate for any misalignment sensed between the carriage means and shaft means.

4,900,963

D.C. MOTOR

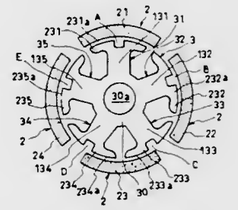
Hiroyuki Amano, Kariya; Tomoaki Nishimura, Toyoake, and Toshinori Sasaki, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Sep. 30, 1988, Ser. No. 251,493

Claims priority, application Japan, Sep. 30, 1987, 62-246734

Int. Cl.[4] H02K *23/42, 21/26, 21/00*

U.S. Cl. 310—187 **3 Claims**



1. A D.C. motor comprising at least two circumferentially spaced apart squared field magnet means and a rotatable armature core means with at least three teeth wherein each tooth has a plurality of axially extending slots with a rectangular cross section disposed on an end surface of each tooth with one of said slots being located centrally of each tooth for enlarging the air gap between said magnets and said core, said magnet means having a circumferential extent and spacing and each tooth of said core means having a circumferential extent such that when one tooth is disposed in complete overlapping relation with one of said magnet means the ends of the opposed magnet means will be disposed in alignment with said centrally located slots in adjacent teeth respectively whereby said magnet means and said core means provide an increase in cogging force.

4,900,964

POLE FACE SLOT FILLER

Sui-Chun Ying, Winter Springs, and Robert T. Hagaman, Oviedo, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

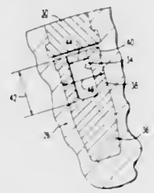
Filed Jan. 11, 1989, Ser. No. 295,699

Int. Cl.[4] H02K *3/34*

U.S. Cl. 310—215 **8 Claims**

1. A pole face slot filler for insertion into a pole face slot formed in a pole region of a generator rotor, said filler having a U-shaped cross section and being composed of a base portion and two leg portions extending from said base portion and forming the legs of said U-shaped cross section, said leg por-

tions extending from said base portion in the radial direction away from the axis of the rotor when inserted in the pole face slot, wherein said filler is configured and dimensioned to



achieve a press fit in the pole face slot by said leg portions having laterally protruding parts at the ends thereof remote from said base portion.

4,900,965

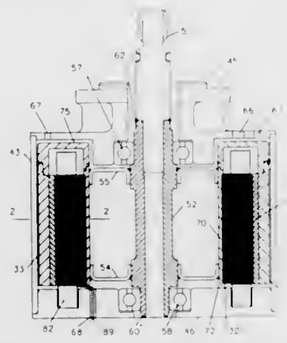
LIGHTWEIGHT HIGH POWER ELECTROMOTIVE DEVICE

Gene A. Fisher, Highlands Ranch, Colo., assignor to Fisher Technology, Inc., Littleton, Colo.

Filed Sep. 28, 1988, Ser. No. 250,263

Int. Cl.[4] H02K *1/16, 21/22;* **H01F** *7/08*

U.S. Cl. 310—216 **39 Claims**



1. An electromotive device, comprising:

an inductor including a plurality of magnetic flux conducting bars and electric windings disposed about said bars for generating an electromagnetic field;

said electric windings comprising electrical conductors randomly dispersed between said flux conducting bars;

said bars incorporating a geometry which shields said windings from the magnetic fields within the electromotive device;

a magnetic field generator positioned adjacent to one side of said inductor;

a first flux return path on the side of said magnetic field generator opposite said inductor; and

a second flux return path on the side of said inductor opposite said magnetic field generator.

4,900,966

PROTECTION SWITCH FOR VEHICLE DC WINDOW MOTOR

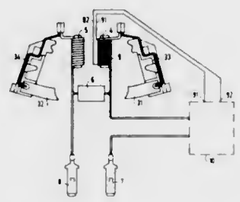
Udo Winter, Kuernach, and Andreas Schebler, Wuerzburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,795

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730630

Int. Cl.[4] H02K *11/00;* **H02P** *5/16*

U.S. Cl. 310—239 **3 Claims**



3. A method of controlling an operating switch of a dc commutator motor that has a brush holder and radio interference suppression choke coupled to the brush holder, comprising:

providing an inductor coil wound concentrically on the radio interference suppression choke, said inductor coil being coupled to said operating switch;

inducing a voltage in said inductor coil when said motor is running;

switching off said motor with said operating switch upon a reduction in said voltage in said inductor coil, whereby no separate inductors and capacitors are needed.

4,900,967

ELECTRIC MOTOR ASSEMBLY

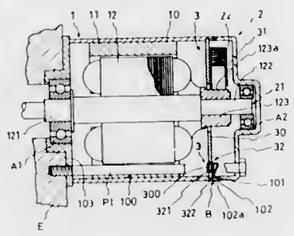
Hiroyuki Amano, Kariya, and Hiroyuki Takagi, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Sep. 30, 1988, Ser. No. 251,594

Claims priority, application Japan, Sep. 30, 1987, 62-150046[U]

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—239 **4 Claims**



1. An electric motor assembly comprising housing means having first and second substantially cylindrical parts provided with stepped end portions connected in an interfitting circumferentially extending stepped connection, stator means secured within said housing means, rotor means rotatably supported in said housing means, a stationary base plate having a circumferential portion with circumferential concave recesses disposed intermediate the stepped end portions of said first and second substantially cylindrical parts in axial engagement with one of

said first and second substantially cylindrical parts, spring means having intermediate portions mounted in said recesses between said plate and the other of said first and second substantially cylindrical parts and having end portions engaging said housing means for biasing said plate into engagement with said one of said first and second substantially cylindrical parts, and brush means mounted on said plate for engagement with commutator means carried by said motor assembly.

4,900,968

ELECTRONICALLY COMMUTATED COLLECTORLESS DIRECT-CURRENT MOTOR

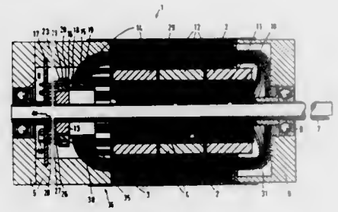
Josef Feigel, Landshut, and Klaus Pfendler, Bonndorf, both of Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz Aktiengesellshaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,497

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710659

Int. Cl.[4] H02K *3/46*

U.S. Cl. 310—260 **10 Claims**



1. Electronically commutated, collectorless direct-current motor having a predetermined number of poles, comprising:

a rotor having a multipolar body of permanent-magnet material;

a multipolar stator coil surrounding said rotor, said stator coil having a plurality of electrical ends;

an internal magnetic yoke surrounded by said multipolar stator coil; said stator coil having a plurality of phase windings equal in number to a multiple of said predetermined number of poles;

a cylindrical body having a rim and a portion which is concentrically disposed within said stator coil;

a plurality of eyehooks connected to a front portion of said rim of said cylindrical body; each of said plurality of electrical ends of said stator coil being respectively secured to said rim by corresponding ones of said plurality of eyehooks, said rim having a plurality of circumferential recesses which are equal to the number of said plurality of phase windings, each of said plurality of circumferential recesses containing a corresponding one of said eyehooks.

4,900,969

SURFACE ACOUSTIC WAVE CONVOLVER

Syuichi Mitsutsuka, and Takeshi Okamoto, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,403

Claims priority, application Japan, Apr. 17, 1987, 62-094490

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—313 A **12 Claims**

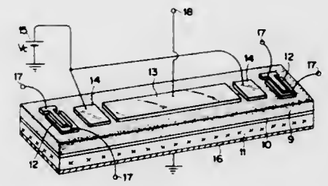
1. A surface acoustic wave convolver, comprising:

a multi-layered structure which includes a piezoelectric layer and includes a semiconductor layer having a surface;

a pair of spaced input electrodes disposed on said piezoelectric layer;

a gate electrode which is disposed along a propagation path of surface acoustic waves in said piezoelectric layer at a location between said input electrodes and which extracts convolution signals from said convolver;

two auxiliary electrodes each disposed between said gate electrode and a respective one of said input electrodes; and



means for applying to each said auxiliary electrode a bias voltage which causes portions of said surface of said semiconductor layer located below said auxiliary electrodes to be in an inverted state.

4,900,970

ENERGY-TRAPPING-TYPE PIEZOELECTRIC RESONANCE DEVICE

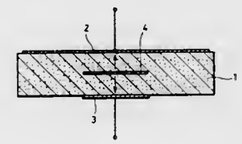
Akira Ando; Toshihiko Kittaka; Yukio Sakabe, and Satoru Fujishima, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 6, 1988, Ser. No. 215,549

Claims priority, application Japan, Jul. 6, 1987, 62-168491

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—320 **10 Claims**



1. An energy-trapping-by-frequency-lowering-type piezoelectric-resonance device utilizing the mode of thickness-extensional vibration, comprising:

a plate-shaped body of a piezoelectric material having major surfaces; and

three or more electrodes arranged opposed to each other in the direction of thickness of said body through layers of the piezoelectric material; and

said electrodes being spaced apart from each other by an amount selected to result in resonance at a harmonic mode; and

at least one of said electrodes being smaller in area than the major surfaces of said body, thereby to be capable of energy trapping by frequency lowering.

4,900,971

FACE SHEAR MODE QUARTZ CRYSTAL RESONATOR

Hirofumi Kawashima, Sendai, Japan, assignor to Seiko Electronic Components Ltd., Japan

Filed Mar. 7, 1989, Ser. No. 320,157

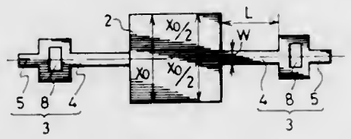
Claims priority, application Japan, Mar. 10, 1988, 63-57106; Mar. 10, 1988, 63-57109; Mar. 22, 1988, 63-67819

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—361 **1 Claim**

1. A face shear mode quartz crystal resonator having a vibrational portion and supporting portions incorporated therein by and etching method, characterized in that a flexural portion of said supporting portion is connected with a central portion of a side of said vibrational portion, the width W of

said flexural portion connected with said vibrational portion is smaller than 0.67 L (L is the length of said flexural portion), said supporting portions are provided at the edges in the z'-axis direction of said vibrational portion, said vibrational portion is



substantially square, each side of said vibrational portion is from 0.72 mm to 2.02 mm, and said vibrational portion is fixedly supported via both distal end portions of said supporting portions.

4,900,972

ELECTRODE FOR PIEZOELECTRIC COMPOSITES

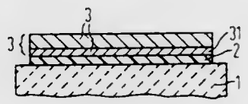
Wolfram Wersing, Kirchheim; Manfred Schnoeller, Haimhausen; Karl Lubitz, Ottobrunn, and Jutta Mohaupt, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,794

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724290

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—364 5 Claims



1. An electrode for piezoelectric composites having high acoustic attenuation comprising:

a first layer composed of an intrinsically conductive plastic that is generated directly on a ceramic of a piezoelement by polymerization and having a higher elasticity than the ceramic; and

a second layer composed of a metal having a higher conductivity than the plastic layer.

4,900,973

ELECTRON TUBE SEALING STRUCTURE

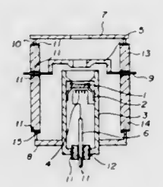
Wakou Suzuki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 16, 1988, Ser. No. 271,906

Claims priority, application Japan, Nov. 17, 1987, 62-291129

Int. Cl.[4] H01J *1/90, 19/44*

U.S. Cl. 313—251 3 Claims



1. An electron tube sealing structure comprising:

a cylindrical insulator having metallized layers on both end surfaces thereof,

sealing metal members, each being fixed to a corresponding one of said metallized layers to provide a vacuum chamber within the insulator, and

electrodes each connected to a corresponding one of said sealing members for producing an electric field across said sealing members,

wherein said cylindrical insulator is provided with at least one salient portion at an inner end thereof, said salient portion being parallel to the electric field and positioned on the side of a negative electrode for said electric field, thereby shielding at least a corresponding one of said metallized layers.

4,900,974

ION SOURCE

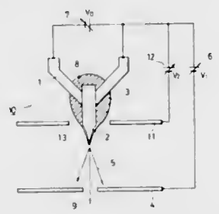
Tohru Ishitani, Sayama; Hideo Todokoro, Tokyo, and Hifumi Tamura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 533,745, Sep. 19, 1983, abandoned, which is a continuation of Ser. No. 231,334, Feb. 4, 1981, abandoned. This application Nov. 7, 1984, Ser. No. 668,932

Claims priority, application Japan, Feb. 8, 1980, 55-13724

Int. Cl.[4] H01J *1/02*

U.S. Cl. 313—359.1 6 Claims



1. An ion source comprising a first electrode means having a holding part for holding a substance to-be-ionized maintained in a molten state, and a pointed end part formed in a shape of a needle; a control electrode means disposed in a vicinity of the pointed end part for applying an electric field to the molten substance held by said holding part and for controlling a quantity of the molten substance supplied to the pointed end part by applying an electric field to a liquid surface of the molten substance held by said holding part; and an extractor means disposed opposite to the pointed end part for applying an electric field to the pointed end part wetted with the molten substance and for extracting ions of said molten substance from the pointed end part, said control electrode means shielding the liquid surface of the molten substance on said first electrode means from the electric field generated by said extractor means so that the effect of the field generated by the extractor means on the profile of the liquid surface is reduced thereby ensuring a uniform flow of the molten substance.

4,900,975

TARGET OF IMAGE PICKUP TUBE HAVING AN AMORPHOUS SEMICONDUCTOR LAMINATE

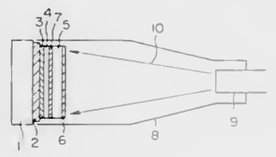
Yasuharu Shimomoto, Hamamatsu, Japan; Sachio Ishioka, Burlingame, Calif.; Yukio Takasaki, Kawasaki; Tadaaki Hirai, Koganei; Kazutaka Tsuji, Hachioji; Tatsuo Makishima, Mitaka; Hirokazu Matsubara, Tokyo; Kenji Sameshima, Hachioji; Junichi Yamazaki, Kawasaki; Kenkichi Tanioka; Mitsuo Kosugi, both of Tokyo; Keiichi Shidara; Tatsuro Kawamura, both of Tama; Eikyuu Hiruma, Komae, and Takashi Yamashita, Sagamihara, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed Jun. 29, 1987, Ser. No. 67,229

Claims priority, application Japan, Jun. 27, 1986, 61-149553

Int. Cl.[4] H01J *29/45, 31/38*

U.S. Cl. 313—366 12 Claims



1. A target of an image pickup tube comprising: a light-transmitting substrate; a transparent conductive layer on said substrate; a photoconductive layer on said conductive layer having a first amorphous layer for converting incident light into photo carriers and consisting essentially of silicon, and a second amorphous layer consisting essentially of selenium, wherein said first amorphous layer is disposed on a light receiving side of said photoconductive layer; and a blocking layer for preventing injection of carriers from said transparent conductive layer into said photoconductive layer.

4,900,976

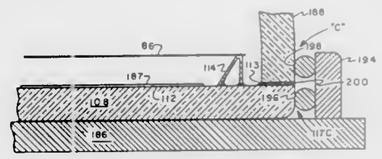
MATERIAL AND ASSEMBLIES FOR TENSIONED FOIL SHADOW MASKS

Michael Livshultz, Skokie, and Hua Sou Tong, Mundelein, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 127,724, Dec. 2, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 287,560

Int. Cl.[4] H01J *29/07*

U.S. Cl. 313—402 13 Claims



1. A foil shadow mask for use in a tensioned foil color cathode ray tube, said foil mask being formed from an alloy comprising between about 30 and about 85 weight-percent nickel, between about 3 and about 5 weight-percent molybdenum between 0 and about 2 weight-percent of an alloying agent selected from the group consisting of vanadium, titanium, hafnium, niobium and mixtures thereof, balance iron and incidental impurities, said alloy having a coefficient of expansion that is not less than about that of the faceplate of the cathode ray tube.

4,900,977

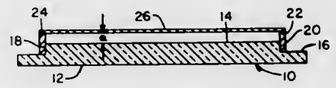
SUPPORT SYSTEM FOR FLAT CRT TENSION MASK

Donald J. Lopata, Horseheads, and Robert L. Mathew, Elmira, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Apr. 4, 1988, Ser. No. 177,338

Int. Cl.[4] H01J *29/07, 29/86*

U.S. Cl. 313—407 6 Claims



1. A CRT panel and mask assembly comprising:

a glass panel member having an outer surface and an inner surface;

said inner surface having a central target area surface portion and a sealing land, with said sealing land surrounding and being stepped with respect to said central target area surface portion;

a peripheral surface bounding said central target area surface portion and extending substantially perpendicular to said target surface portion, and being formed as a connecting wall between said stepped sealing land and said central target area surface portion;

a support frame snuggly positioned against said peripheral bounding surface;

said support frame having a bonding surface spaced from said central target area surface portion with a desired Q-spacing; and

a pretensioned flat shadow mask secured to said bonding surface.

4,900,978

ELECTRON GUN HAVING BLACKENED GRIDS USED IN-LINE TYPE COLOR CRT, AND COLOR CRT USING THE SAME

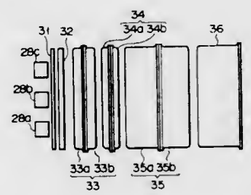
Toshio Shimaohgi; Hideo Mori, and Tadanori Okada, all of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1988, Ser. No. 171,734

Claims priority, application Japan, Mar. 23, 1987, 62-65554

Int. Cl.[4] H01J *29/56*

U.S. Cl. 313—409 8 Claims



1. An in-line type color CRT electron gun comprising a triode and a plurality of grids, wherein at least one of said plurality of grids is composed of a black member or a member on which a black film is formed and wherein an emissivity of said black member or black film is 0.3 or more when an emissivity of a perfect black body is 1.

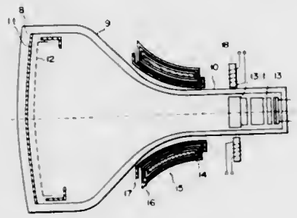
VOL 1111 ISS 2 FE 13 1990 UMI

4,900,979

COLOR CATHODE RAY APPARATUS PROVIDED WITH DYNAMIC CONVERGENCE MEANS

Taketoshi Shimoma, Isesaki; Katsuei Morohashi, Menuma, and Jiro Shimokobe, Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 25, 1988, Ser. No. 198,822
Claims priority, application Japan, May 28, 1987, 62-129620
Int. Cl.[4] H01J *29/51, 29/56*
U.S. Cl. 313—412 **7 Claims**



1. A color cathode ray apparatus comprising:
a vacuum envelope;
a phosphor screen formed in the envelope which includes a center region, horizontal side regions each arranged on either horizontal side of the center region, and vertical side regions each arranged on either vertical side of the center region;
an electron gun assembly of the in-line type for emitting center and side electron beams to the phosphor screen;
a shadow mask provided with a plurality of apertures and facing the phosphor screen to allow three electron beams to pass therethrough toward the phosphor screen;
deflecting means arranged outside the envelope for generating vertical and horizontal magnetic fields to deflect the electron beams in horizontal and vertical directions, the horizontal magnetic field being of the barrel type;
a static convergence means for correctly converging the three electron beams being applied to the horizontal side regions of the screen and allowing the three electron beams directed to the center region of the phosphor screen to have a weak convergence compared to the convergence of the beams applied to the horizontal side regions; and
a dynamic convergence means for further converging the electron beams having weak convergence and being applied to the center region of the screen to correct the weak convergence in accordance with the horizontal deflection, so that the deflected electron beams are correctly converged all over the phosphor screen.

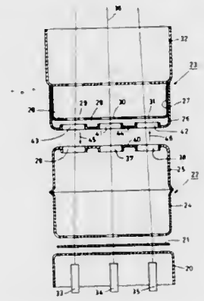
4,900,980

COLOR DISPLAY TUBE

Antonius H. P. M. Peels, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 516,028, Jul. 22, 1983, abandoned. This application Nov. 25, 1985, Ser. No. 802,068
Claims priority, application Netherlands, Aug. 25, 1982, 8203320
Int. Cl.[4] H01S *29/48*
U.S. Cl. 313—414 **4 Claims**

1. A color display tube comprising an evacuated envelope containing a lumineacent screen and an electron gun system for producing a central electron beam and first and second outer electron beams lying in a single plane, said electron gun system including first and second spaced-apart lens electrodes, each having a plate-shaped part defining central and first and second outer apertures for passing the respective electron beams, said lens electrodes being reasponsive to an applied potential difference to collectively effect production of an electrical focusing lens for focusing the electron beams onto the luminescent screen;
characterized in that said plate-shaped parts are selected from a batch of the parts manufactured by the same tool during the same production period and have geometrically-identical apertures, any geometrical imperfections of the apertures in one of the plate-shaped parts also substantially existing in the other, said parts being arranged with corresponding sides facing each other such that their central and first and second outer apertures are aligned with each other but are inverted with respect to each other, any imperfections in one plate also appearing in the other plate but on opposite side of said plane, said arrangement reducing any astigmatic effect of the imperfections on beam focusing.

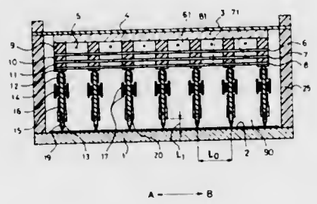


4,900,981

FLAT-SHAPED DISPLAY APPARATUS

Fumio Saeki Yamazaki, Kirakata Toyonaka; Kaoru Tomii, Isehara; Hiroshi Miyama, Yokohama; Toshifumi Nakatani, Moriguchi, and Kiyoshi Saeki, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Kadoma, Japan

Filed Dec. 19, 1986, Ser. No. 943,458
Claims priority, application Japan, Dec. 20, 1985, 60-288477
Int. Cl.[4] H01J *29/70*
U.S. Cl. 313—422 **14 Claims**



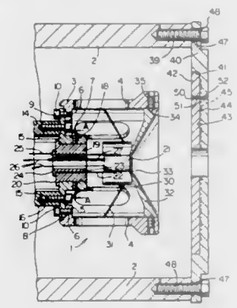
1. A display apparatus comprising:
a face plate having a phosphor screen on an inner surface thereof,
a rear plate provided apart from said face plate in parallel,
side plates for forming a vacuum cavity by connecting said face plate and said rear plate with a given space therebetween,
electron beam emitting means within said cavity for emitting electron beams, and
plural rectangular supporting plates disposed in parallel to each other between said face plate and said rear plate, and substantially perpendicular to said face plate, wherein each respective supporting plate is supported by a plurality of column-shaped supporting rods, one end of each of said supporting rods being bonded by adhesive on an end of each respective supporting plate facing said face plate, said supporting rods being bonded at intervals of a certain distance in a lengthwise direction of each respective supporting plate, the other end of each of said supporting rods being tapered and touching said face plate at predetermined points.

4,900,982

ELECTRON GUN DESIGN

Hans J. Kolpin, White Lake, Canada, assignor to Atomic Energy of Canada Limited-Energie Atomique Du Canada Comitee, Ottawa, Canada

Filed Dec. 16, 1988, Ser. No. 285,801
Claims priority, application Canada, Jan. 7, 1988, 555997
Int. Cl.[4] H01J *3/02, 3/38*
U.S. Cl. 313—452 **17 Claims**



1. A cathode assembly for mounting in an electron gun, comprising a metal support member having a first portion for securing the support member to a cathode assembly support within the gun and having a second portion which is generally cylindrical, a plurality of set screws spaced around the periphery of the second portion and extending radially through the thickness of the second portion, a split ring of solid insulating material having an outer diameter slightly less than the inner diameter of the first portion of the metal support member and being received within the first portion, a metal cylindrical holder having an outer diameter less than the inner diameter of the split ring and being received within the split ring to define with respect to the split ring a cylindrical space, a metal cathode tube carrying at its one end a cathode and heater and having at its other end a portion which is received snugly within the cylindrical space, the cathode tube having a bore through which extend heater leads, whereby axial alignment of the cathode can be adjusted by means of the set screws.

4,900,983

CATHODE RAY TUBE EMPLOYING INDEX PHOSPHOR ELEMENTS ADHERED TO A COLOR SELECTIVE ELECTRODE

Hiroshi Kato; Hiromasa Mori, and Yoshirou Ishikawa, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 204,036
Claims priority, application Japan, Jun. 25, 1987, 62-158517
Int. Cl.[4] H01J *29/22*
U.S. Cl. 313—471 **1 Claim**

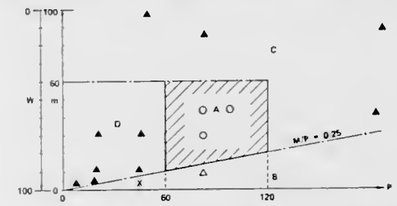
1. A color cathode ray tube comprising
a tube bulb having means for producing cathode rays,
deflecting means outside of said tube bulb for controlling the direction of the cathode rays emitted by said cathode ray producing means,
a color-selective electrode in said tube bulb and adapted for color-selecting said cathode rays and projecting the color-selected rays on the phosphor surface formed on the inner surface of said tube bulb,
index element means formed on the surface of said color-selective electrode facing to said cathode ray producing means,
means for sensing signals produced when said cathode rays are projected onto said index element means, and
an automatic convergence unit responsive to output signals of said sensing means to control said deflecting means,
wherein the improvement comprises said index element means comprising a paste consisting essentially of a mixture of index phosphors, an inorganic adhesive and water and is formed by being coated and dried in situ on said surface, said paste having a composition represented by the formulae

$M/P \geqq 0.25$,

$0.6 \leqq P/(m+w) \leqq 1.2$, and

$m/(m+w) \leqq 0.6$

wherein P denotes the weight of the index phosphors in grams, M the weight of said inorganic adhesive in grams, m the volume of said inorganic adhesive in milliliters and w the volume of the water in milliliters.

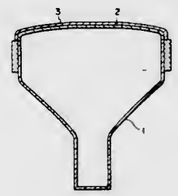


4,900,984

CATHODE RAY TUBE WITH ANTISTATIC FILM ON FRONT PANEL

Takeo Itou, Fukaya; Hidemi Matsuda, Oomiya; Mamory Yoshizako, Machida, and Osamu Yagi, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tama Chemicals Co., Ltd., Tokyo, both of, Japan

Filed Apr. 27, 1988, Ser. No. 187,005
Claims priority, application Japan, Apr. 28, 1987, 62-103049
Int. Cl.[4] H01J *29/86*
U.S. Cl. 313—479 **5 Claims**



1. A cathode ray tube comprising:
an envelope having a front panel; and
a glass film formed on said front panel and containing SiO_2 or P_2O_5 as a main component and a hygroscopic metal salt sealed in the interstices of the skeleton structure of said glass film.

4,900,985

HIGH-VOLTAGE INPUT TERMINAL STRUCTURE OF A MAGNETRON FOR A MICROWAVE OVEN

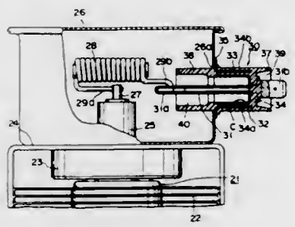
Norio Tashiro; Masaki Adachi, both of Yokohama; Toshio Ikeda, Ebina; Hisao Saito, Fujisawa; Saburo Matsushita, Kanagawa, and Masataka Komine, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 27, 1987, Ser. No. 126,229

Claims priority, application Japan, Nov. 29, 1986, 61-284531; Jul. 13, 1987, 62-174116

Int. Cl.⁴ H01J *25/50*

U.S. Cl. 315—39.51 **18 Claims**



1. A high-voltage input terminal structure of a magnetron for a microwave oven, said magnetron including a magnetron body having a cathode lead terminal for supplying power to the magnetron body and a shield box enclosing the cathode lead terminal, comprising:

a cylindrical earth electrode having one end secured to the shield box;

a cylindrical high potential inner electrode having a cover section provided with an insertion bore and coaxially arranged in said cylindrical earth electrode with a gap therebetween;

a central conductor fitted in the insertion bore, electrically connected to the inner electrode, longitudinally extending in said cylindrical high-potential electrode and having one end and the other end as an external terminal;

an inductor connected between the cathode lead terminal and one end of the central conductor;

an insulating resin layer for defining a capacitor portion, which is formed by a resin filled in the gap, in one direction vectorially so as to prevent the occurrence of cracks and voids, between the cylindrical earth electrode and the high-potential electrode; and

cylindrical insulating sheaths formed with the insulating resin layer by the resin, extending from both sides of the insulating resin layer, covering a part of the cylindrical earth electrode and having a cup section in which a part of the central conductor is located to electrically insulate the central electrode from the cylindrical earth electrode, the insulating resin layer and the cylindrical insulating sheaths being continuously formed and substantially extending along a straight line.

4,900,986

BALLAST CIRCUIT FOR STARTING FLUORESCENT LAMPS

Edward E. Hammer, Mayfield Village, and Eugene Lemmers, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 6, 1988, Ser. No. 240,904

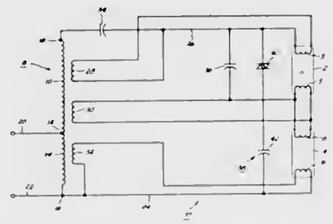
Int. Cl.⁴ H05B *41/14, 41/36*

U.S. Cl. 315—101 **16 Claims**

1. An improved rapid-start ballast circuit for a fluorescent lamp having a cathode disposed at each end thereof, said ballast circuit comprising:

a ballasting transformer having a secondary winding for developing a high AC voltage across a pair of output terminals respectively connected to the lamp cathodes; and

a high frequency oscillator including an electronic bilateral triggering device and a capacitor connected in series combination across the fluorescent lamp cathodes, said



electronic bilateral triggering device and said capacitor generating high frequency oscillations superimposed on the high AC voltage applied across the lamp cathodes thereby to achieve efficient and reliable starting of the lamp, said device becoming non-conductive after the lamp has started.

4,900,987

METHOD FOR DRIVING A GAS DISCHARGE DISPLAY PANEL

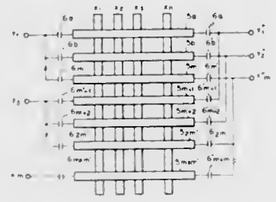
Akira Otsuka, Zama; Kenji Horio, Kawasaki, and Tsuyoshi Tanioka, Musashino, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 678,677, Dec. 5, 1984, abandoned. This application Jun. 2, 1987, Ser. No. 58,633

Claims priority, application Japan, Dec. 9, 1983, 58-233129; Aug. 9, 1984, 59-166805

Int. Cl.⁴ G09F *9/00*

U.S. Cl. 315—169.4 **19 Claims**



19. A system for driving a gas discharge display panel having a pair of first and second spaced substrates separated by a gas discharge space and respective, first and second pluralities of parallel display electrodes thereon transversely oriented to define a matrix of intersections and corresponding discharge cells therebetween, and a capacitive matrix, multiplex drive system for the display electrodes on at least the first substrate for selectively producing and thereafter maintaining discharges in the discharge cells of the panel corresponding to data to be displayed and extinguishing discharges in the discharge cells not corresponding to data to be displayed and accordingly in which discharges are not to be maintained, each display electrode having first and second opposite ends, the system employing write voltage pulses of a first, predetermined voltage level relative to a reference voltage level and sustain voltage pulses of a second predetermined voltage level, intermediate the write pulse and reference voltage levels, and comprising first and second pluralities of driving electrodes, the first and second opposite ends of each display electrode on

the first substrate being individually, capacitively coupled to corresponding driving electrodes of the first and second pluralities thereof and the driving electrodes of the first plurality being connected in a first arrangement of plural first groups and the driving electrodes of the second plurality being connected in a second, different arrangement of plural second groups thereby to permit multiplexed, individual and successive selection of the display electrodes on the first substrate by successive selection of the plural driving electrodes of the first and second groups thereof, each the group of driving electrodes having a common signal terminal, wherein discharges, once initiated in the discharge cells, are maintained by applying to all discharge cells sustain voltage pulses of alternating polarity and of a voltage level intermediate the write and reference voltage levels, comprising:

first means for selecting a given display electrode of the first substrate by selecting the common signal terminals of the respective first and second groups of driving electrodes associated with the given display electrode and for applying a write voltage pulse to the common signal terminals of the respective first and second groups of driving electrodes associated with the selected display electrode while maintaining all the electrodes of the second substrate at a reference voltage level thereby to initiate a discharge in each discharge cell associated with the selected display electrode; and

second means for applying an erase voltage pulse to the common signal terminals of the respective first and second groups of driving electrodes associated with the selected display electrode and, substantially simultaneously, selectively applying an erase cancel voltage pulse to the display electrodes of the second substrate which define discharge cells associated with the selected display electrode of the first substrate which correspond to the data to be displayed to cancel the effect of the erase pulse and thereby to maintain the discharge initiated in each the data-corresponding discharge cell associated with the selected display electrode, the erase pulse erasing the discharges initiated in the remaining discharge cells associated with the selected display electrode and not corresponding to the data to be displayed, and thereby producing a display of the data.

4,900,988

HIGH VOLTAGE STABILIZING CIRCUIT FOR PREVENTING OVERHEAT

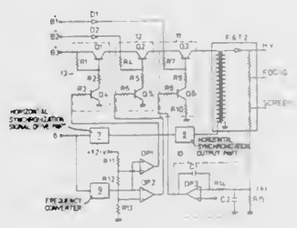
Geun J. Yuk, Kyungsangbook, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 31, 1987, Ser. No. 140,095

Claims priority, application Rep. of Korea, Dec. 31, 1986, 22114/1986

Int. Cl.⁴ H01J *29/70*

U.S. Cl. 315—411 **8 Claims**



1. A high voltage stabilizing apparatus comprising:

horizontal synchronization drive means for developing a drive signal in response to a horizontal synchronization signal input thereto;

horizontal synchronization output means for developing a pulse signal in response to said drive signal;

frequency converting means for developing first and second input signals in response to said horizontal synchronization signal;

a first comparator for developing a first comparison signal responsive to said first input signal and a first reference signal input thereto;

a second comparator for developing a second comparison signal responsive to said second input signal and a second reference signal input thereto;

third power control means for developing a third control output signal in response to said first comparison signal and a third power supply input thereto;

second power control means for developing a second control output signal in response to said third control output signal, a second power supply and said second comparison signal input thereto;

first power control means for developing a first control output signal in response to said second control output signal and a first power supply input thereto;

flyback transforming means having a primary coil and a secondary coil for developing a high voltage output signal in response to said first control output signal being connected to a first node of said primary coil and said drive signal being connected to a second node of said primary coil; and

amplifying means being connected to said secondary coil for developing an amplified control signal to said first power control means, said first, second, and third power supplies being applied to said flyback transforming means in response to said horizontal synchronization signal.

4,900,989

MAGNETRON FEEDING APPARATUS AND METHOD OF CONTROLLING THE SAME

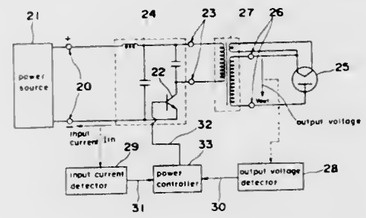
Haruo Suenaga, Soraku; Naoyoshi Maehara, Shiki; Kazuho Sakamoto, Soraku; Takahiro Matsumoto; Takashi Niwa, both of Ikoma, and Daisuke Bessyo, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 2, 1988, Ser. No. 189,166

Claims priority, application Japan, Apr. 30, 1987, 62-106636; May 14, 1987, 62-117339; May 14, 1987, 62-117344

Int. Cl.⁴ H05B *41/36*

U.S. Cl. 315—224 **19 Claims**



1. A magnetron feeding apparatus comprising a power-supply for feeding a DC current, an inverter circuit for converting the DC current into high-frequency power through the switching operation of a semiconductor switch, a high-tension transformer which converts the high-frequency power into high-tension power to be supplied to a magnetron, an output voltage detector for detecting the output voltage of the high-tension transformer, an input current detector for detecting the input current into the inverter circuit, and a power controlling means for controlling the switching operation of the semiconductor switch using the output voltage information of the

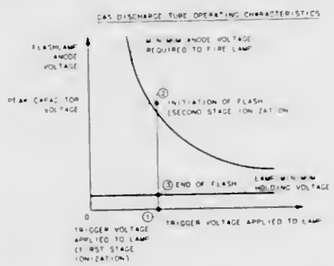
output voltage detector and the input current information of the input current detector.

4,900,990

METHOD AND APPARATUS FOR ENERGIZING A GASEOUS DISCHARGE LAMP USING SWITCHED ENERGY STORAGE CAPACITORS

Scott T. Sikora, 2420 S. Eldorado, Mesa, Ariz. 85254

Filed Oct. 6, 1987, Ser. No. 105,714
Int. Cl.[4] H05B *41/14*
U.S. Cl. 315—241 P **57 Claims**



1. Apparatus for flashing a gaseous discharge lamp having a gaseous interior, anode and cathode terminals, a trigger electrode, a minimum anode voltage and a minimum holding voltage, comprising:

a. trigger means for applying a series of spaced apart trigger voltage pulses to said trigger electrode where each trigger voltage pulse initiates first stage ionization of the gas in said lamp;

b. capacitor means including a boost storage capacitor rated to operate at a first voltage having a magnitude less than the magnitude of the trigger voltage pulses and an electrolytic energy storage capacitor rated to operate at a second voltage lower than the minimum anode voltage but higher than the minimum holding voltage for storing a defined quantum of energy, said energy storage capacitor having an equivalent series resistance substantially lower than the equivalent series resistance of a high voltage electrolytic capacitor rated to operate at a voltage above the minimum anode voltage and capable of storing the defined quantum of energy at an operating voltage above the minimum anode voltage, the capacitance rating of said energy storage capacitor substantially exceeding the capacitance rating of said high voltage capacitor and the capacitance rating of said boost storage capacitor;

c. a DC to DC converter power supply coupled to said capacitor means for charging said boost storage capacitor to the first voltage and for charging said energy storage capacitor to the second voltage, wherein the sum of the first and second voltages exceeds the minimum anode voltage, said power supply including

i. a coupled inductor having a primary winding and a secondary winding;

ii. a switching transistor having collector and emitter terminals coupled in series with said primary winding for switching between conductive and non-conductive states to control the flow of current through said primary winding;

iii. said secondary winding of said coupled inductor including a first winding section coupled to direct a charging current into said boost storage capacitor when the voltage on said first winding section exceeds the voltage on said boost storage capacitor and a second winding section coupled to direct a charging current into said energy storage capacitor when the voltage on said second winding section exceeds the voltage on said energy storage capacitor, wherein said boost storage capacitor and said energy storage capacitor are recharged simultaneously during a part of each time interval between sequential trigger voltage pulses; and

d. voltage controlled capacitor switching means having input terminals coupled across said boost storage capacitor and across said energy storage capacitor and output terminals coupled to the anode and cathode terminals of said lamp for operating in a first state to apply a boost voltage exceeding the minimum anode voltage to the anode and cathode terminals of said lamp to allow energy to flow into said lamp after the first stage ionization of the gas in said lamp has been achieved by said trigger means to initiate second stage ionization of the gas in said lamp and for switching into a second state after the boost voltage falls below the minimum anode voltage but before the boost voltage falls below the minimum holding voltage to couple said energy storage capacitor across the anode and cathode terminals of said lamp to enable said energy storage capacitor to discharge additional energy into said lamp;

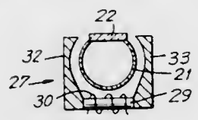
whereby said energy storage capacitor dissipates substantially less heat in its equivalent series resistance and operates at a lower temperature than the high voltage, higher equivalent series resistance electrolytic capacitor.

4,900,991

MONOTUBE CRT

Peter Seats, Boonton, N.J., assignor to Thomson Electron Tubes and Devices Corporation, Totowa, N.J.

Continuation-in-part of Ser. No. 151,437, Feb. 2, 1988, Pat. No. 4,827,182, and a continuation-in-part of Ser. No. 151,438, Feb. 2, 1988, abandoned, and a continuation-in-part of Ser. No. 151,439, Feb. 2, 1988, Pat. No. 4,827,183. This application Dec. 29, 1988, Ser. No. 291,607
Int. Cl.[4] H01J *29/70, 31/00*; H01H *1/00*; H01P *7/00*
U.S. Cl. 315—366 **4 Claims**



1. A cathode ray tube comprising,

means forming an elongated envelope including first and second sections aligned in a longitudinal direction;

an electron gun at an end of the envelope for launching at least one electron beam for flow in a longitudinal path along said envelope;

an elongated target in a sidewall of the envelope along a downstream portion of the envelope;

an array of electromagnets along said downstream portion of the envelope for deflecting the electron beam transversely from its longitudinal path for linear scan of the target; and

means for modulating the electron beam in accordance with signal information for varying the number of electrons incident along the target; characterized in that:

the first section of the envelope houses the electron gun and is substantially circularly cylindrical, and the longitudinal path of the electron beam in said section is essentially along its longitudinal axis;

the second section of the envelope houses the target and is substantially rectangular in cross section including a pair of relatively narrow sidewalls and a pair of relatively wide sidewalls, the target being in one of the narrow sidewalls and the undeflected longitudinal path of the electron beam in the second section being adjacent the other narrow sidewall; and

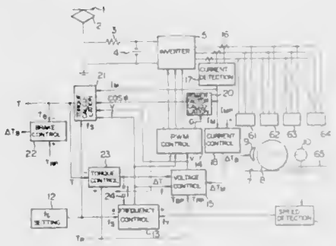
each electromagnet of the array includes a core portion adjacent said other narrow sidewall and pole pieces extending from the core portion parallel and adjacent to the wide sidewalls.

4,900,992

APPARATUS AND METHOD FOR CONTROLLING ELECTRIC CAR

Toshihiko Sekizawa; Hiroyuki Matsumura, and Makoto Yasuda, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 3, 1989, Ser. No. 293,080
Claims priority, application Japan, Jan. 6, 1988, 63-384
Int. Cl.[4] H02K *41/00*
U.S. Cl. 318—135 **18 Claims**



1. An electric car control apparatus comprising:

a power converter generating an a.c. output having a variable voltage and a variable frequency;

a linear induction motor to which power is supplied from said power converter;

an electric car driven by said linear induction motor;

means for detecting the power factor of said power converter; and

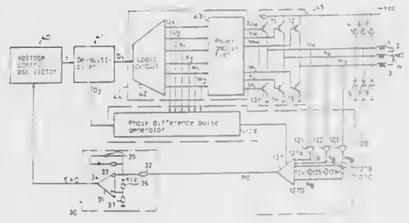
means for regulating a torque imparted to said electric car on the basis of the detected power factor.

4,900,993

DRIVING APPARATUS FOR BRUSHLESS MOTOR

Masahiro Yasohara, Amagasaki; Yoshitsugu Kimura, Sabae, and Hiromitsu Nakano, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 16, 1988, Ser. No. 207,527
Claims priority, application Japan, Jun. 17, 1987, 62-150637
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **12 Claims**



1. A driving apparatus for a brushless motor having a plurality of driving coils for different phases, comprising:

switching means for switching voltages to said driving coils of said brushless motor,

a switching signal generation circuit for controlling said switching means and for generating a switching signal,

a phase difference detector for detecting a phase difference between a counter-electromotive voltage induced by one of said switching voltages in one of said plurality of driving coils and said switching signal in a time period that said induced voltage equals said one switching voltage,

an amplifier for amplifying a detected signal of said phase difference detector and outputting an amplified signal, and

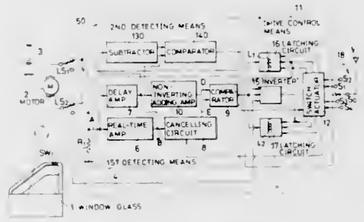
a voltage-controlled oscillator for oscillating a signal controlled in frequency by said amplified signal and for supplying said oscillated signal to said switching signal generation circuit.

4,900,994

PROTECTION CIRCUIT FOR A POWER WINDOW APPARATUS

Ken Mizuta, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,450
Claims priority, application Japan, Sep. 29, 1987, 62-242450
Int. Cl.[4] H02P *1/22*
U.S. Cl. 318—283 **3 Claims**



1. A power window device comprising:

a window glass set in a window frame;

a motor rotatable in two opposite directions operably connected to open and close said window glass in response to a driving current provided to said motor;

drive controlling means for controlling said driving current;

a switch connected to said motor, said switch being actuated for opening and closing said window;

energization current sensing means for detecting a value of said driving current;

first sensing means for sensing an object being held between said window glass and said window frame, by comparing said value of said driving current to a delayed value of said driving current, said first sensing means being inoperative for a predetermined time after an actuation of said switch;

reversing means included in said drive controlling means for reversing a direction of rotation of said motor for a predetermined time in response to said first sensing means;

second sensing means for sensing that said window glass is fully opened or fully closed in said window frame by comparing said value of said driving current to a delayed value of said driving current; and

switch controlling means included in said drive controlling mean for overriding said switch and preventing provision of said driving current to said motor, in response to said second sensing means.

4,900,995

VEHICLE WINDOW WIPERS WITH ALTERNATING SYMMETRICAL OVERLAP

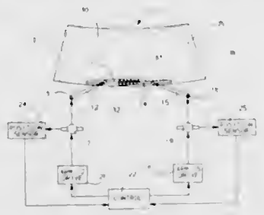
Richard E. Wainwright, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1989, Ser. No. 371,154
Int. Cl.[4] B60S *1/08*
U.S. Cl. 318—443 **7 Claims**

1. A method of operating a pair of wiper blades on a vehicle window comprising the steps:

oscillating the wiper blades in repeating cycles of opposing movement through overlapping wipe areas on the window between separated outer wipe positions and an overlapping inner wipe arrangement in which one of the wiper blades overlaps the other of the wiper blades, with the one of the wiper blades preceding the other of the wiper blades in movement away from the overlapping inner wipe arrangement; and,

in each successive cycle, moving the one of the wiper blades which precedes the other of the wiper blades in movement away from the overlapping inner wipe arrangement so as to also precede the other of the wiper blades in movement back into the overlapping inner wipe arrangement so that the wiper blades alternate overlapping each other in the overlapping inner wipe arrangement on successive cycles.



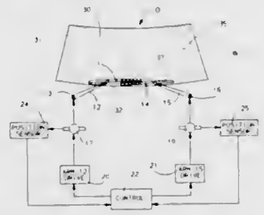
5. A window cleaning apparatus for a vehicle window comprising a pair of wiper blades carried by arms with a separate motor drive apparatus for each arm adapted to move the associated wiper blade through a wipe area on the window between an outer wipe position and a selected one of a high inner wipe position and a low inner wipe position, each motor drive apparatus including a wiper position sensor, the window cleaning apparatus further comprising a motor drive control adapted to oscillate the wiper blades in repeating cycles of opposing movement through the wipe areas, the motor drive control being responsive to the wiper position sensors to move one of the wiper blades to its low inner wipe position and the other of the wiper blades to its high inner wipe position to begin each cycle, with the wiper blades alternated in their respective high and low inner wipe positions on successive cycles.

4,900,996

VEHICLE WINDOW WIPERS WITH DYNAMIC SYMMETRICAL OVERLAP

Richard E. Wainwright, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 26, 1989, Ser. No. 371,157
Int. Cl.[4] B60S *1/08*
U.S. Cl. 318—443 **6 Claims**



1. A method of operating a pair of wiper blades on a vehicle window comprising the steps:

oscillating the wiper blades in repeating cycles of opposing movement through overlapping wipe areas on the window between separated outer wipe positions and an overlapping inner wipe position in which an upper one of the wiper blades overlaps a lower one of the wiper blades, with the upper one of the wiper blades preceding the lower one of the wiper blades, in movement away from the overlapping inner wipe position;

determining, in each successive cycle, which of the wiper blades first reaches its outer wipe position; and

moving the first of the wiper blades to reach its outer wipe position ahead of the other of the wiper blades back into the overlapping inner wipe position to become the lower one of the wiper blades so that, in each of a series of successive cycles, the upper one of the wiper blades which overlaps and precedes the lower one of the wiper blades out of the overlapping inner wipe position is the latter of the wiper blades to reach its outer wipe position in the immediately preceding cycle.

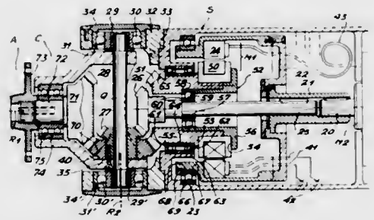
5. A window cleaning apparatus for a vehicle window comprising a pair of wiper blades carried by arms with separate motor drive apparatus for each arm adapted to move the associated wiper blade through a wipe area on the window between an outer wipe position and a selected one of a high inner wipe position and a low inner wipe position, each motor drive apparatus including a wiper position sensor, the window cleaning apparatus further comprising a motor drive control adapted to oscillate the wiper blades in repeating cycles of opposing movement through the wipe areas, the motor drive control being responsive to the wiper position sensors to determine in each cycle the one of the wiper blades that first reaches its outer wipe position and to move the one of the wiper blades to its low inner wipe position and the other of the wiper blades to its high inner wipe position.

4,900,997

DEVICE TO GUIDE AN OBJECT AROUND TWO AXES OF ROTATION

Patrick Durand, Maisons Alfort; Francois Viette, Creteil, and Alain Riwan, Vanves, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 20, 1988, Ser. No. 247,031
Claims priority, application France, Sep. 21, 1987, 87 13037
Int. Cl.[4] B25J *9/00*
U.S. Cl. 318—568.21 **3 Claims**



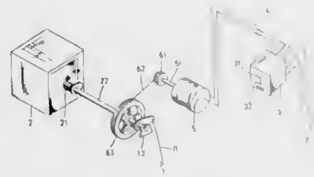
1. A device to guide an object comprising a first motor composed of a stator and a rotor linked by means of a first transmission to a shaft pivoting around a first axis on a fork joint and integral with the object, a second motor having an output shaft controlling said fork joint in rotation around a second axis by means of a second transmission, wherein the output shaft of said second motor is rigidly linked to said stator of said first motor allowing for the joint rotation of said stator and said rotor of said first motor when the second motor is activated, and wherein the transmissions are disposed so that the pivoting of the shaft thus created from the second motor by means of the first motor is equal with an opposite direction to the pivoting of said shaft created by the displacement of the shaft on the first transmission due to the rotation of the fork joint under the effect of the same action of the second motor by means of the second transmission, both said motors turning about the same axis of rotation.

4,900,998

AUTOMATIC CAR SPEEDER SYSTEM

David Y. Shyi, 7F-1, No. 687, Chung-Shan N. Road, Sec. 5, Taipei, Taiwan

Filed Jul. 12, 1988, Ser. No. 217,899
Int. Cl.[4] G05B *11/28*; F22B *37/22*
U.S. Cl. 318—599 **3 Claims**



1. An automatic car speeder control comprising:

a speed controller comprising speed setting means for retaining a preset speed and generating a signal proportional thereto, speed indicator means for generating a signal proportional to the actual speed, and comparator means for comparing said signals and generating a signal proportional to the comparison;

a DC servo motor having an output shaft, a small pulley mounted on the output shaft; control means coupled between said motor and the output of said comparator means for driving said motor in a direction of rotation responsive to the comparator signal;

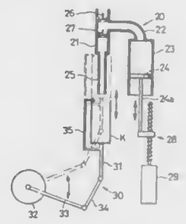
accelerating pump means for controlling the speed of a car having an actuator shaft, a large pulley mounted on said shaft said pulleys being coupled together in a driving relationship whereby said small pulley is the driver and the large pulley is driven by said servo motor to drive said pump means; and brake switch means coupled to the controller for selectively activating and deactivating said controller.

4,900,999

CONTROL SYSTEM FOR RECIPROCATING LINEAR MOTION OR INTERMITTENT MOTION DEVICES

Masato Shibata, and Yoshitaka Yamane, all of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed Feb. 3, 1989, Ser. No. 305,683
Claims priority, application Japan, Feb. 5, 1988, 63-26253
Int. Cl.[4] G05B *11/00*
U.S. Cl. 318—687 **5 Claims**



1. A control system for a reciprocating linear motion or intermittent motion device comprising:

a servomotor for driving an operation member of the device,

means for setting an amount of stroke for the operation member,

means for setting a period of stroke time for the operation member,

memory means for storing therein in the order of addresses items of velocity data at stroke positions at a specified spacing, the items of velocity data being obtained from a predetermined operation member velocity diagram,

pulse generator means for generating a pulse signal having a period equal to a velocity data reading interval determined by the stroke time set by the stroke time setting means and the number of velocity data items stored in the memory means,

means for counting the number of pulses produced by the pulse generating means,

means for reading the velocity data from the address in the memory means corresponding to a nenewed count obtained by the counting means every time the count is renewed,

means for converting the read velocity data to a signal corresponding to a velocity obtained by multiplying the velocity data by a ccefficient determined by the amount of stroke set by the stroke amount setting means, the stroke time set by the stroke time setting means and all items of velocity data stored in the memory means, and

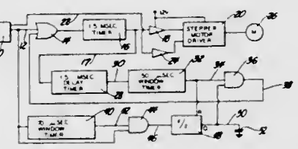
means for controlling the speed of the servomotor according to the output signal of the converting means.

4,901,000

VARIABLE RATE STEPPER MOTOR DRIVER CIRCUIT AND METHOD

Marc B. Center, Royal Oak, and Norman Maasshoff, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1989, Ser. No. 313,915
Int. Cl.[4] H02L *8/00*
U.S. Cl. 318—696 **9 Claims**



1. A variable rate stepper motor driver circuit responsive to a coded input signal for issuing output pulses at a low rate or a higher rate comprising:

a motor driver circuit responsive to an input signal for delivering an output signal for stepping a motor at each input signal, and

a decoding circuit responsive to the coded input signal for detecting a higher rate code and issuing at least one auxiliary input signal to the driver circuit when a higher rate code is detected to step the motor at least a second time.

4,901,001

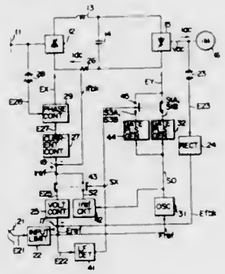
POWER CONVERTER FOR AC LOAD

Suzuo Saito, and Tadao Mose, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawsaki, Japan

Continuation of Ser. No. 27,126, Mar. 16, 1987, abandoned, which is a continuation of Ser. No. 705,676, Feb. 26, 1985, abandoned. This application Nov. 14, 1988, Ser. No. 271,404
Claims priority, application Japan, Mar. 2, 1984, 59-40107; May 30, 1984, 59-110265
Int. Cl.[4] H02P *5/40, 1/30*
U.S. Cl. 318—779 **9 Claims**

1. A power converter for an AC induction type load comprising:

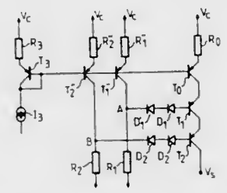
detector means for detecting whether or not the frequency of an AC output from the power converter falls within a predetermined frequency range, and for generating a detection signal when the frequency of said AC output falls within a predetermined frequency range;
current control means coupled to said detector means, for determining an AC output current of the power converter in accordance with a given current reference, when said detection signal is generated, said AC output current being supplied to the AC load;
a voltage controlled type main circuit including,
rectifier means for converting an AC input from an AC power source, in accordance with said given current reference, and providing a DC current to a DC circuit of the power converter;
filter means for filtering ripples in said DC output of said rectifier means;



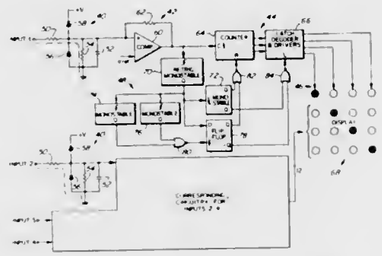
inverter means for re-converting the filtered DC output from said filter means, to generate an AC output voltage to be applied to said AC load;
voltage control means coupled to said detector means and said inverter means, for regulating the DC output voltage in accordance with a given voltage reference when the detection signal disappears;
a capacitor coupled in parallel to said DC circuit for filtering off ripples in said DC current;
release means coupled to said capacitor and said detector means, for releasing said capacitor from said DC circuit when said detection signal is generated; and
absorbing means coupled to said DC circuit, for absorbing reactive energy from said AC load when said release means releases said capacitor from said DC circuit.

4,901,002
CURRENT SOURCE HAVING A WIDE RANGE OF OUTPUT VOLTAGES
Marc Simon, Luc/Mer, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 23, 1989, Ser. No. 315,009
Claims priority, application France, Mar. 4, 1988, 88 02772
Int. Cl.[4] G05F *3/26*
U.S. Cl. 323—312 **6 Claims**

1. A current source having a wide range of output voltages, said source comprising: an emitter-collector path of a main transistor of the npn type, arranged to define the value of the current of the current source, connected in series with the emitter-collector paths of n output transistors of the npn type, where $n \geqq 2$, each of said ouput transistors having an emitter, a base and a collector, a first output transistor having its collector connected to the emitter of the main transistor, a pth output transistor, where $1 < p \leqq n$, having its collector connected to the emitter of the $(p-1)^{th}$ output transistor, the emitter of the nth output transistor constituting an output of the current sourse, wherein every q^{th} output transistor is associated with a qth control transistor of the opposite type, whose base includes at least one diode poled in the forward direction and referred to a qth reference potential, whose collector is connected to the base of the qth output transistor, and whose emitter is connected to the collector of the $(q-r)^{th}$ output transistor if $q > r$ and to the collector of the main transistor and to a supply voltage source if $q \leqq r$, where $r \geqq 1$.



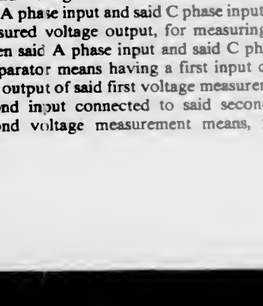
4,901,003
TELECOMMUNICATIONS WIRING TEST APPARATUS AND METHOD INCLUDING TWO COLOR DISPLAY INDICATING CORRECT WIRING
David D. Clegg, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Dec. 2, 1987, Ser. No. 127,313
Claims priority, application Canada, Oct. 30, 1987, 550735
Int. Cl.[4] G01R *19/145, 31/02*
U.S. Cl. 324—66 **28 Claims**



1. A method of testing wiring comprising at least two wires extending between two locations, comprising the steps of:
at a first location, sequentially and cyclically supplying respective predetermined signals to each of the wires, and simultaneously sequentially and cyclically coupling to a point of common potential at the first location at least one other wire to which a respective predetermined signal is not currently supplied; and
at a second location, monitoring a signal on each wire and simultaneously providing a return path connection for such signal from each wire to at least said one other wire via a unidirectional current conducting device.

4,901,004
APPARATUS AND METHOD FOR MAPPING THE CONNECTIVITY OF COMMUNICATIONS SYSTEMS WITH MULTIPLE COMMUNICATIONS PATHS
Fred N. King, 1930 Lake Port Way, Reston, Va. 22091
Filed Dec. 9, 1988, Ser. No. 282,133
Int. Cl.[4] H04M *3/22;* **G01R** *31/02*
U.S. Cl. 324—66 **16 Claims**

1. A method, using computer means, of correlating the respective locations of a plurality of first terminals comprising communications jacks, connections and devices installed at first locations, each of said first terminals being connected by a communications medium to respective second terminals at a second location, comprising the steps of:
generating a signal at each first terminal, transmitting each said signal from a sequence of respective first terminals to respective ones of said second terminals,
recording first information correlating the sequence of said signal transmission and the location of each first terminal,
detecting each said transmitted signal at each respective second terminal,
identifying in said computer means the sequence in which



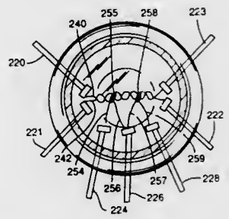
said second terminals receive said signal with second information correlating the sequence of said signal detection and the location of said second terminals,
comparing in said computer means said first information obtained in said recording step and said second information obtained in said identifying step to create a third information which correlates the physical location of each first terminal to the physical location of a corresponding second terminal, and
providing a map of the communications medium which connects said first and second terminals.

4,901,005
ZERO VOLTAGE CROSSOVER DETECTOR FOR POLYPHASE SYSTEMS
Charles H. Shir, Springfield, and George K. Woodworth, Manassas, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 5, 1988, Ser. No. 280,470
Int. Cl.[4] G01R *25/00*
U.S. Cl. 324—86 **4 Claims**



1. A zero voltage crossover detector for a three phase power system, having A, B and C voltage phase inputs, comprising:
a first voltage measurement means connected between said A phase input and said B phase input, having a first measured voltage output, for measuring the voltage between said A phase input and said B phase input;
a second voltage measurement means connected between said A phase input and said C phase input, having a second measured voltage output, for measuring the voltage between said A phase input and said C phase input;
a comparator means having a first input connected to said first output of said first voltage measurement means and a second input connected to said second output of said second voltage measurement means, for generating a signal when said first measured voltage is substantially equal in magnitude and opposite in polarity from said second measured voltage, indicating a zero voltage crossover event for said A phase.

4,901,006
METHOD AND APPARATUS FOR AC SIGNAL COMPARISON, CALIBRATION AND MEASUREMENT
Archie J. Harrison, Mount Arlington, and Fred L. Katzmann, Cedar Grove, both of N.J., assignors to Electro Scientific Industries, Inc., Portland, Oreg.
Continuation of Ser. No. 99,232, Sep. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 92,154, Sep. 2, 1987, abandoned, which is a continuation of Ser. No. 761,609, Aug. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 580,450, Feb. 15, 1984, Pat. No. 4,695,793. This application Jun. 29, 1989, Ser. No. 374,607
Int. Cl.[4] G01R *5/22;* **H01V** *1/32*
U.S. Cl. 324—106 **11 Claims**

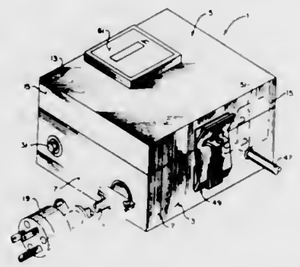


1. Electrothermal conversion apparatus for generating a DC voltage related to the RMS value of an AC signal comprising:
(a) first elongate means for generating thermal energy in response to a first signal;
(b) second elongate means for generating thermal energy in response to a second signal;
(c) said first and second means being in physical contact with one another over a substantial portion of their lengths, separated only by thermally conductive electrical insulation over the substantial portion of their lengths for which they are in physical contact, and forming a heater assembly; and
(d) a temperature responsive electrical sensing means in physical contact with said heater assembly, said temperature responsive means producing a temperature-indicating electrical signal representative of the temperature of said heater assembly.

4,901,007
PORTABLE ELECTRICAL ENERGY MONITOR
Timothy D. Sworm, Rte. 9, Box I, Carbondale, Ill. 62901
Filed Aug. 31, 1988, Ser. No. 238,481
Int. Cl.[4] G01R *1/04;* **H01R** *13/52*
U.S. Cl. 324—110 **14 Claims**

1. A portable electrical energy monitor for measuring the electrical energy usage of an appliance including:
a portable enclosure having a cover for opening and closing said enclosure;
electrical measuring means within said enclosure for determining the electrical energy usage of an appliance, said electrical measuring means adapted to be coupled intermediate a power source and the appliance;
an interior receptacle socket connected to said electrical measuring means mounted within said enclosure for complementary interconnection to a receptacle plug extending from an appliance, said appliance receptacle plug being received within said enclosure;
the cover of said enclosure being closed and locked relative

to said enclosure when the appliance receptacle plug is operably interconnected to the receptacle socket of said electrical measuring means; and



display means connected to said electrical measuring means and mounted on the cover of said enclosure for visual displaying electrical energy usage of an interconnected appliance.

4,901,008

CIRCUIT ARRANGEMENT FOR TESTING THE CORRECT FUNCTIONING OF CIRCUIT(S)

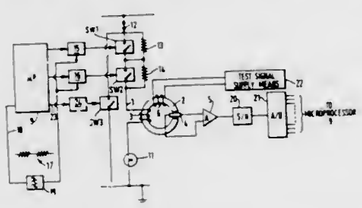
David A. Quastel, Melksham, and Nigel K. Hill, Chippenham, both of Great Britain, assignors to Westinghouse Brake & Signal Company Ltd., Pew Hill, Great Britain

Filed Sep. 29, 1988, Ser. No. 252,246

Claims priority, application United Kingdom, Oct. 14, 1987, 8724087

Int. Cl.[4] G01R *33/06, 21/08*

U.S. Cl. 324—117 H **5 Claims**



1. A circuit arrangement comprising:

(a) a load;

(b) supply means for supplying current to said load via a current path;

(c) a microprocessor connected for controlling the supply of current from said supply means;

(d) means for detecting said current, said detecting means comprising:

(i) a core of magnetizable material;

(ii) a winding coupled inductively with said core, said winding being included in said current path; and

(iii) transducing means for sensing magnetic flux in said core, said transducing means being coupled with said microprocessor for the supply to said microprocessor of an indication being dependent on the magnitude of said current;

the circuit arrangement further including testing means for testing the condition of said detecting means, said testing means comprising:

(e) a further winding coupled inductively with said core; and

(f) further supply means, for supplying current to said further winding, said transducing means also sensing magnetic flux in said core due to current in said further winding when said further supply means supplies such current so that said indication supplied to said microprocessor is then dependent on the condition of said detecting means.

4,901,009

METHOD AND DEVICE FOR THE AUTOMATIC RECORDING OF SIGNAL CURVES

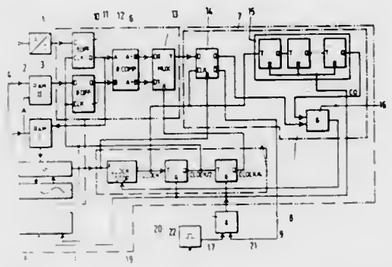
Wolfgang Schultze, Nüremberg; Werner Tödter, Soltau, and Reinhold Kern, Neumarkt/Opf, all of Fed. Rep. of Germany, assignors to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Dec. 29, 1988, Ser. No. 291,508

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1987, 3744398

Int. Cl.[4] G01R *13/20, 13/32*

U.S. Cl. 324—121 R **15 Claims**



1. Method for recording signal curves which comprises:

(a) dissecting the signal curves into digitized amplitude samples;

(b) supplying the digitized amplitude samples to a signal memory;

(c) determining the signal curve to be stored with an analog trigger;

(d) subsequently displaying an image of at least part of the stored signal curve on a screen;

(e) generating lower and upper envelope curves enclosing a tolerance range for a signal curve stored in the signal memory and storing the envelope curves in an envelope curve memory;

(f) continuously overwriting the signal memory with cyclically repetitive new amplitude samples of the signal curve, and comparing the new amplitude samples with time-analogous amplitude samples of the lower envelope curve and the upper envelope curve;

(g) issuing a first switching signal when one of the two envelope curves is exceeded by at least one amplitude sample of the signal curve;

(h) transferring amplitude samples of the signal curve arriving after the first switching signal into the signal memory until the end of the instantaneous signal curve; and

(i) generating a second switching signal at the end of the instantaneous signal curve and stopping the overwriting of the signal memory or transferring the amplitude values contained in the signal memory into a separate long-time store.

4,901,010

CURRENT-MEASURING DEVICE

Landre Bernard, Paris, France, assignor to Universal Technic, Paris, France

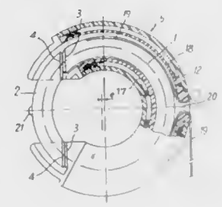
Division of Ser. No. 82,543, Aug. 7, 1987, Pat. No. 4,841,237.

This application Apr. 13, 1989, Ser. No. 338,050

Claims priority, application France, Aug. 11, 1986, 86 11586

Int. Cl.[4] G01R *11/02, 11/04*

U.S. Cl. 324—127 **5 Claims**



1. A current-measuring device comprising an annular magnetic circuit having separate first and second magnetic circuit portions with ends suitable for coming face-to-face to form a closed magnetic circuit, a housing surrounding at least the first portion of the magnetic circuit, said first portion being slidably mounted within said housing. magnetic flux detection means for detecting a magnetic flux in the magnetic circuit, wherein said housing includes a bearing member against which said second portion of the magnetic circuit is firmly held when slided with said first portion from a position where said second portion does not face said bearing member to a position where said second portion faces said bearing member.

4,901,011

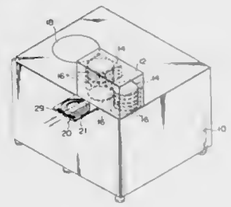
CARRIER FOR TRANSFERRING PLATE-LIKE OBJECTS ONE BY ONE, A HANDLING APPARATUS FOR LOADING OR UNLOADING THE CARRIER, AND A WAFER PROBING MACHINE FITTED WITH THE HANDLING APPARATUS FOR THE WAFER CARRIER

Hisashi Koike, Yamanashi, and Sumi Tanaka, Kofu, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Nov. 4, 1988, Ser. No. 267,375

Int. Cl.[4] G01R *31/26*

U.S. Cl. 324—158 F **17 Claims**



1. A water probing machine fitted with a handling apparatus for a wafer carrier, comprising:

a testing section where a multitude of probes are brought into contact with the pads of a device circuit of semiconductor wafers to pass an electric current to the device circuit under test;

a loading/unloading section provided adjacent to said testing section, for automatically taking the semiconductor wafers into and out of said testing section one after another; and

means for transferring the semiconductor wafers between said loading/unloading section and said testing section, and

including:

a sampling case mounted to said loading/unloading section and having formed therein a first opening communicating with the outside of said loading/unloading section and a second opening communicating with the interior of said loading/unloading section;

a drawer adapted to go into and out of said sampling case through the first opening;

means for guiding said drawer between the first opening and the second opening of said sample case;

a carrier which is loaded on said drawer and used to hold one semiconductor wafer at a time comprising:

a tray means for loading thereon the semiconductor wafer submitted to processing, said tray means having a groove which is formed therein for unloading the semiconductor wafer therefrom; and

means for positioning said tray means relative to a predetermined location of the drawer,

whereby, when the carrier having the semiconductor wafer mounted thereon is inserted into the sampling case through the first opening, only the semiconductor wafer is transferred to the loading/unloading section through the second opening by the transferring means.

4,901,012

CIRCUIT FOR MEASURING THE DYNAMIC CHARACTERISTICS OF A PACKAGE FOR HIGH-SPEED INTEGRATED CIRCUITS AND A METHOD FOR MEASURING SAID DYNAMIC CHARACTERISTICS

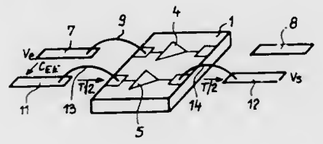
Maurice Gloanec, Bures Sur Yvette; Jacques Jarry, St Cyr L'Ecole, and Jean L. Lailler, Bures sur Yvette, all of France, assignors to Thomson Hybrides et Microondes, Paris, France

Filed Nov. 18, 1987, Ser. No. 122,125

Claims priority, application France, Nov. 18, 1986, 86 15996

Int. Cl.[4] G01R *19/10*

U.S. Cl. 324—158 R **3 Claims**



1. A method of measurement for measuring the coupling coefficient $C_{S/S}$ between two adjacent output connections of a package to be used to encapsulate an integrated circuit, comprising the steps of:

leaving a first amplifier of a measuring circuit unconnected at the output of said first amplifier;

connecting a second amplifier which is parallel to the first amplifier to one input connection and to one output connection of the package;

sending a signal (V_e) to the input connection of the first amplifier;

obtaining an output signal (V_S) on the second amplifier equal to:

$$V_s = C_{E/E} \cdot A \cdot V_e \cdot T$$

whence $C_{E/E} = (1/A \cdot T) \cdot (V_s/V_e)$;

connecting the first amplifier of the measuring circuit at its input and connecting its output to two external connections;

connecting the output of the second amplifier which is parallel to the first amplifier to a package connection, and leaving said second amplifier disconnected to its input;

sending a signal V_e to the input connection of the first amplifier;

obtaining an output signal for the second amplifier equal to:

$$V_{S2}=C_{S/S}\cdot A\cdot V_e T$$

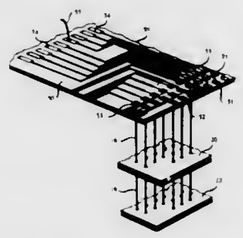
whence $C_{S/S}=(1/A\cdot T)\cdot(V_{s2}V_e)$.

4,901,013

APPARATUS HAVING A BUCKLING BEAM PROBE ASSEMBLY

William E. Benedetto, Succasunna, and Joseph M. Moran, Berkeley Heights, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 19, 1988, Ser. No. 233,777
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—158 F **6 Claims**



1. Apparatus for electrically testing an electrical circuit comprising an array of test points on an essentially planar substrate, the apparatus comprising a buckling beam probe assembly comprising

(a) a first guide element comprising a central portion that contains a multiplicity of through-holes forming an array that corresponds to the array of test points;

(b) a second guide element;

(c) spacer means that serve to maintain the second guide element spaced apart from, and in fixed relationship with, the first guide element, the spacer elements being arranged such that the central portion of the first and of the second guide element is unobstructed by the spacer means;

(d) a multiplicity of buckling beam probe elements, any given probe element attached to the second guide element, extending through one of the holes in the first guide element and a small distance beyond, and being essentially parallel with the other probe elements; and

(e) conductor means making electrical contact with at least one of the probe elements; wherein

(f) the second guide element comprises a body having a first surface and a second surface substantially parallel to the first surface, the body comprising an array of through-holes that corresponds to the array in the first guide element, the through-holes extending between the first and second surfaces, the probe elements secured to the respective holes in the body, the array of holes in the first guide element being laterally offset with respect to the array in the body, whereby a predetermined buckling direction is imposed on the probe elements; and wherein the means of

(e) comprise a multiplicity of conductor lines disposed on the first surface of the body, a given conductor line serving to electrically connect a probe element with a corresponding contact means disposed on the first surface; and wherein

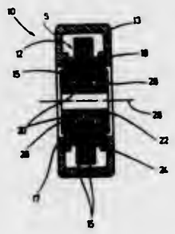
(g) the body is a Si body, the Si body is secured to a circuit board comprising conductive features, and a given contact means on the major surface of the Si body is electrically connected to a conductive feature on the circuit board.

4,901,014

ELASTIC BEARING ARRANGEMENT FOR ROTATIONAL SIGNAL GENERATOR

Johannes Riegger, Wurmlingen, Fed. Rep. of Germany, and Walter Blöchle, Beamsville, Canada, assignors to Hohner Elektrotechnik KG, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,103
Int. Cl.[4] G01P *3/48*
U.S. Cl. 324—166 **19 Claims**



1. A rotational signal generator for generating signals that correspond to the rotational speed and/or the angle of rotation of a rotatable component part, comprising:

a generator housing,

a bearing housing supported in the generator housing,

a pulse disk that is rotatably arranged in the bearing housing and is non-rotatably connectable with the rotatable component part, and

a signal generating device that is mounted at the bearing housing, is assigned to the pulse disk and generates signals from the rotational movement of the pulse disk that correspond to the rotational speed and/or the angle of rotation of the rotatable component part,

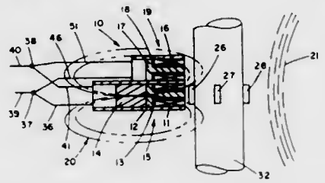
wherein the pulse disk is carried by a hollow shaft that can be fitted onto the rotatable component part and is rotatably disposed in the bearing housing, and wherein the bearing housing is elastically held in axial and radial direction in the generator housing by elastic support means, said elastic support means being in direct contact with both the bearing housing and generator housing over a substantial portion of the circumference of the bearing housing.

4,901,015

AMBIENT ELECTROMAGNETIC FIELD COMPENSATING MAGNETIC PICK-UP CIRCUIT FOR INTEGRATED DRIVE GENERATORS

Edwin L. Pospischil, South Beloit, and Otto W. Dschida, Rockford, both of, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 21, 1988, Ser. No. 247,133
Int. Cl.[4] G01B *7/30*
U.S. Cl. 324—207.17 **20 Claims**



1. A magnetic pickup circuit operating within an enclosure adjacent a single source emanating an ambient electromagnetic field, comprising:

a first coil responsive to said ambient electromagnetic field emanating from said single source and a modulated flux field;

a second coil responsive to said ambient electromagnetic field connected to said first coil in opposition and positioned such that wavefronts of said ambient electromagnetic field simultaneously impinge on said first and second coils to thereby ensure that a signal induced by said ambient electromagnetic field in said first coil is cancelled by a signal induced by said ambient electromagnetic field in said second coil; and

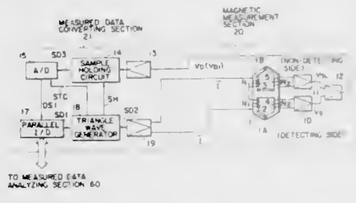
means coupled to said first coil and said second coil for providing an output signal representative of modulation of said modulated flux field, which output signal is free from distortion due to said ambient electromagnetic field.

4,901,016

DEVICE HAVING A MAGNETIC HEAD FOR MEASURING MAGNETIZATION CHARACTERISTICS OF A MAGNETIC THIN FILM

Sadatoshi Kusatani, and Toru Nakashima, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Mar. 25, 1988, Ser. No. 174,448
Claims priority, application Japan, Mar. 25, 1987, 62-70668
Int. Cl.[4] G01R *33/12*; G01N *27/72*; G11B *27/36, 5/17*
U.S. Cl. 324—210 **17 Claims**



1. A device for measuring magnetization characteristics of a magnetic thin film comprising: a differential magnetic head; a triangle wave signal generator for exciting said differential magnetic head with a triangle wave signal; a magnetic head moving means for positioning said differential magnetic head to a position closely adjacent to the magnetic thin film; a measured data converting means for sampling differential output voltages from said differential magnetic head when said differential magnetic head is positioned closely adjacent to the magnetic thin film and for converting the thus sampled output voltage values into respective digital values; and a measured data analyzing means for sequentially storing said digital values converted by said converting means and for calculating magnetiaztion characteristics of the magnetic thin film.

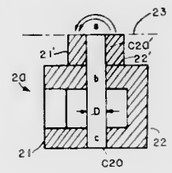
4,901,017

GAP-MODIFIED MAGNETIC BRIDGE DEVICE FOR FRINGING FLUX ANALYSIS

Otto H. Zinke, 817 N. Jackson Dr., Fayetteville, Ark. 72701

Filed Aug. 28, 1987, Ser. No. 90,778
Int. Cl.[4] G01N *27/72, 27/83*; G01R *33/12*; G01P *15/08*
U.S. Cl. 324—239 **17 Claims**

1. A magnetic bridge for fringing flux evaluation of samples having a substantial degree of conductivity, said bridge comprising a magnetic circuit having at least four arms, a driving leg and a sensing leg, one of said arms being utilized for evaluating at least one sample, the sample-evaluating arm including pole pieces forming end faces for producing a usable core field and defining between them a sample-evaluating gap of the sample-evaluating arm, an electrically conductive gap insert fitted between said pole pieces within said gap, the electrically conductive gap insert extending out and away from the core on all sides of the core except from a selected portion on one side of the core at the sample-evaluating gap for inducing thereby a second field of origin within the gap insert superposed with the core field to produce a stray core field and for providing high reluctance stray flux paths at the gap except in the vicinity of the selected core portion at which there is a low reluctance path for encouraging said stray core field to cross the gap insert and so extend beyond the gap to provide a fringing flux exteriorly of the gap, means for placement of a sample in



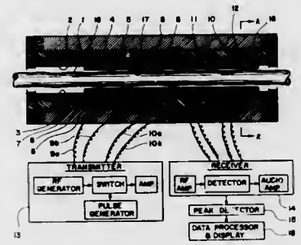
juxtaposition to the selected core portion at the sample-evaluating gap for causing the sample to be exposed to said fringing flux, whereby the sample changes the fringing flux, driving means associated with the driving leg for providing a time-varying flux path within the four arms of the bridge, and sensing means associated with the sensing leg for sensing changes in the sensing leg caused by changes in the fringing flux resulting from characteristics of the sample.

4,901,018

NUCLEAR MAGNETIC RESONANCE NET ORGANIC FLOWMETER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 56,001, Jun. 1, 1987, Pat. No. 4,788,295. This application Oct. 31, 1988, Ser. No. 264,358
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—306 **9 Claims**



1. An apparatus for measuring flow rate of media moving through a flow passage comprising in combination:

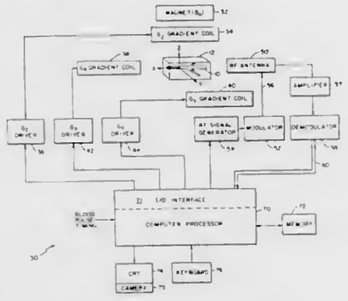
(a) a magnet providing a generally constant magnetic field in a region including a segment of the flow passage;

(b) a transmitter coil disposed in said region generating a series of localized pulsed alternating magnetic field generally perpendicular to the constant magnetic field, wherein said pulsed alternating magnetic field oscillates at a nuclear magnetic resonance frequency of the media and a pause time between two consecutive pulses of the altrnating magnetic field is significantly less than a spin-lattice relaxation time of a nuclear magnetic resonance emission from the media;

(c) a receiver antenna disposed adjacent to said transmitter coil picking up nuclear magnetic resonance emission emitted by a localized volume of the media located in a vicinity of said receiver antenna, said nuclear magnetic reso-

nance emission generated by said pulsed alternating magnetic field;
(d) means for measuring peak values of a series of pulsed nuclear magnetic resonance emissions from the media generated by said series of pulsed alternating magnetic fields and picked up by said receiver antenna; and
(e) means for determining flow rate of the media from the peak values of said series of pulsed nuclear magnetic resonance emissions in a range of flow rate wherein the peak value monotonically increases as a function of increasing flow rate of the media.

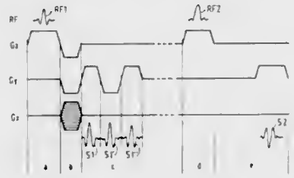
4,901,019
THREE-DIMENSIONAL IMAGING
Van J. Wedeen, Somerville, Mass., assignor to The General Hospital Corporation, Boston, Mass.
Filed Aug. 18, 1986, Ser. No. 897,527
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **21 Claims**



2. Apparatus for generating information representative of an image of an object that has a predetermined extent in at least one dimension, comprising
means for acquiring data from said objects, said acquiring means having field of view in said one dimension that is smaller than the extent of said object in said one dimension and being arranged to produce aliasing in said acquired data, and
means for processing said acquired data to generate said information representative of said image, free of the effects of said aliasing.

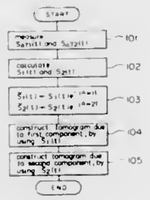
4,901,020
PULSE SEQUENCE FOR OPERATING A NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS FOR PRODUCING IMAGES WITH DIFFERENT T_2 CONTRAST
Ralf Ladebeck; Hubertus Fischer, both of Erlangen, and Franz Schmitt, Baiersdorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Mar. 23, 1989, Ser. No. 327,891
Claims priority, application Fed. Rep. of Germany, May 30, 1988, 3818375
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **12 Claims**

1. A method for generating a pulse sequence for operating a nuclear magnetic resonance tomography apparatus for producing separate images having respectively different T_2 contrast comprising the steps of:
(a) generating a first, selective radio-frequency pulse simultaneously with a gradient in the z-direction as a slice selection gradient;
(b) generating a gradient in the y-direction with a directional sign for dephasing spins in the y-direction simultaneously with a gradient in the x-direction for phase coding spins in the x-direction, said gradient in the x-direction having characteristics from which an amplitude-time integral associated with said gradient in the x-direction can be calculated;
(c) reversing the directional sign of said gradient in the y-direction thereby generating a first radio signal, and reading out said radio signal;
(d) generating a second radio-frequency pulse with a flip angle of approximately 180°;
(e) generating another gradient in the y-direction having the same operational sign as in step (c) thereby generating a second radio signal, and reading-out said second radio signal;



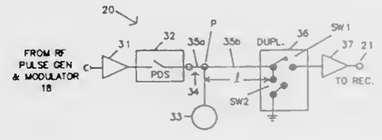
(f) executing steps (a) through (e) a plurality of times and varying said characteristics of said gradient in said x-direction from execution-to-execution so that said amplitude-time integral varies from execution-to-execution, said plurality of said executions resulting in a data set of said first radio signals and a data set of said second radio signals;
(g) constructing a first image having a T_2 contrast from said data set of said first radio signals; and
(h) constructing a second image having a T_2 contrast differing from the T_2 contrast of said first image from said data set of said second radio signals,
said x-, y- and z-directions being orthogonal.

4,901,021
IMAGE CONSTRUCTING DEVICE INCLUDED IN A MAGNETIC RESONANCE IMAGING APPARATUS
Akira Maeda, Gardena, Calif.; Koichi Sano, Sagamihara, Japan; Tetsuo Yokoyama, Tokyo, Japan, and Hideaki Koizumi, Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 25, 1988, Ser. No. 262,282
Claims priority, application Japan, Nov. 6, 1987, 62-279217
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **16 Claims**



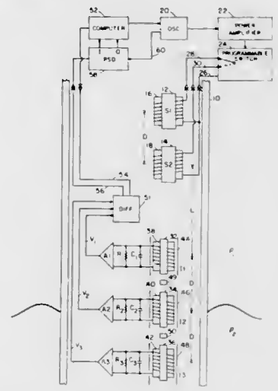
1. An image constructing device included in a magnetic resonance imaging apparatus, the device comprising:
a plurality of magnetic-field generating means for generating a static magnetic field, gradient magnetic fields and a high-frequency magnetic field, the static, gradient and high-frequency magnetic fields being applied to an object to be inspected;
means for controlling the output of each of the magnetic-field generating means in accordance with a predetermined procedure;
means for measuring resonance signals from the to-be-inspected object at different periods of time under the condition that the strengths of the gradient magnetic fields are changed as the time elapses;
means for estimating a resonance signal due to only a predetermined chemical shift component, from a plurality of measured resonance signals; and
means for constructing a tomogram due to the predetermined chemical shift component, from the estimated resonance signal.

4,901,022
BROADBAND MATCHING AND DECOUPLING NETWORK
Hanan Keren, Kfar Saba, and Itzchak Linenberg, Netanya, both of Israel, assignors to Elscint, Ltd., Haifa, Israel
Continuation of Ser. No. 140,787, Jan. 5, 1988, abandoned. This application Jul. 5, 1989, Ser. No. 374,552
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **4 Claims**



1. A broadband matching and decoupling network for connecting a radio frequency (RF) coil to a magnetic resonance (MR) data acquisition system, said MR data acquisition system having transmitter means for transmitting RF pulses and receiving means for receiving RF signals at more than one frequency, said network comprising:
a first coaxial cable connected at one end to said RF coil,
a second coaxial cable connected between said transmitter means and said receiver means,
means connecting the other end of said first coaxial cable to a point on said second coaxial cable,
first decoupling means for decoupling the said receiver means from said second coaxial cable during transmission of said RF pulses,
second decoupling means for decoupling the said transmitter means from said second coaxial cable during receipt of said RF signals,
said first decoupling means including means for shorting the end of said second coaxial cable connected at the first decoupling means to ground,
the length of said second coaxial cable between said point and said means for shorting is: $(f_H/f_L)\lambda_H$ where:
f_H=the higher frequency of said more than one frequency
f_L=a frequency lower than said higher frequency
λ_H=the wavelength at the higher frequency, and the ratio f_H/f_L=an odd integer, and
wherein the difference between the actual lower frequency of said more than one frequency and said theoretical lower frequency is in a range that provides a reflective power output reduced by at least 20 Db relative to the forward transmitted RF power.

4,901,023
METHODS AND APPARATUS FOR MEASUREMENT OF LOW FREQUENCY A.C. MAGNETIC FIELDS WITHIN CASED BOREHOLES TO DETERMINE PROPERTIES OF GEOLOGICAL FORMATIONS
William B. Vail, III, Bothell, Wash., assignor to ParaMagnetic Logging, Inc., Woodinville, Wash.
Continuation-in-part of Ser. No. 857,160, Apr. 29, 1986, Pat. No. 4,748,415. This application May 31, 1988, Ser. No. 200,573
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[4] G01V *3/28, 3/24*
U.S. Cl. 324—339 **18 Claims**

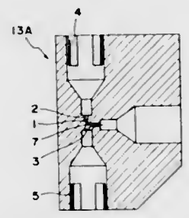


6. An apparatus for measuring subterranean properties of geological formations penetrated by a conducting and magnetic steel borehole casing comprising a circular loop of insulated wire concentric with said borehole casing which is energized with A.C. current with a magnitude in excess of 0.10 amps peak-to-peak at a frequency within the frequency interval of 0.001 Hz to 20 Hz which therefore subjects the subterranean formation to an applied primary A.C. magnetic field thereby resulting in the production of eddy currents which in turn produce secondary A.C. magnetic fields responsive to the resistivity of the subterranean geological formation, and a longitudinal A.C. magnetic detector means located at a depth from the surface of the earth within said cased borehole which is responsive to the longitudinal components of said primary and secondary fields which penetrate said casing at said depth which thereby provides an apparatus capable of measuring information useful for determining the resistivity and changes in the resistivity of subterranean geological formations in the, vicinity of said cased borehole.

4,901,024
APPARATUS FOR ANALYZING AND SEPARATING PARTICLES AND A SYSTEM USING THE SAME
Shinichi Miyake, and Masayuki Kometani, both of Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan
Filed Nov. 24, 1987, Ser. No. 124,596
Claims priority, application Japan, Jan. 20, 1987, 62-8887
Int. Cl.[4] G01N *27/00*
U.S. Cl. 324—438 **6 Claims**

3. A particle analyzer which comprises:
a constricted passage for the passage of fine particles contained in a suspension therethrough for isolation;
upstream and downstream passage communicated with the constricted passage and positioned on upstream and downstream sides of the constricted passage with respect to the direction of flow of the suspension;

a diluting liquid passage communicated with the upstream passage for the supply of a diluting liquid;
a detecting means including upstream and downstream electrodes disposed in the upstream and downstream passage, respectively, so as to confront with each other for detecting the fine particles being passed through the constricted passage; and
a cleansing passage communicated with either one of the upstream and downstream passage for the supply of a cleansing liquid.

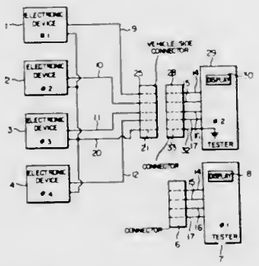


4,901,025

FAULT DIAGNOSIS SYSTEM FOR ELECTRONIC DEVICES ON AUTOMOBILES

Shigeaki Hirano, and HIrotoshi Maekawa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 13, 1987, Ser. No. 84,841
Int. Cl.[4] G01R *31/00*
U.S. Cl. 324—537 **2 Claims**



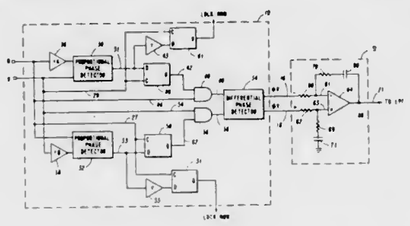
1. A fault diagnosis system for an automobile comprising:
at least one automotive electronic device mounted on an automobile which performs a fault diagnosis on the automobile, the electronic device having a signal line for outputting signals representing results of the fault diagnosis according to either one of a plurality of output signaling schemes and having a control line for inputting a signal selecting the output signal scheme;
a vehicle-side connector connected to the signal line and the control line;
a first tester adapted to a first one of the plurality of output signaling schemes and having a display for displaying results of the fault diagnosis transmitted from said electronic device in accordance with the first output signaling scheme, the first tester having a first tester-side connector which can be connected to said vehicle-side connector for linking the signal lines and the control line between said electronic device and said first tester, the first tester providing a first signal for designating the first output signaling scheme to said control line; and
a second tester adapted to a second one of the plurality of output signaling schemes and having a display for displaying results of the fault diagnosis transmitted from said electronic device in accordance with the second output signaling scheme, the second tester having a second tester-side connector which can be connected to said vehicle-side connector for linking the signal lines and the control line between said electronic device and said second tester, the second tester providing a second signal for designating the second output signaling scheme to said control line;
wherein either one of said tester-side connectors of said testers can be selectively connected to said vehicle-side connector.

4,901,026

PHASE DETECTOR CIRCUIT HAVING LATCHED OUTPUT CHARACTERISTIC

Donald E. Phillips, Cedar Rapids, and Gregory A. Jobe, Marion, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 68,877, Jul. 1, 1987, Pat. No. 4,801,896.
This application Nov. 23, 1988, Ser. No. 275,803
Int. Cl.[4] H03L *7/08*; H03K *9/08*
U.S. Cl. 328—133 **7 Claims**



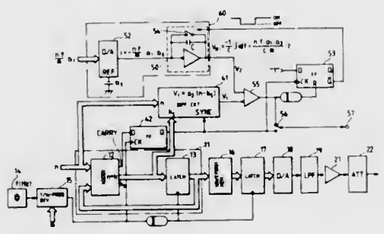
1. A phase detector circuit operative in response to first and second input signals having a phase relationship, comprising:
means for generating a signal indicative of said phase relationship between the first and second input signals; means for detecting when said phase relationship between the first and second input signals is outside a predetermined desired range; and means responsive to the detecting means for decoupling said first and second signals from said generating means when said phase relationship is outside the predetermined desired range.

4,901,027

SIGNAL GENERATOR

Hitoshi Kitayoshi, Gyoda, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,691
Claims priority, application Japan, Dec. 28, 1987, 62-332599
Int. Cl.[4] H03K *5/13, 7/00, 17/00*
U.S. Cl. 328—155 **7 Claims**



1. A signal generator comprising:

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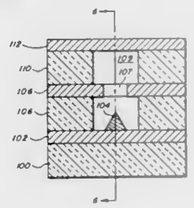
a phase accumulator for accumulating a phase add amount n upon each occurrence of a clock of a frequency f/m and for providing an output;
a waveform memory, coupled to said phase accumulator, which is read out based on the output of said phase accumulator;
a first digital-to-analog (D-A) converter, coupled to said waveform memory, for converting the output of said waveform memory into an analog signal;
a difference circuit, coupled to said phase accumulator, which, when said phase accumulator yields a carry output, generates an analog voltage $V_1=a_2(n-k_s)$ which is in proportion to the difference between the output k_s of the phase accumulator and the phase add amount n;
a ramp function voltage generator for generating a ramp voltage $V(t)=nfa_1a_3t/cm$ which is in proportion to the product of the clock frequency f/m and the phase add amount n; and
a comparator, coupled to said ramp function voltage generator and said difference circuit, which compares the analog voltage and the ramp function voltage and outputs a synchronization pulse when they agree with each other.

4,901,028

FIELD EMITTER ARRAY INTEGRATED DISTRIBUTED AMPLIFIERS

Henry F. Gray, Alexandria, Va., and Richard F. Greene, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 22, 1988, Ser. No. 171,706
Int. Cl.[4] H03F *3/60*
U.S. Cl. 330—54 **9 Claims**



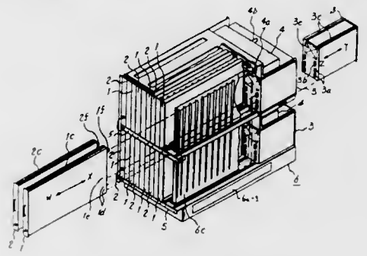
1. A distributed amplifier comprising,
a grid;
a collector; and
a field emitter;
wherein said grid and said emitter are adapted to form an input electromagnetic waveguide for said amplifier, and said collector and said emitter are adapted to form an output electromagnetic waveguide for said amplifier, both said input electromagnetic waveguide and said output electromagnetic waveguide being adapted to have equal impedance effective to cause the speed of electromagnetic propagation in each said waveguide to be substantially equal;
and wherein said emitter is in the shape of an elongate wedge disposed along an elongate distance substantially parallel to the direction of electromagnetic propagation in each said waveguide.

4,901,029

SOLID-STATE HIGH POWER AMPLIFIER ARRANGEMENT

Kazuo Fujino; Tetsumichi Yamamoto; Tomohito Ikegami, and Takeshi Yanagibayashi, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Sep. 14, 1988, Ser. No. 244,088
Claims priority, application Japan, Sep. 16, 1987, 62-233142
Int. Cl.[4] H03F *1/00*; H05K *7/20*
U.S. Cl. 330—65 **12 Claims**



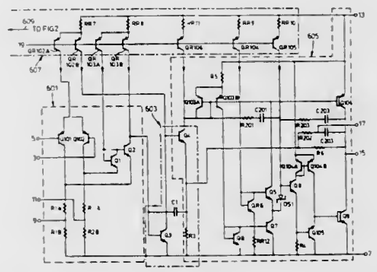
1. A power amplifier arrangement comprising:
an air chamber having a flat face thereon, said flat face including a plurality of ports to deliver cooling air:
a plurality of blower ducts disposed on said flat face of said air chamber to receive said cooling air from said ports, each of said blower ducts having an upwardly-tapered shape;
a plurality of amplifier units disposed on said flat face of said air chamber and respectively disposed beside said blower ducts, each of said amplifier units having a flat plate on which a plurality of transistors are fitted; and
a plurality of nozzels attached to each of said blower ducts for directly blowing said cooling air onto said flat plate of said amplifier unit, wherein space between adjacent two of said amplifier units operates as an exhaust duct, said space containing each of said blower ducts, and said exhaust duct having a substantially upwardly-widened shape.

4,901,030

OPERATIONAL AMPLIFIER STAGES

Stephen P. Webster, Oakville, Canada, assignor to Gennum Corporation, Burlington, Canada

Filed Aug. 11, 1988, Ser. No. 230,950
Claims priority, application Canada, Sep. 14, 1987, 546821
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—252 **15 Claims**



1. A gain stage, for use in an operational amplifier having a first and a second supply rail, the gain stage comprising:
a stage input and a stage output;

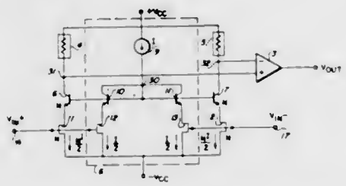
a first current gain element;
a voltage controlled second current gain element;
current controlled first and second voltage sources;
an integrating capacitor;
the stage input being connected to the first current gain element, an end of the integrating capacitor, and an input of the first voltage source;
another end of the integrating capacitor being connected to an input of the second voltage source;
an input to the second current gain element being connected to an output of the first current gain element;
an output of each of the first and second voltage sources is connected to the negative supply rail;
a first and a second voltage control input of the second current gain element connected one to each of another voltage output of each of the first and second voltage sources;
an output of the second gain element is connected to the stage output;
whereby an input current signal at the stage input is integrated by the capacitor, the integrated current being removed from the input current signal producing a modified input current signal, the modified current signal is amplified by the first and second gain elements to produce an output current at the stage output, the gain of the second gain element being controlled by a difference voltage between the two voltage sources, the first voltage source controlled by the modified current signal while the second voltage source is controlled by the integrated current.

4,901,031

COMMON-BASE, SOURCE-DRIVEN DIFFERENTIAL AMPLIFIER

Timothy V. Kalthoff; Rodney T. Burt, and R. Mark Stitt, II, all of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Jan. 17, 1989, Ser. No. 298,116
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 **17 Claims**



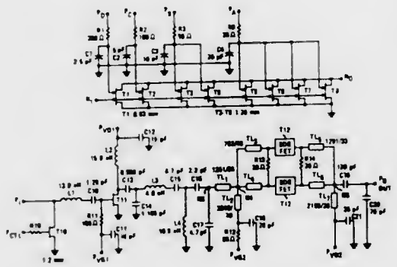
14. A method of achieving high speed, low noise amplification of a differential input signal, comprising the steps of:
(a) applying a first input voltage to a gate electrode of a first field effect transistor and applying a second input voltage to a gate electrode of a second field effect transistor, and also applying the first and second input voltages to a bias circuit;
(b) causing first and second currents to flow in the bias circuit in response to the first and second input voltages, the relative values of the first and second currents being dependent on the first and second input voltages and producing a bias voltage in response to the first and second currents;
(c) forcing a third current to flow through a first bipolar transistor and a first load device in response to the first input voltage and the bias voltage, and forcing a fourth current to flow through a second bipolar transistor and a second load device in response to the second input voltage and the bias voltage, to thereby produce an output voltage between a terminal of the first load device and a terminal of the second load device.

4,901,032

DIGITALLY CONTROLLED VARIABLE POWER AMPLIFIER

James J. Komiak, Lansing, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 1, 1988, Ser. No. 278,548
Int. Cl.[4] H03F *3/195*
U.S. Cl. 330—277 **5 Claims**



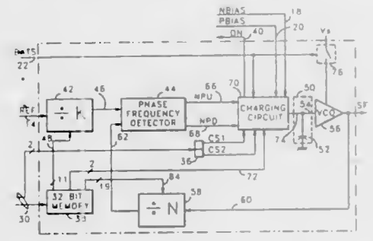
1. In a transistor amplifier for radio frequency signals in which power added efficiency is substantially maintained as the power level is reduced, the combination comprising:
A. a segmented dual gate field effect transistor (SDGFET) for r.f. signal amplification comprising:
(i) a source electrode at signal ground,
(ii) a first, signal gate electrode, adjacent to the source electrode to which input signals are applied, referenced to signal ground,
(iii) a drain electrode, at which amplified output signals appear, referenced to signal ground,
(iv) a second, conduction control gate electrode, adjacent to the drain electrode, formed of an m-fold plurality of segments of scaled widths (e.g. 1, 2, 4, units) selected to achieve a greater than m fold plurality of effective segmental widths (e.g. 1, 2, 3, 4, 5, 6, 7 units) when selectively activated,
(v) each segment having a separate terminal for activating a portion of the FET coextensive with said segment when a first potential is applied, and for inactivating said portion when a second potential is applied,
said source, first gate, segmented second gate, and drain electrodes being of a width determined by the desired power level and coextensive;
each SDGFET portion having a first saturated class A state at a desired power level, and a second zero current zero power state, as a function of the potentials applied to said electrodes;
B. a FET driver stage to which an input r.f. signal is applied, and from which an amplified r.f. signal is obtained and coupled to the first gate electrode of said SDGFET, said FET driver stage supplying said r.f. signal at an amplitude which substantially saturates said SDGFET transistor in a minimum power level, at which the SDGFET transistor gain is minimum, thus insuring saturated operation and thereby accurately scaled power levels and a uniform phase transfer response at all power levels of said SDGFET transistor; and
C. energization and power control means for said SDGFET comprising:
(i) means to apply a dc bias between source and drain electrodes for efficient signal amplification,
(ii) means to bias said first gate electrode for signal amplification at a saturated power setting, and
(iii) means for selectively applying one of said two potentials to each of said m fold segment terminals to set a desired power level for the output signal appearing at said drain electrode, the application of said second potential to successive segment decrementing the signal power from the maximum power level with a minimum reduction in power added efficiency and a minimum change in signal transfer phase.

4,901,033

FREQUENCY SYNTHESIZER WITH DYNAMICALLY PROGRAMMABLE FREQUENCY RANGE OF SELECTED LOOP BANDWITH

Barry W. Herold, Boca Raton, and Omid Tabernia, Coconut Creek, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1989, Ser. No. 345,809
Int. Cl.[4] H03L *7/10, 7/18*
U.S. Cl. 331—1 A **15 Claims**



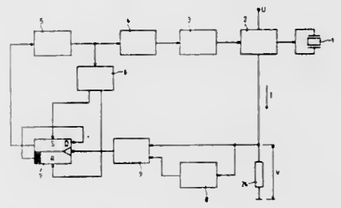
1. A frequency synthesizer governed by a frequency channel setting to generate a synthesized frequency signal, said frequency synthesizer including a phase lock loop (PLL) circuit operative in a first loop bandwidth state to maintain said synthesized frequency signal substantially at said frequency channel setting, said PLL circuit programmably settable randomly between old and new frequency channel settings, said PLL circuit operative in a second loop bandwidth state in response to a new frequency channel setting to converge the synthesized frequency signal to said new frequency channel setting, said PLL circuit comprising:
phase detecting means governed by a reference frequency signal and a feedback frequency signal to generate at least one control signal based on the phase difference between said reference and feedback frequency signals;
storage means for maintaining a governing signal;
oscillator means controlled by said governing signal to generate said synthesized frequency signal proportional in frequency to the amplitude of said governing signal;
means for frequency dividing said synthesized frequency signal in accordance with a programmably settable frequency channel setting to generate said feedback frequency signal;
means governed by said at least one control signal to adjust the governing signal of said storage means in a selected one of a plurality of loop bandwidth states including said first and second loop bandwidth states, said adjusting means including a digitally programmable control circuit for dynamically setting the frequency range of the selected loop bandwidth state in one of a predetermined plurality of frequency ranges, whereby an appropriate loop bandwidth frequency range may be dynamically set in accordance with a new frequency channel setting.
7. A frequency synthesizer comprising:
a plurality of phase lock loop (PLL) circuits, each PLL circuit governed by a respective frequency channel setting to generate a synthesized frequency signal, each PLL circuit operative in a first loop bandwidth state to maintain its synthesized frequency signal substantially at its respective frequency channel setting, each PLL circuit programmably settable randomly between old and new frequency channel settings, each PLL circuit operative in a second loop bandwidth state in response to a new frequency channel setting to converge its synthesized frequency signal to said new frequency channel setting; and
a common bias circuit programmably operative to generate at least one bias signal which is coupled commonly to said plurality of PLL circuits for setting a common frequency range for the first and second loop bandwidth states of all of the PLL circuits.

4,901,034

PROCESS AND CIRCUIT FOR EXCITING AN ULTRASONIC GENERATOR AND ITS USE FOR ATOMIZING A LIQUID

Jagdt Frank-Peter, Schofflisdorf, Switzerland, assignor to Satronic, AG, Dielsdorf, Switzerland

Filed Apr. 28, 1989, Ser. No. 345,344
Claims priority, application Switzerland, May 6, 1988, 1728/88
Int. Cl.[4] H03L *7/12;* **H03B** *23/00*
U.S. Cl. 331—4 **8 Claims**



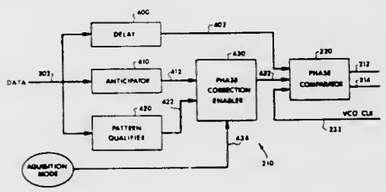
1. A process for exciting an ultrasonic generator, comprising the steps of providing a voltage-controlled oscillator and exciting said ultrasonic generator by an output signal of said voltage-controlled oscillator, wherein a control voltage of the oscillator is regulated in such a way that a frequency of said oscillator is periodically swept in a predetermined range covering the frequency of the series resonance of the ultrasonic generator, the method further comprising the steps of forming a measured control quantity corresponding to the damping of the ultrasonic generator and comparing said measured control quantity with a predetermined threshold value which corresponds to a predetermined maximum permitted damping, and additionally regulating said control voltage as a function of said measured quantity if the comparison reveals that the damping of the ultrasonic generator is lower than the maximum permitted damping.

4,901,035

PHASE-LOCKED LOOP CONTROL FOR READING DATA OFF STORAGE MEDIA

Brian G. Cleveland, Boulder, Colo., assignor to Aspen Peripherals Corp., Longmont, Colo.

Filed Apr. 20, 1988, Ser. No. 183,843
Int. Cl.[4] H03L *7/14*
U.S. Cl. 331—14 **5 Claims**



1. A phase-locked loop control having a phase detector (210)

receptive of a data preamble of all "ones" from a storage sub-system (**10, 30, 40, 50, 200**) for producing early and late signals applied to a voltage controlled oscillator (**220, 225, 230**) in order for the frequency of said oscillator to be synchronized with the frequency of said data preamble, said phase detector comprising:

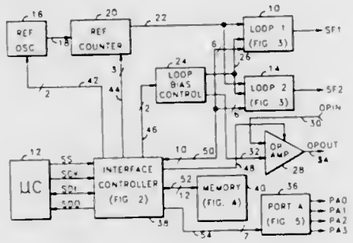
means receptive of said data preamble for preventing the generation of said early and late signals when a preamble pulse (**600**) is not present within a predetermined window (W) of time.

4,901,036

FREQUENCY SYNTHESIZER WITH AN INTERFACE CONTROLLER AND BUFFER MEMORY

Barry W. Herold, Boca Raton; Omid Tabernia, Coconut Creek; Walter L. Davis, Coral Springs, and Mario A. Rivas, West Palm Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 29, 1989, Ser. No. 372,997
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—25 **26 Claims**



1. A frequency synthesizer including at least one phase lock loop (PLL) circuit operationally characterized by a central controller to generate a synthesized channel frequency signal, said PLL circuit including at least one storage register dynamically programmable with data words which characterize the operation of said PLL circuit in generating said synthesized channel frequency signal, said frequency synthesizer comprising:

an interface controller coupled between said central controller and said at least one storage register of said PLL circuit and operative to receive operational code words and data words from said central controller; and

a buffer memory coupled to said interface controller for storing a plurality of data words for characterizing the operation of said phase lock loop, said interface controller responsive to said operational code words received from said central controller to direct a transfer of data words between said central controller, said at least one storage register and said buffer memory.

4,901,037

OSCILLATOR WITH AMPLITUDE STABILIZING CIRCUIT

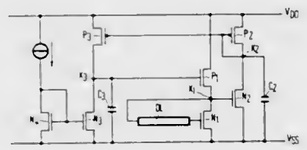
Ernst Feller, Brunaustrasse 66, CH-8002 Züricb, Switzerland

Filed Sep. 1, 1988, Ser. No. 239,574
Claims priority, application Netherlands, Sep. 8, 1987, 8702122
Int. Cl.[4] H03B *5/04;* **H03L** *1/00*
U.S. Cl. 331—109 **5 Claims**

1. An oscillator circuit comprising:

an amplifier controlled by means of a control voltage on a control terminal and which comprises a feedback circuit coupled between an amplifier input and an amplifier output;

an amplitude controller which comprises an amplitude detector for controlling the oscillation amplitude in dependence on a detected amplitude and a first and a second current source for supplying currents of mutually opposed polarity to the control terminal, at least one of the current



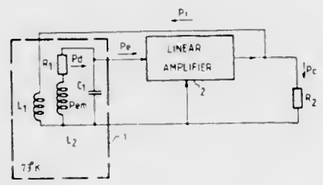
sources being controllable by the amplitude controller in dependence on an amplitude which is detected during at the most one half of an oscillation period.

4,901,038

LOW-NOISE OSCILLATOR USING SUPERCONDUCTING NONLINEAR ELEMENT

Didier Dusclaux, Paris, and Jean-Claude Mage, Levallois Perret, both of France, assignors to Thomson CSF, Paris, France

Filed Dec. 30, 1988, Ser. No. 292,164
Claims priority, application France, Dec. 30, 1987, 8718370
Int. Cl.[4] H03B *5/08*
U.S. Cl. 331—167 **6 Claims**



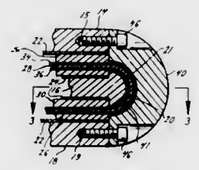
1. A low-noise oscillator comprising a resonator, a linear amplifier, and a nonlinear element formed of superconducting material maintained at low temperature under conditions in the vicinity of transition between the superconducting state and the resistive state.

4,901,039

COUPLED STRIP LINE CIRCUIT

Robert G. Corzine, and Joseph A. Mosko, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1989, Ser. No. 320,449
Int. Cl.[4] H01P *5/00*
U.S. Cl. 333—1 **12 Claims**



1. A strip line assembly having two stacked strip lines, each said strip line having a second dielectric layer with conductor leads etched in either side thereof, and first and third dielectric

layers sandwiching said second dielectric layer and having ground planes etched on their outer surfaces, comprising:

a center holding plate sandwiched between said two stacked strip lines and having a curved, ground plane extension extending beyond said stacked strip lines, with conductor channels disposed therein;

first and third holding plates sandwiching said stacked strip lines, each of said plates having an end surface on its end adjacent to said ground plane extension of said center holding plate;

an extension of said second dielectric layer comprising a central bend area between the adjoining ends of said layer in each of said stacked, strip lines, said extension juxtaposed upon and about said curved ground plane extension; and

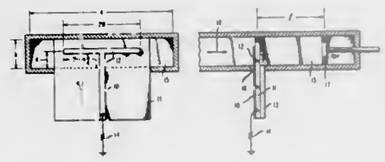
a ground plane cover for enclosing said second dielectric layer extension upon said curved ground plane extension, said cover having a top and bottom end surface for mating contact with the facing end surface of each of said outer holding plates.

4,901,040

REDUCED-HEIGHT WAVEGUIDE-TO-MICROSTRIP TRANSITION

William G. Ahlborn, Somerville; Harry F. Lenzing, Atlantic Highlands, and You-Sun Wu, Princeton Junction, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 3, 1989, Ser. No. 331,770
Int. Cl.[4] H01P *5/107*
U.S. Cl. 333—26 **7 Claims**



1. A waveguide transition comprising:

a reduced-height waveguide section for propagating electromagnetic signals in at least one predetermined frequency band; and

a microstrip transition for insertion through an aperture in the reduced-height waveguide section in a transverse plane of the reduced-height waveguide section, and for transmitting or receiving the electromagnetic signals propagating in the reduced-height waveguide section, the microstrip transition comprising,

a substrate formed from a non-conductive material comprising a first and a second opposing major surface,

a conductive layer formed on the first major surface of the substrate comprising a T-bar configuration, where the arms of the T-bar configuration are disposed parallel to and near a first end of the substrate that is inserted into the reduced-height waveguide section to provide a predetermined capacitance component with the nearest wall of the reduced-height waveguide section, and the body of the T-bar configuration emanating from only one side of the arms extends a predetermined distance within the reduced-height waveguide section to provide a predetermined inductance component, and

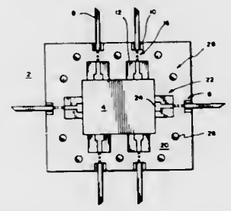
a ground plane conductive layer formed on the second major surface of the substrate, the ground plane layer being excluded from at least the area opposite the T-bar configuration.

4,901,041

HIGH-PERFORMANCE PACKAGE FOR MONOLITHIC MICROWAVE INTEGRATED CIRCUITS

Raymond S. Pengelly, Lawrenceville, N.J., assignor to Grumman Corporation, Bethpage, N.Y.

Filed Sep. 30, 1988, Ser. No. 251,446
Int. Cl.[4] H01P *5/00*
U.S. Cl. 333—33 **6 Claims**



1. A compensated feedthrough for a monolithic microwave integrated circuit package, comprising:

a first microstrip transmission line section including a first microstrip signal conductor;

a pseudostrip transmission line section electrically connected to said first microstrip transmission line section, including a pseudostrip signal conductor electrically connected to said first microstrip signal conductor, wherein at least a portion of the length of said pseudostrip signal conductor is no greater than 6 mil in width; and

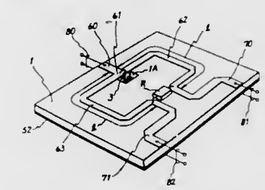
a second microstrip transmission line section electrically connected to said pseudostrip transmission line section, including a second microstrip signal conductor electrically connected to said pseudostrip signal conductor, said second microstrip signal conductor having first and second ends, wherein said first end is electrically connected to said pseudostrip conductor and said second end is arranged to form two open-circuited studs.

4,901,042

HIGH FREQUENCY POWER DIVIDER

Takashige Terakawa; Noriyuki Akaba, and Sadayoshi Hattori, all of Yokohama, Japan, assignors to Tokyo Keiki Co., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,424
Claims priority, application Japan, Apr. 1, 1987, 62-80161
Int. Cl.[4] H01P *5/12*
U.S. Cl. 333—127 **6 Claims**



1. A high-frequency power divider, comprising:

a dielectric base having a ground formed on one side of said dielectric base;

an input line formed on a second side of said dielectric base;

a pair of input-output lines formed on said second side of said dielectric base, said input-output lines forming a pair of output terminals;

a pair of high-impedance transmission lines formed on said second side of said dielectric base that diverge from each other at a side opposite where high-frequency power is

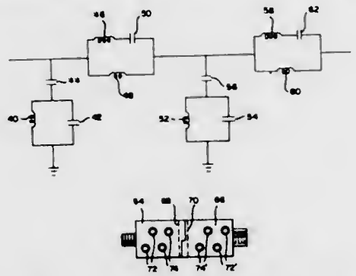
inputted into said input line, said pair of impedance transmission lines extending to said pair of input-output lines;
an isolation resistor having one end thereof connected to one of said pair of high-impedance transmission lines, the remaining end of said isolation resistor being connected to the remaining high-impedance transmission line; and
a capacitive component comprising a capacitor disposed at an inner side where said high-impedance transmission lines diverge from said input line, said capacitive component cancelling undesired reflections along said high-frequency power divider.

4,901,043

COMPACT FILTER HAVING A MULTI-COMPARTMENT HOUSING

Raymond W. Palinkas, Clay, N.Y., assignor to Andrew F. Tresness, Syracuse, N.Y.

Filed Jul. 2, 1987, Ser. No. 69,521
Int. Cl.[4] H03H *7/12*
U.S. Cl. 333—175 **8 Claims**



1. A filter comprising at least two compartments including first and second compartments, means for magnetically isolating said first compartment from said second compartment, first filter means for removing a first frequency range and having cooperating components in each of said first and second compartments, and second filter means for removing a second frequency range and having cooperating components in said first and second compartments, said cooperating components of each of said first and second filter means comprising discrete inductive and capacitive elements, wherein said first frequency range differs from said second frequency range by an amount such that magnetic coupling between said components of said first and second filter means in each of said first and second compartments is substantially prevented.

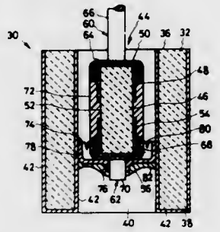
4,901,044

DISTRIBUTED-CONSTANT FILTER

Masao Igarashi; Isao Akiyama; Kazuhiro Kumagai, all of Takasaki; Yoshinobu Takeda, Gunma; Mamoru Yamaki, Gunma; Yoshiaki Iguchi, Gunma, and Satoshi Kazama, Takasaki, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1989, Ser. No. 293,945
Claims priority, application Japan, Jan. 13, 1988, 63-6253; Apr. 28, 1988, 63-108070
Int. Cl.[4] H01P *1/202*
U.S. Cl. 333—207 **25 Claims**

1. A distributed-constant filter comprising:
(a) a dielectric filter body having a pair of opposite end faces, with a resonance hole extending through the filter body between the pair of end faces;
(b) a conductive covering formed on the filter body and including an inner portion formed on the surface of the filter body defining the resonance hole;
(c) a capacitor at least partly disposed in the resonance hole in the filter body, the capacitor comprising:
(1) a dielectric capacitor body;
(2) a first and a second electrode on the capacitor body;
(3) first terminal means connected to the first electrode and having a lead at least partly disposed outwardly of the resonance hole in the filter body; and
(4) second terminal means connected to the second electrode and disposed in the resonance hole in the filter body; and



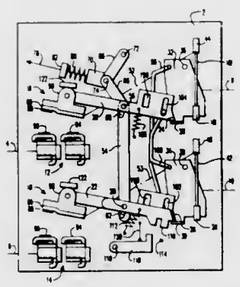
(d) connector means disposed in the resonance hole in the filter body and electrically connecting the second terminal means of the capacitor to the inner portion of the conductive covering on the filter body.

4,901,045

SECONDARY CIRCUIT BREAKER FOR DISTRIBUTION TRANSFORMERS

E. R. Eley, Athens, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 20, 1989, Ser. No. 325,760
Int. Cl.[4] H01H *73/48, 71/16, 61/08*
U.S. Cl. 335—70 **17 Claims**



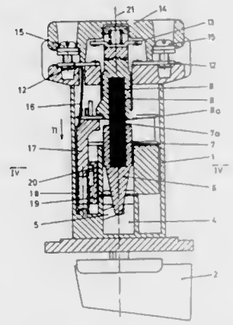
1. In a circuit breaker including a current conducting path, a fixed current contact and a movable current contact connected in the current path, a mechanism supporting the movable current contact for movement between a contact closing position in which the movable current contact is in contact with the fixed current contact to complete the current path and a contact opening position in which the movable current contact is separated from the fixed current contact to open the current path, latch means movable between a latching position for engaging the mechanism to enable the mechanism to be in the contact closing position and a release position for releasing the mechanism to allow the mechanism to move to the contact opening position, and latch actuating means coupled to the latch means for moving the latch means between the latching and release positions, the improvement wherein said latch actuating means comprise: a memory metal element mechanically connected to said latch means and electrically connected in said current conducting path to be heated by current flowing through said path, said memory metal element being formed to place said latch means in the latching position when the current through said path is below a selected magnitude and to place said latch means in the release position when the current through said path is above the selected magnitude.

4,901,046

MANUALLY ACTUATED ON-OFF SWITCH WITH ELECTROMAGNETIC RELEASE

Gottfried Alsch, Vienna, Austria, assignor to Hubert Laurenz Naimer, Nuvola Bianca, Switzerland

Filed May 25, 1988, Ser. No. 198,580
Claims priority, application Austria, Jun. 9, 1987, 1455/87
Int. Cl.[4] H01H *3/00*
U.S. Cl. 335—185 **20 Claims**



1. A trip free release manually actuated on-off electrical switch comprising:
switch contacts including a movable contact mounted for movement between an open and a closed position;
an actuating member;
a connecting component for operatively connecting said movable contact to said actuating member, with coupling means, to move said movable contact between said open and closed positions in response to actuation of said actuating member;
spring means for biasing said connecting component to a position in which said switch contacts are in said open position, with a given spring biasing force;
an electromagnet; and
said coupling means comprising magnetic material means for operatively coupling said actuating member and said connecting component together with a first coupling force in response to a magnetic flux applied by said electromagnetic, said first coupling force being greater than said spring biasing force, and coupling said actuating member and said connecting component together with a second coupling force if a magnetic flux is not applied by said electromagnet, said second coupling force being less than said spring biasing force, so that if said electromagnet is energized the movement of said movable contact is controlled precisely by movement of said actuating member, and when said electromagnet is de-energized, said movable contact moves to said open position regardless of the position of said actuating member.

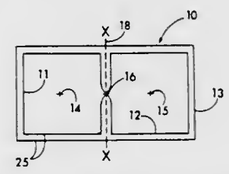
4,901,047

MAGNETIC FIELD TRANSFER DEVICE AND METHOD

Stefan L. Wipf, Hamburg, Fed. Rep. of Germany, assignor to Astronautics Corporation of America, Milwaukee, Wis.

Filed Feb. 6, 1989, Ser. No. 307,365
Int. Cl.[4] H01F *7/22*
U.S. Cl. 335—216 **15 Claims**

1. A magnetic field transfer device comprising:
(a) a pair of oppositely wound inner coils which each include at least one winding around an inner coil axis, the two inner coil axes being substantially parallel and laterally spaced from each other so the inner coils are positioned in side-by-side relation; and
(b) an outer coil which includes at least one winding around an outer coil axis, the outer coil being outwardly positioned from said inner coils and rotatable relative to the inner coils about a rotational axis substantially perpendicular to said inner coil axes to generate a hypothetical



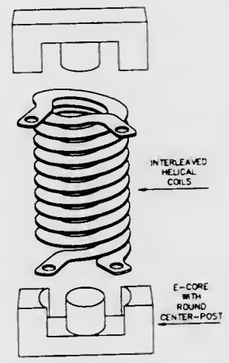
surface substantially enclosing said inner coils, and thereby moving between a first position wherein the outer coil axis is substantially parallel to said inner coil axes and a magnetic field can be formed within one inner coil parallel to its inner coil axis, and a second position wherein the magnetic field is transferred into the other inner coil and reoriented 180°.

4,901,048

MAGNETIC CORE MULTIPLE TAP OR WINDINGS DEVICES

James A. Williamson, Costa Mesa, Calif., assignor to Williamson Windings Inc., Santa Ana, Calif.

Division of Ser. No. 742,589, Jun. 10, 1985, Pat. No. 4,814,735.
This application Mar. 15, 1989, Ser. No. 323,674
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[4] H01F *27/28, 15/10*
U.S. Cl. 336—180 **8 Claims**



1. A multiple winding magnetic core inductor comprising in combination:
a core comprising a substantially closed magnetic path about a core window;
a plurality of continuous, monolithic helix coils of insulated flat metal ribbon having a width greater than the thickness and forming at least two insulated stacked turns having a first integral end, a second integral end and a central opening; said central opening of each said coil being provided to receive a central leg of said magnetic core, each of said first and second integral ends on each coil comprising respective elongated integral tabs,

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each said turn being uniformly coated with an insulating envelope to comprise said insulated turns, at least two of said coils being interleaved;

said core having at least two outer legs, each outer leg having an inner portion thereof bordered by vertical edges, said inner portions facing said central leg in opposing relation to receive the outer perimeter of each of said helix coils, said opposing vertical edges forming the side borders of the core window through which said elongated integral tabs exit said core and respective coils normal to the plane of said window, said elongated tabs being parallel and offset inwardly from a direction tangential to its respective coil central opening;

each end of each of said helix coils comprising an unwound elongated integral tab exiting its respective helix coil in said direction offset inwardly from said direction tangential to said central opening;

the offset position of the tabs locates the inner edges of said elongated tabs, which edges, if extended, in the direction of said coil central opening define chords of the coil central opening rather than tangents to said central opening;

each of said elongated tabs has a decreased width and cross sectional area relative to the width and cross sectional area of the turns, and,

each of said helix coils being compact, comprising n+1 turns but characterized by a height substantially equal to the height of a similar uncompacted coil of n turns.

4,901,049

TEMPERATURE LIMITER

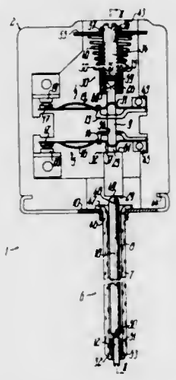
Robert Kicherer, Oberderdingen; Willi Essig, Boeblingen, and Heinz Petri, Bretten, all of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Feb. 19, 1988, Ser. No. 157,896

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705260

Int. Cl.⁴ H01H *37/48*

U.S. Cl. 337—394 **39 Claims**



1. A temperature limiter for a heating system, comprising:

a base member;

a substantially rod-like temperature sensor having at least one outer tube and an inner rod member arranged in said outer tube, said outer tube and said inner rod member having different thermal expansion coefficients, said inner rod member having an outer end portion remote from said base member;

at least one switch means arranged on said base member and provided for operation by said temperature sensor; and,

an insulating means directly surrounding the inner rod member and providing an abutment for said outer end portion of the inner rod member, and wherein said insulating means is provided by said outer tube being an insulating member, said inner rod manner being constructed as a pressure rod provided for transferring compressive forces, said inner rod member being supported on said insulating member provided for tensile-stress under the compressive forces of said inner rod member, said insulating member having an inner end portion fixed to the base member and an outer end portion, means being provided for fixing said inner end portion of said insulating member to prevent movement in a direction towards the outer end portion.

4,901,050

TILT SENSOR FOR VEHICLE STEERING SHAFT

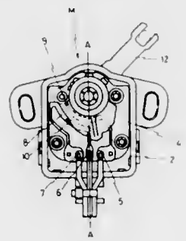
Mitsuko Kotaki, Chiryu; Takayoshi Tsuzuki, Toyota; Yukihisa Oda, Chiryu; Ryobei Yabuno, and Masami Ishii, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 28, 1988, Ser. No. 225,202

Claims priority, application Japan, Jul. 29, 1987, 62-189780

Int. Cl.⁴ H01C *7/00*; **B63H** *21/26*

U.S. Cl. 338—13 **3 Claims**



1. A tilt sensor for a vehicle steering shaft comprising:

a base plate;

a base resistive element layer provided on a surface of said base plate, said base resistive layer having a volume inherent resistance; and

a protective resistive element layer of at least one layer formed on said base resistive element layer, said protective resistive element having a volume inherent resistance;

said base resistive element layer and said protective resistive element layer together defining a plural layer structure in which the volume inherent resistance of the protective resistive layer is higher than the volume inherent resistance of the base resistive element layer.

4,901,051

PLATINUM TEMPERATURE SENSOR

Tsuneo Murata, Kyoto, Japan, and Walter Gottshling, Schwabach, Fed. Rep. of Germany, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 31, 1988, Ser. No. 239,195

Claims priority, application Japan, Sep. 4, 1987, 62-222868

Int. Cl.⁴ H01C *3/04*

U.S. Cl. 338—25 **18 Claims**

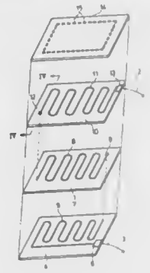
1. A platinum temperature sensor comprising:

a plurality of stacked plate-type ceramic sheets;

platinum resistance patterns provided on surfaces of respective said ceramic sheets, each of said platinum resistance patterns having a plurality of bent portions and thereby having a nonlinear configuration; and

connecting means for connecting adjacent ones of said platinum resistance patterns with each other;

wherein an outermost one of said ceramic sheets has through holes communicating with an outermost one of said platinum resistance patterns, which is located adjacent said outermost ceramic sheet.



4,901,052

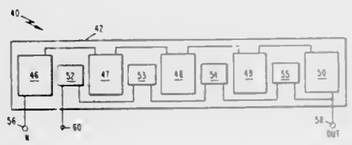
RESISTOR NETWORK HAVING BI-AXIAL SYMMETRY

Roy W. Chapel, Jr., and Robert W. Hammond, both of Edmonds, Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Continuation-in-part of Ser. No. 26,156, Mar. 16, 1987, Pat. No. 4,792,782, which is a continuation of Ser. No. 778,984, Sep. 23, 1985, abandoned. This application Jul. 8, 1988, Ser. No. 217,697

Int. Cl.⁴ H01C *1/012*

U.S. Cl. 338—308 **7 Claims**



1. A symmetrically arranged resistive network for providing substantially uniform temperature coefficient of resistance to a plurality of film resistors in a network formed on a substrate, comprising:

a substrate;

resistive material on said substrate; and

at least three sets of resistive elements forming said resistors, wherein

said resistive elements include a plurality of resistive portions symmetrically arranged with respect to one another relative to two axes of symmetry along said substrate,

said plurality of resistive portions being symmetrically disposed relative to said two axes of symmetry,

wherein said resistive portions include laser trim section means for trimming said resistive portions to provide substantially identical geometric structures to corresponding symmetrically disposed resistive portions.

4,901,053

ANTI-THEFT SYSTEM FOR AUTOMOTIVE VEHICLES

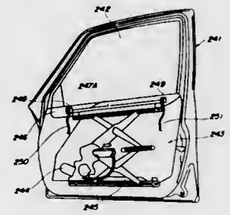
Masaaki Fukamachi; Mobuyuki Onitsuka, both of Miyazaki; Akira Tanaka, and Kazuo Nakamura, both of Wako, all of Japan, assignors to Honda Lock Manufacturing Co., Ltd., Miyazaki and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 17,756, Feb. 24, 1987, abandoned. This application Jun. 15, 1989, Ser. No. 368,066

Claims priority, application Japan, Feb. 28, 1986, 61-043245; Feb. 28, 1986, 61-043247; May 23, 1986, 61-78608[U]; Feb. 14, 1987, 62-31966

Int. Cl.⁴ B60R *25/00*; **109** *21, 42*

U.S. Cl. 340—426 **9 Claims**



1. Apparatus for detecting forceful entry into an automotive vehicle by breakage of at least one windowpane of said automotive vehicle, comprising:

said at least one windowpane being formed of toughened glass which is pulverized when broken;

at least one electrically conductive strip provided coupled to said at least one windowpane at a location along substantially the entire length of a side thereof where it is invisible from outside of said automotive vehicle and adapted to be cut or broken when a corresponding one of said at least one windowpane pulverizes upon being broken; and

detecting means coupled to said at least one electrically conductive strip for electrically detecting cutting or breaking of said at least one electrically conductive strip.

4,901,054

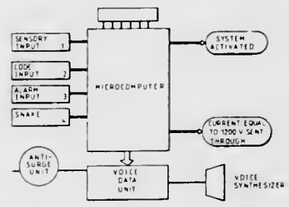
ALARM SYSTEM FOR AN AUTOMOBILE

Serville Waterman, 5421 Beverly Rd., Brooklyn, N.Y. 11203

Filed Oct. 16, 1987, Ser. No. 109,732

Int. Cl.⁴ B60R *25/10*

U.S. Cl. 340—426 **5 Claims**



1. An alarm system for an automobile comprising:

a plurality of sensors, including at least one sensor for detecting entry into said automobile;

a microcomputer having a control panel, said control panel including a code input and an alarm input, said microcomputer being activated by said sensor to detect entry into said automobile;

a siren;

a pushbutton on said control panel of said microcomputer

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which is capable of activating at least one sensor of said plurality of sensors for starting and turning off said automobile, at least one sensor of said plurality of sensors for locking and unlocking doors of said automobile, at least one sensor of said plurality of sensor which is capable of steering said automobile and at least one sensor of said plurality of sensors which is capable of activating said siren;

means for voice generation including means for providing voice warning, said means for voice generation activated by said microcomputer; and,

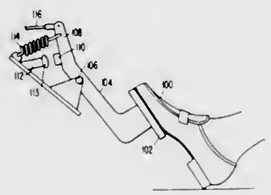
a snake being capable of carrying an electrical current from a battery from said automobile to said microcomputer with said snake being threaded, at least partially, through a flexible metal casing.

4,901,055

VEHICLE DECELERATION WARNING PIEZO-SENSOR

Armand Rosenberg, Rehovot, and Menashe Yehezkel, Yavne, both of Israel, assignors to Makash Advanced Piezo Technology, Hangegey, Israel

Filed Sep. 20, 1988, Ser. No. 246,687
Int. Cl.[4] B60Q *1/44*
U.S. Cl. 340—467 **9 Claims**



1. A vehicle deceleration warning apparatus for use in a vehicle having brake lights, a floorboard and an accelerator pedal, said system comprising:

piezoelectric sensor means connected to one of the accelerator pedal or the floorboard for outputting a first signal when subjected to an appropriate stress condition;

contact means connected to the other of the accelerator pedal or the floorboard for contacting said piezoelectric sensor means in a manner which is dependent upon the rate of release of the accelerator pedal and causing said sensor means to output said first signal in response thereto; and

circuit means connected to the brake lights and to said piezoelectric sensor means for analyzing said first signal produced by said piezoelectric sensor means and for actuating the brake lights in response to the analysis when said first signal is above a predetermined threshold.

4,901,056

TEST INITIATION APPARATUS WITH CONTINUOUS OR PULSE INPUT

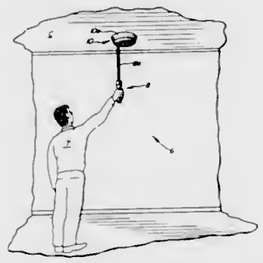
Nicholas J. Bellavia, Bartlett; Daniel J. Birk, Aurora; Fred J. Conforti, Wheaton, and Ronald Sisselman, Aurora, all of Ill., assignors to Pittway Corporation, Northbrook, Ill.

Continuation of Ser. No. 160,823, Feb. 26, 1988, Pat. No. 4,827,244, which is a continuation-in-part of Ser. No. 140,410, Jan. 4, 1988, abandoned. This application Mar. 3, 1989, Ser. No. 319,414
Int. Cl.[4] G08B *29/00, 17/10*; H04Q *9/14*
U.S. Cl. 340—514 **9 Claims**

1. In an electrical unit which can be tested using an intermittently incident energy beam which originates at a location displaced from the unit, an electrical circuit comprising:

means, responsive to the intermittently incident energy beam, for generating a pulsed electrical signal;

energy storage means for accumulating electrical energy in response to the pulsed electrical signal; and



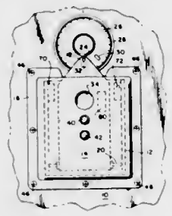
means, responsive to the presence of a predetermined quantity of accumulated electrical energy, for initiating testing of the electrical unit.

4,901,057

DEVICE FOR SECURING A COMBINATION DIAL LOCK

Lars R. Suneborn, 26946 Fortrose, Mission Viejo, Calif. 92691

Filed Apr. 15, 1988, Ser. No. 182,157
Int. Cl.[4] E05B *45/06*
U.S. Cl. 340—542 **16 Claims**



1. A device for securing a combination locking mechanism, comprising:

a base member for being mounted in a fixed position relative to said locking mechanism;

a cover member for substantially enveloping said base member to prevent access to said base member;

securing means for engaging the locking mechanism when the base member is mounted in said fixed position, to prevent the unauthorized operation of said locking mechanism;

means for disengaging said securing means from said locking mechanism to allow said locking mechanism to be operated upon the occurrence of a predetermined access condition;

means for generating an alarm signal when said locking mechanism is in an unsecured state for more than a predetermined period of time; and

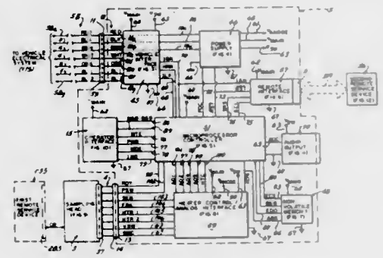
means for generating a tamper alarm signal in response to an unauthorized removal or attempted removal of said device from said fixed position, said tamper alarm signal being generated in response to an unauthorized removal or attempted removal of said cover member from said base member or said base member from said fixed position.

4,901,058

SOBRIETY INTERLOCK WITH BYPASS DETECTION

Felix J. E. Comeau, Brampton; Herman Quast, Burlington, and Jeffrey C. Jewitt, Etobicoke, all of Canada, assignors to Guardian Technologies, Inc., Cincinnati, Ohio

Filed Jun. 17, 1988, Ser. No. 209,091
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—576 **38 Claims**



1. A bypass detecting sobriety interlock for a machine, said sobriety interlock comprising:

(a) sensor means for detecting an intoxicating substance in the breath of a person;

(b) control means connectable to said sensor means and the machine, said control means normally operating to enable starting of the machine only if at least a first predetermined condition is satisfied;

(c) monitoring means connected to the machine and to said control means for determining whether the machine has been started, and

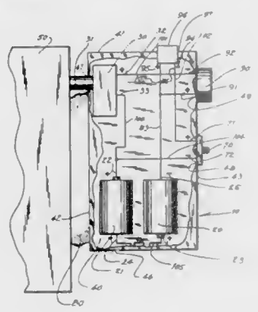
(d) non-volatile memory means connected to said control means, said control means further operating to store within said memory means a record indicating that a bypass event has occurred when the machine is started unless said at least first predetermined condition has been satisfied within a first specified time before the starting of the machine.

4,901,059

OVERHEAT WARNING FOR WOOD STOVES

Matthew J. Arnann, 613 N. Ninth St., Gladstone, Mich. 49837

Filed Dec. 27, 1988, Ser. No. 290,070
Int. Cl.[4] G08B *17/06*
U.S. Cl. 340—594 **4 Claims**



1. A temperature sensitive alarm circuit consisting of;

a thermostatic normally open switch,

said switch having a heat sensitive element;

an alarm annunciator;

a self-contained electric power source;

and a series circuit connecting said switch, said alarm annunciator, and said power source;

a metal box,

said metal box containing said switch, said heat sensitive element, said alarm annunciator, and said electric power source,

said heat sensitive element being exposed outside of said metal box,

the side of said metal box where said heat sensitive element is exposed being secured to the side of a wood burning furnace,

whereby said metal box dissipates the heat of wood furnace and prevents the heat from damaging the power source contained inside the metal box,

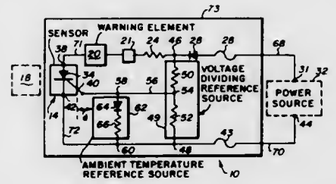
the heat from the wood furnace at a specific temperature causing the heat sensitive element to close the thermostatic normally open switch and complete the circuit causing the alarm to sound thereby warning the user of overheating in time so that he may adjust the heat of the furnace before any damage is done.

4,901,060

INCREASING TEMPERATURE WARNING DEVICE

Lester C. Liu, 2151 Old Oakland Rd., #89, San Jose, Calif. 95131

Filed Oct. 11, 1988, Ser. No. 255,879
Int. Cl.[4] G01K *7/00*
U.S. Cl. 340—598 **24 Claims**



1. An increasing temperature warning device sized for positioning inside of an electrical apparatus and for providing a warning when the temperature of said electrical apparatus exceeds a predetermined magnitude, the device comprising:

a pair of electrical leads connected to a power source within said electrical apparatus and for providing electrical power to the increasing temperature warning device;

a first means for sensing temperature changes connected to the pair of electrical leads and placed in thermal communication with a component of said electrical apparatus at which temperature sensing is desired when current flows through said component;

a warning means positioned in said electrical apparatus and connected to the first means for sensing temperature changes and for providing a warning indication when temperature changes of a predetermined magnitude in said component are sensed by said first means for sensing temperature changes, said predetermined magnitude being a level less than that which causes fire ignition within said apparatus; and

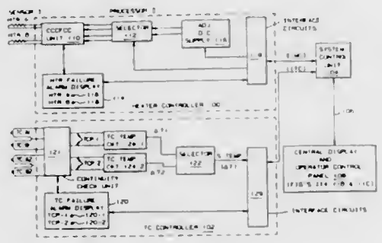
a voltage dividing reference means connected to the first means for sensing temperature change and providing a reference voltage relative to said predetermined magnitude.

VOL 1111 ISS 2 FEB 13 1990 UMI

4,901,061
INSTRUMENTATION AND MONITORING SYSTEMS EMPLOYING DIFFERENTIAL TEMPERATURE SENSORS

Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 58,956, Jun. 5, 1987, abandoned. This application May 20, 1988, Ser. No. 196,707
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—604 **30 Claims**



23. An instrumentation system for monitoring fluid conditions within the interior of a pressure vessel, comprising:

at least one duplex differential temperature sensor having a pair of first and second substantially identical probes integrally interconnected at first ends thereof and extending in parallel axial relationship and spaced by a bilateral plane and adapted to be mounted to the sidewall of a pressure vessel with the probes in communication through a penetration in the sidewall with the fluid state within the interior of the pressure vessel, each said probe incorporating a heater element and a pair of associated temperature sensing elements, the heater element and a selected temperature sensing element of said first probe and a selected temperature sensing element of said second probe comprising a first differential temperature sensor component and the heater element of the said second probe and a selected temperature sensing element thereof and a selected temperature sensing element of said first probe comprising a second differential temperature sensor component:

heater controller means for selectively supplying electrical power to said respective heater elements of said first and second probes of said sensor, the selected heater element heating the corresponding probe and raising the temperature thereof, in the absence of a fluid in the line contacting and dissipating heat from the probe, and thereby producing a difference between the temperatures sensed by the selected temperature sensing elements associated with the respective, heated and unheated probes of the sensor, said heater controller means further comprising means for determining operability of each of the heater elements of the sensor and producing an inoperative heater element output upon determining the inoperability of a heater element;

temperature sensing element controller means for selecting the temperature sensing elements of the first and second probes and for monitoring the sensed temperature outputs of the selected temperature sensing elements, for providing a differential temperature output indicative of the difference between the respective, sensed temperature outputs of the selected temperature sensing elements of the first and second probes, and for determining the operability of the selected temperature sensing elements of the first and second probes; and

system control means for controlling said heater and temperature sensing element controller means to select the heater and sensing elements of each sensor corresponding to the first sensor component thereof in a normal monitoring mode of the instrumentation system, for defining a normal differential temperature output condition, for detecting an alarm condition in the normal monitoring mode when the differential temperature output of the selected, first sensor component differs from the normal differential temperature condition, and for producing an alarm output in response to detecting an alarm condition;

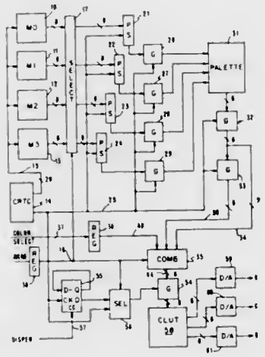
display means responsive to an alarm output of said system control means for producing an alarm display identified with the corresponding sensor; and

said system control means being responsive to an inoperative heater element output from said heater controller for the selected heater of said first probe, corresponding to the first sensor component, for automatically causing said heater controller to select the heater element of the second probe and supply electrical power thereto and thereby to switch from the first to the second sensor component of the given sensor.

4,901,062
RASTER SCAN DIGITAL DISPLAY SYSTEM

Jeanne E. Morel; Darwin P. Rackley; Stephen W. Trynosky, and William A. Wall, all of Boca Raton, Fla., assignors to International Business Machines, Armonk, N.Y.

Continuation of Ser. No. 918,249, Oct. 14, 1986, abandoned. This application Dec. 6, 1988, Ser. No. 282,919
Int. Cl.[4] G09G *1/02, 1/28*
U.S. Cl. 340—703 **10 Claims**



8. A digital display system for driving a raster scan display device, said system comprising:

(a) a refresh store for storing picture element data at locations corresponding to locations of associated picture elements on said display device;

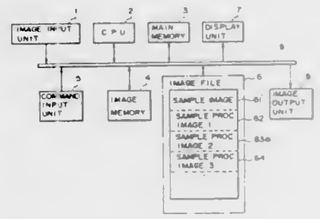
(b) means for reading consecutive picture element data from said refresh store to form data groups at a first clock frequency; and

(c) means for converting said data groups to picture element drive signal groups for the display device including means for merging together each 2^n successive data groups to generate a corresponding individual picture element drive signal group which is delivered to the display device at an $n+1$ sub harmonic of said first clock frequency, n being a positive integer.

4,901,063
IMAGE PROCESSING APPARATUS WHICH HELPS AN OPERATOR TO CHOOSE APPROPRIATE IMAGE PROCESSING

Hiroyuki Kimura, Yokohama; Masayuki Iimura, Kodaira; Makoto Katsuma, Saitama; Kazunobu Urushihara, Inagi; Susumu Matsumura, Yokohama, and Hiroshi Ohmura, Wako, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 18,289
Claims priority, application Japan, Feb. 27, 1986, 61-40422
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—723 **10 Claims**



1. An image processing apparatus comprising:

an image processor having a capability of executing first and second image processes, kinds of said first and second image processes being respectively different from each other, and said image processor being capable of executing each of those image processes wherein processing parameters are changed respectively for the first and the second image processes;

memory means for storing in advance a plurality of sample processed images, the plurality of sample processed images being obtained by changing the processing parameters respectively for the first and the second image processes;

selecting means for selecting one of the first and second image processes to be executed by said image processor; and

display means for displaying, from among the stored plurality of sample processed images respectively for the first and second image processes, the plurality of sample processed images for the image process selected by said selecting means together with their processing parameters.

4,901,064
NORMAL VECTOR SHADING FOR 3-D GRAPHICS DISPLAY SYSTEM

Michael F. Deering, Los Altos, Calif., assignor to Schlumberger Technologies, Inc., San Jose, Calif.

Filed Nov. 4, 1987, Ser. No. 117,162
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—729 **6 Claims**

1. A normal vector shading processor for use in a serial pipeline of identical processors for shading pixels of a three-dimensional image to be displayed, comprising:

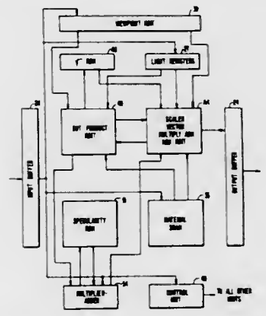
a processor input;

a memory for storing set-up data indicating at least a direction and intensity of at least one light source and a viewpoint of a viewer of said three-dimensional image;

means coupled to said memory, for performing mathematical operations on a representation of a pixel provided to said processor input in accordance with said set-up in said memory, said mathematical operations including at least a vector dot product, a scaler product and a scaler sum; and

command interpretation means, coupled to said processor input and having control inputs coupled to said memory and said means for performing mathematical operations, for

detecting a load command in a predetermined command field of input data on said processor input and providing first control signals to said memory to load said set-up data in a predetermined data field of said input data into said memory,



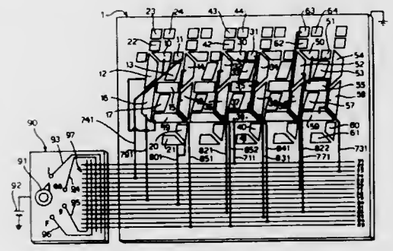
detecting a process command in said command field and providing second control signals to said means for performing mathematical operations, and

detecting a grabbed command in said command field and providing third control signals to cause said input data to be presented to an output of said processor without being altered.

4,901,065
APPARATUS FOR SELECTIVELY PRESENTING, PARTICULARLY IN MOTOR VEHICLES, THE SAME INFORMATION MESSAGE IN DIFFERENT LANGUAGES

Eraldo Cerruti, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Continuation of Ser. No. 111,140, Oct. 19, 1987, abandoned, which is a continuation of Ser. No. 577,831, Feb. 7, 1984, abandoned. This application Oct. 7, 1988, Ser. No. 256,101
Claims priority, application Italy, Feb. 14, 1983, 67162 A/83
Int. Cl.[4] G09G *3/04*
U.S. Cl. 340—756 **5 Claims**



1. An apparatus for selectively displaying a predetermined message in a set of different languages, said apparatus comprising:

a visual display device having surface segments each of which can be switched individually and selectively between two states of operation, one of which corresponds to visual perceptibility of the segment itself,

a power supply for causing switching of said segments to their states of visual perceptibility,

connecting lines equal in number to the number of possible non-null sub-sets of said set, each of said connecting lines being associated with a different one of said sub-sets and connecting said power supply to all of said segments required to be switched to their states of visual perceptibility, for displaying said message, which are common in every language in the associated sub-set, and

selector means for enabling the selection of a selected language from said set of different languages, and for connecting said power supply to the connecting lines which correspond to the sub-sets which include the selected language.

4,901,066

METHOD OF DRIVING AN OPTICAL MODULATION DEVICE

Yoshinori Kobayashi, Hirakata; Tsuyoshi Uemura, Higashiosaka; Yoshihiro Gohara, Toyono, and Naohide Wakita, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 9, 1987, Ser. No. 132,883

Claims priority, application Japan, Dec. 16, 1986, 61-299405; Dec. 16, 1986, 61-299407

Int. Cl.[4] G09G *3/34*

U.S. Cl. 340—805 **15 Claims**



1. A method of driving an optical modulation device forming pixels in a matrix between scanning lines and signal lines, comprising the steps of:

dividing a selection period in which a scanning line is selected into at least four division periods;

applying a voltage to each pixel connected to the selected scanning line in such a manner that each pixel becomes a first stable state of its bistable states during third and second division periods counted from the last division period in the selection period, and either becomes a second stable state of the bistable states or holds the first stable state during the last division period according to data to be displayed; and

applying a voltage for holding a stable state established during the selection period to each pixel during a non-selection period in which the scanning line is not selected.

4,901,067

INTERFACE CIRCUIT FOR USE IN A PROGRAMMABLE MESSAGE DISPLAY

Robert L. Miller, and Leon C. Brower, both of Davenport, Iowa, assignors to Utlcor Technology, Inc., Bettendorf, Iowa

Filed Apr. 26, 1988, Ser. No. 186,383

Int. Cl.[4] G09G *3/00*

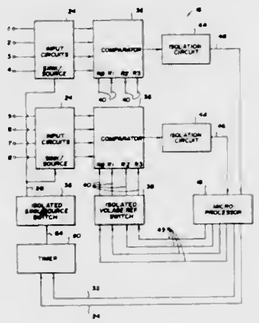
U.S. Cl. 340—811 **18 Claims**

1. An interface circuit for reading data to a programmable message display including a microprocessor for providing control signals, a message memory for storing multiple messages in a binary digit code and an electronic display device, the microprocessor being responsive to the output of the memory for causing the display device to display a message corresponding to the coded signal provided by the memory, the circuit comprising:

a plurality of input circuits for receiving a like plurality of parallel input data signals, each of said input circuits being responsive to an isolated control signal to condition its respective input data signal;

reference signal generating means responsive to at least two control signals from the microprocessor to provide at least first and second reference signals;

a like plurality of comparator circuits, each of said compara-



tor circuits being coupled to its respective input circuit and to said reference signal generating means, first and second banks of said comparator circuits sequentially comparing their respective conditioned input signals with the first and second reference signals, respectively; and

at least first and second isolation circuits, each of said isolation circuits being coupled to the output of a single comparator circuit of each of the banks of the comparator circuits, the isolation circuits providing isolated output signals to the microprocessor corresponding to the level of the input data signals received by the input circuits.

4,901,068

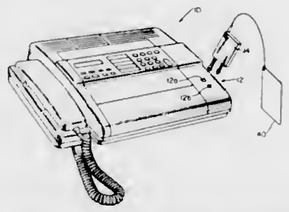
IDENTIFICATION APPARATUS FOR OPERATING SECURE EQUIPMENT

William M. Benton, Fort Lauderdale, and William Mee, Pompano Beach, both of Fla., assignors to Moneyfax, Inc., Ft. Lauderdale, Fla.

Filed Jan. 17, 1989, Ser. No. 298,347

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.31 **6 Claims**



1. Data processing apparatus for enabling/disabling secured equipment, comprising:

a key formed of a module having at least one electrical plug extending therefrom adapted to interfit with at least one corresponding electrical jack provided at equipment to be secured, said electrical plug including a plurality of sections arranged longitudinally and electrically insulated from each other;

an integrated circuit including solid state memory means within said module for processing electrical signals;

said sections positioned on said plug to be in contact with corresponding electrical contacts in said jack;

wiring for interconnecting said sections of said plug with said integrated circuit; and

wherein said integrated circuit means contains a plurality of terminals and said module contains two plugs extending therefrom, each of said plugs containing a plurality of sections, said wiring interconnecting, one-to-one, said sections and said terminals of said integrated circuit means.

4,901,069

APPARATUS FOR ELECTROMAGNETICALLY COUPLING POWER AND DATA SIGNALS BETWEEN A FIRST UNIT AND A SECOND UNIT AND IN PARTICULAR BETWEEN WELL BORE APPARATUS AND THE SURFACE

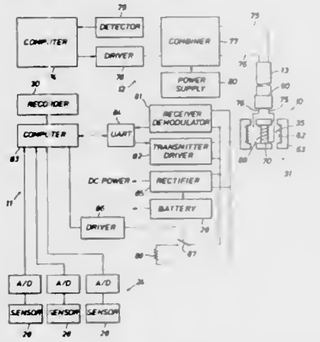
Anthony F. Veneruso, Richmond, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 74,445, Jul. 16, 1987, Pat. No. 4,806,928. This application Feb. 14, 1989, Ser. No. 310,804

The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.

Int. Cl.[4] G01V *1/00*

U.S. Cl. 340—853 **21 Claims**



1. Apparatus adapted to be disposed in a wellbore for inductively coupling power and data signals between surface equipment and subsurface equipment, comprising:

a first conductor adapted to be connected to the surface equipment;

a second conductor adapted to be connected to the subsurface equipment; and

coupling means interconnecting said first conductor to said second conductor for conducting said power and data signals between said surface equipment and said subsurface equipment, said coupling means including,

a first coil connected to said first conductor,

a second coil connected to said second conductor and coaxially disposed around said first coil, said second coil being inductively coupled with said first coil, and

core means for assisting in the inductive coupling of said first coil and said second coil, said core means including a material having a magnetic permeability greater than that of air and an electrical resistivity greater than that of iron.

4,901,070

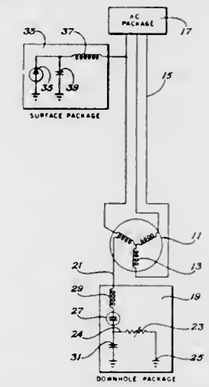
PRESSURE MONITORING SYSTEM WITH ISOLATING MEANS

Joseph E. Vandevier, Claremore, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Jul. 25, 1989, Ser. No. 385,223

Int. Cl.[4] G01V *1/00*

U.S. Cl. 340—856 **3 Claims**



1. In a submersible pump system having an AC motor located in a well for driving a centrifugal pump, power supply means at the surface for supplying AC power over a power cable having conductors to a motor winding of an AC motor, a downhole pressure transducer of a type which has a resistance which varies with temperature, having one lead electrically connected to ground and another lead electrically connected to the motor winding, measuring means at the surface for superimposing a voltage on one of the power conductors to monitor the resistance of the pressure transducer, an improved means for isolating the motor winding from ground through the pressure transducer to allow testing of the insulation resistance of the conductors and the motor winding, comprising in combination:

a temperature actuated switch connected downhole in series with the pressure transducer, the switch being open below a selected temperature and closed above the selected temperature, the selected temperature being set at a level above the expected downhole well ambient temperature with the motor shut off but below the expected temperature of the switch which occurs when the motor is warmed up and running, thereby isolating the power cable and motor winding from the ground through the pressure transducer while the motor is shut off and at ambient temperature of the well.

4,901,071

PORTABLE RESERVED PARKING ALARM SYSTEM

Frank I. Fletcher, 915 E. Walnut Ave., Burbank, Calif. 91501

Filed Mar. 30, 1989, Ser. No. 331,606

Int. Cl.[4] G08G *1/00*; E01F *13/00*

U.S. Cl. 340—932.2 **4 Claims**

1. A portable reserved parking alarm system comprising:

a housing removably mounted on a base plate,

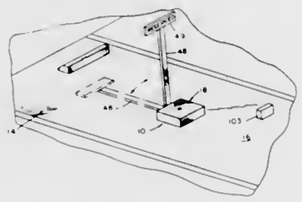
an electric motor mounted on a bracket secured to said base plate and located within said housing, said motor having a 300:1 speed reducer member,

a gear box connected to said motor and having an output shaft with an outer end,

an output arm with a top end and a bottom end that is connected to said outer end of said output shaft of said gear box

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a pivot block member mounted at one end of said base plate,
a sign support bracket having a bottom end pivotally mounted on said pivot block and having a top end,
a sign support mast member mounted on said sign support bracket and having a top end provided with a sign member,
an eccentric rod having an inner end pivotally connected to said top end of said output arm and having an outer end

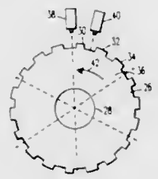


pivotally connected to said top end of said sign support bracket, means mounted on said bracket for limiting up and down travel of said output arm,
means located within said housing for energizing said motor upon activation by a radio frequency signal from outside of said housing, and
means for activating an alarm whenever said sign support mast member is moved other than by the action of said motor.

4,901,072
POSITION DETECTOR UTILIZING GRAY CODE FORMAT

David A. Fox, Shawnee Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 17, 1988, Ser. No. 156,690
Int. Cl.⁴ H03M *1/24*
U.S. Cl. 341—10 **9 Claims**

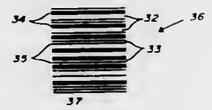


1. A position detector for providing an indication of the position of a movable member, said detector comprising:
a first encoded element, having first indicia representative of a first bit sequence of a first pair of bits of a Gray code and capable of being mechanically coupled to a movable member;
first and second sensors positioned adjacent to said first encoded element, said first and second sensors producing digital signals in response to said first indicia of said first encoded element and being mechanically spaced from each other by an amount corresponding to a shift of said first bit sequence between said first pair of bits;
a second encoded element, having second indicia representative of a second bit sequence of a second pair of bits of said Gray code and capable of being mechanically coupled to said movable member; and
third and fourth sensors positioned adjacent to said second encoded element, said third and fourth sensors producing digital signals in response to said second indicia of said second encoded element and being mechanically spaced from each other by an amount corresponding to a shift of said second bit sequence between said second pair of bits.

4,901,073
ENCODER FOR MEASURING THE ABSOLUTE POSITION OF MOVING ELEMENTS

Robert I. Kibrick, Santa Cruz, Calif., assignor to Regent of the University of California, Alameda, Calif.

Continuation-in-part of Ser. No. 938,164, Dec. 4, 1986, Pat. No. 4,736,187. This application Mar. 30, 1988, Ser. No. 176,109
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.⁴ H03M *1/22*
U.S. Cl. 341—13 **14 Claims**



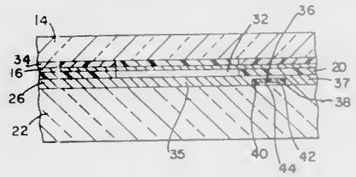
1. An encoding system for determining the absolute position of a movable member relative to a stationary member, including in combination:
an encoding band supported by one said member comprising a series of bar-code symbols disposed at regular intervals along said band, each said symbol being distinctly different from every other said symbol and each comprising a pattern of bars and spaces for encoding the absolute position corresponding to the location of its symbol along said band,
reading means rigidly supported by the other said member for scanning said bar-code symbols on said encoding band including means for generating an analog signal voltage,
said movable member being capable of both discrete and continuous motion in two directions, and
decoding means actuated by said analog signal voltage for determining the absolute position of said movable member relative to said stationary member,
whereby said absolute position can be determined solely from said system without dependence on any additional information external to said system.

4,901,074
GLASS MEMBRANE KEYBOARD SWITCH ASSEMBLY FOR DOMESTIC APPLIANCE

Richard E. Sinn, St. Joseph Township, Berrien County, and Robert R. Williams, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 31, 1987, Ser. No. 139,919
Int. Cl.⁴ H03K *17/967*
U.S. Cl. 341—22 **24 Claims**

1. A keyboard switch assembly for a domestic appliance comprising:
a rigid substrate;
a first conductive layer disposed above said substrate;
a solid electrically insulating spacing layer disposed above said first conductive layer and having an aperture therein, said aperture defining a switch contact area;
a second conductive layer disposed above said spacing layer and spaced from said first conductive layer by said spacing layer; and
a glass top layer disposed above said second conductive layer, said glass top layer being sufficiently thin to flex causing said second conductive layer to contact said first conductive layer within said switch contact area when an

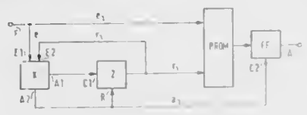


area of the glass top layer located above said switch contact area is touched.

4,901,075
METHOD AND APPARATUS FOR BIT RATE REDUCTION

Peter Vogel, Diepersdorf, Fed. Rep. of Germany, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Sep. 11, 1987, Ser. No. 96,177
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1986, 3631252; Nov. 8, 1986, 3638127; May 23, 1987, 3717399
Int. Cl.⁴ H03M *7/46*
U.S. Cl. 341—63 **13 Claims**

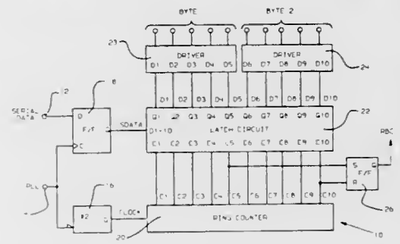


1. A circuit arrangement for coding a signal comprising a run of zero coefficients and a subsequent coefficient, wherein said coefficients are applied with predetermined delays to the address inputs of a memory (PROM) and to a first input (E1) of a comparator circuit (K), in that a counter (Z) is provided whose count is applied to further address inputs of the memory (PROM) and to a second input (E2) of the comparator circuit (K), in that the comparator circuit (K) supplies a counting pulse to the counter (Z) from a first output (A1) if a zero coefficient is present at the first input (E1) and if the count has not exceeded a value stored in a memory of the comparator circuit (K) supplies a pulse from a second output (A2) if the conditions for the supply of a counting pulse are not fulfilled, and in that the counter (Z) is reset by means of the pulse at the second output (A2) of the comparator circuit (K), and in that the codeword present at the outputs of the memory (PROM) is transferred to an intermediate memory (FF).

4,901,076
CIRCUIT FOR CONVERTING BETWEEN SERIAL AND PARALLEL DATA STREAMS BY HIGH SPEED ADDRESSING

Haluk O. Askin, Clinton Corners, and Frank D. Ferraiolo, New Windsor, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1987, Ser. No. 114,178
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 341—100 **26 Claims**

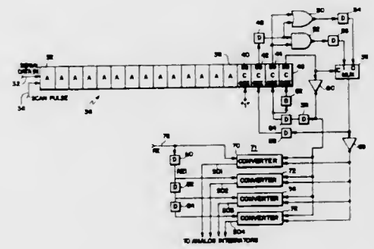


2. The circuit of claim 1 wherein the odd numbered stages of said ring counter are positive edge triggered latches, and the even numbered stages of said ring counter are negative edge triggered latches.

4,901,077
SIGMA-DELTA MODULATOR FOR D-TO-A CONVERTER

Todd J. Christopher, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

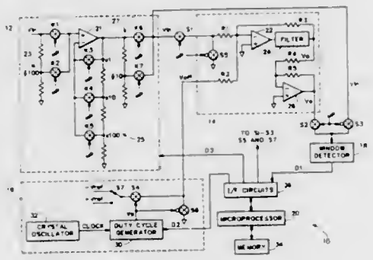
Filed Apr. 18, 1988, Ser. No. 182,665
Int. Cl.⁴ H03M *3/02*
U.S. Cl. 341—143 **15 Claims**



1. Digital-to-analog conversion means comprising:
a signal input terminal for applying binary samples at a first rate;
sampled data sigma-delta modulator means, coupled to said signal input terminal, for resampling said binary samples to produce samples more coarsely quantized than said binary samples and at a rate greater than said first rate;
sample conversion means for converting said coarsely quantized samples into sequences of pulses, the number of

pulses in a sequence being determined by amplitude values represented by said coarsely quantized samples; and
analog means for integrating/averaging said pulse sequences.

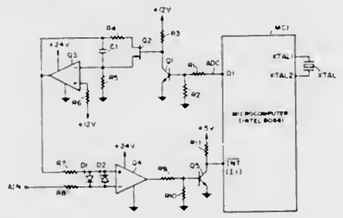
4,901,078
VARIABLE DUTY CYCLE WINDOW DETECTING ANALOG TO DIGITAL CONVERTER
Ramesh C. Goyal, Bothell, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.
Continuation of Ser. No. 852,723, Apr. 14, 1986, abandoned. This application Jul. 29, 1988, Ser. No. 227,428
Int. Cl.[4] H03M *1/40*
U.S. Cl. 341—163 **18 Claims**



1. The method of accurately measuring an input signal comprising the steps of:
measuring said input signal to provide an estimate of the magnitude of said input signal;
generating a periodic offset signal in response to said estimate, said offset signal being of a period adjusted so that said offset signal has a time-average magnitude differing from said estimate of the magnitude of said input signal by an amount that is less than a full scale input signals range of a signal magnitude measuring device and greater than a substantial portion of said full scale input signal range;
offsetting said input signal by said offset signal to produce a difference signal;
measuring a time-average magnitude of said difference signal with said signal magnitude measuring device; and
ascertaining the magnitude of said input signal to an improved degree of resolution according to the magnitude of said offset signal and the measured magnitude of said difference signal.

4,901,079
ANALOG-DIGITAL CONVERTER
Nao Nagashima, Tokyo; Koji Suzuki, Yokohama; Jyoji Nagahira, Tokyo; Kouki Kuroda, Yokohama, and Yoshiaki Takayanagi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 873,481, Jun. 12, 1986, abandoned, which is a continuation of Ser. No. 723,005, Apr. 16, 1985, abandoned, which is a continuation of Ser. No. 436,803, Oct. 26, 1982, abandoned, which is a continuation of Ser. No. 215,827, Dec. 12, 1980, abandoned. This application Feb. 2, 1988, Ser. No. 153,568
Claims priority, application Japan, Dec. 21, 1979, 54-166774
Int. Cl.[4] H03M *1/56*
U.S. Cl. 341—169 **3 Claims**

1. An analog-to-digital converter comprising:
output means comprising an integrator circuit including a capacitor for generating an output signal in response to application of a start signal for instructing a start of analog-to-digital conversion of an input analog signal, the output signal being variable such that it increases in value and being generated as a reference signal for comparing with the input analog signal;
comparing means for comparing the analog signal to be converted to a digital signal, with the value of the output signal generated by said output means, and for providing an output as a result of the comparison, when the output signal is equal to or greater than the analog signal;
a bus line for transferring data therethrough;
clock pulse generating means connected to said bus line for generating clock pulses;
an output unit connected to said bus line for applying the start signal to said output means;
an input unit connected to said bus line for receiving the output of said comparing means;
counting means connected to said bus line for counting the number of clock pulses generated by said clock pulse generating means, said counting means generating a counting result transferred through said bus line;

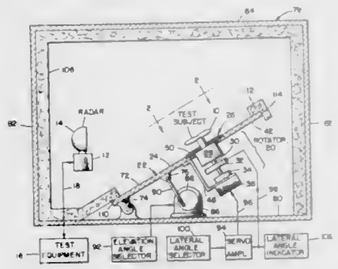


digital signal generating means connected to said bus line for generating a digital signal which is transferred through said bus line;
memory means connected to said bus line for storing the digital signal transferred through said bus line; and
program storing means connected to said bus line, for storing a program for analog-to-digital conversion, said program storing means comprising means for instructing said output unit to issue the start signal therethrough, means for instructing said counting means to count the number of clock pulses from the time when the start signal is applied from the output unit until the time when said input unit receives said output from said comparing means, means for instructing said digital signal generating means to generate a digital signal having a digital value directly corresponding to an analog value of the input analog signal on the basis of the counting result of said counting means transferred through said bus line, and means for storing the digital signal generated by said digital signal generating means in said memory means.

4,901,080
RADAR TEST DEVICE WITH PLANAR REFLECTING SHIELD
Mark A. McHenry, Stanford, Calif., assignor to Northrop Corporation, Hawthorne, Calif.
Filed Jul. 6, 1988, Ser. No. 215,680
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[4] G01S *7/40*
U.S. Cl. 342—1 **8 Claims**

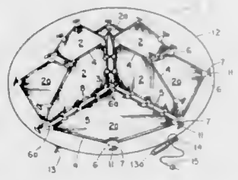
1. Radar test apparatus for examining a test subject to be illuminated by a beam of radiation from a radar set including an antenna for emitting and receiving a radar beam into and from a path extending in a predetermined direction, comprising:
a rotator for supporting said test subject and including platform means for mounting the test subject for rotation in the path of said beam together with a conductive turntable mounted below said test subject,

a shield positioned behind the test subject on the side away from the radar antenna,
said shield being inclined at an angle to the direction of said beam for reflecting those portions of the radar beam which pass the test subject out of the received path seen by the antenna,
said shield having an opening therein surrounding said shaft and turntable,
means forming a seal between the turntable and the shield and including a recess having a diamond shaped outer periphery formed in the shield and a thickness substantially less than one-quarter wavelength of the radar beam,



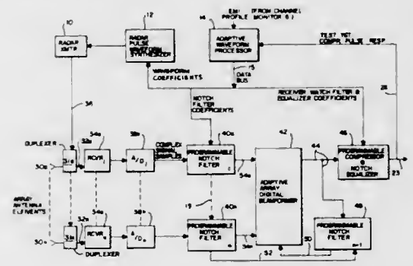
said recess having a plurality of edges formed in the shield and generally configured-oriented so that no edge is reflective into the receive path of said antenna, and
a foil having a peripheral shape complementary to said recess for closely fitting in the outer periphery of said recess and in making relation to the shield in the manner of a fairing to provide a continuous smooth transition therebetween essentially free from generation of reflections, and further having an inner shape for lying in touching engagement onto the upper surface of said turntable.

4,901,081
ELLIPTICAL INFLATABLE RADAR REFLECTOR
John H. Bain, Jr., Dickinson, and Gene E. Gentry, Alvin, both of Tex., assignors to Lifeball International Corporation, Houston, Tex.
Filed Aug. 22, 1988, Ser. No. 234,741
Int. Cl.[4] H01Q *15/20, 15/18*
U.S. Cl. 342—8 **13 Claims**



9. Improved radar reflector apparatus comprising a collapsible and inflatable radar wave permeable envelope which when inflated assumes the shape of an ellipsoid surrounding a radar reflective array having a number of radar wave reflectors which when said envelope is inflated are arranged to form a plurality of corner reflectors, said reflectors being of a flexible material so as to allow collapsing of said reflector array upon collapse of said envelope, and suspension means supporting each of said reflectors within said envelope independently of each other of said reflectors so that upon inflation of said envelope each of said reflectors floats on said suspension means to seek out optimum planar disposition to form planes substantially independent of and mutually orthogonal to planes formed by other of said reflectors, said envelope and said surrounded radar reflective array are constructed so that when inflated, said envelope and said surrounded radar reflective array will assume the shape of an ellipsoid having an eccentricity value of between 0.70 and 0.95.

4,901,082
ADAPTIVE WAVEFORM RADAR
Heinz H. Schreiber, Centerport, and Martin G. O'Connor, Massapequa, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Nov. 17, 1988, Ser. No. 272,374
Int. Cl.[4] G01S *7/34*
U.S. Cl. 342—89 **20 Claims**

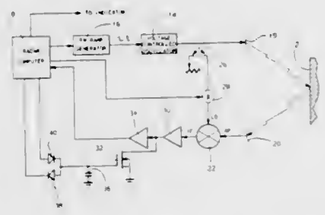


1. A radar system for operating in an electromagnetic environment including in-band and out-of-band interferences, comprising:
means for sampling the environment to provide a spectral electromagnetic profile representative of the environment;
processor means for obtaining from the profile an optimal channel for the environment and for generating a receiver matched filter corresponding to the channel and equalizer coefficients from responsive pulses, the optimal channel having an optimum center frequency and maximum channel bandwidth with fewest in-band interferences;
means for receiving an echo of a target signal transmitted to the environment;
means for multiplying the frequency spectrum of the echo with the matched filter and for notching out the interferences in the frequency spectrum;
means for transforming the interference free frequency spectrum into a responsive pulse to be transmitted to the processor means;
wherein the processor means, using the responsive pulse, calculates transversal equalizer filter coefficients for reducing temporal sidelobes of the responsive pulse to effect an interference free signal having a desirable main lobe to sidelobe ratio.

4,901,083
NEAR OBSTACLE DETECTION SYSTEM
Phillip A. May, Goleta; Cheng P. Wen, Mission Viejo; Douglas L. Dunn, Bellflower, and Stephen J. Ferry, Santa Barbara, all of Calif., assignors to Delco Electronics Corporation; Santa Barbara Research Center, both of Goleta and Hughes Aircraft Company, Los Angeles, all of, Calif.
Filed Jun. 20, 1988, Ser. No. 209,111
Int. Cl.[4] G01S *13/34, 13/93*
U.S. Cl. 342—128 **11 Claims**

1. A narrow bandwidth frequency modulated radar system for measuring the range to an object, the system comprising in combination:
means for transmitting a frequency modulated radar signal;

means for receiving the transmitted radar signal reflected from the object;
means for mixing the transmitted and received radar signals to generate an IF signal;
means for determining (A) the value of the DC component of the IF signal and (B) the value of each of the harmonic frequency components of the IF signal, and



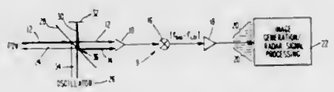
means for indicating the range (A) in accord with the frequency components when the value of the DC component is less than a predetermined value and (B) in accord with the DC component when the value of the DC component is greater than the predetermined value.

4,901,084

OBJECT DETECTION AND LOCATION SYSTEM

Richard G. Huguenin, South Deerfield; Paul F. Goldsmith, Leverett; Naresh C. Deo, Conway, and David K. Walker, Northfield, all of Mass., assignors to Millitech Corporation, South Deerfield, Mass.

Filed Apr. 19, 1988, Ser. No. 183,215
Int. Cl.[4] G01S *13/89*; H01L *27/14*
U.S. Cl. 342—179 **64 Claims**



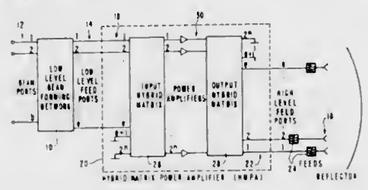
1. A millimeter wave object detection and location system, comprising:
an array of oscillators for emitting a beam of millimeter wave radiation the frequency of which varies according to a predetermined function of time;
means for directing said radiation onto a detector array as a local oscillator signal, and for transmitting said radiation into a field of view;
a detector array for detecting said emitted time-varying radiation having been reflected from one or more objects in the field of view, wherein said detector array comprises a two-dimensional array of detectors, each of said detectors being capable of forming a signal responsive to mixing of millimeter-wave radiation reflected from an object in the corresponding portion of said field of view with said local oscillator signal;
wherein said array of oscillators each direct radiation into a particular portion of said field of view and onto a corresponding portion of said detector array; and
means for processing the signals formed by each of said detectors in order to detect the presence of any said objects in the field of view and to indicate their locations.

4,901,085

DIVIDED LLBFN/HMPA TRANSMITTED ARCHITECTURE

Kerry W. Spring, Pointe Claire, and Harry J. Moody, Montreal, both of Canada, assignors to Spar Aerospace Limited, Ontario, Canada

Filed Sep. 23, 1988, Ser. No. 248,190
Int. Cl.[4] H01Q *3/22*
U.S. Cl. 342—373 **3 Claims**



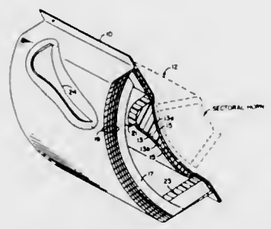
1. In an overlapping beam, power versatile system for a communications transmitter comprising a low level beam forming network having inputs to which a plurality of individual beam signals are respectively applied, the low level beam forming network having a plurality of outputs, some of which respectively carry the sum of components of more than one input signal, a hybrid matrix power amplifier means having input ports respectively connected to the outputs of the low level beam forming network and having complementary output ports respectively connected to a plurality of radiating elements of the same number as the outputs of the beam forming network, whereby a plurality of beams each emanating from more than one of the radiating elements can be achieved, some of the radiating elements being used in common for more than one beam to achieve beam overlap, the improvement where the hybrid matrix power amplifier means is formed as a plurality of separate hybrid matrix power amplifiers.

4,901,086

LENS/POLARIZER RADOME

Keith C. Smith, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 270,450, Nov. 7, 1988, abandoned, Continuation of Ser. No. 103,778, Oct. 2, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,848
Int. Cl.[4] H01Q *15/12*
U.S. Cl. 343—909 **2 Claims**



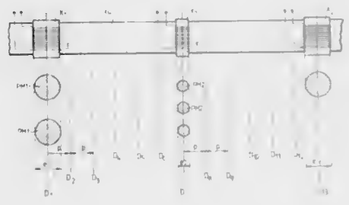
1. In an antenna system wherein the phase distribution of radio frequency energy across the aperture of an antenna array is to be changed from a first to a second phase distribution, the improvement comprising:
(a) a dielectric lens formed of a material having a dielectric constant greater than 2.0, such lens having a first side with a curvature substantially corresponding to the curvature of the aperture of the antenna array and a second side shaped to change the phase distribution of radio frequency energy from the first to the second phase distribution;
(b) impedance matching means overlying the first side of the dielectric lens and overlying the second side of the dielectric lens, such means being fabricated from a sheet of dielectric material having a dielectric constant substantially equal to the square root of the dielectric constant of the material of the dielectric lens and a thickness substantially equal to one-quarter wavelength of the radio frequency energy;
(c) absorbing means disposed around the periphery of the dielectric lens to control sidelobes and pattern nulls; and
(d) supporting means for holding the lens, the impedance matching means and the absorbing means in the path of radio frequency energy passing to and from the aperture, the supporting means further being adapted to cause the first side of the lens to be tilted with respect to the aperture of the antenna array.

4,901,087

DEVICE FOR FORMING LATENT MAGNETIC IMAGES ON THE RECORDING ELEMENT OF A MAGNETOGRAPHIC PRINTER

Bernard Cherbuy, Essert, Belfort, France, assignor to Bull S.A., Paris, France

Filed Mar. 30, 1989, Ser. No. 330,469
Int. Cl.[4] G01H *15/00*
U.S. Cl. 346—74.2 **25 Claims**



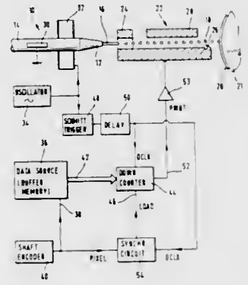
1. A device for forming latent magnetic images on the recording element (11) of a magnetographic printer, the recording element being driven for displacement along a predetermined direction (F) and being provided with magnetic recording tracks (D1, D2, D3, . . .) oriented practically parallel to said direction and said tracks being spaced apart from one another by a constant pitch (p), comprising:
at least two magnetic recording heads (X1, Y1) each having a recording pole (E) the width of which differs from one head to another, the width (e1) of the largest pole being greater than the spacing pitch (p) of the tracks, the width (e2) of the narrowest pole being such that the sum (e1+e2) of the widths of the widest pole and the narrowest pole is less than twice said spacing pitch,
driving means (33, 34, 35, 36) arranged to dispose said heads successively facing each of said tracks and to permit said heads, when they are selectively excited, to form magnetized points (PM1, PM2) of different sizes centered on said tracks,
and a control unit means (40) for activating the heads, said control unit means being arranged to excite said heads selectively in such a manner that the magnetized points formed on the recording element do not overlap.

4,901,088

METHOD AND APPARATUS FOR HIGH RESOLUTION INK JET PRINTING

Carl H. Hertz, Skolbanksvagen 8, S-223 67 Lund, Sweden, and Bo A. Samuelsson, Ostra Tornsvagen 25, Lund, Sweden

Filed Feb. 19, 1988, Ser. No. 157,776
Claims priority, application European Pat. Off., Apr. 14, 1987, 87105560.4
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **8 Claims**



1. An ink jet printing method wherein a record is produced by applying varying amounts of ink on a plurality of pixel locations of a record medium, said method comprising the steps:
(a) generating an ink jet directed towards said record medium, said ink jet breaking up into a series of drops with a predetermined drop formation rate,
(b) applying an electric charge of predetermined magnitude to selected drops,
(c) deflecting each charged drop as a function of its charge to determine whether the drop travels along a recording path to reach said recording medium or is intercepted,
(d) producing relative transverse movement between said drop path and said recording medium,
(e) generating a first signal indicative of the drop formation rate,
(f) generating a second signal from said relative movement, the second signal being indicative that pixel position on the record medium is aligned with said drop path,
(g) deriving a density value for the aligned pixel position in response to said second signal,
(h) generating a print pulse signal of predetermined length between leading and trailing edges in response to said derived density value and said first signal, said density value controlling the length and said first signal controlling the time of occurrence of the leading edge of said print pulse signal,
(i) controlling said charging step (b) by means of said print pulse signal, the improvement consisting in
(j) combining said first and second signals to establish a non-coincidental time relationship between the time at which said density value deriving step (g) occurs and the time when the leading edge of the print pulse occurs.

4,901,089

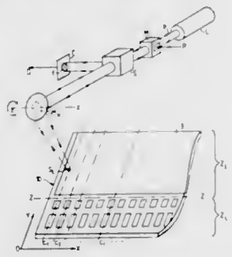
METHOD AND DEVICES FOR THE RECORDING OF PICTURES BY LASER

Claude Bricot, Villejuif, France, assignor to Thomson-CSF, Puteaux, France

Filed Dec. 19, 1988, Ser. No. 286,513
Int. Cl.[4] G11B *7/00*; G01D *9/42*
U.S. Cl. 346—76 L **6 Claims**

1. A method for recording a picture on a medium device by means of a laser beam, said medium device comprising:

a substrate
a layer of a first material, arranged in columns on said substrate, said layer forming a picture zone and a reading zone;
a layer of a second absorbent material, capable of being destroyed by the laser beam, laid on said picture zone of said first material;
the laser beam being capable of a double relative motion with respect to the medium device:
a first fast motion along a first axis;



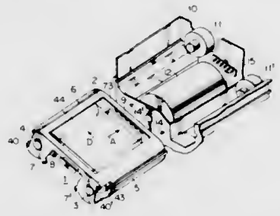
a second motion, slow in comparison with the first motion, along a second axis;
the laser beam being guided on said columns by means of said reading zone and the power of the laser beam being modulated, as a function of said picture, in synchronism with said first motion so as to destroy or not destroy said second material, thus revealing or not revealing said first material, the zones of said picture zone where the first material is revealed forming said picture, said reading zone being removed after said recording.

4,901,090

INKED SHEET CASSETTE AND THERMAL TRANSFER-TYPE RECORDING APPARATUS

Naohiro Ozawa; Hiroshi Shimizu, both of Yokohama; Toshibiko Gotoh, Tokyo; Kentaro Hamma, Yokohama; Seizi Okunomiya, Katsuta; Takeshi Nomura, and Mikio Shiraishi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,098
Claims priority, application Japan, Apr. 13, 1987, 62-88810; Apr. 30, 1987, 62-104253; May 20, 1987, 62-121209
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **23 Claims**



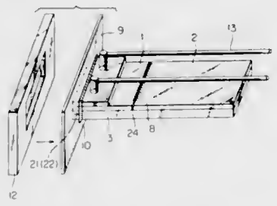
1. An inked sheet cassette comprising a cassette case encasing an inked sheet constituted by a thin web-like film or paper sheet with at least one type of ink applied thereto, and a pair of reels disposed in said cassette case including a supply reel and a take-up reel on which are wound the respective end sides of said inked sheet, a window being provided at least in one of a portion of said cassette case adjacent to said supply reel and a portion of said cassette case adjacent to said take-up reel so as to enable the user to visually check the diameter of a roll of said inked sheet on said reel adjacent to said window, said window comprising an opening extending over a region of said cassette case opposite to an end face and a side face of one of said supply and take-up reels.

4,901,091

INK JET RECORDING HEAD AND INK JET RECORDING APPARATUS USING SAME

Masami Kasamoto, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 68,791, Jul. 2, 1987, abandoned, which is a continuation of Ser. No. 785,619, Oct. 9, 1985, abandoned. This application Apr. 14, 1989, Ser. No. 338,423
Claims priority, application Japan, Oct. 19, 1984, 59-218652
Int. Cl.[4] G01D *15/16;* **B41J** *3/04*
U.S. Cl. 346—140 R **45 Claims**



1. An ink jet recording head comprising:
a laminated body formed by a first member and a second member with a common surface therebetween and side surfaces joined by the common surface, the laminated body having an orifice portion for ejecting ink and a wiring portion spaced from the orifice portion for supplying electrical signals to the orifice portion;
first sealing means disposed at the common surface of the first member and the second member between the orifice portion and wiring portion, the first sealing means extending the width of the laminated body between the side surfaces to prevent ink from traveling along the common surface from the orifice portion to the wiring portion; and
second sealing means disposed on the side surfaces of the laminated body at a location wherein the second sealing means is in contact with the first sealing means to prevent ink from traveling along the side surfaces from the orifice portion to the wiring portion.

4,901,092

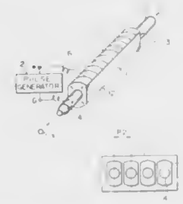
INK JET RECORDING HEAD USING A PIEZOELECTRIC ELEMENT HAVING AN ASYMMETRICAL ELECTRIC FIELD APPLIED THERETO

Jiro Moriyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 941,362, Dec. 15, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 252,002
Claims priority, application Japan, Dec. 17, 1985, 60-281863
Int. Cl.[4] G01D *15/16;* **B41J** *3/04*
U.S. Cl. 346—140 R **16 Claims**

1. An ink jet recording head including a piezoelectric element having an outer cross-sectional shape in a plane perpendicular to the direction in which ink is discharged therefrom, said shape comprising opposed, curved first surfaces and opposed second surfaces, and having an inner surface defining a hollow portion providing a path for guiding the ink to be discharged from the head, wherein:
one of said first surfaces has an electrode disposed thereon, and

said piezoelectric element is deformable by applying a voltage to said electrode to create in said plane an electric field



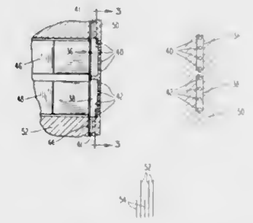
stronger in one direction than in a direction different from said one direction to more efficiently discharge ink.

4,901,093

METHOD AND APPARATUS FOR PRINTING WITH INK JET CHAMBERS UTILIZING A PLURALITY OF ORIFICES

Richard Ruggiero, Danbury; William R. Gardner, Wilton, and Robert L. Rogers, Sandy Hook, all of Conn., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 89,020, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 801,926, Nov. 26, 1985, abandoned. This application Aug. 22, 1988, Ser. No. 236,327
Int. Cl.[4] G01D *15/16;* **B41J** *3/04*
U.S. Cl. 346—140 R **26 Claims**



12. The method of claim 11 including the repetition of said steps.

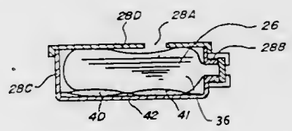
4,901,094

WASTE COLLECTING DEVICE OF AN INK JET PRINTER

Fusao Iwagami, Nara, and Sei Murayama, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 7, 1988, Ser. No. 202,495
Claims priority, application Japan, Sep. 6, 1987, 62-89121; Sep. 6, 1987, 62-89122
Int. Cl.[4] G01D *15/6;* **B41J** *3/04*
U.S. Cl. 346—140 R **3 Claims**

1. A waste collection device for an ink jet printer, comprising:
an ink cartridge member removably mounted to said printer;
ink supply means provided within said ink cartridge member for supplying ink liquid to said printer;
a waste collecting bag provided within said ink cartridge member and in contact with said ink supply means, said bag being divided into a plurality of discrete sections, each of said plurality of sections containing a powdered material for absorbing fluid;
means for directing waste fluid from said ink jet printer into communication with said waste collecting bag; and



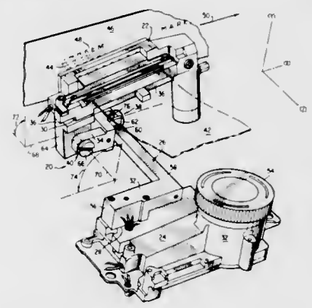
means for enabling said waste collecting bag to uniformly absorb said waste fluid within said ink cartridge member upon exhaustion of ink liquid from said ink supply means.

4,901,095

INK JET PRINTING APPARATUS WITH ADJUSTABLE PRINT HEAD

Andrew G. Perra, Jr., North Swanzey, and James M. Cheever, Keene, both of N.H., assignors to Markem Corporation, Keene, N.H.

Filed Nov. 10, 1988, Ser. No. 269,402
Int. Cl.[4] B41J *3/04;* **G01D** *15/16, 15/00*
U.S. Cl. 346—140 R **15 Claims**



1. An ink jet printing apparatus comprising:
an ink jet print head;
a reservoir for supplying ink to the print head; and
rigid articulated support means carried by said reservoir for supporting said print head, said support means affording two degrees of rotational freedom for allowing adjustment of the print head relative to the reservoir and having an internal channel extending from the reservoir to the print head for conducting ink to the print head.

4,901,096

CAMERA APPARATUS AND METHOD

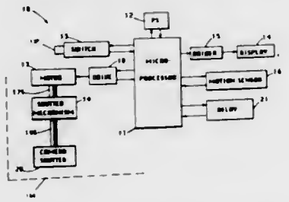
Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Filed Dec. 30, 1988, Ser. No. 292,338
Int. Cl.[4] G03G *17/38*
U.S. Cl. 354—268 **19 Claims**

1. A camera apparatus comprising in combination:
(a) a camera for taking still pictures and including a lens system for receiving light patterns of images to be photographed and a normally closed shutter for allowing, when opened, light to pass into said camera and to be recorded on a record medium therein, and manually operable means for causing said shutter to be briefly opened to allow light to be received and patterns thereof recorded in said camera, the improvement comprising:
first means secured to said camera for sensing movement thereof and generating movement sensing signals,

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second means including electronic computing means for receiving, processing and analyzing said movement sensing signals and generating control signals,



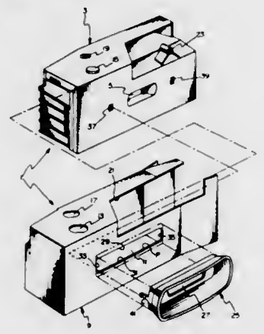
third means for receiving said control signals and preventing the operation of said shutter of said camera by a person attempting to employ said camera to take a picture.

4,901,097

DISPOSABLE SINGLE-USE CAMERA WITH LENS SHADE

Alan V. Vandemoere, Rochester; William H. Goddard, Hilton, and Ralph M. Lyon, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1989, Ser. No. 334,402
Int. Cl.[4] G03B *11/04*
U.S. Cl. 354—295 **5 Claims**



1. An improved disposable single-use camera wherein (a) a rigid inner camera shell is pre-loaded with film and has a taking lens opening and (b) an outer paper pack contains said rigid camera shell and has a larger opening for substantially revealing said taking lens opening, and wherein the improvement comprises:

a lens shade adapted to overlie said paper pack at the perimeter of said larger opening and to substantially reveal said taking lens opening; and

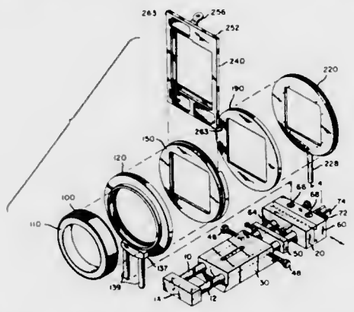
coupling means arranged on said rigid camera shell and said lens shade for connecting the shell and the shade intimately to secure said paper pack in place between the two, to prevent the paper pack from shifting or bowing relative to the shell.

4,901,098

MATTE BOX AND FILTER ASSEMBLY

Roger Salles, P.O. Box 704, Orange, N.J. 07050

Filed Oct. 24, 1988, Ser. No. 261,718
Int. Cl.[4] G03B *11/00*
U.S. Cl. 354—295 **12 Claims**



1. A matte box and filter assembly for a camera having a lens comprising:

a mounting frame connected to and supported from said camera extending forwardly of said lens, said mounting frame slidably mounted to said camera and selectively securable by means of set screws, the slidable disposition of said camera being limited by a backstop on said mounting frame and a slidably adjustable front stop, said mounting frame having a junction box positioned forward of said front stop, said junction box comprising a first section and a second section slidably dove-tailed together to permit lateral disposition of said junction box;

a light shield means for engaging said lens, a matte box means for shielding the light entering said lens, supported by said mounting frame, a plurality of interchangeable filter assemblies selectively positioned between said light shield means and said matte box means, said plurality of filter assemblies comprising a back ring, ring body, ring cover, and front ring cover, engaged in series between said light shield means and said matte box means to permit a combination of plurality of filters, said filter assemblies interconnected with successive filter assemblies selectively rotatable with each other, said plurality of filters selectively slidable perpendicular to the axis of said lens, said filter assemblies rotatably secured by means of an annular groove and coupling screws to aid rotation and perpendicular disposition of each of such filters adjustable by means of a single adjustment means for each such filter.

4,901,099

WATER SUPPLY SYSTEM FOR DEVELOPING APPARATUS

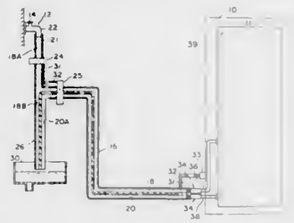
Kilchiro Sakamoto; Haruo Takase; Kazushige Uenaka, and Junya Nakajima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 37,672, Apr. 13, 1987, abandoned. This application Jul. 21, 1988, Ser. No. 222,585
Claims priority, application Japan, Apr. 11, 1986, 61-083935; Apr. 11, 1986, 61-083934
Int. Cl.[4] G03D *3/02*
U.S. Cl. 354—324 **21 Claims**

1. A rinsing water supply system for supplying rinsing water to a rinsing unit in which a photosensitive material is rinsed, comprising:

water supply passage means for supplying water from a water source to said rinsing unit;

first solenoid valve means for opening and closing said water supply passage means; and



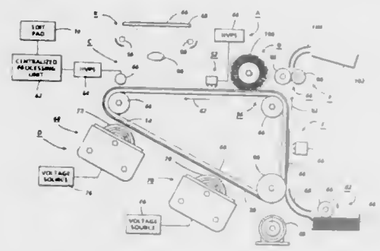
optical signal transmitting means disposed along and integrally with said water supply means for transmitting optical signals for operating said solenoid valve means.

4,901,100

SINGLE PASS COLOR HIGHLIGHTING COPYING SYSTEM

Anthony J. DiBianca, Downingtown, Pa., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 18, 1988, Ser. No. 233,408
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—328 **17 Claims**



1. A copy system, including:

input means for inputting a color highlighting condition for image editing;

a copying machine;

means for coupling said input means to said copying machine; and

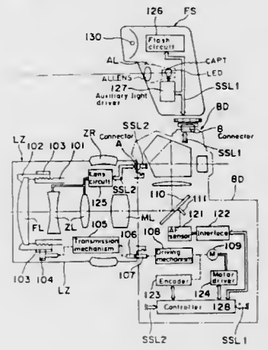
image forming means installed in said copying machine and for forming a copy image of an original being edited in accordance with the color highlighting condition so that the copy image has a plurality of different charge levels with a first charge level corresponding to a first region of the copy image to be developed with developer material of a first color and a second charge level corresponding to a second region of the copy image to be developed with developer material of a second color, said image forming means comprises a photoconductive member, means for charging said photoconductive member to a substantially uniform charge level, means, responsive to said inputting means, for exposing the charged portion of said photoconductive member to record the electrostatic latent image on said photoconductive member having the plurality of different charge levels, said exposing means comprises means for projecting a light image of the original being edited, and means, responsive to said inputting means, for adjusting the intensity of the light image so that the light image has a plurality of different intensities with a first intensity level corresponding to the first region of the copy image to be developed with developer material of the first color and a second intensity level corresponding to the second region of the copy image to be developed with developer material of the second color.

4,901,101

AUTOMATIC FOCUS CONTROL DEVICE FOR USE IN A CAMERA SYSTEM

Tokuji Ishida, Daito; Masataka Hamada, Minamikawachi, and Kenji Ishibashi, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 159,951, Feb. 24, 1988, abandoned, which is a continuation of Ser. No. 082,095, Aug. 5, 1987, abandoned. This application Jul. 5, 1989, Ser. No. 376,911
Claims priority, application Japan, Aug. 6, 1986, 61-185942
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—403 **14 Claims**



1. An automatic focus control device for use in a camera, comprising:

a photographic lens;

light receiving means including a plurality of photocells which receives light passing through said photographic lens from an object;

focus condition detecting means for detecting a focus condition of said photographic lens based on the output of said light receiving means and calculating the amount of defocus of said photographic lens;

auxiliary light emitting means for emitting auxiliary light to said object;

comparing means for comparing the output of said light receiving means under the auxiliary light emission and ambient light with the output of said light receiving means under the ambient light; and

means for correcting the detected defocus amount under the auxiliary light emission and ambient light in accordance with the result of said comparison.

4,901,102

FOCUS DETECTING OPTICAL SYSTEM

Toshihiko Karasaki, and Kazumi Sugitani, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1988, Ser. No. 225,909
Claims priority, application Japan, Jul. 30, 1987, 62-192080
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—408 **15 Claims**

1. A focus detecting optical system comprising:

an objective lens for forming an image of an object;

at least one condenser lens, disposed behind a predetermined image plane of said objective lens, for converging light passed through said objective lens;

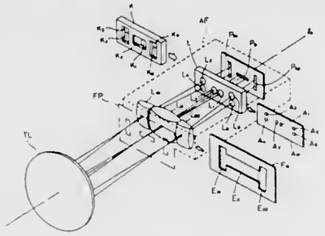
at least one pair of image re-forming lenses, located behind

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said condenser lens, for re-forming a pair of secondary images of the image formed by said objective lens;

at least one pair of rows of light receiving elements, arrayed in a single line behind and in alignment with said paired image re-forming lenses, for detecting said paired secondary images; and

a light deflecting member, disposed between said image re-forming lenses and said element rows and separated from said image re-forming lenses by an air space, for



deflecting light fluxes forming said secondary images outwards in a direction of array of said element rows with respect to a center of said paired secondary images,

said condenser lens, said paired image re-forming lenses, said paired element rows and said light deflecting member constituting one focus detecting assembly for detecting a state of focus adjustment of said objective lens on the basis of a change of the position of said secondary images detected by said element rows.

4,901,103

IMAGE RECORDING APPARATUS USING PRESSURE SENSITIVE SHEET

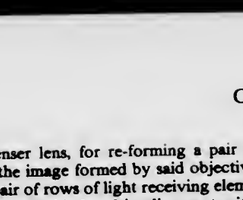
Kiyoharu Hayakawa, Ama; Yumio Matsumoto, Kasugai; Masashi Ueda, Nagoya; Akira Sago, Nagoya, and Osamu Tagaki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 3, 1988, Ser. No. 201,905

Claims priority, application Japan, Jun. 8, 1987, 62-142554; Jun. 8, 1987, 62-142555

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—27 **6 Claims**



1. A pressure developing device for use in an image recording apparatus which uses a pressure-sensitive recording sheet and a developer sheet, comprising;

a pair of pressure developing rollers, said pressure-sensitive recording sheet being fed to pass between said pressure developing rollers and having a pressure-sensitive image bearing layer on one surface thereof, said developer sheet being selectively fed to pass between said pressure developing rollers in superposed relation to said pressure-sensitive image bearing layer, said pressure developing rollers being spaced from each other by a gap which is greater than a thickness of said pressure-sensitive sheet and smaller than a combined thickness of said pressure-sensitive sheet and said developer sheet.

4,901,104

IMAGE RECORDING APPARATUS

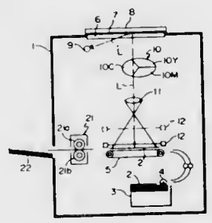
Kenji Sakakibara, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 20, 1988, Ser. No. 196,977

Claims priority, application Japan, May 25, 1987, 62-127482

Int. Cl.[4] G03B *27/37, 27/52, 27/72*

U.S. Cl. 355—32 **12 Claims**



1. An apparatus for recording an image on an original onto a photo-sensitive recording medium high in gamma value, which comprises:

light source means for emitting a light with which said original is illuminated, the light from said light source means passing along a predetermined optical path extending between said light source means and said photo-sensitive recording medium;

an optical system arranged on said predetermined optical path for exposing said photo-sensitive recording medium to the light from said original to form an image on said photo-sensitive recording medium, which image corresponds to the image on said original;

halftone screen means having its light transmittance varying regularly, said halftone screen means being arranged on said optical path for movement therealong with respect to said photo-sensitive recording medium between an operative position where a screening effect of said halftone screen means is validated and an inoperative position where the screening effect of said halftone screen means is invalidated;

moving means for moving said halftone screen means between said operative and inoperative positions; and

control means for controlling said moving means in such a manner that when the image on the original is of a continuous tone, said moving means moves said halftone screen means to said operative position, while when the image on the original is of a dot tone, said moving means moves said halftone screen means to said inoperative position.

4,901,105

CONSTANT VELOCITY OPTICAL SCANNING SYSTEM

Albert P. Pisano, Berkeley, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 16, 1989, Ser. No. 311,242

Int. Cl.[4] G03B *27/50, 27/70*

U.S. Cl. 355—51 **11 Claims**

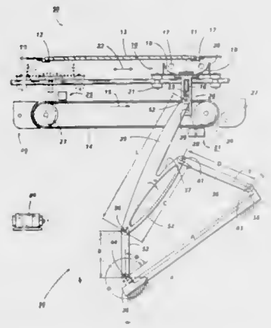
1. Apparatus for scanning a stationary transparent platen on which an original document or other object may be placed for scanning thereof for the purpose of directing a light image of the document or other object generated by the scanning apparatus upon a moving image receiving member, comprising:

a frame having said transparent platen fixedly mounted thereon;

a carriage having a scanning means mounted thereon and being adapted to move relative to the frame;

means for guiding the carriage along a path of travel parallel to the platen whereby successive incremental regions of the document or other object on said platen are scanned and the incremental light images formed by the scanning are directed to the image receiving member;

a multiple link mechanism having an input link adapted for full revolutions at a constant speed and being slidably



connected to the carriage for imparting thereto a straight line motion at constant speed, said imparted motion includes a forward direction from a start of scan position to an end of scan position and an automatic return to the start of scan position; and

means for imparting a constant angular speed to the input link of said link mechanism without the need for return springs, cams, clutches, cables or pulleys, so that the forward scanning distance of the carriage is within a predetermined velocity accuracy.

4,901,106

METHOD OF DETERMINING EXPOSURE TIME FOR PHOTOGRAPHIC PRINTER

Shohei Yamamoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 26, 1988, Ser. No. 200,150

Claims priority, application Japan, May 26, 1987, 62-129543

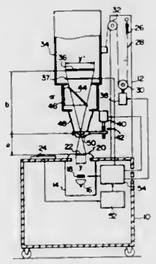
Int. Cl.[4] G03B *27/52*

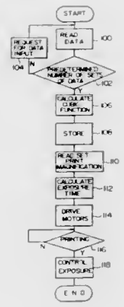
U.S. Cl. 355—55 **9 Claims**

1. A method of determining an exposure time for a photographic printer which is applicable to a photographic printer capable of varying the print magnification, to determine an exposure time corresponding to a print magnification set during actual printing of said printer, comprising the steps of:

conducting a plurality of test printings with different test print magnifications, in such a manner as to obtain an optimum test print each time;

calculating a relationship between the test print magnifications and test exposure times corresponding to said test print magnifications by using a cubic function; and





determining, on the basis of said relationship, said exposure time corresponding to said set print magnification.

4,901,107

LENS REPOSITIONING DEVICE IN A COPIER

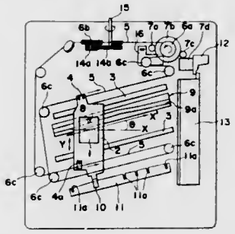
Ken Iwamoto, Nara; Masafumi Okumura, Yamatokoriyama, and Tatsushi Hayashi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 30, 1988, Ser. No. 292,394

Claims priority, application Japan, Jan. 7, 1988, 63-1635

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—55 **2 Claims**



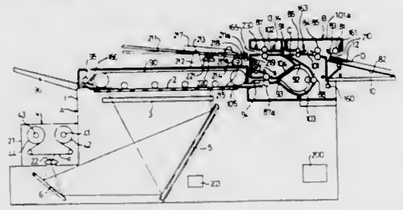
1. A lens repositioning device for use in a copying machine of a side-alignment system wherein an original document to be copied is adapted to be placed on a document support with one side edge thereof held in abutting relationship with a reference side edge of the document support, which device comprises:

a generally elongated lens carriage having a lens assembly fixedly mounted thereon;

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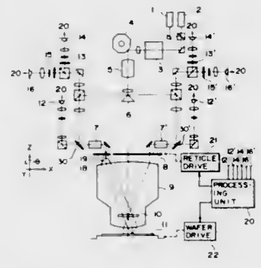
drive means;
a single traction cable adapted to be driven by the drive means and including generally intermediate first and second cable portions over the length thereof, said first and second cable portions extend generally parallel to each other, said first and second cable portion being, when the traction cable is driven by the drive means, movable at the same velocity in the same direction, said lens carriage being rigidly connected at its opposite ends with the respective portions of the traction cable; and
guide means operable during movement of the traction cable accompanied by movement of the lens carriage to guide the lens assembly to follow a curved path of predetermined configuration.

4,901,108
MICROFILMING APPARATUS
Wataru Hamakawa, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Nov. 30, 1987, Ser. No. 126,702
Claims priority, application Japan, Nov. 29, 1986, 61-284495; Nov. 29, 1986, 61-284496; Nov. 29, 1986, 61-284497; Nov. 29, 1986, 61-284498; Nov. 29, 1986, 61-284499; Nov. 29, 1986, 61-284500; Apr. 17, 1987, 62-95799; Apr. 17, 1987, 62-95800
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—64 **7 Claims**



1. A microfilming apparatus of the automatic document feed type comprising:
means comprising a document sheet tray for stacking a plurality of document sheets to be photographed thereon,
feed transport means for feeding one document after another one of the document sheets one by one along a feed path from said document sheet tray to a specified position,
photographing means for photographing an image of the document sheet at the specified position onto a film,
discharging means for discharging the document sheet from the specified position after it has been photographed by said photographing means,
operation instructing means for issuing a start photographing instruction instructing said photographing means to start a photographing operating,
mode selecting means for selecting one of a successive mode and a non-successive mode, and
control means responsive to a mode selection by said mode selecting means for controlling said transport means, said photographing means and said discharging means so as to control said feed transport means to successively transport a plurality of the document sheets from said document sheet tray to the specified position one by one in response to one instruction of said instructing means, photograph images on the document sheet and thereafter discharge the document sheets when said successive mode is selected, and so as to control said feed transport means to transport a single document sheet from said document sheet tray to the specified position in response to one instruction of the instructing means, photograph an image of said single document sheet and thereafter discharge the single document sheet when said non-successive mode is selected.

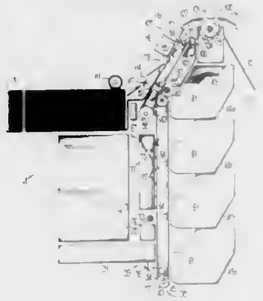
4,901,109
ALIGNMENT AND EXPOSURE APPARATUS
Noriyuki Mitome, Yokohama, and Hideki Ina, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 22,020, Mar. 5, 1987, abandoned. This application May 30, 1989, Ser. No. 358,505
Claims priority, application Japan, Mar. 10, 1986, 61-050504
Int. Cl.[4] G03B *27/42, 27/74, 27/80*
U.S. Cl. 355—68 **6 Claims**



1. A projection exposure apparatus for projecting a pattern of an original having an alignment mark on a workpiece having an alignment mark, said exposure apparatus comprising:
a first stage for supporting the original;
a second stage for supporting the workpiece;
an illumination system for illuminating the original with light having a predetermined wavelength;
a projection lens system for projecting the pattern of the original illuminated by said illumination system on the workpiece;
an alignment mark illuminating arrangement for providing a first light of a first wavelength, substantially the same as the predetermined wavelength, and a second light of a second wavelength different from the first wavelength, said illuminating arrangement being adapted to direct the first and second lights toward the original and the workpiece so that the first light is focused on the original while the second light is not focused on the original and such that both the first and second lights are focused on the workpiece through said projection lens system, and said illuminating arrangement including means for scanning the first and second lights so that the alignment marks of the original and the workpiece are scanned with the first and second lights;
converting means for receiving diffracted light components from the alignment marks of the original and the workpiece, scanned with the first and second lights, and for photoelectrically converting the received light components into electric signals; and
adjusting means for adjusting a positional relationship between the original and the workpiece on the basis of the signals from said converting means.

4,901,110
VERTICAL PRINT ENGINE FOR ELECTROPHOTOGRAPHIC APPARATUS
E. Neal Tompkins, Roswell, and Danny L. Slayton, Lilburn, both of Ga., assignors to Colorocs Corporation, Norcross, Ga.
Filed Dec. 18, 1987, Ser. No. 135,113
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—212 **13 Claims**

1. An electrophotographic printer machine, comprising:
an electronic controller;
a first endless loop photosensitive belt stretched across an upper roller and a lower roller such that the exterior surface of the first belt defines a developing position for an electrostatic image in a substantially vertical plane;
an exposure station on a first side of the printer adjacent the lower roller, configured to focus a beam of light on the developing position of the first belt to form the electrostatic image.
at least one toner module on a second side of the printer adjacent the first belt to apply toner to the electrostatic image to form a developed image;
a second endless loop belt stretched between a first roller and a second roller;
the first roller spaced apart from the second roller and positioned on the first side of the printer horizontally adjacent but vertically lower than the upper roller;

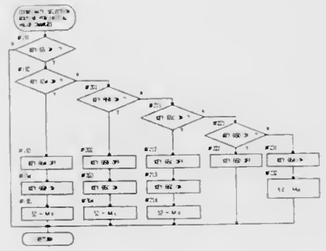


the second roller positioned on the second side of the printer horizontally off-set and vertically higher than the upper roller, the second loop thereby oriented at an angle with respect to the first loop to have a downward facing outside surface which wraps over the first belt and the upper roller to define an arcuate contact between the first belt and the second belt;
means for transferring the developed image from the first belt to the second belt; and
a paper handling means for receiving a sheet of paper, communicating the developed image to the paper and fixing the developed image on the paper.

4,901,111
ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH AN EDITING MODE
Tadashi Ohira; Masazumi Ito, and Syuzi Maruta, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 7, 1988, Ser. No. 142,799
Claims priority, application Japan, Jan. 9, 1987, 62-3871; Jan. 9, 1987, 62-3872; Jan. 16, 1987, 62-8583; Jan. 28, 1987, 62-18872
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—218 **23 Claims**

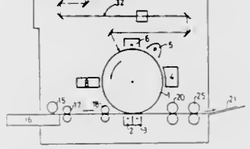
1. A copying apparatus having a usual mode wherein a document image is copies in its entirety onto copy paper and an edition made wherein a desired portion of the document image is copied onto copy paper, the copying apparatus comprising:
image forming means capable of copying the document image in the usual mode and the edition mode,
coordinate memory means for storing area data for use in controlling the copying operation of the apparatus in the edition mode,
means for selecting the edition mode,
means responsive to the selection of the edition mode for feeding specific area data to the coordinate memory means,
means for varying the data stored in the coordinate memory means including a coordinate initial value memory for storing area data specifying a specific area of the document, and





means for controlling the image forming means in the edition mode according to the data stored in the coordinate memory means.

4,901,112
COPYING APPARATUS AND METHOD OF DEVELOPMENT CONTROL
Kazuhiro Araki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Dec. 22, 1988, Ser. No. 288,157
Claims priority, application Japan, Dec. 23, 1987, 62-326518
Int. Cl.[4] G03G *15/06*
U.S. Cl. 355—245 **5 Claims**



1. A copying apparatus, comprising:
an original table capable of placing two originals in a row;
a photoconductive drum having moving photoconductive surface;
an image forming means for forming on the photoconductive drum electrostatic latent images of two originals placed on the original table successively in the direction of movement of the photoconductive surface;
a developing means disposed at a fixed position wherein development is performed by supplying toner to electrostatic latent images on the moving photoconductive surface;
a development control means which is arranged to suspend operation of the developing means for a predetermined

period of time when boundary portion of two electrostatic latent images passes through the developing means; and

a transfer means for transferring developed two images onto the same sheet of a copy paper.

4,901,113

IMAGE-FORMING DEVICE

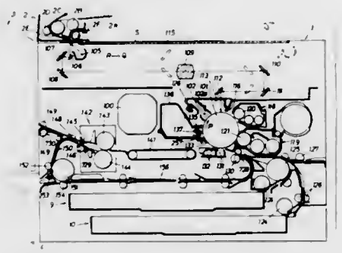
Noboru Sawayama, Tokyo; Shinichi Kamiyama, Yokohama; Hideo Yuh, Tama; Masayuki Takashima, Yokohama, and Tadayuki Sekiya, Ichikawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 73,480, Jul. 15, 1987. This application Oct. 27, 1988, Ser. No. 263,366

Claims priority, application Japan, Jul. 15, 1986, 61-164831; Jul. 15, 1986, 61-164832

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—243 **3 Claims**



1. An image forming device having a mechanism for conducting variable magnification by moving mirrors and lenses, which comprises: an optical system including at least six mirrors and a lens wherein said lens is disposed downstream of a fourth and fifth mirror of said at least six mirrors;

a mechanism for moving said fourth and fifth mirror; and

means for shifting said lens towards said fourth and fifth mirrors so as to change the magnification thereof between x2.0 and x0.5

4,901,114

TRI LEVEL XEROGRAPHY USING A MICR TONER IN COMBINATION WITH A NON-MICR TONER

Delmer G. Parker; Michael D. Thompson, both of Rochester, and Gerald M. Fletcher, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 31,627, Mar. 3, 1987, abandoned. This application Jun. 28, 1988, Ser. No. 220,408

Int. Cl.[4] G03G *15/00*

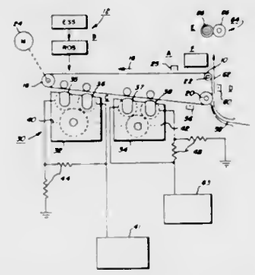
U.S. Cl. 355—245 **6 Claims**

1. An improved process for electrostatically generating printed documents in a single pass which comprises:

providing a substrate;

using electrostatic printing method and magnetic toner, printing only character image, recognizable by magnetic character recognition devices, on said substrate for subsequent recognition by a magnetic character recognition device; and

using electrostatic printing methods and non-magnetic toner, printing character images on said substrate which



are not recognizable by magnetic character recognition devices.

4,901,115

TONER CONCENTRATION CONTROL DEVICE FOR A DEVELOPING APPARATUS

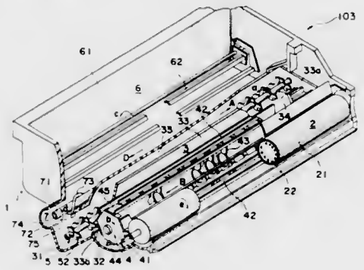
Miooru Nakamura, Toyohashi; Masahide Ueda, and Toru Matsui, both of Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

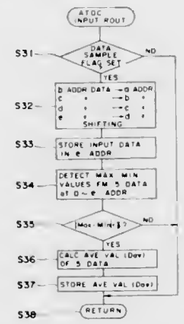
Filed Oct. 21, 1987, Ser. No. 110,792

Claims priority, application Japan, Oct. 23, 1986, 61-253176

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—246 **10 Claims**





1. A developing apparatus which comprises toner replenishing means for replenishing toner into the developing apparatus, toner concentration detecting means for generating an output

corresponding to the toner amount in a developing material stirred and transported through the developing apparatus, said output having varying output levels with a portion where said varying level is within a predetermined range, discriminating means for deriving said portion where said varying level is within a predetermined range, and comparing means for outputting a feeding signal to said toner replenishing means through comparison between the output from said discriminating means and a preliminarily set reference value.

4,901,116

DEVELOPING APPARATUS

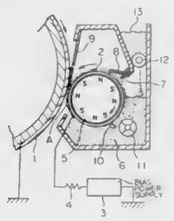
Satoshi Haneda, and Kunihiko Yoshino, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 57,164, Jun. 1, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 282,828

Claims priority, application Japan, Jun. 12, 1986, 61-134827

Int. Cl.[4] G03G *15/09, 15/06*

U.S. Cl. 355—253 **22 Claims**



1. A developer apparatus comprising an image-forming means having a moving surface on which a latent image is developed by a developer containing toner particles, said apparatus furtlier comprising,

a developer-conveying means for conveying a magnetic developer containing toner particles, said developer-conveying means having a magnet therein whereby said developer forms a developer layer on said developer-conveying means, said developer layer having a predetermined width transverse to a developer-conveying direction,

said developer-conveying means facing the moving surface of said image-forming means whereby a developing area is formed on said moving surface, at a position opposite said developer-conveying means, and

a smoothing member comprising a plate-shaped member having a width substantially equal to the predetermined width of said developer layer, said smoothing member being positioned upstream of a moving direction of the moving surface of said image-forming means near said developing area whereby one side of said plate-shaped member contacts the surface of said developer layer and another side of said smoothing member contacts the moving surface of said image-forming means bearing said latent image being developed.

4,901,117

SHEET FEEDER FOR SECOND PASS COPY SUBSTRATE

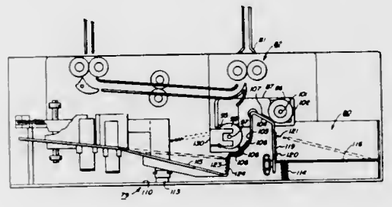
John F. Derrick, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

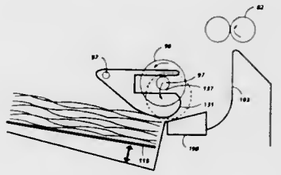
Filed Oct. 3, 1988, Ser. No. 252,617

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—309 **19 Claims**

9. A printing machine comprising means to form a toner image on a sheet substrate, means to heat fuse said toner image to said substrate, a paper path including means to transport said sheet substrate from a supply of sheets through said means to form and said means to heat fuse and including a sheet substrate collection tray for collecting sheet substrates having at least one fused toner image thereon, said tray having a sheet support platform and operatively associated therewith a sheet feeder for feeding said sheets having at least one fused toner image thereon, said sheet feeder comprising a rotatable sheet feed roll, means to reciprocally move said feed roll between a





sheet feeding position wherein said feed roll is in feeding engagement with the top sheet when at least one sheet is on said support platform and a retracted standby position wherein said feed roll is retracted from feeding engagement with said top sheet, a movable sheet restrictor member positioned by gravity to maintain said top sheet spaced from said rotatable feed roll when said feed roll is in the retracted standby position.

4,901,118

COPYING APPARATUS WITH RECIRCULAR AUTOMATIC DOCUMENT FEEDER

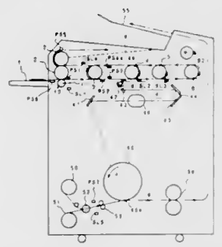
Hiroaki Hamano, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1988, Ser. No. 209,833

Claims priority, application Japan, Jun. 24, 1987, 62-157025

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—310 **3 Claims**



1. A copying apparatus comprising,

a document circularly conveying means including a document feed-in device to which a document is inserted, and a recirculating path through which said inserted document is circularly conveyed, to convey circularly said document in said recirculating path;

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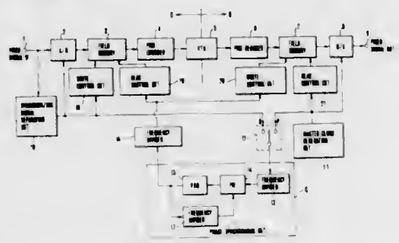
an image processing means for forming and copying the document image;
a paper feeding means for feeding a roll paper to said image processing means;
a cutting means for cutting said roll paper according to a prescribed cutting signal;
a first document detecting means disposed at said document feed-in device for detecting said document thereat to output a first document detecting signal;
a document length detecting means for detecting the inserted document length;
a document length memory means for storing said document length detected by said document length detecting means;
a second document detecting means disposed in said recirculating path for detecting said document thereat to output a second document detecting signal; and
a cutting control means outputting said cutting signal on the basis of said first document detecting signal of said first document detecting means when copying a first sheet, and outputting said cutting signal on the basis of said document length stored in said document length memory means, and said second document detecting signal of said second document detecting means when copying a second sheet onward.

4,901,119

VIDEO SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

Katsuji Yoshimura; Toshiyuki Masui; Chikara Sato, and Tadayoshi Nakayama, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 78,219, Jul. 27, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 273,735
Claims priority, application Japan, Jul. 28, 1986, 61-175753
Int. Cl.[4] H04N *9/80, 9/89*
U.S. Cl. 358—319 **13 Claims**



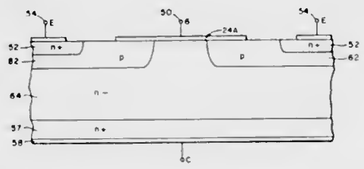
1. A video signal recording apparatus in which an analog video signal is digitized before being recorded on a recording medium, comprising:
(A) converting means receptive of and digitizing the analog video signal and producing the digitized inputted analog video signal as video data;
(B) memory means for temporarily memorizing the video data produced by said converting means;
(C) clock signal forming means for producing a first clock signal for writing the video data produced by said converting means in said memory means and a second clock signal of different frequency from that of said first clock for reading the memorized video data in said memory means from said memory means, and for synchronizing the phases of said first and said second clock signals with each other; and
(D) recording means for recording the video data read out from said memory means on said recording medium.

4,901,120

STRUCTURE FOR FAST-RECOVERY BIPOLAR DEVICES

Carson E. Weaver, Tewksbury, and Philip L. Hower, Concord, both of Mass., assignors to Unitrode Corporation, Lexington, Mass.

Filed Jun. 10, 1987, Ser. No. 61,189
Int. Cl.[4] H01L *29/48*
U.S. Cl. 357—15 **9 Claims**



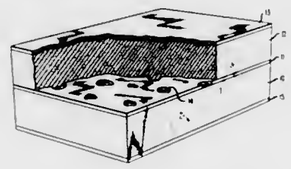
1. A rectifying semiconductor device providing increased minority carrier recombination during the recovery phase of the operation of said device, comprising:
a p-N junction formed from a P+ diffusion region having a grid-like pattern in an N-type substrate; and
a metalization layer in contact with said P+ diffusion region and said substrate, forming an array of Schottky barrier rectifying contact cells, wherein each of said cells is bounded by said P+ diffusion region.

4,901,121

SEMICONDUCTOR DEVICE COMPRISING A PERFORATED METAL SILICIDE LAYER

John M. Gibson, Upper Montclair; John C. Hensel; Anthony F. Levi, both of Summit, and Raymond T. Tung, New Providence, all of N.J., assignors to American Telephone & Telegraph Co., AT&T Bell Labs., Murray Hill, N.J.

Continuation of Ser. No. 717,649, Mar. 29, 1985, abandoned. This application Apr. 18, 1988, Ser. No. 185,288
Int. Cl.[4] H01L *29/48, 21/24*
U.S. Cl. 357—15 **9 Claims**



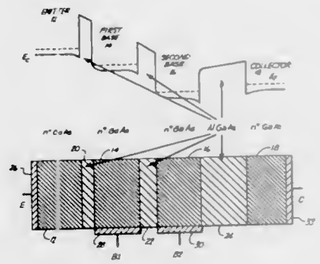
1. A transistor comprising
(a) a single crystal substrate comprising doped Si, the substrate having a major surface having an orientation with respect to the substrate crystal lattice;
(b) a layer of metal silicide in contact with the major surface of the substrate and forming a junction therewith, associated with the junction being a zero bias depletion width W, the thickness of the silicide layer being between about 5% and about 50% of W, the silicide layer having been formed by a process that comprises deposition of metal, or of metal and silicon, or of metal followed by silicon, onto the major surface of the substrate, and annealing of the deposit;
(c) a layer of silicon overlying at least a part of the silicide layer, the layer of silicon comprising doped silicon;
(d) means for making electrical contact to the substrate, the silicide layer and the layer of silicon, respectively; characterized in that
(e) the silicide layer is perforated by a multiplicity of apertures, with silicon, or doped silicon, extending through at least some of the apertures associated with each aperture being an effective diameter of the aperture, with the average of the effective diameter of the apertures being in the range from about 10% to about 100% of W, with the apertures in the silicide layer having been formed during formation of the silicide layer without use of lithography and/or etching.

4,901,122

DOUBLE-BASE HOT CARRIER TRANSISTOR

Jingming Xu, Toronto, Canada, and Michael Shur, Golden Valley, Minn., assignors to Regents of the University of Minnesota, St. Paul, Minn.

Continuation of Ser. No. 86,001, Aug. 14, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 327,381
Int. Cl.[4] H01L *29/161*
U.S. Cl. 357—16 **13 Claims**



1. A transistor comprising:
an emitter for launching electrons;
a collector for receiving electrons;
a first base between the emitter and the collector;
means for applying an electric field in the first base whereby electrons launched from the emitter and received by the first base are accelerated in a direction generally parallel to the electric field;
a second base between the first base and the collector having a second base electrical contact for applying an input signal;
a collector barrier between the second base and the collector; and
a base-base barrier between the first and second bases.

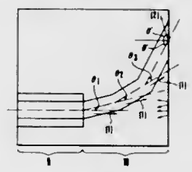
4,901,123

SUPERLUMINESCENT DIODE

Yoshio Noguchi; Haruo Nagai, both of Isehara; Kazumasa Takada, Katsuta, and Juichi Noda, Mito, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 277,000
Claims priority, application Japan, Dec. 2, 1987, 62-308296; Aug. 19, 1988, 63-205024; Oct. 3, 1988, 63-249627
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 **8 Claims**

1. A superluminescent diode comprising:
a current injection portion having a current injection electrode formed adjacent to a first end face;
a light-absorption portion contiguous with said current injection portion; and
a waveguide continuously formed to extend from said current injection portion to said light-absorption portion,
wherein said waveguide is constituted by an active layer and a member which completely buries said active layer, has a bandgap larger than that of said active layer, and is formed of a material having a small refractive index, said waveguide of said current injection portion is linearly formed to be perpendicular to said first end face, and said waveguide of said light-absorption portion has an end



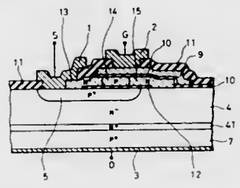
portion for guiding reflected light in a direction different from a propagation direction of light propagating through said waveguide.

4,901,124

CONDUCTIVITY MODULATED MOSFET

Yasukazu Seki, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 18, 1989, Ser. No. 339,814
Claims priority, application Japan, Apr. 22, 1988, 63-99473
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.4 **1 Claim**



1. A conductivity modulated metal oxide semiconductor field effect transistor, comprising:
a semiconductor substrate having a base layer of first conductivity type, a drain layer of second conductivity type formed on a first surface of said base layer, and an emitter region of the second conductivity type formed on a second surface of said base layer;
an oxide film deposited on said substrate so that it spans over a part of a surface of said emitter region and a part of a surface of said base layer;
a first polycrystalline silicon layer of the second conductivity type deposited so that it comes into contact with only said oxide film;
a second polycrystalline silicon layer of the first conductivity type deposited so that it spans over said emitter region and said oxide film, and so that it comes into contact with a first side wall of said first polycrystalline silicon layer;
a third polycrystalline silicon layer of the first conductivity type deposited so that it spans over said base region and said oxide film, and so that it comes into contact with a second side wall of said first polycrystalline silicon layer;
a gate polycrystalline silicon layer deposited so that it spans over from said first polycrystalline silicon layer to said third polycrystalline silicon layer through an insulating layer;
a source electrode coming into contact with said emitter region and said second polycrystalline silicon layer;
a gate electrode coming into contact with said gate polycrystalline silicon layer; and
a drain electrode coming into contact with said drain layer.

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4,901,125

CHARGE COUPLED DEVICE CAPABLE OF EFFICIENTLY TRANSFERRING CHARGE

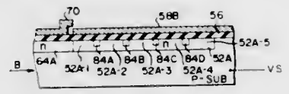
Tetsuo Yamada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 23,928, Mar. 9, 1987, abandoned, which is a continuation of Ser. No. 804,621, Dec. 5, 1985, abandoned. This application Aug. 10, 1988, Ser. No. 231,645

Claims priority, application Japan, Dec. 6, 1984, 59-257933; Dec. 28, 1984, 59-276089

Int. Cl.[4] H01L *29/78; G11C 19/28*

U.S. Cl. 357—24 **8 Claims**



1. A charge coupled device comprising:

a semiconductor substrate of a first conductivity type;

a channel region of a second conductivity type formed in a surface area of said semiconductor substrate, extending in one direction and serving as a transfer channel;

charge supplying means, substantially adjacent to said channel region in the lateral direction of said channel region, for supplying charge to said channel region;

electrode means insulated from said channel region, for applying a control voltage to said channel region to transfer charge through said channel region; and

potential control means for efficiently transferring small amounts of charge through at least one subregion of said channel region while transferring large amounts of charge through the entire channel region, including a plurality of electrical barrier regions formed in said channel region extending in said one direction substantially throughout said transfer channel and containing an impurity of the first conductivity type, the impurity concentration of each of said electrical barrier regions being inversely proportional to the distance between it and said charge supplying means and the electrostatic potential energy of each of said electrical barrier regions being set at a level higher than that of said transfer channel and lower than that of said substrate outside of said transfer channel when said control voltage is applied thereto.

4,901,126

RADIATION DETECTOR

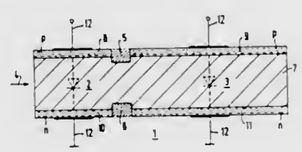
Reiner Schulz, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 1, 1987, Ser. No. 103,383

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1986, 3633998

Int. Cl.[4] G01T *1/24;* **H01L** *29/06, 29/12*

U.S. Cl. 357—29 **6 Claims**



1. A detector for radiation arriving at an incoming radiation propagation direction, comprising:

a semiconductor body having spaced surfaces disposed substantially parallel to the direction of radiation propagation;

a region of first conductivity type disposed at one of said surfaces;

a region of second conductivity type disposed at the other of said surfaces;

a section of lower conductivity disposed in at least one of said regions and extending transversely to the direction of radiation propagation, said section of lower conductivity dividing said radiation detector into a plurality separate detector elements disposed following each other in the direction of incoming radiation propagation; and

means attached to each of said regions for tapping an electrical signal from said individual detector elements.

4,901,127

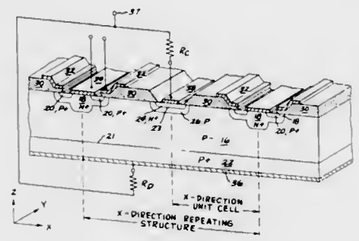
CIRCUIT INCLUDING A COMBINED INSULATED GATE BIPOLAR TRANSISTOR/MOSFET

Tat-Sing P. Chow, Schenectady, N.Y., and Bantval J. Baliga, Raleigh, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 7, 1988, Ser. No. 254,897

Int. Cl.[4] H01C *27/02*

U.S. Cl. 357—23.4 **31 Claims**



1. A circuit comprising: a semiconductor device comprised of an insulated gate bipolar transistor and an MOSFET combined and integrated in a single body of semiconductor material, said body including:

a drift region of one type conductivity,

a base region of opposite type conductivity forming a first PN junction with said drift region,

a source/emitter region of said one type conductivity disposed within and forming a second PN junction with said base region,

said base region including a channel portion disposed between aid source and drift regions,

a collector region of said opposite type conductivity forming a third PN junction with said drift region and spaced from said base region, and

a drain region spaced from said base region, having said one type conductivity forming an interface with said drift region and being more heavily doped than said drift region;

said semiconductor device further including:

an insulated gate electrode disposed adjacent said channel portion of said base region for controlling the conductivity of said channel portion of said base region for charge carriers of said one type conductivity,

a first electrode disposed in ohmic contact with said base and source/emitter regions and comprising a first main terminal of said circuit

a drain electrode disposed in ohmic contact with said drain region, and

a collector electrode disposed in ohmic contact with said collector region; and

a drain/collector circuit connected to said device, said drain/collector circuit including said drain and collector regions, said drain and collector electrodes, a non-zero resistive impedance and a second main terminal.

4,901,128

SEMICONDUCTOR MEMORY

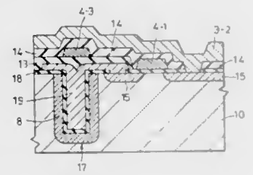
Hideo Sunami, Tokyo; Tokuo Kure, Kokubunji; Masanobu Miyao, Tokorozawa; Yoshifumi Kawamoto, Kanagawa; Katsuhiro Shimohigashi, Musashimurayama; Yoshio Sakai, Kanagawa; Osamu Minato; Toshiaki Masuhara, both of Tokyo, all of Japan; Mitsumasa Koyanagi, Cupertino, Calif., and Shinji Shimizu, Houya, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 548,844, Nov. 4, 1983, abandoned, and Ser. No. 820,839, Jan. 22, 1986, abandoned, and Ser. No. 780,601, Sep. 26, 1985, abandoned, and Ser. No. 640,515, Aug. 13, 1984, abandoned, and Ser. No. 686,599, Dec. 26, 1984, abandoned. This application Nov. 24, 1986, Ser. No. 934,556

Claims priority, application Japan, Nov. 4, 1982, 57-192478; Nov. 11, 1983, 58-210825; Nov. 18, 1983, 58-216143; Dec. 26, 1983, 58-243997; Oct. 1, 1984, 59-204001

Int. Cl.[4] H01L *29/78, 27/02, 29/06, 29/34*

U.S. Cl. 357—23.6 **21 Claims**



1. A semiconductor memory which includes a plurality of word lines, a plurality of bit lines, and a plurality of memory cells, each memory cell including an insulated-gate field-effect transistor and a capacitor with a data storage portion formed on a semiconductor surface region having a first conductivity type, wherein said insulated-gate field-effect transistor comprises:

a gate electrode electrically connected to one of the plurality of word lines,

a source and drain provided in the semiconductor surface region, one of the plurality of bit lines being connected to the drain or source of the insulated-gate field-effect transistor, and

a gate insulation film provided between the semiconductor surface region and the gate electrode, the gate insulation film being formed less than 50 nm; and

wherein said capacitor comprises:

a groove formed into the semiconductor surface region, wherein a depth of the groove is more than 1 μm, wherein the depth of the groove is greater than a distance between inner walls of the grooves, and wherein the semiconductor surface region surrounding the groove acts as a first electrode,

a capacitor insulation film formed on a surface of the groove, wherein the capacitor insulation film comprises a composite film of SiO_2 and Si_3N_4, and

a second electrode formed in the groove over the capacitor insulation film, the second electrode being connected to the source or drain of the insulated-gate field-effect transistor, wherein the second electrode comprises a polycrystalline silicon, and wherein the groove is filled with the second electrode,

wherein an individual groove is provided for forming the capacitor for each memory cell.

4,901,129

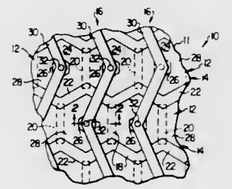
BULK CHARGE MODULATED TRANSISTOR THRESHOLD IMAGE SENSOR ELEMENTS AND METHOD OF MAKING

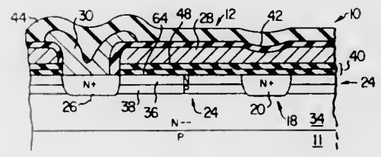
Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 36,617, Apr. 10, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 328,723

Int. Cl.[4] H01L *27/14, 29/18, 27/02*

U.S. Cl. 357—30 **14 Claims**





1. A bulk charge modulated MOSFET for sensing light comprising:

a semiconductor substrate of a first conductivity type;

a deep buried channel of a semiconductor of a second conductivity type formed in said substrate;

a gate region formed in said deep buried channel, said gate region having a bulk charge gate region of a first conductivity type and a shallow buried channel region of a second conductivity type formed over said bulk charge gate region, said bulk charge gate region defining a first potential well for charge carriers of a first type and having a voltage threshold potential, said shallow buried channel region defining a second potential well for charge carriers of a second type, said charge carriers of the first and the second type generated in said MOSFET in response to said light incident on said MOSFET;

a source region of a second conductivity type formed in said deep buried channel and extending through said gate region, said source region more heavily doped than said deep buried channel;

a drain region of a second conductivity type formed in said deep buried channel and extending through said gate region, said drain region laterally spaced from and enclosing said source region and more heavily doped than said deep buried channel;

an insulator region formed over said gate and drain regions; and

a gate conductor formed over said insulator region and conductively coupled to a source of bias voltage to selectively apply a voltage pulse to said gate conductor changing the voltage threshold potential of said bulk charge gate region and driving the accumulated charge carriers of the first type into the substrate.
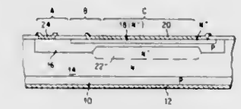
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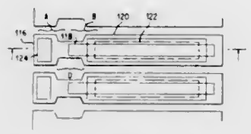
4,901,130

PROTECTION THYRISTOR WITH AUXILIARY GATE

Patrice Jeudi, La Membrolle, and Christine Anceau, Saint Pierre des Corps, both of France, assignors to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jul. 1, 1988, Ser. No. 214,255
Claims priority, application Japan, Jul. 3, 1987, 62-09457
Int. Cl.[4] H01L *29/74, 29/06, 29/747*
U.S. Cl. 357—38 **1 Claim**





1. A protection thyristor turning on whenever a predetermined voltage threshold between its anode and cathode is exceeded, comprising a P-type anode region (**10**), a N-type central region (**14**), a P-type gate region contact with the anode region, and a cathode electrode (**20**) in contact with the cathode region, the central region (**14** comprising a highly doped region (**22**) below the cathode electrode, wherein:

the protection thyristor comprises a gate electrode (**24**) in contact with the gate region;

the gate region comprises a portion of little thickness (C) at the location where it is adjacent to the highly doped portion of the central region and a thicker portion (A, B) at the location where it is adjacent to the remaining portion of the central region the gate electrode being in contact with the gate region in its thicker part;

between the gate electrode and the highly doped region, the gate region presents a portion of narrowed width (D) with respect to the width of the region above the highly doped region;

the cathode region extends above said highly doped region and protrudes above said highly doped portion towards the gate electrode.

4,901,131

CONDUCTIVITY MODULATED METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR

Keiju Takahashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 20, 1988, Ser. No. 246,806
Claims priority, application Japan, Sep. 22, 1987, 62-239601
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—43 **2 Claims**

1. A conductivity modulated MOS FET comprising,

a semiconductor substrate of a conduction type,

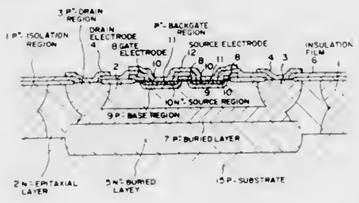
an epitaxial layer of a different conduction type grown on said semiconductor substrate,

a first buried layer of said different conduction type which is on a partial upper surface of said semiconductor substrate, said first buried layer being in contact partly with said epitaxial layer,

a second buried layer of said conduction type which is on a boundary region between said first buried layer and said epitaxial layer,

a drain region of said conduction type which is in said epitaxial layer, said drain region extending from the upper surface of said epitaxial layer to the bottom surface thereof to be in contact with said second buried layer,

a base region of said conduction type which is on a portion of said epitaxial layer, said portion being above said second buried layer,



a source region which is on said base region, and

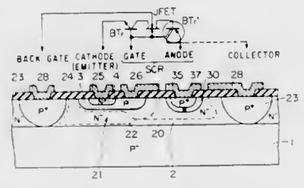
a gate electrode which is on a gate insulation film, said insulation film being across the upper surfaces of said epitaxial layer and said source region.

4,901,132

SEMICONDUCTOR INTEGRATED CIRCUIT WITH SWITCHING BIPOLAR TRANSISTORS HAVING HIGH WITHSTAND VOLTAGE CAPABILITY

Hiromichi Kuwano, Tokyo, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 55,103, May 28, 1987, abandoned. This application Jan. 31, 1989, Ser. No. 303,979
Claims priority, application Japan, Jun. 9, 1986, 61-134501
Int. Cl.[4] H01L *27/02, 29/80, 29/72*
U.S. Cl. 357—43 **6 Claims**



1. An integrated circuit semiconductor structure providing a first vertical bipolar transistor and a second lateral bipolar transistor connected in a thyristor configuration with a JFET, said integrated circuit semiconductor structure comprising:

semiconductor substrate means including a semiconductor body portion of a first conductivity type and a semiconductor layer portion of a second conductivity type disposed on said semiconductor body portion, a PN junction defined between said semiconductor body portion of said first conductivity type and said semiconductor layer portion of said second conductivity type electrically isolating said semiconductor layer portion of said second conductivity type from said semiconductor body portion of said first conductivity type;

a first dopant region of said first conductivity type disposed in said semiconductor layer portion of said second conductivity type and opening onto the surface thereof;

a second dopant region of said second conductivity type disposed within said first dopant region of said first conductivity type and opening onto the surface of said first dopant region;

a third dopant region of said second conductivity type disposed in said semiconductor layer portion of said second conductivity type and having a higher dopant concentration in relation thereto, said third dopant region of said second conductivity type onto the surface of said semiconductor layer portion of said second conductivity type and disposed in laterally spaced relationship with respect to said first dopant region of said first conductivity type;

a fourth dopant region of said first conductivity type disposed within said third dopant region of said second conductivity type and opening onto the surface of said third dopant region;

said first dopant region and said second dopant region defining the base region and the emitter region respectively with the underlying area of said semiconductor layer portion defining the collector region of said first vertical bipolar transistor;

said base region and said collector region of said first vertical bipolar transistor respectively defining a gate and a channel of said JFET;

said fourth dopant region of said first conductivity type cooperating with said semiconductor layer portion of said second conductivity type and said first dopant region of said first conductivity type in respectively defining the emitter, base and collector regions of said second lateral bipolar transistor connected in the thyristor configuration to said first vertical bipolar transistor through said JFET; and

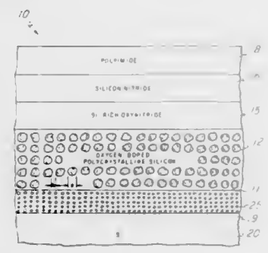
set JFET enabling said first vertical bipolar transistor to withstand a higher voltage signal by achieving a pinch-off condition before the onset of voltage breakdown between the collector and emitter regions of said first vertical bipolar transistor, and said second lateral bipolar transistor having the capability of achieving a higher withstand voltage due to the prevention of surface inversion by said third dopant region of said second conductivity type.

4,901,133

MULTILAYER SEMI-INSULATING FILM FOR HERMETIC WAFER PASSIVATION AND METHOD FOR MAKING SAME

Patrick A. Curran, Plano, and Susan R. Wilson, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 2, 1986, Ser. No. 847,357
Int. Cl.[4] H01L *45/00, 29/34, 29/04*
U.S. Cl. 357—54 **14 Claims**



1. A multilayer semi-insulating passivation film for monocrystalline silicon comprising:

a layer of amorphous silicon on a surface of the monocrystalline silicon,

a layer of oxygen doped polycrystalline silicon overlying the amorphous silicon, and

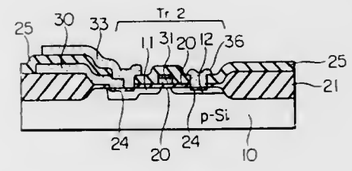
an interface layer therebetween comprising a mixture of amorphous and polycrystalline silicon.

4,901,134

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

Yutaka Misawa, Katsuta, and Osamu Saito, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 794,687, Nov. 4, 1985, abandoned. This application Apr. 21, 1988, Ser. No. 184,370
Claims priority, application Japan, Nov. 2, 1984, 59-231489; Nov. 28, 1984, 59-251376
Int. Cl.[4] H01L *23/48, 29/04, 23/48, 29/78*
U.S. Cl. 357—67 **23 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having a region doped with impurity of an conductivity type differing from that of said semiconductor substrate, the impurity-doped region including a relatively deep portion intruding into the semiconductor substrate and a relatively shallow portion;

an insulation layer having a window through which at least part of said relatively deep portion of said impurity-doped region is exposed;

a silicide layer formed on said relatively deep portion of said impurity-doped region, the relatively deep portion and the silicide layer being substantially aligned with said window; and

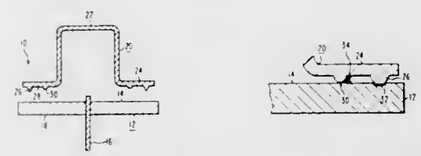
at least two electrodes each directly contacting said silicide layer, one of said electrodes being mainly formed of a same main component material as said semiconductor substrate.

4,901,135

HERMETICALLY SEALED HOUSING WITH WELDING SEAL

Jack P. Costigan, Mountaintop, Pa., assignor to General Electric Company, Somerville, N.J.

Filed Aug. 15, 1988, Ser. No. 232,197
Int. Cl.[4] H01L *23/02, 23/10*
U.S. Cl. 357—74 **9 Claims**



1. In a hermetically sealed housing having a cup-shaped metal cup with a flange extending radially outwardly from the rim of the cup and a weld ring projecting from a surface of the flange, the improvement comprising:

a second ring projecting from said surface of the cap flange in the same direction as the weld ring, said second ring being spaced radially inwardly from the weld ring and projecting a shorter distance from the flange surface than the weld ring.

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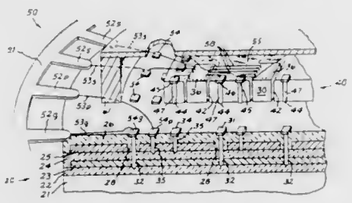
MULTI-CHIP INTERCONNECTION PACKAGE

Constantine A. Neugebauer; Lionel M. Levinson, both of Schenectady; Homer H. Glascock, II, Scotia; Charles W. Eichelberger, Schenectady; Robert J. Wojnarowski, Ballston Lake, and Richard O. Carlson, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 73,136, Jul. 14, 1987, Pat. No. 4,783,695. This application Dec. 15, 1988, Ser. No. 285,363

Int. Cl.[4] H01L *23/16, 23/48, 23/02*

U.S. Cl. 357—75 **15 Claims**



1. A semiconductor interconnection package comprising:
a chip-holding frame having opposed, planar major surfaces, a plurality of holes extending through said frame between said major surfaces, said holes housing a power conducting feedthrough and a ground conducting feedthrough, each of said feedthroughs having opposed ends situated substantially flush with said major surfaces;
a plurality of integrated circuit chips carried in openings within said frame, said chips having planar opposed major faces, one of said faces including terminal pads including ground and power pads; and
a multilayer substrate supporting said chips, said substrate having an exterior flat surface to which said frame is attached and comprising an insulating wafer having a ground conductor layer, a power conductor layer, and an insulator layer deposited thereover and interposed between said frame and said wafer, said power and ground conductor layers separated from each other by said insulator layer, a first set of conductive vias for electrically coupling said ground conductor layer to said ground pads through said ground conducting feedthroughs, and a second set of conductor layer to said power pads through said power feedthroughs.

4,901,137

ELECTRONIC APPARATUS HAVING SEMICONDUCTOR DEVICE

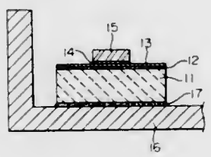
Hideki Sato, and Nobuyuki Mizunoya, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 28, 1988, Ser. No. 225,130

Claims priority, application Japan, Jul. 30, 1987, 62-190801

Int. Cl.[4] H01L *23/02*

U.S. Cl. 357—81 **7 Claims**



1. An electronic apparatus, comprising
a ceramic substrate of sintered aluminum nitride;
a metallized layer formed on a first surface of said ceramic substrate;
a semiconductor device mounted on said metallized layer;
a metallic vessel for holding said ceramic substrate with said semiconductor device, bonded on an opposite surface of the first surface of said ceramic substrate by means of a thermal stress and strain-resistant adhesive agent; and
wherein an internal portion of said metallic vessel is resin-sealed.

4,901,138

SEMICONDUCTOR CONVERTER

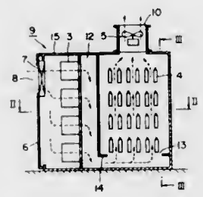
Ryoichi Kushibiki, Kiyose, and Tadamichi Fukutake, Hanno, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 2, 1987, Ser. No. 127,393

Claims priority, application Japan, Dec. 4, 1986, 61-186172[U]

Int. Cl.[4] H01L *23/34, 23/46*

U.S. Cl. 357—81 **6 Claims**



1. A semiconductor converter provided with a cooling structure comprising:
a housing provided with a panel board;
cooling air intake means formed in said panel board for introducing cooling air into said housing;
a plurality of semiconductor units installed one above another in said housing on the side of said panel board;
a plurality of heat generating elements such as resistors installed in said housing behind said semiconductor units with respect to the direction of flow of the cooling air;
a cooling air duct means formed between said semiconductor units and said heat generating elements in such a manner that cooling air flows diverging for cooling said semiconductor units are converged and the converged air flow is directed towards said heat generating elements to cool the same in turn; and
cooling air exhaust means for discharging the cooling air after cooling said heat generating element.

4,901,139

METHOD FOR PULSE CODE MODULATING A DIGITAL VIDEO SIGNAL

James H. Wilkinson, Hants, United Kingdom, and Ueda Mamoru, Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

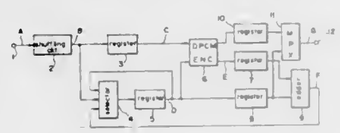
Filed Jul. 25, 1988, Ser. No. 223,527

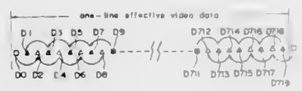
Claims priority, application Japan, Jul. 29, 1987, 62-189853; Jul. 29, 1987, 62-189854; Jul. 29, 1987, 62-189855

Int. Cl.[4] H04N *5/38*

U.S. Cl. 358—13 **7 Claims**

1. Method for transmitting a digital video signal which is modulated with differential pulse code modulation, comprising:
grouping a predetermined number of samples of said digital video signal which are at alternate sample positions in a horizontal line so as to provide respective sample groups;
differentially modulating the samples other than the center sample in each of said groups of samples with reference to said center sample of the respective group; and
transmitting the differentially modulated other samples and the center sample having an original number of bits as a cluster of samples;





each said group of samples comprising N samples wherein N is an odd integer, and the center samples of successive groups are N sample positions apart.

4,901,140

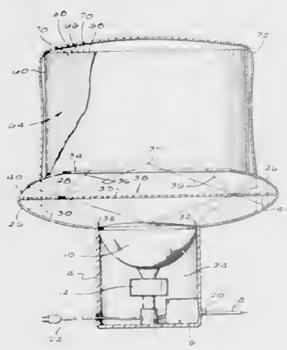
SOLID STATE 360 DEGREE VIEWING SYSTEM HAVING A LIQUID CRYSTAL DISPLAY (LCD) SCREEN THAT ENCIRCLES THE ROTATING REAL IMAGE IN SPACE AND FUNCTIONS AS A MULTI-COLOR FILTER SYSTEM

Paul W. Lang, and Franklin C. Gribshaw, Orange, Calif., assignors to Gold Stake, Pasadena; C. Allen Jensen and Gregory D. Levy, both of Orange, all of, Calif.

Continuation-in-part of Ser. No. 320,289, Mar. 7, 1989. This application Mar. 17, 1989, Ser. No. 326,173

Int. Cl.[4] H04N *9/16*

U.S. Cl. 358—64 **83 Claims**



1. A 360° viewing system, comprising:
an optical system for continuously projecting a real image in space;
means for rotating the real image in space at a given number of revolutions per minute;
a field sequential color generation system encircling the real image in space, the field sequential color generation system comprising a plurality of red filters, green filters and blue filters, the red filters being sequentially activated during a red cycle to define a viewing window through which the real image in space can be viewed, the green filters being sequentially activated during a green cycle to similarly define a viewing window, and the blue filters being sequentially activated during a blue cycle to define a viewing window, wherein the red, green and blue cycles alternately occur to continuously redefine the viewing window about the color generation system in synchronization with rotation of the real image in space such that the real image in space can be continuously viewed in color through the color generation system; and
means for synchronizing the red, green and blue cycles with the rotation of the real image in space.

4,901,141

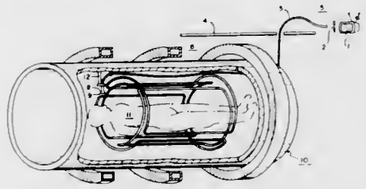
FIBEROPTIC DISPLAY FOR A VIDEO IMAGE

James G. Costello, Huntington Beach, Calif., assignor to Olympus Corporation, Lake Success, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,770

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—93 **22 Claims**



1. A video display for an imaging zone of a Magnetic Resonance Imaging (MRI) apparatus, comprising:
means for receiving a video image;
means for transferring the video image into the imaging zone of the MRI apparatus when the MRI apparatus is generating a high magnetic flux density in the imaging zone without the high magnetic flux density degrading the video image or the video image degrading the high magnetic flux density; and
means for displaying the video image to a patient who is in the imaging zone when the MRI apparatus is generating the high magnetic flux density in the imaging zone.

4,901,142

VIDEO SCOPE SYSTEM

Yuji Ikuno, Ohme; Takeaki Nakamura, Hino; Yoshikazu Tojo, Hachioji; Shinichi Nishigaki, Setagaya; Hiromasa Suzuki, Akishima; Hisao Yabe, Hachioji; Jun Yoshinaga, Hino; Takeshi Yokoi, Hachioji; Kazuhiko Ohzeki, Hachioji, and Masahide Kanno, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 169,959

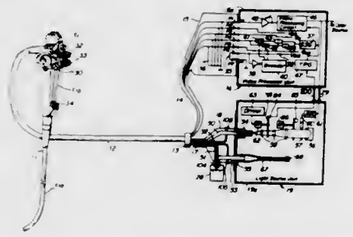
Claims priority, application Japan, Mar. 23, 1987, 62-68575; Apr. 22, 1987, 62-97599; Jan. 22, 1988, 62-10940

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—98 **23 Claims**

1. A video scope system for picking up an image of an object under inspection, said image being formed by an optical system disposed at a distal end of an insertion section inserted in said object under inspection, said video scope system comprising;
a video scope comprising said insertion section, an image sensor for picking up said image of said object under inspection, a conductor connected to said image sensor, a first connector connected to said conductor, a light guide extending through said insertion section and having a light incident end, and a second connector holding said light incident end;
a light source unit having a first socket detachably connected to said second connector, and feeding an illumination light into said light guide;
a video processor unit having a second socket detachably

connected to said first connector, said video processor unit providing a driving signal for said image sensor, and processing an image signal supplied from said image sensor;



a shielding means for thermally shielding said light source unit and said video processor unit from each other; and

an electrical connecting means for transmitting a signal between said light source unit and said video processor unit.

4,901,143

ELECTRONIC ENDOSCOPE SYSTEM PROVIDED WITH A MEANS OF IMAGING FROZEN PICTURES HAVING FEW PICTURE IMAGE SMEARS

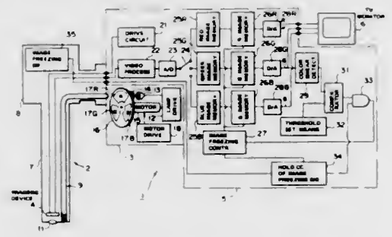
Masao Uehara; Masahide Kanno; Katsuyuki Saito; Akinobu Uchikubo; Katsuyoshi Sasagawa; Shinji Yamashita; Akira Kusumoto; Kazunari Nakamura, all of Hachioji; Shinichiro Hattori; Keiichi Hiyama, both of Akishima; Jun Hasegawa, Hino; Masahiko Sasaki, and Takehiro Nakagawa, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 311,510

Claims priority, application Japan, Feb. 16, 1988, 63-31809; May 6, 1988, 63-109187; Aug. 12, 1988, 63-199791; Aug. 19, 1988, 63-206804; Aug. 23, 1988, 63-209677; Oct. 14, 1988, 63-259917; Oct. 27, 1988, 63-272833; Nov. 11, 1988, 63-286322

Int. Cl.[4] A61B *1/04, 1/06*

U.S. Cl. 358—98 **51 Claims**



1. An electronic endoscope system comprising:

an electronic endoscope provided with an elongate insertable part, an objective optical system provided on the tip side of said insertable part and forming an image of an object, an imaging device photoelectrically converting the image based on said objective optical system and an illuminating light emitting means emitting an illuminating light from the tip side of said insertable part;

a driving signal outputting means outputting a driving signal outputting a picture image signal from said imaging device;

a video signal processing means producing a video signal from said picture image signal;

a displaying means displaying said video signal on a monitor picture surface;

a picture image recording means which can write-in/read-out said picture image signal or said video signal;

a movement detecting means whereby picture image signals imaged by said imaging device at different times are input and the movement amounts of the respective picture image signals are detected;

a frozen picture memory judging means judging whether said movement amount detected by said movement detecting means is adapted to the frozen picture memorizing condition or not;

a frozen picture memorizing signal outputting means outputting a control signal making said picture image memorizing means hold the picture image signal of the frozen picture by the judging signal judged by said judging means to be adapted to said memorizing condition; and

a frozen picture directing means directing the memorization of the frozen picture adapted to said memorizing condition.

4,901,144

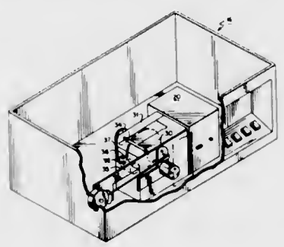
VIDEO ENDOSCOPE APERTURE WHEEL DRIVE SYSTEM

Stanley R. English, Elbridge, and David R. McKenzie, Auburn, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Jul. 20, 1988, Ser. No. 221,650

Int. Cl.[4] A61B *1/04, 1/06;* **H04N** *5/238*

U.S. Cl. 358—98 **5 Claims**



1. In a video endoscope wherein a source of light is projected onto an object to be viewed and the light reflected from the object being viewed is received by an imaging device carried at the distal end of a viewing probe and the intensity of the light projected onto the object is varied by passing through an aperture wheel positioned in the optical path of the video endoscope, said aperture wheel being rotatable by a stepping motor to maintain a predetermined light intensity through the selective interposing of apertures formed in the aperture wheel into the optical path, the improvement comprising

inertia force isolating drive means coupled between said stepping motor and said aperture wheel for effecting rotation of said aperture wheel in response to rotation of said stepping motor and isolating said aperture wheel from inertia forces generated by the rotation of said stepping motor when said stepping motor is rotated.

4,901,145

MOTION VECTOR ESTIMATION IN TELEVISION IMAGES

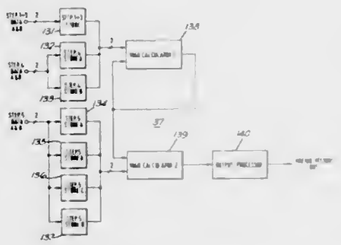
Vincent C. Harrabine, and Clive H. Gillard, both of Basingstoke, United Kingdom, assignors to Sony Corporation, Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,562

Claims priority, application United Kingdom, Jun. 9, 1987, 8713456; Dec. 4, 1987, 8728448

Int. Cl.[4] H04N *7/01*

U.S. Cl. 358—105 **21 Claims**



1. A method of motion vector estimation in a television image comprising using a digitized signal for representing said image, and using a block matching technique with successive refinement of the motion vector estimate and in which motion in said image at points spaced a predetermined number of samples horizontally and a predetermined number of samples vertically is determined by the block matching technique.

4,901,146

IMAGING ASSEMBLY AND MOUNTING FOR SURVEILLANCE VIEWING UNDER REMOTE CONTROL

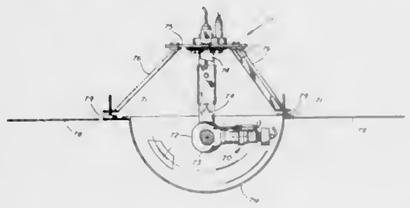
Kenneth E. Struhs; Mark J. Struhs, and Patrick L. Struhs, all of Salt Lake, Utah, assignors to Applied Engineering Products Co., Salt Lake City, Utah

Continuation-in-part of Ser. No. 198,365, May 5, 1988, Pat. No. 4,855,823. This application Jul. 11, 1989, Ser. No. 378,166

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—108 **34 Claims**



1. An integrated imaging assembly and mounting therefor particularly for surveillance viewing under remote control from a closed circuit television system, said imaging assembly comprising an optical lens arrangement including, among other lenses, an objective lens, a mount for said objective lens, and an electronic, charge-coupled, image-acquisition device optically aligned with said lens arrangement for receiving images therefrom; mounting means for said imaging assembly; means pivotally mounting said objective lens mount in said mounting means rearwardly of but adjacent to said objective lens, so said objective lens can be tilted and panned within the concavity of a concave viewing dome of unusually small and shallow size to sweep over a broad viewing area with limited protrusion thereinto and with said mounting means being substantially wholly outside of and behind said concavity of the viewing dome; remotely controlled means for tilting and panning said objective lens mount; remotely controlled means for adjusting the positions of lenses in said lens arrangement; and electronic video camera means with which said charge-coupled, image-acquisition device is electrically connected.

4,901,147

VIDEO SYSTEM WITH SELF-DIAGNOSE FUNCTION

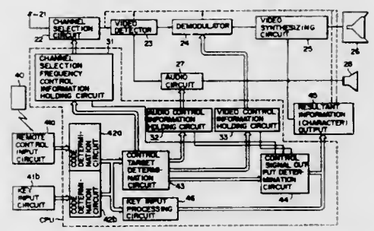
Teruo Tajima, Sakai, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1988, Ser. No. 174,505

Claims priority, application Japan, Mar. 30, 1987, 62-47105

Int. Cl.[4] H04N *17/04*

U.S. Cl. 358—139 **20 Claims**



1. A video system with a self-diagnose function, comprising:

video signal processing means for receiving a video signal and performing predetermined processing for the video signal;

control information supplying means, coupled to said video signal processing means, for supplying output control information for the predetermined processing;

information input means, coupled to said control information supplying means, for receiving input control information for changing the output control information;

determination means, coupled to said information input means and said control information supplying means, for determining a relationship between the output control information and the input control information;

display signal generating means, coupled to said determination means, for generating a predetermined display signal corresponding to a determination result from said determination means;

synthesizing means, coupled to said video signal processing means and said display signal generating means, for synthesizing the predetermined display signal on the video signal processed by said video signal processing means; and

display means for receiving and displaying an output signal from said synthesizing means.

4,901,148

DATA PROCESSING DEVICE

Tadayoshi Nakayama; Chikara Satoh; Akio Fujii; Katsuji Yoshimura, and Koji Takahashi, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1988, Ser. No. 143,974

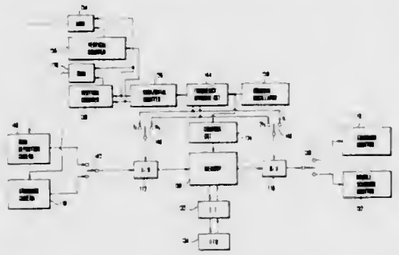
Claims priority, application Japan, Jan. 19, 1987, 62-008630; Jan. 20, 1987, 62-008875

Int. Cl.[4] H04N *7/01*

U.S. Cl. 358—140 **14 Claims**

1. A data processing device comprising:

(a) a first signal generating source arranged to generate a first information signal;
(b) a second signal generating source arranged to generate a second information signal which has a greater amount of information per unit of time than said first information signal;
(c) selecting means for selectively producing said first information signal or said second information signal;
(d) analog-to-digital converting means for analog-to-digital converting signals produced by said selecting means;
(e) storing means for storing signals digitized by said analog-to-digital converting means; and



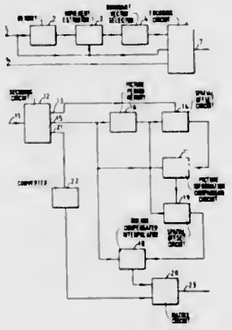
(f) change-over means for changing a sampling frequency of said analog-to-digital converting means and a data writing cycle of said storing means in response to a selecting action of said selecting means, such that the sampling frequency of said analog-to-digital converting means which is obtained while said selecting means is producing said first information signal and that of said analog-to-digital converting means which is obtained while said selecting means is producing said second information signal are caused to differ from each other in a ration of 1:n (wherein n represents an integer which is at least 2).

4,901,149

METHOD AND APPARATUS FOR PROVIDING AN ENHANCED TELEVISION SIGNAL

Gerard M. X. Fernando, Croydon; David W. Parker, Redhill, and Peter Saraga, Wallington, all of United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 29, 1988, Ser. No. 226,104
Claims priority, application United Kingdom, Aug. 10, 1987, 8718901
Int. Cl.[4] H04N *7/04, 7/08*
U.S. Cl. 358—141 12 Claims



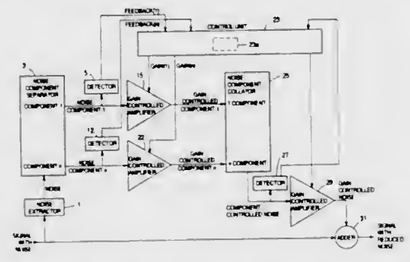
1. A television transmission system comprising a signal generator for producing a television signal which comprises a vision signal representing a sequence of pictures with each picture containing a plurality of sequential or interlaced lines and further comprises a motion information signal, each field of a picture being subdivided into a plurality of regions, a transmission channel for conveying said television signal from said generator to a television receiver in which the vision signal and motion information signal in the received television signal are processed to enable a television display to be provided, characterized in that in the signal generator a number of motion vectors are produced for each region and up to a limited number, which limited number is an integral number greater than one, of the most dominant of the motion vectors appropriate to that region are selected, the selected motion vectors for the various regions in a field forming said motion information signal while in the receiver a number, which corresponds to the said limited number, of comparisons are made for each picture information point in a region in at least the major part of each field between vision information in the vision signal for a region in a first field and respective offsets comprising spatially offset vision information in a corresponding field for an adjacent picture which offsets are determined by each selected motion vector appropriate to the region containing the vision information the subject of the said comparisons, and utilizing the results of the comparisons for the regions to derive from said received vision signal vision information for an up-converted picture signal.

4,901,150

AUTOMATIC NOISE REDUCTION FOR INDIVIDUAL FREQUENCY COMPONENTS OF A SIGNAL

Marc Klingelhofer, Fremont, and Vinson R. Perry, San Carlos, both of Calif., assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1988, Ser. No. 274,820
Int. Cl.[4] H04N *5/21*
U.S. Cl. 358—167 27 Claims



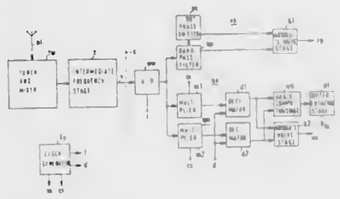
1. An automatic noise reduction method for processing an input signal having a noise portion for each of a set of frequency components, signals indicative of a minimum noise value for each frequency component in the set, and signals indicative of a range of gain values bounded by a minimum gain value and a maximum gain value for each frequency component in the set, including the steps of:
(a) generating a feedback signal indicative of the amplitude of one of the noise portions having a selected frequency component;
(b) generating a gain control signal for the noise portion having said selected frequency component, in response to the feedback signal for said noise portion;
(c) generating a gain controlled component signal by amplifying the noise portion having said selected frequency to an amplitude determined by the gain control signal for said noise portion;
(d) repeating steps (a) through (c) for each frequency component in the set; and
(e) combining the gain controlled component signals to generate a component controlled noise signal, in a manner so that the amplitude of each frequency component of the component controlled noise signal is determined by the amplitude of the gain controlled component signal for said frequency component.

4,901,151

TELEVISION RECEIVING SECTION WITH DIGITAL STAGES

Sonke Mehrgardt, March, and Dietmar Ehrhardt, Freiburg, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 288,550
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743727; European Pat. Off., Oct. 31, 1988, 88118095
Int. Cl.[4] H04N *5/44, 5/60*
U.S. Cl. 358—181 6 Claims



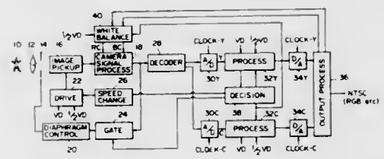
1. A television receiving section having analog and digital stages, said television receiving section including a tuner and mixer stage that receives a received signal and an intermediate frequency stage that provides a video- and audio-information-containing signal responsive to said received signal at an intermediate frequency, said television receiving section having at least one interface between said analog and digital stages, said television receiving section comprising:
a single analog-to-digital (A/D) converter driven by a sampling clock signal having a frequency approximately equal to twice the bandwidth of said received signal, said single A/D converter receiving an analog signal responsive to said video- and audio-information-containing signal and providing a digital output signal at a rate determined by the frequency of said sampling clock signal;
a video-information processing channel having an input and an output, said input receiving said digital output signal from said A/D converter, said video-information processing channel comprising:
a band-pass filter (bp) having a passband that extends between 1 MHz and 6 MHz, said band-pass filter having an input that receives said digital output signal from said A/D converter, said band-pass filter having an output that provides a band-pass filtered output signal;
a 90° phase shifter having an input that receives said band-pass filtered output signal from said band-pass filter and provides a phase-shifted output signal shifted in phase by 90° from said band-pass filtered output signal; and
a first absolute-value stage having two inputs and an output, one of said inputs receiving said band-pass filtered output signal from said band-pass filter and the other of said inputs receiving said phase-shifted output signal from said 90° phase shifter, said first absolute-value stage producing an output equal to the magnitude of the vector sum of its two input signals, said output of said first absolute-value stage being a digital composite color signal;
and an audio-information processing channel having an input and an output, said input receiving said digital output signal from said A/D converter, said audio-information processing channel comprising:
a quadrature mixer having an input and two outputs, said input receiving said digital output signal from said A/D converter, said quadrature mixer responsive to two locally generated signals having the same, frequency-standard-dependent, fixed frequency, said fixed frequency being between 7 and 7.5 MHz, said quadrature mixer providing first and second output signals on said two outputs;
a first decimator having a signal input and a signal output and having a decimator clock input driven by a decimator clock signal having a frequency lower than the frequency of said sampling clock, said signal input of said first decimator receiving said first output signal from said quadrature mixer, said first decimator providing a first decimator output signal on said signal output at a rate determined by said decimator clock signal;
a second decimator having a signal input and a signal output and having a decimator clock input driven by said decimator clock signal, said signal input of said second decimator receiving said second output signal from said quadrature mixer, said second decimator providing a second decimator output signal on said signal output at a rate determined by said decimator clock signal;
a second absolute-value stage having first and second inputs and an output, said first input receiving said first decimator output signal and said second input receiving said second decimator output signal, said second absolute-value stage producing an output signal on said output equal to the magnitude of the vector sum of said first and second decimator output signals;
an angle-computing stage having first and second inputs and an output, said first input receiving said first decimator output signal and said second input receiving said second decimator output signal, said angle computing stage computing the angle between said first decimator output signal and said second decimator output signal and providing an output signal responsive to said computed angle, said output of said second absolute-value stage being an amplitude-demodulated audio signal when an amplitude-demodulated input signal is received by said audio-information-processing channel; and
a differentiating stage having an input an output, said input of said differentiating stage receiving said output of said angle-computing stage, said output of said differentiating stage being a frequency-demodulated audio signal when a frequency-modulated input signal is received by said audio-information-processing channel.

4,901,152

IMAGE PICKUP APPARATUS

Teruo Hieda; Toshiyuki Masui, both of Kawasaki; Koji Takahashi, Yokohama, and Katsuji Yoshimura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1988, Ser. No. 236,141
Claims priority, application Japan, Aug. 31, 1987, 62-217377; Sep. 25, 1987, 62-240282
Int. Cl.[4] H04N *9/73*
U.S. Cl. 358—209 11 Claims



1. An image pickup apparatus comprising:
(a) an image pickup section for alternately performing light storage for a first period and light storage for a second period shorter than the first period, and for outputting an

image pickup signal obtained by mixing an image stored in the first period and an image stored in the second period; and

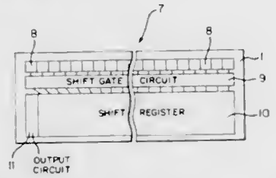
(b) white balance control means for separately performing white-balance control of the stored image portion of the first period and the stored image portion of the second period obtained from the image pickup signal.

4,901,153

IMAGE SENSOR WITH REDUCED SURFACE REFLECTION INTERFERENCE

Satoshi Machida; Yukito Kawahara, and Hiroshi Mukainakano, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,179
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.11 **15 Claims**



1. An image sensor for converting an optical signal into an electric signal, comprising:

a photo-electro conversion element for effecting photo-electro conversion; and

a passivation film covering the photo-electro conversion element, the passivation film having a thickness more than ten times the wavelength of incident light to be irradiated onto the photo-electro conversion element, and the passivation film being composed of at least a resin layer.

4,901,154

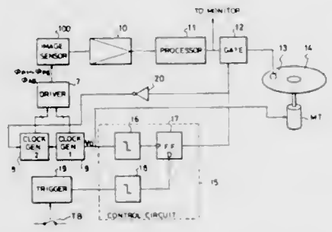
IMAGE PICKUP APPARATUS WITH COORDINATED CLEAR AND SHUTTER FUNCTIONS

Akira Suga, and Tadashi Okino, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 208,810, Jun. 22, 1988, Pat. No. 4,868,680, which is a continuation of Ser. No. 874,629, Jun. 16, 1986, abandoned, which is a continuation of Ser. No. 580,954, Feb. 16, 1984, Pat. No. 4,622,596. This application Feb. 16, 1989, Ser. No. 311,354

Claims priority, application Japan, Feb. 21, 1983, 58-27291; Feb. 21, 1983, 58-27292; Feb. 21, 1983, 58-27293; Feb. 21, 1983, 58-27294

Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.19 **8 Claims**



1. An image pickup apparatus comprising:

photosensing means for converting an optical image into an electrical signal;

combining means for periodically combining a part of the electrical signal converted by said photosensing means with a signal opposite in polarity to said electrical signal;

shutter means for selectively blocking the light incident on said photosensing means and having an open state wherein light is incident on said photosensing means and a closed state wherein light is blocked; and

control means for making said combining means inoperative for at least a predetermined period of time after initiation of said closed state of said shutter means.

4,901,155

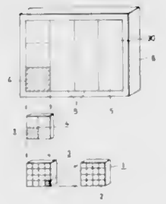
SIGNAL PROCESSING SYSTEM FOR LARGE SCREEN DISPLAY APPARATUS

Zenichiro Hara, and Toshiji Tanaka, both of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 73,661, Jul. 15, 1987, Pat. No. 4,833,542. This application Jun. 9, 1988, Ser. No. 204,314

Claims priority, application Japan, Jul. 15, 1986, 61-166151; Aug. 18, 1986, 61-191720; Oct. 24, 1986, 61-25338

Int. Cl.[4] H04N *5/66, 5/74, 9/12, 9/31*
U.S. Cl. 358—230 **4 Claims**



1. A display apparatus having a plurality of picture elements (2) each capable of having any one of plural display gradations, said apparatus comprising:

a display means (4) in which picture elements (2) are arranged in a matrix form of $2^a \times 2^b$ picture elements, where a and b are integers;

a frame memory (15) for storing c-bit data representing one of 2^c different gradations for each said picture element where c is an integer, said frame memory responding to an address input of (a+b) bits to provide a c-bit data output corresponding to a picture element identified by said (a+b)-bit address input; and

a clock signal source for providing a clock signal;

an address control section (18) for frequency-dividing said clock signal successively by factors ranging from $\frac{1}{2}$ to $(\frac{1}{2})^{a+b+c}$ to obtain an output of (a+b+c) bits, wherein (a+b) of said output bits from said address control section correspond to one of said (2^a+2^b) picture elements in said display means and determine said (a+b)-bit address input to said frame memory, and wherein c of said output bits from said address control section identify a reference signal level corresponding to one of said 2^c display gradations available for each picture element;

an on-off decision section (16) for performing a comparison of the c-bit data output from said frame memory with said reference level and for producing 1-bit data output representing "on" and "off" states of said picture elements in accordance with results of said comparison; and

timing control means (FIG. 15) for applying said 1-bit data to said picture elements and holding said 1-bit data for a predetermined period of time to drive said display means;

4,901,156

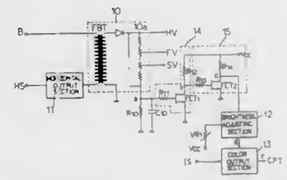
AUTOMATIC BRIGHTNESS LIMITING CIRCUIT

Keun J. Yook, Kyeongsangbook-do, Rep. of Korea, assignor to Goldstart Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 23, 1987, Ser. No. 137,068

Claims priority, application Rep. of Korea, Dec. 26, 1986, 21306/1986

Int. Cl.[4] H04N *3/18*
U.S. Cl. 358—243 **2 Claims**



1. An automatic brightness limiting circuit for preventing color dispersion of a display signal caused by an excessive beam current flowing through a color picture tube comprising:

output signal means for developing a focus control signal, a screen control signal, a high output signal and a constant output signal in response to input signals, said output signal means including,

flyback transforming means for developing said high output signal in response to said input signals,

a serial resistor circuit connected to said high output signal for developing said focus control signal from a first terminal, said screen control signal from a second terminal and said constant output signal from a third terminal of said serial resistor circuit, and

an RC circuit connected to said output of said serial resistor circuit;

detecting means for detecting said constant output signal, said detecting means including a first field effect transistor and first and second resistors;

amplifying means for developing an amplified signal of said constant output signal detected by said detecting means, said amplifying means including a second field effect transistor and third and fourth resistors;

brightness adjusting means connected to said amplifying means for developing a control signal; and

color output means for developing the display signal in response to said control signal, said control signal compensating for the excessive beam current and preventing color dispersion of the display signal.

4,901,157

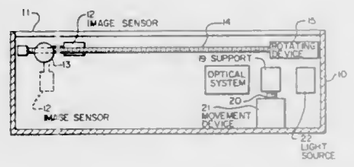
LINE SCAN IMAGE SCANNER FOR USE WITH REFLECTIVE ORIGINALS AND TRANSPARENT FILMS

Selsbi Ohmori, Tokyo, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 8, 1988, Ser. No. 229,538

Claims priority, application Japan, Sep. 30, 1987, 62-246368

Int. Cl.[4] H04N *1/024, 1/040*
U.S. Cl. 358—474 **1 Claim**



1. A line scan image scanner comprising:

a platen onto which a reflective original is placed;

a line scan type image sensor having a line of sensor elements;

a support device for supporting the image sensor so that the image sensor is rotatable from a first position in which the line of sensor elements face the platen to a second position which is about 90° apart from the platen;

means for moving said support device relative to said platen so as to enable the image sensor to scan originals a line at a time;

a film support device for supporting transparent film;

a source of light;

an optical system for projecting light from the source through the film onto the image sensor when in its second position; and

means for moving the film support device.

4,901,158

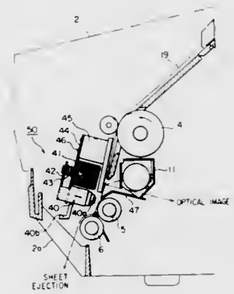
VERIFICATION STAMP EQUIPMENT

Siro Sato, Hachioji; Kazuyuki Nisbino, Ageo, and Shiro Hatakeyama, Tokyo, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 302,176

Claims priority, application Japan, Jan. 30, 1988, 63-11714

Int. Cl.[4] G01D *15/20;* **B41J** *27/00*
U.S. Cl. 358—296 **7 Claims**



1. A stamping apparatus for use in a facsimile machine apparatus for stamping a document with a mark, comprising:

stamp means having a stamp face for marking a document;

slider means for detachably holding the stamp means, the stamp means being removable from the slider means by applying a removing force along a removing direction and being insertable into the slider means by applying an inserting force along an inserting direction;

driving means in fixed relation to the facsimile machine for moving the slider means relative to the facsimile machine between a first position, wherein the stamp face is spaced from the document, and a second position, wherein the stamp face is in engagement with the document; and

mounting means for mounting said driving means to the facsimile machine.

4,901,159

MAGNETIC RECORDING APPARATUS FOR RECORDING VIDEO AND TWO KINDS OF AUDIO SIGNALS

Shuzo Hitotsumachi, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 22, 1988, Ser. No. 184,870

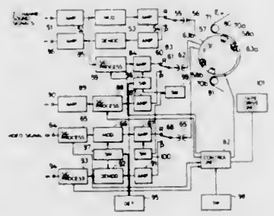
Claims priority, application Japan, May 14, 1987, 62-117367

Int. Cl.[4] H04N *5/782*
U.S. Cl. 358—330 **5 Claims**

1. A recording and reproducing apparatus comprising:

(a) a first group of magnetic heads having different azimuth

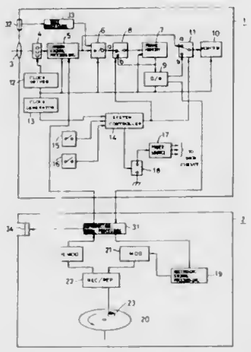
angles, a second group of magnetic heads having different azimuth angles which also differ from the azimuth angles of the magnetic heads in the first group, and a third group of magnetic heads having different azimuth angles which also differ from the azimuth angles of the magnetic heads in the first and second groups;
(b) a first modulator converting a first input signal into a corresponding frequency-modulated signal;
(c) means for applying an output signal of the first modulator to the first group of the magnetic heads;
(d) a first demodulator demodulating a signal reproduced via the first group of the magnetic heads;
(e) a first digital signal processor converting the first input signal into a corresponding digital signal and processing the digital signal;
(f) means for applying an output signal of the digital signal processor to the second group of the magnetic heads;
(g) a second digital signal processor processing a signal reproduced via the second group of the magnetic heads and converting the reproduced and processed signal into an analog signal;
(h) a first signal processor separating an input video signal into a luminance signal and a color signal;



(i) a second modulator converting output signals of the first signal processor into a corresponding frequency-modulated luminance signal and a corresponding down-converted chrominance signal;
(j) means for applying an output signal of the second modulator to the third group of the magnetic heads;
(k) a second demodulator converting a signal, reproduced via the third group of the magnetic heads, into a luminance signal and a color signal;
(l) a second signal processor converting output signals of the second demodulator into a video signal;
(m) a detector sensing a sensed portion of a magnetic tape cassette and generating a detection signal representative thereof;
(n) means for enabling the application of the output signal of the first digital signal processor to the second group of the magnetic heads in accordance with the detection signal; and
(o) means for increasing a frequency of a carrier of the frequency-modulated luminance signal in accordance with the detection signal.

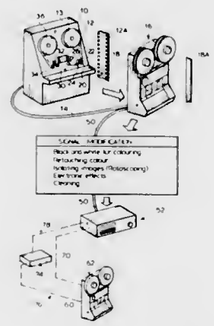
4,901,160
ELECTRONIC CAMERA
Takao Kinoshita, and Yoshiyuki Takishima, both of Kawasaki, Japan
PCT No. PCT/JP86/00479, § 371 Date May 12, 1987, § 102(e) Date May 12, 1987
PCT Filed Sep. 13, 1986, Ser. No. 54,590
Claims priority, application Japan, Sep. 13, 1985, 60-201745
Int. Cl.[4] H04N *5/76, 5/782*
U.S. Cl. 358—335 **10 Claims**

1. An electronic camera system comprising:
a camera unit including an image pickup element and digital memory means for recording at least one frame of digital image signals supplied from said image pickup element; and
an external recording unit including an analog memory means,
wherein said external recording unit is capable of being removably mounted on said camera unit,



and wherein said external recording unit receives said digital image signal recorded in said digital memory means from said camera unit and converts the received digital image signal into an analog signal for recording on said analog memory means.

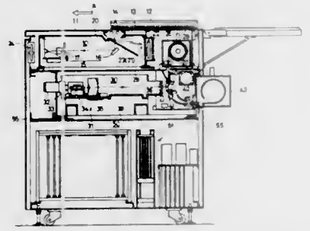
4,901,161
METHOD OF TRANSFER OF FILM TO VIDEO AND SYSTEM THEREFOR
Wilfred J. Giovanella, Weston, Canada, assignor to Tintoretto Inc., Toronto, Canada
Filed Dec. 10, 1987, Ser. No. 132,421
Claims priority, application Canada, Dec. 23, 1986, 526209
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—346 **8 Claims**



1. An improved process of transferring film images to video or conversion of video containing images from film previously transferred to video for the affecting thereof and the recording thereof to a master recording at a real time rate, the process comprising the steps of:
(a) transferring film images to video or recording video carrying the film images previously recorded to it to video in a 1:1 frame of film images to frame of video ratio where one frame of film, or one frame of film previously transferred to video as the case may be, corresponds to one frame of video;

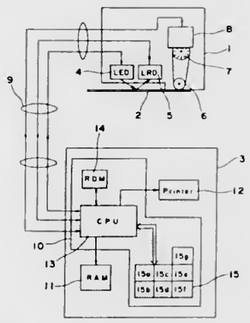
(b) affecting the film images on the video;
(c) transferring the video to a master recording suitable for play at a real time rate by simulating the 3:2 pull down by recording the fields of the video to the fields of the master in the following sequence, either:
(i) two fields of the video recorded on two fields of the master, then the next two fields of the video recorded on the next three fields of the master, then the next two fields of the video recorded on the next two fields of the master, then the next two fields of the video on the next three fields of the master and so on; or
(ii) two fields of the video recorded on three fields of the master, then the next two fields of the video recorded on the next two fields of the master, then the next two fields of the video recorded on the next three fields of the master, then the next two fields of the video recorded on the next two fields of the master and so on; maintaining throughout the 3:2 "pull-down" the same sequence of transfer.

4,901,162
IMAGE READING AND RECORDING APPARATUS
Kenji Kawai; Kazuma Kan, both of Shiga, and Takumi Yoshida, Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan
Filed Nov. 17, 1987, Ser. No. 121,520
Claims priority, application Japan, Nov. 25, 1986, 61-180855[U]
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—468 **14 Claims**



1. An apparatus for reading an image of an original and recording said original on a photosensitive material, said apparatus comprising:
a single housing having an upper section, a middle section located below said upper section and a lower section located below said middle section;
an image reading station including a fixed type image forming optical system for reading an image of said original, said image reading station being located in said upper section of said housing;
original moving means for moving said original in a forward and backward direction at a location above said image reading station so as to be scanned by said fixed type image forming optical system;
magazine means located in said upper section of said housing horizontally adjacent to said image reading station for holding and supplying said photosensitive material, said magazine means dispensing said photosensitive material in the downward direction;
an image recording station located in said middle section of said housing for recording said image on said supplied photosensitive material located at said image recording station based on a signal read by said image reading station, said image recording station comprising a photosensitive material storage bin at its end, said exposed photosensitive material being stored in said storage bin, said magazine means and said storage bin being located at the ends of the same sides of said image reading station and said image recording station;
electric control means located in said lower section of said housing for controlling the reading operation of said image reading station and for controlling the recording operation of said image recording station.

4,901,163
IMAGE READER FOR A PORTABLE COPIER
Hiroshi Tsujioka, Nara; Shigeo Yoneda, Yamatokooriyama, and Yasufumi Yatsuzuka, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 16, 1987, Ser. No. 108,993
Claims priority, application Japan, Oct. 16, 1986, 61-246700; Oct. 17, 1986, 61-248140; Oct. 20, 1986, 61-249840; Oct. 20, 1986, 61-249829; Oct. 20, 1986, 61-250407; Oct. 20, 1986, 61-250408
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—473 **7 Claims**



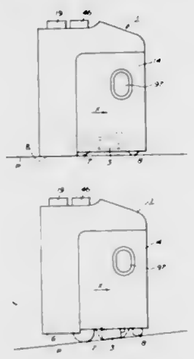
1. An image reader comprising:
a reading head being capable of scanning a document and which is comprised of detection means for generating pulses according to the movement of the reading head and an image sensor for reading the document image in a manner synchronized with pulses generated by the detection means,
memory means for storing image data obtained by the image sensor,
write control means for writing said image data into the memory means,
image data processing means including dot count means for counting respective sums of real dot data aligned on individual dot lines of said document image and decision means for discriminating against image data contained in an area defined between two of said dot lines for respective sums of real dot data which is less than a predetermined sum value and writing image data greater than said predetermined sum value into the memory means whereby undesired noise data is removed from the image data read by the image sensor prior to writing image data into the memory means and thereafter printing an image of said document, and
a printer for printing out a noise free image of the image data stored in the memory means.

4,901,164

HAND SCANNER TYPE IMAGE INPUT/OUTPUT DEVICE WITH RECIPROCABLY SUPPORTED ROLLER AND THERMAL HEAD

Hideaki Kurosawa, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 24, 1989, Ser. No. 315,154
Claims priority, application Japan, Mar. 1, 1988, 63-48076
Int. Cl.[4] H04N *1/04, 1/23*
U.S. Cl. 358—473 **24 Claims**



1. A hand scanner type image input/output device comprising

a main body adapted to be moved on and scan an object and having enclosed therein a read-out scanning section adapted to read out and scan the information recorded on the desired portion of said object, said information being entered via a read-out opening formed in a surface facing to said object, said main body including a mounting reference surface with respect to said object on the perimeter of said read-out opening,

a movable roll reciprocably supported on the surface in which said read-out opening is formed, said movable roll being rotated in synchronism with means adapted for detecting the amount of movement of said main body, and

a travel guide section rotatably mounted to said main body.

4,901,165

VIDEO SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

Yasutoshi Matsuo, Kawasaki, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

Continuation of Ser. No. 189,159, May 2, 1988, abandoned, which is a division of Ser. No. 684,863, Dec. 21, 1984, Pat. No. 4,768,109. This application Feb. 21, 1989, Ser. No. 314,226
Claims priority, application Japan, Dec. 24, 1983, 58-251843; Dec. 24, 1983, 58-251844; Dec. 28, 1983, 58-247455
Int. Cl.[4] H04N *5/92*
U.S. Cl. 360—9.1 **1 Claim**

1. A video signal recording and reproducing apparatus comprising:

sampling means for sampling an input video signal such as a luminance signal by a signal having a frequency f_s, said frequency f_s being lower than twice an upper limit frequency of said input video signal and being higher than the upper limit frequency, said frequency f_s being described by an equation $f_s \approx (\frac{1}{4}).(2n+1).f_H$, where n is a natural number and f_H represents a horizontal scanning frequency of said input video signal;

multiplexed signal obtaining means for obtaining a multiplexed signal by multiplexing a reference burst signal to an output sampled signal of said sampling means for every predetermined time period, said reference burst signal being obtained by frequency-dividing said signal having the frequency f_s;

recording means for recording the output multiplexed signal of said multiplexing means on a recording medium;

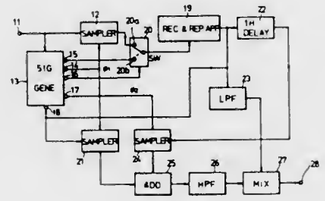
reproducing means for reproducing the recorded multiplexed signal from said recording medium;

reproduced sampled signal obtaining means comprising a delay circuit for obtaining from the output reproduced multiplexed signal of said reproducing means first and second reproduced sampled signals having a relative time difference of one horizontal scanning period;

sampling pulse generating means for generating first and second sampling pulses having the frequency f_s and having phases which mutually differ by 180° in phase synchronism with said reference burst signal which is separated from the output reproduced multiplexed signal of said reproducing means;

re-sampling means for obtaining a first re-sampled signal by re-sampling said first reproduced sampled signal by said first sampling pulse and for obtaining a second re-sampled signal by re-sampling said second reproduced sampled signal by said second sampling pulse; and

reproduced video signal producing means for at least adding the output first and second re-sampled signals of said



re-sampling means so as to produce a reproduced video signal which is essentially sampled at a frequency $2f_s$,

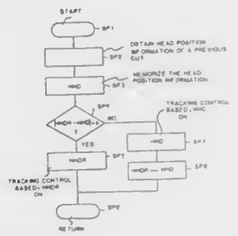
wherein said sampling pulse generating means comprises reference burst signal reproducing means for separating said reference burst signal from the output reproduced multiplexed signal of said reproducing means and for producing a comparison signal having a frequency related to the frequency f_s by frequency-multiplying said reference burst signal, a phase synchronizing circuit for producing as said first sampling pulse a pulse which is in phase synchronism with the horizontal synchronizing signal separated from the reproduced multiplexed signal and has the frequency f_s from a variable frequency oscillator within a loop of said phase synchronizing circuit, and sample and bold means for sampling a phase error signal in a duration in which said reference burst signal is reproduced and for holding the sampled value until a next reference burst signal is reproduced so as to obtain a certain signal, said phase error signal being obtained by comparing the phase of the output comparison signal of said reference burst signal reproducing means and the phase of said first sampling pulse, said certain signal being supplied to said variable frequency oscillator as a control signal for controlling the oscillation frequency of said variable frequency oscillator.

4,901,166

TRACKING CONTROL FOR VTR EDITING EMPLOYING PREVIOUSLY RECORDED TRACKING INFORMATION

Toshiaki Kojima, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 11, 1987, Ser. No. 24,712
Claims priority, application Japan, Mar. 20, 1986, 51-064563
Int. Cl.[4] G11B *27/02*
U.S. Cl. 360—14.1 **8 Claims**



1. Editing apparatus for recording an information signal in transverse tracks at respective editing points on a record medium, comprising:

a transducing device;

means for generating tracking information signals from previously recorded signals on the record medium indicative of respective relative positions between at least first and second groups of tracks at respective locations on said record medium and said transducing device;

means for generating a difference signal between generated first and second tracking information signals obtained from a first location prior to an editing point on said record medium and a second location prior to the first location, respectively; and

position controlling means for selecting one of said first and second tracking information signals based upon the generated difference signal and for controlling a relative position between the record medium and the transducing device in response thereto, said position controlling means including means for comparing the difference signal with a predetermined value contained within said means for comparing that represents a percentage of a track width, so that one of the first and second tracking information signals is selected in response to a result of the comparison.

4,901,167

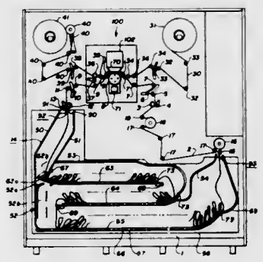
LOOP BIN

John E. Gantzhorn, Jr., Hockessin, Del.; Toshiaki Shima; Koichi Sota, both of Tokyo, Japan, and Kwai-Yung B. Su, Hockessin, Del., assignors to Otari Electric Company, Ltd., Japan

Filed Mar. 25, 1988, Ser. No. 174,495
Int. Cl.[4] G11B *5/86;* **B65H** *20/24*
U.S. Cl. 360—15 **3 Claims**

1. In a magnetic tape recording system of the type having a contact printing station for receiving a copy tape and an endless master tape and producing a reversed image of the image on the master tape onto the copy tape, a supply reel for supplying the copy tape, a rewind reel for rewinding the copy tape, copy tape tension detection and control means, master tape tension detection and control means, tape driving means for transporting the tapes, and a loop bin for storing a portion of the master tape in a zigzag fashion, the loop bin having an inlet and an outlet, the improvement which comprises:

means capable of dividing the loop bin into cascading levels for continuously transporting the zigzag master tape portion on each level, wherein



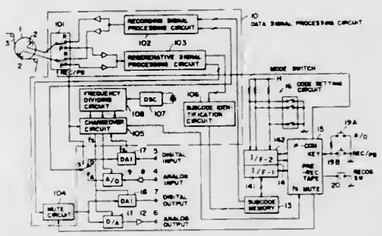
said means for transporting comprises at least one drive roller and a plurality of rotatable rollers having grooves interconnected by a plurality of belts in the grooves.

4,901,168

APPARATUS AND METHOD FOR RECORDING AND REPRODUCING A DIGITAL SIGNAL

Shiro Yoshida; Tatsuro Shirai, and Satoru Nagashima, all of Maebashi, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 11, 1988, Ser. No. 180,059
Claims priority, application Japan, Apr. 9, 1987, 62-87515
Int. Cl.[4] G11B *15/04*
U.S. Cl. 360—60 **4 Claims**



1. An apparatus for recording and reproducing a digital signal, which apparatus records an input digital signal on a recording medium and reproduces therefrom digital signals recorded thereon, comprising:

first means for recording on the recording medium an identification code being an identification number particular to said digital signal recording and reproducing apparatus only when said input digital signal has a predetermined sampling frequency at the time of recording whereby said identification code is selectively recorded on the recording medium along with said input digital signal; and

second means for reproducing said recorded identification code at the time of reproduction of said recorded input digital signal, for thus permitting the input digital signal recorded on said recording medium to be reproduced only when the reproduced identification code is coincident with said identification number particular to said digital signal recording and reproducing apparatus.

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4,901,169

DATA RECORDING APPARATUS ABLE TO ACCURATELY ACCESS A FLOPPY DISK REGARDLESS OF RECORDING DENSITY

Hiromi Hamaoka, and Shoji Saito, both of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 8, 1988, Ser. No. 153,711
Claims priority, application Japan, Feb. 27, 1987, 62-44544
Int. Cl.[4] G11B *5/03, 5/09*
U.S. Cl. 360—66 **13 Claims**

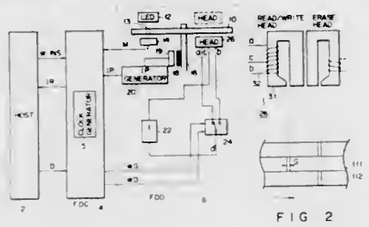


FIG 2

1. A data recording apparatus including at least one read/write head capable of accurately accessing a floppy disk recording medium regardless of a recording density thereof, said floppy disk medium being rotated, comprising:

density determining means for determining whether said medium is of a high or low density;

erase means for selectively erasing data previously recorded on a recording area of a track where said read/right head is currently positioned in accordance with a result determined by said density determining means and a write command input thereto with said erasing being done while a first rotation of said medium is performed;

write means for selectively writing write data on said recording area in accordance with said result determined by said density determining means and said write command input thereto with said writing being done while a second rotation of said medium is performed; and

erase determining means for determining whether erasure of the recorded data by said erase means has been completed said erase determining means comprising generating means for generating index pulses upon rotation of a spindle and determining means for determining, based on the number of pulses received from said generating means, whether erasure of the recorded data on a recording area has been completed.

4,901,170

ROTARY HEAD TYPE DIGITAL SIGNAL REPRODUCING METHOD

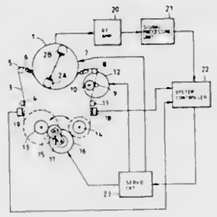
Takahiro Kato, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 19, 1988, Ser. No. 195,971
Claims priority, application Japan, Jun. 16, 1987, 62-148045
Int. Cl.[4] G11B *15/46*
U.S. Cl. 360—73.07 **4 Claims**

1. A method for reproducing a digitally recorded tape with a rotary head reproducing apparatus, comprising the steps of:

automatically detecting selections recorded on said tape recorded in an unreproducible mode; and

automatically fast forwarding said tape in a forward direction past ones of said selections found recorded in said unreproducible mode, wherein said step of automatically detecting selections recorded in said unreproducible mode comprises detecting PCM-ID portions recorded and comparing said decoded data with the reproducing capabilities of the reproducing apparatus mode.

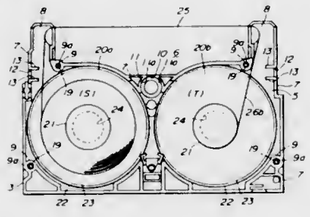


4,901,171

OPTICAL TAPE END SENSING ARRANGEMENT FOR MAGNETIC TAPE CASSETTE

Kiyoshi Urayama; Shinya Sato, and Yuji Iwahashi, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 174,206
Claims priority, application Japan, Apr. 6, 1987, 62-084462
Int. Cl.[4] G11B *5/22*
U.S. Cl. 360—74.6 **29 Claims**



1. In a tape cassette including a tape having at least one tape end having greater light transmittance than the rest of the tape, the combination of:

means for housing a light source;

means defining a light transmission aperture in a wall portion of the cassette; and

means for sensing the tape end being reached, said tape end sensing means comprising means associated with said light transmission aperture for preventing light which does not come directly from the light source from passing through said light transmission aperture, said light passage preventing means being formed integrally with the cassette housing.

4,901,172

RECORDING/PLAYBACK APPARATUS WITH AUTO-CHANGER

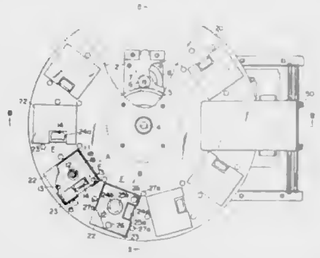
Makoto Nakazawa; Takao Miyazaki, and Mitsuo Soumi, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 9, 1988, Ser. No. 191,938
Claims priority, application Japan, May 8, 1987, 62-110484; May 8, 1987, 62-110485; Aug. 18, 1987, 62-200796; Sep. 11, 1987, 62-226499; Sep. 11, 1987, 62-226500
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—98.05 **12 Claims**

1. A recording/playback apparatus comprising:

a rotary body (20) on which a plurality of holding means each holding a disk-like recording medium (F) in a freely loadable and unloadable manner are fixedly arranged at predetermined angular intervals circumferentially about the rotary body, and

two types of drive units provided at a predetermined angular position with respect to said rotary body and arranged to freely approach and separate from a selected one of said plurality of holding means which has arrived at said predetermined position for rotatively driving the selected recording medium held by said selected one of said plurality of holding means and subjecting the selected recording medium to recording/playback, one of said drive units approaching and separating from one main surface of said disk-like recording medium and the other of said drive units approaching and separating from the other main surface of said recording medium.

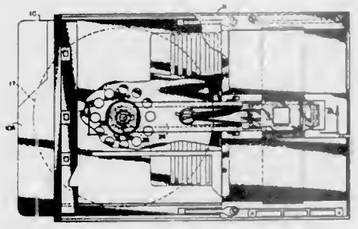


4,901,173

APPARATUS FOR COUPLING RECORD DISK TO DISK DRIVE

David E. Jones, 1289 E. 800 North, Layton, Utah 84041; Robert D. Freeman, 4439 S. 1800 West, Roy, Utah 84067, and Randall C. Bauck, 1256 E. 800 North, Layton, Utah 84041

Continuation of Ser. No. 854,333, Apr. 21, 1986, abandoned. This application Aug. 24, 1988, Ser. No. 238,980
Int. Cl.[4] G11B *5/016*
U.S. Cl. 360—99.04 **8 Claims**



1. A device for coupling and aligning a record disk to a drive spindle contained in a disk drive for rotation of said record disk, said device comprising:

(a) a rotatable cylindrical drive spindle having at one end a surface substantially parallel to the plane of rotation of said disk and an aligning slot in said surface, said aligning slot having a closed end which terminates at about the axis of rotation of said drive spindle and an open end which extends to the perimeter of said drive spindle;

(b) an aligning pin mounted to the disk and contained within said aligning slot upon entry of said disk into said disk drive; and

(c) means for engaging and rotating said disk so as to urge said aligning pin into said closed end of said aligning slot, said engaging and rotating means including:

(i) a disk hub mounted coaxially to the record disk;

(ii) a drive lip on the disk hub extending from the circumference of the disk hub; and

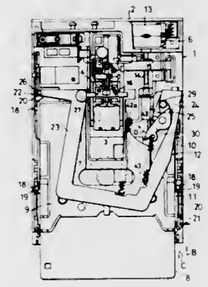
(iii) a drive pin mounted to said drive spindle and in contact with said drive lip such that rotation of said drive spindle causes rotation of said disk and urges said aligning pin into the apex of said aligning slot.

4,901,174

DISK CASSETTE LOADING AND EJECTING MECHANISM FOR A MAGNETIC DISK APPARATUS

Yukio Saito, and Masao Ohkita, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1988, Ser. No. 180,296
Claims priority, application Japan, Dec. 16, 1987, 62-316093
Int. Cl.[4] G11B *17/028*
U.S. Cl. 360—99.06 **3 Claims**



1. A disk cassette loading mechanism for a disk driving apparatus **1** having a chassis **2**, a cassette holder **9** for holding a disk cassette **8**, a turntable **7** for rotating a disk contained in a disk cassette, a frame **10** for supporting the cassette holder so that the cassette holder is able to move perpendicularly to the chassis, and a sliding plate **11** for moving the cassette holder perpendicularly to the chassis, said disk cassette loading mechanism comprising:

a first operating member **25** pivotally coupled to a first arm **24** of a second operating member **23** and movable in a plane horizontal to a plane of said cassette holder, said first operating member having a first pin means **37** for being contacted by a disk cassette inserted in the disk driving apparatus upon the arrival of the disk cassette at a predetermined position on the cassette holder, said disk cassette, when contacting said first pin means upon insertion of said disk cassette, applying pressure thereto to cause said first operating member to pivot in a first pivoting direction about a first pivot point **32**, said first operating member having a second pin means **39** which, upon pivoting of said first operating member, engages a recess **38** of the disk cassette, said pivoting of said first operating member causing said first operating member to be unlocked from a first position;

said second operating member **23** which supports the first operating member pivotally thereon being supported pivotally on the chassis at a second pivot point **27**, said second operating member being biased resiliently in a cassette loading direction by resilient means **42**, said second operating member pivoting about said second pivot point in the cassette loading direction when the first operating member is unlocked during insertion of said disk cassette, said pivoting of said second operating member causing a second arm **26** of said second operating member to exert a force on said sliding plate **11** and causing said sliding plate to be moved in a direction opposite said cassette loading direction, said disk cassette being moved

in said cassette loading direction by said second operating member under force supplied by said resilient means for positioning over said turntable, said second operating member being movable in a plane horizontal to a plane of said cassette holder; and

a third operating member **33** provided on the sliding plate for engagement with the first operating means when the sliding plate is pushed in said cassette loading direction for cassette ejection operation, said pushing in of said sliding plate in said cassette loading direction for cassette ejection operation, said pushing in of said sliding plate in said cassette loading direction causing said first operating member to pivot in a direction opposite to said first pivoting direction so as to cause the first operating member to be locked **41** and to disengage said first pin **39** from the recess of the disk cassette so that the disk cassette can be removed from the disk driving apparatus, said third operating member and said sliding plate being movable in a plane horizontal to said plane of said cassette holder.

4,901,175

MAGNETIC HEAD SUPPORTING DEVICE

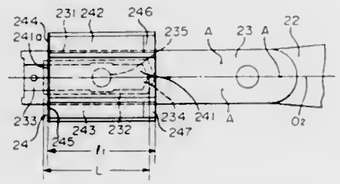
Yoshiaki Ito; Jolchiro Ezaki, and Katsuhiko Tomita, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jun. 13, 1988, Ser. No. 206,121

Claims priority, application Japan, Jun. 26, 1987, 62-99169[U]

Int. Cl.⁴ G11B *5/60, 2/21*

U.S. Cl. 360—103 **3 Claims**



1. A magnetic head supporting device of a type wherein the longitudinal direction of the supporting device extends in the tangential direction to the tracks of a magnetic disk, and which comprises:

a supporter having a flexible spring portion and a rigid beam portion contiguous to said flexible spring portion;

a flexible piece having a flexible flat portion extending substantially parallel to the longitudinal direction of said supporter, a pair of flexible outer frame portions extending from both edges of a free end of said flexible piece and parallel to the longitudinal direction of said supporter, a lateral frame portion connecting the free ends of said pair of flexible outer frame portions, and a central tongue portion formed of a substantially rectangular flexible plate which has one end fixed to the intermediate part of said lateral frame portion and the other end extending inside and substantially parallel to said pair of flexible outer frame portions to form a free end, said flexible piece having the other end fixed to said supporter;

a loading projection attached to the upper surface of said central tongue portion or the lower surface of the terminal portion of said supporter to transmit a loading force at the terminal portion of said supporter to said central tongue portion; and

a magnetic head with a slider attached to the lower surface of said central tongue portion, wherein the slider includes float rails and reading/writing elements and is placed in such a manner that the float rails extend in the same direction as the longitudinal direction of said supporter and the front end of the float rails of said slider does not overlap with said lateral frame portion.

4,901,176

MAGNETIC HEAD SUPPORT ASSEMBLY FOR FLOPPY DEVICE

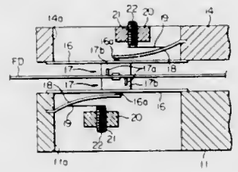
Takashi Kuzuhara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 29, 1988, Ser. No. 149,835

Claims priority, application Japan, Jan. 31, 1987, 62-21295

Int. Cl.⁴ G11B *21/20, 21/24*

U.S. Cl. 360—104 **5 Claims**



1. A head supporting assembly able to read data from and write data on either side of a disk having two sides, comprising:

a pair of head means for reading data from and writing data on both sides of the disk;

a pair of flexible head supporting plates for movably supporting the head means, respectively;

a pair of head supporting means, opposed to each other, each for supporting one of the head supporting plates, at least one of the head supporting means being pivotable toward and away from the other head supporting means;

a pair of pivot spring means, each mounted on one of the head supporting means, for supporting the head supporting plates;

pressure spring means for forcing the head supporting means so that in one of the reading and writing operations the head means contact the disk;

in one of the reading and writing operations, the flexible head supporting plates and the pivot spring means bend and provide first pressing forces for maintaining close operative relation between the head means and the disk;

adjusting spring means for providing a second pressing force with the pivot spring means, the adjusting spring means having higher flexibility than that of the pivot spring means; and

pressure adjusting means for finely adjusting the first pressing forces for the head means by adjusting the second pressing force.

4,901,177

MAGNETIC READ HEAD FOR A VERY NARROW TRACK

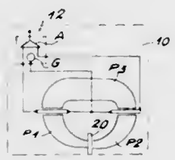
Jean-Pierre Lazzari, Corenc, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 14, 1988, Ser. No. 167,729

Claims priority, application France, Mar. 19, 1987, 87 03821

Int. Cl.⁴ G11B *5/30*

U.S. Cl. 360—113 **2 Claims**



1. A magnetic read head comprising:

a semiconductor substrate having an upper face;

a spacer formed by a magnetic vertical wall perpendicular to said upper face, said spacer having a height at least equal to the width of a track to be read;

a loop-like magnetic circuit formed by a magnetic coating, said circuit having two pole pieces separated by said spacer, said magnetic circuit being interrupted by two slots arranged symmetrically with respect to a plane passing through said spacer;

two elements having an electric property sensitive to a magnetic field, said two elements being inserted in said slots,

an electronic circuit integrated in said semiconductor substrate, said circuit having at least one regulated current generator (G) and a differential amplifier (A) with two inputs respectively connected to the two elements sensitive to the magnetic field and connected in opposition, said amplifier having an output supplying a reading signal.

4,901,178

THIN FILM MAGNETIC HEAD

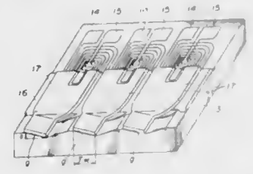
Tomio Kobayashi; Iwao Abe; Kazuo Kashiwa; Yukihiro Aizawa, all of Miyagi, and Hiroyuki Suzukawa, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 13, 1987, Ser. No. 14,535

Claims priority, application Japan, Feb. 13, 1986, 61-17961; Apr. 26, 1986, 61-97656; Apr. 26, 1986, 61-97657; Sep. 4, 1986, 61-208701

Int. Cl.⁴ G11B *5/147*

U.S. Cl. 360—126 **17 Claims**



1. A thin film magnetic head including a magnetic substrate having a generally planar upper surface, a coil conductor and an upper magnetic film that are successively laminated on said upper generally planar surface of said magnetic substrate with the interposition of respective insulating films above and below said coil conductor, and at least one inclined surface formed on said substrate in the vicinity of a slide contact surface thereof with a magnetic recording medium, said inclined surface being inclined at a predetermined angle relative to said upper surface, said upper magnetic film being formed on said inclined surface for setting the azimuth of a magnetic gap formed between said substrate and said upper magnetic film.

4,901,179

MAGNETIC HEAD HAVING A LAMINATED STRUCTURE

Mitsuo Satomi, Katano; Ken Hirota, Toyonaka, and Osamu Inoue, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

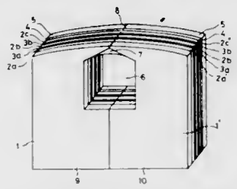
Continuation of Ser. No. 829,070, Feb. 13, 1986, abandoned. This application Feb. 23, 1988, Ser. No. 161,408

Claims priority, application Japan, Feb. 15, 1985, 60-28639; Oct. 11, 1985, 60-227111

Int. Cl.⁴ G11B *5/147, 5/235*

U.S. Cl. 360—126 **5 Claims**

1. A magnetic head having a tape contact surface defined by a magnetic core and a gap, characterized in that said gap is filled with a gap space material and said magnetic core has a multilayered structure comprising alternate layers of a magnetic material and an interface insulation material, and at least one of said interface insulation material and said gap space material is substantially of one component selected



from the group consisting of α-Fe_2O_3, MgO-NiO, MgO-MnO, MgO-TiO_2, SrO-TiO_2, NiO-MnO and ZnO-Fe_2O_3.

4,901,180

MAGNETIC DISK CARTRIDGE

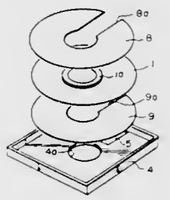
Kengo Oishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 94,558, Sep. 9, 1987, abandoned. This application Mar. 27, 1989, Ser. No. 333,722

Claims priority, application Japan, Sep. 9, 1986, 61-138375

Int. Cl.⁴ G11B *23/02*

U.S. Cl. 360—133 **5 Claims**



1. A magnetic disk cartridge, comprising:

a disk case,

a magnetic disk rotatably disposed in said disk case; and

a liner member disposed at least between an inner surface of said disk case and a circular surface of said magnetic disk, wherein said liner member is a porous super-high molecular weight polyethylene.

4,901,181

MOTOR CONTROL DEVICE

Chosbich Miyanaga, and Kanji Yokomizo, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 8,166, Jan. 29, 1987, abandoned. This application Feb. 9, 1989, Ser. No. 308,935

Claims priority, application Japan, Jan. 30, 1986, 61-12466[U]; Jan. 31, 1986, 61-19861

Int. Cl.⁴ H02H *7/09*

U.S. Cl. 361—33 **6 Claims**

1. A motor control device for controlling a motor comprising:

motor driving means for supplying power to said motor and driving said motor in a first direction in response to a motor drive signal;

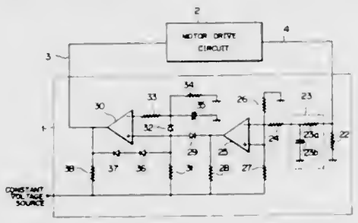
load detecting means for detecting a load of said motor and for developing a load signal in response thereto;

overload detecting means, responsive to said load signal, for determining whether said motor is in an overload condition by comparing the load signal to a predetermined reference load value indicative of an overload condition, said overload detecting means developing an overload signal when said overload condition is detected and devel-

oping a normal condition signal when said overload condition is absent; and

controlling means, responsive to the overload condition signal of said overload detecting means, for inhibiting said motor drive signal for a predetermined time period, and for supplying a control signal to said motor driving means during said predetermined time period for alternately driving said motor between said first direction and in a second direction opposite to said first direction;

said overload detecting means again determining after said predetermined time period has elapsed whether said motor is in said overload condition and developing said



overload condition signal to again initiate inhibition of the motor drive signal from said motor driving means for said predetermined time period if an overload condition continues to exist;

said motor driving means being responsive to said normal condition signal and resupplying said motor drive signal to said motor driving means upon the elapse of said predetermined time period when said overload condition is absent;

said overload detecting means, said controlling means, and said motor driving means collectively operating to intermittently and reversibly drive said motor driving means during said overload condition.

4,901,182

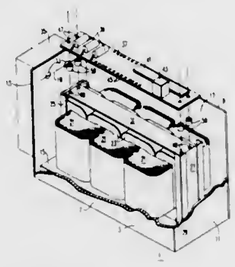
ELECTRICAL TRANSFORMER COMPONENT MOUNTING ASSEMBLY

William J. Book, Jefferson City, Mo., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 129,220, Nov. 27, 1987, abandoned. This application May 4, 1989, Ser. No. 348,088

Int. Cl.[4] H02H *7/04*; **H05K** *7/02*

U.S. Cl. 361—38 **2 Claims**



1. An electrical distribution transformer assembly comprising:

a tank having opposite side walls, opposite end walls, a bottom wall and an access opening;

a transformer core winding assembly including end frame members, a bottom frame member and a top frame member, supporting and securing a plurality of coils and at least one core, said transformer core winding assembly being movable into and out of said tank through said access opening;

a planar insulating component mounting board including a plurality of prepunched holes therethrough to accommodate a variety of component combinations thereon, mounted to and spaced from said top frame member between said core winding assembly and said access opening, a plurality of transformer components mounted to the surface of said component mounting board remote from said core winding assembly adjacent said access opening; and

a plurality of insulating spacers disposed between said insulating mounting board and said top frame member whereby said transformer components are readily accessible through said access opening and are positioned such as to not impede the removal of said transformer core winding assembly from said tank.

4,901,183

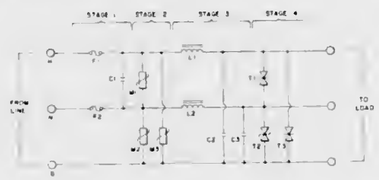
SURGE PROTECTION DEVICE

Benny H. Lee, Sonoma, Calif., assignor to World Products, Inc., Sonoma, Calif.

Filed Aug. 29, 1988, Ser. No. 237,745

Int. Cl.[4] H02H *9/00*

U.S. Cl. 361—56 **2 Claims**



1. A fail-safe voltage surge protection circuit for transient protection of AC lines, comprising:

input means having a hot line, a neutral line and a ground line for receiving power from an AC supply line;

output means having a hot line, a neutral line and a ground line for supplying said power to a load;

a first MOV connected between the hot line and neutral line of said input means, a second MOV connected between the neutral line and the ground line of said input means and a third MOV connected between the hot line and the ground line of the input means;

a first silicon transient suppressor connected between the hot line and neutral line of said output means, a second silicon transient suppressor connected between the neutral line and the ground line of said output means and a third silicon transient suppressor connected between the hot line and the ground line of the output means;

a first inductor connected between the hot line of said input means and the hot line of said output means, and a second inductor connected between the neutral line of said input means and the neutral line of said output means; first fuse means having a response time of less than 20 milliseconds at a precise current level connected in series in said hot line of said input means for fail-safe removal of said power from said load if any of said first MOV, third MOV, first silicon transient suppressor or third silicon transient suppressor fail shorted;

second fuse means having a response time of less than 20 milliseconds at a precise current level connected in series in said neutral line of said input means for fail-safe removal of said power from said load if any of said first MOV, second MOV, first silicon transient suppressor or second silicon transient suppressor fail shorted; and

said ground line of said input means connected to said ground line of said output means.

4,901,184

TRIP CONTROL APPARATUS OF CIRCUIT BREAKER

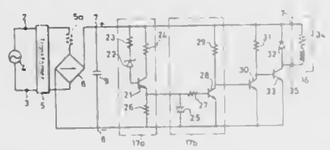
Kazuhiro Iahii; Yoshihiro Hatakeyama, both of Fujuyama, Japan, and Akira Takao, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,719

Claims priority, application Japan, Sep. 14, 1987, 62-140598[U]

Int. Cl.[4] H02H *3/24*

U.S. Cl. 361—36 **2 Claims**



1. A trip control apparatus of a circuit breaker comprising:

voltage detecting means for issuing an output signal in a voltage range above a predetermined voltage of a D.C. power source having an internal resistance,

first switch means to be closed by said output signal of said voltage detecting means,

a load resistance to be connected to said D.C. Power source by closing of said first switch means

second switch means to be closed by opening of said first switch means and to be opened by closing of said first switch means, and

a tripping coil of said circuit breaker having a resistance larger than said load resistance and to be connected to said D.C. power source by closing of said second switch means.

4,901,185

MAGNETIC HEAD DEVICE USED WITH A RIGID MAGNETIC DISK PROVIDING A CONSTANT DISTANCE BETWEEN THE MAGNETIC DISK AND A MAGNETIC GAP OF THE MAGNETIC HEAD DEVICE

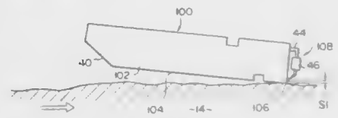
Masahiro Kubo, and Yasuo Ohtsubo, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 884,098, Jul. 10, 1986, abandoned. This application Feb. 2, 1988, Ser. No. 153,480

Claims priority, application Japan, Jul. 19, 1985, 60-159352; Jul. 19, 1985, 60-159353

Int. Cl.[4] G11B *5/48, 5/60*

U.S. Cl. 360—104 **7 Claims**



1. A magnetic head device used with a rotatable disk of a rigid type, which has a magnetic recording surface on at least one side surface thereof and which rotates in one direction, comprising:

a slider having a flat surface which faces the magnetic recording surface of the rotatable disk and which extends in a tangential direction with respect to said disk when said slider is located adjacent the periphery of the rotatable disk, and having a trailing end face extending perpendicular with respect to the recording surface of the rotatable disk, and further having a support surface opposite the flat surface;

support/drive means for elastically supporting the slider such that the slider is movable at least in a direction perpendicular to the rotatable disk, and for moving the slider in the radial direction of the disk;

floating means for applying a floating force to the slider to float the same above the magnetic recording surface of the rotatable disk when the disk is rotating, said floating means including at least one air bearing surface formed on the flat surface of said slider, and at least one tapered surface defined at a leading portion of the air bearing surface with respect to the rotational direction of the rotatable disk, said tapered surface being slanted in a direction away from the magnetic surface;

urging means for rotatively urging said slider so as to bring a trailing portion of the air bearing surface of the floating means, toward and in contact with the magnetic recording surface of the disk when said disk is rotating such that said slider receives the floating force produced by said floating means; and

a magnetic head provided on the trailing end face of the slider, and having a magnetic gap to perform data read and write operations on the magnetic recording surface of the rotatable disk, the magnetic gap being spaced apart from the trailing portion of the air bearing surface by a predetermined distance in a direction, perpendicular to the recording surface of the disk.

4,901,186

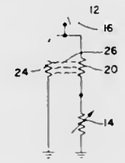
TEMPERATURE COMPENSATED THERMAL PROTECTOR

James A. Tennant, Perrysville, and Charles Yagher, Jr., Lexington, both of Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Jun. 6, 1988, Ser. No. 202,945

Int. Cl.[4] H01H *5/04*

U.S. Cl. 361—106 **3 Claims**



1. A thermal protector for electric circuits comprising first and second PTC devices connectable in series and being in heat transfer relationship with one another, said first PTC device being connectable in parallel with a load protected by said second PTC device, and said first PTC device being switchable to a high resistance state at a substantially lower temperature than said second PTC device, whereby switching of said first PTC to its high resistance state transfers heat to said second PTC device for maintaining same at an elevated temperature substantially below its switching temperature but at which elevated temperature its switching time is less susceptible to variations in ambient temperature.

4,901,187

ELECTRICAL TRANSIENT SURGE PROTECTION

Edward F. Allina, 605 Capri Blvd., Treasure Island, Fla. 33706

Continuation-in-part of Ser. No. 923,524, Oct. 28, 1986. This application Jan. 12, 1988, Ser. No. 123,419

Int. Cl.[4] H02H *9/04*

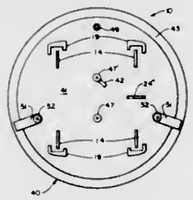
U.S. Cl. 361—117 **15 Claims**

1. In electrical apparatus containing a plurality of disklike

varistors of given diameter and thickness protective against lightning or other source of transient electrical surges, as via an available ground connector, the improvement in insulated means for holding such varistors, comprising

a base having a diameter greater than the varistor diameter and an opening therein to accommodate electrical conducting means in contact with one face of a varistor in such holding means, and

a circumferential sidewall upstanding from the base and having recessed therein at intervals therearound to accommodate connection to other electrical conducting means,



wherein such other electrical conducting means includes as parallel connectors thereof

a first such connector with a pair of conductive laminae interconnected by a flexible conductive bight curved to oppose the laminae spaced apart in contact with corresponding first faces of a pair of such varistors, and

a second such connector with a pair of conductive laminae interconnected by a flexible conductive bight curved to oppose the laminae spaced apart in contact with corresponding second faces of the same pair of varistors.

4,901,188

LINE PROTECTOR WITH SPRING

Alexander Gilberts, Algonquin, Ill., assignor to Reliance Comm/Tec Corporation, Franklin Park, Ill.

Filed Dec. 30, 1988, Ser. No. 292,387
Int. Cl.[4] H02H 9/06
U.S. Cl. 361—119 **17 Claims**



1. A line protector module device for a communications circuit comprising:

a base member, a frame member having a retaining portion, biasing means mounted to said base member, and an arrester and a solder pellet compressibly contained between said biasing means and said retaining portion of said frame member;

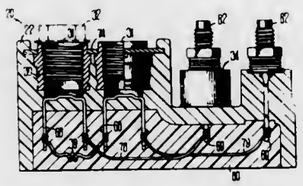
said biasing means further comprising a strip of material which is formed in an S-shape for compressing said arrester and said solder pellet against said retaining portion of said frame member, and stop means operatively coupled with said biasing means for preventing nonrecoverable compression of said S-shaped strip of material.

4,901,189

TERMINAL BLOCK AND METHODS OF MAKING

Glenn A. Merriman, Omaha, and Michael E. Szymanski, Elkhorn, both of Nebr., assignors to AT&T Technologies, Inc. American Telephone and Telegraph Company, Berkeley Heights, N.J.

Filed Jun. 24, 1988, Ser. No. 211,302
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—119 **13 Claims**



1. A protected terminal block, which comprises:

a plurality of wells;

a bushing which is disposed in each said well;

a protector which is received and secured in each said bushing;

a terminal associated and aligned with each of said bushings and having two tangs depending from a base thereof, said base of said terminal being spaced a predetermined distance from said associated bushing;

a plate through which the bushings extend and said plate providing a common ground for the plurality of bushings;

a plurality of pairs of terminal posts, each post having a conductorconnecting spade and each said pair being associated with two of said terminals, each of said posts being adapted to be connected to an outgoing cable;

a first plastic material which is disposed about innermost portions of said bushings, innermost portions of said tangs of said terminals and innermost portions of said spades of said posts, wherein said first plastic material is disposed about said bushings and associated terminals in a manner to hold each bushing and associated terminal in alignment with each other and to allow each said protector in each said bushing to engage said base of the associated terminal;

conductors which extend between remaining portions of said tangs and remaining portions of said spades of said terminal posts which are not enclosed by said first plastic material and from an incoming cable to said remaining portions of said terminal tangs, with the spade of one post of each pair being connected electrically to one of the tangs of one of said associated terminals, the spade of the other connected to one of the tangs of the other one of said associated terminals, and the other tang of each said terminal being connected to an incoming cable; and

a second plastic material which encapsulates said remaining portions of said spades of said terminal posts and said remaining portions of said tangs of said terminals.

4,901,190

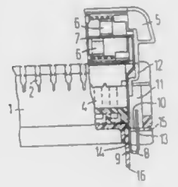
DISTRIBUTION ARRANGEMENT FOR TELECOMMUNICATION APPARATUS

Hans Scholtholt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,627
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 8804099[U]; Mar. 25, 1988, 8804090[U]
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—119 **6 Claims**

1. In a distribution apparatus for telecommunication equipment having a safety plug which plugs into a contact component part which is provided with terminal connecting components for incoming and outgoing electrical leads of telecommunications equipment, wherein the contact component part is held fast to at least one grounded bearing part, and wherein the safety plug has plug-in blades for corresponding opposite contacts of the contact component part connected to the terminal connecting components and a grounding contact which is connected to ground, the improvement comprising:

said grounded bearing part having a bar-shape and being located at a lower surface of said contact component part to one side of said contacts of the contact component part; and



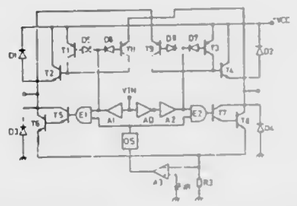
said safety plug being plugged in a plug-in direction into said contact component part at an upper surface thereof opposite from the grounded bearing part, and said grounded contact of said safety plug being located to one side of said plug-in blades and shaped generally in the form of a finger projecting in the plug-in direction beyond the plug-in blades so that it makes contact with said grounded bearing part at the lower surface of said contact component part.

4,901,191

MONOLITHICALLY INTEGRATABLE, LOW POWER DISSIPATION CONTROL CIRCUIT FOR SWITCHING INDUCTIVE LOADS

Angelo Alzati, Bollate, Italy, assignor to SGSATES Componenti Elettronici S.p.A., Italy

Filed Feb. 28, 1985, Ser. No. 707,025
Claims priority, application Italy, Feb. 29, 1984, 19859 A/84
The portion of the term of this patent subsequent to Dec. 13, 2004, has been disclaimed.
Int. Cl.[4] H01H 47/00
U.S. Cl. 361—152 **12 Claims**



1. A monolithically integratable control circuit for switching currents through inductive load impedances, comprising:

an input stage (A1, A0, A2) switched via a logic signal (VIN) and having a first output terminal generating a signal at the same level as the logic signal and a second output terminal generating a signal at an inverted level relative to the logic signal;

an actuating state (R3, A3, VR, OS) having an input terminal and an output terminal;

a first and a second power amplifier in push-pull arrangement, each comprising:

a first stage (T1, T2, T11, D5, D6 and T3, T4, T9, D7, D8) including a first supply terminal coupled to a first terminal of a supply source, an output terminal constituting the output terminal of the power amplifier to which the stage belongs, a second supply terminal coupled to said output terminal of the other power amplifier and two internal control terminals and comprising a circuit means coupled to the two internal control terminals and to an input terminal constituting the input terminal of the stage;

a second stage (T5, T6 and T7, T8) including a first output terminal coupled to the output terminal of the power amplifier to which the stage belongs, a second output terminal coupled to the input terminal of the actuating stage, and an input terminal; the first power amplifier having the input terminals of the first and second stage connected to the first output terminal of the input stage, the second power amplifier having the input stage and each power amplifier having the input terminals of the first and second stage coupled to the second output terminal of the input terminal of the second stage coupled to the output terminal of the actuating stage, and

four recycling diodes (D1-D4), comprising a first and a second diode (D1, D2) coupled between the first terminal of a supply source and the output terminals of the first and second power amplifier respectively and a third and fourth diode (D3, D4) inserted between a second terminal of the supply source and the output terminals of the first and second power amplifier respectively;

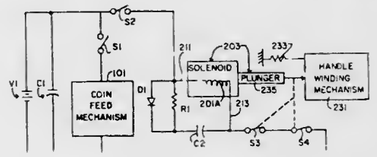
each circuit means comprising two unidirectionally conducting components (D5, D6 and D7, D8) coupled in series and in opposite directions of conduction between the two internal control terminals of the stage to which they belong and having their common terminal coupled to the input terminal of the last-mentioned stage each of said two unidirectionally conducting components being arranged to permit current flow in a direction that activates the stages to which they respectively belong.

4,901,192

ELECTRICAL CIRCUIT FOR DRIVING A LOAD WITH A LARGE FORCE APPLIED INTERMITTENTLY

Nelson S. Smith, Morgantown, W. Va., assignor to Frank M. Ellison, Charleston, W. Va.

Division of Ser. No. 710,440, Mar. 11, 1985, Pat. No. 4,717,008.
This application Nov. 18, 1987, Ser. No. 122,352
Int. Cl.[4] H01H 47/02
U.S. Cl. 361—156 **18 Claims**



1. In a device for moving a load over at least a given distance;

a plunger,

means responsive to movement of said plunger in a first direction for moving said load an increment of said distance,

a solenoid which when energized moves said plunger in said first direction to thereby move said load an increment of said distance, said plunger returning in a second direction which is opposite to said first direction after said plunger moves said load an increment,

a capacitor,

a direct current circuit for energizing said solenoid and said capacitor,

switch means for opening said circuit after the plunger has started to move in said first direction and for reclosing said circuit after said plunger has moved a substantial distance in said second direction,

means for interconnecting the solenoid and the capacitor so

that the capacitor is charged when said circuit is closed and so that said capacitor energizes said solenoid for a limited time after said circuit is opened thereby causing said plunger to continue its travel in said first direction and move the load an incremental amount,

said circuit, said solenoid, said capacitor, said first named means and said switch means comprising means for intermittently moving said plunger in said first direction to move the load in increments until the load has been moved at least said given distance,

said direct current circuit including a battery whose internal resistance so limits its output current that such output current is inadequate to fully activate said solenoid, said direct current circuit also including a second capacitor which is charged by said battery and which will enhance said output current so that there is sufficient current for the actuation of said solenoid.

4,901,193

CONSTRUCTION OF FITTING FLEXIBLE BOARD WITHIN ELECTRONIC APPARATUS

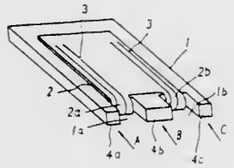
Seiichi Kinugawa; Seio Kainoh; Takashi Kawashima, all of Nara, and Katsumi Okabe, Kyoto, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 7, 1987, Ser. No. 82,514

Claims priority, application Japan, Aug. 7, 1986, 61-122770[U]

Int. Cl.⁴ H05F *3/00;* **H05K** *9/00*

U.S. Cl. 361—212 **13 Claims**



1. An electronic apparatus comprising:

flexible circuit board means having an electric wiring pattern disposed on at least one side thereof, and having an opening formed therein; and

supporter means for supporting said flexible circuit board means, said supporter means having first and second opposing faces and having ends disposed on the sides of said faces, wherein said supporter means includes at least a first protruding means formed on an end thereof, said first protruding means being inserted into said opening of said flexible circuit board means so that said flexible circuit board having said wiring pattern is folded over said first and second faces of said supporter means, wherein said protruding means prevents external electrostatic charge from being transmitted to said wiring pattern.

4,901,194

METHOD AND APPARATUS FOR REGULATING AIR IONIZATION

Arnold J. Steinman, and Michael G. Yost, both of Berkeley, Calif., assignors to Ion Systems, Inc., Berkeley, Calif.

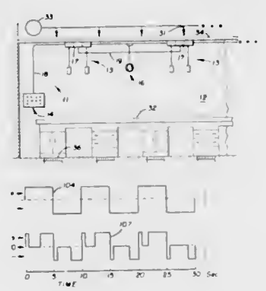
Continuation-in-part of Ser. No. 221,779, Jul. 20, 1988. This application Dec. 29, 1988, Ser. No. 291,770

Int. Cl.⁴ H05F *3/06*

U.S. Cl. 361—213 **18 Claims**

1. In a method of maintaining the ion content of the atmosphere at a predetermined location within a desired range which includes the steps of alternating periods of positive ion generation by a positive ion generator with periods of negative ion generation by a separate negative ion generator and suppressing generation of ions of both polarities during intervals which precede each ion generation period, the improvement comprising:

momentarily generating a relatively brief burst of negative ions at said negative ion generator between each of said periods of positive ion generation and the following one of said intervals of suppressed ion generation, and



momentarily generating a relatively brief burst of positive ions at said positive ion generator between each of said periods of negative ion generation and the following one of said intervals of suppressed ion generation.

4,901,195

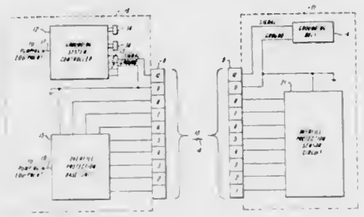
SELF-PROVING VEHICLE GROUNDING SYSTEM

Francis V. Stemporzewski, Jr., Salem, N.H., assignor to Scully Signal Company, Wilmington, Mass.

Filed Jun. 30, 1988, Ser. No. 213,594

Int. Cl.⁴ H02H *3/14;* **H05F** *3/00*

U.S. Cl. 361—217 **12 Claims**



1. A self-proving grounding system for placing the electrical ground voltage of first and second electrically conductive objects at the same voltage for use in conjunction with an overfill protection system comprising an overfill protection base unit associated with the first object and an overfill protection sensor circuit associated with the second object, said overfill protection controller and sensor circuit requiring electrical connection therebetween, comprising:

a ground controller unit having a ground and adapted to be electrically grounded to the first object, comprising:

(a) means for generating a first electrical signal; and

(b) means for detecting a second electrical signal, coupled to the means for generating;

a grounding bolt unit having a ground and adapted to be electrically grounded to the second object, comprising:

(a) means for modifying the first electrical signal when coupled to the controller unit to produce the second electrical signal electrically; and

a single multi-conductor cable for electrically coupling the means for generating a first electrical signal of the ground controller unit to the means for modifying the first electrical signal of the grounding bolt unit and further coupling the overfill protection controller to the overfill protection sensor circuit including an electrical ground connection.

4,901,196

PORTABLE BARBEQUE LIGHTER

John D. Grzybowski, 2309 Bellfield Ave., Cleveland Heights, Ohio 44106

Filed May 16, 1988, Ser. No. 194,277

Int. Cl.⁴ F23Q *7/00*

U.S. Cl. 361—266 **6 Claims**



1. A portable electric fire igniter comprising a battery and an igniter implement having

a manually engageable handle, a metal tube extending from the handle and a heater element disposed within the tube, the tube having a free end portion remote from the handle, the heater element including

inner and outer quartz tubes disposed within the free end portion of the metal tube and generally concentric therewith, the outer quartz tube being closely adjacent the inside of the metal tube and the two quartz tubes defining between themselves an annular, axially extending space, wherein one end of the outer quartz tube, remote from the handle, is closed and a steel plug is positioned between the inner and outer quartz tubes at the other end of the outer tube, one end portion of a tungsten filament being electrically connected to the steel plug,

the tungsten filament disposed in the space between the two quartz tubes and said steel plug and the other end portion of the filament electrically connected with the battery, the filament being spirally wound around the inner quartz tube and supported against excessive transverse movement by the inner and outer quartz tubes.

4,901,197

SENSOR FOR CAPACITIVELY MEASURING PRESSURE IN A GAS

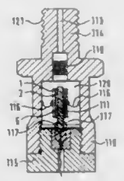
Scato Albarda, Gross Schenkenberg; Werner Thoren; Johannes Lagois, both of Lübeck, and Johann Otten, Bad Schwartau, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Mar. 7, 1989, Ser. No. 320,164

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811047

Int. Cl.⁴ H01G *7/00;* **H01J** *7/44*

U.S. Cl. 361—283 **11 Claims**



1. A sensor for capacitively measuring the pressure of a gas, the sensor comprising:

two mutually adjacent measuring electrodes arranged in the gas and being spaced apart so as to conjointly define an intermediate space therebetween for receiving the gas to be investigated therein; and,

a plurality of electrically insulating spacers interposed between said electrodes for determining the electrode spacing therebetween and for maintaining said electrode spacing during the measurement while at the same time permitting the gas to reach every location between said electrodes not occupied by said spacers thereby preventing a pressure difference to form across said sensor.

4,901,198

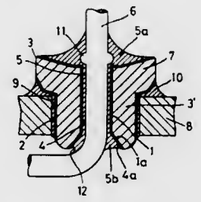
THROUGH CAPACITOR

Takeshi Tanabe, Fukui, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Aug. 9, 1985, Ser. No. 764,065

Int. Cl.⁴ H01G *1/14*

U.S. Cl. 361—302 **7 Claims**



1. A through capacitor, comprising:

a lead terminal extending along a center axis;

a generally cylindrical inner electrode having a through hole therethrough extending along said center axis, surrounding said lead terminal, said lead terminal extending entirely through said inner electrode, said hole having first and second open ends at respective first and second opposite axial ends of said inner electrode, said lead terminal having a protuberance extending radially outwardly, located adjacent to and axially outward of said first opening;

a generally cylindrical outer electrode surrounding said inner electrode in radially spaced relation thereto; and

solder fixedly connecting said lead terminal to said inner electrode, said solder having a first radially expanded portion surrounding said protuberance so as to embed said protuberance therein;

said inner electrode bending radially outwardly and toward said second opening at said second end such that said through hole is tapered radially outwardly toward said second opening at said second end to define an expanded space between said lead terminal and said inner electrode at said second end, said solder filling said expanded space so as to resist axial movement of said lead terminal through said through hole in the direction from said second end toward said first end.

4,901,199

EXTENDED FOIL CAPACITOR WITH RADIALLY SPOKED ELECTRODES

James C. Foster, Indian Shores, Fla., assignor to The United Stats of America as represented by the Department of Energy, Washington, D.C.

Filed Apr. 20, 1989, Ser. No. 340,822

Int. Cl.⁴ H01G *1/14*

U.S. Cl. 361—308 **7 Claims**

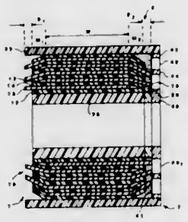
1. An extended foil capacitor comprising:

a convolutely wound cylindrical capacitance section comprising first and second electrically conducting foils separated by dielectric layers;

one edge of a first conducting foil extending longitudinally beyond one edge of each of said dielectric layers, the other edge of each of said dielectric layers extending longitudinally beyond the other edge of said first conducting foil;

the one edge of each of said dielectric layers extending longitudinally beyond one edge of a second conducting foil, the other edge of said second conducting foil extending longitudinally beyond the other edge of each of said dielectric layers,;

first and second electrodes for electrical connection, respectively, to said one edge of said first conducting foil and said other edge of said second conducting foil, wherein each of said electrodes comprises:



a conductive sheet having a disk-shaped planar side, said sheet having:

a plurality of radial spokes extending from an inner rim to an outer rim aligned approximately with the outer surface of said capacitance section; and

a radial hole between each pair of adjacent spokes; and

mounting means for holding said planar side in noncrushing contact with said extended edge.

4,901,200

INSERTABLE HOUSING

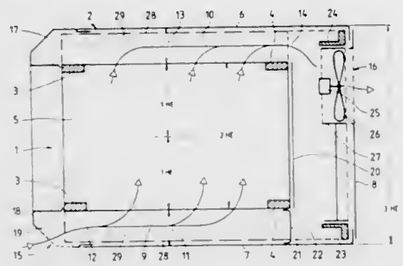
Paul Mazura, Karlsbad/Spielberg, Fed. Rep. of Germany, assignor to Schroff GmbH, Straubenhardt, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 257,634

Claims priority, application European Pat. Off., Oct. 14, 1987, 87 115000.9

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—379 **14 Claims**



1. An insertable housing for electrical and electronic instruments for insertion in racks and cabinets of a modular system which is standarized at least with respect to its height units, comprising:

a component carrier having two side walls connected by upper and lower front supports and upper and lower back supports, said component carrier having an open upper side, an open underside, and a rear wall;

a jacket enclosing said component carrier and having a housing top and a housing bottom which are connected to said two side walls of said component carrier, said jacket including a frontal frame adjacent an end of said component carrier to form an entrance to said component container; said frontal frame having a frontal air intake opening; said housing bottom being spaced predetermined distance below said lower front rail and said lower back rail to define an air intake shaft; said housing top being spaced a predetermined distance above said upper front rail and said upper back rail to define an air discharge shaft; said housing top, said housing bottom, and said sidewalls of said jacket extending rearwardly beyond said rear wall of said component carrier to form an enclosure which is in communication with said air discharge shaft; said rear housing wall of said jacket having an air discharge opening; and

fan means situated only at said rear housing wall of said jacket for exhausting air from said enclosure through said air discharge opening; whereby air is caused to flow in sequence from said frontal air intake opening in said frontal frame through said air intake shaft, through said component carrier in a horizontal direction, through said air discharge shaft, into said enclosure, and out of said jacket through said air discharge opening.

4,901,201

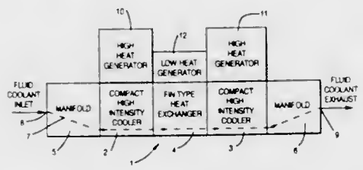
PLATE FIN/CHIC HEAT EXCHANGER

Lawrence E. Crowe, Lindenwood, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 25, 1988, Ser. No. 261,992

Int. Cl.[4] H01L *23/46*

U.S. Cl. 361—384 **20 Claims**



1. A heat exchanger comprising thermally conductive means defining a channel having an inlet for receiving a cooling fluid and an outlet for discharging a cooling fluid to which heat has been transferred, the channel having at least two portions, one of the portions having disposed therein a jet impingement cooling mechanism comprising at least one plate having a plurality of small holes through which cooling fluid is jetted and a heat conductive member spaced from said at least one plate and upon which jets of cooling fluid exiting from said plurality of small holes impinge, and another of the portions of the channel having a non-jet impingement cooling mechanism located at said another portion of the channel for transferring heat in the non-jet impingement cooling mechanism to fluid flowing through said another portion of the channel; a first heat generator in thermal contact with the means defining the channel adjacent the one portion of the channel, heat flowing from the first generator to the one portion to cool the first heat generator during operation of the first heat generator when cooling fluid is flowing through the channel; and a second heat generator in thermal contact with the means defining the channel adjacent said another portion of the channel, heating flowing from the second generator to said another portion to cool the second heat generator during operation of the second heat generator when cooling fluid is flowing through the channel.

4,901,202

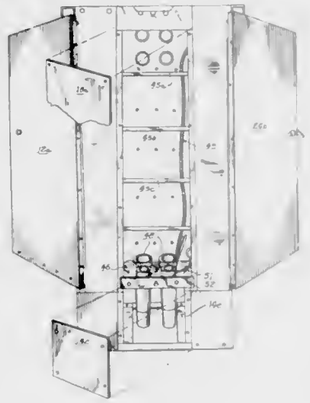
CONTROLLED ACCESS TELECOMMUNICATIONS EQUIPMENT CABINET

Matt Leschinger, Wheaton, Ill., assignor to Reliance Comm/Tec Corporation, Cleveland, Ohio

Continuation of Ser. No. 35,094, Apr. 6, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 314,268

Int. Cl.[4] H05K *5/00*

U.S. Cl. 361—390 **3 Claims**



1. A controlled access telecommunications equipment cabinet comprising: A generally rectilinear enclosure having a plurality of external sides and interior partition means defining a plurality of separate, individual compartments interiorly of said enclosure; at least one access panel on each of said external sides for selectively providing access to one and only one of said compartments; such that different compartments are accessible only from respective different ones of the access panels of said enclosure; and each said access panel being further provided with an associated locking means requiring a corresponding mating unlocking means for opening of the associated access panel; the corresponding unlocking means each being different from each other in unlocking structure means such that controlled access to each of said individual compartments through a predetermined associated access panel only, may be achieved by controlling the distribution of the respective unlocking means; and further including a split base construction for mounting said enclosure to a given surface, said split base comprising at least two spaced-apart, enclosed pedestal-like support members having hollow interiors, the hollow interiors thereof being both in alignment with and an in communication with respective selected compartments of the enclosure by being exposed thereto; and wherein at least one of said pedestal-like support members is provided on its interior with a plurality of removable mounting plates which mount a plurality of removable split cable sleeves.

4,901,203

HYBRID INTEGRATED CIRCUIT MODULE ASSEMBLY

Tetsuo Kobayashi, and Teruhisa Ohkawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 5, 1988, Ser. No. 279,797

Claims priority, application Japan, Mar. 15, 1988, 63-59362

Int. Cl.[4] H05K *7/20*

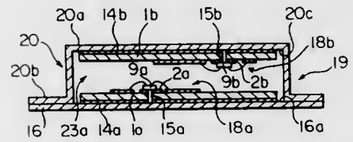
U.S. Cl. 361—395 **3 Claims**

1. A hybrid integrated circuit module assembly comprising:

an electrically conductive plate having opposed first and second surfaces;

an electrically conductive cap including inner and outer surfaces, an opening, and a pair of flanges extending from said cap adjacent the opening wherein said cap is mechanically and electrically joined at said flanges to said first surface of said plate;

first and second insulating substrates disposed inside said cap



on said inner surface and said first surface, respectively; and

first and second circuits disposed facing each other on said first and second insulating substrates, respectively.

4,901,204

SECURING UNIT FOR SECURELY MOUNTING PRINTED CIRCUIT BOARDS RELATIVELY MOVABLE BETWEEN TWO POSITIONS

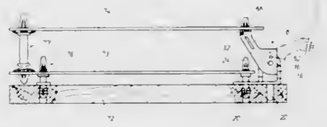
Yoshitoki Hayashi, Aichi, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 45,773, Apr. 30, 1987, abandoned, which is a continuation of Ser. No. 902,027, Aug. 25, 1986, abandoned, which is a continuation of Ser. No. 617,520, Jun. 5, 1984, abandoned. This application Apr. 27, 1988, Ser. No. 188,066

Claims priority, application Japan, Jun. 28, 1983, 58-116397

Int. Cl.[4] H05K *7/02*

U.S. Cl. 361—417 **8 Claims**



1. A securing unit which holds a first board at a predetermined distance from a fixed board and movably mounts a second board such that said second board is movable between open and closed states with respect to said first board, comprising:

a bottom plate;

fastening means extending from a first surface of said bottom plate and fixing said bottom plate on said fixed board;

a first mounting member extending from a second surface of said bottom plate and comprising means securely mounting said first board with respect to said bottom plate;

a coupling plate extending from said second surface of said bottom plate;

a mounting portion comprising a second mounting member, said second mounting member comprising elastic detent means engaging said second board and securely mounting said second board on said mounting portion;

pivotal mounting means pivotally mounting said mounting portion on said coupling plate such that said mounting portion is pivotable so as to move said second board between said open and closed states; and

stopper means restricting the range of pivotal movement of said mounting portion.

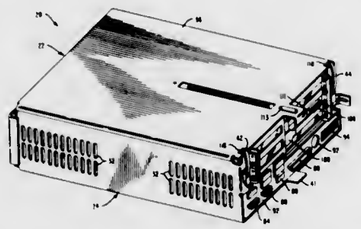
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4,901,205

HOUSING FOR ELECTRONIC COMPONENTS

Donald E. Landis; Jay D. Atkinson; Dale R. Lyons; Todd J. Wilhelm, and David C. Wills, all of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 2, 1988, Ser. No. 239,818
Int. Cl.[4] H05K *9/00*
U.S. Cl. 361—424 **22 Claims**



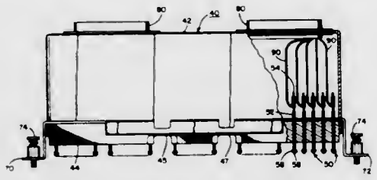
1. A housing for electronic components, comprising:
a lower housing means having a base portion and engaging means for engaging an upper housing means;
said upper housing means having a cover portion and means for receiving the engaging means of the lower housing means;
a first circuit board secured to the base portion of the lower housing means and having circuit board receptacle means on an upper surface thereof;
a vertical frame secured to said upper housing means and depending therefrom;
a bus board secured in vertical orientation to said vertical frame, having connection means at its lower edge to engage the receptacle means on the first circuit board, and also having a plurality of horizontally disposed circuit board receptacle means located on both sides of said bus board; and
a plurality of additional circuit boards, each having connector means at one edge thereof adapted to engage the horizontally disposed circuit board receptacle means on the bus board, at least certain of said additional circuit boards having a width extending outwardly from the connector means which is greater than the vertical distance between said first circuit board and said cover portion.

4,901,206

TEST SHOE

James Dewey; Karl H. Pohl, both of Plymouth, and Patrick J. Brickley, Long Lake, all of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Feb. 16, 1988, Ser. No. 156,543
Int. Cl.[4] H02B *1/02*
U.S. Cl. 361—428 **6 Claims**



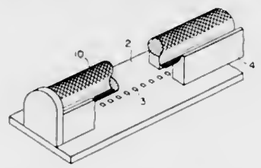
1. A wire distribution apparatus, comprising:
a wire termination module having means defining a module interior separated from an exterior;
a wire termination field having a plurality of electrical connectors carried on said module, said connectors having a first plurality of electrical contact points disposed to receive a first plurality of electrical conductors exterior of said module, said connectors further including a second plurality of electrical contact points disposed to receive a second plurality of electrical conductors from said interior of said module, said connectors also including electrical test contact points disposed in a predetermined first array and exposed to said exterior;
a plurality of circuit protector elements carried on said module, said elements in electrical contact with said connectors;
a test member for accessing test equipment to test signals carried by said conductors, said test member having a housing, attaching means for releasably attaching said housing to said module in a predetermined position, a plurality of electrical contact members carried by said housing and having exposed contact ends arranged in a second array with said exposed contact ends disposed to electrically engage said test contact points when said housing is attached to said module in said predetermined position, electrical connector means carried on said housing for electrically connecting circuit test equipment to said electrical contact members.

4,901,207

LIGHT EMISSION ELEMENT ARRAY AND MANUFACTURING METHOD THEREOF

Naoki Sato, Kawasaki; Teruo Tautsumi, Tama, and Masaaki Katoh, Osaka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Jun. 9, 1988, Ser. No. 204,502
Claims priority, application Japan, Jun. 9, 1987, 62-143687
Int. Cl.[4] F21V *8/00*
U.S. Cl. 362—32 **18 Claims**



1. A light emission element array comprising:
a substrate;
a plurality of light emission elements arranged linearly in a row on said substrate; and
rod like light converging lens means arranged above said light emission element row in parallel thereto and adapted to diffuse and simultaneously converge the transmitted light.

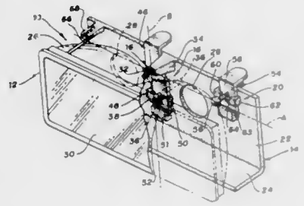
4,901,208

HEADLAMP ASSEMBLY

Gerald R. DePetro, Port Charlotte, Fla., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 6, 1989, Ser. No. 306,120
Int. Cl.[4] B60Q *1/06*
U.S. Cl. 362—66 **3 Claims**

1. The combination with a headlamp assembly adapted to be mounted to a support panel at the front end of a motor vehicle so as to allow selected adjustable movement of a lamp body about a vertical aim axis and a horizontal aim axis, a rigid ball stud member located between said support panel and said lamp body for supporting the latter for universal pivotal movement relative to said support panel and having the center thereof located at the intersection of said horizontal aim axis and said vertical aim axis, a first longitudinally adjustable member having a first ball pivot formed at one end thereof and having the other end extending through a first opening in said support panel for adjustable movement relative thereto, a second longitudinally adjustable member having a second ball pivot formed at one end thereof and having the other end extending through a second opening in said support panel for adjustable movement relative thereto, said first ball member being attached to said lamp body with the center of said first ball member located along said vertical aim axis, said second ball member being attached to said lamp body with the center of said second ball member located along said horizontal axis, each of said first and second longitudinally adjustable members being formed with a plurality of axially spaced stops, and a finger-operated locking member slidingly carried by said support panel adjacent each of said first and second longitudinally adjustable members for engaging said stops thereon for locking the associated adjustable member to said support panel after said lamp body is properly adjusted about one of said aim axes.

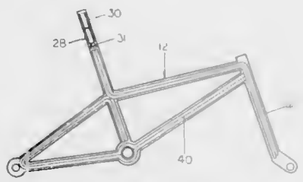


4,901,209

ILLUMINATED BICYCLE FRAME

James C. Nitz, 4250 Executive Square, Suite 801, La Jolla, Calif. 92037

Filed Aug. 5, 1988, Ser. No. 229,276
Int. Cl.[4] B62J *6/00*
U.S. Cl. 362—72 **6 Claims**



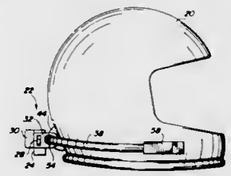
1. An illuminated bicycle comprising:
a body frame having a top tube, a bottom tube and a seat tube; said tubes being hollow and being made of translucent plastic material that allows light to be transmitted radially through their side walls;
a front wheel and a rear wheel;
means for mounting said bicycle body frame on said wheels;
a high intensity lamp having a front end and a rear end, said lamp being mounted at a predetermined location within one of the hollow tubular members of said body frame;
a bundle of flexible elongated optical fibers having a first end and a second end, the first end of said optical fibers being positioned adjacent the front end of said high intensity lamp so that light therefrom would be transmitted through said optical fibers, said optical fibers being threaded throughout the hollow tubular members of said bicycle frame so that when said lamp is illuminated said bicycle frame will glow and make it highly visible at night;
a source of electrical power electrically connected to said high intensity lamp; and
an electrical switch connected to said source of electrical power.

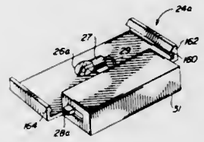
4,901,210

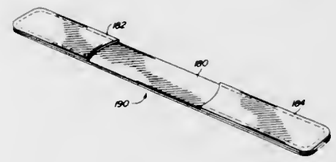
DETACHABLE REAR-MOUNTED LIGHT FOR A MOTORCYCLE HELMET

Akira Hanabusa, 1045 S. Ridgeley Dr., Los Angeles, Calif. 90019

Filed Dec. 30, 1987, Ser. No. 139,401
Int. Cl.[4] F21L *15/14*
U.S. Cl. 362—106 **2 Claims**







1. A detachable light for installation on a helmet, comprising:
(a) a housing;
(b) means for receiving and storing a power source therein;
(c) a power source;
(d) an electrical lamp for providing illumination when energized;
(e) a switch for selectively energizing said electrical lamp;
(f) connection means for making a complete series circuit between a power source stored in said receiving means, said electrical lamp, and sand switch; and
(h) wherein said mounting means comprises:
(1) an elongated flexible strip secured to said housing,
(2) an elongated fastening member releasably secured to said helmet; and
(3) attachment means carried by said fastening member to releasably secure said strip to said fastening member,
(i) wherein said attachment means carried by said fastening member comprises a pair of pockets adapted to receive and releasably retain said flexible strips therein.

4,901,211

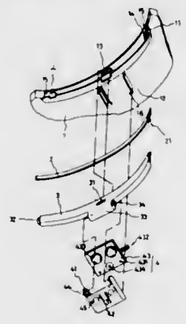
HAT STRUCTURE FOR DISPLAYING INDICIA ILLUMINATED BY A LIGHT

Wayne Shen, 7FL-5, No. 1031, Min Shen E. Rd., Taipei, Taiwan

Filed Dec. 9, 1988, Ser. No. 281,657

Int. Cl.[4] F21L *15/14*

U.S. Cl. 362—106 **3 Claims**



1. A hat structure for displaying indicia illuminated by a light mounted to said structure comprising:

a unitarily formed visor defining a lower surface having a pair of fence wall members extending therefrom, said visor having an arcuate groove formed therein, said visor having a pair of assist board members formed on opposing ends of said arcuate groove and a rib member formed substantially central of said arcuate groove;

a board member having said indicia formed therein and illuminated by said light mounted on said board member;

an arcuate board cover member for contiguously interfacing with said arcuate groove, said arcuate board cover member having a centrally located opening for insert of said rib member therein, said arcuate board cover member having opposing ends defining shoulders for insert into a pair of overhang members on opposing ends of said arcuate groove, said arcuate board cover member having a centrally located boss plate with recess openings formed on opposing transverse sides;

a switch body having a pair of convex ears rotatably mounted within said recess openings formed within said boss plate, said switch body including a pair of opposing wall members frictionally insertable into said pair of fence walls formed on said lower surface of said visor, said switch body including a switch for controlling on/off electrical connections from a battery mounted on a power board member insertable within said switch body, said battery being electrically coupled to said light on said board member whereby said hat structure may display said indicia by said light.

4,901,212

RAPIDLY ADJUSTABLE DECORATIVE EXTERIOR TRIM LIGHTING SYSTEM

Robert B. Prickett, 3916 Mockingbird La., Dallas, Tex. 75205

Filed Jan. 17, 1989, Ser. No. 297,754

Int. Cl.[4] F21S *1/02*

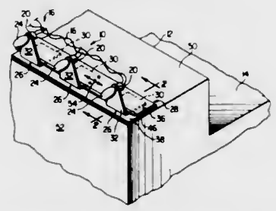
U.S. Cl. 362—145 **14 Claims**

1. Adjustable apparatus for supporting a light string along a surface to be decoratively illuminated, said light string including a length of electrical power supply wiring, a series of bulb sockets operatively secured to said electrical power supply wiring at spaced locations along its length, and a series of light bulbs with base portions adapted to be removably inserted into said sockets, said apparatus comprising:

a series of support members each having a base portion secured to a bulb and socket attachment portion;

means for removably mounting each of said bulb sockets, and its associated light bulb, on a different one of said bulb and socket attachment portions of said support members; and

elongated retaining strip means, laterally securable to said surface to extend lengthwise therealong, for frictionally and releasably engaging and supporting said base portions of said support tab members at predetermined spacing intervals along the length of said retaining strip means in a manner permitting said support members to be slidingly moved along the length of said retaining strip means to selectively vary said spacing intervals,



said elongated retaining strip means having, along essentially their entire length, an internal pocket into and from which said base portions of said support members may be inserted and withdrawn in directions generally parallel to the width of said elongated retaining strip means,

said elongated retaining strip means further having a laterally folded configuration defined by a pair of facing side wall portions extending along opposite sides of said pocket and resiliently biased toward side-by-side contact by a joining section extending along a interconnecting aligned edge portions of said facing side wall portions, whereby longitudinal sections of said facing side wall portions are moved laterally apart from one another by insertion into said pocket of one of said support member base portions and frictionally grip opposite surfaces of the inserted base portion.

4,901,213

FIVE-LEGGED CORE TYPE FREQUENCY TRIPLO-MULTIPLIER

Kazuo Besshо, and Setsuhi Yamada, both of Kanazawa, Japan, assignors to Kanazawa University, Kanazawa, Japan

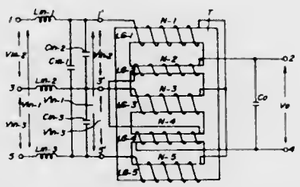
PCT No. PCT/JP87/00711, § 371 Date May 31, 1988, § 102(e) Date May 31, 1988

PCT Filed Sep. 29, 1987, Ser. No. 207,309

Claims priority, application Japan, Sep. 30, 1986, 61-230129

Int. Cl.[4] H02M *5/16*

U.S. Cl. 363—12 **2 Claims**



1. A frequency tripo-multiplier for converting a three-phase input voltage having a predetermined input frequency to a single-phase output voltage having an output frequency which

is three times said predetermined input frequency, said three-phase input voltage being coupled to first, second and third input terminals and said output voltage being applied to first and second output terminals, comprising:

an iron core having first, second, third, fourth and fifth legs, said third leg being interposed between said first and fifth legs, said second leg being interposed between said first and third legs and said fourth leg being interposed between said third and fifth legs;

first, second and third input windings each having first and second ends, said first, second and third input windings being sound of said first, third and fifth legs of said iron core respectively, the second ends of each of said first, second and third input windings being connected to a common point to form a Y-connection;

first, second and third linear reactors interposed between said first, second and third input terminals and the first ends of said first, second and third input windings respectively;

first, second and third input capacitors, said first input capacitor being connected between the first ends of said first and third input windings, said second input capacitor being connected between the first ends of said first and second input windings and said third input capacitor being connected between the first ends of said second and third input windings, said first, second and third linear reactors and said first, second and third input capacitors being resonant at said predetermined input frequency;

first and second output windings, said first and second output windings being wound on said second and fourth legs of said iron core respectively and being connected in series across said first and second output terminals; and

a capacitor connected across said first and second output terminals, said first and second output windings and said capacitor being resonant at said output frequency, whereby said three-phase input voltage and said single-phase output voltage have waveforms which exhibit minimum distortion.

4,901,214

CONTINUITY ANGLE CONTROLLED SELF-EXCITED INVERTER CIRCUIT

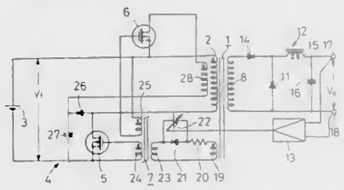
Rihei Hiramatsu, Tokyo; Shigeo Watanabe, Inagi; Yasuyuki Okumura, Inagi, and Jun Maruyama, Inagi, all of Japan, assignors to Yutaka Electric Mfg. Co., Ltd., Japan

Filed Nov. 18, 1988, Ser. No. 288,792

Claims priority, application Japan, Nov. 19, 1987, 62-292916

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—19 **6 Claims**



1. A continuity angle controlled self-excited inverter circuit comprising a main transformer, two switching elements, namely first and second switching elements, and a saturation transformer as the main components, wherein the voltage or current necessary for operating said two switching elements is supplied by supplying a voltage to said saturation transformer from a winding of said main transformer through an impedance element; said two switching elements perform a commutating operation respectively by saturating said saturation transformer; a series circuit comprising a rectifier and a capacitor is connected to both ends of said first switching element; the connecting point of said rectifier and said capacitor is connected to one end of an auxiliary winding with a number of turns substantially equal to a number of turns of a primary winding of said main transformer and the other end connected to a power source through said second switching element; two output windings provided to said saturation transformer are connected respectively to said first and second switching elements so that said switching elements operate reversely to each other; an input winding of said saturation transformer is connected to the auxiliary winding said main transformer through the rectifier, the impedance element and a barrier layer voltage element.

4,901,215

ISOLATED SWITCH MODE POWER SUPPLY CONTROLLER

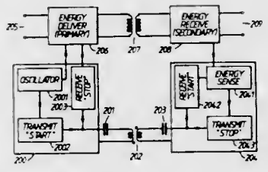
Fernando Martin-Lopez, Santa Clara County, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 207,460, Jun. 16, 1988, abandoned. This application Sep. 14, 1988, Ser. No. 244,493

Claims priority, application United Kingdom, Sep. 18, 1987, 8722050

Int. Cl.[4] H02M *3/28*

U.S. Cl. 363—21 **15 Claims**



1. A switch mode power supply controller for use in a power supply of the type having a primary energy delivering network and a secondary energy receiving network, said switch mode power supply controller comprising:

a control network for controlling an amount of energy supplied by the primary network, the control network generating a start signal immediately before the primary network starts said energy supply function;

a monitoring network for monitoring an output voltage from said secondary network, the monitoring network transmitting a stop signal to said control network when the output voltage of said secondary network exceeds a predetermined threshold, said monitoring network including a delay network means for delaying transmission of said stop signal to ensure that the stop signal is not sent before the control network is ready to receive said stop signal;

an electrically isolated communication path for transmitting said start and stop signals between said monitoring network and said control network; and

said control network being responsive to the stop signal thereby causing said primary network to stop delivering energy to the secondary network upon receipt of said stop signal.

4,901,216

POWER SUPPLY REGULATED BY MODULATING THE INDUCTANCE IN A RESONANT LC CIRCUIT

Kenneth T. Small, Cupertino, Calif., assignor to Boschert Incorporated, Fremont, Calif.

Division of Ser. No. 130,906, Dec. 10, 1987. This application Oct. 14, 1988, Ser. No. 258,262

Int. Cl.[4] H02M *7/538, 3/337*

U.S. Cl. 363—98 **11 Claims**

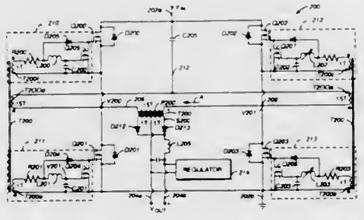
1. A full-bridge converter comprising:

a first lead for receiving a first voltage;

a second lead for receiving a second voltage;

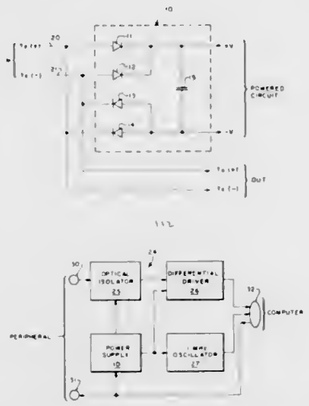
a first switch coupled between said first lead and a first node;

a second switch coupled between said first node and said second lead;
a third switch coupled between said first lead and a second node;
a fourth switch coupled between said second node and said second lead;
transformer and current drawing means having a primary winding coupled between said first and second nodes and a secondary winding, said transformer and current drawing means also causing the voltage across said first switch to drop when said second switch opens;



circuit means coupled to said secondary winding for generating an output voltage in response to power delivered by said secondary winding;
means for ensuring that said first switch closes during a time period in which the voltage across said first switch has dropped; and
regulator means receiving said output voltage, said regulator means modulating the switching phase of said first and second switches relative to said third and fourth switches to thereby regulate said output voltage.

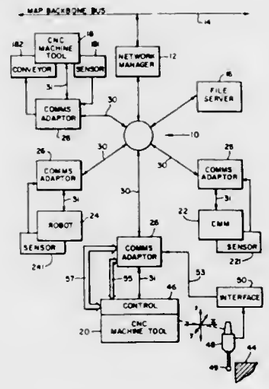
4,901,217
DIGITAL INPUT POWER SUPPLY AND METHOD
David Wilson, Los Altos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Continuation of Ser. No. 127,188, Dec. 1, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,472
Int. Cl.[4] H02M *7/06*
U.S. Cl. 363—126 **11 Claims**



1. A circuit, coupled between a peripheral unit and a personal computer, for converting a differential digital signal originating from said personal computer, to a DC power supply voltage, switching between a first voltage and a second voltage, wherein said first voltage represents a first digital state and said second voltage represents a second digital state, comprising:
a pair of input terminals at a said circuit coupled to receive said differential digital signal from said personal computer;
a pair of output terminals from said circuit coupled to provide said DC power supply voltage;
rectifier means coupled between said input terminals of said circuit and said output terminals of said circuit for providing conversion of said differential digital signal to said DC power supply voltage;
said personal computer having output means to send said differential digital signal to said circuit; said differential digital signal has said first and second voltages at approximately equal magnitude about a reference value, so as to provide a substantially continuous DC power supply voltage from said output terminals of said circuit.

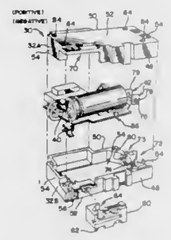
11. A method of coupling a full-wave rectifier circuit between a peripheral unit and a personal computer and for converting a differential digital signal, which originates from an output means of said personal computer, to a continuous DC power supply voltage, including the steps of;
coupling said output means of said personal computer to differential digital signal lines;
coupling input terminals of said full-wave rectifier circuit to other end of said differential signal lines;
providing data transfer between said personal computer and said full-wave rectifier circuit across said differential digital signal lines;
said full-wave rectifier circuit receiving said differential digital signal at said input terminals, rectifying said differential digital signal to provide a substantially continuous DC power supply voltage from said output terminals of said full-wave rectifier circuit.

4,901,218
COMMUNICATIONS ADAPTOR FOR AUTOMATED FACTORY SYSTEM
Peter J. Cornwell, Wotton-Under-Edge, United Kingdom, assignor to Renishaw Controls Limited, Gloucestershire, United Kingdom
Filed Mar. 4, 1988, Ser. No. 164,291
Claims priority, application United Kingdom, Aug. 12, 1987, 8719107; Japan, Sep. 12, 1987, 62-229446
Int. Cl.[4] G06F *15/46;* **G05B** *23/02*
U.S. Cl. 364—131 **18 Claims**



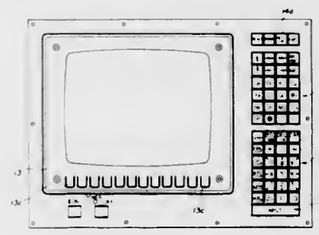
1. A factory system comprising:
a factory machine, having control means for controlling the operation of the machine, said control means accepting or transmitting data in a first data format;
a communications network for connecting a central computer to said factory machine and to one or more further factory machines, said communications network transmitting data in a second data format;
a communications adaptor connected between the control means of said machine and said network, said communications adaptor comprising data processing means for translating data between said first and second data formats, the data processing means having a plurality of means for input and/or output, said control means and said network being connected to first and second said input/output means respectively;
at least one sensing means associated with said machine, operative to produce an output relating to the state or operation of the machine, the sensing means being connected to deliver its said output to a said input/output means of the data processing means, distinct from said first and second input/output means; and
at least one means associated with said machine for performing an operation related thereto, said means for performing an operation being connected to a said input/output means of the data processing means, distinct from the first and second input/output means, the data processing means being programmable to control said means for performing an operation in accordance with the output of the sensing means.

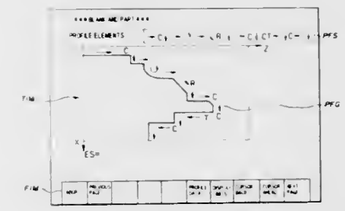
4,901,219
PLUG-IN POWER SUPPLY
Kenneth W. Erickson, Alburnette, Iowa, and Henry J. Zylstra, Lincoln, Nebr., assignors to Square D Company, Palatine, Ill.
Filed Dec. 22, 1987, Ser. No. 136,587
Int. Cl.[4] H02M *1/00*
U.S. Cl. 363—146 **32 Claims**



1. A plug-in power supply for a load center distributing electrical power from line terminals to load terminals of at least one branch circuit, said load center having a mounting panel having line and load terminals accessible through said panel and grouped at regularly spaced intervals normally for accepting circuit breakers, and having an A.C. power source in communication with said line terminals, said power supply comprising a housing; dimensioned to be inserted into an interval normally occupied by a circuit breaker, said housing having input terminals adapted to engage said line terminals through said mounting panel to receive said A.C. power, and circuit means within said housing providing a regulated source of D.C. electrical power to output terminals from said A.C. power.

4,901,220
PART PROFILE INPUT METHOD
Teruyuki Matsumura, and Noritake Nagashima, both of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan
PCT No. PCT/JP88/00349, § 371 Date Dec. 2, 1988, § 102(e) Date Dec. 2, 1988, PCT Pub. No. WO88/08157, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 7, 1988, Ser. No. 283,476
Claims priority, application Japan, Apr. 7, 1987, 62-85412
Int. Cl.[4] G05B *19/403*
U.S. Cl. 364—191 **4 Claims**





1. A part profile input method in an NC data creating apparatus in which a part profile is specified by inputting profile elements of a part and inputting dimensions specifying the profile elements, and NC data are created for machining a blank in accordance with the specified part profile, said method comprising the steps of:
inputting a current profile element;
determining if an angle can be defined by said profile element and a previously inputted profile element;
defining said angle if it can be determined;
displaying a prompt inquiring if a displayed preset dimension chamfer is to be inserted at a corner portion of the current profile element and the previously inputted profile element; and
specifying the corner portion if said angle is less than a set angle.

4,901,221
GRAPHICAL SYSTEM FOR MODELLING A PROCESS AND ASSOCIATED METHOD
Jeffrey L. Kodosky; James J. Truchard, both of Austin, Tex., and John E. MacCrisken, Palo Alto, Calif., assignors to National Instruments, Inc., Austin, Tex.
Filed Apr. 14, 1986, Ser. No. 851,569
Int. Cl.[4] G06F *3/00, 15/60;* **G06G** *7/48*
U.S. Cl. 364—200 **125 Claims**

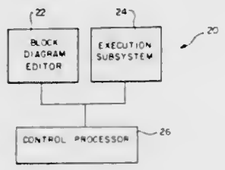
1. A method for programming a computer system including means for displaying images to control at least one of a virtual instrument and an instrument, the method comprising the steps of:
displaying on the screen at least one first function-icon that

references at least one first control means for controlling at least one first function;

displaying on the screen at least one iteration-icon that references iteration control means for controlling multiple iterations of data flow;

displaying on the screen at least one first input variable-icon that references at least one first input variable;

displaying on the screen at least one first output variable-icon that references at least one first output variable and



assembling on the screen a first acyclic data flow diagram including the at least one first function-icon and the at least one iteration-icon and the at least one first input variable-icon and the at least one first output variable-icon, such that the diagram displays a first procedure for producing at least one value for the at least one first output variable-icon from at least one value for the at least one first input variable-icon, and such that the at least one iteration-icon in the diagram indicates multiple iterations of the at least one first function in the course of the first procedure.

4,901,222

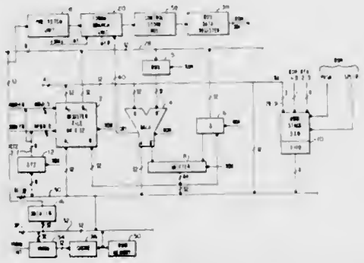
METHOD AND APPARATUS FOR BACKING OUT OF A SOFTWARE INSTRUCTION AFTER EXECUTION HAS BEGUN

Thomas F. Joyce, Westford, Mass.; Richard P. Kelly, Nashua, N.H., and Jian-Kuo Shen, Belmont, Mass., assignors to Bull NH Information Systems Inc., Billerica, Mass.

Filed May 19, 1987, Ser. No. 52,108

Int. Cl.[4] G06F *11/00, 17/00*

U.S. Cl. 364—200 **11 Claims**



1. In a data processing system for performing operations on operands as specified by instructions, apparatus for initializing execution of instructions whose operation is aborted, said apparatus comprising:

control store means for storing sequences of control signals for controlling operation of said system as specified by said instructions, said control store means having address inputs connected to receive said instructions as address inputs and outputs for providing said sequences of control signals and being addressed by said instructions to provide from said outputs a first sequence of said control signals for controlling said execution of said instructions;

register file means having address inputs coupled from said control signal outputs of said control store means and data inputs and data outputs for storing and receiving memory addresses of operands and being addressed by said control signal outputs of said first sequence of said control signals for storing and providing a first memory address for a first operand, said first memory address having a first low order portion and a first high order portion;

stack means having data inputs coupled to said register file means data outputs and having address inputs connected from said control signal outputs and being addressed by said control signals of said first sequence for storing said first low order portion of said first memory address;

memory means having address inputs coupled to said register file means data outputs for receiving said memory address and generating an interrupt signal if said first operand is not stored in said memory means, said interrupt signal indication that said operation of said instruction is aborted,

arithmetic means having data inputs connected from said data outputs of said register file means and data outputs connected to said data inputs of said register file means and control input connected from said control signal outputs,

said arithmetic means being controlled by said control signals of said first sequence to receive said memory address and increment or decrement said first memory address as controlled by said control signals to generate a a second memory address of a second operand stored in said memory means, said second memory address having a second low order portion and a second high order portion;

said register file means being addressed by said control signal outputs of said first sequence of said control signals for storing said second memory address in place of said first memory address;

said control store means having an address input connected from said memory means for receiving said interrupt signal and being addressed by interrupt signal for providing a second sequence of control signals;

said data inputs of said arithmetic means being further coupled to data outputs of said stack means, said register file means and said stack means being addressed by said control signals of said second sequence to respectively provide said first low order portion and a second order portion from said second memory address to said data inputs of said arithmetic means, and said arithmetic means being controlled by said control signals of said second sequence of control signals to receive said first low order portion and a second low order portion and generate a carry signal if said second low order portion was smaller than said first low order portion;

said control store means having an address input connected to receive said carry signal and being addressed by said carry signal to provide a third sequence of control signals, and

said register file means being addressed by said third sequence of control signals for replacing said second memory address in said register file means by said first memory address.

4,901,223

METHOD AND APPARATUS FOR APPLICATION SOFTWARE CONTROL OF ECHO RESPONSE

James R. Rhyne, Stamford, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1986, Ser. No. 858,470

Int. Cl.[4] G06F *13/42, 3/14*

U.S. Cl. 364—200 **6 Claims**

1. In a distributed computer system including a multi-processing central processor for concurrently executing a plurality

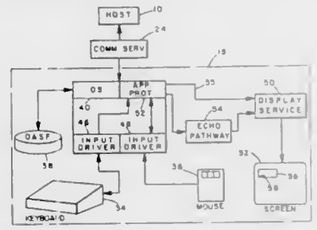
of processes, and a man-machine interface including event registration and display facilities and connected to said central processor by a message pathway interposing indeterminate length message passing delays between said central processor and said man-machine interface, a method for controlling an echo of an application process executing in said central processor to user-initiated actions at said man-machine interface, the user-initiated actions requiring a direct, user-discernible response by the application process within bounded response time, said method comprising the execution by said computer system of the following steps:

providing selection from said man-machine interface of an application process to be executed;

extracting from said application process those processes which provide substantially immediate, user-discernible echo responses within bounded response times;

locating the extracted processes in proximity to said event registration and display support facilities;

providing input parameters for said application process from



said event registration facility, said input parameters including first parameters indicative of a use of said event registration facility requiring a substantially immediate, user-discernible echo response to said use by said display support facility, and computation parameters indicative of user actions requiring computation by said application process;

passing said input parameters from the event registration facility to the extracted processes within the first interval;

ascertaining by means of the extracted processes and in response to said first parameters, said substantially immediate, user-discernible echo response within a second interval;

passing said first parameters from the extracted processes to the display support facility for provision of said substantially immediate, user-discernible echo response within a third interval by said display support facility; and

passing said computation parameters from the extracted processes to the application process by way of said message pathway.

4,901,224

PARALLEL DIGITAL PROCESSOR

Alfred P. Ewert, 1088 Park Ave., New York, N.Y. 10022

Filed Feb. 25, 1985, Ser. No. 704,919

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **19 Claims**

4. A general purpose parallel digital processor including a plurality of processing modules coupled to a common main memory, the improvement comprising parallel processing modules (PPM'S) including:

a program register for storing instruction code;

at least two data registers for storing data to be processed;

a separate parallel port for each of said registers to permit simultaneous transfer of data and code to said respective registers from the common main memory;

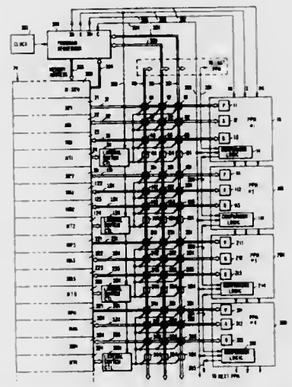
an arithmetic logic unit (ALU) coupled to receive data from said data registers;

an instruction decoder

responsive to said instruction code stored in said program register, and

operative to control said ALU to process data from said data registers according to instructions from said program register;

a transfer control circuit operable in at least an input mode and an execute mode, said transfer control circuit being operative



during said input mode, to transfer data to said registers via said ports from the common main memory, and

during said execute mode, to transfer data to said ALU via one or more of said ports directly to said ALU, or from one or more of said registers to said ALU;

the parallel digital processor further including a transfer bus network for selectively interconnecting:

said PPM's during said execute mode, and said PPM's and the common memory during said input mode.

4,901,225

PROCESSING APPARATUS WITH HIERARCHICAL STRUCTURE FOR IMPLEMENTING A MACHINE INSTRUCTION

Hajime Shiraishi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 8, 1985, Ser. No. 720,881

Claims priority, application Japan, Apr. 9, 1984, 59-70443; Apr. 9, 1984, 59-70444; Aug. 16, 1984, 59-169976; Dec. 28, 1984, 59-276130

Int. Cl.[4] G06F *15/16, 9/30, 13/14*

U.S. Cl. 364—200 **12 Claims**

1. A processing apparatus with a function hierarchical structure, said apparatus being formed on one chip of a highly integrated semiconductor device, and comprising:

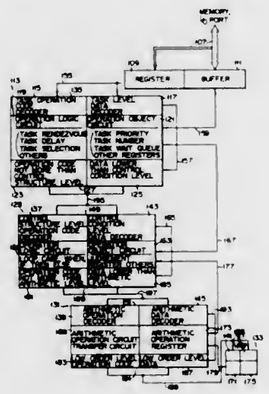
means for decoding a machine instruction having an operation code field designating a function to be executed with a hierarchical structure corresponding to functional levels, and an operation object field, with a hierarchical structure corresponding to that of said operation code field, designating an object for which the function designated by the operation code field is executed,

wherein the operation code includes a task level operation code, and at least one of a control structure level operation code, an operation level operation code, and a basic level operation code, and the operation object field includes task level data, and at leas tone of control condition data, arithmetic object data, and basic level data;

a plurality of functional block means, connected to the machine instruction decoding means and having a hierarchical structure including a higher functional level functional block means and a plurality of lower functional level

functional block means, for executing said function designated by said operation code field,

wherein said higher functional level functional block means includes a task level functional block means, and wherein said plurality of lower functional level functional block means includes at least one of a control structure level functional block means coupled to said task level functional block means and having a lower functional level than said task level functional block means, an operation level functional block means having a lower functional level than the task and the control structure functional block means and coupled to a higher level functional block means, and a basic level functional block means, having a lower functional level than the task, the control, and the operation level functional block means and coupled to a higher level functional block means,



and wherein each of said plurality of functional block means includes:

(a) an operation object circuit for executing a processing operation on one of the task level, the control structure level, the operation level, and the basic level,

(b) an operation logic circuit for controlling said operation object circuit,

(c) encoding means for receiving a machine instruction from a block means having a higher functional level, for encoding from said machine instruction at least block identification data and process data indicating a processing operation, and for selectively supplying the encoded block identification data and process data to a lower functional level functional block means; and

(d) decoder means for decoding encoded block identification data and process data supplied from a functional block means at a higher functional level.

4,901,226

INTER AND INTRA PRIORITY RESOLUTION NETWORK FOR AN ASYNCHRONOUS BUS SYSTEM

George J. Barlow, Tewksbury, Mass., assignor to Bull HN Information Systems Inc., Billerica, Mass.

Filed Dec. 7, 1987, Ser. No. 129,277

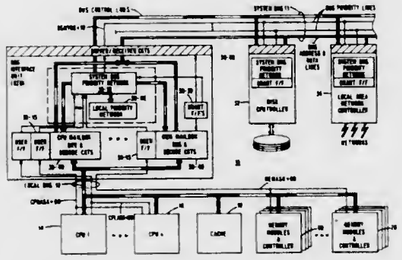
Int. Cl.[4] G06F *13/36*

U.S. Cl. 364—200 **30 Claims**

1. A bus resolver used in a data processing system having a plurality of units including a bus interface unit which couples to a plurality of local units which connect in common to a local bus, said plurality of units being coupled to different physical positions along a common system bus for asynchronously transferring requests between different ones of said units, the transferring of requests proceeding on a priority basis controlled by a plurality of like priority network bus interface sections, one of said sections being included in a different one of said plurality of units and in which said sections collectively form a distributed bus priority network of said common system bus for granting priority access on the basis of each unit's physical position on said common system bus relative to one end of said bus as indicated by signals generated by a corresponding one of said priority network sections included in said each unit, said bus resolver comprising:

bus priority resolution circuit means included in one of said plurality of sections which connects to a predetermined position on said bus, said circuit means having a plurality of inputs coupled to receive bus request and timing signals from said common system bus defining when said bus can be accessed and a plurality of outputs, said resolution circuit means generating signals at said outputs in response to said bus request and timing signals for indicating the result of resolving priorities by said distributed bus priority network during a bus resolution cycle of operation between any simultaneous requests made by another one of said plurality of units to use said common system bus;

request input means includes in said one of said plurality of sections, said request input means having a plurality of request storage means coupled to said outputs of said resolution circuit means, each request storage means being coupled to said local bus and each of said request storage



means for generating a signal for each different type of requester within a predetermined time interval defined by said signals at said outputs of said resolution circuit means indicating when one of said plurality of local units has a request to be transferred to said common system bus; and

logic circuit means coupled to said plurality of request storage means and to said common system bus, said logic circuit means logically combining said signals from each of said plurality of request storage means to produce a resulting request signal on said common system bus to said distributed priority network for signaling a request to access said common system bus on said priority basis; and,

local priority resolution circuit means for resolving internally the relative priorities of said plurality of local units, said local priority resolution circuit means directly coupled to said logic circuit means for receiving said resulting request signal simultaneously applied to said local resolution circuit means and to said common system bus, said local priority resolution circuit means in response to said resulting request signal generating an output signal within a predetermined minimum amount of time established by said local priority resolution circuit means during said bus resolution cycle of operation for signalling to said local unit designated by said request input means that it is the highest priority local unit requesting access to said common system bus and has been granted said access.

4,901,227

MICROCOMPUTER SYSTEM

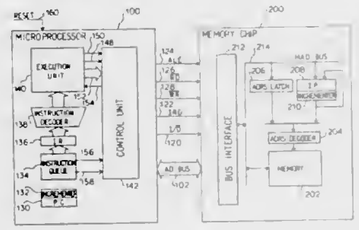
Masahiro Nomura, and Yukio Maehashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 89,871

Claims priority, application Japan, Aug. 27, 1986, 61-202232

Int. Cl.[4] G11C *7/00*; G06F *9/22*

U.S. Cl. 364—200 **20 Claims**



1. A microcomputer system comprising a microprocessor and a memory chip coupled to the microprocessor though an address/data bus and various control signal lines;

said microprocessor being configured to output an address and data through said address/data bus to said memory chip and also to fetch an instruction code and data through said address/data bus from said memory chip, said microprocessor operating to output an address latch signal, a read signal, a write signal, an instruction/data signal and an instruction read signal through said control signal lines to said memory chip;

said memory chip including:

memory means for storing programs and data and being coupled to receive data from said address/data bus and to output an instruction code and data to said address/data bus,

an address latch coupled to latch an address on said address-/data bus in response to said address latch signal,

an instruction pointer holding an address for an instruction code,

an update means coupled to said instruction pointer and operating to output an updated address obtained by changing the address held in said instruction pointer by a predetermined number in response to each instruction read signal when said instruction/data signal designates an instruction, said instruction pointer being updated with said updated address outputted from said update means,

selection means coupled to receive the address latched in said address latch and said updated address outputted from said update means and controlled by said instruction/data signal so as to output the address latched in said address latch when said instruction/data signal designates data and said updated address outputted from said update means when said instruction/data signal designates an instruction, and

decode means coupled to receive the address outputted from said selection means and to output a decoded address to said memory means so that an instruction code or data is read from said memory means in accordance with the decoded address or data is written to said memory means in accordance with the decoded address, whereby

said system being operative such that:

when data is written to said memory means, said microprocessor operates to output an address through said address/data bus to said memory chip and also to output such address latch signal to said memory chip so as to cause the address on said address/data bus to be latched in said address latch of said memory chip, and thereafter, to output data through said address/data bus to said memory chip and also to output said instruction/data signal designating the data and said write signal to said memory chip so that the address latched in said address latch is outputted from said selection means and the data on said address-/data bus to be written into said memory means in accordance with the address latched in said address latch;

when data is read from said memory means, said microprocessor operates to output an address through said address/data bus to said memory chip and also to output said address latch signal to said memory chip so as to cause the address on said address/data bus to be latched in said address of said memory chip, and thereafter, to output data through said address/data bus to said memory chip and also to output said instruction/data signal designating the data and said write signal to said memory chip so that the address latched in said address latch is outputted from said selection means and the data on said address/data bus to be written into said memory means in accordance with the address latched in said address latch;

when data is read from said memory means, said microprocessor operates to output an address through said address/data bus to said memory chip and also to output said address latch signal to said memory chip so as to cause the address on said address/data bus to be latched in said address latch of said memory chip, and thereafter, to output said instruction/data signal designating the data and said read signal to said memory chip so that the address latched in said address latch is outputted from said selection means and data is read from said memory means in accordance with the address latched in said address latch so as to be outputted through said address/data bus to said microprocessor; and

when instruction codes are read from said memory means, said microprocessor operates to output said instruction/-data signal designating the instruction and said read signal to said memory chip and also to intermittently and sequentially output said instruction read signal to said memory chip so that at each time said instruction read signal is outputted from said microprocessor, and address held in said instruction pointer is updated, and an instruction code is read from said memory means in accordance with the updated address, with the result that instruction codes are continuously read from said memory means through said address/data bus to said microprocessor with no address supplied from said microprocessor.

4,901,228

PIPELINED CACHE SYSTEM USING BACK UP ADDRESS REGISTERS FOR PROVIDING ERROR RECOVERY WHILE CONTINUING PIPELINE PROCESSING

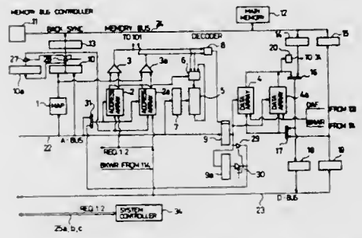
Takashi Kodama, Kamakura, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jul. 15, 1987, Ser. No. 73,513

Claims priority, application Japan, Jul. 17, 1986, 61-168420

Int. Cl.[4] G06F *9/38, 13/36, 11/14*

U.S. Cl. 364—200 **7 Claims**



7. A non-interruptive, pipelined cache memory for use in a data processing system which includes a central processing

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unit and a main memory connected to said central processing unit via a system bus, which comprises:

an address converter connected to said address bus for converting a logical address into a physical address;

at least one address array for storing a physical address from said main memory;

at least one data array for storing data from said main memory corresponding to said physical address stored in said address array;

an address register for storing a physical address from said address converter;

a data array address register for storing a data address of data stored in said data array;

at least one comparator for comparing a physical address from said address converter with a physical address from said address array to produce either a cache hit signal which causes said data in said data array to be read out on said system bus or a cache miss signal which causes a block of data to be loaded in said data array from said main memory;

an error detector for detecting generation of an error in data from said data array and generating an error signal at detection;

address back-up register means connected to said address register for storing a physical address of said data from said data array in response to said error signal;

data array address back-up register means connected to said data array address register for storing a data address of said data from said data array in response to said error signal;

request code back-up register means connected to said system bus for storing REQ and CODE signals in response to said error signal; and

a system control unit which comprises means for enabling the transfer of said physical address from said address register to said address back-up register means and said data address from said data array register to said data array address back-up register means and means for enabling a physical address of a next request to be stored in said address register now empty and a data address of said next request to be stored in said data array address register so that data is read out of said main memory without interrupting a pipeline operation of said cache memory.

4,901,229

PARALLELIZED RULES PROCESSING SYSTEM USING ASSOCIATIVE MEMORY FOR PIPELINED EXECUTION OF PLURAL JOIN OPERATIONS AND CONCURRENT CONDITION COMPARING

Tsutomu Tashiro, 1A, Albert Terrace, Edinburgh, United Kingdom (EH10 5EA); Norihisa Komoda, 3-1-9-203, Nijigaoka, Asao-ku, Kawasaki-shi, Kanagawa, Japan; Isao Tsushima, 7-5-18, Nishi-tsuruma, Yamato-shi, Kanagawa, Japan; Kuniaki Matsumoto, 8-39-22-231, Ooshima, Koto-ku, Tokyo, Japan; Kazuhiro Kawashima, 570, Futoocho, Kohoku-ku, Yokohama-shi, Kanagawa, Japan, and Riyoji Maekawa, 4-36-5, Nagasawa, Tama-ku, Kawasaki-shi, Kanagawa, Japan

Filed Jan. 21, 1986, Ser. No. 820,386

Claims priority, application Japan, Jan. 21, 1985, 60-8906; Jan. 25, 1985, 60-12079; Oct. 11, 1985, 60-224713; Oct. 21, 1985, 60-233298

Int. Cl.⁴ G06F *15/18, 15/20, 15/46, 9/38*

U.S. Cl. 364—200 **9 Claims**

1. A rule based multiprocessor system comprising:

rule memory means for storing rules composed of conditions of facilities to be examined and conclusions describing control commands to be given for said facilities if said conditions are met;

status memory means for storing the statuses of facilities and contents concluded by said rules;

rule applying means for performing comparing processing of the data stored in said status memory means and the conditions stored in said rule memory means and for storing the conclusions of the rules meeting said conditions to determine a desired processing in accordance with said conclusions;

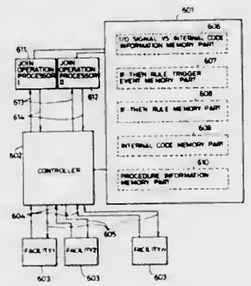
and executing means for executing JOIN operation processing of said rules;

wherein the improvement comprises said executing means including a plurality of JOIN operation executing means for executing JOIN operation processing of the rules in a pipeline manner;

each of said plurality JOIN operation executing means including at least one buffer for latching a set of data which is composed of status data coincident with one condition described in a rule;

associative memory means for latching another set of data which is composed of status data coincident with another condition described in a same rule;

an output buffer for latching and outputting a result of a



JOIN of data operation for generating a set of data composed of all of combination of said set of data and said another set of data, which have equal values corresponding to a common item of said one condition and said another condition;

data combining means for replacing an item value of data in said set of data and said another set of data by a meaningful value to generate one data;

retrieving means for retrieving data from said associative memory means by using data picked up sequentially from said at least one buffer as retrieval data and said common item as a retrieval key; and

control means for executing repeatedly a series of operations from the retrieval processing of said retrieving means to the operation of storing in said output buffer a combined result of said retrieval and retrieved data combined by said combining means.

4,901,230

COMPUTER VECTOR MULTIPROCESSING CONTROL WITH MULTIPLE ACCESS MEMORY AND PRIORITY CONFLICT RESOLUTION METHOD

Steve S. Chen, and Alan J. Schiffleger, both of Chippewa Falls, Wis., assignors to Cray Research, Inc., Minneapolis, Minn.

Continuation of Ser. No. 808,747, Dec. 13, 1985, abandoned, which is a division of Ser. No. 488,083, Apr. 25, 1983, abandoned. This application Jun. 16, 1988, Ser. No. 208,809

Int. Cl.⁴ G06F *9/46, 15/16*

U.S. Cl. 364—200 **12 Claims**

1. A multiprocessor memory system comprising:

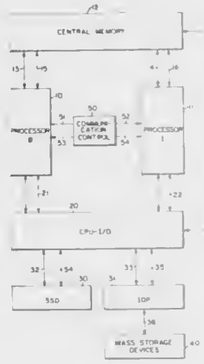
a central memory comprised of a plurality of independently addressable memory banks organized into a plurality of sections each accessible through a plurality of access paths;

a plurality of processing machines;

each of said processing machine including a plurality of ports for generating memory references to any one of said central memory sections; and

conflict resolution means interfacing each of said ports to each of said central memory sections through said central memory access paths, said resolution means for receiving references from said ports and coordinating and controlling the procession of said references along to said access paths, said conflict resolution means comprising a plurality of conflict resolution circuits corresponding in number to said memory sections, each of said circuits receiving said references to its corresponding section from any one of said ports and selectively conveying said references to said access paths for said corresponding section, said circuits each including;

means for checking the readiness of said memory banks to be referenced and holding a reference to a busy one of said banks until said bank is ready to be referenced;



means for detecting when more than one of said references is pending to the same bank simultaneously and holding all but one of said simultaneously pending references; and

means communicating with said ports and the other of said conflict resolution circuits to cause one of said ports referencing said memory to suspend generation of further references when a reference from said referencing port is being held and to cause the other of said conflict resolution circuits which have received a subsequent reference from said referencing port issued subsequent to a held reference generated by said referencing port to hold said subsequent reference until all priorly generated references from said referencing port have proceeded so that references to the memory are kept in the order generated.

4,901,231

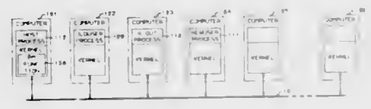
EXTENDED PROCESS FOR A MULTIPROCESSOR SYSTEM

Thomas P. Bishop, Aurora; Mark H. Davis, Warrenville, and Grover T. Surratt, West Chicago, all of Ill., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems, Inc., Morristown, N.J.

Filed Dec. 22, 1986, Ser. No. 944,586

Int. Cl.⁴ G06F *15/16*

U.S. Cl. 364—200 **16 Claims**



1. A method for controlling the execution of a program in a multiprocessor system having a plurality of processors and a communication path interconnecting said plurality of processors, comprising the steps of:

establishing a user process on first one of said processors;

said step of establishing said user process comprises the substeps of

creating a process control block;

creating text and data and stack areas of memory to be identified by said process control block

building a channel table having data structures to identify communication channels;

building a link list to identify data structures in said channel table;

inserting a list pointer into said process control block to identify said link list;

establishing a first stub process on a second one of said processors to be used only by said user process during the execution of file and I/O and other operations of said program;

said step of establishing said first stub process comprises the substeps of

creating a process control block for said first stub process; and

creating a stack area of memory for said first stub process to be identified by said process control block for said first stub process;

establishing a second stub process on a third one of said processors to be used only by said user process during the execution of file and I/O and other operations by said program;

said step of establishing said second stub process comprises the substeps of

creating a process control block for said second stub process;

and creating a stack area of memory for said second stub process to be identified by said process control to solving these and block for said second stub process;

setting up a first virtual communication channel between said user process and said first stub process via said communication path; and

setting up a second virtual communication channel between said user process and said second stub process via said communication path.

4,901,232

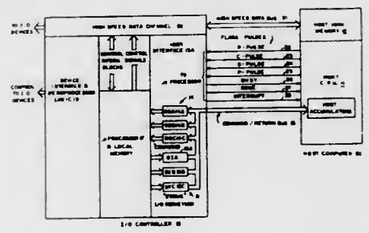
I/O CONTROLLER FOR CONTROLLING THE SEQUENCING OF EXECUTION OF I/O COMMANDS AND FOR PERMITTING MODIFICATION OF I/O CONTROLLER OPERATION BY A HOST PROCESSOR

David M. Harrington, Upton; John R. McDaniel, Acton; Steve A. Caldara, Wayland; Louis A. Lemone, Stow; Kenneth R. Andrews, Jr., Northboro, and Paul Funk, Brookline, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 496,125, May 19, 1983, abandoned. This application Jan. 9, 1987, Ser. No. 5,353

Int. Cl.⁴ G06F *9/30, 15/16*

U.S. Cl. 364—200 **16 Claims**



1. A system for controlling input/output operations required by a host computer, which includes host processor means and

host memory means, in communication with one or more input/output devices, said system comprising:

an input/output controller unit connected to said host computer and to said one or more input/output devices for controlling said input/output operation in response to input/output commands from said host processor means, said controller unit including controller processor means and controller memory means;

said host memory means being accessible to said controller unit for storing a plurality of control block lists, each control block list corresponding to one of said input/output commands and including control blocks of command information;

means for transferring input/output commands from said host processor means to said controller processor means of said controller unit;

said controller processor means being responsive to said input/output commands transferred thereto for successively accessing from said host memory the control block lists corresponding to said input/output commands;

said controller memory means being connected to said controller processor means for storing said control block lists, each including command information, control information supplied by said host processor means, status return informatin supplied by said controller processor means, and error information concerning errors which arise during execution of the operation corresponding to said control block;

said controller processor means includes

means for selecting one of a plurality of different sequences of said control blocks of command information from said control block lists in accordance with a predetermined algorithm in said controller memory means; and

means responsive to said selected sequence of control blocks of command information for executing the operations required by said input/output commands;

said controller unit further including means for storing controller information concerning the operation of said controller unit and for transferring said controller information to said host processor means; and

said host processor means being responsive to said controller information for selectively modifying said controller information so as to modify the operation of said controller unit and for transferring said modified controller information to said controller unit.

4,901,233

COMPUTER SYSTEM WITH LOGIC FOR WRITING INSTRUCTION IDENTIFYING DATA INTO ARRAY CONTROL LISTS FOR PRECISE POST-BRANCH RECOVERIES

John S. Liptay, Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,483

Int. Cl.[4] G06F *9/32, 9/42, 12/02, 9/46*

U.S. Cl. 364—200 **2 Claims**

1. A computer system which has provision for out of sequence instruction execution and provision for processing a conditional branch instruction based on a branch direction guess, comprising:

memory means for storing instructions and data,

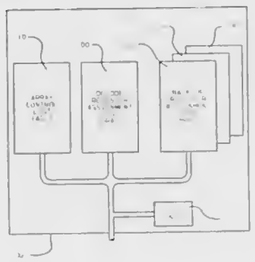
a register array (RA) comprising m physical registers in a system architecture having n logical registers, wherein m is greater than n, said register array (RA) being connected to receive and send information to and from said memory means,

array control list (ACL) means for storing register status information, said ACL means having m positions, wherein each position comprises a register status identifying field associated with one of the m physical registers in said register array (RA) and an instruction identification field indicative of an instruction addressing said one of said m registers,

decode register assignment list (RAL) means connected with said register array (RA), for maintaining assignment status, said RAL means having n positions wherein each position comprises an assignment status identifying field associated with the one of said n logical registers,

instruction execution means for receiving instructions and data and for producing results of instructions, said instruction execution means being connected to provide execution status signals to said ACL means and said DRAL means,

instruction decoding and register means for receiving instructions from said memory means and for sending decoded instructions to be executed to said instruction execution means, and



logic means, connected with said ACL means and said DRAL means, for:

assigning, in accord with said register status, a selected one of said physical registers to perform functions for a first logical register addressed by an instruction decoded by said instruction decoding and register means;

writing first data identifying said selected one of said physical registers into said assignment status identifying field associated with said first logical register; and

writing second data identifying said instruction into said instruction identifying field.

4,901,234

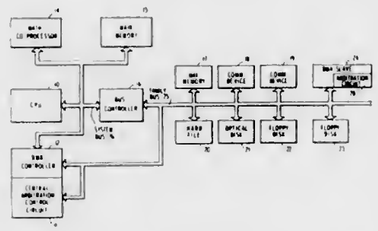
COMPUTER SYSTEM HAVING PROGRAMMABLE DMA CONTROL

Chester A. Heath, and Jorge E. Lenta, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1987, Ser. No. 30,786

Int. Cl.[4] G06F *13/00, 13/28*

U.S. Cl. 364—200 **8 Claims**



1. A computer system comprising:

means for providing a plurality of DMA channels;

a plurality of peripheral devices comprising means for requesting DMA access;

means for assigning at least one of said peripheral devices to a respective dedicated one of said DMA channels for DMA access and for assigning the remainder of said peripheral devices to share the remainder of said DMA channels for DMA access; and wherein said assigning means comprises means for comparing channel priority assignment values of each one of said remainder of said peripheral devices requesting DMA access, with a predetermined programmed set of DMA channel assignment values, and means for granting one of said remainder of said peripheral devices access to a DMA channel when said one of said remainder of said peripheral devices has a channel priority assignment value corresponding to one of said predetermined programmed DMA channel assignment values.

4,901,235

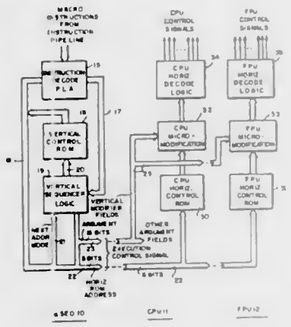
DATA PROCESSING SYSTEM HAVING UNIQUE MULTILEVEL MICROCODE ARCHITECTURE

Chandra R. Vora, Northboro; Donald C. Wiser, Framingham; Mark B. Hecker, Northboro, all of Mass., and Robert N. Murdoch, Sacramento, Calif., assignors to Data General Corporation, Westboro, Mass.

Filed Oct. 28, 1983, Ser. No. 546,572

Int. Cl.[4] G06F *7/48, 9/22, 12/04*

U.S. Cl. 364—200 **11 Claims**



1. In a data processing system having a source of macroinstructions and a first fixed point arithmetic logic execution means for executing fixed point arithmetic operations and a second floating point arithmetic logic execution means for executing floating point arithmetic operations, said first and second execution means including

first and second control store means, respectively, for storing microinstructions and for supplying said microinstructions in response to control store addresses supplied thereto;

said system including common control means responsive to said macroinstructions for providing the same execution control signal to each of said first and second control store means, said control signals comprising at least said control store addresses;

said first control store means responding to first selected ones of said control store addresses to supply microinstructions to said first execution means for execution only by said first execution means;

said second control store means responding to second selected ones of said control store addresses to supply microinstructions to said second execution means for execution only by said second execution means; and

said first and second control store means each responding to third selected ones of said control store addresses to simultaneously supply separate microinstructions to said first and said second execution means for execution by their associated first and second execution means, respectively.

4,901,236

PIPELINE CONTROLLING SYSTEM TO INCREASE EFFECTIVE ADDRESS CALCULATION PERFORMANCE

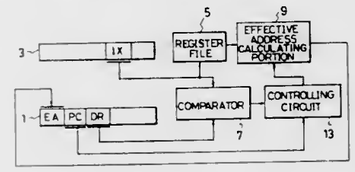
Tohru Utsumi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 4, 1987, Ser. No. 128,795

Claims priority, application Japan, Dec. 5, 1986, 61-289031

Int. Cl.[4] G06F *9/38*

U.S. Cl. 364—200 **8 Claims**



1. A pipeline controlling system for executing a preceding instruction in parallel with calculation of an effective address of a succeeding instruction, said pipeline controlling system comprising:

a first storing means for storing and holding said preceding instruction while said preceding instruction is in an execute phase;

a second storing means, connected to said first storing means, for storing and holding said succeeding instruction while said succeeding instruction is in an effective address calculation phase;

a third storing means, connected to said second storing means, for storing and holding information for executing said preceding instruction and for calculating said effective address of said succeeding instruction;

an effective address calculating means, connected to said first, second, and third storing means for calculating said effective address of said succeeding instruction stored in said second storing means;

a comparing means, connected to said first second storing means, for comparing first information for designating in said third storing means a storing location of information for executing said preceding instruction with second information for designating in said third storing means a storing location of information for calculating said effective address; and

a controlling means, connected to said first storing means and to said comparing means, for controlling said effective address calculating means in accordance with pipeline controlling region information which indicates whether or not information for calculating said effective address is changed with execution of said preceding instruction and in accordance with a comparison result of said comparing means, such that execution of said preceding instruction is capable of being carried out in parallel with calculation of said effective address of said succeeding instruction.

4,901,237

ELECTRONIC SCALE SYSTEM

Michiyasu Hikita, Kusatsu, and Hatsuo Kawaguchi, Shiga, both of Japan, assignors to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 170,116, Mar. 17, 1988, abandoned, which is a continuation of Ser. No. 858,928, May 2, 1986, abandoned. This application Dec. 15, 1988, Ser. No. 285,307

Claims priority, application Japan, May 2, 1985, 60-94687; May 2, 1985, 60-94688

Int. Cl.[4] G01G *23/22;* **G06F** *15/20*

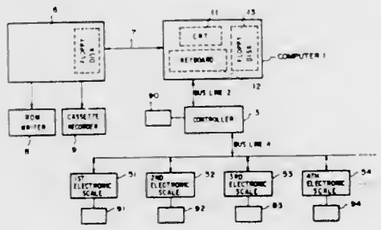
U.S. Cl. 364—464.01 **23 Claims**

1. An electronic scale system, comprising:

input means for entering merchandise data;

memory means for storing the merchandise data entered by said input means;

transmitter means for transmitting the merchandise data stored in said memory means; and



a plurality of electronic scales each connected to said transmitter means and each having a register memory for storing the merchandise data transmitted from said transmitter means and means for storing the merchandise data in an unregistered area of said register memory for each merchandise item.

4,901,238

OXIMETER WITH MONITOR FOR DETECTING PROBE DISLODGEMENT

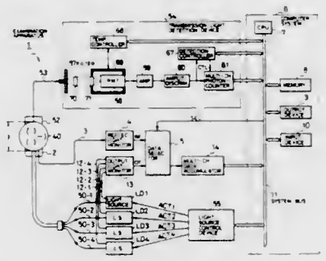
Susumu Suzuki; Sumio Yagi; Naotoshi Hakamata, and Takeo Ozaki, Shizuoka, all of Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed May 2, 1988, Ser. No. 188,912

Claims priority, application Japan, May 8, 1987, 62-110461

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—413.09 **6 Claims**



1. An examination apparatus for measuring the oxygenation in an object with electromagnetic wave transmission spectrophotometry, comprising:

light source means for sequentially emitting electromagnetic waves with different wavelengths;

an illumination-side fixture for making said electromagnetic waves introduced from said light source means incident on a measuring object and detecting reflected electromagnetic waves from said measuring object;

reflection light detection means for detecting said reflected electromagnetic waves introduced from said illumination-side fixture and outputting reflection light data;

output light detection means for detecting emitted electromagnetic waves from said light source means and outputting output light data; and

a computer system for receiving said reflection light data from said reflection light detection means and output light data from said output light detection means, and judging whether a fitting position of said illumination-side fixture has been changed on the basis of said reflection light data and said output light data.

4,901,239

ANTISKID DEVICE

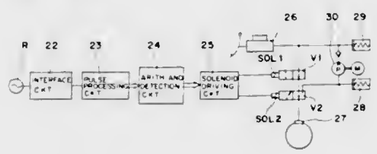
Masato Yoshino, Itami, Japan, assignor to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed May 12, 1988, Ser. No. 193,055

Claims priority, application Japan, May 20, 1987, 62-126324

Int. Cl.[4] B60T *8/34*

U.S. Cl. 364—426.02 **4 Claims**



1. An antiskid brake control device comprising:

a hydraulic brake circuit including a wheel cylinder for applying braking force to a vehicle wheel;

a pressure control valve means disposed within said hydraulic brake circuit and operative, in its first position, to increase fluid pressure in said wheel cylinder, in its second position, to decrease the fluid pressure in said wheel cylinder and, in its third position, to hold the fluid pressure in said wheel cylinder constant;

a wheel speed sensor means for detecting rotational speed of said vehicle wheel and producing speed pulses; and

an electronic/electric control means, for producing first, second and third control signals which actuate said pressure control valve means in the first, second and third positions, respectively, so as to adjust the rotational speed of said vehicle wheel, said control means including:

a wheel speed calculating means for calculating wheel speed based upon the speed pulses;

a wheel acceleration calculation means for calculating wheel acceleration based upon a rate of change of the wheel speed;

a vehicle speed estimating means for calculating vehicle speed based upon the wheel speed;

a standard slip calculating means for calculating standard slip based upon the vehicle speed and the wheel speed;

an excess slip calculating means for calculating an excess slip based upon the vehicle speed, the wheel speed and the standard slip;

a peak detecting means for detecting a peak of deceleration of said vehicle wheel while said electronic/electric control means produces the second control signal;

a deceleration/acceleration reference calculating means for calculating a deceleration/acceleration reference when the wheel acceleration exceeds the peak of deceleration by a predetermined value;

a peak detecting means for detecting a peak of deceleration of said vehicle wheel while said electronic/electric control means produces the second control signal;

a deceleration/acceleration reference calculating means for calculating a deceleration/acceleration reference when the wheel acceleration exceeds the peak of deceleration by a predetermined value;

the deceleration/acceleration reference, DI, being determined as a linear function of time, which has an initial value, Dwd, and is derived from $Dwd=Dpeak+d$ and $DI=Dwd+Ct$ where C denotes a constant coefficient of the linear function and t denotes time measured from a point when the wheel acceleration reaches Dwl;

an evaluating means for evaluating the excess slip by first and second predetermined thresholds, evaluating the wheel acceleration by a third predetermined threshold and the deceleration/acceleration reference value so as to determine which one of the first, second and third control signals should be issued; and

a solenoid driving circuit for driving, based upon the determined one of the first, second and third control signals, a solenoid coupled with said pressure control valve means;

wherein said evaluating means starts issuing the second control signal so as to decrease the fluid pressure in said wheel cylinder such that the rotational speed of said vehicle wheel is accelerated when at least one of the following occurs: the excess slip exceeds the first predetermined threshold and the wheel deceleration exceeds the third predetermined threshold;

wherein said evaluating means starts issuing the first control signal so as to increase the fluid pressure in said wheel cylinder such that the braking force of a vehicle is retrieved when the excess slip recovers into the second predetermined threshold greater than the first predetermined threshold after the peak of deceleration has been detected;

wherein said evaluating means effects change from the second control signal to the third control signal temporarily while the wheel acceleration exceeds the deceleration/acceleration reference value after the peak of deceleration has been detected;

4,901,240

METHOD AND APPARATUS FOR CONTROLLING THE OPERATING CHARACTERISTIC QUANTITIES OF AN INTERNAL COMBUSTION ENGINE

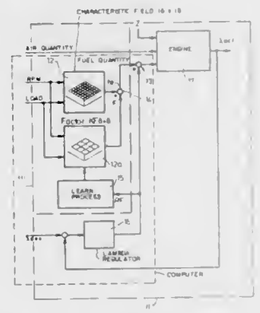
Peter J. Schmidt, and Manfred Schmitt, both of Schwieberdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 21, 1987, Ser. No. 6,696

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1986, 3603137

Int. Cl.[4] F02D *41/26, 41/30;* **F02B** *3/12*

U.S. Cl. 364—431.06 **8 Claims**



8. Apparatus for controlling operating characteristic quantities of an internal combustion engine by calculating values for an anticipatory control for metering fuel, with a characteristic field having values of engine operating quantities stored therein for anticipatorily controlling engine variables influencing the operating characteristic quantities, the apparatus comprising:

a control device sensitive to at least one engine variable as an actual value;

means for correctively influencing the particular characteristic field values emitted by said characteristic field with said control device;

a factor characteristic field associated with said characteristic field;

means for changing values stored in the factor characteristic field via said control device for correcting the characteristic field values, the stored values being addressed in dependence upon operating quantities of the engine such as speed and load;

means for storing at least two corrective characteristic fields I, II operating in common as a factor characteristic field, the influence areas of the corrective characteristic fields being configured so as to be larger than the basic raster of the factor characteristic field and being so determined that said influence areas mutually overlap so that at least one of the corrective characteristic fields is addressed when an input quantity fluctuates about an area limit quantity;

weighting means for also changing areas adjoining the particular support point with reduced influence outwardly;

means for forming quantities for metering fuel to the engine from the following: said characteristic field values of said basic characteristic field, the values of said factor characteristic field and said control factor RF; and,

means for controlling a device for metering fuel to the engine which meters fuel to the engine in correspondence to the value of one of said quantities.

4,901,241

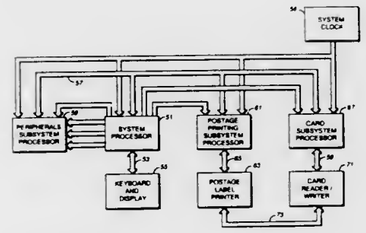
DEBIT CARD POSTAGE METER

Thomas Schneck, San Jose, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Filed Mar. 23, 1988, Ser. No. 172,693

Int. Cl.[4] G07B *17/00*

U.S. Cl. 364—464.02 **7 Claims**



1. A postage value system for a postage meter comprising,

an optical, direct read-after-write debit card having card position indicia and a postage value area,

an optical card reader-writer means for receiving said debit card in a read and write relation,

a postage meter having manual postage input means for commanding and registering a desired postage value, printing means communicating with the input means for printing on a postal label in response to registrations of postal values from the input means and in response to a signal received from the reader-writer means, said reader-writer means communicating with the postage input means and the printing means, said signal causing decrementation of said desired postal value from the debit card and actuating the printing of said postal value on said postage label, said reader-writer means establishing on said card a permanent record of postage label printing.

4,901,242

SYSTEM FOR MANAGING PRODUCTION OF SEMICONDUCTOR DEVICES

Norihiko Kotan, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 1, 1988, Ser. No. 176,863

Claims priority, application Japan, Apr. 3, 1987, 62-83415

Int. Cl.[4] G06F *15/46;* **G05B** *13/04*

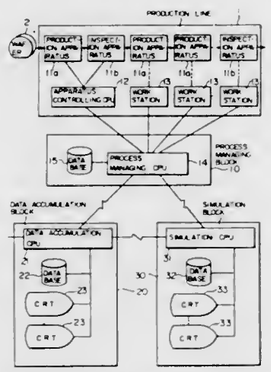
U.S. Cl. 364—468 **8 Claims**

1. A system for managing conditions of successive processes which are carried out on a semi-conductor wafer in a production line for producing semiconductor devices comprising:

processing managing means for receiving data concerning processes which have already been carried out on a semiconductor wafer in a production line and for outputting to the production line conditions for processes which are to be subsequently carried out on the wafer in the production line;

data accumulation means for accumulating the data concerning the processes carried out on wafers in the production line as a statistical data base; and

simulation means for simulating the processes to be carried



out subsequently on the wafer and predicting the characteristics of semiconductor devices produced by carrying out those processes to determine optimum conditions for processes to be carried out on the wafer in the production line in order to produce semiconductor devices having desired characteristics based on the data concerning the processes which have already been carried out on the production line and on the statistical data base accumulated in the data accumulation means, said simulation means providing the optimum conditions to said process managing means.

4,901,243

TIMER CONTROLLED POWER SUPPLY SYSTEM FOR A DATA TERMINAL

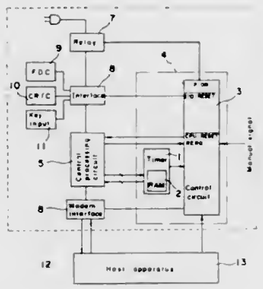
Kazuhiro Uehara, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 15, 1988, Ser. No. 206,733

Claims priority, application Japan, Jun. 16, 1987, 62-150389

Int. Cl.[4] G05B *23/02*

U.S. Cl. 364—483 **9 Claims**



1. A power source control system for activating a data terminal device at a predetermined time for transmitting data to a host apparatus, comprising:

controlled means for supplying electrical power to said data terminal device;

a power source control device in said data terminal device and including a control circuit for energizing said controlled means and a timer having a memory for activating said control circuit in response to a preset time;

means on said data terminal device for selecting a predetermined activation time;

central processor means on said data terminal device for communicating with said power source control device, setting said activation time in said memory, and for transmitting data to said host apparatus when said control circuit of said power source control device is activated; and

an interface circuit coupled between said central processor means and said host apparatus and being activated by said control circuit to transmit data to said host apparatus.

4,901,244

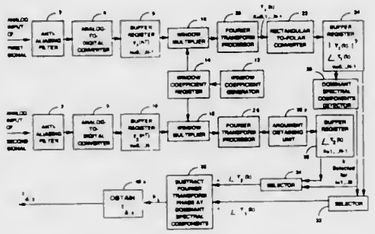
APPARATUS FOR, AND METHOD OF, ANALYZING SIGNALS

Lai-wan M. Szeto, 57 Axsmith Cres., Willowdale, Ontario, Canada (M2J 3K2)

Continuation-in-part of Ser. No. 695,017, Jan. 25, 1985, Pat. No. 4,730,257. This application Mar. 7, 1988, Ser. No. 165,243

Int. Cl.[4] G01R *25/00, 23/00*

U.S. Cl. 364—481 **33 Claims**



17. An apparatus, for use in measuring the amount of shift between the corresponding signal constituents of two signals, the apparatus comprising:

(i) first transform means for applying a Fourier Transform to a signal, to create a plurality of first spectral components representative of the said signal, and having an output for the first spectral components;

(ii) second transform means connected to the input of the shifted signal, for applying a Fourier Transform to the said shifted signal to create a plurality of second spectral components representative of the said shifted signal, and having an output for the second spectral components;

(iii) phase obtaining means connected to the outputs of the first and second transform means for obtaining the phases of the corresponding first and second spectral components and having an output for the said phases;

(iv) phase difference obtaining means, connected to the output of the phase obtaining means, and having an output for the phase difference; and

(v) shift obtaining means, connected to the output of the phase difference obtaining means, for obtaining the amount of shift between the corresponding signal constituents in the two signals, from the said phase difference of step (iv) and the frequency of the signal constituent.

4,901,245

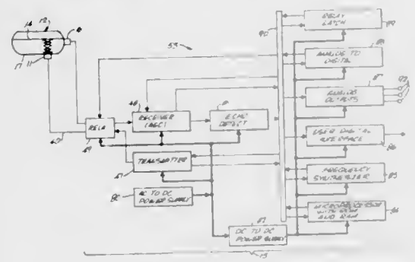
NONINTRUSIVE ACOUSTIC LIQUID LEVEL SENSOR

Rodney S. Olson, Chiloquin, and Edward L. Christensen, Klamath Falls, both of Oreg., assignors to Moore Technologies, Inc., Klamath Falls, Oreg.

Filed Dec. 1, 1987, Ser. No. 127,265

Int. Cl.[4] G01F *23/00*

U.S. Cl. 364—509 **44 Claims**



41. A method for determining the location in a tank of the surface of a quantity of liquid in the tank, the method comprising the steps of

(a) directing pulses of sound energy form a source thereof in an essentially vertical direction toward a liquid surface in the tank and detecting substantially at said source echoes of the pulses from the liquid surface,

(b) for each pulse, measuring the time between direction of the pulse and the detection of the echo thereof,

(c) providing information about the speed at which sound travels from the sound pulse source to the liquid surface,

(d) using said information and the time measurements to determine the distance from the sound pulse source to the liquid surface, thereby to determine the location of the liquid surface, and

(e) for subsequent sound pulses, disregarding for determination of source-to-surface distance any sound pulse echo which does not have an origin within a defined range of distances above and below the liquid surface.

4,901,246

METHOD AND APPARATUS FOR CLEARING FAULTS AT WORK STATION OF A TEXTILE MACHINE

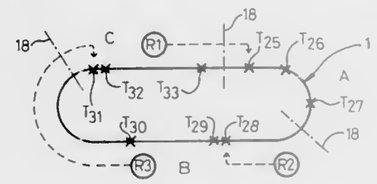
Urs Meyer, Niederglatt, and Stefan Huppi, Baar, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Sep. 22, 1988, Ser. No. 247,888

Claims priority, application Switzerland, Sep. 24, 1987, 03724/87

Int. Cl.[4] G05B *19/00*

U.S. Cl. 364—513 **16 Claims**



1. A method of clearing faults at fault-reporting work stations of at least one textile machine with the assistance of at least two centrally controlled robots movable along a track alongside the machine, said method comprising the steps of

determining the position and number of faulty work stations;

determining the position and number of robots for clearing the faulty work stations;

uniformly distributing the number of faulty work stations to be cleared to the robots numerically;

allocating a respective sub-section of the track to each robot;

thereafter directing each robot to a respective allocated sub-section; and

clearing the faulty work stations of each sub-section solely by the robot allocated to said sub-section.

4,901,247

METHOD FOR CONTROLLING AN OPERATION OF A BLAST FURNACE

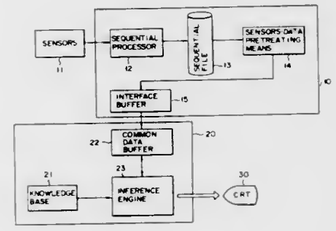
Kazumasa Wakimoto; Motohiro Shibata; Takaharu Ishii, and Masaaki Sakurai, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

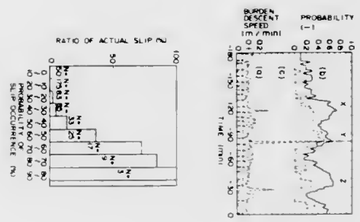
Continuation of Ser. No. 46,296, May 4, 1987, abandoned. This application Aug. 7, 1989, Ser. No. 391,639

Claims priority, application Japan, May 20, 1986, 61-113794

Int. Cl.[4] G05B *23/02; C21B 5/00*

U.S. Cl. 364—513 **15 Claims**





1. A method for preventing channeling, slip and hanging in a blast furnace, comprising the steps of:

measuring a burden-descent speed by a first sensor means;

measuring an in-furnace pressure by a second sensor means;

measuring a burden temperature by a third sensor means;

measuring an in-furnace gas temperature by a fourth sensor means;

measuring a composition of an in-furnace gas by a fifth sensor means;

measuring a pressure of a blast gas blown in through tuyeres set in the blast furnace by a sixth sensor means;
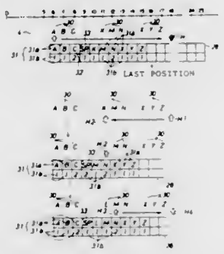
storing first data from the first to sixth sensor means;
processing said first data, and preparing second data corresponding to the conditions of the channeling, slip and hanging in the blast furnace;
preparing true-and-false data, as third data, by comparing said second data with standard data;
inferring conditions of channeling, slip and hanging, from the third data and from a knowledge base formed by accumulated experience on an operation of the blast furnace; and
repeating the above-mentioned steps at predetermined intervals.

4,901,248

PRINTING DEVICE WITH COMPRESSED TEXT DATA MEMORY

Hideo Ueno, Nagoya, and Keiko Yamada, Ama, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 30, 1987, Ser. No. 139,740
Claims priority, application Japan, Jan. 7, 1987, 62-1217
Int. Cl.[4] G06F *5/00*
U.S. Cl. 364—519 **5 Claims**



1. A printing device with a text data memory and a printing head, the printing device comprising:
input means for inputting character data and space data;
data coding means for making a first character print data by combining a character code data corresponding to the character data input through the input means and a normal printing pitch data when the character data is followed by another character data, and for making a second character print data by combining a character code data corresponding to the character data input through the input means and an extended printing pitch data when the character data is followed by a space data; and
data storing means for serially storing the first and second character print data in the text data memory.

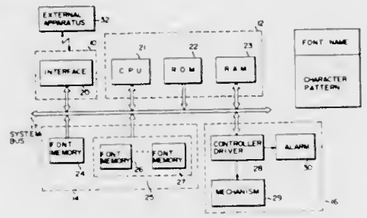
4,901,249

PRINTING APPARATUS WHICH CAN SPECIFY A FONT MEMORY IRRESPECTIVE OF A MOUNTING POSITION THEREOF, AND A METHOD OF SPECIFYING A FONT MEMORY

Keiichi Shiota, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1986, Ser. No. 842,219
Claims priority, application Japan, Mar. 30, 1985, 60-67051
Int. Cl.[4] G06F *9/00, 15/626*
U.S. Cl. 364—519 **13 Claims**

1. A printing apparatus comprising:
means for receiving externally generated signals including input character code data, a font-specifying instruction, and a printing instruction;
character pattern memory means for generating character pattern data corresponding to said input character code data, including:
a plurality of font memories each of the font memories storing character pattern data and an identifying font name,
means for generating and corresponding character pattern data in accordance with said font memory,
means for detachably mounting a plurality of font memories;
a fixed font memory including one of the plurality of font memories, and
a detachable cartridge including one of the plurality of font memories;



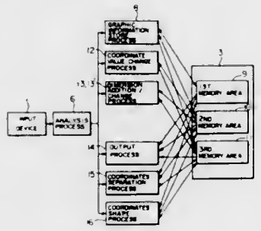
font memory specifying means for sequentially searching each font memory of said character pattern memory means for the font memory to be used in a printing operation in accordance with said font-specifying instruction;
output means for outputting character code data to said character pattern memory means in response to said printing instruction; and
printing means for printing the character pattern data from said character pattern memory means.

4,901,250

GRAPHIC COMMUNICATION PROCESSING APPARATUS CAPABLE OF CHAINING GRAPHIC INFORMATION WITH A SMALL NUMBER OF PROCESSES

Tomotoshi Ishida, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 20, 1987, Ser. No. 51,698
Claims priority, application Japan, May 21, 1986, 61-114616
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—521 **16 Claims**



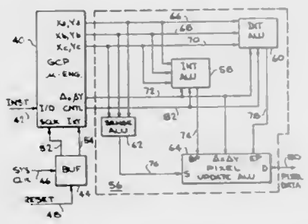
1. A graphic information processing apparatus comprising:
an input device for inputting graphic information, including coordinate values for a plurality of coordinate points of graphic data, and process command data for said graphic information;
a memory having first and second memory areas for storing graphic information received from said input devices;
a display device for displaying said graphic information stored in said memory; and
a processor connected to receive said process command data from said input device, and including graphic information store means for storing said graphic information from said input device in said memory, stored information change means for changing graphic information stored in said memory, display means for reading graphic information stored in said memory and for supplying said read graphic information to said display device and means responsive to said process command data from said input device for operating one of said graphic information store means, said store information change means and said display means;
wherein said graphic information store means comprises:
coordinate value store means for storing coordinate values of each coordinate point of said graphic information from said input device in said second memory area; and
coordinate point store means for storing in said first memory area data representing each coordinate point and pointers indicating store areas of said coordinate values stored in said second memory area.

4,901,251

APPARATUS AND METHODOLOGY FOR AUTOMATED FILLING OF COMPLEX POLYGONS

Adrian Sfarti, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 3, 1986, Ser. No. 847,807
Int. Cl.[4] G06F *3/153*
U.S. Cl. 364—521 **24 Claims**



1. Computer graphics apparatus for filling a complex polygon, as defined by an enumeration of P vertices, with a fill quantity, said apparatus comprising:
(a) means for selecting a first vertex from said enumeration of P vertices and for decomposing said complex polygon into an set of P-2 triangles, each said triangle representable as a respective enumeration of T vertices including said first vertex and two successive vertices in said enumeration of P vertices;
(b) means, receiving each said respective enumeration of T vertices, for deriving a sense value for each said triangle, said deriving means determining each said sense value based on the enumerated order of the T vertices in a plane defined thereby, a first sense value corresponding to a clockwise enumeration order and a second sense value corresponding to a counterclockwise enumeration order; and
(c) means, responsive to said deriving means, for successively filling the area bounded by each said triangle with a fill quantity qualified by said first or second sense value.

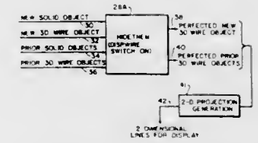
4,901,252

METHOD FOR PRODUCING PLANAR GEOMETRIC PROJECTION IMAGES

William J. Fitzgerald, Ridgefield, Conn.; Franklin Gracer, Yorktown Heights, and Robert N. Wolfe, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 630,627, Jul. 13, 1984, abandoned. This application Sep. 24, 1987, Ser. No. 100,686
Int. Cl.[4] G06F *15/62*
U.S. Cl. 364—522 **15 Claims**





2. An improved method for changing a planar geometrical projection image of a compound physical structure which is comprised of a plurality of component objects having separate boundary faces, the method comprising separately storing information for each object on each segment of each edge line formed by an object face edge, said edge lines being segmented at line of sight intersections with other lines representing contour edges of visible faces, checking each edge line segment against all visible faces to be represented in the image to determine which edge line segments are visible and which are invisible, including information on visibility with the information stored for each edge line segment, and then modifying the image by changing the number of component objects and after each change in number of objects checking edge line segments for visibility only with respect to the changes associated with the changed objects.

4,901,253

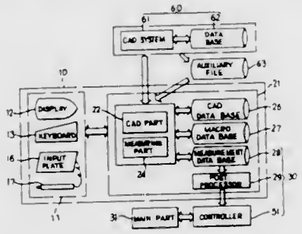
COORDINATE MEASURING INSTRUMENT AND METHOD OF GENERATING PATTERN DATA CONCERNING SHAPE OF WORK TO BE MEASURED

Hideo Iwano, Kawasaki, and Soichi Kadowaki, Tokyo, both of Japan, assignors to Mitutoyo Corporation, Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 158,292
Claims priority, application Japan, Feb. 23, 1987, 62-40565; Feb. 23, 1987, 62-40566; Feb. 24, 1987, 62-42149
Int. Cl.[4] G05B *19/42;* **G06F** *15/60*
U.S. Cl. 364—522 **9 Claims**

1. A coordinate measuring instrument, comprising:
a main part which effects three-dimensional relative movement between a work to be measured and a probe sensor, and a controller which controls said main part in accordance with a predetermined procedure and which measures the shape and size of said work by moving said probe sensor according to a measuring procedure to a plurality of successive positions in each of which said sensor senses the position of a respective one of a plurality of points on an external surface of said work and by recording positional information for each of said points; and
measuring procedure instruction means which includes input means for facilitating input into said measuring procedure instruction means of measuring condition parameters, which includes means for storing data represent-

ing a plurality of simple geometric shapes, which includes means for facilitating input into said measuring procedure instruction means of given design data for said work, and which includes a coordinate measurement supporting system having CAD means for generating shape pattern data representing a shape pattern corresponding to the shape of said work by selectively combining said geometric shapes based on said given design data, and having measuring means operatively coupled to said controller



for generating, based on said shape pattern data generated by said CAD means and said measuring condition parameters from said input means, measurement information defining said measuring procedure for said controller, said measurement information including a definition of said plurality of positions and a definition of a path of movement for said probe sensor which causes said probe sensor to successively pass through each of said positions;

whereby said measuring procedure is generated without actual physical measurement of a reference work.

4,901,254

METHOD AND APPARATUS FOR INFLUENCING THE COLOUR APPEARANCE OF A COLORED AREA IN A PRINTING PROCESS

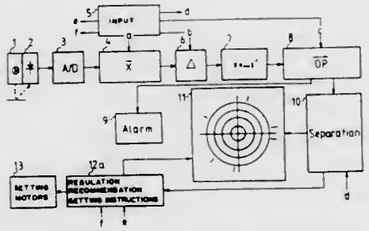
Friedrich Dolezalek, Groebenzell, and Karl-Heinz Besson, Munich, both of Fed. Rep. of Germany, assignors to Fogra Deutsche Forschungsgellschaft fur Druckund, Reproduktionstechnik e.V., Fed. Rep. of Germany

Filed Jul. 14, 1987, Ser. No. 73,444

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1986, 3626423

Int. Cl.[4] G01J *3/46;* **G06F** *15/20*

U.S. Cl. 364—526 **14 Claims**



1. In a method for influencing the colour appearance of a coloured area made up of at least three chromatic separation colours in a printing process, on the basis of densitometric measurements in at least one test area in which density value differences between the densitometric actual values and predetermined target values are determined for the separation colours and are used to influence the inking of the separation colours, the improvement comprising inking the chromatic separation colours in at most two chromatic separation colours as a function of the coloured proportion of a sum vector, determining said sum vector starting from the density value differences of the chromatic separation colours and based on a coloured area which is to be influenced as regards its colour appearance in an equidistantly graded colour space, and breaking down the colour shift indicated by said sum vector into a grey proportion which only affects brightness as well as a coloured proportion relating to at most two chromatic separation colours, said sum vector being formed by addition of separation colour vectors associated with the chromatic separation colours, the absolute amount and direction thereof being determined by means of at least one test run so that the sum vector in a plane of equal brightness corresponds substantially to the vector which points from the colour coordinates of the coloured area appertaining to the target values to the colour coordinates of the coloured area appertaining to the actual values, said absolute amount of the separation colour vectors being determined as the product

(a) of the percent dot area of the respective separation colour in the coloured area to be influenced and

(b) a calibration factor (f) which is determined by approximation as

$$f = 80 \times D - 1.1$$

where D is the mean of the target colour densities of the chromatic separation colours measured in the test areas.

4,901,255

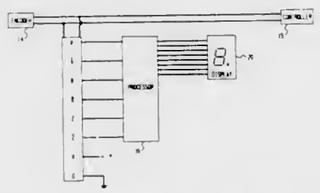
METHOD AND APPARATUS FOR EVALUATING QUADRATURE ENCODERS

John S. Lynn; William I. Jenrette, both of Mecklenburg County, N.C., and Glenn B. Fox, Miami, Fla., assignors to Lynn Electronics Corp., Charlotte, N.C.

Filed Mar. 21, 1988, Ser. No. 171,473

Int. Cl.[4] G01R *25/00, 29/02*

U.S. Cl. 364—551.01 **24 Claims**



1. A method for evaluating the performance of a device which generates two electrical wave train signals, each wave train signal varying between first and second states and the two wave train signals normally being out of phase one with the other, the method comprising the steps of: distinguishing, from a succession of changes of the two wave train signals between respective first and second states, four types of change of phase relation between the two wave train signals; timing and recording a time interval required for each type of phase change; accumulating a plurality of sets of records of timed intervals for each of the four types of change of phase relation between the two wave train signals; computing from the accumulated plurality of sets of records the mean time interval for a change of phase relation between the two wave train signals; comparing the computed mean time interval with the accumulated sets of records of timed intervals and determining the one type of phase change for which the difference from the mean time interval is the greatest; deriving, from the record of timed intervals which has the greatest difference from the mean time interval and the computed mean time interval, a quality signal representative of the performance of the device generating the wave train signals; and displaying the quality signal.

4,901,256

CO-ORDINATE MEASURING

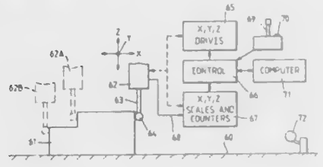
David R. McMurtry, Wotton-under-Edge; John P. Robertson, Horfield, and Alan D. Darlington, Dursley, all of United Kingdom, assignors to Renishaw plc, Gloucestershire, United Kingdom

Filed Jul. 22, 1987, Ser. No. 76,688

Claims priority, application United Kingdom, Jul. 25, 1986, 8618152

Int. Cl.[4] G01B *21/20*

U.S. Cl. 364—560 **20 Claims**



18. Apparatus for use in inspecting an article, the apparatus comprising a co-ordinate positioning apparatus having a fixed part, a movable part and co-ordinate measuring means providing outputs indicative of the amount of relative movement between the two parts; probe means mounted on one of said fixed and movable parts of the co-ordinate positioning apparatus for relative movement towards points on an article on the other of said fixed and movable parts to sense such points; said probe means providing a signal indicative of such sensing; and computing means arranged to use outputs of the measuring means to

(a) detect the direction of relative movement of the probe means towards each of said points,

(b) determine co-ordinates of each of said points in response to the probe means and outputs of the co-ordinate measuring means, and

(c) on the basis of said directions, make a decision concerning the geometrical shape of at least a portion of said article.

4,901,257

TEMPERATURE CALIBRATION SYSTEM

Daniel Y. Chang, Canoga Park; Bradley C. Waldron, Woodland Hills, and James M. Walthers, Sr., Chatsworth, all of Calif., assignors to King Nutronics Corporation, Woodland Hills, Calif.

Filed Jun. 12, 1987, Ser. No. 61,297

Int. Cl.[4] G06F *15/20;* **G01K** *7/16*

U.S. Cl. 364—571.01 **12 Claims**

1. In an apparatus for providing a desired temperature for use in calibrating a temperature measuring device, the combination of:

a heat source having a receptacle for receiving the temperature measuring device to be calibrated;

means for measuring the temperature of said heat source to provide a measured temperature, said means including a temperature sensing resistor having a nonlinear relationship between the temperature and resistance of said resistor;

means for setting in digital form a desired temperature for the heat source;

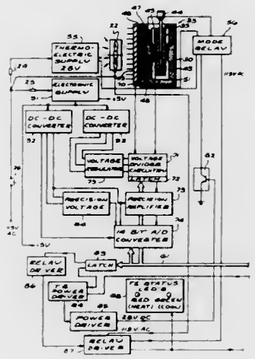
control means for controlling electric power for connection to said heat source for controlling the temperature of said heat source;

a bridge circuit having four arms and two pairs of terminals, with said temperature sensing resistor connected as one arm thereof and resistors of known resistance connected as the other arms thereof, with a known voltage connected across one pair of bridge terminals and providing a differential voltage at the other pair of bridge terminals, which differential sensing resistor;

a converter for converting said differential voltage to a digital resistance number;

a processor having said digital resistance number as an input for calculating the digital temperature of said temperature sensing resistor as a measure of the temperature of said heat source;

said processor including means for comparing said digital temperature of said temperature sensing resistor and said digital desired temperature to provide a digital temperature error signal; and



means for converting said digital temperature error signal to an analog signal as an input to said control means for controlling the electric power to said heat source;

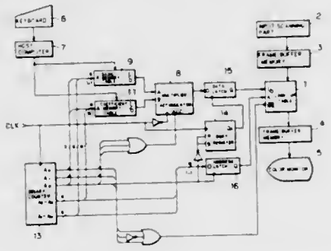
wherein said processor includes means for calculating said digital temperature of said temperature sensing resistor using known equations with three predetermined coefficients, and including

a coefficient memory for said predetermined coefficients, and

means for storing values for said coefficients in said memory, and

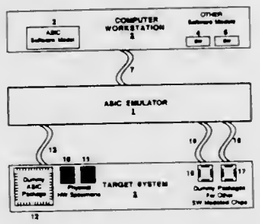
wherein said known equations are the IPTS-68 equations.

4,901,258
METHOD OF AND APPARATUS FOR GENERATING LOOK-UP TABLE DATA
Kazuya Akiyama, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan
Filed Dec. 23, 1987, Ser. No. 137,144
Claims priority, application Japan, Dec. 23, 1986, 61-315186
Int. Cl.[4] G06F *15/353, 15/66;* **G11C** *7/00*
U.S. Cl. 364—577 **18 Claims**



6. A method in accordance with claim 2 wherein $1 \leqq c < a$.

4,901,259
ASIC EMULATOR
Daniel R. Watkins, Saratoga, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.
Filed Aug. 15, 1988, Ser. No. 232,269
Int. Cl.[4] G06G *7/48;* **G06F** *11/00*
U.S. Cl. 364—578 **2 Claims**



1. A structure for modeling the operation of a specified computing device in a target system, said structure comprising

a computer for executing a software model of said specified computing device, said specified computing device not being physically present in said target system, said software model comprising

software input pin means for receiving one or more software input pin signals representing the signals received as inputs to said specified computing device,

software output pin means for transmitting one or more software output pin signals representing the signals generated as outputs of said specified computing device, and

software modeling means for modeling in software the execution of said specified computing device, by which software input pin signals are transformed into software output pin signals, a target system comprising

one or more physical computing devices physically present in said target system, and

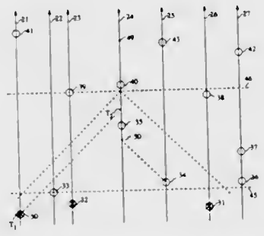
a dummy package placed in the target system where said specified computing device, once fabricated, is intended to be placed, said dummy package comprising

bidirectional hardware input/output pin means for receiving as input and transmitting as output both hardware input pin signals, representing the signals generated as inputs to said specified computing device, and hardware output pin signals, representing the signals generated as outputs of said specified computing device,

input synchronization means, operationally connected to said computer and said target system, for receiving hardware input pin signals from said target system and transforming said hardware input pin signals into software input pin signals by synchronizing the bidirectional hardware input/output pin means of said dummy package with the software input pin means of the software model of said specified computing device, and

output synchronization means, operationally connected to said computer and said target system, for receiving software output pin signals from said computer and transforming said software output pin signals into hardware output pin signals by synchronizing the software output pin means of the software model of said specified computing device with the bidirectional hardware input/output pin means of said target system.

4,901,260
BOUNDED LAG DISTRIBUTED DISCRETE EVENT SIMULATION METHOD AND APPARATUS
Boris D. Lubachevsky, Bridgewater, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.
Filed Oct. 28, 1987, Ser. No. 114,369
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—578 **24 Claims**

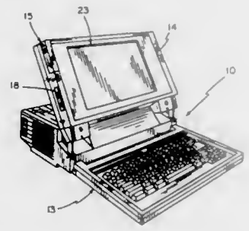


1. A method for simulating behavior of a system containing interacting subsystems, where a known minimum delay exists between changes occurring at one of said subsystems and the effects of said changes on others of said subsystems, said simulating being performed with a simulation system having a plurality of interconnected processors with each of said subsystems to be simulated being simulated on one of said processors, wherein the improvement comprises:

in each of said processors, a step of simulating events of subsystems, to be simulated in each of said processors, whose simulated time lies within a preselected interval following the earliest simulation time of events yet to be simulated by said processors.

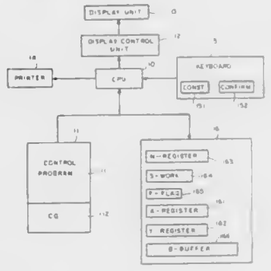
4,901,261
RETRACTABLE HANDLE AND LATCH FOR PORTABLE COMPUTERS
Eric D. Fuhs, Stevensville, Mich., assignor to Zenith Electronics Corporation, Glenview, Ill.
Filed Oct. 31, 1988, Ser. No. 265,110
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—708 **22 Claims**

1. A portable computer, comprising: a base including at least one drive, a keyboard assembly projecting forwardly from the base, a lid assembly pivotally mounted on the computer and movable from a closed position over the keyboard assembly to an open position permitting viewing of a visual display, at least one latch assembly for locking the lid assembly in a closed



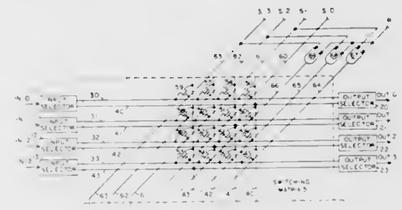
position, a retractable handle assembly on the computer movable from a retracted position to an extended position, and means responsive to movement of the handle assembly toward its extended position for activating the latch assembly.

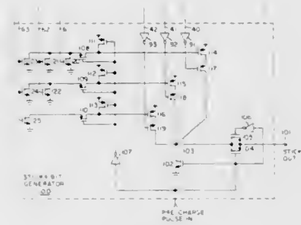
4,901,262
ELECTRONIC CALCULATOR PROVIDING FLEXIBLE CONSTANT UTILIZATION
Yasuharu Tanaka, and Ken'ichi Inui, both of Nara, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 22, 1986, Ser. No. 136,676
Claims priority, application Japan, Dec. 23, 1987, 61-315502
Int. Cl.[4] G06F *3/02, 7/38*
U.S. Cl. 364—709.16 **3 Claims**



1. An electronic calculator comprising a keyboard having numerical keys and others, output means, a read only memory (ROM) to store control programs, a random-access memory (RAM), and a CPU to control these devices, wherein said RAM provides a constant register to store constants, an operator storage unit to store operators, and a flag storage unit to store a flag to show whether an operator is positioned before or after a constant, wherein said keyboard includes a setting key to set an entered constant and operator and includes also a confirmation key which initiates operation of said output means to generate characters confirming the order of entry of the predetermined constant and operator, wherein, according to the contents of the flag storage unit in RAM indicative of the position of the operator, the sequence of subsequent calculations employing the constant and operator is changed.

4,901,263
VERSATILE DATA SHIFTER WITH STICKY BIT GENERATION CAPABILITY
Chung-Yih Ho, Niskaynua; Karl J. Molnar, Clifton Park, and Daniel A. Staver, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Sep. 12, 1988, Ser. No. 243,359
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—715.08 **3 Claims**





1. A data shifter for binary data having a plurality n in number of bit places, said data shifter comprising:

a first plurality of binary-place busses respectively identified by consecutive ordinal numbers zeroeth through $(n-1)^{th}$;

a second plurality of further binary-place busses also respectively identified by consecutive ordinal numbers zeroeth through $(n-1)^{th}$;

a plurality of input selectors respectively identified by consecutive ordinal numbers zeroeth through $(n-1)^{th}$ for selecting respective bit pieces of input data to correspondingly identified binary-place busses in said first plurality thereof during shifts towards increased significance and to correspondingly identified further binary-place busses in said second plurality during shifts towards decreased significance;

a plurality of output selectors identified by consecutive ordinal numbers zeroeth through $(n-1)^{th}$ for selecting respective bit places of output data from correspondingly identified further binary-place busses in said second plurality thereof during shifts towards increased significance and from correspondingly identified binary-place busses in said first plurality thereof during shifts towards decreased significance;

a plurality n^2 in number of switches, respective ones of said switches selectively connecting each of said first plurality of binary place busses to each of said second plurality of further binary place busses, as controlled by respective control signals received by said switches;

a plurality of shift control busses respectively identified by consecutive ordinal numbers zeroeth through $(n-1)^{th}$, each shift control bus connected for applying control signals to those of said switches selectively connecting a binary-place bus in said first plurality to a further binary-place bus in said second plurality with identification num-

ber larger than its own by the identification number of that shift control bus;

means for issuing a shift command to only a selected one of said shift control busses;

a plurality of rotation control busses respectively identified by consecutive ordinal numbers first through $(n-1)^{th}$, each rotation control bus connected for applying control signals to those of said switches selectively connecting a further binary place bus in said second plurality to a binary-place bus in said first plurality with identification number larger than its own by the identification number of that rotation control bus;

means, responsive, only whenever a rotation enable signal is supplied thereto, to a shift command appearing on one of said first through $(n-1)^{th}$ shift control busses, for generating a rotation command on the rotation control bus with identification number corresponding to that of the shift control bus on which said shift command appears; and

means for supplying a respective fill bit to each said binary-place bus and further binary place bus in said first and second pluralities thereof that is neither currently selected by one of said input selectors nor is currently connected by one of said switches to a binary-place bus in said first and second pluralities thereof that is currently selected by one of said input selectors.

4,901,264

PSEUDO RANDOM PATTERN GENERATING DEVICE

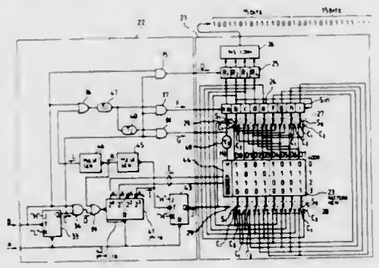
Mishio Hayashi, Saitama, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,520

Claims priority, application Japan, Jul. 31, 1987, 62-192157; Jul. 31, 1987, 62-192158

Int. Cl.[4] G06F *1/02, 3/00*

U.S. Cl. 364—717 **10 Claims**



1. A pseudo random pattern generating device comprising:

pattern memory means wherein there are stored at 2^{n-m} addresses for 2^{n-m} subpatterns of at least $(2^{m+1}-1)$ bits in length, where n is an integer equal to or greater than 3 and m is a positive integer smaller than n, each of the subpatterns being composed of one of 2^{n-m} split patterns into which a pseudo random pattern, which recurs on a cycle of (2^2-1) bits, is split at intervals of 2^m bits, starting at the beginning of the pseudo random pattern, and a continuation pattern of a predetermined number of bits subsequent to said each split pattern in the recurring pseudo random pattern;

a 2^{n-m} counter which counts a clock and sequentially outputs the count values as address signals;

readout means which is supplied with the address signals one after another, for reading out the subpatterns stored in said pattern memory means at addresses corresponding to the address signals, in synchronism with the clock;

shift means for outputting a pattern composed of a contiguous 2^2 bits in each of the subpatterns read out by said readout means from the addresses, while circularly shifting in a rightward direction the 2^m-bit pattern to be output by one bit position in the subpatterns upon each readout of the 2^{n-m} subpatterns;

latch means for latching the 2^m-bit pattern output from said shift means; and

parallel-serial converting means which is supplied with the 2^2-bit pattern in parallel form from said latch means, for outputting the 2^m-bit pattern as a serial pattern.

4,901,265

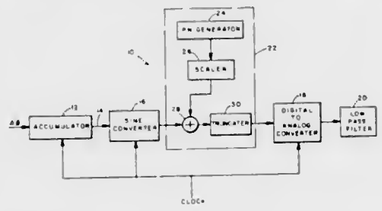
PSEUDORANDOM DITHER FOR FREQUENCY SYNTHESIS NOISE

Richard J. Kerr, and Lindsay A. Weaver, both of San Diego, Calif., assignors to Qualcomm, Inc., San Diego, Calif.

Filed Dec. 14, 1987, Ser. No. 132,348

Int. Cl.[4] G06F *1/02*

U.S. Cl. 364—721 **20 Claims**



6. An apparatus for reducing spurious output response in a direct digital frequency synthesizer, employing a phase angle accumulator connected to a sine function converter to convert phase data to digital amplitude numbers and being further connected to a Digital-to-Analog converter which generates an analog signal according to the amplitude numbers, comprising:

a pseudorandom number generator;

scaler means for receiving generated pseudorandom numbers and for scaling a magnitude of said pseudorandom numbers by a predetermined amount; and

summation means for adding together two numbers to generate a sum, having a first input connected to an output of said sine function converter, a second input connected to said sine function converter, a second input connected to an output of said scaler, and an output connected to the input of said Digital-to-Analog converter.

4,901,266

INTERPOLATING APPARATUS WITH A PROCESSING SECTION FOR LINE SEGMENTS PARALLEL WITH A COORDINATE AXIS

Toshiyuki Takagi, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 224,075

Claims priority, application Japan, Aug. 25, 1987, 62-209274

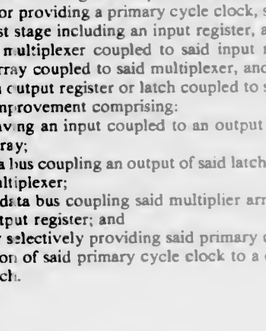
Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—723 **5 Claims**

1. In a line-figure processing system, an interpolating apparatus for producing from data of starting point coordinates and terminating point coordinates on a two-dimensional coordinates system a dot pattern for a line segment extending between two points corresponding respectively to said starting point coordinates and said terminating point coordinates, comprising:

comparing means for comparing a value of a first coordinate component of said starting point coordinates with a value of a first coordinate component of said terminating point coordinates;

data modifying means started in response to detection by said comparing means of coincidence of said first coordinate component values for recursively modifying a value of a second coordinate component of said starting point coordinates by a unit value up to a value of a second coordinate component of said terminating point coordinates;



means for combining one of said first coordinate component values and a series of values obtained from said data modifying means to produce a series of interpolating coordinates data; and

general-purpose interpolating means started in response to detection by said comparing means of noncoincidence of said first coordinate component values.

4,901,267

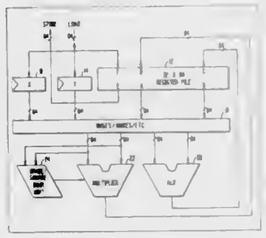
FLOATING POINT CIRCUIT WITH CONFIGURABLE NUMBER OF MULTIPLIER CYCLES AND VARIABLE DIVIDE CYCLE RATIO

Mark Birman, Fremont; George K. Chu, Sunnyvale; Fred A. Ware, Los Altos Hills, and Selfia Halim, Los Gatos, all of Calif., assignors to Weitek Corporation, Sunnyvale, Calif.

Filed Mar. 14, 1988, Ser. No. 167,802

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—736 **7 Claims**



1. In a circuit having a multiplier, an arithmetic logic unit and means for providing a primary cycle clock, said multiplier having a first stage including an input register, a second stage including a multiplexer coupled to said input register and a multiplier array coupled to said multiplexer, and a third stage including an output register or latch coupled to said multiplier array, the improvement comprising:

a latch having an input coupled to an output of said multiplier array;

a first data bus coupling an output of said latch to an input of said multiplexer;

a second data bus coupling said multiplier array directly to said output register; and

means for selectively providing said primary cycle clock or a fraction of said primary cycle clock to a clock input of said latch.

4,901,268

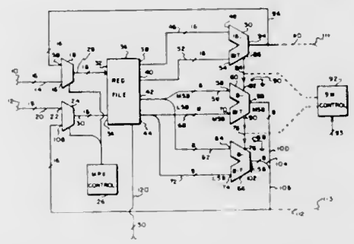
MULTIPLE FUNCTION DATA PROCESSOR

James E. Judd, Maple Shade, N.J., assignor to General Electric Company, Moorestown, N.J.

Filed Aug. 19, 1988, Ser. No. 234,124

Int. Cl.[4] G06P *7/38*

U.S. Cl. 364—745 **10 Claims**



1. An arrangement for processing 2N-bit data produced at first and second N-bit source ports, which data is configurable in the form of a 2N-bit word or two N-bit words or a word including 3N/2-bit mantissa with N/2-bit exponent, comprising:

an N-bit register file including first and second N-bit input ports and first, second, third, fourth, fifth and sixth output ports, said first and second output ports having N bits, said third and fourth output ports each having N/2 bits which together constitute one N-bit output port, with said third output port representing the most significant of said N bits, and said fourth output port representing the remaining bits of lesser significance, said fifth and sixth output ports each having N/2 bits, which together constitute one N-bit output port, with said fifth output port representing the most significant bits, and said sixth output port representing the remaining bits of lesser significance;

a dynamically reconfigurable arithmetic logic unit including first and second input ports coupled to a first portion of said arithmetic logic unit, said first and second input ports of said first portion of said arithmetic logic unit each having N bits and being coupled to said first and second output ports of said register file, respectively, said first portion of said arithmetic logic unit further including a carry input terminal and an N-bit output port, said reconfigurable arithmetic logic unit further including third and fourth input ports coupled to a second portion of said arithmetic logic unit, said second portion of said arithmetic logic unit further including a carry input terminal, a carry output terminal, and an N/2 bit output port, said third input port of said arithmetic logic unit having N/2 bits and being coupled to said third output port of said register file, said fourth input port of said arithmetic logic unit having N/2 bits and being coupled to said fifth output port of said register file, said reconfigurable arithmetic logic unit further including fifth and sixth input ports coupled to a third portion of said arithmetic logic unit, said third portion of said arithmetic logic unit further including a carry output terminal and an N/2 bit output port, said fifth input port of said arithmetic logic unit having N/2 bits and being coupled to said fourth output port of said register file, and said sixth input port of said arithmetic logic unit having N/2 bits and being coupled to said sixth output port of said register file, said reconfigurable arithmetic logic unit further including first and second controllable switch means, said first switch means including a controllable path coupled to said carry output terminal of said second portion of said arithmetic logic unit and to said carry input terminal of said first portion of said arithmetic logic unit, said second switch means including

VOL 1111 ISS 2 FEB 13 1990 UMI

a controllable path coupled to said carry output terminal of said third portion of said arithmetic logic unit and to said carry input terminal of said second portion of said arithmetic logic unit, said first and second switch means each further including control input terminals;

coupling means coupled to said first and second N-bit input port of said register file and adapted to be coupled to said first and second N-bit source ports for coupling data from said first and second source ports to said first and second input ports of said register file, respectively;

switch control means coupled to said first and second switch means for controlling said switch means in first, second and third operating modes, said first operating mode having said first and second switch means closed for thereby operating said first, second and third portions of said arithmetic logic unit together as a 2N-bit arithmetic logic unit, said second operating mode having said first switch means open and said second switch means closed for thereby operating said first portion of said arithmetic logic unit independently and for operating said second and third portions of said arithmetic logic unit together as an N-bit portion, said third operating mode having said first switch means closed and said second switch means open for thereby forming a 3N/2 bit portion of said arithmetic logic unit including said first and second portions of said arithmetic logic unit together with a separate N/2 bit portion including said third portion of said arithmetic logic unit.

4,901,269

MULTIPLE-STAGE CARRY-SELECT ADDER HAVING UNIQUE CONSTRUCTION FOR INITIAL ADDER CELLS

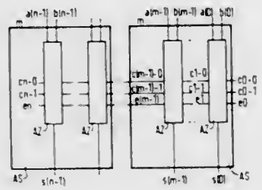
Anton Stoelzle, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 21, 1987, Ser. No. 87,829

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629011

Int. Cl.⁴ G06F *7/50*

U.S. Cl. 364—784 **7 Claims**



1. An adder for processing n-bit-wide operands (a,b) with the assistance of n/m adder stages, each having a processing width of m-bits for m-bit-wide sub-operands, each adder stage comprising in combination:

(a) an initial adder coil (AZA) for the least significant bit of a sub-operand and m-1 normal adder cells (AZN), constructed alike, one each for the remaining bits of the sub-operand;

(b) each adder cell (AZA, AZN) being connected to receive a first carry-in signal and a second carry-in signal from a next-lower adder cell, to generate a sum signal (S) from the operand bits supplied to it and from one of said carry-in signals, and to generate a first carry-out signal and a second carry-out signal, said carry-out signals are supplied to a next adder cell of this stage or the initial adder cell of the next higher adder stage as said carry-in signals;

(c) said initial adder cell having means for generating said sum signal by selecting one of said carry-in signals supplied to it in response to a first selection signal, said carry-in signals are permanently set to logic 0 at the least significant adder stage, otherwise the carry signals are supplied from the next-lower stage, for generating a second selection signal for the next higher adder stage by transferring from said initial adder cell to the next higher adder stage, the carry-in signal which is used to generate the sum signal, for generating a first carry-out signal by an AND operation from the operand bits supplied to it and a second carry-out signal by an OR-operation of said operand bits;

(d) each normal adder cell (AZN) having means for generating said sum signal by selecting one of said carry-in signals supplied to it in response to said second selection signal, for generating carry-out signals which are identical to said received carry-in signals when the supplied operand bits have different logic values, which are logic 0 when both operand bits are logic 0 and which are logic 1 when both operand bits are logic 1, for transferring the second selection signal to the next adder cell of said stage or to the initial adder cell of the next higher adder stage as said first selection signal.

4,901,270

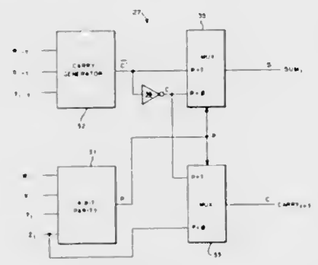
FOUR-TO-TWO ADDER CELL FOR PARALLEL MULTIPLICATION

David Galbi, Mountain View, and Alfred K. Chan, San Jose, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 23, 1988, Ser. No. 248,797

Int. Cl.⁴ G06F *7/50, 7/52*

U.S. Cl. 364—786 **5 Claims**



1. An adder circuit for receiving four input numbers and generating two output numbers that when summed equals the summation of said four input numbers, comprising:

a plurality of adder cells arranged in parallel, each said adder cell for adding corresponding bits of said four inputted numbers, said adder cell comprising:

(i) a carry generator circuit coupled to accept three of four corresponding bits from its previous adder cell and coupled to provide an intermediate carry output as a first input to a first multiplexer (MUX) and a complement of said intermediate carry output as a second input to said first MUX;

(ii) a parity circuit coupled to accept said four corresponding bits of said input numbers for generating a control signal determined by a parity comparison of said four corresponding bits;

(iii) one of said four corresponding bits which corresponds to a number not coupled to receive a bit from its previous adder cell being coupled as a first input to a second MUX and said complement of said intermediate carry output being coupled as a second input to said second MUX; and

(iv) said control signal selecting between said first and second inputs to said first MUX for determining one of said two output numbers and said control signal also selecting between said first and second inputs to said second MUX for determining other of said two output numbers.

4,901,271

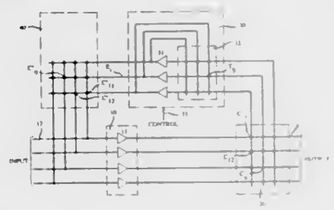
COMPUTATIONAL NETWORK

Hans P. Graf, East Keansburg, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 5,248, Jan. 20, 1987, abandoned. This application Jan. 4, 1989, Ser. No. 293,598

Int. Cl.⁴ G06G *7/02*

U.S. Cl. 364—807 **36 Claims**



1. A network for storing K vectors M_i, where i is an index in the range 1 to K designates a particular vector, and each vector M_i has components M_{ij} where j is an index in the range 1 to L designates the component number of the vector, K and L being integers, comprising:

a decision network for developing at output ports of said decision network signals that indicate recognition of a degree of presence of said vectors within input signals appearing at input ports of said decision network; and

an interconnection network having K input leads connected to said output ports and output leads connected to said input ports, and L network interface leads, where each of said network interface leads, i, is connected to each output lead of said interconnection network, j, through a connection C_{ij} and to each input lead of said interconnection network j, through a connection C'_{ij}, and where said C_{ij} and C'_{ij} connnections are related only to components j of vector i from among said K vectors.

4,901,272

VARIABLE PHASE COMPENSATING APPARATUS

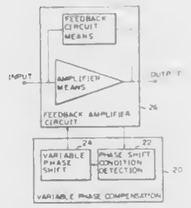
Masahiko Eto, Tokyo, Japan, assignor to Leader Electronics Corp., Yokohama, Japan

Filed Jul. 29, 1988, Ser. No. 226,351

Claims priority, application Japan, Jul. 31, 1987, 62-192420

Int. Cl.⁴ H02M *5/16, 7/00*

U.S. Cl. 364—857 **13 Claims**



1. A variable phase compensation apparatus for making phase compensation for a feedback amplifying circuit which includes an input terminal for receiving an input signal having a level within a predetermined range of level and has a gain setting varying in response to the level of the input signal to generate an output signal, and which has frequency characteristics on gain and phase varying as the gain setting varies, said variable phase compensation apparatus comprising:

a. phase shift condition detecting means for detecting the level of said input signal to generate a signal defining an amount of phase shift depending upon the level detected; and

b. variable phase shifting means connected in a signal path in the feedback amplifying circuit and connected to receive said signal for defining the amount of phase shift, for phase shifting a signal in the signal path by an amount corresponding to said signal for defining the amount of phase shift, whereby a frequency range in which there is a substantially constant gain with respect to any given level of the input signal.

4,901,273

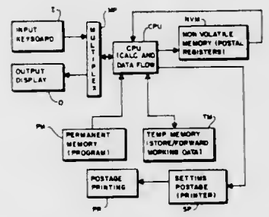
ELECTRONIC POSTAGE METER HAVING A MEMORY MAP DECODER

Peter C. DiGiulio, Easton, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 12, 1985, Ser. No. 710,800

Int. Cl.⁴ G06F *15/24, 11/30, 12/14, 15/46*

U.S. Cl. 364—900 **3 Claims**



1. In a postage meter having a microprocessor for controlling the printing of value and for accounting for the printing of such value, a first non-volatile memory for storage of accounting data, said microprocessor controlling the printing and accounting in accordance with a program stored in another memory, the first non-volatile memory having a first range of predetermined addresses for accessing thereof by said microprocessor, the improvement comprising selection means connected to the microprocessor to receive address information and to compare it to the first range for providing a first signal whenever the microprocessor selects addresses within said first range, the microprocessor also providing address information at a predetermined address that does not include addresses of said first range, decoding means responsive to said address information at a predetermined address for producing a second signal of longer duration than said address information at a predetermined address, and means responsive to said first and second signals for producing an enabling signal to enable access to said non-volatile memory so as to assure that the selection of the non-volatile memory by the microprocessor is not due to erroneous address information.

4,901,274

METHOD AND SYSTEM FOR DATA DRIVEN INFORMATION PROCESSING

Yukihito Maejima, Hachioji; Hirotoshi Shirasu, Yokohama; Taihei Suzuki, Kodaira; Yoshiaki Tokita, Yokohama; Shirou Tanabe, Hachioji, and Takashi Morita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 11, 1985, Ser. No. 753,852

Claims priority, applicatioo Japan, Jul. 11, 1984, 59-142283; Nov. 21, 1984, 59-244432

Int. Cl.⁴ G06F *9/40, 9/30, 15/20*

U.S. Cl. 364—900 **8 Claims**

1. A method for performing data driven processing in a data processing system which comprises sequential execution processing means for performing functions by executing program

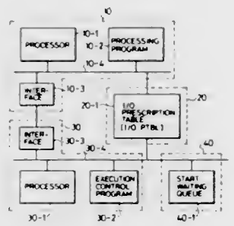
instructions in a predetermined sequence and memory means containing a plurality of processing program modules, comprising the steps of:

storing in said memory means a plurality of input/output prescription tables each corresponding to a respective one of said processing program modules and including input data source information, input data preparation situation indicating information, output notice destination information and an output data storage area;

executing with said data processing system a processing program corresponding to one of said processing program modules such that input data for said processing program is fetched according to said input data source information contained in said corresponding input/output prescription table and output data is stored in said output storage area of said corresponding input/output prescription table;

updating with said data processing system said input data preparation situation indicating information in a different input/output prescription table which is designated by said output notice destination information in said corresponding input/output prescription table of said one of said processing program modules so as to indicate that corresponding input data is prepared;

selecting with said data processing system a different one of said processing program modules having an input/output



prescription table whose input data preparation situation indicating information indicates that all input data necessary to perform said processing program thereof is prepared; and

executing with said data processing system said processing program corresponding to said different one of said processing program modules which is selected by said selecting step;

wherein said input data source information includes constant data and address information for data produced by other processing program modules than the processing program module corresponding to the input/output prescription table in which said input data source information is held, and said corresponding input/output prescription table further includes input data class information for indicating whether said input data is produced by any of said other processing program modules or is constant data, and said first executing step includes the steps of fetching required input data from a memory location specified by said address information when said input data class information indicates that the required input data is produced by another processing program module, and fetching said constant data directly from said input/output prescription table when said input data class information indicates that the required data is constant data.

4,901,275

ANALOG DATA ACQUISITION APPARATUS AND METHOD PROVIDED WITH ELECTRO-OPTICAL ISOLATION

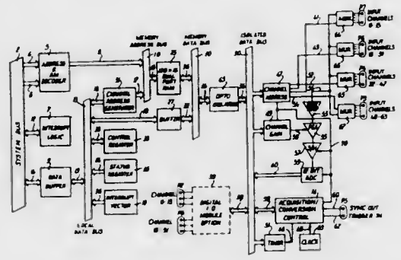
Ian Hardie, and David Vine, both of West Lothian, Scotland, assignors to Burr-Brown Limited, Livingston, Scotland

Filed Sep. 4, 1987, Ser. No. 93,253

Claims priority, application United Kingdom, Dec. 18, 1986, 8630260

Int. Cl.[4] G06F *3/05*

U.S. Cl. 364—900 2 Claims



1. A data acquisition interface unit for processing a plurality of analog data input signals for use by an external digital data processing system comprising:

(a) circuit means for selecting, setting a gain on and digitizing a selected one of said plurality of analog input signals, said circuit means including:

(i) multi-channel multiplexer means comprising 0–63 input channels for receiving said plurality of analog data input signals,

(ii) channel address logic circuit means coupled to said multi-channel multiplexer means for enabling selection of a particular analog signal to be processed,

(iii) channel gain circuit coupled to a programmable gain amplifier for enabling said setting a gain on said particular analog signal to be processed, said programmable gain amplifier also being coupled to said multi-channel multiplexer means, and

(iv) analog-to-digital converter coupled to said programmable gain amplifier via a sample-and-hold circuit, said analog-to-digital converter digitizing said particular analog signal to be processed;

(b) parallel-to-serial-to-parallel optical coupling circuitry means coupled to said circuit means for processing said digitized analog signal;

(c) memory means coupled to said parallel-to-serial-to-parallel optical coupling means for storing said processed digital signal, said memory means also storing a channel scan list consisting of channel order information relating to selection of said 0–63 input channels to be processed and gain information relating to a gain to be applied on analog signals received on said 0–63 input channels prior to being digitized;

input/output data bus means coupled to said memory means for coupling said interface unit to said external data processing system; and

local data bus coupled to said input/output data bus means and to said memory means for receiving and transferring interrupt, status, channel address, and control information generated by interrupt vector logic, status register, channel address generator and control register circuitry, respectively, to said memory means via a memory address bus and to said circuit means via a memory data bus coupled to said parallel-to-serial-to-parallel optical coupling means.

4,901,276

PORTABLE ELECTRONIC APPARATUS HAVING A FUNCTION OF CHECKING FOR EMPTY AREAS IN WHICH TO WRITE DATA

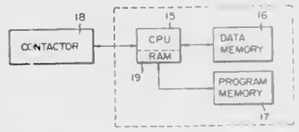
Yasuo Iijima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 63,655, Jun. 18, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,856

Claims priority, application Japan, Jun. 20, 1986, 61-144116

Int. Cl.[4] G06F *12/06, 12/14, 13/12*

U.S. Cl. 364—900 5 Claims



1. A portable electronic apparatus comprising:

contactor means, couplable to a portable electronic apparatus handling system, for receiving a write instruction including a write function field, a write area number field, a write data string length field, and a write data string field from said portable electronic apparatus handling system;

storage means which is divided into a plurality of areas, each of the areas having a pointer data field indicating a final location thereof where data is written, for storing in a specific area at least data for recognizing a final address of each of the areas and a data string supplied from said portable electronic apparatus handling system;

reading means for reading out from said storage means data recognizing the final address of the area designated by a write area number field of the write instruction and pointer data from said storage means in response to a write instruction supplied from said portable electronic apparatus handling system;

calculating means for calculating a memory capacity from the values of the final address and the pointer data read by said reading means;

comparing means for comparing the memory capacity calculated by said calculating means with a value of the write data string length field of the write instruction;

determining means for determining whether a data string which has been requested to be written can be written entirely; and

writing means for writing the data string to said storage means when said determining means determines that the data string can be written.

4,901,277

NETWORK DATA FLOW CONTROL TECHNIQUE

Stuart R. Soloway, Wrentham; Bradford R. Steinka, Stoughton, and Pierre A. Humblet, Cambridge, all of Mass., assignors to Codex Corporation, Mansfield, Mass.

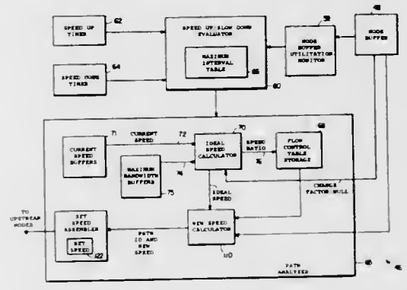
Continuation of Ser. No. 777,078, Sep. 17, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 144,756

Int. Cl.[4] G06F *5/06*

U.S. Cl. 364—900 22 Claims

1. A system for controlling the flow of data in a communication network of the kind in which a plurality of data streams are sent from an upstream node to a downstream node via a respective plurality of data paths carried on a link connected between said nodes, comprising

means for said downstream node to specify information concerning permissible speeds of said data streams on the respective paths, and



means for said upstream node to update the speeds of said plurality of data streams when necessary in response to said information.

4,901,278

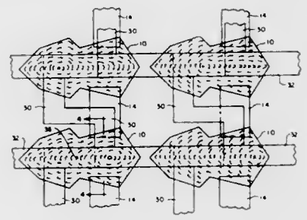
BLOCH-LINE MEMORY ELEMENT AND RAM MEMORY

Leonard J. Schwee, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1987, Ser. No. 54,977

Int. Cl.[4] G11C *11/14*

U.S. Cl. 365—87 9 Claims



1. A random access bi-stable Bloch-line memory element having a standard deviation of the switching field below 5 percent comprising:

a discrete planar magnetic memory element having magnetic configuration consisting of a movable bi-stable Bloch-line disposed within the memory element whereby a one or a zero is specified depending on the location of the Bloch-line;

write means coupled to the memory element for applying a magnetic field to a predetermined portion of the memory element; and

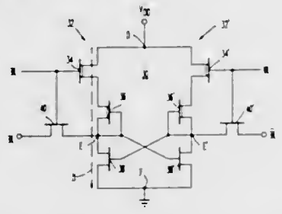
read means for determining whether the movable bi-stable Bloch-line is disposed within the predetermined portion of the memory element.

4,901,279

MESFET SRAM WITH POWER SAVING CURRENT-LIMITING TRANSISTORS

Donald W. Plass, Pleasant Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1988, Ser. No. 208,719
Int. Cl.[4] G11C *11/40, 7/00*
U.S. Cl. 365—154 **7 Claims**



1. In a static random access memory cell implemented with metal Schottky field-effect transistors, said cell including first and second branches, each of said branches comprising a first circuit node adapted for connection to a source of bias potential, a load transistor having a source and gate connected to a second circuit node, an active transistor having a drain connected to said second circuit node and a source connected to a third circuit node, an access transistor having a source connected to said second circuit node, the gate of said access transistor adapted to receive a cell word-line signal, the drain of said access transistor adapted to receive a cell bit-line signal, and said third circuit node adapted for connection to a reference potential, said first and second branches cross-connected between said second nodes and the gates of said active transistors, current limiting apparatus in each of said branches comprising:

current limiting means connected intermediate said first circuit node and said drain of said load transistor for reducing the drain current of said load transistor when said word line signal is not enabled; and

means for applying said word-line signal to said current limiting means.

3. A static random access memory cell implemented with metal Schottky field-effect transistors, said cell adapted for connection to a source of bias voltage and a reference potential, said cell responsive to a word-line signal and complimentary bit-line signals for storing complimentary voltage levels, said cell comprising:

first and second branches, each of said branches including

a depletion mode current limiting transistor having a drain connected to a first circuit node,

a depletion mode load transistor having a drain connected to the source of said current limiting transistor and a source and gate connected to a second circuit node,

an enhancement mode active transistor having a drain connected to said second circuit node and a source connected to a third circuit node,

an enhancement mode access transistor having a source connected to said second circuit node and a gate connected to the gate of said current limiting transistor,

the commonly connected gates of said current limiting transistor and said access transistor adapted to receive said word-line signal,

the drain of said access transistor adapted to receive a bit-line signal,

said first circuit node adapted for connection to said source of bias voltage, and

said third circuit node adapted for connection to said circuit reference potential; and

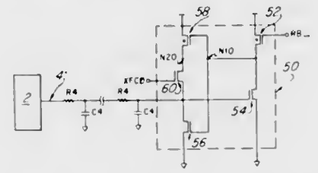
said first and second branches cross-connected between said second nodes and the gates of said active transistors.

4,901,280

PULL-UP CIRCUIT FOR HIGH IMPEDANCE WORD LINES

Pravin Patel, Sugar Land, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 207,915, Jun. 13, 1988, abandoned, which is a continuation of Ser. No. 884,565, Jul. 11, 1986, abandoned. This application Apr. 19, 1989, Ser. No. 342,584
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.11 **20 Claims**



1. In a circuit for driving a load from a first logic state to a second logic state, wherein the load comprises a line conductor having a first end and a second end, and having a resistance and a capacitance between its time end and its second end of said load and a pull-up circuit connected to the second end of said load, said pull-up circuit comprising:

a precharger responsive to a clock signal, for precharging a precharged node prior to said load being driven to its second logic state;

a discharger, responsive to said load being driven from said first logic state to a voltage between said first logic state and said second logic state, for discharging said precharged node; and

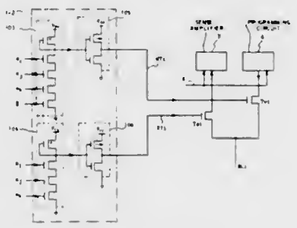
a driver, responsive to said precharged node being discharged, for driving said second end of said load from a first power supply having a voltage corresponding to said second logic state.

4,901,281

SEMICONDUCTOR MEMORY DEVICE HAVING TWO COLUMN TRANSFER GATE TRANSISTOR GROUPS INDEPENDENTLY PROVIDED FOR A SENSE AMPLIFIER AND A PROGRAMMED CIRCUIT

Masanobu Yoshida, Kawaguchi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 262,094, Oct. 19, 1988, abandoned, which is a continuation of Ser. No. 895,106, Aug. 11, 1986, abandoned. This application May 12, 1989, Ser. No. 353,163
Claims priority, application Japan, Aug. 16, 1985, 60-179442
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—189.05 **5 Claims**



1. A semiconductor memory device into which an externally generated datum is programmed by an externally generated programming address signal when said memory device is in a programming mode, and from which a datum, stored in said memory device, is read out by an externally generated reading address signal when said memory device is in a reading mode, said memory device comprising:

a plurality of word-lines;

a plurality of bit-lines extending across said word-lines to form a plurality of intersection points;

a plurality of memory cells formed at said intersection points;

a column decoder means for providing a first column selecting signal in response to said programming address signal when said memory device is in said programming mode, and for providing a second column selecting signal in response to said reading address signal when said memory device is in said reading mode;

a programming circuit for providing a selected memory cell with a data signal corresponding to said externally generated datum when said memory device is in said programming mode;

a sense amplifier for amplifying a data signal obtained from said datum read out from a selected memory cell when said memory device is in said reading mode;

a plurality of metal-oxide semiconductor (MOS) first column transfer gate transistors connected between said programming circuit and said plurality of bit lines, respectively, for selectively connecting a selected bit-line to said programming circuit in response to said first column selecting signal during said programming mode, said first column transfer gate transistors being made non-conductive during said reading mode; and

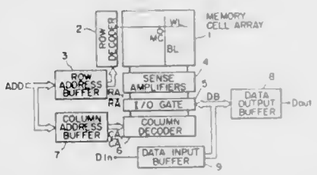
a plurality of metal-oxide semiconductor (MOS) second column transfer gate transistors connected between said sense amplifier and said plurality of bit lines, respectively, for selectively connecting a selected bit-line to said sense amplifier in response to said second column selecting signal during said reading mode, wherein the current carrying capacity of each of said first column transfer gate transistors is greater than that of each corresponding second column transfer gate transistor.

4,901,282

POWER EFFICIENT STATIC-COLUMN DRAM

Toshifumi Kobayashi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 901,057, Aug. 26, 1986, abandoned. This application Mar. 24, 1989, Ser. No. 328,814
Claims priority, application Japan, Oct. 31, 1985, 60-245114
Int. Cl.[4] G11C *7/00, 8/00*
U.S. Cl. 365—222 **11 Claims**



1. A static column dynamic random access memory device comprising:

a plurality of memory cells arranged in rows and columns;

means to initiate memory operations involving said memory cells, said memory operations including read/write and refresh operations;

timing circuit means, to provide clocks for controlling means to initiate memory operations;

wherein said timing circuit means comprises

(a) means to receive a row address strobe signal;

(b) means, in communication with said means to receive a row address strobe signal, for terminating memory operations other than said refresh operation if said row address strobe signal has been removed before the end of said refresh operation, and

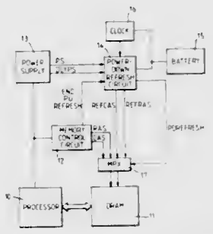
(c) means, in communication with said means to receive a row address strobe signal, for causing continuation of said read/write operations if said row address strobe signal is still applied at the end of said refresh operation.

4,901,283

DYNAMIC RANDOM-ACCESS MEMORY SYSTEM WITH POWER-UP AND POWER-DOWN REFRESH CIRCUITS

Jonathan M. Hanbury, and Keith Burton, both of Bracknell, Great Britain, assignors to International Computers Limited, London, England

Filed Nov. 2, 1988, Ser. No. 266,391
Claims priority, application United Kingdom, Jan. 22, 1988, 8801472
Int. Cl.[4] G11C *7/00;* **G06F** *12/16*
U.S. Cl. 365—222 **5 Claims**



1. A dynamic random-access memory system comprising:

(a) a dynamic random-access memory,

(b) means for generating control signals defining a power-down condition, a transition condition, and a power-up condition,

(c) a power-down refresh circuit, responsive to said control signals, for producing a series of refresh signals at a first predetermined frequency in the power-down condition and at a second predetermined frequency in the transition condition, the second predetermined frequency being higher that the first predetermined frequency,

(d) a power-up refresh circuit for producing a series of refresh signals in the power-up condition, the power-up refresh circuit having a higher power requirement than the power-down refresh circuit, and

(e) selection means, responsive to said control signals, for selecting refresh signals from the power-down refresh circuit to determine refresh cycles for the memory during the power-down condition and the transition condition, and for selecting refresh signals from the power-up refresh circuit to determine refresh cycles for the memory during the power-up condition.

4,901,284

STATIC RANDOM ACCESS MEMORY

Kiyofumi Ochii, Yokohama; Masataka Matsui, Tokyo, and Osamu Ozawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1988, Ser. No. 288,198
Claims priority, application Japan, Dec. 23, 1987, 62-325687
Int. Cl.[4] G11C *13/00, 11/40*
U.S. Cl. 365—226 **9 Claims**

1. A static random access memory comprising:

an array of static memory cells each having resistors functioning as load elements;

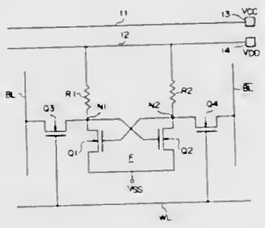
peripheral circuits for controlling the writing of data into, and the reading of data from, the static memory cells;

a first power-supply voltage line for applying a first power-supply voltage to the peripheral circuit;

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a bonding pad connected to the first power-supply voltage line;

a second power-supply voltage line for applying a second power-supply voltage to the static memory cells; and



level-shifting means connected between the first and second power-supply voltage lines, for shifting the level of the first power-supply voltage and applying the level-shifted voltage to the static memory cells via said second power-supply voltage line.

4,901,285

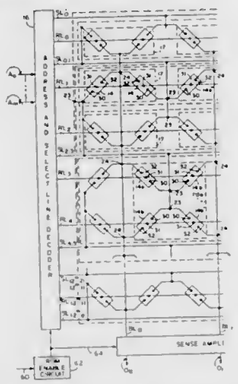
HIGH DENSITY READ-ONLY MEMORY

Jun-ichi Sano, Chelmsford; Moshe Mazin, Andover, and Lance A. Glasser, Lexington, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 133,226, Dec. 14, 1987, abandoned, which is a continuation of Ser. No. 813,290, Dec. 24, 1985, abandoned. This application Feb. 27, 1989, Ser. No. 316,590

Int. Cl.[4] G11C *8/00*

U.S. Cl. 365—230.01 **1 Claim**



1. In a read only memory wherein pairs of field effect transistors, each having actuable gate, drain and source electrodes, are disposed to form an M X N matrix, where M is the number of rows and N is the number of columns in such matrix, with the gate electrode of each one of the N pairs of field effect transistors in each one of the M rows being connected to a "one out of M" decoder so that the gate electrodes of the field effect transistors in a selected row may be actuated and with the drain electrodes of a first one of each one of the M pairs of field effect transistors in each one of the N columns being connected to a first one of corresponding N output lines and the drain electrode of the second one of each one of such M pairs being connected to a second one of the corresponding N output lines so that the drain electrode of each field effect transistor in each one of such M pairs may be separately actuated, the improvement comprising:

(a) means, responsive to the "one out of M" decoder, for producing a first and a second actuating signal for the source electrodes of the N pairs of field effect transistors in the selected row; and

(b) means for applying the first actuating signal to the source electrode of the first field effect transistor in each one of the N pairs of field effect transistors in the selected row and for applying the second actuating signal to the source electrode of the second field effect transistor in each one of the N pairs of field effect transistors in the selected row whereby the gate, drain and source electrodes of only a single one of the M pairs of field effect transistors in each one of the N columns may be simultaneously actuated.

4,901,286

DIGITAL FIFO MEMORY

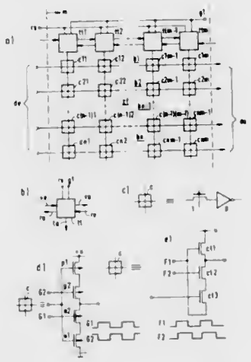
Ulrich Theus, Gundelfingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Aug. 15, 1988, Ser. No. 232,064

Claims priority, application European Pat. Off., Oct. 6, 1987, 87114545.4

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—230.01 **18 Claims**



1. A digital FIFO memory comprising:

insulated-gate field-effect transistors and a memory cell array (zf) of n parallel signal channels (b1 . . . bn) having their inputs connected to the data input (de) of the memory and having their outputs coupled to the data output (da) of the memory;

each signal channel containing m series-connected, identical memory cells (c . . .) each having an enable input; and

clock signals being applied to the memory cells in so that memory cells which are adjacent in the direction of signal flow are rendered conductive one after the other;

wherein the input of the respective signal channel is connected directly to the data input (de), and the output to the data output (da);

wherein a first clock driver (tt1), a second clock driver (tt2), and an mth clock driver (ttm−1, ttm) are associated with the n first memory cells (c . . . 1), the n second memory cells (c . . . 2), and the n mth memory cells (c . . . m−1, c . . . m), respectively;

wherein the m clock drivers (tt . . .), which are identical in construction, are fed a reset signal (rs) and a basic clock signal (g1) whose frequency is greater than twice the maximum input data rate (g2);

wherein each clock driver (tt . . .) has a reset input (rs), and data availability input line (ve) and a data availability output line (va), with the data availability input line (ve) of a clock driver (tt2) connected to the data availability output line (va) of the directly preceding clock driver (tt1), as well as a data request input line (re) and a data request output line (ra), with the data request input line (re) of a clock driver (tt1) connected to the data request output line (ra) of the following clock driver (tt2);

wherein the data availability input line (ve) of the first clock driver (tt1) has a signal applied thereto which indicates the presence of valid input data; and

wherein the data request input line of the last clock driver (ttm) has a signal applied thereto which indicates that a next data word has to be transferred to the output.

4,901,288

COMPACT CYLINDRICAL SONOBUOY

Carl F. Baker, Kalamazoo, and Theadore E. Upham, Jackson, both of Mich., assignors to Sparton Corporation, Jackson, Mich.

Filed Jun. 23, 1988, Ser. No. 210,367

Int. Cl.[4] H04B *1/59*

U.S. Cl. 367—4 **8 Claims**



1. A sonobuoy comprising:

a generally cylindrical housing defining an axis and including a cylindrical portion,

an electronic circuit in said housing,

an antenna supported on said housing in a retracted position,

hydrophone means releasably retained in said housing,

an electrical signal cable coiled around said cylindrical portion of the housing and electrically connected between said hydrophone means and said electronic circuit,

said housing being buoyant in water and adapted to float with the axis of the housing parallel to the surface of the water,

means for moving said antenna to an erected position,

and means for releasing said hydrophone means from said housing while the sonobuoy is in a body of water whereby said hydrophone means sinks and said cable is uncoiled thereby causing rotation of the housing about said axis as the hydrophone means descends,

the center of mass of said sonobuoy, after deployment of said hydrophone means, being located with respect to the center of rotation of the housing to provide a righting moment which, in conjunction with the pull of the cable, causes said sonobuoy to float with said antenna extending vertically after it is erected, the righting moment being small enough to allow rotation of the housing during descent of the hydrophone means.

4,901,287

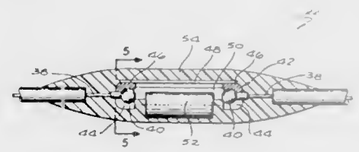
UNDERWATER SONAR ARRAY

Daniel G. Hathaway, Sherman Oaks, and Robert M. Bridges, Northbridge, both of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 28, 1988, Ser. No. 174,046

Int. Cl.[4] H04B *1/59*

U.S. Cl. 367—3 **12 Claims**



1. In an underwater sonar system including a data collection and instrumentation unit

A hydrophone array extending vertically from said data and instrumentation unit including an elongated cable containing a center strength member, a plurality of insulated conducting wires, and an external jacket of durable plastic material;

a substantial number of hydrophone units connected to said cable, said hydrophone units each including a bracket member having a pair of longitudinally extending flat parts and a socket part at each end of said flat parts including longitudinally aligned slots operatively connected to said strength member, a hydrophone and a circuit board attached to said bracket member, some of said conducting wires being connected to said circuit board and said hydrophone being connected to said circuit board, said hydrophone units having a coating of paraxylene resin and an external potting coat of polyurethane which is smoothly tapered at each end of said hydrophone units from said brackets to said cable;

said cable including a plurality of sections of progressively smaller diameter attached together with the largest diameter section containing the most conducting wires attached to said data and instrumentation unit, the next smaller diameter cable section having fewer conductive wires being attached to the largest section, and with additional sections progressively becoming smaller in diameter and having fewer conducting wires with the last section having the smallest diameter and the fewest conducting wires.

4,901,289

SYSTEM FOR ACQUIRING AND RECORDING SIGNALS DELIVERED BY A SET OF SENSORS DISPOSED IN WELL PROBES

Jacques Cretin, Le Chesnay, and Jean-Francois Therond, Neuilly S/Seine, both of France, assignors to Institut Francais Du Petrole, Rueil Malmaison, France

Filed May 31, 1988, Ser. No. 200,732

Claims priority, application France, Jun. 4, 1987, 87 07867

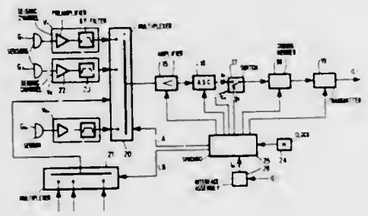
Int. Cl.[4] G01V *1/40, 1/22;* **B21B** *47/12*

U.S. Cl. 367—34 **9 Claims**

1. System for acquiring and recording signals delivered by a set of sensors disposed in one or more probes which are lowered into a well at the end of a multi-function cable provided with signal transmission lines, comprising an acquisition assembly disposed in a probe and having signal amplification means, analog-to-digital conversion means, means for adapting the signals before they are applied to at least one line of the multi-function cable and synchronization means, and a control and recording assembly disposed on the surface and connected to the signal transmission lines, which system further, comprises a signal multiplexing assembly formed of at least two parallel multiplexing units each having the same number of input chan-

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nels, the outputs of the two multiplexing units being interconnected to the input of the acquisition assembly and the input channels of one at least of these two units receiving the signals coming from said sensors, control means for enabling a single multiplexing unit at a time so as to select the input channels



thereof and means for controlling the switching of the input channels of the multiplexing assembly at a frequency independent of the number of multiplexing units used, so as to cause the readout frequency of each of the input channels connected to a sensor to vary as a function of the number of multiplexing units used.

4,901,290

APPARATUS FOR THE GENERATION OF PRESSURE PULSES IN DRILLING MUD COMPOSITIONS

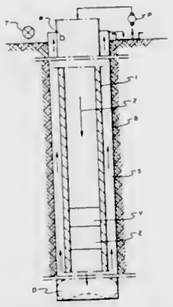
Dagobert Feld, Hanover, and Johann Biehl, Kirchbeim/Teck, both of Fed. Rep. of Germany, assignors to Eastman Christensen Company, Salt Lake City, Utah

Filed May 9, 1988, Ser. No. 191,409

Claims priority, application Fed. Rep. of Germany, May 9, 1987, 37155148

Int. Cl.[4] G01V *1/40*

U.S. Cl. 367—85 **11 Claims**



1. Apparatus for generating pressure pulses in a fluid flowing within a drill string, comprising:

tubular housing means adapted to be secured within said drill string and defining a flow orifice on the interior thereof;

longitudinally reciprocable primary valve means disposed within said housing means in generally coaxial relationship thereto;

fluid force responsive drive means for selectively moving said primary valve means into said flow orifice to generate a pressure pulse;

fluid force responsive impedance means for directly longitudinally resisting said primary valve means movement into said flow orifice and preventing impact on said housing means responsive to said movement during pressure pulse generation.

4,901,291

WRIST WATCH TYPE RECEIVER OF FISH SONAR

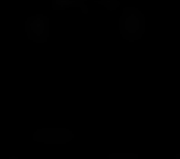
Hisao Kurata, Aichi, Japan, assignor to Honda Electric Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1988, Ser. No. 157,405

Claims priority, application Japan, May 13, 1987, 62-71299[U]

Int. Cl.[4] G01S *15/06*

U.S. Cl. 367—111 **4 Claims**



1. A fish sonar apparatus comprising:

transmitter means comprising:

transmitting circuit means for transmitting pulse signals,

transmitting-receiving vibrator means for generating ultrasonic waves and for receiving echo signals,

signal processing means for processing said received echo signals,

RF signal converter means for converting the processed signals to RF signals, and

antenna means for transmitting said RF signals in the air; and

at least one wrist watch type receiver for displaying a state of water, each comprising:

a case,

a band attached to said case for securing the case about a wrist of a user,

an antenna line connected to said case or the band for receiving RF signals containing information on the state of the water, from the transmitting means,

RF signal converting means in said case for converting the RF signals to electric signals,

display signal converting means in said case for converting said electric signals to display signals, and

display means of a surface of said case for displaying the state of the water in response to the display signals.

4,901,292

METHOD FOR THE POSITION DETECTION OF THE STRIP EDGE OF A MATERIAL WEB

Hans-Joachim Schrauwen, Hiddenhausen, Fed. Rep. of Germany, assignor to AEG Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

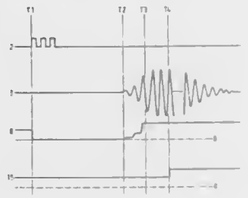
PCT No. PCT/EP85/00598, § 371 Date Jul. 11, 1986, § 102(e) Date Jul. 11, 1986, PCT Pub. No. WO86/02913, PCT Pub. Date May 22, 1986

PCT Filed Nov. 9, 1985, Ser. No. 888,322

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442154

Int. Cl.[4] G01S *3/80*

U.S. Cl. 367—118 **7 Claims**



1. A method for detecting the position of a material web edge, comprising the steps of: transmitting a plurality of ultrasonic wave packets from a transmitter to the web material adjacent the material web edge, each wave packet having at least one pulse, the transmission of said wave packets being spaced in time from each other by a selected amount with a first wave packet being transmitted at time T1; receiving said wave packets at an ultrasonic receiver and transforming said wave packets into electric oscillation packets, the first wave packet being received and transformed at time T2, the time interval between time T1 and T2 being substantially as long as the time required for sound waves to travel a distance between the transmitter and the receiver; scanning each electric oscillation packet with an electronic signal analysis device for a scanning period, a first oscillation packet being scanned for a scanning period beginning at time T2 and ending at time T3 to obtain a peak scan value during said scanning period for each oscillation packet scanned; inactivating the electronic signal analysis device after the scanning period for each electric oscillation packet; storing the peak scan value of each oscillation packet, the first oscillation packet being stored at time T4; choosing the time interval T3 minus T1 between the end of the scanning interval and the transmission of a wave packet to be shorter than the time interval required for an interfering echo signal, which has been emitted by the transmitter at time T1, to be reflected to the receiver and choosing the time interval between transmission of the first wave packet and transmission of a second wave packet to be as long as the time required for the interfering echo signal of the first wave packet to have faded.

4,901,293

RARE EARTH FLEXTENSIONAL TRANSDUCER

Philip M. Kuhn, Severna Park, Md., assignor to Martin Marietta, Orlando, Fla.

Continuation of Ser. No. 683,697, Dec. 19, 1984, abandoned. This application Jun. 24, 1987, Ser. No. 65,183

Int. Cl.[4] H04R *15/00*

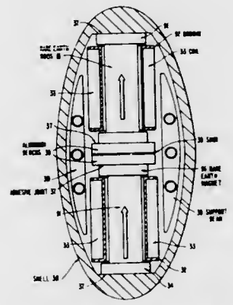
U.S. Cl. 367—168 **19 Claims**

1. A flextensional transducer, comprising:

an elliptical flextensional shell having a major axis and a minor axis perpendicular to the major axis;

rare earth drive means, mounted inside said shell and oriented along the major axis, for expanding said shell along the major axis and causing deflection along the minor axis; and

rare earth biasing means, inside said shell and adjacent said drive means, for permanently and uniformly magnetically



biasing said drive means along the major axis and, said rare earth biasing means comprising means compressively urged against at least one end of said rare earth drive means for transmitting to said rare earth drive means compressive prestressing force.

4,901,294

ELECTRONIC TIME MEASURING APPARATUS INCLUDING ACOUSTIC DATA RECORDING/REPRODUCING FUNCTIONS

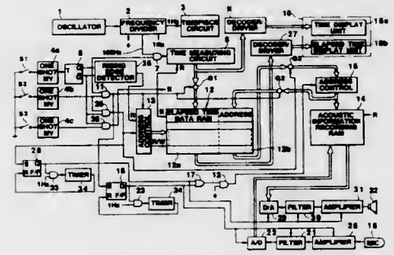
Fumikazu Aihara, Kita, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1989, Ser. No. 403,136

Claims priority, application Japan, Sep. 7, 1988, 63-117569

Int. Cl.[4] G04B *21/08;* **G04F** *8/00*

U.S. Cl. 368—63 **14 Claims**



1. An electronic time measuring apparatus comprising:

time measuring means for counting a reference signal so as to obtain time data;

display means for displaying said time data acquired by said time measuring means;

start/stop controlling means for controlling a start/stop of the counting operation for said reference signal by said time measuring means;

switch means operable while the counting operation by said time measuring means is carried out under the control of said start/stop control means;

intermediate time data memory means for storing intermediate time data measured by said time measuring means when the switch operation by said switch means is performed;

recording means coupled to said switch means, capable of

recording acoustic information externally supplied thereto when said switch means is operated;

display control means for controlling said display means to display thereon the time data which has been stored in said intermediate time data memory means; and,

reproducing means for reproducing the acoustic information which has been recorded by said recording means while the time data stored in said intermediate time data memory means is displayed by the display means under the control of the display control means.

4,901,295

DEVICE COMPRISING A SOLAR CELL FOR WINDING A BARREL SPRING

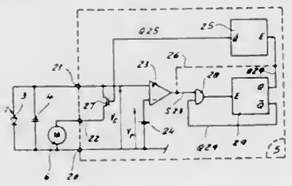
Dabo Taguezout, Lausanne, and Mai T. Xuan, Chavannes, both of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Dec. 9, 1988, Ser. No. 281,613

Claims priority, application Switzerland, Dec. 11, 1987, 4856/87

Int. Cl.⁴ G04C *1/00*

U.S. Cl. 368—149 **11 Claims**



1. A barrel-spring winding device comprising:

a capacitor having terminals;

a solar cell arranged to receive ambient light and to charge said capacitor;

a control circuit connected to terminals of said capacitor; and

a motor connected to said circuit and having a rotor operatively connected to wind the spring,

wherein said motor is a stepping motor having two terminals, and the control circuit comprises:

means for supplying a drive signal having a first state or a second state and including first means for setting said drive signal to said first state in response to a charge parameter representing the state of charge of the capacitor, and second means for resetting said drive signal to said second state a fixed interval of time after the beginning of said first state; and

means for connecting said motor to the terminals of said capacitor in response to the first state of said drive signal and for disconnecting said motor from said capacitor in response to the second state of said drive signal.

4,901,296

WATCH WITH SPEED ADJUSTMENT DURING TRAVEL FOR REDUCING JET LAG

Ross E. Mitchell, 4 Allston St., Newtonville, Mass. 02160

Filed Mar. 17, 1989, Ser. No. 325,293

Int. Cl.⁴ G04C *9/00*

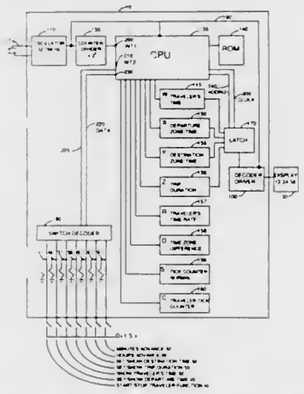
U.S. Cl. 368—185 **15 Claims**

1. In a timepiece for continuously advancing an indication of time at a standard rate, an improvement for assisting a traveler to accommodate to a change of an applicable time standard caused by travel, for a given travel time, from a time zone at a place of departure to a different time zone at a place of destination, comprising:

input means for entering travel data representing at least two of the following data: a time zone of departure, a time zone of destination and the travel time;

storage means for storing travel data representing the local time at said departure time zone, the time at said destination time zone, and said travel time;

calculation means, responsive to said travel data in said storage means, for automatically calculating and supplying, during said travel time, output data representing a non-standard rate of advance of time for said timepiece based upon said travel data such that said non-standard rate of advance will correspond to the rate at which time would progress if the time standard experienced by said traveler gradually changed during said travel time from the time standard in said departure time zone to the time standard in said destination time zone;



display means, responsive to said output data off said calculation means, for indicating time at said nonstandard rate for said travel time,

such that the time indicated by said timepiece varies gradually during travel between the correct local time at said departure time zone and the correct local time at said destination time zone, and such that said traveler, by observing said timepiece during said travel time, will tend to experience less of the psychological symptoms of jet lag than if said traveler experienced an abrupt change of applicable time standards.

4,901,297

OPTICAL MAGNETIC RECORDING AND REPRODUCING METHOD AND APPARATUS CAPABLE OF PROLONGING A RECORDING TIME

Keiichi Komatsu; Shinji Ozaki; Hikaru Masui, all of Katsuta, and Keo Kubo, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Video Engineering, Inc., Yokohama, both of, Japan

Filed Jan. 6, 1987, Ser. No. 871

Claims priority, application Japan, Jan. 10, 1986, 61-2070

Int. Cl.⁴ G11B *11/12, 13/04, 11/10*

U.S. Cl. 369—13 **9 Claims**

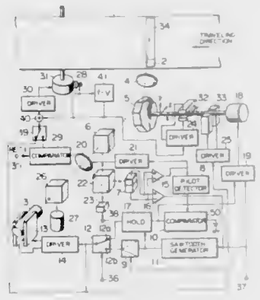
1. An optical magnetic recording and reproducing apparatus comprising:

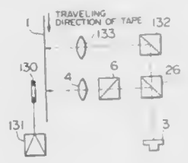
optical beam scanning means for scanning a recording medium with an optical beam and forming a track having a predetermined angle with respect to a traveling direction of said recording medium;

means for applying a magnetic field onto said recording medium; and

means for generating said optical beam;

wherein said optical beam scanning means comprises a rotating body having a plurality of reflex faces and includes means for rotating the rotating axis of said rotating body around at least two arbitrary axes perpendicular to said rotating axis, and wherein said optical beam generating means includes means for making the optical beam axis move in the traveling direction of the recording medium.





4,901,298

TRACK PULSE CONTROLLED ADDRESS SEARCH METHOD FOR OPTICAL DISK PLAYER

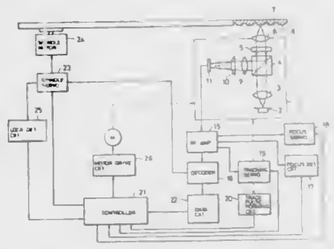
Naoki Masaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 2, 1987, Ser. No. 115,731

Claims priority, application Japan, Oct. 31, 1986, 61-260425

Int. Cl.⁴ G11B *7/085*

U.S. Cl. 369—32 **4 Claims**



1. In a recording disk player comprising focus servo means for controlling the position of the convergent point of a light beam emitted from a light source to form a data detecting light spot on the reflective recording surface of a recording disk, and tracking servo means for providing a tracking error signal corresponding to a position of said data detecting light spot relative to a recording track in response to said light beam reflected from said recording surface to control said relative position of said data detecting light spot, an address search method in which the distance of movement of said data detecting light spot in a track jumping operation is controlled in response to a track pulse formed according to a level of said tracking error signal, comprising the steps of: in said track jumping operation, determining whether or not said track pulse has been produced for a predetermined period of time, and when it s determined that no track pulse has been produced for said predetermined period of time, suspending said track jumping operation, subjecting said focus servo means to abnormal condition detection and correction, then starting said track jumping operation again.

4,901,299

OPTICAL DISK READING HEAD CONTROLLER

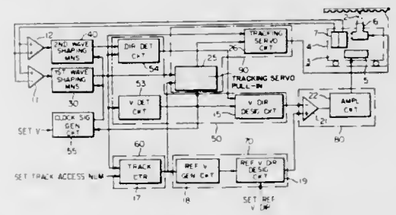
Keiji Nakatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 29, 1987, Ser. No. 138,952

Claims priority, application Japan, Jan. 7, 1987, 52-2291

Int. Cl.⁴ G11B *17/22*

U.S. Cl. 369—32 **5 Claims**



1. In an optical-disk driving apparatus wherein a tracking actuator furnished with a condensing lens, which forms a spot of a light beam on tracks provided at predetermined intervals on a surface of a rotating disk and which permits the spot to traverse the tracks in a predetermined number, and a photosensor unit which senses quantities of reflected light of the light beam from the disk surface and which converts them into electric signals, are mounted, on a carriage; the carriage is driven by a head actuator, to move the spot in a direction of traversing the tracks and to detect a first position signal and a second position signal indicative of a position of the spot on the tracks through addition and subtraction of the electric signals corresponding to changes of the quantities of the reflected light attendant upon the movement; while a velocity signal at the movement of the spot across the track as detected on the basis of both the signals and a reference velocity signal previously determined by a number of tracks to be accessed to a target track as externally applied are being compared successively by receiving the first position signals, the head actuator is subjected to a velocity control; and when the moving velocity of the spot has become lower than a predetermined velocity at a predetermined track before the target track, the tracking actuator is subjected to a position control, thereby to position the spot to the target track; an optical-disk driving apparatus characterized by comprising first waveshaping means for causing a half wave greater and a half wave smaller than an arithmetic mean value of maximum and minimum values of an oscillating waveform of said first position signal to correspond to a single square pulse and a zero output as to each cycle, respectively, and for converting them into a first shaped position signal delayed for a predetermined time, and second waveshaping means for causing a half wave greater and a half wave smaller than an arithmetic mean value of maximum and minimum values of an oscillating waveform of said second position signal to correspond to a single square pulse and a zero output as to each cycle, respectively, and for converting them into a second shaped position signal delayed for a predetermined time.

4,901,300

METHOD OF AND APPARATUS FOR RECORDING AN INFORMATION SIGNAL

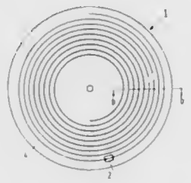
Paulus C. M. Van Der Zande, and Petrus C. J. Hoeven, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1988, Ser. No. 265,638

Claims priority, application Netherlands, Jan. 22, 1988, 8800151

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—47 **9 Claims**



1. A method of recording an information signal, in particular an EFM-modulated signal, on a record carrier, which information signal comprises time-code signals indicating the time positions of the associated signal portions within the information signal and which alternate with time-synchronisation signals, in which method a preformed servo track of the record carrier is scanned, an information pattern of recording marks, corresponding to the information signal, being recorded in the servo track and the servo-track portion intended for recording being provided with a periodic track modulation which can be distinguished from the information pattern, characterized in that said record carrier is of a type in which the frequency of the track modulation is modulated in conformity with a position-information signal, the position-information signal comprising position-code signals which indicate the positions of the associated track portions relative to the beginning of the servo track, which position-code signals alternate with position-synchronisation signals, and in that during recording of the information signals a fixed phase relationship is maintained between the time-synchronisation signals and the position-synchronisation signals represented by the track modulation of the track portions being scanned.

4,901,301

REGION DETECTION SYSTEM FOR DETECTING EMPTY SECTORS ON A RECORDING MEDIUM

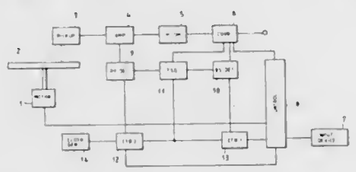
Susumu Senshu, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,153

Claims priority, application Japan, Jun. 18, 1987, 62-151983

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—54 **12 Claims**



1. A method for discriminating recording regions on a recording medium as one of a data-recorded region and a data-unrecorded region on the basis of predetermined signals recorded on the medium, the method comprising the steps of:

detecting the presence of the predetermined signals in a recording region;

counting a total number of the detected predetermined signals in the region; and

determining whether data is unrecorded in the region based on a comparison of the total number with a predetermined value.

4,901,302

APPARATUS FOR REPRODUCING INFORMATION RECORDED ON A COMPACT DISC ONTO A RECORDING MEDIUM HAVING TWO RUNNING DIRECTIONS

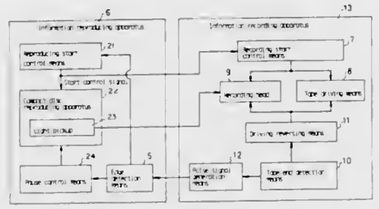
Jiro Yamada, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 21, 1987, Ser. No. 76,429

Claims priority, application Japan, Jul. 25, 1986, 61-175913

Int. Cl.[4] G11B *7/28*

U.S. Cl. 369—85 **2 Claims**



1. An information reproducing and recording apparatus comprising:

a disc reproducing apparatus for reproducing information recorded on a disc,

a recording apparatus for recording the information reproduced from said disc on a recording medium having at least two running directions,

recording start control means for controlling the start of said disc reproducing apparatus a predetermined time after the start of the recording apparatus,

end detection means for detecting the end of said recording medium,

reversing means for reversing the running direction of the recording medium in the recording apparatus,

pause control means for pausing said reproducing information from said disc reproducing apparatus when the end detection means detects the end of the recording medium until the reversing means reverses the running direction of the recording medium.

4,901,303

PHOTO-ELECTRO-MAGNETIC DISC DEVICE

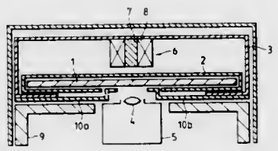
Ikuya Kikuchi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 1, 1988, Ser. No. 226,905

Claims priority, application Japan, Jan. 25, 1988, 63-7962[U]

Int. Cl.[4] G11B *13/04*

U.S. Cl. 369—112 **4 Claims**



1. A photo-electro-magnetic disc device comprising:

a cartridge holder adapted to hold a disc cartridge containing a photo-electro-magnetic disc, loaded therein, and to place said photo-electro-magnetic disc on a turn table;

an optical head for applying a light spot to said photo-electro-magnetic disc placed on said turn table; and

magnetic field applying means, arranged on one side of said photo-electro-magnetic disc on the other side of which said optical head is provided, for applying a magnetic field in a predetermined direction to the part of said photo-electro-magnetic disc which is irradiated by said light spot, the improvement comprising:

magnetic members arranged as to confront said magnetic field applying means through said photo-electromagnetic disc, wherein;

said cartridge holder is made of magnetic material, and

said magnetic members are magnetically coupled to said magnetic field applying means through said cartridge holder.

4,901,304

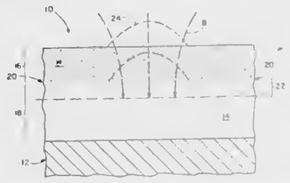
ERASABLE OPTICAL DATA STORAGE MEDIUM HAVING A ZONED INTEGRAL RECORDING LAYER

Michael A. Lind, Durham; W. Eugene Skiens, Wilsonville; Clyde D. Feyrer, and John W. Swanson, both of Portland, all of Oreg., assignors to Optical Data, Inc., Beaverton, Oreg.

Filed Oct. 8, 1986, Ser. No. 916,609

Int. Cl.[4] G11B *7/24*

U.S. Cl. 369—284 **30 Claims**



1. An erasable optical data storage medium comprising:

(a) a data recording layer of a single integral material; and

(b) said data recording layer having a first zone and a second zone, said zones treated to yield different optical properties.

4,901,305

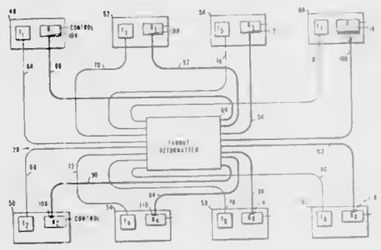
DISTRIBUTED CROSSBAR SWITCH

Gregory L. Tangonan, 141 Santa Rosa, Oxnard, Calif. 93035

Filed Dec. 28, 1987, Ser. No. 138,619

Int. Cl.[4] H04B *9/00*

U.S. Cl. 370—1 **8 Claims**



1. A distributed switching assembly, comprising:

(a) N transmitter-receiver pairs, wherein each receiver comprises a switched array of N detectors for detecting and selecting a particular transmitted signal, wherein each transmitter-receiver pair is packaged together;

(b) optical fiber routing means for linking a transmitter and a receiver through

(c) fanout reformatter means for:

(i) accepting a signal output from each transmitter by way of the optical fiber routing means;

(ii) fanning out the signal output from each transmitter from 1 to N branches; and

(iii) reformatting all of the Kth branches, where K is from 1 to N, from each transmitter for providing N inputs to the Kth receiver by way of the optical fiber routing means.

4,901,306

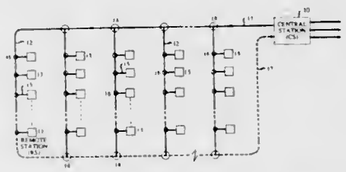
WAVELENGTH-DIVISION MULTIPLEXED OPTICAL FIBER NETWORK

William B. Gardner, Duluth, Ga., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 17,903, Feb. 24, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 281,864

Int. Cl.[4] H04B *9/00*

U.S. Cl. 370—3 **8 Claims**



1. An optical communication system for transmitting information signals between a central station and a multiplicity of subscriber stations RS_i ($i = 1, 2, \ldots N$) connected to the central station by first optical fiber transmission means; characterized in that

(a) associated with any given subscriber station RS_j is at least one distinct predetermined wavelength λ_j, with all the predetermined wavelengths being within a spectral region $\Delta\lambda$;

(b) the central station comprises central station generating means adapted for generating electromagnetic radiation of a multiplicity of distinct wavelengths including the predetermined wavelengths within $\Delta\lambda$;

(c) the first optical fiber transmission means comprise

(i) a "backbone" fiber connected to the central station such that radiation comprising the predetermined wavelengths within $\Delta\lambda$ can be coupled into the backbone;

(ii) l fiber "laterals" ($1 < l < N$), each given lateral connected to the backbone by means that comprise means for coupling radiation power from the backbone into the lateral such that radiation of a multiplicity of wavelengths within $\Delta\lambda$ can be coupled into the given lateral from the backbone; and

(iii) means for connecting a multiplicity of subscriber stations to a given lateral, the means comprising a multiplicity of fiber "drops" and wavelength selective first coupling means for coupling a given drop to the lateral; and

(d) the given subscriber station RS_j comprises radiation detection means, the wavelength selective first coupling means are selected such that only an information signal associated with the wavelength λ_j can be received by the subscriber station RS_j; wherein

(e) at least one given subscriber station RS_j comprises subscriber station generating means adapted for generating electromagnetic radiation of substantially the wavelength λ_j associated with RS_j, and wherein the communications

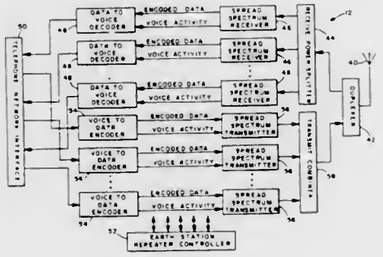
system further comprises second optical fiber transmission means, connected to the subscriber station generating means, and central station radiation detection means that are connected to the second optical fiber transmission means, such that the radiation substantially of wavelength λ_j can be transmitted from RS_j to, and be detected by, the central station detection means, with the central station radiation detection means comprising D central station radiation detectors ($1 \leqq D < N$) connected to the second optical fiber transmission means by means that comprise wavelength selective couplers adapted for insuring that any given central station radiation detector receives, at any given time, substantially only radiation from at most one of the subscriber stations.

4,901,307

SPREAD SPECTRUM MULTIPLE ACCESS COMMUNICATION SYSTEM USING SATELLITE OR TERRESTRIAL REPEATERS

Klein S. Gilhousen, San Diego; Irwin M. Jacobs, La Jolla, and Lindsay A. Weaver, Jr., San Diego, all of Calif., assignors to Qualcomm, Inc., San Diego, Calif.

Filed Oct. 17, 1986, Ser. No. 921,261
Int. Cl.[4] H04J *13/00*
U.S. Cl. 370—18 **46 Claims**



1. A multiple access, spread spectrum communication system, comprising:

means for communicating information signals between at least two of a plurality of system users using code-division-spread-spectrum communication signals;

isolation means, coupled to said means for communicating, for unequally weighting signal power of said code-division-spread-spectrum communication signals, wherein said isolation means comprises:

activity detection means for measuring signal activity levels for said information signals relative to a no activity level over a predetermined sampling time and for providing an activity signal corresponding to measured activity; and

power control means coupled to said means for communicating for adjusting a transmission power duty cycle for said code-division-spread-spectrum communication signals in response to changes in said activity signal.

4,901,308

DIGITAL BRIDGE FOR A TIME SLOT INTERCHANGE DIGITAL SWITCHED MATRIX

Stephen A. Deschaine, Garland, Tex., assignor to DSC Communications Corporation, Plano, Tex.

Continuation of Ser. No. 148,383, Jan. 25, 1988, Pat. No. 4,825,433, which is a continuation-in-part of Ser. No. 939,036, Dec. 8, 1986, Pat. No. 4,771,420. This application Apr. 25, 1989, Ser. No. 343,086
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58.1 **1 Claim**

1. A split-bridge switch for interconnecting digital call signals from a master switch port to a plurality of slave switch ports and interconnecting digital call signals from the slave switch ports to the master switch ports, comprising:

a plurality of intermediate switch ports associated in said split-bridge switch;

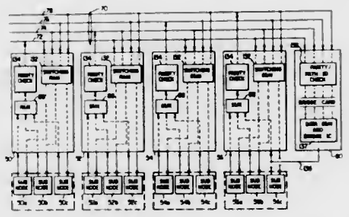
a summing circuit for receiving digital call signals from said intermediate switch ports to output a single digital call signal to a separate one of said intermediate switch ports;

a plurality of nodes, one of said nodes associated with said master switch port, each of said slave switch ports and each of said intermediate switch ports;

receiving means associated with each of said nodes for receiving a single data value from each of said plurality of digital call signals from associated switch ports in a single collection time frame;

call storage means associated with each of said nodes for storing at each of said nodes all of the digital call signal data values received by said receiving means from all of said nodes in said switch during said collection time frame;

pattern storage means associated with each of said nodes for storing associated interconnect patterns for each of said



switch ports, said associated interconnect patterns comprised of a first master interconnect pattern for defining the communication path between said master switch port and each of said slave switch ports, a second master interconnect pattern for defining the call path between said intermediate switch port associated with the output of said summing circuit, and a slave interconnect pattern for defining the call path between said slave switch ports and said circuit at said associated intermediate switch ports;

interconnect means for interconnecting each of said call storage means with each of said receiving means such that each of said call storage means receives all the digital call signal data values received by all of said receiving means in said switch; and

access means associated with each of said nodes for accessing said stored digital call signal data values from said associated call storage means in accordance with said interconnect patterns in said associated pattern storage means in a single transmission time frame subsequent to said collection time frame.

4,901,309

CROSS-CONNECT FOR SWITCH MODULES

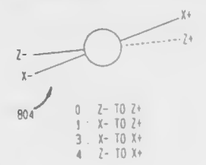
Jonathan S. Turner, University City, Mo., assignor to Washington University, St. Louis, Mo.

Division of Ser. No. 773,380, Sep. 6, 1985, Pat. No. 4,734,907. This application Dec. 30, 1987, Ser. No. 139,463
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 **5 Claims**

1. An interconnection apparatus comprising

a planar array of electronic switches, each of said switches in said planar array having at least four electronic switching leads, two of said leads lying in said plane, one of said leads extending perpendicular to said plane on one side thereof, and one of said leads extending perpendicular to said plane on the other side thereof, and

electronic control means associated with each of said switches for establishing a switched electronic connection



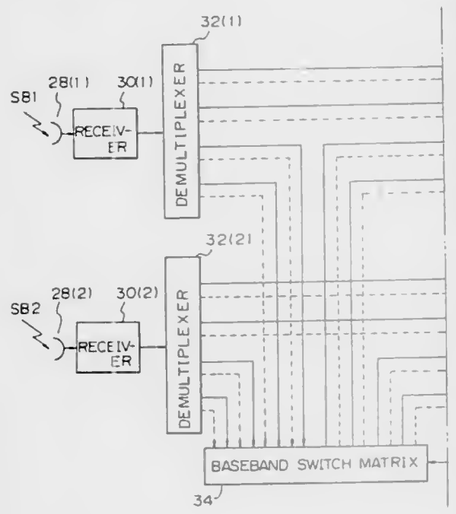
between a specific pair of said four leads comprising each switch.

4,901,310

MOBILE SATELLITE COMMUNICATION SYSTEM

Osamu Ichiyoshi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 9, 1988, Ser. No. 242,707
Claims priority, application Japan, Sep. 11, 1987, 62-228088
Int. Cl.[4] H04J *1/02, 1/10*
U.S. Cl. 370—75 **7 Claims**



1. In a satellite communication system including a plurality of mobile stations situated on the earth and a communication satellite communicatable with said mobile stations by using radio signals over a plurality of spot beams, the combination with the foregoing, comprising:

said mobile stations each comprising a transmitter for modulating voice and data to produce a frequency-division-multiplexed (FDM) signal and transmitting said FDM signal to said communication satellite over any of the spot beams which is associated with said mobile station; and

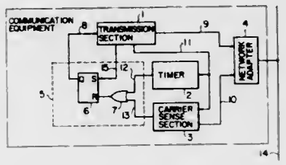
said communication satellite comprising an onboard transponder for separating FDM signals which are sent from said mobile stations from each other, time-division-multiplexing the resulting separated signals, and then respectively interconnecting the spot beams to transmit the resulting time-division-multiplexed signals to said mobile stations for which said FDM signals are meant.

4,901,311

COMMUNICATION METHOD AND EQUIPMENT THEREFOR

Koichi Tanaka, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 910,637, Sep. 23, 1986, abandoned. This application Oct. 26, 1988, Ser. No. 265,294
Claims priority, application Japan, Sep. 27, 1985, 60-213812
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—85.1 **7 Claims**



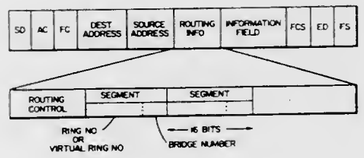
1. A communication method using LAN of a CSMA/CD system, wherien each communication equipment initiates a transmission delay instruction after transmission of a frame is completed, terminates said transmission delay instruction when either the condition that a first predetermined time has passed from the time when said transmission of the frame is completed or the condition that a second predetermined time has passed from the time when reception from any other communication equipment is completed, and initiates transmission of the next frame, provided that said transmission delay instruction has been terminated, wherein the first and second predetermined times have such a relationship that said second predetermined time is less than 2τ which is less than or equal to the first predetermined time, where τ is a time required until a signal is propagated to another communication equipment located at a furthermost position.

4,901,312

REMOTE INTERCONNECTION OF LOCAL AREA NETWORKS

Man H. Hui, 4 Colville Court, Kanata, Ontario, Canada (K2K 1B1); Radhakrishna S. Valiveti, 231 Pickford Dr., Kanata, Ontario, Canada (K2L 2C6); Haroon Patel, 2 Seabury Gate, Nepean, Ontario, Canada (K2J 2Z4); James A. Lamont, 6 Belgrave Road, Ottawa, Ontario, Canada (K1S 0M1), and Yogesh B. Shah, 19 Fox Meadow Lane, Nepean, Ontario, Canada (K2G 3W1)

Filed Sep. 8, 1988, Ser. No. 241,846
Claims priority, application Canada, May 5, 1988, 565962
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—85.12 **7 Claims**



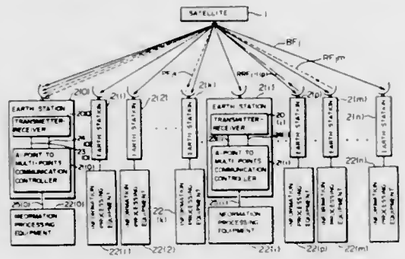
1. A communication system for sending data link frames between mutually remotely located token rings via a communication network, comprising respective bridge means connecting each token ring to the network, each bridge means comprising means for inserting source routing information in the frames to specify the order in which the frames are to be routed through the token rings, the bridge means and the

network, the source routing information including bridge numbers unique to the respective bridge means, ring numbers unique to the respective token rings and a virtual ring number identifying the network.

4,901,313
A-POINT TO MULTI-POINTS COMMUNICATION SYSTEM

Nobuyuki Fujikura, Kodaira; Hiroshi Morita, Yokohama; Yoshihisa Ikeda, Ibaraki, and Ryoichi Sasaki, Fujisawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,727
Claims priority, application Japan, May 11, 1987, 62-114276
Int. Cl.[4] H04J *3/06, 3/16*
U.S. Cl. 370—104.1 **32 Claims**



1. An a-point to multi-points communication system comprising:

a master station for transmitting an a-point to multi-points

a plurality of slave stations for receiving said a-point to multi-points frame, and for returning response frames each including an indicator for indicating, to said master station, whether said a-point to multi-points frame said master station is received normally or abnormally by a slave station in response to said received a-point to multi-points frame;

said master station including:

counting means for counting the number of slave stations which return a response frame including an indicator indicating abnormal receiving of said a-point to multi-points frame, and

detecting means for detecting whether the number of slave stations counted by said counting means is above a predetermined value indicating that said a-point to multi-point frame is to be retransmitted.

4,901,314
FAILSOFT RADIO CONTROL CONSOLE

Jeffrey G. Lohrbach, Elgin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1988, Ser. No. 213,408
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—11.2 **12 Claims**

5. In a radio communications system having:

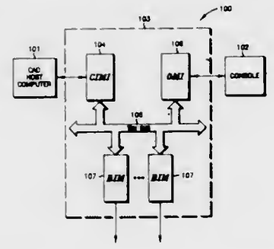
CAD host computer means for providing a control signal;

console means for controlling a plurality of radio communication paths; and

link means for providing said control signal to said console means to allow said CAD host computer means to influence control of at least some of said plurality of radio communication paths;

an improvement comprising:

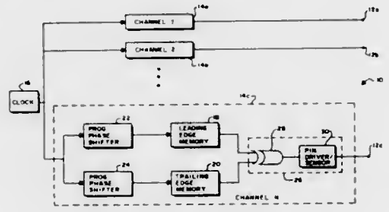
response means responsive to detection of a predetermined event for causing said console means to control said plurality of radio communication paths in a predetermined manner, with the exception of any communication paths that are supporting communications having at least a predetermined priority when said response means responds to said detection.



4,901,315
INTEGRATED DATA AND TIMING CIRCUITRY FOR AUTOMATIC CIRCUIT TESTER

William Ian Heaps, Stockport, England, assignor to GenRad, Ltd., Cheshire, England

Filed Apr. 4, 1988, Ser. No. 177,067
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—27 **2 Claims**



1. An apparatus, including apparatus terminals adapted for connection of an electronic circuit thereto, for applying signals to and/or sensing signals at the apparatus terminals, the apparatus comprising:

A. a clock for generating a master clock signal comprising periodically occurring pulses; and

B. a data/timing channel associated with each terminal, each channel comprising:

i. a leading-edge memory and a trailing-edge memory, each given memory including an ordered plurality of memory locations, operable by application of respective individual clock signals thereto to produce, in response to the occurrence of each pulse in the respective individual clock signal, an output signal determined by the contents of the next location in the given memory and occurring at a time determined by the time of occurrence of the respective individual-clock-signal pulse; and

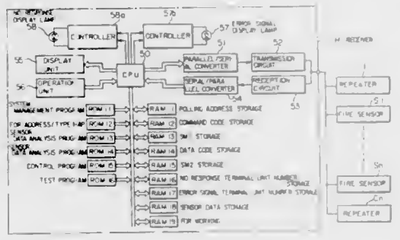
ii. individual-clock-signal means responsive to the master clock signal for applying to the leading-edge memory and the trailing-edge memory a respective individual clock signal containing a pulse in response to each pulse in the master clock signal; and

iii. a formatter connected to receive the outputs of the leading-edge and trailing edge memories for performing one of (a) applying to its respective terminal signal pulses whose leading edges are determined by the times of occurrence of transitions in the output of the leading-edge memory and whose trailing edges are determined by the times of occurrence of transitions in the output of the trailing-edge memory and (b) testing for the presence at the associated terminal, at points in a time determined by the times of occurrence of transitions in the leading-edge-memory and the trailing-edge-memory outputs, of signals having values determined by the leading-edge-memory and the trailing-edge-memory outputs.

4,901,316
DISASTER PREVENTION MONITORING AND CONTROL FACILITY

Akira Igarashi, and Takashi Kobayashi, both of Tokyo, Japan, assignors to Nohmi Bosai Kogyo Co., Ltd., Tokyo, Japan

Filed May 18, 1987, Ser. No. 50,476
Claims priority, application Japan, May 27, 1986, 61-121922; May 27, 1986, 61-121923; May 27, 1986, 61-121924
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37.1 **11 Claims**



1. A disaster prevention monitoring and control facility comprising:

a plurality of terminal units;

a central unit for connection to said plurality of terminal units, and having means for transmitting and receiving data information signals to and from each of said plurality of terminal units;

sum checking means, disposed in each of said terminal units and central means, for summing selected portions of each of said data information signals transmitted and received by said central unit and by each of said terminal units, and for determining whether each of said data information signals contains an error on the basis of the thus summed selected portions of each of said data information signals;

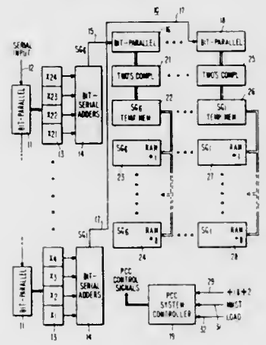
a polling means, disposed in said central unit, for polling each of said terminal units, said polling means conducting P polling attempts during a first polling cycle, P being an integer greater than 1, wherein said central unit initiates a transfer to another process when a terminal unit fails to properly respond to said P polling attempts, said polling means further conducting Q polling attempts during a second polling cycle after said transfer to another process, Q being a positive integer less than P;

wherein, during said first and second polling cycles, each subsequent polling attempt is conducted when said sum checking means indicates that said data information signal received in response to a previous polling attempt from one of said terminal units contains an error and when an absence of a data information signal is detected in response to a previous polling attempt from one of said terminal units.

4,901,317
EFFICIENT MAXIMUM-LIKELIHOOD DECODER FOR THE GOLAY (24,12) CODE

Craig K. Rushforth, Kaysville, and Ayyoob D. Abbaszadeh, Salt Lake City, both of Utah, assignors to Unisys Corp., Blue Bell, Pa.

Filed Aug. 11, 1988, Ser. No. 231,125
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37.1 **18 Claims**



1. An efficient maximum likelihood decoder for the Golay (24,12) code comprising:

precomputational circuit means for receiving a dimensional vector (X) to be decoded,

register means comprising a plurality of sets of storage registers for dividing said dimensional vector information into sets of information,

bit serial adder means coupled to said individual sets of said registers for producing precomputed SG_K values representative of said sets of information,

random access (RAM) storage means for storing said SG_K values,

inner product circuit means comprising a plurality of processing elements,

each of said processing elements being coupled to a part of said RAM storage means representative of sets of said SG_K values,

means for addressing and sequentially reading said precomputed SG_K values out of said random access storage means into said inner product circuit means,

means for comparing said SG_K values and for determining a minimum SG_K values and the subcode values for the SG_K values,

means for determining the sign of the SG_K subcode values,

means for calculating and selecting the largest inner product values for said subcode values,

select means for determining the single subcode value whose inner product with the received dimensional vector (X) is the largest, and

means for presenting said subcode value as information bits associated with said subcode value to a utilization device.

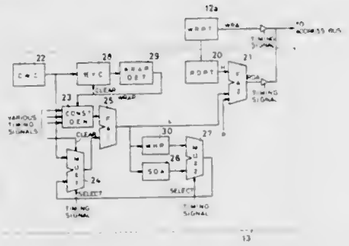
4,901,318
ADDRESS GENERATING CIRCUIT

Shin'ichiro Tomisawa, Takatsuki, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Apr. 21, 1988, Ser. No. 184,335
Claims priority, application Japan, Apr. 28, 1987, 62-105390
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—40.1 **4 Claims**

1. An address generating circuit which generates reading addresses for addressing a memory in which a plurality of error correcting code words composed of data and parity symbols

for detecting or correcting errors in the data are sequentially stored for each symbol so that said data and parity symbols are sequentially read from said memory for each symbol in an order corresponding to a decoding order number so as to decode said error correcting code words, said error correcting code words being formed by data arranged for each symbol in a predetermined arrangement and parity symbols which are added to the data based on said predetermined arrangement, comprising:



a first operation circuit for generating a symbolic location of each symbol in said predetermined arrangement based on at least the order number of the symbol of said error correcting code words; and

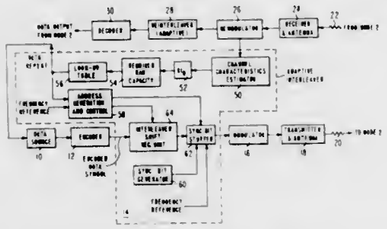
a second operation circuit for generating an address of each symbol with respect to said memory based on at least said symbolic location being outputted from said first operation circuit.

4,901,319

TRANSMISSION SYSTEM WITH ADAPTIVE INTERLEAVING

Daniel P. Ross, Philadelphia, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Mar. 18, 1988, Ser. No. 169,699
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—45 **16 Claims**



16. A transmission system comprising:

first receiving means for receiving a signal in a first channel having fading characteristics;

an adaptive interleaver having a first input means for receiving a data signal having a plurality of bits, a second input means coupled to said first receiving means for receiving said first channel signal for controlling an interleaving interval in accordance with fading characteristics of said first channel, and an output means for providing all of said plurality of data signal bits in interleaved form and a synchronization signal occurring at said interleaving interval;

means coupled to said interleaver output means for transmitting said data signal in interleaved form in a second channel;

second receiving means for receiving said data signal in interleaved form and said synchronization signal; and

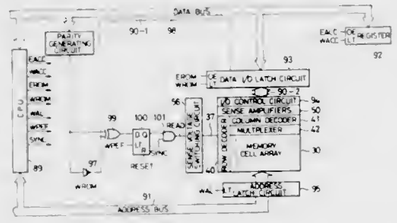
an adaptive deinterleaver having a first input means coupled to said second receiving means for receiving at least said data signal, a second input means coupled to said second receiving means for receiving at least said synchronization signal for controlling a deinterleaving interval in accordance with the synchronization signal, and an output means for providing a deinterleaved data signal with all of said bits.

4,901,320

SELF-CORRECTING SEMICONDUCTOR MEMORY DEVICE AND MICROCOMPUTER INCORPORATING THE SAME

Kikuzo Sawada; Kouzi Tanagawa; Nobuhiro Tomari, and Tomoaki Yoshida, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1988, Ser. No. 238,811
Claims priority, application Japan, Aug. 31, 1987, 62-217544; Jun. 8, 1988, 63-141401
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—51.1 **23 Claims**



1. A self-correcting semiconductor memory device comprising:

a memory cell array having sets of cells, each set comprising data cells for storing data bits and a parity cell for storing a parity bit for detecting bit errors generated by said data cells;

selection means for selecting an arbitrary set of cells;

read-out means for applying a first sense voltage to the selected set of cells to produce first read data comprising data bits and a parity bit;

parity checking means for checking the parity of the first read data and producing an output indicating whether a parity error is present;

said read-out means capable of applying a second sense voltage of a level different from the level of said first sense voltage to said selected set of cells to produce second read data comprising data bits and a parity bit; and

correction means for receiving the read data and producing correct read data, said correction means correcting any error in the data bits of the read data responsive to the read data and the output of the parity checking means.

4,901,321

OPTICAL WAVEGUIDE MADE SOLID STATE MATERIAL LASER APPLYING THIS WAVEGUIDE

Robert Blondeau, Ablis; Yannic Bourdin, Antony; Beaudoin de Cremoux, Orsay; Michel Papuchon; Michel Krakowsky, both of Paris; Alain Bensoussan, Toulouse; Manijeh Razeghi, Orsay, and Francoise Lozes, Castanet, all of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 30, 1987, Ser. No. 31,954
Claims priority, application France, Mar. 28, 1986, 86 04523
Int. Cl.[4] H01S *3/30*
U.S. Cl. 372—7 **25 Claims**

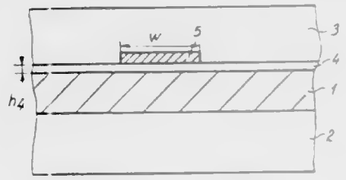
1. Optical waveguide made of solid state materials and adapted to operate at an operating wavelength comprising:

at least one layer of optical guiding material having a first index, and being in a plane x O y defined between three points x, O and y;

at least one lower optical confinement layer below the optical guiding material layer, having a second index, and being extending along a plane parallel to the plane xOy and covered by said layer of optical guiding material;

at least one layer for stopping chemical attack completely covering the layer of optical guiding material;

at least one optical guiding element located on said layer for stopping chemical attack, and covering only part of said layer for stopping chemical attack, a material of the optical guiding element having a chemical nature different



than that of the layer for stopping chemical attack and having a fourth index, the thickness of optical guiding element being smaller than few tenths of said operating wavelength of said waveguide; and

at least one upper optical confinement layer above the optical guiding material, having a third index, completely covering said optical guiding element and the layer for stopping chemical attack in the portions where it is not covered by the optical guiding element;

the first index being higher than the second index and then the third index, the fourth index being higher than the third index.

4,901,322

TUNABLE PULSED SINGLE LONGITUDINAL MODE LASER OSCILLATOR

Kenneth W. Kangas, Bellevue, Wash., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Jul. 1, 1988, Ser. No. 214,419
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—20 **19 Claims**

1. A tunable pulsed single longitudinal mode laser oscillator, comprising:

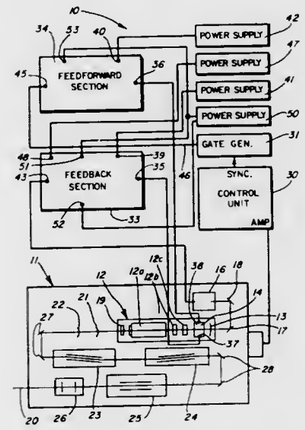
an optical cavity having a predetermined length, including

first optical element means for receiving optical energy along a reflective optical path and for reflecting said optical energy back along said reflective optical path, said reflective optical path having a reflective path length,

second optical element means for diffracting a first portion of said optical energy onto a diffraction axis and a second portion of said optical energy onto an output axis, said diffraction axis having a diffraction axis path length, the predetermined length of said optical cavity being equal to the sum of the reflective path length and the diffraction axis path length and being sufficiently short to sustain optical energy having substantially only a single longitudinal mode along said reflective optical path, and

third optical element means for reflecting optical energy received along said diffraction axis back along said diffraction axis; and

a solid-state gain medium located along said reflective optical path between said first optical element means and said second optical element means, said gain medium produc-



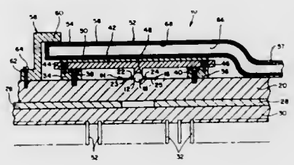
ing a pulse of optical energy in a substantially single longitudinal mode along said reflective optical path in response to the receipt of a pump beam of energy.

4,901,323

LASER PULSE STRETCHER METHOD AND APPARATUS

Jon K. Hawkins, Naperville, and William A. Williams, Burr Ridge, both of Ill., assignors to Universities Research Association, Inc., Batavia, Ill.

Filed May 1, 1987, Ser. No. 45,829
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—25 **20 Claims**



1. A laser system including an oscillator stage, control means for initiating operation of said oscillator stage, and a Pockels Cell associated with said oscillator stage to control the intensity of the laser light developed by said oscillator stage, said control means being arranged for supplying a synchronizing pulse in timed relation to the initiation of operation of said oscillator stage, and control apparatus for control of said oscillator stage, the improvements comprising: photocell means in said control apparatus for monitoring the output of said oscillator stage, feedback means in said control apparatus coupled to said photocell means of said control apparatus and to said Pockets Cell of said oscillator stage to respond to changes in the light output of said oscillator stage and control said Pockels Cell to change the light output of said oscillator stage in an inverse direction, and feedforward means in said control apparatus responsive to said synchronizing pulse to cooperate with said feedback means in the control of said Pockels Cell and to

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maintain the light output of said oscillator stage means constant to within certain limits for an extended time interval.

4,901,324

HEAT TRANSFER DEVICE FOR COOLING AND TRANSFERRING HEAT FROM A LASER DIODE DEVICE AND ASSOCIATED HEAT GENERATING ELEMENTS

Danny W. Martin, St. Charles, Mo., assignor to Laser Diode Products, Inc., Earth City, Mo.

Filed Dec. 19, 1988, Ser. No. 286,069
Int. Cl.[4] H01S *3/04*
U.S. Cl. 372—36 **19 Claims**

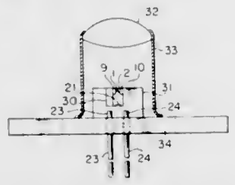
1. Means to remove heat from a heat producing element of a laser comprising an elongated tubular member having a heat conductive outer layer closed at both opposite ends, a coating of fluid absorbing material on the inner surface of the outer layer forming a passageway therethrough, a heat transfer fluid positioned in the tubular member absorbed by the absorbent layer, a portion adjacent one end of the tubular member being positioned adjacent to a heat producing element of a laser so that the heat generated by the heat producing element will heat said portion of the tubular member, and a heat conductive member in heat conductive relationship to the tubular member at a location spaced from the heat producing element whereby heat generated in the tubular member heats the fluid in the tubular member adjacent thereto establishing a fluid pressure which forces the fluid to move through the passageway toward the location where the heat conductive member is in heat conductive relationship to the tubular member.

4,901,325

SEMICONDUCTOR LASER DEVICE

Takeshi Kato, Kokubunji; Kenichi Mizuishi, Hachioji; Katuaki Chiba, Akigawa; Takeshi Nakao, Sagamihara; Masahiro Ojima, Tokyo; Shigeru Nakamura, Tachikawa, and Takeshi Maeda, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,658
Claims priority, application Japan, Mar. 26, 1987, 62-70268; Sep. 11, 1987, 62-226339
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 **19 Claims**



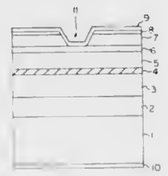
1. A semiconductor laser device comprising:
a first semiconductor laser chip including first and second chip surfaces which are parallel to each other, a first active layer which is located between and parallel to said first and second chip surfaces, said first active layer being positioned closer to said first chip surface than said second chip surface, and a light emitting surface;
a second semiconductor laser chip including first and second chip surfaces which are parallel to each other, a second active layer which is located between and parallel to said first and second ship surfaces, said second active layer being positioned closer to said first chip surface than said second chip surface, and a light emitting surface;
means for exciting said first and second semiconductor laser chips;
supporting means for supporting said first and second semiconductor laser chips such that said first surface of said first semiconductor laser chip and said first surface of said second semiconductor laser chip are substantially parallel and opposite to each other.

4,901,326

SEMICONDUCTOR LASER DEVICE

Toshiro Hayakawa, Yokohama; Takahiro Suyama, Nara; Masafumi Kondo, Nara, and Kosei Takahashi, Nara, all of Japan, assignors to Shapr Kabushiki Kaisha, Osaka, Japan

Filed Oct. 6, 1988, Ser. No. 254,080
Claims priority, application Japan, Oct. 8, 1987, 62-254920
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **12 Claims**



1. In a semiconductor laser device, the combination of:
a semiconductor substrate;
a first electrode formed under said substrate;
a buffer layer formed on said substrate;
a double heterostructure laser operating area comprising successively a first cladding layer, an active layer, and a second cladding layer on said buffer layer;
a cap layer formed on said laser operating area;
a current blocking layer formed on said cap layer, said current blocking layer having a stripe-shaped groove;
a contact layer formed on the upper face of said current blocking layer; and
a second electrode formed on the upper face of said contact layer and on the inner face of said stripe-shaped groove;
wherein the growth plane of said substrate is substantially the (111) plane and said double heterostructure laser operating area is disposed above said growth plan.

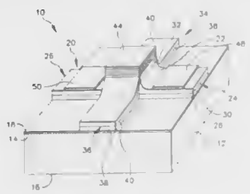
4,901,327

TRANSVERSE INJECTION SURFACE EMITTING LASER

Eric M. Bradley, Escondido, Calif., assignor to General Dynamics Corporation, Electronics Division, San Diego, Calif.

Filed Oct. 24, 1988, Ser. No. 261,413
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **16 Claims**

1. A surface emitting laser comprising:
a semiconductor substrate having planar top and bottom surfaces and an aperture formed therebetween;
a semiconductor optical cavity formed upon said substrate top surface and aligned with said aperture, said optical cavity having substantially coplanar top and bottom surfaces;
first and second dielectric mirrors, said first dielectric mirror formed upon said optical cavity top surface and said second dielectric mirror formed upon said optical cavity bottom surface within said aperture;
contact means for conducting current through said optical cavity in a direction substantially parallel to said optical cavity top and bottom surfaces; and



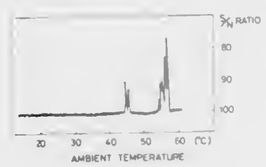
current confinement means disposed in intimate contact with said optical cavity for confining current flowing in said optical cavity along a predetermined path extending between said contact means.

4,901,328

SEMICONDUCTOR VSIS LASER

Sadayoshi Matsui, Tenri; Haruhisa Takiguchi, Osaka; Shinji Kaneiwa, Tenri, and Mototaka Taneya, Sakai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 188,765, May 3, 1988, abandoned, which is a continuation of Ser. No. 54,041, May 26, 1987, abandoned, which is a continuation of Ser. No. 662,687, Oct. 19, 1984, abandoned. This application Jul. 17, 1989, Ser. No. 380,745
Claims priority, application Japan, Oct. 25, 1983, 58-200261
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—46 **3 Claims**



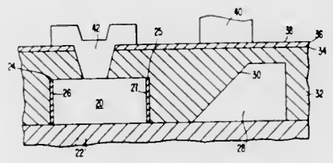
1. A V-channeled substrate inner stripe (VSIS) semiconductor laser comprising as a composite:
a p-GaAs substrate;
an n-GaAs current blocking layer formed on said p-GaAs substrate
a V-shaped groove formed in said n-GaAs current blocking layer in a manner to reach said p-GaAs substrate;
a p-$Ga_{1-x}Al_xAs$ first cladding layer formed on said n-GaAs current blocking layer;
a p-$Ga_{1-x}Al_yAs$ active layer formed on said p-$Ga_{1-x}Al_xAs$ first cladding layer;
an n-$Ga_{1-x}Al_xAs$ second cladding layer formed on said p-$Ga_{1-y}Al_yAs$ active layer;
an n-GaAs cap layer formed on said n-$Ga_{1-x}Al_xAs$ second cladding layer to form said composite and said composite being sandwiched between electrode means, wherein
said AlAs mole fraction x of the first and second cladding layers is selected between about 0.45 and 0.52 and wherein the cavity length of said V-channeled substrate inner stripe (VSIS) semiconductor laser is selected to be longer than about 300 μm, whereby the occurrence of the mode competition noise at the normal operating temperature is minimized.

4,901,329

INTEGRATED LASER ARRAYS AND SUPPORT CIRCUITS

James M. Leas, Bethesda, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 264,422, Oct. 31, 1988, abandoned. This application Apr. 25, 1989, Ser. No. 344,553
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 **26 Claims**



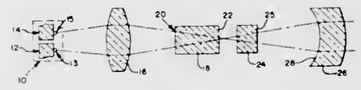
1. A semiconductor laser element comprising:
a semiconductor laser formed by sequential epitaxial layers of semiconductor material disposed on a semiconductor substrate so that light produced by said semiconductor laser is emitted in a direction substantially parallel to said semiconductor substrate;
an internal reflector composed of a low index material having a slanted surface, said internal reflector disposed on said semiconductor substrate adjacent to said semiconductor laser and positioned to deflect light emitted from said laser on said slanted surface;
a high index material disposed on and embedding both said semiconductor laser and said internal reflector so that light emitted from said semiconductor laser enters said high index material before striking said slanted surface;
wherein the indexes of refraction of said low index and said high index material are chosen so that all of the light emitted by said laser striking said slanted surface of said internal reflector is deflected back into said high index material at an angle equal to the angle of incidence.

4,901,330

OPTICALLY PUMPED LASER

Thomas Wolfram, Wheaton; Bruce A. Vojak, Naperville; Edward T. Maas, Jr., Batavia, and Robert D. Burnham, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jul. 20, 1988, Ser. No. 221,670
Int. Cl.[4] H01S *3/091*
U.S. Cl. 372—75 **27 Claims**



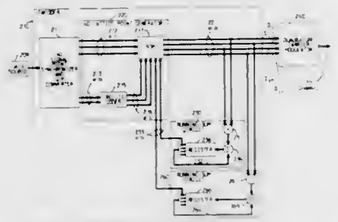
1. An optically pumped laser comprising
(a) a laser diode array for generating optical pumping radiation, said pumping radiation having a bandwidth which is about 3 nm to about 15 nm wide and wherein the intensity of said pumping radiation is substantially uniformly distributed over said bandwidth, and
(b) a lasant material with an absorption band for receiving radiation within said bandwidth of said laser diode array.

4,901,331

TRELLIS CODES WITH PASSBAND SPECTRAL NULLS

Arthur R. Calderbank, Maplewood, and James E. Mazo, Fair Haven, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 19, 1989, Ser. No. 354,573
Int. Cl.[4] H04L *5/12. 1/00;* **H03M** *13/00*
U.S. Cl. 375—39 **32 Claims**



1. A data transmission system adapted to transmit on a communication channel a sequence of passband signals in response to a sequence of (k+n)-bit input words, each of said passband signals representing a respective signal point of a predetermined alphabet of signal points, said system comprising

means responsive to the values of n bits of each input word in said input word sequence and the value of at least one bit of a previous input word in said input word sequence for identifying one of 2^m predetermined subsets of said alphabet, m being an integer greater than n,

means responsive to the other k bits of said each input word for identifying a plurality of signal points of said one subset,

means for selecting one of said plurality of signal points as a function of two independent variables which are the respective odd and even components of the signal points represented by previously transmitted ones of said passband signals, and

a quadrature carrier modulator for generating on said communication channel as an individual one of said sequence of passband signals a signal representing the selected signal point, the in-phase and quadrature-phase inputs to said modulator respectively being the odd and even components of said selected signal point.

4,901,332

NONCOHERENT-COHERENT A.C. COUPLED BASE BAND AGC RECEIVER

Bruce H. Williams, Sandy; Christopher R. Keate, Salt Lake City, and Jeffrey Mac Thornock, Layton, all of Utah, assignors to Unisys Corp., Blue Bell, Pa.

Filed Oct. 27, 1988, Ser. No. 263,678
Int. Cl.[4] H03D *3/18*
U.S. Cl. 375—81 **5 Claims**

1. An A.C. coupled base band AGC receiver for receiving phase shifted key(PSK) data signals, said receiver being of the type having a phase lock loop (PLL), comprising:

said phase lock loop having a data detection branch and a carrier tracking branch coupled to a voltage controlled oscillator (VCO),

first and second linear analog multipliers connected respectively in one of said branches of said PLL,

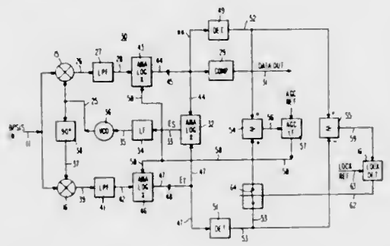
third analog multiplier means coupled to said PLL branches,

first and second means for A.C. coupling said third analog multiplier means to said first and second linear analog multipliers,

first and second detector means coupled to the output of said first and second means for A.C. coupling.

summing means coupled to the output of said first and second detector means,

an automatic gain control loop filter coupled to the output of said summing means, and



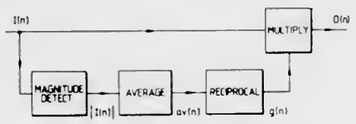
the output of said automatic gain control loop filter being coupled as an input to said first and second linear analog multipliers to provide voltage control gain devices in each of said branches of said phase lock loop.

4,901,333

DATA TRANSMISSION SYSTEMS

William Hodgkiss, London, England, assignor to The General Electric Company, p.l.c., United Kingdom

Filed Mar. 16, 1987, Ser. No. 26,148
Claims priority, application United Kingdom, Mar. 24, 1986, 8607288; Mar. 24, 1986, 8607289; Mar. 24, 1986, 8607290; Mar. 24, 1986, 8607291; Mar. 24, 1986, 8607292; Jan. 9, 1987, 8700461
Int. Cl.[4] H04L *27/08*
U.S. Cl. 375—98 **1 Claim**



1. A data transmission system in which data signal values to be transmitted over the system are represented in transmission by phase and amplitude values of two electric carrier signals of the same frequency but in phase quadrature, wherein a modem comprises digital signal processor means responsive to input data signal values for supplying digital electric output signals which represent, in pulse code modulation form, the required phase and amplitude values of successive samples of the two electric carrier signals; a digital-to-analog converter which derives said carrier signals from said digital output signals; means for periodically sampling and digitally encoding received carrier signals; and an automatic gain control arrangement comprising means for digitally determining the average magnitude of encoded sample values, means for deriving a reciprocal of said average magnitude, and means for digitally multiplying each of said encoded sample values by said reciprocal of said average magnitude.

4,901,334

TRAFFIC COUNTER APPARATUS FOR SELECTIVE LANE USE

Guy P. Gibson, 48731 Roberts Rd., Oakridge, Oreg. 97463

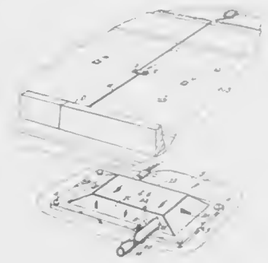
Filed Jun. 30, 1988, Ser. No. 213,995
Int. Cl.[4] G08G *1/065;* **E01F** *11/00*
U.S. Cl. 377—9 **4 Claims**

1. A traffic counter apparatus actuated by vehicle travel

along a traffic lane of a multi-lane roadway, said apparatus comprising,

a housing assembly including a base adapted for securement to the roadway surface between two traffic lanes, a housing having a low profile to said roadway with inclined exterior walls, means removably mounting said housing to said base, said housing defining a chamber closed by said base and constructed of material to withstand being run over by any roadway vehicle,

a road tube for disposition in a traffic lane and having an end attached to said housing assembly,



pressure responsive transducer switch means in said chamber responsive to air pressure changes in the road tube caused by vehicle passage thereover, thereby producing electrical pulses,

signal transmitting means in said chamber connected to and actuated by said pressure responsive switch means for transmitting said electrical pulses and

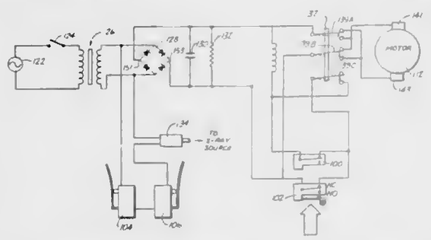
tally means remote from said housing assembly and triggered by said pulses from said signal transmitting means.

4,901,335

MAMMOGRAPHY APPARATUS

Daniel J. Ferlic, 406 Birchwood Ave., White Bear Lake, Minn. 55110; Frank T. Kotula, 15345 70th Pl. North, Maple Grove, Minn. 55369, and Kurt Amplatz, 10 Evergreen St., North Oaks, Minn. 55110

Filed Nov. 3, 1988, Ser. No. 266,798
Int. Cl.[4] A61B *6/04*
U.S. Cl. 378—37 **12 Claims**



1. A method of performing a mammography examination on a human subject, the method comprising the steps of:

generating x-rays from an x-ray source;

exposing an image receptor to x-ray radiation from an x-ray source through a breast of the subject;

suppressing scattered x-ray radiation produced in the breast relative to the image receptor with a slot grid of circular section centered on an axis through the x-ray source;

moving the slot grid during the mammography examination to blur areas of negative density cast by the slot grid on the image receptor; and

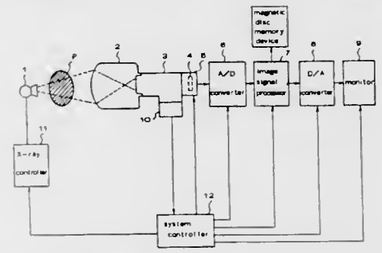
initiating and interrupting the generation of x-ray radiation during movement of the slot grid as a function of slot grid position to provide for cumulative homogeneous exposure of the image receptor.

4,901,336

X-RAY RADIOGRAPHIC APPARATUS

Masayuki Nishiki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 19, 1988, Ser. No. 286,151
Claims priority, application Japan, Dec. 18, 1987, 62-320418
Int. Cl.[4] H05G *1/64*
U.S. Cl. 378—99 **6 Claims**



1. An X-ray radiographic apparatus comprising:

an X-ray tube for irradiating an object with X-rays;

an image intensifier for receiving X-rays transmitted through said object and generating, an optical image indicative thereof;

solid-state image means for receiving an optical image from said image intensifier and providing a signal indicative thereof, said solid-state image means including a photoelectric conversion member and a transfer member;

detecting means for sensing X-irradiation determining when irradiation has reached a predetermined level; and

control means for stopping a supply of field shift pulses used as a trigger to transfer an electric signal from said photoelectric conversion member to said transfer member during the term of X-ray irradiating.

4,901,337

X-RAY IMAGING APPARATUS

Yuichi Fujimoto, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 5, 1989, Ser. No. 347,699
Claims priority, application Japan, May 18, 1988, 63-113518
Int. Cl.[4] H05G *1/64*
U.S. Cl. 378—99 **12 Claims**

1. An X-ray imaging apparatus comprising:

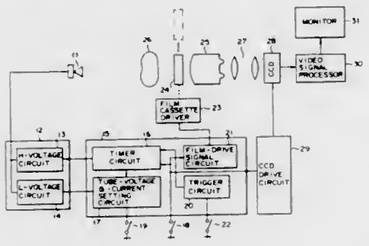
X-ray generating means for radiating an X-ray to an object to be examined;

X-ray/optical image converting means for converting the X-ray passing through said object to be examined into an optical image;

solid-state image sensor means having electric charge storage areas for storing electric charges corresponding to the optical image obtained by said converting means and electric charge transfer areas for transferring the electric charges stored in said electric charge storage areas, for outputting transferred electric charges as a video signal;

mode selecting means for selecting a fluoroscopic mode for visually observing an X-ray image and a photographing mode for picking up the X-ray image;

X-ray driving means for driving said X-ray generating means to selectively generate a low-level X-ray suitable for the fluoroscopic mode and a high-level X-ray suitable for the photographing mode from said X-ray generating means; and



drive circuit means for driving said solid-state image sensor means to discharge a predetermined amount of electric charges stored in said electric charge storage areas in said solid-state image sensor means in order to adjust the luminance of the video signal in the photographing mode.

4,901,338

ROTARY ANODE FOR X-RAY TUBES AND METHOD OF MANUFACTURE

Peter Rödhammer, Reutte, and Karlheinz Kailer, Breitenwang, both of Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Continuation of Ser. No. 226,760, Aug. 1, 1988, abandoned. This application Jun. 12, 1989, Ser. No. 366,239

Claims priority, application Austria, Aug. 3, 1987, 1959/87

Int. Cl.⁴ H01J *35/10*

U.S. Cl. 378—144 **23 Claims**

22. A method of manufacturing a rotary anode for use in x-ray tubes comprising:

(a) applying a focal track coating comprised of a refractory metal or refractory metal alloy onto a graphite substrate; and

(b) coating said graphite substrate with a layer of carbon formed both by decomposition of hydrocarbon gases at temperatures ranging from about 200° C. to about 650° C. and pressures ranging from about 0.5 Pa to about 2.0 Pa and evaporation of graphite by means of an electron beam gun.

4,901,339

STAND FOR AN X-RAY EXAMINATION APPARATUS COMPRISING A TELESCOPING COLUMN

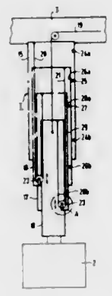
Lothar Heinz, Neunkirchen, and Thomas Schmitt, Forchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,202

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 8710117

Int. Cl.⁴ H05G *1/02*

U.S. Cl. 378—197 **8 Claims**



8. A stand for an x-radiator including a telescoping column that guides a part of the x-ray examination apparatus along a longitudinal axis, and which has at least three tubular telescope parts joined inside one another with respective stop means for limiting the relative displacement between telescope parts adjacent to one another, comprising:

adjustment means for adjusting the positions of the telescope parts relative to one another when two or more stop means take effect at different times relative to each other, wherein the adjusting is in the direction of the longitudinal axis of the telescoping column such that all stop means essentially take effect simultaneously; said adjustment means being mounted so as to be actuatable from the exterior of the telescoping column without dismantling the telescoping column.

4,901,340

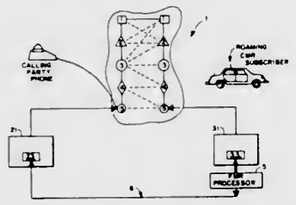
SYSTEM FOR THE EXTENDED PROVISION OF CELLULAR MOBILE RADIOTELEPHONE SERVICE

Terry S. Parker, Spring; Harold G. Saroka, Winfield; Harold E. Horton, San Ramon; Edward L. Didion, Spring; Elmer Lyle, Spring, and Randall L. Crouse, Spring, all of Tex., assignors to GTE Mobilnet Incorporated, Houston, Tex.

Filed Sep. 19, 1988, Ser. No. 246,582

Int. Cl.⁴ H04Q *7/04*

U.S. Cl. 379—60 **78 Claims**



1. A method for enabling a roaming CMR subscriber to automatically receive, in a foreign service area, calls placed to his home service area, the method comprising the steps:

(a) receiving at a foreign service area MTSO request information indicating that the roaming CMR subscriber desires to receive, in the foreign service area, calls placed to his home service area;

(b) validating the roaming subscriber;

(c) upon validation of the roaming subscriber, assigning the roaming subscriber a temporary directory number (TDN) for use in the foreign service area; and

(d) providing command information to the roaming CMR subscriber's home service area MTSO so as to enable the roaming CMR subscriber's home service area MTSO to call forward, to the TDN, calls placed to the roaming CMR subscriber's MID in his home service area.

4,901,341

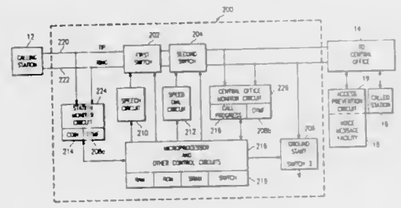
METHOD AND APPARATUS FOR CALLER-CONTROLLED RECEIPT AND DELIVERY OF VOICE MESSAGES

Howard E. Carter, Denton; Joel A. Pugh, Dallas, and Byron C. Pierce, Garland, all of Tex., assignors to Messager Partners, Dallas, Tex.

Continuation-in-part of Ser. No. 209,891, Jun. 22, 1988, Pat. No. 4,825,460. This application Apr. 24, 1989, Ser. No. 342,480

Int. Cl.⁴ H04M *1/70, 3/50, 15/10*

U.S. Cl. 379—67 **5 Claims**



3. A method, using a line interface unit, for controlling receipt and delivery of voice messages over a telephone system having a voice message facility connectible to at least one calling station and a called station via a central office, the voice message facility normally having access prevention means for preventing storage of voice messages unless predetermined access codes are received and verified by the access prevention means, wherein the line interface unit includes a monitor circuit for monitoring tip and ring lines of the calling station, a speech circuit for issuing a predetermined prompt to a caller at the calling station, a signaling circuit for signaling the voice message facility, a detector circuit connected to the monitor circuit for detecting signals on the tip and ring lines and a control circuit for controlling the operation of the line interface unit, comprising the steps of:

(a) determining, using the monitor circuit and the detector circuit, whether a predetermined condition exists at the called station upon call initiation to the called station;

(b) if the predetermined condition exists, connecting the speech circuit to the calling station to thereby enable the speech circuit to issue the prompt;

(c) activating, under the control of the control circuit, the speech circuit to issue the prompt to the caller at the calling station;

(d) determining, using the monitor circuit and the detector circuit, whether a predetermined code has been received from the calling station indicating that the caller desires to leave a voice message for the called station;

(e) if the predetermined code has been received from the calling station, connecting the signaling circuit to the central office to thereby enable the signaling circuit to signal the voice message facility;

(f) activating, under the control of the control circuit, the signaling circuit to signal the voice message facility;

(g) determining, using the monitor circuit and the detector circuit, whether a predetermined code has been received from the voice message facility; and

(h) if the predetermined code has been received from the voice message facility, transmitting a predetermined data string from the line interface unit to the voice message facility, the predetermined data string including information that, once recognized by the access prevention means of the voice message facility, enables the voice message to be stored and forwarded from the voice message facility without entry of the predetermined access codes normally required by the access prevention means.

4,901,342

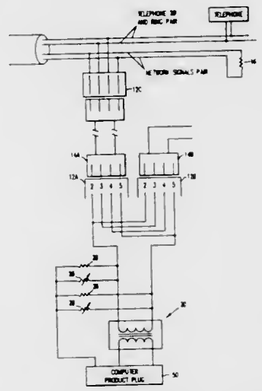
LOCAL AREA NETWORK CONNECTING COMPUTER PRODUCTS VIA LONG TELEPHONE LINES

Reese M. Jones, 2533 Dana St., Berkeley, Calif. 94704

Continuation of Ser. No. 899,413, Aug. 22, 1986, abandoned. This application Oct. 27, 1988, Ser. No. 267,759

Int. Cl.⁴ H04M *11/00*

U.S. Cl. 379—93 **13 Claims**



8. A connector according to claim 7, wherein the isolation means comprises a transformer with low interwinding capacitance and low interwinding A.C. resistance, having at least two primary terminals and at least two secondary terminals, with each transformer primary terminal being connectable to a separate one of the signal lines, in the local area network and with each secondary terminal being connectable to a separate one of the signal lines of the second interface means.

4,901,343

DATA COMMUNICATION APPARATUS

Shingo Yamaguchi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 13, 1987, Ser. No. 84,731

Claims priority, application Japan, Aug. 15, 1986, 61-190570

Int. Cl.⁴ H04M *11/00*

U.S. Cl. 379—93 **12 Claims**

1. A communication apparatus for use as being connected to a telephone line, comprising:

a first communication unit of a first kind, said first communication unit being connectable to said telephone line;

a second communication unit of a second kind which is different from said first kind, said second communication unit being connectable to said telephone line;

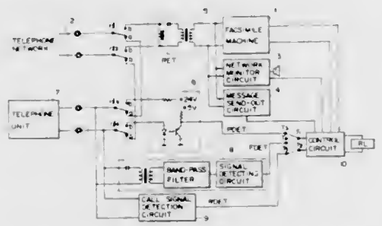
detecting means for detecting a call signal from a calling station at a remote location on said telephone line;

sending means for sending a predetermined message;

monitoring means for monitoring an oral response of a caller

at said station in response to said predetermined message, said monitoring means including generating means for generating a sound of said caller's oral response; and

control means responsive to a call detection signal from said detecting means for causing said first communication unit to be connected to said telephone line and said sending means to send said predetermined message to said calling station, said control means causing said second communication unit to be connected to said telephone line while causing said first communication unit to be disconnected from said telephone line if an operator carries out a predetermined dialing operation to said second communication unit in response to said sound of said caller's response generated by said generating means after said first communication unit has been connected to said telephone line in response to said call detection signal.



4,901,344

TELEPHONE SYSTEM DIGITAL CHANNEL BANK INTERFACE

Jean-Yves Mooette, Prevost, and Sylvain Desabrais, Mirabel, both of Canada, assignors to 15672 Canada Incorporated, Prevost, Canada

Filed Aug. 31, 1988, Ser. No. 238,617
Int. Cl.[4] H04M *1/00*
U.S. Cl. 379—93 **5 Claims**



1. An improved telephone system of the type having a remote terminal, a plurality of electronic business set telephone instruments connected to the remote terminal, each electronic business set telephone instrument including a key pad, a plurality of function keys and means responsive to actuation of each key pad key or function key to generate a unique ASK function code including a sequence of pulses of a tone at a frequency significantly above voiceband frequency, a central office including digital multiplex switch (DMS) means for responding to function codes generated by an electronic business set telephone instrument and for directing calls to a selected telephone instrument identified by a unique dialing sequence, and a plurality of telephone lines interconnecting the remote terminal and the central office terminal, the improvement comprising the combination of coder-decoder means in said remote terminal including means for receiving a composite signal in one direction including voice frequency analog voice signals and said function codes from an electronic business set telephone instrument and for producing a sequence of digital output words representative of said analog voice signals for delivery to said telephone lines,

each said digital word produced by said coder-decoder means for transmission over said telephone lines including 8 bit groups in each of which the least significant bit is set at a first predetermined level when an ASK is present and a second predetermined level when no ASK is present for delivery on said telephone lines to said DMS means in said central office;

said coder-decoder means further including means for receiving digital words from said telephone lines, for converting said received digital words into analog signals for delivery to a selected electronic business set telephone instrument and for generating ASK signals when the least significant bits of said received words are at said first predetermined level whereby said ASK function code is transmitted from another electronic business set telephone instrument and to or from said DMS means without increasing the bandwidth of said telephone lines.

4,901,345

TELEPHONE SET USABLE AS AN ACOUSTIC COUPLER

Yasunori Imagawa, Hamamatsu, Japan, assignor to Nisser Opto Co., Ltd., Shizuoka, Japan

Filed Jul. 8, 1988, Ser. No. 216,427
Claims priority, application Japan, Jul. 9, 1987, 62-105728[U]
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—387 **2 Claims**



1. A telephone set usable as an acoustic coupler comprising:

a base plate;

a telephone transmitter swingably attached to said base plate, for generating an acoustic signal in response to an electric signal applied thereto;

a telephone receiver swingably attached to said base plate, for generating an electric signal in response to an acoustic signal applied thereto;

a belt attached to said base plate, for coupling said telephone transmitter and said telephone receiver with those of a hand set of another telephone set in alignment therewith;

a telephone unit means attached to said base plate, for dialing another telephone set;

switching means for switching between a telephone mode and an acoustic coupler mode of said telephone set;

a switching controller means attached to said base plate and electrically connected to said telephone transmitter, said telephone receiver and said switching means, for controlling the operation mode of said telephone set in response to the operation of said switching means;

display means electrically connected with said switching controller means, for indicating the current operation mode of said telephone set;

first connecting means electrically connected with said telephone unit means, for electrically connecting with a public telephone line;

second connecting means electrically connected with said switching controller means, for electrically connecting with an external device, and

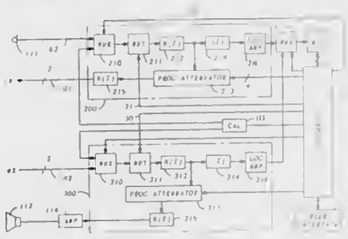
said telephone transmitter and sais telephone receiver being electrically connected with said first connecting means through said telephone unit means, when said telephone set is in the telephone mode, and said telephone transmitter and said telephone receiver being electrically connected with said second connecting means when said telephone set is in the acoustic coupler mode.

4,901,346

COMPUTER CONTROLLED SPEAKERPHONE FOR ADAPTING TO A COMMUNICATION LINE

Richard H. Erving, Red Bank, N.J., assignor to American Telephone and Telegraph Co., New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Dec. 28, 1988, Ser. No. 290,771
Int. Cl.[4] H04B *3/20*; **H04M** *1/60*
U.S. Cl. 379—389 **10 Claims**



1. In a voice switching apparatus for processing speech signals on a communication line, the apparatus including means for switching between a receive state for receiving speech signals from the communication line and a transmit state for transmitting speech signals over the communication line, a line adapting arrangement for determining the type of communication line to which the voice switching apparatus is connected, the line adapting arrangement comprising:

means for measuring a transmit speech signal provided by the apparatus to the communication line for transmission over the communication line;

means for measuring a receive speech signal from the communication line, the level of the receive speech signal being indicative of the return level of the transmit speech signal provided by the apparatus to the communication line; and

calibration means operably responsive to both the transmit speech measuring means and the receive speech measuring means for adjusting threshold switching levels at which the apparatus switches between the receive state and the transmit state.

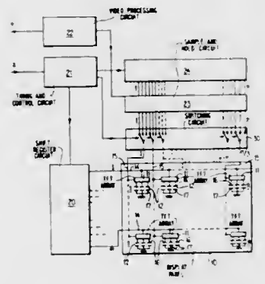
4,901,347

CIRCUIT ARRANGEMENT FOR TELECOMMUNICATION SWITCHING SYSTEMS, PARTICULARLY PCM-TIME-DIVISION MULTIPLEX TELEPHONE SWITCHING SYSTEMS WITH A CENTRAL MATRIX AND WITH LOCAL SUB-SWITCHING MATRICES CONNECTED TO THE SAME

Lothar Schmidt, Fuerstenfeldbruck; Klaus Eberlein, Wolfratshausen; Gerhard Schaich, Munich, and Fritz Hlawa, Deisenhofen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,533
Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717387
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 379—279 **12 Claims**

1. A circuit arrangement for centrally controlled telecommunication switching systems, including PCM-telephone switching systems wherein a central switching matrix serving for the interconnection, together with a program controlled central processor serving, at least, for its control and the required switch identifier processing, and wherein a multiplicity of local trunk line groups, each group with a sub-switching matrix for the connection of external trunk and/or subscriber lines, and equipped with a local programmable control unit for the reception of switch identifiers from said lines, for switch identifier pre-processing as well as for forwarding switch identifiers to the central processor and for the transmission of switch identifiers on said lines is provided, and wherein sub-switching matrices within these trunk line groups are internally connected via groups of link lines, separated in groups, with switching terminations of the central switching matrix, and wherein the line trunk groups are allocated to each other in pairs, wherein line units, primarily connected to their sub-switching matrix and within the respective line trunk group serving for the external connection of subscriber and/or trunk lines, are switchable in a manner wherein the line units of respectively a first of these two line trunk groups is additionally switched to the sub-switching matrix of the respective other, of a respective second line trunk group, whereupon the corresponding switch identifier processing as well as the sub-switching matrix setting for the calls to be interconnected via the switched-over line units is likewise executed by the local control unit of the other, second line trunk group, characterized in that, in preparation for a switch-over within each of said pairs of line trunk groups allocated to each other in pairs,



each of the two appertaining local control units provide call data, relative to all existing calls via the respective allocated sub-switching matrix, regarding which external sub-switching matrix circuit is respectively connected with which internal sub-switching matrix circuit, which are transmitted via respective local transmission paths of the line trunk pairs to the respective corresponding associated control units, and that each of the local control units establishes individual partial connections in conjunction with said call data transmitted to and received by them via the sub-switching matrix of the appertaining allocated line trunk group respectively between internal sub-switching matrix circuits and external sub-switching matrix circuits, wherein such external sub-switching matrix circuits with which the line circuits of the respective associated line trunk groups are connectable through a switch-over on the one hand and such internal sub-switching matrix circuits with which the line units of the respective associated line trunk group are connectable through said switch-over, on the other hand.

4,901,348

DATA TRANSMISSION SECURITY ARRANGEMENT FOR A PLURALITY OF DATA STATIONS SHARING ACCESS TO A COMMUNICATION NETWORK

John M. Nichols, Arvada, and Richard A. Windhausen, Thornton, both of Colo., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

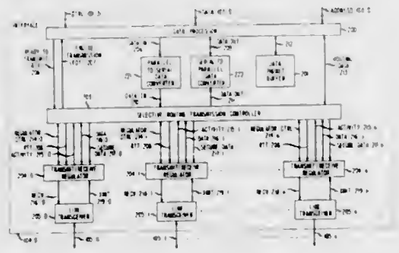
Filed Dec. 24, 1985, Ser. No. 812,974
Int. Cl.[4] H04L *11/16, 11/26*
U.S. Cl. 380—6 **34 Claims**

1. In a data communication network interconnecting a plurality of data terminal devices via corresponding interface devices where a group of said data terminal devices share a single interface device, a data security arrangement in said

single interface device for providing privacy of data transmissions comprising:

means for detecting the origination of a data transmission for one of said group of data terminal devices;

means responsive to a detected data transmission origination for identifying the destination one of said group of data terminal devices associated with said data transmission origination;



means responsive to said identifying means for transmitting said data transmission only via an individual, non-broadcast link to said destination data terminal device; and

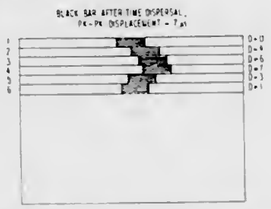
means responsive to said identifying means for transmitting a spurious data transmission, coexistent with said data transmission, via individual, non-broadcast links to all of said group of data terminal devices save said destination data terminal device.

4,901,349

TIME DISPERSAL ENCRYPTION OF TV SIGNALS

Sidney Metzger, Rockville, and Ronald K. Garlow, Damascus, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Dec. 31, 1987, Ser. No. 140,267
Int. Cl.[4] M04N *7/167*
U.S. Cl. 380—11 **46 Claims**



1. A method of encrypting video signals of the type comprising a plurality of lines each having an active signal portion representing a line of image to be displayed, with the active signal portions of successive lines of an original video signal being separated from one another by horizontal blanking periods including a horizontal synchronization pulse, said method comprising:

removing said horizontal synchronization pulses from each horizontal blanking period;

delaying the active signal portion of each line with respect to said original video signal by a respective delay period less than the duration of a horizontal blanking period; and

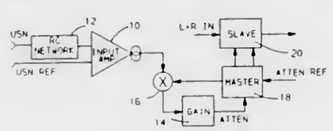
periodically changing said delay period.

4,901,350

CLOSED-LOOP AUDIO ATTENUATOR

Fred J. Anderson, Kokomo; Richard A. Kennedy, Russiaville; Gregory J. Manlove, and Jeffrey J. Marrah, both of Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Apr. 20, 1989, Ser. No. 340,834
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—13 **3 Claims**



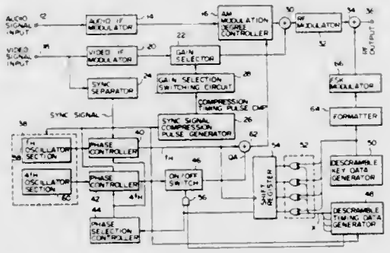
1. An audio attenuator circuit for an FM stereo receiver providing substantially linear audio attenuation over a predefined range of RF signal strength, comprising a slave section for combining proportional amounts of L+R signal and quiet signal in accordance with a differential control signal to thereby produce an attenuated audio signal, control means comprising a master differential amplifier responsive to a reference voltage and to an input voltage from a gain stage and providing said differential control signal as an output, an input amplifier responsive to an ultrasonic noise input of predetermined duration and magnitude, current multiplier means for modulating a current output of said input amplifier in accordance with a differential output of said master differential amplifier and for applying the modulated current output to said gain stage.

4,901,351

VIDEO SIGNAL SCRAMBLE SYSTEM

Masatoshi Tanaka; Wataru Kurolwa; Akinori Masuko; Jyoji Maeda, all of Fukaya; Shouji Uehara, and Tsutomu Uekusa, both of Konosu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 7, 1988, Ser. No. 241,314
Claims priority, application Japan, Sep. 7, 1987, 62-223348; Oct. 30, 1987, 62-275478; Nov. 25, 1987, 62-296828
Int. Cl.[4] H04N *7/167*
U.S. Cl. 380—15 **16 Claims**



1. A video signal scrambling system comprising:

transmitter encoder means including

compression pulse generator means for generating a sync compression pulse synchronized with a horizontal sync signal,

level compression means for subjecting a horizontal sync signal component of a video intermediate frequency signal to level compression for a scrambling purpose, at a timing of said sync compression pulse generated by said compression pulse generator means,

first sine wave generator means for generating a first sine wave representing a basis of the generating timing of said sync compression pulse,

second sine wave generator means for generating a second sine wave having a frequency different from that of said first sine wave generated by said first sine wave generator means,

mixing means for mixing said first and second sine waves generated by said first and second sine wave generator means to provide a composite signal,

modulation means for subjecting an audio intermediate frequency signal to AM modulation by means of said composite signal from said mixing means, and

output means for outputting said video intermediate frequency signal subjected to level compression in said level compression means and said audio intermediate frequency signal AM-modulated by said modulation means; and

receiver decoder means including

reproduction means for subjecting said AM-modulated audio intermediate frequency signal from said transmitter encoder means to AM detection to reproduce said composite signal,

extraction means for extracting said first sine wave from said composite signal reproduced by said reproduction means,

expansion pulse generator means for generating a sync expansion pulse based on said first sine wave extracted by said extraction means, and

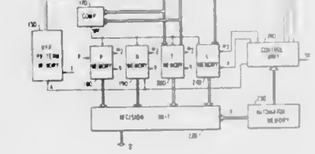
level expansion means for subjecting said level-compressed horizontal sync signal component of said video intermediate frequency signal from said transmitter encoder means to level expansion by means of said sync expansion pulse generated by said expansion pulse generator means.

4,901,352

PATTERN MATCHING METHOD USING RESTRICTED MATCHING PATHS AND APPARATUS THEREFOR

Masao Watari, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,603
Claims priority, application Japan, Apr. 5, 1984, 59-68015
Int. Cl.[4] G10L *7/08*
U.S. Cl. 381—43 **4 Claims**



4. A pattern matching apparatus for recognizing a string of spoken words, comprising:

an input unit for receiving an input speech and transforming said speech into a feature pattern of $A=a_1, a_2, \ldots, a_i, \ldots, a_I$ where a_i is a feature vector;

a reference pattern memory for storing a n-th reference pattern of $B^n=b_1^n, b_2^n, \ldots, b_j^n, \ldots, b_J^n$ n for a n-th word among a word set $\Sigma=\{n\}$ where b_j^n is a feature vector;

an automaton memory for storing a state transition table including a first state 0 and a final state F, or for storing a set of combinations (p, q, n) indicating an occurrence of a state transition $p \rightarrow q$ when said word n appears in an input pattern as a recognized word sequence;

a T memory for storing a minimum accumulated distance T(m, q) at an input pattern time m and a state q which is the minimum of an accumulated distance calculated at the end time J^n of the word of all the reference patterns which let the state transition be the state q;

N, P and L memories for storing in association with said T memory a word N(m, q) which is a word n giving the minimum accumulated distance T(m, q) at the state q and the input pattern time m, for storing a state P(m, q) which is a state p given by the word n giving said minimum accumulated distance T(m, q), and for storing a path value L(m, q) which is a starting point time of the word n giving said minimum accumulated distance T(m, q), respectively;

a G memory and an H memory for storing an accumulated distance G(p, n, j) and a path value H(p, n, j) at a time j of a n-th reference pattern on a p state on a boundary line between a present slant block and an immediately preceding slant block;

a distance calculating unit connected to receive signals from said input unit and said reference pattern memory for calculating a distance d(m, j) between each feature vector b_j^n of a n-th reference pattern and the feature vector a_m of the input pattern corresponding to each point (m, j) of an i-th slant block defined in the form of a parallelogram which has the width of an input pattern frame IL as a first side along an input pattern time axis and which has a second side inclined with respect to a reference pattern time axis and said input pattern time axis;

a DP (dynamic processing) matching unit responsive to said distance calculating unit and operative to interact with said G memory, said H memory, and said T memory for calculating accumulated distance g(m, j) and a path value h(m, j) at the input pattern time m and at the reference pattern time j in said i-th slant block by using DP equations under the boundary conditions $g(m-1, 0)$ equals the value of said minimum accumulated distance $T(m-1, p)$ and $g(m-m_{sj}-1, j)$ equals the value of said accumulated distance G(p, n, j) and $h(m-m_{sj}-1, j)$ equals the value of said path value H(p, n, j), which are designated in accordance with the state p, the word n, and the reference pattern time j, and for storing said accumulated distance $g(m-m_{ej}, j)$ and said path value $h(m-m_{ej}, j)$ into said G memory as G(p, n, j) and said H memory as H(p, n, j), respectively, as the results of DP equations at the boundary between the i-th slant block and the (i+1)-th slant block, where m(sj) and m(ej) are indicative of m(sj)-th through the m(ej)-th input feature vectors;

a comparator responsive to said DP matching unit for determining a minimum accumulated distance T(m, q) among values of accumulated distance $g(m, j=J^n)$ whose word n transits a state to q and, for storing said minimum accumulated distance in said T memory at T(m, q), and for storing the word designation n, the state designation p and the path value $h(m, j=J^n)$, which give said minimum, in said N, P and L memories as N(m, q), P(m, q) and L(m, q), respectively;

a control unit connected to read said set of combinations (p,q,n) for generating signals of said input pattern time m, said slant block number i, said word designation n, said state designations p and q, and said reference pattern time j and to provide said designations selectively to said memories (G,H,P,N,T,L); and

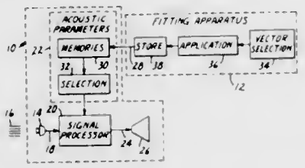
a decision unit connected to read said P, N, T, L memories and responsive to said automaton memory for determining the minimum T(m, q) at an input end time M=I under a state q contained in said final state group F, and for getting a recognized result by referencing said P, N and L memories.

4,901,353

AUDITORY PROSTHESIS FITTING USING VECTORS

Gregory P. Widin, Township of West Lakeland, County of Washington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 10, 1988, Ser. No. 192,351
Int. Cl.[4] H04K 25/00
U.S. Cl. 381—68 40 Claims



1. For use with a hearing improvement device having a storage means for storing a set of signal processing parameters corresponding to a known signal processing characteristic, and a signal processor to process a signal representing sound in accordance with said set of signal processing parameters with at least one of said signal processing parameters designed to compensate for a hearing impairment, a method of determining a new set of said signal processing parameters in accordance with a desired change in the auditory characteristics of said hearing improvement device, comprising the steps of:

selecting a vector consisting of changes in the values of individual signal processing parameters in accordance with predetermined signal processing characteristics related to said desired change in the auditory characteristics of said hearing improvement device; and

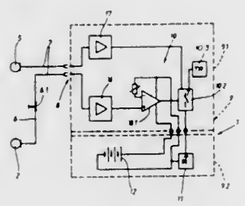
applying said changes in the values of said individual signal processing parameters of said vector against the values of corresponding ones of the individual signal processing parameters of said set of signal processing characteristics to create a new set of signal processing parameters.

4,901,354

METHOD FOR IMPROVING THE RELIABILITY OF VOICE CONTROLS OF FUNCTION ELEMENTS AND DEVICE FOR CARRYING OUT THIS METHOD

Klaus Gollmar, Horb-Ahldorf, and Gerhard Jënemann, Leonberg, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 279,814
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3742929
Int. Cl.[4] H03G 3/20
U.S. Cl. 381—110 12 Claims



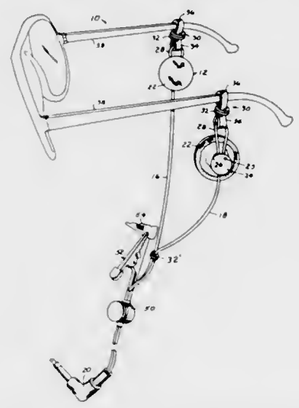
1. Method for improving the reliability of voice control systems of function elements at work stations or in motor vehicles, particularly by reliably detecting the beginning of voice commands in a voice recognition circuit, in which mainly sound generated during speaking is applied to a first microphone and at least ambient noises are applied; to a second microphone and in which misinterpretation of a pure ambient noise as voice command is prevented by signals generated in both microphones being electrically brought into a particular relation with respect to one another, wherein contact measurable sound generated during the speaking of an operating person is applied to the first microphone by direct contact and that the second microphone, which is directed towards the mouth of the operating person with a spatial distance and to which, as a result, sound generated during speaking is also applied, is electrically switched to the voice recognition circuit for the transmission of the voice signal only when the first microphone in turn generates signals from the contact measurable sound.

4,901,355

COMBINATION MULTIPLE SUPPORTED VARIABLE POSITION AUDIO INTAKE CONTROL DEVICES

Michael R. Moore, P.O. Box 1761, La Jolla, Calif. 92038

Continuation of Ser. No. 892,641, Aug. 4, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 134,613
Int. Cl.[4] H04M 1/05; H04R 1/10
U.S. Cl. 381—183 13 Claims



1. A personal audio unit for connection with an audio source, comprising:

a pair of speakers;

flexible leads extending between and having opposing ends respectively operatively connecting said speakers with an audio source;

mounting means including a clamp secured to each speaker of said pair of speakers for attachment with means on the head of a user, wherein the mounting means adjustably supports the respective speaker of said pair of speakers in variable positions enabling the user to select and hear combined sounds, the combined sounds including speaker generated sounds mixed with external, ambient sounds;

each speaker of said pair of speakers having a cylindrical portion and having a transverse aperture therethrough slidably receiving an intermediate portion of the respective lead for forming a closed leading loop adjacent the speaker connected end of the respective lead; and,

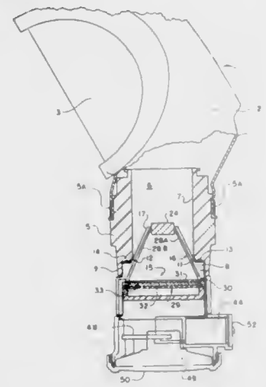
said clamp surrounding an intermediate portion of the respective lead forming the lead loop in speaker supporting relation.

4,901,356

VOICE TRANSMISSION SYSTEM

Alfred Bauer, Parma, Ohio, assignor to Actron Manufacturing Company, Cleveland, Ohio

Filed Dec. 18, 1987, Ser. No. 134,934
Int. Cl.[4] H04R 1/08; H04M 1/05
U.S. Cl. 381—160 8 Claims



1. A voice transmission system for a protective face mask having a voice emitter passage with its inner end positioned proximate a person's mouth wearing the mask, the improvement comprising:

(a) a microphone assembly at least partially received in and sealed to the emitter passage, the microphone assembly including (1) a first housing, (2) a microphone mounted on the first housing, (3) outwardly facing contact means carried by the first housing and (4) first electrical leads extending from the contact means to the microphone; and

(b) an amplifier assembly secured to an outer end of the microphone assembly, the amplifier assembly including (1) a second housing having a generally open forward end and carrying a portable power source, (2) an amplifier board mounted in the second housing, (3) a speaker mounted in the second housing adjacent its open end, (4) contactor means carried by the second housing to engage the contact means on the first housing to form an electrical connection therebetween, and (5) second electrical leads interconnecting the power source with the contact means, amplifier board and speaker to complete an electrical circuit between the power source, microphone, amplifier board and speaker to transmit and amplify the wearer's voice when the microphone assembly and amplifier assembly are fully installed onto the emitter passage, said contactor means including two spring loaded contactors respectively resiliently engaging two radially spaced, circumferentially continuous contacts on the first housing.

4,901,357

ELECTROMAGNETIC TRANSDUCER

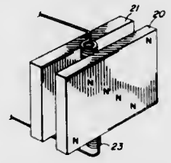
Eugene A. Albright, 1742 W. Rose, Phoenix, Ariz. 85015

Filed Jan. 20, 1987, Ser. No. 6,619
Int. Cl.[4] H04R 5/02
U.S. Cl. 381—192 12 Claims

1. An electromagnetic transducer including in combination:

first and second closely spaced flat ceramic magnetic plates of permanently magnetized material, said plates each having a thickness substantially less than the length and width thereof, with first and second faces thereon and magnetized through the thicknesses thereof to form a North Pole on the first face thereof and to form a South Pole on the second face thereof; and

a coil of electrically conductive material immovably sandwiched between said magnetic plates and located in the magnetic field between said first face of said first plate and said second face of said second plate for inducing changes in the magnetic field adjacent said second face of said first plate and said first face of said second plate when current is applied through said coil, changes in the magnetic field at said second face of said first plate and said first face of said second plate being proportional to such current.



4,901,358

METHOD OF COMPARING A HANDWRITING WITH A REFERENCE WRITING

Louis Bechet, Douvaine, France, assignor to Battelle Memorial Institute, Geneva, Switzerland

Continuation of Ser. No. 9,332, Dec. 22, 1986, abandoned. This application Oct. 7, 1988, Ser. No. 256,090
Claims priority, application Switzerland, Apr. 26, 1985, 1788/85; PCT Int'l Appl., Apr. 18, 1986, PCT/CH86/00051
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—3 2 Claims

1. A method of verifying the authenticity of a handwritten sample by use of a reference handwriting comprising the steps of:

(a) measuring and recording speed component signals V_x and V_y of a reference handwriting and a handwritten sample, respectively, where V_x and V_y are the speed component signals along the abscissa and ordinate of a rectangular coordinates system;

(b) dividing each speed component signal of the movement which produced the writing into equal discrete time segments;

(c) coordinating the position of each said segment of the handwritten sample with the corresponding segment of the reference writing;

(d) tracing vectors from the signals V_x and V_y corresponding to said discrete tine segments in the plane bounded by coordinate axes OX and OY to produce the hodograph of respectively the reference handwriting and the handwritten sample;

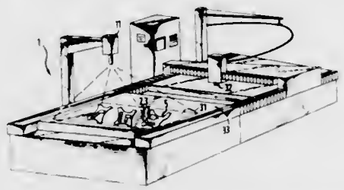
(e) selecting position R_1 to R_n of the reference writing hodograph and positions M_1 to M_n of the handwritten sample hodograph at times t_1 to t_n;
(f) calculating the Euclidian distance between the positions of the two hodographs at a given time t, the distance corresponding to the length of the vector MR;
(g) dividing the length of the vector MR by the length of the vector OR;
(h) comparing the value of the ratio MR/OR to a predetermined acceptance threshold; and
(i) repeating steps (e) to (g) for all values of M and R corresponding of values t_1 to t_n and tabulating the number of positions at which the value of the ratio MR/OR is acceptable.

4,901,359

METHOD AND APPARATUS FOR AUTOMATICALLY CUTTING MATERIAL IN STANDARD PATTERNS

Wolfgang Bruder, Bielefeld, Fed. Rep. of Germany, assignor to Durkopp System Technik GmbH, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 937,880
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544251
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—8 **33 Claims**



1. A method of controlling a cutting machine having a pattern memory, for automatically cutting material in accordance with a standard pattern, comprising the steps of:
assigning a name to the pattern;
storing contour data, which enable the cutting machine to cut along a contour defined by the pattern, in the pattern memory of the cutting machine, and associating the contour data in the pattern memory with the name of the corresponding pattern;
placing machine-readable coding on the pattern that is representative of the name of the pattern;
placing the material to be cut onto the cutting machine, and placing the pattern at a desired position on the material;
automatically detecting whether coding is present on the pattern, and if so, reading the coding to determine therefrom the name of the pattern and its position on the cutting machine; and
automatically supplying data indicative of the name and position of the pattern to the cutting machine and thereby controlling the cutting machine to cut along the contour defined by the pattern at the position of the pattern.

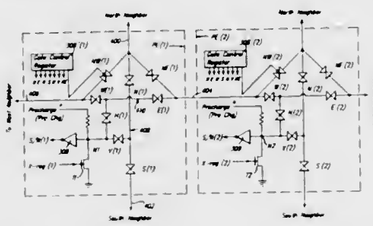
4,901,360

GATED ARCHITECTURE FOR COMPUTER VISION MACHINE

David B. Shu, Canoga Park, and James G. Nash, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 23, 1987, Ser. No. 113,084
Int. Cl.[4] C06K *9/36*
U.S. Cl. 382—41 **12 Claims**

1. A computer architecture for performing iconic and symbolic operations, said architecture comprising:
an array of substantially identical processing elements (PE) arranged in horizontal rows and vertical columns, each PE having electrically conductive lines running in the North, South, East and West directions connected to neighboring PEs in those directions, respectively; the North and South lines being connected together to form a vertical line, with the East and West lines being connected together to form a horizontal line;
each PE having a node with a programmable voltage level thereon representing a given logical state of the PE, the array being arranged so that said logical state on the node can be simultaneously shared between PEs which are connected together;



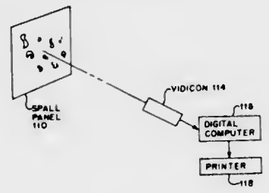
a vertical gate connected between the vertical line and the node in each PE to thereby permit selective connection of PE nodes in a column together;
a horizontal gate connected between the horizontal line and the node in each PE to thereby permit selective connection of PE nodes in a row together;
control means for opening and closing the gates; and
memory means in each PE coupled to said node for storing a some/none result related to whether some or none of the nodes of the connected PEs are in a given logical state.

4,901,361

AUTOMATED SPALL PANEL ANALYZER

Joseph G. Glenn, Fort Walton Beach, Fla., and David L. Hamil, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 27, 1988, Ser. No. 202,759
Int. Cl.[4] G06K *09/48*
U.S. Cl. 382—18 **10 Claims**



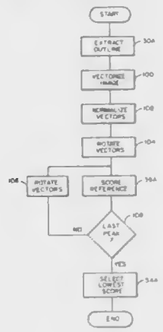
1. A method of accurately determining the size, shape and number of a plurality of highly irregular shaped spall holes within a target image area, including the steps of:
(a) producing a hit data array of clusters of elemental electronic pixel hit data having a distribution within the hit array corresponding to locations of pixel sub-areas within the holes, each cluster indicating the size and location of each hole within the target image area;
(b) assigning spall hit numbers sequentially and automatically to each spall hole and each said cluster; and
(c) producing a spall number data array of clusters of electronic spall data, having a distribution within the spall number data array corresponding to pixel sub-areas within the hit array, each cluster of spall data having first values for a first hole cluster, second values for a second hole cluster, and nth values for an nth hole cluster, where n is an integer, to indicate the number and position of discrete spall holes within the target area.

4,901,362

METHOD OF RECOGNIZING PATTERNS

John Terzian, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 8, 1988, Ser. No. 229,395
Int. Cl.[4] G06K *9/50*
U.S. Cl. 382—22 **4 Claims**



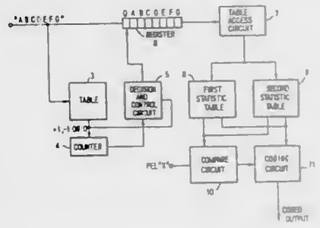
1. A method of identifying an unknown object from a digitized image of the silhouette of the object by comparing the digitized image to each one of a plurality of images of the silhouettes of known objects, comprising the steps of:
(a) representing the digitized image of the silhouette of the unknown object as a set of radial vectors;
(b) forming a normalized set of radial vectors by dividing each radial vector in the set by a scale factor; and
(c) rotating the set of radial vectors until the largest radial vector is the first vector in the set.

4,901,363

SYSTEM FOR COMPRESSING BI-LEVEL DATA

Kazuharu Toyokawa, Yamato, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 185,332, Apr. 21, 1988, abandoned, which is a continuation of Ser. No. 891,813, Jul. 31, 1986, abandoned. This application Sep. 28, 1988, Ser. No. 250,596
Claims priority, application Japan, Jul. 31, 1985, 60-167868
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—56 **12 Claims**



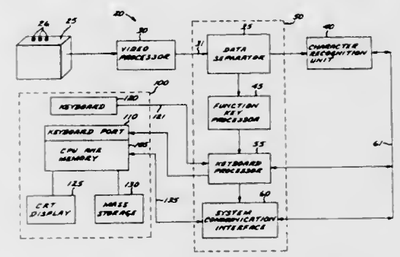
1. A method for compressing a bi-level data stream representing an image, wherein each bit of bi-level data represents one pel of either a text/graphic dominant image pattern or a dither dominant image pattern, comprising the steps of:
processing the bits of bi-level data individually and successively in lines of pels forming the image, by sampling previously processed pels which comprise:
adjacent pels to the current pel being processed; and
pels so separated from said adjacent pels as to adapt to a period of a dither matrix for a dither dominant image pattern;
determining the bi-level data of said adjacent pels and said separated pels for identifying during said processing the type of image pattern represented by said adjacent pels and said separated pels as either a text/graphic dominant image or a dither dominant image pattern;
selectively accessing a respective one of a first and a second statistical table in accordance with said determination by using said bi-level data of said adjacent pels and said separated pels as an address for the table respectively selected to be accessed;
storing at each entry in the respective table being selectively accessed the more probable symbol and the probability of the less probable symbol for said respective bi-level data of said address;
comparing the bi-level data of said current pel with said more probable symbol in said respective addressed entry;
producing coded data in accordance with said comparison and said probability of less probable symbol in said respective addressed entry; and
modifying said more probable symbol and said probability of less probable symbol in said respective addressed entry.

4,901,364

INTERACTIVE OPTICAL SCANNER SYSTEM

James L. Faulkerson, Woodside, and Edward J. Menard, Sunnyvale, both of Calif., assignors to Everex TI Corporation, Calif.

Filed Sep. 26, 1986, Ser. No. 912,834
Int. Cl.[4] G06K *9/22*
U.S. Cl. 382—59 **6 Claims**



1. An interactive optical scanner system comprising:
a host computer comprising a central processor and a keyboard having a plurality of keyboard character and keyboard function keys to provide keyboard character and function data to the central processor in accordance with predetermined keyboard codes;
a camera housing suitable for hand-held use;
an opto-electronic transducer array disposed within-said housing for capturing successive images of characters on a medium surface and providing digital video signals representative of said images;
a plurality of tactilely-operated camera function keys disposed on said housing for providing respective function token signals corresponding to each camera function key in dependence on the user manipulation thereof;
user-programmable means responsive to said respective camera function key token signals for associating a particular token signal with a respective programmable output

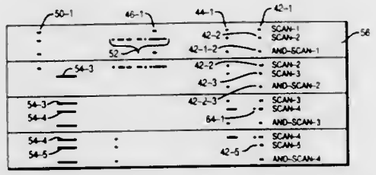
value corresponding to one or more keyboard character or keyboard function keys;
means for transforming said respective output values into scanner system signals corresponding to said corresponding keyboard codes; and
means for coupling said scanner system signals to said central processor unit of that said camera function key manipulation emulates the operation of one or more of said keyboard keys.

4,901,365

METHOD OF SEARCHING BINARY IMAGES TO FIND SEARCH REGIONS IN WHICH STRAIGHT LINES MAY BE FOUND

Stewart B. Kelland, Waterloo, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 19, 1988, Ser. No. 286,411
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—61 **11 Claims**



1. A method of searching a matrix of binary data to find search regions in which straight lines may be found, with the straight lines being those which are perpendicular to the original direction of scanning which produced the matrix of binary data; said method comprising the steps:
(a) determining a number of search scans to cover a predetermined area of said matrix of binary data;
(b) scanning said predetermined area in a direction which is parallel to said original direction of scanning to search for the presence of binary ones along said predetermined number of search scans to generate search results for each of said search scans, with a binary one indicating the presence of data;
(c) ANDing the search results of preselected said search scans to generate AND-scans;
(d) ORing preselected said AND-scans to generate OR-scans; and
(e) using said OR-scans to define said search regions in which to look for said straight lines which are perpendicular to the original direction of scanning.

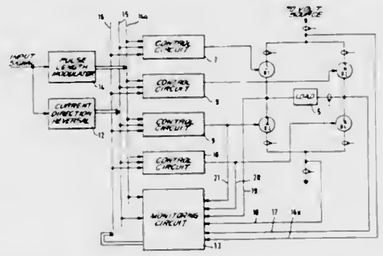
4,901,366

CIRCUIT ARRANGEMENT FOR THE TIMED CONTROL OF SEMICONDUCTOR SWITCHES

Michael Röttger, Glashütten, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 197,005
Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3716995; May 30, 1987, 3718309
Int. Cl.[4] H02P *1/00*
U.S. Cl. 388—811 **15 Claims**

1. In a system including a bridge circuit for the timed control of semiconductor switches, in parallel with each of which there is a freerunning diode, which switches are located in branches of the bridge circuit; and wherein
the bridge circuit comprises four branches, a first and a second of said branches being connected at a first node of the bridge circuit, a third and a fourth of said branches being connected at a second node opposite said first node, said first and said third branches joining at a third node of said bridge circuit and said second and said fourth branches joining at a fourth node opposite said third node; said first and said second nodes being connectable to an external source of dc voltage, there being an ohmic-inductive load, in particular a dc motor, connected between said third and said fourth nodes; and wherein
two semiconductor switches which lie diagonally opposite each other in the bridge circuit are closed during a current-application phase, and a freerunning current flows through the load in a freerunning phase, the improvement wherein the system further comprises
feedback means connected to the switches in each of said branches for operating said switches to place said switches in states of conduction and nonconduction to current



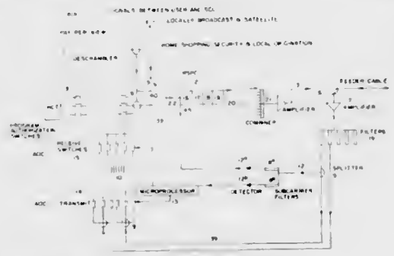
induced by said voltage source, said first branch being diagonally opposite said fourth branch and lying alongside said second branch, said third branch lying alongside said fourth branch and diagonally opposite said second branch, said feedback means operating said switches to provide that:
at the start of a freerunning phase only one of the two diagonally opposite semiconductor switches in the first and the fourth branches is opened and thereupon a semiconductor switch of the third branch is closed; and
before the start of a then following current-application phase, the semiconductor switch of the third branch is opened before the opened semiconductor switch of the first branch is again closed.

4,901,367

CABLE COMMUNICATIONS SYSTEM WITH REMOTE SWITCHING AND PROCESSING CONVERTERS

Victor Nicholson, 5225 Pooks Hill Rd., Suite 1704-S, Bethesda, Md. 20814

Filed Nov. 30, 1988, Ser. No. 277,936
Int. Cl.[4] H04H *1/00*
U.S. Cl. 455—5 **9 Claims**



1. A two-way, cable apparatus comprising:
plural groups of program sources; and
a switching control center having external switch means for switching a selected group of program sources, plural

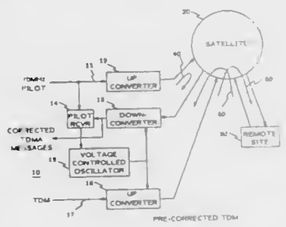
remote switching and signal processing converters into which are fed the selected group of program sources, the plural remote switching and signal processing converters are connected to a channel combiner by distribution cables and the channel combiner is connected to a broad band amplifier,
wherein each of the plural remote switching and signal processing converters have an internal multi-channel tuner connected to the external switching means, a demodulator, a modulator to a selected channel and a channel filter connected in serial to one another, the channel filter being connected by a distribution cable to the channel combiner.

4,901,368

FREQUENCY TRANSLATION CORRECTION SCHEME FOR SATELLITE COMMUNICATION SYSTEM

M. Phillip Arnold, Melbourne, and George W. Waters, Indialantic, both of Fla., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 109,450, Oct. 19, 1987, abandoned.
This application Aug. 2, 1989, Ser. No. 390,483
Int. Cl.[4] H04B *7/185*
U.S. Cl. 455—12 **32 Claims**



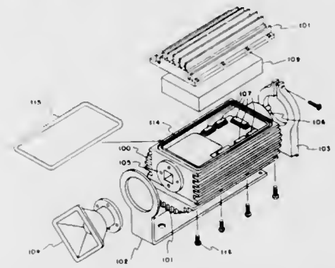
1. For use with a communication system having a first station for transmitting message signals over a communications link to a second station, said communications link subjecting signals transmitted thereover to a modification of a characteristic thereof, a method of enabling message signals transmitted from said first station to be received at said second station without said characteristic modification so that the information contained there in may be recovered at said second station comprising the steps of:
at said first station,
(a) transmitting a signal over the communications link for reception by the first station;
(b) monitoring the signal received in step (a) relative to said transmitted signal to determine said modification of a characteristic of signals transmitted over said communications link;
(c) subjecting message signals, comprising information not related to any portion of said modification of a characteristic of signals over said communications link, to a premodification of said characteristic thereof that is effectively complementary to the monitored modification of the characteristic of signals by said communications link, so that, when transmitted over said communications link from said first station to said second station, message signals that have been premodified are received by said second station effectively free of the modifications imparted by the first station and said communications link; and
(d) at the second station, determining a preselected characteristic of the received message signals and controlling a preselected characteristic of message signals to be transmitted from the second station to the first station using the determined preselected characteristic of the received message signals.

4,901,369

MICROWAVE TRANSMITTER/RECEIVER APPARATUS

Masao Momose; Kazuo Kosukegawa; Noriyuki Asari; Hirohisa Ozawa; Yubei Kosugi, and Osamu Yamamoto, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 831,667, Feb. 19, 1986, abandoned.
This application Nov. 3, 1988, Ser. No. 267,642
Claims priority, application Japan, Feb. 22, 1985, 60-24510[U]; Jan. 31, 1986, 61-20681
Int. Cl.[4] H04B *1/40*
U.S. Cl. 455—84 **31 Claims**



1. A microwave transmitter/receiver apparatus comprising:
a housing having a front shaft portion and a rear shaft portion, said housing having a central partition plate;
a primary radiator adapted for wave radiation;
a transmit/receiver multiplexer for multiplexing a transmit signal and a receive signal, said multiplexer having a transmit input and a receive input, at least the transmit/-receive multiplexer being a waveguide circuit in the central partition plate of the housing;
a transmit filter and a receive filter connected respectively to said transmit input and said receive input of said transmit/-receive multiplexer;
transmit means connected to said transmit filter for outputting the transmit signal responsive to receiving a predetermined transmit intermediate frequency (IF) signal;
receive means connected to the receive filter for outputting a predetermined receive IF signal responsive to receiving the receive signal;
means for accommodating the transmit/receive multiplexer, the transmit and the receive filters, the transmit means and the receive means in the housing;
means for mounting the primary radiator in an opening in the housing; and
support means coupled to said front and rear shaft portions for rotatably supporting the housing to turn about a wave radiation axis of the housing support means, thereby controlling the plane of a wave polarization.

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DESIGN PATENTS

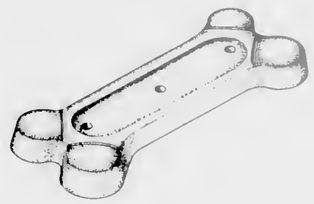
GRANTED FEB. 13, 1990

ERRATA

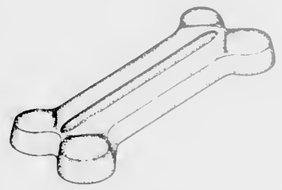
For CLASS	See PATENT NO.
D23-235	306,059

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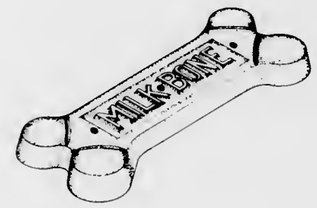
305,950
CANINE BISCUIT
Albert Spiel, Yonkers, N.Y., and Henry C. Spanier, West Milford, N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.
Filed Jan. 5, 1987, Ser. No. 967
The portion of the term of this patent subsequent to Oct. 3, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D1—106



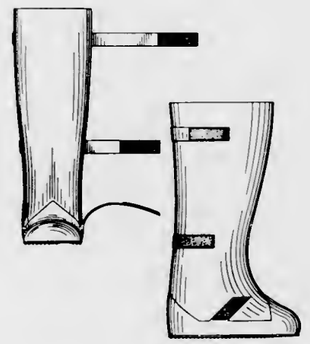
305,951
CANINE BISCUIT
Albert Spiel, Yonkers, N.Y., and Henry C. Spanier, West Milford, N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.
Filed Jan. 5, 1987, Ser. No. 975
The portion of the term of this patent subsequent to Nov. 7, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D1—105



305,952
CANINE BISCUIT
Henry C. Spanier, West Milford, N.J., and Albert Spiel, Yonkers, N.Y., assignors to Nabisco Brands, Inc., East Hanover, N.J.
Filed Jan. 5, 1987, Ser. No. 963
The portion of the term of this patent subsequent to Oct. 3, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D1—106



305,953
BOOT
Gerald M. Magnuson, Tarpon Springs, Fla., assignor to Maggie's Enterprises, Inc., Tampa, Fla.
Filed Jul. 17, 1987, Ser. No. 74,506
Term of patent 14 years
U.S. Cl. D2—275



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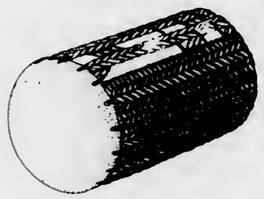
305,954
INSOLE
Tee P. Kin, No. 73 Jalan Bukit Bintang, 55100,Kuala Lumpur, Malaysia
Filed Nov. 10, 1986, Ser. No. 929,138
Term of patent 14 years
U.S. Cl. D2—318



305,955
SHOE SOLE
Yoshiaki Hase, Akashi, Japan, assignor to Asics Corporation, Hyogo, Japan
Filed Oct. 13, 1987, Ser. No. 107,069
Claims priority, application Japan, Apr. 18, 1987, 62-15261
Term of patent 14 years
U.S. Cl. D2—320



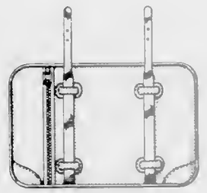
305,956
THIMBLE
Joyce McCroskey, P.O. Box 6, Walland, Tenn. 37886
Filed Feb. 24, 1986, Ser. No. 835,324
Term of patent 14 years
U.S. Cl. D3—29



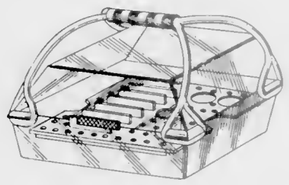
305,957
EQUIPMENT BAG OR SIMILAR ARTICLE
Edwin G. Cruger, 347 E. Carter Dr., Glendora, Calif. 91740, and Gerard J. Plent, 3543 Honeysuckle Ave., Chino, Calif. 91709
Filed May 15, 1986, Ser. No. 863,555
Term of patent 14 years
U.S. Cl. D3—48



305,958
LUGGAGE PANEL
Richard B. Gibbs, 11548 Thurston Cir., Los Angeles, Calif. 90049
Filed Aug. 1, 1986, Ser. No. 891,604
Term of patent 14 years
U.S. Cl. D3—71



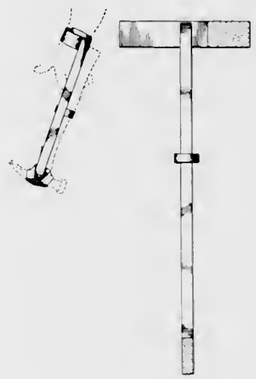
305,959
COVERED DISHRACK CONTAINER
Margaret A. Laguerra, 4403 Fourteenth St., NW., Apt. 46, Washington, D.C. 20011
Filed Jun. 27, 1986, Ser. No. 879,555
Term of patent 14 years
U.S. Cl. D3—74



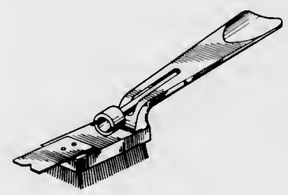
305,960
COMBINED PILL CUTTER AND CONTAINER
Stephen H. Wolff, 222 E. 35th St., New York, N.Y. 10016
Filed Jun. 23, 1986, Ser. No. 877,277
Term of patent 14 years
U.S. Cl. D3—74

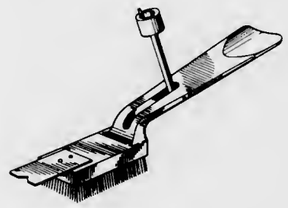


305,961
HAMMER HOLDER
Randal L. Cobb, 1107 N. Bush, #4, Santa Ana, Calif. 92701
Flied Feb. 5, 1987, Ser. No. 11,232
Term of patent 14 years
U.S. Cl. D3—105



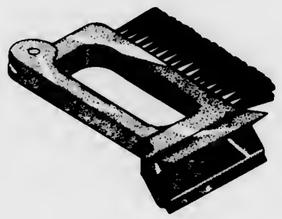
305,962
COMBINED BRUSH, SHOEHORN AND COMBINATION TOOL FOR GOLF SHOES
Rene L. Ibanez, 3520 Jermantown Rd., Fairfax, Va. 22030
Filed Jan. 8, 1987, Ser. No. 1,669
Term of patent 14 years
U.S. Cl. D4—116

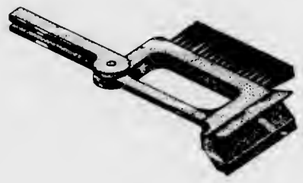




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305,963
COMBINED BRUSH AND ICE SCRAPER
Barry Brinker, and John E. Busse, both of Cincinnati, Ohio, assignors to 'Totes', Incorporated, Loveland, Ohio
Filed May 18, 1989, Ser. No. 354,423
Term of patent 14 years
U.S. Cl. D4—118

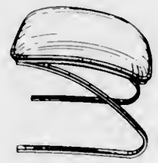




305,964
ARTIST'S DAUBER
Joe Hurwitz, 10204 Kindly Ct., Gaithersburg, Md. 20879
Filed Sep. 3, 1987, Ser. No. 95,332
Term of patent 14 years
U.S. Cl. D4—135

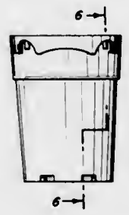


305,965
OTTOMAN
George C. Mulhauser, Paramus, N.J., assignor to Design Institute America, Inc., Montpelier, Ohio
Division of Ser. No. 880,666, Jun. 30, 1986. This application Dec. 22, 1988, Ser. No. 289,580
Term of patent 14 years
U.S. Cl. D6—349



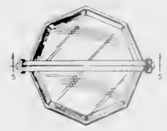
305,966
DRINKING CUP OR SIMILAR ARTICLE
Robert A. DeMars, 7932 Maestro Ave., Canoga Park, Calif. 91304
Filed Mar. 26, 1987, Ser. No. 31,387
Term of patent 14 years
U.S. Cl. D7—509



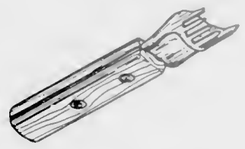


305,967
ICE BUCKET
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Sep. 1, 1987, Ser. No. 91,857
Term of patent 14 years
U.S. Cl. D7—603

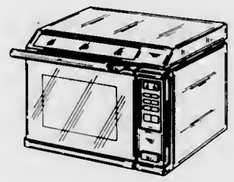


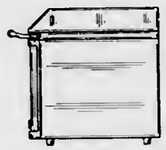


305,968
FOOD SCOOP
Charles Stein, 1708 Megargee St., Philadelphia, Pa. 19152
Filed May 15, 1987, Ser. No. 51,112
Term of patent 14 years
U.S. Cl. D7—688

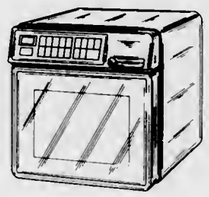


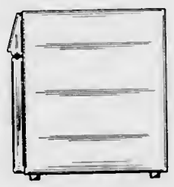
305,969
MICROWAVE OVEN WITH TOASTER
Junichi Saito, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 23, 1987, Ser. No. 137,013
Claims priority, application Japan, Jun. 23, 1987, 62-25758
The portion of the term of this patent subsequent to Jan. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351



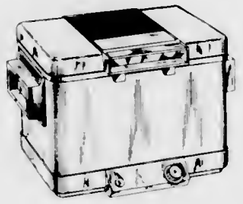


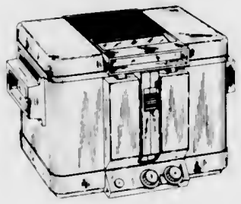
305,970
MICROWAVE OVEN
Hiroshi Nishibori, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Sep. 9, 1987, Ser. No. 94,545
Claims priority, application Japan, Mar. 19, 1987, 62-10323
The portion of the term of this patent subsequent to Jan. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351



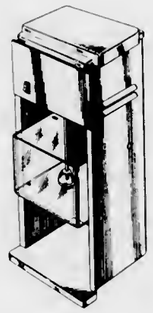


305,971
FRYER
Wilhelmus G. E. Janssens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 18, 1986, Ser. No. 945,444
Claims priority, application Benelux, Jun. 27, 1986, 61214-01; Jun. 27, 1986, 61214-02
Term of patent 14 years
U.S. Cl. D7—360

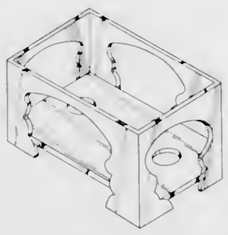




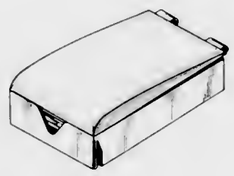
305,973
ICE CREAM MIXER
Frank P. Barnard, Olmsted Falls, and John K. Barnard, Bay Village, both of Ohio, assignors to Vita-Mix Corporation, Cleveland, Ohio
Filed Jul. 21, 1986, Ser. No. 887,714
Term of patent 14 years
U.S. Cl. D7—379



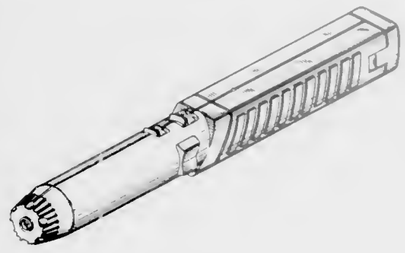
305,972
FOLDING HOLDER FOR A CHAFING DISH
William A. Pearce, Rte. 3, Box 548, Glen Allen, Va. 23060
Filed Jun. 5, 1986, Ser. No. 871,665
Term of patent 14 years
U.S. Cl. D9—366



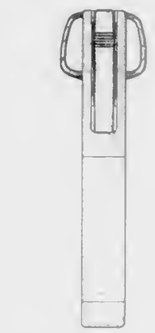
305,974
BOTTLE CAP SNIPPER
A. Victor Mastrella, 709 Dearborn Ave., Newbury Park, Calif. 91320
Filed Dec. 21, 1987, Ser. No. 136,243
Term of patent 14 years
U.S. Cl. D8—33



305,975
CORDLESS SCREWDRIVER
Ronald Emmerling, New City, N.Y., assignor to International Consumer Brands, Trumbull, Conn.
Continuation-in-part of Ser. No. 86,716, Aug. 21, 1987. This application Dec. 23, 1987, Ser. No. 137,472
Term of patent 14 years
U.S. Cl. D8—61

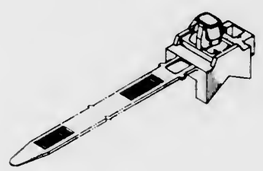


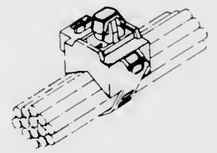
305,976
THREE-PIECE DESK SET
Siegfried Hölterscheidt, Hückelhoven, Fed. Rep. of Germany, assignor to Walter Henkels GmbH, Fed. Rep. of Germany
Filed Apr. 10, 1986, Ser. No. 851,401
Claims priority, application Fed. Rep. of Germany, Jan. 6, 1986, MR 166
Term of patent 14 years
U.S. Cl. D8—104





305,977
CLAMPING STRAP FOR ELECTRICAL WIRE
Mamoru Ono, Toyota, Japan, assignor to Yazaki Corporation, Japan
Filed Oct. 13, 1987, Ser. No. 108,301
Term of patent 14 years
U.S. Cl. D8—396



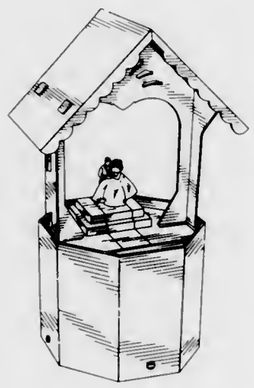


305,978
COMBINED PACKAGE AND DISPENSER FOR SOFT-FROZEN COMESTIBLES
George Mileos, Riverdale, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
Filed Sep. 2, 1986, Ser. No. 903,052
Term of patent 14 years
U.S. Cl. D9—306

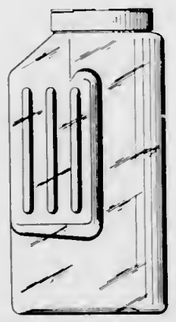


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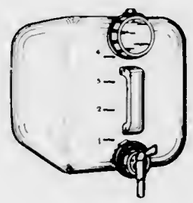
305,979
PRESENTATION BOX
J. Scott Parker, 3238 Valcourt Crescent, Mississauga, Ontario, Canada (L5L 2J5)
Filed Jan. 13, 1987, Ser. No. 3,080
Term of patent 14 years
U.S. Cl. D9—307



305,980
JAR OR SIMILAR ARTICLE
J. Morris Binder, Des Moines, Iowa; Robert T. Drummond, Palatine, and Alan F. Schwimmer, Wheeling, both of Ill., assignors to Tone Brothers, Inc., Des Moines, Iowa
Filed Dec. 15, 1987, Ser. No. 133,381
Term of patent 14 years
U.S. Cl. D9—372



305,981
LIQUID DISPENSER
Marvin Levee, Wilmette, Ill., assignor to Walton-March Inc., Highland Park, Ill.
Filed May 1, 1986, Ser. No. 862,390
Term of patent 14 years
U.S. Cl. D9—374



305,982
GASOLINE CONTAINER
John G. Gillispie, and Donald J. Mitchell, both of Wellsburg, W. Va., assignors to Eagle Manufacturing Company, Wellsburg, W. Va.
Filed Oct. 8, 1987, Ser. No. 107,043
Term of patent 14 years
U.S. Cl. D9—374



305,983
DECANTER WITH STOPPER
M. Michel Duncourt, Cognac, France, assignor to Camus la Grande Marque, Cognac, France
Filed Mar. 24, 1988, Ser. No. 172,651
Term of patent 14 years
U.S. Cl. D9—385

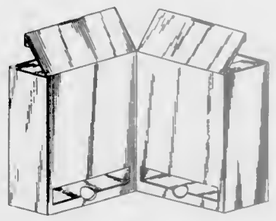


305,984
BOTTLE
Alfred C. Alberghini, Dunwoody; David A. Brunson, Marietta, and David A. Deemer, Jr., Douglasville, all of Ga., assignors to Sewell Plastics, Inc., Atlanta, Ga.
Filed Oct. 7, 1987, Ser. No. 105,334
Term of patent 14 years
U.S. Cl. D9—393

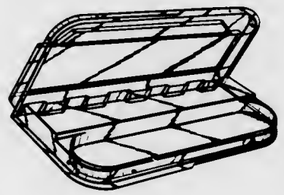




305,985
SHIPPING CARTON WITH INVENTORY DISPLAY
Jeffrey A. Miller, 332 Cliffmine Rd., Corapolis, Pa. 15108
Filed Nov. 24, 1987, Ser. No. 124,769
Term of patent 14 years
U.S. Cl. D9—418



305,986
DISPLAY CONTAINER FOR DENTAL ARTICLES OR THE LIKE
Aline Christiansen, Carlsbad; Donald Wendell, and Lonnie Pogue, both of San Diego, all of Calif., assignors to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.
Filed Jul. 16, 1987, Ser. No. 74,432
Term of patent 14 years
U.S. Cl. D9—424



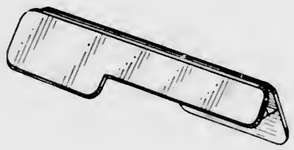
305,987
TEAR STRIP BOTTLE CAP
Sven-Ake Magnusson, Kungaly, Sweden, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan
Filed Feb. 2, 1987, Ser. No. 10,020
Claims priority, application Sweden, Nov. 17, 1986, 86-2696
Term of patent 14 years
U.S. Cl. D9—438

305,988
CONTAINER FOR LINT-REMOVING ADHESIVE STRIPS
Virgin R. Swope, Jr., 6910 Stoneman Dr., North Highlands, Calif. 95660
Filed Sep. 21, 1987, Ser. No. 99,840
Term of patent 14 years
U.S. Cl. D9—432

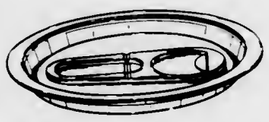


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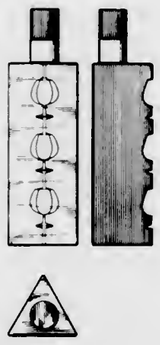
305,989
BAG CLOSURE CLIP
Scott Fohrman, 1123 Linden, Wilmette, Ill. 60091
Filed Sep. 14, 1987, Ser. No. 95,934
Term of patent 14 years
U.S. Cl. D9—434



305,990
CONTAINER CLOSURE
Joseph S. Taylor, Long Wittenham, England, assignor to CMB Packaging (UK) Limited, Perry Wood Walk, England
Filed Mar. 17, 1986, Ser. No. 845,043
Claims priority, application United Kingdom, Sep. 20, 1985, 1029368
The portion of the term of this patent subsequent to Jan. 2, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—438



305,991
BOTTLE
Wolfgang Zoller, Sur Seine, France, assignor to Sempe S.A., Aignan, France
Filed Dec. 31, 1985, Ser. No. 815,366
Claims priority, application France, Jul. 2, 1985, 853146
Term of patent 14 years
U.S. Cl. D9—402



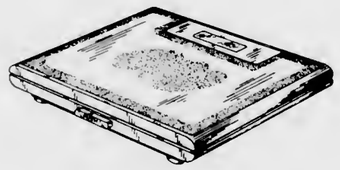
305,992
WEIGHING SCALE
Francesco L. Carnevale, Waynesboro, and Glen D. Kemnitz, Laurel, both of Miss., assignors to Sunbeam Corporation, Downers Grove, Ill.
Filed Jan. 6, 1987, Ser. No. 919
Term of patent 14 years
U.S. Cl. D10—92



305,993
BEAM SCALE
Francesco L. Carnevale, Waynesboro, and Glen D. Kemnitz, Pachuta, both of Miss., assignors to Sunbeam Corporation, Downers Grove, Ill.
Filed Apr. 2, 1987, Ser. No. 33,988
Term of patent 14 years
U.S. Cl. D10—93



305,994
WEIGHING SCALE
Francesco L. Carnevale, Waynesboro, Miss., assignor to Sunbeam Corporation, Downers Grove, Ill.
Filed Dec. 29, 1987, Ser. No. 138,977
Term of patent 14 years
U.S. Cl. D10—92



305,995
RING
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,109
Claims priority, application Italy, Jun. 22, 1987, 35871/87[U]
Term of patent 14 years
U.S. Cl. D11—35





305,996
EARRING
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,131
Claims priority, application Italy, Jun. 22, 1987, 35872/87[U]
Term of patent 14 years
U.S. Cl. D11—75

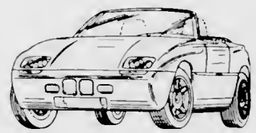




305,997
PULL FOR SLIDE FASTENER SLIDER
Billy R. Harvey, and David W. Rohrer, both of Jackson, Wyo., assignors to Life-Link International, Inc., Jackson, Wyo.
Filed Oct. 13, 1987, Ser. No. 107,523
Term of patent 14 years
U.S. Cl. D11—221



305,998
AUTOMOBILE
Harm Lagaay, Herrsching, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Jan. 29, 1987, Ser. No. 8,416
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, MR 16768
Term of patent 14 years
U.S. Cl. D12—92



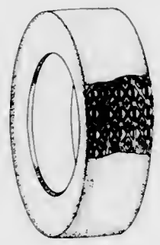


305,999
FOUR WHEEL MOTORCYCLE
Kyohei Ueda; Mitsuru Yamamoto; Tetsuya Nakazawa, and Kazuhiko Saito, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Jun. 10, 1987, Ser. No. 61,202
Claims priority, application Japan, Dec. 12, 1986, 61-49394
Term of patent 14 years
U.S. Cl. D12—107

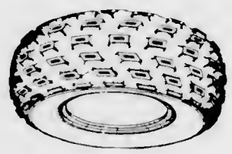


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306,000
VEHICLE TIRE
Januarius L. Mechtel, 8875 County Rd. 10E, Waconia, Minn. 55387
Filed Mar. 17, 1987, Ser. No. 26,558
Term of patent 14 years
U.S. Cl. D12—138



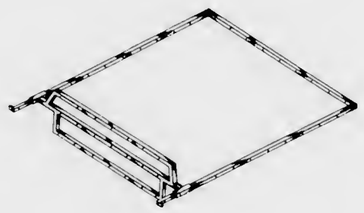
306,001
VEHICLE TIRE
Yuzi Shimamoto, and Tokimi Hamada, both of Osaka, Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed May 6, 1987, Ser. No. 46,496
Claims priority, application Japan, Dec. 17, 1986, 61-50167
Term of patent 14 years
U.S. Cl. D12—140



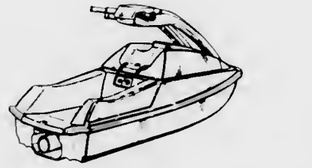
306,002
VEHICLE TIRE
Yuzi Shimamoto, Osaka, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Jan. 8, 1987, Ser. No. 59,683
Claims priority, application Japan, Dec. 17, 1986, 61/50166
Term of patent 14 years
U.S. Cl. D12—151



306,003
CARGO RESTRAINT FOR PICKUP TRUCK
William A. Berkan, Jr., P.O. Box 700, Dixon, Calif. 95620
Filed Sep. 14, 1987, Ser. No. 96,429
Term of patent 14 years
U.S. Cl. D12—155

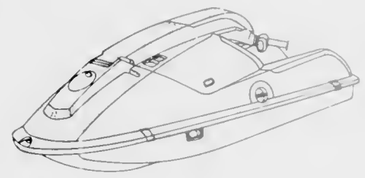


306,004
WATER SCOOTER
Keiji Nakagawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Oct. 21, 1987, Ser. No. 111,972
Claims priority, application Japan, Apr. 23, 1987, 62-15913
Term of patent 14 years
U.S. Cl. D12—307

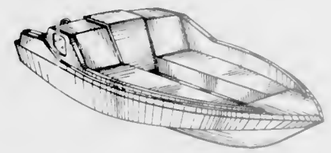


306,005
MOTORBOAT
Toshiro Suzuki, Kobe, and Seiichi Ino, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan
Filed Jan. 2, 1987, Ser. No. 1,668
Claims priority, application Japan, Jul. 4, 1986, 61-26039
Term of patent 14 years
U.S. Cl. D12—307

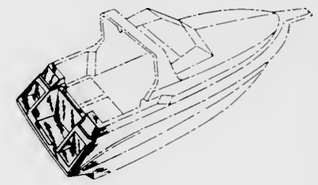




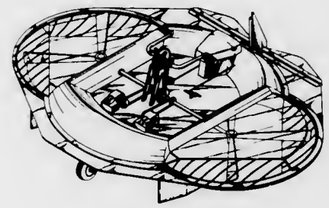
306,006
BOAT
James Backus, 1220 NE. 143rd St., Apt. 104-G, Seattle, Wash. 98125
Filed Mar. 17, 1988, Ser. No. 169,366
Term of patent 14 years
U.S. Cl. D12—314



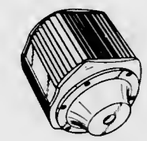
306,007
BOAT STERN
James P. DePrey, and Brian J. Cornell, both of Green Bay, Wis., assignors to Cruisers Incorporated, Oconto, Wis.
Filed Jan. 2, 1987, Ser. No. 913
Term of patent 14 years
U.S. Cl. D12—318

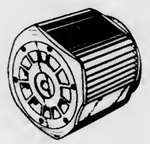


306,008
AMPHIBIOUS FLYING MACHINE
Alton Hudnall, 1720 Lexington Pl., Bedford, Tex. 76021
Filed Apr. 6, 1987, Ser. No. 34,563
Term of patent 14 years
U.S. Cl. D12—324



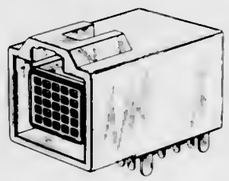
306,009
ELECTRIC MOTOR HOUSING
S. Stanley Mintz, Monrovia; Tsu-Hsun Ku, Rosemead, both of Calif., and Edward T. Liljenwall, Everett, Wash., assignors to Servo Products Company, Pasadena, Calif.
Filed Dec. 12, 1988, Ser. No. 283,754
Term of patent 14 years
U.S. Cl. D13—1



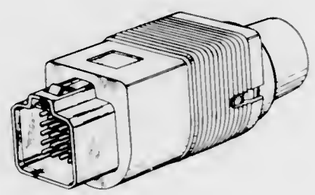


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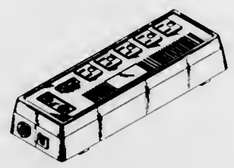
306,010
MULTI-PIN SOCKET
Yasuhiro Komatsu, Osaka, Japan, assignor to Hosiden Electronics Co. Ltd., Osaka, Japan
Filed Oct. 13, 1987, Ser. No. 107,449
Claims priority, application Japan, Apr. 17, 1987, 62-15246
Term of patent 14 years
U.S. Cl. D13—24



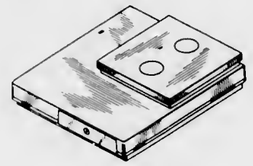
306,011
MULTI-PIN PLUG
Yasuhiro Komatsu, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan
Filed Oct. 13, 1987, Ser. No. 107,727
Claims priority, application Japan, Apr. 17, 1987, 62-15245
Term of patent 14 years
U.S. Cl. D13—28



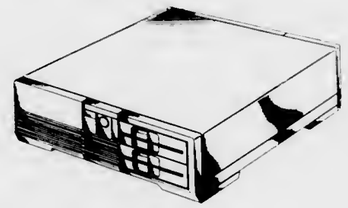
306,012
ELECTRICAL OUTLET
Klaus Oesterheld, Middletown, N.J., and James J. Richter, Queens, N.Y., assignors to North American Philips Corporation, New York, N.Y.
Filed Jun. 22, 1987, Ser. No. 65,208
Term of patent 14 years
U.S. Cl. D13—30



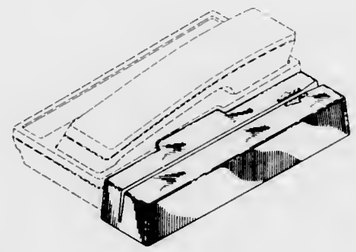
306,013
CONTROLLER FOR A POINT-OF-SALES SYSTEM OR SIMILAR ARTICLE
Shuzo Kato, and Yasushi Nakamura, both of Hiratsuka, Japan, assignors to NCR Corporation, Dayton, Ohio
Filed Sep. 25, 1987, Ser. No. 101,344
Claims priority, application Japan, Mar. 30, 1987, 62-11681
Term of patent 14 years
U.S. Cl. D14—100



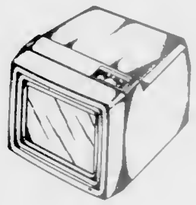
306,014
COMPUTER
Duane M. Loose, Chelmsford, and Thomas A. Tedham, Boston, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed Feb. 5, 1987, Ser. No. 11,484
Term of patent 14 years
U.S. Cl. D14—100



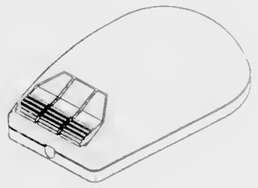
306,015
CREDIT CARD READER OR SIMILAR ARTICLE
Joseph F. Pulio, Jr., South Barrington, and Bruce D. Hillier, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumberg, Ill.
Filed Apr. 27, 1987, Ser. No. 43,134
Term of patent 14 years
U.S. Cl. D14—105



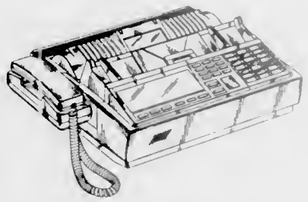
306,016
VIDEO DISPLAY
John F. Czech, Mt. Prospect; Irving M. Drucker, Des Plaines, both of Ill., and Peter A. Ojeda, St. Joseph, Mich., assignors to Zenith Electronics Corporation, Glenview, Ill.
Filed Dec. 22, 1987, Ser. No. 136,877
Term of patent 14 years
U.S. Cl. D14—113



306,017
MOUSE FOR COMPUTER BOARD
Donald P. Shulman, and Betty A. Shulman, both of 440 Brentwood Dr., Piscataway, N.J. 08854
Filed Jul. 25, 1988, Ser. No. 223,768
Term of patent 14 years
U.S. Cl. D14—114



306,018
INTREGRAL FACSIMILE AND TELEPHONE
Kunio Hara, Chiba, and Shinichi Hiroki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 30, 1987, Ser. No. 126,679
Claims priority, application Japan, Jun. 2, 1987, 62-22531
Term of patent 14 years
U.S. Cl. D14—118

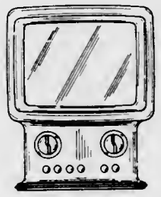


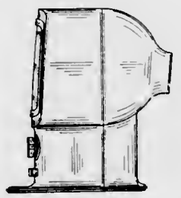
306,019
TELEVISION SET
Yasuo Matsudaira; Kouji Satake, and Tomitaro Saito, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 17, 1987, Ser. No. 121,746
Claims priority, application Japan, May 21, 1987, 62-20202
Term of patent 14 years
U.S. Cl. D14—126





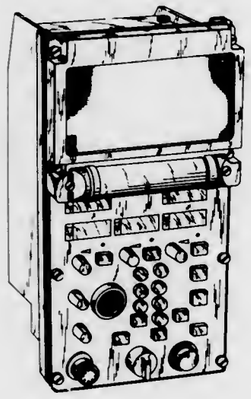
306,020
TELEVISION SET
Manabu Hokazono, and Tomitaro Saito, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 17, 1987, Ser. No. 121,745
Claims priority, application Japan, May 21, 1987, 62-20203
Term of patent 14 years
U.S. Cl. D14—133



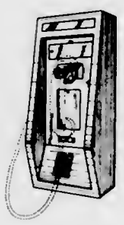


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306,021
SHIPBOARD OPERATIONS TERMINAL USED WITH DIGITIZED VOICE CONTROL MACHINE AND COMMUNICATION SYSTEMS
Serge A. Cavalier, Nice, France, assignor to Safare-Crouzet, France
Filed Aug. 6, 1987, Ser. No. 83,055
Claims priority, application France, Feb. 10, 1987, 870648
Term of patent 14 years
U.S. Cl. D14—140



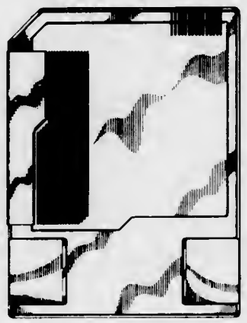
306,022
UPRIGHT TELEPHONE STAND
Joseph Farina, Toronto, Canada, assignor to Fabritec Enclosures Inc. Div. of Fabtech, Scarborough, Canada
Filed Sep. 22, 1988, Ser. No. 247,585
Claims priority, application Canada, Jun. 21, 1988, 21-06-885
Term of patent 14 years
U.S. Cl. D14—146





306,023
BASE FOR A TELEPHONE SET
Jacques Gagnon, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Sep. 22, 1988, Ser. No. 247,994
Term of patent 14 years
U.S. Cl. D14—151



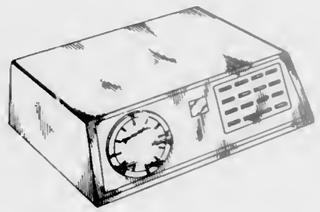


306,024
LOUDSPEAKER
Steven J. Eberbach, Ann Arbor, Mich., assignor to Howard Krausse, Ann Arbor, Mich.
Filed May 30, 1986, Ser. No. 869,058
Term of patent 14 years
U.S. Cl. D14—214

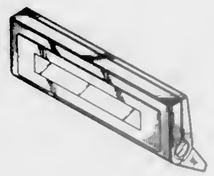




306,025
ANTENNA ROTATOR CONTROL UNIT
Joel Wittkamp, Raleigh, N.C., assignor to Avnet, Inc., New York, N.Y.
Filed Oct. 20, 1987, Ser. No. 111,051
Term of patent 14 years
U.S. Cl. D14—237



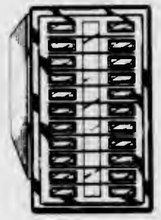
306,026
DISPLAY ADD-ON FOR TELEPHONE EQUIPMENT, OR THE LIKE
Alan P. Boykiw, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Oct. 13, 1988, Ser. No. 257,238
Term of patent 14 years
U.S. Cl. D14—240



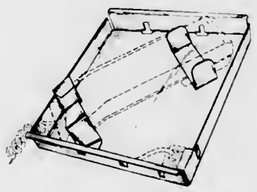


306,027
ADD-ON ACCESS MODULE FOR A TELEPHONE SET
Jacques Gagnon, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Sep. 22, 1988, Ser. No. 247,991
Term of patent 14 years
U.S. Cl. D14—241





306,028
TRAY BRACKET HOLDER FOR A TELEPHONE HANDSET OR SIMILAR ARTICLE
Robert L. Hankins, 748 Warwick Dr., Plano, Tex. 75023
Filed Jun. 20, 1988, Ser. No. 208,555
Term of patent 14 years
U.S. Cl. D14—251



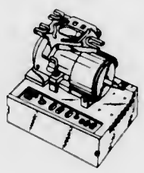


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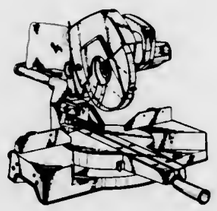
306,029
PROTECTOR FOR OUTBOARD MOTOR FUEL HOSES
David L. Fuhr, Rte. 2, Box 38, Wabasso, Minn. 56293
Filed Jan. 17, 1987, Ser. No. 63,280
Term of patent 14 years
U.S. Cl. D15—5



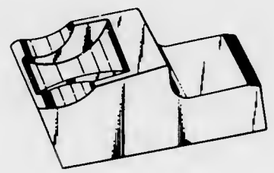
306,030
ELECTRIC SEWING MACHINE MOTOR
Tatsuya Sawato; Yoozo Ookawa; Takashi Nakamura; Hiroshi Kumatani, all of Nagoya, and Yoshinori Abe, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 4, 1987, Ser. No. 57,978
Claims priority, application Japan, Jan. 26, 1987, 62-2611
Term of patent 14 years
U.S. Cl. D15—72



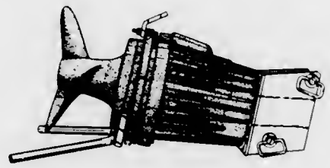
306,031
MITRE SAW
Shigeharu Ushiwata; Yoshio Matsumoto; Masayuki Sato, and Kenji Sakai, all of Fukushima, Japan, assignors to Hitachi Koki Haramachi Co., Ltd., Fukushima, Japan
Filed Jan. 11, 1988, Ser. No. 142,769
Term of patent 14 years
U.S. Cl. D15—133



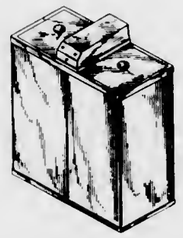
306,032
CUTTING TOOL INSERT
Wlajko Mihic, Tegnérvägen 9, S-802 28 Gävle, Sweden
Filed Jan. 29, 1988, Ser. No. 149,861
Claims priority, application Sweden, Aug. 7, 1987, 87-1716
Term of patent 14 years
U.S. Cl. D15—139



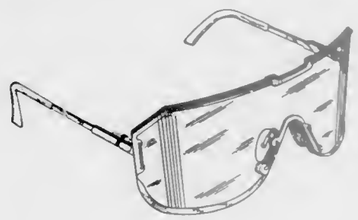
306,033
SUBMERSIBLE MIXER
Hjalmar Fries, Spanga, and Ingvar Karlsson, Stenhamra, both of Sweden, assignors to Flygt AB, Solna, Sweden
Filed Nov. 2, 1987, Ser. No. 116,138
Claims priority, application Sweden, Jun. 18, 1987, 871418
Term of patent 14 years
U.S. Cl. D15—147



306,034
CHEMICAL MIXER
Frederic P. Auger, 1296 Clearbrook, West Chester, Pa. 19380
Filed Jun. 15, 1987, Ser. No. 61,402
Term of patent 14 years
U.S. Cl. D15—199



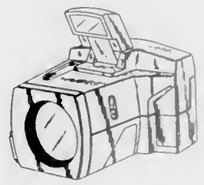
306,035
EYEGLASSES
Jan H. Matthias, Beverly Hills, Calif., assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed May 28, 1987, Ser. No. 55,764
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1986, 16 969
Term of patent 14 years
U.S. Cl. D16—112



306,036
35 MM CAMERA
Yasuhiko Nakayama, Nagano, Japan, assignor to Chinon Kabushiki Kaisha, Nagano, Japan
Filed Jul. 9, 1987, Ser. No. 71,285
Claims priority, application Japan, Jan. 16, 1987, 1450/87
Term of patent 14 years
U.S. Cl. D16—209



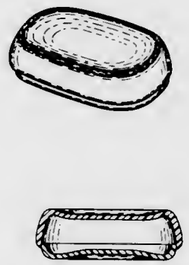
306,037
35 MM CAMERA
Yasuhiko Nakayama, Nagano, Japan, assignor to Chinon Kabushiki Kaisha, Nagano, Japan
Filed Apr. 3, 1987, Ser. No. 33,635
Term of patent 14 years
U.S. Cl. D16—209



306,038
BALL-POINT PEN
Carlalberto Cerniglia, Turin, Italy, assignor to Top-Pen di Dott, Turin, Italy
Filed May 5, 1987, Ser. No. 46,339
Claims priority, application Italy, Nov. 7, 1986, 54059-B/86
Term of patent 14 years
U.S. Cl. D19—41



306,039
OVAL HOLDER FOR SMALL METALLIC OBJECTS
Feather W. King, 165 Reiten Dr., Ashland, Oreg. 97520
Continuation-in-part of Ser. No. 442,156, Nov. 16, 1982, Pat. No. D. 282,380, which is a continuation-in-part of Ser. No. 133,434, Mar. 24, 1980, Pat. No. D. 266,934. This application Nov. 26, 1985, Ser. No. 806,546
The portion of the term of this patent subsequent to Nov. 16, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—75



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306,040
STEP RACK
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Oct. 15, 1987, Ser. No. 108,973
Term of patent 14 years
U.S. Cl. D19—90





306,041
SLANTED DIAGONAL SORTER
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Jun. 11, 1987, Ser. No. 60,409
Term of patent 14 years
U.S. Cl. D19—90





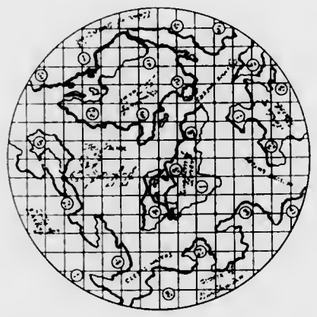
306,042
WALL MOUNTED SIGN
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Sep. 8, 1987, Ser. No. 96,832
Term of patent 14 years
U.S. Cl. D20—10



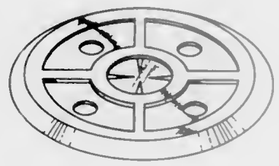
306,043
PLANT TAG
Robert C. Hickmott, Lansing, Mich., assignor to The John Henry Company, Lansing, Mich.
Filed Feb. 9, 1987, Ser. No. 12,633
Term of patent 14 years
U.S. Cl. D20—27



306,044
GAME BOARD
Gregory A. Breeden, 9721 Shannon Dr., Edmond, Okla. 73034
Filed Mar. 2, 1987, Ser. No. 20,823
Term of patent 14 years
U.S. Cl. D21—31

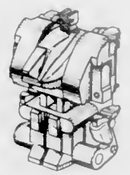


306,045
AERIAL DISK
Jim Hill, 6018 Innes Trace Rd., Louisville, Ky. 40202
Filed Oct. 6, 1986, Ser. No. 916,030
Term of patent 14 years
U.S. Cl. D21—86



306,046
RECONFIGURABLE TOY MONSTER
Daishirou Shibukawa, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,709
Claims priority, application Japan, Dec. 2, 1986, 61-47696
Term of patent 14 years
U.S. Cl. D21--148





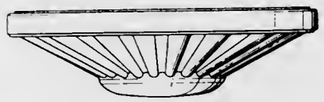
306,047
ROBOTIC HUMANOID TOY ASSEMBLY
Muneyoshi Shinohara, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jan. 20, 1987, Ser. No. 5,141
Claims priority, application Japan, Nov. 18, 1986, 61-45590
Term of patent 14 years
U.S. Cl. D21—150



306,048
RECONFIGURABLE TOY MONSTER
Daishirou Shibukawa, Matsudo, Japan, assignor to Takara Co., Inc., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,708
Claims priority, application Japan, Dec. 2, 1986, 61-47697
Term of patent 14 years
U.S. Cl. D21—150

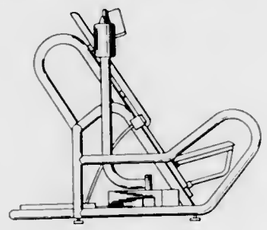


306,049
ROCKABLE EXERCISE PLATFORM
Richard S. J. Bancroft, 4, Tenter Terrace, Morpeth, Northumberland, NE61 1TN, England
Filed Jan. 25, 1988, Ser. No. 147,915
Claims priority, application United Kingdom, Jul. 30, 1987, 1043798
Term of patent 14 years
U.S. Cl. D21—191

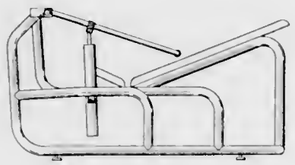


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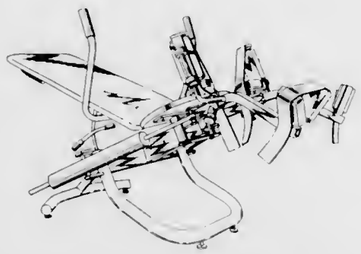
306,050
BUTTERFLY EXERCISER
Jerry D. Brentham, P.O. Box 599, 2121 Industrial Park, Belton, Tex. 76513
Filed May 11, 1987, Ser. No. 48,138
Term of patent 14 years
U.S. Cl. D21—195



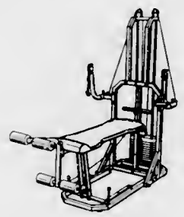
306,051
BENCH PRESS/ROW PHYSICAL EXERCISER
Jerry D. Brentham, P.O. Box 599, Belton, Tex. 76513
Filed May 11, 1987, Ser. No. 48,139
Term of patent 14 years
U.S. Cl. D21—195



306,052
ABDUCTION-ADDUCTION HIP EXERCISER
Jerry D. Brentham, P.O. Box 599, 2121 Industrial Park, Belton, Tex. 76513
Filed Jun. 22, 1987, Ser. No. 64,791
Term of patent 14 years
U.S. Cl. D21—195



306,053
EXERCISE MACHINE
Jose L. Beistegui, Vitoria Alava, Spain, assignor to BH Holdings, Ltd., St. Helier, Channel Islands
Filed Nov. 23, 1987, Ser. No. 123,993
Claims priority, application Spain, Jun. 11, 1987, 113,278
Term of patent 14 years
U.S. Cl. D21—195



306,054
RACKET
Cheng-Sheng Chen, No. 77, Po Ai Street, Feng Yuan, Taiwan
Filed Dec. 19, 1986, Ser. No. 945,311
Term of patent 14 years
U.S. Cl. D21—212



306,055
PENDULUM PUTTER
Thomas Morris, 15 Pleasant View Dr., Millville, N.J. 08332
Filed Nov. 4, 1987, Ser. No. 116,753
Term of patent 14 years
U.S. Cl. D21—218



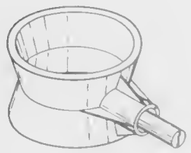
306,056
GOLF PUTTER HOLDER
Richard B. C. Tucker, Baltimore, Md., assignor to Wm. T. Burnett & Co., Inc., Baltimore, Md.
Filed Jan. 22, 1987, Ser. No. 6,094
Term of patent 14 years
U.S. Cl. D21—234



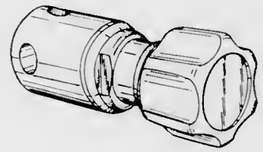
306,057
GOLF GREEN REPAIR TOOL
John P. Vaughan, Jr., 1221 Huffman Square, Bolivar, Ohio 44612
Filed Apr. 27, 1987, Ser. No. 42,647
Term of patent 14 years
U.S. Cl. D21--234



306,058
GOLF BALL RETRIEVER HEAD
John B. Blake, 587 Finch Avenue, Pickering, Ontario, Canada (L1V 1J1)
Filed Jul. 29, 1987, Ser. No. 79,287
Term of patent 14 years
U.S. Cl. D21—234



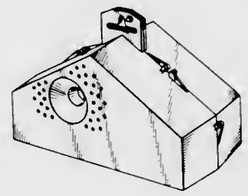
306,059
GAS REGULATOR
Richard W. Miller, Denton, and Roger D. Zwicker, Arlington, both of Tex., assignors to Victor Equipment Company, Denton, Tex.
Filed Apr. 30, 1986, Ser. No. 858,293
Term of patent 14 years
U.S. Cl. D23—235



306,060
COMBINED GOLFER'S TOOL
Ralph W. Washburn, 400 Moultrie, Mattoon, Ill. 61938
Filed Jul. 14, 1987, Ser. No. 73,210
Term of patent 14 years
U.S. Cl. D21—234

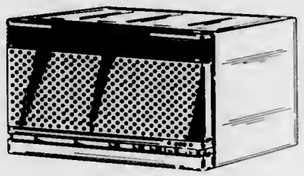


306,061
YELLOW JACKET TRAP
John W. Cutter, 10 Sleepy Hollow La., Orinda, Calif. 94563
Filed Jan. 12, 1987, Ser. No. 2,557
Term of patent 14 years
U.S. Cl. D22—122

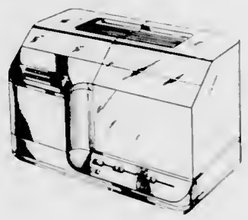


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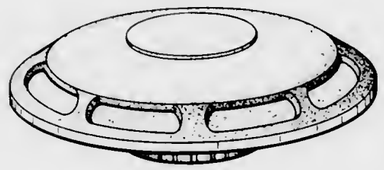
306,062
AIR CONDITIONER
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 25, 1987, Ser. No. 125,446
Claims priority, application Japan, Jun. 5, 1987, 62-23227
Term of patent 14 years
U.S. Cl. D23—353



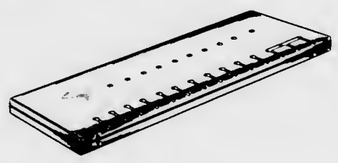
306,063
ULTRASONIC HUMIDIFIER
Bernard Chiu, Ashland, Mass., and Richard M. O'Grady, Southington, Conn., assignors to Holmes Products Corp., Holliston, Mass.
Filed Dec. 17, 1987, Ser. No. 133,994
Term of patent 14 years
U.S. Cl. D23—356



306,064
CONVECTION BLOWER OR SIMILAR ARTICLE FOR USE IN AN ELECTRIC OVEN
William L. Bartlett, Santa Barbara, and David A. Weir, Santa Ynez, both of Calif., assignors to Zephyr Convection Cooking Systems Co., San Francisco, Calif.
Filed Mar. 11, 1988, Ser. No. 166,895
Term of patent 14 years
U.S. Cl. D23—383



306,065
DISPENSER CASSETTE OR THE LIKE FOR DISPENSING DOSES OF STERILIZING LIQUID
Harold R. Williams, San Clemente, and Charles W. Howlett, San Juan Capistrano, both of Calif., assignors to Surgikos, Inc., Arlington, Tex.
Filed Mar. 8, 1989, Ser. No. 320,724
Term of patent 14 years
U.S. Cl. D24—9



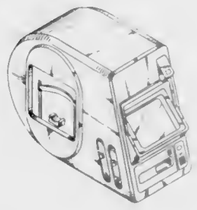
306,066
MULTI-DISPENSER CASSETTE OR THE LIKE FOR DISPENSING DOSES OF STERILIZING LIQUID
Harold R. Williams, San Clemente, and Charles W. Howlett, San Juan Capistrano, both of Calif., assignors to Surgikos, Inc., Arlington, Tex.
Filed Mar. 8, 1989, Ser. No. 320,723
Term of patent 14 years
U.S. Cl. D24—9



306,067
DENTAL IMPLANT CLEANING TOOL
Steven P. Bogdanoff, 1125 S. University Dr., Plantation, Fla. 33324, and Gary L. Golden, 3911 Hollywood Blvd., Hollywood, Fla. 33021
Filed Nov. 25, 1987, Ser. No. 125,059
Term of patent 14 years
U.S. Cl. D24—11



306,068
AUTOMATIC PERIMETER FOR EYESIGHT EXAMINATION
Keunosuke Cyujou; Keijiro Jinmon, both of Tokyo, and Takashi Hirano, Shizki, all of Japan, assignors to Kowa Company Ltd., Nagoya, Japan
Filed Feb. 28, 1986, Ser. No. 840,713
Claims priority, application Japan, Sep. 3, 1985, 60-37058
Term of patent 14 years
U.S. Cl. D24— 17



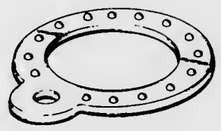
306,069
MEDICAL SYRINGE
William M. Kelly, Beavercreek; Thomas Jay, Kettering, and Robert F. Freund, Centerville, all of Ohio, assignors to Freund Medical Products, Inc., Dayton, Ohio
Filed Jun. 29, 1987, Ser. No. 67,697
Term of patent 14 years
U.S. Cl. D24—24



306,070
NEEDLE HEAD FOR BIOPSY CANNULA
Dan Akerfeldt, Upsala, Sweden, assignor to C. R. Bard, Inc., Murray Hill, N.J.
Filed Mar. 20, 1987, Ser. No. 28,322
Term of patent 14 years
U.S. Cl. D24—25



306,071
BABY BOTTLE NECK RING
Daniel B. Klitsner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.
Filed Nov. 19, 1987, Ser. No. 122,887
Term of patent 14 years
U.S. Cl. D24—47

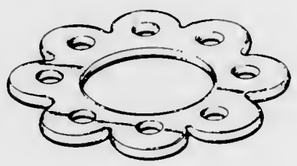


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306,072
BABY BOTTLE NECK RING
Daniel B. Klitsner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.
Filed Nov. 19, 1987, Ser. No. 122,884
Term of patent 14 years
U.S. Cl. D24—47



306,073
BABY BOTTLE NECK RING
Daniel B. Klitsner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.
Filed Nov. 19, 1987, Ser. No. 122,888
Term of patent 14 years
U.S. Cl. D24—47



306,074
BABY BOTTLE NECK RING
Daniel B. Klitsner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.
Filed Nov. 19, 1987, Ser. No. 122,886
Term of patent 14 years
U.S. Cl. D24—47



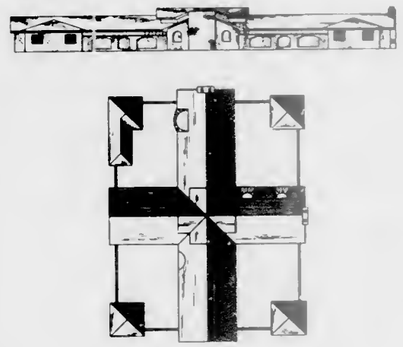
306,075
BABY BOTTLE NECK RING
Daniel B. Klitsner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.
Filed Nov. 19, 1987, Ser. No. 123,071
Term of patent 14 years
U.S. Cl. D24—47



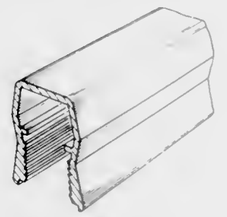
306,076
I.V. SUPPORT STAND FOR MOUNTING UPON A WHEELCHAIR OR THE LIKE
Charles F. Wood, 8341 W. Foothill Dr., Peoria, Ariz. 85354
Filed Nov. 17, 1987, Ser. No. 121,737
Term of patent 14 years
U.S. Cl. D24—51



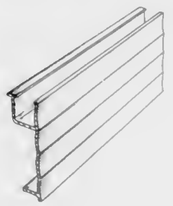
306,077
CRUCIFORM DWELLING STRUCTURE
Louis J. Jean, Indianapolis, Ind., assignor to Atrium Structures, Inc., Indianapolis, Ind.
Continuation-in-part of Ser. No. 906,124, Sep. 11, 1986, abandoned. This application Oct. 5, 1987, Ser. No. 104,666
Term of patent 14 years
U.S. Cl. D25—17



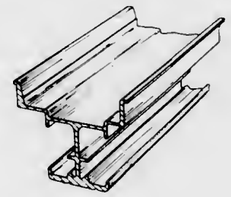
306,078
SHOWER DOOR PANEL FRAME MEMBER
John Whitney, Victoria, Australia, assignor to Dowell Australia Limited, Preston, Australia
Filed Aug. 4, 1987, Ser. No. 81,183
Term of patent 14 years
U.S. Cl. D25—119



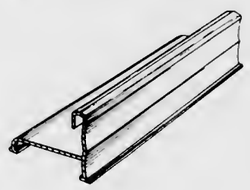
306,079
SHOWER DOOR FRAME RETURN JAMB
John Whitney, Victoria, Australia, assignor to Dowell Australia Limited, Preston, Australia
Filed Aug. 4, 1987, Ser. No. 81,166
Term of patent 14 years
U.S. Cl. D25—119



306,080
SHOWER DOOR HEAD TRACK
John Whitney, Victoria, Australia, assignor to Dowell Australia Limited, Preston, Australia
Filed Aug. 4, 1987, Ser. No. 81,175
Term of patent 14 years
U.S. Cl. D25—119



306,081
SHOWER DOOR FRAME SILL
John Whitney, MacLeod, Australia, assignor to Dowell Australia Limited, Preston, Australia
Filed Aug. 4, 1987, Ser. No. 81,165
Term of patent 14 years
U.S. Cl. D25—119



306,082
HANDLED HOLDER FOR AN APPLICATOR
David Kidd, 700 Welsh Rd., Apartment E11, Huntingdon Valley, Pa. 19006
Filed Mar. 30, 1989, Ser. No. 330,720
Term of patent 14 years
U.S. Cl. D28—7



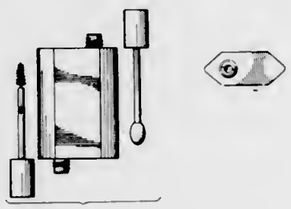
306,083
NAIL POLISH REMOVER WAND CONTAINING DISPOSABLE PADS
Louise Smith, 805 E. Butler Dr., Phoenix, Ariz. 85020, and Frank W. Kautman, 1633 W. JoanDeArc, Phoenix, Ariz. 85029
Filed Jan. 19, 1988, Ser. No. 145,245
Term of patent 14 years
U.S. Cl. D28—57



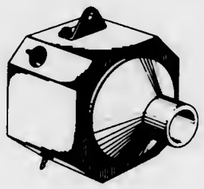
306,084
PEDICURE PAD
Norma L. Volz, 1125 E. River Dr., Margate, Fla. 33063, and Mary A. DeWitt, 250 NW. 40th Ct., Pompano Beach, Fla. 33065
Filed Oct. 22, 1987, Ser. No. 111,568
Term of patent 14 years
U.S. Cl. D28—61

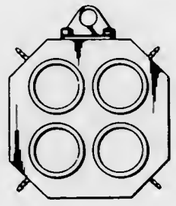


306,085
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Filed Mar. 28, 1989, Ser. No. 329,495
Term of patent 14 years
U.S. Cl. D28—77

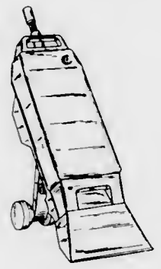


306,086
FIVE WAY RESPIRATORY VALVE
Hans Rudolph, Shawnee Mission, and Kevin A. Rudolph, Leawood, both of Kans., assignors to Hans Rudolph, Inc., Kansas City, Mo.
Filed Aug. 6, 1987, Ser. No. 82,187
The portion of the term of this patent subsequent to Mar. 14, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D29—7

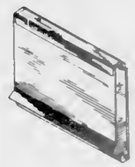




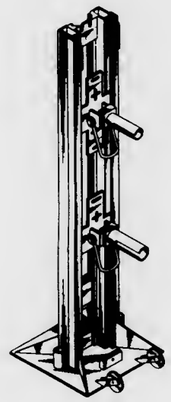
306,087
CARPET CLEANER
Michael B. Woodhall, Maidenhead, and Mark Jennings, Windsor, both of England, assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Aug. 10, 1987, Ser. No. 83,836
Claims priority, application United Kingdom, Feb. 10, 1987, 10039852
Term of patent 14 years
U.S. Cl. D32—22



306,088
WALL OUTLET BOX FOR A CENTRAL VACUUM CLEANING SYSTEM
Thomas J. Anostko, Madison, Wis., assignor to Research Products Corporation, Madison, Wis.
Filed Jun. 5, 1986, Ser. No. 871,664
Term of patent 14 years
U.S. Cl. D32—25



306,089
POWERED POST FOR AUTOMOTIVE VEHICLE BODY AND FRAME REPAIRS
Gary S. Caico, 11270 Campbell Ave., Riverside, Calif. 92505, and Ronnie C. Bartley, 526 Riverfront Dr., Bullhead City, Ariz. 86442
Filed Feb. 22, 1988, Ser. No. 159,049
Term of patent 14 years
U.S. Cl. D34—31



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A. C. Marble, Inc.: *See—*
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Aarts, Hubertus H., to Sulzer Brothers Limited. Apparatus for removing a faulty weft yarn from a weaving shed. 4,899,788, Cl. 139-116.00A.

Abbagnaro, Louis A.; Brown, Robert G.; Siegel, William J.; Kautter, William J.; and Quasney, Robert S., Sr., to Pace Incorporated. Apparatus for removal and installing electronic components with respect to a substrate. 4,899,920, Cl. 228-11.000.

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Abbott Laboratories: *See—*
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Hutchings, Richard S.; and Bottom, Carey B., 4,899,398, Cl. 4-228.000.

Boubille, Jacques C. Apparatus for weighing a pallet with a load thereon for use with a vehicle having tines or the like. 4,899,840, Cl. 177-139.000.

Bourdin, Yannic: *See—*
Blondeau, Robert; Bourdin, Yannic; de Cremoux, Beaudoin; Papuchon, Michel; Krakowsky, Michel; Bensoussan, Alain; Razeghi, Manijeh; and Lozes, Francoise, 4,901,321, Cl. 372-7.000.

Bourret, Michel, to Bombardier Inc. Throttle lever. 4,899,610, Cl. 74-489.000.

Boutade Worldwide Investments NV: *See—*
Van Der Westhuizen, Hermanus Q.; and Muller, Thomas M., 4,900,092, Cl. 299-13.000.

Bovino, Alessio A.; and Bitting, Robert C. Tile squaring device. 4,899,455, Cl. 33-527.000.

Bovino, Lawrence J.: *See—*
Weiner, Maurice; Kim, Anderson H.; and Bovino, Lawrence J., 4,900,947, Cl. 307-110.000.

Bowden, Thomas A.; and Wilt, Brian L., to Mobil Oil Corporation. Crowned meat tray. 4,899,925, Cl. 229-2.50R.

Bowen, B. Dean: *See*—
Mills, Gary L.; and Bowen, B. Dean, 4,899,570, Cl. 72-364.000.
Bowen, Gerald K.: *See*—
Eskra, Michael D.; Delaney, William C.; and Bowen, Gerald K., 4,900,643, Cl. 429-241.000.
Bowen, Kim E.; Foster, Steven M.; and Izadi, Said, to Williams International Corporation. Multi-alloy turbine rotor disk. 4,900,635, Cl. 428-547.000.
Bowler, Michael W.: *See*—
Torres, Guillermo M.; Bowler, Michael W.; and Otto, Robert A., 4,899,400, Cl. 4-487.000.
Bowley, Heather J.; and Gerrard, Donald L., to British Petroleum Company, p.l.c., The. Diamond mapping. 4,900,147, Cl. 356-30.000.
Boyd, Randall T. Cogeneration/CO_2 production process and plant. 4,899,544, Cl. 60-618.000.
Boyle, Michael D. P.; Reis, Kathleen J.; and Ayouh, Elia M., to University of Florida. Streptococcal fc rc. 4,900,660, Cl. 435-7.000.
Brabander, Barbara: *See*—
Fischer, Wolfgang; Arlt, Edda; and Brabander, Barbara, 4,900,682, Cl. 436-129.000.
Brackett, Stephen E.; and Charles, Herbert N., to Siemens-Bendix Automotive Electronic Limited. Axial flow ring fan. 4,900,229, Cl. 416-189.000.
Bradley, Eric M., to General Dynamics Corporation, Electronics Division. Transverse injection surface emitting laser. 4,901,327, Cl. 372-45.000.
Bradshaw, Franklin C.; and Saxton, Jeffery C., to Product Search, Inc. Slidable indicia alignment and transfer device. 4,900,392, Cl. 156-541.000.
Brady, Thomas J.: *See*—
Lauffer, Randall B.; and Brady, Thomas J., 4,899,755, Cl. 128-654.000.
Brame, J. Yancey; Horn, Michael F.; Saucier, Jeffrey A., Siedman, David L.; Thomas, Emery G.; and Varnum, Robert L., to Whitman Controls Corporation. Fluid-operated compound switch. 4,900,883, Cl. 200-83.00S.
Brammer, Norman; and Nobileau, Philippe C., to Vetco Gray Inc. Pipe connector. 4,900,066, Cl. 285-92.000.
Brandenberger, Urs: *See*—
Menk, Werner; and Brandenberger, Urs, 4,900,509, Cl. 420-31.000.
Braschel, Volker, to Lucas Industries public limited company. Method of controlling the brake pressure in an anti-lock vehicle brake system. 4,900,099, Cl. 303-95.000.
Breda, Michael A.; and Snyder, George K., to General Motors Corporation. Method for assembling heat exchanger plate pair by snap fit. 4,900,328, Cl. 29-890.039.
Breed, David S., to Automotive Technologies International, Inc. Gas damped crash sensor. 4,900,880, Cl. 200-61.45M.
Brehm, Gerhard; Knipf, Manuela; Mayrhuber, Rudolf; Schuhmacher, Jurgen; and Stadler, Max, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe m.b.H. Method and liquid preparation for removing residues of auxiliary sawing materials from wafers. 4,900,363, Cl. 134-3.000.
Brent Jr., Fred D.; Nelson, Richard G.; and Ruff, William A., to Texaco, Inc. Stabilizing spent hydrotreating catalyst for reprocessing or storage. 4,900,713, Cl. 502-439.000.
Breslow, Jeffrey D.: *See*—
Kulesza, Ralph J.; Wozniak, Walter J., and Breslow, Jeffrey D., 4,900,026, Cl. 273-119.00A.
Bresson, Raymond: *See*—
Bernard, Georges; Bresson, Raymond; LeClercq, Pierre; Filleau, Odile; and Scarponi, Francois, 4,900,882, Cl. 200-147.00R.
Breuer Electric Mfg. Co.: *See*—
Fischer, Ernest J., 4,900,881, Cl. 200-61.850.
Brian, Pierre L. T.; and Dean, Sheldon W., Jr., to Air Products and Chemicals, Inc. Fluidized bed combustion heat transfer enhancement. 4,899,695, Cl. 122-4.00D.
Brickley, Patrick J.: *See*—
Dewey, James; Pohl, Karl H.; and Brickley, Patrick J., 4,901,206, Cl. 361-428.000.
Bricot, Claude, to Thomson-CSF. Method and devices for the recording of pictures by laser. 4,901,089, Cl. 346-76.00L.
Bridges, Jack E., to IIT Research Institute. Confinement in porous material by driving out water and substituting sealant. 4,900,196, Cl. 405-267.000.
Bridges, John A., to Aladdin Industries, Inc. Microwave beverage maker. 4,900,886, Cl. 219-10.55E.
Bridges, Robert M.: *See*—
Hathaway, Daniel G.; and Bridges, Robert M., 4,901,287, Cl. 367-3.000.
Bridgestone/Firestone, Inc.: *See*—
Hoffman, Keith E.; Geno, Wayne H.; and Weitzenhof, David A., 4,899,995, Cl. 267-64.270.
Brighton, Richard W., to Rainier International, Inc. Training round for firearm. 4,899,660, Cl. 102-447.000.
Brini, marco: *See*—
Gamberini, Antonio; and Brini, marco, 4,899,889, Cl. 209-535.000.
Brisdon, Brian J.; England, Richard; and Abed-Ali, Sera S., to National Research Development Corporation. Moiety for selective separation. 4,900,845, Cl. 549-352.000.
Briston-Myers Company: *See*—
Patell, Mahesh K., 4,900,559, Cl. 424-470.000.
Bristow, Stephen: *See*—
Wright, Christopher B.; and Bristow, Stephen, 4,900,903, Cl. 235-380.000.
Wright, Christopher B.; and Bristow, Stephen, 4,900,904, Cl. 235-381.000.
Britax (Geco) SA: *See*—
Duroux, Bernard, 4,900,142, Cl. 350-634.000.
British Aerospace Public Limited Company: *See*—
Carter, Walter S., 4,900,137, Cl. 350-395.000.
British Petroleum Company, p.l.c., The: *See*—
Bowley, Heather J.; and Gerrard, Donald L., 4,900,147, Cl. 356-30.000.
Dean, Alan J.; and Hopper, Hans P., 4,900,433, Cl. 210-170.000.
Ogilvy, Norman, 4,900,456, Cl. 252-8.551.
British Telecommunications, plc.: *See*—
Mortimore, David B.; and Payne, David B., 4,900,114, Cl. 350-96.150.
Broemmelsiek, H. Eugene; Lee, Raymond; and Lanier, Carroll W., to Ethyl Corporation. Production of foamed polymer structures. 4,900,762, Cl. 521-184.000.
Brois, Stanley J.: *See*—
Colclough, Terence; and Brois, Stanley J., 4,900,852, Cl. 556-19.000.
Bronnes, Robert L.: *See*—
Goldburt, Efim S.; Hemmer, Richard E.; McKinlay, James K.; and Bronnes, Robert L., 4,900,136, Cl. 350-360.000.
Brookhart, George C., Jr. Ballast block for roofing structures. 4,899,514, Cl. 52-553.000.
Brooks, Timothy L.; and Linstedt, Brian K., to Whirlpool Corporation. Pouring shield for a food mixer. 4,900,160, Cl. 366-347.000.
Brose Fahrzeugteile GmbH & Co. Kommanditgesellschaft: *See*—
Becker, Herbert; Schelhorn, Gerhard; Dallwig, Claus; Poschl, Dieter; and Volk, Hans J., 4,900,960, Cl. 310-85.000.
Szerdahelyi, Ferenc, 4,899,492, Cl. 49-352.000.
Brossi, Arnold; Yu, Qian-Sheng; Atack, John R.; and Rapoport, Stanley I., to United States of America, Health and Human Services. Carbamates related to (−)-physostigmine as cholinergic agents. 4,900,748, Cl. 514-411.000.
Brost, Wilmut: *See*—
Titlow, Joseph D.; Brost, Wilmut, and Hahn, David T., 4,899,588, Cl. 73-597.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Tagaki, Osamu, 4,901,103, Cl. 355-27.000.
Sakakibara, Kenji, 4,901,104, Cl. 355-32.000.
Takahashi, Akio; and Yasuda, Mamoru, 4,899,673, Cl. 112-67.000.
Ueno, Hideo; and Yamada, Keiko, 4,901,248, Cl. 364-519.000.
Brotz, Gregory R. Foamed energy cell. 4,900,368, Cl. 136-253.000.
Browder, I. William: *See*—
Williams, David L.; Browder, I. William; and DiLuzio, Nicholas R., deceased, 4,900,722, Cl. 514-54.000.
Brower, Leon C.: *See*—
Miller, Robert L.; and Brower, Leon C., 4,901,067, Cl. 340-811.000.
Brown, Cal R.: *See*—
Yusko, Edward M., Jr.; Brown, Cal R.; Kalain, Terry M.; and Williams, Peter C., 4,899,783, Cl. 137-556.000.
Brown, Harold D. Automatically-reversing piston-and-cylinder unit. 4,899,638, Cl. 91-346.000.
Brown J. Michael; Sherwood, Stevn P.; and Holder, E. Paul, to Betz Laboratories, Inc. Method of controlling manganese deposition in open recirculating aqueous systems. 4,900,451, Cl. 210-699.000.
Brown, Mark D.; and Holmes, David C. Apparatus and method for measuring spinal instability. 4,899,761, Cl. 128-781.000.
Brown, Robert G.: *See*—
Abbagnaro, Louis A.; Brown, Robert G.; Siegel, William J.; Kautter, William J.; and Quasney, Robert S., Sr., 4,899,920, Cl. 228-11.000.
Brownlee, Michael: *See*—
Vlassara, Helen; Brownlee, Michael; and Cerami, Anthony, 4,900,747, Cl. 514-402.000.
Brownlee, Richard W. Storage and display receptacle assembly. 4,899,487, Cl. 47-41.010.
Brozek, James P.: *See*—
O'Connor, Michael T.; Capistran, James D.; Brozek, James P.; and Morgan, Albert W., 4,900,618, Cl. 428-328.000.
Brubaker, Thomas J. Miniature vehicle wheel mounts. 4,900,095, Cl. 301-63.0PW.
Bruce, Charles R., to Marathon Oil Company. Method and means for injecting well treatment fluid. 4,899,820, Cl. 166-310.000.
Bruckner Trockentechnik GmbH & Co. KG: *See*—
Gresens, Harry, 4,899,427, Cl. 26-92.000.
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Melnik, George; Amrein, Bruce E.; Brucksch, Robert C.; McCoy, Curtis L.; and Martin, James A., 4,899,619, Cl. 74-625.000.
Bruder, Wolfgang, to Durkopp System Technik GmbH. Method and apparatus for automatically cutting material in standard patterns. 4,901,359, Cl. 382-8.000.
Bruhnke, Ulrich; Duenas, Santiago; Fischer, Helmut; Greiner, Ferdinand; Jobmann, Ingo; Korber, Jurgen; Nothacker, Siegfreid; Pfaffenbach, Jurgen; and Trube, Hans, to Diamler-Benz AG. Cover sleeve arrangement for a vehicle steering column. 4,899,612, Cl. 74-493.000.
Brun, Milivoj K.: *See*—
Jun, Choll K.; and Brun, Milivoj K., 4,900,700, Cl. 501-78.000.
Brunk, Bertil E., to Brunk Industries, Inc. Suturing apparatus. 4,899,746, Cl. 606-144.000.
Brunk Industries, Inc.: *See*—
Brunk, Bertil E., 4,899,746, Cl. 606-144.000.
Brunkan, B. J., to Hackney wholesale. Fence panel bracket. 4,899,991, Cl. 256-69.000.

Brunswick Corporation: *See*—
McCormick, Daniel F., 4,900,281, Cl. 440-78.000.
Brusoni, Roberto: *See*—
Bosoni, Marco, Brusoni, Roberto; Fiorentini, Carlo; and Fracassi, Pietro, 4,899 825, Cl. 169-14.000.
Bryan, Avron I.; and Cushman, Michael R. System for monitoring and reporting the operability and calibration status of a dissolved oxygen sensor. 4,900,422. Cl. 204-401.000.
BSRD Limited: *See*—
Meyer, Rudolph; and Specht, Martin, 4,899,949, Cl. 242-107.200.
Buchanan, Jeffery J.; and Cassity, Terrance A., to Square D Company. Push in-screw out fastening system. 4,900,210, Cl. 411-508.000.
Buck, Robert J.; Landeck, Helmut H.; and Luer, Henry J., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Insulation system for magnetic windings. 4,900,879, Cl. 174-120.00R.
Buell, Kenneth B., to Procter & Gamble Company, The. Disposable garment with breathable leg cuffs. 4,900,317, Cl. 604-370.000.
Buferne, Pierre, to Automobiles Peugeot; and Automobiles Citroen. Device for fastening a first part such as an accessory to a second part such as a support with a bush for eliminating the assembling backlash between the two parts and bush used for the fastening of these parts. 4,899,703, Cl. 123-195.00A.
Buff, Ernest D.: *See*—
Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., 4,899,503, Cl. 52-171.000.
Buffalo, Vann M. Model airplane holder toy. 4,900,286, Cl. 446-30.000.
Buhler, Ernst; Wehrli, Peter; Martignoni, Massimo; and Erba, Mauro, to Ag fur Elektronik Industrielle, AGIE. Current supply device for movable electrodes of spark erosion machines. 4,900,889, Cl. 219-69.120.
Bulavintsev, Igor A.: *See*—
Zhidkov, Vasily D.; Kudrin, Nikolai A., Sokolov, Vladimir I.; Karelin, Stanislav N.; Bulavintsev, Igor A.; and Churakov, Vladimir N., 4,899,994, Cl. 266-94.000.
Buljan, Sergej-Tomislav: *See*—
D'Angelo, Charles; Baldoni, Joseph G., II, and Buljan, Sergej-Tomislav, 4,900,525, Cl. 422-245.000
Bull HN Information Systems Inc.: *See*—
Barlow, George J., 4,901,226, Cl. 364-200.000.
Bull NH Information Systems Inc.: *See*—
Joyce, Thomas F.; Kelly, Richard P., and Shen, Jian-Kuo, 4,901,222, Cl. 364-200.000.
Bull S.A.: *See*—
Cherbuy, Bernard, 4,901,087, Cl. 346-74.200.
Burch, Lester G.: *See*—
Summons, Wayne L.; and Burch, Lester G., 4,899,909, Cl. 222-25.000.
Burdeska, Kurt: *See*—
Tzikas, Athanassios; and Burdeska, Kurt, 4,900,813, Cl. 534-635.000
Burgdorf, Jochen; Reinartz, Hans D.; Steffes, Helmut; Volz, Peter; and Goossens, Andre, to Alfred Teves GmbH. Pressure fluid-activated brake system including an anti-locking traction slip control. 4,900,105, Cl. 303-116.000.
Burger, William F.: *See*—
Mandel, Barry P.; and Burger, William F., 4,900,391, Cl. 156-364.000
Burk, Gerhard: *See*—
Schwuchow, Norbert; and Burk, Gerhard, 4,900,082, Cl. 296-194.000.
Burke, Edward H.: *See*—
Garries, Ray W.; Burke, Edward H.; Leone, Joseph D., and Mueller, Kevin D., 4,899,647, Cl. 98-121.100.
Burkett, Jerry L.: *See*—
Arnold, Fred E.; and Burkett, Jerry L., 4,900,805, Cl. 528-337.000.
Arnold, Fred E.; and Burkett, Jerry L., 4,900,806, Cl. 528-337.000.
Burnham, Robert D.: *See*—
Wolfram, Thomas; Vojak, Bruce A.; Maas, Edward T., Jr., and Burnham, Robert D., 4,901,330, Cl. 372-75.000.
Burns, Ian W.: *See*—
Birth, Brian J.; and Burns, Ian W., 4,900,424, Cl. 204-409.000.
Burr-Brown Corporation: *See*—
Kalthoff, Timothy V.; Burt, Rodney T., and Stitt, R. Mark, II, 4,901,031, Cl. 330-253.000.
Burr-Brown Limited: *See*—
Hardie, Ian; and Vine, David, 4,901,275, Cl. 364-900.000.
Burr, Bruce H.: *See*—
Sullivan, Eric C.; and Burr, Bruce H., 4,899,838, Cl. 175-371.000.
Burt, Rodney T.: *See*—
Kalthoff, Timothy V.; Burt, Rodney T.; and Stitt, R. Mark, II, 4,901,031, Cl. 330-253.000
Burton, Charles D.; and Morgan, Matthew. Automatic long line commercial fishing apparatus. 4,899,481, Cl. 43-4.000.
Burton, Keith: *See*—
Hanbury, Jonathan M.; and Burton, Keith, 4,901,283, Cl. 365-222.000.
Bushman, Donald W.; Klapwald, Marissa A.; and Mikkonen, John W., to S. C. Johnson & Son, Inc. Powder emitting animal collar and method of making. 4,900,876, Cl. 119-106.000.
Butergerds, Helmut: *See*—
Debus, Jurgen; Koch, Hans-Georg; Zachrei, Jurgen, and Butergerds, Helmut, 4,899,900, Cl. 220-4.00R.
Butler Manufacturing Company: *See*—
Biebuyck, Lawrence, 4,899,508, Cl. 52-235.000
Buttiker, Jean-Pierre; and Klaiber, Max, to Hoffmann-La Roche Inc. Tamper-proof container closure. 4,899,897, Cl. 215-228.000.
Bye, Duane; and Haugen, Robert, to Laurie Stanley Hardie; and Coleman, Leonard John. Hinge system. 4,899,420, Cl. 16-1.00C.
C. R. Bard, Inc.: *See*—
Nadeau, Michael A., 4,900,312, Cl. 604-246.000.
Nestor, James R.; Schiff, Jonathan D.; and Priest, Benjamin H., 4,900,933, Cl. 250-458.100.
C&s Distributing Co.: *See*—
Rehkemper, Steven; and Rivette, Denni, 4,900,020, Cl. 273-1.00R.
Cachero, Curtis J. G. Tote bag and attached weightlifter's belt. 4,899,887, Cl. 206-579.000.
Cal R&D, Inc.: *See*—
May, Richard L.; and Curran, Kenneth J., 4,900,289, Cl. 446-342.000.
Caldara, Steve A.: *See*—
Harrington, David M.; McDaniel, John R.; Caldara, Steve A.; Lemone, Louis A.; Andrews, Kenneth R., Jr.; and Funk, Paul, 4,901,232, Cl. 364-200.000.
Calderbank, Arthur R.; and Mazo, James E., to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Trellis codes with passband spectral nulls. 4,901,331, Cl. 375-39.000.
Cale, Kenneth W.; Imura, Naoto; Jasovsky, George A.; and Katz, Saul N., to General Foods Corporation. Aroma recovery from the thermal hydrolysis of spent grounds. 4,900,575, Cl. 426-387.000.
Callaghan, John K.: *See*—
Wolfe, Philip R.; Callaghan, John K.; and Pidgeon, Simon, 4,899,645, Cl. 98-2.020.
Calvin, Douglas G., to Keystone International Holdings Corp. Corrosion-resistant overlay for the edge of butterfly valves. 4,899,775, Cl. 137-15.000.
Camco Inc.: *See*—
Daeschler, Jean-Louis; and Asbury, Anthony J., 4,899,822, Cl. 166-339.000.
Campbell, Donald: *See*—
Fitzgerald, John W., Jr.; and Campbell, Donald, 4,899,691, Cl. 118-665.000.
Campbell, Simon F.; and Roberts, David A., to Pfizer Inc. precursors to Quinolone inotropic agents. 4,900,839, Cl. 548-250.000.
Campos-Kreutzer, Raoul: *See*—
Campos, Samuel; and Campos-Kreutzer, Raoul, 4,900,033, Cl. 273-249.000.
Campos, Samuel; and Campos-Kreutzer, Raoul. Spelling game apparatus. 4,900,033, Cl. 273-249.000.
Canadian Patents & Development Ltd.: *See*—
Hill, Kenneth O.; Johnson, Derwyn C.; Bilodeau, Francois; and Faucher, Sylvain, 4,900,119, Cl. 350-96.150.
Candiard, Rene, to Timken Company, The. Taper roller bearings for vehicle wheels. 4,900,166, Cl. 384-560.000.
Canon Kabushiki Kaisha: *See*—
Hashimoto, Kenichiro, 4,900,003, Cl. 271-114.000.
Hieda, Teruo; Masui, Toshiyuki; Takahashi, Koji; and Yoshimura, Katsuji, 4,901,152, Cl. 358-209.000.
Hikake, Norio; Kanda, Hitoshi; and Hyosu, Yoshihiko, 4,900,647, Cl. 430-137.000.
Kasamoto, Masami, 4,901,091, Cl. 346-140.00R.
Kimura, Hiroyuki; Iimura, Masayuki; Katsuma, Makoto; Urushihara, Kazunobu; Matsumura, Susumu; and Ohmura, Hiroshi, 4,901,063, Cl. 340-723.000.
Kitahara, Makoto; Naito, Masataka; and Takahashi, Yuji, 4,900,009, Cl. 271-296.000.
Mitome, Noriyuki; and Ina, Hideki, 4,901,109, Cl. 355-68.000.
Moriyama, Jiro, 4,901,092, Cl. 346-140.00R.
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,901,079, Cl. 341-169.000.
Nakagawa, Katsumi, 4,900,694, Cl. 437-109.000.
Nakayama, Tadayoshi; Satoh, Chikara; Fujii, Akio; Yoshimura, Katsuji; and Takahashi, Koji, 4,901,148, Cl. 358-140.000.
Okamura, Shigeru, 4,900,173, Cl. 400-606.000.
Sakakibara, Kenzo, 4,900,902, Cl. 235-375.000.
Suga, Akira; and Okino, Tadashi, 4,901,154, Cl. 358-213.190.
Yoshimura, Katsuji; Masui, Toshiyuki; Sato, Chikara; and Nakayama, Tadayoshi, 4,901,119, Cl. 358-319.000.
Yuasa, Satoshi; Nishimura, Yukuo; Yoshinaga, Yoko; Munakata, Hirohide; and Haruta, Masahiro, 4,900,135, Cl. 350-354.000.
Capistran, James D.: *See*—
O'Connor, Michael T.; Capistran, James D.; Brozek, James P.; and Morgan, Albert W., 4,900,618, Cl. 428-328.000.
Cappotto, Samuel D.: *See*—
Mueller, Hans W.; and Cappotto, Samuel D., 4,900,171, Cl. 400-208.000.
Carboloy Inc.: *See*—
Jun, Choll K.; and Brun, Milivoj K., 4,900,700, Cl. 501-78.000.
Carbonell, Walt D.: *See*—
Odink, Harry J.; and Carbonell, Walt D., 4,900,491, Cl. 264-59.000.
Cardiac Pacemakers, Inc.: *See*—
Pederson, Brian D.; and Tockman, Bruce A., 4,899,759, Cl. 128-693.000.
Cardis, Angeline B., to Mobil Oil Corp. Sulfurized olefin adducts of dihydrocarbyl phosphates and phosphites and lubricant compositions containing same. 4,900,460, Cl. 252-46.600.
Carl-Zeiss-Stiftung: *See*—
Gerlinger, Hermann, 4,900,923, Cl. 250-228.000.
Raff, Horst; and Traeger, Rolf, 4,900,914, Cl. 250-216.000.
Schafer, Norbert; Weimer, Eugen; Gross, Herbert; Eppli, Bernd; and Rossow, Eberhard, 4,900,932, Cl. 250-397.000.
Carlingswitch, Inc.: *See*—
Fasano, Michael A., 4,900,275, Cl. 439-716.000.

Carlson, Richard O.: *See—*
Neugebauer, Constantine A.; Levinson, Lionel M.; Glascock, Homer H., II; Eichelberger, Charles W.; Wojnarowski, Robert J.; and Carlson, Richard O., 4,901,136, Cl. 357-75.000.

Carmo, Robert A. Apparatus and method for playing a card toss game. 4,900,035, Cl. 273-401.000.

Caron, Pierre: *See—*
Khan, Tasadduq; Caron, Pierre; and Raffestin, Jean-Louis, 4,900,511, Cl. 420-448.000.

Carow, Robert. Metering device for liquids. 4,899,789, Cl. 141-24.000.

Carr, Keith E.; and Jautakis, Karl, to Whirlpool Corporation. Dryer outlet grill with sensor. 4,899,464, Cl. 34-133.000.

Carrier Corporation: *See—*
Chopko, Robert A.; and Androff, Joel W., 4,899,550, Cl. 62-163.000.
Reedy, Wayne R., 4,900,237, Cl. 417-356.000.
Schrank, douglas A.; and Lewis, Russell G., 4,900,234, Cl. 417-312.000.
Shaw, David N., 4,899,555, Cl. 62-505.000.
Waterman, Timothy J., 4,899,726, Cl. 126-110.00R.

Carroll, John F., Jr., to Eastman Kodak Company. Paint coated article. 4,900,611, Cl. 428-216.000.

Carter, Alan T., to Carter Associates, Inc. Foam packaging separator. 4,899,880, Cl. 206-448.000.

Carter Associates, Inc.: *See—*
Carter, Alan T., 4,899,880, Cl. 206-448.000.

Carter, Howard E.; Pugh, Joel A.; and Pierce, Byron C., to Messager Partners. Method and apparatus for caller-controlled receipt and delivery of voice messages. 4,901,341, Cl. 379-67.000.

Carter-Wallace Inc.: *See—*
Parrotta, Umberto V., Jr.; Soldati, Gianluigi; and Sisbarro, Frederick P., 4,900,542, Cl. 424-66.000.

Carter, Walter S., to British Aerospace Public Limited Company. Mirrors. 4,900,137, Cl. 350-395.000.

Cartoni, Guido. Modular element as a component of a damping member for support heads of motion-picture or television cameras in professional cinematography and television. 4,899,854, Cl. 188-290.000.

Carty, Daniel T.: *See—*
Farr, James P.; and Carty, Daniel T., 4,900,469, Cl. 252-96.000.

Caruso, John T., to Moog Controls Inc. Oscilatory hydraulic actuators with internal supply, return, and control passageways for multi-axis wrist actuator. 4,899,637, Cl. 91-173.000.

Caruthers, Scott, to DAR Products Corporation. Method of use of exercise device. 4,900,016, Cl. 272-122.000.

Case Western Reserve University: *See—*
Silver, Jerry; Smith, George M.; and Jacobberger, James W., 4,900,553, Cl. 424-422.000.

Casida, Kenneth L., to Hydro-Tool Company, Inc. Method and apparatus for servicing well casing and the like. 4,899,821, Cl. 166-312.000.

Casio Computer Co., Ltd.: *See—*
Aihara, Fumikazu, 4,901,294, Cl. 368-63.000.

Cassity, Terrance A.: *See—*
Buchanan, Jeffery J.; and Cassity, Terrance A., 4,900,210, Cl. 411-508.000.

Castells, Jordi: *See—*
Boden, Richard M.; Fylak, William J.; Mc Ghie, Joseph A.; and Castells, Jordi, 4,900,718, Cl. 512-19.000.

Caterpillar Inc.: *See—*
Gumaste, Anand V.; and Tsals, Izrail, 4,899,598, Cl. 73-862.360.
Krone, John J.; and Fidler, Jerry D., 4,900,093, Cl. 299-37.000.

Caviglia, Francesco; and Ricaldone, Piergiorgio, to Cselt Centro Studi E Laboratori Telecomunicazioni S.P.A. Device for coupling single-mode optical fibers. 4,900,120, Cl. 350-96.180.

Cederroth, Sture C.; and Zutler, Bruce B., to Arctic Icewater, Inc. Ice cube tray. 4,899,976, Cl. 249-61.000.

Center, Marc B.; and Maasshoff, Norman, to General Motors Corporation. Variable rate stepper motor driver circuit and method. 4,901,000, Cl. 318-696.000.

Central Glass Company, Limited: *See—*
Nagashima, Toshikazu, 4,900,778, Cl. 524-837.000.
Suzuki, Junichi; Nakamura, Masato; Takeuchi, Nobuyuki; Iida, Yasunobu; and Nishii, Hiroyuki, 4,900,630, Cl. 428-432.000.

Centre D'Innovations Et De Recherches Appliquers, societe anonyme: *See—*
Rutten, Leon; and Rutten, Jean, 4,899,717, Cl. 124-67.000.

Centre National de la Recherche Scientifique (CNRS): *See—*
Guesdon, Jean-Luc; Avrameas, Stratis; and Mazie, Jean-Claude, 4,900,661, Cl. 435-7.000.

Cerami, Anthony: *See—*
Vlassara, Helen; Brownlee, Michael; and Cerami, Anthony, 4,900,747, Cl. 514-402.000.

Cerny, Lawrence C., to Masonic Medical Research Laboratory. Acellular resuscitative fluid. 4,900,780, Cl. 525-54.100.

Cerruti, Eraldo, to Fiat Auto S.p.A. Apparatus for selectively presenting, particularly in motor vehicles, the same information message in different languages. 4,901,065, Cl. 340-756.000.

Cesal, Milos: *See—*
Jansa, Jaroslav; Urbanek, Peter; Cesal, Milos; and Bitto, Karel, 4,900,447, Cl. 210-635.000.

CFM Technologies, Inc.: *See—*
McConnell, Christopher F.; and Walter, Alan E., 4,899,767, Cl. 134-56.00R.

Chacko, Varkki P.: *See—*
Hochberg, Arie A.; Chacko, Varkki P.; and DeStio, Paul, 4,900,610, Cl. 428-195.000.

Chafetz, Harry: *See—*
Sawicki, Robert A.; and Chafetz, Harry, 4,900,705, Cl. 502-158.000.

Chan, Alfred K.: *See—*
Galbi, David; and Chan, Alfred K., 4,901,270, Cl. 364-786.000.

Chan, Ka-kong; and Saucy, Gabriel G., to Hoffmann-La Roche Inc. Quinone intermediates for asymmetric synthesis of natural vitamin E. 4,900,476, Cl. 552-309.000.

Chan, M. Kenneth: *See—*
Whitescarver, Olin D.; Kwan, Jonathan T.; Chan, M. Kenneth; and Hoyer, Daniel P., 4,900,360, Cl. 106-97.000.

Chan, Randolph W.: *See—*
Dubrow, Robert S.; Holland, Christine J.; Chan, Randolph W.; Martin, Albert R.; Siden, Dennis C.; and Germeraad, Paul B., 4,900,877, Cl. 174-35.0GC.

Chance, Leon H.; Danna, Gary F.; and Andrews, Bethlehem K., to United States of America, Agriculture. Agents for non-formaldehyde durable press finishing and textile products therefrom. 4,900,324, Cl. 8-116.400.

Chandler, John; and Beene, Bobby R. Bowling alley bumper system. 4,900,024, Cl. 273-37.000.

Chang, Charles C.: *See—*
Sanchez, Moises G.; Chang, Charles C.; Laine, Norman R.; and Waters, Sandra M., 4,900,529, Cl. 423-328.000.

Chang, Daniel Y.; Waldron, Bradley C.; and Walthers, James M., Sr., to King Nutronics Corporation. Temperature calibration system. 4,901,257, Cl. 364-571.010.

Chapel, Roy W., Jr.; and Hammond, Robert W., to John Fluke Mfg. Co., Inc. Resistor network having bi-axial symmetry. 4,901,052, Cl. 338-308.000.

Chapman, Donald L.; and Kimbrough, Robert L., to Square D Company. Large capacity electrical service fitting for concrete floors. 4,899,506, Cl. 52-221.000.

Chapman, Michael R., to Boeing Company, The. Method for producing composite materials. 4,900,379, Cl. 156-64.000.

Charles, Herbert N.: *See—*
Brackett, Stephen E.; and Charles, Herbert N., 4,900,229, Cl. 416-189.000.

Charpey, Bernhard: *See—*
Holtmann, Wilhelm; Zellerhoff, Robert; Oberkobusch, Rudolf; Staglich, Peter; and Charpey, Bernhard, 4,900,717, Cl. 505-812.000.

Chatani, Ayako: *See—*
Horii, Sadashige; Haraguchi, Hideaki; and Chatani, Ayako, 4,899,442, Cl. 30-133.000.

Cheever, James M.: *See—*
Perra, Andrew G., Jr.; and Cheever, James M., 4,901,095, Cl. 346-140.00R.

Chen, Chang-Yu. Laminated padlock. 4,899,560, Cl. 70-52.000.

Chen, Chin H.; and Fox, John L., to Eastman Kodak Company. Novel benzofuran dyes. 4,900,831, Cl. 546-66.000.

Chen, Linus T. Rotary optical coupler utilizing cylindrical ringshaped mirrors and method of making same. 4,900,117, Cl. 350-96.150.

Chen, Samuel J., to Kendall Company. Novel adhesives and tapes including same. 4,900,624, Cl. 428-343.000.

Chen, Shu P.; Engelmann, Theodore R.; and Oltmann, Harold D., to Allied-Signal Inc. Crosslinkable polyethylene composition. 4,900,792, Cl. 525-264.000.

Chen, Steve S.; and Schiffleger, Alan J., to Cray Research, Inc. Computer vector multiprocessing control with multiple access memory and priority conflict resolution method. 4,901,230, Cl. 364-200.000.

Chen, Yu-Lin, to General Motors Corporation. Chemical milling of titanium. 4,900,398, Cl. 156-664.000.

Cheng, Dah Yu, to International Power Technology, Inc. Steam-injected free-turbine-type gas turbine. 4,899,537, Cl. 60-39.161.

Cheng, Yu-Ling; Gale, Robert M.; Sugihara, Edna; and Sanders, Harold F., to Alza Corporation. Skin permeation enhancer compositions using sucrose esters. 4,900,555, Cl. 424-449.000.

Cherbuy, Bernard, to Bull S.A. Device for forming latent magnetic images on the recording element of a magnetographic printer. 4,901,087, Cl. 346-74.200.

Chern, Jenn-Rong. Hanging lock. 4,899,559, Cl. 70-25.000.

Cherrington, Martin D. Jet bit with onboard deviation means. 4,899,835, Cl. 175-74.000.

Cherukuri, Subraman R.; and Raman, Krishna P., to Warner-Lambert Company. Fructose sweetened chewing gum compositions. 4,900,563, Cl. 426-5.000.

Chevallier, Jean: *See—*
Pouget, Gilles; Chevallier, Jean; and Hampton, Genc, 4,899,682, Cl. 114-264.000.

Chevron Research Company: *See—*
Schroeder, Albert H.; Ching, Ta Y.; Suzuki, Shigeto; and Katsumoto, Kiyoshi, 4,900,458, Cl. 252-8.555.

Chew, Bonnie G., II. Portable child enclosure. 4,899,496, Cl. 5-98.00R.

Chiang, Bin Y.: *See—*
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 4,900,577, Cl. 426-563.000.

Chiba, Katuaki: *See—*
Kato, Takeshi; Mizuishi, Kenichi; Chiba, Katuaki; Nakao, Takeshi; Ojima, Masahiro; Nakamura, Shigeru; and Maeda, Takeshi, 4,901,325, Cl. 372-44.000.

Chiba, Mitsuharu; Taniguchi, Kazuyoshi; and Iwase, Hiroshi, to Seiko Instruments Inc. Instrument for tuning musical instruments. 4,899,636, Cl. 84-454.000.

Chicago Faucet Company: *See—*
Laube, Daniel J., 4,899,778, Cl. 137-242.000.

Chicago Lock Company: *See—*
Steinbach, Robert, 4,899,565, Cl. 70-491.000.

Child, Ralph G.; Bitha, Panayota; Hlavka, Joseph J.; and Lin, Yang-I, to American Cyanamid Company. (2,2-bis(aminomethyl)-1,3-propanediol-N,N')platinum complexes. 4,900,756, Cl. 514-492.000.

Chinese Petroleum Company: *See—*
Huang, Huei-Huay; and Peng, Yu-Yin, 4,899,699, Cl. 123-73.00C.

Ching, Ta Y.: *See—*
Schroeder, Albert H.; Ching, Ta Y.; Suzuki, Shigeto; and Katsumoto, Kiyoshi, 4,900,458, Cl. 252-8.555.

Chiri, Chiaffredo, Gianoglio, Pierino; Giraudo, Claudio; Marengo, Sergio; and Zaino, Giovanni, to Tecno-Sameg S.r.L.; Chiri, Chiaffredo; and Zaino, Giovanni. Machine for cutting stone materials. 4,899,720, Cl. 125-21.000.

Chisso Corporation: *See—*
Miyazawa, Kazutoshi; Ushioda, Makoto; Inoue, Hiromichi; Saito, Shinichi; and Ohno, Kouji, 4,900,472, Cl. 252-299.610
Miyazawa, Kazutoshi; Inue, Hiromichi; Saito, Shinichi; Ohno, Kouji; and Ushioda, Makoto, 4,900,473, Cl. 252-299.610.

Cho, James R.: *See—*
Smith, Terry E.; Cho, James R.; and Cottrell, Ian W., 4,900,775, Cl. 524-548.000.

Chopko, Robert A.; and Androff, Joel W., to Carrier Corporation. Refrigeration unit and hydraulic power system. 4,899,550, Cl. 62-163.000.

Chou, Eddie C.; and Beckstead, Leo W., to Amax Inc Separation of nickel and cobalt from sulfate solutions by solvent extraction. 4,900,522, Cl. 423-139.000.

Chow, Tat-Sing P.; and Baliga, Bantval J., to General Electric Company. Circuit including a combined insulated gate bipolar transistor/-MOSFET. 4,901,127, Cl. 357-23.400.

Christensen, Edward L.: *See—*
Olson, Rodney S.; and Christensen, Edward L., 4,901,245, Cl. 364-509.000.

Christol, Lilian, to Societe Manoel Bouchet, S.A., a part interest. Pedaling unit for a bicycle. 4,899,618, Cl. 74-594.600.

Christoph, Erich M.: *See—*
Bartels, Hermann A.; Christoph, Erich M.; and Leipnitz, Ruediger, 4,900,493, Cl. 264-71.000.

Christopher, Todd J., to Thomson Consumer Electronics, Inc. Sigma-delta modulator for D-to-A converter. 4,901,077, Cl. 341-143.000.

Chu, Benjamin; and Dhadwal, Harbans S., to Research Foundation of State University of New York. Method and apparatus for determining viscosity. 4,899,575, Cl. 73-55.000.

Chu, George K.: *See—*
Birman, Mark; Chu, George K.; Ware, Fred A., and Halim, Selfia, 4,901,267, Cl. 364-736.000.

Chu, Tak-Kin; and Santiago, Francisco, to United States of America, Navy. Sensitisation pretreatment of Pb-salt epitaxial films for schottky diodes by sulfur vapor exposure. 4,900,373, Cl. 148-33.400.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Kato, Yoshiro; and Usami, Hiroko, 4,900,724, Cl. 514-62.000.

Chung, Ding Yu; and DebRoy, Tapan K., to Du Pont de Nemours, E. I., and Company. Low cure cathodic electrodeposition coatings. 4,900,415, Cl. 204-181.700.

Churakov, Vladimir N.: *See—*
Zhidkov, Vasily D.; Kudrin, Nikolai A.; Sokolov, Vladimir I.; Karelin, Stanislav N.; Bulavintsev, Igor A.; and Churakov, Vladimir N., 4,899,994, Cl. 266-94.000.

Church, Robert F. R.: *See—*
Dean, William D.; Church, Robert F. R.; and Ridge, David N., 4,900,477, Cl. 260-397.400.

Ciba-Geigy Corporation: *See—*
Husler, Rinaldo; Kirchmayr, Rudolf; and Rutsch, Werner, 4,900,823, Cl. 544-174.000.
Kraushaar, Douglas J., 4,900,763, Cl. 522-14.000
Metzger, Andre; Grimm, Peter, Nohl, Andre J., and Nau, Vance J., 4,900,683, Cl. 436-179.000.
Schweigl, Erwin; Hayes, Thomas P.; Kljajic, Dusan, and Jellositz, Rolf, 4,899,914, Cl. 222-394.000.
Seifert, Gottfried; and Hassig, Robert, 4,900,827, Cl. 544-303.000.
Tzikas, Athanassios; and Burdeska, Kurt, 4,900,813, Cl. 534-635.000.

Ciecko, Daniel: *See—*
De Bruyn, Gerard; and Ciecko, Daniel, 4,899,712, Cl. 123-468.000.

Ciokajlo, John J.; and Ritchie, Henry B., to General Electric Company. Jet engine fan and compressor bearing support. 4,900,221, Cl. 415-142.000.

Citizen Watch Co., Ltd.: *See—*
Ikeda, Hiroshi; Sawada, Takashi; and Bansho, Mitsuo. 4,900,175, Cl. 400-659.000.

Citizens Bank: *See—*
Baugh, Benton F., 4,899,837, Cl. 175-218.000

Clarion Co., Ltd.: *See—*
Mitsutsuka, Syuichi; and Okamoto, Takeshi, 4,900,969, Cl. 310-313.00A.
Okada, Hitoshi; Terada, Shinichiro; and Nozawa, Katsuya, 4,899,951, Cl. 242-204.000.

clark, Daniel O.: *See—*
Admassu, Wudneh; Jensvold, John A.; and clark, Daniel O., 4,900,334, Cl. 55-16.000.

Clark, Robert C.; and Kavanagh, Dean L., to Monsanto Company. Phenolic foams. 4,900,759, Cl. 521-98.000.

Clarke, Ron: *See—*
Barnes, Brian A.; Clarke, Ron; Martin, Brian M.; and McCandless, John J. M., 4,899,424, Cl. 24-641.000

Clarke-Sturman, Anthony J.; and Sturla, Phillip L., to Shell Oil Company. Aqueous polysaccharide compositions. 4,900,457, Cl. 252-8.514.

Clausen, Thomas; and Lowe, Isolde, to Wella, Aktiengesellschaft. Process for the production of 4-[ethyl-(2'-hydroxyethyl)-amino]-1-[(2'-hydroxyethyl)-amino]-2-nitrobenzene. 4,900,869, Cl. 564-441.000.

Claussen, Nils; Schubert, Helmut; Ruhle, Manfred; and Petzow, Gunter, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. High-strength and temperature-stable formed bodies of zirconium dioxide. 4,900,492, Cl. 264-65.000.

Clegg, David D., to Northern Telecom Limited. Telecommunications wiring test apparatus and method including two color display indicating correct wiring. 4,901,003, Cl. 324-66.000.

Cleveland, Brian G., to Aspen Peripherals Corp. Phase-locked loop control for reading data off storage media. 4,901,035, Cl. 331-14.000.

Cleveland, William G. Stirrup clip. 4,900,184, Cl. 403-397.000.

Clifford, Gary. Pressure modulation valve. 4,900,104, Cl. 303-115.000.

Cloke, Martin: *See—*
Schechter, Michael M.; and Cloke, Martin, 4,899,714, Cl. 123-533.000.

Clorox Company, The: *See—*
Farr, James P.; and Carty, Daniel T., 4,900,469, Cl. 252-96.000.
Mitchell, James D.; and Farr, James P., 4,900,468, Cl. 252-95.000.
Smith, William L., 4,900,467, Cl. 252-95.000.

Clumb, Thomas E. Self energizing fastener system. 4,899,919, Cl. 227-9.000.

CMI International, Inc.: *See—*
Wuepper, Thomas E.; and Franklyn, Terry L., 4,899,806, Cl. 164-377.000.

Cobb, Charles C.; Ladbrook, Eric R. McK.; and Cowan, Peter, to Otis Engineering Corporation. Method and apparatus for running coiled tubing in subsea wells. 4,899,823, Cl. 166-351.000.

Cobe Laboratories, Inc.: *See—*
Langley, Robert W., 4,900,298, Cl. 494-82.000.

Codex Corporation: *See—*
Soloway, Stuart R.; Steinka, Bradford R.; and Humblet, Pierre A., 4,901,277, Cl. 364-900.000.

Cody, Ian A.; Hamner, Glen P., deceased (by Hamner, Nita A. M., executrix); Sawyer, Willard H.; and Schorfheide, James J., to Exxon Research and Engineering Company. Method for producing a wax isomerization catalyst. 4,900,707, Cl. 502-230.000.

Cohen, Donald M., to Baxter International, Inc. Miniscope. 4,899,732, Cl. 128-6.000.

Cohen, Thomas S.: *See—*
Hnatuck, Robert J.; Cohen, Thomas S.; and Grabbe, Dimitry G., 4,900,258, Cl. 439-63.000.

Cohen, Todd, to Leonard Bloom, a part interest. System for and method of therapeutic stimulation of a patient's heart. 4,899,751, Cl. 128-419.0PG.

Cohen, Todd J., to Bloom, Leonard. System for and method of therapeutic stimulation of a patient's heart. 4,899,752, Cl. 128-419.0PG.

Cohn, Jay N.: *See—*
Finkelstein, Stanley M.; and Cohn, Jay N., 4,899,758, Cl. 128-672.000.

Colamussi, Arturo, to Vortex Systems S.r.l. Apparatus for the ordered arrangement and creation of a feed stock in boxing plants for cones and/or conoids. 4,899,866, Cl. 198-418.100.

Colclough, Terence; and Brois, Stanley J., to Exxon Chemical Patents Inc. Heavy metal salts of dithiophosphonate compounds. 4,900,852, Cl. 556-19.000.

Coleman, Leonard John: *See—*
Bye, Duane; and Haugen, Robert, 4,899,420, Cl. 16-1.00C.

Colgate-Palmolive Co.: *See—*
Ramachandran, Pallassanna; and Shulman, Jan E., 4,900,475, Cl. 252-532.000.

Colin Electronics Co., Ltd.: *See—*
Jaeb, Jonathan P.; and Converse, Merle E., 4,899,760, Cl. 128-696.000.

Colleran, Stephen A.; Geib, Lawrence E.; Gugelmeyer, Robert J.; and Wilson, Bill B., to Molex Incorporated. Electrical connector for fuel injector and terminals therefor. 4,900,271, Cl. 439-595.000.

Collins, Michael H.; and Lyle, Alan R., to Shell Oil Company. Method of manufacturing a syntactic sleeve for insulating a pipeline. 4,900,488, Cl. 264-45.700.

Collins, Robert F.: *See—*
Dursch, Harry W.; Anderson, Donald A.; and Collins, Robert F., 4,900,383, Cl. 156-184.000.

Colorocs Corporation: *See—*
Tompkins, E. Neal; and Slayton, Danny L., 4,901,110, Cl. 355-212.000.

Colton, Douglas E.; and Slautterback, Fred A., to Slautterback Corporation. Quasi-random dot pattern adhesive joining method. 4,900,390, Cl. 156-291.000.

Columbia Manufacturing Corporation: *See—*
Baumgarten, James E., 4,899,493, Cl. 49-425.000.

Comalco Aluminum Limited: *See—*
Goodes, Christopher G.; Wellwood, Grant A.; and Hayden, Howard W., Jr., 4,900,535, Cl. 423-484.000.

Combustion Engineering, Inc.: *See—*
Anthony, Andrew J., 4,900,508, Cl. 376-438.000.

Comeau, Felix J. E.; Quast, Herman; and Jewitt, Jeffrey C., to Guardian Technologies, Inc. Sobriety interlock with bypass detection. 4,901,058, Cl. 340-576.000.

Commissariat a l'Energie Atomique: *See—*
Durand, Patrick; Viette, Francois; and Riwan, Alain, 4,900,997, Cl. 318-568.210.

Lazzari, Jean-Pierre, 4,901,177, Cl. 360-113.000.
Tournier, Edmond; and Tararine, Michel, 4,900,931, Cl. 250-369.000.

Communications Satellite Corporation: *See—*
Metzger, Sidney; and Garlow, Ronald K., 4,901,349, Cl. 380-11.000.

Comte, Georges: *See—*
Laboureau, Jacques-Philippe; and Comte, Georges, 4,899,745, Cl. 606-142.000.

Conforti, Fred J.: *See—*
Bellavia, Nicholas J.; Birk, Daniel J.; Conforti, Fred J.; and Sisselman, Ronald, 4,901,056, Cl. 340-514.000.

Congleton, Ray L.: *See—*
Machado, Octavio J.; Henry, Clifford W.; Congleton, Ray L.; and Flynn, William M., 4,900,505, Cl. 376-272.000.

Conklin, Jerry R.: *See—*
Meyers, Marc A.; and Conklin, Jerry R., 4,900,573, Cl. 426-302.000.

Conn-Weld Industries, Inc.: *See—*
Connolly, James D.; and McCormick, Richard L., Jr., 4,900,442, Cl. 210-380.300.

Connolly, James D.; and McCormick, Richard L., Jr., to Conn-Weld Industries, Inc. Air seal centrifuge screen basket. 4,900,442, Cl. 210-380.300.

Conoco Inc.: *See—*
Flanigan, David A.; Shimoda, Elwyn; and Stolhand, James E., 4,900,445, Cl. 210-512.100.
Le, Hanh T., 4,900,331, Cl. 44-62.000.
Le, Hanh T., 4,900,569, Cl. 526-245.000.

Consiglio Nazionale Delle Ricerche: *See—*
Bosco, Canneli G.; and Enrico, D'ottavi, 4,899,845, Cl. 181-122.000.

Container Corporation of America: *See—*
Straub, Gustave O.; and Kurth, Charles W., 4,899,927, Cl. 229-109.000.

Converse, Merle E.: *See—*
Jaeb, Jonathan P.; and Converse, Merle E., 4,899,760, Cl. 128-696.000.

Cooper, Brian, to BASF Aktiengesellschaft. Preparation of pyruvic acid. 4,900,668, Cl. 435-101.000.

Cooper, David A.: *See—*
Barlow, Robert W.; and Cooper, David A., 4,900,123, Cl. 350-96.200.

Cooper, Frank T.: *See—*
Gregory, Edward J.; Felton, John; and Cooper, Frank T., 4,899,808, Cl. 165-1.000.

Cooper, John C.; Panayappan, Ramanathan; and Guy, Joseph T., to United States of America, Navy. Method of preparing superconducting "orthorhomibic"-type compounds in bulk using C_1-C_6 alkanoic acid salts. 4,900,715, Cl. 505-1.000.

Cooper Tire & Rubber Company: *See—*
Klose, Karl W., 4,900,382, Cl. 156-128.600.

Cooperative Research Farms: *See—*
Miller, Bill L., 4,900,562, Cl. 426-2.000.

Coovert, Richard E.: *See—*
Tuenge, Richard T.; and Coovert, Richard E., 4,900,584, Cl. 427-66.000.

Corby Jr., Nelson R.: *See—*
Penney, Carl M.; Corby Jr., Nelson R.; and Irwin, Nancy H., 4,900,146, Cl. 356-1.000.

Corby, Kenneth D.: *See—*
Hacknauer, Frank; and Corby, Kenneth D., 4,899,690, Cl. 118-653.000.

Cordero, Federico: *See—*
Falzoni, Gian L.; and Cordero, Federico, 4,899,851, Cl. 184-6.120.

Cormack, Robert H., to Ball Corporation. System employing preconditioned radiation for detecting defects in transparent objects. 4,900,916, Cl. 250-223.00B.

Cornell Research Foundation, Inc.: *See—*
Lee, Chang Y.; and Kime, Robert W., 4,900,564, Cl. 426-15.000.
Zall, Robert R.; and Wecker, Matthew, 4,900,670, Cl. 435-147.000.

Corning Incorporated: *See—*
Lopata, Donald J.; and Mathew, Robert L., 4,900,977, Cl. 313-407.000.

Cornwell, Peter J., to Renishaw Controls Limited. Communications adaptor for automated factory system. 4,901,218, Cl. 364-131.000.

Corpak, Inc.: *See—*
Quinn, David G.; Edwards, Robert B., II; and Andersen, Erik, 4,900,306, Cl. 604-97.000.

Corzine, Robert G.; and Mosko, Joseph A., to United States of America, Navy. Coupled strip line circuit. 4,901,039, Cl. 333-1.000.

Costello, James G., to Olympus Corporation. Fiberoptic display for a video image. 4,901,141, Cl. 358-93.000.

Costigan, Jack P., to General Electric Company. Hermetically sealed housing with welding seal. 4,901,135, Cl. 357-74.000.

Cote , William F.; and Speranza, Donald, to Eaton Corporation. Method and control system for updating of control parameter value indicative of master clutch point of incipient engagement. 4,899,858, Cl. 192-0.090.

Cotie, Michael E.: *See—*
Redford, Douglas E.; Perdelwitz, Lee E., Jr.; Iff, Ron H.; Gaddis, Paul G.; Halley, David G.; Cotie, Michael E.; Hanke, David E.; and Neogi, Amar N., 4,900,377, Cl. 156-62.200.

Cottrell, Ian W.: *See—*
Smith, Terry E.; Cho, James R.; and Cottrell, Ian W., 4,900,775, Cl. 524-548.000.

Cowan, Peter: *See—*
Cobb, Charles C.; Ladbrook, Eric R. McK.; and Cowan, Peter, 4,899,823, Cl. 166-351.000.

Cox, David; Dowlatshahi, Hossein A.; Hall, David E.; Ingall, Anthony H.; and Suschitzky, John L., to Fisons plc. 2-Pyridinyl-phenyl-sulphinyl-and-phenyl-thio-benzimidazoles having antiflammatory or gastic acid secretion inhibition activity. 4,900,751, Cl. 514-338.000.

Cox, David W., Jr. Manual tool for preparing tube ends for jointure. 4,899,409, Cl 7-167.000.

Coy, Calvin L.: *See—*
Moore, Roy J.; and Coy, Calvin L., 4,899,664, Cl. 104-12.000.

CPC International Inc.: *See—*
King, Arvid D., 4,900,567, Cl. 426-93.000.

Crabtree, Larry L.: *See—*
Pittner, Gregory A.; and Crabtree, Larry L., 4,900,336, Cl. 55-55.000.

Craig, Thomas A., to Hein-Werner Corporation. Vehicle scissor lift. 4,899,987, Cl. 254-122.000.

Craig, Timothy D.: *See—*
Wulf, James B.; Craig, Timothy D.; Evans, Alfred P.; and Sentz, Ross H., 4,900,225, Cl. 415-224.500.

Cranko, Ernest; and Moore, Roger K. Anchoring. 4,899,972, Cl. 248-231.910.

Craun, Gary P.: *See—*
Hahn, Kenneth G., Jr.; and Craun, Gary P., 4,900,592, Cl. 427-375.000.

Crawford, Dennis W.; and Turner, Larry G., to Masco Corporation of Indiana. Aspirator for a tub/shower diverter assembly. 4,899,397, Cl. 4-191.000.

Crawley, Michael W.; and Stanley, Paul Louis R., to Eastman Kodak Company. Novel pyrazolone photographic color couplers and photographic elements containing them. 4,900,657, Cl. 430-555.000.

Cray Research, Inc.: *See—*
Chen, Steve S.; and Schiffleger, Alan J., 4,901,230, Cl. 364-200.000.

Creative Point, Inc.: *See—*
Long, Jerry M.; and Palmer, Peter J., 4,900,107, Cl. 312-15.000.

Cretin, Jacques; and Therond, Jean-Francois, to Institut Francais Du Petrole. System for acquiring and recording signals delivered by a set of sensors disposed in well probes. 4,901,289, Cl. 367-34.000.

Crisp, Nadine Z. Automobile seat with built in child seat. 4,900,087, Cl. 297-238.000.

Cromwell, Thomas H.: *See—*
Bonnett, John H.; Cromwell, Thomas H.; and Norton, Rick, 4,900,576, Cl. 426-438.000.

Crouse, Randall L.: *See—*
Parker, Terry S.; Saroka, Harold G.; Horton, Harold E.; Didion, Edward L.; Lyle, Elmer; and Crouse, Randall L., 4,901,340, Cl. 379-60.000.

Crowe, Lawrence E., to Sundstrand Corporation. Plate fin/chic heat exchanger. 4,901,201, Cl. 361-384.000.

Crowley, Patrick: *See—*
Heaney, Stephen P.; Crowley, Patrick; and Reynolds, Lawrence G., 4,900,349, Cl. 71-76.000.

Crump, Gregory A. Magnetic golf club holding apparatus. 4,899,894, Cl. 211-70.200.

Csabai, Julius S., to Metatron Investments, Inc. Purification system. 4,900,341, Cl. 55-222.000.

Cselt Centro Studi E Laboratori Telecomunicazioni S.P.A.: *See—*
Caviglia, Francesco; and Ricaldone, Piergiorgio, 4,900,120, Cl. 350-96.180.

Cucksey, Edward L.: *See—*
LaManna, Richard J.; Hinton, James L.; Cucksey, Edward L.; and Kull, Leo, 4,900,168, Cl. 400-130.000.

Cuffaro, Antonino. Occupancy marker. 4,899,683, Cl. 116-215.000.

Culligan International Company: *See—*
Schmidt, Kenneth A., 4,900,450, Cl. 210-679.000.

Cultrera, Vito: *See—*
Anania, Guido; Bianchi, Angelo; Cultrera, Vito; Russo, Francesco; and Spagna, Giovanni, 4,900,530, Cl. 423-342.000.

Cummings, Gordon F., III, to Rockford Powertrain, Inc. Variable speed drive for engine cooling fans. 4,899,861, Cl. 192-85.0AA.

Cunningham, Donald M.; Bartels, Mark A.; and Markum, T. Randall, to Emerson Electric Co. Sheathed electric heating element assembly. 4,900,897, Cl. 219-336.000.

Curran, Kenneth J.: *See—*
May, Richard L.; and Curran, Kenneth J., 4,900,289, Cl. 446-342.000.

Curran, Patrick A.; and Wilson, Susan R., to Texas Instruments Incorporated. Multilayer semi-insulating film for hermetic wafer passivation and method for making same. 4,901,133, Cl. 357-54.000.

Cushman, Michael R.: *See—*
Bryan, Avron I.; and Cushman, Michael R., 4,900,422, Cl. 204-401.000.

Cutilli, Davide: *See—*
Ruscitti, Tommaso; Cutilli, Davide; and Del Leonardis, Demetrio, 4,899,913, Cl. 222-385.000.

CVD Incorporated: *See—*
Hui, Benjamin C.; Kanjolia, Ravindra K.; and Lorberth, Jorg, 4,900,855, Cl. 556-70.000.

Cyrus, William L., Jr.: *See—*
Pokora, Alexander R.; and Cyrus, William L., Jr., 4,900,671, Cl. 435-156.000.

Cytosignet, Inc.: *See—*
Smith, Nathan L., III, 4,900,685, Cl. 436-519.000.

Czech, Bronislav P., to Technicon Instruments Corporation. Large scale synthesis of twelve member diazamonocyclic compounds. 4,900,818, Cl. 540-454.000.

Czeczerski, Nordfried. Device for the apportioning of washing agents in hand held shower heads. 4,899,939, Cl. 239-310.000.

Czetto, Paul; and Woods, David. Arrowed projectile structure. 4,900,038, Cl. 273-416.000.

Daeschler, Jean-Louis; and Asbury, Anthony J., to Cameo Inc. Apparatus for controlling the operation of an underwater installation. 4,899,822, Cl. 166-339.000.

Dahnert, Dean L., to White Consolidated Industries, Inc. Method of providing a light bar for storage apparatus. 4,900,284, Cl. 445-22.000.

Daicel Chemical Industries, Ltd.: *See—*
Murabayashi, Katsuyoshi; Kotani, Motoharu; and Sato, Keishi, 4,900,765, Cl. 523-122.000.

Daido Tokushuko Kabushiki Kaisha: *See—*
Terai, Kazuto; Isobe, Susumu; Tsukuda, Kenji, Inoue, Hisao; and Kobayashi, Hiroshi, 4,900,248, Cl. 432-234.000

DaidoSanso K. K.: *See—*
McLeod, Paul M.; Fraas, Lewis M., and Weiss, Robert E., 4,900,518, Cl. 422-199.000.

Daiichi Seiyaku Co., Ltd.: *See—*
Tanaka, Noriko; Inoue, Kazuhiro; Korenaga, Hiroshi; and Ogawa, Hidemasa. 4,900,815, Cl. 536-54.000.

Daikin Industries Ltd.: *See—*
Arase, Takuya; Shibuya, Yoshiyuki; and Daimon, Shigeo, 4,900,464, Cl. 252-62.550.
Ihara, Kiyohiko; Yamaguchi, Fumihiko; and Yamane, Shinichi, 4,900,874, Cl. 570-142.000.

Daimler-Benz AG: *See—*
Forster, Alfred; Kotzab, Johann; and Geyer, Willi, 4,900,084, Cl. 297-216.000.
Gollmar, Klaus; and Jenemann, Gerhard, 4,901,354, Cl. 381-110.000.
Schwuchow, Norbert; and Burk, Gerhard, 4,900,082, Cl. 296-194.000.

Daimler-Benz Aktiengesellschaft. *See—*
Andres, Rudolf; Knoll, Heinz W.; Petri, Volker; and Pfistner, Harald, 4,900,925, Cl. 250-231.00R.

Daimon, Shigeo *See—*
Arase, Takuya; Shibuya, Yoshiyuki; and Daimon, Shigeo, 4,900,464, Cl. 252-62.550.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Akiyama, Kazuya, 4,901,258, Cl. 364-577.000.
Kawai, Kenji; Kan, Kazuma, and Yoshida, Takumi, 4,901,162, Cl. 358-468.000.

Dale Electronics, Inc.: *See—*
Plough, Charles T., Jr., 4,900,417, Cl 204-192.210

Dalhart R & R Machine Works, Inc.: *See—*
Wood, Ray M., 4,899,943, Cl. 241-232.000.

Dallwig, Claus: *See—*
Becker, Herbert; Schelhorn, Gerhard; Dallwig, Claus; Poschl, Dieter; and Volk, Hans J., 4,900,960, Cl. 310-85.000.

Daly, John K.: *See—*
Bennett, Glenn E.; Bermier, Jr. Frank H., Daly, John K.; Grebe, Robert K.; Kreinberg, Earl R.; and Puerner, Dean A., 4,900,264, Cl. 439-391.000.

D'Amato, Salvatore F.; and Weitzen, Edward H., to American Bank Note Holographics, Inc. Embossed holograms formed on hard metal surfaces. 4,900,111, Cl. 350-3.850.

Damin, Bernard: *See—*
Denis, Jacques; Sillion, Bernard; Damin, Bernard, and Leger, Robert, 4,900,332, Cl. 44-62.000.

Damin Industries Inc.: *See—*
Mindel, David M., 4,899,396, Cl. 2-268.000.

Dandliker, Walter B.; Watson, W. Keith R.; and Drees, Thomas C., to International Therapeutics Inc. Perfluoro hexamethylenetetramine useful in synthetic blood. 4,900,824, Cl. 544-185.000.

Dandurand, Jean-Pierre. Solar compass and time indicator device. 4,899,451, Cl. 33-269.000.

D'Angelo, Charles; Baldoni, Joseph G., II; and Buljan, Sergej-Tomislav, to GTE Laboratories Incorporated. Chemical vapor deposition reactor for producing metal carbide or nitride whiskers 4,900,525, Cl. 422-245.000.

Danna, Gary F.: *See—*
Chance, Leon H.; Danna, Gary F.; and Andrews, Bethlehem K., 4,900,324. Cl. 8-116.400.

Danno, Atsushi *See—*
Ohmori, Toshihide; Kitamura, Kazuhiko; Kawamura, Masuhiko; Danno, Atsushi; Shirai, Tokuo; Sugiura, Yukio; and Nakane, Mitsuru, 4,900,459, Cl. 252-32.500.

Danton, John L.; Klaiber, Albert F., III; and Terboss, Richard A., to International Business Machines Corp. Drill spindle depth adjustment. 4,900,201, Cl. 408-129.000.

DAR Products Corporation: *See—*
Caruthers, Scott, 4,900,016, Cl 272-122.000.

Dara-Abrams, Benay P. Object-directed emotional resolution apparatus and method. 4,900,256, Cl. 434-236.000

Darlington, Alan D.: *See—*
McMurtry, David R.; Robertson, John P.; and Darlington, Alan D., 4,901,256, Cl. 364-560.000.

Darnopuk, Harry: *See—*
November, Daniel; Langley, William E.; Darnopuk, Harry; and Hectus, George V., 4,899,576, Cl. 73-59.000

Darovec, James L., to Aluminum Company of America. Tag for labeling an article cast from molten material, method therefore and article. 4,900,637, Cl. 428-577.000.

Das, Shyam C., to Digital Equipment Corporation. Method of producing a pole piece with improved magnetic domain structure. 4,900,650, Cl. 430-319.000.

Data General Corporation: *See—*
Harrington, David M.; McDaniel, John R.; Caldara, Steve A.; Lemone, Louis A.; Andrews, Kenneth R., Jr.; and Funk, Paul, 4,901,232, Cl. 364-200.000.
Vora, Chandra R.; Wiser, Donald C.; Hecker, Mark B.; and Murdoch, Robert N., 4,901,235, Cl. 364-200.000.

Dataproducts Corporation: *See—*
Ruggiero, Richard; Gardner, William R.; and Rogers, Robert L., 4,901,093, Cl. 346-140.00R.

Davenport, Theodore M.: *See—*
Martin, Terry G.; Newbold, George T.; and Davenport, Theodore M., 4,899,716, Cl. 124-41.00A.

Davis, Douglas W., to Roplas Sales Pty. Ltd. Slat assembled chair and method of assembly thereof. 4,900,090, Cl. 297-440.000.

Davis, James W.; Deal, Philip A.; Howard, Travis B.; and Marritt, Clifford R., to R. J. Reynolds Tobacco Company. Process for manufacturing cigarette rods. 4,899,765, Cl. 131-84.100.

Davis, Mark H.: *See—*
Bishop, Thomas P.; Davis, Mark H.; and Surratt, Grover T., 4,901,231, Cl. 364-200.000.

Davis, Michael A.: *See—*
Ryan, Patrick J.; Davis, Michael A.; and Melchior, Donald L., 4,900,540, Cl. 424-9.000.

Davis, Walter L.: *See—*
Herold, Barry W.; Tahernia, Omid; Davis, Walter L.; and Rivas, Mario A., 4,901,036, Cl. 331-25.000.

Davy McKee (Stockton) Limited: *See—*
Stamp, George W., 4,899,979, Cl. 251-58.000.

Day, Fleming H.: *See—*
Andrews, Walter R., Jr.; and Day, Fleming H., 4,900,496, Cl. 264-103.000.

Dayco Products-Eaglemotive, Inc.: *See—*
Settles, David J., 4,899,863, Cl. 192-110.00R.

Dayton, Hugh W.: *See—*
Richbourg, Henry L.; and Dayton, Hugh W., 4,899,468, Cl. 36-110.000.

Dayton, Roderick R.; Papp, Michael C.; and Tokos, Glenn T., to Bicron Corporation. Well logging detector with decoupling optical interface. 4,900,937, Cl. 250-483.100.

De Staat der Nederlanden Vertegenwoordigd door de Minister van Welzion, Volksgezondheid en Cultuur: *See—*
De Vries, Petra; van Wezel, Antonius L., deceased; and Beuvery, Eduard C., 4,900,549, Cl. 424-88.000.

Deal, Philip A.: *See—*
Davis, James W.; Deal, Philip A.; Howard, Travis B.; and Marritt, Clifford R., 4,899,765, Cl. 131-84.100.

Dean, Alan J.; and Hopper, Hans P., to British Petroleum Company p.l.c., The. Vertical oil separator. 4,900,433, Cl. 210-170.000.

Dean, Sheldon W., Jr.: *See—*
Brian, Pierre L. T.; and Dean, Sheldon W., Jr., 4,899,695, Cl. 122-4.00D.

Dean, Thomas R.: *See—*
Barnette, William E.; Dean, Thomas R.; Petersen, Wallace C.; and Wexler, Barry A., 4,900,353, Cl. 71-93.000.

Dean, William D.; Church, Robert F. R.; and Ridge, David N., to American Cyanamid Company. Novel intermediates and an improved process for producing the compound (3β,5α)-3-hydroxycholest-8(14)-en-15-one. 4,900,477, Cl. 260-397.400.

deBarbadillo, John J.: *See—*
Bell, James A. E.; and deBarbadillo, John J., 4,900,640, Cl. 428-633.000.

de Boer, Jan: *See—*
Tabankia, Farshid M. H.; and de Boer, Jan, 4,900,784, Cl. 525-67.000.

DebRoy, Tapan K.: *See—*
Chung, Ding Yu; and DebRoy, Tapan K., 4,900,415, Cl. 204-181.700.

De Bruyn, Gerard; and Ciecko, Daniel. Fuel injection rail manufacturing means and process. 4,899,712, Cl. 123-468.000.

Debus, Jurgen; Koch, Hans-Georg; Zachrei, Jurgen; and Butergerds, Helmut, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Switching box. 4,899,900, Cl. 220-4.00R.

de Carbon, Christian B. Piston assembly having an outer skirt and a spaced inner core. 4,899,855, Cl. 188-322.150.

DeCastro, Eugene A.; and Goodfriend, Roger, to Blackstone Ultrasonic, Inc. Device and technique for transurethral ultrasonic lithotripsy using a flexible ureteroscope. 4,899,733, Cl. 128-7.000.

Decorate-It!, Inc.: *See—*
Martinez, Angel R.; and Martinez, Frances M., 4,900,604, Cl. 428-79.000.

de Cremoux, Beaudoin: *See—*
Blondeau, Robert; Bourdin, Yannic; de Cremoux, Beaudoin; Papuchon, Michel; Krakowsky, Michel; Bensoussan, Alain; Razeghi, Manijeh; and Lozes, Francoise, 4,901,321, Cl. 372-7.000.

Deen, Andre : *See—*
de Hoog, Johannes H.; Deen, Andre ; and Wever, Peter J., 4,900,915, Cl. 250-222.200.

Deere & Company: *See—*
Hawbaker, Jerry B.; Kleinschrodt, Dave; and Eichhorst, Ryland H., 4,899,841, Cl. 180-9.520.

Deering, Michael F., to Schlumberger Technologies, Inc. Normal vector shading for 3-D graphics display system. 4,901,064, Cl. 340-729.000.

Deetz, David W.: *See*—
Bonne, Ulrich; Deetz, David W.; Lai, Juey H.; Odde, David J.; and Zook, J. David, 4,900,448, Cl. 210-637.000.

de Fries, Jan R. P.: *See*—
Ziegler, Heinrich; and de Fries, Jan R. P., 4,900,440, Cl. 210-321.680.

DeGooyer, Lonnie C. Spacer and fabric mesh reinforcement member for glass block masonry installation. 4,899,512, Cl. 52-396.000.

DeGraff, Alfred H. Convertible exercise cycle. 4,900,014, Cl. 272-73.000.

Degussa AG: *See*—
Domesle, Rainer; Engler, Bernd; Koberstein, Edgar; and Volker, Herbert, 4,900,517, Cl. 422-171.000.

Dehan, Gerard C. H.; Doublier, Michel G. A.; and Greiner, Gerard, to Societe Nationale D'Etude et de Construction de Moteurs d'Aviation "SNECMA". Turbojet fuel supply system with fuel recycling. 4,899,535, Cl. 60-39.080.

Dehls, Robert B.: *See*—
Beachy, Dale K.; Dehls, Robert B.; Owen, S. Hudson; and Simpson, James H., 4,899,932, Cl. 238-8.000.

Dehn, Karl R.: *See*—
Sanders, Donald J.; Bellin, Keith G.; and Dehn, Karl R., 4,900,384, Cl. 156-204.000.

de Hoog, Johannes H.; Deen, Andre ; and Wever, Peter J., to Heineken Technisch Beheer B.V. Method of counting articles supplied on a conveyor track in a random pattern. 4,900,915, Cl. 250-222.200.

Delaney, William C.: *See*—
Eskra, Michael D.; Delaney, William C.; and Bowen, Gerald K., 4,900,643, Cl. 429-241.000.

Delco Electronics Corporation: *See*—
Anderson, Fred J.; Kennedy, Richard A.; Manlove, Gregory J.; and Marrah, Jeffrey J., 4,901,350, Cl. 381-13.000.
May, Phillip A.; Wen, Cheng P.; Dunn, Douglas L.; and Ferry, Stephen J., 4,901,083, Cl. 342-128.000.

Delk, Joe H.: *See*—
Maxson, Wayne S.; Hargrove, Joel T.; and Delk, Joe H., 4,900,734, Cl. 514-171.000.

Dell, Hans-Dieter; Kraus, Reinhold; and Schierstedt, Detlef, to Troponwerke GmbH & Co. KG. Pellet formulation. 4,900,557, Cl. 424-452.000.

Del Leonardis, Demetrio: *See*—
Ruscitti, Tommaso; Cutilli, Davide; and Del Leonardis, Demetrio, 4,899,913, Cl. 222-385.000.

Delvco Industries, Inc.: *See*—
Weber, Paul; and Tannenbaum, Michael A., 4,899,883, Cl. 206-484.000.

Demarest, Gilbert: *See*—
Santalucia, Andre R. G.; and Demarest, Gilbert, 4,899,662, Cl. 102-505.000.

DeMars, Robert A. No spill lid. 4,899,902, Cl. 220-254.000.

Dempski, Robert E.; Scholtz, Edward C.; Nibbelink, Donald W.; and Reines, Scott A., to Merck & Co. Controlled release combination of carbidopa/levodopa. 4,900,755, Cl. 424-469.000.

Denain-Anzin Mineraux Refractaire Ceramique S.A.: *See*—
Volpi, Cariou F.; Predali, Jean-Jacques; and Raveneau, Philippe, 4,900,431, Cl. 209-166.000.

Denis, Jacques; Sillion, Bernard; Damin, Bernard; and Leger, Robert, to Institut Francais du Petrole; and Elf France. Nitrogenous copolymers, their preparation and use as additives for improving the pour properties of hydrocarbon middle distillates. 4,900,332, Cl. 44-62.000.

Dennis, Richard K., to Die Tech, Inc. Solder terminal. 4,900,279, Cl. 439-876.000.

Deo, Naresh C.: *See*—
Huguenin, Richard G.; Goldsmith, Paul F.; Deo, Naresh C.; and Walker, David K., 4,901,084, Cl. 342-179.000.

Depcik, Hans W., to Bayer Aktiengesellschaft. Filled plastic granulate. 4,900,600, Cl. 428-67.000.

DePetro, Gerald R., to General Motors Corporation. Headlamp assembly. 4,901,208, Cl. 362-66.000.

Derakhshani, Felora; and Gotcher, Ricky, to Weed Instrument Company, Inc. Multi-level sealing method. 4,900,486, Cl. 264-40.100.

Dern, Jean-Claude: *See*—
Leguet, Pierre L.; and Dern, Jean-Claude, 4,899,580, Cl. 73-148.000.

Derrick, John F., to Xerox Corporation. Sheet feeder for second pass copy substrate. 4,901,117, Cl. 355-309.000.

Derujinsky, Gleb. Integral seamless composite bicycle frame. 4,900,048, Cl. 280-281.100.

Desabrais, Sylvain: *See*—
Monette, Jean-Yves; and Desabrais, Sylvain, 4,901,344, Cl. 379-93.000.

Deschaine, Stephen A., to DSC Communications Corporation. Digital bridge for a time slot interchange digital switched matrix. 4,901,308, Cl. 370-58.100.

de Souza, Noel J.: *See*—
Kattige, Samba L.; Naik, Ramchandra G ; Lakdawalla, Aftab D.; Dohadwalla, Alihussein N.; Rupp, Richard H.; and de Souza, Noel J., 4,900,727, Cl. 514-212.000.

Dessertine, Albert L.; and Hudson, Thomas P. Compliance and patient status monitoring system and method. 4,899,839, Cl. 177-25.190.

DeStio, Paul: *See*—
Hochberg, Arie A.; Chacko, Varkki P.; and DeStio, Paul, 4,900,610, Cl. 428-195.000.

Detroit Neurosurgical Foundation: *See*—
Muller, George H., 4,899,762, Cl. 128-850.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Saad, Masoud; and Hahn, Bernd D., 4,900,928, Cl. 250-336.100.

Deutsche ITT Industries GmbH: *See*—
Mehrgardt, Sonke; and Ehrhardt, Dietmar, 4,901,151, Cl. 358-188.000.
Theus, Ulrich, 4,901,286, Cl. 365-230.010.

DeVilbiss Company, The: *See*—
Weinstein, Richard, 4,899,936, Cl. 239-224.000.

Devine, Michael P.: *See*—
Bosch, Daniel J.; Real, John D.; and Devine, Michael P., 4,899,815, Cl. 165-173.000.

de Vries, Luitzen, to Fokker Aircraft B.V. Control system for synchrophasing aircraft propellers. 4,900,226, Cl. 416-34.000.

De Vries, Petra; van Wezel, Antonius L., deceased (by van Wezel-Berendse, Cornelia M., administratrix); and Beuvery, Eduard C., to De Staat der Nederlanden Vertegenwoordigd door de Minister van Welzion, Volksgezondheid en Cultuur. Process for preparing immunogenic complexes and pharmaceutical composition containing these complexes. 4,900,549, Cl. 424-88.000.

Dewey, James; Pohl, Karl H.; and Brickley, Patrick J., to ADC Telecommunications, Inc. Test shoe. 4,901,206, Cl. 361-428.000.

Dexter, Amos C.; Lees, Michael I.; and Taylor, Barry J., to Electricity Council, The. Method and apparatus for thermochemical treatment. 4,900,371, Cl. 148-20.300.

Dhadwal, Harbans S.: *See*—
Chu, Benjamin; and Dhadwal, Harbans S., 4,899,575, Cl. 73-55.000.

Diamler-Benz AG: *See*—
Bruhnke, Ulrich; Duenas, Santiago; Fischer, Helmut; Greiner, Ferdinand; Jobmann, Ingo; Korber, Jurgen; Nothacker, Siegfreid; Pfaffenbach, Jurgen; and Trube, Hans, 4,899,612, Cl. 74-493.000.

DiBianca, Anthony J., to Xerox Corporation. Single pass color highlighting copying system. 4,901,100, Cl. 355-328.000.

Dickerson, Robert E.; Kelly, James E.; Diehl, Donald R.; and Factor, Ronda E., to Eastman Kodak Company. Radiographic element. 4,900,652, Cl. 430-502.000.

Dickins, John S., III; and Williamson, Thomas D., to Du Pont de Nemours, E. I., and Company. Yarn winding apparatus and process. 4,899,944, Cl. 242-35.50R.

Dickson, Glen A.; and Gray, Donnie R., to Ocean Wash, Inc. Chemical and method for bleaching textiles. 4,900,323, Cl. 8-111.000.

Didiergeorge, Pierre, to Schlumberger Industries. System for providing tickets with or without a stub. 4,900,174, Cl. 400-621.000.

Didion, Edward L.: *See*—
Parker, Terry S.; Saroka, Harold G.; Horton, Harold E.; Didion, Edward L.; Lyle, Elmer; and Crouse, Randall L., 4,901,340, Cl. 379-60.000.

Die Tech, Inc.: *See*—
Dennis, Richard K., 4,900,279, Cl. 439-876.000.

Diederich, Paul W. Fan clutch mechanism. 4,899,860, Cl. 192-58.00B.

Diedrich, James G. Paint removal system. 4,900,364, Cl. 134-4.000.

Diehl, Donald R.: *See*—
Dickerson, Robert E.; Kelly, James E.; Diehl, Donald R.; and Factor, Ronda E., 4,900,652, Cl. 430-502.000.
Factor, Ronda E.; and Diehl, Donald R., 4,900,653, Cl. 430-522.000.

Diehl, Karl-Heinz, to Schulke Mayr, GmbH. Salts of alkyl-2-benzimidazole-carbamate and fungicidal compositions thereof suitable for paints and plaster. 4,900,736, Cl. 514-245.000.

Diesel Kiki Co., Ltd.: *See*—
Miyanaga, Choshich; and Yokomizo, Kanji, 4,901,181, Cl. 361-33.000.

Digital Equipment Corporation: *See*—
Das, Shyam C., 4,900,650, Cl. 430-319.000.

DiGiulio, Peter C., to Pitney Bowes Inc. Electronic postage meter having a memory map decoder. 4,901,273, Cl. 364-900.000.

DiLuzio, Nicholas M., legal representative: *See*—
Williams, David L.; Browder, I. William; and DiLuzio, Nicholas R., deceased, 4,900,722, Cl. 514-54.000.

DiLuzio, Nicholas R., deceased: *See*—
Williams, David L.; Browder, I. William; and DiLuzio, Nicholas R., deceased, 4,900,722, Cl. 514-54.000.

Dimijian, Berge A., to Dimijian, Berge A.; and Beverly Rodeo Development Corporation, a part interest. Ice forming apparatus. 4,899,548, Cl. 62-138.000.

Dimmick, Henry M.; and Spryn, Richard A., to American Glass Research, Inc. Apparatus and an associated method for leak and volume inspection of containers. 4,899,573, Cl. 73-49.200.

Disch, Karlheinz: *See*—
Bansemir, Klaus; Disch, Karlheinz; Hachmann, Klaus; Lehmann, Rudolf; Biermann, Manfred; and Schnegelberger, Harald, 4,900,721, Cl. 514-25.000.

Dissinger, Thomas E. Exercise device. 4,900,015, Cl. 272-116.000.

Dixon, Melvyn; Olsson, Nils A.; Tench, Robert E.; and Tzeng, Liang, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Polarization insensitive optical communication device utilizing optical preamplification. 4,900,917, Cl. 250-225.000.

Djabbarah, Nizar F., to Mobil Oil Corporation. Miscible oil recovery process using carbon dioxide and alcohol. 4,899,817, Cl. 166-252.000.

DLH Industries, Inc.: *See*—
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Gibson, Guy P. Traffic counter apparatus for selective lane use. 4,901,334, Cl. 377-9.000.
Gibson, John M.; Hensel, John C.; Levi, Anthony F.; and Tung, Raymond T., to American Telephone & Telegraph Co., AT&T Bell Labs. Semiconductor device comprising a perforated metal silicide layer. 4,901,121, Cl. 357-15.000.
Gigl, Paul D.: *See—*
Slutz, David E.; Gigl, Paul D.; Flood, Gary M.; and Smith, Gary W., 4,899,922, Cl. 228-121.000.
Gilbert, Leamon A. Doorknob security device. 4,899,564, Cl. 70-428.000.
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Gill, Steven S.; and Jackson, Joseph F. Expansible cannula. 4,899,729, Cl. 128-3.000.

Gillard, Clive H.: *See—*
Harradine, Vincent C.; and Gillard, Clive H., 4,901,145, Cl. 358-105.000.

Gillery, Frank H., to PPG Industries, Inc. High performance multilayer coatings. 4,900,633, Cl. 428-432.000.

Gillespie, Jay D.: *See—*
Ostrowski, Henry S.; Goodwin, Roy D.; Jackson, William C.; and Gillespie, Jay D., 4,900,619, Cl. 428-284.000.

Gillies, Peter J.: *See—*
Billheimer, Jeffrey T.; Gillies, Peter J.; and Wilkerson, Wendell W., 4,900,744, Cl. 514-398.000.

Giovanella, Wilfred J., to Tintoretto Inc. Method of transfer of film to video and system therefor. 4,901,161, Cl. 358-346.000.

Girard, Leland K.; and Hinchcliffe, Robert L. Simulated food product carrier. 4,899,881, Cl. 206-457.000.

Giraudo, Claudio: *See—*
Chiri, Chiaffredo; Gianoglio, Pierino; Giraudo, Claudio; Marengo, Sergio; and Zaino, Giovanni, 4,899,720, Cl. 125-21.000.

Gitchev, Chavdar L.: *See—*
Kostov, Georgi D.; Gargov, Bogoya G.; Gitchev, Chavdar L.; and Kostova, Sophya G., 4,900,097, Cl. 301-63.0PW.

Glaceries De Saint - Roch S.A.: *See—*
Mairlot, Henri, 4,899,507, Cl. 52-222.000.

Glang, Siegfried; and Grabe, Werner, to Phoenix Aktiengesellschaft. Sealing profile. 4,900,607, Cl. 428-131.000.

Glascock, Homer H., II: *See—*
Neugebauer, Constantine A.; Levinson, Lionel M.; Glascock, Homer H., II; Eichelberger, Charles W.; Wojnarowski, Robert J.; and Carlson, Richard O., 4,901,136, Cl. 357-75.000.

Glasser, Lance A.: *See—*
Sano, Jun-ichi; Mazin, Moshe; and Glasser, Lance A., 4,901,285, Cl. 365-230.010.

Glauder, Jan: *See—*
Konig, Wolfgang; Mullner, Hubert; and Glauder, Jan, 4,900,658, Cl. 435-4.000.

Glaverbel: *See—*
Terneu, Robert; and Van Cauter, Albert, 4,900,634, Cl. 428-432.000.

Glaxo Group Limited: *See—*
Phillipps, Gordon H.; Bailey, Esme J.; and Lester, Michael G., 4,900,737, Cl. 514-279.000.

Glazier, Scott A.: *See—*
Arnold, Mark A.; and Glazier, Scott A., 4,900,404, Cl. 204-1.00T.

Gleixner, Ronald: *See—*
Adam, Peter; and Gleixner, Ronald, 4,899,432, Cl. 29-596.000.

Glenn, Joseph G.; and Hamil, David L., to United States of America, Air Force. Automated spall panel analyzer. 4,901,361, Cl. 382-18.000.

Glidden Company, The: *See—*
Hahn, Kenneth G., Jr.; and Craun, Gary P., 4,900,592, Cl. 427-375.000.

Gloanec, Maurice; Jarry, Jacques; and Lailler, Jean L., to Thomson Hybrides et Microondes. Circuit for measuring the dynamic characteristics of a package for high-speed integrated circuits and a method for measuring said dynamic characteristics. 4,901,012, Cl. 324-158.00R.

Globe-Union Inc.: *See—*
Eskra, Michael D.; Delaney, William C.; and Bowen, Gerald K., 4,900,643, Cl. 429-241.000.

Glory Kogyo Kabushiki Kaisha: *See—*
Kusatani, Sadatoshi; and Nakashima, Toru, 4,901,016, Cl. 324-210.000.

Godbersen, Byron L. Boat trailer frame assembly. 4,900,051, Cl. 280-414.100.

Godbersen, Byron L. Boat trailer hull support swivel roller cluster. 4,900,216, Cl. 414-534.000.

Goddard, William H.: *See—*
Vandemoere, Alan V.; Goddard, William H.; and Lyon, Ralph M., 4,901,097, Cl. 354-295.000.

Goehring, Richard A.: *See—*
Spaulding, Mark F.; and Goehring, Richard A., 4,900,199, Cl. 406-14.000.

Goggans, William E., Jr.: *See—*
Morris, Robert E.; Witherspoon, Clark D.; and Goggans, William E., Jr., 4,900,301, Cl. 604-23.000.

Gohara, Yoshihiro: *See—*
Kobayashi, Yoshinori; Uemura, Tsuyoshi; Gohara, Yoshihiro; and Wakita, Naohide, 4,901,066, Cl. 340-805.000.

Golban, Evgeny G.: *See—*
Sivachenko, Leonid A.; Kurguzikov, Alexandr M.; Moiseenko, Vladimir V.; Bochkov, Sergei L.; Golban, Evgeny G.; and Lescheva, Maria V., 4,899,941, Cl. 241-134.000.

Gold, Raymond: *See—*
Roberts, James H.; and Gold, Raymond, 4,900,935, Cl. 250-472.100.

Gold Stake: *See—*
Lang, Paul W.; and Gribshaw, Franklin C., 4,901,140, Cl. 358-64.000.

Goldburt, Efim S.; Hemmer, Richard E.; McKinlay, James K.; and Bronnes, Robert L., to North American Philips Corporation. Method of metallizing silica-containing gel and solid state light modulator incorporating the metallized gel. 4,900,136, Cl. 350-360.000.

Goldsmith, Paul F.: *See—*
Huguenin, Richard G.; Goldsmith, Paul F.; Deo, Naresh C.; and Walker, David K., 4,901,084, Cl. 342-179.000.

Goldstar Co., Ltd.: *See—*
Yuk, Geun J., 4,900,988, Cl. 315-411.000.

Goldstart Co., Ltd.: *See—*
Yook, Keun J., 4,901,156, Cl. 358-243.000.

Gollmar, Klaus; and Jenemann, Gerhard, to Daimler-Benz AG. Method for improving the reliability of voice controls of function elements and device for carrying out this method. 4,901,354, Cl. 381-110.000.

Golovko, Viktor A.: *See—*
Valts, Semen P.; Golovko, Viktor A.; Stepanenko, Alexei N.; Tetior, Alexandr N.; Fen, Karim P.; Lekhno, Alexandr M.; Barykin, Boris J.; Altunin, Vitaly L.; Pekarsky, Valentin V.; and Meleshko, Georgy K., 4,899,502, Cl. 52-169.400.

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Valts, Semen P.; Golovko, Viktor A.; Stepanenko, Alexei N.; Tetior, Alexandr N.; Fen, Karim P.; Lekhno, Alexandr M.; Barykin, Boris J.; Altunin, Vitaly L.; Pekarsky, Valentin V.; and Meleshko, Georgy K., 4,899,502, Cl. 52-169.400.

Good, Dave. Low-profile hydraulic lift. 4,899,985, Cl. 254-8.00B.

Goodes, Christopher G.; Wellwood, Grant A.; and Hayden, Howard W., Jr., to Comalco Aluminum Limited. Recovery of fluoride values from waste materials. 4,900,535, Cl. 423-484.000.

Goodfriend, Roger: *See—*
DeCastro, Eugene A.; and Goodfriend, Roger, 4,899,733, Cl. 128-7.000.

Goodman, Mark M.; and Knapp, Furn F., Jr., to United States of America, Energy. Radiohalogenated thienylethylamine derivatives for evaluating local cerebral blood flow. 4,900,539, Cl. 424-1.100.

Goodman, Michael G., to Scripps Clinic and Research Foundation. Modulation of animal cellular responses with compositions containing isoxanthopterin-8-(1'-β-aldoglycosidyl) derivatives. 4,900,675, Cl. 435-240.270.

Goodwin, Roy D.: *See—*
Ostrowski, Henry S.; Goodwin, Roy D.; Jackson, William C.; and Gillespie, Jay D., 4,900,619, Cl. 428-284.000.

Goodyear Tire & Rubber Company, The: *See—*
Johnson, David W., 4,899,868, Cl. 198-520.000.

Goossens, Andre : *See—*
Burgdorf, Jochen; Reinartz, Hans D.; Steffes, Helmut; Volz, Peter; and Goossens, Andre , 4,900,105, Cl. 303-116.000.

Gorecki, Benedict F.: *See—*
Johnson, Donald H.; and Gorecki, Benedict F., 4,899,411, Cl. 12-142.00R.

Gossler, Gerhard: *See—*
Schreder, Felix; and Gossler, Gerhard, 4,900,899, Cl. 219-464.000.

Gotcher, Ricky: *See—*
Derakhshani, Felora; and Gotcher, Ricky, 4,900,486, Cl. 264-40.100.

Goto, Tsutomu: *See—*
Inami, Toshihide; and Goto, Tsutomu, 4,899,593, Cl. 73-861.120.

Gotoh, Toshihiko: *See—*
Ozawa, Naohiro; Shimizu, Hiroshi; Gotoh, Toshihiko; Hamma, Kentaro; Okunomiya, Seizi; Nomura, Takeshi; and Shiraishi, Mikio, 4,901,090, Cl. 346-76.0PH.

Gottshling, Walter: *See—*
Murata, Tsuneo; and Gottshling, Walter, 4,901,051, Cl. 338-25.000.

Govier, William C. Sunscreen composition. 4,900,541, Cl. 424-47.000.

Goyal, Ramesh C., to John Fluke Mfg. Co., Inc. Variable duty cycle window detecting analog to digital converter. 4,901,078, Cl. 341-163.000.

Grabbe, Dimitry G.: *See—*
Hnatuck, Robert J.; Cohen, Thomas S.; and Grabbe, Dimitry G., 4,900,258, Cl. 439-63.000.

Grabe, Werner: *See—*
Glang, Siegfried; and Grabe, Werner, 4,900,607, Cl. 428-131.000.

Gracer, Franklin: *See—*
Fitzgerald, William J.; Gracer, Franklin; and Wolfe, Robert N., 4,901,252, Cl. 364-522.000.

Graco Robotics, Inc.: *See—*
Fender, Norman, 4,899,602, Cl. 73-865.900.

Gradient Lens Corporation: *See—*
Atkinson, Leland G., III; Moore, Duncan T.; and Zinter, J. Robert, 4,900,138, Cl. 350-413.000.

Graf, Hans P., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Computational network. 4,901,271, Cl. 364-807.000.

Grah, Klaus; Korsten, Gunter; and Schauf, Werner. Process for the electrostatic lacquering of printed circuit boards. 4,900,580, Cl. 427-33.000.

Graham, John A.: *See—*
Beckman, Kenneth A.; and Graham, John A., 4,900,162, Cl. 374-132.000.

Grandadam, Jean A., to Roussel Uclaf. Zootechnical compositions. 4,900,735, Cl. 514-171.000.

Granelli, Franco: *See—*
Menicatti, Sergio; Miola, Cesare; and Granelli, Franco, 4,899,813, Cl. 165-133.000.

Graphoplast S.p.A.: *See—*
Piana, Ivana; and Piana, Silvano, 4,899,474, Cl. 40-316.000.

Graton, Michel; and Alas, Jacques, to Valeo. Torsion damping device with a centring ring member. 4,899,862, Cl. 192-106.200.

Graus, Andreas; and Schutzler, Michael, to Sartorius GmbH. Small filter and method of its manufacture. 4,900,441, Cl. 210-321.840.

Gray, Donnie R.: *See—*
Dickson, Glen A.; and Gray, Donnie R., 4,900,323, Cl. 8-111.000.

Gray, Henry F.; and Greene, Richard F., to United States of America, Navy. Field emitter array integrated distributed amplifiers. 4,901,028, Cl. 330-54.000.

Great Lakes Frozen Foods, Inc.: *See—*
Bakker, James L.; Uebersax, Mark A., Kowal, Anthony P.; McGinnis, Richard K.; and Williams, David, 4,900,578, Cl. 426-634.000.

Grebe, Robert K.: *See—*
Bennett, Glenn E.; Bermier, Jr Frank H.; Daly, John K., Grebe, Robert K., Kreinberg, Earl R.; and Puerner, Dean A., 4,900,264, Cl. 439-391.000.

Green, Charles J.: *See—*
Morris, John M.; Gabrlik, Zdenek; and Green, Charles J., 4,899,786, Cl. 137-637.050.

Green, Guerry E. Screen retainer strip assembly. 4,899,797, Cl. 160-395.000.

Green, James R., to Du Pont de Nemours, E. I., and Company. Comfortable fabrics of high durability. 4,900,613, Cl. 42-225.000.

Greenburg, James E.: *See—*
Espasandin, Timothy M.; and Greenburg, James E., 4,899,895, Cl. 211-71.000.

Greene, Richard F.: *See—*
Gray, Henry F.; and Greene, Richard F., 4,901,028, Cl. 330-54.000.

Greenlee Textron Inc.: *See—*
Adleman, Larry, 4,899,447, Cl. 30-360.000.

Gregory, Edward J.; Felton, John; and Cooper, Frank T., to Marston Palmer Limited. Condensing surface for heat exchanger with fins arranged to drip condensate onto one side only. 4,899,808, Cl. 165-1.000.

Gregory, Thomas D.: *See—*
Winterton, Richard C.; Hoffman, Ronald J., and Gregory, Thomas D., 4,900,354, Cl. 556-70.000.

Greiner, Ferdinand: *See—*
Bruhnke, Ulrich; Duenas, Santiago; Fischer, Helmut; Greiner, Ferdinand; Jobmann, Ingo; Korber, Jurgen; Nothacker, Siegfreid; Pfaffenbach, Jurgen; and Trube, Hans, 4,899,612, Cl. 74-493.000.

Greiner, Gerard: *See—*
Dehan, Gerard C. H.; Doublier, Michel G. A., and Greiner, Gerard, 4,899,535, Cl. 60-39.080.

Gresens, Harry, to Bruckner Trockentechnik GmbH & Co. KG. Tensioning machine for the heat treatment of textile fabric. 4,899,427, Cl. 26-92.000.

Gressel, Jonathan; Aviv, Dvora; and Perl, Avihai, to Yeda Research and Development Co. Ltd. Method of producing herbicide resistant plant varieties and plants produced thereby. 4,900,676, Cl. 435-240.490.

Gribshaw, Franklin C.: *See—*
Lang, Paul W.; and Gribshaw, Franklin C., 4,901,140, Cl. 358-64.000.

Gridley, Michael; and Kalweit, Hans-Ulrich, to ANT Nachrichtentechnik GmbH. Arrangement for orderly guidance of cable ends. 4,900,265, Cl. 439-449.000.

Grieb, Donald L. Foam cement highway sound barrier. 4,899,498, Cl. 52-144.000.

Griffith, James M.: *See—*
Pope, Joseph L., Jr.; Griffith, James M., Gessert, James M.; Maciel, Mario; and Zalesky, Paul, 4,899,757, Cl. 128-662.060.

Grim, James W.: *See—*
Perkins, Jimmie G.; and Grim, James W., 4,900,235, Cl. 417-315.000.

Grimm, Peter: *See—*
Metzger, Andre; Grimm, Peter; Nohl, Andre J., and Nau, Vance J., 4,900,683, Cl. 436-179.000.

Grob, James T., and Kinch, John M., to Frymaster Corporation, The. Deep fat frying apparatus having an improved cooking fluid filtration system. 4,899,649, Cl. 99-408.000.

Groenendaal, John C., Jr., to Westinghouse Electric Corp. Steam turbine. 4,900,223, Cl. 415-190.000.

Groeneveld, Michiel J.: *See—*
Zuideveld, Pieter L.; and Groeneveld, Michiel J., 4,900,340, Cl. 55-208.000.

Grollier, Jean F., to L'Oreal. Dye composition for human keratinous fibres in the form of foam, based on 5,6-dihydroxyindole. 4,900,326, Cl. 8-409.000.

Grollman, Jack D., to Triangle Container Corporation. Self-erecting container with removable section. 4,899,929, Cl. 229-122.100.

Gross, Gunter, to Hoffmann-La Roche Inc. Novel retinoids. 4,900,478, Cl. 260-408.000.

Gross, Herbert *See—*
Schafer, Norbert; Weimer, Eugen; Gross, Herbert; Eppli, Bernd; and Rossow, Eberhard, 4,900,932, Cl. 250-397.000.

Gross, Joseph, to Hair Remover Ltd. Device for removing hair. 4,899,748, Cl. 606-133.000.

Grumman Aerospace Corporation: *See—*
Lom, Kwok-kelm, 4,900,128, Cl. 350-162.130.
Romanelli, Marcello J.; and Otterstedt, Paul J., 4,899,543, Cl. 60-527.000.
Schreiber, Heinz H., and O'Connor, Martin G., 4,901,082, Cl. 342-89.000.

Grumman Corporation: *See—*
Pengelly, Raymond S., 4,901,041, Cl. 333-33.000.

Gruner, Heiko: *See—*
Hodes, Erich; Engel, Ulrich; and Gruner, Heiko, 4,900,639, Cl. 428-610.000.

Grutzner, John B.; and Pellechia, Perry J., to Purdue Research Foundation. Vortex stabilized electrophoretic separation apparatus. 4,900,421, Cl. 204-299.00R.

Grzybowski, John D. Portable barbeque lighter. 4,901,196, Cl. 361-266.000.

GSI Corporation: *See—*
Sainsbury, John D.; and Karkow, Edward, 4,900,266, Cl. 439-451.000.

GT Development Corporation: *See—*
Morris, John M.; Gabrlik, Zdenek; and Green, Charles J., 4,899,786, Cl. 137-637.050.

GTE Laboratories Incorporated: *See—*
D'Angelo, Charles; Baldoni, Joseph G., II; and Buljan, Sergej-Tomislav, 4,900,525, Cl. 422-245.000.

GTE Mobilnet, Incorporated: *See—*
Miller, Harmon R.; Smith, William J.; Stanley, Hollie M., Jr.; and Smith, William J., 4,899,500, Cl. 52-146.000.
Parker, Terry S.; Saroka, Harold G.; Horton, Harold E.; Didion, Edward L.; Lyle, Elmer; and Crouse, Randall L., 4,901,340, Cl. 379-60.000.

GTE Products Corporation: *See—*
Barlow, Robert W.; and Cooper, David A., 4,900,123, Cl. 350-96.200.
Lynch, Thomas M., 4,900,269, Cl. 439-499.000.
Ritsko, Joseph E.; Johnson, Walter A.; and Kopatz, Nelson E., 4,900,587, Cl. 427-216.000.
Ritsko, Joseph E.; Johnson, Walter A.; and Kopatz, Nelson E., 4,900,590, Cl. 427-216.000.

Guadagno, Janine P.: *See—*
Bhat, Ramachandra K.; Guadagno, Janine P.; and Duncan, Clarence E., 4,899,453, Cl. 33-348.000.

Guardian Technologies, Inc.: *See—*
Comeau, Felix J. E.; Quast, Herman; and Jewitt, Jeffrey C., 4,901,058, Cl. 340-576.000.
Fuller, Kip L., 4,900,514, Cl. 422-84.000.

Guder, Hans-Joachim: *See—*
von der Eltz, Herbert; Guder, Hans-Joachim; and Muhlegger, Klaus, 4,900,822, Cl. 544-102.000.

Gudmundsson, Per E. W.; Lindstrom, Alf I.; and Berg, Jan-Erik, to Sunds Defibrator Aktiebolag. Arrangement for liquid treatment of pulp. 4,900,400, Cl. 162-308.000.

Guenther, Martin; and Rupp, Lothar, to Hewlett-Packard Company. Method for manufacturing a measuring probe. 4,900,381, Cl. 156-90.000.

Guesdon, Jean-Luc; Avrameas, Stratis; and Mazie, Jean-Claude, to Institut Pasteur Paris; and Centre National de la Recherche Scientifique (CNRS). Method for immunological determination of amines, monoclonal antibodies and kit of reagents for carrying out the method. 4,900,661, Cl. 435-7.000.

Gugelmeyer, Robert J.: *See—*
Colleran, Stephen A.; Geib, Lawrence E.; Gugelmeyer, Robert J.; and Wilson, Bill B., 4,900,271, Cl. 439-595.000.

Guglielmo, Giorgio; and Gamberetto, Gian P., to Ausimont S.p.A. Process for the preparation of fluorohalogenated ethers starting from fluorooxy-compounds and halogenated olefins. 4,900,872, Cl. 568-684.000.

Guimier, Michel S.; Kapala, Patrick; and Paris, Philippe, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Turbo-engine exhaust gas housing with temperature control device. 4,900,220, Cl. 415-136.000.

Gumaste, Anand V.; and Tsals, Izrail, to Caterpillar Inc. Apparatus for measuring torque applied to a shaft. 4,899,598, Cl. 73-862.360.

Gurit Essex AG: *See—*
Halg, Paul; and Rohrer, Paul, 4,900,601, Cl. 428-68.000.

Gustavsberg VVS Aktiebolag: *See—*
Andersson, Erland; and Skonvall, Tage, 4,899,511, Cl. 52-292.000.

Gustin, Craig R.: *See—*
Swisher, George W., Jr.; Gustin, Craig R.; and Murray, Stuart W., 4,900,186, Cl. 404-105.000.

Guy, Joseph T.: *See—*
Cooper, John C.; Panayappan, Ramanathan; and Guy, Joseph T., 4,900,715, Cl. 505-1.000.

H. Flude & Co. (Hinckley) Limited: *See—*
Humphreys, John C., 4,899,676, Cl. 112-121.150.

H.S.M. Concepts: *See—*
Maras, Henry S., 4,899,646, Cl. 98-99.100.

Haag, Werner O.; and Palermo, Robert E., to Mobil Oil Corp. Polar lubricating fluid and a method for its synthesis. 4,900,462, Cl. 252-52.00R.

Haake-Fisons Instruments, Inc.: *See—*
November, Daniel; Langley, William E.; Darnopuk, Harry; and Hectus, George V., 4,899,576, Cl. 73-59.000.

Haas, Daniel D., to Eastman Kodak Company. Method of scanning. 4,900,130, Cl. 350-321.000.

Haas, Luis-Dieter, to Licentia Patent-Verwaltungs GmbH. Radiation detection device. 4,900,929, Cl. 250-338.100.

Habegger, Ernst: *See—*
Wengmann, Bernd; and Habegger, Ernst, 4,900,010, Cl. 272-3.000.

Haberle, Norman; and Reutter, Anneliese, to Dow Chemical Company, The. 3-halosuccinimides. 4,900,840, Cl. 548-545.000.

Habermann, Harley R.; and Karow, Gerald D., to Messer-Griesheim Industries, Inc. Breakaway tool assembly. 4,899,993, Cl. 266-77.000.

Habrard, Alain G. J.: *See—*
Gastebois, Philippe M. D., Habrard, Alain G. J.; and Picard, Jean L., 4,899,539, Cl. 60-261.000.

Hachmann, Klaus: *See—*
Bansemir, Klaus; Disch, Karlheinz; Hachmann, Klaus; Lehmann, Rudolf; Biermann, Manfred; and Schnegelberger, Harald, 4,900,721, Cl. 514-25.000.

Hackett, Larry. Lathe and indexing jig for table saws. 4,899,795, Cl. 144-138.000.

Hacknauer, Frank; and Corby, Kenneth D., to Eastman Kodak Company. Container for electrostatographic toner or developer. 4,899,690, Cl. 118-653.000.

Hackney wholesale: *See—*
Brunkan, B. J., 4,899,991, Cl. 256-69.000.

Hackstein, Karl G.: *See—*
Hezel, Rudolf; and Hackstein, Karl G., 4,900,369, Cl. 136-255.000

Haedicke, Erich: *See—*
Werner, Arend; Hibst, Hartmut; Haedicke, Erich, and Kronenbitter, Johann, 4,900,397, Cl. 156-643.000.

Hafener, Klaus: *See—*
Ball, Peter; Marquardt, Klaus; Selig, Manfred, and Hafener, Klaus, 4,900,777, Cl. 524-819.000.

Hafner, Klaus: *See—*
Maassen, Jurgen; and Hafner, Klaus, 4,899,996, Cl. 267-140.100

Hagaman, Robert T.: *See—*
Ying, Sui-Chun; and Hagaman, Robert T., 4,900,964, Cl. 310-215.000.

Hahn, Andreas: *See—*
Frank, Frank; Hengst, Thomas; and Hahn, Andreas, 4,900,122, Cl. 350-96.200.

Hahn, Bernd D.: *See—*
Saad, Masoud; and Hahn, Bernd D., 4,900,928, Cl. 250-336.100.

Hahn, David T.: *See—*
Titlow, Joseph D.; Brost, Wilmut, and Hahn, David T., 4,899,588, Cl. 73-597.000.

Hahn, Kenneth G., Jr.; and Craun, Gary P., to Glidden Company, The. Ion-exchanged, crosslinking latex paints. 4,900,592, Cl. 427-375.000.

Hair Remover Ltd.: *See—*
Gross, Joseph, 4,899,748, Cl. 606-133.000.

Haiwara, Tarou: *See—*
Kumasaka, Hideyuki, Haiwara, Tarou; Nakamura, Katsumi; Miyazaki, Kenichi; Kuriyama, Hiroshi; Takao, Kouji, and Inoue, Keizo, 4,900,083, Cl. 296-197.000.

Hakamata, Naotoshi: *See—*
Suzuki, Susumu; Yagi, Sumio; Hakamata, Naotoshi; and Ozaki, Takeo, 4,901,238, Cl. 364-413.090.

Hakko Electric Co., Ltd.: *See—*
Shirae, Hiroshi; and Shirae, Shinichi, 4,900,900, Cl. 219-501.000.

Haldric, Bernard; Feucht, Pascal; and Fernand, Christian, to NACAM. Coupling device and the application thereof in particular in an automobile steering device. 4,900,178, Cl. 403-24.000.

Halg, Paul; and Rohrer, Paul, to Gurit Essex AG. Multi-layer body structure for the reinforcement of a panel and a method of reinforcing a panel. 4,900,601, Cl. 428-68.000.

Halim, Selfia: *See—*
Birman, Mark; Chu, George K.; Ware, Fred A.; and Halim, Selfia, 4,901,267, Cl. 364-736.000.

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Hikake, Norio; Kanda, Hitoshi; and Hyosu, Yoshihiko, to Canon Kabushiki Kaisha. Process for producing electrophotographic toner comprising micropulverization, classification and smoothing. 4,900,647, Cl. 430-137.000.
Hikita, Michiyasu; and Kawaguchi, Hatsuo, to Ishida Scales Mfg. Co., Ltd. Electronic scale system. 4,901,237, Cl. 364-464.010.
Hilgarth, Kurt, to Skischuhfabrik Dynafit Gesellschaft m.b.H. Device for securing a leg or leg cover on ski boots. 4,899,469, Cl. 36-120.000.
Hill, Kenneth O.; Johnson, Derwyn C.; Bilodeau, Francois; and Faucher, Sylvain, to Canadian Patents & Development Ltd. Wavelength selective optical devices using optical directional coupler. 4,900,119, Cl. 350-96.150.
Hill, Nigel K.: *See—*
Quastel, David A.; and Hill, Nigel K., 4,901,008, Cl. 324-117.00H.
Hilpert, Klaus: *See—*
Moormann, Rainer; Hilpert, Klaus; and Verfondern, Karl, 4,900,506, Cl. 376-314.000.
Hinchcliffe, Robert L.: *See—*
Girard, Leland K.; and Hinchcliffe, Robert L., 4,899,881, Cl. 206-457.000.
Hindle, Kurt J., to Smith & Wesson Corp. Reversible magazine catch mechanism for handguns. 4,899,476, Cl. 42-7.000.
Hinds, Carlos O. F.: *See—*
Eaglin, David; and Hinds, Carlos O. F., 4,899,968, Cl. 248-131.000.
Hino, Masumi: *See—*
Kitai, Mitsumasa; Katsuro, Yoshio; Kawamura, Shigenori; Hino, Masumi; and Sato, Keiichi, 4,900,843, Cl. 549-252.000.
Hinoto, Yuji: *See—*
Fujiki, Hironao; Okami, Takehide; and Hinoto, Yuji, 4,900,362, Cl. 106-287.140.
Hinton, James L.: *See—*
LaManna, Richard J.; Hinton, James L.; Cucksey, Edward L.; and Kull, Leo, 4,900,168, Cl. 400-130.000.
Hioki, Takanori; Inagaki, Yoshio; and Yabe, Masao, to Fuji Photo Film Co., Ltd. Optical information recording medium. 4,900,648, Cl. 430-270.000.
Hirabayashi, Tetsuya; and Takahashi, Mikio, to Kanzaki Paper Mfg. Co., Ltd. Method of producing cast coated paper using near-infrared radiation. 4,900,583, Cl. 427-55.000.
Hirai, Kentaro: *See—*
Matsumoto, Saichi; Doteuchi, Masami; Mizui, Takuji; and Hirai, Kentaro, 4,900,749, Cl. 514-334.000.
Hirai, Tadaaki: *See—*
Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, 4,900,975, Cl. 313-366.000.
Hirai, Toshio: *See—*
Matsuda, Toshitsugu; Nakae, Hiroyuki; and Hirai, Toshio, 4,900,526, Cl. 423-290.000.
Hirai, Yasuo; and Niwa, Toshio, to Kayaku Noury Corporation. Process for modifying addition polymerization plastics. 4,900,781, Cl. 525-387.000.
Hirakawa, Osamu: *See—*
Toshima, Takayuki; and Hirakawa, Osamu, 4,899,686, Cl. 118-50.000.
Hiramatsu, Rihei; Watanabe, Shigeo; Okumura, Yasuyuki; and Maruyama, Jun, to Yutaka Electric Mfg. Co., Ltd. Continuity angle controlled self-excited inverter circuit. 4,901,214, Cl. 363-19.000.
Hirano, Shigeaki; and Maekawa, HIrotoshi, to Mitsubishi Denki Kabushiki Kaisha. Fault diagnosis system for electronic devices on automobiles. 4,901,025, Cl. 324-537.000.
Hirata, Hiroki: *See—*
Sano, Akira; Yoshizumi, Motohiko; Hirata, Hiroki; Matsuura, Kazuo; and Suyama, Hisahiko, 4,900,790, Cl. 525-192.000.
Hirata, Yoshito: *See—*
Kudo, Shinichi; and Hirata, Yoshito, 4,900,961, Cl. 310-90.000.
Hironaka, Takashi: *See—*
Tan, Kazuo; Hironaka, Takashi; and Nakamura, Michio, 4,900,821, Cl. 540-540.000.
Hirose Electric Co., Ltd.: *See—*
Matsuzaki, Shuichi, 4,900,262, Cl. 439-354.000.
Hirose, Takeshi: *See—*
Nakazyo, Kiyoshi; Hirose, Takeshi; Hurusawa, Genichi; Takahashi, Osamu; Furutachi, Nobuo; and Kobayashi, Hidetoshi, 4,900,655, Cl. 430-546.000.

Hirota, Kazuo: *See—*
Akahane, Shoji; Tosaki, Satoshi; Hirota, Kazuo; and Tomioka, Kentaro, 4,900,697, Cl. 501-57.000.
Hirota, Ken: *See—*
Kugimiya, Koichi; Hirota, Ken; and Matsuyama, Kenichi, 4,900,393, Cl. 156-600.000.
Satomi, Mitsuo; Hirota, Ken; and Inoue, Osamu, 4,901,179, Cl. 360-126.000.
Hirschhorn, Richard S. Bolted steel staircase. 4,899,504, Cl. 52-182.000.
Hirst, Ian: *See—*
Blyth, Richard C.; Masters, Jeffrey J.; Hirst, Ian; and Gates, Leonard V., 4,900.005, Cl. 271-127.000.
Hiruma, Eikyuu: *See—*
Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, 4,900,975, Cl. 313-366.000.
Hitachi, Ltd.: *See—*
Fujikura, Nobuyuki; Morita, Hiroshi; Ikeda, Yoshihisa; and Sasaki, Ryoichi, 4,901,313, Cl. 370-104.100.
Inoue, Hiroaki; Katsuyama, Toshio; Matsumura, Hiroyoshi; Sakano, Shinji; and Nakamura, Hitoshi, 4,900,134, Cl. 350-354.000.
Ishida, Tomotoshi, 4,901,250, Cl. 364-521.000
Ishitani, Tohru Todokoro, Hideo; and Tamura, Hifumi, 4,900,974, Cl. 313-359.100.
Kagohata, Tsuneo; and Ito, Toshikazu, 4,899,930, Cl. 236-91.00F.
Kato, Takeshi; Mizuishi, Kenichi; Chiba, Katuaki; Nakao, Takeshi; Ojima, Masahiro; Nakamura, Shigeru; and Maeda, Takeshi, 4,901,325, Cl. 372-44.000.
Komatsu, Keiichi; Ozaki, Shinji; Masui, Hikaru; and Kubo, Ken, 4,901,297, Cl. 369-13.000.
Maeda, Akira; Sano, Koichi; Yokoyama, Tetsuo, and Koizumi, Hideaki, 4,901,021, Cl. 324-309.000.
Maejima, Yukihito; Shirasu, Hirotoshi; Suzuki, Taihei; Tokita, Yoshiaki; Tanabe, Shirou; and Morita, Takashi, 4,901,274, Cl. 364-900.000.
Misawa, Yutaka; and Saito, Osamu, 4,901,134, Cl. 357-67.000.
Nishikawa, Akio; Koyama, Toru; Asano, Hideki; and Narahara, Toshikazu, 4,900,807, Cl. 528-362.000.
Ozawa, Naohiro; Shimizu, Hiroshi; Gotoh, Toshihiko; Hamma, Kentaro; Okunomiya, Seizi; Nomura, Takeshi; and Shiraishi, Mikio, 4,901.090, Cl. 346-76.0PH.
Saeki, Junichi; Kaneda, Aizo; Ozawa, Masakazu; Nakagawa, Takashi; and Nishi, Kunihiko, 4,900,501, Cl. 264-272.170.
Sasayama, Takao; Suzuki, Seikoh; Suzuki, Toshitake; Miki, Masayuki; and Ueno, Sadayasu, 4,900,425, Cl. 204-426.000.
Sekizawa, Toshihiko; Matsumura, Hiroyuki; and Yasuda, Makoto, 4,900,992, Cl. 318-135.000.
Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, 4,900,975, Cl. 313-366.000.
Sunami, Hideo; Kure, Tokuo; Miyao, Masanobu; Kawamoto, Yoshifumi; Shimohigashi, Katsuhiro; Sakai, Yoshio, Minato, Osamu; Masuhara, Toshiaki; Koyanagi, Mitsumasa; and Shimizu, Shinji, 4,901,128, Cl. 357-23.600.
Takagi, Toshiyuki, 4,901,266, Cl. 364-723.000.
Takahashi, Takahiko; Itoh, Funikazu; Shimase, Akira; Yamaguchi, Hiroshi; Hongo, Mikio; and Haraichi, Satoshi, 4,900,695, Cl. 437-195.000.
Hitachi Microcomputer Engineering Ltd.: *See—*
Fujikura, Nobuyuki; Morita, Hiroshi; Ikeda, Yoshihisa; and Sasaki, Ryoichi, 4,901,313, Cl. 370-104.100.
Hitachi Video Engineering, Inc.: *See—*
Komatsu, Keiichi; Ozaki, Shinji; Masui, Hikaru, and Kubo, Ken, 4,901,297, Cl. 369-13.000.
Hitotsumachi, Shuzo, to Matsushita Electric Industrial Co., Ltd. Magnetic recording apparatus for recording video and two kinds of audio signals. 4,901,159, Cl. 358-330.000.
Hiyama, Keiichi: *See—*
Uehara, Masao; Kanno, Masahide; Saito, Katsuyuki; Uchikubo, Akinobu; Sasagawa, Katsuyoshi; Yamashita, Shinji, Kusumoto, Akira; Nakamura, Kazunari; Hattori, Shinichiro, Hiyama, Keiichi; Hasegawa, Jun; Sasaki, Masahiko; and Nakagawa, Takehiro, 4,901,143, Cl. 358-98.000.
Hlavka, Joseph J.: *See—*
Child, Ralph G.; Bitha, Panayota; Hlavka, Joseph J.; and Lin, Yang-I, 4,900,756, Cl. 514-492.000.
Hlawa, Fritz: *See—*
Schmidt, Lothar; Eberlein, Klaus; Schaich, Gerhard, and Hlawa, Fritz, 4,901.347, Cl. 379-279.000.
Hnatuck, Robert J.; Cohen, Thomas S.; and Grabbe, Dimitry G., to AMP Incorporated. Multi-port coaxial printed circuit board connector. 4,900,258, Cl. 439-63.000.
Ho, Chung-Yih; Molnar, Karl J.; and Staver, Daniel A., to General Electric Company. Versatile data shifter with sticky bit generation capability. 4,901,263, Cl. 364-715.080.
Hoaki, Kouji, to Seisan Gijutsu Center Co., Ltd.; and NKS Corporation. Method and apparatus for removing old pile. 4,900,198, Cl. 405-303.000.
Hobrecht, Alvin J. Rollguard. 4,900,058, Cl. 280-756.000.
Hochberg, Arie A.; Chacko, Varkki P.; and DeStio, Paul, to Hoechst Celanese Corporation. Polyester molding composition. 4,900,610, Cl. 428-195.000.
Hochstatter, Brian R.: *See—*
Rohde, William A.; Pletka, Joseph J.; Hochstatter, Brian R.; Kivioja, Olaf; and Otto, Thomas, 4,899,911, Cl. 222-103.000.
Hockney, Richard L.; Downer, James R.; Eisenhaure, David B.; Hawkey, Timothy J.; and Johnson, Bruce G., to SatCon Technology Corporation. Magnetic translator bearings. 4,900,962, Cl. 310-90.500.
Hodes, Erich; Engel, Ulrich; and Gruner, Heiko, to 501 Glyco-Metall-Werke Daelen; and Loos GmbH. Cladding of bearing metal and process for production thereof. 4,900,639, Cl. 428-610.000.
Hodgkiss, William, to General Electric Company, p.l.c., The. Data transmission systems. 4,901,333, Cl. 375-98.000.
Hoechst Aktiengesellschaft: *See—*
Bicker, Richard; Schrod, Manfred; and Militzer, Hans, 4,900,523, Cl. 423-236.000.
Kattige, Samba L.; Naik, Ramchandra G.; Lakdawalla, Aftab D.; Dohadwalla, Alihussein N.; Rupp, Richard H.; and de Souza, Noel J., 4,900,727, Cl. 514-212.000.
Konig, Wolfgang; Mullner, Hubert; and Glauder, Jan, 4,900,658, Cl. 435-4.000.
Schmidt, Erwin; and Keller, Reinhold, 4,900,863, Cl. 560-41.000.
Hoechst Celanese Corporation: *See—*
Hochberg, Arie A.; Chacko, Varkki P.; and DeStio, Paul, 4,900,610, Cl. 428-195.000.
Kohn, Rachel S., 4,900,621, Cl. 428-333.000.
Kohn, Rachel S., 4,900,623, Cl. 428-336.000.
Simons, Frank H.; and Black, Carl N., 4,899,678, Cl. 112-262.100.
Yang, Nan-Loh; Auerbach, Andrew; Paul, James L.; Pesce, Rose; and Wang, Shian S., 4,900,783, Cl. 525-412.000.
Hoechst-Roussel Pharmaceuticals, Inc.: *See—*
Effland, Richard C.; Klein, Joseph T.; and Kapples, Kevin J., 4,900,742, Cl. 514-343.000.
Hoeffkes, Horst: *See—*
Rose, David; Lieske, Edgar; Maak, Norbert; and Hoeffkes, Horst, 4,900,325, Cl. 8-408.000.
Wisotzki, Klaus-Dieter; Hoeffkes, Horst; and Hollenberg, Detlef, 4,900,545, Cl. 424-70.000.
Hoefner, Mark L.: *See—*
Jennings, Alfred R., Jr.; Hoefner, Mark L.; and Shu, Paul, 4,899,818, Cl. 166-270.000.
Hoekstra, Charles F. Cable anchoring apparatus. 4,899,499, Cl. 52-146.000.
Hoeven, Petrus C. J.: *See—*
Van Der Zande, Paulus C. M.; and Hoeven, Petrus C. J., 4,901,300, Cl. 369-47.000.
Hoever, Franz-Peter: *See—*
Kruger, Bernd-Wieland; Sasse, Klaus; Hoever, Franz-Peter; Nentwig, Gunther; and Behrenz, Wolfgang, 4,900,834, Cl. 546-245.000.
Hoffkes, Horst: *See—*
Ritter, Wolfgang; Tenhaef, Rolf; Hoffkes, Horst; and Seidel, Kurt, 4,900,543, Cl. 424-70.000.
Ritter, Wolfgang; Tenhaef, Rolf; Hoffkes, Horst; and Seidel, Kurt, 4,900,544, Cl. 424-70.000.
Hoffman, Keith E.; Geno, Wayne H.; and Weitzenhof, David A., to Bridgestone/Firestone, Inc. Clamp ring assembly for air spring. 4,899,995, Cl. 267-64.270.
Hoffman-La Roche Inc.: *See—*
Serafini, Siro; and Zagotto, Giuseppe, 4,900,859, Cl. 558-418.000.
Hoffman, Ronald J.: *See—*
Winterton, Richard C.; Hoffman, Ronald J.; and Gregory, Thomas D., 4,900,854, Cl. 556-70.000.
Hoffman, Thomas W., to Midrex International B.V. Process and apparatus for producing metallized pellets and scrubbing spent reducing gas. 4,900,356, Cl. 75-35.000.
Hoffmann, Gerhard; Huemmer, Wolfgang; Koch, Horst; and Littmann, Dieter, to BASF Aktiengesellschaft. Polymer ammonium salts. 4,900,795, Cl. 525-329.900.
Hoffmann-La Roche Inc.: *See—*
Buttiker, Jean-Pierre; and Klaiber, Max, 4,899,897, Cl. 215-228.000.
Chan, Ka-kong; and Saucy, Gabriel G., 4,900,476, Cl. 552-309.000.
Gross, Gunter, 4,900,478, Cl. 260-408.000.
Hoffmann-LaRoche Inc.: *See—*
Belica, Peter S.; Huang, Tai-Nang; Manchand, Percy S.; Partridge, John J.; and Tam, Steve, 4,900,828, Cl. 544-317.000.
Hohmann, Andreas: *See—*
Freudenberg, Enrique; Wittmer, Peter; Hohmann, Andreas; and Bechtolsheimer, Hans-Heinrich, 4,900,479, Cl. 260-408.000.
Hohner Elektrotechnik KG: *See—*
Riegger, Johannes; and Blochle, Walter, 4,901,014, Cl. 324-166.000.
Hoitink, Harry A., to Ohio State University Research Foundation, The. Production of disease suppresive compost and container media, and microorganism culture for use therein. 4,900,348, Cl. 71-6.000.
Hokao, Naomi, to Honda Sangyo Co., Ltd. Anti-weaving conveyor belt. 4,899,872, Cl. 198-840.000.
Holder, E. Paul: *See—*
Brown J. Michael; Sherwood, Stevn P.; and Holder, E. Paul, 4,900,451, Cl. 210-699.000.
Holland, Christine J.: *See—*
Dubrow, Robert S.; Holland, Christine J.; Chan, Randolph W.; Martin, Albert R.; Siden, Dennis C.; and Germeraad, Paul B., 4,900,877, Cl. 174-35.0GC.
Holland, Philo K., III. Athletic shoe. 4,899,470, Cl. 36-133.000.

Hollenberg, Detlef: *See—*
Wisotzki, Klaus-Dieter; Hoeffkes, Horst; and Hollenberg, Detlef, 4,900,545, Cl. 424-70.000.

Hollick, John C.: *See—*
Peter, Rolf W.; and Hollick, John C., 4,899,728, Cl. 126-428.000.

Holmes, David C.: *See—*
Brown, Mark D.; and Holmes, David C., 4,899,761, Cl. 128-781.000.

Holtmann, Wilhelm; Zellerhoff, Robert; Oberkobusch, Rudolf; Staglich, Peter; and Charpey, Bernhard, to Rutgerswerke AG. Recovery of 2,6-dialkyl-naphthalene isomers. 4,900,717, Cl. 505-812.000.

Holtsch, Ernst P., to Holtsch Metallwarenherstellung. Dispensing container with small premoisturized cloths. 4,899,905, Cl. 221-63.000.

Holtsch Metallwarenherstellung: *See—*
Holtsch, Ernst P., 4,899,905, Cl. 221-63.000.

Holub, Fred F.: *See—*
Abolins, Visvaldis; Betts, Joseph E.; Holub, Fred F.; and Lee, Gim F., Jr., 4,900,768, Cl. 524-141.000.

Holzhauer, Juergen K.: *See—*
Hussmann, Gregory P.; Holzhauer, Juergen K.; and Kuhlmann, George E., 4,900,865, Cl. 562-412.000.

Hommelwerke GmbH: *See—*
Ulbers, Gerd, 4,900,151, Cl. 356-358.000.

Honda Electric Co., Ltd.: *See—*
Kurata, Hisao, 4,901,291, Cl. 367-111.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Fukamachi, Masaaki; Onitsuka, Mobuyuki; Tanaka, Akira; and Nakamura, Kazuo, 4,901,053, Cl. 340-426.000.
Iino, Takashi, 4,899,542, Cl. 60-487.000.
Inoue, Kazuo; and Kishi, Noriyuki, 4,899,701, Cl. 123-90.160.
Kawaguchi, Masaaki, 4,899,613, Cl. 74-552.000.
Ozawa, Mituharu; Nagatsuma, Nobuyoshi; and Nagata, Naofumi, 4,899,437, Cl. 29-787.000.
Sasaki, Ichiro; and Ogano, Takeo, 4,899,471, Cl. 37-233.000.
Yagi, Toru; and Matsuki, Hideo, 4,899,597, Cl. 73-862.360.

Honda Lock Manufacturing Co., Ltd.: *See—*
Fukamachi, Masaaki; Onitsuka, Mobuyuki; Tanaka, Akira; and Nakamura, Kazuo, 4,901,053, Cl. 340-426.000.

Honda Sangyo Co., Ltd.: *See—*
Hokao, Naomi, 4,899,872, Cl. 198-840.000.

Honda, Yasuhiro: *See—*
Sakano, Hajime; Ito, Akitoshi; Yano, Motoichi; Honda, Yasuhiro; and Fujiwara, Takayoshi, 4,900,787, Cl. 525-71.000.

Honeycutt, Travis W., to Isolyser Co., Inc. Point-of-use infectious waste disposal system. 4,900,500, Cl. 264-263.000.

Honeywell Inc.: *See—*
Bonne, Ulrich; Deetz, David W.; Lai, Juey H.; Odde, David J.; and Zook, J. David, 4,900,448, Cl. 210-637.000.
Marshall, Charles M.; and McClelland, Jeffrey L., deceased, 4,900,943, Cl. 250-578.000.

Hongo, Mikio: *See—*
Takahashi, Takahiko; Itoh, Funikazu; Shimase, Akira; Yamaguchi, Hiroshi; Hongo, Mikio; and Haraichi, Satoshi, 4,900,695, Cl. 437-195.000.

Hoogovens Groep B.V.: *See—*
Janssen, Leonard J. J.; and Van Haastrecht, Gijsbertus C., 4,900,406, Cl. 204-28.000.

Hopkins, Bob C.; Wester, Randy J.; and Underwood, Don C., to FMC Corporation. Subsea well casing hanger packoff system. 4,900,041, Cl. 277-30.000.

Hopper, Hans P.: *See—*
Dean, Alan J.; and Hopper, Hans P., 4,900,433, Cl. 210-170.000.

Horewitch, Richard L. Burner assembly for heating chafing dishes. 4,899,722, Cl. 126-39.00H.

Horii, Sadashige; Haraguchi, Hideaki; and Chatani, Ayako, to Matsushita Electric Works, Ltd. Hand-held clipper for removing entangled fiber strands from the surface of fabrics. 4,899,442, Cl. 30-133.000.

Horikawa, Makoto, to Mitsubishi Jukogyo Kabushiki Kaisha. Air intake system of an aircraft. 4,899,958, Cl. 244-53.00B.

Horio, Kenji: *See—*
Otsuka, Akira; Horio, Kenji; and Tanioka, Tsuyoshi, 4,900,987, Cl. 315-169.400.

Horn, Michael F.: *See—*
Brame, J. Yancey; Horn, Michael F.; Saucier, Jeffrey A.; Siedman, David L.; Thomas, Emery G.; and Varnum, Robert L., 4,900,883, Cl. 200-83.00S.

Horne, Ruediger: *See—*
Becker, Horst-Peter; and Horne, Ruediger, 4,900,101, Cl. 303-110.000.

Horton, Harold E.: *See—*
Parker, Terry S.; Saroka, Harold G.; Horton, Harold E.; Didion, Edward L.; Lyle, Elmer; and Crouse, Randall L., 4,901,340, Cl. 379-60.000.

Horton, Norman P. Continuous pyrolysis system for tire shreds. 4,900,401, Cl. 202-117.000.

Hoshi, Toshio; and Okada, Noboru, to Komori Printing Machinery Co., Ltd. Wiping apparatus for intaglio printing press. 4,899,654, Cl. 101-167.000.

Hoshizaki Electric Co., Ltd.: *See—*
Minari, Katsunobu, 4,899,552, Cl. 62-352.000.

Hosotani, Shiro; Miki, Takahiro; and Kumamoto, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Voltage comparison apparatus. 4,900,952, Cl. 307-355.000.

Houck, Douglas L., to DLH Industries, Inc. Quick-connect fluid coupling. 4,900,065, Cl. 285-73.000.

Houtz, Bradley L. Putting stroke training device. 4,900,030, Cl. 273-183.00E.

Houzvic, Vladimir; and Jakl, Viri, to Jednotne Rolnicke Druzstvo Jedlova Vo Vysnej Jedlovej. Pressure indicating bottle stopper. 4,899,684, Cl. 116-272.000.

Howard, Alan N., to Howard Foundation, The. Confectionary product and a process for producing the same. 4,900,566, Cl. 426-72.000.

Howard Foundation, The: *See—*
Howard, Alan N., 4,900,566, Cl. 426-72.000.

Howard, Travis B.: *See—*
Davis, James W.; Deal, Philip A.; Howard, Travis B.; and Marritt, Clifford R., 4,899,765, Cl. 131-84.100.

Hower, Philip L.: *See—*
Weaver, Carson E.; and Hower, Philip L., 4,901,120, Cl. 357-15.000.

Hoyer, Daniel P.: *See—*
Whitescarver, Olin D.; Kwan, Jonathan T.; Chan, M. Kenneth; and Hoyer, Daniel P., 4,900,360, Cl. 106-97.000.

Hsu, Kuo H. Golf club handle sleeve assembling mechanism. 4,899,428, Cl. 29-235.000.

Huang, Ding S. Basic formula for active sketch pattern drawing in upper body tailoring. 4,899,448, Cl. 33-17.00R.

Huang, Huei-Huay; and Peng, Yu-Yin, to Chinese Petroleum Company; and Industrial Technology Research Institute. Low pressure injection system for injecting fuel directly into cylinder of gasoline engine. 4,899,699, Cl. 123-73.00C.

Huang, Tai-Nang: *See—*
Belica, Peter S.; Huang, Tai-Nang; Manchand, Percy S.; Partridge, John J.; and Tam, Steve, 4,900,828, Cl. 544-317.000.

Hubner, Thorger: *See—*
Bleimhofer, Walter; and Hubner, Thorger, 4,899,465, Cl. 36-14.000.

Huck Manufacturing Co.: *See—*
Sadri, Shahriar M., 4,900,205, Cl. 411-38.000.

Hudelmaier, Gerhard: *See—*
Waitzinger, Franz; and Hudelmaier, Gerhard, 4,900,154, Cl. 366-56.000.

Hudson, Thomas P.: *See—*
Dessertine, Albert L.; and Hudson, Thomas P., 4,899,839, Cl. 177-25.190.

Huehls, Patrick N.: *See—*
Kaufman, Stephen B.; Patterson, Robert; Bacehowski, David V.; Bilstad, Arnold C.; and Huehls, Patrick N., 4,900,321, Cl. 604-409.000.

Huemmer, Wolfgang: *See—*
Hoffmann, Gerhard; Huemmer, Wolfgang; Koch, Horst; and Littmann, Dieter, 4,900,795, Cl. 525-329.500.

Huffy Corporation: *See—*
Bishop, Stephen J.; and Melton, Michael D., 4,900,050, Cl. 280-281.100.

Huggins, Edward R. Open sight addition for a telescopic gun sight. 4,899,450, Cl. 33-245.000.

Huggins, Orville C.: *See—*
Sugiura, Ikuzo; Uchimura, Mitsuo; Kawamura, Kouichi; Fogle, Ronald L.; and Huggins, Orville C., 4,899,947, Cl. 242-68.300.

Hughes Aircraft Company: *See—*
Ichkhan, Elie J., 4,900,878, Cl. 174-258.000.
May, Phillip A.; Wen, Cheng P.; Dunn, Douglas L.; and Ferry, Stephen J., 4,901,083, Cl. 342-128.000.
Shu, David B.; and Nash, James G., 4,901,360, Cl. 382-41.000.

Hughes Tool Company: *See—*
Sullivan, Eric C.; and Burr, Bruce H., 4,899,838, Cl. 175-371.000.

Huguenin, Richard G.; Goldsmith, Paul F.; Deo, Naresh C.; and Walker, David K., to Millitech Corporation. Object detection and location system. 4,901,084, Cl. 342-179.000.

Hui, Benjamin C.; Kanjolia, Ravindra K.; and Lorberth, Jorg, to CVD Incorporated. Chemical process for obtaining high purification of monoalkylarsines and dialkylarsines and purified mono- and dialkylarsines. 4,900,855, Cl. 556-70.000.

Hui, Man H.; Valiveti, Radhakrishna S.; Patel, Haroon; Lamont, James A.; and Shah, Yogesh B. Remote interconnection of local area networks. 4,901,312, Cl. 370-85.120.

Humblet, Pierre A.: *See—*
Soloway, Stuart R.; Steinka, Bradford R.; and Humblet, Pierre A., 4,901,277, Cl. 364-900.000.

Hummel, Kurt M., to Herman Hemscheidt Maschinenfabrik GmbH & Co. Hydraulic shock-absorber and vibration damper with an inner tube. 4,899,853, Cl. 188-269.000.

Humphreys, John C., to H. Flude & Co. (Hinckley) Limited. Automatic flat seaming apparatus. 4,899,676, Cl. 112-121.150.

Huppi, Stefan: *See—*
Meyer, Urs; and Huppi, Stefan, 4,901,246, Cl. 364-513.000.

Hurlstone, Graham F. Tree shelters. 4,899,486, Cl. 47-30.000.

Hurusawa, Genichi: *See—*
Nakazyo, Kiyoshi; Hirose, Takeshi; Hurusawa, Genichi; Takahashi, Osamu; Furutachi, Nobuo; and Kobayashi, Hidetoshi, 4,900,655, Cl. 430-546.000.

Husler, Rinaldo; Kirchmayr, Rudolf; and Rutsch, Werner, to Ciba-Geigy Corporation. Phenyl ketone derivatives. 4,900,823, Cl. 544-174.000.

Hussmann, Gregory P.; Holzhauer, Juergen K.; and Kuhlmann, George E., to Amoco Corporation. Method for producing a di-(mono- or poly-)carboxyaryl ether. 4,900,865, Cl. 562-412.000.

Hutchings, Richard S.; and Bottom, Carey B., to Drackett Company, The. In-tank toilet dispenser. 4,899,398, Cl. 4-228.000.

Hutchinson, Donald P.: *See—*
Bessler, Michael; and Hutchinson, Donald P., 4,900,143, Cl. 351-205.000.

Hvilsted, Niels; and Pedersen, Kaj. Hydraulic cylinder comprising at least one electric position indicator 4,899,643, Cl. 92-5.00R.

Hwang, Chrang-Chuan. Pneumatic combined with hydraulic brake chamber. 4,899,642, Cl. 91-510.000.

Hydro-Tool Company, Inc.: *See—*
Casida, Kenneth L., 4,899,821, Cl. 166-312.000.

Hynecek, Jaroslav, to Texas Instruments Incorporated Bulk charge modulated transistor threshold image sensor elements and method of making. 4,901,129, Cl. 357-30.000.

Hyosu, Yoshihiko *See—*
Hikake, Norio; Kanda, Hitoshi; and Hyosu, Yoshihiko, 4,900,647, Cl. 430-137.000.

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Shishkin, Viktor V., 4,899,489, Cl. 47-65.000

Ichikawa, Junichi *See—*
Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katsutomo; and Ichikawa, Junichi, 4,900,602, Cl. 428-76.000.

Ichimura, Takeshige: *See—*
Itoga, Kazuhe; and Ichimura, Takeshige, 4,900,370, Cl. 136-256.000.

Ichiyoshi, Osamu, to NEC Corporation Mobile satellite communication system. 4,901,310, Cl. 370-75.000.

Ichkhan, Elie J., to Hughes Aircraft Company Circuit terminations having improved electrical and structural integrity. 4,900,878, Cl. 174-258.000.

ICI Americas Inc : *See—*
Felix, Raymond A., 4,900,351, Cl. 71-88.000
Fisher, Karl J., 4,900,758, Cl. 514-717.000

Ida, Shunya: *See—*
Kondo, Yoshikazu; Yamamoto, Toshihiro; Ida, Shunya; and Yamamoto, Atsushi, 4,900,625, Cl. 428-383.000.

Ide, Masaaki: *See—*
Kazino, Hiroshi; and Ide, Masaaki, 4,900,206, Cl. 411-377.000.

Ide, Takanobu: *See—*
Takano, Masamitsu; and Ide, Takanobu, 4,899,643, Cl. 180-312.000.

Idel, Karsten; Ostlinning, Edgar; and Freitag, Dieter, to Bayer Aktiengesellschaft. Process for the production of high molecular weight, optionally branched polyarylene sulphides in polar solvent and lactam. 4,900,808, Cl. 528-388.000.

Iff, Ron H.: *See—*
Redford, Douglas E.; Perdelwitz, Lee E., Jr.; Iff, Ron H.; Gaddis, Paul G.; Halley, David G.; Cotie, Michael E.; Hanke, David E.; and Neogi, Amar N., 4,900,377, Cl. 156-62.200.

Igarashi, Akira; and Kobayashi, Takashi, to Nohmi Bosai Kogyo Co., Ltd. Disaster prevention monitoring and control facility 4,901,316, Cl. 371-37.100.

Igarashi, Masao; Akiyama, Isao; Kumagai, Kazuhiro; Takeda, Yoshinobu; Yamaki, Mamoru; Iguchi, Yoshiaki, and Kazama, Satoshi, to Taiyo Yuden Co., Ltd. Distributed-constant filter. 4,901,044, Cl. 333-207.000.

Iguchi, Yoshiaki: *See—*
Igarashi, Masao; Akiyama, Isao; Kumagai, Kazuhiro; Takeda, Yoshinobu; Yamaki, Mamoru; Iguchi, Yoshiaki; and Kazama, Satoshi, 4,901,044, Cl. 333-207.000.

Ihama, Mikio: *See—*
Tani, Tadaaki; Ihama, Mikio; and Okazaki, Masaki, 4,900,656, Cl. 430-550.000.

Ihara Chemical Industry Co., Ltd.: *See—*
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,900,352, Cl. 71-92.000.

Ihara, Kiyohiko Yamaguchi, Fumihiko; and Yamane, Shinichi, to Daikin Industries, Ltd. Method for producing fluorine-containing olefin. 4,900,874, Cl. 570-142.000.

Iida, Takeaki; and Kawabe, Takeshi, to Unitika Ltd. Enzyme sensor using immobilized glucokinase. 4,900,423, Cl. 204-403.000.

Iida, Yasunobu: *See—*
Suzuki, Junichi; Nakamura, Masato; Takeuchi, Nobuyuki; Iida, Yasunobu; and Nishii, Hiroyuki, 4,900,630, Cl. 428-432.000.

Iijima, Yasuo, to Kabushiki Kaisha Toshiba. Portable electronic apparatus having a function of checking for empty areas in which to write data. 4,901,270, Cl. 364-900.000.

Iimura, Masayuki: *See—*
Kimura, Hiroyuki; Iimura, Masayuki; Katsuma, Makoto; Urushihara, Kazunobu; Matsumura, Susumu; and Ohmura, Hiroshi, 4,901,063, Cl. 340-723.000.

Iino, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Control device for a continuously variable transmission for motor vehicles. 4,899,542, Cl. 60-487.000.

IIT Research Institute: *See—*
Bridges, Jack E., 4,900,196, Cl. 405-267.000.

Ikeda, Hiroshi; Sawada, Takashi; and Bansho, Mitsuo, to Citizen Watch Co., Ltd. Platen assembly. 4,900,175, Cl. 400-659.000

Ikeda, Toshio: *See—*
Tashiro, Norio; Adachi, Masaki; Ikeda, Toshio; Saito, Hisao; Matsushita, Saburo; and Komine, Masataka, 4,900,985, Cl. 315-39.510.

Ikeda, Yoshihisa: *See—*
Fujikura, Nobuyuki; Morita, Hiroshi; Ikeda, Yoshihisa, and Sasaki, Ryoichi, 4,901,313, Cl. 370-104.100.

Ikegami, Tomohito: *See—*
Fujino, Kazuo; Yamamoto, Tetsumichi; Ikegami, Tomohito; and Yanagibashi, Takeshi, 4,901,029, Cl. 330-65.000

Ikegaya, Akihiko; and Tobioka, Masaaki, to Sumitomo Electric Industries, Ltd. Gaseous phase synthesized diamond and method for synthesizing same. 4,900,628, Cl. 428-408.000.

Ikehira, Hideyuki: *See—*
Saito, Isao; Matsuura, Teruo; and Ikehira, Hideyuki, 4,900,407, Cl. 204-73.00R.

Ikuno, Yuji; Nakamura, Takeaki; Tojo, Yoshikazu; Nishigaki, Shinichi; Suzuki, Hiromasa; Yabe, Hisao; Yoshinaga, Jun; Yokoi, Takeshi; Ohzeki, Kazuhiko; and Kanno, Masahide, to Olympus Optical Co., Ltd. Video scope system. 4,901,142, Cl. 358-98.000.

Iley, William J.: *See—*
Atkinson, Colin; Heybourne, Michael J.; Iley, William J.; Knight, Peter C.; Russell, Peter J.; Taylor, Thomas; and Jones, David P., 4,900,466, Cl. 252-174.140.

Illingworth, Lori D. Bedding system. 4,899,408, Cl. 5-484.000.

Imagawa, Yasunori, to Nisser Opto Co., Ltd. Telephone set usable as an acoustic coupler. 4,901,345, Cl. 379-387.000.

Imanaka, Masayoshi; Noda, Koji; and Isayama, Katsuhiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Curable resin composition. 4,900,772, Cl. 524-303.000.

IMI-Tech Corporation: *See—*
Lee, Raymond; and O'Donnell, Michael D., 4,900,761, Cl. 521-184.000.

Immonen, Henrik, to Sarvis Oy. Keel structure. 4,899,679, Cl. 114-39.100.

Immunomedics, Inc.: *See—*
Hansen, Hans J., 4,900,684, Cl. 436-518.000.

Imperial Chemical Industries plc: *See—*
Harris, Gregory P., 4,900,846, Cl. 549-373.000.
Heaney, Stephen P.; Crowley, Patrick; and Reynolds, Lawrence G., 4,900,349, Cl. 71-76.000.
Lowe, Barrie M.; and Araya, Abraham, 4,900,528, Cl. 423-328.000.

Imura, Naoto: *See—*
Cale, Kenneth W.; Imura, Naoto; Jasovsky, George A.; and Katz, Saul N., 4,900,575, Cl. 426-387.000.

Ina, Hideki: *See—*
Mitome, Noriyuki; and Ina, Hideki, 4,901,109, Cl. 355-68.000.

Inaba, Shigemitsu; and Ootaka, Kazuto, to Yazaki Corporation. Connector. 4,900,277, Cl. 439-752.000.

Inagaki, Yoshio: *See—*
Hioki, Takanori; Inagaki, Yoshio; and Yabe, Masao, 4,900,648, Cl. 430-270.000.

Inami, Toshihide; and Goto, Tsutomu, to Yamatake-Honeywell Co., Ltd. Electrode structure for electromagnetic flowmeter. 4,899,593, Cl. 73-861.120.

Inco Alloys International, Inc.: *See—*
Mankins, William L., 4,900,394, Cl. 156-603.000.
Terai, Kazuto; Isobe, Susumu; Tsukuda, Kenji; Inoue, Hisao; and Kobayashi, Hiroshi, 4,900,248, Cl. 432-234.000.

Inco Limited: *See—*
Bell, James A. E.; and deBarbadillo, John J., 4,900,640, Cl. 428-633.000.

Industrial Technology Research Institute: *See—*
Huang, Huei-Huay; and Peng, Yu-Yin, 4,899,699, Cl. 123-73.00C.

Industrias Arquimides Rossi S.A.: *See—*
Rossi, Amadeo A., 4,900,213, Cl. 414-416.000.

Industrias Fenix S.A.: *See—*
Pajares, Luis R., 4,899,723, Cl. 126-39.00R.

Ing. C. Olivetti & C., S.p.A.: *See—*
Falconieri, Remo; and Gianotti, Ester G., 4,900,169, Cl. 400-157.200.

Ing. Johann Leinweber Anstalt fur Mechanik: *See—*
Leinweber, Johann, 4,900,240, Cl. 425-110.000.

Ingall, Anthony H.: *See—*
Cox, David; Dowlatshahi, Hossein A.; Hall, David E.; Ingall, Anthony H.; and Suschitzky, John L., 4,900,751, Cl. 514-338.000.

Ingle, David M.: *See—*
Kissell, Charles L.; Selover, Jay C.; and Ingle, David M., 4,900,615, Cl. 428-262.000.

Ingrid Hudelmaier: *See—*
Waitzinger, Franz; and Hudelmaier, Gerhard, 4,900,154, Cl. 366-56.000.

Ingvarsson, Lars I., to Ortic AB. Rolling mill machine for longitudinal bending of plate. 4,899,568, Cl. 72-181.000.

Injectall Limited: *See—*
Bates, Kenneth W., 4,900,357, Cl. 75-51.100.
Thrower, Anthony; and Gelsthorpe, John R., 4,899,992, Cl. 266-44.000.

INNOPLAN-Ingenieurgesellschaft Braas und Co. mbH: *See—*
Nickel, Klaus-Dietrich, 4,895,901, Cl. 220-5.00A.

Inokuchi, Iwane, to Nissan Motor Co., Ltd. Proportional pressure reducing valve. 4,899,785, Cl. 137-625.650.

Inoue, Hiroaki; Katsuyama, Toshio; Matsumura, Hiroyoshi; Sakano, Shinji; and Nakamura, Hitoshi, to Hitachi, Ltd. Optical device. 4,900,134, Cl. 350-354.000.

Inoue, Hirokatsu; and Shimizu, Chuji, to Fukuda Denshi Co., Ltd. Electrocardiographic electrode. 4,899,753, Cl. 128-639.000.

Inoue, Hiromichi: *See—*
Miyazawa, Kazutoshi; Ushioda, Makoto; Inoue, Hiromichi; Saito, Shinichi; and Ohno, Kouji, 4,900,472, Cl. 252-299.610.

Inoue, Hisao: *See—*
Terai, Kazuto; Isobe, Susumu; Tsukuda, Kenji; Inoue, Hisao; and Kobayashi, Hiroshi, 4,900,248, Cl. 432-234.000.

Inoue, Kazuhiro: *See—*
Tanaka, Noriko; Inoue, Kazuhiro; Korenaga, Hiroshi; and Ogawa, Hidemasa, 4,900,815, Cl. 536-54.000.

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Inoue, Kazuo; and Kishi, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Valve operation control device for internal combustion engine. 4,899,701, Cl. 123-90.160.

Inoue, Keizo: *See—*
Kumasaka, Hideyuki; Haiwara, Tarou; Nakamura, Katsumi; Miyazaki, Kenichi; Kuriyama, Hiroshi; Takao, Kouji; and Inoue, Keizo, 4,900,083, Cl. 296-197.000.

Inoue, Osamu: *See—*
Satomi, Mitsuo; Hirota, Ken; and Inoue, Osamu, 4,901,179, Cl. 360-126.000.

Inskip, Peter F.: *See—*
Berry, Paul S.; Frost, Derek J., and Inskip, Peter F., 4,900,292, Cl. 474-84.000.

Institut Francais Du Petrole: *See—*
Cretin, Jacques; and Therond, Jean-Francois, 4,901,289, Cl. 367-34.000.
Denis, Jacques; Sillion, Bernard; Damin, Bernard; and Leger, Robert, 4,900,332, Cl. 44-62.000.

Institut Pasteur Paris: *See—*
Guesdon, Jean-Luc; Avrameas, Stratis; and Mazie, Jean-Claude, 4,900,661, Cl. 435-7.000.

Intel Corporation: *See—*
Galbi, David; and Chan, Alfred K., 4,901,270, Cl. 364-786.000.

Interior Creators, Inc.: *See—*
Power, Richard S., 4,899,509, Cl. 52-238.100.

International Business Machines: *See—*
Morel, Jeanne E.; Rackley, Darwin P.; Trynosky, Stephen W.; and Wall, William A., 4,901,062, Cl. 340-703.000.

International Business Machines Corporation: *See—*
Askin, Haluk O.; and Ferraiolo, Frank D., 4,901,076, Cl. 341-100.000.
Danton, John L.; Klaiber, Albert F., III; and Terboss, Richard A., 4,900,201, Cl. 408-129.000.
Dorleans, Fernand J.; Norton, Robert O.; and Pokrzywa, Robert S., 4,900,274, Cl. 439-680.000.
Fitzgerald, William J.; Gracer, Franklin; and Wolfe, Robert N., 4,901,252, Cl. 364-522.000.
Heath, Chester A.; and Lenta, Jorge E., 4,901,234, Cl. 364-200.000.
Leas, James M., 4,901,329, Cl. 372-50.000.
Liptay, John S., 4,901,233, Cl. 364-200.000.
Plass, Donald W., 4,901,279, Cl. 365-154.000.
Rhyne, James R., 4,901,223, Cl. 364-200.000.
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International Computers Limited: *See—*
Hanbury, Jonathan M.; and Burton, Keith, 4,901,283, Cl. 365-222.000.

International Flavors & Fragrances Inc.: *See—*
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International Immunoassay Laboratories, Inc.: *See—*
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International Medication Systems Limited: *See—*
Ogle, George B., II, 4,900,310, Cl. 604-198.000.

International Paper Company: *See—*
Quick, James R.; and Mitchell, James W., 4,900,594, Cl. 428-34.200.

International Power Technology, Inc.: *See—*
Cheng, Dah Yu, 4,899,537, Cl. 60-39.161.

International Therapeutics Inc.: *See—*
Dandliker, Walter B.; Watson, W. Keith R.; and Drees, Thomas C., 4,900,824, Cl. 544-185.000.

Interox Chemicals Limited: *See—*
Baxter, Paul L.; and Whiring, Michael J. L., 4,900,471, Cl. 252-186.260.

Intersolar Ltd.: *See—*
Wolfe, Philip R.; Callaghan, John K.; and Pidgeon, Simon, 4,899,645, Cl. 98-2.020.

InterTherapy, Inc.: *See—*
Pope, Joseph L., Jr.; Griffith, James M.; Gessert, James M.; Maciel, Mario; and Zalesky, Paul, 4,899,757, Cl. 128-662.060.

Inui, Ken'ichi: *See—*
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Inumada, Masato, to Kabushiki Kaisha Toshiba. High frequency heating system with changing function for rated consumption power. 4,900,885, Cl. 219-10.55B.

Inward, Peter W., to Lever Brothers Company. Preparation of antiperspirants. 4,900,534, Cl. 423-463.000.

Ion Systems, Inc.: *See—*
Steinman, Arnold J.; and Yost, Michael G., 4,901,194, Cl. 361-213.000.

Ioue, Hiromichi: *See—*
Miyazawa, Kazutoshi; Ioue, Hiromichi; Saito, Shinichi; Ohno, Kouji; and Ushioda, Makoto, 4,900,473, Cl. 252-299.610.

Iowa State University Research Foundation: *See—*
Thompson, R. Bruce; Smith, John F.; Lee, Seung S.; and Li, Yan, 4,899,589, Cl. 73-597.000.

Iowa State University Research Foundation, Inc.: *See—*
Tipton, Carl L.; and Shih, Meiling, 4,900,726, Cl. 514-182.000.

Irwin, James K. Polished surface protective sleeve for covering the electrical cord of a car wax polishing and buffing machine. 4,899,414, Cl. 15-97.00B.

Irwin, Nancy H.: *See—*
Penney, Carl M.; Corby Jr., Nelson R.; and Irwin, Nancy H., 4,900,146, Cl. 356-1.000.

Irwin, Richard D., to Even Flow Products, Inc. Hot strip mill cooling system. 4,899,547, Cl. 62-63.000.

Isayama, Katsuhiko: *See—*
Imanaka, Masayoshi; Noda, Koji; and Isayama, Katsuhiko, 4,900,772, Cl. 524-303.000.

Ish, Arthur B., III; and Johnson, Jeffrey B. Exercise machine with multiple exercise stations. 4,900,018, Cl. 272-134.000.

Ishibashi, Kenji: *See—*
Ishida, Tokuji; Hamada, Masataka; and Ishibashi, Kenji, 4,901,101, Cl. 354-403.000.

Ishida Scales Mfg. Co., Ltd.: *See—*
Hikita, Michiyasu; and Kawaguchi, Hatsuo, 4,901,237, Cl. 364-464.010.

Ishida, Shigetoshi: *See—*
Akiba, Genji; Tanaka, Kohya; and Ishida, Shigetoshi, 4,899,446, Cl. 30-276.000.

Ishida, Takeshi; and Kawazoe, Kazuhiko, to Kawasaki Jukogyo Kabushiki Kaisha. Mounting member. 4,899,973, Cl. 248-298.000.

Ishida, Tokuji; Hamada, Masataka; and Ishibashi, Kenji, to Minolta Camera Kabushiki Kaisha. Automatic focus control device for use in a camera system. 4,901,101, Cl. 354-403.000.

Ishida, Tomotoshi, to Hitachi, Ltd. Graphic communication processing apparatus capable of chaining graphic information with a small number of processes. 4,901,250, Cl. 364-521.000.

Ishigaki Kiko Co., Ltd.: *See—*
Iwatani, Akitoshi, 4,900,436, Cl. 210-225.000.

Ishii, Kazuhiro; Hatakeyama, Yoshihiro; and Takao, Akira, to Mitsubishi Denki Kabushiki Kaisha. Trip control apparatus of circuit breaker. 4,901,184, Cl. 361-86.000.

Ishii, Kenichi: *See—*
Hayashi, Yutaka; Ishii, Kenichi; and Fujita, Shunsuke, 4,900,396, Cl. 156-651.000.

Ishii, Masami: *See—*
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Ishii, Takaharu: *See—*
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Ishikawa, Misao; Kohsaka, Yohji; Ouchi, Chiaki; and Masamura, Katsumi, to Nippon Kokan Kabushiki Kaisha. High strength and corrosion resistant titanium alloy having excellent corrosion-wear properties. 4,900,510, Cl. 420-418.000.

Ishikawa, Takatoshi; and Fujimoto, Hiroshi, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic materials using a developer comprising chelatin agents, brightening agents and no benzyl alcohol. 4,900,651, Cl. 430-380.000.

Ishikawa, Yasuki: *See—*
Higashimata, Akira; Ishikawa, Yasuki; Yasuno, Yoshiki; and Fujishiro, Takeshi, 4,900,100, Cl. 303-100.000.

Ishikawa, Yoshirou: *See—*
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Ishioka, Sachio: *See—*
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Ishitani, Tohru; Todokoro, Hideo; and Tamura, Hifumi, to Hitachi, Ltd. Ion source. 4,900,974, Cl. 313-359.100.

Isley, Richard W. Golf cart heater. 4,899,931, Cl. 237-12.30C.

Isobe, Susumu: *See—*
Terai, Kazuto; Isobe, Susumu; Tsukuda, Kenji; Inoue, Hisao; and Kobayashi, Hiroshi, 4,900,248, Cl. 432-234.000.

Isohata, Shigeru: *See—*
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Isolyser Co., Inc.: *See—*
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Isozaki, Hideo: *See—*
Nagatsu, Yoshiro; Isozaki, Hideo; Shiroshita, Tooru; and Suzuki, Jiro, 4,900,826, Cl. 544-277.000.

Isozumi, Shuzoo; Konishi, Keiichi; and Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Starting electric motor. 4,899,603, Cl. 74-6.000.

Isozumi, Shuzoo; Tanaka, Toshinori; and Odawara, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Engine starter. 4,900,945, Cl. 290-48.000.

Israel Institute for Biological Research: *See—*
Fisher, Abraham; and Karton, Ishai, 4,900,830, Cl. 546-18.000.

Israel, Yedy; and Arnon, Ruth, to Alcoholism and Drug Addition Research Foundation. Reagent for detection and measurement of acetaldehyde-protein condensates in a fluid, together with its preparation and method of use. 4,900,664, Cl. 435-7.000.

Ito, Akitoshi: *See—*
Sakano, Hajime; Ito, Akitoshi; Yano, Motoichi; Honda, Yasuhiro; and Fujiwara, Takayoshi, 4,900,787, Cl. 525-71.000.

Ito, Masazumi: *See—*
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, 4,901,111, Cl. 355-218.000.

Ito, Toshikazu: *See—*
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Morishita, Junichi; Kimura, Nobuo; and Okamura, Hiromichi, 4,900,701, Cl. 501-102.000.

Kimura, Tsutomu; and Watanabe, Yukio, to Fuji Photo Film Co., Ltd. Method of and apparatus for recording and reading out radiation image information. 4,900,927, Cl. 250-327.200.

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Yasohara, Masahiro; Kimura, Yoshitsugu; and Nakano, Hiromitsu, 4,900,993, Cl. 318-254.000.

Kinch, John M.: *See*—
Grob, James T.; and Kinch, John M., 4,899,649, Cl. 99-408.000.

Kinergy Corporation: *See*—
Dumbaugh, George D., 4,899,669, Cl. 110-101.00C.

King, Arvid D., to CPC International Inc. Process for preparing a cereal. 4,900,567, Cl. 426-93.000.

King, Fred N. Apparatus and method for mapping the connectivity of communications systems with multiple communications paths. 4,901,004, Cl. 324-66.000.

King Industries, Inc.: *See*—
Gallacher, Lawrence V., 4,900,358, Cl. 106-14.130.

King, James J. Fish processing machine with automatic length responsive cutting control mechanism. 4,899,422, Cl. 17-54.000.

King, Maurice E.; and Katucki, Gregory M., to Teleflex, Incorporated. Self-contained supplemental guidance module for projectile weapons. 4,899,956, Cl. 244-3.210.

King Nutronics Corporation: *See*—
Chang, Daniel Y.; Waldron, Bradley C.; and Walthers, James M., Sr., 4,901,257, Cl. 364-571.010.

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Takiguchi, Yoshihiro; and Kinoshita, Katsuyuki, 4,900,930, Cl. 250-361.00R.

Kinoshita, Satoshi; and Kume, Hiroyuki, to Nissan Motor Co., Ltd.; and Fuji Kiko Co., Ltd. Tilting and telescope traveling steering column arrangement. 4,900,059, Cl. 280-775.000.

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Kinugawa, Seiichi; Kainoh, Seio; Kawashima, Takashi; and Okabe, Katsumi, to Sharp Kabushiki Kaisha. Construction of fitting flexible board within electronic apparatus. 4,901,193, Cl. 361-212.000.

Kirchmayr, Rudolf: *See*—
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Kirkpatrick, Michael A. Key stamp. 4,899,652, Cl. 101-4.000.

Kirstein, Lothar: *See*—
Jonner, Wolf-Dieter; and Kirstein, Lothar, 4,900,102, Cl. 303-110.000.

Kisalus, John C., to Nalco Chemical Company. Triphenylphosphine oxide as an ethylene furnace antifoulant. 4,900,426, Cl. 208-48.0AA.

Kishi, Noriyuki: *See*—
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Kishida, Hajime: *See*—
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Kishioka, Takashi. Ozonic bubble water generator. 4,900,481, Cl. 261-64.400.

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Kissell, Charles L.; Selover, Jay C.; and Ingle, David M., to Union Oil Company of California. Textile materials and compositions for use therein. 4,900,615, Cl. 428-262.000.

Kistler Instrumente: *See*—
Wolfer, Peter; Pfeifer, Hans P.; Spur, Gunter; Siebert, Jan C.; and Benzinger, Klaus-Jurgen, 4,899,594, Cl. 73-862.060.

Kitagawa Industries Co., Ltd.: *See*—
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Kitahara, Haruo; and Ohshita, Takeshi, to Shinano Tokki Corporation. Drive motor for magnetic disks, optical disks, and magneto-optical disks. 4,900,958, Cl. 310-67.00R.

Kitahara, Makoto; Naito, Masataka; and Takahashi, Yuji, to Canon Kabushiki Kaisha. Sorter. 4,900,009, Cl. 271-296.000.

Kitai, Mitsumasa; Katsuro, Yoshio; Kawamura, Shigenori; Hino, Masumi; and Sato, Keiichi, to Mitsubishi Chemical Industries Limited. Method for dimerization of aromatic halide compounds. 4,900,843, Cl. 549-252.000.

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Kitano, Katsuhiro: *See*—
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Kitayoshi, Hitoshi, to Advantest Corporation. Signal generator. 4,901,027, Cl. 328-155.000.

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Kittaka, Toshihiko: *See*—
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Klecker, Brian D.; and Koenig, Thomas H., to Pullman Company, The. Twin face seal. 4,900,039, Cl. 277-27.000.

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Kleefeldt, Frank; and Menke, Johannes T., to Kiekert GmbH & Co. Kommanditgesellschaft. Motor-vehicle door latch with child-safety cutout. 4,900,074, Cl. 292-216.000.

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Kleinschrodt, Dave: *See*—
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Klett, Michael W., to PPG Industries, Inc. Phosphorus-containing organo silanes. 4,900,857, Cl. 556-405.000.

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Klingelhofer, Marc; and Perry, Vinson R., to Sony Corporation. Automatic noise reduction for individual frequency components of a signal. 4,901,150, Cl. 358-167.000.

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Knapp, Furn F., Jr.: *See*—
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Knappe, Wolfram; and Kummel, Alfred, to Siemens Aktiengesellschaft. Gear arrangement, in particular for use in connection with motor vehicle window lifter drives. 4,899,608, Cl. 74-411.000.

Knight, Peter C.: *See*—
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Kobayashi, Kiyonori; Kamiya, Masakazu; and Kagiyama, Junji, to Aisin Seiki Kabushiki Kaisha. Rotary drive transmitting mechanism with damping springs. 4,899,617, Cl. 74-574.000.

Kobayashi, Koji, to Kowa Company Ltd. Three-dimensional shape measurement apparatus. 4,900,144, Cl. 351-206.000.

Kobayashi, Koji: *See*—
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Kobayashi, Tetsuo; and Ohkawa, Teruhisa, to Mitsubishi Denki Kabushiki Kaisha. Hybrid integrated circuit module assembly. 4,901,203, Cl. 361-395.000.

Kobayashi, Tomio; Abe, Iwao; Kashiwa, Kazuo; Aizawa, Yukihiro; and Suzukawa, Hiroyuki, to Sony Corporation. Thin film magnetic head. 4,901,178, Cl. 360-126.000.

Kobayashi, Toshifumi, to Mitsubishi Denki Kabushiki Kaisha. Power efficient static-column DRAM. 4,901,282, Cl. 365-222.000.

Kobayashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Automatic transmission for a motor vehicle. 4,899,622, Cl. 475-160.000.

Kobayashi, Yoshinori; Uemura, Tsuyoshi; Gohara, Yoshihiro; and Wakita, Naohide, to Matsushita Electric Industrial Co., Ltd. Method of driving an optical modulation device. 4,901,066, Cl. 340-805.000.

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Koehler, Hermann; and Dockner, Toni, to BASF Aktiengsellschaft. Preparation of 4-nitro-5-imidazolyl ethers and thioethers. 4,900,825, Cl. 544-276.000.

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Kohjin Co., Ltd.: *See*—
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Kohler, Helmut O., to BioMed Researchy Consultants, Ltd. Combined cimetidine-pirensepine formulation for treating peptic ulcers and erosions. 4,900,741, Cl. 514-396.000.

Kohn, Rachel S., to Hoechst Celanese Corporation. Ultrathin blended cellulose nitrate polymer films and their preparation. 4,900,621, Cl. 428-333.000.

Kohn, Rachel S., to Hoechst Celanese Corporation. Ultrathin polymethylmethacrylate polymer films. 4,900,623, Cl. 428-336.000.

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Koike, Hisashi; and Tanaka, Sumi, to Tokyo Electron Limited. Carrier for transferring plate-like objects one by one, a handling apparatus for loading or unloading the carrier, and a wafer probing machine fitted with the handling apparatus for the wafer carrier. 4,901,011, Cl. 324-158.00F.

Koiwa, Mitsuru; and Okamura, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Ignition device for internal combustion engine. 4,899,715, Cl. 123-644.000.

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Kolpin, Hans J., to Atomic Energy of Canada Limited-Energie Atomique Du Canada Comitee. Electron gun design. 4,900,982, Cl. 313-452.000.

Komatsu, Keiichi; Ozaki, Shinji; Masui, Hikaru; and Kubo, Ken, to Hitachi, Ltd.; and Hitachi Video Engineering, Inc. Optical magnetic recording and reproducing method and apparatus capable of prolonging a recording time. 4,901,297, Cl. 369-13.000.

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Kondo, Yoshikazu; Yamamoto, Toshihiro; Ida, Shunya; and Yamamoto, Atsushi, to Kanebo, Ltd. Deep-colored fibers and a process for manufacturing the same. 4,900,625, Cl. 428-383.000.

Koneval, Donald J.; Pollnow, Harold J., and Molus, Richard J., Sr., to Allen-Bradley Company, Inc. Enclosure for electrical sensor. 4,899,586, Cl. 73-431.000.

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Konishi, Tatsuya: *See*—
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Kora, Hiroyuki: *See*—
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Kotaki, Mitsuko; Tsuzuki, Takayoshi; Oda, Yukihisa; Yabuno, Ryohei; and Ishii, Masami, to Aisin Seiki Kabushiki Kaisha. Tilt sensor for vehicle steering shaft. 4,901,050, Cl. 338-13.000.

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Mairlot, Henri, to Glaceries De Saint - Roch S.A. Curved glazed panels. 4,899,507, Cl. 52-222.000.

Maksh Advanced Piezo Technology: *See*—
Rosenberg, Armand; and Yeheakel, Menashe, 4,901,055, Cl. 340-467.000.

Makino, Yoshihiko; and Ogawa, Masashi, to Fuji Photo Film Co., Ltd. Electrophoretic method. 4,900,416, Cl. 204-182.800.

Makishima, Tatsuo: *See*—
Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, 4,900,975, Cl. 313-366.000.

Malden, Peter J., to English Clays Lovering Pochin & Company. Alkaline earth metal carbonates. 4,900,533, Cl. 423-430.000.

Malmborg, Bengt E.: *See*—
Lundqvist, Mona K.; and Malmborg, Bengt E., 4,900,315, Cl. 604-311.000.

Manabe, Yukio: *See*—
Ohtsubo, Toshiro; Tsuda, Shigenori; Manabe, Yukio; Itoh, Takaaki; Kawada, Hitoshi; Shinjo, Goro; and Tsuji, Kozo, 4,900,551, Cl. 424-408.000.

Manassero, Lorenzo G.; and Martucci, Roberto, to Molex Incorporated. Positive connector latch. 4,900,263, Cl. 439-358.000.

Manchand, Percy S.: *See*—
Belica, Peter S.; Huang, Tai-Nang; Manchand, Percy S.; Partridge, John J.; and Tam, Steve, 4,900,828, Cl. 544-317.000.

Mandel, Barry P., to Xerox Corporation. Tangential approach, low noise paddle wheel drive. 4,900,006, Cl. 271-178.000.

Mandel, Barry P.; and Burger, William R., to Xerox Corporation. Recirculating folder for direct mail application. 4,900,391, Cl. 156-364.000.

Mankina, William L., to Inco Alloys International, Inc. Process for producing single crystals. 4,900,394, Cl. 156-603.000.

Manlove, Gregory J.: *See*—
Anderson, Fred J.; Kennedy, Richard A.; Manlove, Gregory J.; and Marrah, Jeffrey J., 4,901,350, Cl. 381-13.000.

Mannesmann AG: *See*—
Beck, Dieter; and Lohrmann, Gerhard, 4,900,170, Cl. 400-196.000.
von Hagen, Ingo; Nickel, Wilhelm; and Prasser, Christoph, 4,900,376, Cl. 148-153.000.

Mannesmann Aktiengesellschaft: *See*—
Kaufmann, Clemens, 4,900,167, Cl. 400-124.000.
Koller, Walter; and Alfes, Ludger, 4,899,850, Cl. 184-6.300.

Manning, Robert W., to United Technologies. Process for making polysilicon field plate with improved suppression of parasitic transistors. 4,900,693, Cl. 437-78.000.

Mao, Simon J. T.; and Jackson, Richard L., to Merrell Dow Pharmaceuticals Inc. Hypocholesterolemic and antiatherosclerotic uses of bix(3,5-di-tertiary-butyl-4-hydroxyphenylthio)methane. 4,900,757, Cl. 514-712.000.

Maras, Henry S., to H.S.M. Concepts. Window rain guard. 4,899,646, Cl. 98-99.100.

Marathon Oil Company: *See*—
Bruce, Charles R., 4,899,820, Cl. 166-310.000.

Marengo, Sergio: *See*—
Chiri, Chiaffredo; Gianoglio, Pierino; Giraudo, Claudio; Marengo, Sergio; and Zaino, Giovanni, 4,899,720, Cl. 125-21.000.

Marietta, Martin: *See*—
Kuhn, Philip M., 4,901,293, Cl. 367-168.000.

Markem Corporation: *See*—
Perra, Andrew G., Jr.; and Cheever, James M., 4,901,095, Cl. 346-140.00R.

Markum, T. Randall: *See*—
Cunningham, Donald M.; Bartels, Mark A.; and Markum, T. Randall, 4,900,897, Cl. 219-336.000.

Marlett, Everett M., to Ethyl Corporation. Preparation of metal halide-amine complexes. 4,900,856, Cl. 556-176.000.

Marquardt, Klaus: *See*—
Ball, Peter; Marquardt, Klaus; Selig, Manfred; and Hafener, Klaus, 4,900,777, Cl. 524-819.000.

Marrah, Jeffrey J.: *See*—
Anderson, Fred J.; Kennedy, Richard A.; Manlove, Gregory J.; and Marrah, Jeffrey J., 4,901,350, Cl. 381-13.000.

Marritt, Clifford R.: *See*—
Davis, James W.; Deal, Philip A.; Howard, Travis B.; and Marritt, Clifford R., 4,899,765, Cl. 131-84.100.

Marritt, William A.: *See*—
Besecker, Charles J.; and Marritt, William A., 4,900,853, Cl. 556-30.000.

Mars G.B. Limited: *See*—
Smallwood, Karen C.; and Adams, William J., 4,900,574, Cl. 426-330.300.

Marshall, Charles M.; and McClelland, Jeffrey L., deceased (by administrators, Clyde L. McClelland and Joan R. McClelland joint), to Honeywell Inc. Multiplex time delay integration. 4,900,943, Cl. 250-578.000.

Marshall, Claire B., to Alloy Rods Global, Inc. Rectangular electrode. 4,900,895, Cl. 219-145.220.

Marston Palmer Limited: *See*—
Gregory, Edward J.; Felton, John; and Cooper, Frank T., 4,899,808, Cl. 165-1.000.

Martignoni, Massimo: *See*—
Buhler, Ernst; Wehrli, Peter; Martignoni, Massimo; and Erba, Mauro, 4,900,889, Cl. 219-69.120.

Martin, Albert R.: *See*—
Dubrow, Robert S.; Holland, Christine J.; Chan, Randolph W.; Martin, Albert R.; Siden, Dennis C.; and Germeraad, Paul B., 4,900,877, Cl. 174-35.0GC.

Martin Archery, Inc.: *See*—
Martin, Terry G.; Newbold, George T.; and Davenport, Theodore M., 4,899,716, Cl. 124-41.00A.

Martin, Brian M.: *See*—
Barnes, Brian A.; Clarke, Ron; Martin, Brian M.; and McCandless, John J. M., 4,899,424, Cl. 24-641.000.

Martin, Danny W., to Laser Diode Products, Inc. Heat transfer device for cooling and transferring heat from a laser diode device and associated heat generating elements. 4,901,324, Cl. 372-36.000.

Martin, Frank J., to Frank J. Martin Company. Re-keyable pin tumbler drawer lock and pin tumbler cabinet door lock. 4,899,563, Cl. 70-367.000.

Martin, James A.: *See*—
Melnik, George; Amrein, Bruce E., Brucksch, Robert C.; McCoy, Curtis L., and Martin, James A., 4,899,619, Cl. 74-625.000.

Martin, John K. Railway crossing insert. 4,899,933, Cl. 238-8.000.

Martin-Lopez, Fernando, to Seagate Technology, Inc. Isolated switch mode power supply controller. 4,901,215, Cl. 363-21.000.

Martin, Mark R.: *See*—
Gentry, John T.; and Martin, Mark R., 4,900,261, Cl. 439-353.000.

Martin, Ronald R.; and Miller, Vernon J., Sr., to Southwire Company. Method of and apparatus for recovering and reusing organic pickling vapors. 4,899,798, Cl. 164-5.000.

Martin, Terry G.; Newbold, George T.; and Davenport, Theodore M., to Martin Archery, Inc. Arrow rest. 4,899,716, Cl. 124-41.00A.

Martinez, Angel R.; and Martinez, Frances M., to Decorate-It!, Inc. Adhesive wall decorating system. 4,900,604, Cl. 428-79.000

Martinez, Frances M.: *See*—
Martinez, Angel R.; and Martinez, Frances M., 4,900,604, Cl. 428-79.000.

Martor-Argentax E.H. Beermann KG: *See*—
Beermann, Ewald H., 4,899,443, Cl. 30-162.000.

Martucci, Roberto: *See*—
Manassero, Lorenzo G.; and Martucci, Roberto, 4,900,263, Cl. 439-358.000.

Maruta, Syuzi: *See*—
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, 4,901,111, Cl. 355-218.000.

Maruyama, Jun: *See*—
Hiramatsu, Rihei; Watanabe, Shigeo; Okumura, Yasuyuki; and Maruyama, Jun, 4,901,214, Cl. 363-19.000.

Maruyama, Toshio: *See*—
Usutani, Shigenobu; Maruyama, Toshio; Yamauchi, Tadashi; and Ban, Yasunori, 4,899,718, Cl. 125-11.0TP.

Marvin Glass & Associates: *See*—
Kulesza, Ralph J.; Wozniak, Walter J.; and Breslow, Jeffrey D., 4,900,026, Cl. 273-119.00A.

Marvin, Wayne S.: *See*—
Beeman, John A.; Leep, James L.; Marvin, Wayne S., Smith, Troy F.; and Solt, Floyd R., 4,899,518, Cl. 53-439.000.

Masaki, Naoki, to Pioneer Electronic Corporation. Track pulse controlled address search method for optical disk player. 4,901,298, Cl. 369-32.000.

Masaki, Takeshi; Mizutani, Takeshi; Yonemaochi, Katsutoshi; and Tanaka, Akemi, to Matsushita Electric Industrial Co., Ltd. Electric discharge machining method and apparatus for machining a microshaft. 4,900,890, Cl. 219-69.170.

Masamura, Katsumi: *See*—
Ishikawa, Misao; Kohsaka, Yohji; Ouchi, Chiaki; and Masamura, Katsumi, 4,900,510, Cl. 420-418.000.

Maschinenfabrik Goebel GmbH: *See*—
Thomas, Hermann; Herd, Josef; and Hasper, Uwe, 4,899,656, Cl. 101-216.000.

Masco Corporation of Indiana: *See*—
Crawford, Dennis W.; and Turner, Larry G., 4,899,397, Cl. 4-191.000.

Masonic Medical Research Laboratory: *See*—
Cerny, Lawrence C., 4,900,780, Cl. 525-54.100.

Massachusetts Institute of Technology: *See*—
Allen, Mark G.; and Senturia, Stephen D., 4,899,581, Cl. 73-150.00A
Hanson, Robert M.; Ko, Soo Y; and Sharpless, Karl B., 4,900,847, Cl. 549-529.000.
Wheatley, Margaret A.; Langer, Robert S., and Eisen, Herman N., 4,900,556, Cl. 424-450.000.

Masters, Jeffrey J.: *See*—
Blyth, Richard C.; Masters, Jeffrey J.; Hirst, Ian; and Gates, Leonard V., 4,900,005, Cl. 271-127.000.

Masuda, Yukinori: *See*—
Seto, Kiyotomo; Matsumoto, Hiroo; Kamikawaji, Yoshimasa; Ohrai, Kazuhiko; Nakayama, Kyoko; Sakoda, Ryozo; and Masuda, Yukinori, 4,900,752, Cl. 514-364.000.

Masuda, Yutaka; and Okutani, Norio, to Matsushita Electric Industrial Co., Ltd. Reference signal generation apparatus for position detector. 4,900,924, Cl. 250-231.0SE.

Masuhara, Toshiaki: *See*—
Sunami, Hideo; Kure, Tokuo; Miyao, Masanobu; Kawamoto, Yoshifumi; Shimohigashi, Katsuhiro; Sakai, Yoshio; Minato, Osamu; Masuhara, Toshiaki; Koyanagi, Mitsumasa; and Shimizu, Shinji, 4,901,128, Cl. 357-23.600.

Masui, Hikaru: *See*—
Komatsu, Keiichi; Ozaki, Shinji; Masui, Hikaru; and Kubo, Ken, 4,901,297, Cl. 369-13.000.

Masui, Toshiyuki: *See*—
Hieda, Tetuo; Masui, Toshiyuki; Takahashi, Koji, and Yoshimura, Katsuji, 4,901,152, Cl. 358-209.000.
Yoshimura, Katsuji; Masui, Toshiyuki; Sato, Chikara; and Nakayama, Tadayoshi, 4,901,119, Cl. 358-319.000.

Masuko, Akinori: *See*—
Tanaka, Masatoshi; Kuroiwa, Wataru; Masuko, Akinori; Maeda, Jyoji; Uehara, Shouji; and Uekusa, Tsutomu, 4,901,351, Cl. 380-15.000.

Mat Menziken Automation AG: *See*—
Keil, Bernd, 4,899,865, Cl. 198-351.000.

Mathew, Robert L.: *See*—
Lopata, Donald J.; and Mathew, Robert L., 4,900,977, Cl. 313-407.000.

Mathis, Ronald F., to General Dynamics Corporation, Electronics Division. Multiple pole optical filter. 4,900,116, Cl. 350-96.150.

Matsubara, Hiro, to JAC Creative Foods, Inc. Shrimp forming process. 4,900,570, Cl. 426-250.000.

Matsubara, Hirokazu: *See*—
Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, 4,900,975, Cl. 313-366.000.

Matsuda, Hidemi: *See*—
Itou, Takeo; Matsuda, Hidemi; Yoshizako, Mamory; and Yagi, Osamu, 4,900,984, Cl. 313-479.000.

Matsuda, Toshitsugu; Nakae, Hiroyuki; and Hirai, Toshio, to Research Development Corporation of Japan; Japan Metals & Chemicals Co., Ltd.; Furukawa Electric Company, Ltd., The; and Hirai, Toshio, a part interest. Polycrystalline rhombohedral boron nitride and method of producing the same. 4,900,526, Cl. 423-290.000.

Matsui, Kiyohide: *See*—
Kurauchi, Yasuhiro; Seita, Toru; Matsui, Kiyohide; and Sugimoto, Kikuo, 4,900,420, Cl. 204-296.000.

Matsui Manufacturing Co., Ltd.: *See*—
Harumoto, Kimura; and Toyoaki, Tanigawa, 4,900,200, Cl. 406-93.000.

Matsui, Masataka: *See*—
Ochii, Kiyofumi; Matsui, Masataka; and Ozawa, Osamu, 4,901,284, Cl. 365-226.000.

Matsui, Sadayoshi; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Taneya, Mototaka, to Sharp Kabushiki Kaisha. Semiconductor VSIS laser. 4,901,328, Cl. 372-46.000.

Matsui, Toru; and Karasaki, Toshihiko, to Minolta Camera Kabushiki Kaisha. Focus detecting system utilizing correction data on aberrations of the photographic lens. 4,900,911, Cl. 250-201.000.

Matsui, Toru: *See*—
Nakamura, Minoru; Ueda, Masahide; and Matsui, Toru, 4,901,115, Cl. 355-246.000.

Matsuki, Hideo: *See*—
Yagi, Toru; and Matsuki, Hideo, 4,899,597, Cl. 73-862.360.

Matsumoto, Hiroo: *See*—
Seto, Kiyotomo; Matsumoto, Hiroo; Kamikawaji, Yoshimasa; Ohrai, Kazuhiko; Nakayama, Kyoko; Sakoda, Ryozo; and Masuda, Yukinori, 4,900,752, Cl. 514-364.000.

Matsumoto, Kuniaki: *See*—
Tashiro, Tsutomu; Komoda, Norihisa; Tsushima, Isao; Matsumoto, Kuniaki; Kawashima, Kazuhiro; and Maekawa, Riyoji, 4,901,229, Cl. 364-200.000.

Matsumoto, Saichi; Doteuchi, Masami; Mizui, Takuji; and Hirai, Kentaro, to Shionogi & Co., Ltd. Isoprenoidamine compounds useful as antiulcer agents. 4,900,749, Cl. 514-334.000.

Matsumoto, Takahiro: *See*—
Suenaga, Haruo; Maehara, Naoyoshi; Sakamoto, Kazuho; Matsumoto, Takahiro; Niwa, Takashi; and Bessyo, Daisuke, 4,900,989, Cl. 315-224.000.

Matsumoto, Yumio: *See*—
Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Tagaki, Osamu, 4,901,103, Cl. 355-27.000.

Matsumura, Hiroyoshi: *See*—
Inoue, Hiroaki; Katsuyama, Toshio; Matsumura, Hiroyoshi; Sakano, Shinji; and Nakamura, Hitoshi, 4,900,134, Cl. 350-354.000.

Matsumura, Hiroyuki: *See*—
Sekizawa, Toshihiko; Matsumura, Hiroyuki; and Yasuda, Makoto, 4,900,992, Cl. 318-135.000.

Matsumura, Susumu: *See*—
Kimura, Hiroyuki; Iimura, Masayuki; Katsuma, Makoto; Urushihara, Kazunobu; Matsumura, Susumu; and Ohmura, Hiroshi, 4,901,063, Cl. 340-723.000.

Matsumura, Teruyuki; and Nagashima, Noritake, to Fanuc Ltd. Part profile input method. 4,901,220, Cl. 364-191.000.

Matsuo, Yasutoshi, to Victor Company of Japan, Ltd. Video signal recording and/or reproducing apparatus. 4,901,165, Cl. 360-9.100.

Matsushita Electric Industrial Co.: *See*—
Yamazaki, Fumio Saeki; Kiyoshi; Tomii, Kaoru; Miyama, Hiroshi; Nakatani, Toshifumi; and Saeki, Kiyoshi, 4,900,981, Cl. 313-422.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hitotsumachi, Shuzo, 4,901,159, Cl. 358-330.000.
Kobayashi, Yoshinori; Uemura, Tsuyoshi; Gohara, Yoshihiro; and Wakita, Naohide, 4,901,066, Cl. 340-805.000.
Kugimiya, Koichi; Hirota, Ken; and Matsuyama, Keiichi, 4,900,393, Cl. 156-600.000.
Masaki, Takeshi; Mizutani, Takeshi; Yonemaochi, Katsutoshi; and Tanaka, Akemi, 4,900,890, Cl. 219-69.170.
Masuda, Yutaka; and Okutani, Norio, 4,900,924, Cl. 250-231.0SE.
Mochizuki, Hideaki; Tamura, Tooru; Takahashi, Kenichi; and Oshima, Mitsuaki, 4,900,649, Cl. 430-311.000.
Ono, Yukiyoshi; Nishino, Atsushi; Takeuchi, Yasuhiro; and Numoto, Hironao, 4,900,703, Cl. 501-136.000.
Satomi, Mitsuo; Hirota, Ken; and Inoue, Osamu, 4,901,179, Cl. 360-126.000.
Suenaga, Haruo; Maehara, Naoyoshi; Sakamoto, Kazuho; Matsumoto, Takahiro; Niwa, Takashi; and Bessyo, Daisuke, 4,900,989, Cl. 315-224.000.
Yamada, Jiro, 4,901,302, Cl. 369-85.000.

Yasohara, Masahiro; Kimura, Yoshitsugu; and Nakano, Hiromitsu, 4,900,993, Cl. 318-254.000.
Matsushita Electric Works, Ltd.: *See*—
Horii, Sadashige; Haraguchi, Hideaki; and Chatani, Ayako, 4,899,442, Cl. 30-133.000.
Matsushita, Saburo: *See*—
Tashiro, Norio; Adachi, Masaki; Ikeda, Toshio; Saito, Hisao; Matsushita, Saburo; and Komine, Masataka, 4,900,985, Cl. 315-39.510.
Matsushita, Takashi; and Tsuchiya, Kozaburo, to Sanden Corporation. Method for manufacturing a rotor frame of an electromagnetic clutch. 4,899,569, Cl. 72-336.000.
Matsuura, Kazuo: *See*—
Sano, Akira; Yoshizumi, Motohiko; Hirata, Hiroki; Matsuura, Kazuo; and Suyama, Hisahiko, 4,900,790, Cl. 525-192.000.
Matsuura, Teruo: *See*—
Saito, Isao; Matsuura, Teruo; and Ikehira, Hideyuki, 4,900,407, Cl. 204-73.00R.
Matsuura, Tooru; and Narita, Yoshinori, to NGK Spark Plug Company, Limited. Engine cylinder head with precombustion chambers using ceramics insert. 4,899,707, Cl. 123-270.000.
Matsuyama, Keiichi: *See*—
Kugimiya, Koichi; Hirota, Ken; and Matsuyama, Keiichi, 4,900,393, Cl. 156-600.000.
Matsuzaki, Shuichi, to Sony Corporation. Cassette case for magnetic tape and the like featuring improved tape tension control arrangement. 4,899,950, Cl. 242-198.000.
Matsuzaki, Shuichi, to Hirose Electric Co., Ltd. Lock mechanism for electrical connector. 4,900,262, Cl. 439-354.000.
Matsuzawa, Hideki, to Fuji Photo Film Co., Ltd. Process for producing information recording medium. 4,900,380, Cl. 156-73.100.
Matt, Lukas, to Etablissement Supervis. Device for assembling a cam member with a cam shaft. 4,899,615, Cl. 74-567.000.
Mattson, Christopher T.: *See*—
Niedospial, John J., Jr.; and Mattson, Christopher T., 4,899,948, Cl. 242-71.100.
Matusima, Takesi; and Okamoto, Atutosi, to Nippondenso Co., Ltd. Optical information reading apparatus. 4,900,907, Cl. 235-472.000.
Maus, Daryl D. Continuous flow water heater with magnetically-actuated flow switch. 4,900,896, Cl. 219-309.000.
Maus, Steven M.; and Galic, George J. Apparatus for injection molding articles. 4,900,242, Cl. 425-149.000.
Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Claussen, Nils; Schubert, Helmut; Ruhle, Manfred; and Petzow, Gunter, 4,900,492, Cl. 264-65.000.
Maxson, Wayne S.; Hargrove, Joel T.; and Delk, Joe H. Novel pharmaceutical composition containing estradiol and progesterone for oral administration. 4,900,734, Cl. 514-171.000.
May, Phillip A.; Wen, Cheng P.; Dunn, Douglas L.; and Ferry, Stephen J., to Delco Electronics Corporation; Santa Barbara Research Center; and Hughes Aircraft Company. Near obstacle detection system. 4,901,083, Cl. 342-128.000.
May, Richard L.; and Curran, Kenneth J., to Cal R&D, Inc. Mechanism for animating a doll's facial features. 4,900,289, Cl. 446-342.000.
Maynard, John; and Sexton, Dale, to A. C. Marble, Inc. Handicap-accessible bath facility. 4,899,402, Cl. 4-663.000.
Mayrhuber, Rudolf: *See*—
Brehm, Gerhard; Knipf, Manuela; Mayrhuber, Rudolf; Schuhmacher, Jurgen; and Stadler, Max, 4,900,363, Cl. 134-3.000.
Mayumi, Kazuhisa: *See*—
Sasaki, Norio; Mayumi, Kazuhisa; and Maeda, Yorishige, 4,899,702, Cl. 123-193.00P.
Mazda Motor Corporation: *See*—
Bota, Keiji; and Sawasaki, Tomoo, 4,899,624, Cl. 74-868.000.
Tabara, Yoshitaka; Takaba, Tetsuro; and Rikitake, Tomotsugu, 4,899,711, Cl. 123-425.000.
Mazie, Jean-Claude: *See*—
Guesdon, Jean-Luc; Avrameas, Stratis; and Mazie, Jean-Claude, 4,900,661, Cl. 435-7.000.
Mazin, Moshe: *See*—
Sano, Jun-ichi; Mazin, Moshe; and Glasser, Lance A., 4,901,285, Cl. 365-230.010.
Mazo, James E.: *See*—
Calderbank, Arthur R.; and Mazo, James E., 4,901,331, Cl. 375-39.000.
Mazura, Paul, to Schroff GmbH. Insertable housing. 4,901,200, Cl. 361-379.000.
MBB GmbH: *See*—
Hararat-Tehrani, Mohamad; Schwarz, Frank; and Taddiken, Michael, 4,899,960, Cl. 244-118.500.
McAuley, Kenneth A.: *See*—
Fichter, June C.; and McAuley, Kenneth A., 4,900,008, Cl. 271-277.000.
McCandless, John J. M.: *See*—
Barnes, Brian A.; Clarke, Ron; Martin, Brian M.; and McCandless, John J. M., 4,899,424, Cl. 24-641.000.
McClelland, Jeffrey L., deceased: *See*—
Marshall, Charles M.; and McClelland, Jeffrey L., deceased, 4,900,943, Cl. 250-578.000.
McCollum, John M.; and Snyder, John N., to Dresser Industries, Inc. Aluminum reverberatory furnace lining. 4,900,249, Cl. 432-248.000.
McConnell, Christopher F.; and Walter, Alan E., to CFM Technologies, Inc. Method and system for fluid treatment of semiconductor wafers. 4,899,767, Cl. 134-56.00R.
McCord Winn Textron Inc.: *See*—
Perkins, Jimmie G.; and Grim, James W., 4,900,235, Cl. 417-315.000.
McCormick, Daniel F., to Brunswick Corporation. Marine drive with improved propeller mounting. 4,900,281, Cl. 440-78.000.
McCormick, Richard L., Jr.: *See*—
Connolly, James D.; and McCormick, Richard L., Jr., 4,900,442, Cl. 210-380.300.
McCoy, Curtis L.: *See*—
Melnik, George; Amrein, Bruce E.; Brucksch, Robert C.; McCoy, Curtis L.; and Martin, James A., 4,899,619, Cl. 74-625.000.
McCoy, Sherilyn S., to McNeil-PPC, Inc. Sanitary napkin with panty gathering flaps. 4,900,320, Cl. 604-387.000.
McCray, Scott B.: *See*—
Babcock, Walter C.; McCray, Scott B.; LaChapelle, Edward D.; and Krichko, Kris A., 4,900,502, Cl. 264-346.000.
McCue, Brian. Waterbed sheet fasteners. 4,899,407, Cl. 5-508.000.
McCue, Richard H., Jr.; and Pickering, John L., Jr., to Mobil Corporation. Cryogenic separation of gaseous mixtures. 4,900,347, Cl. 62-24.000.
McCullough, Richard E.: *See*—
Lee, Jhang W.; and McCullough, Richard E., 4,900,372, Cl. 148-33.400.
McDaniel, John R.: *See*—
Harrington, David M.; McDaniel, John R.; Caldara, Steve A.; Lemone, Louis A.; Andrews, Kenneth R., Jr.; and Funk, Paul, 4,901,232, Cl. 364-200.000.
McDaniel, Max P.; Pitzer, Emory W.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Peptized and phosphated inorganic oxides and catalysts supported on said oxides. 4,900,704, Cl. 502-210.000.
McDonald, Neil K.: *See*—
Boston, Ray W., Jr.; McDonald, Neil K.; and Herbst, LeRoy J., 4,900,109, Cl. 312-276.000.
McEwen, Stephen N., to Henry Filters, Inc. Pump mounting for a filtration system. 4,900,438, Cl. 210-236.000.
McFadden, David H.: *See*—
Putnam, Brett J.; McFadden, David H.; and Dowst, William P., 4,899,462, Cl. 34-19.000.
Mc Ghie, Joseph A.: *See*—
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Nakamatsu, Shuji: *See—*
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Nakamura, Kazunari: *See—*
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Nakamura, Masato: *See—*
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Nakamura, Michio: *See—*
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Nakamura, Minoru; Ueda, Masahide; and Matsui, Toru, to Minolta Camera Kabushiki Kaisha. Toner concentration control device for a developing apparatus. 4,901,115, Cl. 355-246.000.

Nakamura, Mitsuo, to Fuji Jukogyo Kabushiki Kaisha. Fuel injection control system for an automotive engine. 4,899,713, Cl. 123-478.000.

Nakamura, Osamu, to Tsukamoto Seiki Co., Ltd. Axial retainer for a cutter in a rotary drill bit. 4,900,164, Cl. 384-96.000.

Nakamura, Shigeru: *See—*
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Nakamura, Takahiro, to Anritsu Corporation. Optical system for measuring a surface profile of an object using a converged, inclined light beam and movable converging lens. 4,900,940, Cl. 250-560.000.

Nakamura, Takeaki: *See—*
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Nakano, Hiromitsu: *See—*
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Nakao, Haruki: *See—*
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Nakatsu, Keiji, to Mitsubishi Denki Kabushiki Kaisha. Optical disk reading head controller. 4,901,299, Cl. 369-32.000.

Nakayama, Kyoko: *See—*
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Nakayama, Masatoshi; Kobayashi, Koji; Ueda, Kunihiro; Takai, Mitsuru; and Kurose, Shigeo, to TDK Corporation. Magnetic recording medium. 4,900,622, Cl. 428-336.000.

Nakayama, Muneo; Hashimoto, Akira; Nishimura, Toshihiro; Kashiwagi, Eiichi; and Hijikata, Isamu, to Tokyo Ohka Kogyo Co., Ltd. Method for improving film quality of silica-based films. 4,900,582, Cl. 427-54.100.

Nakayama, Tadayoshi; Satoh, Chikara; Fujii, Akio; Yoshimura, Katsuji; and Takahashi, Koji, to Canon Kabushiki Kaisha. Data processing device. 4,901,148, Cl. 358-140.000.

Nakayama, Tadayoshi: *See—*
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Nakazawa, Makoto; Miyazaki, Takao; and Soumi, Mitsuo, to Fuji Photo Film Co., Ltd. Recording/playback apparatus with autochanger. 4,901,172, Cl. 360-98.050.

Nakazyo, Kiyoshi; Hirose, Takeshi; Hurusawa, Genichi; Takahashi, Osamu; Furutachi, Nobuo; and Kobayashi, Hidetoshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,900,655, Cl. 430-546.000.

Nalco Chemical Company: *See—*
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Napolitano, Michael L., to E. D. Bullard Company. Respirator system for use with a hood or face mask. 4,899,740, Cl. 128-202.220.

Napper, Andrew D.: *See—*
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Nestor, James R.; Schiff, Jonathan D.; and Priest, Benjamin H., to C. R. Bard, Inc. Excitation and detection apparatus for remote sensor connected by optical fiber. 4,900,933, Cl. 250-458.100.

Netherton, Fred; and Livneh, Steven Z., to Netherton, Fred; and Livneh, Steven Z. Needle shield. 4,900,309, Cl. 604-192.000.

Neu, Gustav; Nerlich, Ernst-Gunter; and Berger, Karl-Heinz, to Bochumer Eisenhutte Heintzmann GmbH & Co. KG. Electrohydraulic coal-mining system. 4,900,091, Cl. 299-1.000.

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Neugebauer, Constantine A.; Levinson, Lionel M.; Glascock, Homer H., II; Eichelberger, Charles W.; Wojnarowski, Robert J.; and Carlson, Richard O., to General Electric Company. Multi-chip interconnection package. 4,901,136, Cl. 357-75.000.

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Newkirk, Marc S.; Lesher, H. Daniel; Dwivedi, Ratnesh K.; and Kantner, Robert C., to Lanxide Technology Company, LP. Reservoir feed method of making ceramic composite structures and structures made thereby. 4,900,699, Cl. 501-94.000.

Newton, Walter A. Surgical irrigation/aspiration set-up kit. 4,900,302, Cl. 604-30.000.

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Nichols, John M.; and Windhausen, Richard A., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Data transmission security arrangement for a plurality of data stations sharing access to a communication network. 4,901,348, Cl. 380-6.000.

Nichols, Robert L. Medical instrument sterilization container. 4,900,519, Cl. 422-292.000.

Nicholson, James E.; and Gatturna, Roland F., to Mitek Surgical Products, Inc. Suture anchor installation tool. 4,899,743, Cl. 606-139.000.

Nicholson, Victor. Cable communications system with remote switching and processing converters. 4,901,367, Cl. 455-5.000.

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Nioue, Francois; Nedelec, Lucien; Philibert, Daniel; and Moguilewsky, Martine, to Roussel Uclaf. Steroids including a spiro ring in position 17, the process for their preparation and their use. 4,900,725, Cl. 514-173.000.

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Noda, Koji: *See*—
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Nohl, Andre J.: *See*—
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Nohmi Bosai Kogyo Co., Ltd.: *See*—
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Noiret, Robert: *See*—
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Nolet, Leopold. Exerciser and playpen structure having a trampoline like bottom. 4,900,011, Cl. 272-65.000.

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Nomura, Kazuhiko: *See*—
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Nomura, Masahiro; and Machashi, Yukio, to NEC Corporation. Microcomputer system. 4,901,227, Cl. 364-200.000.

Nomura, Takeshi: *See*—
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North American Philips Corporation: *See*—
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Northern Telecom Limited: *See*—
Clegg, David D., 4,901,003, Cl. 324-66.000.
Rheault, Denis J. A., 4,899,892, Cl. 211-41.000.

Northlake Marketing and Supply Company: *See*—
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Northrop Corporation: *See*—
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Norton, Rick: *See*—
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Norton, Robert O.: *See*—
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Nothacker, Siegfreid: *See*—
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Novak, Richard E.: *See*—
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November, Daniel; Langley, William E.; Darnopuk, Harry; and Hectus, George V., to Haake-Fisons Instruments, Inc. Method for testing repeatability of a rheologic system. 4,899,576, Cl. 73-59.000.

Nowell, Charles P. Powered towing dolly for vehicles. 4,900,215, Cl. 414-428.000.

Nozawa, Katsuya: *See*—
Okada, Hitoshi; Terada, Shinichiro; and Nozawa, Katsuya, 4,899,951, Cl. 242-204.000.

Nudelman, Abraham: *See*—
Sterling, Jeffrey; Nudelman, Abraham; Herzig, Jaacov; Keinan, Ehud; and Weiner, Ben Z., 4,900,814, Cl. 536-18.100.

Nukem GmbH: *See*—
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Numoto, Hironao: *See*—
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NutraSweet Company, The: *See*—
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Nyman Pile Driving, Inc.: *See*—
Uchida, Jack; and Michaelsen, Christopher J., 4,900,187, Cl. 405-3.000.

Obara, Hideo; Kimitsuka, Akira; and Yanagishima, Takayuki, to Nissan Motor Co., Ltd. Control system for vehicle equipment. 4,900,079, Cl. 296-65.100.

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Ochi, Katsutoshi; Suzuki, Tokitaro; Ogawa, Hisao; Shibata, Hideo; and Takada, Masaru, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Method for forming container. 4,900,385, Cl. 156-245.000.

Ochi, Koji; and Harada, Masahide, to Nippon Oil and Fats Company, Limited; and Harada Electronics Industry. Delay type electric detonator. 4,899,658, Cl. 102-206.000.

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Odenthal, Heinz F., to Ostma Maschinenbau GmbH. Filling apparatus for a powdery product. 4,899,790, Cl. 141-134.000.

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Ogle, George B., II, to International Medication Systems Limited. Protective device for cannula used to draw blood. 4,900,310, Cl. 604-198.000.

Ohio State University, The: *See—*
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Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus with an editing mode. 4,901,111, Cl. 355-218.000.

Ohkawa, Teruhisa: *See—*
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Provence, Marc; Rousset, Didier; and Dunand, Josiane, 4,900,052, Cl. 280-615.000.
Rudolph, Werner: *See*—
Wilkes, Bernd; Naumann, Dieter; Rudolph, Werner; and Sander, Ruediger, 4,900,867, Cl. 564-91.000.
Ruff, William A.: *See*—
Brent Jr., Fred D.; Nelson, Richard G.; and Ruff, William A., 4,900,713, Cl. 502-439.000.
Ruggiero, Richard; Gardner, William R.; and Rogers, Robert L., to Dataproducts Corporation. Method and apparatus for printing with ink jet chambers utilizing a plurality of orifices. 4,901,093, Cl. 346-140.00R.
Ruhle, Manfred: *See*—
Claussen, Nils; Schubert, Helmut; Ruhle, Manfred; and Petzow, Gunter, 4,900,492, Cl. 264-65.000.
Rumford, Kimball J.: *See*—
Janik, Stanley; Rumford, Kimball J.; and Warner, Timothy, 4,899,596, Cl. 73-862.330.
Rumler, Joseph E., to Milliken Research Corporation. Fabric pile lay detector using mirror system with means to rotate 360 degrees. 4,900,942, Cl. 250-572.000.
Runkles, Richard R.; and Dyer, John A., to Stanley Aviation Corporation. Conduit coupling device with redundancy features. 4,900,070, Cl. 285-233.000.
Ruottu, Seppo: *See*—
Engstrom, Folke; and Ruottu, Seppo, 4,900,516, Cl. 422-147.000.
Rupp, Lothar: *See*—
Guenther, Martin; and Rupp, Lothar, 4,900,381, Cl. 156-90.000.
Rupp, Richard H.: *See*—
Kattige, Samba L.; Naik, Ramchandra G.; Lakdawalla, Aftab D.; Dohadwalla, Alihussein N.; Rupp, Richard H.; and de Souza, Noel J., 4,900,727, Cl. 514-212.000.
Ruscitti, Tommaso; Cutilli, Davide; and Del Leonardis, Demetrio, to S.A.R. S.p.A. Hand pump for delivering thick or liquid substances contained in bottles. 4,899,913, Cl. 222-385.000.
Rushforth, Craig K.; and Abbaszadeh, Ayyoob D., to Unisys Corp. Efficient maximum-likelihood decoder for the golay (24,12) code. 4,901,317, Cl. 371-37.100.
Russell, Alexander I., Jr. Boat mooring device and method of using same. 4,899,680, Cl. 114-230.000.
Russell, Peter J.: *See*—
Atkinson, Colin; Heybourne, Michael J.; Iley, William J.; Knight, Peter C.; Russell, Peter J.; Taylor, Thomas; and Jones, David P., 4,900,466, Cl. 252-174.140.
Russo, Francesco: *See*—
Anania, Guido; Bianchi, Angelo; Cultrera, Vito; Russo, Francesco; and Spagna, Giovanni, 4,900,530, Cl. 423-342.000.
Rutgerswerke AG: *See*—
Holtmann, Wilhelm; Zellerhoff, Robert; Oberkobusch, Rudolf; Staglich, Peter; and Charpey, Bernhard, 4,900,717, Cl. 505-812.000.
Rutsch, Werner: *See*—
Husler, Rinaldo; Kirchmayr, Rudolf; and Rutsch, Werner, 4,900,823, Cl. 544-174.000.
Rutten, Jean: *See*—
Rutten, Leon; and Rutten, Jean, 4,899,717, Cl. 124-67.000.
Rutten, Leon; and Rutten, Jean, to Centre D'Innovations Et De Recherches Appliquers, societe anonyme. Airgun. 4,899,717, Cl. 124-67.000.
Ryan, Kelly P. Rotor for an agricultural feed bagger. 4,899,867, Cl. 198-513.000.
Ryan, Patrick J.; Davis, Michael A.; and Melchior, Donald L., to University of Massachusetts, Trustees of the. Lipisomes containing gas for ultrasound detection. 4,900,540, Cl. 424-9.000.
Ryobi Ltd.: *See*—
Aoki, Atsuhito, 4,899,952, Cl. 242-260.000.
Ryuno, Koitchiro: *See*—
Yamada, Hideaki; Enomoto, Kanehiko; Ryuno, Koitchiro; and Shimizu, Hitoshi, 4,900,672, Cl. 435-188.000.
Ryuno, Toshiro: *See*—
Shima, Yoshisuke; Shibazaki, Kunihiro; Konishi, Yoshiyuki; Ryuno, Toshiro; Fujita, Mitsunobu; and Yoshida, Hisaji, 4,899,517, Cl. 53-432.000.
S.A.R. S.p.A.: *See*—
Ruscitti, Tommaso; Cutilli, Davide; and Del Leonardis, Demetrio, 4,899,913, Cl. 222-385.000.
S. C. Johnson & Son, Inc.: *See*—
Bushman, Donald W.; Klapwald, Marissa A.; and Mikkonen, John W., 4,900,876, Cl. 119-106.000.
Saad, Masoud; and Hahn, Bernd D., to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Process and apparatus for determining quantity of radioactive material in a centrifuge. 4,900,928, Cl. 250-336.100.
Sachetto, Jean-Pierre; Stepto, Robert F. T.; and Zeller, Heinz, to Warner-Lambert Company. Destructurized starch essentially containing no bridged phosphate groups and process for making same. 4,900,361, Cl. 106-213.000.
Sadri, Shahriar M., to Huck Manufacturing Co. Blind fastener forming a blind head with a large effective area. 4,900,205, Cl. 411-38.000.
Saeki, Akio: *See*—
Miyazawa, Teruo; Yasuda, Keiichi; Fujimoto, Kenshiro; and Saeki, Akio, 4,900,680, Cl. 436-71.000.
Saeki, Junichi; Kaneda, Aizo; Ozawa, Masakazu; Nakagawa, Takashi; and Nishi, Kunihiko, to Hitachi, Ltd. Method and apparatus for encapsulating semi-conductors. 4,900,501, Cl. 264-272.170.
Saeki, Kiyoshi: *See*—
Yamazaki, Fumio Saeki; Kiyoshi; Tomii, Kaoru; Miyama, Hiroshi; Nakatani, Toshifumi; and Saeki, Kiyoshi, 4,900,981, Cl. 313-422.000.
Safe Stress, Inc.: *See*—
Edwards, Mary S.; and Dubrinsky, Max M., 4,900,270, Cl. 439-502.000.
Safe-T-Rack Systems, Inc.: *See*—
Espasandin, Timothy M.; and Greenburg, James E., 4,899,895, Cl. 211-71.000.
Safeguard Industrial Corporation: *See*—
Sebastian, Peter R.; and Sebastian, Thomas V., 4,899,763, Cl. 128-878.000.
Sagara, Hiroshi: *See*—
Kakemoto, Gohki; Sagara, Hiroshi; Suzuki, Noriyuki; and Kachi, Shogo, 4,900,873, Cl. 568-761.000.
Sago, Akira: *See*—
Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Tagaki, Osamu, 4,901,103, Cl. 355-27.000.

Sainsbury, John D.; and Karkow, Edward, to GSI Corporation. Strain relief system for connecting cables. 4,900,266, Cl. 439-451.000
Saint-Gobain Vitrage: *See*—
Zortea, Michel; Noiret, Robert, and Dossier, Gerard, 4,900,337, Cl. 65-135.000.
Saito, Hiroyuki: *See*—
Yamamoto, Kazuo; and Saito, Hiroyuki, 4,900,060, Cl. 280-804.000.
Saito, Hisao: *See*—
Tashiro, Norio; Adachi, Masaki; Ikeda, Toshio; Saito, Hisao; Matsushita, Saburo; and Komine, Masataka, 4,900,985, Cl. 315-39.510.
Saito, Isao; Matsuura, Teruo; and Ikehira, Hideyuki, to Yamasa Shoyu Kabushiki Kaisha. Method for deoxygenation of alcohols. 4,900,407, Cl. 204-73.00R.
Saito, Katsuyuki: *See*—
Uehara, Masao; Kanno, Masahide; Saito, Katsuyuki; Uchikubo, Akinobu; Sasagawa, Katsuyoshi; Yamashita, Shinji; Kusumoto, Akira; Nakamura, Kazunari; Hattori, Shinichiro; Hiyama, Keiichi; Hasegawa, Jun; Sasaki, Masahiko; and Nakagawa, Takehiro, 4,901,143, Cl. 358-98.000.
Saito, Osamu: *See*—
Misawa, Yutaka; and Saito, Osamu, 4,901,134, Cl. 357-67.000.
Saito, Sadao: *See*—
Tabei, Kazuhiko; Saito, Sadao; and Kai, Shunichi, 4,899,910, Cl. 222-54.000.
Saito, Shinichi: *See*—
Miyazawa, Kazutoshi; Ushioda, Makoto; Inoue, Hiromichi; Saito, Shinichi; and Ohno, Kouji, 4,900,472, Cl. 252-299.610.
Miyazawa, Kazutoshi; Ioue, Hiromichi; Saito, Shinichi; Ohno, Kouji; and Ushioda, Makoto, 4,900,473, Cl. 252-299.610.
Saito, Shoji: *See*—
Hamaoka, Hiromi; and Saito, Shoji, 4,901,169, Cl. 360-66.000.
Saito, Suzuo; and Mose, Tadao, to Kabushiki Kaisha Toshiba. Power converter for AC load. 4,901,001, Cl. 318-779.000.
Saito, Tadashi; Sakamoto, Ichiro; Ando, Shizuo; and Yamakawa, Souhei, to Pioneer Electronic Corporation. Latch-up restoration circuit. 4,900,951, Cl. 307-296.400.
Saito, Yasuhisa; Watanabe, Katsuya; Okuno, Kohichi; Kamio, Kunimasa; Morii, Akira; and Nakamura, Hiroshi, to Sumitomo Chemical Company, Limited. Low-viscosity epoxy resin, and fiber-reinforced composite material from triglycidyl m-aminophenols. 4,900,848, Cl. 549-517.000.
Saito, Yoshihiro: *See*—
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,900,352, Cl. 71-92.000.
Saito, Yukio; and Ohkita, Masao, to Alps Electric Co., Ltd. Disk cassette loading and ejecting mechanism for a magnetic disk apparatus. 4,901,174, Cl. 360-99.060.
Saitoh, Hitoshi, to Fujitsu Limited. Delay type flip-flop arrangement using transistor transistor logic. 4,900,949, Cl. 307-272.200.
Sakabe, Yukio: *See*—
Ando, Akira; Kittaka, Toshihiko; Sakabe, Yukio; and Fujishima, Satoru, 4,900,970, Cl. 310-320.000.
Sakai, Yoshio: *See*—
Sunami, Hideo; Kure, Tokuo; Miyao, Masanobu; Kawamoto, Yoshifumi; Shimohigashi, Katsuhiro; Sakai, Yoshio; Minato, Osamu; Masuhara, Toshiaki; Koyanagi, Mitsumasa; and Shimizu, Shinji, 4,901,128, Cl. 357-23.600.
Sakaki, Katsunori, to Eidaikako Kabushiki Kaisha. Runner for covering a carpet. 4,900,506, Cl. 428-99.000.
Sakakibara, Kenji, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus. 4,901,104, Cl. 355-32.000.
Sakakibara, Kenzo, to Canon Kabushiki Kaisha. Data communication apparatus. 4,901,902, Cl. 235-375.000.
Sakakibara, Shiro, to Aisin-Warner Kabushiki Kaisha. Automatic transmission for vehicles. 4,899,621, Cl. 475-205.000.
Sakakura, Toshiyasu; and Tanaka, Massato, to Agency of Industrial Science and Technology. Process for direct carbonylation of hydrocarbons. 4,900,413, Cl. 204-157.870.
Sakamoto, Ichiro: *See*—
Saito, Tadashi; Sakamoto, Ichiro; Ando, Shizuo, and Yamakawa, Souhei, 4,900,951, Cl. 307-296.400.
Sakamoto, Kazuho: *See*—
Suenaga, Haruo; Maehara, Naoyoshi; Sakamoto, Kazuho; Matsumoto, Takahiro; Niwa, Takashi; and Bessyo, Daisuke, 4,900,989, Cl. 315-224.000.
Sakamoto, Kiichiro; Takase, Haruo; Uenaka, Kazushige; and Nakajima, Junya, to Fuji Photo Film Co., Ltd. Water supply system for developing apparatus. 4,901,099, Cl. 354-324.000.
Sakamoto, Koji: *See*—
Takeda, Fuchio; Sakamoto, Koji; and Kobayashi, Kazuo, 4,899,689, Cl. 118-651.000.
Sakamoto, Tomoyoshi: *See*—
Abe, Seiichi; Shiratori, Yoshitaka; and Sakamoto, Tomoyoshi, 4,899,719, Cl. 125-14.000.
Sakano, Hajime; Ito, Akitoshi; Yano, Motoichi; Honda, Yasuhiro; and Fujiwara, Takayoshi, to Sumitomo Naugatuck Co., Ltd. Composition containing rubber-modified graft copolymer and carboxylic acid-modified olefin. 4,900,787, Cl. 525-71.000.
Sakano, Shinji: *See*—
Inoue, Hiroaki; Katsuyama, Toshio; Matsumura, Hiroyoshi; Sakano, Shinji; and Nakamura, Hitoshi, 4,900,134, Cl. 350-354.000.
Sakoda, Ryozo: *See*—
Seto, Kiyotomo; Matsumoto, Hiroo; Kamikawaji, Yoshimasa; Ohrai, Kazuhiko; Nakayama, Kyoko; Sakoda, Ryozo; and Masuda, Yukinori, 4,900,752, Cl. 514-364.000.
Sakurai, Masaaki: *See*—
Wakimoto, Kazumasa; Shibata, Motohiro; Ishii, Takaharu; and Sakurai, Masaaki, 4,901,247, Cl. 364-513.000.
Sala International AB: *See*—
Hedlund, Hans-Goran; and Backstrom, Lennart, 4,900,454, Cl. 210-770.000.
Saleen, Merrill E. Pencil eraser assembly. 4,899,419, Cl. 15-428.000.
Saletan, David I., to Shell Oil Company. Process for the production of dichlorohydrin. 4,900,849, Cl. 549-521.000.
Salk Institute for Biological Studies, The: *See*—
Richardelli, Joseph, 4,900,329, Cl. 29-430.000.
Salles, Roger. Matte box and filter assembly. 4,901,098, Cl. 354-295.000.
Salmon, John K.; and Yoo, Young S., to Otis Elevator Company. Elevator car mounting assembly. 4,899,852, Cl. 187-1.00R.
Salomon S.A.: *See*—
Provence, Marc; Rousset, Didier; and Dunand, Josiane, 4,900,052, Cl. 280-615.000.
Sameshima, Kenji: *See*—
Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, 4,900,975, Cl. 313-366.000.
Sampath, Walajabad S.: *See*—
Lee, Kyu Y.; Sampath, Walajabad S.; and Wu, Samuel C., 4,900,579, Cl. 427-11.000.
Samuelsson, Bo A.: *See*—
Hertz, Carl H.; and Samuelsson, Bo A., 4,901,088, Cl. 346-75.000.
Sanchez, Moises G.; Chang, Charles C.; Laine, Norman R.; and Waters, Sandra M., to W. R. Grace & Co.-Conn. Process for making crystalline siliceous materials. 4,900,529, Cl. 423-328.000.
Sanden Corporation: *See*—
Kato, Isao; and Sunaga, Mamoru, 4,899,554, Cl. 62-442.000.
Matsushita, Takashi; and Tsuchiya, Kozaburo, 4,899,569, Cl. 72-336.000.
Shigemi, Shimizu; Kazuto, Kikuchi; and Kiyoshi, Terauchi, 4,900,238, Cl. 417-410.000.
Sander, Ruediger: *See*—
Wilkes, Bernd; Naumann, Dieter; Rudolph, Werner; and Sander, Ruediger, 4,900,867, Cl. 564-91.000.
Sanders Associates, Inc.: *See*—
Kurpan, Vincent E., 4,900,955, Cl. 307-568.000.
Sanders, Donald J.; Bellin, Keith G.; and Dehn, Karl R., to Kimberly-Clark Corporation. Method and apparatus for making elasticized containment flaps. 4,900,384, Cl. 156-204.000.
Sanders, Harold F.: *See*—
Cheng, Yu-Ling; Gale, Robert M.; Sugihara, Edna; and Sanders, Harold F., 4,900,555, Cl. 424-449.000.
Sanders, Ronald J. Shotgun rib mount. 4,899,479, Cl. 42-102.000.
Sanderson, John R.; and Meyer, Robert A., to Texaco Inc. Recovery of purified ditertiary butyl peroxide. 4,900,850, Cl. 549-529.000.
Sanderson, William; and Zinn, Michael, to Zinn, Michael. Folding cushion. 4,899,406, Cl. 5-449.000.
Sandoz Ltd.: *See*—
Moser, Helmut A.; and Wald, Roland, 4,900,812, Cl. 534-627.000.
Sankyo Manufacturing Company, Ltd.: *See*—
Kato, Heizaburo, 4,899,616, Cl. 74-571.00L.
Sanno, Hiroaki, to Murao Boki Kabushiki Kaisha. Residual roving clearing apparatus. 4,899,532, Cl. 57-304.000.
Sano, Akira; Yoshizumi, Motohiko; Hirata, Hiroki; Matsuura, Kazuo; and Suyama, Hisahiko, to Nippon Oil Company, Limited; and Mitsubishi Metal Corporation. Polyethylene resin composition. 4,900,790, Cl. 525-192.000.
Sano, Jun-ichi; Mazin, Moshe; and Glasser, Lance A., to Raytheon Company. High density read-only memory. 4,901,285, Cl. 365-230.010.
Sano, Koichi: *See*—
Maeda, Akira; Sano, Koichi; Yokoyama, Tetsuo; and Koizumi, Hideaki, 4,901,021, Cl. 324-309.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Takahashi, Masanori; and Uchida, Tatsuki, 4,900,282, Cl. 440-89.000.
Sansone, Ronald P.: *See*—
Barton, Maya R.; Sansone, Ronald P.; and Sievel, Mark E., 4,900,941, Cl. 250-566.000.
Santa Barbara Research Center: *See*—
May, Phillip A.; Wen, Cheng P.; Dunn, Douglas L.; and Ferry, Stephen J., 4,901,083, Cl. 342-128.000.
Santalucia, Andre R. G.; and Demarest, Gilbert, to Etienne Lacroix Tous Artifices S.A. Container-disperser for chaff constituted by metal strips or by metallized strips. 4,899,662, Cl. 102-505.000.
Santangelo, Ron L. Drum mute. 4,899,635, Cl. 84-411.00M.
Santiago, Francisco: *See*—
Chu, Tak-Kin; and Santiago, Francisco, 4,900,373, Cl. 148-33.400.
Sanvordeker, Dilip R.; and Leung, Sau-Hung S., to Watson Laboratories, Inc. Mucoadhesive buccal dosage forms. 4,900,552, Cl. 424-422.000.
Sanyo Electric Co., Ltd.: *See*—
Tomisawa, Shin'ichiro, 4,901,318, Cl. 371-40.100.
Saplest S.A.: *See*—
Lalloz, Guy; and Joly, Gabriel, 4,900,487, Cl. 264-45.200.

Saraga, Peter: *See—*
Fernando, Gerard M. X.; Parker, David W.; and Saraga, Peter, 4,901,149, Cl. 358-141.000.

Saroka, Harold G.: *See—*
Parker, Terry S.; Saroka, Harold G.; Horton, Harold E.; Didion, Edward L.; Lyle, Elmer; and Crouse, Randall L., 4,901,340, Cl. 379-60.000.

Sartorius GmbH: *See—*
Graus, Andreas; and Schutzler, Michael, 4,900,441, Cl. 210-321.840.

Sarvis Oy: *See—*
Immonen, Henrik, 4,899,679, Cl. 114-39.100.

Sasagawa, Katsuyoshi: *See—*
Uehara, Masao; Kanno, Masahide; Saito, Katsuyuki; Uchikubo, Akinobu; Sasagawa, Katsuyoshi; Yamashita, Shinji; Kusumoto, Akira; Nakamura, Kazunari; Hattori, Shinichiro; Hiyama, Keiichi; Hasegawa, Jun; Sasaki, Masahiko; and Nakagawa, Takehiro, 4,901,143, Cl. 358-98.000.

Sasaki, Asao, to Fuji Jukogyo Kabushiki Kaisha. Fuel shortage detection system for engine driven generator. 4,899,706, Cl. 123-198.00D.

Sasaki, Ichiro; and Ogano, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Auger for self-propelled snow removing machine. 4,899,471, Cl. 37-233.000.

Sasaki, Masahiko: *See—*
Uehara, Masao; Kanno, Masahide; Saito, Katsuyuki; Uchikubo, Akinobu; Sasagawa, Katsuyoshi; Yamashita, Shinji; Kusumoto, Akira; Nakamura, Kazunari; Hattori, Shinichiro; Hiyama, Keiichi; Hasegawa, Jun; Sasaki, Masahiko; and Nakagawa, Takehiro, 4,901,143, Cl. 358-98.000.

Sasaki, Norio; Mayumi, Kazuhisa; and Maeda, Yorishige, to Toyota Jidosha Kabushiki Kaisha. Aluminum alloy piston and piston-ring assembly treated to suppress agglutination of the piston alloy to a piston-ring. 4,899,702, Cl. 123-193.00P.

Sasaki, Ryoichi: *See—*
Fujikura, Nobuyuki; Morita, Hiroshi; Ikeda, Yoshihisa; and Sasaki, Ryoichi, 4,901,313, Cl. 370-104.100.

Sasaki, Toshinori: *See—*
Amano, Hiroyuki; Nishimura, Tomoaki; and Sasaki, Toshinori, 4,900,963, Cl. 310-187.000.

Sasaki, Toshio; Ebara, Takeshi; Kora, Hiroyuki; Kawai, Kiyoshi; Yamasaki, Mituharu; and Kawamata, Syozo, to Sumitomo Chemical Company, Limited. Process for producing olefin polymers and catalyst used therein. 4,900,706, Cl. 502-116.000.

Sasaki, Yoshio: *See—*
Fujioka, Keiji; Sato, Shigeji; Tamura, Nobuhiko; Takada, Yoshihiro; and Sasaki, Yoshio, 4,900,304, Cl. 604-60.000.

Sasao, Masami: *See—*
Yamada, Shoji; Sasao, Masami; and Yamamoto, Yoshihisa, 4,900,278, Cl. 439-857.000.

Sasayama, Takao; Suzuki, Seikoh; Suzuki, Toshitaka; Miki, Masayuki; and Ueno, Sadayasu, to Hitachi, Ltd. Oxygen sensor. 4,900,425, Cl. 204-426.000.

Sasse, Klaus: *See—*
Kruger, Bernd-Wieland; Sasse, Klaus; Hoever, Franz-Peter; Nentwig, Gunther; and Behrenz, Wolfgang, 4,900,834, Cl. 546-245.000.

SatCon Technology Corporation: *See—*
Hockney, Richard L.; Downer, James R.; Eisenhaure, David B.; Hawkey, Timothy J.; and Johnson, Bruce G., 4,900,962, Cl. 310-90.500.

Sato, Chikara: *See—*
Yoshimura, Katsuji; Masui, Toshiyuki; Sato, Chikara; and Nakayama, Tadayoshi, 4,901,119, Cl. 358-319.000.

Sato, Hideki; and Mizunoya, Nobuyuki, to Kabushiki Kaisha Toshiba. Electronic apparatus having semiconductor device. 4,901,137, Cl. 357-81.000.

Sato, Keiichi: *See—*
Kitai, Mitsumasa; Katsuro, Yoshio; Kawamura, Shigenori; Hino, Masumi; and Sato, Keiichi, 4,900,843, Cl. 549-252.000.

Sato, Keishi: *See—*
Murabayashi, Katsuyoshi; Kotani, Motoharu; and Sato, Keishi, 4,900,765, Cl. 523-122.000.

Sato, Koichiro; Nakagawa, Mikio; Kanemoto, Kuniaki; and Nishimura, Akito, to Mitsui Petrochemical Industries, Ltd. Laminated structure. 4,900,612, Cl. 428-216.000.

Sato, Masaharu: *See—*
Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yosuke; Hano, Sunao; and Sato, Masaharu, 4,900,056, Cl. 280-708.000.

Sato, Naoki; Tsutsumi, Teruo; and Katoh, Masaaki, to Kabushiki Kaisha Toshiba; and Sharp Kabushiki Kaisha. Light emission element array and manufacturing method thereof. 4,901,207, Cl. 362-32.000.

Sato, Shigeji: *See—*
Fujioka, Keiji; Sato, Shigeji; Tamura, Nobuhiko; Takada, Yoshihiro; and Sasaki, Yoshio, 4,900,304, Cl. 604-60.000.

Sato, Shinya: *See—*
Urayama, Kiyoshi; Sato, Shinya; and Iwahashi, Yuji, 4,901,171, Cl. 360-74.600.

Sato, Siro; Nishino, Kazuyuki; and Hatakeyama, Shiro, to Konica Corporation. Verification stamp equipment. 4,901,158, Cl. 358-296.000.

Satoh, Chikara: *See—*
Nakayama, Tadayoshi; Satoh, Chikara; Fujii, Akio; Yoshimura, Katsuji; and Takahashi, Koji, 4,901,148, Cl. 358-140.000.

Satomi, Mitsuo; Hirota, Ken; and Inoue, Osamu, to Matsushita Electric Industrial Co., Ltd. Magnetic head having a laminated structure. 4,901,179, Cl. 360-126.000.

Satronic, AG: *See—*
Frank-Peter, Jagdt, 4,901,034, Cl. 331-4.000.

Saucier, Jeffrey A.: *See—*
Brame, J. Yancey; Horn, Michael F.; Saucier, Jeffrey A.; Siedman, David L.; Thomas, Emery G.; and Varnum, Robert L., 4,900,883, Cl. 200-83.00S.

Saucy, Gabriel G.: *See—*
Chan, Ka-kong; and Saucy, Gabriel G., 4,900,476, Cl. 552-309.000.

Savall, Monsieur V., to Societe Degremont. Device for the introduction of a flnid in a receiving medium, such as that of an apparatus used for the treatment of liquids, notably water. 4,900,437, Cl. 210-232.000.

Savannah Plastics, Inc.: *See—*
Harris, Jack E., 4,899,526, Cl. 56-320.200.

Savarese, Robert. System for providing heated air bubbles to a spa or tub. 4,899,401, Cl. 4-542.000.

Sawada, Kikuzo; Tanagawa, Kouzi; Tomari, Nobuhiro; and Yoshida, Tomoaki, to Oki Electric Industry Co., Ltd. Self-correcting semiconductor memory device and microcomputer incorporating the same. 4,901,320, Cl. 371-51.100.

Sawada, Takashi: *See—*
Ikeda, Hiroshi; Sawada, Takashi; and Bansho, Mitsuo, 4,900,175, Cl. 400-659.000.

Sawai Pharmaceutical Co., Ltd: *See—*
Kato, Yoshiko; and Usami, Hiroko, 4,900,724, Cl. 514-62.000.

Sawasaki, Tomoo: *See—*
Bota, Keiji; and Sawasaki, Tomoo, 4,899,624, Cl. 74-868.000.

Sawayama, Noboru; Kamiyama, Shinichi; Yuh, Hideo; Takashima, Masayuki; and Sekiya, Tadayuki, to Ricoh Company, Ltd. Image-forming device. 4,901,113, Cl. 355-243.000.

Sawicki, Robert A.; and Chafetz, Harry, to Texaco Inc. Novel ligand catalyst systems formed by reaction of carbonyl compounds with organosilicon compounds. 4,900,705, Cl. 502-158.000.

Sawyer, Willard H.: *See—*
Cody, Ian A.; Hamner, Glen P., deceased; Sawyer, Willard H.; and Schorfheide, James J., 4,900,707, Cl. 502-230.000.

Saxton, Jeffery C.: *See—*
Bradshaw, Franklin C.; and Saxton, Jeffery C., 4,900,392, Cl. 156-541.000.

Scanpump AB: *See—*
Algers, Bengt, 4,900,335, Cl. 55-21.000.

Scarponi, Francois: *See—*
Bernard, Georges; Bresson, Raymond; LeClercq, Pierre; Filleau, Odile; and Scarponi, Francois, 4,900,882, Cl. 200-147.00R.

SCES Enterprises, Inc.: *See—*
Eaglin, David; and Hinds, Carlos O. F., 4,899,968, Cl. 248-131.000.

Schade, Horst. Apparatus for continuous filtration of fluids. 4,900,434, Cl. 210-189.000.

Schafer, Norbert; Weimer, Eugen; Gross, Herbert; Eppli, Bernd; and Rossow, Eberhard, to Carl-Zeiss-Stiftung. Cathodoluminescence detector utilizing a hollow tube for directing light radiation from the sample to the detector. 4,900,932, Cl. 250-397.000.

Schafer, Richard J. Stepping staff. 4,899,452, Cl. 33-296.000.

Schafer, Walter: *See—*
Halpaap, Reinhard; Pedain, Josef; Kreuder, Hans-Joachim; Klein, Gerhard; Schafer, Walter; and Arlt, Dieter, 4,900,800, Cl. 528-66.000.

Schaffer, Stanley; and Schussel, Bert. Roller applicator with folding handle. 4,899,417, Cl. 15-230.110.

Schaich, Gerhard: *See—*
Schmidt, Lothar; Eberlein, Klaus; Schaich, Gerhard; and Hlawa, Fritz, 4,901,347, Cl. 379-279.000.

Schaub, Robert E.: *See—*
Wissner, Allan; and Schaub, Robert E., 4,900,731, Cl. 514-77.000.

Schauf, Werner: *See—*
Grah, Klaus; Korsten, Gunter; and Schauf, Werner, 4,900,580, Cl. 427-33.000.

Schebler, Andreas: *See—*
Winter, Udo; and Schebler, Andreas, 4,900,966, Cl. 310-239.000.

Schechter, Michael M.; and Cloke, Martin, to Ford Motor Company. Air/gas forced fuel injection system. 4,899,714, Cl. 123-533.000.

Schelhorn, Gerhard: *See—*
Becker, Herbert; Schelhorn, Gerhard; Dallwig, Claus; Poschl, Dieter; and Volk, Hans J., 4,900,960, Cl. 310-85.000.

Scherer, Paul T.: *See—*
Miller, Benson L.; Scherer, Paul T.; and Maclin, Neiman C., 4,899,667, Cl. 108-47.000.

Schering A.G.: *See—*
Morgan, Thomas K., Jr., 4,900,841, Cl. 548-966.000.

Schierstedt, Detlef: *See—*
Dell, Hans-Dieter; Kraus, Reinhold; and Schierstedt, Detlef, 4,900,557, Cl. 424-452.000.

Schiff, Jonathan D.: *See—*
Nestor, James R.; Schiff, Jonathan D.; and Priest, Benjamin H., 4,900,933, Cl. 250-458.100.

Schiffer, Wernar, to Tet Holding Ges.M.B.H. Drive for a double-worm extruder. 4,899,620, Cl. 74-665.00N.

Schiffleger, Alan J.: *See—*
Chen, Steve S.; and Schiffleger, Alan J., 4,901,230, Cl. 364-200.000.

Schillings, Dieter; Peters, Bernard; and Oellers, Hans G., to J. I. Case Company. Frontal connection apparatus for tractors. 4,899,831, Cl. 172-810.000.

Schirmer, Robert M.; Alquist, Henry E.; and Fromm, Ellsworth H., to Phillips Petroleum Company. Apparatus for burning nitrogen-containing fuels. 4,900,246, Cl. 431-352.000.

Schlecht, Karl. Method for removal of broken ground. 4,900,191, Cl. 405-138.000.

Schlumberger Industries: *See—*
Didiergeorge, Pierre, 4,900,174, Cl. 400-621.000.

Schlumberger Technologies, Inc.: *See—*
Deering, Michael F., 4,901,064, Cl. 340-729.000

Schlumberger Technology Corporation: *See—*
Pouget, Gilles; Chevallier, Jean; and Hampton, Gene, 4,899,682, Cl. 114-264.000.
Veneruso, Anthony F., 4,901,069, Cl. 340-853.000.

Schlutter, Aloys; Kaewert, Klaus; Witolla, Christian; Kopp, Bernd; and Rosler, Hans-Jurgen, to Niederberg-Chemie GmbH. Method and apparatus for use in a slurry filled trench for providing a sealing shield therein. 4,900,195, Cl. 405-267.000.

Schmid, Heinrich: *See—*
Wolf, Robert; and Schmid, Heinrich, 4,899,811, Cl. 165-89.000.

Schmidt, Erwin; and Keller, Reinhold, to Hoechst Aktiengesellschaft. Process for the purification of N-acylaspartame. 4,900,863, Cl. 560-41.000.

Schmidt, Kenneth A., to Culligan International Company. Removing residual alkali metal ions from demineralized water. 4,900,450, Cl. 210-679.000.

Schmidt, Lothar; Eberlein, Klaus; Schaich, Gerhard; and Hlawa, Fritz, to Siemens Aktiengesellschaft. Circuit arrangement for telecommunication switching systems, particularly PCM-time-division multiplex telephone switching systems with a central matrix and with local sub-switching matrices connected to the same. 4,901,347, Cl. 379-279.000.

Schmidt, Peter J.; and Schmitt, Manfred, to Robert Bosch GmbH. Method and apparatus for controlling the operating characteristic quantities of an internal combustion engine. 4,901,240, Cl. 364-431.060.

Schmidt, Rudolf, to EMAG Maschinenfabrik GmbH. Arrangement for centering and clamping work pieces. 4,899,627, Cl. 82-117.000.

Schmidt, Vinzenz, to Ford Motor Company. Articulated belt for continuously variable conical pulley, belt-drive transmission. 4,900,296, Cl. 474-242.000.

Schmitt, Christian: *See—*
Schmitt, Gunther; and Schmitt, Christian, 4,899,533, Cl. 57-339.000.

Schmitt, Franz: *See—*
Ladebeck, Ralf; Fischer, Hubertus; and Schmitt, Franz, 4,901,020, Cl. 324-309.000.

Schmitt, German: *See—*
Kolb, Wolfgang; and Schmitt, German, 4,900,076, Cl. 293-132.000.

Schmitt, Gunther; and Schmitt, Christian, to FAG Kugelfischer Georg Schafer (KGaA). Motor mount for false twist texturing unit. 4,899,533, Cl. 57-339.000.

Schmitt, Manfred: *See—*
Schmidt, Peter J.; and Schmitt, Manfred, 4,901,240, Cl. 364-431.060.

Schmitt, Thomas: *See—*
Heinz, Lothar; and Schmitt, Thomas, 4,901,339, Cl. 378-197.000.

Schneck, Thomas, to Drexler Technology Corporation. Debit card postage meter. 4,901,241, Cl. 364-464.020.

Schneeberger, Erich Gottfried. Garage door opener drive mechanism. 4,900,294, Cl. 474-167.000.

Schnegelberger, Harald: *See—*
Bansemir, Klaus; Disch, Karlheinz; Hachmann, Klaus; Lehmann, Rudolf; Biermann, Manfred; and Schnegelberger, Harald, 4,900,721, Cl. 514-25.000.

Schneider, Gottfried: *See—*
Fahmuller, Maximilian; Schuller, Edmund; and Schneider, Gottfried, 4,899,528, Cl. 57-92.000.

Schneidmiller, Rodney G. Disposable insect trap with flexible container. 4,899,485, Cl. 43-122.000.

Schnell, William J.; Munsch, John M.; Flagler, Robert W.; Fabisiewicz, Eugene; and Soubrier, Pierre, to Baxter Travenol Laboratories, Inc. Method of sealing an article via radio frequency. 4,900,389, Cl. 156-273.700.

Schnoeller, Manfred: *See—*
Wersing, Wolfram; Schnoeller, Manfred; Lubitz, Karl; and Mohaupt, Jutta, 4,900,972, Cl. 310-364.000.

Schoeps, Jochen: *See—*
Leitz, Edgar; Eichenauer, Herbert; Ott, Karl-Heinz; Peters, Horst; and Schoeps, Jochen, 4,900,785, Cl. 525-67.000.

Scholtholt, Hans, to Siemens Aktiengesellschaft. Distribution arrangement for telecommunication apparatus. 4,901,190, Cl. 361-119.000.

Scholtz, Edward C.: *See—*
Dempski, Robert E.; Scholtz, Edward C.; Nibbelink, Donald W.; and Reines, Scott A., 4,900,755, Cl. 424-469.000.

Schorfheide, James J.: *See—*
Cody, Ian A.; Hamner, Glen P., deceased; Sawyer, Willard H.; and Schorfheide, James J., 4,900,707, Cl. 502-230.000.

Schrank, douglas A.; and Lewis, Russell G., to Carrier Corporation. Refrigerant injection into oil for sound reduction. 4,900,234, Cl. 417-312.000.

Schrauwen, Hans-Joachim, to AEG Aktiengesellschaft. Method for the position detection of the strip edge of a material web. 4,901,292, Cl. 367-118.000.

Schreder, Felix; and Gossler, Gerhard, to E.G.O. Elektro-Gerate Blanc u. Fischer. Cooking unit with radiant heaters. 4,900,899, Cl. 219-464.000.

Schreiber, Heinz H.; and O'Connor, Martin G., to Grumman Aerospace Corporation. Adaptive waveform radar. 4,901,082, Cl. 342-89.000.

Schrod, Manfred: *See—*
Bicker, Richard; Schrod, Manfred; and Militzer, Hans, 4,900,523, Cl. 423-236.000.

Schroeder, Albert H.; Ching, Ta Y.; Suzuki, Shigeto; and Katsumoto, Kiyoshi, to Chevron Research Company. Polyalkylenepolyamines as corrosion inhibitors. 4,900,458, Cl. 252-8.555.

Schroff GmbH: *See—*
Mazura, Paul, 4,901,200, Cl. 361-379.000.

Schubert, Helmut: *See—*
Claussen, Nils; Schubert, Helmut; Ruhle, Manfred; and Petzow, Gunter, 4,900,492, Cl. 264-65.000.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Fahmuller, Maximilian; Schuller, Edmund; and Schneider, Gottfried, 4,899,528, Cl. 57-92.000.

Schuchart, Thomas L.: *See—*
Berrong, David B.; and Schuchart, Thomas L., 4,899,983, Cl. 251-214.000.

Schuhmacher, Jurgen: *See—*
Brehm, Gerhard; Knipf, Manuela; Mayrhuber, Rudolf; Schuhmacher, Jurgen; and Stadler, Max, 4,900,363, Cl. 134-3.000.

Schulke Mayr, GmbH: *See—*
Diehl, Karl-Heinz, 4,900,736, Cl. 514-245.000.

Schuller, Edmund: *See—*
Fahmuller, Maximilian; Schuller, Edmund; and Schneider, Gottfried, 4,899,528, Cl. 57-92.000.

Schulte, Guenter: *See—*
Alt, Anton; Schulte, Guenter; Toelke, Peter; and Wilhelm, Ludwig, 4,900,375, Cl. 148-139.000.

Schultze, Wolfgang; Todter, Werner; and Kern, Reinhold, to Asea Brown Boveri Aktiengesellschaft. Method and device for the automatic recording of signal curves. 4,901,009, Cl. 324-121.00R.

Schulz, Reiner, to Siemens Aktiengesellschaft. Radiation detector. 4,901,126, Cl. 357-29.000.

Schumacher, William A., to E. R. Squibb & Sons, Inc. Method of preventing or reducing venous thrombosis using a thromboxane A_2 receptor antagonist in conjunction with heparin and combination. 4,900,723, Cl. 514-56.000.

Schumaker, Everett P.: *See—*
Sweppy, Michael S.; Tuttle, Richard R.; and Schumaker, Everett P., 4,899,579, Cl. 73-118.100.

Schussel, Bert: *See—*
Schaffer, Stanley; and Schussel, Bert, 4,899,417, Cl. 15-230.110.

Schutt, Frank: *See—*
Kaschemekat, Jurgen; Schutt, Frank; and Wenzlaff, Axel, 4,900,402, Cl. 203-19.000.

Schutzler, Michael: *See—*
Graus, Andreas; and Schutzler, Michael, 4,900,441, Cl. 210-321.840.

Schwartz, Marcus. Stable fingernail ring. 4,899,557, Cl. 63-15.000.

Schwarz, Frank: *See—*
Hararat-Tehrani, Mohamad; Schwarz, Frank; and Taddiken, Michael, 4,899,960, Cl. 244-118.500.

Schwarz, Wilfried; and Stommel, Peter, to Reifenhauser GmbH & Co. Maschinenfabrik. Method of metering an additive into and mixing it with a thermoplastified synthetic resin. 4,900,155, Cl. 366-76.000.

Schwarzkopf Development Corporation: *See—*
Rodhammer, Peter; and Kailer, Karlheinz, 4,901,338, Cl. 378-144.000.

Schwee, Leonard J., to United States of America, Navy. Bloch-line memory element and ram memory. 4,901,278, Cl. 365-87.000.

Schweier, Guenther: *See—*
Kerth, Juergen; Mueller-Mall, Rudolf; and Schweier, Guenther, 4,900,798, Cl. 526-152.000.

Schweigl, Erwin; Hayes, Thomas P.; Kljajic, Dusan; and Jellositz, Rolf, to CIBA-Geigy Corporation. Method for producing a sterile preservative-free aerosol saline solution. 4,899,914, Cl. 222-394.000.

Schwindeman, James A., to American Cyanamid Company. Herbicidally active substituted diphenyl ether oxime derivatives. 4,900,862, Cl. 560-21.000.

Schwirtlich, Ingo: *See—*
Kurz, Gunter; Schwirtlich, Ingo; and Gebauer, Klaus, 4,900,532, Cl. 423-348.000.

Schwuchow, Norbert; and Burk, Gerhard, to Daimler-Benz AG. Front section for a motor vehicle, especially a passenger motor vehicle. 4,900,082, Cl. 296-194.000.

Scripps Clinic and Research Foundation: *See—*
Benkovic, Stephen; Lerner, Richard A.; Tramontano, Alfonso; and Napper, Andrew D., 4,900,674, Cl. 435-232.000.
Goodman, Michael G., 4,900,675, Cl. 435-240.270.
Sutcliffe, J. Gregor, 4,900,811, Cl. 530-324.000.

Scully Signal Company: *See—*
Stemporzewski, Francis V., Jr., 4,901,195, Cl. 361-217.000.

Seagate Technology, Inc.: *See—*
Martin-Lopez, Fernando, 4,901,215, Cl. 363-21.000.

Seats, Peter, to Thomson Electron Tubes and Devices Corporation. Monotube CRT. 4,900,991, Cl. 315-366.000.

Sebastian, Peter R.; and Sebastian, Thomas V., to Safeguard Industrial Corporation. Therapeutic appliance for the wrist. 4,899,763, Cl. 128-878.000.

Sebastian, Thomas V.: *See—*
Sebastian, Peter R.; and Sebastian, Thomas V., 4,899,763, Cl. 128-878.000.

Sedlmayer, Peter, to Krause-Maffei Aktiengesellschaft. Filter centrifuge control. 4,900,453, Cl. 210-742.000.

Seebacher, Franz, to Rohren- und Pumpenwerk Rudolf Bauer Aktiengesellschaft. Reversing mechanism for a switchover seat-type valve. 4,899,639, Cl. 91-347.000.

Seichter, Daniel J.; and Olofson, David L., to AMCA International Corporation. Dynamically compensating counterbalance. 4,899,628, Cl. 82-131.000.

Seidel, Kurt: *See—*
Ritter, Wolfgang; Tenhaef, Rolf; Hoffkes, Horst; and Seidel, Kurt, 4,900,543, Cl. 424-70.000.
Ritter, Wolfgang; Tenhaef, Rolf; Hoffkes, Horst; and Seidel, Kurt, 4,900,544, Cl. 424-70.000.

Seifert, Gottfried; and Hassig, Robert, to Ciba-Geigy Corporation. Process for the preparation of pyrimidine derivatives. 4,900,827, Cl. 544-303.000.

Seiko Electronic Components Ltd.: *See—*
Kawashima, Hirofumi, 4,900,971, Cl. 310-361.000.

Seiko Instruments Inc.: *See—*
Chiba, Mitsuharu; Taniguchi, Kazuyoshi; and Iwase, Hiroshi, 4,899,636, Cl. 84-454.000.
Machida, Satoshi; Kawahara, Yukito; and Mukainakano, Hiroshi, 4,901,153, Cl. 358-213.110.

Seisan Gijutsu Center Co., Ltd.: *See—*
Hoaki, Kouji, 4,900,198, Cl. 405-303.000.

Seita, Toru: *See—*
Kurauchi, Yasuhiro; Seita, Toru; Matsui, Kiyohide; and Sugimoto, Kikuo, 4,900,420, Cl. 204-296.000.

Seita, Yukio; and Onishi, Makoto, to Terumo Corporation. A porous membrane for blood components and method for manufacturing thereof. 4,900,444, Cl. 210-500.360.

Seki, Yasukazu, to Fuji Electric Co., Ltd. Conductivity modulated MOSFET. 4,901,124, Cl. 357-23.400.

Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Ochi, Katsutoshi; Suzuki, Tokitaro; Ogawa, Hisao; Shibata, Hideo; and Takada, Masaru, 4,900,385, Cl. 156-245.000.

Sekiya, Tadayuki: *See—*
Sawayama, Noboru; Kamiyama, Shinichi; Yuh, Hideo; Takashima, Masayuki; and Sekiya, Tadayuki, 4,901,113, Cl. 355-243.000.

Sekizawa, Toshihiko; Matsumura, Hiroyuki; and Yasuda, Makoto, to Hitachi, Ltd. Apparatus and method for controlling electric car. 4,900,992, Cl. 318-135.000.

Selig, Manfred: *See—*
Ball, Peter; Marquardt, Klaus; Selig, Manfred; and Hafener, Klaus, 4,900,777, Cl. 524-819.000.

Selover, Jay C.: *See—*
Kissell, Charles L.; Selover, Jay C.; and Ingle, David M., 4,900,615, Cl. 428-262.000.

Sema, Yoshihito: *See—*
Nakada, Toshio; Takemura, Fumio; Sema, Yoshihito; and Kataoka, Kazuhito, 4,900,465, Cl. 252-62.550.

Semi-Gas Systems, Inc.: *See—*
Kulha, Edward, 4,899,585, Cl. 73-293.000.

Senn, Thomas P.: *See—*
Espin, Mario W.; Espin, Helen P.; Senn, Thomas P.; and Joyner, Harry M., Jr., 4,899,946, Cl. 242-55.000.

Senoh, Shiro: *See—*
Suwa, Yoshihide; Kiyota, Noriko; Yoshizumi, Hajime; and Senoh, Shiro, 4,900,538, Cl. 424-10.000.

Sens, Andri: *See—*
Lenglet, Michel; and Sens, Andri, 4,899,567, Cl. 72-159.000.

Senshu, Susumu, to Pioneer Electronic Corporation. Region detection system for detecting empty sectors on a recording medium. 4,901,301, Cl. 369-54.000.

Senske, Wilhelm; Niemann, Ekkehard; Herkert, Roland; and Blang, Guido, to Licentia Patent-Verwaltungs-GmbH. Electrophotographic recording material and method of producing it. 4,900,646, Cl. 430-64.000.

Senturia, Stephen D.: *See—*
Allen, Mark G.; and Senturia, Stephen D., 4,899,581, Cl. 73-150.00A.

Sentz, Ross H.: *See—*
Wulf, James B.; Craig, Timothy D.; Evans, Alfred P.; and Sentz, Ross H., 4,900,225, Cl. 415-224.500.

Seo, Akikazu; and Miyake, Mitsunao, to Mitsubishi Jukogyo Kabushiki Kaisha. Driving system for a rotary press. 4,899,655, Cl. 101-181.000.

Serafini, Siro; and Zagotto, Giuseppe, to Hoffman-La Roche Inc. Process for 4-dimethylamino-3,5-dimethoxybenzaldehyde. 4,900,859, Cl. 558-418.000.

Sergeant, Mark R. Adjustable plunge-cut road saw mechanism. 4,900,094, Cl. 299-39.000.

Sericol Group Limited: *See—*
Smith, Jonathan H., 4,900,617, Cl. 428-325.000.

Serrot Corporation: *See—*
Torres, Guillermo M.; Bowler, Michael W.; and Otto, Robert A., 4,899,400, Cl. 4-487.000.

Seshadri, Jayaram: *See—*
Berge, Jeffrey B.; Seshadri, Jayaram; and Hanson, Jay L., 4,899,549, Cl. 62-160.000.

Seto, Kiyotomo; Matsumoto, Hiroo; Kamikawaji, Yoshimasa; Ohrai, Kazuhiko; Nakayama, Kyoko; Sakoda, Ryozo; and Masuda, Yukinori, to Nissan Chemical Industries, Ltd. Pyranobenzoxadiazole derivatives. 4,900,752, Cl. 514-364.000.

Setra Systems, Inc.: *See—*
Lee, Shih-Ying, 4,899,600, Cl. 73-862.640.

Settinger, Manfred: *See—*
Pontius, Klaus; and Settinger, Manfred, 4,899,912, Cl. 222-145.000.

Settles, David J., to Dayco Products-Eaglemotive, Inc. Method of making a shaft for a clutch for a cooling fan of a motor vehicle. 4,899,863, Cl. 192-110.00R.

Sexton, Dale: *See—*
Maynard, John; and Sexton, Dale, 4,899,402, Cl. 4-663.000.

Sfarti, Adrian, to Advanced Micro Devices, Inc. Apparatus and methodology for automated filling of complex polygons. 4,901,251, Cl. 364-521.000.

SFT AG Spontanfordertechnik: *See—*
Meier, Jacques, 4,899,666, Cl. 104-88.000.

SGS Thomson Microelectronics S.A.: *See—*
Dubujet, Bruno, 4,900,950, Cl. 307-272.300.
Jeudi, Patrice; and Anceau, Christine, 4,901,130, Cl. 357-38.000.

SGSATES Componenti Elettronici S.p.A.: *See—*
Alzati, Angelo, 4,901,191, Cl. 361-152.000.

Shaffer, Jeremiah J.: *See—*
Dziubakowski, Donald J.; Keyes, Marion A., IV; and Shaffer, Jeremiah J., 4,900,232, Cl. 417-53.000.

Shah, Vipin D.; Yen, Shing-Erh; and Anchin, Gerald M., to International Immunoassay Laboratories, Inc. CK-MM myocardial infarction immunoassay. 4,900,662, Cl. 435-7.000.

Shah, Yogesh B.: *See—*
Hui, Man H.; Valiveti, Radhakrishna S.; Patel, Haroon; Lamont, James A.; and Shah, Yogesh B., 4,901,312, Cl. 370-85.120.

Shallenberger, John M.; and Ferlan, Stephen J., to Westinghouse Electric Corp. Nuclear fuel assembly debris filter bottom nozzle. 4,900,507, Cl. 376-352.000.

Shamir, Yechiel. Arm wrestling apparatus. 4,900,019, Cl. 272-138.000.

Shankland, Ian R.: *See—*
Lund, Earl E. A.; Richard, Robert G.; and Shankland, Ian R., 4,900,365, Cl. 134-12.000.

Shapiro, Bernard H.: *See—*
MacLeod, James N.; and Shapiro, Bernard H., 4,900,313, Cl. 604-261.000.

Shapr Kabushiki Kaisha: *See—*
Hayakawa, Toshiro; Suyama, Takahiro; Kondo, Masafumi; and Takahashi, Kosei, 4,901,326, Cl. 372-45.000.

Sharp Corporation: *See—*
Tanaka, Yasuharu; and Inui, Ken'ichi, 4,901,262, Cl. 364-709.160.

Sharp Kabushiki Kaisha: *See—*
Iwagami, Fusao; and Murayama, Sei, 4,901,094, Cl. 346-140.00R.
Iwamoto, Ken; Okumura, Masafumi; and Hayashi, Tatsushi, 4,901,107, Cl. 355-55.000.
Kinugawa, Seiichi; Kainoh, Seio; Kawashima, Takashi; and Okabe, Katsumi, 4,901,193, Cl. 361-212.000.
Matsui, Sadayoshi; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Taneya, Mototaka, 4,901,328, Cl. 372-46.000.
Sato, Naoki; Tsutsumi, Teruo; and Katoh, Masaaki, 4,901,207, Cl. 362-32.000.
Tajima, Yoshimitsu; Mohri, Motoo; and Tanaka, Hideaki, 4,900,588, Cl. 427-122.000.
Tsujioka, Hiroshi; Yoneda, Shigeo; and Yatsuzuka, Yasufumi, 4,901,163, Cl. 358-473.000.
Uehara, Kazuhiro, 4,901,243, Cl. 364-483.000.

Sharpless, Karl B.: *See—*
Hanson, Robert M.; Ko, Soo Y; and Sharpless, Karl B., 4,900,847, Cl. 549-529.000.

Shaw, David N., to Carrier Corporation. Evaporator feed system with flash cooled motor. 4,899,555, Cl. 62-505.000.

Shawler, Ralph H., to Packaging Service Corporation of Kentucky. Adjustable packing carton for transportation of rectilinear articles. 4,899,888, Cl. 206-586.000.

Shekleton, Jack R., to Sundstrand Corporation. Hot gas generator. 4,899,538, Cl. 60-39.465.

Shell Oil Company: *See—*
Bass, Ronald M., 4,899,671, Cl. 110-341.000.
Clarke-Sturman, Anthony J.; and Sturla, Phillip L., 4,900,457, Cl. 252-8.514.
Collins, Michael H.; and Lyle, Alan R., 4,900,488, Cl. 264-45.700.
Gergen, William P., 4,900,789, Cl. 525-185.000.
Rhodes, Robert B.; and Bean, Arthur R., 4,900,875, Cl. 585-11.000.
Saletan, David I., 4,900,849, Cl. 549-521.000.
Zuideveld, Pieter L.; and Groeneveld, Michiel J., 4,900,340, Cl. 55-208.000.

Shen, Jian-Kuo: *See—*
Joyce, Thomas F.; Kelly, Richard P.; and Shen, Jian-Kuo, 4,901,222, Cl. 364-200.000.

Shen, Wayne. Hat structure for displaying indicia illuminated by a light. 4,901,211, Cl. 362-106.000.

Sheppard Envelope Company: *See—*
Spaulding, Lincoln B., 4,899,926, Cl. 229-73.000.

Sheridan, John. Game scoring method. 4,900,027, Cl. 273-148.00R.

Sherman, Dean R., Sr.: *See—*
Ottsman, Guy L.; and Sherman, Dean R., Sr., 4,899,681, Cl. 114-230.000.

Sherwin-Williams Company, The: *See—*
Johansen, Norman A., 4,899,886, Cl. 206-555.000.

Sherwood, Stevn P.: *See—*
Brown J. Michael; Sherwood, Stevn P.; and Holder, E. Paul, 4,900,451, Cl. 210-699.000.

Shibata, Hideo: *See—*
Ochi, Katsutoshi; Suzuki, Tokitaro; Ogawa, Hisao; Shibata, Hideo; and Takada, Masaru, 4,900,385, Cl. 156-245.000.

Shibata, Masato; and Yamane, Yoshitaka, to Shikoku Kakoki Co., Ltd. Control system for reciprocating linear motion or intermittent motion devices. 4,900,999, Cl. 318-687.000.

Shibata, Motohiro: *See—*
Wakimoto, Kazumasa; Shibata, Motohiro; Ishii, Takaharu; and Sakurai, Masaaki, 4,901,247, Cl. 364-513.000.

Shibazaki, Kunihiro: *See—*
Shima, Yoshisuke; Shibazaki, Kunihiro; Konishi, Yoshiyuki; Ryuno, Toshiro; Fujita, Mitsunobu; and Yoshida, Hisaji, 4,899,517, Cl. 53-432.000.

Shibuya, Hiromichi: *See—*
Ouchi, Teruo; and Shibuya, Hiromichi, 4,899,787, Cl. 138-131.000.

Shibuya, Yoshiyuki: *See—*
Arase, Takuyo; Shibuya, Yoshiyuki; and Daimon, Shigeo, 4,900,464, Cl. 252-62.550.

Shidara, Keiichi: *See—*
Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, 4,900,975, Cl. 313-366.000.

Shigemi, Shimizu; Kazuto, Kikuchi; and Kiyoshi, Terauchi, to Sanden Corporation. Scroll type compressor with releasably secured hermetic housing. 4,900,238, Cl. 417-410.000.

Shigenobu, Hiromichi: *See—*
Nagasaka, Yasuhiro; Shigenobu, Hiromichi; Shiraki, Kazuyuki; and Maeda, Akira, 4,900,267, Cl. 439-489.000.

Shih, Meiling: *See—*
Tipton, Carl L.; and Shih, Meiling, 4,900,726, Cl. 514-182.000.

Shikoku Kakoki Co., Ltd.: *See—*
Shibata, Masato; and Yamane, Yoshitaka, 4,900,999, Cl. 318-687.000.

Shima, Toshiaki: *See—*
Gantzhorn, John E., Jr.; Shima, Toshiaki; Sota, Koichi; and Su, Kwai-Yung B., 4,901,167, Cl. 360-15.000.

Shima, Yoshisuke; Shibazaki, Kunihiro; Konishi, Yoshiyuki; Ryuno, Toshiro; Fujita, Mitsunobu; and Yoshida, Hisaji, to Mitsui Toatsu Chemicals, Inc.; Kyokujitsu Co., Ltd.; and Koike Chemical Co., Ltd. Storage, transporation method, packaging material, and package for agricultural products. 4,899,517, Cl. 53-432.000.

Shimamune, Takayuki: *See—*
Nishiki, Yoshinori; Nakamatsu, Shuji; and Shimamune, Takayuki, 4,900,419, Cl. 204-290.00R.

Shimano Industrial Company Limited: *See—*
Toda, Junichi, 4,899,953, Cl. 242-268.000.

Shimaohgi, Toshio, Mori, Hideo; and Okada, Tadanori, to Kabushiki Kaisha Toshiba. Electron gun having blackened grids used in-line type color CRT, and color CRT using the same. 4,900,978, Cl. 313-409.000.

Shimase, Akira: *See—*
Takahashi, Takahiko; Itoh, Funikazu; Shimase, Akira; Yamaguchi, Hiroshi; Hongo, Mikio; and Haraichi, Satoshi, 4,900,695, Cl. 437-195.000.

Shimizu, Chuji: *See—*
Inoue, Hirokatsu; and Shimizu, Chuji, 4,899,753, Cl. 128-639.000.

Shimizu, Hiroshi: *See—*
Ozawa, Naohiro; Shimizu, Hiroshi; Gotoh, Toshihiko; Hamma, Kentaro; Okunomiya, Seizi; Nomura, Takeshi; and Shiraishi, Mikio, 4,901,090, Cl. 346-76.0PH.

Shimizu, Hitoshi: *See—*
Yamada, Hideaki; Enomoto, Kanehiko; Ryuno, Koichiro; and Shimizu, Hitoshi, 4,900,672, Cl. 435-188.000.

Shimizu, Shinji: *See—*
Sunami, Hideo; Kure, Tokuo; Miyao, Masanobu, Kawamoto, Yoshifumi; Shimohigashi, Katsuhiro; Sakai, Yoshio; Minato, Osamu; Masuhara, Toshiaki; Koyanagi, Mitsumasa; and Shimizu, Shinji, 4,901,128, Cl. 357-23.600.

Shimoda, Elwyn: *See—*
Flanigan, David A.; Shimoda, Elwyn; and Stolhand, James E., 4,900,445, Cl. 210-512.100.

Shimohigashi, Katsuhiro: *See—*
Sunami, Hideo; Kure, Tokuo; Miyao, Masanobu; Kawamoto, Yoshifumi; Shimohigashi, Katsuhiro; Sakai, Yoshio; Minato, Osamu; Masuhara, Toshiaki; Koyanagi, Mitsumasa; and Shimizu, Shinji, 4,901,128, Cl. 357-23.600.

Shimokobe, Jiro: *See—*
Shimoma, Taketoshi; Morohashi, Katsuei; and Shimokobe, Jiro, 4,900,979, Cl. 313-412.000.

Shimoma, Taketoshi; Morohashi, Katsuei; and Shimokobe, Jiro, to Kabushiki Kaisha Toshiba. Color cathode ray apparatus provided with dynamic convergence means. 4,900,979, Cl. 313-412.000.

Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Target of image pickup tube having an amorphous semiconductor laminate. 4,900,975, Cl. 313-366.000.

Shin, Charles H.; and Woodworth, George K., to International Business Machines Corporation. Zero voltage crossover detector for polyphase systems. 4,901,005, Cl. 324-86.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Fujiki, Hironao; Okami, Takehide; and Hinoto, Yuji, 4,900,362, Cl. 106-287.14C.
Terae, Nobuyuki; Mutoh, Teiichi; and Yoshida, Akira, 4,900,474, Cl. 252-358.000.

Shinano Tokki Corporation: *See—*
Kitahara, Haruo; and Ohshita, Takeshi, 4,900,958, Cl. 310-67.00R.

Shinjo, Goro: *See—*
Ohtsubo, Toshiro; Tsuda, Shigenori; Manabe, Yukio; Itoh, Takaaki; Kawada, Hitoshi; Shinjo, Goro; and Tsuji, Kozo, 4,900,551, Cl. 424-408.000.

Shiomi, Iwaji; and Nakao, Haruki, to Nikki Co., Ltd. Gas separation-/extraction apparatus for separating and extracting a desired gas from a gas mixture and a balance valve therefor. 4,900,338, Cl. 55-161.000.

Shionogi & Co., Ltd.: *See—*
Matsumoto, Saichi; Doteuchi, Masami; Mizui, Takuji; and Hirai, Kentaro, 4,900,749, Cl. 514-334.000.

Shiota, Keiichi, to Kabushiki Kaisha Toshiba. Printing apparatus which can specify a font memory irrespective of a mounting position thereof, and a method of specifying a font memory. 4,901,249, Cl. 364-519.000.

Shioya, Tetsuo; and Kitano, Katsuhiro, to Efuesukei Kabushiki Kaisha. Sheet slitting apparatus. 4,899,630, Cl. 83-425.400.

Shirae, Hiroshi; and Shirae, Shinichi, to Hakko Electric Co., Ltd. Method and apparatus for controlling a-c power by means of thyristors for a resistance-type electric furnace. 4,900,900, Cl. 219-501.000.

Shirae, Shinichi: *See—*
Shirae, Hiroshi; and Shirae, Shinichi, 4,900,900, Cl. 219-501.000.

Shirai, Tatsuro: *See—*
Yoshida, Shiro; Shirai, Tatsuro; and Nagashima, Satoru, 4,901,168, Cl. 360-60.000.

Shirai, Tokuo: *See—*
Ohmori, Toshihide; Kitamura, Kazuhiko; Kawamura, Masuhiko; Danno, Atsushi; Shirai, Tokuo; Sugiura, Yukio; and Nakane, Mitsuru, 4,900,459, Cl. 252-32.500.

Shiraishi, Hajime, to Kabushiki Kaisha Toshiba. Processing apparatus with hierarchical structure for implementing a machine instruction. 4,901,225, Cl. 364-200.000.

Shiraishi, Mikio: *See—*
Ozawa, Naohiro; Shimizu, Hiroshi; Gotoh, Toshihiko; Hamma, Kentaro; Okunomiya, Seizi; Nomura, Takeshi; and Shiraishi, Mikio, 4,901,090, Cl. 346-76.0PH.

Shiraki, Kazuyuki: *See—*
Nagasaka, Yasuhiro; Shigenobu, Hiromichi; Shiraki, Kazuyuki; and Maeda, Akira, 4,900,267, Cl. 439-489.000.

Shirasu, Hirotoshi: *See—*
Maejima, Yukihito; Shirasu, Hirotoshi; Suzuki, Taihei; Tokita, Yoshiaki; Tanabe, Shirou; and Morita, Takashi, 4,901,274, Cl. 364-900.000.

Shiratori, Yoshitaka: *See—*
Abe, Seiichi; Shiratori, Yoshitaka; and Sakamoto, Tomoyoshi, 4,899,719, Cl. 125-14.000.

Shiroshita, Tooru: *See—*
Nagatsu, Yoshiro; Isozaki, Hideo; Shiroshita, Tooru; and Suzuki, Jiro, 4,900,826, Cl. 544-277.000.

Shishkin, Viktor V., to Ibzhenerny Tsentr "Truboprovod". Device for growing plants. 4,899,489, Cl. 47-65.000.

Shoji, Kazunori; Ohtani, Yoshinori; Kikkawa, Hirofumi; Terada, Hiroshi; Murata, Masayasu; and Meguri, Nobuyasu, to Babcock-Hitachi Kabushiki-Baisha. Process for producing a high concentration coal-water slurry. 4,900,330, Cl. 44-51.000.

Shoji, Takashi, to Fuji Photo Film Co., Ltd. Driver circuit for semiconductor light-emitting device. 4,900,912, Cl. 250-205.000.

Shopsmith, Inc.: *See—*
Snyder, Steven A.; Smith, Jack; Flora, David D.; and Bartlett, Robert L., 4,899,793, Cl. 142-7.000.

Shu, David B.; and Nash, James G., to Hughes Aircraft Company. Gated architecture for computer vision machine. 4,901,360, Cl. 382-41.000.

Shu, Paul: *See—*
Jennings, Alfred R., Jr.; Hoefner, Mark L.; and Shu, Paul, 4,899,818, Cl. 166-270.000.

Shulman, Jan E.: *See—*
Ramachandran, Pallassanna; and Shulman, Jan E., 4,900,475, Cl. 252-532.000.

Shur, Michael: *See—*
Xu, Jingming; and Shur, Michael, 4,901,122, Cl. 357-16.000.

Shyi, David Y. Automatic car speeder system. 4,900,998, Cl. 318-599.000.

Sibalis, Dan, to Drug Delivery Systems Inc. Commercial separation system and method using electrokinetic techniques. 4,900,414, Cl. 204-180.100.

Sibley, Murray J.; and Nite, Rebecca F., to Pilkington Visioncare Holdings, Inc. Method for cleaning contact lens with dissolving abradant. 4,900,366, Cl. 134-42.000.

Sick, Hans-Hermann, to TRW United Carr GmbH & Co. Plastic pipe line holder. 4,899,964, Cl. 248-68.100.

Siden, Dennis C.: *See—*
Dubrow, Robert S.; Holland, Christine J.; Chan, Randolph W.; Martin, Albert R.; Siden, Dennis C.; and Germersad, Paul B., 4,900,877, Cl. 174-35.0GC.

Siebert, Jan C.: *See—*
Wolfer, Peter; Pfeifer, Hans P.; Spur, Gunter; Siebert, Jan C.; and Benzinger, Klaus-Jurgen, 4,899,594, Cl. 73-862.060.

Siedman, David L.: *See—*
Brame, J. Yancey; Horn, Michael F.; Saucier, Jeffrey A.; Siedman, David L.; Thomas, Emery G.; and Varnum, Robert L., 4,900,883, Cl. 200-83.00S.

Siegel, William J.: *See—*
Abbagnaro, Louis A.; Brown, Robert G.; Siegel, William J.; Kautter, William J.; and Quasney, Robert S., Sr., 4,899,920, Cl. 228-11.000.

Siemens Aktiengesellschaft: *See—*
Adam, Peter; and Gleixner, Ronald, 4,899,432, Cl. 29-596.000.
Baeuerle, Dieter; Eyett, Michael; Thomann, Helmut; and Wersing, Wolfram, 4,900,892, Cl. 219-121.850.
Heinz, Lothar; and Schmitt, Thomas, 4,901,339, Cl. 378-197.000.
Keller, Wolfgang, 4,900,887, Cl. 219-10.770.
Knappe, Wolfram; and Kummel, Alfred, 4,899,608, Cl. 74-411.000.
Ladebeck, Ralf; Fischer, Hubertus; and Schmitt, Franz, 4,901,020, Cl. 324-309.000.
Liefke, Johannes; Nickel, Bernd; Pabst, Josef; and Fleer, Otto, 4,900,252, Cl. 433-27.000.
Schmidt, Lothar; Eberlein, Klaus; Schaich, Gerhard; and Hlawa, Fritz, 4,901,347, Cl. 379-279.000.
Scholtholt, Hans, 4,901,190, Cl. 361-119.000.
Schulz, Reiner, 4,901,126, Cl. 357-29.000.
Stoelzle, Anton, 4,901,269, Cl. 364-784.000.
Weber, Robert; and Mechtold, Helmut, 4,899,571, Cl. 72-401.000.
Wersing, Wolfram; Schnoeller, Manfred; Lubitz, Karl; and Mohaupt, Jutta, 4,900,972, Cl. 310-364.000.
Winter, Udo; and Schebler, Andreas, 4,900,966, Cl. 310-239.000.
Siemens-Bendix Automotive Electronic Limited: *See—*
Brackett, Stephen E.; and Charles, Herbert N., 4,900,229, Cl. 416-189.000.
Siemens Components,Inc.: *See—*
Franz, Michael; and Whang, Tsung C., 4,900,954, Cl. 307-455.000.
Siemens-Pacesetter, Inc.: *See—*
Ekwall, Christer, 4,899,750, Cl. 128-419.0PG.
Sievel, Mark E.: *See—*
Barton, Maya R.; Sansone, Ronald P.; and Sievel, Mark E., 4,900,941, Cl. 250-566.000.
Sigurdsson, Alexander. Machine for portioning and cutting dough. 4,900,241, Cl. 425-140.000.
Sikora, Scott T. Method and apparatus for energizing a gaseous discharge lamp using switched energy storage capacitors. 4,900,990, Cl. 315-241.00P.
Sillion, Bernard: *See—*
Denis, Jacques; Sillion, Bernard; Damin, Bernard; and Leger, Robert, 4,900,332, Cl. 44-62.000.
Silver, Jerry; Smith, George M.; and Jacobberger, James W., to Case Western Reserve University. Method of reducing glial scar formation and promoting axon and blood vessel growth and/or regeneration through the use of activated immature astrocytes. 4,900,553, Cl. 424-422.000.
Simmonds Precision Products, Inc.: *See—*
Spillman, William B., Jr., 4,900,921, Cl. 250-227.000.
Simon, Marc, to U.S. Philips Corporation. Current source having a wide range of output voltages. 4,901,002, Cl. 323-312.000.
Simons, Frank H.; and Black, Carl N., to Hoechst Celanese Corporation. Method and apparatus for testing sewing thread. 4,899,678, Cl. 112-262.100.
Simonson, Rune: *See—*
Bengtsson, Goran; Simonson, Rune; and Agnemo, Roland, 4,900,399, Cl. 162-26.000.
Simpson, James H.: *See—*
Beachy, Dale K.; Dehls, Robert B.; Owen, S. Hudson; and Simpson, James H., 4,899,932, Cl. 238-8.000.
Sinclair, Hugh J. Golf club head with aerodynamic upper surface. 4,900,029, Cl. 273-167.00E.
Sinn, Richard E.; and Williams, Robert R., to Whirlpool Corporation. Glass membrane keyboard switch assembly for domestic appliance. 4,901,074, Cl. 341-22.000.
Siol, Werner; and Terbrack, Ulrich, to Rohm GmbH Chemische Fabrik. Compatible polyblends. 4,900,791, Cl. 525-228.000.
Sipila , Eero S. K.; and Yli-Vakkuri, Erkki P. J., to Tamglass Oy. Method of and storage rack for storing glass sheets. 4,899,891, Cl. 211-41.000.
Sisbarro, Frederick P.: *See—*
Parrotta, Umberto V., Jr.; Soldati, Gianluigi; and Sisbarro, Frederick P., 4,900,542, Cl. 424-66.000.
Sisselman, Ronald: *See—*
Bellavia, Nicholas J.; Birk, Daniel J.; Conforti, Fred J.; and Sisselman, Ronald, 4,901,056, Cl. 340-514.000.
Sivachenko, Leonid A.; Kurguzikov, Alexandr M.; Moiseenko, Vladimir V.; Bochkov, Sergei L.; Golban, Evgeny G.; and Lescheva, Maria V. Apparatus for grinding. 4,899,941, Cl. 241-134.000.
Skaja, Joseph J., to Kaepa, Inc. Footwear lace locking assembly. 4,899,466, Cl. 36-50.000.
Skelton, John W.: *See—*
Azzopardi, Michael J.; and Skelton, John W., 4,900,219, Cl. 414-786.000.
SKF Industrial Trading and Development Co.: *See—*
Kapaan, Hendrikus J., 4,900,236, Cl. 417-354.000.
Skiens, W. Eugene: *See—*
Lind, Michael A.; Skiens, W. Eugene; Feyrer, Clyde D.; and Swanson, John W., 4,901,304, Cl. 369-284.000.
Skischuhfabrik Dynafit Gesellschaft m.b.H.: *See—*
Hilgarth, Kurt, 4,899,469, Cl. 36-120.000.
Skonvall, Tage: *See—*
Andersson, Erland; and Skonvall, Tage, 4,899,511, Cl. 52-292.000.
Slautterback Corporation: *See—*
Colton, Douglas E.; and Slautterback, Fred A., 4,900,390, Cl. 156-291.000.
Slautterback, Fred A.: *See—*
Colton, Douglas E.; and Slautterback, Fred A., 4,900,390, Cl. 156-291.000.
Slayton, Danny L.: *See—*
Tompkins, E. Neal; and Slayton, Danny L., 4,901,110, Cl. 355-212.000.
Sleighter, George E., to PPG Industries, Inc. Chemical vapor deposition of a reflective film on the bottom surface of a float glass ribbon. 4,900,110, Cl. 350-1.700.
Slutz, David E.; Gigl, Paul D.; Flood, Gary M.; and Smith, Gary W., to General Electric Company. Brazed thermally-stable polycrystalline diamond compact workpieces and their fabrication. 4,899,922, Cl. 228-121.000.
Small, Kenneth T., to Boschert Incorporated. Power supply regulated by modulating the inductance in a resonant LC circuit. 4,901,216, Cl. 363-98.000.
Smallwood, Karen C.; and Adams, William J., to Mars G.B. Limited. Soluble or dissolved tea product. 4,900,574, Cl. 426-330.300.
Smith, Billy Joe: *See—*
Katahara, Keith W.; and Smith, Billy Joe, 4,899,844, Cl. 181-106.000.
Smith Corona Corporation: *See—*
Mueller, Hans W.; and Cappotto, Samuel D., 4,900,171, Cl. 400-208.000.
Smith, Gary W.: *See—*
Slutz, David E.; Gigl, Paul D.; Flood, Gary M.; and Smith, Gary W., 4,899,922, Cl. 228-121.000.
Smith, George M.: *See—*
Silver, Jerry; Smith, George M.; and Jacobberger, James W., 4,900,553, Cl. 424-422.000.
Smith, Jack: *See—*
Snyder, Steven A.; Smith, Jack; Flora, David D.; and Bartlett, Robert L., 4,899,793, Cl. 142-7.000.
Smith, John F.: *See—*
Thompson, R. Bruce; Smith, John F.; Lee, Seung S.; and Li, Yan, 4,899,589, Cl. 73-597.000.
Smith, Jonathan H., to Sericol Group Limited. Masking compositions. 4,900,617, Cl. 428-325.000.
Smith, Keith C., to Raytheon Company. Lens/polarizer radome. 4,901,086, Cl. 343-909.000.
Smith, Lawrence N.: *See—*
Potter, Curtis N.; Smith, Lawrence N.; and Kroger, Harry, 4,899,439, Cl. 29-846.000.
Smith, Nathan L., III, to Cytosignet, Inc. Analyte detection in particulate-containing samples. 4,900,685, Cl. 436-519.000.
Smith, Nelson S., to Ellison, Frank M. Electrical circuit for driving a load with a large force applied intermittently. 4,901,192, Cl. 361-156.000.
Smith, Robert E., III, to National Coupling Company, Inc. Undersea hydraulic coupling with dovetail seal. 4,900,071, Cl. 285-379.000.
Smith, Sanford N., to Phillips Petroleum Company. Method for separating elongated contaminants from a stream of material. 4,900,498, Cl. 264-169.000.
Smith, Terry B.: *See—*
Frost, Terry; Smith, Terry B.; and Jones, Jennings A., 4,900,297, Cl. 493-82.000.
Smith, Terry E.; Cho, James R.; and Cottrell, Ian W., to GAF Chemicals Corporation. Solubilization of complexes of water-insoluble organic compounds by aqueous solutions of polyvinylpyrrolidone. 4,900,775, Cl. 524-548.000.
Smith, Timothy J. N.; van Eyken, Alois J.; and Mulvenna, Charles A., to Queen's University at Kingston. Ambulatory infusion pump. 4,900,305, Cl. 604-65.000.
Smith, Troy F.: *See—*
Beeman, John A.; Leep, James L.; Marvin, Wayne S.; Smith, Troy F.; and Solt, Floyd R., 4,899,518, Cl. 53-439.000.
Smith & Wesson Corp.: *See—*
Hindle, Kurt J., 4,899,476, Cl. 42-7.000.
Smith, William C. Auxiliary safety chain locking device. 4,900,075, Cl. 292-263.000.
Smith, William J.: *See—*
Miller, Harmon R.; Smith, William J.; Stanley, Hollie M., Jr.; and Smith, William J., 4,899,500, Cl. 52-146.000.
Miller, Harmon R.; Smith, William J.; Stanley, Hollie M., Jr.; and Smith, William J., 4,899,500, Cl. 52-146.000.
Smith, William L., to Clorox Company, The. Viscoelastic cleaning compositions with long relaxation times. 4,900,467, Cl. 252-95.000.
Snamprogetti, S.p.A.: *See—*
Bosoni, Marco; Brusoni, Roberto; Fiorentini, Carlo; and Fracassi, Pietro, 4,899,825, Cl. 169-14.000.
Menicatti, Sergio; Miola, Cesare; and Granelli, Franco, 4,899,813, Cl. 165-133.000.
Snyder, George K.: *See—*
Breda, Michael A.; and Snyder, George K., 4,900,328, Cl. 29-890.039.
Snyder, John N.: *See—*
McCollum, John M.; and Snyder, John N., 4,900,249, Cl. 432-248.000.
Snyder, Steven A.; Smith, Jack; Flora, David D.; and Bartlett, Robert L., to Shopsmith, Inc. Duplicating system for a lathe. 4,899,793, Cl. 142-7.000.
Snyder, Thomas S.; and Stoltz, Richard A., to Westinghouse Electric Corp. Preparation of precursors for yttrium-containing ceramic superconductors. 4,900,536, Cl. 423-593.000.
Societe AMF: *See—*
Techer, Jean F.; and Onnis, Jean P., 4,899,824, Cl. 168-14.000.
Societe Anonyme dite: ALCATEL CIT: *See—*
Lange , Francois; and Pernet, Michel, 4,900,272, Cl. 439-630.000.
Pernet, Michel, 4,900,273, Cl. 439-630.000.

Societe de Recherches Industries (S.O.R.I.): *See—*
Robin, Jacques; Pruneau, Didier; and Bellamy, Francois, 4,900,833, Cl. 546-19.000.
Societe Degremont: *See—*
Savall, Monsieur V., 4,900,437, Cl. 210-232.000.
Societe Manoel Bouchet, S.A.: *See—*
Christol, Lilian, 4,899,618, Cl. 74-594.600.
Societe Nationale d Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." : *See—*
Guimier, Michel S.; Kapala, Patrick; and Paris, Philippe, 4,900,220, Cl. 415-136.000.
Societe Nationale D'Etude et de Construction de Moteurs d'Aviation "SNECMA": *See—*
Dehan, Gerard C. H.; Doublier, Michel G. A.; and Greiner, Gerard, 4,899,535, Cl. 60-39.080.
Gastebois, Philippe M. D.; Habrard, Alain G. J.; and Picard, Jean L., 4,899,539, Cl. 60-261.000.
Lenglet, Michel; and Sens, Andri, 4,899,567, Cl. 72-159.000.
Societe Nationale Elf Aquitaine: *See—*
Angles, Michel; Blazejczak, Jean; Roques, Henry; and Aurelle, Yves, 4,900,452, Cl. 210-706.000.
Sokolov, Vladimir I.: *See—*
Zhidkov, Vasily D.; Kudrin, Nikolai A., Sokolov, Vladimir I.; Karelin, Stanislav N.; Bulavintsev, Igor A., and Churakov, Vladimir N., 4,899,994, Cl. 266-94.000.
Solaronics: *See—*
Ahmady, Farshid, 4,900,245, Cl. 431-328.000.
Solarwall International limited: *See—*
Peter, Rolf W.; and Hollick, John C., 4,899,728, Cl. 126-428.000.
Solberg, Dean C. Support for minature objects. 4,900,000, Cl. 269-152.000.
Soldati, Gianluigi: *See—*
Parrotta, Umberto V., Jr.; Soldati, Gianluigi; and Sisbarro, Frederick P., 4,900,542, Cl. 424-66.000.
Soletanche: *See—*
Ward, Jacob, 4,900,197, Cl. 405-273.000.
Soloway, Stuart R ; Steinka, Bradford R.; and Humblet, Pierre A., to Codex Corporation. Network data flow control technique. 4,901,277, Cl. 364-900.000.
Solt, Floyd R.: *See—*
Beeman, John A.; Leep, James L.; Marvin, Wayne S., Smith, Troy F.; and Solt, Floyd R., 4,899,518, Cl. 53-439.000.
Sommer, Herbert; and Rieleit, Peter, to Jagenberg Aktiengesellschaft. Device for coating a web of material traveling around a backing roller. 4,899,687, Cl. 118-126.000.
Sommer, Norbert: *See—*
Bechtle, Rudolf; Resag, Jorg; and Sommer, Norbert, 4,900,088, Cl. 297-379.000.
Sonek, Jiri D. Articulated needle guide for ultrasound imaging and method of using same. 4,899,756, Cl. 128-662.050.
Sony Corporation: *See—*
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Suzuki, Junichi; Nakamura, Masato; Takeuchi, Nobuyuki; Iida, Yasunobu; and Nishii, Hiroyuki, to Central Glass Company, Limited. Glass plate with reflective multilayer coatings to give golden appearance. 4,900,630, Cl. 428-432.000.
Suzuki, Katsumi, to Kabushiki Kaisha Toshiba. Information storage medium. 4,900,598, Cl. 428-64.000.
Suzuki, Koji: *See*—
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,901,079, Cl. 341-169.000.
Suzuki, Noriyuki: *See*—
Kakemoto, Gohki; Sagara, Hiroshi; Suzuki, Noriyuki; and Kachi, Shogo, 4,900,873, Cl. 568-761.000.
Suzuki, Seikoh: *See*—
Sasayama, Takao; Suzuki, Seikoh; Suzuki, Toshitaka; Miki, Masayuki; and Ueno, Sadayasu, 4,900,425, Cl. 204-426.000.
Suzuki, Shigeto: *See*—
Schroeder, Albert H.; Ching, Ta Y.; Suzuki, Shigeto; and Katsumoto, Kiyoshi, 4,900,458, Cl. 252-8.555.
Suzuki, Shinji; Suzuki, Hiroko; and Arai, Tetsuji, to Uahio Denki. Method of treating photoresists. 4,900,938, Cl. 250-442.200.
Suzuki, Susumu; Yagi, Sumio; Hakamata, Naotoshi; and Ozaki, Takeo, to Hamamatsu Photonics Kabushiki Kaisha. Oximeter with monitor for detecting probe dislodgement. 4,901,238, Cl. 364-413.090.
Suzuki, Taihei: *See*—
Maejima, Yukihito; Shirasu, Hirotoshi; Suzuki, Taihei; Tokita, Yoshiaki; Tanabe, Shirou; and Morita, Takashi, 4,901,274, Cl. 364-900.000.
Suzuki, Tokitaro: *See*—
Ochi, Katsutoshi; Suzuki, Tokitaro; Ogawa, Hisao; Shibata, Hideo; and Takada, Masaru, 4,900,385, Cl. 156-245.000.
Suzuki, Toshitaka: *See*—
Sasayama, Takao; Suzuki, Seikoh; Suzuki, Toshitaka; Miki, Masayuki; and Ueno, Sadayasu, 4,900,425, Cl. 204-426.000.
Suzuki, Wakou, to NEC Corporation. Electron tube sealing structure. 4,900,973, Cl. 313-251.000.
Svensson, Leif: *See*—
Ericsson, Per; Svensson, Leif; Olsson, Nils-Ingvar; and Bergstrom, Bertil, 4,900,819, Cl. 540-475.000.
Svoboda, Rudolf. Printer assembly with paper guide. 4,900,172, Cl. 400-605.000.
Swan, Ellen L.: *See*—
Lund, Earl A. E.; Swan, Ellen L.; Basu, Rajat S.; and Wilson, David P., 4,900,470, Cl. 252-171.000.
Swanson, John W.: *See*—
Lind, Michael A.; Skiens, W. Eugene; Feyrer, Clyde D.; and Swanson, John W., 4,901,304, Cl. 369-284.000.
Sweppy, Michael S.; Tuttle, Richard R.; and Schumaker, Everett P., to Ford Motor Company. Onboard diagnostic system of vehicle ignition system. 4,899,579, Cl. 73-118.100.
Swisher, George W., Jr.; Gustin, Craig R.; and Murray, Stuart W. Three-track zero clearance paver. 4,900,186, Cl. 404-105.000.
Sworm, Timothy D. Portable electrical energy monitor. 4,901,007, Cl. 324-110.000.
Systems Analysis and Integration: *See*—
Pomatto, Larry A.; and Franklin, Kevin T., 4,899,440, Cl. 29-846.000.
Syverson, Daniel J.; and Novak, Richard E., to FSI International, Inc. HF gas etching of wafers in an acid processor. 4,900,395, Cl. 156-639.000.
Szerdahelyi, Ferenc, to Brose Fahrzeugteile GmbH & Co. Kommanditgesellschaft. System for window operation, especially in a motor vehicle. 4,899,492, Cl. 49-352.000.
Szeto, Lai-wan M. Apparatus for, and method of, analyzing signals. 4,901,244, Cl. 364-481.000.
Szwerc, Joseph A.: *See*—
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 4,900,577, Cl. 426-563.000.
Szymanski, Michael E.: *See*—
Merriman, Glenn A.; and Szymanski, Michael E., 4,901,189, Cl. 361-119.000.
Tabankia, Farshid M. H.; and de Boer, Jan, to General Electric Company. PBT-PC-rubber-brominated FR high tracking resistance+VO. 4,900,784, Cl. 525-67.000.
Tabara, Yoshitaka; Takaba, Tetsuro; and Rikitake, Tomotsugu, to Mazda Motor Corporation. Engine knock control system. 4,899,711, Cl. 123-425.000.
Tabei, Kazuhiko; Saito, Sadao; and Kai, Shunichi, to Mitsubishi Kinzoku Kabushiki Kaisha. Sealant injector. 4,899,910, Cl. 222-54.000.
Tachi-S Co., Ltd.: *See*—
Kawasaki, Kiyoshi, 4,899,674, Cl. 112-121.120.
Kawasaki, Kiyoshi, 4,899,675, Cl. 112-121.120.
Taddiken, Michael: *See*—
Hararat-Tehrani, Mohamad; Schwarz, Frank; and Taddiken, Michael, 4,899,960, Cl. 244-118.500.
Taffe, Patricia A.; and Rose-Pehrsson, Susan L. Hydrazine detection. 4,900,681, Cl. 436-106.000.
Tagaki, Osamu: *See*—
Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Tagaki, Osamu, 4,901,103, Cl. 355-27.000.
Taggart, Andrew W. Siding application tool. 4,899,459, Cl. 33-646.000.
Taguchi, Yoshio: *See*—
Nagase, Takashi; and Taguchi, Yosbio, 4,900,489, Cl. 264-46.500.

Taguezout, Daho; and Xuan, Mai T., to Asulab S.A. Device comprising a solar cell for winding a barrel spring. 4,901,295, Cl. 368-149.000.

Tahernia, Omid: *See*—
Herold, Barry W.; and Tahernia, Omid, 4,901,033, Cl. 331-1.00A.
Herold, Barry W.; Tahernia, Omid; Davis, Walter L.; and Rivas, Mario A., 4,901,036, Cl. 331-25.000.

Taiyo Yuden Co., Ltd.: *See*—
Igarashi, Masao; Akiyama, Isao; Kumagai, Kazuhiro; Takeda, Yoshinobu; Yamaki, Mamoru; Iguchi, Yoshiaki; and Kazama, Satoshi, 4,901,044, Cl. 333-207.000.

Tajima, Teruo, to Kabushiki Kaisha Toshiba. Video system with self-diagnose function. 4,901,147, Cl. 358-139.000.

Tajima, Yoshimitsu; Mohri, Motoo; and Tanaka, Hideaki, to Sharp Kabushiki Kaisha. Method for the production of a carbon electrode. 4,900,588, Cl. 427-122.000.

Takaba, Tetsuro: *See*—
Tabata, Yoshitaka; Takaba, Tetsuro; and Rikitake, Tomotsugu, 4,899,711, Cl. 123-425.000.

Takada, Kazumasa: *See*—
Noguchi, Yoshio; Nagai, Haruo; Takada, Kazumasa; and Noda, Juichi, 4,901,123, Cl. 357-17.000.

Takada, Masaru: *See*—
Ochi, Katsutoshi; Suzuki, Tokitaro; Ogawa, Hisao; Shibata, Hideo; and Takada, Masaru, 4,900,385, Cl. 156-245.000.

Takada, Yoshihiro: *See*—
Fujioka, Keiji; Sato, Shigeji; Tamura, Nobuhiko; Takada, Yoshihiro; and Sasaki, Yoshio, 4,900,304, Cl. 604-60.000.

Takagi, Hiroyuki: *See*—
Amano, Hiroyuki; and Takagi, Hiroyuki, 4,900,967, Cl. 310-239.000.

Takagi, Masahiro: *See*—
Tanaka, Gotaro; Suganuma, Hiroshi; Urano, Akira; Takagi, Masahiro; and Mizuno, Shunichi, 4,900,894, Cl. 219-121.590.

Takagi, Toshiyuki, to Hitachi, Ltd. Interpolating apparatus with a processing section for line segments parallel with a coordinate axis. 4,901,266, Cl. 364-723.000.

Takahashi, Akio; and Yasuda, Mamoru, to Brother Kogyo Kabushiki Kaisha. Control device for cyclic sewing machine. 4,899,673, Cl. 112-67.000.

Takahashi, Hiroshi, to Nissan Motor Company, Ltd. System and method for detecting and determining knocking in an internal combustion engine. 4,899,710, Cl. 123-425.000.

Takahashi, Keiju, to NEC Corporation. Conductivity modulated metal oxide semiconductor field effect transistor. 4,901,131, Cl. 357-43.000.

Takahashi, Kenichi: *See*—
Mochizuki, Hideaki; Tamura, Tooru; Takahashi, Kenichi; and Oshima, Mitsuaki, 4,900,649, Cl. 430-311.000.

Takahashi, Kenji: *See*—
Kohda, Katsuhiro; and Takahashi, Kenji, 4,900,641, Cl. 428-690.000.

Takahashi, Koji: *See*—
Hieda, Teruo; Masui, Toshiyuki; Takahashi, Koji; and Yoshimura, Katsuji, 4,901,152, Cl. 358-209.000.
Nakayama, Tadayoshi; Satoh, Chikara; Fujii, Akio; Yoshimura, Katsuji; and Takahashi, Koji, 4,901,148, Cl. 358-140.000.

Takahashi, Kosei: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Kondo, Masafumi; and Takahashi, Kosei, 4,901,326, Cl. 372-45.000.

Takahashi, Masanori; and Uchida, Tatsuki, to Sanshin Kogyo Kabushiki Kaisha. Exhaust gas purifying device for marine engine. 4,900,282, Cl. 440-89.000.

Takahashi, Mikio: *See*—
Hirabayashi, Tetsuya; and Takahashi, Mikio, 4,900,583, Cl. 427-55.000.

Takahashi, Osamu: *See*—
Nakazyo, Kiyoshi; Hirose, Takeshi; Hurusawa, Genichi; Takahashi, Osamu; Furutachi, Nobuo; and Kobayashi, Hidetoshi, 4,900,655, Cl. 430-546.000.

Takahashi, Satoru: *See*—
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,900,352, Cl. 71-92.000.

Takahashi, Susumu, to Kanto Yakin Kogyo K.K. High-temperature heating furnace. 4,900,247, Cl. 432-153.000.

Takahashi, Takahiko; Itoh, Funikazu; Shimase, Akira; Yamaguchi, HIroshi; Hongo, Mikio; and Haraichi, Satoshi, to Hitachi, Ltd. Semiconductor integrated circuit device and process for producing the same. 4,900,695, Cl. 437-195.000.

Takahashi, Yuji: *See*—
Kitahara, Makoto; Naito, Masataka; and Takahashi, Yuji, 4,900,009, Cl. 271-296.000.

Takai, Mitsuru: *See*—
Nakayama, Masatoshi; Kobayashi, Koji; Ueda, Kunihiro; Takai, Mitsuru; and Kurose, Shigeo, 4,900,622, Cl. 428-336.000.

Takano, Masamitsu; and Ide, Takanobu, to Nissan Motor Co., Ltd.; and Yamakawa Industrial Co., Ltd. Center member structure for motor vehicle. 4,899,843, Cl. 180-312.000.

Takao, Akira: *See*—
Ishii, Kazuhiro; Hatakeyama, Yoshihiro; and Takao, Akira, 4,901,184, Cl. 361-86.000.

Takao, Kouji: *See*—
Kumasaka, Hideyuki; Haiwara, Tarou; Nakamura, Katsumi; Miyazaki, Kenichi; Kuriyama, Hiroshi; Takao, Kouji; and Inoue, Keizo, 4,900,083, Cl. 296-197.000.

Takasaki, Yukio: *See*—
Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, 4,900,975, Cl. 313-366.000.

Takase, Haruo: *See*—
Sakamoto, Kiichiro; Takase, Haruo; Uenaka, Kazushige; and Nakajima, Junya, 4,901,099, Cl. 354-324.000.

Takashima, Masayuki: *See*—
Sawayama, Noboru; Kamiyama, Shinichi; Yuh, Hideo; Takashima, Masayuki; and Sekiya, Tadayuki, 4,901,113, Cl. 355-243.000.

Takata, Toshimasa; and Nakamura, Hideo, to Mitsui Petrochemical Industries, Ltd. Epoxy compounds and epoxy resin compositions containing the same. 4,900,801, Cl. 528-87.000.

Takato, Norio: *See*—
Kawachi, Masao; Takato, Norio; Jinguji, Kaname; Sugita, Akio; and Sumida, Shin, 4,900,112, Cl. 350-96.120.

Takaya, Yasuo: *See*—
Mitsuji, Masaru; Endo, Mitsugu; Morita, Kaoru; and Takaya, Yasuo, 4,900,774, Cl. 524-512.000.

Takayama, Syuichi; and Ueda, Yasuhiro, to Olympus Optical Co., Ltd. Endoscope. 4,899,731, Cl. 128-4.000.

Takayanagi, Yoshiaki: *See*—
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,901,079, Cl. 341-169.000.

Takeda, Fuchio; Sakamoto, Koji; and Kobayashi, Kazuo, to Ricoh Company, Ltd. Developing device with a developing roller and using a single-component developer and method for producing such developing roller. 4,899,689, Cl. 118-651.000.

Takeda, Yoshinobu: *See*—
Igarashi, Masao; Akiyama, Isao; Kumagai, Kazuhiro; Takeda, Yoshinobu; Yamaki, Mamoru; Iguchi, Yoshiaki; and Kazama, Satoshi, 4,901,044, Cl. 333-207.000.

Takei, Terutaka; Morita, Shigeru; and Kawakita, Hiroaki, to Kubota, Ltd. Clipping collector equipped with front mower. 4,899,525, Cl. 56-202.000.

Takemura, Fumio: *See*—
Nakada, Toshio; Takemura, Fumio; Sema, Yoshihito; and Kataoka, Kazuhito, 4,900,465, Cl. 252-62.550.

Takemura, Yorio: *See*—
Oketani, Isao; and Takemura, Yorio, 4,899,918, Cl. 225-43.000.

Takenaka, Yasushi; and Kajita, Shunsuke, to Nissan Shatai Company, Limited. Automotive air conditioner system with automatic adjustment of discharge air temperature. 4,899,809, Cl. 165-12.000.

Takenouchi, Syoishi; Morita, Kazuhiro; Ezaka, Shinichi; and Kuroda, Yoshitaka, to Nippondenso Co., Ltd. Metal plate laminated body. 4,900,636, Cl. 428-571.000.

Takeuchi, Nobuyuki: *See*—
Suzuki, Junichi; Nakamura, Masato; Takeuchi, Nobuyuki; Iida, Yasunobu; and Nishii, Hiroyuki, 4,900,630, Cl. 428-432.000.

Takeuchi, Yasuhiro: *See*—
Ono, Yukiyoshi; Nishino, Atsushi; Takeuchi, Yasuhiro; and Numoto, Hironao, 4,900,703, Cl. 501-136.000.

Takiguchi, Haruhisa: *See*—
Matsui, Sadayoshi; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Taneya, Mototaka, 4,901,328, Cl. 372-46.000.

Takiguchi, Yoshihiro; and Kinoshita, Katsuyuki, to Hamamatsu Photonics Kabushiki Kaisha. Alpha-ray image detecting apparatus. 4,900,930, Cl. 250-361.00R.

Takikawa, Kazunori, to Usui Kokusai Sangyo Kaisha Ltd. Structure for connecting branch pipe in high-pressure fuel manifold. 4,900,180, Cl. 403-233.000.

Takishima, Yoshiyuki: *See*—
Kinoshita, Takao; and Takishima, Yoshiyuki, 4,901,160, Cl. 358-335.000.

Tam, Steve: *See*—
Belica, Peter S.; Huang, Tai-Nang; Manchand, Percy S.; Partridge, John J.; and Tam, Steve, 4,900,828, Cl. 544-317.000.

Tama Chemicals Co., Ltd.: *See*—
Itou, Takeo; Matsuda, Hidemi; Yoshizako, Mamory; and Yagi, Osamu, 4,900,984, Cl. 313-479.000.

Tamglass Oy: *See*—
Sipila , Eero S. K.; and Yli-Vakkuri, Erkki P. J., 4,899,891, Cl. 211-41.000.

Tamper Corp.: *See*—
Moore, Roy J.; and Coy, Calvin L., 4,899,664, Cl. 104-12.000.

Tamura, Hifumi: *See*—
Ishitani, Tohru; Todokoro, Hideo; and Tamura, Hifumi, 4,900,974, Cl. 313-359.100.

Tamura, Hiroyuki, to OKI Electric Industry Co., Ltd. MOS semiconductor process with double-layer gate electrode structure. 4,900,690, Cl. 437-43.000.

Tamura, Nobuhiko: *See*—
Fujioka, Keiji; Sato, Shigeji; Tamura, Nobuhiko; Takada, Yoshihiro; and Sasaki, Yoshio, 4,900,304, Cl. 604-60.000.

Tamura, Tooru: *See*—
Mochizuki, Hideaki; Tamura, Tooru; Takahashi, Kenichi; and Oshima, Mitsuaki, 4,900,649, Cl. 430-311.000.

Tan, Kazuo; Hironaka, Takashi; and Nakamura, Michio, to Mitsubishi Kasei Corporation. Method for producing high-purity caprolactam. 4,900,821, Cl. 540-540.000.

Tanabe, Shirou: *See*—
Maejima, Yukihito; Shirasu, Hirotoshi; Suzuki, Taihei; Tokita, Yoshiaki; Tanabe, Shirou; and Morita, Takashi, 4,901,274, Cl. 364-900.000.

Tanabe, Takeshi, to Murata Manufacturing Co., Ltd. Through capacitor. 4,901,198, Cl. 361-302.000.

Tanagawa, Kouzi: *See*—
Sawada, Kikuzo; Tanagawa, Kouzi, Tomari, Nobuhiro; and Yoshida, Tomoaki, 4,901,320, Cl. 371-51.100.

Tanaka, Akemi: *See*—
Masaki, Takeshi; Mizutani, Takeshi; Yonemaochi, Katsutoshi; and Tanaka, Akemi, 4,900,890, Cl. 219-69.170.

Tanaka, Akira: *See*—
Fukamachi, Masaaki; Onitsuka, Mobuyuki; Tanaka, Akira; and Nakamura, Kazuo, 4,901,053, Cl. 340-426.000.

Tanaka, Gotaro; Suganuma, Hiroshi; Urano, Akira; Takagi, Masahiro; and Mizuno, Shunichi, to Sumitomo Electric Industries, Ltd. Method of heating a quartz glass tube. 4,900,894, Cl. 219-121.590.

Tanaka, Hideaki: *See*—
Tajima, Yoshimitsu; Mohri, Motoo; and Tanaka, Hideaki, 4,900,588, Cl. 427-122.000.

Tanaka Kogyo Co., Ltd.: *See*—
Akiba, Genji; Tanaka, Kohya; and Ishida, Shigetoshi, 4,899,446, Cl. 30-276.000.

Tanaka, Kohya: *See*—
Akiba, Genji; Tanaka, Kohya; and Ishida, Shigetoshi, 4,899,446, Cl. 30-276.000.

Tanaka, Koichi, to Kabushiki Kaisha Toshiba. Communication method and equipment therefor. 4,901,311, Cl. 370-85.100.

Tanaka, Masatoshi; Kuroiwa, Wataru; Masuko, Akinori; Maeda, Jyoji; Uehara, Shouji; and Uekusa, Tsutomu, to Kabushiki Kaisha Toshiba. Video signal scramble system. 4,901,351, Cl. 380-15.000.

Tanaka, Massato: *See*—
Sakakura, Toshiyasu; and Tanaka, Massato, 4,900,413, Cl. 204-157.870.

Tanaka, Noriko; Inoue, Kazuhiro; Korenaga, Hiroshi, and Ogawa, Hidemasa, to Daiichi Seiyaku Co., Ltd. Sulfated polysaccharide DS4152. 4,900,815, Cl. 536-54.000.

Tanaka, Saburo: *See*—
Fujita, Nobuhiko; Itozaki, Hideo; Tanaka, Saburo, Yazu, Shuji; and Jodai, Tetsuji, 4,900,716, Cl. 505-1.000.

Tanaka, Sumi: *See*—
Koike, Hisashi; and Tanaka, Sumi, 4,901,011, Cl. 324-158.00F.

Tanaka, Toshiji: *See*—
Hara, Zenichiro; and Tanaka, Toshiji, 4,901,155, Cl. 358-230.000.

Tanaka, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Starter with planet gear speed reducer. 4,899,605, Cl. 74-7.00E.

Tanaka, Toshinori: *See*—
Isozumi, Shuzoo; Tanaka, Toshinori; and Odawara, Kazuhiro, 4,900,945, Cl. 290-48.000.

Tanaka, Yasuharu; and Inui, Kenichi, to Sharp Corporation. Electronic calculator providing flexible constant utilization. 4,901,262, Cl. 364-709.160.

Taneya, Mototaka *See*—
Matsui, Sadayoshi; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Taneya, Mototaka, 4,901,328, Cl. 372-46.000.

Tangonan, Gregory L. Distributed crossbar switch. 4,901,305, Cl. 370-1.000.

Tani, Kazuyoshi; and Ochiai, Masaki, to Bando Chemical Industries, Ltd. Belt transmission device for motorcar engines and auxiliary devices. 4,900,295, Cl. 474-167.000.

Tani, Tadaaki; Ihama, Mikio; and Okazaki, Masaki, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,900,656, Cl. 430-550.000.

Taniguchi, Katsuo: *See*—
Yokoyama, Keiichi; Taniguchi, Katsuo; and Kiso, Yoshihisa, 4,900,861, Cl. 556-430.000.

Taniguchi, Kazuyoshi: *See*—
Chiba, Mitsuharu; Taniguchi, Kazuyoshi, and Iwase, Hiroshi, 4,899,636, Cl. 84-454.000.

Tanioka, Kenkichi: *See*—
Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, 4,900,975, Cl. 313-366.000.

Tanioka, Tauyoshi: *See*—
Otsuka, Akira; Horio, Kenji; and Tanioka, Tsuyoshi, 4,900,987, Cl. 315-169.400.

Tanis, Dale R., to J. I. Case Company. Crop delivery system for an axial-flow combine. 4,900,290, Cl. 460-70.000.

Tannenbaum, Michael A.: *See*—
Weber, Paul; and Tannenbaum, Michael A., 4,899,883, Cl. 206-484.000.

Tanno, Koichi; and Yagi, Masaaki, to Miyagi National College of Technology. Method for making high-purity metal powder by jet-cooling. 4,900,355, Cl. 75-0.50C.

Tanokura, Nobukazu: *See*—
Miyasaka, Eiichi; Nishimura, Tetsuro; and Tanokura, Nobukazu, 4,899,903, Cl. 220-266.000.

Tararine, Michel *See*—
Tournier, Edmond; and Tararine, Michel, 4,900,931, Cl. 250-369.000.

Tashiro, Norio; Adachi, Masaki; Ikeda, Toshio; Saito, Hisao; Matsushita, Saburo; and Komine, Masataka, to Kabushiki Kaisha Toshiba. High-voltage input terminal structure of a magnetron for a microwave oven. 4,900,985, Cl. 315-39.510.

Tashiro, Tautomu; Komoda, Norihisa; Tsushima, Isao; Matsumoto, Kuniaki; Kawashima, Kazuhiro; and Maekawa, Riyoji. Parallelized rules processing system using associative memory for pipelined execution of plural join operations and concurrent condition comparing. 4,901,229, Cl. 364-200.000.

Tateno, Toshiaki; Fukushima, Shigeki; Iwamoto, Tomoyuki; and Kijima, Nobuo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Automatic transmission apparatus for vehicle. 4,899,857, Cl. 192-0.072.

Taylor, Barry J.: *See*—
Dexter, Amos C.; Lees, Michael I.; and Taylor, Barry J., 4,900,371, Cl. 148-20.300.

Taylor, Thomas: *See*—
Atkinson, Colin; Heybourne, Michael J.; Iley, William J.; Knight, Peter C.; Russell, Peter J.; Taylor, Thomas; and Jones, David P., 4,900,466, Cl. 252-174.140.

Tazi, Mohammed; Login, Robert B.; and Kundel, Nikhil, to GAF Chemicals Corporation. Process of rendering copolymers of maleic anhydride and alkyl vinyl ethers prepared in benzene solvent substantially benzene-free. 4,900,809, Cl. 528-497.000.

Tazmo Co., Ltd.: *See*—
Kawakami, Kazushi, 4,899,685, Cl. 118-50.000.

TCI International Inc.: *See*—
Doolan, Martin P., 4,900,073, Cl. 292-169.220.

TDK Corporation: *See*—
Ito, Yoshiaki; Ezaki, Joichiro; and Tomita, Katsuhiko, 4,901,175, Cl. 360-103.000.
Nakayama, Masatoshi; Kobayashi, Koji; Ueda, Kunihiro; Takai, Mitsuru; and Kurose, Shigeo, 4,900,622, Cl. 428-336.000.

Techer, Jean F.; and Onnis, Jean P., to Societe AMF. Dampening device for the hoofs of ungulates, more particularly horses. 4,899,824, Cl. 168-14.000.

Technicon Instruments Corporation: *See*—
Czech, Bronislaw P., 4,900,818, Cl. 540-454.000.

Technologitchen Center "IPOMA": *See*—
Kostov, Georgi D.; Gargov, Bogoya G.; Gitchev, Chavdar L.; and Kostova, Sophya G., 4,900,097, Cl. 301-63.0PW.

Tecno-Sameg S.r.L.: *See*—
Chiri, Chiaffredo; Gianoglio, Pierino; Giraudo, Claudio; Marengo, Sergio; and Zaino, Giovanni, 4,899,720, Cl. 125-21.000.

Tecsa S.r.l.: *See*—
Bosoni, Marco; Brusoni, Roberto; Fiorentini, Carlo; and Fracassi, Pietro, 4,899,825, Cl. 169-14.000.

Tecumseh Products Company: *See*—
Kronich, Peter G., 4,899,704, Cl. 123-196.00W.

Teijin Limited: *See*—
Hara, Shigeyoshi; and Endo, Zen-ichiro, 4,900,799, Cl. 526-282.000.

Teijin Seiki Co., Ltd.: *See*—
Fumio, Tanae, 4,899,529, Cl. 57-261.000.

Teikoku Seiyaku Co., Ltd.: *See*—
Yanagibashi, Norio; Iwasaki, Setsuo; Mizobuchi, Takafumi; Konishi, Ryoji; Konishi, Tatsuya; and Wato, Takahiko, 4,900,554, Cl. 424-448.000.

Tektronix, Inc.: *See*—
Bos, Philip J., 4,900,132, Cl. 350-346.000.

Tel Kyushu Limited: *See*—
Toshima, Takayuki; and Hirakawa, Osamu, 4,899,686, Cl. 118-50.000.

Teledyne Industries, Inc.: *See*—
Mills, Gary L.; and Bowen, B. Dean, 4,899,570, Cl. 72-364.000.

Teleflex, Incorporated: *See*—
King, Maurice E.; and Katucki, Gregory M., 4,899,956, Cl. 244-3.210.

Tella, Louis L.: *See*—
Fattal, Jean A.; Dugas, David J.; and Tella, Louis L., 4,899,955, Cl. 244-3.210.

Tench, Robert E.: *See*—
Dixon, Melvyn; Olsson, Nils A.; Tench, Robert E.; and Tzeng, Liang, 4,900,917, Cl. 250-225.000.

Tenhaef, Rolf: *See*—
Ritter, Wolfgang; Tenhaef, Rolf; Hoffkes, Horst; and Seidel, Kurt, 4,900,543, Cl. 424-70.000.
Ritter, Wolfgang; Tenhaef, Rolf; Hoffkes, Horst; and Seidel, Kurt, 4,900,544, Cl. 424-70.000.

Tennant, James A.; and Yagher, Charles, Jr., to Therm-O-Disc, Incorporated. Temperature compensated thermal protector. 4,901,186, Cl. 361-106.000.

Terada, Hiroshi: *See*—
Shoji, Kazunori; Ohtani, Yoshinori; Kikkawa, Hirofumi; Terada, Hiroshi; Murata, Masayasu; and Meguri, Nobuyasu, 4,900,330, Cl. 44-51.000.

Terada, Shinichiro: *See*—
Okada, Hitoshi; Terada, Shinichiro; and Nozawa, Katsuya, 4,899,951, Cl. 242-204.000.

Terae, Nobuyuki; Mutoh, Teiichi; and Yoshida, Akira, to Shin-Etsu Chemical Co., Ltd. Silicone antifoamers. 4,900,474, Cl. 252-358.000.

Terai, Kazuto; Isobe, Susumu; Tsukuda, Kenji; Inoue, Hisao; and Kobayashi, Hiroshi, to Daido Tokushuko Kabushiki Kaisha; and Inco Alloys International, Inc. Skid rail. 4,900,248, Cl. 432-234.000.

Terakawa, Takashige; Akaba, Noriyuki; and Hattori, Sadayoshi, to Tokyo Keiki Co. High frequency power divider. 4,901,042, Cl. 333-127.000.

Teramachi, Hiroshi. Rotational positioning device. 4,899,998, Cl. 269-63.000.

Teraoka, Masao, to Tochigifujisangyo Kabushiki Kaisha. Power transmission apparatus. 4,899,859, Cl. 192-4.00A.

Terashima, Kaoru; Kageyama, Shigeki; and Katsuyama, Harumi, to Fuji Photo Film Co., Ltd. Integral multilayer analytical element for

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use in the measurement of alkaline phosphatase activity. 4,900,665, Cl. 435-21.000.
Terboss, Richard A.: *See—*
Danton, John L.; Klaiber, Albert F., III; and Terboss, Richard A., 4,900,201, Cl. 408-129.000.
Terbrack, Ulrich: *See—*
Siol, Werner; and Terbrack, Ulrich, 4,900,791, Cl. 525-228.000.
Terneu, Robert; and Van Cauter, Albert, to Glaverbel. Method of coating glass and coated flat glass. 4,900,634, Cl. 428-432.000.
Terumo Corporation: *See—*
Seita, Yukio; and Onishi, Makoto, 4,900,444, Cl. 210-500.360.
Terumo Kabushiki Kaisha: *See—*
Miyasaka, Eiichi; Nishimura, Tetsuro; and Tanokura, Nobukazu, 4,899,903, Cl. 220-266.000.
Terzian, John, to Raytheon Company. Method of recognizing patterns. 4,901,362, Cl. 382-22.000.
Tet Holding Ges.M.B.H.: *See—*
Schiffer, Wernar, 4,899,620, Cl. 74-665.00N.
Tetior, Alexandr N.: *See—*
Valts, Semen P.; Golovko, Viktor A.; Stepanenko, Alexei N.; Tetior, Alexandr N.; Fen, Karim P.; Lekhno, Alexandr M.; Barykin, Boris J.; Altunin, Vitaly L.; Pekarsky, Valentin V.; and Meleshko, Georgy K., 4,899,502, Cl. 52-169.400.
Texaco, Inc.: *See—*
Brent Jr., Fred D.; Nelson, Richard G.; and Ruff, William A., 4,900,713, Cl. 502-439.000.
Sanderson, John R.; and Meyer, Robert A., 4,900,850, Cl. 549-529.000.
Sawicki, Robert A.; and Chafetz, Harry, 4,900,705, Cl. 502-158.000.
Texas Instruments Incorporated: *See—*
Curran, Patrick A.; and Wilson, Susan R., 4,901,133, Cl. 357-54.000.
Hynecek, Jaroslav, 4,901,129, Cl. 357-30.000.
Kuwano, Hiromichi, 4,901,132, Cl. 357-43.000.
Mikahara, Takanori, 4,900,212, Cl. 414-416.000.
Patel, Pravin, 4,901,280, Cl. 365-189.110.
Therm-O-Disc, Incorporated: *See—*
Tennant, James A.; and Yagher, Charles, Jr., 4,901,186, Cl. 361-106.000.
Thermo King Corporation: *See—*
Berge, Jeffrey B.; Seshadri, Jayaram; and Hanson, Jay L., 4,899,549, Cl. 62-160.000.
Thermwood Corporation: *See—*
Susnjara, Kenneth J., 4,899,644, Cl. 92-18.000.
Therond, Jean-Francois: *See—*
Cretin, Jacques; and Therond, Jean-Francois, 4,901,289, Cl. 367-34.000.
Thery, Georges. Combustion chamber for two-stroke reciprocating engine, and and engine making use thereof. 4,899,698, Cl. 123-65.00A.
Theus, Ulrich, to Deutsche ITT Industries GmbH. Digital FIFO memory. 4,901,286, Cl. 365-230.010.
Thomann, Helmut: *See—*
Baeuerle, Dieter; Eyett, Michael; Thomann, Helmut; and Wersing, Wolfram, 4,900,892, Cl. 219-121.850.
Thomas, Emery G.: *See—*
Brame, J. Yancey; Horn, Michael F.; Saucier, Jeffrey A.; Siedman, David L.; Thomas, Emery G.; and Varnum, Robert L., 4,900,883, Cl. 200-83.00S.
Thomas, Hermann; Herd, Josef; and Hasper, Uwe, to Maschinenfabrik Goebel GmbH. Machine for processing a continuous web or sheets. 4,899,656, Cl. 101-216.000.
Thomas, Penrhyn F. Method and apparatus for buckling contact lenses. 4,900,482, Cl. 264-2.700.
Thomas, Raymond H. P.; Magid, Hillel; Wilson, David P.; and Pelava, John W., to Allied-Signal Inc. Refrigeration lubricant blends. 4,900,463, Cl. 252-54.000.
Thomas, Roy S., Jr., to Allied-Signal Inc. In-run cleanable orifice trap. 4,899,981, Cl. 251-207.000.
Thompson, Michael D.: *See—*
Parker, Delmer G.; Thompson, Michael D.; and Fletcher, Gerald M., 4,901,114, Cl. 355-245.000.
Thompson, Nigel, to Metal Closures Limited. Closures for containers. 4,899,898, Cl. 215-252.000.
Thompson, Paul K.: *See—*
Lyons, John; and Thompson, Paul K., 4,900,064, Cl. 285-53.000.
Thompson, R. Bruce; Smith, John F.; Lee, Seung S.; and Li, Yan, to Iowa State University Research Foundation. Semi-automatic for ultrasonic measurement of texture. 4,899,589, Cl. 73-597.000.
Thomson-Brandt-Armements: *See—*
Trouplin, Claude, 4,900,227, Cl. 416-132.00B.
Thomson Consumer Electronics, Inc.: *See—*
Christopher, Todd J., 4,901,077, Cl. 341-143.000.
Thomson-CSF: *See—*
Blondeau, Robert; Bourdin, Yannic; de Cremoux, Beaudoin; Papuchon, Michel; Krakowsky, Michel; Bensoussan, Alain; Razeghi, Manijeh; and Lozes, Francoise, 4,901,321, Cl. 372-7.000.
Bricot, Claude, 4,901,089, Cl. 346-76.00L.
Dusclaux, Didier; and Mage, Jean-Claude, 4,901,038, Cl. 331-167.000.
Robin, Philippe; Robert, Albert; Bertho, Francoise; and Batail, Patrick, 4,900,842, Cl. 549-36.000.
Thomson Electron Tubes and Devices Corporation: *See—*
Seats, Peter, 4,900,991, Cl. 315-366.000.
Thomson Hybrides et Microondes: *See—*
Gloanec, Maurice; Jarry, Jacques; and Lailler, Jean L., 4,901,012, Cl. 324-158.00R.
Thoren, Werner: *See—*
Albarda, Scato; Thoren, Werner; Lagois, Johannes; and Otten, Johann, 4,901,197, Cl. 361-283.000.
Thorgersen, Harold; and Olsen, Fred. Bristle pile textile for garment applications. 4,900,605, Cl. 428-88.000.
Thorn, Richard P., to Lord Corporation. Fluid filled resilient bushing. 4,899,997, Cl. 267-140.100.
Thorn, William F., to Automotive Systems Laboratory, Inc. Percussion initiated inflator assembly. 4,899,663, Cl. 102-530.000.
Thottathil, John K., to E. R. Squibb & Sons, Inc. Process for preparing phosphonyloxyacyl amino acids. 4,900,860, Cl. 558-87.000.
Thrower, Anthony; and Gelsthorpe, John R., to Injectall Limited. Devices and apparatus for injecting gas into high temperature liquids, e.g. molten metals. 4,899,992, Cl. 266-44.000.
Thurber, Gerald A.: *See—*
Ewing, Richard C.; Kuczewski, Walter V.; Thurber, Gerald A.; and Kunig, Helmut, 4,899,890, Cl. 209-699.000.
Tiley, Edward P.: *See—*
Sutherland, Derek R.; Ramsay, Michael V. J.; Tiley, Edward P.; Pereira, Oswy Z.; Ward, John B.; Porter, Neil; Noble, Hazel M.; Fletton, Richard A.; and Noble, David, 4,900,753, Cl. 514-450.000.
Timken Company, The: *See—*
Candiard, Rene, 4,900,166, Cl. 384-560.000.
Timperi, Jukka; and Vesala, Reijo. Centrifugal pump structure. 4,900,224, Cl. 415-213.100.
Tintoretto Inc.: *See—*
Giovanella, Wilfred J., 4,901,161, Cl. 358-346.000.
Tipton, Carl L.; and Shih, Meiling, to Iowa State University Research Foundation, Inc. 20-Hydroperoxy cholesterol compounds for suppression of atherogenesis. 4,900,726, Cl. 514-182.000.
Tischer, James C., to American Standard Inc. Self-fixturing cabinet corner member. 4,900,108, Cl. 312-265.300.
Titlow, Joseph D.; Brost, Wilmut; and Hahn, David T., to Micro Motion Incorporated. Method and apparatus for determining elastic constants in tubes. 4,899,588, Cl. 73-597.000.
TMC Corporation: *See—*
Freisinger, Henry; Stritzl, Karl; and Luschnig, Franz, 4,900,053, Cl. 280-628.000.
Tobioka, Masaaki: *See—*
Ikegaya, Akihiko; and Tobioka, Masaaki, 4,900,628, Cl. 428-408.000.
Tobler, Peter, to Equus Marketing AG. Chair construction arrangement, particularly for office chairs, typing chairs, and the like. 4,900,085, Cl. 297-219.000.
Tochigifujisangyo Kabushiki Kaisha: *See—*
Genda, Toshinobu, 4,900,042, Cl. 277-70.000.
Kurihara, Sakuo, 4,899,856, Cl. 192-0.02R.
Teraoka, Masao, 4,899,859, Cl. 192-4.00A.
Tockman, Bruce A.: *See—*
Pederson, Brian D.; and Tockman, Bruce A., 4,899,759, Cl. 128-693.000.
Toda, Junichi, to Shimano Industrial Company Limited. Double bearing fishing reel. 4,899,953, Cl. 242-268.000.
Todokoro, Hideo: *See—*
Ishitani, Tohru; Todokoro, Hideo; and Tamura, Hifumi, 4,900,974, Cl. 313-359.100.
Todter, Werner: *See—*
Schultze, Wolfgang; Todter, Werner; and Kern, Reinhold, 4,901,009, Cl. 324-121.00R.
Toelke, Peter: *See—*
Alt, Anton; Schulte, Guenter; Toelke, Peter; and Wilhelm, Ludwig, 4,900,375, Cl. 148-139.000.
Toepel, Fritz, to Heidelberger Zement AG. Silo for bulk goods. 4,899,915, Cl. 222-459.000.
Tohoku Electronic Industrial Co., Ltd.: *See—*
Miyazawa, Teruo; Yasuda, Keiichi; Fujimoto, Kenshiro; and Saeki, Akio, 4,900,680, Cl. 436-71.000.
Tojo, Yoshikazu: *See—*
Ikuno, Yuji; Nakamura, Takeaki; Tojo, Yoshikazu; Nishigaki, Shinichi; Suzuki, Hiromasa; Yabe, Hisao; Yoshinaga, Jun; Yokoi, Takeshi; Ohzeki, Kazuhiko; and Kanno, Masahide, 4,901,142, Cl. 358-98.000.
Tokai Carbon Co., Ltd.: *See—*
Nakada, Toshio; Takemura, Fumio; Sema, Yoshihito; and Kataoka, Kazuhito, 4,900,465, Cl. 252-62.550.
Tokita, Makiko; Nakagawa, Masahiro; Kobayashi, Akira; and Yasuda, Kenji, to OJI Paper Co., Ltd. Ink jet recording sheet. 4,900,620, Cl. 428-330.000.
Tokita, Yoshiaki: *See—*
Maejima, Yukihito; Shirasu, Hirotoshi; Suzuki, Taihei; Tokita, Yoshiaki; Tanabe, Shirou; and Morita, Takashi, 4,901,274, Cl. 364-900.000.
Tokos, Glenn T.: *See—*
Dayton, Roderick R.; Papp, Michael C.; and Tokos, Glenn T., 4,900,937, Cl. 250-483.100.
Tokyo Electron Limited: *See—*
Koike, Hisashi; and Tanaka, Sumi, 4,901,011, Cl. 324-158.00F.
Toshima, Takayuki; and Hirakawa, Osamu, 4,899,686, Cl. 118-50.000.
Tokyo Keiki Co.: *See—*
Terakawa, Takashige; Akaba, Noriyuki; and Hattori, Sadayoshi, 4,901,042, Cl. 333-127.000.
Tokyo Ohka Kogyo Co., Ltd.: *See—*
Nakayama, Muneo; Hashimoto, Akira; Nishimura, Toshihiro; Kashiwagi, Eiichi; and Hijikata, Isamu, 4,900,582, Cl. 427-54.100.

Tomantschger, Klaus; and Kordesch, Karl, to Battery Technologies Inc. Catalytic recombination of evolved oxygen in galvanic cells. 4,900,642, Cl. 429-59.000.
Tomari, Nobuhiro: *See—*
Sawada, Kikuzo; Tanagawa, Kouzi; Tomari, Nobuhiro; and Yoshida, Tomoaki, 4,901,320, Cl. 371-51.100.
Tomco Mfg, Ltd.: *See—*
Yatabe, Yasuo, 4,899,768, Cl. 134-66.000.
Tomcufcik, Andrew S.; and Duaza, John P., to American Cyanamid Company. (3-amino-1H-pyrazol-4-yl) (aryl)methanones. 4,900,836, Cl. 546-279.000.
Tomii, Kaoru: *See—*
Yamazaki, Fumio Saeki; Kiyoshi; Tomii, Kaoru; Miyama, Hiroshi; Nakatani, Toshifumi; and Saeki, Kiyoshi, 4,900,981, Cl. 313-422.000.
Tomioka, Kentaro: *See—*
Akahane, Shoji; Tosaki, Satoshi; Hirota, Kazuo; and Tomioka, Kentaro, 4,900,697, Cl. 501-57.000.
Tomisawa, Shin'ichiro, to Sanyo Electric Co., Ltd. Address generating circuit. 4,901,318, Cl. 371-40.100.
Tomita, Atsushi; and Sumi, Hidekatsu, to Aica Kogyo Co., Ltd. Hot melt type seal agent for a lamp. 4,900,770, Cl. 524-274.000.
Tomita, Katsuhiko: *See—*
Ito, Yoshiaki; Ezaki, Joichiro; and Tomita, Katsuhiko, 4,901,175, Cl. 360-103.000.
Tompkins, E. Neal; and Slayton, Danny L., to Colorocs Corporation. Vertical print engine for electrophotographic apparatus. 4,901,110, Cl. 355-212.000.
Tong, Hua Sou: *See—*
Livshultz, Michael; and Tong, Hua Sou, 4,900,976, Cl. 313-402.000.
Torii, Shumpeita: *See—*
Yoshimura, Ryoichi; and Torii, Shumpeita, 4,900,926, Cl. 250-327.200.
Torres, Guillermo M.; Bowler, Michael W.; and Otto, Robert A., to Serrot Corporation. Rain-collection pad. 4,899,400, Cl. 4-487.000.
Tosaki, Satoshi: *See—*
Akahane, Shoji; Tosaki, Satoshi; Hirota, Kazuo; and Tomioka, Kentaro, 4,900,697, Cl. 501-57.000.
Toshima, Takayuki; and Hirakawa, Osamu, to Tokyo Electron Limited; and Tel Kyushu Limited. Coating device. 4,899,686, Cl. 118-50.000.
Tosoh Corporation: *See—*
Kurauchi, Yasuhiro; Seita, Toru; Matsui, Kiyohide; and Sugimoto, Kikuo, 4,900,420, Cl. 204-296.000.
Toth, Michael R., to Kendall Company, The. Absorbent pad with moisture barrier. 4,900,318, Cl. 604-385.100.
Totten, Roger W., to Adolph Coors Company. Liquid level control apparatus. 4,899,791, Cl. 141-288.000.
Tournier, Edmond; and Tararine, Michel, to Commissariat a l'Energie Atomique. Device for locating nuclear radiation and radiation image formation device incorporating such a locating device. 4,900,931, Cl. 250-369.000.
Townsend, Blue H., to Gassett, John D.; and Johnson, Paul H. Ring needle pusher. 4,899,916, Cl. 223-101.000.
Townsend, Kim R.; Bledsoe, Susan G.; Heidenreich, Michael; and Voelz, Michael H., to Bissell Health Care Corporation. Torsion bar splint for forearm. 4,899,735, Cl. 128-87.00R.
Toyo Jozo Co., Ltd.: *See—*
Miyauchi, Yasuyo, 4,900,730, Cl. 514-12.000.
Toyo Soda Manufacturing Co.: *See—*
Kubo, Masashige; Tsutsumi, Yukihiro; Okisaki, Fumio; Fujimura, Shunichi; and Fukuka, Teruo, 4,900,766, Cl. 523-136.000.
Toyoaki, Tanigawa: *See—*
Harumoto, Kimura; and Toyoaki, Tanigawa, 4,900,200, Cl. 406-93.000.
Toyoda Koki Kabushiki Kaisha. *See—*
Usutani, Shigenobu; Maruyama, Toshio; Yamauchi, Tadashi; and Ban, Yasunori, 4,899,718, Cl. 125-11.0TP.
Toyokawa, Kazuharu, to International Business Machines Corporation. System for compressing bi-level data. 4,901,363, Cl. 382-56.000.
Toyokawa, Yasuhumi: *See—*
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi, Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,900,352, Cl. 71-92.000.
Toyota Chemical Engineering Co., Ltd.: *See—*
Ohmori, Toshihide; Kitamura, Kazuhiko; Kawamura, Masuhiko; Danno, Atsushi; Shirai, Tokuo; Sugiura, Yukio, and Nakane, Mitsuru, 4,900,459, Cl. 252-32.500.
Toyota Jidosha Kabushiki Kaisha: *See—*
Nagase, Takashi; and Taguchi, Yoshio, 4,900,489, Cl. 264-46.500.
Sasaki, Norio; Mayumi, Kazuhisa; and Maeda, Yorishige, 4,899,702, Cl. 123-193.00P.
TP Orthodontics, Inc.: *See—*
Kesling, Peter C.; and Henderlong, Dennis B., 4,900,250, Cl. 433-11.000.
Traeger, Rolf: *See—*
Raff, Horst; and Traeger, Rolf, 4,900,914, Cl. 250-216.000.
Trakas, Panos. Sprue bushing assembly and method of making same. 4,899,435, Cl. 29-611.000.
Trakas, Panos. Multi-gate molding heater assembly. 4,900,560, Cl. 425-549.000.
Tramontano, Alfonso: *See—*
Benkovic, Stephen; Lerner, Richard A.; Tramontano, Alfonso; and Napper, Andrew D., 4,900,674, Cl. 435-232.000.
Tresness Andrew F.: *See—*
Palinkas, Raymond W., 4,901,043, Cl. 333-175.000
Triangle Container Corporation: *See—*
Grollman, Jack D., 4,899,929, Cl. 229-122.100.
Trichell, John M.; and Wheeler, Ronald M. Disposable clipper head and method for making the same. 4,899,444, Cl. 30-208.000.
Trig.o.metrics Corporation: *See—*
Francis, John G. R., 4,899,454, Cl. 33-432.000.
Triten Corporation: *See—*
Junier, Marius R., 4,899,899, Cl. 220-3.000.
Trobiani, Ralph A. Golf ball cleaning device. 4,899,413, Cl. 15-21.00A.
Troponwerke GmbH & Co. KG: *See—*
Dell, Hans-Dieter; Kraus, Reinhold; and Schierstedt, Detlef, 4,900,557, Cl. 424-452.000.
Trouplin, Claude, to Thomson-Brandt-Armements. Wind power of hydraulic power machine with axial feed, radial outflow, and variable geometry vanes, and projectiles fitted with wind power or hydraulic power machines of this type. 4,900,227, Cl. 416-132.00B.
Trube, Hans: *See—*
Bruhnke, Ulrich; Duenas, Santiago; Fiscber, Helmut; Greiner, Ferdinand; Jobmann, Ingo; Korber, Jurgen; Nothacker, Siegfreid; Pfaffenbach, Jurgen; and Trube, Hans, 4,899,612, Cl. 74-493.000.
Truchard, James J.: *See—*
Kodosky, Jeffrey L.; Truchard, James J.; and MacCrisken, John E., 4,901,221, Cl. 364-200.000.
TRW United Carr GmbH & Co.: *See—*
Sick, Hans-Hermann, 4,899,964, Cl. 248-68.100.
Trynosky, Stephen W.: *See—*
Morel, Jeanne E.; Rackley, Darwin P.; Trynosky, Stephen W.; and Wall, William A., 4,901,062, Cl. 340-703.000.
Tsai, Mu-Yuan T. Paint spray-gun cleaner. 4,899,769, Cl. 134-111.000.
Tsals, Izrail: *See—*
Gumaste, Anand V.; and Tsals, Izrail, 4,899,598, Cl. 73-862.360.
Tsay, Yung-Lang. Charcoal stove casing set. 4,899,721, Cl. 126-25.00B.
Tseng, Ike Diing-Huang. Bicycle frame. 4,900,049, Cl. 280-281.100.
Tsuboi, Takashi; and Ueda, Hitoshi, to Nippon Ferrite, Ltd. Dielectric ceramic composition. 4,900,702, Cl. 501-134.000.
Tsuchiya, Kozaburo: *See—*
Matsushita, Takashi; and Tsuchiya, Kozaburo, 4,899,569, Cl. 72-336.000.
Tsuda, Shigenori: *See—*
Ohtsubo, Toshiro; Tsuda, Shigenori; Manabe, Yukio; Itoh, Takaaki; Kawada, Hitoshi; Shinjo, Goro; and Tsuji, Kozo, 4,900,551, Cl. 424-408.000.
Tsuji, Kazutaka: *See—*
Shimomoto, Yasuharu; Ishioka, Sachio; Takasaki, Yukio; Hirai, Tadaaki; Tsuji, Kazutaka; Makishima, Tatsuo; Matsubara, Hirokazu; Sameshima, Kenji; Yamazaki, Junichi; Tanioka, Kenkichi; Kosugi, Mitsuo; Shidara, Keiichi; Kawamura, Tatsuro; Hiruma, Eikyuu; and Yamashita, Takashi, 4,900,975, Cl. 313-366.000.
Tsuji, Kozo: *See—*
Ohtsubo, Toshiro; Tsuda, Shigenori; Manabe, Yukio; Itoh, Takaaki; Kawada, Hitoshi; Shinjo, Goro; and Tsuji, Kozo, 4,900,551, Cl. 424-408.000.
Tsujioka, Hiroshi; Yoneda, Shigeo; and Yatsuzuka, Yasufumi, to Sharp Kabushiki Kaisha. Image reader for a portable copier. 4,901,163, Cl. 358-473.000.
Tsukamoto Seiki Co., Ltd.: *See—*
Nakamura, Osamu, 4,900,164, Cl. 384-96.000.
Tsukuda, Kenji: *See—*
Terai, Kazuto; Isobe, Susumu; Tsukuda, Kenji; Inoue, Hisao; and Kobayashi, Hiroshi, 4,900,248, Cl. 432-234.000.
Tsushima, Isao: *See—*
Tashiro, Tsutomu; Komoda, Norihisa; Tsushima, Isao; Matsumoto, Kuniaki; Kawashima, Kazuhiro; and Maekawa, Riyoji, 4,901,229, Cl. 364-200.000.
Tsutsui, Keiichi, to Omron Tateisi Electronics Co., Ltd. Card accessing apparatus having a head disposed under a card feeding stage. 4,900,908, Cl. 235-475.000.
Tsutsumi, Teruo: *See—*
Sato, Naoki; Tsutsumi, Teruo; and Katoh, Masaaki, 4,901,207, Cl. 362-32.000.
Tsutsumi, Yukihiro: *See—*
Kubo, Masashige; Tsutsumi, Yukihiro; Okisaki, Fumio; Fujimura, Shunichi; and Fukuka, Teruo, 4,900,766; Cl. 523-136.000.
Tsuzuki, Takayoshi: *See—*
Kotaki, Mitsuko; Tsuzuki, Takayoshi; Oda, Yukihisa; Yabuno, Ryohei; and Ishii, Masami, 4,901,050, Cl. 338-13.000.
Tuenge, Richard T.; and Coovert, Richard E., to Planar Systems, Inc. Rapid thermal annealing of TFEL panels. 4,900,584, Cl. 427-66.000.
Tung, Raymond T.: *See—*
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Weber, Robert; and Mechtold, Helmut, to Siemens Aktiengesellschaft. Apparatus for drawing-in a pipe end by cold forming. 4,899,571, Cl. 72-401.000.
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Eley, E. R., 4,901,045, Cl. 335-70.000.
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Franklin, Richard D.; Auld, Gregg D.; and Murray, David E., 4,899,697, Cl. 122-379.000.
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Yook, Keun J., to Goldstart Co., Ltd. Automatic brightness limiting circuit. 4,901,156, Cl. 358-243.000.
York, Peter: *See—*
Barry, Brian W.; Mulley, Bryan A.; and York, Peter, 4,900,558, Cl. 424-461.000.
Yoshida, Akira: *See—*
Terae, Nobuyuki; Mutoh, Teiichi; and Yoshida, Akira, 4,900,474, Cl. 252-358.000.
Yoshida, Hisaji: *See—*
Shima, Yoshisuke; Shibazaki, Kunihiro; Konishi, Yoshiyuki; Ryuno, Toshiro; Fujita, Mitsunobu; and Yoshida, Hisaji, 4,899,517, Cl. 53-432.000.
Yoshida, Masanobu, to Fujitsu Limited. Semiconductor memory device having two column transfer gate transistor groups independently provided for a sense amplifier and a programmed circuit. 4,901,281, Cl. 365-189.050.
Yoshida, Shiro; Shirai, Tatsuro; and Nagashima, Satoru, to Victor Company of Japan, Ltd. Apparatus and method for recording and reproducing a digital signal. 4,901,168, Cl. 360-60.000.
Yoshida, Takeo; and Kishida, Hajime, to Yamaha Hatsudoki Kabushiki Kaisha. Valve support for accumulator type fuel injection nozzle. 4,899,935, Cl. 239-91.000.
Yoshida, Takumi: *See—*
Kawai, Kenji; Kan, Kazuma; and Yoshida, Takumi, 4,901,162, Cl. 358-468.000.

Yoshida, Tomoaki *See—*
Sawada, Kikuzo; Tanagawa, Kouzi; Tomari, Nobuhiro; and Yoshida, Tomoaki, 4,901,320, Cl. 371-51.100.
Yoshimura, Katsuji; Masui, Toshiyuki; Sato, Chikara; and Nakayama, Tadayoshi, to Canon Kabushiki Kaisha. Video signal recording and/or reproducing apparatus. 4,901,119, Cl. 358-319.000.
Yoshimura, Katsuji: *See—*
Hieda, Teruo; Masui, Toshiyuki; Takahashi, Koji; and Yoshimura, Katsuji, 4,901,152, Cl. 358-209.000.
Nakayama, Tadayoshi; Satoh, Chikara; Fujii, Akio; Yoshimura, Katsuji; and Takahashi, Koji, 4,901,148, Cl. 358-140.000.
Yoshimura, Ryoichi; and Torii, Shumpeita, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,900,926, Cl. 250-327.200.
Yoshinaga, Jun: *See—*
Ikuno, Yuji; Nakamura, Takeaki; Tojo, Yoshikazu; Nishigaki, Shinichi; Suzuki, Hiromasa; Yabe, Hisao; Yoshinaga, Jun; Yokoi, Takeshi; Ohzeki, Kazuhiko; and Kanno, Masahide, 4,901,142, Cl. 358-98.000.
Yoshinaga, Yoko: *See—*
Yuasa, Satoshi; Nishimura, Yukuo; Yoshinaga, Yoko; Munakata, Hirohide; and Haruta, Masahiro, 4,900,135, Cl. 350-354.000.
Yoshino, Kenji: *See—*
Wakui, Tadahiro; Yoshino, Kenji; Komatsu, Masafumi; Kumazawa, Yumiko; Yamagishi, Touru; and Izumi, Mitsuhiko, 4,900,804, Cl. 528-332.000.
Yoshino, Kunihiko: *See—*
Haneda, Satoshi; and Yoshino, Kunihiko, 4,901,116, Cl. 355-253.000.
Yoshino, Masato, to Sumitomo Electric Industries Ltd. Antiskid device. 4,901,239, Cl. 364-426.020.
Yoshizako, Mamory: *See—*
Itou, Takeo; Matsuda, Hidemi; Yoshizako, Mamory; and Yagi, Osamu, 4,900,984, Cl. 313-479.000.
Yoshizumi, Hajime: *See—*
Suwa, Yoshihide; Kiyota, Noriko; Yoshizumi, Hajime, and Senoh, Shiro, 4,900,538, Cl. 424-10.000.
Yoshizumi, Motohiko: *See—*
Sano, Akira; Yoshizumi, Motohiko; Hirata, Hiroki; Matsuura, Kazuo; and Suyama, Hisahiko, 4,900,790, Cl. 525-192.000.
Yost, Michael G.: *See—*
Steinman, Arnold J.; and Yost, Michael G., 4,901,194, Cl. 361-213.000.
Young, J. Winslow. Inflatable, disposable bedpan apparatus and method. 4,899,399, Cl. 4-451.000.
Yu, Qian-Sheng: *See—*
Brossi, Arnold; Yu, Qian-Sheng; Atack, John R.; and Rapoport, Stanley I., 4,900,748, Cl. 514-411.000.
Yuasa, Satoshi; Nishimura, Yukuo; Yoshinaga, Yoko; Munakata, Hirohide; and Haruta, Masahiro, to Canon Kabushiki Kaisha. Optical element. 4,900,135, Cl. 350-354.000.
Yuh, Hideo: *See—*
Sawayama, Noboru; Kamiyama, Shinichi; Yuh, Hideo; Takashima, Masayuki; and Sekiya, Tadayuki, 4,901,113, Cl. 355-243.000.
Yuk, Geun J., to Goldstar Co., Ltd. High voltage stabilizing circuit for preventing overheat. 4,900,988, Cl. 315-411.000.
Yusko, Edward M., Jr.; Brown, Cal R.; Kalain, Terry M.; and Williams, Peter C., to Whitey Co. Pinch valve. 4,899,783, Cl. 137-556.000.
Yutaka Electric Mfg. Co., Ltd.: *See—*
Hiramatsu, Rihei; Watanabe, Shigeo; Okumura, Yasuyuki; and Maruyama, Jun, 4,901,214, Cl. 363-19.000.
Zachrei, Jurgen: *See—*
Debus, Jurgen; Koch, Hans-Georg; Zachrei, Jurgen; and Butergerds, Helmut, 4,899,900, Cl. 220-4.00R.
Zagotto, Giuseppe: *See—*
Serafini, Sirio; and Zagotto, Giuseppe, 4,900,859, Cl. 558-418.000.
Zaino, Giovanni: *See—*
Chiri, Chiaffredo; Gianoglio, Pierino; Giraudo, Claudio; Marengo, Sergio; and Zaino, Giovanni, 4,899,720, Cl. 125-21.000.
Zalesky, Paul: *See—*
Pope, Joseph L., Jr.; Griffith, James M.; Gessert, James M.; Maciel, Mario; and Zalesky, Paul, 4,899,757, Cl. 128-662.060.
Zall, Robert R., and Wecker, Matthew, to Cornell Research Foundation, Inc. Microbiological production of acetaldeyde. 4,900,670, Cl. 435-147.000.
Zalm, Peter C.: *See—*
Heijman, Maritza G. J.; and Zalm, Peter C., 4,900,709, Cl. 505-1.000.
Zechner, Karl. Sheet folding apparatus. 4,900,002, Cl. 270-45.000.
Zell, Werner V.: *See—*
Becker, Johann A.; and Zell, Werner V., 4,900,121, Cl. 350-96.200.
Zeller, Heinz: *See—*
Sachetto, Jean-Pierre; Stepto, Robert F. T.; and Zeller, Heinz, 4,900,361, Cl. 106-213.000.
Zellerhoff, Robert: *See—*
Holtmann, Wilhelm; Zellerhoff, Robert; Oberkobusch, Rudolf; Staglich, Peter; and Charpey, Bernhard, 4,900,717, Cl. 505-812.000.
Zembrowski, William J.: *See—*
Mylari, Banavara L.; and Zembrowski, William J., 4,900,844, Cl. 549-299.000.
Zenith Electronics Corporation: *See—*
Fuhs, Eric D., 4,901,261, Cl. 364-708.000.
Livshultz, Michael; and Tong, Hua Sou, 4,900,976, Cl. 313-402.000.
Zhidkov, Vasily D.; Kudrin, Nikolai A.; Sokolov, Vladimir I.; Karelin, Stanislav N.; Bulavintsev, Igor A.; and Churakov, Vladimir N., to Vsesojuzny Nauchno-Issledovatelsky Institut Okhrany I Tekhniki Bezpasnosti Chernoi Metallurgii. Device for monitoring the level of molten metal in a converter. 4,899,994, Cl. 266-94.000.
Ziegler, Heinrich; and de Fries, Jan R. P., to Sulzer Brothers Limited. Dynamic pressure filter. 4,900,440, Cl. 210-321.680.
Zimmern, Bernard. Method and a screw machine for processing fluid under high pressures, with liquid injection between a sealing portion and a support portion of the gate-rotor. 4,900,239, Cl. 418-1.000.
Zinke, Otto H. Gap-modified magnetic bridge device for fringing flux analysis. 4,901,017, Cl. 324-239.000.
Zinn, Michael: *See—*
Sanderson, William; and Zinn, Michael, 4,899,406, Cl. 5-449.000.
Zinpro Corporation: *See—*
Abdel-Monem, Mahmoud M.; and Anderson, Michael D., 4,900,561, Cl. 426-2.000.
Zinser Textilmaschinen GmbH: *See—*
Mack, Karl-Heinz, 4,899,531, Cl. 57-281.000.
Zinter, J. Robert: *See—*
Atkinson, Leland G., III; Moore, Duncan T.; and Zinter, J. Robert, 4,900,138, Cl. 350-413.000.
Zlamal, Frank, to Northlake Marketing and Supply Company. Ceramic welding composition and process. 4,900,484, Cl. 264-30.000.
Zook, J. David: *See—*
Bonne, Ulrich; Deetz, David W.; Lai, Juey H.; Odde, David J.; and Zook, J. David, 4,900,448, Cl. 210-637.000.
Zorner, Paul S.: *See—*
Turner, James A.; Zorner, Paul S.; and Jacks, Wendy S., 4,900,354, Cl. 71-94.000.
Zortea, Michel; Noiret, Robert; and Dossier, Gerard, to Saint-Gobain Vitrage. Method and apparatus for working molten glass. 4,900,337, Cl. 65-135.000.
Zuideveld, Pieter L.; and Groeneveld, Michiel J., to Shell Oil Company. Contacting device for gas and solid particles. 4,900,340, Cl. 55-208.000.
Zupancic, Joseph J.; Zweig, Andrew M.; and Wrezel, James A., to Allied-Signal Inc. Styrene terminated multifunctional oligomeric phenols as new thermosetting resins for composites. 4,900,794, Cl. 525-326.300.
Zutler, Bruce B.: *See—*
Cederroth, Sture C.; and Zutler, Bruce B., 4,899,976, Cl. 249-61.000.
Zweig, Andrew M.: *See—*
Zupancic, Joseph J.; Zweig, Andrew M.; and Wrezel, James A., 4,900,794, Cl. 525-326.300.
Zylstra, Henry J.: *See—*
Erickson, Kenneth W.; and Zylstra, Henry J., 4,901,219, Cl. 363-146.000.
15672 Canada Incorporated: *See—*
Monette, Jean-Yves; and Desabrais, Sylvain, 4,901,344, Cl. 379-93.000.
501 Glyco-Metall-Werke Daelen: *See—*
Hodes, Erich; Engel, Ulrich; and Gruner, Heiko, 4,900,639, Cl. 428-610.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF FEBRUARY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brown, Karen K.; and Stewart, Richard C., to Mobay Corporation. Influenza vaccine production in liquid cell culture. Re. 33,164, Cl. 424-89.000.

Hitachi, Ltd.: *See*—
Yoshida, Kenichi; Watanabe, Takao; and Kiguchi, Takashi, Re. 33,162, Cl. 364-492.000.

Kiguchi, Takashi: *See*—
Yoshida, Kenichi; Watanabe, Takao; and Kiguchi, Takashi, Re. 33,162, Cl. 364-492.000.

Madden, Raymond D., to Madden Sales & Service, Inc. Gas equalizer for downhole pump. Re. 33,163, Cl. 417-444.000.

Madden Sales & Service, Inc.: *See*—
Madden, Raymond D., Re. 33,163, Cl. 417-444.000.

Mobay Corporation: *See*—
Brown, Karen K.; and Stewart, Richard C., Re. 33,164, Cl. 424-89.000.

Stewart, Richard C.: *See*—
Brown, Karen K.; and Stewart, Richard C., Re. 33,164, Cl. 424-89.000.

Watanabe, Takao: *See*—
Yoshida, Kenichi; Watanabe, Takao; and Kiguchi, Takashi, Re. 33,162, Cl. 364-492.000.

Whitehead, Robert M. Boat hull with flow chamber. Re. 33,165, Cl. 440-69.000.

Yoshida, Kenichi; Watanabe, Takao; and Kiguchi, Takashi, to Hitachi, Ltd. Method and apparatus for guidance of an operation of operating power plants. Re. 33,162, Cl. 364-492.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Alt, Eckhard; and Calfee, Richard V., to Intermedics, Inc. Exercise-responsive rate-adaptive cardiac pacemaker. B1 4,719,920, 2-13-90, Cl. 128-419.0PG.

Calfee, Richard V.: *See*—
Alt, Eckhard; and Calfee, Richard V., B1 4,719,920, Cl. 128-419.0PG.

Intermedics, Inc.: *See*—
Alt, Eckhard; and Calfee, Richard V., B1 4,719,920, Cl. 128-419.0PG.

Russo, Ronald D., to Superior Biosystems Inc. Gastroenteric feeding tube for feeding endoscopic placement. B1 4,769,014, 2-13-90, Cl. 604-270.000.

Superior Biosystems Inc.: *See*—
Russo, Ronald D., B1 4,769,014, Cl. 604-270.000.

LIST OF DESIGN PATENTEES

Abe, Yoshinori: *See*—
Sawato, Tatsuya; Ookawa, Youzo; Nakamura, Takashi; Kumatani, Hiroshi; and Abe, Yoshinori, 306,030, Cl. D15-72.000.

Akerfeldt, Dan, to C. R. Bard, Inc. Needle bead for biopsy cannula. 306,070, 2-13-90, Cl. D24-25.000.

Alberghini, Alfred C.; Brunson, David A.; and Deemer, David A., Jr., to Sewell Plastics, Inc. Bottle. 305,984, 2-13-90, Cl. D9-393.000.

Anoszko, Thomas J., to Research Products Corporation. Wall outlet box for a central vacuum cleaning system. 306,088, 2-13-90, Cl. D32-25.000.

Asics Corporation: *See*—
Hase, Yoshiaki, 305,955, Cl. D2-320.000.

Atrium Structures, Inc.: *See*—
Jenn, Louis J., 306,077, Cl. D25-17.000.

Auger, Frederic P. Chemical mixer. 306,034, 2-13-90, Cl. D15-199.000.

Avnet, Inc.: *See*—
Wittkamp, Joel, 306,025, Cl. D14-237.000.

Backus, James. Boat. 306,006, 2-13-90, Cl. D12-314.000.

Bancroft, Richard S. J. Rockable exercise platform. 306,049, 2-13-90, Cl. D21-191.000.

Barnard, Frank P.; and Barnard, John K., to Vita-Mix Corporation. Ice cream mixer. 305,973, 2-13-90, Cl. D7-379.000.

Barnard, John K.: *See*—
Barnard, Frank P.; and Barnard, John K., 305,973, Cl. D7-379.000.

Bartlett, William L.; and Weir, David A., to Zephyr Convection Cooking Systems Co. Convection blower or similar article for use in an electric oven. 306,064, 2-13-90, Cl. D23-383.000.

Bartley, Ronnie C.: *See*—
Caico, Gary S.; and Bartley, Ronnie C., 306,089, Cl. D34-31.000.

Bayerische Motoren Werke AG: *See*—
Lagaay, Harm, 305,998, Cl. D12-92.000.

Beistegui, Jose L., to BH Holdings, Ltd. Exercise machine. 306,053, 2-13-90, Cl. D21-195.000.

Berkan, William A., Jr. Cargo restraint for pickup truck. 306,003, 2-13-90, Cl. D12-155.000.

BH Holdings, Ltd.: *See*—
Beistegui, Jose L., 306,053, Cl. D21-195.000.

Binder, J. Morris; Drummond, Robert T.; and Schwimmer, Alan F., to Tone Brothers, Inc. Jar or similar article. 305,980, 2-13-90, Cl. D9-372.000.

Blake, John B. Golf ball retriever head. 306,058, 2-13-90, Cl. D21-234.000.

Bogdanoff, Steven P.; and Golden, Gary L. Dental implant cleaning tool. 306,067, 2-13-90, Cl. D24-11.000.

Boykiw, Alan P., to Northern Telecom Limited. Display add-on for telephone equipment, or the like. 306,026, 2-13-90, Cl. D14-240.000.

Breeden, Gregory A. Game board. 306,044, 2-13-90, Cl. D21-31.000.

Brentham, Jerry D. Butterfly exerciser. 306,050, 2-13-90, Cl. D21-195.000.

Brentham, Jerry D. Bench press/row physical exerciser. 306,051, 2-13-90, Cl. D21-195.000.

Brentham, Jerry D. Abduction-adduction hip exerciser. 306,052, 2-13-90, Cl. D21-195.000.

Brinker, Barry; and Busse, John E., to 'Totes', Incorporated. Combined brush and ice scraper. 305,963, 2-13-90, Cl. D4-118.000.

Brunson, David A.: *See*—
Alberghini, Alfred C.; Brunson, David A.; and Deemer, David A., Jr., 305,984, Cl. D9-393.000.

Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Ring. 305,995, 2-13-90, Cl. D11-35.000.

Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Earring. 305,996, 2-13-90, Cl. D11-75.000.

Busse, John E.: *See*—
Brinker, Barry; and Busse, John E., 305,963, Cl. D4-118.000.

C. R. Bard, Inc.: *See*—
Akerfeldt, Dan, 306,070, Cl. D24-25.000.

Caico, Gary S.; and Bartley, Ronnie C. Powered post for automotive vehicle body and frame repairs. 306,089, 2-13-90, Cl. D34-31.000.

Camus la Grande Marque: *See*—
Daucourt, M. Michel, 305,983, Cl. D9-385.000.

Carnevale, Francesco L.; and Kemnitz, Glen D., to Sunbeam Corporation. Weighing scale. 305,992, 2-13-90, Cl. D10-92.000.

Carnevale, Francesco L.; and Kemnitz, Glen D., to Sunbeam Corporation. Beam scale. 305,993, 2-13-90, Cl. D10-93.000.

Carnevale, Francesco L., to Sunbeam Corporation. Weighing scale. 305,994, 2-13-90, Cl. D10-92.000.

Cassai, Gino H.: *See*—
Cassai, Henry J.; and Cassai, Gino H., 306,085, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 306,085, 2-13-90, Cl. D28-77.000.

Cavalier, Serge A., to Safare-Crouzet. Shipboard operations terminal used with digitized voice control machine and communication systems. 306,021, 2-13-90, Cl. D14-140.000.

Cerniglia, Carlalberto, to Top-Pen di Dott. Ball-point pen. 306,038, 2-13-90, Cl. D19-41.000.

Chen, Cheng-Sheng. Racket. 306,054, 2-13-90, Cl. D21-212.000.

Chinon Kabushiki Kaisha: *See*—
Nakayama, Yasuhiko, 306,036, Cl. D16-209.000.
Nakayama, Yasuhiko, 306,037, Cl. D16-209.000.

Chiu, Bernard, and O'Grady, Richard M., to Holmes Products Corp. Ultrasonic humidifier. 306,063, 2-13-90, Cl. D23-356.000.

Christiansen, Aline; Wendell, Donald; and Pogue, Lonnie, to Johnson & Johnson Consumer Products, Inc. Display container for dental articles or the like. 305,986, 2-13-90, Cl. D9-424.000.

CMB Packaging (UK) Limited: *See*—
Taylor, Joseph S., 305,990, Cl. D9-438.000.

Cobb, Randal L. Hammer holder. 305,961, 2-13-90, Cl. D3-105.000.

Cornell, Brian J.: *See*—
DePrey, James P.; and Cornell, Brian J., 306,007, Cl. D12-318.000.

Cruger, Edwin G.; and Plent, Gerard J. Equipment bag or similar article. 305,957, 2-13-90, Cl. D3-48.000.

Cruisers Incorporated: *See*—
DePrey, James P.; and Cornell, Brian J., 306,007, Cl. D12-318.000.

Cutter, John W. Yellow jacket trap. 306,061, 2-13-90, Cl. D22-122.000.

Cyujou, Kennosuke; Jinmon, Keijiro; and Hirano, Takashi, to Kowa Company Ltd. Automatic perimeter for eyesight examination. 306,068, 2-13-90, Cl. D24-17.000.

Czech, John F.; Drucker, Irving M.; and Ojeda, Peter A., to Zenith Electronics Corporation. Video display. 306,016, 2-13-90, Cl. D14-113.000.

Daucourt, M. Michel, to Camus la Grande Marque. Decanter with stopper. 305,983, 2-13-90, Cl. D9-385.000.

Deemer, David A., Jr.: *See*—
Alberghini, Alfred C.; Brunson, David A.; and Deemer, David A., Jr., 305,984, Cl. D9-393.000.

DeMars, Robert A. Drinking cup or similar article. 305,966, 2-13-90, Cl. D7-509.000.

DePrey, James P.; and Cornell, Brian J., to Cruisers Incorporated. Boat stern. 306,007, 2-13-90, Cl. D12-318.000.

Design Institute America, Inc.: *See*—
Mulhauser, George C., 305,965, Cl. D6-349.000.

DeWitt, Mary A.: *See*—
Volz, Norma L.; and DeWitt, Mary A., 306,084, Cl. D28-61.000.

Discovery Toys, Inc.: *See*—
Klitsner, Daniel B., 306,071, Cl. D24-47.000.
Klitsner, Daniel B., 306,072, Cl. D24-47.000.
Klitsner, Daniel B., 306,073, Cl. D24-47.000.
Klitsner, Daniel B., 306,074, Cl. D24-47.000.
Klitsner, Daniel B., 306,075, Cl. D24-47.000.

Dowell Australia Limited: *See*—
Whitney, John, 306,078, Cl. D25-119.000.
Whitney, John, 306,079, Cl. D25-119.000.
Whitney, John, 306,080, Cl. D25-119.000.
Whitney, John, 306,081, Cl. D25-119.000.

Drucker, Irving M.: *See*—
Czech, John F.; Drucker, Irving M.; and Ojeda, Peter A., 306,016, Cl. D14-113.000.

Drummond, Robert T.: *See*—
Binder, J. Morris; Drummond, Robert T.; and Schwimmer, Alan F., 305,980, Cl. D9-372.000.

Durand, Jean-Jacques. Ice bucket. 305,967, 2-13-90, Cl. D7-603.000.

Eagle Manufacturing Company: *See*—
Gillispie, John G.; and Mitchell, Donald J., 305,982, Cl. D9-374.000.

Eberbach, Steven J., to Krausse, Howard. Loudspeaker. 306,024, 2-13-90, Cl. D14-214.000.

Eldon Industries, Inc.: *See*—
Evenson, Mel, 306,040, Cl. D19-90.000.
Evenson, Mel, 306,041, Cl. D19-90.000.
Evenson, Mel, 306,042, Cl. D20-10.000.

Emmerling, Ronald, to International Consumer Brands. Cordless screwdriver. 305,975, 2-13-90, Cl. D8-61.000.

Evenson, Mel, to Eldon Industries, Inc. Step rack. 306,040, 2-13-90, Cl. D19-90.000

Evenson, Mel, to Eldon Industries, Inc. Slanted diagonal sorter. 306,041, 2-13-90, Cl. D19-90.000.

Evenson, Mel, to Eldon Industries, Inc. Wall mounted sign. 306,042, 2-13-90, Cl. D20-10.000.

Fabritec Enclosures Inc. Div. of Fabtech: *See*—
Farina, Joseph, 306,022, Cl. D14-146.000.

Farina, Joseph, to Fabritec Enclosures Inc. Div. of Fabtech. Upright telephone stand. 306,022, 2-13-90, Cl. D14-146.000.

Flygt AB: *See*—
Fries, Hjalmar; and Karlsson, Ingvar, 306,033, Cl. D15-147.000.

Fohrman, Scott. Bag closure clip. 305,989, 2-13-90, Cl. D9-434.000.

Freund Medical Products, Inc.: *See*—
Kelly, William M.; Jay, Thomas; and Freund, Robert F., 306,069, Cl. D24-24.000.

Freund, Robert F.: *See*—
Kelly, William M.; Jay, Thomas; and Freund, Robert F., 306,069, Cl. D24-24.000.

Fries, Hjalmar; and Karlsson, Ingvar, to Flygt AB. Submersible mixer. 306,033, 2-13-90, Cl. D15-147.000.

Fuhr, David L. Protector for outboard motor fuel hoses. 306,029, 2-13-90, Cl. D15-5.000.

Gagnon, Jacques, to Northern Telecom Limited. Base for a telephone set. 306,023, 2-13-90, Cl. D14-151.000.

Gagnon, Jacques, to Northern Telecom Limited. Add-on access module for a telephone set. 306,027, 2-13-90, Cl. D14-241.000.

General Foods Corporation: *See*—
Mileos, George, 305,978, Cl. D9-306.000.

Gibbs, Richard B. Luggage panel. 305,958, 2-13-90, Cl. D3-71.000.

Gillispie, John G.; and Mitchell, Donald J., to Eagle Manufacturing Company. Gasoline container. 305,982, 2-13-90, Cl. D9-374.000.

Golden, Gary L.: *See*—
Bogdanoff, Steven P.; and Golden, Gary L., 306,067, Cl. D24-11.000.

Hamada, Tokimi: *See*—
Shimamoto, Yuzi; and Hamada, Tokimi, 306,001, Cl. D12-140.000.

Hankins, Robert L. Tray bracket holder for a telephone handset or similar article. 306,028, 2-13-90, Cl. D14-251.000.

Hans Rudolph, Inc.: *See*—
Rudolph, Hans; and Rudolph, Kevin A., 306,086, Cl. D29-7.000.

Hara, Kunio; and Hiroki, Shinichi, to Kabushiki Kaisha Toshiba. Intregral facsimile and telephone. 306,018, 2-13-90, Cl. D14-118.000.

Harvey, Billy R.; and Rohrer, David W., to Life-Link International, Inc. Pull for slide fastener slider. 305,997, 2-13-90, Cl. D11-221.000.

Hase, Yoshiaki, to Asics Corporation. Shoe sole. 305,955, 2-13-90, Cl. D2-320.000.

Hickmott, Robert C., to John Henry Company, The. Plant tag. 306,043, 2-13-90, Cl. D20-27.000.

Hill, Jim. Aerial disk. 306,045, 2-13-90, Cl. D21-86.000.

Hillier, Bruce D.: *See*—
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Ellison, J. Howard; and Kinelski, John J., to Rutgers University. Asparagus plant named 'Jersey Princess'. 7,155, 2-13-90, Cl. 89.000.

Flemer, William, III, to New Plant Associates. *Malus hupehensis* named 'Cardinal'. 7,147, 2-13-90, Cl. 34.000.

Garabedian, John M. Plum Tree, "Jake's Best". 7,148, 2-13-90, Cl. 38.000.

Kinelski, John J.: *See*—
Ellison, J. Howard; and Kinelski, John J., 7,155, Cl. 89.000.

Klemm, Siegfried. Geranium plant named Marpanet. 7,149, 2-13-90, Cl. 68.000.

Klemm, Siegfried. Geranium plant named Marktex. 7,153, 2-13-90, Cl. 68.000.

Laboratoire de Physiologie Vegetale: *See*—
Di Giorgio, Antonio; and Di Giorgio, Renato, 7,154, Cl. 71.000.

New Plant Associates: *See*—
Flemer, William, III, 7,147, Cl. 34.000.

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Ellison, J. Howard; and Kinelski, John J., 7,155, Cl. 89.000.

Schneider, Georg. Apple tree — Schneica. 7,146, 2-13-90, Cl. 34.000.

Vletter, Floris, to de Vennootschap Onder Firma Gebr, Vletter & J.A. Den Haan. *Eryngium planum* plant named Silver Stone. 7,150, 2-13-90, Cl. 68.000.

Vletter, Floris, to de Vennootschap Onder Firma Gebr, Vletter & J. A. Den Haan. *Eryngium planum* plant named Blue Ribbon. 7,151, 2-13-90, Cl. 68.000.

Vletter, Floris, to de Vennootschap Onder Firma Gebr, Vletter & J.A. Den Haan. *Eryngium planum* plant named Calypso. 7,152, 2-13-90, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 13, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

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487 4,899,400
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663 4,899,402

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	4,900,373
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139	4,900,375
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64	4,900,379
73.1	4,900,380
90	4,900,381
128.6	4,900,382
184	4,900,383
204	4,900,384
245	4,900,385
250	4,900,386
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273.7	4,900,389
291	4,900,390
364	4,900,391
541	4,900,392
600	4,900,393
603	4,900,394
639	4,900,395
643	4,900,397
651	4,900,396
664	4,900,398
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699	4,899,890
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225	4,900,436
232	4,900,437
236	4,900,438
321.68	4,900,440
321.84	4,900,441
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490	4,900,443
500.36	4,900,444
512.1	4,900,445
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651	4,900,449
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252	4,899,898
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69.12	4,900,889
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104.93	4,900,884
121.59	4,900,894
121.6	4,900,891
121.82	4,900,893
121.85	4,900,892
145.22	4,900,895
309	4,900,896
336	4,900,897
339	4,900,898
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501	4,900,900
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67	4,899,906
194	4,899,907
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394	4,899,914
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193	4,899,923
242	4,899,924
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109	4,899,927
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375	4,900,902
380	4,900,903
381	4,900,904
	4,900,905
	4,900,906
472	4,900,907
475	4,900,908
487	4,900,909
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224	4,899,936
289	4,899,937
294	4,899,938
310	4,899,939
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200	4,899,942
232	4,899,943
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107.2	4,899,949
198	4,899,950
204	4,899,951
260	4,899,952
268	4,899,953
CLASS 244	
2	4,899,954
3.21	4,899,955
	4,899,956
17.11	4,899,957
53 B	4,899,958
54	4,899,959
118.5	4,899,960
122 AG	4,899,961
129.2	4,899,962
CLASS 248	
65	4,899,963
68.1	4,899,964
	4,899,965
74.4	4,899,966
97	4,899,967
131	4,899,968
161	4,899,969
210	4,899,970
225.1	4,899,971
231.91	4,899,972
298	4,899,973
467	4,899,974
481	4,899,975
CLASS 249	
61	4,899,976
68	4,899,977
219.2	4,899,978
CLASS 250	
201	4,900,910
	4,900,911
205	4,900,912
209	4,900,913
216	4,900,914
222.2	4,900,915
223 B	4,900,916
225	4,900,917
227	4,900,918
	4,900,919
	4,900,920
	4,900,921
	4,900,922
228	4,900,923
231 R	4,900,925
231 SE	4,900,924
327.2	4,900,926
	4,900,927
	4,900,928
336.1	4,900,929
338.1	4,900,930
361 R	4,900,931
369	4,900,932
397	4,900,933
442.2	4,900,938
458.1	4,900,934
461.2	4,900,935
472.1	4,900,936
474.1	4,900,937
483.1	4,900,939
548	4,900,940
560	4,900,941
566	4,900,942
572	4,900,943
578	4,900,944
CLASS 251	
58	4,899,979
175	4,899,980
207	4,899,981
214	4,899,982
	4,899,983
306	4,899,984
CLASS 252	
8.514	4,900,457
8.551	4,900,456
8.555	4,900,458
8.8	4,900,455
32.5	4,900,459
46.6	4,900,460
49.6	4,900,461
52 R	4,900,462
54	4,900,463
62.55	4,900,464
	4,900,465
95	4,900,467
	4,900,468
96	4,900,469
171	4,900,470
174.14	4,900,466
186.26	4,900,471
299.61	4,900,472
	4,900,473
358	4,900,474
532	4,900,475
CLASS 254	
8 B	4,899,985
	4,899,986
122	4,899,987
292	4,899,988
CLASS 256	
1	4,899,989
57	4,899,990
69	4,899,991
CLASS 260	
397.4	4,900,477
408	4,900,478
	4,900,479
CLASS 261	
36.1	4,900,480
64.4	4,900,481
CLASS 264	
2.7	4,900,482
29.2	4,900,483
30	4,900,484
40.1	4,900,485
	4,900,486
45.2	4,900,487
45.7	4,900,488
46.5	4,900,489
54	4,900,490
59	4,900,491
65	4,900,492
71	4,900,493
102	4,900,494
103	4,900,495
	4,900,496
104	4,900,497
169	4,900,498
257	4,900,499
263	4,900,500
272.17	4,900,501
346	4,900,502
508	4,900,503
529	4,900,504
CLASS 266	
44	4,899,992
77	4,899,993
94	4,899,994
CLASS 267	
64.27	4,899,995
140.1	4,899,996
	4,899,997
CLASS 269	
63	4,899,998
152	4,900,000
240	4,899,999
CLASS 270	
1.1	4,900,001
45	4,900,002
CLASS 271	
114	4,900,003
121	4,900,004
127	4,900,005
178	4,900,006
185	4,900,007
277	4,900,008
296	4,900,009
CLASS 272	
3	4,900,010
65	4,900,011
	4,900,012
70	4,900,013
73	4,900,014
116	4,900,015
122	4,900,016
127	4,900,017
134	4,900,018
138	4,900,019
CLASS 273	
1 R	4,900,020
12	4,900,021
30	4,900,022
34 B	4,900,023
37	4,900,024
77 A	4,900,025
119 A	4,900,026
148 R	4,900,027
164	4,900,028
167 E	4,900,029
183 E	4,900,030
243	4,900,031
	4,900,032
249	4,900,033
274	4,900,034
401	4,900,035
402	4,900,036
416	4,900,037
	4,900,038
CLASS 277	
27	4,900,039
30	4,900,040
	4,900,041
70	4,900,042
CLASS 280	
37	4,900,043
47.21	4,900,044
233	4,900,045
260	4,900,046
278	4,900,047
281.1	4,900,048
	4,900,049
	4,900,050
414.1	4,900,051
615	4,900,052
628	4,900,053
688	4,900,054
704	4,900,055
708	4,900,056
713	4,900,057
756	4,900,058
775	4,900,059
804	4,900,060
813	4,900,061
CLASS 281	
15.1	4,900,062
CLASS 285	
24	4,900,063
53	4,900,064
73	4,900,065
92	4,900,066
140	4,900,067

161	4,900,068
197	4,900,069
233	4,900,070
379	4,900,071
405	4,900,072
CLASS 290	
3	4,900,944
48	4,900,945
CLASS 292	
169.22	4,900,073
216	4,900,074
263	4,900,075
CLASS 293	
132	4,900,076
CLASS 294	
1.3	4,900,077
86.4	4,900,078
CLASS 296	
65.1	4,900,079
100	4,900,080
136	4,900,081
194	4,900,082
197	4,900,083
CLASS 297	
216	4,900,084
219	4,900,085
238	4,900,086
	4,900,087
379	4,900,088
391	4,900,089
440	4,900,090
CLASS 299	
1	4,900,091
13	4,900,092
37	4,900,093
39	4,900,094
CLASS 301	
37 SS	4,900,096
63 PW	4,900,095
	4,900,097
CLASS 303	
1	4,900,098
95	4,900,099
100	4,900,100
110	4,900,101
	4,900,102
114	4,900,103
115	4,900,104
116	4,900,105
CLASS 305	
57	4,900,106
CLASS 307	
10.1	4,900,946
110	4,900,947
149	4,900,948
272.2	4,900,949
272.3	4,900,950
296.4	4,900,951
355	4,900,952
450	4,900,953
455	4,900,954
568	4,900,955
CLASS 310	
61	4,900,956
62	4,900,957
67 R	4,900,958
68 D	4,900,959
85	4,900,960
90	4,900,961
90.5	4,900,962
187	4,900,963
215	4,900,964
216	4,900,965
239	4,900,966
	4,900,967
260	4,900,968
313 A	4,900,969
320	4,900,970
361	4,900,971
364	4,900,972
CLASS 312	
15	4,900,107
265.3	4,900,108
276	4,900,109
CLASS 313	
251	4,900,973
359.1	4,900,974
366	4,900,975
402	4,900,976
407	4,900,977
409	4,900,978
412	4,900,979
414	4,900,980
422	4,900,981
452	4,900,982
471	4,900,983
479	4,900,984
CLASS 315	
39.51	4,900,985
101	4,900,986
169.4	4,900,987
224	4,900,989
241 P	4,900,990
366	4,900,991
411	4,900,988
CLASS 318	
135	4,900,992
254	4,900,993
283	4,900,994
443	4,900,995
	4,900,996
568.21	4,900,997
599	4,900,998
687	4,900,999
696	4,901,000
779	4,901,001
CLASS 323	
312	4,901,002
CLASS 324	
66	4,901,003
	4,901,004
86	4,901,005
106	4,901,006
110	4,901,007
117 H	4,901,008
121 R	4,901,009
127	4,901,010
158 F	4,901,011
	4,901,013
158 R	4,901,012
166	4,901,014
207.17	4,901,015
210	4,901,016
239	4,901,017
306	4,901,018
309	4,901,019
	4,901,020
	4,901,021
322	4,901,022
339	4,901,023
438	4,901,024
537	4,901,025
CLASS 328	
133	4,901,026
155	4,901,027
CLASS 330	
54	4,901,028
65	4,901,029
252	4,901,030
253	4,901,031
277	4,901,032
CLASS 331	
1 A	4,901,033
4	4,901,034
14	4,901,035
25	4,901,036
109	4,901,037
167	4,901,038
CLASS 333	
1	4,901,039
26	4,901,040
33	4,901,041
127	4,901,042
175	4,901,043
207	4,901,044
	4,901,045
185	4,901,046
216	4,901,047
CLASS 336	
180	4,901,048
CLASS 337	
394	4,901,049
CLASS 338	
13	4,901,050
25	4,901,051
308	4,901,052
CLASS 340	
426	4,901,053
	4,901,054
467	4,901,055
514	4,901,056
542	4,901,057
576	4,901,058
594	4,901,059
598	4,901,060
604	4,901,061
703	4,901,062
723	4,901,063
729	4,901,064
756	4,901,065
805	4,901,066
811	4,901,067
825.31	4,901,068
853	4,901,069
856	4,901,070
932.2	4,901,071
CLASS 341	
10	4,901,072
13	4,901,073
22	4,901,074
63	4,901,075
100	4,901,076
143	4,901,077
163	4,901,078
169	4,901,079
CLASS 342	
1	4,901,080
8	4,901,081
89	4,901,082
128	4,901,083
179	4,901,084
373	4,901,085
CLASS 343	
909	4,901,086
CLASS 346	
74.2	4,901,087
75	4,901,088
76 L	4,901,089
76 PH	4,901,090
140 R	4,901,091
	4,901,092
	4,901,093
	4,901,094
	4,901,095
CLASS 350	
1.7	4,900,110
3.85	4,900,111
46.23	4,900,126
96.12	4,900,112
96.13	4,900,113
96.15	4,900,114
	4,900,115
	4,900,116
	4,900,117
	4,900,118
	4,900,119
96.18	4,900,120
96.20	4,900,121
	4,900,122
	4,900,123
96.21	4,900,124
	4,900,125
96.34	4,900,127
162.13	4,900,128
167	4,900,129
321	4,900,130
	4,900,131
346	4,900,132
	4,900,133
354	4,900,134
	4,900,135
360	4,900,136
395	4,900,137
413	4,900,138
432	4,900,139
452	4,900,140
465	4,900,141
634	4,900,142
CLASS 351	
205	4,900,143
206	4,900,144
221	4,900,145
CLASS 354	
268	4,901,096
295	4,901,097
	4,901,098
324	4,901,099
403	4,901,101
408	4,901,102
CLASS 355	
27	4,901,103
32	4,901,104
51	4,901,105
55	4,901,106
	4,901,107
64	4,901,108
68	4,901,109
212	4,901,110
218	4,901,111
243	4,901,113
245	4,901,112
	4,901,114
246	4,901,115
253	4,901,116
309	4,901,117
310	4,901,118
328	4,901,100
CLASS 356	
1	4,900,146
30	4,900,147
244	4,900,148
311	4,900,149
349	4,900,150
358	4,900,151
411	4,900,152
430	4,900,153
CLASS 357	
15	4,901,120
	4,901,121
16	4,901,122
17	4,901,123
23.4	4,901,124
	4,901,127
23.6	4,901,128
24	4,901,125
29	4,901,126
30	4,901,129
38	4,901,130
43	4,901,131
	4,901,132
54	4,901,133
67	4,901,134
74	4,901,135
75	4,901,136
81	4,901,137
	4,901,138
CLASS 358	
13	4,901,139
64	4,901,140
93	4,901,141
98	4,901,142
	4,901,143
	4,901,144
105	4,901,145
108	4,901,146
139	4,901,147
140	4,901,148
141	4,901,149
167	4,901,150
188	4,901,151
209	4,901,152
213.11	4,901,153
213.19	4,901,154
230	4,901,155
243	4,901,156
296	4,901,158
319	4,901,119
330	4,901,159
335	4,901,160
346	4,901,161
468	4,901,162
473	4,901,163
	4,901,164
474	4,901,157
CLASS 360	
9.1	4,901,165
14.1	4,901,166
15	4,901,167
60	4,901,168
66	4,901,169
73.07	4,901,170
74.6	4,901,171
98.05	4,901,172
99.04	4,901,173
99.06	4,901,174
103	4,901,175
104	4,901,176
	4,901,185
113	4,901,177
126	4,901,178
	4,901,179
133	4,901,180
CLASS 361	
33	4,901,181
38	4,901,182
56	4,901,183
86	4,901,184
106	4,901,186
117	4,901,187
119	4,901,188
	4,901,189
	4,901,190
152	4,901,191
156	4,901,192
212	4,901,193
213	4,901,194
217	4,901,195
266	4,901,196
283	4,901,197
302	4,901,198
308	4,901,199
379	4,901,200
384	4,901,201
390	4,901,202
395	4,901,203
417	4,901,204
424	4,901,205
428	4,901,206
CLASS 362	
32	4,901,207
66	4,901,208
72	4,901,209
106	4,901,210
	4,901,211
145	4,901,212
CLASS 363	
12	4,901,213
19	4,901,214
21	4,901,215
98	4,901,216
126	4,901,217
146	4,901,219
CLASS 364	
131	4,901,218
191	4,901,220
200	4,901,221
	4,901,222
	4,901,223
	4,901,224
	4,901,225
	4,901,226
	4,901,227
	4,901,228
	4,901,229
	4,901,230
	4,901,231
	4,901,232
	4,901,233
	4,901,234
	4,901,235
	4,901,236
413.09	4,901,238
426.02	4,901,239
431.06	4,901,240
464.01	4,901,237
464.02	4,901,241
468	4,901,242
481	4,901,244
483	4,901,243
492	Re.33,162
509	4,901,245
513	4,901,246
	4,901,247
519	4,901,248
	4,901,249
521	4,901,250
	4,901,251
522	4,901,252
	4,901,253
526	4,901,254
551.01	4,901,255
560	4,901,256
571.01	4,901,257
577	4,901,258
578	4,901,259
	4,901,260
708	4,901,261
709.16	4,901,262
715.08	4,901,263
717	4,901,264
721	4,901,265
723	4,901,266
736	4,901,267
745	4,901,268
784	4,901,269
786	4,901,270
807	4,901,271
857	4,901,272
900	4,901,273
	4,901,274
	4,901,275
	4,901,276
	4,901,277
CLASS 365	
87	4,901,278
154	4,901,279
189.05	4,901,281
189.11	4,901,280
222	4,901,282
	4,901,283
226	4,901,284
230.01	4,901,285
	4,901,286
CLASS 366	
56	4,900,154
76	4,900,155
85	4,900,156
132	4,900,157
143	4,900,158
343	4,900,159
347	4,900,160
CLASS 367	
3	4,901,287
4	4,901,288
34	4,901,289
85	4,901,290
111	4,901,291
118	4,901,292
168	4,901,293
CLASS 368	
63	4,901,294
149	4,901,295
185	4,901,296
CLASS 369	
13	4,901,297
32	4,901,298
	4,901,299
47	4,901,300
54	4,901,301
85	4,901,302
112	4,901,303
284	4,901,304
CLASS 370	
1	4,901,305
3	4,901,306
18	4,901,307
58.1	4,901,308
60	4,901,309
75	4,901,310
85.1	4,901,311
85.12	4,901,312
104.1	4,901,313
CLASS 371	
11.2	4,901,314
27	4,901,315
37.1	4,901,316
	4,901,317
40.1	4,901,318
45	4,901,319
51.1	4,901,320
CLASS 372	
7	4,901,321
20	4,901,322
25	4,901,323
36	4,901,324
44	4,901,325
45	4,901,326
	4,901,327
46	4,901,328
50	4,901,329
75	4,901,330
CLASS 374	
123	4,900,161
132	4,900,162
CLASS 375	
9	4,901,334
CLASS 378	
37	4,901,335
99	4,901,336
	4,901,337
144	4,901,338
197	4,901,339
CLASS 379	
60	4,901,340
67	4,901,341
93	4,901,342
	4,901,343
	4,901,344
279	4,901,347
387	4,901,345
389	4,901,346
CLASS 380	
6	4,901,348
11	4,901,349
15	4,901,351
CLASS 381	
13	4,901,350
43	4,901,352
68	4,901,353
110	4,901,354
169	4,901,356
183	4,901,355
192	4,901,357
CLASS 382	
3	4,901,358
8	4,901,359
18	4,901,361
22	4,901,362
41	4,901,360
56	4,901,363
59	4,901,364
61	4,901,365

CLASS 383

119 4,900,163

CLASS 384

96 4,900,164
220 4,900,165
560 4,900,166

CLASS 388

811 4,901,366

CLASS 400

124 4,900,167
130 4,900,168
157.2 4,900,169
196 4,900,170
208 4,900,171
605 4,900,172
606 4,900,173
621 4,900,174
659 4,900,175

CLASS 401

258 4,900,176

CLASS 403

13 4,900,177
24 4,900,178
174 4,900,179
233 4,900,180
322 4,900,181
325 4,900,182
385 4,900,183
397 4,900,184

CLASS 404

104 4,900,185
105 4,900,186

CLASS 405

3 4,900,187
27 4,900,188
39 4,900,189
43 4,900,190
138 4,900,191
215 4,900,192
252 4,900,193
258 4,900,194
267 4,900,195
4,900,196
273 4,900,197
303 4,900,198

CLASS 406

14 4,900,199
93 4,900,200

CLASS 408

129 4,900,201
240 4,900,202

CLASS 410

36 4,900,203
97 4,900,204

CLASS 411

38 4,900,205
377 4,900,206
383 4,900,207
387 4,900,208
432 4,900,209
508 4,900,210

CLASS 412

38 4,900,211

CLASS 414

416 4,900,212
4,900,213
4,900,214
428 4,900,215
534 4,900,216
537 4,900,217
729 4,900,218
786 4,900,219

CLASS 415

136 4,900,220
142 4,900,221
143 4,900,222
190 4,900,223
213.1 4,900,224
224.5 4,900,225

CLASS 416

34 4,900,226
132 B 4,900,227
183 4,900,228
189 4,900,229
223 A 4,900,230

CLASS 417

16 4,900,231
53 4,900,232
266 4,900,233
312 4,900,234
315 4,900,235
354 4,900,236
356 4,900,237
410 4,900,238
444 Re.33,163

CLASS 418

1 4,900,239

CLASS 420

31 4,900,509
418 4,900,510
448 4,900,511

CLASS 422

63 4,900,512
64 4,900,513
84 4,900,514
100 4,900,515
147 4,900,516
171 4,900,517
199 4,900,518
245 4,900,525
292 4,900,519
302 4,900,527

CLASS 423

22 4,900,520
130 4,900,521
139 4,900,522
236 4,900,523
242 4,900,524
290 4,900,526
328 4,900,528
4,900,529
342 4,900,530
345 4,900,531
348 4,900,532
430 4,900,533
453 4,900,534
484 4,900,535
593 4,900,536
629 4,900,537

CLASS 424

1.1 4,900,539
9 4,900,540
10 4,900,538
47 4,900,541
66 4,900,542
70 4,900,543
4,900,544
4,900,545
81 4,900,546
88 4,900,547
4,900,548
4,900,549
89 Re.33,164
195.1 4,900,550
408 4,900,551
422 4,900,552
4,900,553
448 4,900,554
449 4,900,555
450 4,900,556
452 4,900,557
461 4,900,558
469 4,900,755
470 4,900,559

CLASS 425

110 4,900,240
140 4,900,241
149 4,900,242
406 4,900,243
549 4,900,560

CLASS 426

2 4,900,561
4,900,562
5 4,900,563
15 4,900,564
28 4,900,565
72 4,900,566
93 4,900,567
231 4,900,568
250 4,900,570
276 4,900,571
282 4,900,572
302 4,900,573
330.3 4,900,574
387 4,900,575
438 4,900,576
563 4,900,577
634 4,900,578

CLASS 427

11 4,900,579
33 4,900,580
54.1 4,900,582
55 4,900,583
66 4,900,584
77 4,900,585
122 4,900,588
125 4,900,586
188 4,900,589
216 4,900,587
4,900,590
255 4,900,591
375 4,900,592
420 4,900,593
531 4,900,581

CLASS 428

34.2 4,900,594
34.4 4,900,595
34.5 4,900,596
41 4,900,597
64 4,900,598
65 4,900,599
67 4,900,600
68 4,900,601
76 4,900,602
77 4,900,603
79 4,900,604
88 4,900,605
99 4,900,606
131 4,900,607
151 4,900,608
163 4,900,609
195 4,900,610
216 4,900,611
4,900,612
251 4,900,614
262 4,900,615
284 4,900,619
316.6 4,900,616
325 4,900,617
328 4,900,618
330 4,900,620
333 4,900,621
336 4,900,622
4,900,623
343 4,900,624
383 4,900,625
398 4,900,626
403 4,900,627
408 4,900,628
422 4,900,629
432 4,900,630
4,900,633
4,900,634
483 4,900,631
542.8 4,900,632
547 4,900,635
571 4,900,636
577 4,900,637
606 4,900,638
610 4,900,639
633 4,900,640
690 4,900,641

CLASS 429

59 4,900,642
241 4,900,643

CLASS 430

6 4,900,644
58 4,900,645
64 4,900,646
137 4,900,647
270 4,900,648
311 4,900,649
319 4,900,650
380 4,900,651
502 4,900,652
522 4,900,653
533 4,900,654
546 4,900,655
550 4,900,656
555 4,900,657

CLASS 431

5 4,900,244
328 4,900,245
352 4,900,246

CLASS 432

153 4,900,247
234 4,900,248
248 4,900,249

CLASS 433

11 4,900,250
20 4,900,251
27 4,900,252
30 4,900,253
65 4,900,254

CLASS 434

188 4,900,255
236 4,900,256

CLASS 435

4 4,900,658
6 4,900,659
7 4,900,660
4,900,661
4,900,662
4,900,663
4,900,664
21 4,900,665
25 4,900,666
84 4,900,667
101 4,900,668
108 4,900,669
147 4,900,670
156 4,900,671
188 4,900,672
199 4,900,673
232 4,900,674
240.27 4,900,675
240.49 4,900,676
259 4,900,677
313 4,900,678

CLASS 436

69 4,900,679
71 4,900,680
106 4,900,681
129 4,900,682
179 4,900,683
518 4,900,684
519 4,900,685
546 4,900,686

CLASS 437

27 4,900,687
29 4,900,688
31 4,900,689
43 4,900,690
52 4,900,691
67 4,900,692
78 4,900,693
109 4,900,694
195 4,900,695
200 4,900,257
229 4,900,696

CLASS 439

63 4,900,258
107 4,900,259
321 4,900,260
353 4,900,261
354 4,900,262
358 4,900,263
391 4,900,264
449 4,900,265
451 4,900,266
489 4,900,267
493 4,900,268
499 4,900,269
502 4,900,270
595 4,900,271
630 4,900,272
4,900,273
680 4,900,274
716 4,900,275
751 4,900,276
752 4,900,277
857 4,900,278
876 4,900,279

CLASS 440

50 4,900,280
69 Re.33,165
78 4,900,281
89 4,900,282

CLASS 445

22 4,900,283
4,900,284
50 4,900,285

CLASS 446

30 4,900,286
183 4,900,287
224 4,900,288
342 4,900,289

CLASS 455

5 4,901,367
12 4,901,368
84 4,901,369

CLASS 460

70 4,900,290

CLASS 474

80 4,900,291
84 4,900,292
152 4,900,293
167 4,900,294
4,900,295
242 4,900,296

CLASS 475

160 4,899,622
205 4,899,621

CLASS 493

82 4,900,297

CLASS 494

4,900,298

CLASS 501

57 4,900,697
78 4,900,700
80 4,900,698
94 4,900,699
102 4,900,701
134 4,900,702
136 4,900,703

CLASS 502

116 4,900,706
158 4,900,705
210 4,900,704
228 4,900,711
230 4,900,707
304 4,900,712
340 4,900,708
439 4,900,713

CLASS 505

1 4,900,709
4,900,710
4,900,715
4,900,716
812 4,900,717

CLASS 512

19 4,900,718

CLASS 514

12 4,900,730
18 4,900,719
21 4,900,720
25 4,900,721
54 4,900,722
56 4,900,723
62 4,900,724
77 4,900,731
120 4,900,733
122 4,900,732
171 4,900,734
4,900,735
173 4,900,725
182 4,900,726
210 4,900,728
212 4,900,727
220 4,900,729
245 4,900,736
279 4,900,737
322 4,900,738
334 4,900,749
335 4,900,750
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343 4,900,742
364 4,900,752
373 4,900,739
381 4,900,740
384 4,900,743
396 4,900,741
398 4,900,744
400 4,900,745
4,900,746
402 4,900,747
411 4,900,748
450 4,900,753
459 4,900,754
492 4,900,756
712 4,900,757
717 4,900,758

CLASS 521

98 4,900,759
160 4,900,760
184 4,900,761
4,900,762

CLASS 522

14 4,900,763

CLASS 523

106 4,900,764
122 4,900,765
136 4,900,766
205 4,900,767

CLASS 524

141 4,900,768
227 4,900,769
274 4,900,770
296 4,900,771
303 4,900,772
473 4,900,773
512 4,900,774
548 4,900,775
700 4,900,776
819 4,900,777
837 4,900,778
862 4,900,779

CLASS 525

54.1 4,900,780
67 4,900,784
4,900,785
68 4,900,786
71 4,900,787
166 4,900,788
185 4,900,789
192 4,900,790
228 4,900,791
264 4,900,792
326.3 4,900,793
4,900,794
329.9 4,900,795
359.3 4,900,796
387 4,900,781
398 4,900,782
412 4,900,783
413 4,900,797

CLASS 526

152 4,900,798
245 4,900,569
282 4,900,799

CLASS 528

66 4,900,800
87 4,900,801
190 4,900,802
204 4,900,803
332 4,900,804
337 4,900,805
4,900,806
362 4,900,807
388 4,900,808
497 4,900,809

CLASS 530

324 4,900,811

CLASS 534

627 4,900,812
635 4,900,813

CLASS 536

18.1 4,900,814
54 4,900,815
120 4,900,816

CLASS 540

128 4,900,817
454 4,900,818
475 4,900,819
492 4,900,820
540 4,900,821

CLASS 544

102 4,900,822
174 4,900,823
185 4,900,824
276 4,900,825
277 4,900,826
303 4,900,827
317 4,900,828
319 4,900,829

CLASS 546

18 4,900,830
19 4,900,833
66 4,900,831
186 4,900,832
245 4,900,834
272 4,900,835
279 4,900,836
285 4,900,837

CLASS 548

111 4,900,838
250 4,900,839
545 4,900,840
966 4,900,841

CLASS 549

36 4,900,842
252 4,900,843
299 4,900,844
352 4,900,845
373 4,900,846
517 4,900,848
521 4,900,849
529 4,900,847
4,900,850

CLASS 552

12 4,900,851
309 4,900,476

CLASS 556

19 4,900,852
30 4,900,853
70 4,900,854
4,900,855
176 4,900,856
405 4,900,857
430 4,900,861
470 4,900,858

CLASS 558

87 4,900,860
418 4,900,859

CLASS 560

21 4,900,862
41 4,900,863
177 4,900,864

CLASS 562

412 4,900,865

CLASS 564

13 4,900,866
91 4,900,867
398 4,900,868
441 4,900,869

CLASS 568

354 4,900,870
399 4,900,871
684 4,900,872
761 4,900,873

CLASS 570

142 4,900,874

CLASS 585

11 4,900,875

CLASS 604

4,900,299
22 4,900,300
23 4,900,301
30 4,900,302
54 4,900,303
60 4,900,304
65 4,900,305
97 4,900,306
110 4,900,307
126 4,900,308
192 4,900,309
198 4,900,310
4,900,311
246 4,900,312
261 4,900,313
270 B1 4,769,014
282 4,900,314
311 4,900,315
313 4,900,316
370 4,900,317
385.1 4,900,318
4,900,319
387 4,900,320
409 4,900,321
410 4,900,322

CLASS 606

27 4,899,741
133 4,899,748
139 4,899,743
142 4,899,745
144 4,899,746
153 4,899,744
180 4,899,742
192 4,899,747

CLASSIFICATION OF DESIGNS

D1— 106 305,930
305,951
305,952
D2— 275 305,953
318 305,954
320 305,955
D3— 29 305,956
48 305,957
71 305,958
74 305,959
305,960
105 305,961
D4— 116 305,962
118 305,963
135 305,964
D6— 349 305,965
D7— 351 305,969
305,970
360 305,971
379 305,973
509 305,966
603 305,967
688 305,968
D8— 33 305,974
61 305,975
104 305,976
396 305,977
D9— 306 305,978
307 305,979
366 305,972
372 305,980
374 305,981
305,982
385 305,983
393 305,984
402 305,991
418 305,985
424 305,986
432 305,988
434 305,989
438 305,987
305,990
D10— 92 305,992
305,994
93 305,993
D11— 35 305,995
75 305,996
221 305,997
D12— 92 305,998
107 305,999
138 306,000
140 306,001
151 306,002
155 306,003
307 306,004
306,005
314 306,006
318 306,007
324 306,008
D13— 1 306,009
24 306,010
28 306,011
30 306,012
D14— 100 306,013
306,014
105 306,015
113 306,016
114 306,017
118 306,018
126 306,019
133 306,020
140 306,021
146 306,022
151 306,023
214 306,024
237 306,025
240 306,026
241 306,027
251 306,028
D15— 5 306,029
72 306,030
133 306,031
139 306,032
147 306,033
199 306,034
D16— 112 306,035
209 306,036
306,037
D19— 41 306,038
75 306,039
90 306,040
306,041
D20— 10 306,042
27 306,043
D21— 31 306,044
86 306,045
148 306,046
150 306,047
306,048
191 306,049
195 306,050
306,051
306,052
306,053
212 306,054
218 306,055
234 306,056
306,057
306,058
306,060
D22— 122 306,061
D23— 235 306,059
353 306,062
356 306,063
383 306,064
D24— 9 306,065
306,066
11 306,067
17 306,068
24 306,069
25 306,070
47 306,071
306,072
306,073
306,074
306,075
51 306,076
D25— 17 306,077
119 306,078
306,079
306,080
306,081
D28— 7 306,082
57 306,083
61 306,084
77 306,085
7 306,086
D29— 7 306,086
D32— 22 306,087
25 306,088
D34— 31 306,089

CLASSIFICATION OF PLANTS

P.— 34 7,146
7,147
38 7,148
68 7,149
7,150
7,151
7,152
7,153
71 7,154
89 7,155

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PATENTS

01 :	4,899,496	4,899,727	4,900,307	4,901,086	09 :	4,899,596	4,900,689
	4,900,301	4,899,732	4,900,310	4,901,105		4,899,641	4,900,734
	4,900,314	4,899,736	4,900,334	4,901,140		4,899,796	4,900,837
02 :	4,899,450	4,899,757	4,900,336	4,901,141		4,899,852	4,900,901
04 :	4,899,534	4,899,766	4,900,351	4,901,150		4,900,131	4,900,919
	4,899,556	4,899,770	4,900,354	4,901,183		4,900,239	4,900,956
	4,899,693	4,899,771	4,900,360	4,901,194		4,900,275	4,900,959
	4,899,773	4,899,772	4,900,366	4,901,209		4,900,358	4,900,964
	4,899,799	4,899,805	4,900,367	4,901,210		4,900,508	4,901,033
	4,900,264	4,899,807	4,900,390	4,901,215		4,900,605	4,901,036
	4,900,392	4,899,821	4,900,401	4,901,216		4,900,759	4,901,061
	4,900,418	4,899,826	4,900,405	4,901,217		4,900,844	4,901,062
	4,900,692	4,899,835	4,900,428	4,901,241		4,900,883	4,901,068
	4,900,990	4,899,840	4,900,443	4,901,251		4,900,941	4,901,187
	4,901,031	4,899,860	4,900,458	4,901,257		4,901,093	4,901,199
	4,901,357	4,899,874	4,900,467	4,901,259		4,901,223	4,901,208
05	4,900,286	4,899,878	4,900,468	4,901,265		4,901,252	4,901,234
	4,900,484	4,899,895	4,900,469	4,901,267		4,901,273	4,901,361
	4,900,776	4,899,902	4,900,491	4,901,270	10 :	4,899,513	4,901,368
	4,901,017	4,899,908	4,900,500	4,901,287		4,899,619	4,899,421
06 :	4,899,396	4,899,928	4,900,513	4,901,305	13	4,899,688	4,899,499
	4,899,400	4,899,956	4,900,518	4,901,307		4,899,747	4,899,526
	4,899,414	4,899,963	4,900,531	4,901,327		4,900,331	4,899,574
	4,899,416	4,899,968	4,900,541	4,901,342		4,900,495	4,899,634
	4,899,423	4,899,990	4,900,552	4,901,355		4,900,569	4,899,725
	4,899,434	4,900,027	4,900,555	4,901,360		4,900,613	4,899,798
	4,899,440	4,900,032	4,900,570	4,901,364		4,900,644	4,899,893
	4,899,473	4,900,035	4,900,597	4,899,482	08 :	4,900,699	4,900,124
	4,899,493	4,900,036	4,900,604	4,899,514		4,900,733	4,900,126
	4,899,494	4,900,043	4,900,615	4,899,566		4,900,779	4,900,182
	4,899,497	4,900,045	4,900,662	4,899,588		4,900,788	4,900,767
	4,899,519	4,900,058	4,900,663	4,899,601		4,901,167	4,901,045
	4,899,536	4,900,061	4,900,666	4,899,791	11 :	4,900,047	4,901,110
	4,899,537	4,900,067	4,900,675	4,899,795	12 :	Re.33,165	4,901,306
	4,899,538	4,900,069	4,900,758	4,899,820	15 :	4,899,401	4,899,491
	4,899,545	4,900,072	4,900,811	4,899,909		4,899,405	4,899,887
	4,899,548	4,900,080	4,900,824	4,899,967	16 :	4,899,406	4,899,419
	4,899,557	4,900,086	4,900,851	4,899,978		4,899,415	4,900,561
	4,899,562	4,900,107	4,900,877	4,900,048		4,899,417	4,900,576
	4,899,582	4,900,116	4,900,878	4,900,070	17 :	4,899,429	4,899,413
	4,899,584	4,900,117	4,900,903	4,900,115		4,899,490	4,899,435
	4,899,585	4,900,133	4,900,904	4,900,298		4,899,515	4,899,447
	4,899,587	4,900,150	4,900,954	4,900,403		4,899,761	4,899,561
	4,899,606	4,900,162	4,901,021	4,900,514		4,899,774	4,899,565
	4,899,631	4,900,205	4,901,039	4,900,522		4,899,983	4,899,595
	4,899,633	4,900,215	4,901,048	4,900,595		4,900,038	4,899,653
	4,899,635	4,900,219	4,901,057	4,900,693		4,900,104	4,899,668
	4,899,659	4,900,222	4,901,060	4,900,896		4,900,223	4,899,778
	4,899,681	4,900,233	4,901,064	4,900,916		4,900,230	4,899,789
	4,899,694	4,900,253	4,901,071	4,900,965		4,900,422	4,899,861
	4,899,696	4,900,256	4,901,073	4,901,018		4,900,432	4,899,879
	4,899,722	4,900,289	4,901,080	4,901,035		4,900,505	4,899,881
	4,899,724	4,900,300	4,901,083	4,901,348		4,900,660	4,899,896

	4,899,911	4,900,529	4,899,759	4,901,268	4,900,378		4,900,313
	4,899,925	4,900,688	4,899,849	4,901,271	4,900,408		4,900,353
	4,899,937	4,900,698	4,899,864	4,901,331	4,901,255		4,900,507
	4,900,020	4,900,732	4,899,974	4,901,346	38 : 4,900,000		4,900,536
	4,900,021	4,900,748	4,900,077	36 : 4,899,449	39 : 4,899,398		4,900,537
	4,900,026	4,901,278	4,900,108	4,899,455	4,899,412		4,900,568
	4,900,040	4,901,293	4,900,129	4,899,504	4,899,472		4,900,587
	4,900,093	4,901,329	4,900,202	4,899,543	4,899,518		4,900,590
	4,900,196	4,901,349	4,900,217	4,899,550	4,899,520		4,900,633
	4,900,208	4,901,367	4,900,242	4,899,551	4,899,647		4,900,674
	4,900,211	25 4,899,476	4,900,344	4,899,555	4,899,756		4,900,723
	4,900,271	4,899,581	4,900,395	4,899,575	4,899,783		4,900,744
	4,900,290	4,899,600	4,900,448	4,899,576	4,899,793		4,900,755
	4,900,291	4,899,691	4,900,567	4,899,637	4,899,877		4,900,760
	4,900,306	4,899,743	4,900,948	4,899,646	4,899,886		4,900,763
	4,900,321	4,899,755	4,901,206	4,899,690	4,899,922		4,900,796
	4,900,388	4,899,847	4,901,335	4,899,733	4,899,936		4,900,832
	4,900,389	4,899,890	4,901,353	4,899,737	4,899,938		4,900,835
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	4,900,560	4,899,954	29 Re.33,164	4,899,875	4,900,065		4,900,871
	4,900,572	4,899,955	4,899,418	4,899,940	4,900,139		4,900,891
	4,900,667	4,900,008	4,899,467	4,899,948	4,900,160		4,900,895
	4,900,740	4,900,207	4,899,599	4,899,976	4,900,193		4,900,897
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	4,900,746	4,900,280	4,899,904	4,900,014	4,900,232		4,901,100
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	4,900,794	4,900,312	4,900,087	4,900,111	4,900,342		4,901,319
	4,900,865	4,900,318	4,900,261	4,900,127	4,900,348	44 :	4,899,971
	4,900,881	4,900,372	4,900,427	4,900,128	4,900,382		4,769,014
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	4,901,015	4,900,540	4,901,182	4,900,138	4,900,553		4,899,521
	4,901,056	4,900,556	4,901,309	4,900,146	4,900,578		4,899,664
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	4,901,231	4,900,650	4,899,868	4,900,199	4,900,711		4,900,619
	4,901,314	4,900,669	4,899,970	4,900,201	4,900,719		4,900,942
	4,901,323	4,900,673	4,900,319	4,900,225	4,900,743	46 :	4,899,934
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	4,899,509	4,900,686	4,901,219	4,900,259	4,900,805		4,899,991
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	4,899,544	4,900,847	4,900,955	4,900,283	4,900,817		4,900,143
	4,899,700	4,900,855	4,901,095	4,900,328	4,900,853		4,900,235
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	4,900,098	4,901,019	4,899,503	4,900,414	4,900,986	48 :	Re.33,163
	4,900,237	4,901,084	4,899,598	4,900,430	4,900,995		4,899,439
	4,900,250	4,901,120	4,899,648	4,900,463	4,900,996		4,899,466
	4,900,374	4,901,222	4,899,749	4,900,470	4,901,072		4,899,483
	4,900,398	4,901,226	4,899,839	4,900,477	4,901,186		4,899,500
	4,900,421	4,901,232	4,899,921	4,900,480	4,901,196		4,899,508
	4,900,589	4,901,235	4,900,068	4,900,564	4,901,205		4,899,544
	4,900,946	4,901,277	4,900,094	4,900,594	4,901,356		4,899,590
	4,901,077	4,901,285	4,900,148	4,900,611	40 : 4,899,583		4,899,592
	4,901,350	4,901,296	4,900,168	4,900,629	4,899,833		4,899,671
19 :	4,899,589	4,901,362	4,900,214	4,900,652	4,899,916		4,899,705
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	4,899,894	4,899,408	4,900,303	4,900,659	4,900,157		4,899,775
	4,899,985	4,899,464	4,900,311	4,900,670	4,900,186		4,899,817
	4,900,023	4,899,547	4,900,320	4,900,705	4,900,244		4,899,818
	4,900,051	4,899,579	4,900,460	4,900,708	4,900,246		4,899,819
	4,900,216	4,899,602	4,900,461	4,900,731	4,900,445		4,899,823
	4,900,251	4,899,714	4,900,462	4,900,747	4,900,499		4,899,827
	4,900,404	4,899,742	4,900,475	4,900,756	4,900,550		4,899,832
	4,900,562	4,899,762	4,900,476	4,900,768	4,900,627		4,899,834
	4,900,637	4,899,806	4,900,483	4,900,780	4,900,704		4,899,837
	4,900,726	4,899,858	4,900,542	4,900,783	4,901,070		4,899,838
	4,901,026	4,899,880	4,900,546	4,900,786	41 : 4,899,480		4,899,844
	4,901,067	4,899,882	4,900,559	4,900,818	4,899,505		4,899,863
20 :	4,899,638	4,899,917	4,900,563	4,900,831	4,899,870		4,899,869
	4,900,030	4,899,945	4,900,575	4,900,838	4,900,132		4,899,899
	4,900,609	4,899,975	4,900,577	4,900,977	4,900,203		4,899,943
	4,900,632	4,899,988	4,900,610	4,901,032	4,900,502		4,899,980
21 :	4,899,402	4,900,075	4,900,621	4,901,043	4,900,584		4,900,013
	4,899,667	4,900,095	4,900,623	4,901,054	4,901,245		4,900,024
	4,899,669	4,900,096	4,900,679	4,901,076	4,901,304		4,900,031
	4,899,740	4,900,192	4,900,684	4,901,082	4,901,334		4,900,037
	4,899,888	4,900,209	4,900,718	4,901,097	42 : 4,899,445		4,900,041
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	4,900,210	4,900,270	4,900,739	4,901,117	4,899,573		4,900,073
22 :	4,899,649	4,900,412	4,900,742	4,901,127	4,899,591		4,900,159
	4,899,816	4,900,415	4,900,754	4,901,136	4,899,651		4,900,184
	4,900,001	4,900,449	4,900,775	4,901,144	4,899,670		4,900,293
	4,900,324	4,900,573	4,900,782	4,901,224	4,899,695		4,900,322
	4,900,548	4,900,608	4,900,809	4,901,233	4,899,697		4,900,323
	4,900,722	4,900,635	4,900,828	4,901,263	4,899,767		4,900,339
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24 :	4,899,404	4,900,898	4,900,860	4,899,564	4,899,883		4,900,486
	4,899,420	4,901,000	4,900,879	4,899,570	4,899,929		4,900,519
	4,899,751	4,901,059	4,900,880	4,899,678	4,899,932		4,900,713
	4,899,752	4,901,074	4,900,918	4,899,735	4,899,997		4,900,789
	4,899,763	4,901,261	4,900,947	4,899,738	4,900,110		4,900,793
	4,899,812	4,901,288	4,900,991	4,899,765	4,900,123		4,900,849
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	4,900,016	4,899,479	4,901,013	4,899,923	4,900,185		4,900,875
	4,900,028	4,899,540	4,901,040	4,899,944	4,900,218		4,901,069
	4,900,029	4,899,549	4,901,041	4,899,946	4,900,249		4,901,081
	4,900,265	4,899,625	4,901,096	4,900,039	4,900,258		4,901,129
	4,900,373	4,899,626	4,901,098	4,900,044	4,900,269		4,901,133
	4,900,435	4,899,754	4,901,121	4,900,302	4,900,276		4,901,212
	4,900,446	4,899,758	4,901,260	4,900,356	4,900,279		4,901,221

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 1, 1990, and was announced in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1140.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 18, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Patent Cooperation Treaty (PCT) Update

Change in International Search Fee Charged by the European Patent Office Effective March 1, 1990

The International Bureau of the World Intellectual Property Organization has informed the U. S. Patent and Trademark Office that, due to changes in the enchange rate of the U. S. dollar in relation to the German Mark, the dollar amount of the international search fee charged by the European Patent Office for international applications filed in the United States Receiving Office will be $1,242.00, effective March 1, 1990.

January 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 17, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,642,814 through 4,644,587
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 15, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,373,211 through 4,374,438
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 3, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,303,045	06/215,936	12/01/81
4,303,318	06/219,955	12/01/81
4,303,411	06/221,608	12/01/81
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REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,704,604, Re. S. N. 07/429,927, Filed Oct. 31, 1989, Cl. 340/700, PIVOTING MOUNT FOR DETACHABLE KEYBOARD, Eric D. Fuhs, Owner of Record: *Zenith Electronics Corp., Glenview, Ill.*, Attorney or Agent: Dillis V. Allen, Ex. Gp.: 266

4,708,179, Re. S. N. 07/434,888, Filed Nov. 13, 1989, Cl. 141/388, EXTENDIBLE HOSE ASSEMBLY FOR SERVICE TRUCK, William G. Beaty, Owner of Record: *Inventor*, Attorney or Agent: C. A. Phillips, Ex. Gp.: 243

4,710,315, Re. S. N. 07/444,251, Filed Dec. 1, 1989, Cl. 252/299, ANISOTROPIC COMPOUNDS AND LIQUID CRYSTAL MIXTURES THEREWITH, Hans P. Schad et al., Owner of Record: *Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Federal Republic of Germany*, Attorney or Agent: Anthony J. Zelano, Ex. Gp.: 223

4,714,943, Re. S. N. 07/438,341, Filed Nov. 16, 1989, Cl. 355/27, IMAGING DEVICE, Kenji Sakakibara, et al., Owner of Record: *Brother Kogyokabushiki Kaisha, Aichi, Japan*, Attorney or Agent: Gerald Levy, Ex. Gp.: 211

4,717,038, Re. S. N. 07/452,640, Filed Dec. 18, 1989, Cl. 220/94R, DISPOSABLE PAN, Gary P. Anders, Owner of Record: *Industrial Precision Products Co., Schamburg, Ill.*, Attorney or Agent: George H. Gerstman. Ex. Gp.: 241

4,724,538, Re. S. N. 07/461,791, Filed Jan. 12, 1990, Cl. 379/59, EMERGENCY ROADSIDE TELEPHONE COMMUNICATION SYSTEM, Edward P. Farrell, Owner of Record: *GTE Mobilnet Incorp , Houston, Tex.*, Attorney or Agent: Robert Green, Ex. Gp.: 261

4,782,575, Re. S. N. 07/457,155, Filed Dec. 26, 1989, Cl. 29/411, METHOD OF FABRICATING A POWER TRANSMISSION BOLT AND APPARATUS THEREFOR, Yoshihiko Kamiyama, et al., Owner of Record: *Mitsuboshi Belting LTD, Nagato, Japan*, Attorney or Agent: John S. Motimer, Ex. Gp.: 326

4,824,636, Re. S. N. 07/459,304, Filed Dec. 29, 1989, Cl. 420/59, AUSTENITIC STEEL WITH IMPROVED HIGH TEMPERATURE STRENGTH AND CORROSION RESISTANCE, Sergio Vacchiano, et al., Owner of Record: *Centro Sviluppo Materiali S.P.A., Rome, Italy*, Attorney Agent: Robert J. Patch, Ex. Gp.: 111

4,870,585, Re. S. N. 07/457,304, Filed Dec. 26, 1989, Cl. 364/431.03, DYNOMOMETER ENGINE PERFORMANCE ANALYZER SYSTEM, David S. Manzolini, Owner of Record: *Inventor*, Attorney or Agent: Bernhard P. Molldrem, Ex. Gp.: 234

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

Re. 28,461, Reexam No. 90/001,923, Requested Jan. 16, 1990, Cl. 250/570, TAPE CARTRIDGE AND READER, Jerome Lemelson, Owner of Record: *Inventor, Princeton, N. J.*, Attorney or Agent: David Fink, Ex. Gp.: 250, Requester: Matsushita Electric Corp. of America, Secaucus, N. J.

4,763,333, Reexam No. 90/001,924, Requested Jan. 16, 1990, Cl. 371/066, WORK-SAVING SYSTEM FOR PREVENTING LOSS IN A COMPUTER DUE TO POWER INTERUPTION, Kerry Byrd, Owner of Record: *Universal Vectors Corp., Washington, D. C.*, Attorney or Agent: Burns, Doane, Swecker & Mathis, Ex. Gp.: 230, Requester: Owner

4,846,326, Reexam No. 90/001,922, Requested Jan. 8, 1990, Cl. 192/70.190, CARBON TO CARBON FRICTION CLUTCH, McLane Tillton, et al., Owner of Record: *Tilton Engineering, Inc., Buellton, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 350, Requester: Krass & Young, Troy, Mich.

4,848,725, Reexam No. 90/001,921, Requested Jan. 8, 1990, Cl. 251/129, VALVE CONSTRUCTION, Edward C. Tibbals, Jr., Owner of Record: *Interface, Inc., La Grange, Ga.*, Attorney or Agent: Kilpatrick & Cody, Ex. Gp.: 340, Requester: Owner

U. S. DEPARTMENT OF COMMERCE

Agency: Patent and Trademark Office.
Action: Notice.
Summary: In Accordance with Section 10(a)(2) of the Federal Advisory Committee Act (Public Law 92-463), announcement is made of the open meeting of the Public Advisory Committee for Trademark Affairs.
Date: The Public Advisory Committee for Trademark Affairs will meet from 10:00 a.m. until 4:00 p.m. on February 27, 1990.
Place: U. S. Patent and Trademark Office, 2121 Crystal Drive, Crystal Park 2, Room 912, Arlington, Virginia.
Status: The meeting will be open to public observation; seating will be available for the public on a first-come-first-served basis. Members of the public will be permitted to make oral comments of three (3) minutes each. Written comments and sugestions will be accepted before or after the meeting on any of the matters discussed. Copies of the minutes will be available upon request.
Matters To Be Considered: The agenda for the meeting is as follows:
(1) Finance
(2) Automation
(3) Strategic Planning
(4) Current Trademark Office Practice Issues
Contact Person For More Information: For further information, contact Lynne Beresford, Office of the Assistant Commissioner for Trademarks, Room CPK2-910, Patent and Trademark Office, Washington, D.C. 20231. Telephone: (703) 557-7464.

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

United States Patent and Trademark Office
Before the Commissioner of Patents and Trademarks

CAMERON WEIFFENBACH, Director, Office of Enrollment and Discipline

v.

WESLEY TURNER, Respondent.

Proceeding No. D89-6

NOTICE BY PUBLICATION

Notice is hereby given to the above named respondent that proceedings under 35 U.S.C. § 32 have been instituted against him. A copy of the COMPLAINT AND NOTICE OF PROCEEDINGS UNDER 35 U.S.C. 32, including the charges against respondent, was twice mailed to respondent's residence address of record and business address of record. The COMPLAINT AND NOTICE was twice returned from respondent's residence and business addresses of record by the U.S. Postal Service.

Respondent may obtain a copy of the above-mentioned COMPLAINT AND NOTICE from:

John H. Raubitschek
Associate Solicitor
U.S. Patent and Trademark Office
Office of Enrollment and Discipline
P.O. Box 15667
Arlington, Va. 22215

This notice will appear in the *Official Gazette* for four (4) consecutive weeks beginning with the issue of January 30, 1990.

Respondent has thirty (30) days from the date of the last publication of this notice to file and answer to the charges against him. Failure to file an answer will be taken as an admission of the charges. 37 CFR § 10.136(d).

CAMERON WEIFFENBACH, *Director*
January 4, 1990 *Office of Enrollment and Discipline*

PATENT TERMS EXTENDED UNDER 35 USC 156

Certificates extending the following patents were issued on January 25, 1990.

U. S. Patent No. 4,140,707, granted February 20, 1979 to Michael J. Cleare, et al., Owner of Record: Research Corporation Technologies, Inc., Title: MALONATO PLATINUM ANTITUMOR COMPOUNDS, Classification: 260/429R, Product Trade Name: Paraplatin, Term Extended: 916 days.

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U. S. Patent No. 4,156,724, granted May 29, 1979 to Hirotada Yamada, et al., Owner of Record: Sumitomo Pharmaceutical Company, Ltd., Title: N-ACYLAMINO-ALPHA-ARYLACETAMIDO CEPHALOSPORINS AND ANTIBACTERIAL COMPOSITIONS AND METHODS CONTAINING THEM, Classification; 514/205, Product Trade Name: Cefpiramide Sodium, Term Extended: 2 years.

Patent No. 4,278,663, granted July 14, 1981 to Choa-Min Liu, et al., Owner of Record: Hoffman LaRoche Inc., Title: ANTIBIOTIC X-14868 A, B, C AND D, Classification: 424/119, Product Trade Name: Cygro, Term Extended 3 years.

Patent No. 4,329,364, granted May 11, 1982 to Rudolph Neri, et al., Owner of Record: Schering Corporation, Title; ANTLANDROGENEIC AGENTS AND METHODS FOR THE TREATMENT OF ANDROGEN DEPENDENT DISEASE STATES, Classification: 424/324, Product Trade Name: Eulexin, Term Extended: 2 years.

An interim extension of the term of U. S. Patent No. 3,856,935 has been granted for a period of one year under 35 U.S.C. 156(e)(2). The application for patent term extension was filed by the patent owner Swiss Serum and Vaccine Institute Berne based on FDA approval of the product "Typhoid Vaccine Live Oral TY21a."

ADVERSE DECISIONS IN INTEFERENCE

In the designated Interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,377,960, Takatoshi Okumura, ELECTRONIC MUSICAL INSTRUMENT OF WAVEFORM MEMORY READING TYPE, Interference No. 101,610, decided July 19, 1989, claims 1-6 and 10.

Patent No. 4,456,257, Sonnie J. Perkins, GOLF CLUB SWING TRAINING DEVICE, Interference No. 101,424, decided March 31, 1988, claims 1-13.

Patent No. 4,510,411, Kazuo Hakamata, Tadao Takagi, Yukio Hyodo, DRIVE CIRCUIT FOR SURFACE-WAVE DRIVEN MOTOR UTILIZING ULTRASONIC VIBRATION, Inteference No. 101,742, decided September 20, 1989, claims 1-3 and 5-10.

Patent No. 4,517,367, Carlo Skotsch, Deitrich Baumert, Hansjorg Krahmer, Friedrich Arndt, AZOLYL-PENTENE DERIVATIVES AND BIOCIDAL COMPOSITIONS CONTAINING THE SAME, Interference No. 102,241, decided November 28, 1989, claims 1-77.

Patent No. 4,525,448, Chuni L. Ghosh, METHOD OF FABRICATING SUB-HALF-MICRON-SIZE GATES ON SEMICONDUCTOR SUBSTRATES, Interference No. 101,595, decided November 9, 1989, claims 1, 2, 6 and 13.

Patent No. 4,528,363, Akira Tominaga, HEAT-CURABLE RESIN COATING COMPOSITION, Interference No. 101,573, decided August 8, 1989, claims 1-16.

Patent No. 4,528,884, Kinji Kawamoto, Kazuhiro Murase, WAVE READING APPARATUS, Interference No. 101,610, decided July 19, 1989, claims 1-4.

Patent No. 4,543,535, Yalcin Ayasli, DISTRIBUTED POWER AMPLIFIER, Interference No. 101,620, decided June 6, 1989, claims 1-21.

Patent No. 4,575,317, Georg H. Lindner, CONSTANT CLEARING POSITIVE DISPLACEMENT PISTON PUMP, Interference No. 101,871, decided November 27, 1989, claims 1, 2, 9 and 10.

Patent No. 4,757,659, Donald E. Pezzolo, James W. Pfeiffer, Thomas E. Corder, SENSOR TIMER FOR LAMPS, Interference No. 102,093, decided December 14, 1989, claims 1, 3, 4, 8, 10-15, 17 and 18.

Patent No. 4,602,691, Gary E. Weaver, DIAMOND DRILL BIT WITH VARIED CUTTING ELEMENTS, Inteference No. 101,840, decided September 18, 1989, claim 1.

Patent No. 4,629,270, Howard W. Andrews, Jr., Clifford F. Bobb, Robert F. Cobagh, (deceased), Jacqueline R. Cobaugh, executrix; Attalee S. Taylor, ZERO INSERTION FORCE CARD - EDGE CONNECTOR WITH FLEXIBLE FILM CIRCIUTRY, Interference No. 102,039, decided November 24, 1989, claims 1-10, 27-35, 65-69, 81 and 92.

Patent No. 4,703,339, Youichi Matsuo, PACKAGE HAVING A HEAT SINK SUITABLE FOR A CERAMIC SUBSTRATE, Interference No. 102,250, decided October 27, 1989, claims 1-6.

Patent No. 4,723,028, Koichi Shudo, STILBENE DERIVATIVES, Interference No. 102,170, decided December 11, 1989, claims 1-6, 8-11, 13 and 14.

Patent No. 4,774,301, Richard E. Campbell, Jr., Gregory F. Schmidt, ZIRCONIUM CONTAINING CATALYSTS AND METHOD OF USE, Interference No. 102,177, decided December 11, 1989, claims 1-8.

NANNIE B. HENRY, *Deputy Clerk*
Board of Patent Appeals and Interferences

Removal From Register

Pursuant to the provisions of 37 CFR §10.11 (b), a letter was directed on November 18, 1988 to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address or the forwarding had expired.

Accordingly, the names of the following person have been removed from the Register of Patent Attorneys and Agents.

CAMERON WEIFFENBACH
Director,
Office of Enrollment & Discipline
November 30, 1989

Casey P. August, 7 Hauteview Court, Don Mills, Ont., Canada M3A 2Z8
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PATENT NOTICES

Certificates of Correction For Week of February 20, 1990

4,565,380	4,810,910	4,825,082	4,832,838
4,581,109	4,811,305	4,825,295	4,833,041
4,684,982	4,811,409	4,825,726	4,833,468
4,721,590	4,811,670	4,826,292	4,833,909
4,728,679	4,812,900	4,826,665	4,834,351
4,734,124	4,813,308	4,826,800	4,834,623
4,745,731	4,813,613	4,827,191	4,835,307
4,754,059	4,813,701	4,827,226	4,835,351
4,769,499	4,815,155	4,827,821	4,835,362
4,774,505	4,815,663	4,827,975	4,836,058
4,777,128	4,816,503	4,827,989	4,836,104
4,777,227	4,816,642	4,828,244	4,836,136
4,777,484	4,816,937	4,828,372	4,836,762
4,781,795	4,817,385	4,828,387	4,836,817
4,784,261	4,817,627	4,828,525	4,837,001
4,786,395	4,817,705	4,828,619	4,837,038
4,790,289	4,818,420	4,828,708	4,837,406
4,791,365	4,819,394	4,828,735	4,837,732
4,792,316	4,820,603	4,828,964	4,837,824
4,794,015	4,820,620	4,829,011	4,839,043
4,795,239	4,820,930	4,829,091	4,839,067
4,797,544	4,820,989	4,829,334	4,839,305
4,798,448	4,821,226	4,829,570	4,839,630
4,799,350	4,821,518	4,830,049	4,839,712
4,800,692	4,821,715	4,830,358	4,839,803
4,801,286	4,821,765	4,830,425	4,839,823
4,801,963	4,821,939	4,830,440	4,839,866
4,804,577	4,822,061	4,830,511	4,840,183
4,805,480	4,822,432	4,830,730	4,840,529
4,807,722	4,822,598	4,830,940	4,840,536
4,807,768	4,822,975	4,831,117	4,841,846
4,808,126	4,823,472	4,831,764	4,849,571
4,808,614	4,824,226	4,831,938	4,854,679
4,809,862	4,824,535	4,832,372	4,860,316
4,810,854	4,824,974	4,832,582	4,866,731
4,810,889	4,825,065	4,832,764	4,870,111

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PATENT APPLICATION	New patent application and associated papers and fees.
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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF December 30, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-21-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	1-13-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-28-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	12-24-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during December 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,704,469 to 3,707,728 inclusive
Plant Patents ..... 3262 to 3280 inclusive

REISSUES

FEBRUARY 20, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

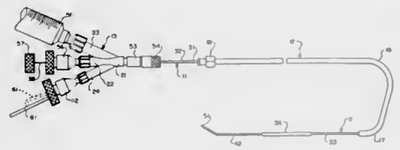
Re. 33,166
STEERABLE DILATATION CATHETER

Wilfred J. Samson, Saratoga, Calif., assignor to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Original No. 4,582,181, dated Apr. 15, 1986, Ser. No. 522,835, Aug. 12, 1983. Application for reissue Apr. 15, 1988, Ser. No. 181,986

Int. Cl.[4] **A61B** *19/00*

U.S. Cl. 606—194 **24 Claims**



20. A dilatation catheter comprising:
(a) a first tubular member having an inner lumen extending therethrough;
(b) an inflatable balloon disposed near the distal end of the tubular member having its interior in fluid communication with the inner lumen of the tubular member;
(c) a second tubular member having an inner lumen extending therethrough which extends through the interior of the balloon and having at least one opening therein distally of the balloon with the distal end of the balloon sealed about the second tubular member to prevent the loss of inflation liquid from the interior of the balloon; and
(d) means to vent air from within the interior of the balloon through the inner lumen of the second tubular member.

Re. 33,167
CIRCUIT ARRANGEMENT FOR MONITORING SPEED OF A DRIVE MOTOR

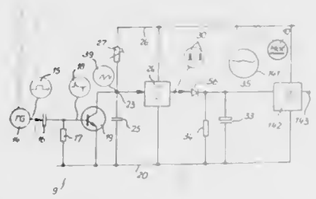
Helmut Moosmann, Villingen-Schwenningen, and Rolf Müller, St. Georgen, both of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Original No. 4,544,852, dated Oct. 1, 1985, Ser. No. 410,969, Aug. 24, 1982. Application for reissue Sep. 28, 1987, Ser. No. 101,581

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133725; Apr. 29, 1982, 3216001

Int. Cl.[4] **G01R** *23/09, 23/15*

U.S. Cl. 307--519 **34 Claims**



33. Circuit arrangement for monitoring the speed of a drive motor, comprising detection means for producing an input signal sequence having a speed-dependent repetition frequency, a signal converter for converting the input signal sequence into an output signal which is a function of the repetition frequency of the input signal sequence, and an evaluation circuit having means responsive to the output signal for providing an alarm signal when the output signal corresponds to a drop of the motor speed below a predetermined minimum speed, said evaluation circuit having a predetermined response delay exceeding the acceleration time of the motor to prevent provision of said alarm signal during motor start-up.

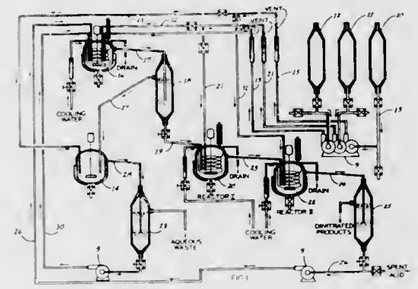
Re. 33,168
NITRATION PROCESSES

Larry A. McDaniel, Germantown, Tenn., assignor to Jerome A. Gross, St. Louis, Mo., a part interest

Original No. 4,621,157, dated Nov. 4, 1986, Ser. No. 607,794, May 7, 1984. Application for reissue Jul. 5, 1988, Ser. No. 214,932

Int. Cl.[4] **C07C** *85/24, 79/10*

U.S. Cl. 564—411 **10 Claims**



7. The process of dinitrating a dinitratable substituted phenol compound without use of sulfuric acid which comprises the steps of:
(A) supplying the following ingredients: an aqueous nitric acid of about 10% to 50% HNO_3 by weight and substantially free of sulfuric acid; a dinitratable substituted phenol compound; and a liquid, inert, water-immiscible organic solvent for said substituted phenol compound;
(B) reacting said ingredients, thereby forming an emulsion containing a mononitrated derivative of the said compound;
(C) permitting the separation of said emulsion into an organic phase containing the mononitrated derivative of said compound, and an aqueous phase containing aqueous spent nitric acid as a waste;
(D) reacting said separated organic phase with aqueous nitric acid of 60% to 100% by weight HNO_3 and substantially free of sulfuric acid, thereby forming a second mixture;
(E) permitting the separation of said second mixture into an aqueous phase consisting of spent nitric acid of 10% to 50% by weight, and an organic phase containing the dinitrated derivative of said substituted phenol compound;
(F) removing said organic phase containing the dinitrated derivative, thus leaving the said spent nitric acid of step (E), and
(G) repeating the foregoing steps (A) to (F), inclusive, utilizing as the acid in step (A) the said spent nitric acid of step (E), whereby the aqueous waste of step (C) is the only waste generated in the process.

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Re. 33,169
SIDE STROKING GOLF PUTTER
John G. Leek, 1503 Imperial Ave., New Hyde Park, N.Y. 11040
Original No. 4,621,816, dated Nov. 11, 1986, Ser. No. 748,310, Jun. 24, 1985. Application for reissue Nov. 8, 1988, Ser. No. 268,931
Int. Cl.[4] A63B *53/04, 53/02*
U.S. Cl. 273—168 **4 Claims**

1. A side stroking double-faced golf putter for swinging front and rear along the sides of the body in the direction of the length of the feet of the user comprising a head having elongated putting faces in opposite directions on said head for putting in opposite directions,

a shaft connected with said head to move the same through a putting swing in the opposite directions of said putting faces,

said shaft having an elongated [vertical] single handle portion for swinging the head in the opposite directions of said faces and a relatively shorter vertical shank portion connected with the head proximate the center of the length of the head above and centrally between said elongated putting faces and spaced remote from and non-aligned with said handle in a direction away from the side of the body of the user,

and said shaft having a connection portion offset from and substantially perpendicular to said vertical shank portion connecting said non-aligned shank and handle portions together in vertical spaced non-aligned relationship with said handle portion closer to the side of the body of the user than said shank portion, said connection portion being spaced remote from said handle portion and adjacent to said head and aligned with and between said elongated putting faces.



PLANT PATENTS

GRANTED FEBRUARY 20, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,156
FLORIBUNDA ROSE PLANT NAMED SMOOTH TALK
O. L. Weeks, 12610 Central Ave., Ste. 76, Chino, Calif. 91710
Filed Jan. 31, 1989, Ser. No. 304,280
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.--23 **1 Claim**

1. A new and distinct variety of rose plant of the Floribunda rose class, substantially as shown and described, characterized particularly by attractive white flowers of good form.

7,157
ROSE PLANT AROTRUSIM
Jack E. Christensen, Ontario, Calif., assignor to Bear Creek Gardens, Inc., Somis, Calif.
Filed Nov. 17, 1988, Ser. No. 272,729
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.--29 **1 Claim**

1. A new and distinct variety of rose plant and parts thereof of the Floribunda class, characterized particularly as to novelty by the long shapely buds of crimson produced in clusters of usually two to three flowers on relatively long stems and the vigorous, upright plant which grows well on its own root system, requires little care, and has better than average disease resistance and above average cold hardiness, essentially as described and illustrated herein.

7,158
VARIETY OF TROPICAL MANGO
Edward F. Mitchell, 13950 SW. 67 Ave., Miami, Fla. 33158
Filed Feb. 12, 1988, Ser. No. 155,478
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—33 **1 Claim**

1. A new and distinct variety of tropical mango substantially as described and illustrated having a fruit characterized by a golden color with a light green blush at the stylar end on the surface of the fruit.

7,159
PLUM TREE, "GAR-BELMONT"
John M. Garabedian, P.O. Box 7883, Fresno, Calif. 93747
Filed Nov. 7, 1988, Ser. No. 268,081
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree substantially as illustrated and described and which is somewhat similar to the Aleta Rose Plum Tree (U.S. Plant Pat. No. 5,231) and the Early Gar Rosa Plum Tree (U.S. Plant Pat. No. 5,453), but which is distinguished therefrom and characterized principally as to novelty by producing fruit which are ripe for harvesting and shipment approximately June 1 through June 10 under the ecological conditions prevailing in Fresno, Calif., the subject variety producing fruit which are ripe for harvesting and shipment approximately two or three weeks before the Aleta Rose Plum Tree and approximately five days after the Early Gar Rosa Plum Tree at the same geographical location.

7,160
STRAWBERRY PLANT NAMED K1
Harold A. Johnson, Jr.; Amado Q. Amorso, and Joseph I. Espejo, Jr., all of Watsonville, Calif., assignors to Driscoll Strawberry Associates, Inc., Watsonville, Calif.
Filed Nov. 28, 1988, Ser. No. 277,071
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—48 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

7,161
LILIUM CHINA
Judith Freeman-McRae, Boring, Oreg., assignor to Columbia-Platte Lilies, Inc., Boring, Oreg.
Filed Dec. 15, 1988, Ser. No. 285,758
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease; its tolerance of virus; its vigorous growth and rapid natural propagation; and in particular by its unusual consistently and completely double flowers with their hairline magenta tepal margins. This color pattern and double flower form are unique among Asiatic hybrid lilies.

7,162
BEGONIA PLANT NAMED CAMELLA
Jan Man, Lisse, Netherlands, assignor to Oglevee, Ltd., Connellsville, Pa.
Filed Sep. 22, 1988, Ser. No. 250,932
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Begonia characterized by fullness of form, extensive branching, soft pink with a peach hue and clean in appearance flowers and highly floriferous as shown and described herein and parts therefor.

7,163
BEGONIA PLANT NAMED 'LARESSA'
Jan Man, Lisse, Netherlands, assignor to Oglevee, Ltd., Connellsville, Pa.
Filed Oct. 6, 1988, Ser. No. 254,277
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Begonia characterized by its vigorous growth, resultant strong plant, color of the bloom bright and clear and pleasing to the eye, and high tolerance to botrytis and powdery mildew as herein shown and described.

7,164
CARNATION NAMED DIGITOS
Antonio Di Giorgio, and Renato Di Giorgio, both of San Remo, Italy, assignors to Laboratoire de Physiologie Vegetale, La Londe-les Maures, France
Filed Dec. 21, 1988, Ser. No. 294,520
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. The new and distinctive carnation plant, substantially as herein shown and described, particularly characterized by its light pink, medium sized flowers which are produced profusely on long, strong, upright stems having moderately abundant foilage.

7,165
CARNATION NAMED LADYCHINERA
Giacomo Nobbio, Strada Villetta, 17, San Remo, Italy
Filed Oct. 3, 1988, Ser. No. 252,592
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. The new and distinct carnation variety, substantially as herein shown and described, characterized by its light pink monochrome flowers of the double type.

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PATENTS

GRANTED FEB. 20, 1990

ERRATA

For CLASS	See PATENT NO.
475-230	4,901,599
475-348	4,901,601
475-335	4,901,602
076-041	4,901,604
606-098	4,901,711
606-075	4,901,712
606-001	4,901,717
606-004	4,901,718
606-049	4,901,719
606-040	4,901,720
606-103	4,901,721
606-223	4,901,722
606-133	4,901,723
356-316	4,902,099
210-628	4,902,302
208-110	4,902,392
552-207	4,902,447
428-295	4,902,480
139-292	4,902,535
525-421	4,902,778
549-364	4,902,807
310-216	4,902,941
250-561	4,903,054
346-160	4,903,067
369-290	4,903,224
369-036	4,903,252
365-091	4,903,343
365-051	4,903,344

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4,901,370

GARMENT FOR PROTECTING AGAINST ENVIRONMENTAL CONTAMINATION

James R. Suda, Fairfax, Va., assignor to Redi-Corp Protective Materials, Inc., Chantilly, Va.

Continuation of Ser. No. 231,418, Aug. 12, 1988, Pat. No. 4,847,914, which is a continuation of Ser. No. 49,355, May 14, 1987, Pat. No. 4,831,664. This application May 16, 1989, Ser. No. 352,319

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[4] A41D *13/02*

U.S. Cl. 2—2

14 Claims



1. Protective apparel designed to protect the user against the adverse effects of chemical, biological and like environmental contamination comprising a body garment defined by a pair of legs, a pair of arms, a body and a hood adapted to totally enclose a wearer thereof; said body garment being defined by a laminate including a first layer of material defining an outer generally impermeable ply of synthetic polymeric/copolymeric plastic material, said laminate including an inner ply of synthetic polymeric/copolymeric plastic material fibers defining a generally porous internal surface; said plies being laminated to each other, said fibers defining a porosity sufficient to function as a filter for relatively large size contaminants in the event said generally impermeable ply becomes torn, punctured or the impermeable integrity thereof is otherwise damaged, a transparent window in said hood, at least one opening in said body garment, filter means covering said opening for filtering contaminated air drawn therethrough as a wearer of the garment inhales, and a conduit for conducting exhaled air to atmosphere.

12. Protective apparel designed to protect the user against the adverse effects of chemical, biological and like environmental contamination comprising a body garment defined by a pair of legs, a pair of arms, a body and a hood adapted to totally enclose a wearer thereof; a transparent window in said hood, at least one opening in said body garment, filter means covering said opening for filtering contaminated air drawn therethrough as a wearer of the garment inhales, a conduit for conducting exhaled air to atmosphere, and said conduit includes valve means operative for preventing contamination from entering said conduit upon inadvertent inhalation of contaminated air through said conduit.

4,901,371

INFANT BAG GARMENT

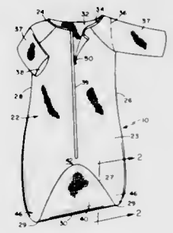
Bonnie S. Christians, P.O. Box 1025, Del Mar, Calif. 92014

Filed Oct. 31, 1988, Ser. No. 264,346

Int. Cl.[4] A41B *13/06*

U.S. Cl. 2—69.5

8 Claims



1. A garment for a child comprising:

a substantially tubular member to enclose the child's torso and lower extremities and having a front, a back, lateral sides with a medial plane intermediate therebetween, an upper end at least partially open and a bottom edge, said bottom edge being closer to said upper end at said medial plane of said garment and extending downwardly and outwardly toward said lateral sides of said garment, to define elongated lower ends on said opposite lateral sides, a line extending between said elongated lower ends defining the bottom of said garment; and

elastic panel means joined to said tubular member along the entire length of said bottom edge and substantially completely closing said tubular member at said bottom end, said panel means being a unitary elastic piece of fabric beginning at the front of said garment and extending outwardly of either side of the medial plane of said garment and downwardly toward said opposite lower end of said garment, around the bottom of said garment an upwardly and inwardly to a corresponding point on the back of said garment, such that said panel means can be distended upwardly to accommodate placement of a strap between the legs and feet of said child.

4,901,372

BARRIER SURGICAL GLOVE

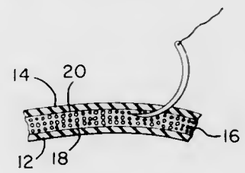
William S. Pierce, 1201 Saradana Rd., Harrisburg, Pa. 17112

Filed Sep. 23, 1988, Ser. No. 248,827

Int. Cl.[4] A41D *19/00*

U.S. Cl. 2—167

23 Claims



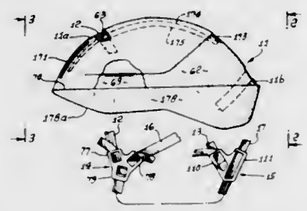
22. A barrier surgical hand covering comprising:

(a) A continuous inner barrier layer adapted to extend over a portion of a hand;

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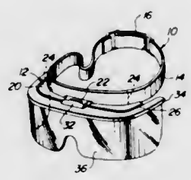
(b) A continuous outer barrier layer overlying the inner layer;
(c) Each of said layers being formed from a flexible, resilient and imperforate barrier material; and
(d) A continuous central layer located between said inner and outer layers and joined to one of said layers along an interface therebetween to prevent contamination migration along the interface, said central layer being formed from flexible, resilient and puncture-resistant closed cell foam means.

4,901,373
HELMET RETENTION SYSTEM WITH ADJUSTABLE BUCKLE
Lester V. Broersma, Bellflower, Calif., assignor to Bell Helmets, Inc., Norwalk, Calif.
Filed Mar. 7, 1988, Ser. No. 164,852
Int. Cl.[4] A42B *7/00*; **A63B** *71/10*
U.S. Cl. 2—421 **13 Claims**



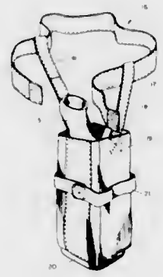
1. In a helmet retention system, the combination comprising:
(a) a strap supporting shell,
(b) a chin strap,
(c) webbing connected to the shell and extending downwardly beneath left and right sides of the shell,
(d) and means interconnecting the chin strap with said webbing, and including chin strap gripping junction plate means through which the chin strap extends in looping configuration, the plate means configured to loosen its grip on the chin strap when tilted relative to the face of the wearer,
(e) and including a lightweight, thin, plastic outer shell adhered downwardly upon upper extent of the strap supporting shell, the strap supporting shell defining an upward facing ledge that seats the lower rim of the outer shell, in looping configuration.

4,901,374
FACE SHIELD
Gerbrig W. Van der Woude, Rock Island, Ill., assignor to Prolens
Filed Apr. 22, 1988, Ser. No. 184,846
Int. Cl.[4] A61F *9/02, 9/06*
U.S. Cl. 2—453 **5 Claims**



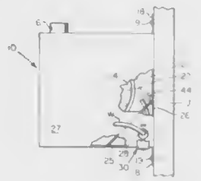
1. A face shield, comprising a head-encircling element including a frontal part adapted to fit against the brow of the wearer and having a relatively rigid central support portion, a protective screen positionable in a protective mode in dependent relation to the frontal part and closely ahead of the eyes of the wearer, said screen having an upper edge portion closely proximate to the support portion of the frontal part, and screen-mounting means including a relatively rigid frame disposed closely ahead of the frontal part and of U-shaped configuration as seen from above so as to generally conform to the brow of the wearer, said screen-mounting means further including a hinge on a transverse axis connecting a central region and the frame and the central support portion of the frontal part, the screen being also U-shaped to conform to the frame and the upper edge portion of the screen being removably carried by the frame and said frame further including a downwardly-opening channel configured to conform to the frame and relatively tightly receiving the upper edge portion of the screen, and said shield being initially flat and of flexible material adapted to be manually curved to fit the channel and capable of returning to its flat status when removed from the channel.

4,901,375
MALE URINAL APPLIANCE
Marcella Dahlgren, 1811 Lakehurst Dr., Nashville, Tenn. 37206
Filed Mar. 2, 1988, Ser. No. 163,304
Int. Cl.[4] A47K *11/00*
U.S. Cl. 4—144.3 **2 Claims**



1. An improved male urinal appliance comprising in combination:
(a) a circular orifice for receptively engaging the wearer and receiving the urine to be collected, said orifice having a beveled edge for reducing irritation;
(b) a neck joining said orifice with a reservoir and substantially radially contoured such that such said orifice is higher than said reservoir so as to minimize direct or reflux leakage, maximize comfort and to allow said bottle to rest on a flat surface while still effectively engaging the wearer;
(c) said reservoir having flat upper and lower surfaces and contoured side surfaces to comfortably engage the wearers body to fit in between wearers legs;
(d) a support belt adapted for carrying and securing said bottle to the wearer comprising an adjustable leg strap, adjustable vertical straps, and bottle retaining pouch; and
(e) where said bottle retaining pouch comprises a flap means for removing said bottle from the bottom of said pouch.

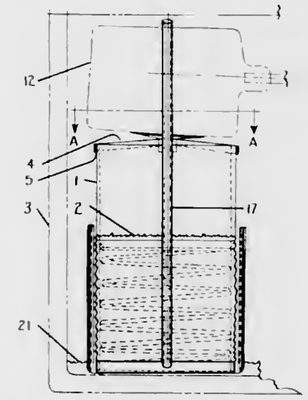
4,901,376
BATHROOM VENTILATOR HOUSING
Charles W. Ivey, Hope Mills, N.C., assignor to Fasco Industries, Inc., Lake Forest, Ill.
Filed Aug. 8, 1988, Ser. No. 229,475
Int. Cl.[4] H02G *3/14*; **F24F** *7/00*
U.S. Cl. 4—213 **12 Claims**



1. An enclosure for an electrical appliance, comprising
a plurality of walls interconnected to each other to form a housing for an electrical appliance of the type having a plurality of wire leads disposed to be connected in the housing to power supply wires originating externally of the housing,
a first one of said walls having therein a first wire inlet/outlet opening,
a second one of said walls having therein a second wire inlet/outlet opening,
a knockout hole cover element releasably secured in a first position on said housing with a first portion thereof overlying said first opening in said first wall, and with a second portion thereof overlying said second opening in said second wall,
one of said portions of said cover element having therethrough a first access opening which registers with one of said inlet/outlet openings,
the other portion of said cover element having formed thereon a knockout plug which overlies and covers the other of said inlet/outlet openings, and which can be knocked out of said element to form therein a second access openings when use of both said first and second inlet/outlet openings is desired, and
means forming in said housing a wiring chamber communicating with said first and second wire inlet/outlet openings,
said means comprising a second cover element removably mounted in said housing and extending transversely of the walls of said housing, whereby said chamber is formed in part by portions of said housing walls and in part by said second cover element.

4,901,377
TOILET BOWL AUTOMATIC FLOW SHUT OFF AND WATER SAVER DEVICE
Richard L. Weir, 2217 Grant Ave., Dayton, Ohio 45406
Filed Oct. 31, 1988, Ser. No. 264,903
Int. Cl.[4] E03D *1/00, 1/22*
U.S. Cl. 4—415 **1 Claim**

1. A time delay device for use in a water flush toilet tank of a conventional toilet to automatically cut off water flow thru a lever arm float controlled inlet to the water tank when the flush valve mal-functions allowing water in the tank to continuously drain for an extended period of time, the time delay device consists of a relatively small actuator tank which has a small orifice therein near its bottom to restrict the flow a fluid out of said tank, said actuator tank being attached to said lever arm float by an attached mechanism, said actuator tank being seated on a sealed air entrained spring bellows device, which has one end of a tube attached to the sealed air section with the opposite end of said tube providing air exit to a level above the water in the tank, said bellows being seated on the bottom of the toilet tank and providing upward pressure on the actuator tank, which in turn provides upward pressure on the ball float via said attached mechanism; wherein, when the outlet valve mal-functions to allow water in the tank to flow out over an extended period of time, with the actuator tank below the normal full water level of the tank, the weight of water in said actuator tank will cause said bellows to compress as the lever arm float decends during the tank water level drop, however



after a period of time longer than the normal water outlet time water in said actuator tank will begin to drain out of the small orifice until the weight of the water and actuator tank will no longer be sufficient to compress the bellows at which time the spring force of the bellows will move the empty actuator tank and attached float lever arm upwardly to close the tank inlet.

4,901,378
SHAMPOO BASIN
Lealyce Reddell, P.O. Box 986, Mena, Ark. 71953
Filed Jan. 19, 1989, Ser. No. 298,356
Int. Cl.[4] A45D *19/00, 19/08*
U.S. Cl. 4—515 **19 Claims**

1. A shampoo basin, comprising:
basin means;
said basin means including a floor portion having a drain means positioned therein;
a substantially semi-circular notch formed in said basin means;
said notch providing a support means for said head of said person during usage of said basin;
and first rinse means fixedly attached to said basin means proximate said notch, said first rinse means serving to supply water to a dorsal surface of a person's head and neck.

8. A shampoo basin designed to more efficiently rinse with water the hair of a person receiving a shampoo, said basin comprising:
basin means,
said basin means including a floor portion having a drain means positioned therein;
a substantially semi-circular notch formed in said basin means, said notch providing a support means for said head of said person during usage of said basin;
first rinse means fixedly attached to said basin means proximate said notch, said first rinse means serving to supply water to a dorsal surface of a person's head and neck; and overflow means positioned proximate said first rinse means, said overflow means serving to facilitate drainage of water from a person's head and neck into said basin means.

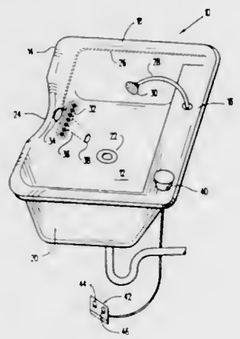
15. A portable shampoo basin insert for use in a conventional

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shampoo basin of the type having a neck receiving notch, said insert comprising:

a basin body portion;

support means on said basin body portion for supporting said basin body portion within said conventional shampoo basin;





a notch in said basin body portion dimensioned for registry with said conventional shampoo basin notch;

spray means on said basin body portion proximate said notch for directing a flow of water to a dorsal surface of a person's head and neck received in said notch;

and conduit means for connecting said spray means to a water supply.

4,901,379

AIR EXCITATION HYDROMASSAGE SYSTEM

Philip E. Chalberg, Costa Mesa, and James P. McKnight, El Toro, both of Calif., assignors to Hydrabaths, Inc., Santa Ana, Calif.

Filed Apr. 25, 1988, Ser. No. 185,919

Int. Cl.[4] A61H *33/02*

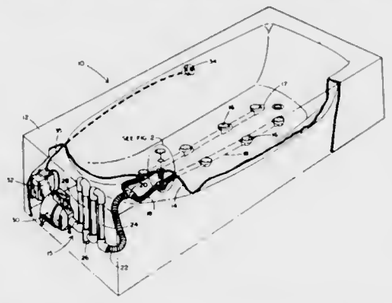
U.S. Cl. 4—543 **8 Claims**

1. An air bubble only injection water agitation system comprising at least one air nozzle assembly having means for connection to a source of air pressure, means for directing said air pressure into a water-filled bathtub and means for controlling the flow intensity and direction of air through said water, said connection means, said directing means and said controlling means being serially interconnected for channelling air from said pressure source into said bathtub;

said connection means comprising a hose and a nozzle foot connected to said hose;

said directing means comprising a threaded tubular member extending through an aperture in the wall of said bathtub; and

said controlling means comprising a nozzle cap and a nozzle body, said cap having radially-directed slots and having apertures, said body having air flow blocks, said cap and



said body being rotatably interconnected on the inside surface of said tub wall adjacent said tub wall aperture, the relative rotational position of said cap slots and apertures and said body flow blocks determining the intensity and direction of air flow into said bathtub water.

4,901,380

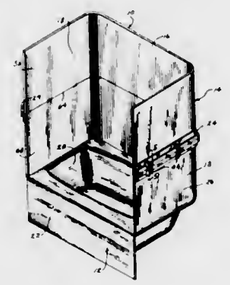
KNOCKDOWN BATHING ENCLOSURE

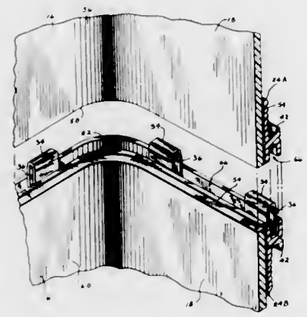
Iain M. Smith, Vernon, Canada, assignor to Kohler Ltd./Ltee, Toronto, Canada

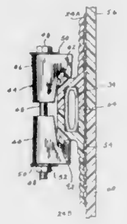
Filed Jan. 30, 1989, Ser. No. 303,255

Int. Cl.[4] A47K *3/22*

U.S. Cl. 4—596 **5 Claims**







detachably interconnected tubular sections comprising an elongated base section; a pair of elongated side sections; and, a top section, said support units being disposed in substantially vertical planes that are substantially parallel to each other, said support units being connected to each other solely by the hammock tether means, and being held in said substantially vertical planes by stabilizing means connecting the top sections to the support surface.

4,901,382

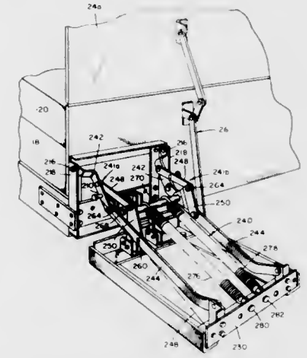
MOUNTING APPARATUS FOR WALL BEDS

Melvin P. Spitz, 619 N. Elm Dr., Beverly Hills, Calif. 90210

Continuation-in-part of Ser. No. 143,374, Jan. 12, 1988. This application Jul. 20, 1988, Ser. No. 221,756

Int. Cl.[4] A47C *17/40*

U.S. Cl. 5—136 **7 Claims**



1. A wall bed type assembly adapted to be mounted within a cavity and pivoted at one end to move between a closed vertical position and an open horizontal position, said assembly including

a bed base for holding a mattress,

a mounting element within the cavity, and

a counter-balancing spring assembly connected between the bed base and the mounting element, said counter-balancing spring assembly having extension spring means connected to a linkage assembly that enables the spring means to act on thew bed base to provide a counter-balancing force as the bed is being opened and closed, but effectively neutralizes the counter-balancing force when the bed is open,

said linkage assembly including four link elements pivotably connected together to form a four sided polygon which changes shape as the wall bed type assembly is opened and closed,

said spring means being connected to one of said link elements, with the counter-balancing force of the spring means acting primarily on said one link element during opening and closing and shifting when the wall type bed assembly is fully open to act, at least partially, on another link to effectively neutralize the counter-balancing force.

4,901,381

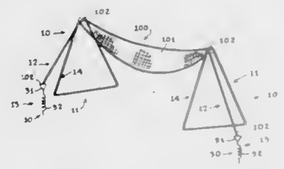
SUPPORT APPARATUS FOR HAMMOCKS

Gary D. Swergold, 8413 Buckhannon Dr., Bethesda, Md. 20854

Filed May 2, 1989, Ser. No. 346,194

Int. Cl.[4] A45F *3/24, 3/22*

U.S. Cl. 5—127 **7 Claims**



1. A support apparatus for conventional hammock constructions including a hammock body and hammock tether means disposed on opposite ends of the hammock body wherein the support apparatus comprises:

a pair of support units operatively associated with the hammock tether means wherein each of the support units comprises a generally triangular support member, supported on a support surface, which includes a plurality of detachably interconnected tubular sections comprising an elongated base section; a pair of elongated side sections; and, a top section, said support units being disposed in substantially vertical planes that are substantially parallel to each other, said support units being connected to each other solely by the hammock tether means, and being held in said substantially vertical planes by stabilizing means connecting the top sections to the support surface.

4,901,383

MODULAR FRAME FOR A WATER BED

Alex Yang, Yuan-Ho, and Ben-Shin Liao, Taipei, both of Taiwan, assignors to Alex Yang, Yuan-Ho, Taiwan

Filed Mar. 9, 1989, Ser. No. 322,202

Int. Cl.[4] A47C *19/00*

U.S. Cl. 5—201 **14 Claims**

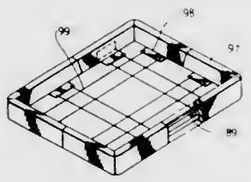
1. A frame adapted to surround a liquid-filled sack and a rigid support in a manner such that said sack can be placed on

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an upper surface of said support so as to form a cushion-like upper portion of a water bed, said frame comprising:

four rails interconnected to form a rectangular shape;

at least two detachably interconnected sections;



four generally L-shaped corner elements each having two arms interconnected at a right angle; and

four coupling units each connecting one of said corner elements detachably to two, of said four, adjacent rails.

4,901,384

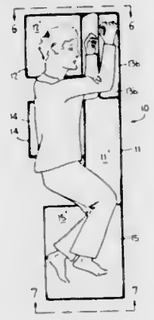
BODY PILLOW

Paul A. Eary, Rt. 15, Box 472, Oakland, Md. 21550-9805

Continuation-in-part of Ser. No. 89,977, Oct. 19, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,350

Int. Cl.[4] A47C *20/00*

U.S. Cl. 5—431 **20 Claims**



1. A pillow, comprising:

connecting means formed by an elongate flexible volume exhibiting deformable resilient support surfaces on opposite sides of a horizontal plane bisecting said connecting means, for supporting human anatomical members; and

a multiplicity of spaced-apart major sections of flexible volumes each jointed to and extending distally outward on both sides of said horizontal plane from said connecting means, with each of said major sections being formed by flexible volumes and exhibiting deformable, resilient support surfaces on opposite sides of said horizontal plane for supporting human anatomical members, with each of said major sections being disposable upon a horizontal substrate underlying said connecting means and said major sections, with a plurality of said major sections jointed to different sides of said connecting means, and with a first pair of said major sections having vertical thicknesses greater than a vertical thickness of said connecting means adjacent to said pair of major sections when said connecting means and said major sections are disposed upon and supported by a horizontal substrate.

4,901,385

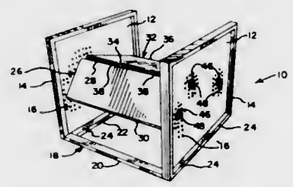
ADJUSTABLE THERAPEUTIC LEG SUPPORT DEVICE

Emil E. Adolphson, 117 Briar La., North Aurora, Ill. 60542

Filed Jan. 9, 1989, Ser. No. 364,245

Int. Cl.[4] A47C *20/08*

U.S. Cl. 5—443 **17 Claims**



1. An adjustable leg support comprising:

a frame having panel support means;

an upper leg support panel adjustably supported at said panel support means at an elevation and at an inclination with respect to horizontal,

a lower leg support panel adjustably supported at said panel support means at an elevation and at an inclination with respect to horizontal said upper leg support panel being separate and distinct from said lower leg support panel and also being angularly adjustable relative to said lower leg support panel.

4,901,386

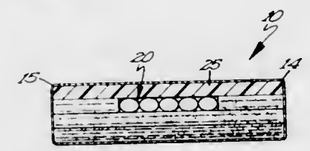
AIR ADJUSTABLE WATER MATTRESS

Walter W. Lane, Route 1, Roca, Nebr. 68430

Filed Feb. 1, 1989, Ser. No. 305,467

Int. Cl.[4] A47C *27/08*

U.S. Cl. 5—450 **11 Claims**



1. In a waterbed of the type adapted to support one or more persons on a sleeping surfaces established by a confined, liquid-containing bladder, the sleeping surface having nominal head, foot and opposing side areas, the improvement which comprises:

selectively inflatable air chamber means within said liquid-containing bladder and extending from one of said side areas toward the other of said side areas for adjusting the firmness of at least a portion of the sleeping surface between said head and foot area;

means for selectively establishing the inflation level of said air chamber means; and

means within said bladder for reducing wave motion therein, said wave motion reducing means comprising fibrous material formed in multiple sheets and interacting with said air chamber means to maintain the position of said air chamber means within said bladder, said air chamber means being positioned above at least some of said sheets.

4,901,387

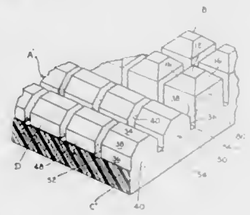
MATTRESS OVERLAY WITH INDIVIDUAL FOAM SPRINGS

John K. Luke, 420 Sweetwater Rd., Greer, S.C. 29651

Filed Mar. 21, 1988, Ser. No. 170,819

Int. Cl.[4] A47C *27/14*; A61G *7/04*

U.S. Cl. 5—464 **21 Claims**



4. The foam overlay of claim 1, wherein said convergent solid body includes a polyhedron having trapezoidal bases terminating in said planar support surface.

4,901,388

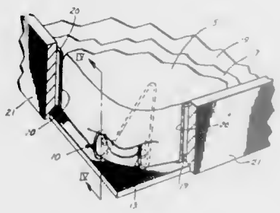
WATER BED CORNER CLOTHES HOLDER

Dick D. Irwin, 4698 18th St., Byron, Mich. 49315

Filed Nov. 3, 1988, Ser. No. 266,828

Int. Cl.[4] A47C *21/02*

U.S. Cl. 5—491 **3 Claims**



1. In a waterbed including a bedframe and a water filled mattress having a plurality of soft and spongelike corners positioned within said bedframe flexible coverings with attached corner retainers upon the water filled mattress, and a corner bed clothes holder having an inherent resilience being situated at each of said plurality of corners for yieldingly anchoring by means of said attached corner retainers, the flexible coverings on said water filled mattress, each corner bed clothes holder comprising

a first section consisting of a plurality of integral base legs that diverge from a common point,

a second section consisting of a plurality of upright extensions each extension being integral with base leg, each of said upright extensions having a "C" shaped connector adapted to receive the said corner retainers of the said flexible coverings,

the said first section of each of said corner bed clothes holders being placed diagonally under a different one of said soft and spongelike corners of the said water filled mattress a sufficient distance to embed the said "C" shaped connectors of said second section into each said corner, thereby closing off the "C" shaped connectors and securing the said corner retainers contained therein whereby the inherent resilience of the said plurality of integral base leg portions permit the said first section to follow the up and down movement of the said corners of the said water filled mattress and the inherent resilience of the said plurality of upright diverging extensions permit the said second section follow the lateral movements of the said corners of the said water filled mattress in response to the movement of the water in the said water filled mattress generated by the weight and movements of an occupant on the said water filled mattress thereby maintaining the embedded registry between the said "C" shaped connectors and the said soft and spongelike corners and yieldingly anchoring the said flexible coverings at each of said corners of the said water filled mattress.

4,901,389

GRAFTING PROCESS, ENSURING WATERPROOFING, OF A POLYMERIC MATERIAL BY A FLUORINATED MONOMER AND MATERIAL OBTAINED THEREBY

Jacques Poulenard; Louis Gavet, both of Lyon; Roger Chatelin, Lissieu per Lozanne, and Annie Giorgio, Villeurbanne, all of France, assignors to Institut Textile De France, Boulogne Billancourt, Cedex, France

Filed Apr. 14, 1988, Ser. No. 181,728

Claims priority, application France, Apr. 14, 1988, 87 05 308

Int. Cl.[4] C08F *259/00, 271/02*; D06M *14/22, 14/26*

U.S. Cl. 8—115.63 **9 Claims**

1. A process for cografting a polymeric material including the steps of:

(a) forming an aqueous emulsion by adding a fluorinated monomer and a graftable derivative of morpholine in the presence of at least one surface-active agent and mechanically stirring,

(b) creating free radicals on the material by activation,

(c) impregnating the material with said aqueous emulsion containing the fluorinated monomer and the graftable derivative of morpholine.

4,901,390

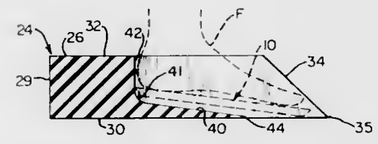
METHOD OF MANUFACTURING CUSTOM INSOLES FOR ATHLETIC SHOES

Peter A. Daley, Steamboat Springs, Colo., assignor to Dynamic Foam Products, Inc., Steamboat Springs, Colo.

Filed Sep. 26, 1988, Ser. No. 248,613

Int. Cl.[4] A43D *11/00*

U.S. Cl. 12—142 N **3 Claims**



1. A method of making a custom insole comprising the steps of:

preparing a blank of multiple layers of thermoformable material;

bonding said layers together into a unitary structure under the combined application of heat and pressure;

cutting an insole out of said blank to correspond to the outline of a foot and to define a heel and ball portion with an arch portion therebetween;

heating said blank of thermoformable material to make it pliable and thereafter placing said heel portion on an inclined resilient support portion with said ball portion on a firm surface;

placing the foot on top of said layers and applying downward pressure to cause the heel of the foot to form a depression in said heel portion and pressing said ball portion of the foot against said firm surface such that said layers beneath the ball portion of the foot remain flat; and

flattening said bottom surface of said layers beneath said heel

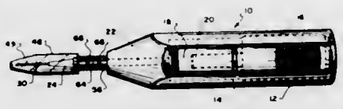
portion so as to be aligned in a substantially common plane with the undersurface of said ball portion.

4,901,391

HEARING AID CANAL CLEANING APPARATUS

Ravindra G. Athalye, 22700 Lake Shore Forest #113, El Toro, Calif. 92630

Filed Sep. 29, 1988, Ser. No. 250,528
Int. Cl.[4] A47L *25/00*
U.S. Cl. 15—3 **5 Claims**



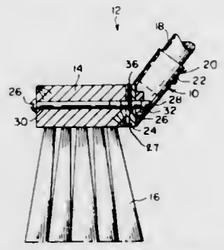
1. A hearing aid canal cleaning apparatus comprising:
a housing having an exterior threaded sleeve;
a motor shaft protruding from said housing through said threaded sleeve, said motor shaft connected to a motor, said motor to cause rotation of said motor shaft relative to said housing;
a tool attached to said motor shaft and to be rotatable therewith, said tool being narrow in width and elongated in length, said tool terminating in a tip at its free outer end; and
a cover threadably mounted on said threaded sleeve, said cover having an interior chamber, said tool being located within said interior chamber, said tip of said tool being capable of protruding from said threaded sleeve, said cover being movably mounted on said threaded sleeve from a first position totally locating said tool within said interior chamber to a second position resulting in protrusion of said tip of said tool a predetermined distance from said threaded sleeve, whereby said tip is to be located within the canal of a hearing aid and upon rotation of said tool cause removal of accumulated earwax within the canal.

4,901,392

CONNECTOR BETWEEN BRUSH AND HANDLE

David Shapiro, 58-23 251 St., Little Neck, N.Y. 11362, and George Spector, 233 Broadway Rm 3815, New York, N.Y. 10007

Filed Jun. 16, 1988, Ser. Nn. 207,530
Int. Cl.[4] A46B *15/00*
U.S. Cl. 15—172 **6 Claims**



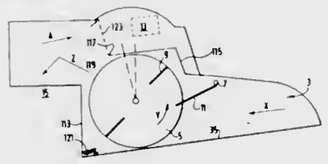
1. A brush to handle connector for a push broom having a brush head with extending bristles and an elongated handle, said connector comprising:
(a) means for adjustably attaching the handle to the brush head in such a manner as to allow user of the push broom to twist the brush head in various directions, thereby allowing the user to fit the brush head into narrow spaces and by changing the angle between the brush head and the handle to use the push broom more easily and more efficiently than with the usual rigid connection; and
(b) means for retaining the brush head to said adjustably attaching means for angular adjustment, wherein said adjustably attaching means includes:
(c) a sleeve secured to lower end of the handle;
(d) a lug having a threaded aperture, said lug transversly affixed to lower end of said sleeve in such a manner that said sleeve extends angularly therefrom; and
(e) a bolt having an annular groove in a threaded shaft which extends transversely through the brush head and through the threaded aperture in said lug.

4,901,393

HAY AND STRAW CLEANING APPARATUS

Leslie R. Tucker, Nr Bridgwater, England, assignor to Sedgemoor Developments PLC, Chester, England

Filed Dec. 28, 1987, Ser. No. 138,418
Claims priority, application United Kingdom, Nov. 10, 1987, 8726256
Int. Cl.[4] B08B *7/04*
U.S. Cl. 15—308 **15 Claims**



1. An apparatus for cleaning hay and straw comprising
a housing having a feeding tray and an inlet for receiving hay and straw at one end and outlet for discharging hay and straw at the other end,
beating and loosening means, positioned in said housing between said inlet and said outlet, for separating hay and straw from fine particular matter, comprising a fixed rake bar with a plurality of tines, a plurality of rotary tines supported for rotation through said rake bar tines, and a motor operatively connected to said rotary tines for rotating the same to provide a combing and beating action on said hay and straw and to convey the same through the apparatus,
said housing having a perforate wall opening located between said beating and loosening means and said outlet, and
vacuum suction means operatively connected to the outside of said perforate wall opening to separate particulate matter from the beaten and combed hay and straw passing through the apparatus.

4,901,394

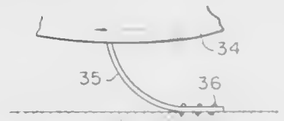
FLOOR NOZZLE FOR ELECTRIC CLEANER

Kazuo Nakamura, Yokkaichi; Yoshitaka Murata, Shiga; Hiroshi Kawakami, Yokkaichi, and Takemitu Okuma, Katano, all nf Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 17, 1989, Ser. No. 339,114
Claims priority, application Japan, Apr. 20, 1988, 63-97100
Int. Cl.[4] A47L *5/30*
U.S. Cl. 15—383 **4 Claims**

1. A floor nozzle for a vacuum cleaner, comprising:
a floor nozzle body;
an agitator incorporated in said floor nozzle body and having a rotor provided on its outer peripheral surface with flexible lips, and

a drive source incorporated in said nozzle floor body, for driving said agitator,



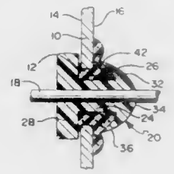
said lips being made of a material in which 30 to 60 parts of talc is added to 100 parts of vulcanized polyurethane.

4,901,395

SELF-SEALING HEAT ACTIVATED GROMMET

Waldemar R. Semrau, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 27, 1989, Ser. No. 316,128
Int. Cl.[4] B65D *53/06*
U.S. Cl. 16—2 **5 Claims**



1. A grommet of the type for mounting in an opening in a compartment wall and including an elastomeric body having a passage therethrough for passing an elongated member through the compartment wall, such grommet comprising:
an axially extending central tubular portion of diameter less than the diameter of the compartment wall opening;
a flange portion integral with the central tubular portion and having a diameter greater than the diameter of the compartment wall opening to limit the extent of insertion of the central tubular portion into the compartment wall opening;
a retention means integral with the central tubular portion in axial spaced relation from the flange portion, said retention means having a free state dimension greater than the diameter of the central tubular portion and being yieldable to permit insertion of the tubular portion through the compartment wall opening and then returning to the free state condition to retain the grommet in loose fitting relation with the compartment wall;
and an annular ring of heat expandable material carried by the grommet, said annular ring expanding in response to occurrence of predetermined heat condition to fill the space between the grommet and the compartment wall and thereby seal the compartment wall opening.

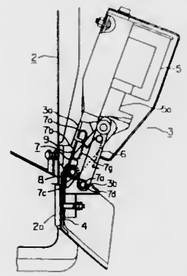
4,901,396

ICE DISCHARGE APPARATUS OF ICE DISPENSER

Susumu Tatematsu; Yasumitsu Tsukiyama, and Naoya Uchida, all of Toyoake City, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake City, Japan

Filed Jan. 26, 1989, Ser. No. 302,437
Claims priority, application Japan, Jan. 29, 1988, 63-9678[U]; Feb. 12, 1988, 63-16281[U]; Mar. 4, 1988, 63-28163[U]
Int. Cl.[4] E05F *01/08*
U.S. Cl. 16—76 **10 Claims**

1. An ice discharging apparatus of an ice dispenser, comprising an openable door normally urged resiliently to one of closed and opened states by means of a torsion coil spring and biased to the other of the closed and opened states by a door actuator under the control of a control apparatus, said torsion coil spring including an intermediate coil portion, and at least



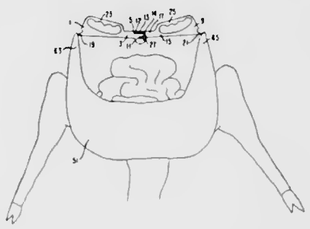
one coil end portion extending therefrom, wherein under an unloaded condition, said intermediate coil portion is in the form of a substantially cylindrical form and said at least one coil end portion has an inner diameter greater than an average diameter of said intermediate coil portion.

4,901,397

CARCASS SPREADER DEVICE

Mark S. Pursell, 302 New Jersey Ave., and Michael T. Pursell, 266 Bates St., both of Phillipsburg, N.J. 08865

Filed Mar. 2, 1989, Ser. No. 318,184
Int. Cl.[4] A22C *15/00*
U.S. Cl. 17—1 R **12 Claims**



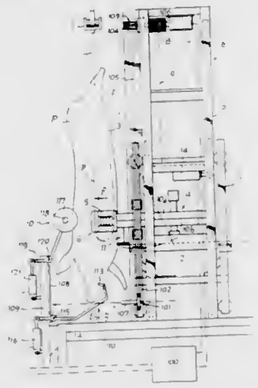
1. A portable compact device for spreading a carcass for cleaning, which comprises:
(a) a pair of opposite, elongated arms each having a top end and a bottom end, each being rotatably connected to one another about an axle near the top end, each having bolding means located towards the bottom end and each having carcass engaging means at the bottom end, wherein said pair of elongated arms may be brought together in parallel so as to be closed when not in use and may be spread apart rotatably by affixing the carcass engaging means of each arm to an open carcass while lifting the handles upwardly and pivotally away from one another;
(b) a spring which is connected to said elongated arms at an area towards the top end but below the axle so as to bias the elongated arms in the closed position when not in use and in an open position when spreading a carcass; and,
(c) a rotational axle located near the top end of said elongated arms establishing a pivot point perpendicular to the length of said elongated arms.

4,901,398

PROCESS AND MACHINE FOR PULLING OFF BELLY STRIPS FROM A HOG CARCASS

Lucien Durand, Baix, France, assignor to Société Anonyme: Societe Des Ateliers De Constructions Mecaniques: Lucien Durand, Baix, France

Filed Feb. 21, 1989, Ser. No. 312,204
Claims priority, application France, Feb. 23, 1988, 88 02436
Int. Cl.[4] A22B *5/00*
U.S. Cl. 17—1 R **17 Claims**



1. Machine for pulling off the belly strips from a hog of the type comprising means for suspending an eviscerated hog carcass by means of a hooking bar engaged in the Achilles tendon of the hog's hind legs, in order to introduce in the open rib cage of the hog, a clamp comprising jaws with outwardly directed active members, to place the active jaws substantially inside the plane of the lower end portions of the belly strips lining the inner faces of the hog's sides, with a view to gripping said end portions and pulling them off, and then to raise the clamp for pulling off the strips, machine wherein, in order to define the plane of the lower end portions of the belly strips, means are provided for:

determining the vertical height (H) of the suspended hog between a horizontal plane (PL) traversing the hooking bar engaged in the Achille's tendons, and a horizontal plane (PL') traversing the hog's snout,

placing the clamp at a height (h_2) varying between 700 and 900 mm from the plane (PL').

4,901,399

APPARATUS FOR STRIPPING MEAT FROM THE EXTREMITIES OF POULTRY

Heinz-Dieter Hegelmann, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. Kg, Lubeck, Fed. Rep. of Germany

Filed Dec. 21, 1988, Ser. No. 287,836
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743541
Int. Cl.[4] A22C *17/04*
U.S. Cl. 17—1 G **20 Claims**

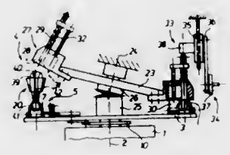
1. An apparatus for stripping meat from the extremities of poultry, particularly from leg parts such as thighs or drumsticks, which comprise a bone at least partially surrounded by meat, of turkeys or chickens, said apparatus comprising

(a) a first supporting disk driven to rotate about a substantially vertical first axis and defining a rotary plane;

(b) a second supporting disk rotating synchronously with said first supporting disk about a second axis intersecting in inclined manner said first axis;

(c) means for axially advancing said leg part to be processed, whilst engaging said bone in a centring manner in the vicinity of its proximal joint, which means are associated with said second supporting disk and essentially comprise at least one depression arranged on the underside facing said first supporting disk, which depression supports said leg part in the vicinity of its proximal condyle in a shape-adapted manner;

(d) means for retaining said meat during said advancing action, whilst radially embracing said bone, which meat retaining means are attached to said first supporting disk and comprise at least one stripping tool opposite to said at



least one depression, respectively, having a tubular body of at least two segments, and initially embracing said bone in the vicinity of its distal condyle, said tubular body being designed at its projecting front edge as a circular cutting edge and being oriented substantially perpendicular to said rotary plane of said first supporting disk; and

(e) a receptacle also associated with said first supporting disk and adapted to receive in a centring manner with respect to said stripping tool said leg part to be processed, which receptacle is arranged above said stripping tool.

4,901,400

DE-HIDING TOOL

Ralph K. Karubian, 7100 So. Avalon Blvd., Los Angeles, Calif. 90003

Filed Jan. 27, 1989, Ser. No. 302,619
Int. Cl.[4] A22B *5/16*
U.S. Cl. 17—21 **11 Claims**



1. A de-hiding tool, including:

a frame portion having first and second opposed faces;

a hollow handle portion coupled to said frame portion;

a tool-control valve portion coupled to said handle portion;

an air motor carried in said hollow handle portion and coupled, pneumatically, to said tool-control valve portion;

said air motor having a rotor;

a pinion gear carried by said rotor in coaxial relationship thereto;

blade-bearing means carried by said frame in said first face thereof;

first and second toothed blades carried by said blade-bearing means, said first toothed blade being proximate to said first face of said frame;

a wave spring

a low-friction insert;

first cover means for covering said first face of said frame;

said first cover means including a recess for receiving said wave spring and said low friction insert, said wave spring being positioned to bias said low-friction insert towards said first face of said frame;

said low-friction insert, when said first cover is attached to said frame, forcefully engaging said second toothed blade which, in turn, becomes contiguous with said first toothed blade, whereby space between said first and second toothed blades is eliminated; and,

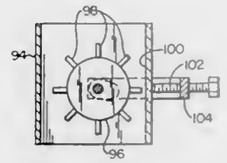
drive means coupled to said pinion gear for driving said first and second blades in oppositely reciprocating directions.

4,901,401

HARVESTING, SHUCKING AND EVISCERATING CLAMS AT SEA

William E. Gallant, Scarborough, Me., assignor to Borden, Inc., Columbus, Ohio

Division of Ser. No. 267,367, Nov. 4, 1988, which is a division of Ser. No. 122,014, Nov. 17, 1987. This application Jul. 12, 1989, Ser. No. 379,361
Int. Cl.[4] A22C *29/04*
U.S. Cl. 17—74 **6 Claims**



1. A clam crusher including a rectangular box with a rotatable body mounted therein,

said box being closed on four sides and open on two sides to allow clams to be delivered through one open side, crushed between one closed side and the body, and discharged through the other open side,

said body being mounted to rotate about an axis perpendicular to the direction of flow of clams entering said box and parallel with said one closed side,

said body including an axle projecting through slots on two closed sides of said box, said two closed sides being generally parallel to each other and perpendicular to said one closed side.

said axle including radially extending fins which form compartments to receive clams delivered through said one open side,

means for adjusting the spacing between said axle and said one closed side.

4,901,402

CLAMPING DEVICE

Malcolm J. S. Begemann, Biesdelselaan 12A, 6881 CG Velp, Netherlands

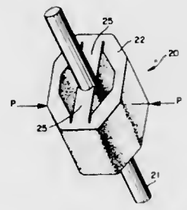
Filed Mar. 10, 1989, Ser. No. 321,785
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—129 D **13 Claims**

11. Clamping device for clamping onto a support element comprising:

a. a unitary piece of material having a high coefficient of elasticity;

b. said piece of material being formed to have a portion with geometry which defines a major axis and a minor axis, whereby external pressure applied inwardly and substantially perpendicular to said major axis causes elastic outward movement of said piece substantially along said minor axis;

c. said piece having fingers extending substantially along said major axis and connected to said portion substantially adjacent opposite ends of said major axis;



d. said fingers defining substantially convex clamping surfaces at the inner ends thereof, said surfaces being separated by a predetermined distance to define a receiving space; and

e. said portion having a pressure side with a reduced thickness opposite said receiving space for receiving side external pressure.

4,901,403

FASTENING MEANS FOR FASTENING A PROTECTIVE SHEET MATERIAL TO A SCAFFOLD OR A SIMILAR FRAME STRUCTURE

Bj rn E. H. Larsen, Nylandsvej 6, 400 K ge, Denmark

PCT No. PCT/DK87/00155, § 371 Date Aug. 12, 1988, § 102(e) Date Aug. 12, 1988, PCT Pub. No. WO88/04368, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 14, 1987, Ser. No. 235,889
Claims priority, application Denmark, Dec. 12, 1986, 6007/86
Int. Cl.[4] B65D *63/00*
U.S. Cl. 24—16 PB **17 Claims**



1. A fastening means for fastening a protective sheet material to a frame structure such as a scaffold, said fastening means being a substantially flat, integral, strip-like member comprising:

a pointed sheet-piercing first end to be inserted through the protective sheet material,

a barb-like member arranged adjacent to the pointed end for engaging with a side surface of the pierced sheet material so as to counteract retraction of the pointed first end when inserted through the sheet material, said barb-like member extending in the substantially same general plane as the flat strip-like member,

a second opposite end portion, which may be received in an

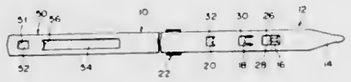
opening defined in the strip-like member so as to form a loop opening a part of the frame structure, and
means for counteracting withdrawal of said second opposite end from said opening.

4,901,404

FASTENING BAND AND FASTENING TOOL THEREFOR

Yasumasa Mizukoshi, Fujisawa, and Minoru Ishijima, Maebashi, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,361
Claims priority, application Japan, Apr. 16, 1987, 62-91863
Int. Cl.[4] F16L *33/00*
U.S. Cl. 24—20 TT **4 Claims**



1. A fastening band adapted to be formed into a loop-like shape around a cylindrical member with a first end portion of the band overlapping a second end portion of the band to the outside of the second end portion, characterized in that:
said first end portion has, in succession from a tip end thereof, a rectangular hole and an elongate slot extending longitudinally in a lengthwise direction of the band, with an inwardly directed first projection being formed at an end edge of said slot nearer to said tip end and with an end edge of said rectangular hole nearer to said tip end constituting a first tool-engaging portion,
said second end portion has, in succession from a tip end thereof, an outward protuberance with an end edge constituting a second tool-engaging portion, an outwardly directed second projection for tentative fastening, and an outwardly directed third projection for final fastening, and
said rectangular hole, said slot, said protuberance, and said first, second and third projections are configured and disposed such that said first and second end portions may be partially overlapped into a tentatively fastened state in which said protuberance and said second projection are received by said slot with said second projection engaging said first projection, and such that with said fastening band in said tentatively fastened state, said first and second tool-engaging portions may be engaged by a fastening tool, and said first tool-engaging portion thereby subjected to a tangential fastening force tending to move said first tool-engaging portion relatively away from said second tool-engaging portion to cause said first projection to ride over said third projection thereby to bring the fastening band into a finally fastened state in which said protuberance and said second and third projections ar received by said slot with said first projection engaging said third projection.

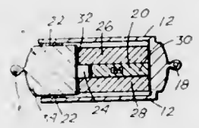
4,901,405

SELF-ALIGNING MAGNETIC NECKLACE CLASP

Alfred H. Grover, and Verna A. Grover, both of 5436 Clark Rd. #27 A, Paradise, Calif. 95969

Filed Aug. 25, 1988, Ser. No. 236,172
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—303 **3 Claims**

1. A self-aligning magnetic necklace clasp, comprising:
a cylindrical insert member structured solidly of ferrous materials;
a tubular chamber member structured of non-ferrous materials;
said tubular chamber member being a hollow tubular structure having an open first end and a closed second end
a tubular insert;
said tubular insert being a retainer ring having an opened first end a second end partly closed by a centrally disposed U-shaped cross piece, said tubular insert and said U-shaped cross piece structured of non-ferrous materials;
a bar magnet;
at least two bar magnet support members having a ferrous material structure;
said bar magnet support members each having at least one surface transversely configured to conjoin uniformly in width with opposing surfaces of said bar magnet and sized to extend longitudinally beyond an edge of said bar magnet a distance equal to the distance of an opening formed by said U-shaped cross piece in said second end of said tubular insert;
said bar magnet with said support members sized for close tolerance insertion into said tubular chamber member abutting said closed second end;
said tubular insert sized for emplacement inside said tubular chamber member through and adjacent said opened end of said tubular chamber member being retained by wall pressure inside said tubular chamber member with said



U-shaped cross piece pressed against said magnet with said extensions of said magnet support members forward of said magnet retained by annular edges abutting an interfaced annular edge of said tubular insert;
said cylindrical insert member sized to be slidably inserted into said tubular chamber member through said tubular insert accessibly protruding therefrom and be removably retained by magnetic flux attraction to an end surface of said cylindrical member in contact with said extended ends of said magnet support members, said ferrous material structure of said magnet support members magnetizing cooperatively with said bar magnet and directing said magnetic flux along a circulatory path through said ferrous material in said cylindrical member, there being air space between said end surface of said cylindrical member and said magnet with said U-shaped cross piece on said tubular insert providing said air space;
means for external attachment at said accessibly protruding end of said solid cylindrical member;
means for external attachment at said closed end of said hollow tubular member.

4,901,406

TOWEL CLASP SYSTEM

Charles B. Shelby, 7228 Craig St., and Jack E. Everett, 7216 Craig St., both of Fort Worth, Tex. 76112

Filed Mar. 7, 1989, Ser. No. 319,731
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—521 **5 Claims**

1. A clasp for gripping a towel, comprising:
a base having a substantially planer surface;
a pair of flanges protruding upward from the base, having opposed apertures;
an opening at one end of the base for receiving a strap;
a locking member having a projection means on opposite sides for receipt in the apertures for pivotally mounting the locking member to the flanges for movement between an open position and a closed position;
the locking member having a first portion defining gripping teeth;
the locking member having a second portion extending from the first portion at an angle that is less than 90 degrees and which contacts the planer surface of the base when the locking meraber is in the closed position;
the locking member having a third portion extending from the second portion parallel to the base planer surface when the locking member is in the closed position;
the third portion having a recess at its end which aligns with the opening in the base plate when the locking member is in the closed position to provide access for the strap extending through the opening;



the locking member defining a first clearance between the planar surface of the base and the first portion when the locking member is in the open position for loading a towel between the locking member and the base;
the locking member defining a second and very small clearance between the gripping teeth and the planer surface of the base plate when the locking member is in the closed position to accommodate towel thickness and to prevent the towel from being pulled from the clasp; and
the clasp being adapted to be attached to a golf bag by the strap.

4,901,407

VEHICULAR SEAT BELT COVERING

Thomas A. Pandola, and Carol A. Pandola, both of 7161 Rivol Rd., West Hills, Calif. 91307

Filed Feb. 13, 1989, Ser. No. 309,491
Int. Cl.[4] A44B *17/00*
U.S. Cl. 24—631 **1 Claim**



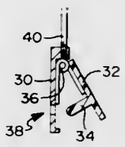
1. A vehicular seat belt covering in combination with a clasp member and a buckle member comprising,
a locking couple each formed at terminal ends of a flexible seat belt wherein the clasp member is formed with a release member oriented through an upper end of said clasp member and wherein said buckle member is formed with a solid buckle body including an outwardly extending locking boss receivable within said clasp member,
said seat belt covering comprising, a plurality of elongate body members including a first and second elongate body member to respectively encompass the clasp member and buckle member respectively wherein the body members are each formed to include a continuous elastomeric base portion to enable stretching of each body member over each respective clasp and buckle member from a first cylindrical configuration to a second configuration geometrically accommodating each respective clasp and buckle member, and
a through-extending opening formed through a wall of each body member, and
wherein each first and second elongate body is further formed with outwardly extending fabric integrally secured to said elastomeric base portion, and
further including a hook and loop fastener patch securable to each clasp and buckle member at a position diametrically opposed to said opening, and
wherein an adhesive member is interiorly secured to each first and second elongate body diametrically opposed to said opening for securement to each respective clasp and buckle member, and
wherein a plurality of further adhesive members are secured to an interior wall of each respective first and second elongate body at opposite sides of said opening, and
further including a plug section formed with an additional adhesive member secured to a lowermost side of a further elastomeric body portion with outwardly extending further nap members extending outwardly thereof and formed of a geometrical configuration to complement that defined by said opening to secure said plug section to said buckle member when said second elongate body is enveloping said buckle member, and
wherein each first and second elongate body is of a length equal to that of said clasp member and buckle body respectively to envelop and cover said clasp member and buckle body only.

4,901,408

MEANS FOR FASTENING SUSPENDERS TO A GARMENT OR OTHER ARTICLE OF CLOTHING

Sal Hermann, 5458 Claridge Ln., West Bloomfield, Mich. 48033

Filed Jun. 15, 1988, Ser. No. 206,830
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—637 **1 Claim**



1. Apparatus for fastening suspenders to a garment, comprising:
a fastener including a first and second member, said first member having a needle-like post attached thereto extending towards said second member in a complementary relation;
said second member being pivotally attached to the first member by means of opposed side projections which are confined within openings in attachments to the second member, said second member having an opening therein for receiving the needle-like post attached to the first member;
an actuating cam member including a clamping plate and a depending cam section lying adjacent to the first member, and pivotally attached to the second member by means of opposed side projections which are confined within the openings of the attachments to the second member, said actuating cam member exerting a sufficient force to maintain the suspender fastener in a closed position;
said first and second members having plates attached thereto on the surfaces facing one another, and said plates having complementary male and female portions which come together and cooperate when in a closed position; and
said needle-like post being attached to the first member in a complementary relation to the opening in the second

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member, said opening extending through the plate attached to the second member, such that when the suspender fastener is in a closed position the post remains attached to the first member, extends through both the complementary plates, and further extends through the garment being supported, is received by the opening in the second member, whereby the fabric of the garment being supported is substantially held fixed.

4,901,409

ORNAMENTAL EARRING SOUNDING A CLICK UPON ATTACHMENT

Sheldon Seidman, 709 Ave. K, Brooklyn, N.Y. 11230

Filed May 10, 1988, Ser. No. 192,376
Int. Cl.[4] A44C *7/00*
U.S. Cl. 24—705 **5 Claims**



1. An ornamental earring for removable attachment to the earlobe of a wearer through a pierced passage in the earlobe, said earring comprising:

an elongated socket member including a disk-shaped central base portion and adapted to be disposed on the wearer's earlobe and having an aperture in said base portion in juxtaposition with one end of the pierced passage; and

a stud member comprising an enlarged ornament portion adapted to be disposed on the earlobe at the other end of the passage and an elongated stem adapted to extend from said ornament portion through the passage and into said aperture for releasable retention therein;

said stem being provided along at least a portion of its length with a serrated surface comprised of a series of alternate crests and troughs,

said socket further including a plurality of individual elongated leaf springs integral with and extending from said disk-shaped base portion to free ends which are formed with stem-engaging tabs adapted to alternately engage successive ones of said crests and troughs while being pushed onto said stem, said leaf springs having sides abutting against each other throughout a substantial portion of their length so as to increase rigidity of said socket, each leaf spring bowing outwardly from said base portion, bowing inwardly towards said free end and having an elongated closed aperture intermediate said base portion and said free end such that said free ends are caused to bear securely against said stem, said tabs being adapted to resiliently snap into a trough and to emit a clicking sound to indicate to the wearer that secure engagement of said stem with said socket has been accomplished.

4,901,410

ANATOMICAL PREPARATION STATION

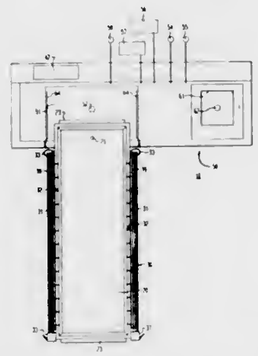
Theodore V. Fischer, Dexter, and Arthur L. Rathburn, Ypsilanti, both of Mich., assignors to The University of Michigan, Ann Arbor, Mich.

Filed Feb. 25, 1987, Ser. No. 18,645
Int. Cl.[4] A61G *13/00*
U.S. Cl. 27—21.1 **7 Claims**

1. A cadaver preparation station having a sink for receiving discharge from the cadaver and excess fluids used in processing the cadaver, the cadaver preparation station comprising:

tray means for supporting the cadaver during the processing of the cadaver, said tray means having an elongated configuration and being provided with a discharge hole therethrough which can be opened and closed;

tray support means for supporting removably said tray means installed thereon at a predetermined position wherein said discharge hole of said tray means is positioned to deposit the discharge from the cadaver and excess fluids used in processing the cadaver into the sink, said tray means being longitudinally selectably fixed or



movable with respect to said tray support means, and removable therefrom, while supporting the cadaver thereon and

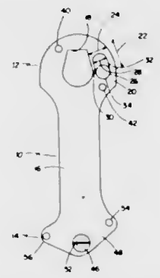
air exhaust means coupled to said tray support means, said air exhaust means having a first port for coupling to a source of reduced air pressure and a longitudinal duct arranged to extend along said tray means for removing fumes in the vicinity of said tray means.

4,901,411

APPARATUS FOR PARTIAL DISASSEMBLY OF FIREARM

M. Gaines Chestnut, Kremmling, Colo., and Ernest Brandenburg, Dallas, Tex., assignors to Ram-Line, Inc., Golden, Colo.

Filed Aug. 16, 1988, Ser. No. 232,807
Int. Cl.[4] B23P *13/00*
U.S. Cl. 29—1.1 **23 Claims**



1. Apparatus usable in rotating a barrel bushing of a firearm having a depressable plug adjacent to said barrel bushing comprising:

means for engaging a barrel bushing wherein rotation of said means for engaging is accompanied by rotation of said barrel bushing;

means, operatively connected to said means for engaging, for rotating said means for engaging wherein said barrel bushing is rotated from a first position to a second position;

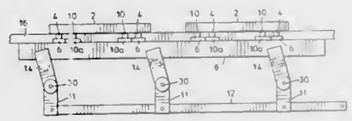
flange means extending outward from said means for engaging wherein said flange means substantially overlies the depressable plug when said barrel bushing is rotated to said second position.

4,901,412

APPARATUS FOR MOVING PALLETS IN AUTOMATED MACHINE TOOL ASSEMBLIES

Joel W. Jones, Windsor, Canada, assignor to Tri-Way Machine Ltd., Windsor, Ontario, Canada

Filed Sep. 19, 1988, Ser. No. 245,919
Claims priority, application Canada, Jul. 12, 1988, 571,797
Int. Cl.[4] B23Q *7/00*; B65G *47/00*
U.S. Cl. 29—33 P **5 Claims**



1. An automated machine tool assembly comprising:

a plurality of work stations,

slide rails connecting the work stations in a serial manner,

at least one pallet on which a workpiece can be mounted so that various machine tool operations can be performed on the workpiece at the different work stations, the pallet being slidable on top of the slide rails,

transfer bar means adjacent and parallel to the slide rails, the transfer bar means having engagement means for engaging said at least one pallet and being slidable longitudinally of the slide rails to move said at least one pallet between work stations,

means for moving the transfer bar means longitudinally of the slide rails,

and lift means for applying an upward force against said at least one pallet which is sufficient to reduce frictional drag between the pallet and the slide rails but is insufficient to lift the pallet off the slide rails.

4,901,413

METHOD AND APPARATUS FOR ESTABLISHING MULTI-STAGE GAS SEPARATION UPSTREAM OF A SUBMERSIBLE PUMP

Robert D. Cotherman, Houston, Tex., and Keith F. Way, Traverse City, Mich., assignors to Shell Western E & P Inc., Houston, Tex.

Filed Nov. 22, 1988, Ser. No. 275,245
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—890.14 **8 Claims**

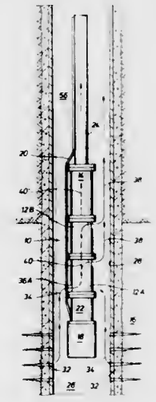
1. A method for constructing a multiple-stage separator assembly for downhole use upstream of a submersible pump system deployed for production from a high gas-to-liquid ratio reservoir, said method comprising:

forming a first-stage gas separator from a first conventional single-stage gas separator;

connecting a coupling assembly to the first-stage gas separator at a downstream end thereof at a position to receive an initially processed liquid component from a first-stage liquid outlet;

forming a second-stage gas separator from a second conventional single-stage gas separator having at least one exteriorally, radially protruding lower flange by removing each said which is upstream of a fluid inlet of the second conventional single-stage gas separator;

connecting the upstream end of the second-stage gas separator to the coupling assembly; and



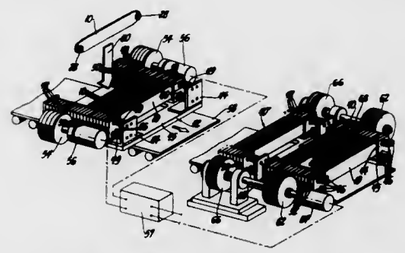
establishing a flow path from the first-stage liquid outlet to the second-stage inlet through the coupling.

4,901,414

METHOD FOR ASSEMBLING PAIRS OF HEAT EXCHANGER PLATES

Michael A. Breda, East Amherst, and George K. Snyder, Lockport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1989, Ser. No. 329,170
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—890.04 **4 Claims**



1. In a process for assembling pairs of tube plates and air centers for a heat exchanger core on a pallet having an array of adjacent plate holders corresponding in number to the number of desired tube plate pairs, a method of inserting the plates into the holders comprising the steps of:

normally holding the holders in side to side contact on the pallet;

advancing the pallet with the holders past a loading station;

sequentially spacing each of the holders from the holders adjacent thereto as the holders advance past the loading station, said spacing being determined to prevent interference between a pair of plates previously loaded in one holder and a pair of plates being inserted in an adjacent trailing holder, and

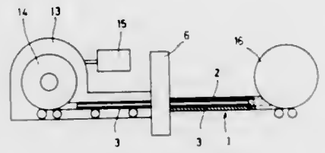
sequentially dropping pairs of plates into the holders at the loading station while they are spaced at the noninterferring distance from adjacent holders.

4,901,415

METHOD FOR CONNECTION COMPOSITE PIPES

Ryosuke Hata, Osaka, Japan, assignor to Sumitomo Electric Industries Ltd., Osaka, Japan

Division of Ser. No. 64,390, Jun. 22, 1987, Pat. No. 4,817,259, which is a division of Ser. No. 811,164, Dec. 19, 1985, Pat. No. 4,733,699. This application Mar. 14, 1988, Ser. No. 166,696
Claims priority, application Japan, Dec. 21, 1984, 59-271593
Int. Cl.[4] B21D *53/08*
U.S. Cl. 29—890.032 **1 Claim**



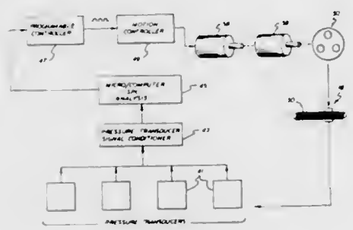
1. A method for connecting adjacent ends of composite pipes, each composite pipes comprising an aluminum pipe and a lead pipe provided in said aluminum pipe and having its outer wall in contact with the inner wall of said aluminum pipe, said method comprising the steps of cutting off the ends of said aluminum pipes at the adjacent ends of the composite pipes to form exposed ends of said lead pipes, increasing the diameter of the exposed end of one of said lead pipes sufficiently to receive the exposed end of the other of said lead pipes, placing the exposed end of other of said lead pipes into engagement with the interior of the enlarged exposed end of the one of said lead pipes and connecting the exposed lead pipe ends together, and winding a glass tape impregnated with epoxy resin around the connected pipe ends to form a reinforcing layer.

4,901,416

CONTROL SYSTEM FOR MANUFACTURING ENHANCED TUBES

Craig J. McKinney, Fulton, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 16, 1985, Ser. No. 809,465
Int. Cl.[4] B21D *53/02*
U.S. Cl. 29—726 **2 Claims**



1. A closed loop control system for a finning head of a production finning machine which has a plurality of tool arbors with a tool gang arrangement for manufacturing an enhanced outer surface of an evaporator tube, having subsurface channels connected to surface pores, comprising:

at least one pneumatic measuring means for measuring the pore size on a portion of the outer surface of the enhanced evaporator tube and generating an electrical signal indicative of the measured pore size;

processor means for receiving said signal indicative of the measured pore size and for processing said signal to determine the different between the measured pore size and a preselected pore size, and for generating an output signal when the determined pore size is different that the preselected pore size; and

means for adjusting the tool arbors of the finning head with respect to the outer surface of the next manufactured evaporator tube in response to the generated output signal of said processor means for manufacturing the correct pore size on the surface of the next manufactured evaporator tube.

4,901,417

METHOD OF FINISHING SCREEN PLATES

David E. Chupka, Middletown, Ohio, and Carl C. Landegger, New York, N.Y., assignors to The Black Clawson Company, Middletown, Ohio

Division of Ser. No. 81,771, Aug. 5, 1987, Pat. No. 4,795,560, which is a continuation-in-part of Ser. No. 39,381, Apr. 6, 1987, abandoned. This application Apr. 1, 1988, Ser. No. 176,500
Int. Cl.[4] B23P *15/16*
U.S. Cl. 29—163.8 **8 Claims**



1. The method of finishing a metal screen plate for use in the pressure screening of papermaking stock for removing contaminant particles therefrom in pressure screening apparatus, in which the screen plate has a substantially cylindrical body of metal material of generally uniform thickness throughout said body having a radially outer outlet surface and a radially inner inlet surface, and in which the finished plate has a plurality of openings leading from said inner inlet surface to said outer outlet surface, comprising the steps of:

directing a laser-energy beam at said outer outlet surface to cut said openings in said plate body from said outer outlet surface through said inner inlet surface, and

focusing said beam, with respect to the thickness of said plate body adjacent said inner inlet surface, to form said openings defined by tapered walls with the wider ends of said openings at said outer outlet surface.

4,901,418

GOLF HEAD REMOVAL TOOL

Rodney I. Machado, 66328 Cactus Dr., Desert Hot Springs, Calif. 92240, and Marc I. Machado, 82-281 Rebecca Ct., Indio, Calif. 92201

Filed Dec. 1, 1988, Ser. No. 278,443
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—263 **2 Claims**

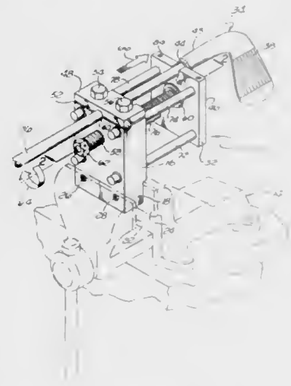
1. A golf club head removal tool comprising:

a main block having means for securing said removal tool to a fixed member and a locking plate for securing said golf club shaft to said main block;

a force plate formed in a plane parallel to said main block plane and having an opening therein for positioning said golf club shaft therein;

a drive bolt secured to said force plate and movable with respect to said main block along an axis perpendicular to said force plate plane for moving said force plate with respect to said main block; and

stabilizing means for keeping said force plate in a plane perpendicular to said drive bolt when said force plate moves with respect to said main block comprising a plurality of diagonally opposed pins whose axis are perpendicular to the plane of said force plate and secured thereto, said pins being interconnected between said force plate and said main plate, said drive bolt axis being intermediate and offset from the intersection of planes formed parallel to and interconnecting said diagonally opposed stabilizing pins.

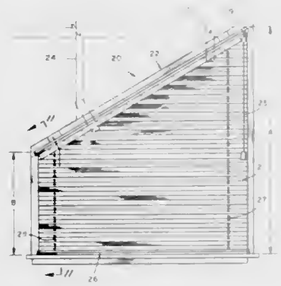


4,901,419

A-FRAME WINDOW COVERING MOUNTING ARRANGEMENT

Robert J. Voss, Fountain Valley, Calif., assignor to Home Fashions, Inc., Westminster, Calif.

Filed Jan. 3, 1989, Ser. No. 293,054
Int. Cl.[4] A47H *23/04*
U.S. Cl. 29—412 **5 Claims**



1. A method of making a pleated window covering having an extent of pleated material, a first rail interconnected with a lower edge of the pleated material for generally horizontal disposition and a second upper rail from which the pleated material hangs for arrangement with respect to a wall surface and oriented for disposition at a predetermined angle with respect to the horizontal, comprising the steps of:

laying a length of pleated material onto a horizontal surface, with each pleat being defined by a pair of pleat lines;

securing the first rail to a lower edge of the pleated material;

forming a strip with outer and inner parallel sides on an upper surface of the pleated material, with said strip being arranged at the predetermined angle relative to a pleat line;

severing the pleated material along the outer side of the strip;

severing the pleated material along each pleat line from the outer side of the strip to the inner side of the strip thereby forming a plurality of tabs; and

securing the tabs to one surface of the second rail.

4,901,420

METHOD OF MAKING AND USING A SHAPE ADAPTABLE PROTECTIVE CUSHIONING DEVICE

Howard W. Keithley, Jr., Adelphi, Md., assignor to Marie E. Keithley; Steven W. Keithley and Gwenn M. Kelly, Adelphi, Md.

Division of Ser. No. 717,793, Mar. 29, 1985, Pat. No. 4,694,774. This application Sep. 17, 1987, Ser. No. 97,752
Int. Cl.[4] B23P *17/00;* **B21B** *1/46;* **B22D** *11/126*
U.S. Cl. 29—417 **7 Claims**



1. A method of making a plurality of flexible protective pads comprising the following steps:

forming in one piece a bendable spine having offset lateral arm extensions with said lateral arm extensions being on opposite sides of said spine;

coating the tips of the lateral extension arms with liquid rubber; and

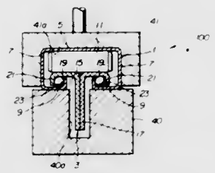
applying resilient cushions of semi-rigid foam on said spine portions between respective pairs of lateral extension arms.

4,901,421

METHOD OF ASSEMBLING SEAT SLIDE DEVICE

Isamu Takarabe, and Yutaka Miyame, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Jan. 27, 1989, Ser. No. 302,290
Claims priority, application Japan, Feb. 1, 1988, 63-19489
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—437 **9 Claims**



1. A method of assembling a set slide device which comprises a lower rail, an upper rail slidably disposed on said lower rail and rotating members disposed between said lower and upper rails, said method comprising by steps:

(a) temporarily assembling the lower and upper rails;

(b) disposing the rotating members between a space defined between the temporarily assembled lower and upper rails;

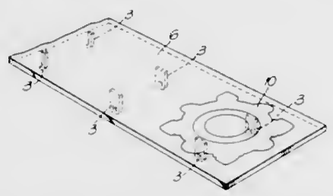
(c) pressing the temporarily assembled lower and upper rails against each other with a given pressing force;
(d) making a relative longitudinal movement between the temporarily assembled lower and upper rails whereby said pressing force is maintained;
(e) removing said pressing force after an amount of relative longitudinal movement sufficient for reshaping at least one member of said seat sliding device.

4,901,422

BADGES AND A METHOD FOR THEIR MANUFACTURE

William J. Woods, 56, Glenarriff Road, Dublin 7, Ireland

Filed Mar. 11, 1988, Ser. No. 165,461
Claims priority, application Ireland, Mar. 12, 1987, 642/87
Int. Cl.[4] B21C *23/00*
U.S. Cl. 29—527.6 **9 Claims**



9. A method of manufacturing a badge which comprises taking a metal extrusion in the form of a channel-shaped section having a flat planar surface portion and parallel flanges projecting rearwardly from the flat planar surface portion and at right-angles thereto, feeding the extrusion through a punching machine which removes a portion of the metal of the flanges to form oppositely arranged lugs integral with and projecting from the flat surface portion, forming a badge in the flat planar surface portion of the extrusion and severing the badge with a pair of lugs formed integrally therewith from the remainder of the extrusion.

4,901,423

METHOD OF SHAPING AND HOLDING A SHEET OF MATERIAL ABOUT A FLOWER POT WITH A COLLAR

Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Division of Ser. No. 232,541, Aug. 11, 1988, Pat. No. 4,835,834, which is a continuation of Ser. No. 876,405, Jun. 20, 1986, abandoned. This application Mar. 21, 1989, Ser. No. 327,996
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—432 **2 Claims**



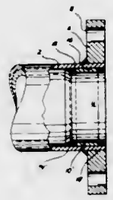
1. A method for shaping and holding an imperforate sheet of material about the outer peripheral surface of a flower pot having an upper and a lower end comprising:
providing a collar having an opening formed therethrough, the opening being shaped and adapted to receive a flower pot so that the flower pot extends through the opening formed in the collar and so the collar extends generally about the outer peripheral surface of the flower pot with the collar being positioned generally between the upper and the lower ends of the flower pot, a plurality of barbed piercing elements being formed in the collar and spaced generally circumferentially about the collar, each of the barbed piercing elements being adapted so that a portion of the sheet of material may be secured on each of the barbed piercing elements with the barbed piercing elements cooperating to secure the sheet of material connected to the collar and extending generally about the outer peripheral surface of the flower pot for forming a decorative flower pot cover; positioning and securing said collar on the outer periphery of said flower pot between said upper and lower ends; placing the bottom of said flower pot on said sheet; and shaping said sheet of material generally about bottom and the outer peripheral surface of the flower pot and generally about the outer peripheral surface of the collar with portions of the sheet of material being pierced by and retainingly disposed on said circumferentially extending barbed piercing elements for securing the sheet of material positioned generally about the outer peripheral surface of the flower pot.

4,901,424

METHOD OF FORMING AN END SEAL FOR A PIPE LINER

Hernan R. Menendez, Millington, Tenn., assignor to Insituform of North America, Inc., Memphis, Tenn.

Filed Jul. 26, 1988, Ser. No. 224,469
Int. Cl.[4] B23P *11/00;* **B29C** *63/34*
U.S. Cl. 29—451 **18 Claims**



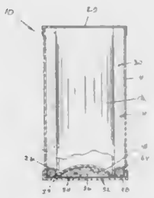
1. In conjunction with the repair of a length of pipe by inserting a lining into said pipe, the method of sealing an end of an joint between said lining and an end of said pipe which comprises:
(a) inserting said lining into said pipe and locating a tubular form radially between said lining and said end of said pipe;
(b) forming said lining by radially urging said lining into engagement with an interior surface of said pipe and an interior surface of said tubular form and retaining said lining in its formed condition;
(c) removing said tubular form to leave a space between said tube and said lining;
(d) inserting into said space formerly occupied by said tubular form a sealing ring which is radially compressed within said space, and
(e) inserting packing means into that portion of said space formerly occupied by said tubular form which is axially between said end of said pipe and said sealing ring and securing said packing means in place, thereby to prevent escape of said sealing ring from said space.

4,901,425

METHOD OF INSULATING A WATER HEATER DEVICE

Thomas E. Nelson, Anchorage, Ky., assignor to Soltech, Inc., Shelbyville, Ky.

Division of Ser. No. 177,393, Apr. 4, 1988, Pat. No. 4,844,049. This application Mar. 29, 1989, Ser. No. 330,296
Int. Cl.[4] B21D *39/00;* **B23P** *11/00*
U.S. Cl. 29—455.1 **1 Claim**



1. A method of insulating a water heater device of the type including an inner water tank with a generally cylindrical side wall and a contoured bottom surface, an outer shell surrounding and radially spaced from the inner water tank so as to define a first clearance space therebetween and a bottom cap disposed beneath the bottom surface of the water tank so as to define a second clearance space therebetween, the method comprising the following steps:
providing a collar of insulation material with a size and shape configuration to radially seal said first clearance space between said inner water tank and said outer shell;
providing an enclosed envelope with insulation material contained therein having a size and shape configuration to fit within said second clearance space;
attaching said collar to the side wall proximate the bottom of the inner water tank and said envelope to the bottom surface of said water heater;
positioning the inner water tank on said bottom cap and within said outer shell; and
injecting expandable foam insulation material into the first clearance space above said collar.

4,901,426

METHOD OF MAKING A PEDAL ROD

Charles E. Laue, 1041 Pawnee Rd., Wilmette, Ill. 60091

Filed Feb. 21, 1989, Ser. No. 312,464
Int. Cl.[4] B21D *39/00;* **B23P** *11/00*
U.S. Cl. 29—510 **7 Claims**



1. A method of fabricating a brake pedal rod comprising the steps of forming an end-piece from a light weight, readily machinable flat material having an aperture in one end thereof for attachment to a brake pedal, forming a shank piece with an internally threaded hollow end portion of material having greater strength under compressive load than the end-piece, and then attaching a flat other end of the end-piece to the shank piece hollow end to form a pedal rod by threading said flat other end having spaced arcuate threaded edge surfaces into threaded engagement with the internal threads of the hollow end of the shank piece along interference threads capable of resisting unthreading forces of the order of at least 5–40 inch pounds or more.

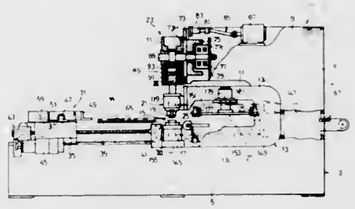
5. A method of fabricating a brake pedal rod comprising the steps of forming an end-piece from a readily machinable flat material, forming a shaft piece with an internally threaded hollow end portion of readily machinable material, and then preparing a connection between the end-piece having a flat end with spaced arcuate threaded edge surfaces by threading same into engagement with said internally threaded hollow end portion of the shaft piece, and forming said shaft piece with flattened spaced surfaces separated by spaced curved surfaces in threaded engagement with said spaced arcuate threaded edges of said end-piece.

4,901,427

PUNCH PRESS

Katsuyoshi Sakamoto, and Takeshi Takahashi, both of Kanagawa, Japan, assignors to Amada Company, Limited, Japan

Filed Feb. 6, 1987, Ser. No. 11,867
Claims priority, application Japan, Feb. 6, 1986, 61-15069; Feb. 6, 1986, 61-15070; Mar. 12, 1986, 61-34665; Mar. 12, 1986, 61-34666
Int. Cl.[4] B21D *37/14;* **B23Q** *3/155*
U.S. Cl. 29—568 **8 Claims**



1. A punch press comprising:
a frame;
a tool holder arranged on the frame, for removably supporting at a process position a tool set comprising a punch and a die;
a ram supported on the frame, for striking the punch so as to punch a workpiece placed between the punch and the die;
means arranged in the frame, for storing a plurality of tool sets to be exchanged for the tool set supported on the tool holder, said storing means being adapted to position a predetermined tool set selected from among the stored tool sets at a tool exchange position wherein a tool set to be exchanged is removed from the tool set storage means; and
an automatic tool exchange device supported on the frame, for exchanging the tool set supported on the tool holder for a tool set stored in the tool set storage means,
the automatic tool exchange device further comprising;
(a) a pivotal shaft pivotally supported on the frame with a longitudinal axis thereof disposed vertically with respect to said frame;
(b) a first arm supported on the pivotal shaft, for removing a tool set positioned at the tool exchange position on the storage means, and for setting the removed tool set to the process position on the tool holder;
(c) a second arm supported on the pivotal shaft, for removing a tool set arranged at the process position on the tool holder, and for returning the tool set to the tool exchange position on the storage means,
the second arm being supported on the pivotal shaft so as to be substantially perpendicular to the first arm in a plane disposed horizontally with respect to said frame, wherein said pivotal shaft is adapted to be pivoted and positioned at an angular position in which the first arm is located to face the tool exchange position on the tool set storage

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means and the second arm is located to face the process position on the tool holder;

(d) means supported on the frame for pivoting the pivotal shaft, said pivotal shaft pivoting means capable of positioning the pivotal shaft at three different angular positions,

wherein at the first angular position, the first arm is located to face the tool exchange position on the tool set storage means and the second arm is located to face the process position on the tool holder, at the second angular position, the first arm is located to face the process position with the second arm located to face a position other than the process position and the tool exchange position, and at the third angular position, the second arm is located to face the tool exchange position with the first arm located to face a position other than the process position and the tool exchange position;

said pivotal shaft pivoting means further comprising;

(i) a second cylinder supported on the frame,

(ii) a first cylinder supported on the second cylinder with a longitudinal axis thereof parallel to a longitudinal axis of the second cylinder,

said first and second cylinders each having respective pistons, the first cylinder being mechanically coupled to the second cylinder in a manner such that when the respective pistons of the first and the second cylinders are projected or retracted, the first cylinder is moved along the longitudinal direction thereof, and when both pistons of the cylinder are retracted to their stroke ends, the first cylinder is positioned at a first position with respect to the longitudinal axes of the first and second cylinders, when the piston of the second cylinder is retracted to the stroke end and the piston of the first cylinder is projected to the stroke end, the first cylinder is positioned at a second position with respect to the longitudinal axes of the first and second cylinders, and when the piston of the second cylinder is projected to the stroke end and the piston of the first cylinder is retracted to the stroke end, the first cylinder is positioned at a third position with respect to the longitudinal axes of the first and second cylinders, and

(iii) means connecting the first and second cylinders with the pivotal shaft for pivoting the pivotal shaft in accordance with the movement of the first cylinder, wherein the first, the second, and the third angular positions of the pivotal shaft correspond to the first, the second, and the third positions of the first cylinder, respectively.

4,901,428

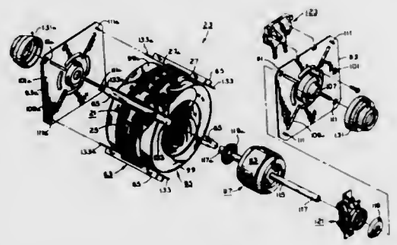
METHOD OF FORMING AN EDGEWISE WOUND CORE

James L. King, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 124,305, Nov. 23, 1987, which is a division of Ser. No. 660,101, Oct. 12, 1984, Pat. No. 4,712,292. This application Feb. 3, 1989, Ser. No. 305,967

Int. Cl.[4] H02K *15/02*

U.S. Cl. 29—596 **8 Claims**



1. A method of forming an edgewise wound core from a lanced strip of generally thin ferromagnetic material, the lanced strip including a pair of interrupted opposite edges, a continuous yoke section extending generally lengthwise of the lanced strip between the interrupted opposite edges thereof, a plurality of spaced apart teeth having preselected pitch axes and extending generally laterally from the yoke section, respectively, a plurality of tips on the teeth defining one of the interrupted opposite edges of the lanced strip, respectively, and a plurality of extensions extending generally laterally from the yoke section on the pitch axes opposite the teeth to define the other of the interrupted opposite edges of the lanced strip with the width of the extensions generally lengthwise of the lanced strip being no greater than the width of the tooth tips generally lengthwise of the lanced strip, respectively, the method comprising the steps of:

deforming the lanced strip generally edgewise thereof and forming thereby a plurality of generally helical convolutions of the deformed lanced strip;

extending the teeth and extensions on the yoke section of the deformed lanced strip respectively generally radially inwardly and outwardly of the helical convolutions during the forming step;

accumulating the helical convolutions into a generally axial stack thereof with leading and trailing portions of the deformed lanced strip defining a pair of generally axially spaced apart opposite end faces on the stack; and

arranging the teeth and the extensions so as to respectively extend only on the pitch axes generally radially inwardly and outwardly of the stack and generally in axial row formations across the stack between the opposite end faces with the tooth tips on each axial row formation of the teeth defining in part a generally axial bore through the stack between the opposite end faces and disposing the axial row formations of the teeth and the extensions at least generally in radial alignment with each other on the pitch axes with the circumferential extents of each axial row formation of the extensions being no greater than the circumferential extent of the tooth tip on each axial row formation of the teeth, respectively.

4,901,429

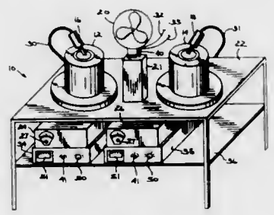
METHOD AND APPARATUS FOR MAKING A SUPERCONDUCTING JOINT

Vishnu C. Srivastava, Florence, S.C., assignor to General Electric Company, Milwaukee, Wis.

Filed Feb. 17, 1988, Ser. No. 157,345

Int. Cl.[4] H01L *9/29*

U.S. Cl. 29—599 **8 Claims**



1. A method of making a joint between superconductors made of filaments of superconducting material embedded in a matrix material including the steps of:

stripping the matrix material away from ends of the superconductors to be joined;

providing a heated soldering bath of molten metal, said metal being a superconducting material;

vibrating the soldering bath at an ultrasonic frequency;

submerging the stripped ends to be joined of the superconductors into the vibrating soldering bath;

filling a mold with the superconductive material of the soldering bath in a molten state;

placing the ends of the superconductors to be joined into the molten superconductive material in the mold; and

cooling the superconductive material in the mold to encase the ends of the superconductors in the solidified superconducting material of the soldering bath.

4,901,430

METHOD OF MOUNTING A MAGNETIC HEAD

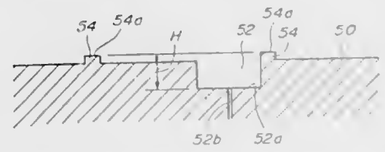
Ichiro Noguchi, Nagaoka; Kazuo Kobayashi, Furukawa; Toru Sawada, Furukawa; Masao Okita, Furukawa; Yasunari Takayama, Yokohama, and Kazuo Kozumi, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 908,508, Sep. 16, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 219,888

Claims priority, application Japan, Sep. 18, 1985, 60-204395

Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—603 **4 Claims**



1. A method of mounting an upper magnetic head, having a sliding contact surface on a lower side and a mounting surface on an upper side thereof, to one end of a pivotable case which extends longitudinally over a carriage supporting a lower magnetic head, said upper magnetic head being mounted precisely to said one end of said case such that when said case is pivoted downwardly toward said carriage, said upper magnetic head faces opposite said lower magnetic head on opposite sides of a magnetic disk interposed in a plane therebetween, said case being provided with a mounting surface on said one end for mounting the magnetic head, comprising:

employing a jig having a grooved placing unit with a bottom surface formed downwardly in the jig and a pair of supports projecting upwardly from the jig by a predetermined height above, and spaced apart longitudinally and in parallel with, the bottom surface of the groove placing unit;

placing the sliding contact surface of the head on the bottom surface of the placing unit of the jig to position the head therein;

placing the case longitudinally on the pair of supports so that its mounting surface on said one end thereof is located opposite the mounting surface of the upper side of said head and spaced from the contact surface placed on the bottom surface of said placing unit by a predetermined spacing determined by the predetermined height of the supports; and

filling a bonding agent in a resulting gap between the mounting surfaces of the head and the case created by said predetermined spacing and allowing the head and case to bond together.

4,901,431

POWERED FASTENER INSTALLATION APPARATUS

Robert L. Gast, Tustin, Calif., assignor to Textron Inc., Providence, R.I.

Filed Jun. 6, 1988, Ser. No. 203,240

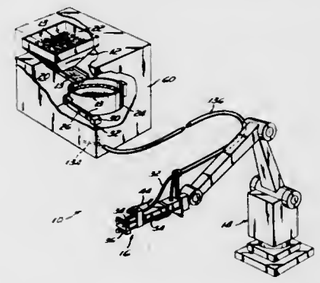
Int. Cl.[4] B21J *15/28*

U.S. Cl. 29—707 **11 Claims**

1. Apparatus for automatically installing a fastener in a workpiece comprising:

a base adapted to be mounted on a robot used to move said fastener installing apparatus to locations for installing fasteners in said workpiece;

a pulling head movable relative to said base towards and away form said workpiece, said head having a chamber for receiving a fastener and having means for applying a



pulling force on the fastener stem to set the fastener in the workpiece and breaking away a portion of said stem as the fastener is set in said workpiece; and

said detector in response to said event being adapted to provide an output utilized to interrupt the stem pulling force and to initiate the withdrawal of said head.

4,901,432

APPARATUS FOR ACCURATELY POSITIONING COMPONENTS

Jerrold S. Pine, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1989, Ser. No. 316,129

Int. Cl.[4] H05K *13/02*

U.S. Cl. 29—759 **7 Claims**



1. Apparatus for presenting components in a predetermined orientation, comprising:

a hollow cylindrical member having a longitudinal slot therein;

a helical member substantially coaxially positioned within said cylindrical member; and

motor means for rotating said helical member to thereby move along said longitudinal slot components which are, in use, slidably mounted on said helical member so as to extend into said longitudinal slot whereby said components are presented at an end of said longitudinal slot in said predetermined orientation.

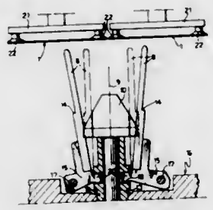
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4,901,433

DEVICE FOR INSERTING A PLURALITY OF PHASE INSULATORS IN THE CAVITIES OF THE STATOR OF A DYNAMO-ELECTRIC MACHINE

Giorgio Barrera, Leumann-Collegno, Italy, assignor to Officine Meccaniche Pavesi & C. S.p.A., Turin, Italy

Filed Jun. 24, 1988, Ser. No. 211,012
Claims priority, application Italy, Mar. 4, 1988, 67178 A/88
Int. Cl.[4] H02K *15/06*
U.S. Cl. 29—734 **5 Claims**



1. A device for inserting a plurality of phase insulators (1) in the cavities (6) of the stator (4) of a dynamo-electric machine, the device comprising:
- a plurality of guide blades (8) for the insertion of the phase insulators, disposed circumferentially around a central axis (9),
- an insertion member (10) slidable within the series of guide blades (8), having a circumferential series of axial grooves (11) in its outer surface in which the various guide blades (8) are engaged, this member being movable from a rest position, in which the phase insulators (1) may be positioned above the guide blades (8), to an operative position so as to cause the phase subsequently to be inserted in the cavities (6) of a stator (4) arranged in correspondence with the end of the series of guide blades (8), characterized in that at least some of the guide blades are movable and means for moving said guide blades are provided for moving said guide blades from their normal operative positions to open positions spaced radially outwardly, in which it is possible to position the phase insulators (1) above the guide blades (8) easily.

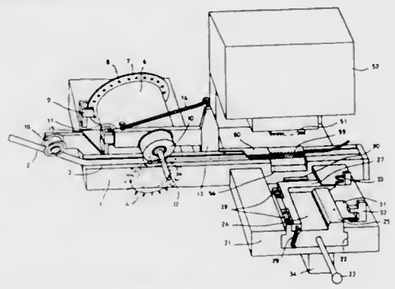
4,901,434

APPARATUS FOR TERMINATING MULTICONDUCTOR CABLE BY PRESSURE CONNECTION

Kensaku Sato, and Shigetomo Sakabe, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1986, Ser. No. 878,027
Claims priority, application Japan, Nov. 15, 1985, 60-174891; Nov. 20, 1985, 60-258573
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—753 **11 Claims**

1. Apparatus for connecting by pressure a plurality of insulated conductors of a multiconductor flat cable to a plurality of contact terminals attached at an end to a terminal strip having a plurality of guide apertures spaced at equal intervals along said terminal strip, which includes:
- a feed rail with a guiding groove along which said terminal strip is fed;
- a sprocket wheel for advancing said terminal strip by engaging said guide apertures;
- a step motor for intermittently rotating said sprocket wheel;
- a pair of upper and lower punches, with said lower punch provided on level with said guiding groove;
- a generally rectangular cable support station secured at substantially right angles to a side of said feed rail to advance said multiconductor flat cable toward said contact terminals placed on said lower punch for insertion of respective insulated conductors of said multiconductor flat cable into said contact terminals; and
- press means for moving said upper punch toward said lower punch to press said contact terminals into said insulated conductors of said multiconductor flat cable for connection by pressure, wherein said cable support station comprises:
- a base plate with a support groove;
- a cable support slidable along said support groove;
- a cable guide provided on said slidable cable support against



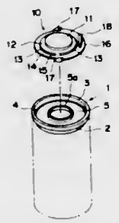
which a side of said multiconductor flat cable is to be abutted for positioning;
- a cable holder for holding said multiconductor flat cable in place along said cable guide on said slidable cable support;
- a cable stopper for positioning respective insulated conductors of said multiconductor flat cable held on said slidable cable support with said cable holder along said cable guide; and
- lowering means for lowering said cable stopper below a horizontal plane in which said slidable cable support is movable.

4,901,435

CUTTER LID OF RISE-AND-ROTATION TYPE FOR CONTAINER

Yoshimasa Tahara, Toyama, Japan, assignor to Ajinomoto Inc., Tokyo and Shirouma Plastics Kogyo Inc., Toyama, both of, Japan

Filed Nov. 22, 1988, Ser. No. 274,482
Claims priority, application Japan, Nov. 24, 1987, 62-295897
Int. Cl.[4] B67B *7/00*
U.S. Cl. 30—2 **9 Claims**



1. A rise-and-rotation type cutter lid for a container including a top cover of the container provided with a cutter member including at least one knife edge adapted to cut into the top cover as a rotatable grip is folded to rise, wherein the top cover is provided with a circumferential groove along which the knife edge cuts into for circumferentially cutting through the top cover.

4,901,436

SHUTTER FOR A DRY-SHAVING APPARATUS AND METHOD OF MANUFACTURING A SHUTTER

Peter Gosch; Albert Klemen, and Arno Wolfger, all of Klagenfurt, Austria, assignors to U.S. Philips Corp., New York, N.Y.

Filed Apr. 21, 1988, Ser. No. 184,310
Claims priority, application Austria, Apr. 24, 1987, 1025/87
Int. Cl.[4] B26B *19/02*
U.S. Cl. 30—43.92 **17 Claims**



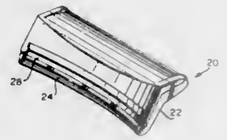
1. A shutter for a dry-shaving apparatus on which it is arranged longitudinally slidable for optionally covering or exposing a shear foil of said apparatus, which shutter comprises an elastic carrier and spaced-apart slats and can be guided laterally at both sides in groove-shaped guides provided on the dry-shaving apparatus, wherein the slats are successively enveloped in the longitudinal direction of the shutter at least partly by the elastic carrier.

4,901,437

RAZOR HEAD AND METHOD OF MANUFACTURE

Clemens A. Iten, Staunton, Va., assignor to American Safety Razor Company, Verona, Va.

Filed May 25, 1984, Ser. No. 614,234
Int. Cl.[4] B26B *21/00*
U.S. Cl. 30—50 **9 Claims**



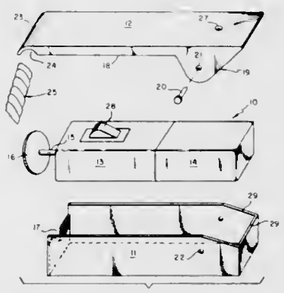
1. A razor head, comprising:
- a cap having an elongated longitudinally curved surface;
- a platform having an elongated longitudinally curved surface adapted to conform to the curved surface of said cap;
- a flexible shaving blade defining two locating holes having centers separated along the surface of the blade by a first predetermined distance, said blade being disposed between said cap and said platform and being contained therebetween to conform to said curved surfaces thereof; and
- two locating pins extending from one of said cap and platform curved surfaces to the other through the holes in said blade, said pins having parallel axes oriented at a non-zero angle to a plane normal to an axis of curvature of said curved surface from which said pins extend, said axes of said pins being separated by less than said first predetermined distance.

4,901,438

SHIELDED CABLE CUTTING DEVICE

Brian E. Gibney, 4701 Americana Dr., #304, Annandale, Va. 22003

Filed Dec. 22, 1988, Ser. No. 288,442
Int. Cl.[4] B21F *13/00*
U.S. Cl. 30—90.3 **4 Claims**



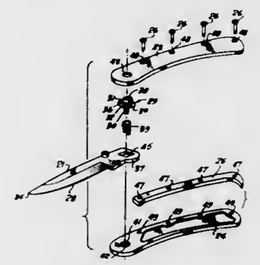
1. A hand-held cutting tool for use on shielded electric cable comprising:
- an electric motor and attached battery pack adapted to fit into a containment shell with hinged cover,
- a drive shaft projecting outwardly from said electrical motor so as to pass through a slot in one end of said containment shell,
- a rotary cutting blade affixed to the end of said outwardly projecting drive shaft,
- a springloaded contact switch which projects upwardly from said electric motor so as to be capable of being depressed by contact with the inner surface of said hinged cover, and
- a downwardly projecting leaf spring attached to said inner surface of said hinged cover.

4,901,439

LOCK BLOCK KNIFE WITH SINGLE LOCK POSITION

Francis M. Boyd, Jr., San Francisco, Calif., assignor to F. Boyd, Ltd., a California Limited Partnership, San Francisco, Calif.

Filed May 1, 1989, Ser. No. 345,432
Int. Cl.[4] B26B *1/04*
U.S. Cl. 30—161 **14 Claims**



1. In a knife having a blade with tang pivotable about an axis and including handle sides forming a pocket into which the blade is pivotable about such axis into a closed position from an open position, an axle on such axis journalled in said handle sides, a block body mounted on said axle, a cavity formed in one of said handle sides, an opening formed in said tang corresponding in size and configuration to such cavity, said block

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releasably slidable between such opening and cavity only when the blade is in its open position, and means mounted to said axle for biasing said block body, the action of said biasing means always towards said cavity,

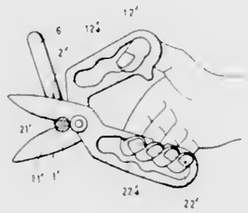
the improvement comprising said block body being eccentrically mounted to said axle so that it is offset to such cavity in the blade's closed position and it straddles both cavity and opening in the blade's open position, thus locking the blade only in open position.

4,901,440

SCISSORS

Seitaro Go, and Shoichiro Go, both of Fukui, Japan, assignors to Yugen Kaisha Go Chuzo Tekkoshio, Tsuruga, Japan

Filed Feb. 10, 1988, Ser. No. 154,294
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—254 **6 Claims**



1. A pair of scissors, comprising:

at least two elongated blades each having a cutting edge and a loop handle; and

a swivel pin connecting the blades to provide for pivotal movement thereof with respect to each other;

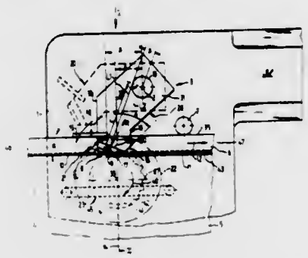
the cutting edges of both blades falling substantially in line with said swivel pin and slightly crossing each other adjacent their terminal ends when said elongated blades are brought into a closed state, the outer peripheral portion of the swivel pin serving as a stopper when the blades are opened to a degree at which the normal cutting operation begins.

4,901,441

CAN OPENER

Reinhard Kurz, Nidderau, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Feb. 22, 1988, Ser. No. 158,860
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706414; Apr. 1, 1987, 3710884
Int. Cl.[4] B67B *7/46*
U.S. Cl. 30—401 **28 Claims**



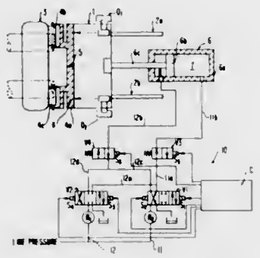
1. A can opener for serving the lid from a can, including support structure, a drive unit, a driving wheel connected in driven relation to said drive unit and rotatably mounted on said support structure, said driving wheel, for the purpose of propelling the can, being adapted to engage from outside under the seam of the can at a point of engagement, a pivot shaft on said support structure at a predetermined distance from said driving wheel, a cutter mounted on said pivot shaft and pivotable from an initial position above the lid of a can into a cutting position, said cutter having a piercing tip and an adjoining straight line cutting edge with a cutting area which is in engagement with the lid when said cutter is in said cutting position, a first abutment stop fixed on said support structure for guiding the can relative to said cutting edge, said first abutment stop being arranged rearwardly of said point of engagement on the can opener when viewed in the direction of movement of the can by said driving wheel, and a second abutment stop on said cutter, said second abutment stop acting upon the seam of the can from above the said cutter in said cutting position, a perpendicular drawn on said straight line cutting edge through said area of engagement between said cutting edge and said lid lying ahead of the center of said pivot shaft of said cutter, when viewed in the direction of movement of the can by said driving wheel, a distance that corresponds to at least half the distance between said cutting area and said piercing tip.

4,901,442

VEHICLE WHEEL TOE-IN TESTING DEVICE

Hiroshi Fujii, Higashihiroshima, Japan, assignor to Mazda Motor Manufacturing (U.S.A.) Corporation, Flat Rock, Mich.

Filed Aug. 31, 1988, Ser. No. 238,815
Int. Cl.[4] G01B *11/275, 5/255, 21/26*
U.S. Cl. 33—203.13 **13 Claims**



1. A vehicle wheel testing device for detecting the alignment of a rotating vehicle wheel, said device comprising:

a base plate slidably mounted in the device, and guide means for slidably guiding said base plate toward and away from the vehicle wheel;

a sensor member carried by said base plate for sliding therewith, and mounting means mounting said sensor member on said base plate for allowing relative movement therebetween;

urging means operatively connected to said base plate for urging said base plate and said sensor member toward the vehicle wheel to place said sensor member in contact with the vehicle wheel and for urging said sensor member against the vehicle wheel;

control means operatively connected to said urging means for controlling said urging means to place said sensor member in contact with the vehicle wheel during a set-up stage, for controlling said urging means to urge said sensor member contacting the vehicle wheel against the vehicle wheel with an initial relatively low force as the vehicle wheel is rotationally accelerated during a start-up stage, and for subsequently controlling said urging means to urge said sensor member contacting the vehicle wheel against the vehicle wheel with a relatively high testing force that is higher than said initial force during a testing stage; and

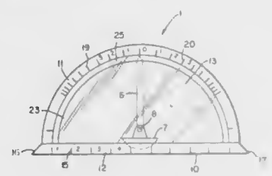
detecting means for detecting the position of said sensor member relative to said base plate during said testing stage.

4,901,443

DEVICE FOR TAKING MEASUREMENTS FOR SEWING

Mikhail Lakhman, 328 Naughton Ave., Staten Island, N.Y. 10305

Filed Oct. 24, 1988, Ser. No. 261,139
Int. Cl.[4] G01C *9/12*
U.S. Cl. 33—391 **5 Claims**



1. A device for taking measurements for sewing, comprising

a housing having a substantially semi-circular shape with a circular peripheral edge and straight transverse edge;

a plurality of scales provided on said housing and including a transverse scale arranged at said straight transverse edge for measuring a length of a body part and two peripheral scales arranged at said circular peripheral edge for measuring deviations of the body part from horizontal and vertical planes;

a standing surface provided on said housing in the region of said straight transverse edge so as to arrange said housing in a standing position with said standing surface on a body part to be measured or on an additional support during non-use;

an arm rotatably supported in said housing so as to turn and point to a respective portion of said at least two scales, said arm having two ends; and

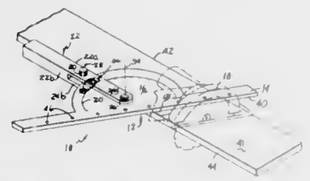
a supporting pin which pivotally supports said arm on one of said ends, and a slot provided in said housing and guiding the other of said ends of said arm.

4,901,444

METHOD AND APPARATUS FOR GUIDING A SAW RELATIVE TO AN ANGULAR CUT OF A BOARD

Frederick W. Maschmeier, 8555 Kugler Mill Rd., Cincinnati, Ohio 45243

Filed Apr. 13, 1988, Ser. No. 181,405
Int. Cl.[4] B43L *7/06*
U.S. Cl. 33—423 **2 Claims**



1. A method of using a carpenter's protractor for guiding a saw relative to an angular cut of a board, which protractor comprises

a base having a generally rectangular linear section and an arcuate section, said arcuate section extending from one edge of said rectangular linear section, said rectangular linear section having an edge opposite said one edge which is a straight edge, said base having a pair of opposed parallel faces, angular indicia on at least one face of said arcuate section of said base, a yoke-shaped arm mounted over said arcuate section of said base, said arm having a pair of fingers at one end, said fingers being located on opposite sides of said arcuate section of said base, said fingers being pivotally secured to said base, said arm having a pair of opposed straight edges, said arm having an end opposite said one end of said arm extending beyond said arcuate section of said base, and means for clamping said arm in an adjusted angular position relative to said arcuate section of said base such that either of said parallel falt faces of said base may be positioned in juxtaposition to a board with one straight edge of said arm in juxtaposition to an edge of said board,

locating said arm at a predetermined angular setting of said arm relative to said arcuate section of said base,

while maintaining said predetermined angular setting of said arm relative to said arcuate section of said base, positioning one face of said protractor against one face of said board with one straight edge of said arm in juxtaposition to one edge of said board and with said straight wedge of said rectangular linear section of said base angled at an angle other than a right angle relative to said one straight edge of said arm, and

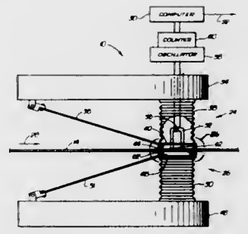
while maintaining said predetermined angular setting of said arm relative to said arcuate section of said base, repositioning said opposite face of said protractor against the opposite side of said board with one straight edge of said arm in juxtaposition to an edge of said board which is parallel and opposite said one edge of said board, and using said straight edge of said rectangular linear section of said base of said repositioned protractor as a guide surface for a saw to cut said board at said angle relative to said one edge of said board.

4,901,445

AERODYNAMIC CALIPER GAUGE

Mathew G. Boissevain, Los Altos; Michael K. Norton, Saratoga; Anthony D. Foskett, San Jose, and Tobias J. Boissevain, Mountain View, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Apr. 17, 1989, Ser. No. 339,506
Int. Cl.[4] G01B *7/04, 7/10*
U.S. Cl. 33—501.02 **19 Claims**



1. An aerodynamic sheet contact pad, the pad having front and back portions and a first side, the first side including a first surface for contact with a moving sheet and at least one indentation in the first side extending from the back end of the pad to a location along the first surface spaced from the back end of the pad

4,901,446

APPARATUS FOR FINELY ACTUATING A GLASS ELECTRODE OR THE LIKE

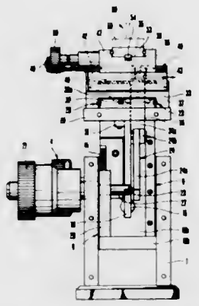
Eiichi Narishige, Tokyo, Japan, assignor to Narishige Scientific Instrument Laboratory, Ltd., Tokyo, Japan

Filed Jul. 13, 1988, Ser. No. 218,241

Claims priority, application Japan, Apr. 20, 1988, 63-53290[U]

Int. Cl.[4] G01B *5/00*

U.S. Cl. 33—572 17 Claims



1. An apparatus for adjusting the position of an instrument for the purpose of acting on a cell, said apparatus comprising:

a casing having at least one surface open;

movable portion means mounted in said casing and being provided for moving in the vertical direction;

first adjustment means for adjusting the vertical position of the movable portion means;

Y-coordinate actuating slider means mounted on said movable portion means for freely sliding along a first lateral direction perpendicular to the vertical direction;

second adjustment means for adjusting the position of the Y-coordinate actuating slider means along the first lateral direction;

X-coordinate actuating slider means mounted on said Y-coordinate actuating slider means for freely sliding along a second lateral direction perpendicular to both the first lateral direction and to the vertical direction;

third adjustment means for adjusting the position of the X-coordinate actuating slider means along the second lateral direction;

X-coordinate rough actuating slider means mounted on said X-coordinate actuating slider means for freely sliding along the second lateral direction;

forth adjustment means for adjusting the position of the X-coordinate rough actuating slider means along the second lateral direction;

Y-coordinate rough actuating slider means mounted on said X-coordinate rough actuating slider means for freely sliding along the first lateral direction; and

fifth adjustment means for adjusting the position of the Y-coordinate rough actuating slider means along the first lateral direction.

4,901,447

ELECTRICAL OUTLET AND SWITCHBOX POSITIONING DEVICE

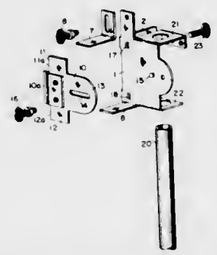
Larry E. Gottschalk, P.O. Box 435, Saint Marys, Ohio 45885

Filed Nov. 23, 1988, Ser. No. 275,572

Int. Cl.[4] B25B *11/00, 1/00*

U.S. Cl. 33—613 4 Claims

1. An outlet box positioning device comprising a body having a planar portion from which legs extend about at right angles to engage a stud, means carried by the body to releasably support an outlet box in position for fastening to a wall stud or the like, gauge marks on said body to locate such box within the outlet of a wall or the like, gripping means extending from the body to maintain such box in fastening positioning, a clamping element adjustably mounted on said body to locate such box as to depth of position within such wall, the legs comprising a pair of flat parts to engage the stud at right angles to the wall mounting surface thereof, the gripping means being positioned to engage the top and bottom surfaces



of an outlet box, to maintain the same at right angles to the flat parts aforesaid, one of said gripping means being adjustable to accommodate different size boxes, the clamping element being slidably mounted on the body to move inwardly and outwardly thereto and including a lip portion to releasably engage a box at an edge of its open area, a leg on which the body is supported, and means to maintain said body on the leg in various positions.

4,901,448

SUSPENSION PREHEATER

Wolfgang Rother, Oelde; Heinz-Herbert Schmits, Rheda-Wiedenbruck, and Heinz-Werner Thiemeyer, Ennigerloh, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Apr. 6, 1989, Ser. No. 334,186

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817355

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—85 9 Claims



1. Suspension preheater for heat exchange between gas and fines before a kiln (5), containing

(a) a plurality of cyclone separators (1 to 4) lying one above another with their axes arranged approximately vertically and each having

(a_1) an essentially straight upper part with a flat cyclone cover wall (9, 9_1),

(a_2) a lower part (10) which is axially connected to the upper part,

(a_3) an inlet pipe connection (1*a*, 11) which opens approximately tangentially into the upper part for a gas-material mixture,

(a_4) a gas outlet pipe (12) leading upwards from the region of the cyclone cover wall (9, 9_1) and

(a_5) a gas outlet pipe (13) connected to the lower end of the lower part (10),

(b) gas and material pipes (14 to 16, 17 to 19) which connect the cyclone separators (1 to 4) one below another and which for their part are connected to the corresponding inlet pipe connections as well as gas and material outlet pipes of the cyclones,

(c) a kiln exhaust gas pipe (7) which connects at least the lowest cyclone separator (1) to the kiln (5) and is at the same time constructed as a calciner, the upper section of the said pipe (7) being bent in a loop and opening into the gas inlet pipe connection (1*a*) of the lowest cyclone separator,

characterised in that the cyclone cover wall (9, 9_1) and the inlet pipe connection (1*a*, 11) of each cyclone separator (1 to 4) are inclined at an acute angle (α) with respect to the horizontal (H), and the mouth end (7*a'*) of the loop-shaped section (7*a*) of the kiln exhaust gas pipe (7) as well as the inlet pipe connection (1*a*) and the cyclone cover wall (9_1) of the lowest cyclone separator (1) have an inclination (α) which falls in the gas flow direction, whereas the inlet pipe connections (11) and the cyclone cover walls (9) of all the other cyclone separators (2 to 4) have an inclination (α) rising in the gas flow direction.

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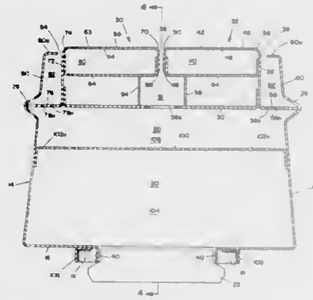
TRI-FLOTATION AIR BAR

Richard J. Wimberger, DePere, Wis., assignor to W. R. Grace & Co.-Conn., Lexington, Mass.

Filed Jun. 7, 1988, Ser. No. 203,072

Int. Cl.[4] F26B *13/00*

U.S. Cl. 34—156 35 Claims



1. Air flotation bar comprising:

a. a single chamber air bar header means;

b. three substantially parallel, longitudinal Coanda slots positioned on a top surface of said single chamber air bar header means; and,

c. chamber means in said air bar header means for passing air to each of said Coanda slots.

4,901,450

SKI BOOT LINER

Jean-Pierre Chemello, Annecy-Le-Vieux, and Thierry Perchet, Saint-Jorioz, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Sep. 2, 1988, Ser. No. 239,651

Claims priority, application France, Sep. 10, 1987, 87 12789

Int. Cl.[4] A43B *17/00, 5/04, 19/00*

U.S. Cl. 36—10 22 Claims

1. An inner boot for a ski boot comprising wall portions that define the body of said inner boot wherein at least a lower portion of said inner boot which surrounds the foot of a skier is at least partially coated by a sealing coating of polyurethane, wherein said wall portions are made from a material that is mechanically compatible for adhesively receiving the polyurethane coating, wherein said wall portions are made from foam injected polyurethane, and wherein said polyurethane coating is of a greater density than the foam injected polyurethane wall portions.

4. A process for manufacturing a ski boot inner boot which comprises:



(a) degreasing an inner boot by soaking said inner boot in a solvent bath;

(b) drying the degreased inner boot;

(c) soaking at least a portion of said inner boot in a polyurethane solution to coat said inner boot with polyurethane;

(d) removing excess polyurethane solution from said inner boot; and

(e) cool drying said inner boot.

4,901,451

TIGHTENING DEVICE FOR ATHLETIC SHOE

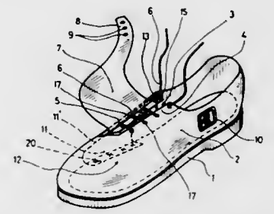
Christophe Cumin, Annecy, France, assignor to Salomon S. A., Annecy, France

Filed Apr. 11, 1988, Ser. No. 179,801

Claims priority, application France, Apr. 10, 1987, 87 05560

Int. Cl.[4] A43B *7/18, 7/14*

U.S. Cl. 36—50 8 Claims



1. Athletic shoe comprising a sole to which is attached a vamp constituting the shaft of the shoe, containing in its upper anterior portion a slit opening toward the upper part of said shaft, the slit being associated with means for tightening the shoe and being covered by a closing flap, wherein

(a) one (4) of the edges of the slit (3) is comprised of a free end of a first side of the vamp (2), the other (16) edge of said slit (3) being comprised of a free end of a yoke (11) attached to the sole (1) on a second side of the vamp (2) and to the inside of the vamp;

(b) the closing flap (7) is comprised of the extension of the said second side of the vamp (2) extending transversely to

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the longitudinal axis of the shoe in order to cooperate with the means for tightening the shoe located on the first side of the vamp; and

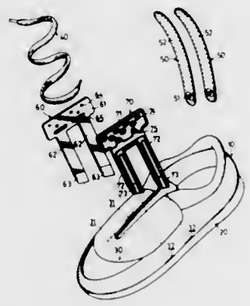
(c) said internal yoke (11) is partially joined to the second side of the vamp (2) at a point (14) located on an upper border 13 of said vamp.

4,901,452

SHOE WITH ADAPTABLE OVERLAY

Win J. Wang, Room 3, 4 Floor, No. 309, Tun Hwa N. Rd., Taipei, Taiwan

Filed Mar. 24, 1989, Ser. No. 328,330
Int. Cl.[4] A43B *11/00*; A43C *5/00, 9/00*
U.S. Cl. 36—50 **7 Claims**



1. A shoe with an adaptab' · overlay comprising:

a sole;

an upper with a pair of first slits and a pair of second slits respectively formed on a first lateral side and a second lateral side thereof and substantially parallel with said sole;

a lace;

an adhering band set including at least one adhering band having a pin formed on an end thereof;

a first cover element which is combinable with the shoe through said pair of first slits, said first cover element comprising a first strap having two first limbs with first wedge-shaped ends, a plurality of first eyelets for receiving said lace, a number of elongated slots which correspond to a number of pins of said adhering band set for receiving said adhering band set; and

a second cover element which is combinable with the shoe through said pair of second slits, said second cover elements comprising a second strap having two second limbs with second wedge-shaped ends, a plurality of second eyelets for receiving said lace, and a number of pin holes which correspond to the number of pins of said adhering band set, said pin holes for receiving and engaging with said pins.

4,901,453

BALLET SLIPPER AND METHOD OF MANUFACTURING A BALLET SLIPPER

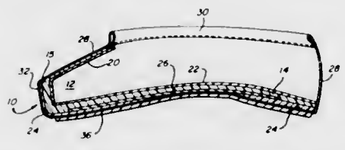
Elizabeth H. Gaynor, 688 Hulls Farm Rd., Southport, Conn. 06490

Filed Mar. 18, 1988, Ser. No. 169,970
Int. Cl.[4] A43B *5/12, 5/00*
U.S. Cl. 36—113 **32 Claims**

1. A ballet slipper comprising:

an integral shank and toe box molded from a thermoplastic polymeric material, said toe box including a platform at its forward end and a curved radius joining said platform and said shank;

a soft resilient polymeric material lining the interior of the upper portion of said toe box and extending backwardly from the edges of said toe box; and



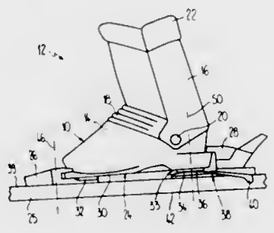
a resilient shock absorbing polymeric material covering the exterior surface of said curved radius and said platform.

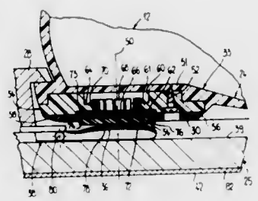
4,901,454

SKI BOOT

Klaus Walkhoff, Kreuzlingen, Switzerland, assignor to Raichle Sportschuh AG, Kreuzlingen, Switzerland

Filed Sep. 9, 1988, Ser. No. 243,290
Claims priority, application Switzerland, Sep. 18, 1987, 03609/87
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—117 **9 Claims**





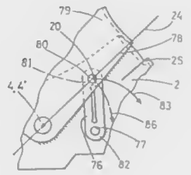
1. A ski boot having a vamp and a sole and including a heel area, comprising a heel element rotatable in an area of the heel about an axis which substantially extends perpendicuarly to the surface of the sole, which heel element can be brought to bear on a support located on a ski.

4,901,455

ALPINE SKI BOOT

Joseph Morell, Annecy; Jean-Louis De Marchi, Duingt, and Norbert Kopp, Chavanod, all of France, assignors to Salomon, S.A., Annecy Cedex, France

Division of Ser. No. 870,374, Jun. 4, 1986, Pat. No. 4,769,930.
This application Apr. 22, 1988, Ser. No. 184,781
Claims priority, application France, Jun. 12, 1985, 8509180
The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—117 **51 Claims**



1. A ski boot comprising:

(a) a shell base;

(b) an upper adapted to engage the lower leg of a skier, wherein said upper is at least partially journalled on said shell base around a pivot axis so as to permit flexion of said upper with respect to said shell base; and

(c) means for controlling said flexion of said upper, wherein said flexion control means is mounted to operate in compression upon forward flexion of said upper, and is attached to said shell base at a predetermined distance from said pivot axis at a linkage point, wherein said flexion control means is connected to said upper at a support point, wherein said flexion control means extends within a substantially vertical plane with respect to the plane of the sole of said ski boot, said flexion control means comprises means:

for maintaining a substantially invariant distance from said pivot axis to said support point during forward flexion of said upper;

for maintaining a substantially invariant distance from said pivot axis to said linkage point during forward flexion of said upper; and

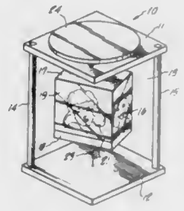
for varying the distance from said support point to said linkage point during forward flexion of said upper.

4,901,456

MAGNETICALLY SUPPORTED DISPLAY

Peter Cotutica, 23127 Meyler Ave., Torrance, Calif. 90502

Filed Nov. 21, 1988, Ser. No. 273,807
Int. Cl.[4] G09F *1/12*
U.S. Cl. 40--152.1 **25 Claims**



1. A display device comprising:

a base having an open display area;

an at least partly transparent display holder disposed in said display area in spaced relationship to said base the holder being formed to removably receive within the at least partly transparent display holder an article for display;

means carried on said base for supporting said at least partly transparent display holder having a flexible anchor securing said at least partly transparent display holder to said base and first magnetic means carried on said base and cooperating with a second magnetic means of at least partly transparent display holder whereby magnetic forces hold said at least partly transparent display holder within said display area against said anchor,

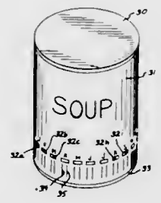
said holder including a transparent cube surrounding a block and said article to be displayed being disposed between said block and said cube, wherein said article to be displayed is a photograph, said base including a pair of plates held apart by supports and the opposing surfaces of said plates defining said display area, said magnetic means including a first magnetic means fixed on an upper one of said plates and a second magnetic or ferro-magnetic material carried on said holder in a groove in the block in close proximity to said base plate carrying said first magnetic means.

4,901,457

CONTAINER LABEL

Donald O. Chandler, 9724 W. Hayes Pl., West Allis, Wis. 53227

Filed Oct. 13, 1987, Ser. No. 107,272
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—306 **9 Claims**



1. In combination with a container, a container label comprising:

a tearable sheet having a rear surface disposed entirely against the outer surface of the container, said sheet having at least one continuous marginal edge with a plurality of spaced slots formed in the sheet and that are adjacent to and spaced inwardly from the marginal edge, the portion of the sheet between each slot and the marginal edge being adapted to be adhere to a container and being displaceable by tearing away from the slit to the marginal edge, the sheet portion between each slot and the marginal edge is weakened to facilitate the removal of the sheet portion by tearing.

4,901,458

SIMULATED WINGED INSECT OR THE LIKE FOR ADVERTISING DISPLAY

Martin P. Belokin, and Norman P. Belokin, both of Denton, Tex., assignors to Martin Paul, Inc., Denton, Tex.

Filed Sep. 7, 1988, Ser. No. 241,357
Int. Cl.[4] A63H *13/20*
U.S. Cl. 40—414 **10 Claims**

1. A display simulating a flying insect such as a butterfly, bee or the like, and comprising;

a rotatably driven member having a central, generally vertically disposed hole for being drivingly engaged on a driving shaft,

a thin, tempered piano wire of a small diameter having

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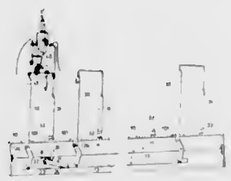
means for being attached to said driven member adjacent the periphery of the latter,

said wire extending upwardly from said driven member and being bent to form a bent portion at an upper portion of said wire,



and a simulated insect such as a butterfly or the like secured to the upper end of said wire, whereby when said simulated insect display is drivingly rotated, said insect assumes a flying motion in a wide swinging and vigorously undulating action.

4,901,459
SWING DEVICE FOR DOLLS IN GROUPS
Yeong R. Lee, P. O. Box 10780, Taipei, 10099, Taiwan
Filed Nov. 25, 1987, Ser. No. 125,187
Int. Cl.[4] G09F *19/08*
U.S. Cl. 40—414 20 Claims



1. A drive device for providing decorative action to a doll comprising:

a first doll leg;

a second doll leg;

a main frame comprising a first frame portion and a second frame portion;

said first frame portion being mounted on and supported by said first and second legs;

a first slotted follower mounted on said first frame portion;

said second frame portion being pivotally mounted on said first frame portion for supporting an upper portion of the doll; and

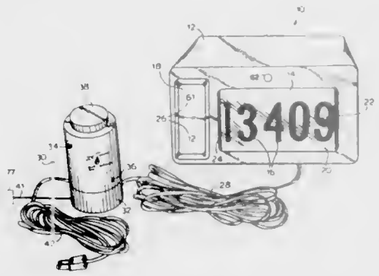
a first activating means, including an eccentric pin member operatively connected in a slot of said first slotted follower, mounted on said main frame for moving said second frame portion relative to said first frame portion between a first position and a second position, such that a first animated motion is imparted to said second frame portion of said doll upon activation of said first activating means.

4,901,460
DISPLAY DEVICE
Maurice Grosse, London, United Kingdom, assignor to Jewell Poster Machines Limited, United Kingdom
Filed Apr. 6, 1988, Ser. No. 178,146
Claims priority, application United Kingdom, Apr. 16, 1987, 8709196
Int. Cl.[4] G09F *11/00*
U.S. Cl. 40—476 7 Claims



1. A display device for displaying a number of indicia one after the other, said device comprising a plurality of flexible sheets for supporting indicia on their opposite sides, each of said sheets including suspension means at or near its uppermost and lowermost when vertically disposed ends, the device also comprising a roller, a ramp for receiving said sheets in a stack with the indicia at one side of an end sheet visible to a viewer of the device, means for defining a closed path around the roller for the suspension means between opposite ends of said ramp, electrically-driven means for positively engaging the uppermost suspension means of a sheet in the viewing position and for transporting that sheet around the roller, gate means which are displaceable upon engagement thereof by said uppermost suspension means, owing to the positive engagement of the uppermost suspension means by the electrically-driven means to permit movement of said uppermost suspension means out of said path, the uppermost suspension means subsequently being the leading suspension means as regards the direction of displacement around the roller, the lowermost, and subsequently trailing, suspension means of each sheet, being unengaged by said electrically-driven engaging means, remaining in said closed path and hence reaching said ramp to place successive sheets at the opposite end of the stack, and electrically-operated mechanism for governing the length of time during which the indicia occupy the position in which they are visible to a viewer of the device, and wherein guide means for said suspension means embraces at least an upper region of said roller and is also provided in a rear region of the device relative to said viewing position, the guide means provided in a rear region of the device relative to said viewing position comprising a substantially vertically extending strap.

4,901,461
HOUSE IDENTIFICATION FIXTURE
Raymond A. Edwards, and Kevin S. Edwards, both of Tuxedo Park, N.Y., assignors to Light-House Products, Inc., Tuxedo Park, N.Y.
Continuation-in-part of Ser. No. 779,809, Sep. 25, 1985. This application Jan. 11, 1988, Ser. No. 142,513
Int. Cl.[4] G09F *13/04*
U.S. Cl. 40—575 12 Claims



1. An apparatus for identifying a house comprising:

a display unit having a low voltage light source there within, and having an identification symbol on the display unit and illuminated by the light source, the display unit comprising a rectangular housing with no reflector and having a window on a front face, the light source comprising a plurality of light bulbs within the housing, there being enough light bulbs to provide reliable illumination without a reflector after some bulbs fail, and a translucent panel mounted in the window having the identification affixed thereon;

a power pack in electrical communication with the display unit, the power pack including a source of low voltage and a multi-modal electronic control circuit for operating the display unit in at least three separate modes including an emergency and a non-emergency mode;

the controls provided by the power pack comprising a remote sensor control for illuminating the display unit independently of said multi-modal control including illumination when the apparatus is switched off; and

an electrical, commercial power source in electrical communication with the power pack for energizing the source of low voltage.

4,901,462
LUGGAGE TAG
Marilyn F. Wrigley, 3746 Harrison, Kansas City, Mo. 64109
Filed Sep. 18, 1987, Ser. No. 98,605
Int. Cl.[4] G09F *3/14*
U.S. Cl. 40—565 1 Claim

1. An ornamental luggage tag, comprising:

a soft flexible plastic hollow body portion configured as a teddy bear;

said body portion being treated with a phosphorescent material whereby it will glow in the dark;

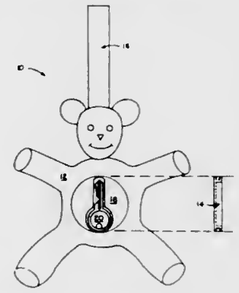
a central circular opening in said body portion;

a soft plastic cylindrical flexible cap removably covering said opening;

said cap having a circular peripheral groove for engaging said body portion, an upper portion of said cap disposed above an upper surface of said body portion when said cap is engaged over said opening;

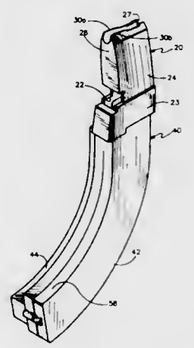
identifying indicia formed on said cap;

a key shaped recess formed within said hollow body portion, said key shaped recess dimensioned for close conformance and frictional engagement with a suitcase key, said key shaped recess covered by said cap;



and a resilient plastic circular loop clip connected to said body portion for attaching said luggage tag to an article of luggage.

4,901,463
CARTRIDGE MAGAZINE HAVING A SINGLE PIECE MAGAZINE HEAD
M. Gaines Chesnut, 1171 Barlow Dr., Kremmling, Colo. 80459
Filed Oct. 29, 1987, Ser. No. 116,035
Int. Cl.[4] F41C *25/02*
U.S. Cl. 42—50 9 Claims



1. A magazine for housing a number of cartridges, comprising:

a magazine body for containing a number of cartridges and including a pair of sidewalls and a pair of end walls with said sidewalls having a greater lateral dimension than the lateral dimension of each of said end walls and said magazine body having a longitudinal extent with said sidewalls and said end walls having upper portions;

a magazine head having a longitudinal extent less than said longitudinal extent of said magazine body, said magazine head being made separately from said magazine body, wherein said magazine head includes a skirt having a lateral dimension extending in a direction across said magazine body sidewalls and an upper member having a lateral dimension substantially parallel to said skirt lateral dimension, said skirt being disposed about and outwardly of said upper portions of said magazine body end walls to overlap said upper portions of said end walls, said upper member lateral dimension being less than the lateral dimension of said magazine body side walls throughout

substantially all of said longitudinal extent of said upper member; and

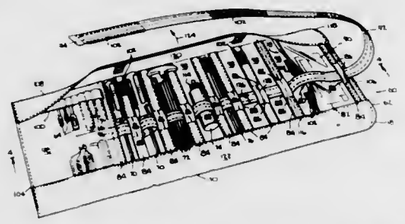
means for connecting said magazine body to said magazine head.

4,901,464

GUN DISASSEMBLY AND CLEANING KIT

Ike Banoun, Brentwood, Calif., assignor to Alsa Corporation, Brentwood, Calif.

Filed Apr. 26, 1988, Ser. No. 186,393
Int. Cl.[4] F41C *31/00*
U.S. Cl. 42—95 10 Claims



1. A portable gun disassembly and cleaning kit that may be used to disassemble and clean essentially all types and sizes of guns and that may be used in the field, said kit comprising:

(a) implements for disassembling and cleaning essentially all types and sizes of guns, the implements being securely held in their storage spaces in the carrying case of element (b); and

(b) a flexible, foldable, oil-resistant and water-resistant carrying case, said case being capable of being rolled up in jelly roll-fashion into its closed configuration and unrolled into a substantially flat open configuration; the case having two oppositely disposed longer edges, two oppositely disposed first and second shorter edges, an inner surface, an outer surface that is outwardly disposed when the case is closed, and elastic strap means attached to the inner surface for releasably holding small implements; rolling to close the case starting with the first shorter edge so that when the case is in its closed configuration the second shorter edge is exposed; the inner surface carrying gateways means that are attached to it and are spaced from one another on the inner surface, each such means having a portion that is not attached to the inner surface of the case so as to define a gateway, the gateways lying substantially in a line roughly parallel to the direction in which the case is rolled to close it; an elongate strap passing through the gateways and having two ends, the elongate strap being fixed to the case near one end of the strap and extending beyond the second shorter edge of the case; two adjacent gateways means, the inner surface of the case therebetween, and the portion of the elongate strap therebetween defining a storage space for one or more of the implements; all of the gateways being large enough in comparison to the cross-section of the elongate strap so that the strap can be easily pulled through all of the gateways to securely hold all of the implements in their storage spaces when the case is closed.

4,901,465

RIFLE GUN BARREL CLEANER

Chung-Ching Hsu, 51-2, Lane 265, Tai-Peng Rd., Taipeng Hsiang, Taichung Hsien, Taiwan

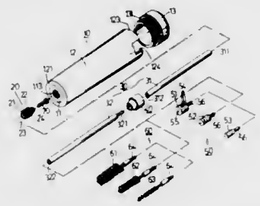
Filed Jan. 26, 1989, Ser. No. 302,413
Int. Cl.[4] F41C *31/00*
U.S. Cl. 42—95 3 Claims

1. An apparatus for cleaning a gun barrel, said apparatus comprising:

a tubular casing having a first opened end covered with a removable cap, a second opened end in which a cylindrical member is integrally fixed, and a receiving chamber defined between said cap and said cylindrical member, said cylindrical member having a threaded central bore formed therein which opens to said second end of said tubular casing;

a connecting means which includes a sleeve having a threaded outer surface for being threaded into said threaded central bore;

a cleaning rod having a plurality of sections detachably connected with one another, said cleaning rod detachably engaged with said connecting means at one end thereof, wherein said cleaning rod is inserted into one end of said sleeve at the end of said cleaning rod on which a threaded bore is formed, the other end of said sleeve having a counter bore in which a screw is mounted so as to be



threaded into said threaded bore at the end of said cleaning rod and enable said cleaning rod to engage with said sleeve, and one of said sections of said cleaning rod, which is connected with said sleeve, has two oppositely threaded bores, each of the remaining sections of said cleaning rod having a threaded insert end and an oppositely threaded bore, said sections of said cleaning rod being interconnected by the interengagement of said threaded bores and said threaded insert ends; and

cleaning members for wiping off dirt and powder attached to the inner surface of the gun barrel, said cleaning members being selectively and detachably connected to the other end of said cleaning rod; whereby said apparatus can be dismantled and said connecting means, said cleaning rod and said cleaning members can be stored in said receiving chamber of said tubular casing after use.

4,901,466

FISHING LURE TREATMENT

Raymond K. Davis, 40 Edgewood Dr., Lawrenceburg, Ind. 47025

Filed May 3, 1988, Ser. No. 189,538
Int. Cl.[4] A01K *85/01*
U.S. Cl. 43—4.5 7 Claims

1. In combination a fishing lure and a treatment applied to said lure said treatments comprising a water soluble chemical composition and means to gradually disperse said chemical composition when said treatment is in water;

wherein said water soluble chemical composition has a negative heat of solution.

4,901,467

ARROW TIP FOR FISHING

Ritch A. Stolpe, R.R. 4, Box 28, Sioux City, Iowa 51109

Filed Apr. 27, 1989, Ser. No. 343,867
Int. Cl.[4] A01K *81/04*
U.S. Cl. 43—6 12 Claims

1. An arrow tip for use in bowfishing comprising an elongated body having a rear end with means for connecting said tip to an arrow, a point attached to a front end of said body with means to facilitate penetration of said tip into said fish, pivoting retainer means moveable to at least three positions, a

first position being a shooting position, a second position being a retention position, a third position being a removal position,



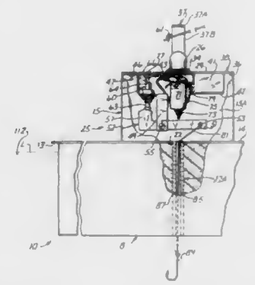
said retainer means being a blade having a pivoting end attached to the body and having a surface which contacts said point to restrict rearward rotation of said blade.

4,901,468

BUOYANT FISHING DEVICE AND METHOD OF USING SAME

Herman Blackledge, 322 Park Ave., East Peoria, Ill. 61611

Filed Jun. 16, 1989, Ser. No. 367,426
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—17 9 Claims



1. A signalling fishing device for attachment to a fishing line, comprising:

buoyant base means having an opening for passage of the fishing line therethrough;

compartment means mounted on top of said base;

signaling means disposed within said compartment means for generating a visible attention attracting signal when a fish strikes the fishing line;

switch actuating means connected to the fishing line for causing said signaling means to generate said signal; and

cover means defining a portion of said compartment means for moving to an opened position to permit access to the interior of said compartment means.

4,901,469

EXPANSIBLE FRAME FOR MOUNTING DOWNRIGGERS

Mark T. Murray, 1060 E. Long Lake Rd., Bloomfield Hills, Mich. 48013

Filed Apr. 17, 1989, Ser. No. 338,575
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 13 Claims

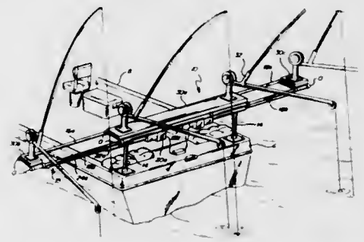
1. An expansible device for mounting fishing rigs such as downriggers thereon mountable on the stern of a boat, said device comprising:

at least one elongated member adapted to extend horizontally across substantially the width of the boat proximate the stern;

means for mounting said at least one member on the transom of the boat;

at least one expansion means including:

an extension associated with a first end of said elongated member and slidingly engagable with said member, said extension being adapted to move from a first position wherein an outboard end thereof is disposed proximate



the first end of said member to a second, extended position wherein said outboard end projects past said first end in an outboard direction to provide an extended surface for the mounting of a fishing rig thereon; and

means for reciprocating said extension between said first and second positions; and

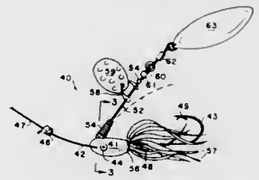
operator actuated means for controlling the reciprocating means.

4,901,470

COILED SPRING SPINNER FISHING LURE

Donald D. Gentry, P.O. Box 64, Carterville, Ill. 62918

Filed Jul. 29, 1988, Ser. No. 225,856
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.13 20 Claims



1. A spinner fishing lure comprising a weighted body means having leading and trailing portions, fishing line attaching means carried by said leading portion of the body means for attaching a fishing line to said lure, hook means carried by said body means including shank and point portions, said shank portion extending from said trailing portion of the body means and away from said leading portion of the body means and terminating in said point portion, flexible spinner blade arm means carried by said body means having leading and trailing portions, said leading portion of the flexible arm means extending from said body means and then outwardly and away from said leading portion of the body means, said body means and said shank portion of the hook means extending longitudinally of said lure, said trailing portion of the flexible arm means and said point portion of the hook means being spaced from each other and on the same side of said shank portion of the hook means, resilient supporting means including a coiled spring carried by said body means for resiliently supporting said leading portion of the flexible arm means adjacent said body means, said resilient supporting means being effective to cause

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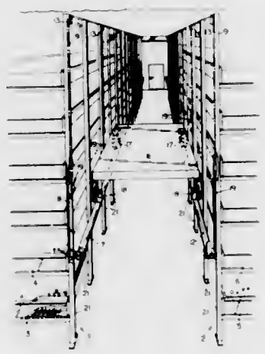
said leading portion of the flexible arm means to resist kinking adjacent said body means, said resilient supporting means also being effective to aid in maintaining said spaced relationship between said trailing portion of the flexible arm means and said point portion of the hook during retrieval of said lure, and fish attracting spinner blade means carried by said flexible arm means.

4,901,471

APPARATUS FOR CULTIVATING MARKET GARDEN PRODUCTS, PARTICULARLY MUSHROOMS

Hendrik van den Top, Bellstraat 19, 3771 AH Barneveld, Netherlands

Filed May 13, 1988, Ser. No. 193,763
Claims priority, application Netherlands, May 22, 1987, 8701239
Int. Cl.⁴ A01G *1/04*
U.S. Cl. 47—1.1 **11 Claims**



1. Apparatus for cultivating market garden products such as mushrooms, which comprises the combination of:
- a building defining a space within which a desired climate is maintained;
- a pair of horizontally spaced and opposed racks, each including horizontal trays disposed in vertically spaced relation and adapted to contain soil for growing the product;
- a work platform of a length which is small compared with the length of the racks;
- horizontal guide means for traveling the work platform back and forth along the racks, there being one horizontal guide means along each rack and the two horizontal guide means being in spaced opposition to each other;
- vertical guide means spaced lengthwise along the racks; and
- the horizontal guide means being engaged with the vertical guide means for guiding the horizontal guide means vertically.

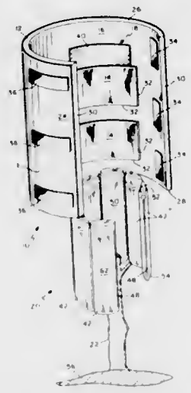
4,901,472

METHOD AND APPARATUS FOR THE PROTECTION OF CITRUS TREES FROM FROST DAMAGE

Thomas P. Donohue, 107 Lindoo Ave., and Richard L. Nash, 120-½ E. Fritz, both of Ladysmith, Wis. 54848

Filed Sep. 16, 1988, Ser. No. 245,891
Int. Cl.⁴ H01G *13/00*
U.S. Cl. 47—2 **27 Claims**

1. A protective device for protecting a tree from damage due to frost, said tree including a trunk or branch having a circumference, said protective device being applied to the tree by a user, said protective device comprising:
- an insulating protective pad, said protective pad having two opposing end edges and a length measured therebetween sufficient that said protective pad may be wrapped around the trunk or branch of the tree in a generally upright position and creating a barrier to retard the loss of thermal energy from the proximity of the trunk or branch of the tree;
- means for securing said protective pad in said generally upright position wrapped around the trunk or branch of the tree;
- at least one self-contained exothermic heat source which produces heat other than by the release of the latent heat of fusion of a liquid, said exothermic heat source being



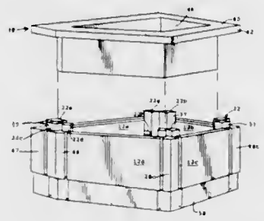
positioned between said protective pad and the trunk or branch of the tree and capable of selectively generating sufficient and sustained thermal energy over a prolonged period when activated by the user to warm the tree to a temperature above the freezing point of water and prevent frost damage to the tree; and
- means for securing said exothermic heat source at a predetermined position relative to said protective pad and the trunk or branch of the tree and enclosed within said protective pad.

4,901,473

KNOCKDOWN FURNITURE

Joaquin Taule, Rio Piedras, P.R., assignor to Tamcor Manufacturing Corporation, Trujillo Alto, P.R.

Filed Oct. 19, 1987, Ser. No. 109,398
Int. Cl.⁴ A01G *9/02*
U.S. Cl. 47—66 **6 Claims**



1. Knockdown furniture comprising a plurality of planar side panels each having inner and outer sides, at least some of which when the furniture is assembled being angularly related to each other to define a closed vertical frame having corners arranged between pairs of adjacently arranged angularly related said planar side panels, said closed vertical frame defining

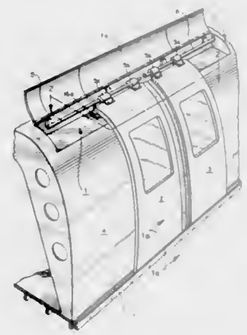
a predetermined shape, a separate vertical post located at each end of each said planar side panel, each side post having a top and bottom end, complementary interengaging releasable fastening means at said each end of each said planar side panel and on each said vertical post for connecting each said vertical post to said inner side at said each end of each said planar side panel, a pilaster located at each said corner, each said pilaster having two angularly related sides corresponding to an angle defined by each said pair of adjacently arranged planar side panels, additional complementary interengaging releasable fastening means on said two sides of each said pilaster and on each said vertical post for releasably connecting together two of said vertical posts and hence each said pair of adjacently arranged side panels, each said vertical post having an upstanding end part extending freely a predetermined distance above each said panel and each said pilaster, and a unitary cover member having a peripheral shape complementary to said predetermined shape of said closed frame defined by said panels, said vertical posts and said pilasters, said cover including an integral continuous flange extending entirely about its periphery to be received over the freely extending upstanding end parts of said vertical posts for resting on top ends of said vertical posts, said flange including a downturned part concealing, at least in part, the upstanding end parts of said vertical posts.

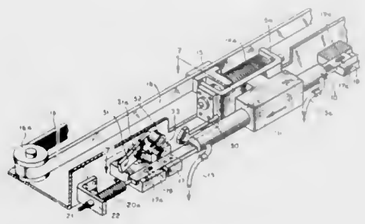
4,901,474

PNEUMATIC DOOR OPERATOR HAVING NOVEL PNEUMATIC ACTUATOR AND LOCK

Robert G. Bayard, St. Eustache, and Anthony J. Walsh, Lachine, both of Canada, assignors to Vapor Corporation, Chicago, Ill.

Filed Mar. 11, 1988, Ser. No. 167,221
Int. Cl.⁴ E05F *15/02*
U.S. Cl. 49—26 **8 Claims**





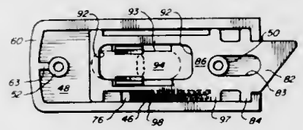
1. In a power door operator of the type using a speed controlled pneumatic cylinder having an internal piston and opposing ends, said cylinder used to provide limited force articulate motion of the piston and at least one door, the improvement comprising:
- means articulating piston and door motion for moving said door between open and closed positions;
- means admitting pressurized fluid to said cylinder for producing piston travel from a first door open position to a second door closed position said piston position adjacent one said cylinder end, said first and second piston positions and piston travel in said cylinder defining a first piston to cylinder end distance in said cylinder for a door open position, and piston travel from said second to first position adjacent the opposite cylinder end further defining a second piston to cylinder end distance for a door closed position;
- means mounting said cylinder for lateral motion from a first to a second cylinder position, said motion responsive to cylinder reaction forces on said admission of pressurized fluid;
- means limiting said cylinder lateral motion to predetermined distance less than said piston travel against predetermined force less than said reaction force;
- a mechanical lock operable by said cylinder motion for locking said articulating means and preventing door movement when said piston is in said second position in said cylinder, and said cylinder is in said first position and, said admission of pressurized fluid to said cylinder produces said piston travel from said first to second position;
- means on said lock responsive to said cylinder lateral motion for releasing said lock when said piston moves from said second to said first position and said cylinder moves from said first to second positions.

4,901,475

EXTERNALLY MOUNTED LATCH FOR SLIDABLE SASH WINDOW

Harold Simpson, Hazel Crest, Ill., assignor to Ashland Products Company, Chicago, Ill.

Continuation-in-part of Ser. No. 148,035, Jan. 25, 1988, Pat. No. 4,837,975. This application Jul. 28, 1988, Ser. No. 225,198
Int. Cl.⁴ E05D *15/22*
U.S. Cl. 49—175 **5 Claims**



1. In a pivotal window sash adapted for installation in the master frame of a double-hung sash window assembly having opposed, vertically extending guide rails to enable vertical reciprocal sliding movement of the sash in the master frame while cooperatively engaged with the guide-rails, the sash having a header, a base and a pair of stiles cooperatively connected together at adjacent extremities thereof to from a rectangular sash frame; the herein invention comprising a manually operable latch adapted to be installed as a pre-assembled unit on an exterior surface of the header for releasably securing said sash to said master frame to permit pivotal movement of said sash and comprising:
- a housing including a top wall having an elongated access opening therethrough, a pair of opposing end walls, one of said end walls having a passageway therethrough;
- a latch bolt slidably received in said housing and having a beveled end aligned with and reciprocal in said passageway and arranged to be engaged in a guide rail for locking the window sash against pivotal movement;
- spring means in said housing and engaging said latch bolt normally to bias said beveled end into said guide rail;
- said latch bolt having a laterally extending lip formation

integral therewith and having a lateral free edge for overlying said spring means and retaining said spring means in operable assembly in the housing;

said top wall having integrally formed means for engaging and retaining the latch bolt in operable assembly in the housing and permit reciprocal sliding movement thereof, comprising a pair of spring-like clip formations depending from said top wall along opposing longitudinal edges of said access opening to engage said latch bolt along opposing longitudinal edges thereof, said latch bolt having an upstanding actuator member integral with a surface of said latch bolt and slidable in said access opening for manually moving the latch bolt.

4,901,476

WINDOW PANE STRUCTURE

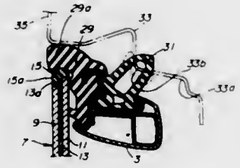
Setsuko Nagashima, and Satoru Ugawa, both of Hadano, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 9, 1988, Ser. No. 229,980

Claims priority, application Japan, Aug. 11, 1987, 62-199229; Aug. 11, 1987, 62-199230

Int. Cl.[4] E06B *7/16*

U.S. Cl. 49—488 **29 Claims**



14. A motor vehicle comprising:

a body with an outer surface, said body having a door opening;

a door with a window pane frame, said door being operatively received in said door opening;

a window pane runner secured to said window pane frame; and

a window pane structure which is slidable along said window pane runner, said window pane structure comprising a laminated glass having inner and outer surfaces and a peripheral edge, and an unitary elastic strip secured to and coextensive with said peripheral edge, said elastic strip having an outer surface which is flush with an outer surface of said laminated glass,

wherein when said door assumes its closed position relative to said door opening, said outer surfaces of said elastic strip and said laminated glass become flush with said outer surface of the vehicle body.

4,901,477

APPARATUS FOR ABRASIVE MACHINING

Teimuraz N. Loladze, ulitsa Lenina, 75, kv. 33; Boris I. Batiashvili, prospekt Vazha Pshavela, 77, kv. 134, and Gennady L. Mamulashvili, ulitsa Oktyabrskaya, 263, kv. 35, all of Tbilisi, U.S.S.R.

PCT No. PCT/SU88/00050, § 371 Date Nov. 7, 1988, § 102(e) Date Nov. 7, 1988, PCT Pub. No. WO88/06950, PCT Pub. Date Sep. 22, 1988

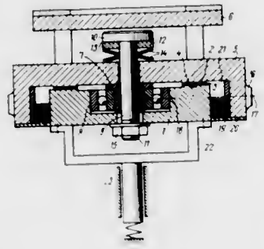
PCT Filed Mar. 3, 1988, Ser. No. 283,272

Claims priority, application U.S.S.R., Mar. 10, 1987, 4201398/08

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—109 R **4 Claims**

1. An apparatus for abrasive machining comprising an annular support (1) carrying a thrust bearing (2) and a faceplate (5;25) operatively connected to a drive and carrying an abrasive tool (6), the faceplate being mounted by means of the thrust bearing (2) for rotation in a radial bearing (8;31) provided inside the annular support (1), characterized in that the faceplate (5;25) has a coaxial bushing (7;24) provided on its inner end face and journalled in the radial bearing (8;31), and in that the faceplate (5;25) and the annular support (1) are elastically coupled to each other by means of an axle (9) having a shoulder (10;28) at one end thereof and a threaded portion (11) and a nut (15) at the other end thereof, the axle extending



through the bushing (7;24) and a central hole of the annular support (1) and being spring-biased in the direction of preload in the thrust bearing (2), the faceplate (5;25) being connected to the axle (9) for rotation relative thereto by means of an auxiliary thrust bearing (12;26) and having a driven member (16;36) of the drive on the outer cylindrical periphery thereof, a plane (17;37) drawn through the middle of width of the driven member extending in a plane (18) drawn substantially through the middle of width of the radial bearing (8).

4,901,478

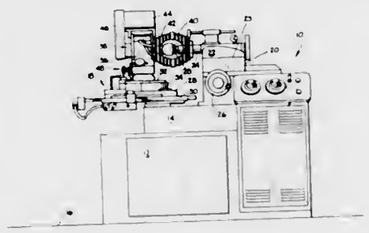
RADIAL DIAMOND ALIGNMENT APPARATUS FOR A LENS GENERATOR

William D. Kane, Bettendorf, Iowa, assignor to The United States Shoe Corporation, Cincinnati, Ohio

Filed Mar. 31, 1988, Ser. No. 176,665

Int. Cl.[4] B24B *13/005*

U.S. Cl. 51—124 L **14 Claims**



1. An apparatus for adjusting a quill of an optical lens generating machine, comprising:

a base;

means for supporting an optical lens blank at a predetermined location relative to the base;

a slide deck supported by said base;

a pivot pin;

means for arcuately moving the slide deck relative to the base about the pivot pin;

a quill riser mounted on the slide deck, said quill riser being movable relative to the slide deck about a first way system;

a quill holder supported by said quill riser;

a grinding tool;

a quill rotatably mounted in the quill holder for rotating the grinding tool;

a radial way system for guiding displacement between the quill holder and the quill riser, the quill holder being movable on the radial way system toward and away from the pivot pin;

means for accurately and bidirectionally effectuating controlled radial displacement of the quill holder relative to the quill riser on the radial way system; and

gauging means for simultaneously measuring and visually displaying the relative radial displacement of the quill holder relative to the quill riser whereby the relative radial position between the quill holder and the quill riser can be adjusted and measured simultaneously.

4,901,479

PORTABLE HAND MACHINE TOOL, PARTICULARLY ANGLE GRINGER

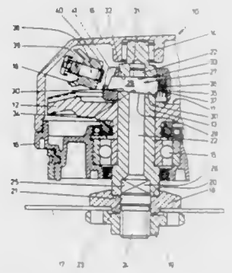
Winfried Helm, Leinfelden, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 343,143

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642153

Int. Cl.[4] B24B *23/02*

U.S. Cl. 51—170 R **13 Claims**



1. A portable hand machine tool, particularly, an angle grinder, comprising a hollow drive shaft having opposite ends; a counterflange mounted on one of said opposite ends of said hollow drive shaft for joint rotation therewith; a spindle having a longitudinal central axis and extending through said hollow drive shaft and coupled thereto for joint rotation therewith and axial displacement relative thereto, said spindle extending through said counterflange and having a threaded end portion; a clamp nut received on said threaded end portion of said spindle and cooperating with the said counterflange for clamping a tool therebetween; a slide member having an inclined surface and slidable in a direction transverse to the longitudinal central axis of said spindle to provide for axial displacement of said spindle relative to said drive shaft and for axial slackening of said clamp nut, said slide member being formed as a wedge coupled to said drive shaft and said spindle for joint rotation therewith and extending transverse through said drive shaft and said spindle, said drive shaft having a wedge surface, said inclined surface of said slide member being located on a side thereof facing the counter flange and said inclined surface abutting said wedge surface of said drive shaft and being displaceable therealong, said inclined surface of said wedge

and said wedge surface of said drive shaft having an inclination angle such that self-locking of said wedge and said drive shaft occurs; and means spaced from said drive shaft and said spindle for displacing said wedge.

4,901,480

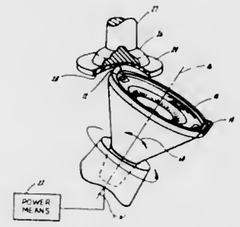
LENS GENERATING TOOL FOR GENERATING A LENS

Laurence A. Dillon, Livonia, Mich., assignor to CDP Diamond Products, Inc., Livonia, Mich.

Filed Oct. 6, 1988, Ser. No. 254,253

Int. Cl.[4] B24D *7/06*

U.S. Cl. 51—209 R **1 Claim**



1. In an apparatus for generating a prescription surface in a plastic lens blank the combination comprising:

a tool having a spindle;

means for rotating said tool about an axis of rotation:

a first replaceable cutting element and a second replaceable cutting element mounted on said tool on opposite sides of said axis of rotation, said first cutting element being identical to the second cutting element, each of said respective cutting elements having a respective insert of a solid polycrystalline diamond material and each respective insert forming a planar cutting face facing in the path of rotation of the tool, said inserts of said polycrystalline diamond material each having a semi-circular cutting tip disposed to engage and progressively shave the surface of a plastic lens blank, the improvement in which:

the planar cutting face of the first insert is disposed with the planar cutting face of the second insert in a plane which contains the axis of rotation of the tool, with each semi-circular cutting tip having a centerline of symmetry extending parallel to said axis of rotation, said first and second replacable cutting elements each comprising an L-shaped support member receivable in complementary-shaped slots in a radial annular face of said tool.

4,901,481

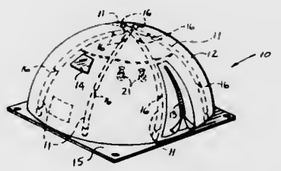
INFLATABLE SHELTER APPARATUS

Jesse R. Seeley, Jr., 404 State Rd., Eliot, Me. 03903

Filed Nov. 21, 1988, Ser. No. 274,344

Int. Cl.[4] E04H *15/20*

U.S. Cl. 52—2 E **7 Claims**



1. An inflatable shelter apparatus defining a hemispherical shape comprising,

a plurality of inflatable elongate cells defining a hemispherical surface of revolution, and

a polymeric film fixedly secured to an exterior surface of said cells define a hemispherical covering, and

a terminal lowermost peripheral edge of said covering

fixedly secured to a flexible sheet to form an enclosure, said cells converging to a distribution valve, said valve positioned for directing pneumatic pressure to said cells, and

at least one valve means contained within each cell for preventing deflation of companion cells upon pneumatic leakage from one or more of said cells, and

wherein said valve means comprises at least one one-way valve positioned within each cell, and said valve means defining a conical configuration, and

wherein the conical configuration includes a plurality of triangular flexible segments secured together to form said conical configuration and each of said triangular segments includes an elongate strip to impart configurational integrity to said one-way valve, and a tip defined by convergence of said triangular segments disposed in a normally open position upon directing pneumatic pressure from a base defined by said conical valve through said tip and disposed at a normally closed position preventing passage of pneumatic pressure directed exteriorly of said conical configuration toward said tip, and

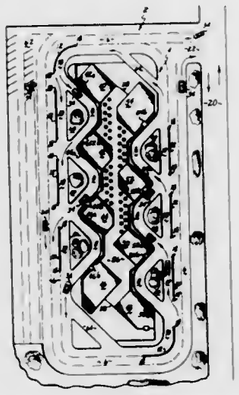
wherein a plurality of one-way valves are fixedly positioned within each cell to maintain integrity of each cell, and wherein a first one-way valve is positioned adjacent to the distribution valve and a second one-way valve is positioned medially of said elongate cell.

4,901,482

MULTI-BUILDING DRIVE THROUGH MALL

Carleen L. Lockard, 3900 Rose Hill, Apt. 402A, Cincinnati, Ohio 45229, and Thomas W. Hefley, 1275 Ida St., Cincinnati, Ohio 45202

Filed May 12, 1989, Ser. No. 351,014
Int. Cl.[4] E04H *3/04*
U.S. Cl. 52—33 **13 Claims**



1. A multi-building shopping establishment for purchasing goods from various vendors from within a vehicle comprising:

a plot of land with public road access thereto;

a central complex on said plot having a plurality of discrete buildings wherein in at least one of said buildings both the ordering and the receiving of goods is accomplished, wherein an order for goods is placed at a building separate from the building at which the goods are received;

a throughway inside the perimeter of said plot connected to said public road;

at least one ordering lane between said complex and said throughway, connecting said building at which said order is placed with said building at which said goods are received; and

a stack lane between said ordering said throughway for accepting additional vehicles prior to the placing of said orders for said goods.

4,901,483

SPIRAL HELIX TENSEGRITY DOME

Charles W. Huegy, 2 Mann St., Irvine, Calif. 92715

Continuation-in-part of Ser. No. 891,401, May 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 603,341, Apr. 16, 1984, abandoned. This application Sep. 20, 1988, Ser. No. 248,340
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—81 **5 Claims**

1. A geodesic dome structure that may be mapped entirely with triangles from zenith to base containing,

a. a zenith, defined as the single point directly above the center of the dome and at the top of the axis of revolution and,

b. a top shape, where top shape is defined as points of juncture at the next level of juncture below the zenith, where the points of juncture are arranged horizontally and parallel to the base and equidistant from those on either side, and where the said top shape may include two juncture points connected by a line segment; three juncture points connected by line segments to form a triangle; four and more than four juncture points connected by line segments to form a polygon and where the number of juncture points of the said top shape is the first entry number of a series of numbers called the multiplicative series: $n_j = kn_i$ where n_j is the second number of the series; n_i is the entry number of the series and k is some constant, each number of the series following the entry number is calculated by multiplying the prior number by the constant 2, and where the points of juncture of the top shape correspond to the first entry number of the series and may be connected to the zenith by line segments, and where all adjacent pairs of points of the top shape are connected by two line segments to the point on the shape below, between, and equidistant from the pair above, to form a triangle where the said triangle will be an extension of the top shape, and,

c. levels of juncture established from the formula: $Z = r'\cos\phi$, where Z is the height of levels of juncture; ϕ is the angle of decline of a vector from its initial position coterminus with the axis of rotation; r' is a parameter and not a constant and which may taken on a set of values for the radius vector from the origin of the dome to the surface of the dome, and where a radius vector from the origin to the surface of the dome will constrain the dome to conform with whatever curvilinear shape is desired, and,

d. primary juncture paths defined as points of juncture emanating from the zenith and proceding to the base where a line segment will initiate the path coterminus with the great circle and where the line segment will connect the top shape to the shape below and where additional line segments will repeat the process following the great circle all the way to the base, and,

e. shapes below the top shape where shapes are defined as points of juncture at the same level of juncture and arranged horizontally in a plane parallel to the base and equidistant from points on either side, and where the second shape will have the same number of juncture points at the second number of the series and where successive shapes below will have the same number of juncture points as their respective number in the multiplicative series and where all points of juncture of the shapes will be equidistant from those on each side and emanate from the primary juncture path and may be connected horizontally with line segments to form polygons and where all points of the shapes may be joined by line segments to points above and below in higher and lower shapes, and,

f. secondary juncture paths, which emanate from points of juncture on the shapes and follow a great circle all the way to the base where line segments coterminus with the great circle connect all lower shapes to the shape from which the secondary juncture path emanates, and where each of the new secondary juncture paths is between a pair of the existing juncture paths, and,

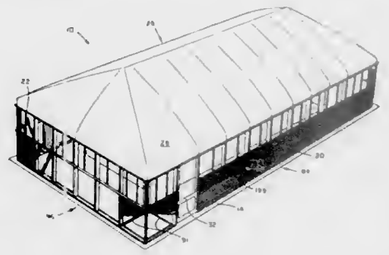
g. primary spirals emanating from the points of the top shape and secondary spirals emanating from the juncture points on the shapes below and where the said spirals are clockwise and counter clockwise and where the paths of the spirals may be described by the formula for the spiral helix: $\phi = a'\theta$, where ϕ is the angle of decline of a vector as it moves away from its initial position coterminus with the axis of revolution of the dome; θ is the angle of rotation of a vector perpendicular to the axis of revolution; a' is a parameter and not a constant, and where a radius vector from the origin to the surface of the dome will constrain the spirals to conform to whatever curvilinear shape is desired, and where segments will complete the mapping of the structure by proceding to connect the juncture points along the spirals.

4,901,484

ENCLOSURE FOR INGROUND SWIMMING POOL

Christopher J. Santosuosso, Everett, Mass., assignor to Christopher Enclosure, Inc., Peabody, Mass.

Filed Jun. 2, 1987, Ser. No. 57,351
Int. Cl.[4] E04B *7/02*
U.S. Cl. 52—90 **40 Claims**



1. An enclosure for a swimming pool, the pool having a planar structural deck surface completely surrounding the pool perimeter, said enclosure comprising:

a plurality of vertically extending support channels, each having a lower and upper end;

an enclosure base support structure defining a rectilinear enclosure perimeter on the planar deck surface, said base support structure comprising; means for structurally supporting said lower ends of said plurality of support channels and for interconnecting said support channels to the structural deck surface, in spaced-apart relationship around said rectilinear perimeter;

vertically extending substantially rigid sidewalls structurally attached to and supported by said vertically extending support channels, said sidewalls having upper edges which co-operate to define a closed upper enclosure perimeter substantially coextensive with said rectilinear enclosure perimeter, said sidewalls including a plurality of windows which may be opened to provide ventilation;

a curvilinear shaped dome-like roof means attached to substantially the entire upper enclosure perimeter of said vertically extending sidewalls to completely enclose a volume lying above a plane passing through said upper enclosure perimeter, said roof means comprising a plurality of curvilinear shaped tubing sections, at least one free end of each of said tubing sections being fixedly attached to the upper end of one of said vertical support channels, said plurality of tubing sections co-operating with one another to define a fixed structurally rigid skeleton-like support structure; and wherein said dome-like roof means further comprises a cover made from a flexible plastic material supported by said skeleton-like structure and; means for retaining the lower edges of said cover at a position substantially adjacent said upper enclosure perimeter; and

means located in one of said sidewalls, for providing access to the interior of said enclosure;

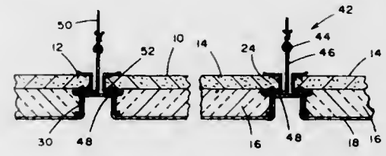
whereby the pool, the planar deck surface, said vertically extending sidewalls and said dome-like roof means cooperate to define an interior volume enclosing the pool and deck surface.

4,901,485

ACOUSTICAL PANEL

Robert J. Meschetti, Buffalo, and Andrew E. Heuer, Niagara Falls, both of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Apr. 6, 1989, Ser. No. 334,039
Int. Cl.[4] E04B *1/82*
U.S. Cl. 52—145 **16 Claims**



1. An acoustical panel comprising a thin unitary, four-sided frame, a rigid board, at least one low density sound absorbing mat and at least one porous fabric facing, said frame having in each of four sides an inwardly directed channel, said rigid board having four side edges, said four side edges being disposed within and substantially completely filling said frame channel, said frame having, in each side, at least one outwardly opening rebend adjacent said channel and a flange adjacent said rebend extending away from said channel, said flanges of said frame four sides forming a space therewithin wherein said low density mat is disposed, said fabric facing having four edges, said facing four edges being disposed and tightly held within said rebends of said frame four sides, said facing extending over said flanges and over said low density mat, retaining said low density mat within the confines of said four flanges.

4,901,486

ELASTO-PLASTIC DAMPER

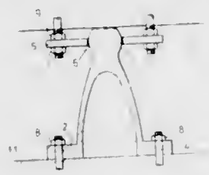
Takuju Kobori; Shunichi Yamada; Shigeru Ban; Koji Ishii; Isao Nishimura; Masatoshi Ishida; Kuniaki Sato; Yasuo Takenaka; Shozo Maeda, and Jun Tagami, all of Tokyo, Japan, assignors to Kajima Corporation, Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,307
Claims priority, application Japan, Mar. 6, 1987, 62-51288; Mar. 6, 1987, 62-51289; Mar. 6, 1987, 62-51290; Jul. 31, 1987, 62-192358; Jul. 31, 1987, 62-192359; Jul. 31, 1987, 62-102360
Int. Cl.[4] E04H *9/02*
U.S. Cl. 52—167 DF **8 Claims**

1. An elasto-plastic damper means adapted to protect structures by attenuating seismic tremors comprising: a steel, substantially cone shaped, load bearing damper having a base and an apex, adapted to support and to space a first member of a structure apart from a second member of a structure; said damper being pivotally secured to said first member and integrally secured to said second member; and said damper being

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elastically deformable responsive to seismic tremors of a a magnitude to stress said said damper within its elastic limit and



being plastically deformable responsive to seismic tremors of a magnitude to stress said damper beyond its elastic limit.

4,901,487

CABLE DUCTING FLOOR SYSTEM

Ralph A. Rigby, 307-8, Henry Lawson Business Centre, Birkenhead Point, Drummoyne, New South Wales, 2047, Australia

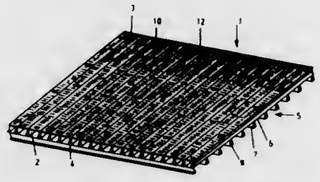
PCT No. PCT/AU87/00414, § 371 Date Aug. 3, 1988, § 102(e) Date Aug. 3, 1988, PCT Pub. No. WO88/04346, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 7, 1987, Ser. No. 265,796

Claims priority, application Australia, Dec. 8, 1986, PH9385

Int. Cl.[4] E04B *5/48*

U.S. Cl. 52—221 **8 Claims**



1. A rectangular flooring module for assembly with like modules on a support means to provide a false floor complete with bi-directional building services ducting, said module having a substantially continuous upper load bearing surface, a planar array of parallel side-by-side service passageways immediately below said upper surface, each passageway being allocated for one or other of the building services, a planar array of parallel side-by-side downwardly open service channels immediately below said services passageways, each channel being allocated for one or other of the building services, the axes of the service passageways lying at an angle to the axes of the service channels, access openings between said service passageways and said service channels located at each crossover of like service allocated service passageways and service channels, and access means in said upper surface to allow access to said service passageways and respectively aligned with said access openings.

4,901,488

FIRE/SMOKE PROTECTION STRUCTURE FOR A PLASTIC PIPE OR CABLE CHANNEL PORTION IN A FLOOR OR WALL

George Murota, Tokyo, and Tadashi Naruse, Yokohama, both of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1988, Ser. No. 269,447

Claims priority, application Japan, Nov. 12, 1987, 62-171926[U]; Nov. 12, 1987, 62-171927[U]

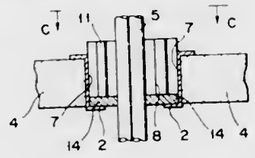
Int. Cl.[4] E04C *2/00*

U.S. Cl. 52—232 **10 Claims**

1. A fire/smoke protection structure for filling a gap between an outer surface of a plastic pipe or cable channel portion and a floor or wall, comprising:

a plurality of thermal expansion composite molded members each molded into a desired shape;

said thermal expansion composite molded members being densely filled to form a filled layer in said gap defined between an inner surface of the floor or wall and said outer surface of said plastic pipe or cable channel portion,



and said composite molded members being selectively removable from said gap; and

each of said filled expansion composite molded members in said gap comprising a core of a predetermined shape formed of a fire retardant resin foamimg body compressed to not more than 90% of a normal volume thereof, and a non-refractory material coated on the outer surface of said core.

4,901,489

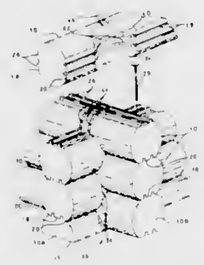
LOG FOR CONSTRUCTING LOG STRUCTURES AND ASSOCIATED LOG FABRICATING PROCESS

Thomas R. Garber, Sevier County, Tenn., assignor to Heritage Log Homes, Inc., Gatlinburg, Tenn.

Filed Apr. 23, 1987, Ser. No. 41,607

Int. Cl.[4] E04B *1/10*

U.S. Cl. 52—233 **18 Claims**



1. An improved log for interlocking with other logs for constructing log structures, said improved log comprising:

an elongated body having an exterior surface, said body defining a longitudinal axis and having first and second opposite end portions, a top portion and a bottom portion, said body being provided with a lateral downwardly oriented saddle notch proximate at least one of said end portions for receiving a top portion of another said improved log, said saddle notch defining an inner notch surface conforming in shape to an exterior surface of another said improved log, said notch surface carrying at least one longitudinally oriented tongue projecting into said saddle notch from said notch surface, said body being further provided with at least one laterally oriented groove provided in said exterior surface of said top portion and disposed above said saddle notch of a depth sufficient for closely receiving a tongue in a saddle notch of another said improved log.

4,901,490

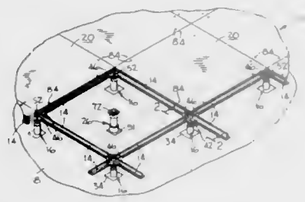
RAISED FLOORING PANEL AND RAISED FLOORING ASSEMBLIES

Francis R. Zinaiel, Gilroy; John G. Barbero, San Jose, and Louis J. Saccullo, deceased, late of Gilroy, all of Calif. (by Josephine P. Saccullo, heir), assignors to Gabalan Corporation, Morgan Hill, Calif.

Filed Dec. 17, 1984, Ser. No. 682,608

Int. Cl.[4] E04B *5/43*

U.S. Cl. 52—263 **4 Claims**



1. A raised flooring assembly comprising:

A. a plurality of grid support pedestals supported by a subfloor;

B. a grid including a plurality of flooring panel support stringers supported by and secured to said grid support pedestals;

C. a plurality of panel support pedestals supported by the subfloor; and

D. a plurality of unitary, injection-molded raised flooring panels supported on the flooring panel support stringers of said grid, each of said unitary, injection-molded raised flooring panel including

(a) a continuous flooring wall having an upper flooring surface,

(b) a plurality of mutually intersecting reinforcing ribs formed integrally with and depending downward from the surface of said flooring wall opposite to the upper flooring surface thereof, said reinforcing ribs being spaced from said subfloor, and

(c) a plurality of mutual intersecting reinforcing central ribs at the central section of said flooring panels seating on said panel support pedestals respectively for support, said central ribs being formed integrally with and depending downward from the surface of said flooring wall opposite to the upper flooring surface thereof.

4,901,491

CONCRETE BUILDING CONSTRUCTION

Donald W. Phillips, 8514 IH 37, Corpus Christi, Tex. 78410

Filed Nov. 7, 1988, Ser. No. 267,971

Int. Cl.[4] E04B *1/04, 5/17*

U.S. Cl. [redacted] **9 Claims**

1. A [redacted]rising

a vertical corner post having a pair of first parallel sides and a pair of second parallel sides perpendicular to the first sides, the posts providing a first series of passages interconnecting the first sides and a second series of passages interconnecting the second sides;

a plurality of generally planar vertical concrete wall panels interconnecting the corner posts and comprising

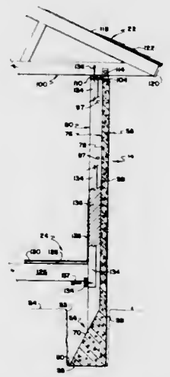
a footer having a bottom supported on an underlying ground surface;

a wall section extending upwardly from the footer having a pair of parallel sides, a web providing a generally planar exterior wall and an interior wall, first and second vertical ribs on the interior wall extending away from the web along the sizes of the wall panel;

the footer bottom being of a first cross-sectional size in a first plane through the bottom parallel to the ground surface and the wall panel being of a second cross-sectional size in a second plane parallel to the first plane, the second cross-sectional size being substantially smaller than the first size;

a first one of the wall panels having a first rib abutting one of the first sides of the corner post and providing a third series of linear passages aligned with the first passages of the corner post;

a first series of elongate tensioned fasteners extending through the aligned first and third passages closing the first wall panel against the corner post and connecting the first panel to the corner post;



a second one of the wall panels having a second rib abutting one of the second sides of the corner post and providing a fourth series of linear passages aligned with the second passages of the corner post;

a second series of elongate fasteners extending through the aligned second and fourth passages closing the first wall panel against the corner post and connecting the second panel to the corner post to provide a corner of the building; and

third and fourth ones of the wall panels, respectively coplanar with the first and second wall panels, having a rib connected to the second rib of the first and second wall panels respectively.

4,901,492

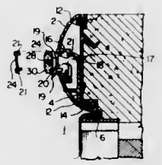
CAP FOR SWIMMING POOL COPING

Paul A. Coates, Burford, Canada, assignor to Pleasure-Way Pools (1978) Limited, Brantford, Canada

Filed Feb. 14, 1989, Ser. No. 309,853

Int. Cl.[4] E04H *12/00*; F21V *8/00*

U.S. Cl. 52—300 **15 Claims**

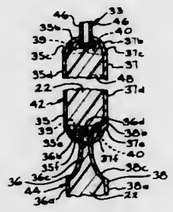


1. In a cap for swimming pool coping about the periphery of a swimming pool, the cap incorporating a bead retainer for a circumscribing bead of a pool cover, the improvement characterized by the cap comprising a longitudinally extending body having securing means to releasably secure the cap to the

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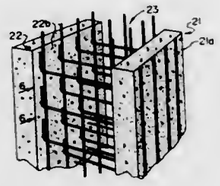
coping, a groove longitudinally extending in the front of the cap within which to releasably secure the pool cover bead and means on the entrance to the groove for releasably retaining therein a plug strip means within that entrance so that water and debris are blocked from entering the groove.

4,901,493
DOOR ASSEMBLY
John F. Thorn, Sylvania, Ohio, assignor to Therma-Tru Corp., Toledo, Ohio
Filed Dec. 15, 1988, Ser. No. 284,494
Int. Cl.[4] E06B *3/00*
U.S. Cl. 52—309.9 **26 Claims**



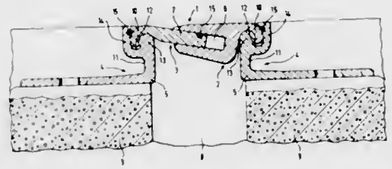
1. A door assembly comprising:
(a) a frame having first and second compression molded skins each having an exterior edge and an interior edge, said first and second skins, when joined together, defining a cavity for receiving a foam core, said interior edges cooperating to define a central opening;
(b) a central panel within said central opening, said central panel including inner and outer compression molded skins, said inner and outer skins cooperating to define a cavity for receiving a foam core and having exterior edges engaged to the interior edges of the first and second skins;
(c) means for positioning said central panel in the central opening of said frame;
(d) means in said frame and said central panel providing communication between the cavities of the frame and the central panel; and,
(e) a foam core extending throughout said frame and central panel cavities.

4,901,494
COLLAPSIBLE FORMING SYSTEM AND METHOD
Brian J. Miller, 1619 N. Draper Rd., McHenry, Ill. 60050, and David W. Turner, 318 Candlewood Trail, Cary, Ill. 60013
Filed Dec. 9, 1988, Ser. No. 282,054
Int. Cl.[4] E04B *2/00*
U.S. Cl. 52—309.12 **16 Claims**



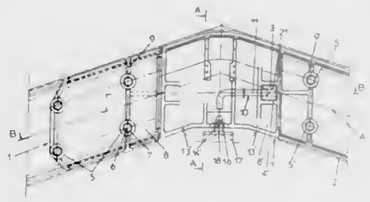
1. A collapsible preassembled forming system for a hardenable material comprising a pair of wall panels of lightweight substantially inflexible material, said wall panels being adjustable between an operative mode wherein said panels are in a predetermined spaced relation for accommodating the hardenable material therebetween and a collapsed inoperative mode wherein said panels are in an offset at least partially face to face proximate relation for transporting said wall panels while in the collapsed mode to a job site; and grid means pivotally interconnecting said panels, said grid means including a plurality of relatively spaced grid assemblies, each having a skeletal first section disposed intermediate said panels and defining a plane substantially perpendicular to said panels when the latter are in said operative mode and substantially parallel to interior surfaces of said panels when the latter are in an inoperative mode, said skeletal first section having a plurality of elongate first rods substantially spanning the distance between said panels when in the operative mode, and a plurality of elongate second rods affixed to said first rods and retaining the latter in a predetermined spaced relation, and a plurality of second sections, each having a first portion engaging an exterior surface of one wall panel and a plurality of relatively spaced second portions extending angularly from said first portion through said one wall panel and each having an end terminating adjacent an interior surface of said one wall panel, said terminating end and an adjacent end of a predetermined first rod coacting to form a pivotal connection between the skeletal first section and the said one wall panel, said grid means permanently affixing said wall panels to exterior surfaces of the hardenable material accommodated between said wall panels when in a hardened state.

4,901,495
EXPANSION JOINT FOR BRIDGING SPACED FLOOR STRUCTURES
Reinhard Gottschling, Essen, Fed. Rep. of Germany, assignor to MIGUA Hammerschmidt GmbH, Fed. Rep. of Germany
Filed Jul. 10, 1989, Ser. No. 377,330
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, 3828980
Int. Cl.[4] E04B *1/62*
U.S. Cl. 52—396 **5 Claims**



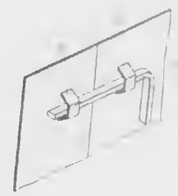
1. An apparatus for bridging a span defined between two relatively movable structural floor members comprising first and second elongate anchor units adapted to be mounted to the opposed edges of the respective said floor members and a bridging unit formed of first and second elongate bridge members, each said bridge member having a captive end pivotally connected to a respective said anchor unit for movement about a horizontal axis and a free end, the free end of said first bridge member including upper and lower spaced legs defining therebetween a groove upwardly inclined at an acute angle to the plane of said floor members, the free end of said second bridge member being downwardly inclined at said acute angle and slidably received within said groove, said upper leg being wedge-shaped in transverse section, becoming progressively thicker in the direction from said free end toward said captive end, the upper surface of said upper leg lying substantially in the plane of said floor members when said floor members are in coplanar alignment.

4,901,496
APPARATUS FOR ASSEMBLING TOGETHER TWO ROOF FRAMES, AT THE LEVEL OF THE RIDGE, FOR MAKING FRAMEWORKS AND STRUCTURES
Andre Fritz, Beinheim, and Jean Gerlinger, Geudertheim, both of France, assignors to Bator S.A., Societe Anonyme, Reichstett, France
Filed Jul. 27, 1988, Ser. No. 224,705
Claims priority, application France, Jul. 27, 1987, 87 10719
Int. Cl.[4] E04C *1/24*
U.S. Cl. 52—578 **10 Claims**



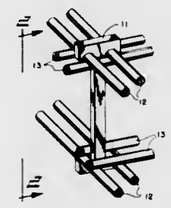
1. Assembly apparatus for the connection of two roof beams at the level of the ridge, for providing frames and structures, characterized in that it consists in two cast members (1, 1') identical to each other, each being disposed fixedly partially in the interior of the upper end of each roof beam (2, 2'), the cast member (1) being disposed head to tail with respect to the cast member (1') and the two members (1, 1') each having a protruding portion (3, 3') spaced a substantial distance from a recess (4, 4'), said protruding portion (3, 3') of each member (1, 1') engaging in the recess (4', 4) of the other member (1, 1') to provide two connections (3, 4' and 3', 4) between the beams (2, 2'), said connections being disposed closely adjacent respective ends of said beams (2, 2') and coacting to ensure the assembly and securement of said roof beams (2, 2') by mere insertion.

4,901,497
FASTENER FOR FORM PANELS
Yuan-Ho Lee, No. 851, Chung-San Rd., Nan-Pao Tsun, Kuei-Jen Hsian, Tainan Hsieng, Taiwan
Filed Jun. 23, 1989, Ser. No. 370,851
Int. Cl.[4] E04G *17/04*
U.S. Cl. 52—582 **2 Claims**



1. A fastening device to fasten at least two edge-to-edge contiguous panel facings each of which has two opposite longitudinal sides, two opposite transverse sides and a back face, comprising
a plurality of looped members projecting from said back face of each of the panel facings along said longitudinal sides, said looped members of one of said panel facings being respectively aligned with said looped members of an adjacent said panel facing, each of said looped members having an engagement face spaced parallely from said back face and two opposed flanks extending from two sides of said engagement face and being connected to said back face, the distance between said flanks being greater than that between said engagement face and said back face, and key members each having an insert rod portion to be inserted in at least two aligned said looped members and a handle rod portion which forms an angle with said insert rod portion, said insert rod portion having a pair of first opposed longitudinal faces, and a pair of second opposed longitudinal faces, the distance between said first opposed faces being smaller than the distance between said engagement face and said back face so that said insert rod portion can be inserted into aligned said looped members, the distance between said second opposed faces being greater than the distance between said first opposed faces, said second opposed faces being engaged respectively with said engagement face and said back face when said insert rod portion is turned a certain angle after being inserted.

4,901,498
T-HEADED STIRRUP FOR REINFORCED CONCRETE STRUCTURES
Ben C. Gerwick, Jr., San Francisco, Calif., assignor to Sohio Petroleum Company, Houston, Tex.
Filed Sep. 23, 1985, Ser. No. 778,991
Int. Cl.[4] E04C *5/16*
U.S. Cl. 52—650 **10 Claims**



1. A stirrup for restricting movement of a reinforcing member in concrete, comprising a shaft having a rigid crosspiece at both ends, with the crosspiece length being greater than the shaft width, each crosspiece being perpendicular to the shaft and parallel one to the other, and each crosspiece having a proximal and distal surface relative to the end of the shaft, said proximal surface having at least one reentrant defined by said rigid crosspiece.

4,901,499
CURVED GLAZED ROOFS
Henri Mairlot, Acoz, Belgium, assignor to Glaceries de Saint-Roch S.A., Sambreville, Belgium
Division of Ser. No. 160,319, Feb. 25, 1988, Pat. No. 4,848,048.
This application Apr. 11, 1989, Ser. No. 336,073
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—742 **8 Claims**

5. A process for the construction of a greenhouse having a curved glazed roof, comprising the steps of:
excavation of foundation holes;
placement of bases in the foundation holes;
placement of columns on the bases;
placement of longitudinal beams on the columns, such that the longitudinal beams are substantially parallel to each other;
construction of trusses, each truss having a curved extrados section including two opposite ends and a respective tie beam including opposite ends thereof;
placement of the trusses between and perpendicularly to the longitudinal beams;
securing the one end of both a curved extrados section and a tie beam of each truss to a longitudinal beam and securing of the opposite end of both the curved extrados section

and the tie beam of each truss to another longitudinal beam;

placement of a peak beam on the extrados section of the trusses, such that the peak beam is substantially parallel to the longitudinal beams;

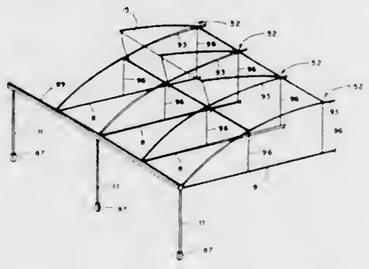
thermally-tempering at least two sheets of glass, whereby two sheets of thermally-tempered glass are formed;

cooling the thermally-tempered sheets of glass, whereby two thermally-tempered, cold sheets of glass are formed;

curving the two thermally-tempered, cold sheets of glass at a temperature being less than 140° C., whereby two thermally-tempered, cold-curved sheets of glass having a resiliently-flexed curvature formed therein are formed;

maintaining the resiliently-flexed curvature of the two sheets of glass under constraint;

assembling a frame about each respective thermally-tempered, cold-curved sheet of glass and securing the frame to the said respective sheet of glass, such that the frame



retains the curvature of the respective sheet of glass under constraint on the template and, whereby at least two curved glazed panels are formed, further maintaining the resiliently-flexed curvature of the sheets of glass under constraint;

placement of the spans of curved glazed panels, such that one of the curved frame sections of each panel in the span is positioned on a respective curved extrados section and further such that the other of the curved frame sections of each panel in the span is positioned on another respective curved extrados section, and further such that a straight frame section of a pair of opposite distal panels of each respective span is supported by a respective longitudinal beam; and

securing of the curved frame sections of the panels of each span to the respective extrados section upon which the said curved sections are supported, whereby the greenbouse having the curved glazed roof is formed.

4,901,500

LIGHTWEIGHT COMPOSITE BEAM

Joseph Wycech, Grosse Pointe Woods, Mich., assignor to Essex Composite Systems, Grosse Pointe Woods, Mich.

Division of Ser. No. 98,159, Sep. 18, 1987, Pat. No. 4,861,097. This application Dec. 12, 1988, Ser. No. 283,344

Int. Cl.[4] E04C *2/08*

U.S. Cl. 52—793 **7 Claims**

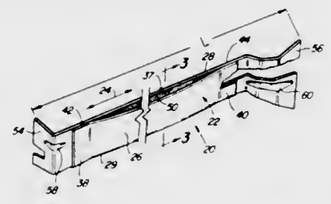
1. A lightweight composite beam adapted to be secured to a structure for providing structural reinforcement, said beam comprising:

an open channel-shaped elongated metal member having a longitudinal cavity and a longitudinal axis, said longitudinal cavity extending substantially the entire length of said open channel-shaped member along said longitudinal axis;

said channel-shaped member having a first wall and a second wall which forms said longitudinal cavity;

one of said first and second walls being curved outwardly along said longitudinal axis;

a core closely received in said longitudinal cavity of said open channel-shaped member, said core being formed of a synthetic resin-based material, said core being in rigid attachment with the walls of said open channel-shaped metal member and substantially entirely filling said longi-



tudinal cavity such that the bending strength of said open channel-shaped member is increased;

first and second mounting means attached to opposite ends of said open-channel-shaped member for securing both ends of said beam to said structure;

wherein said structure is strengthened by the presence of said beam.

4,901,501

CONTINUOUS MOTION CONTAINER PACKER FOR USE WITH TRAYS HAVING POCKETS FOR SUCH CONTAINERS

John L. Randat, North Madison, and Steven DaCunha, West Hartford, both of Conn., assignors to Standard Knapp, Inc., Portland, Conn.

Filed Nov. 18, 1988, Ser. No. 273,212

Int. Cl.[4] B65B *5/10, 21/08, 35/44*

U.S. Cl. 53—48 **4 Claims**



1. Apparatus for loading cylindrical containers into trays that have cylindrical pockets to receive the containers and the tray pockets being uniformly spaced from one another not only within a particular tray but also between end-to-end trays, said apparatus comprising:

(a) individual lane conveyors for advancing containers in discrete columns and for spacing the columns apart to provide a space therebetween,

(b) tray conveyor means for feeding trays end-to-end between said lane conveyors in the same direction as that of the containers,

(c) container deadplate means downstream of said lane conveyors and tray deadplate means below said container deadplate means for supporting the trays as the trays move by line pressure beyond said tray conveyor means and into a load station,

(d) means for moving the containers across said container deadplate means and into said load station, said container moving means providing a container spacing that corresponds to said tray defined pocket spacing,

(e) means for synchronization tray movement with movement of the so separated containers at least through the load station,

(f) neck ring guide means engaging the container necks at said load station to support containers as the containers move off a downstream edge of said container deadplate means, said neck ring guides serving to gradually lower

the containers into the tray defined pockets as the containers and trays are moved in synchronized relationship with one another.

4,901,502

APPARATUS FOR FEEDING GROUPS OF CONES AND/OR CONOIDS IN AN ORDERED AND ORIENTATED ARRANGEMENT TO BOXES IN A BOXING PLANT

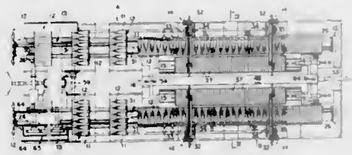
Arturo Colamussi, Ferrara, Italy, assignor to Vortex Systems S.r.l., Fossalta Di Copparo, Italy

Filed Jul. 1, 1988, Ser. No. 214,441

Claims priority, application Italy, Jul. 23, 1987, 21406 A/87

Int. Cl.[4] B65B *5/06, 35/40, 35/44*

U.S. Cl. 53—143 **16 Claims**



1. An apparatus for feeding groups of cones in an ordered and orientated arrangement to container boxes in a boxing plant to which at least two groups of cones of predetermined number are fed, characterised by comprising:

(a) a first section (A) comprising a pair of parallel conveyors (13, 25, 26), said pair of conveyors driven by an intermittently operated geared motor-intermittent motion unit (59,) for moving container trays (12) carrying in cavity seats (21) groups of cones (11) of predetermined number, said container trays (12) being disposed transversely to the movement of said pair of conveyors (13) to lay side-by-side during their translational motion, and being rotatable (23, 24) cam means for causing each of said container trays to rotate to (29, 30, 31) an essentially horizontal plane parallel to that in which the groups of cones (11) are disposed;

(b) a second section (b) in which said container trays (12) of one conveyor (13) of said pair of conveyors are arranged side by side and face respective container trays (12) of the other parallel conveyor (13) of said pair of conveyors so that the groups of cones of the one conveyor are in parallel alignment with and facing the groups of cones of the other conveyor, with tails of the cones pointing towards the center of said apparatus, each side of said second section (B) having transferring means (14, 33, 35) movable transversely to said conveyors (13) for transferring the groups of cones from said container trays (12) to a position above centrally positioned container boxes (17);

(c) first collection means (15) for the groups of cones (11) transferred from said container trays (12), said first collection means (15) being essentially of the rack type (36, 37) and each is positioned to the side of said conveyors (13) towards the center of said second section (B), both of said first collection means being provided with actuators (39) which move said first collection means horizontally in opposite directions parallel to the movement of said conveyors so as to offset the cones present on one of said first collection means with respect to the cones present on the other of said first collection means;

(d) second collection means (16) for receiving the groups of cones (11) transferred from said first collection means (15), said second collection means (16) being disposed centrally to said second section and consisting of flat blade elements (41), said flat blade elements of said second collection means can be opened out above the container boxes (17) after receiving the cones fed by said transfer means (14) from both sides upon both of said first collection means, and after the cones have been intercalated in a head-tail arrangement and have been divided and compacted into a number of identical matrices (44) of same dimensions as the underlying boxes (17) by an associated compactor means (18) with blades (43) which are transverse to said second section (B), said blades (43) of said compactor means being moved parallel to movement of said conveyors by at least one actuator (53).

4,901,503

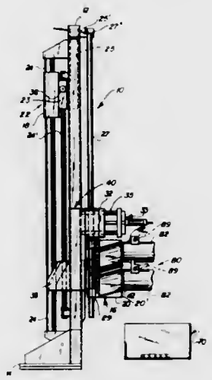
APPARATUS FOR SEPARATING AND PACKAGING PLASTIC PARTS

Enidio A. Gomez, Miami, and Robert J. Downey, Miami Lakes, both of Fla., assignors to Security Plastics, Inc., Miami Lakes, Fla.

Filed Jul. 11, 1988, Ser. No. 217,358

Int. Cl.[4] B65B *5/10;* **B65G** *53/50*

U.S. Cl. 53—244 **16 Claims**



1. An assembly designed to collect and separate an array of a plurality of plastic parts concurrently issuing from a multicavity mold and for the distribution of the parts to preselected ones of a plurality of containers, said assembly comprising:

a. a base having an elongated configuration and disposed adjacent to and in substantially communicating, part receiving relation to a plastic parts mold,

b. a collector means movably supported on said base and positionable into and out of both a receiving position and a delivering position,

c. a delivery means disposed in communicating, interconnecting relation between said collector means and a plurality of containers and structured for the channeling and delivering of the plurality of parts to preselected ones of the plurality of containers,

d. said collector means comprising a collector housing including a plurality of open ended receiving chambers proportional in number to the number of the plurality of plastic parts issuing from the mold in a single array and each of said chambers disposed to receive one of the plastic parts of the array,

e. said receiving position defined by disposition of said collector means on said base in aligned, parts receiving communication with a parts issuing portion of the mold,

f. said delivering position defined by aligned, registry of said delivery means with the open ends of said receiving chambers and in parts receiving relation thereto,

g. drive means mounted at least in part on said collector housing and disposed and structured for transfer of the plastic parts at least between said collector means and the delivery means, and

h. ejector means connected in cooperative relation to said

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collector means for ejecting of a runner structure previously attaching the plurality of plastic parts in the array, said ejector means including an ejector assembly disposed in abutting, engageable relation to the runner structure once disposed on the collector means, said ejector assembly structured to displace the runner structure from the collector means.

4,901,504

FILLING AND CASING SYSTEM

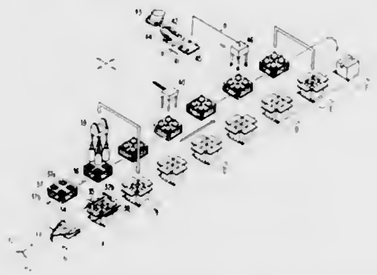
Mikio Tsuji; Kazuo Yoshitomi; Shingo Noro; Masayuki Hayashi; Hiroyasu Murase; Naoyoshi Kato; Kazunori Araki, and Kenjiro Tanaka, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 180,896

Claims priority, application Japan, Apr. 13, 1987, 62-90404; May 29, 1987, 62-131251

Int. Cl.[4] B65B *7/28; B67B 3/20, 7/18*

U.S. Cl. 53—247 **4 Claims**



1. A container filling system comprising a case conveying device for conveying cases, a carrier conveying device disposed adjacent and parallel to said case conveying device for conveying carriers capable of accommodating and holding containers, an uncasing station including a container gripper device movable between said case conveying device and said carrier conveying device for taking containers from cases conveyed by said conveying device and placing them in carriers conveyed by said carrier conveying device, a filling station including a filling head for filling containers disposed in carriers conveyed by said carrier, and a capping station including a capping machine for capping containers filled by said filling head, said uncasing station, said filling station and said capping station being disposed in succession along said case conveying device and said carrier conveying device.

4,901,505

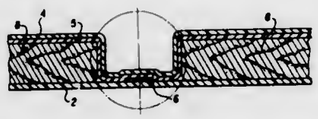
METHOD OF MAKING A PACKAGE HAVING PEELABLE FILM

Allen C. Williams, Jr., Spartanburg, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Division of Ser. No. 156,270, Feb. 12, 1988. This application Dec. 12, 1988, Ser. No. 282,658

Int. Cl.[4] B65B *11/52, 61/18*

U.S. Cl. 53—412 **1 Claim**



1. In a vacuum skin packaging process wherein a plurality of products are packaged between a forming web and a support web, the method of making a package having a peelable film layer wherein the peeling process is easily initiated comprising the steps of:

(a) arranging a plurality of products on a continuous support member in an array of rows and columns;

(b) providing a non-stick surface adjacent to one edge of the support web; by adhering a strip of adhesive tape or other material having a non-stick surface to the support web across the width of the support web between columns prior to vacuum skin packaging the respective column;

(c) providing a forming web having manually separable layers comprising a peelable barrier film and a gas pervious skin film wherein the rupture strength of the skin film is less than that of the peelable film;

(d) forming a plurality of vacuum skin packages with the forming web sealed around the periphery of each product to the support web, the products being spaced apart from the non-stick surface and the unsealed portion of the forming web over the non-stick area whereby a manual pull tab can be formed, the seal strength of the skin film to the support web being greater than the rupture strength of the skin film;

(e) perforating the forming web with a plurality of perforations in a line adjacent to the non-stick surface then severing the support web and the non-stick strip at approximately the mid-line of the tape and between rows to form individual readily peelable packages thus forming said pull tabs whereby when the pull tab is manually pulled away from the support member the skin film ruptures leaving the peelable film free to be peeled off the skin film.

4,901,506

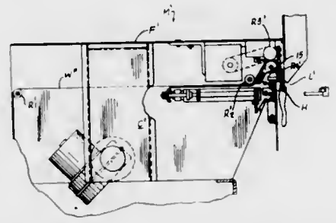
HEAT SEAL TEMPERATURE CONTROL

Ronald R. Weyandt, Chesterland, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation of Ser. No. 31,750, Mar. 30, 1987, abandoned. This application Jun. 13, 1989, Ser. No. 366,301

Int. Cl.[4] B65B *51/14, 51/30, 7/06*

U.S. Cl. 53—479 **27 Claims**



1. A method for stabilizing temperature of an electrically heated sealing element coupled to an energization circuit for intermittently applying electrical power to the sealing element, said method comprising the steps of:

(a) monitoring an electrical parameter associated with said sealing element, which parameter is a function of sealing element temperature, and

(b) changing the duty cycle of said energization circuit in response to said monitoring step.

4,901,507

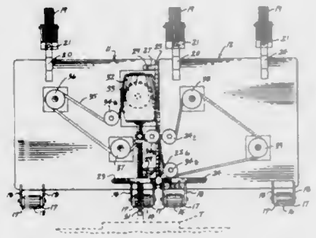
PIVOTED DECK LAWNMOWER

Larry D. Craycraft, Rt. #3 Box 165, Maryville, Mo. 64468

Filed Dec. 5, 1988, Ser. No. 279,510

Int. Cl.[4] A01D *34/66, 34/86, 75/30*

U.S. Cl. 56—5 **9 Claims**



1. A mowing apparatus for connection to a self-propelled vehicle comprising,

a first housing defining a first cavity, and a second housing defining a second cavity, and

cutting means rotatably mounted within said first and second cavities for mowing of grass wherein said cutting means include at least one rotatable blade within each of said first and second cavities fixedly and rotatably secured to a shaft, and

each shaft projects upwardly through said first and second housings terminating in a pulley, and

an elongate drive shaft directed forwardly of said first and second housings for attachment to a power source at a forward end of said drive shaft, and

a gear housing secured to said first housing wherein said drive shaft is secured to said gear housing at its other end, and

said gear housing operably associated with each pulley of said cutting means for imparting rotation to said pulleys, and

elongate hinge means securing said first and second housing together, and

wherein said drive shaft is orientated parallel to said hinge, and

a yoke member projecting upwardly of a forward surface of said first and second housings positioned medially of said hinge means, and

a plurality of first wheels secured to rear surfaces of said first housing and a plurality of second wheels secured to rearward surfaces of said first and second housings wherein said first and second wheels rotatably support said first and second housings for traverse over a surface to be mowed and,

wherein said yoke member includes a connector for connection to a self-propelled vehicle, and wherein said yoke further includes a plurality of legs wherein a first leg is secured to said first housing and a second leg secured to said second housing positioning said yoke medially relative to said elongate hinge.

4,901,508

FENCE ROW MOWER

Douglas L. Whatley, Rte. 1, Box 44A, Paoli, Okla. 73074

Continuation-in-part of Ser. No. 109,026, Oct. 16, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 217,490

Int. Cl.[4] A01O *38/86, 34/66*

U.S. Cl. 56—10.4 **5 Claims**

1. A mower supported and driven by a prime mover for mowing beneath and beyond both sides of the vertical plane of a fence supported by a plurality of fence posts, comprising:

elongated horizontal boom means including inner and outer telescoping tubular members connected at one end with and projecting laterally beyond one side of said prime mover parallel with the surface of the earth;

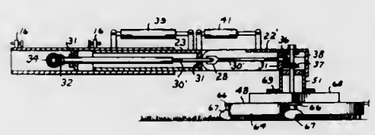
an elongated boom extension hingedly connected at one end with the end of said inner tubular member opposite said prime mover for vertical pivoting movement of its other end portion;

driven shaft means including a driven spindle vertically journalled by said other end portion of said boom extension;

drive shaft means drivably connecting said prime mover with said driven spindle means for angular rotation of the latter;

a universal joint interposed in the drive shaft means at the boom extension hingedly connected position;

platform means including a normally horizontal generally circular planar sheet having a plurality of circumferentially equally spaced peripheral indentations journalled by the depending end of said drive spindle in a manner permitting angular rotation of the platform means independently of the



angular rotation of said driven spindle in response to contact of a peripheral portion of the platform sheet with a stationary object;

means carried by the boom means for vertically tilting the platform sheet about a horizontal axis through an arcuate angle with respect to the longitudinal axis of the boom means for mowing vegetation on a surface inclined with respect to the horizontal;

a plurality of angularly rotating vegetation cutting blades journalled in a circular array by said platform means;

belt and pulley means drivably connecting said cutting blades with said driven spindle;

an inverted cup-like belt and pulley guard overlying said platform sheet and angularly rotatable therewith; and,

a bearing support sleeve depending from said boom extension and axially surrounding said driven spindle, said sleeve having an outstanding annular flange overlying said belt and pulley guard.

4,901,509

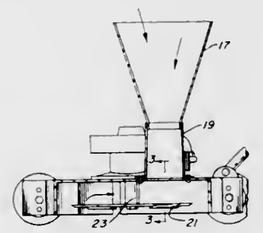
MULCHING ATTACHMENT FOR LAWN MOWER

Frederick E. Leuz, R.D. 1, Box 626, Pipersville, Pa. 18947

Filed Jul. 19, 1988, Ser. No. 221,508

Int. Cl.[4] A01D *34/63*

U.S. Cl. 56—16.9 **4 Claims**

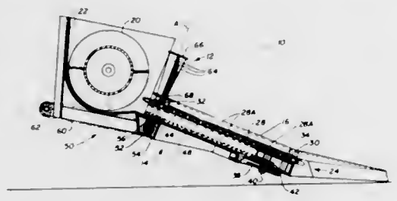


1. A rotary mower converted for use as a garden mulcher, comprising:

a. a housing having a substantially flat, horizontal deck portion;

b. a motor mounted upon said deck, said motor having a motor shaft extending below said deck;
c. a rotary cutting blade located beneath the deck affixed to said motor shaft;
d. a funnel-shaped feed chute affixed to said deck, said feed chute being completely unobstructed and open to the path of the cutting blade;
e. said cutting blade being reversible and having a single, aerodynamic wing portion positioned to create a down draft when oriented in the mulching mode, said blade further including a first cutting edge on the leading surface of said aerodynamic wing located directly beneath said feed chute, said blade further including a second cutting edge on its trailing side opposite said first cutting edge.

4,901,510
ROTARY CROP FEED ASSIST DEVICE FOR A ROW CROP HARVESTING HEADER
John R. McClure, and Gary L. Bich, both of New Holland, Pa., assignors to Ford New Holland, Inc., New Holland, Pa.
Filed Mar. 20, 1989, Ser. No. 326,758
Int. Cl.[4] A01D *45/02*
U.S. Cl. 56—98 **23 Claims**



1. In a row crop harvesting header having a rear discharge outlet, a plurality of laterally-spaced crop dividers and means for feeding crop stalk material rearwardly between said crop dividers and into said rear discharge outlet, the improvement comprising:
a rotary crop feed assist device mounted for rotation about a generally upright axis on at least one of said crop dividers and having a peripheral configuration for sweeping a rotational path in the shape of an inverted truncated cone to impose a downward force on crop stalk material being fed past said device to said rear discharge outlet of said header.

4,901,511
HARVESTER REEL RAKE BAR
Jury N. Yarmashev, Taganrog, I Krepostnoi Pereulok, 34, kv. 213, Rostovskaya oblast; Alexandr I. Nikolaenko, Taganrog, Bezymyannay proezd, 5/1, kv. 40, Rostovskaya oblast; Alexandr F. Kotenko, Taganrog, Bezymyannay proezd, 3, kv. 8, Rostovskaya oblast; Evgeny A. Chernenko, Taganrog, Bezymyannay proezd, 3, kv. 37, Rostovskaya oblast; Vsevolod V. Abramov, ulitsa Poklonnaya, 6, kv. 4; Alexandr V. Veselov, ulitsa Karla Marxa, 21/4, kv. 20, both of Moscow; Nikolai I. Rysin, Solntsevsky prospekt, 6, korpus I, kv. 27, Moscow, and Vera N. Salnikova, ulitsa Studencheskaya, 16, kv. 88, Moscow, all of U.S.S.R.
Filed Oct. 13, 1988, Ser. No. 257,429
Int. Cl.[4] A01D *57/02, 78/16*
U.S. Cl. 56—220 **4 Claims**

1. A harvester reel bat blade, comprising:
a bat blade;
tines in the form of arcuated rods attached at one end to said bat blade and having a concavity in the direction of rotation of the reel;
each of said tines having lateral sides inclined at an angle relative to each other and meeting at a first vertex facing the direction of rotation of the reel and having a cross-sectional configuration in the form of an isosceles triangle with one working edge being formed by said first vertex, and having a second vertex at the other end of each of said tines and having a second working edge in a zone of said



second vertex, said second working edge being defined by the base of the isosceles triangle;
a fastener member for attaching said tines to said bat blade; and
a curvilinear portion with a longitudinal slot on the surface of each of said tines, said portion extending between the vertex of the tine and said fastener member.

4,901,512
DYNAMICALLY COMPENSATED ANTI-CLOG MOWING DEVICE
Luigi Castoldi, Abbiategrasso, Italy, assignor to BCS S.p.A., Milan, Italy
Filed May 31, 1988, Ser. No. 200,691
Claims priority, application Italy, Jun. 12, 1987, 20892 A/87
Int. Cl.[4] A01D *34/03*
U.S. Cl. 56—293 **17 Claims**

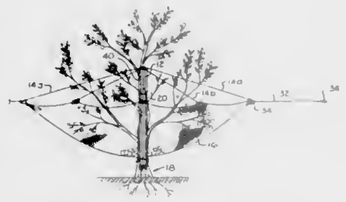
1. A mowing device for mowing machines, comprising a support bar, a comb assembly oscillatable longitudinally of said support bar and provided with elongated teeth extended forwardly in the working direction of the machine, a blade assembly oscillatable longitudinally of said support bar and provided with knives overlying a rear portion of the teeth of said comb assembly, guide surfaces in rigidly-fixed positioned relationship to said support bar and extending longitudinally thereto, a guided surface forming a part of the comb assembly, a guided surface forming a part of the blade assembly, said guided surfaces being in sliding engagement with said guide surfaces, whereby said comb assembly and blade assembly are positively guided to oscillate parallel to said guide surfaces, and means





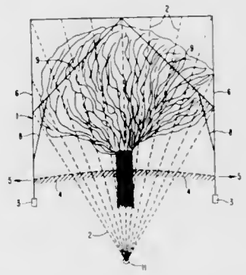
for driving said comb assembly and blade assembly to oscillate in opposite directions.

4,901,513
COLLECTION NETTING FOR FRUITS AND NUTS TREES
Sun Y. Kim, 2384 Lancaster Ct., Hayward, Calif. 94542, and Wilfred C. Frederiksen, 16881 Bolero La., Huntington Beach, Calif. 92649
Filed Jun. 2, 1989, Ser. No. 360,350
Int. Cl.[4] A01G *19/06*
U.S. Cl. 56—329 **9 Claims**



1. A netting system for collection of fruits or nuts in an orchard having trees uniformly spaced in rows and for each tree a net unit comprising:
an elongated pole, wherein each tree has a trunk and branches and the pole has means for securing the pole to the trunk of the tree in an upright position with the pole having a distal end extending up into the branches of the tree;
a net having a center portion with an opening the net having means for securing the center portion around the pole and the trunk of the tree, the net having a perimeter edge extending below the outer branches of the tree;
a plurality of suspension lines each line being connected to the distal end of the pole and connected to the perimeter edge of the net, wherein the net is aerially suspended under the branches of the tree by the suspension lines; and
a plurality of tension lines each line having first and second ends with the first end connected to the perimeter edge of a net and with the second end connectable to the proximal perimeter edge of a net arranged under an adjacent tree wherein the tension lines are of a length that spreads the net under the tree, with each tree in the orchard having a similar net unit interconnected with adjacent nets to form the net system.

4,901,514
FRUIT HARVESTING AND COLLECTING APPARATUS
Luis G. de Morais Zolo, Rua Candido Reis, Lote 4, Carcavelos, Portugal
Continuation-in-part of Ser. No. 894,033, Aug. 7, 1986, abandoned. This application Jan. 30, 1989, Ser. No. 303,239
Claims priority, application Portugal, Aug. 9, 1985, 80931
Int. Cl.[4] A01D *46/26*
U.S. Cl. 56—340.1 **6 Claims**



1. An apparatus for collecting fruit from a tree by contacting the tree, comprising:
an arch-shaped structure having a plurality of interconnected tubular elements for surrounding two sides and the top of the tree;
a plurality of cables connected to said structure and extending radially from two sides thereof; and
a pair of handles one on either side of said structure, for connecting together said cables on either side of said structure, so that manipulation of said handles causes motion of said cables and said structure and contact of said cables and said structure with the tree.

4,901,515
RAKE
Hannon S. McLeod, and W. Stacy McLeod, both of Rte. 5 - Box 144, Lucedale, Miss. 39452
Filed Oct. 11, 1988, Ser. No. 255,327
Int. Cl.[4] A01D *7/06*
U.S. Cl. 56—400.18 **7 Claims**

1. An adjustable rake comprising:
an elongated handle member having a proximal end and a distal end;
a plurality of rake teeth, each said rake tooth having a proximal portion having a substantially circular cross-section

and a distal portion having a substantially flattened cross-section;

means for mounting said rake teeth to said handle member; and

a rake tooth stablizer mounted to a distal end of said handle member and slidably receiving each of said rake teeth, at least one of said means for mounting and said rake tooth stabilizer being longitudinally slidable relative to said handle member, said rake tooth stabilizer being mounted into said handle member so as to have a longitudinal axis thereof disposed substantially transverse to a longitudinal axis of said handle member, said rake tooth stabilizer including a plurality of apertures defined along the length thereof for receiving each of said rake teeth, respectively,



each said aperture of said rake tooth stabilizer having a substantially circular central portion and cut outs defined on either side thereof so as to selectively slidably receive either the round portion or the flat portion of said rake teeth;

whereby sliding movement of said means for mounting relative to said rake tooth stabilizer moves said rake teeth from a spaced apart, open configuration having a maximum width wherein said circular portion of each said aperture slidably engages the circular proximal portion of each said rake tooth to a closed configuration having a minimum width wherein said cut out portions of each said aperture slidably engage the flattened distal portion of each said rake tooth.

4,901,516

SPINNING DEVICE WITH BOBBIN CHANGER

Louis Vignon, Chemin de Vincy 5, CH-1201 Genève, Switzerland

Filed Feb. 27, 1989, Ser. No. 315,570

Claims priority, application Switzerland, Feb. 29, 1988, 743/88

Int. Cl.[4] D01H *9/08, 9/02*

U.S. Cl. 57—267 **5 Claims**



1. A bobbin changer for use in combination with a spinning device which device includes a rotatable and axially displaceable spindle, a thread guide member coaxial to the spindle and rotatable about the axis of said spindle, and an extension releasably extending from a free end of said spindle for winding thereupon a section of yarn of definite length prior to changing said bobbin, said bobbin changer comprising

a bobbin holder means, said bobbin holder means movable in a direction transverse to the axis of said spindle between a first position intersecting said spindle axis to a second position adjacent said spindle, said bobbin holder means capable of cooperative engagement with said bobbin to permit said bobbin holder means to remove a full bobbin from said spindle and transfer said bobbin to said second position, said bobbin holder means also capable of cooperative engagement with an empty bobbin and to transfer said empty bobbin from said second position to said first position,

first support means adapted to restrain said extension from lateral displacement, said first support means movable in a direction transverse to said axis of said spindle from a position adjacent said spindle to a position intersecting said spindle axis and in engagement with said extension.

4,901,517

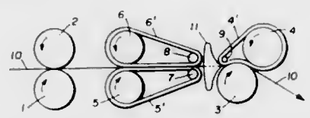
APPARATUS FOR THE DRAFTING SECTION OF RING SPINNING FRAMES

Don E. Fisher, Pensacola, Fla., assignor to Monsanto Company, Pensacola, Fla.

Filed Jul. 17, 1989, Ser. No. 380,944

Int. Cl.[4] D01H *5/26, 5/86*

U.S. Cl. 57—315 **7 Claims**



1. An improved apparatus for the drafting section of ring spinning frames on which sliver consisting of crimped staple fibers is simultaneously and continuously drafted, twisted and wound onto a bobbin, said apparatus comprising a pair of rear nip rolls for metering the input of sliver and a pair of front nip rolls for drafting sliver, each said pair consisting of a cot roll and a driven serrated metal roll, wherein the distance between the nip of said rear rolls and the nip of said front rolls is greater than the length of said staple fibers, drafting control means positioned between said rear nip rolls and said front nip rolls for guiding, controlling and straightening said fibers, a front cot roll apron extending around and in contact with said front cot roll and at least one other elongated member, said member(s) being positioned between said front cot roll and said drafting control means, said member(s) and said front cot roll being of a size and arranged with respect to one another so that said front cot roll apron follows the contour of said front metal roll.

5. In a ring spinning process wherein sliver consisting of loosely assembled crimp staple fibers is (1) drafted by passing the sliver between two pair of nip rolls, a back pair and a front pair, each pair having a cot roll and a serrated metal roll, the distance between said two pair of rolls being slightly greater than the length of said fibers, wherein the sliver en route from said back rolls to said front rolls passes first between and in contact with a pair of rotating aprons having peripheral speeds slightly greater than that of said back rolls and then through a free floating condenser position between said aprons and said front rolls, (2) twisted by means of an upright rotating spindle, and finally (3) wound onto a bobbin mounted on said spindle by means of a ring-and-traveler take-up mechanism, the improvement comprising passing the sliver from said condenser into contact with an apron which guides said sliver into the nip of said front rolls, wherein said apron rotates around the front cot roll and at least one elongated member, said member being positioned between said condenser and said front cot roll such that said apron follows the contour of said front serrated metal roll and presses said sliver against said front serrated metal roll and said apron with a compressive force that permits said fibers to be straightened out and to slip without being stretched in a region between said pair of rotating aprons and said nip of said front rolls, whereby spinning performance in terms of ends down per 1000 spindle hours and yarn uniformity in terms of thick and thin regions and draft ratios in excess of 28:1 may be used without sacrificing acceptable spinning performance or yarn uniformity.

4,901,518

OPEN END FRICTION SPINNING DEVICE FOR PRODUCTION OF A YARN OR THE LIKE

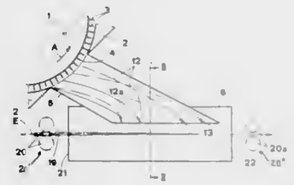
Herbert Stalder, Kollbrunn; Urs Keller, Seuzach; Emil Briner; Werner Oeggerli, both of Winterthur, and Arthur Würmli, Winterthur, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Nov. 12, 1987, Ser. No. 119,497

Claims priority, application Switzerland, Nov. 13, 1986, 04544/86

Int. Cl.[4] D01H *7/882, 7/885*

U.S. Cl. 57—401 **12 Claims**



1. An open end friction spinning device for production of a yarn or the like by means of friction spinning, comprising:

two coacting friction spinning means defining therebetween a convergence zone and movable relative to each other;

at least one of said friction spinning means being provided with a coating forming a friction surface and holes extending through said friction surface for throughflow of air in a predeterminate airflow direction;

said at least one friction spinning means defining a perforated friction spinning means having said friction surface;

a fiber sliver opening roller positioned to cooperate with said two coacting friction spinning means;

a fiber feed duct extending between said fiber sliver opening roller and said at least one perforated spinning means for pneumatic transport of fibers to the friction surface of said at least one friction spinning means;

a yarn formation position located on the friction surface of said at least one friction spinning means at the region of said convergence zone between said two coating friction spinning means;

a yarn withdrawal device for withdrawing yarn spun at the yarn formation position;

said coating defining an entrance opening at each one of said holes;

said entrance opening having a cross-sectional area which is less than 0.196 mm^2, but amounts to at least 0.07 mm^2;

each one of said holes having a predeterminate depth and a predeterminate width;

said coating extending only into part of said predeterminate depth of each one of said holes;

each one of said entrance openings widening, as viewed in said predeterminate airflow direction, along said part of said predeterminate depth to said predeterminate width of the associated hole; and

said coating having a thickness which amounts to at least 0.05 mm.

4,901,519

METHOD AND APPARATUS FOR SEPARATING SLIVER INTO INDIVIDUAL FIBERS IN A SLIVER OPENING DEVICE

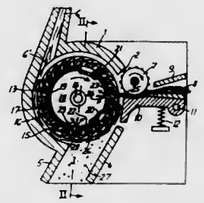
Heinz-Georg Wassenhoven, Moenchengladbach, and Karl-Josef Brockmanns, Willich, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 380,132

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 3832984

Int. Cl.[4] D01H *7/895, 7/888;* **D01G** *9/06, 23/00*

U.S. Cl. 57—411 **14 Claims**



1. A process for separating sliver into individual fibers in a sliver opening device of an open end spinning machine, the sliver opening device being of the type having a sliver intake opening, a trash discharge opening, an outlet opening for the discharge of individual fibers therethrough for feeding to the rotor of the open end spinning machine, a rotating opening roller of the type having a hollow interior and perforations extending from its exterior to its interior, and air flow control means disposed in the hollow interior of the opening roller having an opening located generally adjacent the sliver intake opening and an interior hollow chamber extending from the opening, the chamber being relatively large and the opening being relatively small, comprising:

feeding sliver through the sliver intake opening into the sliver opening device; and

rotating the opening roller, whereby air is caused to move from the exterior of the opening roller interiorly through the opening roller perforations into the hollow interior of the opening roller under the control of said air flow control means to cause fibers from the sliver to project toward the opening roller.

4. A sliver opening apparatus for separating sliver into individual fibers for feeding of the individual fibers to the rotor of an open end spinning machine, comprising:

a housing having a sliver intake opening, a trash discharge opening and a fiber outlet opening for discharge of individual fibers therethrough to the rotor of the open end spinning machine;

an opening roller having an outer surface, a cylindrical inner surface defining a hollow interior and a plurality of perforations extending from its outer surface to its inner surface; and

air flow control means, disposed in said hollow interior of said opening roller, said control means having an opening adjacent said sliver intake opening and an interior hollow chamber, said opening being relatively small and said chamber being relatively large.

4,901,520

GAS TURBINE PRESSURIZED COOLING SYSTEM

Andrew Kozak, Canton, Mass., and George Minkkinen, Fairfield, Conn., assignors to Avco Corporation, Providence, R.I.

Filed Aug. 12, 1988, Ser. No. 231,774

Int. Cl.[4] F02C *3/02*

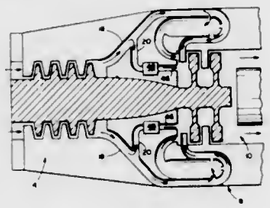
U.S. Cl. 60—39.02 **14 Claims**

10. A method of cooling a turbine assembly in a gas turbine engine, said gas turbine engine having a compressor section

with a first gas compressor means, a combustor section, a turbine section and a first core of gas passing therethrough, the method comprising the steps of:

bleeding pressurized gas from the first core of gas at a point at least partially past said first compressor section to thereby form a second core of gas;

compressing said second core of gas by means of a second



compressor means to thereby increase the pressure of the bleed gas such that the pressure of the second core of gas is greater than the pressure of the first core of gas, said second compressor means being driven by an accessory drive shaft of the engine; and

delivering the increased pressure bleed gas to said turbine section whereby the bleed gas has a higher pressure at said turbine section than the first core of gas.

4,901,521

COMBINED GAS TURBINE AND STEAM POWER PLANT HAVING A FLUIDIZED BED FURNACE FOR GENERATING ELECTRICAL ENERGY

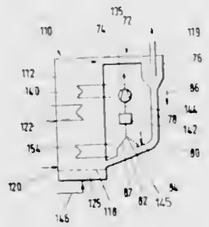
Wolfgang Schemenau, Laudenbach; Jürgen Bennert, Gorxheimertal, and Dietrich Ceelen, Grünstadt, all of Fed. Rep. of Germany, assignors to Brown Boveri & Cie, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 37,618, Apr. 13, 1987, Pat. No. 4,845,942. This application Feb. 28, 1989, Ser. No. 316,935

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3613300

Int. Cl.⁴ F02C *3/26*; F02B *43/08*

U.S. Cl. 60—39.12 **5 Claims**



1. Combined gas turbine and steam power plant for generating electrical energy, comprising:

a combustion chamber for the complete combustion of solid fuels with the aid of a circulating fluidized bed, which serves for generating steam for the steam power plant, said combustion chamber having an upper end region and a lower end region;

a circulation conduit disposed outside said combustion chamber and connected between said upper end region and said lower end region of said combustion chamber for circulating said fluidized bed, a feeding point connected to said circulation conduit for feeding a portion of the fuel into said circulation conduit, said circulation conduit having a fuel degasification and gasification zone formed therein in the vicinity of said feeding point;

a removal point disposed along said circulation conduit for removing combustible gas from said circulation conduit, said removal point being disposed in said fuel degasification and gasification zone; and

a combustor of the gas turbine plant in which air required for operation of the gas turbine plant is heated by combustion of said combustible gas, and a combustible gas line connected between said removal point and said combustor.

4,901,522

TURBOJET ENGINE COMBUSTION CHAMBER WITH A DOUBLE WALL CONVERGING ZONE

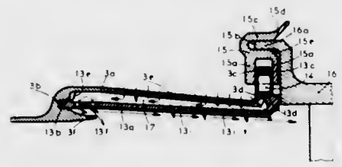
Patrice Commaret, Le Mee s/Seine; Michel A. A. Desaulty, Vert St Denis; Didier H. Hernandez, Ormoy; Jean-Claude Laugeois, Palaiseau; Gérard M. F. Mandet, Fericy,, and Rodolphe Martinez, Perigny s/Yerres, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA), Paris, France

Filed Dec. 9, 1988, Ser. No. 281,749

Claims priority, application France, Dec. 16, 1987, 87 17546

Int. Cl.⁴ F23R *3/60*

U.S. Cl. 60—39.32 **8 Claims**



1. In a turbojet engine having a turbine section, the improved annular combustion chamber having a combustion zone, a dilution zone and convergent zone comprising:

(a) a single thickness first outer annular wall defining a radially outer boundary of the combustion zone and the dilution zone;

(b) a single thickness first inner annular wall defining a radially inner boundary of the combustion zone and the dilution zone;

(c) a double thickness, second outer annular wall defining a radially outer boundary of the convergent zone and connected to the single thickness outer annular wall comprising:

(i) a first cold wall having a first flange extending radially from a downstream edge; and,

(ii) a first hot wall disposed adjacent to but spaced radially inwardly of the first cold wall, and having a second flange extending radially from a downstream edge;

(d) first attaching means to attach the first and second flanges to the turbine section so as to allow relative radial movement between the flanges and the turbine section;

(e) a double thickness second inner annular wall defining a radially inner boundary of the convergent zone and connected to the single thickness inner annular wall comprising:

(i) a second cold wall having a third flange extending radially from a downstream edge; and,

(ii) a second hot wall disposed adjacent to but spaced radially outwardly of the second cold wall, and having a fourth flange extending radially from a downstream edge;

(f) second attaching means to attach the third and fourth flanges to the turbine section so as to allow relative radial movement between the flanges and the turbine section;

(g) a plurality of bores defined by the first, second, third and fourth flanges; and,

(h) a plurality of generally cylindrical studs extending into the bores between the first and second flanges, and between the third and fourth flanges so as to prevent relative circumferential movement between the first and second flanges, and the third and fourth flanges, respectively.

4,901,523

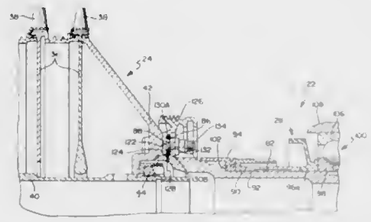
ROTOR FOR GAS TURBINE ENGINE

David S. Huelster, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 9, 1989, Ser. No. 294,442

Int. Cl.⁴ F02C *3/00, 7/00*

U.S. Cl. 60—39.161 **3 Claims**



1. A gas turbine engine rotor comprising:

a turbine including a bladed turbine wheel having a tubular hub with an internal pilot diameter aligned on a longitudinal axis of said turbine perpendicular to the plane of said bladed turbine wheel,

a tubular shaft having a cylindrical outside mounting pilot surface aligned on a longitudinal axis of said shaft closely received in said pilot diameter of said tubular hub when said turbine is disposed on said shaft,

means defining a radial flange at one end of said shaft having an annular face in a plane perpendicular to said longitudinal axis of said shaft,

a compressor rotating group having a longitudinal axis and an annular face at one end thereof in a plane perpendicular to said longitudinal axis of said compressor rotating group and juxtaposed said annular face on said shaft,

an annular adjustable shim pack including a first wedge-shaped annular shim having a first wedge angle and a second wedge-shaped annular shim having a second wedge angle and rotatable relative to said first shim to provide a shim pack wedge angle variable between a minimum at wedge-opposite relative positions of said first and said second annular shims and a maximum at wedge aligned relative positions of said first and said second annular shims,

said shim pack being disposed between said juxtaposed annular faces and adjusted to a shim pack wedge angle corresponding to an angle between the planes of said juxtaposed annular faces when said longitudinal axes of said shaft and said compressor rotating group are collinear, and

means operative to clamp said compressor rotating group to said shaft with said shim pack captured between said juxtaposed annular faces.

4,901,524

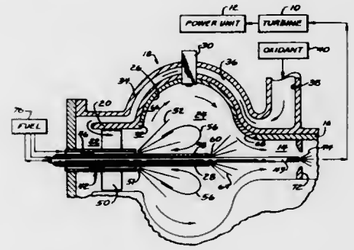
STAGED, COAXIAL, MULTIPLE POINT FUEL INJECTION IN A HOT GAS GENERATOR

Jack R. Shekleton, San Diego; Robert W. Smith, Lakeside, and Roy W. Vershure, Escondido, all of Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 272,409, Nov. 17, 1988, which is a continuation-in-part of Ser. No. 123,303, Nov. 20, 1987. This application Dec. 30, 1988, Ser. No. 292,233

Int. Cl.⁴ F23R *3/34*

U.S. Cl. 60—39.465 **11 Claims**



1. A hot gas generator comprising:

a vessel with an interior wall and having a narrow inlet end, an opposite, narrow elongated outlet end, and an intermediate, relatively wide, combustion chamber interconnecting said inlet end and said outlet end;

an oxidant inlet port at said inlet end; and

a fuel injector disposed generally centrally within said oxidant port and extending thru said chamber generally centrally thereof, said fuel injector having a first fuel discharge port at said inlet end for directing fuel toward said combustion chamber, a second fuel discharge port near said outlet end for directing fuel toward said outlet end, and a third fuel discharge port within said outlet end.

4,901,525

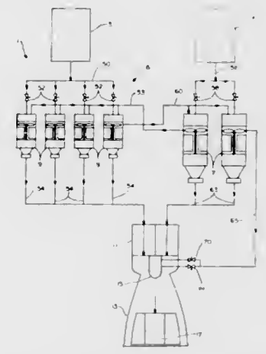
BOOSTER-SUSTAINER ROCKET ENGINE AND METHOD

John H. Beveridge, and William H. Knuth, both of Huntsville, Ala., assignors to Acurex Corporation, Mountain View, Calif.

Filed Mar. 9, 1988, Ser. No. 165,765

Int. Cl.⁴ F02K *9/00*

U.S. Cl. 60—211 **25 Claims**



1. In a liquid rocket propulsion system that includes at least

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two liquid propellants in the form of an oxidant stored in an oxidant tank and a fuel stored in a fuel tank apart from said oxidant, combustion means for mixing and burning said propellants to produce combustion products, said combustion means including a thrust chamber wherein at least a portion of the burning occurs, and a nozzle assembly for expelling the combustion products from the propulsion system to produce thrust, the improvement comprising delivery means for supplying the propellants to the combustion means and for enhanced expulsion from the combustion means, the delivery means comprising:

a plurality of turbopumps for pumping the liquid propellants to operational pressures, each said turbopump including,

a pump impeller for pumping one of the propellants to an operational pressure,

a preburner for combusting a portion of the fuel with a portion of the oxidant to produce a gasified fluid flowstream, and

a turbine wheel for extracting energy from the gasified flowstream to drive the pump impeller;

means for carrying the fluid flowstreams from said turbopumps to said combustion means; and

wherein said plurality of turbopumps gasify substantially all of the propellants prior to delivery of the propellants to the combustion means, and the plurality of turbopumps include at least one oxidant turbopump, each said oxidant turbopump combining and combusting a small portion of the fuel with a substantial portion of the oxidant within its preburner to produce a gasified oxidizer-rich flowstream, and at least one fuel turbopump, each said fuel turbopump assembly combining and combusting a small portion of the oxidizer with a substantial portion of the fuel within its preburner to produce a gasified fuel-rich flowstream.

4,901,526

BOTTOM UNIT FOR THE COMBUSTION CHAMBER OF A LIQUID-FUELED ROCKET

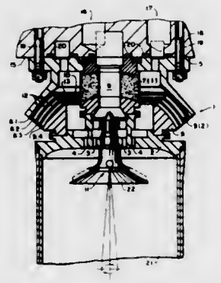
Thomas Barth, Darmstadt, and Heinz Keller, Weinheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 300,419

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 3802257

Int. Cl.[4] F02K *9/52*

U.S. Cl. 60—258 **12 Claims**



1. In a bottom unit for the combustion chamber of a liquid-fueled rocket, including (a) a bottom plate held on a swivel bearing, which can be tilted about a center of rotation with respect to the longitudinal direction of the liquid-fueled rocket and which has circumferentially distributed injection openings for two fuel components, and (b) two separate groups of fuel supply passages connected to the injection openings, the improvement wherein the swivel bearing includes a rigid thrust plate and a rigid hanger plate supported and fastened to one another by an internally located first annular body of rubber elastic material and a second annular body of rubber elastic material surrounding the first annular body and spaced radially therefrom, and wherein one group of supply passages is formed by the cavity surrounded by the first annular body and the other group of supply passages is formed by the space between the first annular body and the second annular body.

4,901,527

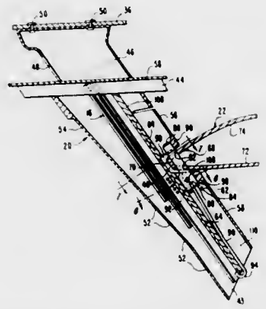
LOW TURBULENCE FLAME HOLDER MOUNT

Dudley O. Nash; James R. Reigel, both of Cincinnati, and Frederick J. Stine, Maineville, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 18, 1988, Ser. No. 156,876

Int. Cl.[4] F02K *3/10*

U.S. Cl. 60—261 **41 Claims**



1. A gas turbine engine afterburner section, comprising:

a plurality of radially inwardly extending fuel injectors surrounded by fairings;

at least one flame holder having a first cross-sectional configuration;

said fairings having a first recessed portion formed therein, said first recessed portions having a second cross-sectional configuration substantially corresponding to a portion of said first cross-sectional configuration of said flame holder for receiving said flame holder therein; and

means for releasably securing said flame holder in selected ones of said first recessed portions of said fairings.

4,901,528

SYSTEM FOR SUPPRESSING NOISE DUE TO EXHAUST GAS FROM MOTOR VEHICLE

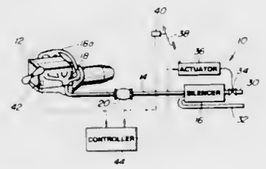
Fumitaka Saigo, Atsugi City; Akira Azuma, Fujisawa City, and Ryoichi Nakagawa, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jan. 17, 1989, Ser. No. 297,649

Claims priority, application Japan, Jan. 16, 1988, 63-7187

Int. Cl.[4] F02B *27/02;* **F01N** *7/00*

U.S. Cl. 60—312 **2 Claims**



1. In an automotive vehicle:

a vehicle cabin;

an engine having an even number of cylinders, said engine having a first group of half of the cylinders connected to a first exhaust manifold and a second group of the remaining cylinders connected to a second exhaust manifold, said first and second exhaust manifolds are joined at a predetermined portion and having different fluid flow paths in length down to said predetermined portion;

a silencer connected to said first and second exhaust manifolds at said predetermined portion, said silencer including selector valve means whereby the exhaust resistance of silencer is altered;

means for detecting engine revolution speed of said engine and generating a first output signal;

means for detecting engine load on said engine and generating a second output signal;

control means responsive to said first and second output signals for normally closing said selector valve means, but opening same when the engine revolution speed indicated by said first output signal exceeds a first predetermined engine revolution speed value when a predetermined order component of exhaust noise coincides with a predetermined resonance frequency within said vehicle cabin when said second output signal indicates that the vehicle is at acceleration, said control means being operative to normally close said selector valve means, but opening the selector valve when the engine revolution speed indicated by said first output signal exceeds a second predetermined engine revolution speed value when a second predetermined order component of the exhaust noise coincides with said predetermined resonance frequency within said vehicle cabin when said second output signal indicates that the vehicle is at deceleration.

4,901,529

HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

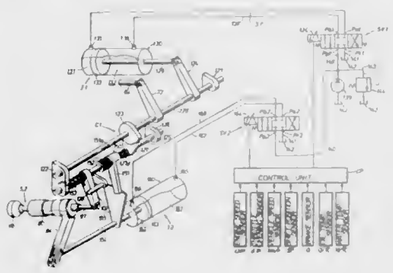
Takashi Iino; Koji Yamaguchi; Eiichiro Kawahara, and Kazuya Maki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1987, Ser. No. 76,789

Claims priority, application Japan, Jul. 23, 1986, 61-173377; Jul. 23, 1986, 61-173378; Jul. 23, 1986, 61-173379

Int. Cl.[4] F16D *39/00*

U.S. Cl. 60—489 **23 Claims**



1. A hydraulically operated continuously variable transmission comprising:

an input shaft;

a hydraulic pump coupled to said input shaft and having inlet and outlet ports;

an output shaft;

a variable-displacement hydraulic motor coupled to said output shaft;

a closed hydraulic circuit interconnecting said hydraulic pump and said hydraulic motor and including a passage connecting said inlet and outlet ports of the hydraulic pump;

a servomotor for making and breaking said hydraulic circuit respectively by opening and closing said outlet port;

a clutch valve for continuously varying the cross-sectional area of said passage to change the amount of power transmitted between said hydraulic pump and said hydraulic motor; and

a control system for independently controlling said servomotor and said clutch valve, said control system being arranged to hold said servomotor in a position to open said outlet port when said clutch valve is opened beyond a prescribed degree.

4,901,530

DEVICE FOR CONTROLLING TURBOCHARGER WITH ROTARY ELECTRIC MACHINE

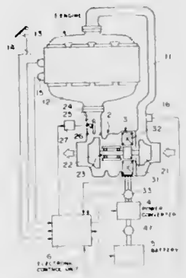
Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motor Limited, Kanagawa, Japan

Filed May 31, 1988, Ser. No. 200,585

Claims priority, application Japan, May 30, 1987, 62-133455

Int. Cl.[4] F02B *37/14*

U.S. Cl. 60—608 **9 Claims**



1. A device for controlling a turbocharger of a motor vehicle engine having an accelerator pedal, comprising:

a turbine mounted on the engine of the motor vehicle being drivable by exhaust gases emitted from the engine;

a rotatable shaft coupled to said turbine;

a compressor coupled to said rotatable shaft delivering air under pressure into the engine;

a rotary electric machine coupled to said rotatable shaft;

an engine speed sensor connected to the engine, detecting a rotational speed of the engine and providing a corresponding signal;

an accelerator sensor connected to the accelerator pedal, detecting an amount of depression of the accelerator pedal and providing a corresponding signal;

a boost pressure sensor connected to said compressor detecting a boost pressure of the air delivered to the engine;

a battery mounted on the motor vehicle and connected to said rotary electric machine;

means for calculating a required boost pressure based on the signals from said engine speed sensor and said accelerator sensor; and

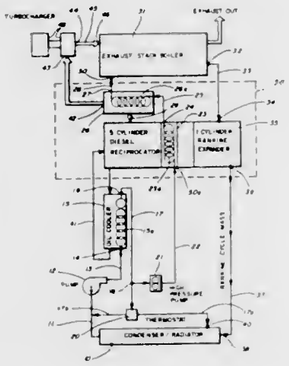
control means for driving said rotary electric machine as a motor and supplying electric power from said battery to said rotary electric machine if a difference between said calculated required boost pressure and the boost pressure detected by said boost pressure sensor is greater than a predetermined value.

4,901,531

RANKINE-DIESEL INTEGRATED SYSTEM

Isoroku Kubo, and Amarjit S. Ghuman, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 29, 1988, Ser. No. 149,850
Int. Cl.[4] F01K *23/10, 23/14*
U.S. Cl. 60—618 1 Claim



1. An integrated diesel/Rankine cycle system for using heat in a multicylinder diesel engine to generate high temperature, high pressure vapor from a circulating stream of engine cooling fluid to drive at least one piston disposed within at least one power cylinder of said diesel engine, said system comprising:

a reservoir of engine cooling fluid;

oil cooling means connected to said engine for recycling heated engine oil and connected to said reservoir for receiving said engine cooling fluid and bringing said fluid into heat exchange relation with heat dissipated from said heated engine oil for heating said engine cooling fluid;

said oil cooling means further comprising an outlet for discharging said heated engine cooling fluid;

first conduit means in communication with said oil cooling means outlet for receiving the discharged heated engine cooling fluid;

high pressure pump means connected to said first conduit means for drawing off a portion of said discharged heated engine cooling fluid from said first conduit means while the remaining discharged heated engine cooling fluid continues to flow in said first conduit means;

thermostat means connected to said first conduit means in parallel with said high pressure pump means, and responsive to the heat of the remaining discharged heated engine cooling fluid flowing in said first conduit means and controlling the flow thereof to said reservoir and said oil cooling means;

cylinder head passageways connected to said high pressure pump means for receiving said heated engine cooling fluid and bringing said heated fluid into heat exchange relation with additional heat discharged from said engine for further heating said engine cooling fluid;

exhaust manifold means connected to said passageways for receiving said heated engine cooling fluid and further bringing said heated fluid into heat exchange relation with additional heat dissipated from said engine for further heating said heated engine cooling fluid;

waste heat recovery means connected to said exhaust manifold means for receiving said heated engine cooling fluid and vaporizing same in response to heat dissipated from said engine;

said power cylinder of said multicylinder engine having an inlet connected to said waste heat recovery means for receiving said vaporized fluid and driving said piston within said engine power cylinder and an outlet for exhausting said vaporized fluid during a predetermined segment of piston travel within the cylinder; and

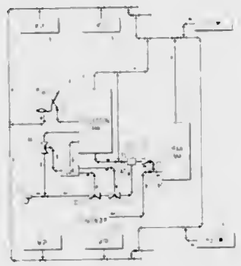
second conduit means in communication with said power cylinder exhaust outlet and said reservoir for effecting circulation of exhaust gases from said power cylinder to said reservoir and condensing and recycling same.

4,901,532

SYSTEM FOR ROUTING PRESEPARATOR DRAINS

George J. Silvestri, Jr., Winter Park, and Homer G. Hargrove, Maitland, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 5, 1988, Ser. No. 253,290
Int. Cl.[4] F01K *17/00*
U.S. Cl. 60—657 7 Claims



7. In a steam turbine employing a moisture preseparator drain system for erosion-prevention of exhaust piping between the steam turbine exhausts and one or more moisture separator drain tanks, which drain system includes drain lines opening into a collection tank for collecting preseparator drain liquid removed from steam exiting the turbine exhausts, the collection tank being upstream of the moisture separator drain tanks, a flash-preventing system for preseparator drain liquid exiting the collection tank, comprising:

eductor means disposed between the collection tank and the moisture separator drain tank, for suctioning liquid from the collection tank;

a source of motive fluid coupled to the eductor means, said motive fluid being at lower temperature and higher pressure than the collection tank liquid;

first pipe means for delivering the collection tank liquid from the collection tank to said eductor means;

second pipe means for delivering liquid discharged from said eductor means to the moisture separator drain tank;

control means for controlling flow of said motive fluid into said eductor means, said control means comprising a flow control valve and a liquid level sensor within the collection tank for controlling the flow control valve in response to the level of liquid within said collection tank such that the amount of flow of motive fluid into said eductor means varies with the level of liquid to be suctioned from the collection tank by said eductor means;

spray means for spraying a cool liquid into the collection tank for precooling the preseparator drain liquid entering the collection tank;

a source of cool liquid for said spray means;

delivery means for delivering said cool liquid to said spray means; and

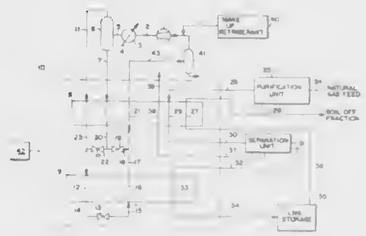
submerged entry means for the drain lines entering into the collection tank, said first pipe means projecting upward within the collection tank so that liquid leaving the collection tank via said first pipe means exits at an elevation above that at which the drain lines enter the collection tank.

4,901,533

PROCESS AND APPARATUS FOR THE LIQUEFACTION OF A NATURAL GAS STREAM UTILIZING A SINGLE MIXED REFRIGERANT

Chung T. Fan, River Edge, N.J., and Hannes Oelschlegel, Thornwood, N.Y., assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 21, 1986, Ser. No. 842,575
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62--11 37 Claims



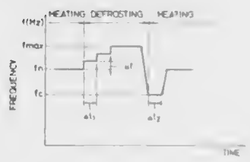
1. In a process for cooling a fluid feed material from an initial temperature to a second, cryogenic temperature which utilizes a single mixed refrigerant composition whose respective constituents possess a range of successively lower boiling points, wherein said refrigerant composition is passed through a single closed loop refrigeration cycle involving stages of: compression; partial condensation in an aftercooler; phase separation to provide a vapor-containing refrigerant stream and a liquid-containing refrigerant stream; heat exchange; and expansion, wherein the heat exchange occurs in a cold box containing a warm end and a cold end heat exchanger, said exchangers being thermally connected in series relationship, wherein the improvement comprises regulating the flow rate of the vapor-containing refrigerant stream passing from said partial condensation stage by diverting predetermined amounts of liquid refrigerant from the liquid-containing refrigerant stream also passing from the partial condensation stage, into said vapor-containing refrigerant stream, said diverting occurring at a point inside the cold box after said vapor-containing refrigerant stream exits the warm end heat exchanger, but before entering the cold end heat exchanger.

4,901,534

DEFROSTING CONTROL OF AIR-CONDITIONING APPARATUS

Eiji Nakatsuno, and Yasunori Himeno, both of Ootsu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 23, 1987, Ser. No. 137,026
Claims priority, application Japan, Dec. 26, 1986, 61-312281
Int. Cl.[4] F25D *21/06*
U.S. Cl. 62--81 6 Claims



1. A method for controlling an air-conditioning apparatus including a variable-frequency compressor arranged to allow a change of its operating frequency, a room heat-exchanger provided in a room to be heated for heat-exchange with a room fan for supplying into said room air heat-exchanged with said room heat-exchanger, and an outdoor heat-exchanger provided at the outside of said room, which are circularly coupled to each other to establish a refrigerating cycle, said air-conditioning apparatus further including a bypass circuit provided between a first line for effecting a connection between an outlet side of said variable-frequency compressor and said room heat-exchanger and a second line for effecting a connection between an inlet side of said variable-frequency compressor and said outdoor heat-exchanger and a restriction device arranged to allow a change of its restriction amount and provided between said room heat-exchanger and said outdoor heat-exchanger, said by pass circuit having an opening and closing valve for shutting off said bypass circuit, the method comprising the steps of:

(a) controlling the restriction amount of said restriction device in response to start of a defrosting mode of said air-conditioning apparatus for defrosting said outdoor heat-exchanger, the restriction amount thereof being reduced as compared with a restriction amount thereof during a heating mode of said air-conditioning apparatus for heating said room;

(b) opening said opening and closing valve of said bypass circuit in response to the start of said defrosting mode for establishing communication between said first and second lines;

(c) controlling said variable-frequency compressor in response to the start of said defrosting mode so that its operating frequency is increased stepwise up to a first predetermined value desirable for said defrosting mode; and

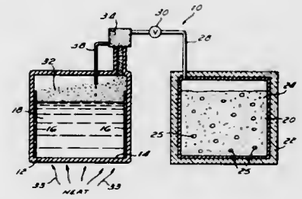
(d) reducing the operating frequency of said compressor to a second predetermined value in response to termination of said defrosting mode and operating said compressor at the operating frequency of said second predetermined value for a first predetermined time period.

4,901,535

TEMPERATURE CHANGING DEVICE IMPROVED EVAPORATION CHARACTERISTICS

Cullen M. Sabin, 3346 Ullman St., San Diego, Calif. 92109; Dennis A. Thomas, 20131 Allentown Dr., Los Angeles, Calif. 91364, and Gary Steidl, 1730 S. El Camino Real, Apt. H-208, Encinitas, Calif. 92024

Continuation-in-part of Ser. No. 70,973, Jul. 7, 1987, Pat. No. 4,759,191, which is a continuation-in-part of Ser. No. 169,869, Mar. 17, 1988. This application Jun. 22, 1988, Ser. No. 208,371
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—101 9 Claims



7. A method for cooling, comprising the steps of:

(a) providing a cooling device, comprising:

(i) a first chamber containing a liquid wherein said first chamber has an interior surface provided with a wicking material for said liquid, wherein said wicking material for said liquid is a hydrophilic gel-forming polymer;

(ii) a second evacuated chamber containing a sorbent for said liquid;

(iii) a conduit connecting said first and said second chambers;

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(iv) a valve in the conduit preventing communication between said first chamber and said second chamber while said valve is closed; and

(v) means for opening said valve to connect said first and said second chambers;

(b) opening said valve to permit communication between said first chamber and said second chamber, whereby the pressure in said first chamber is reduced, causing said liquid to boil, forming a vapor, which vapor is directed through said conduit into said second chamber; and

(c) removing vapor from said second chamber by collecting same in said sorbent until an equilibrium condition is reached, wherein said sorbent is substantially saturated or substantially all of the liquid originally in said first chamber has been collected in said sorbent.

4,901,536

AIR-CONDITIONER CONTROL SYSTEM

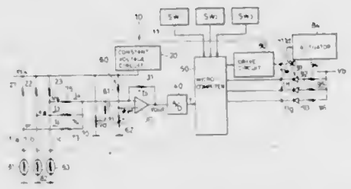
Masahiro Eda, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1988, Ser. No. 277,556

Claims priority, application Japan, Dec. 2, 1987, 62-303411

Int. Cl.[4] F25B *49/00*

U.S. Cl. 62—126 **9 Claims**



1. A control system for controlling actuator means and display means of an air conditioner, said control system comprising:

(a) a plurality of temperature-data input terminals;

(b) reference-voltage generating means including a variable resistor, for generating an adjustable reference voltage;

(c) an operational amplifier having an inverting input terminal, a noninverting terminal and an output terminal, said output terminal and said inverting input terminal being connected to each other through a negative feedback resistor, wherein said temperature-data input terminals are connected to said inverting input terminal through respective input resistors, and wherein said reference voltage from said reference-voltage generating means is inputted to said noninverting input terminal;

(d) an A/D converter for converting an output voltage from said operational amplifier to digital data;

(e) mode-signal generating means for sending a mode signal to a below-mentioned microcomputer; and

(f) the microcomputer including:

(i) judging means for judging whether the air conditioner is in a normal control mode or an adjusting mode, on the basis of said mode signal from said mode-signal generating means,

(ii) normal-control-mode executing means for outputting a control signal representative of a current air-conditioning state, to said display means and for outputting a control signal to said actuator means of said air conditioner on the basis of said digital data from said A/D converter when said normal-control-mode executing means receives a judgment signal from said judging means indicative of said normal control mode, and

(iii) adjusting-mode executing means for outputting a control signal representative of the output voltage from said operational amplifier, to said display means, on the basis of said digital data from said A/D converter when said adjusting-mode executing means receives a judgment signal from said judging means indicative of said adjusting mode.

4,901,537

SOLAR HEAT COLLECTOR SYSTEM

Masaharu Yoshikawa, 1330-2 Toriya-cho, Kashiwara-shi, Nara-ken; Nobushige Arai, 3604-6 Kanmaki, Kanmaki-cho; Masafumi Satomura, 46-301, Kataokadai 3-1, Kanmaki-cho, both of Kitakatsuragi-gun, Nara-ken; Syozo Tanaka, 734 Kume-cho; Yoshiharu Shinobu, 785 Touichi-cho, both of Kashiwara-shi, Nara-ken; Akira Takushima, 24-506, Kataokadai 3-1, Kanamaki-cho, Kitakatsuragi-gun, Nara-ken, and Nobuhiro Yanagisawa, 1765-2 Mise-cho, Kashiwara-shi, Nara-ken, all of Japan

Continuation-in-part of Ser. No. 94,722, Sep. 9, 1987, abandoned, and a continuation of Ser. No. 720,701, Apr. 8, 1985, abandoned. This application Feb. 29, 1988, Ser. No. 161,951

Claims priority, application Japan, Sep. 18, 1984, 59-195599; Sep. 18, 1984, 59-195600; Sep. 18, 1984, 59-195601; Sep. 18, 1984, 59-195602; Sep. 18, 1984, 59-195603; Oct. 23, 1984, 59-160739[U]; Feb. 15, 1985, 60-28929

Int. Cl.[4] F25B *27/00*

U.S. Cl. 62—235.1 **4 Claims**



1. A solar heat collector system comprising:

a heat collector circuit and a fluid heating circuit, said heat collector circuit being in a heat exchange relationship with said fluid heating circuit;

said heat collector circuit including at least one heat collector, a compressor that compresses and outputs thermal media and which is provided with a variable capacity capability by conversion of its operative frequencies, a condenser and an expansion valve, said compressor being interposed between an output side of said at least one heat collector and input side of said condenser and said expansion valve being interposed between an output side of said condenser and input side of said at least one heat collector;

said fluid heating circuit comprising a hot water pool and a fluid heater, said fluid heater being held in a heat-exchange relationship with said condenser; and

control means for controlling said capacity of said compressor including first and second temperature detectors disposed respectively at input and output sides of said fluid heater and a third temperature detector disposed in said hot water pool, which control means adjusts the capacity of said compressor in accordance with said temperatures of said first, second and third temperature detectors.

4,901,538

PORTABLE TEMPERATURE MAINTENANCE SYSTEM

James Anthony, #17 Rockinghorse Rd., Rancho Palos Verdes, Calif. 90274

Filed Jul. 13, 1988, Ser. No. 218,564

Int. Cl.[4] F25D *15/00*

U.S. Cl. 62—237 **7 Claims**

7. A transportable ground system for air-conditioning the interior of an existing unmodified aircraft cargo container of

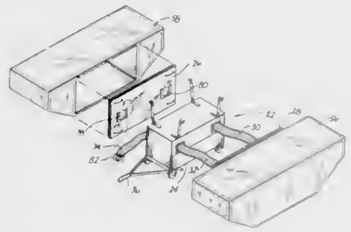
the type having at least one access opening for loading and unloading said container, comprising:

a wheeled carriage, air refrigeration and air circulation means on said carriage including first port means for circulating air through said air refrigeration and air circulation means;

a pair of panels each fully detachable from said carriage, each said panel being adapted to fit over and close the access opening of a cargo container to be refrigerated;

locking means on each said panel manually actuatable into engagement with a cargo container for holding each of said panels in substantially sealing relationship over the access opening in a corresponding cargo container;

second port means in said panel for circulating air through the interior of said corresponding cargo container when said panel is engaged thereto;



a plurality of flexible air ducts each having opposite duct ends, each duct end provided with an end fitting adapted to releasably engage with corresponding fittings on said panels and on said carriage for connecting said first port means with said second port means thereby to recirculate air between said refrigeration means and the corresponding cargo container or containers associated with one or both of said panels for maintaining a controled temperature in the container or containers, said end fittings being the same at each duct end such that either duct end may be interchangeably engaged to said first or said second port means; and

means on said carriage for storing both panels and said air ducts fully disconnected from each other and from said first port means.

4,901,539

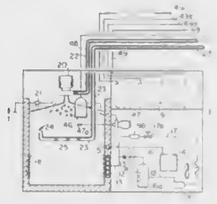
ICE MAKING AND DISPENSING MACHINE

Howard A. Garber, 1900 Lauderdale Dr., Apt. D-109, Richmond, Va. 23233, and William R. Knutson, 10607 Fiesta Rd., Fairfax, Va. 22032

Filed Jan. 30, 1989, Ser. No. 302,951

Int. Cl.[4] F25C *1/12*

U.S. Cl. 62—306 **5 Claims**



2. An ice making and dispensing machine comprising in combination an enclosing cabinet, a water tight container constructed of high thermal transmitting material, pressurized syrup storage container, a refrigerating system including evaporator comprising metalic tubing having multiple contact points configured to contact the outer surface of the said water tight container, said water tight container being filled with water, said evaporator by means of heat transfer to produce a plurality of pure ice cubes beng circular in form and having a slight convex surface adjacent to the side wall of the water tight container upon which they form and a greater convex surface on the opposite side due to ice build up as the cubes grown to any desired thickness, a means for providing a harvesting cycle consisting of an intermittently applied hot gas flow through said evaporator causing the ice cubes to release from the interior side wall and float to the surface of the contained water producing an ice/water mixture, conduits consisting of tubing located internally of the enclosing cabinet for circulating the ice/water mixture to a dispensing head and additional tubing extending from the syrup storage containers and disposed around and in contact with the outer surface of the ice/water mixture container thus effectively cooling the syrup while being delivered to the dispensing head, a means of circulating the ice/water mixture, a means for circulating the syrup to the dispensing head, the dispensing head located within the enclosing cabinet consisting of variable flow-rate dispensing valves and attending actuating members, a control system providing for the simultaneous dispensing of multiple beverage ingredients, a delivery chute consisting of tubing extending downward from the enclosing cabinet at a height sufficient to receive beverage containers, and a means for returning drained chilled water to the said water fill container.

4,901,540

RETIFIER COLUMS FOR VAPOUR GENERATORS

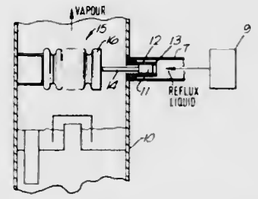
Fred Houghton, Danesbury, 255 Park Road, Hartlepool, Cleveland TS26 9NL, and Paul Holmes, 14 Hayling Way, Hartburn, Stockton-on Tees TS18 50F, both of Great Britain

Filed Jun. 17, 1988, Ser. No. 207,808

Claims priority, application United Kingdom, Jun. 18, 1987, 8714337

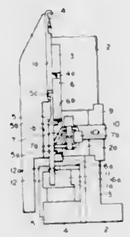
Int. Cl.[4] F25B *33/00*

U.S. Cl. 62—495 **16 Claims**



1. A vapor rectifier column comprising a vapor output, a vapor reflux inlet coupled to a reflux source, modulating means disposed at said inlet for controlling the flow of reflux into said column, and temperature sensitive means located at an upper portion of said column, wherein said temperature sensitive means is responsive to the temperature of vapor occurring at said upper portion of said column, and said modulating means is actuated by said temperature sensitive means to maintain said vapor at an optimum concentration

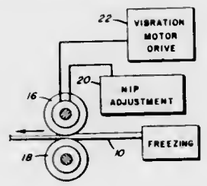
4,901,541
NEEDLE SELECTOR FOR KNITTING MACHINE
Yukio Taki, Konan, and Norihiro Osawa, Kani, both of Japan, assignors to Okuma Machinery Works Ltd., Nagoya, Japan
Filed Apr. 15, 1988, Ser. No. 181,961
Claims priority, application Japan, Apr. 20, 1987, 62-97059
Int. Cl.[4] D04B *15/78, 9/06*
U.S. Cl. 66—220 **7 Claims**



1. A needle selector for a knitting machine, comprising:
a plurality of jacks fitted for movement respectively in needle grooves formed in a needle bed, so as to control respective needles, each of said jacks having one end thereof serving as a fulcrum about which the jack is capable of rocking, the jack having a butt;
a jack groove cam having a raising cam face for moving said jacks along their respective axes;
a control electromagnetic arranged in facing relation to one of said jacks at a yarn feeding position, said control electromagnetic being excited in response to a needle-selecting signal to attract the jack to bring its butt into engagement with said raising cam face of said jack groove cam;
a jack holding cam arranged in juxtaposed relation to the other rocking end of the jack at said yarn feeding position, said jack holding cam having a cam face which is so magnetized as to attract the jack toward said jack groove cam, said jack holding cam extending to a position beyond a knit face section of said raising cam face of said jack groove cam;
a non-magnetic region provided on said cam face of said jack holding cam and extending between a position just before a needle-selecting area due to said control electromagnet and a position just after said needle-selecting area;
a welt cam arranged at such a position as to clamp the jack between said cam face of said jack holding cam and a cam face of said welt cam just before said needle-selecting area, said cam face of said welt cam being so magnetized as to attract the jack,
wherein needle selection is carried out with respect to said jacks passing between said holding cam and said welt cam having their respective cam faces magnetized, in response to presence and absence of the needle-selecting signal to said control electromagnet.

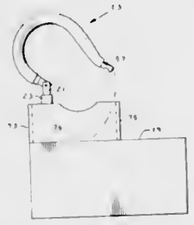
4,901,542
METHOD AND APPARATUS FOR INCREASING LEATHER YIELD FROM TANNED HIDES
Lester Gidge, 61 Linwood St., Nashua, N.H. 03060, and Ronald P. Murro, Martingale Rd., Amherst, N.H. 03031
Filed Nov. 21, 1984, Ser. No. 673,848
Int. Cl.[4] C14B *1/34, 1/18*
U.S. Cl. 69—48 **39 Claims**

1. A process for increasing the surface area of split portions of tanned hides to improve the yield of leather from the hides, comprising the steps of:
freezing the split portions; and



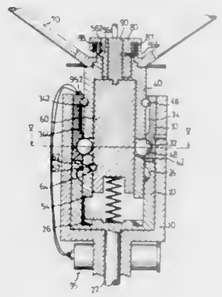
subjecting the frozen split portions to mechanical compression to enlarge the surface area thereof.

4,901,543
LOCK WITH SHIELDED SHACKLE
Paul Appelbaum, Box 27006, Denver, Colo. 80227
Filed Nov. 14, 1988, Ser. No. 270,663
Int. Cl.[4] E05B *67/06*
U.S. Cl. 70—53 **6 Claims**



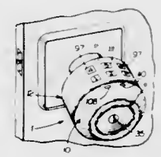
1. Shackle-equipped lock with shielded shackle, including:
(a) a housing enclosing a locking mechanism and having a top wall with first and second bores therein;
(b) shackle, including a shaft having a lower end adapted for making locking engagement within said first bore and an upper end adapted for forming a hinge joint, and said clasp having an upper end, lower leg and a looping midportion, said lower leg adapted for making locking engagement within said second bore, and said upper clasp end making a hinge joint with the upper end of said shaft for rotation of said clasp about an axis perpendicular to the general plane in which said shackle lies, and said shackle having a locked configuration in which said shaft and clasp are locked within said first and second bores, and an unlocked configuration in which said clasp is free to rotate about said axis; and
(c) protective shield surrounding said first and second bores and having a front wall, rear wall and spaced apart side walls, said shield extending upwardly from said housing top wall for a substantial distance relative to the upward extent of said shackle when in its locked configuration, and said front wall spaced from said second bore sufficiently to allow the unlocked lower leg of said clasp to pass when said clasp is rotated.

4,901,544
STEERING WHEEL RELEASING AND ENGAGING MECHANISM
Jaw J. Jang, 6 Fl., No. 36-5, Ho Ping Rd., Pan Chiao City, Taipei Hsien, Taiwan
Filed Jun. 7, 1989, Ser. No. 362,512
Int. Cl.[4] E05B *13/10*
U.S. Cl. 70—218 2 Claims



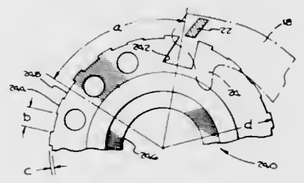
1. A steering wheel releasing and engaging mechanism comprising: a substantially cylindrical outer housing (10) for receiving a steering shaft assembly therein, an engaging block assembly releasably slidable within said steering shaft assembly, a steering wheel (70) fixedly mounted on said engaging block assembly, and a lock assembly for releasing or engaging said engaging block assembly with said steering shaft assembly; wherein;
said steering shaft assembly is composed of a lower part (20) and an upper part (30), said lower part (20) being integral to a steering shaft (22), said lower part (20) being rotatably received within said outer housing (10) and having a plurality of ball guide recesses (24) formed on an inner wall thereof, said upper part (30) being fixedly secured to said outer housing (10), said upper part (30) having an annular ball guide groove (32) and alimit recess (34) formed on an inner wall thereof;
said engaging block assembly is freely rotatable and is longitudinally slidable within said steering shaft assembly between an upper limit position and a lower limit position, said engaging block assembly comprising an engaging block (40) and an actuating block (60), said engaging block (40) having a plurality of ball guide holes (42) formed thereon and an annular groove (44) formed on an outer wall thereof, said actuating block (60) being rotatable within said engaging block (40) by said lock assembly so that said engaging block assembly is slidable between said upper limit position and said lower limit position;
said lock assembly is releasably secured on a top of said engaging block assembly, said actuating block (60) is rotatable by said lock assembly; and
a plurality of guiding balls (46) are disposed between said annular groove (44) and said limit recess (34); a plurality of engaging balls (48) each are disposed in respective ball guide hole (42), said engaging balls (48) being engageable with said ball guide groove (32) so that said engaging block assembly is rotatable relative to said upper part (30) of said steering shaft assembly, said engaging balls (48) being engageable with said ball guide holes (24) so that said engaging block assembly rotates said lower part (20) of said steering shaft assembly to turn.

4,901,545
SELF-CONTAINED ELECTROMECHANICAL LOCKING DEVICE
Michael E. Bacon; Scott W. Morneweck, both of Greenville, Pa.; Roger C. Keith, Euclid, and Arvin B. Simon, Lorain, both of Ohio, assignors to Rising Star Technologies (a partnership), Greenville, Pa.
Filed Dec. 28, 1987, Ser. No. 138,918
Int. Cl.[4] E05B *49/00*
U.S. Cl. 70—278 **34 Claims**



1. An electromechanical locking device completely contained within a doorknob of the type adapted to be fitted on an input shaft of a key actuated lockset, said device including
(a) a self-contained power source;
(b) key actuated mechanical locking means for rotating a locking cylinder from locked to unlocked position;
(c) first means for generating a first signal in response to an entered code;
(d) second means for generating a second signal in response to the first signal and
(e) interlocking means operable in response to the second signal for permitting unlocking of the mechanical locking means by a key.

4,901,546
RANDOMLY-FALSE-GATED TUMBLER WHEELS FOR COMBINATION LOCKS
Tim M. Uyeda, 8317 Elsmore Dr., Rosemead, Calif. 91770; Klaus W. Gartner, 2632 Via Anacapa, Palos Verdes Estates, Calif. 90274, and Peter J. Phillips, 828 Calle de Arboles, Redondo Beach, Calif. 90277
Filed May 12, 1986, Ser. No. 862,003
Int. Cl.[4] E05B *37/00*
U.S. Cl. 70—323 **11 Claims**



1. An improved tumbler wheel for combination locks, wherein the improvement comprises:
said wheel having at least a portion of its outer periphery, exclusive of its true gate, randomly formed between given radial limits.

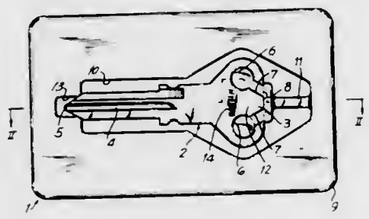
VOL 1111 ISS 3 FE 20 1990 UMI

4,901,547

SPARE CAR KEY AND PLATE HOLDER

Attilio Dal Palu', Rivoli, Italy, assignor to Fabbrica Italiana Serrature Torino Fiat S.p.A., Turin, Italy

Filed Nov. 15, 1988, Ser. No. 271,626
Claims priority, application Italy, Nov. 17, 1987, 67980 A/87
Int. Cl.[4] A47G *29/10*
U.S. Cl. 70—408 **4 Claims**



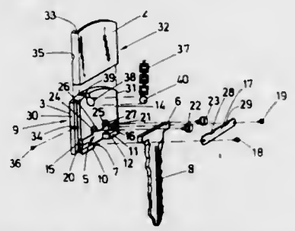
1. A spare car key comprising a metal core (2) defined by a substantially flat active portion (4) and grip portion (3) integral with each other and a plate (9) molded from plastic material and having a center through portion (10) housing said metal core (2) in at least partially removable manner, said metal core (2) being secured inside said center through portion (10) by a flexible appendix (11) integral with said plate (9), extending from said plate (9) into said center through portion (10) and having an anchoring portion (12) molded on to said grip portion (3) of said metal core (2).

4,901,548

KEY HEAD AND KEY FITTED WITH SUCH A HEAD

Gérard Deslandes, Rue Bayet 44, 6000 Charleroi, Belgium

Filed Mar. 25, 1988, Ser. No. 174,403
Claims priority, application Belgium, May 14, 1987, 8700533
Int. Cl.[4] E05B *19/04*
U.S. Cl. 70—408 **8 Claims**



1. An ornamental key head designed to be fitted successively with keys having bits of various shapes and heads provided with cut sections formed by cutting the heads of conventional keys, comprising,

a case formed of at least two parts that are held together in a removable manner, said case having an external surface that has two opposite walls and a peripheral wall, said case having an inner cavity for receiving a said cut section of a key,

said peripheral wall of the case having an opening for receiving the bit of a key that has its cut section in said cavity, said opening being narrower than a portion of the cut section of the key,

one said part of the case having an interior side,

key locking means for locking the cut section of the key head inside the cavity of the case in a position near said opening to prevent the key from being displaced in its own plane relative to the head, said key locking means being mounted on said interior side of said one part of the case,

fixation means for preventing the key from being moved rotationally and from being displaced perpendicularly to its own plane, said fixation means being adjustable according to the thickness of the cut section, said fixation means being mounted on said interior side of said one part of the case, and being operable, independently of the thickness of the cut section, to press the cut section of said bit against said interior side of said one part,

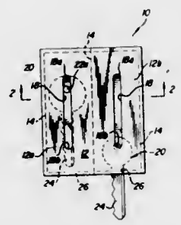
said locking means and said fixation means being positioned where they are not visible when the case is assembled.

4,901,549

KEY RETAINER

Donald F. Dengel, 190 E. Division St., Fond du Lac, Wis. 54935

Filed Sep. 2, 1988, Ser. No. 240,010
Int. Cl.[4] A47G *29/10*
U.S. Cl. 70—456 R **8 Claims**



1. A key retainer, particularly having the facility for manually manipulating keys for stored inoperative positions to partially stored operative positions, comprising:

a first planar member having a first edge and a second edge, said second edge opposing and parallel to said first edge;

a second planar member opposing said first planar member and having substantially identical size and configuration to that of said first planar member;

a joining means, at least along said second edge, for joining said first planar member to said second planar member;

a key storing means, defined between said first and second planar members and between said first and second edges, for retaining said keys positioned therein;

a key receiving finger manipulating slot, integral with said first planar member and positioned longitudinally between the length sides of the retainer; and

an opening, located in said joining means of one of said first or second edges and defined between said first planar member and said second planar member, for receiving the working ends of said keys therethrough, said opening being just sufficiently wide to allow the working end of the key to be moved from the stored position to the opposite position said opening being in a direct longitudinal path with said key receiving-finger manipulating slot.

4,901,550

MANUFACTURING METHOD OF EXTRA FINE WIRE

Masato Koide, Iwaki; Takuro Iwamura, Omiya, and Tsugio Koya, Urawa, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,009
Claims priority, application Japan, Dec. 28, 1987, 62-335842
Int. Cl.[4] B21C *9/00*
U.S. Cl. 72—38 **12 Claims**

1. A method of manufacturing an extra fine wire, comprising the steps of:

(a) cooling a blank wire to a low temperature and passing said cooled wire through a high humidity atmosphere so that the low temperature imparted to the wire and the high humidity atmosphere cause a water coating to be formed on the wire, and subsequently drawing said blank wire to a diameter such that wire breakage due to the drawing does not occur;



(b) heating the drawn blank wire rapidly to anneal the same and, thereafter, cooling the blank wire rapidly to form an intermediate blank wire; and

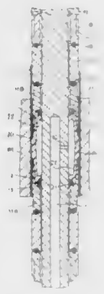
(c) thereafter, drawing said intermediate blank wire at a ordinary temperature.

4,901,551

HYDRAULIC EXPANSION TOOL FOR TUBULAR ELEMENT

Jean E. Widart, Saint Severin, Belgium, assignor to Cockerill Mechanical Industries, Seraing, Belgium

Division of Ser. No. 33,100, Feb. 26, 1987, Pat. No. 4,802,273.
This application Nov. 3, 1988, Ser. No. 266,708
Claims priority, application Belgium, Jul. 18, 1985, 0/215371
Int. Cl.[4] B21D *26/02*; B23P *11/00*
U.S. Cl. 72—58 **5 Claims**



1. Hydraulic expansion tool for expanding a tubular element, comprising:

an elongate body member having an outer surface;

a plurality of seals disposed about the elongate body member, each seal having a head portion fixed to the outer surface of the elongate body member, each seal having a skirt portion forming a crown surrounding the outer surface of the elongate body member, and each seal having an outer marginal zone dimensioned to directly contact over a predetermined length the inner surface of a tubular element to be expanded by the tool;

wherein the skirt portions of the seals are suitably dimensioned and formed of a material sufficiently flexible to enable a reduction in seal dimension when the tool is introduced into a tubular element and consequent flexible fit between the seals and the inner surface of the tubular element;

wherein the skirt portions of at least one pair of adjacent seals are connected to each other to form at least one annular chamber between the at least one pair of seals and the outer surface of the elongate body member;

rings clamped between the head portions of the seals and held by compression means to the elongate body member, said rings comprising a plurality of adjacent sectors;

seal cover means disposed between the seals and the rings for preventing extrusion of the seal between adjacent sectors of the rings; and

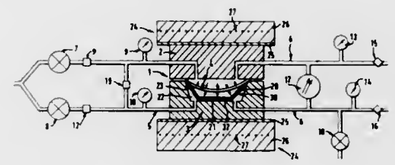
means for introducing an expansion fluid into the at least one annular chamber.

4,901,552

APPARATUS AND A METHOD FOR FABRICATING SUPERPLASTICALLY FORMED STRUCTURES

Brian Ginty; Stephen H. Johnston, and Duncan R. Finch, all of Balderstone, United Kingdom, assignors to British Aerospace PLC, London, United Kingdom

Filed Feb. 6, 1989, Ser. No. 306,467
Claims priority, application United Kingdom, Feb. 6, 1988, 8802738
Int. Cl.[4] B21D *26/02*
U.S. Cl. 72—60 **17 Claims**



11. A method of forming an article from predominantly superplastic materials, which method comprises:

(a) opening a containment vessel having a container portion and a cover portion that between them form an enclosed cavity,

(b) placing into the container portion a die having an interior, an exterior and a bore extending between the said interior and the said exterior, the die being so dimensioned that there is a space between the exterior of the die and the cavity wall, which space is in fluid communication via the bore with the interior of the die,

(c) clamping a blank of predominantly superplastic material across the cavity between the container portion and the cover portion,

(d) heating the blank to a temperature at which the material of the blank exhibits superplastic properties, and establishing a pressure differential across the blank between a first side of the blank adjacent to the said container portion and a second side adjacent to the cover portion such that there is a positive pressure on both sides of the blank to avoid cavitation in the material but the pressure on the second side is greater than that on the first side, thereby urging the blank material into the die,

(e) returning the pressure within the vessel to atmospheric pressure, and

(f) opening the containment vessel, separating the formed article from the die and removing the article from the containment vessel.

4,901,553

METHOD OF MANUFACTURING A FINNED TUBE

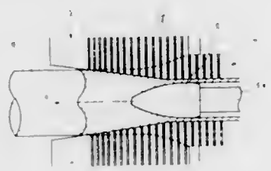
Kouichi Kuroda; Chihiro Hayashi, and Kazuyuki Nakasuji, all of Amagasaki, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 2, 1988, Ser. No. 201,466
Claims priority, application Japan, Jun. 3, 1987, 62-139380; Oct. 20, 1987, 62-266029
Int. Cl.[4] B21D *53/06*
U.S. Cl. 72—97 **13 Claims**

1. A method of manufacturing a finned metallic tube comprising:

supplying a solid metallic bar to an inclined rolling mill having a plurality of rotating rolls disposed around a pass line and provided with a plurality of annular grooves formed in a circumferential direction of an outer circumferential surface thereof;

rolling said solid metallic bar by said rolls; and



working said solid metallic bar into a pierced hollow bar by a piercing plug, and at the same time introducing material of said solid metallic bar into said grooves to form at least one fin at the outer circumferential surface of the pierced hollow bar.

4,901,554

UNIVERSAL FINISHING STAND FOR THE UNIVERSAL ROLLING OF RAILS AND THE LIKE, AND METHOD OF UTILIZING SAME

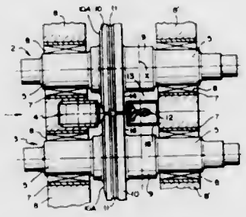
Jean Desvallées, Antibes; Jacques Michaux, Guenange, and Gabriel Mensel, Nilvange, all of France, assignors to Unimetal - Societe Francaise des Aciers Longs, Metz, France

Filed Dec. 2, 1987, Ser. No. 127,361

Claims priority, application France, Mar. 13, 1987, 87 03609

Int. Cl.[4] B21B *13/10*

U.S. Cl. 72—225 **8 Claims**



4. An improved universal finishing stand for the universal rolling of rails and other shaped metal members in a universal rolling process during which the stand is disposed in a waiting position, the stand being of the type including a pair of horizontal rolls having opposed ends journaled for rotation in spaced support posts, a vertical laminating roll disposed between the horizontal rolls, each horizontal roll including a rolling table positioned between the support posts and a rolling wheel carried by each rolling table, each rolling wheel including a peripheral finishing groove, an active surface directed towards the periphery of the vertical laminating roll, and an opposite passive surface, the improvement comprising the passive faces and a corresponding opposed support post defining in part a space at least temporarily of sufficient size to permit free passage of a rail blank therethrough during the universal rolling process when the stand is in a waiting position, and including a conduit disposed within the space through which the rail blank is permitted to freely pass for guiding the rail blank through the space.

4,901,555

HEMMING APPARATUS

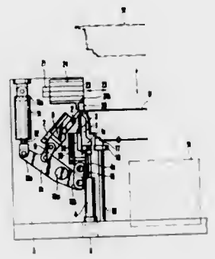
Koji Shimoichi, Hiroshima, Japan, assignor to Hiroshima Press Kogyo Co., Ltd., Hiroshima, Japan

Filed Sep. 19, 1988, Ser. No. 245,664

Claims priority, application Japan, Jul. 6, 1988, 63-168128

Int. Cl.[4] B21D *5/04*; **B23P** *11/00*

U.S. Cl. 72—322 **2 Claims**



1. A hemming apparatus comprising:

a lower anvil on which a work having a peripheral part comprising a plurality of superposed sheet materials to be hemmed is placed with the aid of conveying means, said lower anvil being secured to a frame,

an upper anvil secured to the foremost end of a movable body disposed slidable along a guide member secured to said frame to support said peripheral part of said work from above, said upper anvil being adapted to move from its inoperative position after the work is placed on the lower anvil,

a presser of which base end is operatively connected to the uppermost end of a piston rod of a first hydraulic cylinder disposed on the frame, said presser being adapted to support the peripheral part of the work from the lower side by displacement of the uppermost end of the piston rod,

a link arm of which one end is operatively connected to the lowermost end of a piston in a second hydraulic cylinder secured to the frame, a shaft mounted to the middle of said link arm and mounted to the frame, at least one of said link arm and said shaft being turntable relative to the frame,

a preliminary bending punch operatively connected to the link arm at a position located in the proximity of said one end thereof so as to be slidable relative to the frame to primarily preliminarily bend the peripheral part of the work by displacement of the foremost end of said preliminary bending punch, and

a main bending punch disposed slidable relative to the frame and operatively connected to the link arm at an opposite end thereof to secondarily bend the peripheral part of the work by displacement of the foremost end of said main bending punch, said preliminary bending punch and said main bending punch being located on said link arm so that an extended and retracted position of said second cylinder results in a sequential bending of said work and the formation of a hem on said work by said punches.

4,901,556

LOADING A SEGMENTED DIE AND EJECTING A COMPONENT FORMED THEREIN

Stephen R. James, Astwood Bank, England, assignor to PFD Limited, Birmingham, England

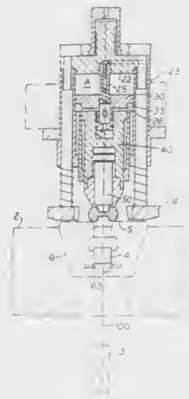
PCT No. PCT/GB87/00875, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/04207, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 3, 1987, Ser. No. 312,771

Claims priority, application United Kingdom, Dec. 6, 1986, 8629226

Int. Cl.[4] B21J *13/08*

U.S. Cl. 72—346 **16 Claims**



1. Apparatus for use in die-forming components, comprising:

a segmented die (6) comprising a number of circumferentially disposed segments defining an axial bore (61) between end faces thereof shaped to receive successive billets (4), and a transversely-extending cavity (500) communicating with the bore into which the billet (4) flows under axial compression as a component (5) is formed;

a die block (2) shaped to receive the die;

ejection/load apparatus for ejecting a formed component (5) from the die (6) and reloading the die with a corresponding fresh billet from which another component is to be formed, comprising means for feeding a fresh billet (4) to one end of the said bore (61) with the die block positioned at an ejection/load station, and means (3) for plunging the fresh billet through the bore (61) to abut against one of said components (5) formed and locked in the die thus to force the die partially out of the die block to permit separation of the die segments, and, on separation of the die segments sufficiently to release the component (5) from the die, to plunge the fresh billet (4) further in the same direction through the opened die to push the component free of the die and permit the die to return to the die block;

and means (77) for removing the freed component (5) from the ejection/load apparatus (1) once the die (6) has returned to its closed state received in the die block (2).

4,901,557

METHOD AND APPARATUS FOR THE PRODUCTION OF FRUSTO-PYRAMIDAL CAN BODIES

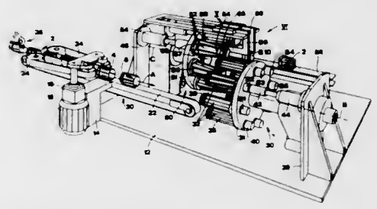
Herwig Schmidt, Hamburg, Fed. Rep. of Germany, assignor to Elpatronic AG, Zug, Switzerland

Filed Jun. 10, 1988, Ser. No. 205,203

Claims priority, application Switzerland, Jul. 7, 1988, 02571/87

Int. Cl.[4] B21D *51/26*

U.S. Cl. 72—370 **16 Claims**



1. A method of producing frustopyramidal can bodies from welded can bodies of a cylindrical shape comprising:

forming a welded can body of cylindrical shape oval-conically over its whole length in a first forming operation which expands the body at one end and then relaxing the body again and then

forming the oval-conical can body in a second forming operation so that it acquires a frustopyramidal shape with a polygon-like, particularly rectangle-like, cross-sectional shape over its whole length.

4,901,558

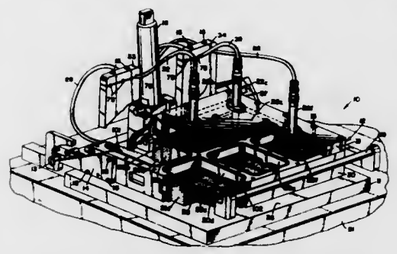
SEAL INTEGRITY TESTER AND METHOD

Lyndon R. Leining; Eric S. Vandenberg, and Ralph O. Erlandson, all of Austin, Minn., assignors to Geo A. Hormel & Co., Austin, Minn.

Filed Dec. 22, 1988, Ser. No. 288,676

Int. Cl.[4] G01M *3/36*

U.S. Cl. 73—49.3 **23 Claims**



1. A vacuum test apparatus of the type wherein a filled sealed plastic container having first and second walls is tested for seal integrity comprising:

(a) a test chamber;

(b) means for holding the container within said chamber;

(c) means for creating a specified vacuum within said chamber;

(d) means for measuring the displacement of the first and second container walls when the vacuum is created and transmitting signals indicative of the displacements;

(e) vacuum measuring means for evaluating the vacuum loss within said chamber after the vacuum is created and transmitting a signal indicative of the vacuum; and

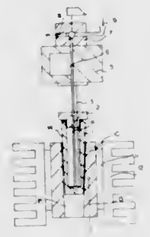
(f) data processing means, receptive to said displacement and vacuum signals, for determining the seal integrity of the plastic container based on the received signals compared with preselected criteria.

4,901,559

METHOD AND ARRANGEMENT FOR MEASURING THE VAPOR PRESSURE OF LIQUIDS

Werner Grabner, Nussdorfer Str. 4/11, A 1090 Vienna, Austria

PCT No. PCT/AT87/00040, § 371 Date Dec. 30, 1988, § 102(e) Date Dec. 30, 1988, PCT Pub. No. WO88/00692, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 17, 1987, Ser. No. 302,238
Claims priority, application Austria, Jul. 18, 1986, 1961/86
Int. Cl.[4] G01N *7/14*
U.S. Cl. 73—64.2 **11 Claims**



1. Method for measuring vapor pressure of liquid in which liquid to be measured is placed in a previously-evacuated measuring cell and influence of gas dissolved in the liquid on measuring results is eliminated, comprising the steps of

adding the liquid to be measured in two or more separate portions into the previously-evacuated measuring cell,

measuring total pressure present in the measuring cell following each addition of one portion and after saturation vapor pressure equilibrium has become established, to obtain a thus-measured value,

deriving gas pressure present in the measuring cell due to the gas dissolved in the liquid from at least two thus-measured values obtained at the same measuring temperature, in which pressure components due to vapor pressure of the liquid are equal, taking into account liquid quantity contained in the liquid portions and the measuring cell volume and using the relationship $pv=RT$, and

determining vapor pressure of the liquid by subtracting the thus-derived gas pressure from the total measured pressure.

4,901,560

ROLLER CLAMP TYPE WHEEL EXAMINING APPARATUS

Akira Hirano, Hidaka; Shinichi Watanabe, Sayama; Yutaka Fukuda, Tokorozawa; Yukio Higuchi, Fuji; Fumio Shibano, Sakado; Hiroshi Sekino, Tokyo; Hiroichi Nabeshima, Hidaka, and Yukimasa Nishizawa, Iruma, all of Japan, assignors to Honda Giken Kogyo K.K. and Anzen Motor Car Co., Ltd., both of Tokyo, Japan

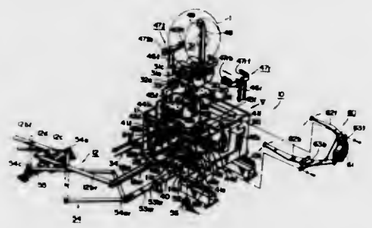
Filed May 19, 1988, Ser. No. 196,208
Claims priority, application Japan, May 20, 1987, 62-121126; May 20, 1987, 62-121127; May 20, 1987, 62-121128; May 20, 1987, 62-121129; May 20, 1987, 62-121130; Sep. 14, 1987, 62-228247; Sep. 14, 1987, 62-228248; Sep. 14, 1987, 62-228249; Sep. 14, 1987, 62-228250
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—117 **51 Claims**

1. A wheel examining apparatus for examining a wheel of a vehicle, comprising:

supporting means for rotatably supporting a wheel of a vehicle to be examined;

driving means for driving said supporting means to rotate in a predetermined direction to thereby cause said wheel supported on said supporting means to rotate around its own rotating axis;

clamping means for clamping both sides of said wheel to



thereby locate a geometrical center of said wheel at a predetermined center of said apparatus, said clamping means clamping said wheel such that said wheel remains rotatable around its own rotating axis, said clamping means being supported to be rotatable around a vertical axis; and

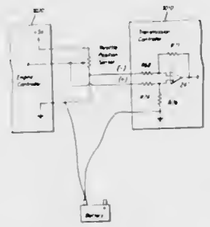
detecting means for detecting a rotation of said clamping means around said vertical axis.

4,901,561

THROTTLE POSITION SENSOR DATA SHARED BETWEEN CONTROLLERS WITH DISSIMILAR GROUNDS

Thomas Glowczewski, Washington Township, Macomb County, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 188,612
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.1 **3 Claims**



1. Between electronic controllers, with dissimilar grounds, on a vehicle, including an engine control unit and a transmission control unit, a battery and a throttle position sensor, a circuit to share a signal from said throttle position sensor comprising:

means for reading the output of said throttle position sensor with one of said controllers by referencing the output to the ground of that controller to generate an absolute throttle position sensor reading; and

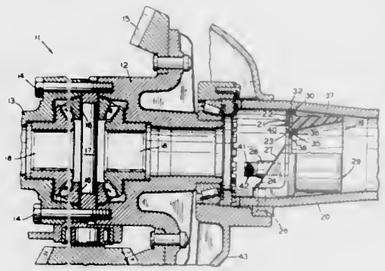
means for reading the output of said throttle position sensor with the other said controller via a differential amplifier to generate a relative throttle position sensor reading.

4,901,562

VEHICLE WHEEL SPEED SENSOR FOR A DRIVE AXLE

Mark L. Beakas, Auburn; Delmar L. Kerney, Fort Wayne; Kraig J. Schlosser, Auburn, all of Ind.; Geoffrey T. Paton, Ontario, Canada; Vernon E. Oechsle, Sylvania, Ohio, and Marvin A. Franklin, III, Fort Wayne, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Mar. 31, 1989, Ser. No. 332,524
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—118.1 **20 Claims**



1. An apparatus for sensing the angular speed of a wheel mounted on the end of a drive axle of a vehicle, the drive axle including a housing enclosing an axle shaft and a differential carrier assembly with a side gear for rotating the axle shaft and an associated wheel, comprising:

a rotor disk having means for indicating the angular speed of rotation formed thereon and means for coupling said rotor disk for rotation with an axle shaft;

an inner mounting bracket including an aperture for receiving the axle shaft and means for attaching to an inner wall of a housing for an axle shaft;

an outer mounting bracket having an aperture for receiving an axle shaft and being attached to said inner mounting bracket, said inner and outer mounting brackets defining a recessed cavity area for retaining and limiting axial movement of said rotor disk; and

means for mounting a sensor adjacent said means for indicating for detecting the passage of said means for indicating as an axle shaft rotates said rotor disk and whereby a predetermined air gap is maintained between said sensor and said rotor disk.

4,901,563

SYSTEM FOR MONITORING FLUIDS DURING WELL STIMULATION PROCESSES

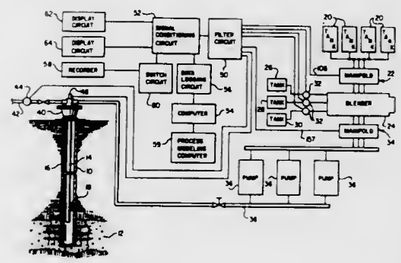
C. Mark Pearson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 243,546, Sep. 13, 1988, Pat. No. 4,845,981. This application May 11, 1989, Ser. No. 350,985
Int. Cl.[4] E21B *43/26*
U.S. Cl. 73—151 **7 Claims**

1. A method for monitoring the quality of a fluid composition for injection into a wellbore for performing a formation treatment process, said method comprising the steps of:

providing at least a first instrument manifold adapted to be interposed between a source of fluid and pump means for pumping said fluid to a wellbore, said first manifold including first and second manifold members interconnected by flow conduit means, said manifold members each including respective fluid inlet and outlet conduit connectors for connecting said first manifold to a source of fluid and to conduit means for conducting fluid from said first manifold, and a sample flow conduit connected to said first manifold for receiving a sample of fluid flow through said first manifold, said sample flow conduit including viscometer means interposed therein;

conducting liquid through said sample flow conduit at selected flow rates;



measuring at least the apparent viscosity of said fluid at respective selected shear rates of said fluid; and

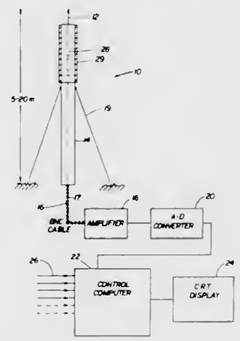
determining at least one of the consistency index (K') and the Power Law Index (n') of said fluid prior to injection of said fluid into a wellbore.

4,901,564

ELECTRICAL DETECTION OF THUNDERSTORM MICROBURSTS

Earle R. Williams, 58 Corey Rd., Brookline, Mass. 02146, and Ralph J. Markson, 46 Kendal Common Rd., Weston, Mass. 02193

Filed Nov. 2, 1987, Ser. No. 116,482
Int. Cl.[4] G01W *1/00*
U.S. Cl. 73—170 R **17 Claims**



1. Apparatus for prediction of thunderstorm microbursts consisting of:

at least one sensor responsive to atmospheric electrostatic fields; and

signal processing apparatus connected to the at least one sensor for determining the rate of discontinuities in the electrostatic field, each peak in the rate of discontinuities being indicative of the likelihood for a future microburst.

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4,901,565

STRAPDOWN MEASURING UNIT FOR ANGULAR VELOCITIES

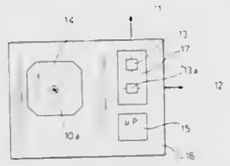
Helmut Seidel, Starnberg, and Fritz Hofmann, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 12, 1988, Ser. No. 231,496

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726958

Int. Cl.[4] G01C *21/00*

U.S. Cl. 73—178 R **3 Claims**



1. A strapdown measuring unit for a flying body having three-axes and rotating rapidly about its first axis, the unit measuring the angular velocity of the body about at least two of the three-axes, the unit being comprised of:

a roll sensor means for determining the roll velocity about the first axis;

angular acceleration sensor means for either the second or third axes or both for determining the angular acceleration of those axes; and

microcomputer means coupled to the roll sensor means and the angular acceleration sensor means for determining the angular velocity of the second and/or third axes using the signal generated by the roll sensor means and the angular acceleration sensor means, said roll sensor means comprising a sensor which operates according to the Sagnac effect, said roll sensor being a planar object disposed lying flat on a planar substrate, the normal to the substrate extending along the first axis, the angular acceleration sensor means and said microcomputer means also being disposed lying flat on said planar substrate.

4,901,566

AIR-FLOW AND DIRECTION SENSOR WITH AN ELECTROMAGNETIC DAMPING AND POSITIONING SYSTEM

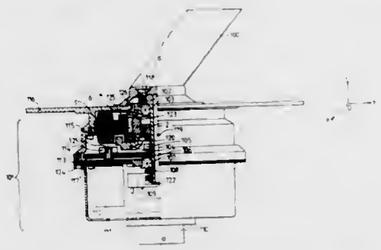
Antoine Boetsch, Paris, and Denis Chabanas, Fresnes, both of France, assignors to Thomson-CSF, Paris, France

Filed Jan. 26, 1989, Ser. No. 301,987

Claims priority, application France, Jan. 26, 1988, 88 00834

Int. Cl.[4] G01C *21/00*

U.S. Cl. 73—180 **12 Claims**



1. An air flow direction sensor for measuring the angle of an aircraft, said sensor comprising:

a part mounted on a shaft, forming a moving assembly which is free to rotate about said shaft centerline, said moving assembly being capable of aligning itself with said air flow direction;

a fixed part to be mounted on said aircraft;

means to measure the rotation of said moving assembly relative to said fixed part;

means to damp the movement of said moving assembly, comprising:

a rotor, produced from ferromagnetic material and mounted on said shaft;

means, mechanically mounted on said rotor, to generate a staggered magnetic field;

a stator, produced in ferromagnetic material and mounted on said fixed part;

electrical conductor means, mechanically mounted in said stator and placed in said magnetic field, thereby said magnetic field, when the rotor turns, generates a torque in said conductor means which opposes the movement of said rotor, said torque being substantially proportional to the angular speed of said rotor, thus damping the rotor movement;

means for positioning said moving assembly in a defined position, said positioning means comprising conductive wires carried by notches provided in the stator, said wires forming at least one phase and a pair of poles, thereby a current passing through said conductor sets the rotor and, consequently, the moving assembly, to a predetermined position.

4,901,567

SHAFT DEVICE FOR A BELLOWS-TYPE GAS METER

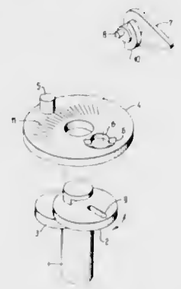
Heinrich Bertke; Reinhard Brüggemann, both of Wallenhorst; Peter Hampel, Belm; Joachim Schmidt, Osnabrück; Werner Pohl, Westerkappeln; Martin Brönstrup, Hütte; Hans Kasselmann, Osnabrück; Hans Lübbers, Haren; Hans Prasse, and Gerhard Schamel, both of Osnabrück, all of Fed. Rep. of Germany, assignors to G. Kromschroder Aktiengesellschaft, Osnabruck, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,336

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623596

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—272 R **5 Claims**



1. A shaft device for a bellows-type gas meter comprising:

a shaft having an axis,

a first eccentric cam assembly coupled to the shaft and having a centerline,

a second eccentric cam assembly configured for placement on the shaft and having a centerline,

the centerline of the first eccentric cam assembly and the centerline of the second eccentric cam assembly placed on the shaft mutually defining an angle,

an element coupled to the shaft, the element having a radial groove therein,

an opening defined in the second eccentric cam assembly, the opening having an axis parallel to the axis of the shaft,

a rotatable insert element configured for insertion in the opening,

a follower means provided on the insert element for engaging the radial groove, the follower means having an axis parallel to the axis of rotation of the insert element, and

a radial protrusion for axially locking the shaft by rotating the insert element,

whereby the angle between the centerline of the first eccentric cam assembly and the centerline of the second eccentric cam assembly placed on the shaft is adjustable by rotation of the rotatable insert element.

4,901,568

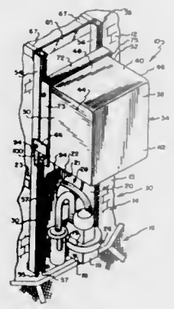
HOOD ASSEMBLY FOR OPACITY MONITOR

Gregory Stroup; Michael A. Krapf, both of Butler, Pa., and Arthur L. Carpenter, Clarence, N.Y., assignors to International Chimney Corporation, Buffalo, N.Y.

Filed Nov. 7, 1988, Ser. No. 267,810

Int. Cl.[4] G01D *11/24*; G12B *9/02*

U.S. Cl. 73—431 **17 Claims**



9. In combination:

opacity monitoring equipment including an opacity monitor fixedly secured to an outside surface of a smokestack and a hood assembly including

(a) hood means for protectably covering the front, top and sides of said opacity monitor and

(b) guide means attached to said monitor in a stationary relationship therewith and cooperating with said hood means for guiding bodily displacement of said hood means relative to said monitor along a substantially vertical path from the lowered condition at which said monitor is substantially covered by said hood means and an elevated condition at which said monitor is accessible.

4,901,569

MOTION SENSORS

Ming-Wah Lui, Kwun Tong, Hong Kong, assignor to Keystone Electronics Company Limited, Hong Kong, Hong Kong

Filed Sep. 8, 1988, Ser. No. 241,716

Int. Cl.[4] G01P *15/08*

U.S. Cl. 73—517 R **6 Claims**

1. A motion sensor comprising:

(i) a hollow reel of non-magnetic material having an upper end and a lower end,

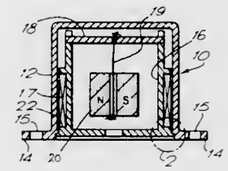
(ii) a length of wire wound around said reel to form an electrical coil,

(iii) support means extending across said upper end of said reel,

(iv) flexible but substantially inextensible hanger means having an upper end attached to said support means and having a lower end hanging down within said hollow reel,

(v) a permanent magnet attached to said lower end and suspended within the hollow reel and movable in pendulum fashion relative the support means,

(vi) detecting means linked to said coil for detecting voltages induced in said coil by pendulum movement of said magnet within said reel when motion is imparted to said motion sensor, and



(vii) an outer cylindrical housing closed at one end and open at the other end and enclosing said reel, said reel being wedged into said open end of said housing to secure it within said housing.

4,901,570

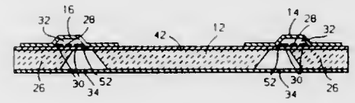
RESONANT-BRIDGE TWO AXIS MICROACCELEROMETER

Shih-Chia Chang, Bloomfield Hills; David B. Hicks, Farmington Hills, and Michael W. Putty, East Detroit, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 274,180, Nov. 21, 1988, abandoned. This application Jan. 30, 1989, Ser. No. 304,057

Int. Cl.[4] G01P *15/10*

U.S. Cl. 73—517 AV **17 Claims**



1. An accelerometer comprising:

a mass;

a support surrounding said mass with a gap provided substantially everywhere therebetween said support and said mass;

at least two bridges attached at one end to said support from which said mass is suspended, said bridges being attached to opposite sides of said mass such that the longitudinal axis through said bridges form a common axis through said mass;

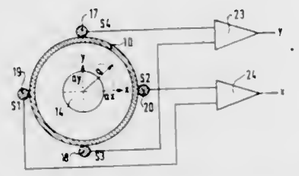
means for vibrating said bridges at their respective resonant frequencies, their respective resonant frequencies change as a function of extension or compression of said bridges due to acceleration of said mass;

means for detecting a change in the difference of said resonant frequencies between both of said bridges, so as to provide an indication of acceleration in a direction along said common axis; and

wherein said means for detection is provided on said support and said bridges span over said means for detection such that a gap exists between said means for detection and said bridges.

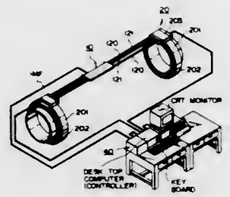
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4,901,571
ACCELERATION PICKUP
Gunter Reinhardt, Ludwigsburg-Oswell, and Kasimir Stromski, Filderstadt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 25, 1989, Ser. No. 301,824
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1988, 3804220
Int. Cl.[4] G01P *15/11*
U.S. Cl. 73—517 R **9 Claims**



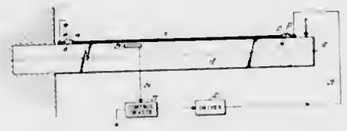
1. A two-dimensional acceleration pickup for use in a control system in a motor vehicle, comprising a housing; a ferromagnetic body located in said housing and having a predetermined starting position; means for generating a magnetic field for holding said ferromagnetic body in the predetermined starting position thereof, said ferromagnetic body being freely displaceable in any direction in a horizontal plane in said housing from the predetermined starting position thereof upon a horizontal acceleration component acting on said pickup deforming the magnetic field that holds said ferromagnetic body in the predetermined starting position thereof; and at least three induction sensors for detecting a deformation of the magnetic field caused by displacement of said ferromagnetic body from the predetermined starting position thereof to thereby determine a momentary value and a direction of the horizontal acceleration component.

4,901,572
METHOD AND APPARATUS FOR MEASURING WEDGE
Toshimitsu Suyama, Oomorinishi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 17, 1989, Ser. No. 311,841
Claims priority, application Japan, Feb. 22, 1988, 63-39295
Int. Cl.[4] G01H *1/14*
U.S. Cl. 73—572 **36 Claims**



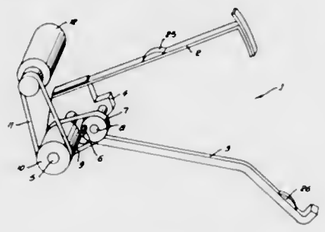
1. A wedge measuring apparatus applied to a structure having a first member having a surface with a slot in which a wedge is driven, and a second member which opposes the surface of said first member so as to be spaced apart therefrom by a predetermined gap, comprising:
testing means, inserted in a gap formed between said first member and said second member, for testing a fitting state between said wedge and said slot; and
shifting means for shifting said testing means in said gap.

4,901,573
INTEGRAL STRUCTURAL COMPONENT VIBRATORY BEHAVIOR CONTROL
Amrutur V. Srinivasan; David G. Cutts, both of Glastonbury, and Graham B. Fulton, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Dec. 27, 1988, Ser. No. 290,532
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—579 **12 Claims**



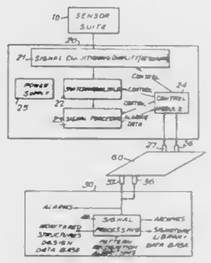
1. A method of controlling the vibratory behavior of an integral structural component, comprising the steps of
connecting two portions of at least one element of memory metal material that are spaced by a predetermined distance from one another in a first state of the memory metal material while said memory metal material is in said first state thereof to respective locations of the integral structural component that are spaced substantially by said predetermined distance from each other along a region of the integral structural component which undergoes considerable cyclical dimensional changes while the integral structural component vibrates; and
employing said element for subjecting the integral structural component to periodic vibratory forces having a predetermined periodicity at least close to a natural resonance frequency of the integral structural component by causing the temperature of said element to alternatingly temporarily rise above and fall below a temperature of transition of said memory metal material to a second state thereof in which the spacing between said two portions of said element differs from said predetermined distance with attendant change in the vibratory behavior of the integral structural component.

4,901,574
RESILIENCE TESTING
Ian Fitzpatrick, Selby, Australia, assignor to A.P.D. Snack Foods Pty Limited, Sydney, Australia
Filed Dec. 2, 1988, Ser. No. 278,960
Claims priority, application Australia, Dec. 8, 1987, P15797
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—579 **13 Claims**



1. A resilience testing gauge comprising:
first and second beams cantilevered from a rigid block;
means for exciting the rigid block at a selected constant frequency such that the beams are caused to vibrate;
detecting means for detecting the dynamic phase response of each beam when the first beam is allowed to vibrate freely and a second beam is brought into contact with an article to be tested; and
output means for outputting an indication of the relative dynamic phase response of the beams with respect to each other.

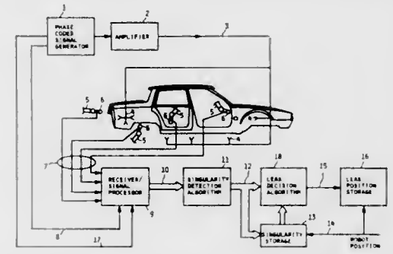
4,901,575
METHODS AND APPARATUS FOR MONITORING STRUCTURAL MEMBERS SUBJECT TO TRANSIENT LOADS
William L. Bohannan, Gales Ferry; J. Vincent Harrington, Groton, both of Conn., and John K. Pfister, Mt. Airy, Md., assignors to GP Taurio, Inc., Columbia, Md.
Filed Nov. 30, 1988, Ser. No. 278,196
Int. Cl.[4] G01D *21/00*
U.S. Cl. 73—587 **35 Claims**



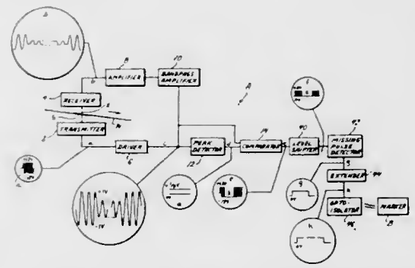
1. Apparatus for detecting changes in the structural integrity of a structural member comprising:
(a) linear motion transducer means for detecting the sonic and infrasonic sounds transmitted by the structural member in a first linear dimension in response to a transient load as a time domain signal;
(b) means for converting the time domain signal into a frequency domain signal;
(c) means for comparing a first frequency domain signal corresponding to the sonic and infrasonic sounds transmitted by the structural member in said first dimension in response to a first transient load and a second frequency domain signal corresponding to the sonic and infrasonic sounds transmitted by the structural member in said first dimension in response to a second transient load; and
(d) means for determining that the second frequency domain signal is different than the first frequency domain signal by more than a predetermined amount, said difference corresponding to a change in structural integrity.

4,901,576
ACOUSTIC LEAK-DETECTION SYSTEM
Paul E. Rademacher, Setauket, N.Y., assignor to Robotic Vision Systems, Inc., Hauppauge, N.Y.
Filed Apr. 8, 1988, Ser. No. 179,579
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—592 **15 Claims**

1. A method for detecting regions of imperfect sealing along seams formed by overlapping sheet materials that would allow gas or liquid penetration, comprising the steps of: generating a modulation code; generating ultrasonic energy; modulating said energy by said modulation code; illuminating one side of a reference seam to be inspected with the modulated ultrasonic energy; transporting a microphone on the opposite side of said reference seam by a robotic positioner; processing the output signal of said microphone to enhance the signal to noise ratio; detecting singularities in said signal; recording said singularities as reference singularities; repeating the steps of illuminating, transporting, processing and detecting on a seam similar to said reference seam; comparing said detected singularities with said recorded reference singularities; and declaring as imperfect any region containing a new singularity or significantly larger singularity.



4,901,577
APPARATUS FOR DETECTING SPLICES IN THE WEB OF A PRINTING PRESS
Christopher C. Roberts, Marion County, Ill., assignor to World Color Press, Inc., Effingham, Ill.
Filed Apr. 28, 1988, Ser. No. 187,339
Int. Cl.[4] G01B *17/02*
U.S. Cl. 73—600 **22 Claims**



1. An apparatus for detecting within a generally uniform sheet material of extended length that moves along a path, a variation, such as a splice, in the otherwise uniform sheet material, said apparatus comprising: transmitting means for generating a sound along the path opposite one face of the moving sheet material; receiving means located along the path opposite the other face of the moving sheet material for converting the sound, after it passes through the sheet and is attenuated thereby, into an oscillating electrical signal of corresponding frequency, whereby the sound passing through the generally uniform of the sheet material will create within the oscillating signal a succession of peaksharing a generally uniform portion magnitude, whereas the sound passing through the variation will create within the oscillating signal peaks of a different magnitude; amplifier means for amplifying the oscillating signal produced by the receiving means so as to provide an amplified signal likewise having peaks of a generally uniform magnitude representing the uniform portion of the sheet material and peaks of a different magnitude representing the variation; detector means connected to the amplifying means for converting the amplified signal into a generally constant reference potential which is different from, yet proportional to, the magnitude of the generally uniform peaks in the amplified signal; and comparing means connected to the amplifying means and the detector means for comparing the amplified

signal with the reference potential and for indicating when the magnitude of the peaks in the amplified signal undergoes a change with respect to the reference potential, whereby the presence of a variation in the moving sheet material is detected.

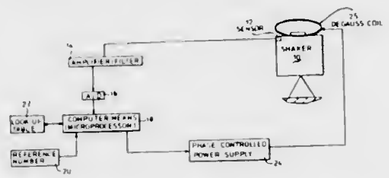
4,901,578
PROBE CARRIER DRIVE ASSEMBLY
Bernard A. Brill, III, Bellevue, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 20, 1988, Ser. No. 196,719
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—623 **33 Claims**



1. A drive assembly for moving a probe carrier in a tubular member, comprising:
(a) an elongated circular member having external threads therearound and having a drive slot extending through the threads;
(b) drive means engaging the external threads and the drive slot of said elongated circular member for moving said elongated circular member axially and rotatably within the tubular member;
(c) rotating means operatively coupled to said drive means for operating said drive means; and
(d) controller means operatively coupled to said rotating means for operating said rotating means so that said elongated circular member selectively rotates in place, follows a linear path in the tubular member or follows a helical path having variable pitch.

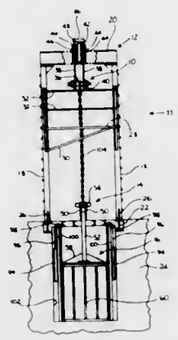
4,901,579
STRAY MAGNETIC FIELD CONTROL SYSTEM FOR VIBRATION TESTING APPARATUS
Gary Butts, Huntington Beach, Calif., assignor to Ling Electronics, Inc., Anaheim, Calif.
Continuation-in-part of Ser. No. 55,650, May 29, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 269,783
Int. Cl.[4] G01M *7/00*
U.S. Cl. 73—668 **7 Claims**

1. A stray magnetic field control system for a vibration testing apparatus, comprising:
a degauss coil disposed in the test environment area of said vibration testing apparatus;
a magnetic field sensor for measuring stray flux emitted by said vibration testing apparatus;
an amplifier/filter connected to an output of the magnetic field sensor;
an A/D converter connected to the output of the amplifier/-filter;
a microprocessor which receives a plurality of digital data bit and control outputs from said A/D converter and which provides a plurality of inputs to said A/D converter;
a power supply connected to provide DC power and zero crossing phase information to said microprocessor and DC power to said amplifier/filter; and



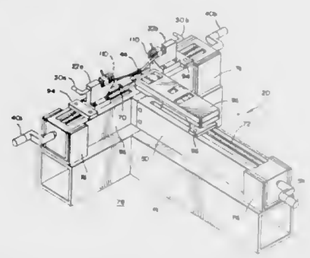
a phase controlled power supply which is controlled by an output from said microprocessor and which triggers periodically to provide current to said degauss coil which generates a magnetic field in a direction to cancel the stray magnetic field.

4,901,580
LOAD TESTING APPARATUS
David Potts, Leigh, England, assignor to Lifting Gear Hire Unlimited, Manchester, United Kingdom
Filed Oct. 3, 1988, Ser. No. 251,751
Claims priority, application United Kingdom, Oct. 3, 1987, 8723254
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—788 **17 Claims**



1. A load testing apparatus comprising:
(a) first and second article mounting members between which an article to be tested is releasably securable;
(b) a weight attachment member to which one of said mounting members is connected;
(c) a plurality of weights disposed beneath said weight attachment member; and
(d) attachment means for releasably securing one or more of said weights to said weight attachment.

4,901,581
METHOD AND APPARATUS FOR TESTING STRETCH FILM
John Fain, and Patrick R. Lancaster, IV, both of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.
Filed Jan. 30, 1989, Ser. No. 302,986
Int. Cl.[4] G01N *3/00;* **G01L** *5/04*
U.S. Cl. 73—795 **19 Claims**

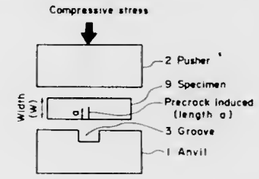


1. A method for testing the properties of stretch film comprising:
collapsing a web of stretch film into a rope;
anchoring the roped web at two locations;
stretching an intermediate portion of the roped web a first distance in a first direction between the locations where it is anchored;
displacing the intermediate portion of the stretched roped web a second distance along a second direction transverse to the first direction and relative to the locations where it is anchored; and
measuring the tension force in the stretched roped web when it is displaced the second distance.

19. An apparatus for alternatively testing the relative stretchability, relative restretch force and relative moldability of stretch film comprising:
first and second means for anchoring a roped web of stretch film at two locations;
means for moving the first and second anchor means away from each other for stretching an intermediate portion of the roped web a first distance in a first direction between the first and second anchor means;
means for securing peripheral portions of a sheet of stretch film and for exposing a central portion of the sheet of stretch film for deformation in a second direction transverse to the first direction;
means for displacing the intermediate portion of the roped web a second distance along the second direction and relative to the anchor means, and for alternatively displacing the central portion of the sheet of stretch film relative to the peripheral portion of the sheet of stretch film a third distance in the second direction; and
means for measuring the tension force in the stretched roped web when it displaced in the second direction, and for alternatively measuring the tension force in the sheet of stretch film when it is displaced in the second direction.

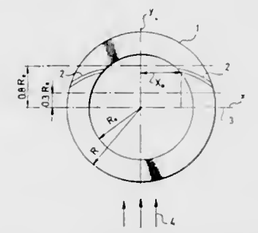
4,901,582
FIXTURE FOR BRITTLE PRE-CRACK INTRODUCTION IN CERAMIC SPECIMEN
Tetsuro Nose, and Toshimitsu Fujii, both of Kanagawaken, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Dec. 29, 1987, Ser. No. 139,259
Claims priority, application Japan, Dec. 29, 1986, 61-315639
Int. Cl.[4] G01N *19/08*
U.S. Cl. 73—799 **18 Claims**

1. A fixture for introducing with high reproducibility a pre-crack in a ceramic specimen which pre-crack has a predetermined length as taken in a widthwise direction of the specimen that is less than the entire width of the specimen, said fixture comprising an anvil provided on the upper side thereof with a central groove and a positioning groove disposed relative to said central groove so as to position a specimen having a thickness corresponding to the width of the positioning



groove over and perpendicular to the central groove when the specimen is seated on the anvil in the positioning groove, and a platelike pusher possessing a smooth and flat lower surface for pushing the specimen seated in the positioning groove downward toward said central groove.

4,901,583
ELECTROMAGNETIC PICK-UP DEVICE FOR MEASURING VOLUME FLOWS OF THICK, HIGHLY ABRASIVE SUSPENSIONS
Miroslav Voln , Baska; Ivo Tomás, Ostrava, and Antonín Sû chop, Brno, all of Czechoslovakia, assignors to Vedeckov zkum uheln ûstav, Ostrava-Radvanice, Czechoslovakia
Filed Nov. 30, 1988, Ser. No. 277,769
Claims priority, application Czechoslovakia, Nov. 30, 1987, 8674-87
Int. Cl.[4] G01F *1/58*
U.S. Cl. 73—861.12 **2 Claims**



1. An electromagnetic pick-up device for measuring the volume throughflow of a thickened highly abrasive suspension comprising: at least one pair of pick-up electrodes, made of electrically conductive material, which are integrally incorporated in a lining of electrically non-conductive material and which are excited by an exciting magnetic field, the improvement wherein; the pick-up electrodes are located at a distance of about 0.3 to 0.8 of the initial internal radius R_o of the lining or of a measuring tube from a plane perpendicular to the direction of the exciting magnetic field, the plane passing through the center of the lining or of the measuring tube, and the electrodes having the shape of a curve the coordinates X, Y of which are determined by the relation:

$$Y = (X.R_o^2.X_o^{-1} - X^2)^{\frac{1}{2}}$$

wherein the coordinates of the first point of the curve X_o complies with the relation:

$$X_o \leq R_o^2.R^{-1}$$

where R is the external radius of the lining or of the measuring tube.

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4,901,584

METHOD OF MEASURING LOCALLY SPECIFIC PRESSURES

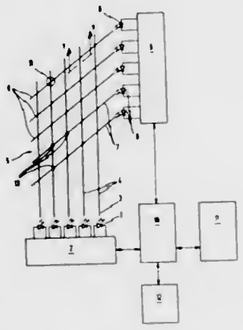
Wolfgang Brunner, Ringemberg 175, D-8999 Maierhöfen, and Ludwig V. Zech, Argensee 3, D-7964 Kisslegg, both of Fed. Rep. of Germany

Filed Feb. 16, 1989, Ser. No. 311,967

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1988, 88102301

Int. Cl.[4] G01L *5/16, 1/24*

U.S. Cl. 73—862.04 **18 Claims**



1. A method for measuring locally predetermined pressures comprising the steps: forming a matrix of intersecting columns and rows of pressure-transmitting conductors in form of optical fibers; arraying the optical fibers of said columns and the optical fibers of said rows with points of intersection; producing areas of contact at said points of intersection dependent on local pressures at said points of intersection; introducing light at at least one end of only a single optical fiber of a column or a row; reading out the amount of light coupled at points of intersection of all optical fibers with said single optical fiber, said intersecting optical fibers being in contact; and measuring local pressures at points of intersection from variations of the areas of contact between the intersecting optical fibers, measurement of said pressures being dependent on the material of said optical fibers.

4,901,585

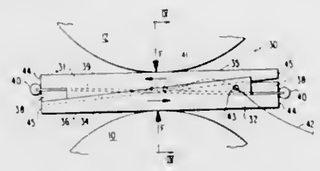
METHOD AND APPARATUS FOR ROLL NIP LOAD MEASUREMENT

Michael L. Shepard, Covington, and Charles A. Snyder, II, Millboro, both of Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Nov. 30, 1988, Ser. No. 277,967

Int. Cl.[4] G01L *1/00, 1/22*

U.S. Cl. 73—862.38 **2 Claims**



1. A low profile load cell comprising a pair of parallel plane plates, each having a pair of lateral edges, a toe edge and a heel edge, said plates being separated by respective pairs of laterally spaced, parallel rails secured along the lateral edges of each of the respective plates, said rails having load bearing edges in a plane set at a small angle to the plate planes, load plate means spanning the length of said parallel plates between said rails and between oppositely directed ones of the heel edges, opposite ends of said load plate means being temporarily secured to said heel edges against tensile stress imposed on said load plate means between said opposite ends and strain sensing means secured to said load plate means to measure the magnitude of said tensile stress resulting from a compressive load imposed upon and substantially normal to said parallel plane plates.

4,901,586

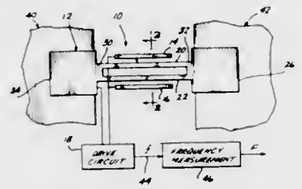
ELECTROSTATICALLY DRIVEN DUAL VIBRATING BEAM FORCE TRANSDUCER

Graeme A. Blake, Bellevue, and Brian L. Norling, Mill Creek, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Feb. 27, 1989, Ser. No. 316,899

Int. Cl.[4] G01L *1/10*

U.S. Cl. 73—862.59 **6 Claims**



1. In a vibrating beam force transducer of the type comprising a body including first and second generally parallel beams coupled together at their ends, the improvement comprising first and second electrodes positioned adjacent to but not in contact with the first and second beams, respectively, and drive means electrically coupled to the electrodes for causing an oscillating voltage to be applied to the electrodes such that the beams are subjected to electrostatic forces that cause the beams to oscillate 180° out of phase with one another in a vibration plane containing both beams, whereby said oscillating voltage has a frequency that is a function of a force applied lengthwise along the beams.

4,901,587

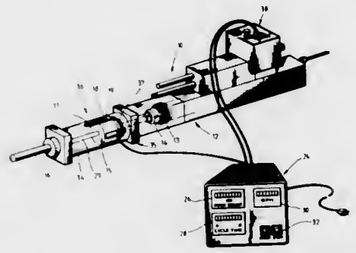
DRILL TEST FIXTURE

Edwin J. Deremo; Joseph Carter, and Kenneth LaCount, all of Lexington, S.C., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 10, 1987, Ser. No. 36,764

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—865.9 **15 Claims**



1. A device for comparing the performance characteristics of air feed or peck air feed drills, said device comprising:
a frame;
means for mounting the air feed or peck air feed drill within said frame;
a simulated linear thrust load;
means for coupling the work output of the air feed or peck air feed drill to said simulated linear thrust load;
said means for coupling the workout output of the air feed or peck air feed drill to the simulated thrust load further including:
means for counting the umber of pecks;
means for measuring drill travel;
means for measuring drill rpm; means for controlling the time of drill operation.

4,901,588

ATTACHMENT FOR POWER TOOL

Andrew Zudal, 4140 Mt. Olney La., Olney, Md. 20832

Filed Mar. 19, 1985, Ser. No. 713,592

Int. Cl.[4] F16H *25/12, 25/16*

U.S. Cl. 74—57 **3 Claims**





1. An attachment for converting the high speed low torque rotary output of a power tool to a low speed high torque linear reciprocating motion, the power tool having an adjustable chuck on the output shaft thereof for attaching tools to the output shaft, comprising
a housing having a threaded end portion,
an end cap for said housing having threads on the outer periphery thereof to screw fit within said housing,
a rotary sleeve in said end cap having a recess in one end thereof to fit in nonslip relationship with the external surface of the adjustable chuck,
a plurality of spaced flexible locking elements on said end cap extending from one end thereof,
clamping means engaging said flexible locking elements for securing said housing around the periphery of the power tool with said sleeve in locking engagement with the adjustable chuck of the power tool,
a sun gear fixedly mounted on said rotary sleeve on the end thereof opposite said recess,
a planetary gear carrier rotatably mounted in said housing adjacent said sleeve,
a plurality of gear shafts fixed on one end of said gear carrier,
a plurality of planetary gears rotatably mounted on said gear shafts and engaged with said sun gear,
a ring gear fixed within said housing and having internal teeth in engagement with said planetary gears,
a bore in the opposite end of said planetary gear carrier, said bore having a cam follower therein,
a linear motion output shaft having an endless helical cam groove in the surface thereof in engagement with the cam follower in said planetary gear carrier,
a pin extending from the surface of said linear motion output shaft engaging an elongated slot in the housing to prevent rotary motion of said linear motion output shaft and
means for attaching a tool to said linear motion output shaft.

4,901,589

DRIVE AND POSITIONING SYSTEM FOR A SLIDE

Karl-Josef Gaigl, Stahringer Str. 10a, D-7768 Stockach 14, Fed. Rep. of Germany

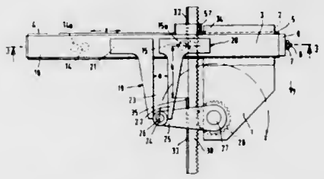
PCT No. PCT/DE87/00494, § 371 Date Jun. 29, 1988, § 102(e) Date Jun. 29, 1988, PCT Pub. No. WO88/03238, PCT Pub. Date May 5, 1988

PCT Filed Nov. 2, 1987, Ser. No. 251,710

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637195; Feb. 14, 1987, 3704669

Int. Cl.[4] F16H *21/44;* **B29C** *45/42*

U.S. Cl. 74—104 **39 Claims**



1. Device for transforming a rotary movement of a drive element eccentrically arranged about a rotary spindle into a linear movement of a slide means with an assured guidance during the linear movement and fixed end positions, whereby for the linear guidance of the slide means the drive element constructed as a guide pulley engages in a guide slot, but leaves the latter on reaching the slide means end position, characterized in that on the slide means (3) are provided two rollers (14,15) as stops, which in the end positions of slide means (3) in each case slide onto and engage on bars (32,33) as a reference edge, said bars (32,33) freeing the rollers (14,15) during the linear guidance of said slide means (3) and are arranged with a spacing (b) each to the other.

4,901,590

MANUAL TRANSMISSION FOR MOTOR VEHICLE

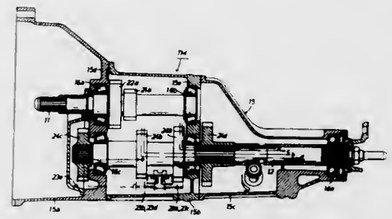
Masaki Inui, and Masakazu Ishikawa, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 22, 1988, Ser. No. 234,624

Claims priority, application Japan, Aug. 21, 1987, 62-208821; Sep. 17, 1987, 62-141881[U]; Sep. 17, 1987, 141882[U]; Sep. 21, 1987, 144127[U]; Sep. 21, 1987, 62-144128[U]

Int. Cl.[4] F16H *3/08*

U.S. Cl. 74—331 **9 Claims**



1. A manual transmission for motor vehicles, comprising:
a housing;
an input shaft rotatably mounted within said housing and having a first drive gear of small diameter for low speed drive and a second drive gear of large diameter for high speed drive fixed thereon;
an output shaft rotatably mounted within said housing in parallel with said input shaft and having at least a pair of axially spaced change-speed driven gears mounted thereon;
a first countershaft rotatably mounted within said housing

and arranged in parallel with said input and output shafts at one side thereof, said first countershaft having a first driven gear fixed thereon and continuously engaged with said first drive gear on said input shaft, a pair of axially spaced low speed drive gears rotatably mounted thereon and continuously engaged with the change-speed driven gears on said output shaft, and a first synchronizer coupling provided thereon to selectively connect said low speed drive gears to said first countershaft; and

a second countershaft rotatably mounted within said housing and arranged in parallel with said input and output shafts at the other side thereof, said second countershaft having a second driven gear fixed thereon and continuously engaged with said second drive gear on said input shaft, a pair of axially spaced high speed drive gears rotatably mounted thereon and continuously engaged with the change-speed driven gears on said output shaft, and a second synchronizer coupling provided thereon to selectively connect said high speed drive gears to said second countershaft;

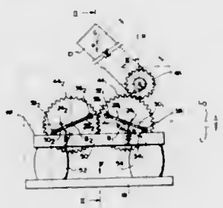
wherein all said drive and driven gears on said input and output shafts and all said driven and drive gears on said countershafts are contained in said housing, and wherein an additional change-speed driven gear is fixed on one end of said output shaft extending into a second housing fastened to one end of said housing, an additional high speed drive gear is rotatably mounted on one end of said second countershaft extending into said second housing and continuously engaged with said additional change-speed driven gear, and a third synchronizer coupling is provided on the one end of said second countershaft to selectively connect said additional drive gear to said second countershaft.

4,901,591

DEVICE FOR BALANCING FORCES, IN PARTICULAR WEIGHT, ACTING ON A ROBOT ARM OR THE LIKE

René Oppermann, 144ter, rue Voltaire, F 45120 Chalette-sur-Loing, France, and Christian Salesse, 30, rue Jules Auffret, F 93330 Neuilly sur Marne, France

Filed Feb. 24, 1989, Ser. No. 315,145
Claims priority, application France, Feb. 26, 1988, 88 02423
Int. Cl.[4] B66C *23/72*; B25J *18/00*
U.S. Cl. 74—469 **9 Claims**



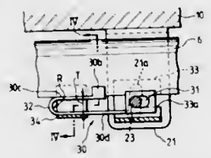
1. A device for balancing forces, in particular weight, acting on a robot arm or the like which is hinged to rotate about an axis, in particular a horizontal axis, said device comprising a rigid auxiliary part hinged about an axis parallel to the axis of the robot arm, said part including two transverse arms extending on either side of its axis and having ends which are aymmetrical about said axis, said ends being suitable for bearing against a rectilinear portion of a moving member which is moveable in translation and which is subjected to a return force towards an initial position, said return force being proportional to the distance between said initial position and the position occupied by the moving member, and rotary drive means for rotating the auxiliary part about its own axis at an angular speed which is equal in absolute value to one half of the angular speed of the robot arm, wherein the device comprises: at least one other rigid auxiliary part so as to form an even number of auxiliary parts hinged about respective parallel and coplanar axes, with each auxiliary part supporting two transverse arms; synchronizing means suitable for rotating said auxiliary parts at angular speeds which are equal in absolute value but which are in opposite directions in pairs; at least one of the auxiliary parts being coupled to said rotary drive means; and the assembly being set up in such a manner that when the robot arm is in a position in which the resultant couple applied about the hinge axis of the arm by said forces to be balanced is zero, the ends of the transverse arms of all of the auxiliary parts bear simultaneously against the rectilinear portion which is in its initial position.

4,901,592

SHOCK ABSORBING STEERING APPARATUS

Nobuyoshi Ito; Toshiyuki Nagashima; Mitsuo Ichikawa, all of Maebashi, and Mikio Yamaguchi, Takasaki, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1988, Ser. No. 234,139
Claims priority, application Japan, Jun. 17, 1988, 63-80391[U]
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—492 **13 Claims**



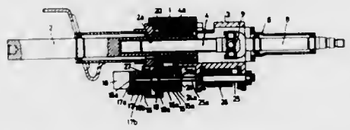
1. A shock absorbing steering apparatus, comprising a steering column having a steering shaft pivotably supported thereon, a distance bracket secured to said steering column, a column bracket for fixing said steering column to a vehicle body through said distance bracket, and a shock energy absorbing U-shaped plate having a first plate portion, a second plate portion, and a bent portion integrally connecting said first and second plate portions, said first plate portion having an end secured to said steering column and said second plate portion having an end secured to said column bracket, such that when said shock energy absorbing plate is shocked, said end of said second plate portion moves a certain distance relative to said column bracket, and said shock energy absorbing plate plastically deforms so that said bent portion moves, thereby absorbing energy.

4,901,593

ADJUSTABLE VEHICLE STEERING MECHANISM

Masanobu Ishikawa, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 26, 1989, Ser. No. 301,714
Claims priority, application Japan, Jan. 26, 1988, 63-15299
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—493 **6 Claims**



1. A vehicle steering mechanism comprising:
a stationary bracket fixedly mounted to a vehicle body;

a lower main shaft rotatably journaled within said stationary bracket;
a slider mounted for axial movement relative to said stationary bracket;
an upper bracket pivotally mounted to said slider;
a middle main shaft splined for rotatable motion with said lower main shaft and rotatably journalled within said slider;
an upper main shaft rotatably journalled within said upper bracket and pivotally mounted with said middle main shaft to pivot with respect to said middle main shaft simultaneously with pivotal motion of said upper bracket with respect to said slider;
axial moving means including at least one first screw shaft rotatably journalled to said stationary bracket, and at least one first nut threadably mounted on said at least one first screw shaft and connected to said slider, said axial moving means for causing axial movement of said slider with respect to said stationary bracket upon rotation of said at least one first screw shaft; and
pivotal moving means including a second screw shaft rotatably journalled to said slider and axially immovable relative to said slider, and a second nut threadably mounted on said second screw shaft, said second nut pivotally secured to said upper bracket, said pivotal moving means for causing pivotal motion of said upper bracket with respect to said slider and simultaneously causing pivotal motion of said upper main shaft with respect to said middle main shaft upon rotation of said second screw shaft.

4,901,594

GAS SPRING ASSEMBLY FOR A PASSENGER SEAT CONTROL

Günther Selzer, Gartenstrasse 9, 5603 Wuelfrath, Fed. Rep. of Germany

Division of Ser. No. 157,893, Feb. 19, 1988, Pat. No. 4,856,762.
This application May 19, 1989, Ser. No. 354,496
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501.5 H **6 Claims**



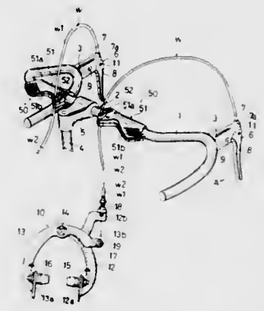
1. An apparatus for adjusting and locking the position of one member with respect to another member comprising:
(a) a gas spring assembly having an elongated housing one end of which is secured to one of said members and a piston rod extending out of the other end of the housing having a valve release rod thereon and being secured to the said other member;
(b) a remote actuating assembly having a push button, a pivotally mounted two-arm crank, one of said arms operatively engaging a back side of the push button and the other arm receiving one end of an operating cable; and
(c) a lever actuating assembly mounted to a support frame for one of said members including a mounting element, a lever arm pivotally mounted at one end thereof to the mounting element and having the other end of the operating cable removably secured to the free end of the lever arm, means on the lever arm to engage the valve release rod on the end of the piston rod, the mounting element having a first opening to receive the free end of the piston rod, a slotted receptacle adjacent and perpendicular to the first opening and adapted to receive a first spring clip, the first spring clip sliding through the receptacle to be mounted about a circumferential groove provided in the free end of the piston rod to thereby retain the free end of the piston rod in position so that movement of the operating cable caused by pressing on the push button of the remote actuator assembly will cause the lever arm to pivot and the means thereon to engage the valve release rod to open a valve and allow movement of hydraulic fluid between a first end chamber and an intermediate chamber.

4,901,595

AUXILIARY BRAKE CONTROL ASSEMBLY FOR BICYCLE

Nobuo Ozaki; Kazuyuki Miura, and Toshimasa Yamazaki, all of Osaka, Japan, assignors to Maeda Industries, Ltd., Osaka, Japan

Filed Aug. 19, 1987, Ser. No. 86,865
Claims priority, application Japan, Aug. 19, 1986, 61-194195
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—502.2 **21 Claims**



1. A bicycle brake control system for a bicycle dropped handlebar, said handlebar including a pair of dropped side portions, and an intermediate straight portion extending between said pair of dropped side portions and centrally supported by a bicycle handle stem, said straight portion having first and second portions separated by said bicycle handle stem, said control system comprising:
a main brake control assembly mounted on each of said dropped side portions and connected to a remote brake assembly through a double type control cable, said double type control cable including an inner cable guided in an outer cable, said outer cable being divided into two separate sections each having a divided end; and
an auxiliary brake control assembly associated with said main brake control assembly and acting on said divided outer cable;
wherein said auxiliary brake control assembly comprises:
a fixed member engaging with the divided end of one section of said outer cable at a fixed position;
an operating grip rotatably fitted on each of said first and second portions of said intermediate straight portion and engaging with the divided end of the other section of said outer cable to bring said divided end of said other section toward and away from the divided end of said one section upon rotation of said grip;
said fixed member is in the form of a ring fixed on said straight portion of said handlebar and having a projecting non-movable engaging portion for engagement with the divided end of said one section of said outer cable while allowing passage therethrough of said inner cable; and
said grip has a projecting movable engaging portion opposed to said non-movable engaging portion of said ring for engagement with the divided end of said other section while allowing passage therethrough of said inner cable, said movable engaging portion coming into surface contact with said non-movable engaging portion when said grip assumes a non-braking rotational position.

4,901,596

ASSEMBLY FOR TAKING UP AND COMPENSATING FOR TORQUE-INDUCED SHOCKS

Wolfgang Reik, Bühl, and Oswald Friedmann, Lichtenau, both of Fed. Rep. of Germany, assignors to Luk Lamellen Und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

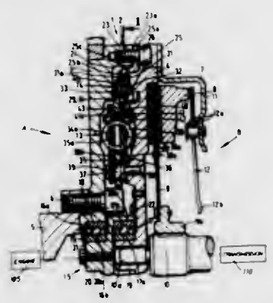
Division of Ser. No. 896,136, Aug. 12, 1986, Pat. No. 4,723,463, which is a continuation of Ser. No. 669,770, Nov. 8, 1984, abandoned. This application Oct. 23, 1987, Ser. No. 113,226

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341442; Mar. 5, 1984, 3411239

The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.[4] F16F *15/10*

U.S. Cl. 74—574 **10 Claims**



1. An assembly for damping vibrations in a torque transmitting arrangement between an engine and an input part of a transmission, particularly for damping vibrations which originate in the engine, comprising a first flywheel connectable to the engine and a second flywheel connectable to an input part of the transmission, said flywheels being rotatable relative to each other; at least one damper means including energy storing means operative to oppose rotation of said flywheels relative to each other; and a plurality of torque-transmitting slip clutches operating between said flywheels and arranged to oppose rotation of the flywheels relative to each other in a predetermined sequence.

4,901,597

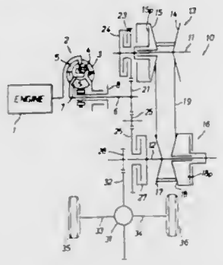
CONTINUOUSLY VARIABLE AUTOMOTIVE TRANSMISSION

Toruo Hattori, Saitama, and Masao Nishikawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,256

Int. Cl.[4] F16H *37/08*

U.S. Cl. 74—665 GE **7 Claims**



1. A continuously variable automotive transmission for transmitting power from an engine to automotive wheels, comprising:

a fluid torque converter adapted to be connected to the engine and having a turbine shaft;

driver gear means fixedly mounted on said turbine shaft; and

a fixed ratio reverse and continuously variable ratio forward transmission mechanism including:

a driver shaft rotatably mounted parallel to said turbine shaft;

a driver pulley mounted on said driver shaft;

a driven shaft rotatably mounted parallel to said turbine shaft and driver shaft;

a driven pulley mounted on said driven shaft;

a V belt trained around said driver and driven pulleys;

said driver pulley and driven pulley having means for varying the drive ratio therebetween transmitted through the V belt;

a forward gear rotatably mounted on said driver shaft and held in mesh with said driver gear means;

a forward clutch mounted on said driver shaft for selectively connecting and disconnecting said forward gear to and from said driver shaft;

a reverse gear rotatably mounted on said driven shaft and held in mesh with said driver gear means through an idler gear;

a reverse clutch mounted on sid driven shaft for selectively connecting and disconnecting said reverse gear to and from said driven shaft; and

said driven shaft continuously coupled through drive means to the automotive wheels for driving the automotive wheels whenever said driven shaft is rotated whereby the reverse driving of the automotive wheels is directly through said drive gear means, said reverse gear, said reverse clutch and said driven shaft without transmitting power through said V belt.

4,901,598

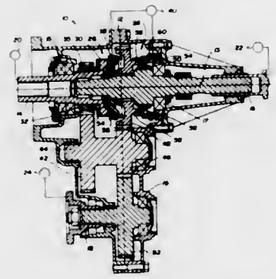
VEHICLE DRIVE-TRAIN TRANSFER CASE

Robert B. Batchelor, Birmingham, and Gerald P. Hentschel, St. Clair Shores, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Nov. 29, 1985, Ser. No. 802,670

Int. Cl.[4] F16H *37/06*

U.S. Cl. 74—665 GA **11 Claims**



1. A torque transfer apparatus comprising:

an input shaft and first means for rotatably supporting said input shaft;

a first output shaft and second means for rotatably supporting said first output shaft;

a second output shaft and third means for rotatably supporting said second output shaft;

low gear means for driving at least one of said first and second output shafts in response to rotation of said input shaft;

high gear means for driving at least one of said first and second output shafts in response to rotation of said input shaft;

first clutch means for selectively connecting one of said low gear means and said high gear means between said input shaft and at least one of said first and second output shafts;

second clutch means for selectively connecting one and both said first and second output shafts to at least one of said low gear means and said high gear means;

means for actuating each of said first and second clutch means comprising a clutch collar, and means for slideably supporting and shifting said clutch collar for coaxial displacement along the axis of said input shaft;

wherein said low gear means comprises an intermediate shaft radially spaced from said input shaft, a first driven gear supported for rotation by said intermediate shaft, a drive gear in constant mesh with said driven gear and rotatably supported about the axis of said input shaft, and means for selectively displacing said clutch collar of said first clutch means for engagement with said drive gear, whereby said intermediate shaft is disengaged from said input shaft when said collar is disengaged from said drive gear;

wherein said intermediate shaft includes a second intermediate driven gear axially spaced from said first driven gear;

wherein said first output shaft is axially aligned with said input shaft, and wherein said second output shaft is radially spaced from said input shaft; and

a drivable gear rotatably and coaxially mounted about the axis of said first output shaft and in engagement with said second intermediate driven gear at a position axially disposed intermediate said first and second clutch means.

4,901,599

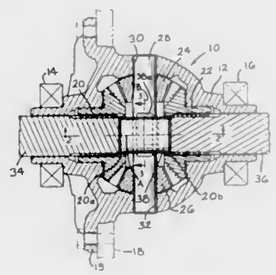
CROSS PIN RETAINER BLOCK FOR A BEVEL GEAR DIFFERENTIAL

Earl J. Irwin, Churubusco, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 29, 1988, Ser. No. 291,506

Int. Cl.[4] F16H *1/40*

U.S. Cl. 475--230 **10 Claims**



1. A differential assembly comprising:

a differential case;

a pair of side gears rotatably supported within said case about a side gear axis;

a pinion cross shaft supported by said case and having a pinion axis generally perpendicular to and intersecting said side gear axis;

a pair of pinion gears rotatably supported within said case about said pinion cross shaft, each of said pinion gears meshingly engaging each of said side gears;

a retainer block mounted on a central portion of said pinion cross shaft, said retainer block being mounted to said pinion cross shaft in such a manner to limit axial movement of said pinion cross shaft along said pinion axis relative to said retainer block;

said retainer block including at least one end portion which is received within an opening formed in at least one of said side gears to secure said retainer block relative to said differential case.

4,901,600

MANUAL CONTROL FOR EXTENDED RANGE SPLITTER TYPE COMPOUND TRANSMISSION

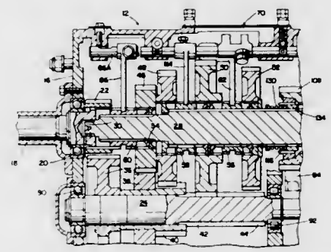
Derek R. Wilson, Bolton, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 25, 1988, Ser. No. 262,419

Claims priority, application United Kingdom, Nov. 14, 1987, 8726712

Int. Cl.[4] F16H *3/02, 3/08*

U.S. Cl. 74—745 **17 Claims**



1. A control for an extended range compound splitter type change gear transmission (10) comprising a housing (16) defining a multiple speed main transmission section (12) connected in series with a multiple speed auxiliary transmission section (14) connected in series with a two speed extended range section (15) defining a first 1:1 ratio and a second speed reduction ratio;

said control comprising a first selector including a shift lever (72) movable in an H-type pattern having a plurality of first positions (1, 2, 3, 4, R) for selecting a main transmission section speed ratio and a second selector (252) for selection of an auxiliary transmission section speed ratio;

said control characterized by said first selector (72) having a second position (1E) for selection of a lowest forward speed main transmission section speed ratio (1st) selectable in one of said first positions (1), said second position located on the opposite side of the neutral (N) position of said H-type pattern from said one of said first positions and sensor means (264) for sensing engagement and disengagement of said lowest forward speed main transmission section speed ratio by movement of said first selector to and from said second position to cause an extended range shifting mechanism (210, 212) to cause said extended range section to shift from said first to second and from said second to first extended range section speed ratio.

4,901,601

PLANETARY CARRIER ASSEMBLY AND METHOD

Angus B. Leggat, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

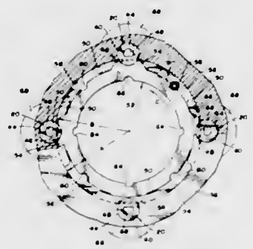
Filed Nov. 14, 1988, Ser. No. 270,854

Int. Cl.[4] F16H *3/44*

U.S. Cl. 475—348 **3 Claims**

1. A planet carrier assembly comprising: a pair of spaced side plates, one of said side plates having an inner periphery with an interrupted annular groove facing radially inward formed therein and a plurality of axially facing opening means for permitting access to the annular groove in an axial direction; a plurality of pairs of apertures axially aligned in said side plates

and being equally radially and circumferentially spaced thereon; pin means disposed in each pair of apertures extending between said side plates; gear means supported on each pin member; a slot formed in each pin member being alignable with said annular groove; and a locking plate having an outer periphery less than said inner periphery of said one side plate



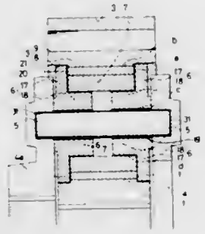
and a plurality of tab means extending radially outward therefrom and having an outer radial dimension substantially equal to an outermost radial dimension of said annular groove and being registered with respective ones of said slot in said pin members and cooperating with said slot and said annular groove for preventing axial and rotary movement of said pin members relative to said side plates.

4,901,602

PLANETARY GEAR ASSEMBLY FOR A PLANETARY TRANSMISSION

Hideyasu Matoba, Osaka, Japan, assignor to Matex Co., Ltd., Osaka, Japan

Filed Aug. 17, 1984, Ser. No. 641,655
Claims priority, application Japan, Mar. 22, 1984, 59-55500
Int. Cl.⁴ F16H *1/28, 13/06*
U.S. Cl. 415—335 **8 Claims**



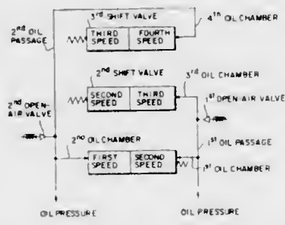
1. A planetary gear transmission, comprising:
a unitary sun gear having an inner sun gear portion and two outer sun gear boss portions said boss portions being formed with said sun gear as one piece;
at least one planetary gear assembly comprised of:
a planetary gear ring meshed with said sun gear;
two unitary planetary discs having an outer thrust projection in at least intermittent rolling contact with said sun gear boss portions and having an inwardly projecting boss supporting the inner surface of said planetary gear ring and sandwiching said planetary gear ring therebetween; and,
a planetary shaft for supporting said planetary gear ring and said planetary discs;
a carrier assembly for receiving said planetary shaft and rotatably supporting said planetary gear assembly;
an outer, inner-toothed unitary ring gear having an outer ring gear located between two outer cylindrical extension portions, said outer ring gear meshed with said planetary gear ring, and said outer cylindrical extension portions in at least intermittent rolling contact with said thrust projections of said unitary planetary discs, wherein:
said outer thrust projections of said unitary planetary discs have a greater diameter than the tooth edge circle of said planetary gear ring;
said sun gear boss portions have smaller diameters than the tooth-root circle of said sun gear;
said outer cylindrical extension portions have greater diameters than the tooth-root circle of said outer inner-toothed unitary ring gear; and,
whereby said two unitary planetary discs both serve to restrain said sun gear from axial movement and to restrain said planetary gear ring from radial movement.

4,901,603

CONTROL APPARATUS FOR HYDRAULICALLY OPERATED VEHICULAR TRANSMISSIONS

Keiichi Ishikawa, Utsunomiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1988, Ser. No. 146,078
Claims priority, application Japan, Jan. 20, 1987, 62-9064
Int. Cl.⁴ B60K *41/10*
U.S. Cl. 74—866 **8 Claims**



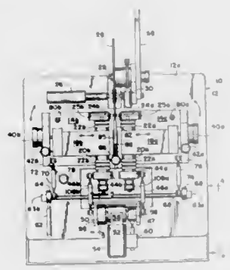
1. A control apparatus for a hydraulically operated vehicular transmission a first-speed hydraulic clutch, a second-speed hydraulic clutch, a third-speed hydraulic clutch, and a fourth-speed hydraulic clutch which respectively establish a first-speed transmission train, a second-speed transmission train, a third-speed transmission train, and a fourth-speed transmission train for forward drive, having a hydraulic circuit through which oil is fed to said clutches and discharged from said clutches and which is provided with a first shift valve connected through a manual valve to a hydraulic power source, a second shift valve located downstream of the first shift valve and a third shift valve located downstream of the second shift valve, said first shift valve being switchable to first-speed position at which the supplying of the oil to the first-speed hydraulic clutch and the discharging of the oil from the second-speed hydraulic clutch are carried out and to second-speed position at which the supplying of the oil to the second shift valve is carried out, said second shift valve being switchable to second-speed position at which the supplying to the second-speed hydraulic clutch of the oil supplied from said first shift valve and the discharging of tee oil from the third-speed hydraulic clutch are carried out and to third-speed position at which the discharging of the oil from the second hydraulic clutch and the supplying to the third shift valve of the oil supplied from said second shift valve are carried out, and said third shift valve being switchable to third-speed position at which the supplying to the third-speed hydraulic clutch of the oil supplied from said second shift valve and the discharging of the oil from the fourth-speed hydraulic clutch are carried out and to fourth-speed position at which the discharging of the oil from the third-speed hydraulic clutch and the supplying of the oil to the fourth-speed hydraulic clutch are carried out, characterized in that said first shift valve is urged to the second-speed position, said second shift valve to the second-speed position and said third shift valve to the third-speed position by respective springs, and that there are provided a first oil chamber giving said first shift valve a pressing force acting towards the second-speed position, a second oil chamber giving said first shift valve a pressing force acting towards the first speed position, a third oil chamber giving said second shift valve a pressing force acting towards the third-speed position, and a fourth oil chamber giving said third shift valve a pressing force acting towards the fourth-speed position, and there are further provided a first electromagnetic open-air valve connected to a first oil passage through which the oil is inputted to the first and the third oil chambers, and a second electromagnetic open-air valve connected to a second oil passage through which the oil is inputted to the second and the fourth oil chambers.

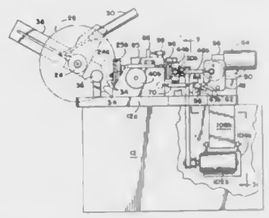
4,901,604

ADJUSTABLE AUTOMATIC DUAL SIDE GRINDER WITH QUICK RETRACT CAM

James Emter, 23429 NE. 29th Ave., Ridgefield, Wash. 98642

Continuation-in-part of Ser. No. 162,196, Feb. 29, 1988, Pat. No. 4,823,649, which is a continuation-in-part of Ser. No. 788,925, Oct. 18, 1985, Pat. No. 4,846,023. This application Apr. 3, 1989, Ser. No. 332,034
Int. Cl.⁴ B63D *63/14*
U.S. Cl. 76—41 **13 Claims**





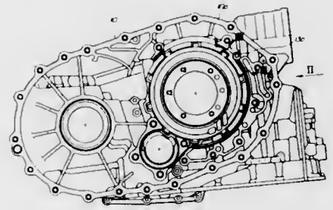
1. A regrinding apparatus for a circular saw comprising:
(a) a frame supporting a pair of rotary spindles;
(b) a grinding wheel mounted on each spindle for engaging the teeth of said circular saw from the side; and
(c) reciprocating means for driving said spindles longitudinally to effect a side grinding motion for said grinding wheels, said reciprocating means including cam means for providing a program of movement for said spindles which includes a forward grinding stroke at a first rate of speed and a rearward quick retract stroke at a second rate of speed, the second rate of speed being faster than the first rate of speed.

4,901,605

ARRANGEMENT FOR DISCHARGING BAND SERVO OPERATING HYDRAULIC PRESSURE IN AUTOMATIC TRANSMISSION

Hiromi Taguchi, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 31, 1988, Ser. No. 176,012
Claims priority, application Japan, Mar. 31, 1988, 62-46997[U]
Int. Cl.⁴ F16H *57/02*
U.S. Cl. 74—606 R **4 Claims**



1. An arrangement for discharging servo piston operating hydraulic pressure in an automatic transmission, comprising:
a transmission case having a control valve body joining outer surface, an oil pump cover outer joining surface, and a servo cylinder chamber passing through said transmission case;
servo release passage means located at said control valve body joining outer surface and extending from said transmission case;
upstanding passage means formed in said transmission case in such a manner as to have at said control valve body joining outer surface a lower open end fluidly connected to said servo release passage means and an upper closed end;
communication passage means formed in said transmission case in such a way as to have an open end adjacent said oil pump cover joining outer surface and the other end fluidly connected to said upper closed end of said upstanding passage means;
said communication passage means being communicated with said servo cylinder chamber at a passage portion between said open and other ends thereof; and
a discharge valve disposed in said open end of said communication passage means for controlling discharge of band servo operating hydraulic pressure therethrough.

4,901,606

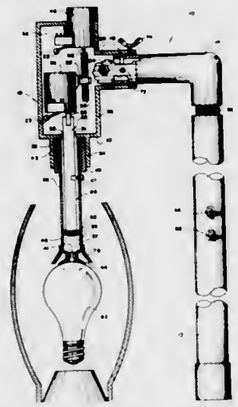
APPARATUS FOR INSERTING AND EXTRACTING LIGHT BULBS

Marc F. Christensen, R.R. #5, Box 178, Covington, La. 70433

Filed Jun. 20, 1988, Ser. No. 208,722
Int. Cl.⁴ B25B *21/00*
U.S. Cl. 81—57.11 **14 Claims**

1. An apparatus for inserting and extracting light bulbs comprising:
a handle means;
a support means attached to said handle means substantially perpendicularly thereto;
a housing means attached to said support means opposite said handle means and adapted for adjustable rotation about said support means;
a piston housing means secured to said housing means and adapted for a rotational movement independently from said housing means;
a gripping means attached to said piston housing means for gripping a light bulb;

said piston housing means housing a piston means adapted for an axial movement within said housing means for



creating a vacuum between said gripping means and a light bulb to be gripped.

4,901,607

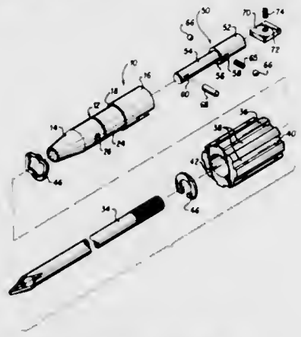
RATCHETING TOOL DRIVER AND METHOD OF ASSEMBLING AN IMPROVED RATCHETING TOOL DRIVER

Anthony F. Beugelsdyk, Wichita, Kans.; Chun-Hsiung Lin, Taichung, and Lester C. Wu, Taipei, both of Taiwan, assignors to Latshaw Enterprises, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 149,486, Jan. 28, 1988, Pat. No. 4,793,222. This application Sep. 23, 1988, Ser. No. 248,182

Int. Cl.[4] B25B *13/46*

U.S. Cl. 81—63.2 **24 Claims**



1. A ratcheting tool driver comprising

a generally conduit head means having an open first end and an open second end that includes a structure defining an external head flange, an internal head flange, and a head slot which is open on its sides, said head means additionally having a structure including a head recess, a head opening, a loading hole in said open second end, and a pair of detent holes in said open second end;

a hollow cylindrical retainer means having an external structure defining a plurality of flutes and an internal structure defining a first cylindrical retainer cavity, a second cylindrical retainer cavity in communication with said first cylindrical retainer cavity and having a smaller diameter than said first cylindrical cavity, and an internal retainer flange that represents the termination point of said first cylindrical retainer cavity and the commencement point of said second cylindrical retainer cavity and the dividing point between the first and the second cylindrical retainer cavity, said retainer means rotatably positioned around said open second end from the beginning of the open second end to the head recess and such that said external head flange rotatably mates with said internal retainer flanges;

a plurality of inwardly facing ratchet teeth means integral with the walls of said first cylindrical retainer cavity, with each respective tooth having a first tooth side and a second tooth side that defines a cam surface;

a washer means mounted around said generally conduit head means and sandwiched between said external head flange and said internal retainer flange;

a snap ring means positioned in said head recess in order to provide friction for said washer means in conjunction with maintaining said retainer means around said open second end;

a generally solid cylindrical switch rod means having a first rod end and a second rod end and including a rod flange integral with outside of said first rod end, a first cylindrical rod hole piercing said first rod end in proximity to said rod flange, a second cylindrical rod hole piercing said second end, said first rod end including a structure defining a channeled side which includes a rod recess therein, and a hollow neck means disposed integrally on said channeled side around said rod recess;

said first cylindrical rod hole having a central axis that is generally parallel with a plane of the face of the channeled side and said switch rod means being rotatably positioned within said conduit head means such that said channeled side of said first rod end of said switch rod means faces and opposes the head slot and said head opening generally registers with said second cylindrical rod hole and said first cylindrical rod hole is essentially circumferentially aligned with said pair of detent holes of said head means;

a pawl means having a first end and a second end and a structure defining a pawl recess and slidably lodged within said head slot such that said pawl recess generally registers with said hollow neck and said rod recess of said first rod end of said switch rod means, said first end of said pawl means engages and is flushed against the cam surface of the second tooth side of a respective tooth when the pawl means is on one side of the head slot and said second end of said pawl means engages and is flushed against the cam surface of the first tooth side of a respective tooth when the pawl means is on the other side of the head slot;

a rod retention spring bias means and a pair of ball means on opposed sides thereof slidably positioned in said first cylindrical rod hole wherein said pair of ball means are biased against the internal wall of said open second end such that when said switch rod means is rotated in one predetermined direction one of said pair of ball means removably lodges in one of said pair of detent holes and when the switch rod means is rotated in the reverse of said predetermined direction said lodged ball means becomes dislodged from said one of said detent holes and with continuing rotation of said switch rod means the other opposed remaining ball means of said pair of ball means becomes lodged in the other opposed remaining detent hole of said pair of detent holes;

a switch button means seated in said second cylindrical rod hole and extending through said head opening of said head means in order to rotate the switch rod means about is central axis within said head means in a predetermined direction;

a bearing means; and

a pawl spring bias means seated in said rod recess and said bearing means disposed against said pawl spring bias means and seated biasingly in said pawl recess such that when said switch button means rotates the switch rod means in a predetermined direction, simultaneous with the

pair of ball means being lodged and dislodged from the pair of detent holes respectively, said biased bearing means forces the pawl means to shift within said head slot and engage one of the plurality of inwardly facing ratchet teeth of said first cylindrical retainer cavity, said pawl means capable of being shifted in opposing directions within said formed head slot in accordance within the predetermined rotation of said switch rod means, the shift of said pawl means from one side and its engagement with said ratchet teeth preventing a rotation of the retainer means in one direction as during application of a force simultaneously with freely providing a reverse turn of said retainer means in preparation for the exertion of additional force in the prevented direction, while a shifting of the said pawl means to the other side of the head slot and its engagement thereat with the ratchet teeth precluding a rotation of the retainer means in an opposite direction while freely providing a reverse turn of said retainer means.

4,901,608

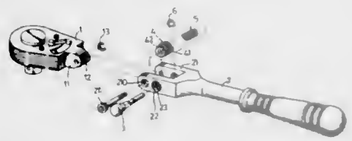
ADJUSTABLE ANGLE RATCHET WRENCH

James Shieh, No. 368-1, Lane 114, Yuan Hwan East Road, Feng Yuan City, Taichung Hsien, Taiwan

Filed Feb. 27, 1989, Ser. No. 315,565

Int. Cl.[4] B25G *1/00*

U.S. Cl. 81—177.8 **2 Claims**



1. An adjustable angle ratchet wrench comprising:

(a) a wrench head including a rectangular protrusion extending outwardly from a side thereof disposed perpendicular to a drive shaft, the protrusion being provided with a semi-cylindrical first gear at one end thereof and a central cylindrical passageway;

(b) a handle including a fork defined by a pair of tines forming a Y-shaped opening sized for receiving the protrusion therein, each tine being substantially rectangular in shape and terminating in an end having a semi-cylindrical shape;

(c) a first cylindrical bore extending through the tines and including a threaded section in one tine and a stepped section in the other tine, and a bolt extending through the cylindrical bore and the central cylindrical passageway of the protrusion, the bolt being disposed in threaded engagement with the threaded section;

(d) a second cylindrical bore extending through the tines and including an outer section and toothed section in one tine, and a larger diameter inner cylindrical opening and a smaller diameter outer cylindrical opening in the other tine;

(e) a second gear provided with teeth on its outer surface and including a set of larger first teeth engageable with the first gear and a set of smaller second teeth engageable with the toothed section, the second gear further including a central rectangular bore and a cylindrical passage;

(f) a button including a cylindrical head portion, a reduced diameter cylindrical section, a rectangular section and a cylindrical shaft, the rectangular section being disposed within the central rectangular bore of the second gear and the cylindrical shaft being received through the cylindrical passage of the second gear, and a spring surrounding the cylindrical shaft and seated within the inner cylindrical opening of the tine, and means for securing the button to the tines;

(g) the wrench head being hinged to the handle for pivotal movement about the bolt during engagement of the first gear and the first teeth of the second gear, the second teeth of the second gear being urged by the spring into engagement with the toothed section of the tine so that the second gear may be disposed in rigid engagement with the handle and secure the wrench head in a rigid fixed position with respect to the handle; and

(h) whereby when the button is depressed against the spring, the smaller second teeth of the second gear is released from engagement with the toothed section of the tine, thereby permitting the wrench head to freely pivot with respect to the handle through an angle of approximately 180° C. about the bolt.

4,901,609

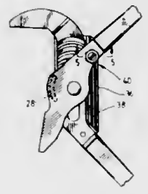
ADJUSTABLE PLIERS

David L. Crum, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed May 5, 1989, Ser. No. 348,057

Int. Cl.[4] B25B *7/04*

U.S. Cl. 81—405 **20 Claims**



1. An apparatus for maintaining first and second halves of an adjustable pliers in an adjusting position whereby the first and second halves of the adjustable pliers are free for sliding motion relative to one another along a path for adjusting the dimension of the pliers jaws, the apparatus comprising:

a ball-type latch connected to the first plier half and extending in a direction generally toward the second plier half, said ball-type latch being movable between first and second positions and urged toward said second position; and

a plate connected to the second plier half and having a groove extending a preselected depth into said plate and along the surface of said plate substantially parallel to said adjusting path, said plate being disposed a preselected distance from said first plier half at a location approximately corresponding to the first position of said ball-type latch, and the preselected depth of said groove approximately corresponding to the second position of said ball-type latch, whereby said ball-type latch engages said groove and allows the first and second halves to slidingly adjust while being guided by said ball-type latch moving along the parallel groove.

4,901,610

ADJUSTABLE TORQUE CONTROLLING MECHANISM

John K. Larson, Arlington Heights, and Talmage O. Green, Shaumburg, both of Ill., assignors to Precision Instruments, Inc., Des Plaines, Ill.

Filed Jul. 7, 1988, Ser. No. 216,000

Int. Cl.[4] B25B *23/157*

U.S. Cl. 81—473 **19 Claims**

1. An adjustable torque controlling mechanism, comprising, in combination:

a drive shaft having one end portion for driving connection with a member to be driven;

a torque releasable clutch on and about an opposite end portion of said shaft and comprising a first disk fixedly attached to the shaft with a terminal part of said shaft

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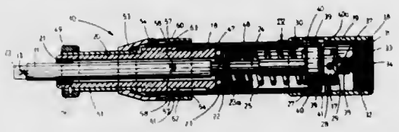
exposed at one side of said fixedly attached disk, and a second disk axially shiftable relative to the opposite side of said first disk;

wear resistant torque sensitive ball detent release means between said disks;

a tubular housing about said shaft including a reaction barrel having a generally cup shaped hand grip member on one end portion of the barrel and enclosing said clutch;

a tubular spindle telescopically shiftable within an opposite end portion of said barrel and having a part projecting from the barrel about said shaft and said driving end portion of the shaft projecting from the projecting part of the spindle;

means on said projecting part of the spindle to facilitate effecting axial adjustments of the spindle relative to the barrel and including torque value calibrations cooperatively related to index means carried by said projecting part of the spindle;



means for fixedly locking said spindle in selectively axially adjusted positions relative to said barrel;

spaced antifriction bearing assemblies rotatably mounting said shaft within said spindle, and one of said bearing assemblies located on an end of said spindle within said barrel and having a bearing race facing in spaced relation toward said second clutch disk;

a compression spring mounted about said shaft and having one end thrusting against said bearing race and an opposite end thrusting against said second disk;

spring rate reaction means coupling said second disk to said barrel; and

a calibration thrust screw mounted on said hand grip and having an end connected in axial alignment thrust relation to said terminal part for effecting a range of selective axial adjustments of said shaft in cooperation with the axially adjusted positions of said spindle, for adjusting the compression rate of the spring.

4,901,611

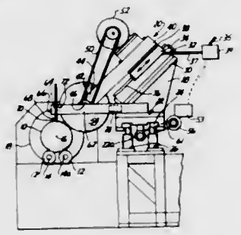
APPARATUS AND METHOD FOR CUTTING MULTS FROM BILLETS

Richard J. Bentley, 6925 Aragon Circle, Unit #30, Buena Park, Calif. 90620

Continuation of Ser. No. 174,777, Mar. 29, 1988, abandoned. This application Mar. 30, 1989, Ser. No. 331,034

Int. Cl.[4] B23B *5/14*

U.S. Cl. 82—100 **3 Claims**



1. Apparatus for accurately cutting a billet of metal into a series of mults each of a predetermined mass, said apparatus comprising:

(a) a rotatable chuck adapted to grip and rotate a metal billet about a first horizontal axis, with a portion of said billet projecting outwardly from said chuck along said first axis;

(b) means to support said portion of the billet for rotation about said first axis;

(c) a stationary base to support said chuck for rotation about said axis;

(d) drive means to rotate said chuck for rotation about said axis;

(e) track means extending parallel to said axis and spaced from the portion of the billet extending from said chuck;

(f) carrier means supported by and slidable along said track means;

(g) drive means to move said carrier means along said track means to any determined point on said track means and to temporarily retain it at said point;

Said carrier means supporting:

(i) A driven rotary cutting device, said cutting device being rotatable about a series of axes, each being parallel to the said first axis;

(ii) Means to enable said cutting device to be advanced or retracted in a plane normal to the first axis, so that, when advanced, said cutting device presents its cutting edge against the rotating billet to cut inwardly at least substantially to the axis thereof, and, upon completing the cutting of the billet, said cutting device may be retracted from said billet, said means to enable cutting device to be advanced or retracted including a first support member secured on said carrier means, said member having a face parallel to said first horizontal axis, a second support member carried by and linearly slidable reciprocably on said face toward and away from said first horizontal axis, the cutting device and its driving means being mounted upon said second member to move therewith, and fluid actuation means connected to both said first member and said second member to drive the latter reciprocably with respect to the first member; and

(iii) Transducer-sensor means adapted to be maintained in contact with the billet to determine the diameter of the billet and to detect variations thereof in its diameter or other assumed dimensions, and to generate electrical signals indicative of such data so determined and detected, said transducer-sensor means including a displaceable sensor probe, said sensor probe displacement responsive to the diameter of said billet defining said electrical signals;

(h) computer means to receive the data from said transducer-sensor means respecting said deviations, said computer means being programmed to utilize said data with other assumed data relating to the billet to determine the point along said track means to which the carrier means is to be moved and temporarily secured, and to emit appropriate electrical command signals properly to dispose and temporarily secure its carrier means on the track means for cutting the billet to produce a mult of such predetermined mass; and

(i) servo means responsive to electrical command signals from the computer to actuate the means to move the carrier means to dispose the carrier means on the track means and to secure temporarily at the predetermined point on said track means;

Whereby the means to advance or retract the cutting means may be actuated to advance the cutting means to cut the rotating billet and thereafter retract it.

4,901,612

BAND SAW APPARATUS AND METHOD WITH PRESSURE CONTROLLED FEED

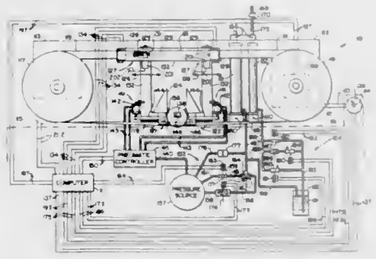
Gerald R. Harris, P.O. Box 1148, Pryor, Okla. 74362

Continuation-in-part of Ser. No. 609,429, May 11, 1986, Pat. No. 4,766,790, which is a continuation-in-part of Ser. No. 577,527, Feb. 6, 1984, Pat. No. 4,558,614. This application May 12, 1987, Ser. No. 48,908

The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.

Int. Cl.[4] B23D *55/04, 55/08*

U.S. Cl. 83—56 **18 Claims**



1. A method of cutting a workpiece with a band saw, said band saw having a movable carriage, a band saw blade mounted to said band saw for advancement to effect cutting, and said fluid control means coupled to control movement of said carriage during cutting of said workpiece, said fluid control means including an adjustable orifice means controlling the flow of a working fluid to control movement of said carriage and an adjustable support force means for providing a support force in a direction opposing and thereby controlling movement of said carriage, said method including the steps of: prior to cutting said workpiece, adjusting said fluid control means to control movement of said carriage when cutting thin sections of said workpiece and when cutting thick sections of said workpiece, and thereafter cutting said workpiece by advancing said blade and simultaneously moving said carriage as controlled by said fluid control means, wherein the improvement in said method comprises:

said step of adjusting said fluid control means is accomplished by adjusting said orifice means to control movement of said carriage when in said thin sections and by adjusting said support force means independently of said orifice means to control movement of said carriage in said thick sections; and

during said cutting step, controlling the rate of movement of said carriage means by varying said support force means independently of said orifice means while maintaining said orifice means at least as open as adjusted prior to cutting to substantially prevent excess loading of said blade and said band saw by controlling said loading independently of the resistance of said workpiece to cutting.

4,901,613

DRIVE LINK FOR SAW CHAIN

Raymond R. Carlton, 3105 SE. Carlton St., Portland, Oreg. 97202

Filed Oct. 24, 1988, Ser. No. 261,409

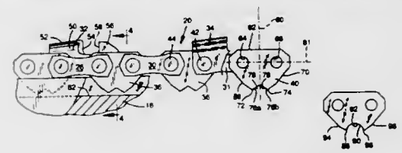
Int. Cl.[4] B27B *33/14*

U.S. Cl. 83—830 **2 Claims**

1. A drive link for power-driven saw chain, the link including a forward edge forming the front of the link, a rear edge forming the rear of the link and an upper edge forming the top of the link,

bores adjacent the front and the rear of the link for joining the link to other links,

a concave arcuate bottom edge forming the base of the link, said bottom edge having a forward portion and said forward edge having a lower front portion and said forward and lower front portions joining to form a pointed prong adjacent the front of the link, said bottom edge having a rear portion and said rear edge having a lower rear portion and said rear and lower rear portions joining to form a pointed prong adjacent the rear of the link, said forward



and rear portions of said bottom edge forming acute angles with respect to a line extending through the ends of said prongs and the lower front portion of said forward edge and lower rear portion of said rear edge defining an acute angle with respect to a line joining said prongs and the acute angles defined by said forward and rear portions of said bottom edge being at least as great as the acute angles defined by the lower front portion and lower rear portion of said forward and rear edges,

the link being symmetrical with respect to a plane bisecting a line joining centers of said bores.

4,901,614

KEYBOARD APPARATUS OF ELECTRONIC MUSICAL INSTRUMENT

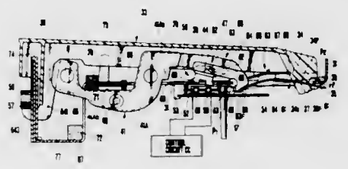
Shinji Kumano; Keisuke Watanabe, and Susumu Ohi, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Oct. 5, 1987, Ser. No. 105,188

Claims priority, application Japan, Oct. 6, 1986, 61-238828; Oct. 20, 1986, 61-250216; Oct. 20, 1986, 61-161312[U]; Oct. 30, 1986, 61-260091; Nov. 17, 1986, 61-273225; Nov. 17, 1986, 61-273226; Nov. 17, 1986, 61-273227; Nov. 17, 1986, 61-273228; Nov. 17, 1986, 61-273229; Nov. 17, 1986, 61-273230; Nov. 17, 1986, 61-176479[U]; Nov. 17, 1986, 61-176480[U]; Nov. 18, 1986, 61-274940; Nov. 18, 1986, 61-177159[U]

Int. Cl.[4] G10H *3/00;* **G10C** *3/12;* **H01H** *9/26*

U.S. Cl. 84—1.1 **56 Claims**



1. A keyboard apparatus for an electronic musical instrument, comprising:

keys each capable of pivoting about a first pivot fulcrum;

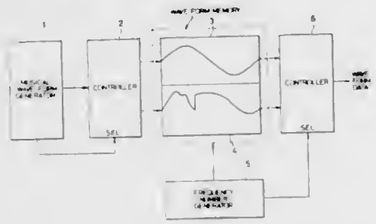
mass members each capable of pivoting about a second pivot fulcrum in cooperation with the corresponding key to provide the corresponding key with inertia of the mass member when the corresponding key is depressed; and

springs for supplying biasing forces to at least said mass members so that said mass members are biased toward initial states,

wherein each of said keys has a point of application for pivoting a corresponding one of said mass members in the

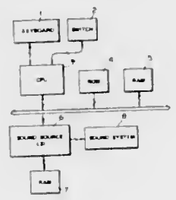
same rotational direction as a pivoting direction of said each key when said each key is depressed.

4,901,615
ELECTRONIC MUSICAL INSTRUMENT
Tadashi Matsushima, and Tatsunori Kondo, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan
Continuation of Ser. No. 108,065, Oct. 13, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 366,245
Claims priority, application Japan, Oct. 16, 1986, 61-246310
Int. Cl.[4] G10H *1/14, 7/00*
U.S. Cl. 84—605 **5 Claims**



1. A temporally varying musical waveform generating device comprising:
(a) musical waveform generating means which sequentially synthesizes temporally varying musical waveform data through operation and provides an output of the synthesized musical waveform data;
(b) first and second memory means which store, alternately with each other, the musical waveform data sequentially output from the musical waveform generating means;
(c) readout means whereby pluralities of sample values stored in the first and second memory means are read out therefrom in accordance with the frequency of a musical tone to be generated, the readout means sequentially reading out sample values at addresses N and N+1 in the first memory means having stored therein the musical waveform data and sample values at addresses N and N+1 in the second memory means having stored therein musical waveform data different from that stored in the first memory means;
(d) interpolation coefficient generating means for sequentially generating interpolation coefficients corresponding to the sample values in the order in which they are read out of the first and second memory means by the readout means;
(e) multiplying means for multiplying each of the sample values sequentially read out of the first and second memory means by the readout means and the corresponding one of the interpolation coefficients sequentially generated by the interpolation coefficient generating means; and
(f) accumulating means for accumulating respective weighted sample values output from the multiplying means;
wherein one interpolated sample value is produced by accumulating the respective weighted sample values by the accumulating means and an interpolation between two different waveforms in the temporally varying musical waveform and an interpolation between successive sample points in the different waveforms are performed simultaneously, thereby generating a temporally varying musical waveform with little noise.

4,901,616
ELECTRONIC MUSICAL INSTRUMENT WITH DELAY TRIGGER FUNCTION
Akinori Matsubara, and Takahashi Akutsu, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Oct. 11, 1988, Ser. No. 256,740
Claims priority, application Japan, Oct. 14, 1987, 62-259297; Oct. 14, 1987, 62-157055[U]; Oct. 14, 1987, 62-157056[U]
Int. Cl.[4] G10H *7/00*
U.S. Cl. 84—1.03 **9 Claims**

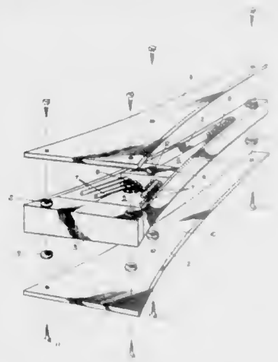


1. An electronic musical instrument, comprising:
tone data output means for outputting tone data including at least pitch data corresponding to a manual performance;
tone generating means for generating musical tones based on said outputted tone data;
sequencer memory means for storing the tone data from said tone data outputting means;
recording address pointer means for incrementing an address of said sequencer memory means every time a recording access is performed to said sequencer memory means;
recording timer means for measuring time interval data of serially obtained tone data;
recording processing means for sequentially storing the tone data and the time interval data from the recording timer means at an address of the sequencer memory means pointed by said recording address pointer means;
playback address pointer means for incrementing an address of said sequencer memory means every time a playback access is performed to said sequencer memory means;
delay time storing means for storing predetermined delay time data; and
sequence playback processing means for commencing to store the tone data and time interval data into said sequencer memory means by said recording processing means, and after a lapse of a time period corresponding to the delay time stored in said delay time storing means, for controlling said playback address pointer means to read out the tone data from said sequencer memory means for every time interval of said time data and to output the read out tone data to said tone generating means so as to generate a musical tone corresponding to the output tone data.

4,901,617
HAND-HELD PERCUSSION INSTRUMENT
Kenneth M. Malone, 2805 Lincoya Dr., Nashville, Tenn. 37214, and Samuel D. Bacco, 4804 Nevada Ave., Nashville, Tenn. 37209
Filed Mar. 24, 1989, Ser. No. 328,536
Int. Cl.[4] G10D *13/08*
U.S. Cl. 84—402 **7 Claims**

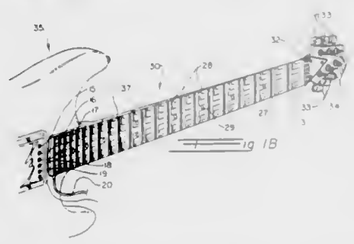
1. A hand-held percussion instrument comprising:
(a) dual sound boards joined at their lower end and separated at their upper end by a block to form generally a "Y" shape;
(b) at least one bridge joining said sound boards thereby defining plural sound chambers between said sound boards and above and below said bridge;
(c) tone prongs attached to and extending from said bridge into at least one of said sound chambers;

(d) top and bottom plates attached to said sound boards and said bridge to enclose said sound chambers; and



(e) filler particles enclosed within at least one of said sound chambers, said particles adapted for noise-making contact with said tone prongs, said bridge, said sound boards, and said plates when said instrument is vibrated.

4,901,618
SYSTEM FOR FACILITATING INSTRUCTION OF MUSICIANS
Kenneth L. Blum, Jr., 12639 Waterspout Ct., Worthington Valley, Md. 21117
Continuation of Ser. No. 133,655, Dec. 16, 1987, Pat. No. 4,791,848. This application Dec. 19, 1988, Ser. No. 286,963
Int. Cl.[4] G10D *3/06*; G10G *3/04*
U.S. Cl. 84—453 **8 Claims**



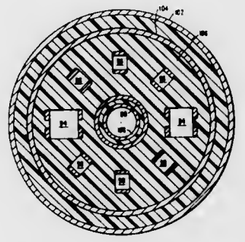
6. An input device for use in conjunction with a conventional stringed instrument of the type having a neck and a plurality of strings spaced from and extending along the neck, the device comprising a thin sheet dimensioned so as to be removably positioned beneath the strings along the neck of the conventional stringed instrument an array of switch means carried in or on said sheet, said switch means being so distributed that respective pluralities of said switch means are positioned beneath each of the strings when the device is in position beneath the strings, and means for removably fixing the thin sheet beneath the strings.

4,901,619
SHAPED CHARGE WITH BARRIER PRODUCED IN SITU
Ulrich Sassmannshausen, Brühl, and Manfred Pietsch, Leverkusen, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany
Filed Dec. 12, 1988, Ser. No. 283,213
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1987, 3742290
Int. Cl.[4] C06D *1/08*; F42B *3/00, 1/00, 1/02*
U.S. Cl. 86—20.12 **7 Claims**



1. A method of assembling a shaped charge in a mold, comprising:
fixing separately produced main and propagating charges together leaving a cavity formed by the main charge and by the propagating charge, filling that cavity with a solidifying material while said solidifying material is still in the fluid state, and allowing said material to solidify with temperature-independent shrinkage behavior to form a barrier in the cavity by curing or polymerizing and thereby bonding that material tenaciously to the main charge and the propagating charge.

4,901,620
ELECTROMAGNETIC LAUNCHER SYSTEMS FOR PENETRATORS AND LARGER CALIBER PROJECTILES
George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 22, 1982, Ser. No. 350,940
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **13 Claims**



7. An electromagnetic projectile launcher comprising:
a single electric current pulse power supply;
a single barrel including at least two bores having different cross-sectional areas;
a first one of said bores including a first pair of generally parallel conductive rails;
a second one of said bores having a larger cross-sectional

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area than said first bore and including a second pair of generally parallel conductive rails;

means for conducting current between said first pair of rails and for propelling first projectile through said first bore;

means for conducting current between said second pair of rails and for propelling a second projectile through said second projectile bore, wherein said second projectile has a larger mass than said first projectile; and

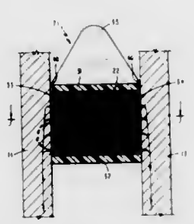
means for commutating current from said electric current pulse power supply to said first pair of rails and said second pair of rails, wherein at a preselected firing current level, the accelerating force applied to said second projectile is a multiple of the accelerating force applied to said first projectile.

4,901,621

SUPERCONDUCTING PROJECTILE FOR A RAIL GUN AND THE COMBINATION OF A RAIL GUN WITH A SUPERCONDUCTING PROJECTILE

Derek A. Tidman, Silver Spring, Md., assignor to GT-Devices, Alexandria, Va.

Filed Jul. 9, 1987, Ser. No. 79,291
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **47 Claims**



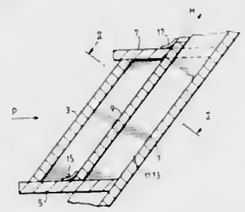
1. A projectile for launching from a rail gun including first and second parallel, elongated electrically conducting metal rails insulated from each other and connected to opposite terminals of a DC power supply, the projectile comprising a forward portion, a rear portion, and an armature between the forward and rear portions, the rails and projectile armature being arranged so that current flows from one terminal of the power supply longitudinally of one of the rails thence through the projectile to the other rail thence longitudinally of the other rail back to the other terminal of the supply; the armature having multiple mutually insulated longitudinally extending superconductors arranged so that current flowing longitudinally in the rails from the power supply flows between the rails longitudinally through the superconductors with a component at right angles to the elongated direction of the rails, the superconductors being arranged, positioned and of a type that the current flowing longitudinally through them at right angles to and between the rails produces a force for driving the projectile longitudinally along the rails, the superconductors having a tendency to go normal in the vicinity of the rails in response to heating of the superconductors in the vicinity of the rails while the projectile is travelling along the rails, and means on the projectile for shunting current from the power supply around the portion of the superconductors having a tendency to go normal to the remainder of the superconductors in the superconducting state.

4,901,622

ARMOUR CONSTRUCTIONS

Melvyn Perry, Wetherby, England, assignor to Royal Ordnance plc, London, England

Filed Dec. 8, 1987, Ser. No. 130,273
Int. Cl.[4] F41H *5/04, 5/16*
U.S. Cl. 89—36.02 **3 Claims**



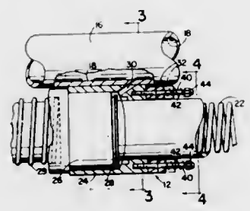
1. A reactive armour construction comprising an outer armour layer rigidly fixed by support means to a structure to be protected so that said outer armour layer is spaced from said structure, an inner armour layer disposed in said space between said outer armour layer and said structure, said inner armour layer being supported on rail means rigidly attached to said structure and being relatively loosely attached to said support means by frangible connectors such that when a projectile penetrates at an oblique angle the outer armour layer and is incident upon the inner armour layer, said connectors are broken whereby said inner armour layer is allowed to move laterally upon said rail means relative to said outer armour layer thereby disrupting a line of attack of the projectile.

4,901,623

COMPENSATING DEVICE FOR GAS ACTUATED FIREARMS

Joseph L. Lee, Woodbridge, Conn., assignor to O.F. Mossberg & Sons, Inc., North Haven, Conn.

Filed Nov. 1, 1984, Ser. No. 667,105
Int. Cl.[4] F41D *5/08*
U.S. Cl. 89—193 **11 Claims**



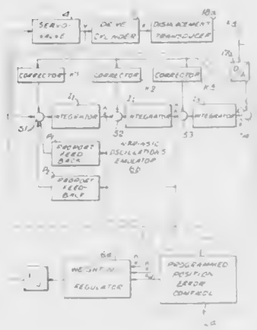
1. In a firearm having a receiver, a barrel supported on and projecting forwardly of the receiver and including a bore, a breech bolt supported within the receiver for movement therein between battery and retired positions, a magazine tube supported on and projecting forwardly of the receiver in axially parallel relation to the barrel, a generally cylindrical gas cylinder mounted in fixed position relative to the barrel and coaxially surrounding an associated portion of the magazine tube in axially spaced relation to the receiver, an annular piston received within the gas cylinder and coaxially surrounding an associated portion of the magazine tube, the piston being supported on said magazine tube for movement therealong and generally toward and away from the receiver, action bar means for moving the breech bolt in response to movement of the piston relative to the gas cylinder, the cylinder cooperating with the magazine tube and the piston to define an annular gas chamber, means defining a bleed port communicating with the bore and with the gas chamber forward of the piston for venting gases of explosion from the bore into the gas chamber, and compensating means for limiting pressure developed within the gas chamber, the improvement wherein said compensating means comprises a generally radially disposed and forwardly facing first annular seating surface on said gas cylinder, at least one gas vent port defined by said gas cylinder communicating with said gas chamber and opening through said first annular seating surface, an obturation ring supported in coaxial encircling relation to an associated portion of said magazine tube forward of said gas cylinder and having a generally radially disposed and rearwardly facing second annular seating surface for seating engagement with said first annular seating surface, and means for biasing said obturation ring toward said gas cylinder to maintain second annular seating surface in seating engagement with said first annular seating surface and in closing relation to said one gas vent port when the magnitude of pressure within said gas cylinder is lower than a predetermined magnitude, said obturation ring being movable away from said gas cylinder and out of seating engagement in response to pressure within said chamber in excess of said predetermined magnitude to vent gases of explosion from said gas chamber through said one gas port and to the atmosphere.

4,901,624

HYDRAULIC DRIVING DEVICE

Alfred Feuser, Lohr-Rodenbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Continuation of Ser. No. 907,676, Sep. 15, 1986, abandoned. This application Jun. 20, 1988, Ser. No. 201,777
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532931.1014
Int. Cl.[4] F15B *21/02*
U.S. Cl. 91--35 **6 Claims**



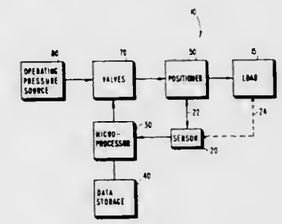
1. A hydraulic driving device including a hydraulic motor and an electro-hydraulic servo system for controlling the displacement of said hydraulic motor, said servo system comprising an electrically controlled control valve connected to a hydraulic pressure circuit of said hydraulic motor; a transducer coupled to a driven member of said hydraulic motor to generate an actual displacement signal; means for comparing the actual displacement signal with a desired displacement signal and generating a position error signal; means for electrically emulating intrinsic oscillations of said hydraulic motor and generating an estimate acceleration signal and an estimate speed signal; and a regulator having inputs connected to said emulating means and an output connected to an electrical control input of said control valve, said regulator weighting said position error signal according to said estimate signals and generating a weighted setting signal for said control valve; said transducer generating a digital actual displacement signal, and said comparing means including a computer programmed for comparing said digital actual displacement signal with a desired displacement value and delivering at its output an analog position error signal.

4,901,625

APPARATUS AND METHOD FOR POSITIONING EQUIPMENT

John E. Bussan, Oak Park; Christopher F. Bussan, Schaumburg, and Bruce H. Blair, Oak Park, all of Ill., assignors to Increcyl, Inc., Franklin Park, Ill.

Filed Jan. 3, 1989, Ser. No. 293,752
Int. Cl.[4] F15B *13/16*
U.S. Cl. 91—361 **45 Claims**



1. A method of positioning a pneumatically-driven load accurately to a plurality of desired positions in the presence of unpredictable variables, comprising:

dividing a path of travel of the load into a multiplicity of short intervals;

characterizing the path of travel of the load into a plurality of path portions, each path portion including several of the short intervals;

providing a data-storage means with data corresponding to movement of the load over the plurality of path portions and multiplicity of short intervals, said data including a set of long move data including an offset distance value for movement of the load over each of the plurality of path portions and a set of short move data including a time interval for movement of the load over one and a plurality of said short intervals from each of the plurality of path portions;

determining a current position and a desired position of the load and the path of load movement therebetween;

determining from said sets of long move data and short move data one or more intervals of application of pneumatic force to said load to effect the desired position, said one or more intervals of pneumatic force application being effected by determining for the path of load movement, the offset distance value and if the path of movement exceeds the offset distance value, applying pneumatic force to the load and sensing load position as the load moves until the sensor indicates the load is at a first position equal to the desired position adjusted by the offset distance value, and if the path of load movement is less than the offset distance value, determining from the set of short move data the time interval corresponding to the path of movement and applying pneumatic force to the load for the determined time interval.

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4,901,626

HYDRAULIC POWER BOOSTER

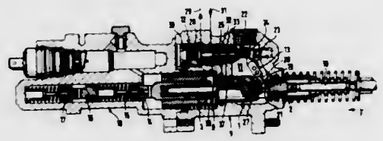
Heinz Zingel, Bad Camberg, and Thomas Bartsch, Kelkheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,583

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725249

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369.1 10 Claims



1. A hydraulic power booster for the actuation of a master cylinder in a hydraulic brake system of a motor vehicle, said brake system including a pressure fluid source, comprising a control device for the control of the hydraulic pressure level in a booster pressure chamber of said power booster, an actuating element connected for the actuation of the control device, said actuating element adapted to be acted upon by an input force, a converting device connected for the conversion of the controlled hydraulic pressure into a translatory force including a converting element adapted to be acted upon by said controlled pressure fluid, and a force transmission element connected for the transmission of the translatory force to the master cylinder, wherein a semi-rigid force transmission unit is arranged between the converting device and the force transmission element, a closable fluid reservoir, means responsive to said input force for closing said fluid reservoir wherein said fluid reservoir is closed to define a pressure reservoir and provide a pressure cushion after a specific input force has been reached.

4,901,627

HYDRAULIC IDLING-REGULATING VALVE

Eckehart Schulze, Stahlbühlstrasse 36, D-7251 Weissach, Fed. Rep. of Germany

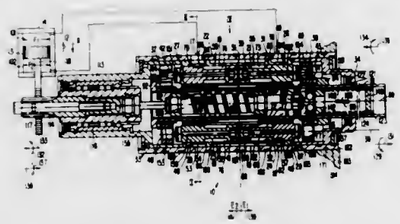
PCT No. PCT/DE87/00403, § 371 Date May 4, 1988, § 102(e) Date May 4, 1988, PCT Pub. No. WO88/01697, PCT Pub. Date Mar. 10, 1988

PCT Filed Sep. 4, 1987, Ser. No. 192,507

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1986, 3630176

Int. Cl.[4] F15P *9/10*

U.S. Cl. 91—374 9 Claims



1. The hydraulic idling-regulating valve means for controlling movements of a machine element drivable by a driving hydraulic cylinder means, the hydraulic idling-regulating valve means comprising at least one pair of mechanically operated through-flow valves arranged in a casing means and controllable by reciprocating movements of a valve actuating element to move from a neutral central position in which both valves are closed into alternative directions into a flow position and a closure position, an electromechanical specified-value setting system and a mechanical actual-value feedback system for at least one of setting and controlling specified and actual values of an instantaneous position of the pistons of the driving hydraulic cylinder means, the specified-value setting system comprising a hollow shaft rotatably mounted in a housing of the valve means and reciprocable in a longitudinal direction, said hollow shaft being rotatable through a number of revolutions correlated with the respective specified value by an electric motor provided for the purpose of controlling the specified value, said actual-value feedback device comprising a feedback spindle engageable through an external thread, with an internal thread of the hollow shaft and coupled by form-locking means to move with the piston of the driving hydraulic cylinder means either, when a connection with the piston is rigid, in a manner that the feedback spindle follows any displacement of the piston or, in the case of a rotational connection with the piston, in a manner that the feedback spindle performs a number of revolutions correlated with the movements of the piston, in which case the valve-actuating elements are subjected to the same displacements in the axial direction as the hollow shaft, the hollow shaft being rotatably supported in the value-actuating element which is secured against rotation in the casing, said casing includes a circular cylindrical core with at least one first longitudinal bore and/or in which the longitudinally movable pistons of the at least one pair of throughflow valves are longitudinally movable between stop elements fixed against rotation relative to the casing means, movable in the longitudinal direction, and another bore in which the hollow shaft of the specified-value setting system is mounted, said stop elements being carried axially and radially on said hollow shaft through pivot pads, said casing means further comprising a cylindrical circular envelope into which the circular cylindrical core is firmly set, connections spaces on a pressure-source side and a consumer side which, depending upon a position of the valve pistons are either connected to communicate with each other or are closed with respect to each other, said connection spaces being defined by external grooves on the circular cylindrical core and by inner surface areas of the envelope fixed thereto, and wherein inlet and outlet ducts are defined by radial bores in the circular cylindrical core and the cylindrical circular envelope.

4,901,628

HYDRAULIC ACTUATOR HAVING A MICROWAVE ANTENNA

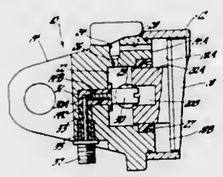
Mark K. Krage, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 522,105, Aug. 11, 1983, Pat. No. 4,501,423.

This application Oct. 9, 1985, Ser. No. 785,679

Int. Cl.[4] G01R *27/06;* F15B *15/28*

U.S. Cl. 92—5 R 1 Claim



1. A hydraulic actuator having a microwave antenna comprising, a cylinder having an end cap, a piston reciprocable within said cylinder, a rod member extending axially of said piston that moves into an axially extending bore formed in said end cap when the piston has moved to a position engaging a portion of said end cap, passage means connecting the interior of the cylinder and the interior of said bore, an axially extending microwave antenna disposed within said bore and a recess formed in said rod member for receiving said antenna.

4,901,629

SEALING ARRANGEMENT

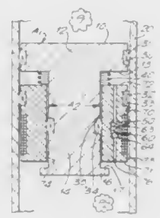
Frank Mohn, London, England, assignor to Framo Developments (UK) Limited, London, England

Filed Oct. 31, 1988, Ser. No. 264,363

Claims priority, application United Kingdom, Oct. 30, 1987, 8725449

Int. Cl.[4] F02F *7/00*

U.S. Cl. 92--261 15 Claims



1. An apparatus comprising a member which is reciprocable in a cavity, seal means operative between the member and the cavity walls, and drive means for producing reciprocal movement of the reciprocable member which, in use, is exposed at its opposite sides to fluids at respective first and second pressures, the first pressure being greater than the second pressure, the reciprocable member comprising a driving part, upon which the drive means act, and a driven part and the apparatus including means for generating during reciprocal movement of the member a fluid pressure in a chamber between the driving and driven parts, the pressure being greater than the first pressure and acting upon the seal means to provide an overpressure which prevents flow of the first fluid past the seal means and from one side of the reciprocal member to the other.

4,901,630

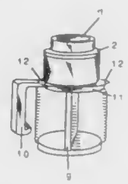
DUAL CHAMBERED BEVERAGE BREWING SYSTEM

Mitchell B. Hall, 1001 S. Marshall St. Ste. 56, Winston-Salem, N.C. 27106

Filed Jul. 5, 1988, Ser. No. 215,315

Int. Cl.[4] A47J *31/00, 31/06*

U.S. Cl. 99--295 4 Claims



1. A beverage brewing apparatus, operable with potable water from any source producing water sufficiently hot for brewing, enabling the brewing of two beverages simultaneously, said apparatus comprising:

(a) a water regulating means controllably dividing a flow of heated water into at least two measured portions,

(b) a means operable for containing two brewing substances and two portions of heated water enabling the separate brewing of two beverages,

(c) a collecting means enabling containment of two beverages.

4,901,631

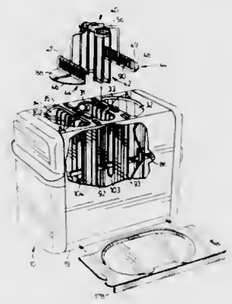
TOASTER

Gordon K. Russell, 1 Richview Rd., Apt. 1101B, Etobicoke, Ontario M9N 4M6; Donald Taylor, Mississauga; Clement Ching, Scarborough, and Kam-Chuen Chan, Richmond, all of Canada, assignors to Gordon K. Russell, Etobicoke, Canada

Filed Jan. 26, 1989, Ser. No. 301,920

Int. Cl.[4] A47J *27/12, 37/08*

U.S. Cl. 99—339 17 Claims



1. A toaster for heating both a frankfurter and a frankfurter bun, said toaster comprising:

a frankfurter heating chamber, said frankfurter heating chamber having an associated first element means for heating a frankfurter placed in said frankfurter heating chamber, said first element means heating said frankfurter on at least two opposed surfaces of said frankfurter,

at least one bun heating chamber, said bun heating chamber having an associated second element means for heating a bun placed in said bun heating chamber, said second element means heating said bun on at least one surface of said bun,

an elevator, said elevator comprising a first portion for supporting said frankfurter in said frankfurter heating chamber, a second portion for supporting said bun in said bun heating chamber and a connecting means, said connecting means connecting said first portion to said second portion and permitting a limited amount of play between said first portion and said second portion, said first portion circumferentially restraining said frankfurter for at least a lower half of said frankfurter, and simultaneously allowing radiant heat from said first element means to impinge on said restrained lower half of said frankfurter,

a means for raising and lowering said elevator, said elevator in a lower position supporting said frankfurter and said bun substantiallly within said respective frankfurter heating chamber and said bun heating chamber, and said elevator, in a raised position supporting said frankfurter and said bun with at least a portion of said frankfurter and said bun projecting outwardly of said respective frankfurter heating chamber and said bun heating chamber through respective open tops of said heating chambers.

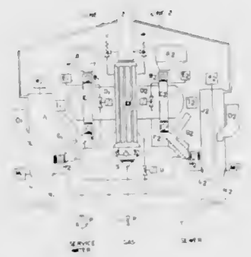
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4,901,632

THREE-PHASE PROCESS AND MACHINE FOR COOKING FOODS AS DRY PASTA, RICE, LEGUMES AND THE LIKE

Giulio Lori, Via Lambruschini, 4, Terni, Italy

Filed Nov. 27, 1987, Ser. No. 126,188
Int. Cl.[4] A47J *44/00*
U.S. Cl. 99—339 **29 Claims**



1. Automatic machine for carrying out a cooking operation in three phases, having a line comprising

a pre-cooking chamber for performing a first of said three phases, comprising an inlet and an outlet,

a first valve disposed in said pre-cooking chamber inlet, and a secondn valve disposed in said pre-cooking chamber outlet,

a dispenser coupled to said pre-cooking chamber inlet in a manner such that feed in said dispenser cascades into said pre-cooking chamber when said first valve is open,

a cooking chamber for performing a second of said three phases, having an inlet coupled to said outlet of said pre-cooking chamber and an outlet in a bottom thereof, with a third valve disposed in said cooking chamber outlet,

a cooling jacket surrounding at least a part of said cooking chamber,

an expeller pipe communicating with an interior of said cooking chamber for releasing pressurized vapor therefrom,

a final cooking chamber for performing a third of said three phases, having a inlet coupled to said outlet of said cooking chamber through said third valve, being substantially cylindrical in shape and vertically positioned with a fourth valve closing a bottom thereof, avoiding direct connection with a surrounding area, and

a boiler for generating over heating water for said cooking operation.

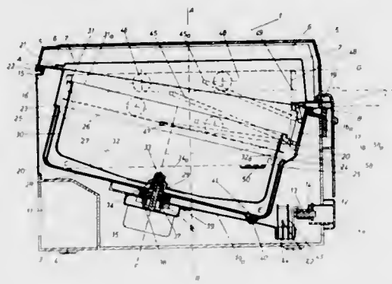
4,901,633

ROTATING OBLIQUE BASKET FRIER FOR CYCLIC IMMERSION COOKING

Guiseppe De Longhi, Treviso, Italy, assignor to De Longhi s.p.a., Trevisoa, Italy

Filed Sep. 28, 1987, Ser. No. 101,446
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—409 **32 Claims**

1. A deep fryer, operable with a quantity of oil for cooking a quantity of food, comprising a housing defining a chamber therein for containing said quantity of oil which oil will have a top surface defining a horizontal plane, a perforated basket for holding said quantity of food rotatably mounted in said chamber, the basket being rotatable such that food in any part of the basket is cyclically and repeatedly moved to be below and then above said horizontal plane of said oil, the basket having a central axis of rotation and being rotatably mounted in said chamber with said central axis oblique relative to vertical, drive means in said housing for rotating said basket such that said food can be cyclically immersed and emersed in said oil,



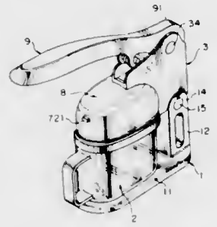
and means in said housing for heating the bottom of said chamber and said oil therein.

4,901,634

VACUUM SEASONING DEVICE

Hiroyuki Kuwahara, and Torazi Kimura, both of Niigata, Japan, assignors to Ookawa Iron Works, Ltd., Niigata, Japan

Continuation of Ser. No. 229,623, Aug. 8, 1988, abandoned. This application Jun. 8, 1989, Ser. No. 364,076
Int. Cl.[4] A23B *7/00*
U.S. Cl. 99—472 **4 Claims**



1. A vacuum seasoning device which comprises a support stand (1) having a base (11), a container (2) located on said base, said support stand having a support column (12) on one side of said base, a main body casing (3) rotatably supported by said support column, said main body casing having side frame (31), a housing (32) projecting horizontally therefrom, and a base plate (33) projecting parallel thereto and below said housing (32), said side frame being pivotally supported at the lower edge thereof on said support column, whereby said body casing shifts its position between horizontal and a predetermined dihedral positive angle at its front end; said base plate, when positioned horizontally, serving as the lid to tightly contact the top opening ede of said container; a vacuum pump apparatus to decompress the interior of said container; which apparatus comprises a vacuum pump having a cylinder (5), a piston (4) located in said housing, piston rod (43), means of reciprocating said piston rod in said cylinder; a unidirectional suction valve (53) which sucks air into the cylinder and a unidirectional discharge check valve (61), said discharge check valve being located in said housing (32), said unidirectional suction valve (53) being located at the bottom of the cylinder whereby it does not interfere with the tight contact between the piston and the opposite surface at the bottom base of the cylinder at the time the piston moves forwardly, said unidirectional discharge valve communicating with the outside air; suction ports (33) bored through said base place (33), said suction ports

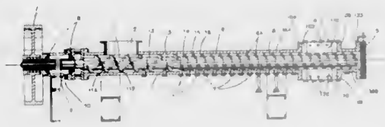
having a suction channel (55); a release valve located on a part of said suction channel to release air from said container through said suction ports.

4,901,635

APPARATUS AND METHOD FOR THE CONTINUOUS EXTRUSION AND PARTIAL DELIQUEFACTION OF OLEAGINOUS MATERIALS

Maurice A. Williams, Brookpark, Ohio, assignor to Anderson International Corp., Cleveland, Ohio

Filed Apr. 8, 1988, Ser. No. 179,486
Int. Cl.[4] A23N *1/00*; A47J *27/00*
U.S. Cl. 99—483 **28 Claims**



1. An extruder for treating oil-bearing material having a water content, comprising:

an elongate enclosure having an inlet end and a discharge end;

means for working and advancing the material through said enclosure from said inlet end to said discharge end while

(i) producing an increase in the vapor pressure of the water in the material as it advances, so as to achieve a vapor pressure significantly in excess of atmospheric pressure as the material approaches the discharge end, and

(ii) producing an increasing mechanical pressure on the material sufficient always to prevent vaporization of the water in the material while the material is in said enclosure; and

means for discharging the material from said discharge end into a zone of reduced pressure to cause vaporization of the water in the material and expansion of the material;

wherein said enclosure comprises a solid wall section and also comprises a perforate wall section disposed between said solid wall section and said discharge end of said enclosure.

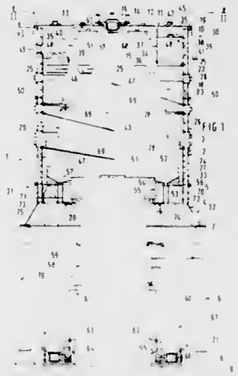
4,901,636

SPINDLE PRESS

Kurt Tegtmeyer, Salzgitter; Hermann Lühs, Grevenbroich, and Wolfgang Werner, Braunschweig, all of Fed. Rep. of Germany, assignors to Salzgitter Maschinenbau GmbH, Salzgitter, Fed. Rep. of Germany

PCT No. PCT/EP87/00670, § 371 Date Jul. 25, 1988, § 102(e) Date Jul. 25, 1988, PCT Pub. No. WO88/04232, PCT Pub. Date Jun. 16, 1988
PCT Filed Nov. 4, 1987, Ser. No. 252,271
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641248
Int. Cl.[4] B30B *9/12*
U.S. Cl. 100—117 **18 Claims**

1. A spindle press for pressing fluid out of a material, such as sugar beet pulp, comprising a housing having a feed side and an outlet side and including a spray casing and a screen casing arranged within said spray casing and forming a first annular space therebetween for guiding out fluid; a hollow spindle rotatably supported in said housing for pressing the material, said spindle being provided with perforations for fluid pressed from the material and enclosing an interior space for guiding out fluid, said spindle and said housing forming therebetween a second annular space into which the material to be pressed is fed at said feed side through filling means with at least one filling opening and from which the pressed material is discharged at said outlet side through an outlet annular gap, said spindle being provided with helically shaped ring worms which extend outwardly and substantially in contact with said screen casing; and a front wall for limiting said second annular space at said feed side, said front wall extending transversely to a longitudinal axis of said spindle and being sealed relative to



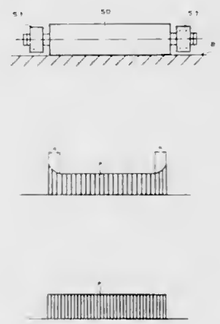
the latter, said front wall being externally fastened to said housing in a tight manner, said front wall being helical in an opposite manner relative to said ring members, and said ring members having a commencement which lies behind an outlet side end of said front wall.

4,901,637

EQUIPMENT IN THE SYSTEM OF ROLLS IN A SUPERCALENDER

Rauno Hagel, Järvenpää , and Wilhelm Landin, Ohkola, both of Finland, assignors to Valmet Paper Machinery Inc., Helsinki, Finland

Filed Dec. 13, 1988, Ser. No. 283,985
Claims priority, application Finland, Jan. 13, 1988, 880137
Int. Cl.[4] B30B *3/04*
U.S. Cl. 100—170 **13 Claims**



1. A supercalendar having first and second ends and comprising:

a plurality of rolls extending between the first and second ends of the supercalendar and including an upper roll, a lower roll and a plurality of intermediate rolls between the upper roll and the lower roll,

a bearing housing at each end of at least one intermediate roll,
a lifting spindle at each end of the supercalendar,
a spindle nut in threaded engagement with each lifting spindle, the spindle nuts being mechanically coupled to the bearing housings of said one intermediate roll whereby the lifting spindles can be employed to raise and lower said one intermediate roll,
a lightening device at each end of said one intermediate roll for reducing distortion in the profile of the linear load between the rolls due to the weight of the bearing housings, and
a lifting device at each end of said one intermediate roll for lifting the lightening device at that end of said one intermediate roll away from the spindle nut on the spindle at that end of said one intermediate roll.

4,901,638

PAINTER'S CAP PRINTING

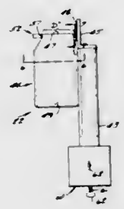
Roger L. Jennings, Glens Falls, N.Y., assignor to R. Jennings Manufacturing Co., Inc., Glens Falls, N.Y.

Division of Ser. No. 548,343, Nov. 3, 1983, Pat. No. 4,612,856, which is a continuation-in-part of Ser. No. 441,672, Nov. 15, 1982, Pat. No. 4,438,693. This application May 23, 1986, Ser. No. 866,562

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.[4] B41F *17/00*

U.S. Cl. 101—126 **16 Claims**



1. A cap printing device for screen printing onto the front of a cap of the type having a sweatband and a bill including a painter's cap, having a generally oval top, a bill, a sweatband, a front, and a hem between the front and top all portions of the bill at the front substantially equidistant from a corresponding portion of the hem; said device comprising:
a frame member:
a saddle secured to the frame member for mounting the cap for printing, said saddle having a flat platen which supports the front of the cap when the cap is so mounted;
a registration plate against which the bill of the cap presses when the cap is mounted on said saddle, said registration plate being secured to said frame in a spaced-apart perpendicular relationship with said platen so as to define a channel therebetween for receiving the sweatband of the cap;
a means for movably securing a printing screen to said frame for movement between an advanced position wherein the screen contacts the front of a cap mounted on said saddle, and a retracted position wherein the screen is withdrawn for changing caps; and
said saddle platen having a substantially linear rear edge portion opposite said registration plate said rear edge portion shaped and positioned with respect to said registration plate so that a painter's cap front may lay flat thereon, no portion of said saddle platen interferingwith the hem of the cap.

4,901,639

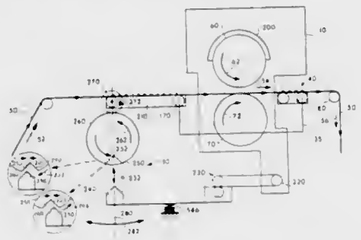
APPARATUS FOR ADAPTING A SINGLE SHEET FEED OFFSET DUPLICATOR TO PRINT ON CONTINUOUS FORM PAPER

James M. Actor, 6557 E. Lookout Dr., Parker, Colo. 80134

Filed May 10, 1988, Ser. No. 192,201

Int. Cl.[4] B41F *7/04, 13/02;* **B41L** *21/80*

U.S. Cl. 101—142 **15 Claims**



1. An apparatus for modifying an individual sheet feed offset duplicator (10) to print impressions on continuous form paper (50), said duplicator having its sheet feed (16) removed from its input (12) and having its sheet delivery (18) removed from its output (14), said duplicator having a rotating printing mechanism (60, 70) for printing said impressions on said continuous form paper and for pulling said continuous form paper through said duplicator, said apparatus comprising:
means (30) connected to said input of said duplicator and engaging said paper for delivering said paper into said duplicator,
means (210, 220, 230, 240, 260) in said delivery means cooperative with the rotation of said printing mechanism for providing indexing to said paper as said paper is delivered through said duplicator so that said printed impressions on said paper are registered at a predetermined location,
means (282) in said delivery means for selecting said predetermined location while said duplicator is printing said impressions,
means (1100) in said delivery means for selectively changing said indexing for different page lengths in said paper,
means (40) connected to said output of said duplicator and engaging said paper for maintaining a predetermined amount of tautness on said paper by providing supplementary pulling on said paper as said paper is pulled through said duplicator by said printing mechanism,
means (270) in said delivering means engaging said paper for generating power as said paper is pulled through said duplicator, said generating means further providing drag to said paper, and
means (35) connected to said duplicator and to said generating means and maintaining means for extending said power from said generating means to said maintaining means to provide the power necessary for said supplementary pull so that said tautness on said paper is created from said drag located at said input and said supplementary pull located at said output as said paper is pulled through said duplicator.

4,901,640

OSCILLATING FORM ROLLER DAMPENER

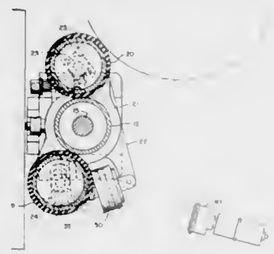
Thaddeus A. Niemiro, Lisle, and Daniel R. Zimich, Cicero, both of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 19, 1988, Ser. No. 262,853

Int. Cl.[4] B41L *25/00*

U.S. Cl. 101—148 **5 Claims**

1. In an offset printing press having spaced apart side frame members, a plate cylinder mounted on the side frame members for rotation between said side frame members, a water drum shaft disposed parallel to the axis of rotation of the plate cylinder and radially spaced from the plate cylinder, said shaft being supported by and extending between said spaced apart side frame members, a water drum having a water receptive hydrophilic surface mounted on said shaft for rotation, said water drum being mounted on said shaft in a fixed position between and spaced from each of said side frame members, and a press dampening system comprising: said water drum;
(a) a form roller;
(b) two mounting means, one at each end of said form roller, rotatably supporting said form roller, between the side



frame members, adjacent and parallel to the axes of the plate cylinder and the water drum;
(c) bearing means supporting each of said mounting means on said water drum shaft located between the ends of said water drum and the adjacent side frame members, to permit movement of said form roller mounting means, with said form roller, along a path parallel to the axis of said water drum shaft; and
(d) drive means connected to at least one of said form roller mounting means to reciprocate said form roller mounting means, with said form roller, between the side frames at a slow rate to thereby direct ink from non-print zones on the plate cylinder toward print zones present thereon.

4,901,641

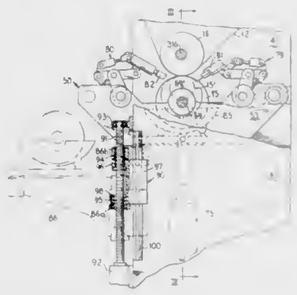
PRINTING PRESS

Jean-Pierre Steiner, Montville, and Thomas Byro, Ringwood, both of N.J., assignors to Bobst SA, Switzerland

Filed Nov. 30, 1988, Ser. No. 278,031

Int. Cl.[4] B41F *9/02, 9/10, 13/20*

U.S. Cl. 101--152 **17 Claims**



1. A printing press comprising a main frame having a pair of side frame members spaced apart, an impression roll mounted for rotation in said side frame members on a first axis extending between the pair of side frame members, a sub-frame, means mounting said sub-frame in the main frame for pivotal movement around a second axis offset from the first axis, said means for mounting enabling a lateral movement of the sub-frame on said second axis and skewing of said second axis relative to said first axis, said sub-frame having chucking means for releasably mounting a printing cylinder for rotation in the sub-frame on a third axis, means for pivoting the sub-frame on said second axis to move a printing surface of the printing cylinder into printing engagement with a web extending between said printing cylinder and said impression roll, inking means for applying printing ink to said printing surface of said printing cylinder, web-guide means including a plurality of rollers mounted to extend between said side frame members for receiving a web entering the press, guiding the web to pass between the impression roll and printing cylinder and for guiding the web out of the press, and means mounted on the sub-frame for rotating at least said printing cylinder.

4,901,642

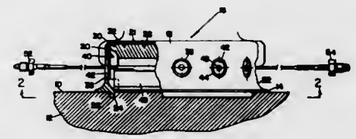
CONSUMABLE WAFER IGNITER

C. Max White, and James D. Rozanski, both of Brigham City, Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Oct. 27, 1988, Ser. No. 263,222

Int. Cl.[4] F42C *19/08;* **F02K** *9/95*

U.S. Cl. 102—202 **7 Claims**



1. A consumable wafer igniter for a rocket motor comprising a cup-shaped container having an open end, an inner end wall and a cylindrical wall with a flange on said open end for attachment to the surface of the propellant of the rocket motor to define the igniter gas generating chamber, said cylindrical wall having a plurality of peripherally spaced exhaust ports therein, the inner surface of said cylindrical wall being lined with at least one layer of elastomer liner having holes therein in alignment with the exhaust ports in said cylindrical wall,
a flat propellant disk positioned in said chamber adjacent said inner end wall of said container, said propellant disk having a plurality of holes therein for adjustment of the mass flow gas rate and having radial grooves on a surface thereof to direct the burning propellant gases through the aligned holes and exhaust ports in said liner and said cylindrical wall, and
means to ignite said propellant disk,
said flange having a circular key thereon extending in a direction parallel to said cylindrical wall and adapted to extend into a mating circular cavity provided on the surface of the rocket motor propellant for interlocking said container and said rocket motor propellant thereby to reduce a tendency for bowing outwardly of said cylindrical wall upon increase in pressure of generated gas in said chamber.

4,901,643

PYROTECHNIC FUZE FOR PROJECTILES

Werner Rudenauer, Roth; Fritz Muller, Nuremberg; Norbert Liebl, Ruckersdorf; Dieter Kufner, Eckental, and Joachim Furtmeyr, Erlangen, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nürnberg, Fed. Rep. of Germany

Filed Nov. 29, 1988, Ser. No. 277,275

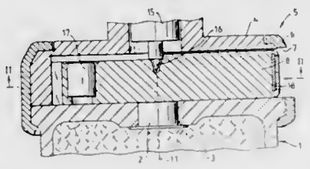
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740967

Int. Cl.[4] F42C *15/34*

U.S. Cl. 102—256 **6 Claims**

1. A pyrotechnic self-destruct fuze for projectiles, rockets, bomblets and mines, comprising a housing; triggering means

for a pyrotechnic delay installation in said housing consisting of a triggering composition in a delay composition; a detonator for the triggering of an explosive charge and a striker for the detonator, said detonator being arranged in a transversely movable slider, and said housing having a side aperture for the slider which is displaceable outwardly beyond the external



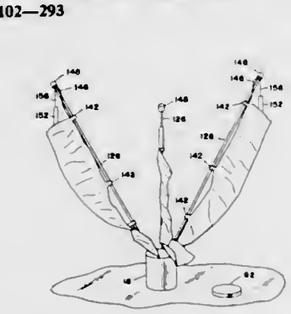
housing contour, and which slider contains the delay installation; wherein the slider includes two bores which extend parallel and which are only connected in a U-shape at one end of the slider in the plane of movement of the slider, said bores containing the triggering means and the pyrotechnic delay installation.

4,901,644

LANE MARKER

William R. Nevins; Neal M. Lundwall, and Dale L. Walker, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1989, Ser. No. 332,851
Int. Cl.[4] F42B *13/00*
U.S. Cl. 102—293 16 Claims



1. An apparatus for marking a safe zone in an explosive hazard area comprising:

a housing having a substantially hollow upper compartment and an adjoining and substantially solid lower compartment containing a plurality of cavities opening into said upper compartment;

a lid operatively secured to the upper compartment end of said housing;

a plurality of means extending axially along and beyond the upper compartment end of said housing for securing said lid to said upper compartment;

means affixed to the upper compartment—facing side of said lid for timed actuation of the release of said lid from said upper compartment;

means movably affixed to and communicating through the side of said lid opposite that facing said upper compartment for sensing explosive overpressure and initiating said means for timed actuation of the release of said lid; means connected between said timed actuation means and securing means prior to lid release; and

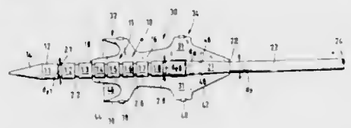
extensible means, disposed compressively within said cavities by said lid until release, for indicating the presence of said apparatus.

4,901,645

INERTIAL PROJECTILE HAVING A BREAKABLE PRE-PENETRATOR

Bernhard Bisping, Ratingen; Peter Wallow, Düsseldorf, and Hermann Jansen, Essen, all of Fed. Rep. of Germany, assignors to Rheinmetall, GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 308,243
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1980, 3031723
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—521 2 Claims



1. An improved inertial projectile arrangement for a barrel type weapon comprising a subcaliber penetrator projectile, which penetrator has a pre-penetrator portion with a nose point, a main penetrator portion, a large length diameter ratio and a high density, and having a segmented sabot of predetermined mass which sabot detaches itself from the penetrator in the form of at least two sabot segments, which sabot and penetrator being axially coextensive over a predetermined axial length forming a connection zone, the peripheral surface of the penetrator and inner peripheral surface of the sabot having surface irregularities which coact with each other to form form-locking means between the sabot and penetrator, the penetrator having a plurality of fracture zones for achieving an intended breakup of the penetrator upon impact at said fracture zones, the improvement comprising,

a predetermined number of said fracture zones forming a part of said form-locking means, said pre-penetrator portion having a transfer frusto-conical portion having a maximum diameter and minimum diameter which adjoins the fracture zone most distant from the nose point of the prepenetrator portion at one end of its axial extent where it has the maximum diameter and the main penetrator portion at its other axial extent where it has the minimum diameter.

4,901,646

FIN-STABILIZED SUBCALIBER PROJECTILE

Fritz K. Feldmann; Paul J. Griffith, and Craig L. Christenson, all of Santa Barbara, Calif., assignors to Pacific Armatechnica Corporation, Santa Barbara, Calif.

Division of Ser. No. 75,818, Jul. 20, 1987, Pat. No. 4,815,682.
This application Mar. 27, 1989, Ser. No. 328,859
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—521 4 Claims



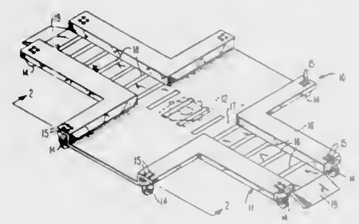
1. A projectile comprising a fin-stabilized subcaliber penetrator and a discarding sabot for firing the projectile from a rifled barrel, the sabot including a segmented metallic base with a plurality of interfaces and a longitudinal cavity for receiving the penetrator near its center of mass and along its longitudinal axis, a plastic sabot body affixed to the base and projecting forwardly therefrom along the projectile axis, an integral rotating band on the sabot body for imparting to the subcaliber penetrator full spin according to rifling twist and muzzle velocity of the barrel plastic sabot body having integral extension through channels provided within the interfaces between the sabot base segments and extending to the rear of the sabot base and there forming an obturator at the junction with the subcaliber projectile body, having the purpose of securing the sabot base segments to the plastic sabot body as well as forming a seal to prevent propellant gases from entering and escaping through the subcaliber projectile-sabot assembly during launch.

4,901,647

MOTORCYCLE MANEUVERING DEVICE

Charles W. Drabing, P.O. Box 59, Loogootee, Ind. 47553

Continuation-in-part of Ser. No. 886,032, Jul. 10, 1986, abandoned. This application Apr. 1, 1988, Ser. No. 177,372
Int. Cl.[4] B60S *13/02*
U.S. Cl. 104—44 4 Claims



1. A motorcycle maneuvering device comprising a base plate anchored to a support surface, a circular platform receded above said base plate for rotating said motorcycle three hundred sixty degrees when mounted on said base plate, and caster means secured to said platform for supporting said platform on said base plate, where an opening provided through said platform selectively receives an operator's foot for engagement with the top surface of said base plate and enables an operator to rotate said platform mounted motorcycle on said caster means, where a central open area provided in said top surface of said platform has a chamfered edge for ready motorcycle travel thereover, where said caster means are equally and radially spaced apart and fixedly secured to the bottom surface of said platform, where said caster means are in rolling engagement with an annular groove provided in said top surface of said base plate, where an outer portion of said top surface of said platform is chamfered and serves as a ramp receiving the wheels of said motorcycle during entry and exit from said platform, and where said platform is removable from said base plate by elevating motion.

4,901,648

TROLLEY BRAKING METHOD AND APPARATUS FOR USE WITH CONVEYORS

Archie S. Moore, and Stephen R. Bode, both of Kansas City, Mo., assignors to Mid-West Conveyor Company, Inc., Kansas City, Kans.

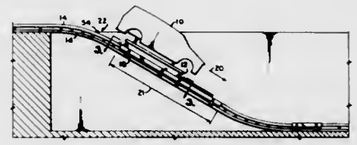
Filed Apr. 15, 1988, Ser. No. 182,472
Int. Cl.[4] B61H *13/00*
U.S. Cl. 104—250 14 Claims

1. A method of braking a trolley associated with a load moving down an inclined track and in danger of a runaway, said track having flanges between which a guide wheel of said trolley is positioned, comprising:

(a) monitoring a speed of said trolley; producing a speed signal associated with the speed of said trolley;

(b) comparing said speed signal to a predetermined signal which is indicative of excessive trolley speed; and

(c) applying pressure to said guide wheel when said speed



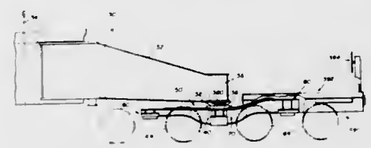
signal equals or exceeds said predetermined signal, said pressure being applied in a direction which forces said guide wheel into speed retarding frictional contact with one of said flanges, thereby slowing said trolley.

4,901,649

SPAN BOLSTER ASSEMBLY

Eugene T. Fehrenbach, Matteson, and Joseph W. Lam, Chicago, both of Ill., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Dec. 1, 1988, Ser. No. 278,544
Int. Cl.[4] B61F *5/00*; B60P *3/40*
U.S. Cl. 105—182 35 Claims



1. A fabricated span bolster comprising:

an elongated center sill having first and second ends;

a lateral first body bolster at the first end of the center sill;

a lateral second body bolster at the second end of the center sill;

a lateral central bolster, located between the first and second body bolsters, comprising a pair of opposing arms extending laterally outward from the center sill;

the center aill and the first, second and central bolsters having a common top cover plate;

a center bowl located on the top cover plate in the center of the central bolster;

the center sill having a reinforcement doubler plate on top of and in contact with and joined to the top cover plate on each side of the center bowl and extending substantially to the respective first and second body bolsters;

a bottom cover plate common to the center sill and the first and second bolsters;

the bottom cover plate portion of the center sill being laterally smoothly curved first downwardly and then upwardly to define a concave and convex portion having its major depth beneath the center bowl;

a bottom doubler plate on top of and in contact with and joined to the bottom cover plate and extending for at least substantially the length of the center sill;

the top and bottom cover plates being joined together through at least two longitudinal spaced apart substantially vertical and parallel web plates between the top and bottom cover plates, with the web plates being longitudinally aligned with, and extending for substantially the length of, the center sill;

the first body bolster having a center plate joined to the bottom of the bottom cover plate located on the center between the bolster ends;

the second body bolster having a center plate joined to the

bottom of the bottom cover plate located on the center between the bolster ends;

the first bolster center plate, the second bolster center plate and the center bowl being centered along a vertical plane through an axial line longitudinal to the center sill; and

the first bolster center plate bottom and the second bolster center plate bottom being in substantially the same horizontal plane.

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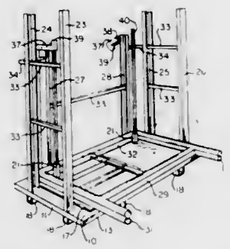
INDUSTRIAL PALLET HAVING UPWARD EXTENDING SUPPORT POSTS AND LOCKING MEANS

Richard L. Armstead, 219 Hwy 52, Erie, Colo. 80516

Continuation of Ser. No. 179,152, Apr. 8, 1988, abandoned. This application Jul. 6, 1989, Ser. No. 376,975

Int. Cl.[4] B65D *19/12*

U.S. Cl. 108—55.1 **6 Claims**



1. An industrial pallet having a multi-function load supporting structure extending upward from a generally horizontal load-bearing platform, comprising,

a generally rectangular, horizontal, load bearing platform member having a front edge, a back edge and two side edges which define the four corners of said platform member, said platform member being adapted to support a first load thereon,

a first pair of rigid, vertically extending, load bearing posts mounted to said platform member adjacent to one of said side edges and spaced from the corners of said platform member,

a second pair of rigid, vertically extending, load bearing posts mounted to said platform member adjacent to the other of said side edges and spaced fom the corners of said platform member,

a third pair of rigid, vertically extending load bearing posts mounted to said platform member adjacent to said rear edge and spaced from the corners of said platform member,

a first, generally horizontal, load bearing brace member extending between said first pair of posts, and

a second, generally horizontal, load bearing brace member extending between said second pair of posts,

said first and second load bearing brace members defining a generally horizontal plane on which a second load that spans the distance between said brace members may be supported.

4,901,651

SECRET REPOSITORY

James R. Herron, 57 Bluebird La., Naperville, Ill. 60565

Filed Jun. 5, 1989, Ser. No. 361,425

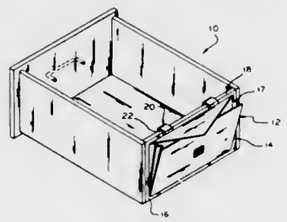
Int. Cl.[4] E05G *01/00*

U.S. Cl. 109—54 **11 Claims**

1. A secret repository for attachment to a drawer or the like comprising:

a receptacle: and

means for removably attaching said receptacle to a rear vertical panel of said drawer or the like positioned adja-



cent an external surface of said rear vertical panel behind said drawer or the like.

4,901,652

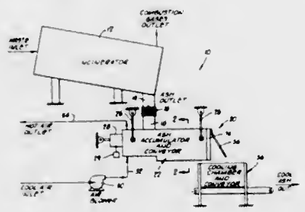
ACCUMULATING AND CONVEYING INCINERATOR ASH

Dale W. Pressnall, Tulsa; John R. Petersen, Jr., Pawnee, and Michael R. Keller, Tulsa, all of Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Apr. 10, 1989, Ser. No. 335,958

Int. Cl.[4] F23G *5/00, 7/00*

U.S. Cl. 110—259 **17 Claims**



13. An incinerator system comprising:

an incinerator for incinerating combustible wastes having a wastes inlet, a combustion gases outlet and a hot ash outlet;

a conduit for conducting hot ash connected to said hot ash outlet of said incinerator; and

an ash accumulator and conveyor connected to said conduit comprising:

a closed housing having first and second compartments therein, an inlet connected to said conduit for receiving hot ash into said first compartment, communicating ash-conveying floors in said compartments and an ash discharge opening for discharging ash from said second compartment;

an internal door hingedly connected within said housing between said first and second compartments for sealingly isolating said first compartment from said second compartment;

an ash discharge door hingedly connected to said housing over said ash discharge opening for sealingly isolating both said first and second compartments when said internal door between said compartments is open; and

oscillating means connected to said housing for oscillating said housing whereby when said internal door is closed and said discharge door open, said ash is accumulated in said first compartment and conveyed and discharged from said second compartment by way of said discharge opening, and when said internal door is open and said discharge door is closed, said ash is conveyed from said first compartment into said second compartment.

4,901,653

HEARTH FOR A FURNACE, NOTABLY A FURNACE FOR URBAN WASTE, INCLUDING A GRATE MADE UP OF ALTERNATELY FIXED AND RECIPROCATING BARS, WITH INCREASED FLEXIBLITY OF ADJUSTMENT

Daniel Baltzinger, Chevreuse, France, assignor to T.I.R.U. - Traitement Industriel des Residus Urbains, Paris, France

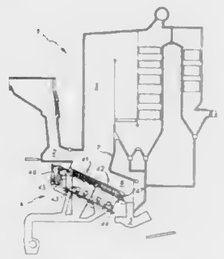
PCT No. PCT/FR88/00203, § 371 Date Dec. 20, 1988, § 102(e) Date Dec. 20, 1988, PCT Pub. No. WO88/08502, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 26, 1988, Ser. No. 297,868

Claims priority, application France, Apr. 27, 1987, 87 05912

Int. Cl.[4] F23H *7/08*

U.S. Cl. 110—281 **10 Claims**



1. Furnace hearth equipped with a grate designed to support a burning mass of solid fragments, notably urban waste, and comprising, sloping downwardly between a loading area (2) at the upstream end and an ash box (3) at the downstream end, at least one bed made up of a succession of transverse bars (55, 55') with a dorsal surface (55*a*, etc) for supporting the mass and a frontal surface (55*b*, etc) with a lower edge sliding on the dorsal surface of the immediately upstream bar, the bars being attached by a downstream end alternately to a fixed frame of the hearth and a mobile frame that can be reciprocated longitudinally by control means, the hearth further comprising, under the grate, at least one draft chamber (43, 44) equipped with ventilation means for feeding combustion-supporting air to the mass through draft holes provided in the bars and, above the grate, a furnace chamber (5) connected to a fumes extractor flue (8) with extends longitudinally from the loading area to a vertical wall (7) referred to as the altar wall, the hearth being extended by a sprung roof from the altar wall to the ash box, characterized in that the grate comprises, within its length, two consecutive beds (41, 42) with substantially the same general slope joined together at a point in substantial vertical alignment with the altar wall (7), each bed having its own mobile frame (45*d*, 46*d*) with its own control means (45, 46) and its own draft chamber (43, 44) with its own ventilation means.

4,901,654

DEODORIZATION AND CLEANING OF MEDIUM TEMPERATURE WET OFF-GASES DERIVED FROM BURNING OF WET WASTE SLUDGE

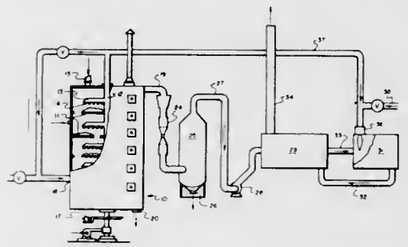
Orris E. Albertson, 1915 Wasatch Dr., Salt Lake City, Utah 84108, and Allen Baturay, 4005 Aldie Rd., Catharpen, Va. 22018

Filed Jul. 15, 1988, Ser. No. 219,721

Int. Cl.[4] F23G *7/04*

U.S. Cl. 110--346 **6 Claims**

1. The method for waste sludge incineration comprising the steps of moving sludge through a thermal treatment zone counter-currently to the flow therethrough of off-gases from said treatment zone while maintaining conditions in said treatment zone sequentially to dry then combust said sludge thereby to yield and discharge as separate products solid residue and said off-gases which off-gases contain particulates as well as vapors of water and other materials and are at a temperature in the range from about 500° F. to about 1100° F.; washing and cooling substantially all of said off-gases to yield conditioned off-gases that are substantially free from particulates and condensibles and are at a temperature in the range from about 80° F. to about 120° F.; introducing said conditioned



off-gases into an afterburner zone; burning fuel in combustion supporting gases in said afterburner zone; retaining said conditioned off-gases with said burning fuel in said afterburner zone to produce hot fully treated off-gases that are at a temperature between about 1400° F. and 2200° F.; flowing said hot fully treated off-gases and said conditioned off-gases through a heat exchange zone before said conditioned off-gases are heated in said afterburner zone thereby to preheat said conditioned off-gases while cooling said fully treated off-gases; and discharging said fully treated off-gases.

4,901,655

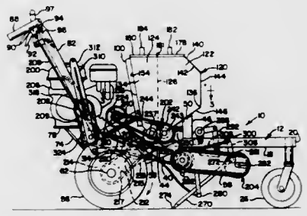
CULTIVATOR

Robert J. Magda, Morganville, N.J., assignor to Lawn Doctor, Inc., Matawan, N.J.

Filed Dec. 11, 1987, Ser. No. 131,988

Int. Cl.[4] A01C *7/00;* **A01B** *33/00*

U.S. Cl. 111—8 **12 Claims**



1. A lawn care and cultivating machine, comprising:

a power driven frame assembly with front wheels and rear wheels, said power driven frame assembly having pivotable crankshaft supporting bars positioned between said front and rear wheels and an engine support platform positioned rearwardly of said crankshaft support bars, said crankshaft supporting bars having front portions and rearward portions;

a set of spring biased cultivating fingers for reciprocating and sequentially cultivating soil, said fingers having crankshaft engaging front portions and pointed rearward portions;

a cultivator drive assembly having a crankshaft extending

laterally between and rotatively connected to said front portions of said crankshaft supporting bars, said crankshaft having eccentric portions connected to said front portions of said cultivating fingers, driven crankshaft sprockets connected to said crankshaft, a cultivator drive shaft extending laterally between and rotatively connected to said rearward portions of said crankshaft supporting bars, crankshaft drive sprockets connected to said drive shaft, crankshaft drive chains operatively connecting said crankshaft drive sprockets and said driven crankshaft sprockets, an engine driven sprocket connected to said drive shaft and positioned between said crankshaft drive sprockets, an engine mounted on said engine support platform and located generally above said rear wheels, an engine drive sprocket operatively connected to said engine, and an engine drive chain operatively connecting said engine drive sprocket and said engine driven sprocket;

said crankshaft supporting bars being pivotable about said cultivator drive shaft from a substantially horizontal position to raise said crankshaft to a downwardly inclined forwardly position to lower said crankshaft;

and a seed spreader assembly positioned rearwardly of said crankshaft; said seed spreader comprising

bin means having a front compartment, a rear compartment, and a partition separating said front compartment from said rear compartment;

front metering means operatively associated with said front compartment for metering substantially solid material, such as grass seed, from said first compartment; and

rear metering means operatively associated with said rear compartment for metering another substantially solid material, such as another type of grass seed, from said rear compartment;

one of said metering means operating at a faster metering rate than the other metering means for metering the material associated with said faster metering means at a faster rate than the material associated with said slower metering means; and

at least one of said metering means revolving at a different rate than said rear wheels.

4,901,656

INFORMATION DISPLAY APPARATUS FOR A SEWING MACHINE

Noriyuki Yoshida, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 9, 1988, Ser. No. 268,980

Claims priority, application Japan, Nov. 13, 1987, 62-288262

Int. Cl.[4] D05B *13/02, 19/00, 3/02, 87/04*

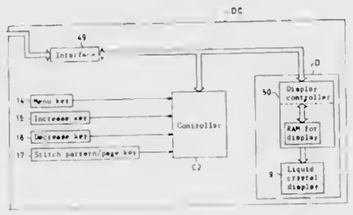
U.S. Cl. 112—121.11 **7 Claims**

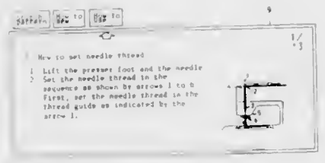
1. An information display apparatus for a sewing machine comprising:

an information memory means for storing various classifications of sewing machine information in a classified manner, each of said various classifications of sewing machine information including a plurality of subclassifications, one of said various classifications of information being general instructing information on methods of using a sewing machine, each said plurality of subclassifications of said general instructing information including information on a name of a method of using the sewing machine, explanatory notes for said method of using the sewing machine and an image for easy understanding of said explanatory notes, said various classifications of information being stored in a form of dot-pattern data,

a selecting means for selecting one of said various classifications of sewing machine information from said information memory means and for selecting one of said plurality of subclassifications of information of a selected one of said various classifications of sewing machine information,

a display installed in said sewing machine to display said subclassification of information selected by said selecting means, said display including a liquid crystal display of a multi-row and multi-column dot pattern configuration, and





a display controlling means which reads said subclassification of information selected by said selecting means from said information memory means and outputs it to said display for display.

4,901,657

MULTIFUNCTION SEWING MACHINE WITH TAPE FEEDING, CUTTING AND HEMMING APPARATUS

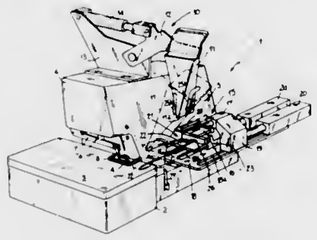
Giorgio Fieschi, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Filed Jul. 18, 1988, Ser. No. 220,540

Claims priority, application Italy, Oct. 9, 1987, 22210 A/87

Int. Cl.[4] D05B *35/02, 35/04*

U.S. Cl. 112—152 **8 Claims**



1. A multifunction sewing machine comprising a bed defining a workpiece supporting table along which a workpiece is caused to move;

a standard raising from the bed and supporting a head in cantilevered fashion;

a presser foot fastened to the lower part of a presser foot holder;

sewing means acting close to said presser foot to sew the workpiece;

a feed unit provided with a tape feed guide to feed a tape close to said presser foot itself; said feed unit having a bracket fixed to the head, a swinging arm rotatably mounted to the bracket according to a horizontal axis and supporting the feed guide and a fluid-operated cylinder acting between the bracket and the swinging arm to move the feed guide from a rest position to a working position;

a cutting unit provided with a cutting element to cut said tape in a portion thereof included between said presser foot and said feed guide;

a hemming group provided with a hem folder to guide and shape one edge of said workpiece.

4,901,658

ANGLED SUPPORT SURFACE FOR A MULTI SEWING MACHINE WORKING SITE

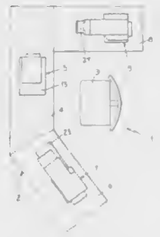
Roberto Sanvito, and Adelio Ronchi, both of Milan, Italy, assignors to Rockwell-Rimoldi S.p.A., Olcella, Italy

Filed Aug. 30, 1988, Ser. No. 238,320

Claims priority, application Italy, May 30, 1988, 20795 A/88

Int. Cl.[4] D05B *21/00*

U.S. Cl. 112—217.2 **4 Claims**



1. A working site for one user to stitch manufactured items comprising a supporting frame having a top with first, second and central supporting surfaces on which sewing machines are mounted and arranged to perform a given number of operations on a manufactured item being worked by said user who is sitting in front of the supporting surfaces, wherein:

said central surface has two ends, a first sewing machine mounted on said central surface between said two ends and which can be used to carry out the greatest number of sewing operations on a manufactured item which has to be submitted to a predetermined work cycle;

said first surface extending obliquely and consecutively from one end of the central surface and facing one side of the user, said first surface having a second sewing machine mounted thereon to be used to perform sewing operations in intercalated relationship with the operations carried out by the first sewing machine; and

said second surface extending consecutively from the other end of the central surface substantially at a right angle and facing the other side of the user when the user is facing the central surface, said second surface carrying a third sewing machine to be used to perform trimming operations on the manufactured item as well as further operations in intercalated relationship with the operations to be performed by the first and second sewing machines.

4,901,659

PATTERN-MATCHING SEWING MACHINE

Etsuzo Nomura; Hirokazu Takeuchi; Shigeru Suzuki; Kazunori Irie, and Hirosumi Itoh, all of Aichi, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 27, 1989, Ser. No. 302,766

Claims priority, application Japan, Jan. 28, 1988, 63-17694

Int. Cl.[4] D05B *27/06, 27/08*

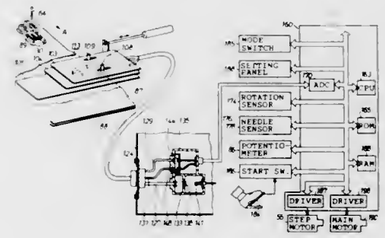
U.S. Cl. 112—314 **14 Claims**

1. A sewing machine for sewing two sheets having the same pattern comprising:

first and second feeding means, each for intermittently feeding one of the sheets;

first and second photo-sensing means, each for optically sensing the pattern on one of the sheets during feeding and for generating photo-intensity data;

a plurality of mismatch detecting means, each for calculating a mismatch distance of the patterns on the two sheets using an algorithm different from that of another mismatch detecting means;



a mode selecting means for selecting one of the plurality of mismatch detecting means according to characteristics of the pattern on the two sheets; and

a feed-adjusting means that uses the mismatch distance calculated by the selected mismatch detecting means, for adjusting one of the feeding means to match the patterns.

4,901,660

PATTERN-MATCHING SEWING MACHINE

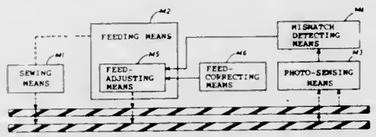
Hirokazu Takeuchi; Hirosumi Itoh; Shigeru Suzuki, all of Nagoya, and Etsuzo Nomura, Kasugai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

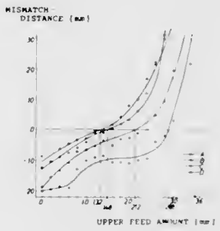
Filed Mar. 31, 1989, Ser. No. 330,909

Claims priority, application Japan, Apr. 6, 1988, 63-84933

Int. Cl.[4] D05B *27/06, 27/08*

U.S. Cl. 112—314 **4 Claims**





1. A pattern-matching sewing machine comprising:

a sewing means for sewing two sheets having the same pattern;

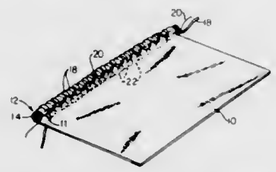
first and second feeding means, each for intermittently feeding one of the sheets;

first and second photo-sensing means, each for optically sensing the pattern on one of the sheets during feeding and

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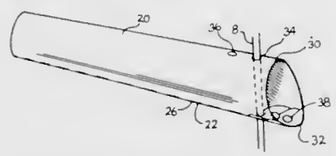
for generating photo-intensity data at a plurality of points on the sheet;
a mismatch detecting means for calculating mismatch distances of patterns on the two sheets from the data sensed by the first and second photo-sensing means;
a feed-adjusting means for adjusting amounts fed by at least one of the feeding means based on the calculated mismatch distance to match the patterns; and
a feed-correcting means for correcting the feed amount adjusted by the feed-adjusting means according to sewing conditions.

4,901,661
DECORATIVE RIBBON
Lillian P. Sturm, 51 Harwood Dr. East, Glen Cove, N.Y. 11542, and Kurt D. Salomon, 743 Lynwood Dr., Langhorne, Pa. 19047
Filed Mar. 10, 1989, Ser. No. 321,720
Int. Cl.[4] D05C *17/00*
U.S. Cl. 112—436 **12 Claims**



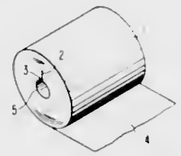
1. A decorative edge-reinforced ribbon comprising:
a web of ribbon material having a lateral folded edge;
a wire filament disposed along and within the fold of said edge; and
stitch means for securing the folded edge of the web around said wire filament, said means including
a trim filament passing through the ribbon material and positioned substantially around the wire filament and the folded edge, thereby substantially covering the edge and the wire filament from view, and
a binding filament passing through the ribbon material and around the wire filament, the folded edge and the trim filament, thereby securing the wire filament and the trim filament to the folded edge.

4,901,662
ANTENNA-MOUNTABLE WINDSOCK COMPRISING RIGID CYLINDER WITH LEVELING HOLES
Stephen Sandeen, 3243 Marilyn Ct., Pleasanton, Calif. 94566, and Todd Rich, 650 El Camino Real, #P, Redwood City, Calif. 94063
Continuation-in-part of Ser. No. 173,889, Mar. 28, 1988, abandoned. This application Sep. 8, 1988, Ser. No. 241,888
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 116—28 R **19 Claims**



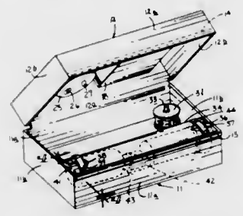
1. An antenna-mountable windsock, comprising:
a rigid, self-supporting, cylinder,
said cylinder having open front and back ends so that wind can pass therethrough,
means for attaching said cylinder to a vehicle's antenna, said means comprising at least three holes in said cylinder,
said holes being sized to accept an antenna of a predetermined diameter,
a plurality of said holes being spaced along the length of one side of said cylinder and at one end of said cylinder,
at least one of said holes being formed in the other side of said one end of said cylinder, opposite said plurality of holes,
whereby said antenna can be inserted through said one of said holes in said other side of said cylinder and through a selected one of said plurality of holes on said other side of said cylinder so that said cylinder can be mounted in a horizontal orientation regardless of the angle of said antenna within a predetermined range of angles.

4,901,663
METHOD OF INDICATING TOWEL ROLL DEPLETION
Raymond F. De Luca, Samford, Conn., assignor to Georgia-Pacific Corporation, Atlanta, Ga.
Filed Jun. 13, 1988, Ser. No. 205,864
Int. Cl.[4] G08B *5/00*
U.S. Cl. 116—200 **14 Claims**



8. A roll of web material having a center portion around which said web is rolled, the improvement comprising:
a first dye stripe mark formed along one side of said roll and extending radially outward away from said center portion for a predetermined distance, said stripe being absorbed into said web to thereby form a first plurality of spaced coding marks along one edge of said web, the distance between said spaced coding marks decreasing and being viewable by a user as said roll is depleted, wherein the presence of said first plurality of coding marks provides a first indication of the amount of web material on said roll.

4,901,664
SURVIVAL KIT APPARATUS
Sylva Labrecque, RD #2 Box 170-48, Richmond, Vt. 05477
Filed Jan. 9, 1989, Ser. No. 295,138
Int. Cl.[4] B64B *1/40*
U.S. Cl. 116—210 **8 Claims**



1. A survival kit apparatus comprising,
a lower container portion including a rear and forward elongate container side walls, and
opposed container end walls, and
an integral floor secured to said side and end walls, and

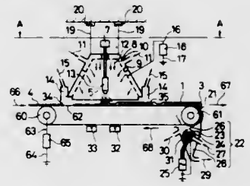
a lid including rear and forward lid side walls, and
opposed lid end walls, and
an integral top wall secured to said side and walls, and
wherein said lid is pivotally secured to said container rear side wall by said lid side wall, and
securement means formed on said container forward side wall and said lid forward side wall for selective securement of said lid to said container, and
said lid further including a compass positioned within a housing directed interiorly of said lid adjacent said rear lid side wall, and
a second container compartment directed interiorly of said lid formed adjacent said compass wherein said second container compartment includes a second lid including a hinge parallel to said lid in container side walls, and
said container portion including a spool means for securement of a predetermined length of flexible tether line positioned adjacent said rear container side wall, and
a tubular container selectively securable adjacent the forward container side wall coextensive with said forward container side wall including an illumination member and an inflation member selectively positioned interiorly of said tubular container wherein said inflation member includes a signal balloon operably secured to said inflation member for selective inflation of said signal balloon wherein said flexible tether line is selectively securable to said balloon subsequent to inflation of said balloon by said inflation member.

4,901,665
LINE MARK BOOK MARK
Paul J. Carlin, 422 N. Austin, Oak Park, Ill. 60302
Filed Nov. 30, 1988, Ser. No. 277,969
Int. Cl.[4] B42D *9/00*
U.S. Cl. 116—235 **1 Claim**



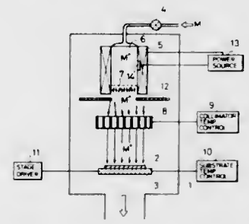
1. A bookmark for locating an exact line, column and page in a book having one or two columns of text on its pages comprising:
A thin flat elongated body for marking a place in the book of interest to a reader;
indicator means for indicating which page and column on that page in the book at the marked place is of interest to the reader, said indicator means being placed on top and bottom sections of both sides of said body and arranged such that only one set of indicia representing a page and column is viewable in an upright position on the side of the body facing the reader; and
a manually operable slide slideably attached to said body, said slide being provided with index means viewable on both sides of said body for alignment with the line of interest to the reader at the indicated page and column of the marked place.

4,901,666
ELECTROSTATIC POWDER COATING DEVICE
Hideo Nagasaka, Hitachi; Nobuo Furuya, Yokohama, and Mitsuyoshi Kumada, Yachiyo, all of Japan, assignors to Onoda Cement Company, Ltd., Yamaguchi, Japan
Filed Dec. 21, 1988, Ser. No. 288,030
Claims priority, application Japan, Jun. 24, 1987, 156928
Int. Cl.[4] B05B *5/02*
U.S. Cl. 118—634 **24 Claims**



1. An electrostatic powder coating device comprising:
an electroconductive belt conveyer for conveying an object to be coated and for adjusting an electric field of an end portion of said object to be coated;
a cover for forming a space for coating above said belt conveyer;
electrostatic powder coating guns pointed at said object to be coated in said space for coating;
means for introducing air into said space for coating;
means for exhausing air from said space for coating; and
means for removing the powder coating material adhered to said belt conveyer.

4,901,667
SURFACE TREATMENT APPARATUS
Keizo Suzuki, Kodaira; Ken Ninomiya, Hachioji; Shigeru Nishimatsu, Kokubunji, and Osami Okada, Chofu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 1, 1986, Ser. No. 891,641
Claims priority, application Japan, Aug. 9, 1985, 60-174111
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—719 **17 Claims**



1. A surface treatment apparatus comprising:
a vacuum chamber;
gas introducing means for introducing a gas into said vacuum chamber;
gas heating means for heating said gas and activating said gas to make active particles while the gas is being introduced, said gas heating means comprising a gas furnace and a heater for heating said gas furnace,
gas injecting means for injecting said activated gas into said vacuum chamber to form a beam of said active particles: and

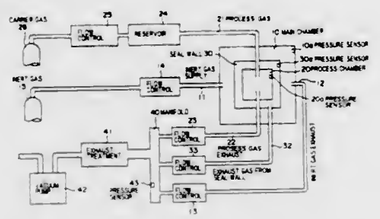
substrate holding means installed in said vacuum chamber to hold a substrate of which a surface is to be treated in a position opposite to said gas injecting means, to allow said beam to impinge on said surface in a perpendicular direction to said surface.

4,901,668

PHOTO-CHEMICAL VAPOR DEPOSITION APPARATUS

Shingo Murakami, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 9, 1988, Ser. No. 282,113
Claims priority, application Japan, Dec. 11, 1987, 62-313848
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—722 **4 Claims**



1. A photo-CVD apparatus comprising,
a main chamber which is hermetically sealed and is provided with a transmitting window for transmitting light radiated from a light source,
a holder for holding an article on which a thin film is grown, said holder moving in a predetermined direction so that a predetermined point of said article is positioned to coincide with an imaging point of said light,
a process chamber for containing said article and growing said thin film on said article, said process chamber being defined to have a predetermined area on said holder and under said transmitting window,
a seal wall for providing a fluid resistance between said main chamber and said process chamber, said seal wall defining said predetermined area of said process chamber,
an inert gas supply means for supplying inert gas to said main chamber, a gas pressure of said main chamber being greater than that of said process chamber,
a process gas supply means for supplying process gas to said process chamber,
a process chamber exhaust means for exhausting gas charged in said process chamber, and
an inert gas exhaust means for exhausting said inert gas which is supplied from said inert gas supply means to maintain a predetermined pressure difference between said main chamber and said process chamber.

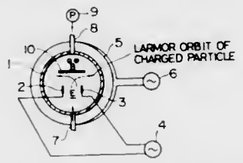
4,901,669

METHOD AND APPARATUS FOR FORMING THIN FILM

Takashi Yamamoto; Shozo Kaneko; Tadashi Gengo; Joji Ichinari, all of Nagasaki; Hiroshi Fujiyama, Nagasaki; Yoshio Kayumi, and Masayoshi Murata, both of Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1987, Ser. No. 47,328
Claims priority, application Japan, May 9, 1986, 61-106313; May 9, 1986, 61-106314; May 9, 1986, 61-106315; Jul. 8, 1986, 61-160217; Aug. 5, 1986, 61-183902
Int. Cl.[4] C23C *16/50*
U.S. Cl. 118—723 **22 Claims**

1. An apparatus for forming a thin film which comprises
a reaction vessel,
a base plate disposed in said reaction vessel,
means for reducing the pressure in said reaction vessel,
means for introducing reaction gases to said reaction vessel,
electrodes for discharge, disposed face to face in said reaction vessel,
a power source connected to said electrodes for causing a glow discharge to said electrodes,
a coil surrounding said electrodes for generating a magnetic



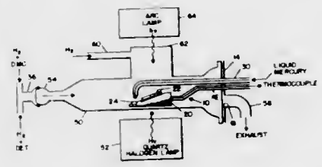
field in a direction crossing at right angles to an electric field generated between said electrodes for discharge, and
an AC power source from which a current for generating the magnetic field is fed to said coil, whereby said thin film is uniformly formed on said base plate by changing the magnetic field, said base plate being positioned outside the range of said discharge electric field and in parallel with the direction of said electric field.

4,901,670

ELEMENTAL MERCURY SOURCE FOR METAL-ORGANIC CHEMICAL VAPOR DEPOSITION

William L. Ahlgren, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Aug. 22, 1988, Ser. No. 234,722
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—728 **21 Claims**



6. A susceptor assembly for use in a metal-organic chemical vapor deposition reactor comprising:
a body comprised of a refractory material, said body having a surface for supporting at least one substrate;
a region formed within said body, said region defining a volume for containing therein a quantity of liquid mercury; and
means for feeding the liquid mercury to the region.

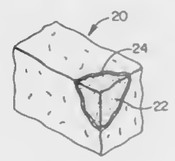
4,901,671

SYNTHETIC CHICKEN LITTER AND METHOD OF USING

Charles Johnston, 1690 Arthur Dr., Wooster, Ohio 44691

Filed Apr. 18, 1988, Ser. No. 182,359
Int. Cl.[4] A01K *215/00*
U.S. Cl. 119—1 **11 Claims**

1. In the combination of an enclosure for raising chickens or the like, said enclosure having a floor and litter on said floor, said litter including a plurality of discrete units distributed over said floor and of a depth to substantially prevent direct physical contact between any chicken in said enclosure and said floor,
each of said units being of a foamed polymer coated with a polymeric material, said polymeric coating material having the physical characteristics of (1) remaining pliable at ambient temperatures, (2) being bonded to said foamed polymer with such strength that it will not separate from said foamed polymer upon impact after being dropped several feet, (3) being bonded to said foamed polymer with such strength that it will not separate from said



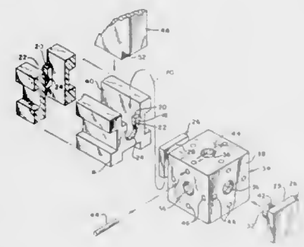
foamed polymer by walking, pecking or scratching by chickens, (4) sloughing chicken droppings to thereby cause said droppings to move to the floor rather than remain on the surface of the litter, (5) being impervious to air and water, and (6) being chemically non-reactive with chicken droppings.

4,901,672

ANIMAL CONTAINMENT STRUCTURE

Edwin D. Rosenberger, 328 E. 5th St., Apt. 1, Brooklyn, N.Y. 11218

Filed Apr. 8, 1988, Ser. No. 179,045
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—19 **6 Claims**



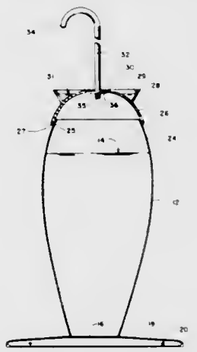
1. An animal containment structure comprising:
a plurality of similar panel mounting rails each formed in one piece with opposite ends, panel edge receiving channel sections extending between the ends, and end walls integrally joined to respective ends of respective rails to extend transversely of respective channel section portions, partly circular, laterally opening apertures formed in respective end walls;
a plurality of similar connectors each formed with a plurality of pairs of opposite faces;
a plurality of similar plugs having shanks and heads extending transversely of said shanks, each shank attached to the connector to extend from a selected face thereof with the respective head spaced apart from said face, the shanks being frictionally received by lateral movement thereof through the lateral openings in respective apertures so that respective heads are located in said opposite ends locked behind respective end walls thereby to lock the rails to the connectors providing interconnection of the rails extending in perpendicular directions to each other defining an open framework; and,
panels received in selected of said channel sections providing closure means for the framework.

4,901,673

INSECT INHIBITING HUMMINGBIRD FEEDER

Richard S. Overstreet, 503 Grove St., Wilson, N.C. 27893

Filed Mar. 8, 1989, Ser. No. 320,582
Int. Cl.[4] A01K *39/026*
U.S. Cl. 119—77 **4 Claims**



1. In a hummingbird feeder having an open top hollow reservoir for storing a supply of simulated nectar, a base in fluid communication with the reservoir, a plurality of apertures in the base for allowing hummingbirds to drink the simulated nectar, and a plurality of perches on the base adjacent the apertures, the improvement comprising:
a removable cap on said open top portion of said reservoir;
cooperating frictional sealing means on said cap and said reservoir including an annular projection formed on one of said reservoir and said cap and a mating annular groove formed on the other of said reservoir and said cap;
said cap having an outer top curved surface sloping downwardly and outwardly from a central portion;
means for suspending said hummingbird feeder attached to said central cap portion;
an upwardly and outwardly tapering open frusto conical receptacle coaxially surrounding said central cap portion;
an insect inhibiting fluid in said receptacle;
a rain cover on said feeder for preventing rain water from washing said insect inhibiting fluid from said receptacle; said rain cover formed by a hemispherical dome slidably mounted on said suspending means;
and
a plurality of radially inwardly extending rests disposed in a circular array within said dome, said rests dimensioned for abutment with a top wall of said frusto conical receptacle to limit downward movement of said cover.

4,901,674

MULTI-SECTIONAL POWDER EMITTING ANIMAL COLLAR AND METHOD OF MAKING

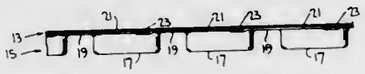
Donald W. Bushman; Marissa A. Klapwald, and John W. Mikkonen, all of County of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jul. 11, 1988, Ser. No. 217,908
Int. Cl.[4] A01K *27/00*
U.S. Cl. 119—106 **26 Claims**

1. An animal collar made from a flexible material and containing a powdered material which is controllably emitted from said collar comprising:
(a) a one piece bottom portion having a plurality of open top pouch-like sections, said sections containing said powdered material; and
(b) a one piece top portion secured to said bottom portion to provide a unitary collar structure, said top portion sealing

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each of said pouch-like sections except for at least one opening which extends from the interior of said pouch-like sections to the exterior of said pouch-like sections,



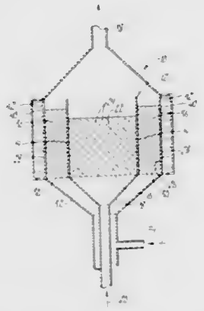
wherein said opening or openings have a diameter sufficient to allow for the movement of said powdered material from said pouch-like sections through said opening or openings.

4,901,675

MEANS AND METHOD FOR CONTROLLING LOAD TURNDOWN IN A FLUIDIZED BED COMBUSTOR

Robert C. Brown, and William H. Buttermore, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 162,278, Feb. 29, 1988, abandoned, which is a continuation of Ser. No. 907,110, Sep. 15, 1986, Pat. No. 4,762,090. This application Mar. 27, 1989, Ser. No. 331,002
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[4] B09B *3/00*
U.S. Cl. 122—4 D **16 Claims**



1. A method of controlling the load turndown in a fluidized bed combustor, the load comprising one or more chambers having a fluid, comprising the steps of:
combusting fuel in a fluidized combustion bed;
surrounding the fluidized combustion bed with a separately fluidized heat transfer bed that is free from combustion, the load surrounding the heat transfer bed; and
adjusting the fluidization of the heat transfer bed to control the load turndown to control the rate of heat transfer to the load.

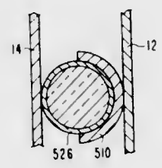
4,901,676

SEALING AND INSULATION DEVICE FOR THE SPACE BETWEEN SPACED APART SURFACES

Thomas E. Nelson, Anchorage, Ky., assignor to Soltech, Inc., Shelbyville, Ky.

Continuation-in-part of Ser. No. 177,439, Apr. 4, 1988. This application Jan. 11, 1989, Ser. No. 295,554
Int. Cl.[4] F22B *5/04*
U.S. Cl. 122—19 **18 Claims**

1. A sealing and insulation device for use between two spaced apart surfaces so as to seal closed the space between said surfaces and insulate the volume occupied by said device, said device comprising:
an envelope constructed out of a flexible, resilient, gas-impermeable material and arranged so as to define a closed and evacuated interior cavity, said evacuated condition achieved by pulling a vacuum on said interior cavity;



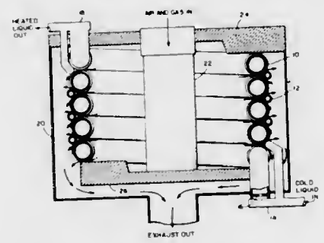
a mass of flexible, resilient, insulation material disposed in said interior cavity and having suitable material properties to be shrunk to a below-normal size as a result of the vacuum pulled on said interior cavity; and
an external laminate layer of flexible, resilient insulation material disposed on the outer surface of said envelope.

4,901,677

FINNED-TUBE HEAT EXCHANGER WITH LIQUID-COOLED BAFFLE

Elia P. Demetri, Woburn, Mass., assignor to Gas Research Institute, Chicago, Ill.

Continuation of Ser. No. 287,460, Dec. 21, 1988, abandoned. This application May 22, 1989, Ser. No. 356,571
Int. Cl.[4] F22B *21/26*; F28F *13/06*
U.S. Cl. 122—235 F **7 Claims**



3. A fluid heater comprising:
a burner comprising a flameholder;
a first coil of finned tubing surrounding the flameholder and carrying fluid to be heated; and
a second coil of tubing surrounding the first coil and in contact with fins of adjacent turns of the first coil, the second coil also carrying fluid to be heated.

4,901,678

HEATING BOILER AND METHOD FOR OPERATING SAME

F. H. C. Nouwens, Hilvarenbeek, Netherlands, assignor to Econosto N.V., Netherlands

Filed Nov. 3, 1988, Ser. No. 267,096
Claims priority, application Netherlands, Nov. 4, 1987, 8702627
Int. Cl.[4] F22B *37/42*
U.S. Cl. 122—504.2 **16 Claims**

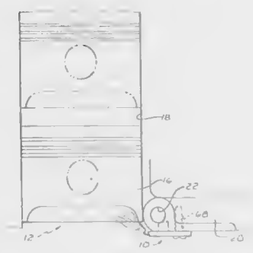
1. A heating system comprising a burner for the combustion of a mixture of air and fuel, a feed channel for feeding said burner, a discharge channel for discharging combustion products from said burner, a heat exchanger to be heated by said burner, means for determining the degree of contamination of said system, a fan for maintaining a pressure difference between said feed and discharge channels and means for increasing the number of revolutions of the fan connected to the means for determining the degree of contamination, such that when the degree of contamination exceeds a predetermined degree the number of revolutions of the fan is increased.

4,901,679

SPRAY NOZZLE ASSEMBLY FOR PISTON COOLING

David H. Hodgkins, Granby, and Leon P. Jahik, Suffield, both of Conn., assignors to Stanadyne Automotive Corp., Windsor, Conn.

Continuation-in-part of Ser. No. 251,906, Sep. 30, 1988, which is a continuation of Ser. No. 245,502, Sep. 19, 1988, which is a continuation-in-part of Ser. No. 203,439, Jun. 7, 1988, abandoned. This application Mar. 14, 1989, Ser. No. 323,296
Int. Cl.[4] F01P *3/08*
U.S. Cl. 123—41.35 **15 Claims**



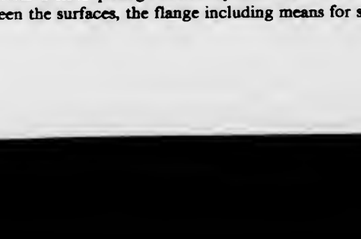
1. A nozzle assembly for cooling the crown of a piston in an internal combustion engine comprising:
housing means having a first nozzle end and an opposing second end and forming a transversely protruding inlet well defining an inlet opening intermediate said nozzle end and said second end and comprising a pair of laterally spaced sidewalls;
plate means received between said sidewalls and secured to said housing means by integral extensions of said sidewalls, said plate means defining an indentation having spaced edges, said plate means indentation cooperating with said housing means to define a nozzle passageway extending from said well to said nozzle end, said indentation edges partially defining a restricted nozzle orifice at said first nozzle end; and
check valve means comprising a valve member and a spring received in said well and captured between said housing means and said plate means, said valve member being biasable by said spring to prevent the passage of fluid through said passageway when the pressure of said fluid is below a pre-established threshold, said valve member being displaceable to permit the passage of fluid through said passageway for injection through said orifice.

4,901,680

INTAKE SYSTEM FOR ENGINES

Hiromitsu Matsumoto, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 6, 1984, Ser. No. 649,141
Claims priority, application Japan, Aug. 9, 1979, 54-101546
Int. Cl.[4] F02M *35/10*
U.S. Cl. 123—52 MB **12 Claims**



1. In an intake system for an internal combustion engine of a type having a combustion chamber, an intake passage and an exhaust passage opening to the combustion chamber, and an intake valve and an exhaust valve disposed in said intake and exhaust passages to open and close the respective passages, said intake valve having a longitudinal axis and a peripheral edge, the improvement comprising a closed supply chamber of a predetermined volume, and control passage means connected at one end to the supply chamber and being open at another end to a lower surface of the intake passage upstream of and in the immediate vicinity of the intake valve and being substantially directed at an angle offset from the longitudinal axis of the intake valve to a juncture formed upstream of the intake valve where the peripheral edge of the intake valve meets the intake passage, and the mixture in the supply chamber is fed to the combustion chamber through the control passage means upon opening of the intake valve.

4,901,681

MOTION ISOLATED ENGINE MANIFOLD

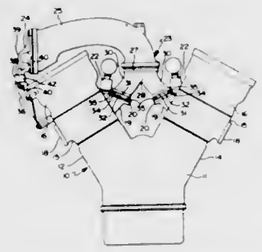
Donald J. Pozniak, Utica, and Carl L. Friebel, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1988, Ser. No. 236,963
Int. Cl.[4] F02B *75/18*
U.S. Cl. 123—52 MV **16 Claims**

1. An engine inlet manifold having a main body, a mounting flange and a resilient isolator adherently secured to spaced opposed surfaces of the body and the flange and defining therewith a fluid passage sealed by the isolator at the joint between the surfaces, the flange including means for securing

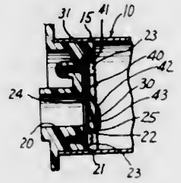
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the flange solidly to a ported engine component and the isolator being operative to allow limited relative motion between



the flange and the main body while supporting the body on the flange.

4,901,682
REED VALVE FOR TWO CYCLE INTERNAL COMBUSTION ENGINES
Robert G. Everts, Chandler, Ariz., assignor to Piston Powered Products, Inc., Chandler, Ariz.
Filed Sep. 30, 1988, Ser. No. 251,897
Int. Cl.[4] F16K *15/14*; F02B *33/30*
U.S. Cl. 123—73 V **6 Claims**



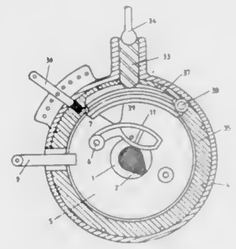
1. A reed valve for incorporation in the flow path of a fuel-/air charge from a carburetor to a metal crankcase of a two cycle internal combustion engine, said reed valve comprising:
- a valve body adapted to be mounted to the crankcase, said valve body being made of a thermally-insulating organic plastic material, having a surface, and a passage extending through the body and opening into said surface;
- a metal seat plate mounted to said surface having a port therethrough aligned with said passage, and having a fully peripheral flat seat extending around said port; and
- a metal reed plate having a fixed end and a free end, said fixed end being fixed to said seat plate, said free end being so proportioned and arranged as to bear against and fully seal against said flat seat when in its relaxed condition, and to flex away from said flat seat to open said valve when the differential pressure across it is sufficient, thereby to enable flow of the fuel/air charge in one direction, and to check against it in the other direction through said passage.

4,901,683
VENTED VALVE FOR INTERNAL COMBUSTION ENGINES
Reggie D. Huff, 12505 SW. North Dakota #906, Tigard, Oreg. 97223
Continuation of Ser. No. 193,036, May 12, 1988, abandoned.
This application Aug. 24, 1989, Ser. No. 405,581
Int. Cl.[4] F01L *1/28*
U.S. Cl. 123—79 C **5 Claims**

1. A reciprocating value for internal combustion engines, the value comprising:
- (A) an outer value having a base and a stem arranged to releasably intercept the conventional openings between a cylinder and its associated intake and exhaust ports, the outer value being configured with vents through its base, the vents communicating between said cylinder and said ports, the said outer valve including a hollow stem;
- (B) an inner valve means associated with said outer valve to releasably intercept said vents through said outer value base, said valve means comprising an inner valve configured with a valve stem that is carried within the hollow stem of the outer value, and the inner valve includes a base arranged to releasably seal to outer valve base opening from communicating between said cylinder and port in a predetermined timed sequence;
- (C) control means for selectively controlling the operation of the said value means in a predetermined timed sequence, and a stop disc inserted in a groove directly below the said inner valve spring retainer assembly;
- (D) the said inner valve comprising a stop disc inserted in a groove directly below the said inner valve spring retainer assembly for transferring the said inner valve's depressed motion to the said outer valve.

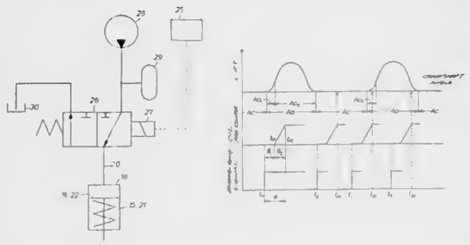
4,901,684
VARIABLE LIFT CAM FOLLOWER
Donald C. Wride, Valley View, Australia, assignor to Marlene Alfreda Wride, Valley View, Australia
Filed Nov. 10, 1988, Ser. No. 269,615
Int. Cl.[4] F01L *1/34*
U.S. Cl. 123—90.16 **6 Claims**

1. A mechanism for varying the lift of the valve of an internal combustion engine, the valve being operated by a cam lobe on a cam shaft, said mechanism including:
- a lever pivoted to a support rotatable about the cam shaft, one side of said lever bearing on the cam lobe, means on the opposite side of said lever adapted to actuate said valve, and means to rotate said support about said cam shaft to vary the timing of lift of the lever and thus of the valve, said means on the opposite side of said lever including a further lever pivoted to a sleeve rotatable about said cam shaft and contacting said first lever, said further lever actuating a cam follower to actuate said valve, whereby, on rotation of said sleeve, the effective lever arm of said



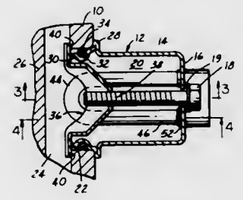
first lever is varied to vary the degree of lift of said cam follower and, hence, of said valve.

4,901,685
VALVE OPERATING MECHANISM FOR AN INTERNAL COMBUSTION ENGINE
Koichi Fukuo; Hiroshi Shirai, and Takashi Tatsumi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 134,659, Dec. 18, 1987, abandoned.
This application Feb. 15, 1989, Ser. No. 310,468
Claims priority, application Japan, Dec. 19, 1986, 61-303156; Dec. 19, 1986, 61-303157
Int. Cl.[4] F01L *1/18*
U.S. Cl. 123—90.16 **7 Claims**



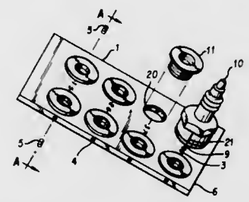
1. A method of controlling a valve operating mechanism for an internal combustion engine having a crankshaft and a plurality of intake or exhaust valves normally biased in a valve closing direction, the valve operating mechanism including a cam rotatable in synchronism with said crankshaft, a plurality of movably mounted valve moving means operable by said cam to operate said valves, coupling means for selectively connecting and disconnecting adjacent ones of said valve moving means under hydraulic pressure, and a hydraulic circuit openable and closable according to a rotational speed of said engine for selectively supplying hydraulic pressure to said coupling means, said method comprising the steps of:
- determining an engine operating condition requiring a change in engine valve operation and emitting a signal in response thereto, delaying transmission of said signal to the hydraulic circuit beyond a predetermined interval occurring between the instant of initial valve opening and an instant prior to the valve reaching its full open position; and
- thereafter transmitting said signal to said hydraulic circuit to actuate said coupling means.

4,901,686
ENGINE HEATING ASSEMBLY
Ian J. C. Scott, Madison Heights, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.
Filed May 22, 1989, Ser. No. 354,601
Int. Cl.[4] F02N *17/02*
U.S. Cl. 123—142.5 E **7 Claims**



1. For use with an engine block having an interior passage for liquid coolant and having a freeze plug opening in the block connected to the coolant passage, an improved coolant heater assembly covering the opening to selectively warm the engine coolant, comprising: a cup-shaped and thin walled heater housing having an interior space open at one end and closed at an opposite end, the housing being adapted to have its open end aligned with the opening in the block thereby allowing coolant to pass into the housing interior; an electrical resistance type heating element extending through the interior and having a pair of spaced end portions extending through the closed end of the housing; externally exposed end portions of the heating element outside of the housing defining terminals for selective application of electrical energy whenever coolant heating is desired; an elongated saddle clamp member of sufficient length to be positioned across the opening in the block with its ends engaging edges thereof adjacent the opening, the clamp having a centrally threaded opening; an elongated fastener extending through the closed end of the housing and the interior into threaded engagement with the saddle clamp, thereby securing the housing to the block.

4,901,687
SPARK PLUG INDEX PLATE FOR COMBUSTION ENGINES
Charles E. Jones, Route 611 & Annawanda Rd., Ottsville, Pa. 18942
Filed Jul. 27, 1988, Ser. No. 224,789
Int. Cl.[4] F02P *15/00*
U.S. Cl. 123—169 R **8 Claims**



1. A device for the orientation, indexing and storage of spark plugs for an internal combustion engine comprising:
- a support member and plural spark plug holding means for indexing and ground electrode orienting of said spark plugs to cylinders of said engine.

4,901,688

IGNITION PLUG FOR USE IN INTERNAL COMBUSTION ENGINES AND AN IGNITION PROCESS BY THE USE THEREOF

Ryohei Kashiwara, Raitsu Ootori 106, 456-1, Ootori-kitamachi 8-cho, Saka-shi, Osaka-fu; Hideaki Kashiwara, 3-B, 611, 151-30, Ninomaru-cho, Makojima, Fushimi-ku, Kyoto-shi; Hidehiko Noguchi, 7-14, Taibo 3-chome, Kanan-cho, Minamikawachi-gun, Osaka-fu, and Takeaki Kashiwara, 3, 37-411, Nagayoshidedo 3-chome, Hirano-ku, Osaka-shi, all of Japan

Filed Feb. 22, 1989, Ser. No. 313,063
Claims priority, application Japan, Oct. 26, 1988, 63-270176
Int. Cl.[4] F02P 1/00
U.S. Cl. 123—169 EL 9 Claims



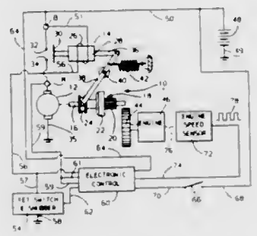
1. An ignition plug for use in internal combustion engines, in which at least one ground electrode is paired with a center electrode, said ground electrode is inwardly bent in the middle approximately at right angles toward said center electrode so that the end thereof may face the side surface of said center electrode with a spark gap in between, and the top of said center electrode is opposed to a piston with a space in between, characterized in that the end of said ground electrode is partially indented in such a way that there may form a recess for holding gas mixture there and the capacity of said recess may steplessly increase with the increase of the distance between said recess and said center electrode.

4,901,689

ELECTRONIC STARTING MOTOR CONTROL HAVING AUTOMATIC DISENGAGEMENT AND LOCKOUT

Donald L. Cummins, and Gregory A. Stephenson, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1988, Ser. No. 282,814
Int. Cl.[4] F02N 11/08
U.S. Cl. 123—179 B 3 Claims



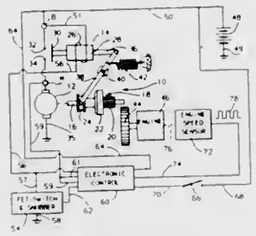
1. An electric starting system for cranking an engine comprising, an engine to be cranked, electric starting apparatus comprising an electric cranking motor operative when energized to crank said engine, switching means operative when closed to energize said cranking motor and operative when in an open condition to deenergize said cranking motor, speed sensor means coupled to said engine operative to develop speed voltage pulses the frequency of which are a function of engine speed, control means coupled to said speed sensor means operative to develop a cranking motor deenergization signal when the number of speed voltage pulses that occur during a constant time period exceeds a predetermined number of speed voltage pulses, means coupling said control means and said switching means operative to actuate said switching means to an open condition in response to the development of said signal, a start switch, means including time delay means for causing said switching means to be actuated to a closed condition a predetermined time period after said start switch is closed, said predetermined time period being of such a magnitude that when said start switch is closed with the engine running said signal will be developed before said predetermined time period elapses whereby said cranking motor is not energized if the start switch is closed with the engine running.

4,901,690

ELECTRONIC STARTING MOTOR SYSTEM HAVING TIMED CRANKING PERIOD CONTROL

Donald L. Cummins, Anderson, and James A. Crisler, Pendleton, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1988, Ser. No. 282,815
Int. Cl.[4] F02N 11/08
U.S. Cl. 123—179 B 5 Claims



1. A starting motor control system for controlling the energization of an electric cranking motor comprising, a start switch, means for causing said motor to be energized when said start switch is closed and to be deenergized when said start switch is open, a source of clock pulses, up-down counter means connected to said source of clock pulses, means for causing said counter means to count up clock pulses when said start switch is closed and to be counted down by said clock pulses when said start switch is open, and means operative when said counter means attains a predetermined count magnitude to cause said cranking motor to be deenergized.

4,901,691

DEVICE FOR MOUNTING INTERNAL COMBUSTION ENGINE ON WORKING MACHINE

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 202,250
Claims priority, application Japan, Jul. 1, 1987, 62-164786
Int. Cl.[4] F02B 75/06
U.S. Cl. 123—192 R 2 Claims

1. In a machine having a machine frame and having formed an internal space, and an internal combustion engine mounted on said machine frame,

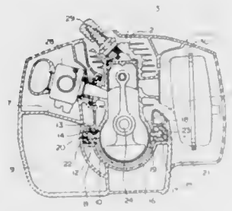
a device for mounting said internal combustion engine on said machine frame comprising:

a rear opening formed in an axial rear end portion of said machine frame as viewed in the direction of axis of a crankshaft of said internal combustion engine;

grooves formed in internal walls of said machine frame formed within said internal space, said grooves laterally opposing each other and extending in the direction of said axis of said crankshaft;

projections formed on both sides of a crankcase of said internal combustion engine so as to extend laterally from both lateral sides of said crankcase, said projections being disposed and fitted in said grooves, thus locating said internal combustion engine within said internal space;

said internal combustion engine insertable into said internal space from said rear opening and movable forwardly with said projections fitted in and slidable along said grooves,



a rear cover having a recoil starter secured thereto, said rear cover attached to said machine frame for closing said rear opening and holding said internal combustion engine at a predetermined position on said machine frame

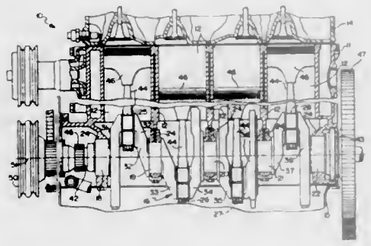
whereby said internal combustion engine is disposed at and fixed to a predetermined portion of said machine frame.

4,901,692

ENGINE AND LOW VIBRATION CRANKSHAFT THEREFOR

Dermot G. Madden, Farmington Hills, Mich., assignor to Saturn Corporation, Troy, Mich.

Filed Dec. 9, 1988, Ser. No. 281,586
Int. Cl.[4] F02B 75/06
U.S. Cl. 123—192 B 6 Claims



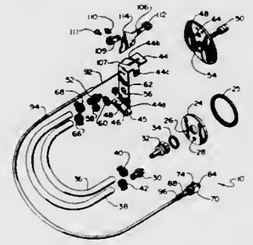
1. In combination in a reciprocating piston machine, a frame having a plurality of cylinders and supporting a crankshaft having a plurality of main journals carried in the frame and spaced along an axis, a plurality of crankpins radially offset from the axis and axially spaced intermediate the main journals and a plurality of crankarms interconnecting the crankpins with adjacent ones of the journals, connecting rods connecting the crankpins with associated pistons acting within the cylinders, and a rotatable mass connected with the crankshaft at one end, the crankshaft having, when rotated in assembly with said other associated components within a prescribed rotational speed range, a peak torsional vibration resonance of a determinable vibration mode and order occurring at a rotational speed within the speed range at which vibrational angular deflection of the crankpins and crankarms relative to a reference at least one zero node reaches a maximum that increases with the distance from the nearest of such nodes, wherein the masses and stiffnesses of the various crankarms are, in general, reduced as their distance from the nearest node is increased, in a degree to approach a minimum vibrating crankshaft mass and limit the maximum angular deflection of the crankpins at said rotational speed.

4,901,693

INTERLOCKED REMOTE OIL FILTER AND DRAIN

Torey W. DeGrazia, Jr., 1014 S. Greenwood Dr., Park Ridge, Ill. 60068

Filed Jun. 28, 1989, Ser. No. 373,150
Int. Cl.[4] I01M 1/00
U.S. Cl. 123—196 S 9 Claims



1. In an interlocked oil filter and drain system for draining oil from an internal combustion engine having a sump for holding oil and oil filter attachment means associated with the engine, said system including adapter means coupled to the attachment means for enabling installation and operation of an oil filter at a remote point from the engine, drain means including a drain valve interconnected with the sump for draining the oil, the drain means including actuating means for enabling draining of the oil from the remote point without removal of the drain means, and interlock means precluding operation of the drain means when the oil filter is operatively associated with said adapter means, the interlock means comprising:

a support frame located at the remote point for supporting the adapter means and the oil filter;

control means operatively associated with said support frame having an interlock tab movable between a drain position and a safe position, said interlock tab when in the drain position occupying space normally occupied by the oil filter and when in said safe position occupying space remote from the oil filter in its operative position; and

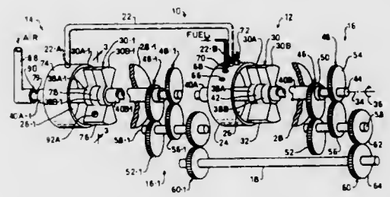
attaching means for securing said actuating means to said control means.

4,901,694

ROTARY ENGINE

Masami Sakita, 307 Beresford Ave., Redwood City, Calif. 94061

Filed Nov. 14, 1988, Ser. No. 271,231
Int. Cl.[4] F02B 53/00
U.S. Cl. 123—234 24 Claims



1. In an internal combustion engine the combination comprising,

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a combustion unit comprising means forming a cylindrical combustion working chamber having inlet and exhaust port means,

two pistons within the working chamber which are intercornected by eccentric elliptical gear means for rotation in the same direction at recurrently variable speeds whereby two combustion sub-chambers of recurrently variable volume are provided wherein one combustion sub-chamber decreases in volume while the other increases in volume, said two pistons comprising the only pistons within the working chamber,

for each complete revolution of the pistons two combustion unit operating cycles being completed, each combustion unit operating cycle including successive power, exhaust, and compression phases without a suction phase, relative piston travel during each said power and exhaust phase being greater than relative piston travel during each said compression phase,

a compressor unit driven by said combustion unit for supplying compressed air to the decreasing-volume combustion sub-chamber during each compression phase, and

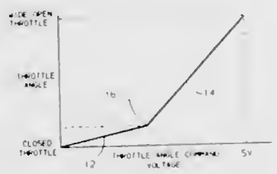
means for supplying fuel to the combustion sub-chambers which, when ignited, initiates the power phase for rotation of said pistons.

4,901,695

DUAL SLOPE ENGINE DRIVE-BY-WIRE DRIVE CIRCUIT

Daniel F. Kabasin, Rochester, N.Y., and Glen C. Hamren, Greentown, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind. and General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1988, Ser. No. 260,337
Int. Cl.[4] F02D *9/02, 41/14*
U.S. Cl. 123—399 **1 Claim**



1. A drive-by-wire system for controlling the position of an internal combustion engine throttle valve member rotatable within a predetermined range, the system comprising:

a digital computer for generating a throttle position command signal having a constant predetermined limited resolution;

means for attenuating the throttle position command signal;

a variable gain amplifier responsive to the attenuated throttle position command signal for generating a modified throttle position command signal;

means for positioning the throttle valve member to an angular position in accord with the value of the modified throttle position command signal; and

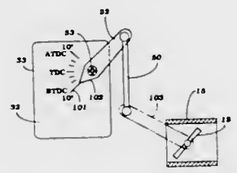
means for (A) setting the gain of the amplifier to a first value when the attenuated throttle position command signal is less than a predetermined value to provide a first portion of the modified position command signal having a first resolution greater than the predetermined limited resolution, the first portion of the modified position command signal resulting in a desired resolution in the positioning of the throttle valve member at throttle positions less than a position corresponding to the predetermined value of the attenuated throttle portion command signal and (B) setting the gain of the amplifier to a second value greater than the first value when the attenuated throttle position command signal is greater than the predetermined value to provide a second portion of the modified position command signal having a second resolution, the second resolution having a value so that the first and second portions of the modified position command signal provide for the positioning of the throttle valve over the entire predetermined range.

4,901,696

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION

Osamu Sakamoto, and Kazuhiro Nakamura, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 19, 1988, Ser. No. 183,678
Claims priority, application Japan, Apr. 20, 1987, 62-095201
Int. Cl.[4] F02P *5/02*
U.S. Cl. 123—413 **7 Claims**



1. An ignition control system for an internal combustion engine having an engine speed controlling element moveable through a predetermined range for controlling engine speed, position sensing means for sensing the position of said speed controlling element and an ignition circuit for controlling ignition timing including arithmetic advancing means moveable in a predetermined range for controlling the ignition timing in response to a signal from said position sensing means, the improvement comprising motion translating means for translating the movement of said speed controlling element of a magnitude into movement of said position sensing means at a different magnitude.

4,901,697

DEVICE FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

Richard Schleupen, Ingersheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

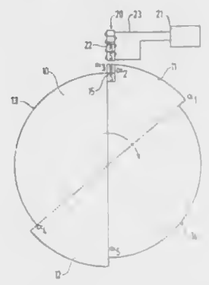
PCT No. PCT/DE87/00350, § 371 Date Mar. 6, 1989, § 102(e) Date Mar. 6, 1989, PCT Pub. No. WO88/01692, PCT Pub. Date Mar. 10, 1988
PCT Filed Aug. 8, 1987, Ser. No. 347,888
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 3630271
Int. Cl.[4] F02P *7/067*
U.S. Cl. 123—414 **5 Claims**

1. A device for controlling an internal combustion engine having a shaft and a predetermined number of cylinders, said device comprising:

a transmitter disc mountable on the internal combustion engine shaft for joint rotation therewith for determining angular positions of said shaft, said transmitter disc having a plurality of circumferentially spaced segments proportional to the predetermined number of cylinders;

a stationary receiving element for generating control signals in accordance with positions of said segments; and

a control circuit for controlling the internal combustion engine in accordance with the control signals generated by said receiving element, said transmitter disc including a permanent magnet formed as a mark and associated with at least one of said plurality of segments for generating a signal communicated to said control circuit, an overall circumferential length of said one of said plurality of



segments together with said permanent magnet being equal to that of others of said plurality of segments.

4,901,698

EMISSION CONTROL SYSTEM

Vladimir A. Novy, Alhambra, Calif., assignor to Los Angeles County Sanitation District, Whittier, Calif.

Division of Ser. No. 99,566, Sep. 22, 1987, Pat. No. 4,825,843. This application Jan. 30, 1989, Ser. No. 304,386
Int. Cl.[4] F02P *5/06*
U.S. Cl. 123—418 **16 Claims**



1. A method for controlling nitrogen oxide emissions in the exhaust gas of a spark-ignition, Otto cycle internal combustion engine including:

(A) at least one combustion chamber formed by a piston and a cylinder having intake and outlet valves;

(B) intake manifold means for delivering a charge of fuel-air mixture through the intake valve to the combustion chamber;

(C) mixing means connected to the intake manifold means and disposed upstream with respect to the intake valve for controlling the ratio of the fuel-air mixture;

(D) spark ignition means for igniting the charge in the combustion chamber; and

(E) spark timing means for advancing or retarding the timing of the ignition of the charge with respect to the position of the cylinder in the Otto cycle, the timing means being programmable to allow the timing to be varied with respect to incremental alterations in engine speed;

the method comprising the steps of:

(1) setting the engine to operate at a given engine speed within the operating range of the engine;

(2) adjusting the spark timing to obtain a desired nitrogen oxide emission at that speed;

(3) recording the required spark timing to obtain t desired nitrogen oxide emission at the speed;

(4) repeating the above steps of setting, adjusting and recording over a plurality of engine operating speeds; and

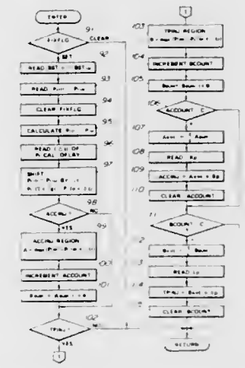
(5) programming the spark timing means based on the data recorded to produce the required spark timing for any given engine speed.

4,901,699

SYSTEM FOR CONTROLLING A FUEL INJECTION QUANTITY AND METHOD THEREFOR

Hiromichi Miwa, Yokohama; Masaaki Uchida, and Yoshihisa Kawamura, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 7, 1988, Ser. No. 216,041
Claims priority, application Japan, Jul. 10, 1987, 62-172356
Int. Cl.[4] F02D *5/14*
U.S. Cl. 123—478 **18 Claims**



1. A system for controlling a fuel supply for an internal combustion engine, comprising:

(a) first means for detecting engine operating conditions;

(b) second means for determining whether a request to increase an engine torque occurs from said first means;

(c) third means for calculating a basic fuel supply quantity to be supplied when the second means determines that the request of the engine torque increase occurs;

(d) fourth means for detecting from said first means a detected variable which has a close correlation to the engine power output;

(e) fifth means for calculating from said first mean an expected variable which has a close correlation to the engine power output;

(f) sixth means for matching gains and phases between said fourth means detected value and said fifth means expected value;

(g) seventh means for deriving from the sixth means a basic fuel supply correction quantity;

(h) eighth means for calculating a learning value based upon said basic fuel injection correction quantity of the seventh means; and

(i) ninth means adding said third means basic fuel supply quantity, seventh means basic fuel supply correction quantity, and eighth means learning value and for outputting a quantity of fuel to the engine based upon the result.

4,901,700
CLAMP FOR AN INTERNAL COMBUSTION ENGINE FUEL INJECTOR

Michael Knight, and Ronald G. Moore, both of Peterborough, United Kingdom, assignors to Perkins Engines Group Limited, London, England

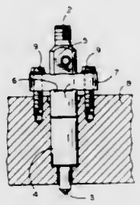
PCT No. PCT/GB83/00302, § 371 Date Jul. 19, 1984, § 102(e) Date Jul. 19, 1984, PCT Pub. No. WO84/02161, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 25, 1983, Ser. No. 638,449

Claims priority, application United Kingdom, Nov. 27, 1982, 8233873

Int. Cl.[4] F02M *61/14*; **F16B** *21/10*

U.S. Cl. 123—470 **8 Claims**



1. A fuel injector clamp adapted to be secured by a pair of fixing bolts to a head of an engine so as to hold a fuel injector in place by enclosing flats on opposite sides of a body of an injector and engaging bearing shoulders alongside each flat, said clamp being in the form of a generally oval-shaped ring manufactured from pipe having a longitudinal axis and major and minor axes lying in a plane perpendicular to said longitudinal axis, the ring having side walls on the minor axis adapted to enclose flats on opposite sides of the injector body, a lower edge adapted to engage a bearing shoulder on the injector body alongside each flat, and end walls on the major axis each adapted to surround a respective fixing bolt and extend around the circumference of a circle over more than 180 degrees.

4,901,701
TWO-CYCLE ENGINE WITH ELECTRONIC FUEL INJECTION

Ronald E. Chasteen, Lakeside, Ariz., assignor to Injection Research Specialists, Inc., Colorado Springs, Colo.

Continuation of Ser. No. 119,626, Nov. 12, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 345,081

Int. Cl.[4] F02M *7/00*; **G05D** *23/00*

U.S. Cl. 123—478 **1 Claim**

1. A fuel injection system for a two-stroke cycle engine of the type comprising at least one cylinder, a crankcase associated with said cylinder, a piston reciprocally mounted in said cylinder and crankcase; a reciprocally openable and closable crankcase inlet for enabling combustible fluid to be drawn into the crankcase, a reciprocally openable and closable transfer port for transferring combustible fluid compressed in said crankcase to said cylinder, an ignition system for igniting compressed combustible fluid in said cylinder, a reciprocally openable and closable exhaust port in said cylinder for enabling exhaust of burned combustible fluid from said cylinder, a crankshaft connected to said piston for transferring mechanical energy from said piston to a drive unit, and an electrical energy supply source including a battery for operating the ignition system and other electrical components, comprising:

(a) fuel injection means for injecting fuel for combustion within said cylinder;

(b) fuel supply means for supplying fuel to said fuel injection means;

(c) battery voltage sensing means for sensing battery voltage and for providing a battery voltage sensing signal representative thereof;

(d) air temperature sensing means for sensing the temperature of ambient air and for providing an air temperature signal representative thereof;

(e) engine speed sensing means for sensing the speed of revolution of said engine and for providing an engine speed signal representative thereof;

(f) timing sensing means for sensing each occurrence of a predetermined cyclically repeating state of said engine and for providing a timing signal indicative thereof;

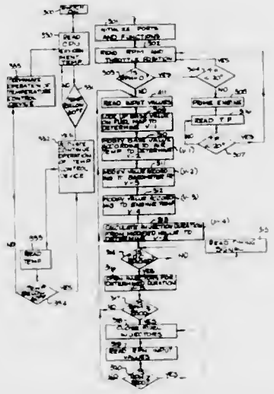
(g) barometric pressure sensing means for sensing atmospheric air pressure and for generating a barometric pressure sensing signal representative thereof;

(h) throttle position sensing means for sensing the relative amount of opening of said throttle valve means and for generating a throttle position signal representative thereof;

(i) first data processing means for receiving and processing said sensing signals comprising:

(i) means for processing said engine speed sensing signal and said throttle position sensing signal and for generating a priming control signal to said fuel injection means for selectively injecting or not injecting fuel into said manifold means based on said engine speed signal and said throttle position signal;

(ii) means for receiving and processing said engine speed signal and throttle position signal for determining a base fuel injection value;



(iii) means for receiving and processing said air temperature signal and calculating an air temperature modification value of said base fuel injection value;

(iv) means for receiving and processing said barometric pressure sensing signal for calculating a barometric pressure modification value of said base fuel injection value;

(v) means for receiving and processing said engine temperature signal for calculating an engine temperature modification value of said base fuel injection value;

(vi) means for determining a total fuel injection value representative of the total fuel amount which is to be injected by said fuel injection means during a single two-stroke operating cycle of said piston from said base fuel injection value, said air temperature modification value, said barometric pressure modification value, and said engine temperature modification value;

(vii) means for determining an injector open duration interval based on said total fuel injection value and a known fuel output rate capacity of said fuel injection means;

(viii) means for generating a control signal for opening said injection means for said determined injector duration open interval at a predetermined point in time determined from said timing sensing signal;

(ix) means for receiving and processing said engine speed sensing signal for generating a pump control signal in response thereto for maintaining said pump at an optimum operating speed for providing said predetermined maximum operating pressure in said fuel circulation conduit means at said pump.

4,901,702
APPARATUS FOR THE MEASURED FEEDING OF VOLATILE FUEL COMPONENTS TO THE INTAKE TUBE OF AN INTERNAL COMBUSTION ENGINE

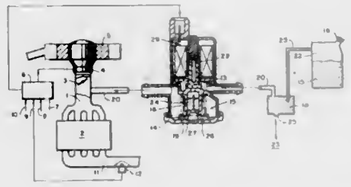
Bernd Beicht, Gross-Umstadt; Reinhard Tinz, Gross-Bieberau, and Joachim Heinemann, Weinheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 300,431

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802664

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—520 **10 Claims**



1. In apparatus for the temporary storage and measured feeding of the volatile fuel components in the free space of a tank system into the intake tube of an internal combustion engine, including a vent line connecting the free space to the atmosphere, in which vent line there is disposed a storage chamber with an absorption element, as well as a line which connects the storage chamber to the intake tube and can be shut by an electromagnetic check valve having a control chamber of expanded cross section relative to said line between the check valve and the intake tube as well as an auxiliary means disposed in the control chamber for varying the opening of the check valve, the improvement wherein the auxiliary means comprises an auxiliary valve situated between the check valve and the intake tube, and wherein the auxiliary valve is closable by a vacuum actuator in response to the pressure difference between the control chamber and the atmosphere.

4,901,703
CRANKCASE VENTILATION SYSTEM FOR A RECIPROCATING INTERNAL COMBUSTION ENGINE

David T. Humphries, Hove, England, assignor to Rolls-Royce Motor Cars Limited, Crewe, England

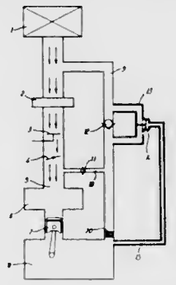
Continuation-in-part of Ser. No. 920,551, Oct. 20, 1986, abandoned. This application May 16, 1988, Ser. No. 195,357

Claims priority, application United Kingdom, Oct. 19, 1985, 8525835

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—572 **9 Claims**

1. A reciprocating internal combustion engine comprising an air input leading to the engine through an air filter, a turbocompressor, an air-meter, throttle and inlet manifold, said engine including means for venting the engine crankcase to the air input after the air filter, means for connecting the air input to the means for venting, valve means for controlling the air flow through the means for venting and the means for connecting to control the pressure in the crankcase below atmospheric pressure within certain limits, in response to crankcase depression, said valve means comprising a non-return valve in the means for connecting.



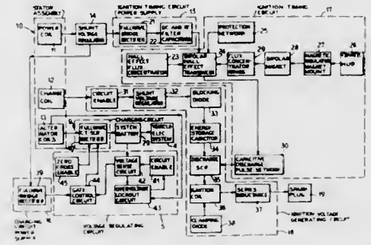
4,901,704
HALL EFFECT DEVICE IGNITION AND CHARGING SYSTEM

Edward J. Safranek, Arlington Heights, Ill., assignor to F & B Mfg. Co., Gurnee, Ill.

Filed May 9, 1988, Ser. No. 191,876

Int. Cl.[4] F02P *3/06*

U.S. Cl. 123—599 **29 Claims**



1. An engine ignition system, comprising:

a rotor having at least one magnet, and also having magnetic timing means for generating a flux path which rotates with the rotor but at a predetermined location relative to the rotor;

a stator having poles with at least one charge coil on one pole and at least one power coil separate from the charge coil on another pole, the stator being positioned relative to the rotor such that as the rotor rotates, the at least one magnet will pass in close proximity to the stator poles;

a bipolar Hall effect transducer means positioned in proximity to said magnetic timing means so that as the flux path passes the Hall effect transducer means as the rotor rotates a trigger pulse is generated;

power supply means connected to the power coil to supply power to the Hall effect transducer means;

engine ignition means for igniting fuel used in the engine; and

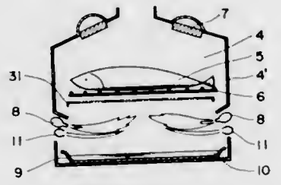
an ignition voltage generating means having a first input connected to the charge coil, an output connected to the engine ignition means for supplying an ignition voltage thereto, and a second input connected to receive said trigger pulse from the Hall effect transducer means, said ignition voltage generating means producing said ignition voltage in timed relation with a rotary position of the

rotor relative to the stator through sensing of said flux path generated by the magnetic timing means.

4,901,705
GAS COMBUSTION APPARATUS

Manabu Takata, Yamatokoriyama; Junzo Tanaka, Fujiidera; Yoshiharu Shimada, Kitakatsuragi, and Yoshiteru Kagomoto, Kashihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 13, 1988, Ser. No. 218,295
Claims priority, application Japan, Jul. 13, 1987, 62-174101; Apr. 4, 1988, 63-97080
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—41 R **6 Claims**

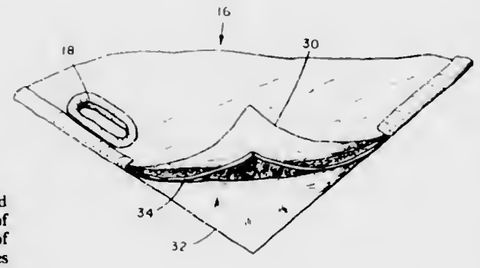


1. A gas combustion apparatus comprising:
a first lower gas burner means for burning a gas supplied thereto, said lower gas burner means including a pair of first and second spaced opposed burner tubes, each one of said pair of first and second spaced opposed burner tubes having a plurality of flame ports defined therein, each one of said plurality of flame ports having means for directing a flame fueled by a gas and originating at said each one of said plurality of flame ports in said first one of said pair of first and second spaced opposed burner tubes substantially horizontally and toward the plurality of flame ports in said second one of said pair of first and second spaced opposed burner tubes for defining a heating region between said pair of first and second spaced opposed burner tubes;
air supply means adjacent to said pair of first and second burner tubes for supplying an air flow adjacent to flames originating at each one of said plurality of flame ports, said air supply means including orifice means for directing the air flow substantially horizontally and adjacent to the substantially horizontal flames originating at each one of said plurality of flame ports for elongating the horizontal length of the flames and for controlling the location of the outermost ends of the flames for further defining the extent of said heating region between said pair of first and second spaced opposed burner tubes;
fire transfer means located between said first and said second ones of said pair of spaced opposed burner tubes for transferring a flame fueled by gas from a first one to a second one of said pair of burner tubes for igniting flames fueled by gas at each one of said plurality of flame ports of both ones of said pair of first and second spaced opposed burner tubes when the plurality of flame ports of at least one of said pair of burner tubes is ignited;
means for unifying said first lower gas burner means, said air supply means, and said fire transfer means into an integral combination;
a second upper gas burner means for burning a gas supplied thereto, and said upper gas burner means being vertically spaced above said lower gas burner means;
a firing burner located between said lower gas burner means and said upper gas burner means for transferring a flame fueled by gas from one of said lower and upper gas burner means to the other one of said lower and upper gas burner means and for causing at least one of said lower and upper gas burner means to always be ignited to prevent release of any unignited gas; and
support means disposed between said first lower gas burner means and said second upper gas burner means for supporting an object to be heated within or adjacent to said heating region between said pair of first and second burner tubes and further defined by the flames originating at said plurality of flame ports and elongated and controlled in location by said orifice means of said air supply means.

4,901,706
ASH MAT

Leroy F. Schwanke, Jr., 95 Great Ring Rd., Sandy Hook, Conn. 06482

Filed May 5, 1986, Ser. No. 859,301
Int. Cl.[4] F23J *1/00*
U.S. Cl. 126—500 **8 Claims**

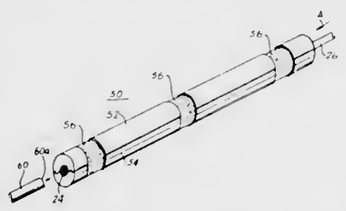


1. A disposable ash mat having an outer periphery preformed generally to conform to the bottom of a structure in which ashes are generated, said mat comprising a foldable laminate including outer layers of metal foil and an inner layer of fireproof material adhered to both of said outer layers, and said mat having handles within said outer periphery to facilitate disposal of the mat and its contents.

4,901,707
PREPACKAGED INTRA-AORTIC BALLOON ASSEMBLY WITH HOLDER, AND METHOD OF USING SAME

Peter Schiff, Cookeville, Tenn., assignor to IABP Corporation, Concord, Mass.

Continuation of Ser. No. 715,625, Mar. 22, 1985, abandoned, which is a division of Ser. No. 442,958, Nov. 19, 1982, Pat. No. 4,576,142. This application Mar. 12, 1987, Ser. No. 24,867
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—1 D **12 Claims**

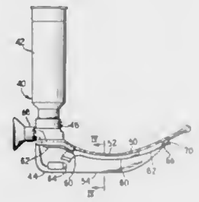


1. A holder, and within said holder, a pre-packaged, ready-for-insertion, intra-aortic balloon assembly for assisting the pumping action of the heart, said balloon assembly comprising an elongated catheter tube, an elongated balloon having a proximal end joined to said catheter tube and having an opposite distal end terminating in a tip, and a slender, elongated balloon support having a distal end terminating in said tip and extending through said balloon and into said catheter tube, said elongated balloon being, as a result of manufacture, in a collapsed, wrapped condition about said balloon support thereby having a reduced profile ready for insertion into a human body; and
said holder comprising a set of separable elongated parts adapted to be assembled to form a holder body having an elongated cavity defined by opposed surfaces of said body parts, said opposed surfaces, with said intra-aortic balloon in collapsed, wrapped condition of reduced profile disposed within said cavity, lying in close contact with said balloon, thereby to restrict said balloon from unwrapping,
said holder defining a first opening at a proximal, first end of said cavity and defining a second opening at a distal, second end of said cavity, said first opening and said second opening sized, relative to the reduced profile size of said balloon in said cavity, for passage of said balloon in a distal direction from within said cavity, out of said holder, in said collapsed, wrapped condition.

4,901,708
VIEWING LARYNGOSCOPE

Tzium-Shou Lee, 924 Maple Rd., Flossmoor, Ill. 60422

Filed Jul. 22, 1988, Ser. No. 222,939
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—11 **7 Claims**

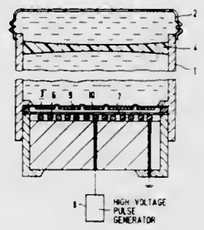


1. A laryngoscope which comprises a handle member adapted to receive batteries therein, a blade member having distal and proximal ends, means for attaching the proximal end of the blade member to the handle member, said blade member having a spatula portion curved longitudinally along its length and transversely across its width to provide an open bottom U-shaped tubulation and viewing channel along its length when inserted in the mouth of the user, a lamp member energized by batteries in the handle suspended from the proximal end of the blade member, below and facing said tubulation and viewing channel to illuminate for viewing and tubulation channel in the area between the distal and proximal ends of the spatula portion of said blade member, a first fiber optic bundle extending lengthwise on one leg of the tubulation an viewing channel from adjacent said lamp member and transmitting short of the distal end of the spatula to receive light from the lamp member and illuminate the area adjacent the distal end of the blade member, a lens on the proximal end of the blade member, a second fiber optic bundle extending lengthwise on the opposite leg of the channel terminating adjacent the distal end of the blade member beyond said first bundle to transmit the lighted view from adjacent said distal end to said lens, and said tubulation and viewing channel portion between the fiber optic bundles being unimpeded for tubulation and providing a clear sight path from the proximal end of the blade member along length of the spatula portion.

4,901,709
SHOCK WAVE SOURCE

Manfred Rattner, Buckenhof, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 214,048
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 8709363[U]
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—24 A **8 Claims**

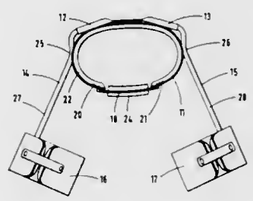


1. A shock wave source for extracorporeal lithotripsy treatment of calculi in a patient, said shock wave source comprising:
a housing containing a volume filled with a shock wave conducting medium closed at one end by a flexible cover adapted for application against said patient; means for generating high-voltage pulses;
a coil connected to said means for generating high-voltage pulses;
an insulator layer disposed adjacent said coil;
a membrane closing an opposite end of said housing and disposed adjacent said insulator layer, said membrane consisting of a flexible base covered by a plurality of discrete geodesic laminae consisting of electrically conductive material, whereby upon the supply of a high-voltage pulse to said coil by said means for generating high-voltage pulses, said coil generates an electromagnetic field which rapidly repells said membrane to generate a pressure pulse and;
means for focusing said pressure pulse into a shock wave on said calculus.

4,901,710
LEG RESTRAINT

Paul A. R. Meyer, 94 Blinco Grove, Cambridge, United Kingdom

Filed Mar. 4, 1987, Ser. No. 21,772
Claims priority, application United Kingdom, Mar. 5, 1986, 8605472
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—78 **11 Claims**



1. An orthopaedic device which comprises a waist band, two thigh bands and two leg bars in which one end of each of the

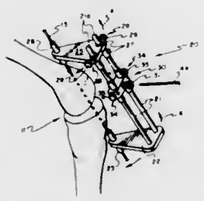
leg bars is attached to a thigh band which is free to rotate about an axis perpendicular to the leg bar, the other end of each leg bar being freely rotatable about its axis and being held for rotation within a sleeve attached to the waist band, each sleeve being capable of being inclined downwards with respect to the plane of the waist band; and said leg bars make an obtuse angle with the axis of the sleeve whereby when worn the separation of leg bars is less when the legs are extended than when they are flexed and in which each leg bar is adapted so that when worn each leg bar is parallel to the leg of the wearer.

4,901,711

DRILL GUIDE

E. Marlowe Goble, 850 E. 1200 North, and W. Karl Somers, 651 N. 150 West, both of Logan, Utah 84321

Filed Dec. 27, 1988, Ser. No. 290,423
Int. Cl.[4] A61F *5/04*
U.S. Cl. 606—98 **9 Claims**



1. A drill guide comprising, a pair of parallel rails; a stationary bracket mounted to spaced apart aligned ends of said parallel rails, which stationary bracket includes a first longitudinally open guide cylinder that extends therefrom, parallel to said parallel rails; a traveling bracket journaled to said parallel rails other ends to travel therealong, which traveling bracket includes a second longitudinally open guide cylinder that extends therefrom, parallel to said rails; trolley means journaled for travel along said rails; and drill sleeve means for mounting to said trolley, said drill sleeve means having a barrel portion that is open therethrough that will align with a straight wire or pin that is installed through said first and second longitudinally open guide cylinders.

4,901,712

BONE NAILER

Douglas W. Voegell, and Robert L. Assell, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 22, 1988, Ser. No. 185,058
Int. Cl.[4] A61F *5/04*; **B25C** *7/00*
U.S. Cl. 606—75 **15 Claims**



1. A bone nailer adapted for use with an elongate nail or screw like insert of the type comprising a head portion having inner and outer end surfaces and a peripheral surface extending between the end surfaces, and an embedable portion projecting from the inner end surface of the head portion and having a smaller transverse cross sectional area than the head portion, said nailer comprising:

a cartridge housing having an inner surface defining a through passageway extending from an inlet opening to an outlet opening, a portion of said inner surface adjacent said outlet opening being adapted to receive the insert with its head portion farthest from said outlet opening and its embedable portion projecting from the head portion toward the outlet opening, the portion of the inner surface defining the passageway including a holding part spaced from the outlet opening adapted for an interference fit with the peripheral surface of the head with an end of the embedable portion opposite the head slightly projecting through the outlet opening, and a guiding part between the holding part and the outlet opening adapted for close clearance fit with the peripheral surface of the head to guide the peripheral surface of the head portion during movement of the insert through the outlet opening;

a driver having an end adapted to engage the outer surface of the head portion and being mounted in said cartridge housing for sliding movement between a load position with the driver spaced from the outlet opening to afford positioning the insert in the passageway, along said passageway so that said end can push the insert toward the outlet opening, to an eject position at which the driver has pushed the insert out said outlet opening;

drive means adapted to be manually activated for rapidly propelling said driver along said passageway from said load to said eject position to rapidly move the insert through said outlet opening and embed its embedable portion in adjacent bone; and

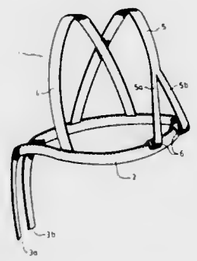
an elongate punch adapted to position an insert at a predetermined position in said passageway, said punch having a first end surface, a socket opening through said first end surface adapted to receive the embedable portion of the insert with the inner surface to the head against the first end surface of the punch, an end portion adjacent said first end surface adapted to freely enter said passageway, and a shoulder too larger to enter said passageway at the end of said end portion opposite said first end surface, the distance between said first end surface and said shoulder being selected to position the head of the insert a predetermined distance within said passageway when the embedable portion of the insert is positioned in said socket and said end portion of the punch is inserted into said passageway to the depth permitted by said shoulder.

4,901,713

SUPPORTIVE ARM SLING

Ursula L. Troeger, 145 Moore Ave., Waterloo, Ontario, Canada (N2J 1X4)

Filed Jun. 6, 1988, Ser. No. 202,824
Claims priority, application Canada, Jun. 9, 1987, 539165
Int. Cl.[4] A61F *5/40*
U.S. Cl. 128—94 **12 Claims**



1. An arm sling comprising:

a waistband securable around a user's waist;

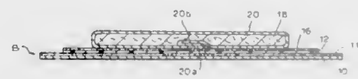
a strap attached to the front and back of the waistband and passable over a user's shoulder of the slung arm from the unslung side back of the waistband to the slung side of the front of the waistband, said strap being a single strip of material that is bifurcated into two support straps in the area of the slung arm at a point a distance above the waistband, said distance at least one-eighth the length between the shoulder and the waistband, to form a substantially triangular shape with the support straps supporting the slung arm at two spaced apart locations, the overall length of the strap and bifurcated support straps being sufficient to form a loop to cradle the slung arm.

4,901,714

BANDAGE

Ole R. Jensen, River Vale, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 9, 1988, Ser. No. 242,179
Int. Cl.[4] H61L *15/00*
U.S. Cl. 128—156 **5 Claims**



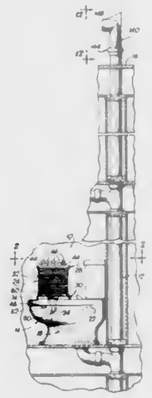
1. A bandage comprising a base which is comprised of a non-woven material and a plastic layer bonded to said non-woven material, a layer of acrylic adhesive on the body contacting surface of said plastic layer and a pad of superabsorbent material, smaller in size than said base, said superabsorbent pad being wrapped in a sheet of non-woven material and affixed to said body-contacting surface of said plastic layer by said adhesive layer, a portion of said adhesive layer forming a border around said pad and being adapted to adhere the bandage to the skin of the wearer.

4,901,715

APPARATUS AND METHOD FOR BREATHING THROUGH THE SOIL-STACK DURING A HIGH-RISE FIRE

Timothy E. Mulcahy, 2650 W. 85th St., Chicago, Ill. 60652

Filed Jun. 20, 1988, Ser. No. 208,967
Int. Cl.[4] A62B *7/10*, *7/00*
U.S. Cl. 128—200.24 **16 Claims**



4,901,716

CLEAN ROOM HELMET SYSTEM

Wyman H. Stackhouse, 3201 Poinsettia Ave., Manhattan Beach, Calif. 90266, and Ian M. Williamson, 555 N. Harbor Dr., Redondo Beach, Calif. 90277

Filed Feb. 6, 1989, Ser. No. 306,043
Int. Cl.[4] A62B *7/10*
U.S. Cl. 128—201.25 **9 Claims**



1. A clean room helmet system comprising:

a helmet having a support member adjustably sized and shaped to fit the head of the user and including an upper horizontal section and a lower horizontal section as an integral part of said helmet;

a hook and pile engaging and holding means located on the external portion of said upper horizontal section and on the external portion of said lower horizontal section;

a curved face shield having an upper peripheral portion conformable generally to the curved upper horizontal section on said helmet and a lower peripheral portion conformable generally to the curved lower horizontal section on said helmet and adapted to protect the face of the user from splashed fluids;

a hook and pile engaging and holding means located on the internal upper peripheral portion of said curved face shield and on the internal lower peripheral portion of said face shield for engaging in a mating and holding relationship with said hook and pile engaging and holding means located on said upper and lower horizontal sections of said helmet respectively;

at least one flapper valve located on said curved face shield for allowing air to enter and at the same time preventing air from being exhausted to the outside atmosphere from said helmet;

said helmet having at least one exhaust port communicating with the interior of said helmet;

motor means including an electric fan/motor and wearable power means for energizing said electric fan/motor;

filter means for trapping particulate in the air and exhausting particulate free air; and

conduit means coupled with said exhaust port on said helmet, said filter means and said motor means to establish a filtering air path for discharging particulate free air from said helmet to the outside atmosphere.

4,901,717

TENDON LEADER

Robert R. Moore, 1897 National Ave., Hayward, Calif. 94545; Steve Lamb, 6724 Corte Del Vista, Pleasanton, Calif. 94566, and Eugene M. Wolf, 414 Eldridge Ave., Mill Valley, Calif. 94941

Division of Ser. No. 211,874, Jun. 27, 1988, abandoned, which is a division of Ser. No. 524, Jan. 5, 1987, Pat. No. 4,773,417. This application Dec. 16, 1988, Ser. No. 285,220
Int. Cl.[4] A61B *17/00*
U.S. Cl. 606—1 **5 Claims**

1. A tendon leader comprising:

a. an elongated stem, said stem including a lead end and a

trailing end, said stem being of a substantially uniform transverse dimension;

b. a tube, said tube being connected to said trailing end of said elongated stem, said tube being expandable to fit around the tendon;



c. means for holding said tube to the tendon, said holding means comprising means for contracting said tube around the tendon upon the application of tension on said elongated stem, said contracting means including a fibrous cross weave structure oriented diagonally relative to said elongated stem.

4,901,718

3-DIMENSIONAL LASER BEAM GUIDANCE SYSTEM

Josef F. Bille, Solana Beach, and Stuart I. Brown, La Jolla, both of Calif., assignors to Intelligent Surgical Lasers, San Diego, Calif.

Filed Feb. 2, 1988, Ser. No. 151,569
Int. Cl.[4] A61N *5/01, 5/06*
U.S. Cl. 60—4 **3 Claims**



1. An apparatus for steering and focusing a laser beam to a predetermined point in space according to the topography of an eye which comprises:

a laser beam source having means to direct said beam along a path in an optical channel defined by an envelope in which said path of said beam is steered;

an optical element positioned in said path to focus said beam at a preselected point on said path;

a director positioned within said optical channel constituting means for selectively reorienting said channel in accordance with the topography of the eye, said director having a turning mirror, a plane mirror, and an objective lens system sequentially oriented in said path of said beam and moveable with respect thereto constituting means for reorienting said optical channel while maintaining the length of said optical channel; and

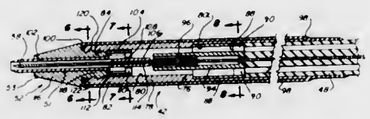
a tuner positioned within said optical channel to receive said beam and selectively alter said path to bring said preselected point on said path into coincidence with said predetermined point in space, said tuner having a plurality of galvanometric mirrors positioned in said path of said beam to alter said path, and said optical element comprises a convex lens positionable in said path of said beam.

4,901,719

ELECTROSURGICAL CONDUCTIVE GAS STREAM EQUIPMENT

Robert P. Trenconsky, Littleton; Carol Bertrand, Englewood, and Robert A. Weiss, Aurora, all of Colo., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 849,950, Apr. 8, 1986, Pat. No. 4,781,175. This application Jul. 26, 1988, Ser. No. 224,485
Int. Cl.[4] A61B *17/39*
U.S. Cl. 606—49 **14 Claims**



1. An electrosurgical unit for creating an eschar in the stroma of a tissue comprising in combination:

means for conducting a preselected gas in a jet stream to the tissue at a predetermined flow rate,

means for transferring electrical energy at a preselected radio frequency range in ionized conductive pathways at a predetermined power level within the gas jet stream in an electrical circuit which includes the tissue to create the eschar,

said means for conducting gas and said means for transferring electrical energy including a flexible hose, connector means having first and second connectable mating portions for connecting the hose to a source of gas and to a source of electrical energy, and nozzle means for delivering the gas jet stream and electrical energy to the tissue,

said hose having at least one hose passageway therethrough for conducting gas and an electrical conductor means for conducting electrical energy therealong,

a rear end of said hose comprising the first mating portion of said connector means, the first mating portion exposing a rear end of the electrical conductor means, the first mating portion including resilient material defining a circular edge, the second mating portion of said connector means including a generally cylindrical element for contacting the circular edge to establish a hermetic seal between said circular edge and the cylindrical element when the first and second mating portions are connected, the second mating portion including an electrical connector means for connecting to said source of electrical energy and operative for contacting the rear end of said electrical conductor means when the first and second mating portions are connected,

a front end of said hose comprising a handle having a front end to which said nozzle means is releasably connected, a nozzle electrical connector means connected to said electrical conductor means at the front end of said handle, a resilient boot on the handle which has a portion that overlaps the front end of the handle where said nozzle means connects, the operative connection of said nozzle means and said handle compressing the overlapping portion of the resilient boot to establish a hermetic seal between the nozzle means and the handle,

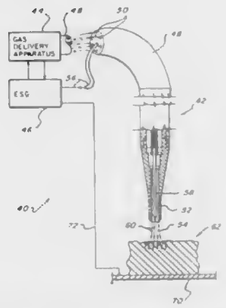
said nozzle means including a nozzle passageway therethrough for directing gas from the hose passageway into the jet stream and also including an elongated electrode disposed in the nozzle passageway and having one end contacting the nozzle electrical connector means of the handle when the nozzle means is connected to the handle, and support means for supporting the elongated electrode within the nozzle passageway along a minority of the length of the electrode.

4,901,720

POWER CONTROL FOR BEAM-TYPE ELECTROSURGICAL UNIT

Carol Bertrand, Englewood, Colo., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 849,950, Apr. 8, 1986, Pat. No. 4,781,175. This application Jul. 26, 1988, Ser. No. 224,301
Int. Cl.[4] A61B *17/39*
U.S. Cl. 606—40 **21 Claims**



1. In an electrosurgical unit which includes means for conducting a predetermined gas in a jet to tissue and means for transferring electrical energy in ionized conductive pathways in the gas jet, said electrical energy transferring means operatively transferring arcs to the tissue in the ionized conductive pathways in an active state to thereby create a predetermined electrosurgical effect on the tissue, said electrical energy transferring means operatively creating substantially only ionized conductive pathways in the gas jet in an inactive state to allow arc initiation upon transition to the active state, said electrical energy transferring means including electrosurgical generator means for generating target bursts of radio frequency electrical energy at a predetermined inactive repetition rate in the inactive state and for generating active bursts of radio frequency electrical energy at a predetermined active repetition rate in the active state, said electrical energy transferring means applying the bursts of radio frequency energy to the gas jet, and an improvement to said electrosurgical generator means comprising, in combination:

repetition rate changing means for changing the predetermined repetition rate of the target bursts to a value substantially less than the predetermined repetition rate of the active bursts.

4,901,721

SUTURING DEVICE

Samir I. Hakki, 8547 Merrimoor Blvd. E., Largo, Fla. 33543

Filed Aug. 2, 1988, Ser. No. 227,230
Int. Cl.[4] A61B *17/08;* **B65D** *63/10*
U.S. Cl. 606—103 **14 Claims**

1. A surgical device for suturing together bodily tissue, which allows limited movement of the bodily tissue sutured thereby, said surgical device comprising:

(a) a wire suture having a first end and a second end, wherein said first end comprises a needle;

(b) a longitudinally-oriented biasing means for cinching said wire suture tightly around the bodily tissue immediately surrounded by said surgical device, said biasing means having a first end and a second end, wherein said biasing means first end is operatively connected to said wire suture second end; and

(c) a suture receiving means for passing said wire suture first end therethrough, said suture receiving means being operatively connected to said biasing means second end, and said suture receiving means and said biasing means being arranged such that pressure is exerted on said biasing



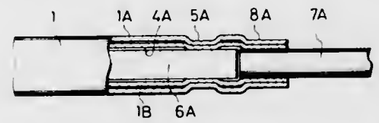
means when said wire suture is cinched tightly around the tissue immediately adjacent to said surgical device.

4,901,722

SUTURING NEEDLE WITH SUTURE

Takeshi Noguchi, Osaka, Japan, assignor to Kabushiki Kaisha Mutec, Osaka, Japan

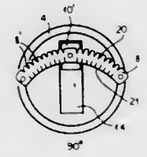
Continuation of Ser. No. 58,173, Jun. 4, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 349,931
Claims priority, application Japan, Jun. 12, 1986, 61-136758; Sep. 22, 1986, 61-224664; Nov. 21, 1986, 61-279250
Int. Cl.[4] A61B *17/06*
U.S. Cl. 606—223 **6 Claims**



1. A suturing needle with suture, comprising a needle in the form of an elongated hollow tube having a first end and a second end, the first end of the hollow tube being closed to form a needle point, and inner core material disposed within said hollow bore along substantially the entire length thereof and terminating a short distance inwardly of said second end having an outer diameter conforming to the inner diameter of said bore, weldment means welding the hollow tube to the inner core material at said first end and means fixing the inner core material to the hollow tube portion of said needle near said second end and spaced slightly toward said needle point from the end of said inner core material spaced inwardly from said second end, the first end of the hollow tube and adjoining portion of the inner core material being swaged after such welding to form said needle point, the space between said last mentioned end of the inner core material and said second end of the hollow tube defining a suture fixing hole opening through said second end of the hollow tube, and the suture having an end portion thereof inserted into and fixed in said suturing fixing hole.

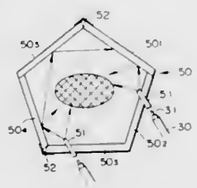
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4,901,723
DEPILATORY DEVICE
Avner Platek, Tel Aviv, Israel, assignor to Securicome Development Inc., Geneva, Switzerland
Filed Nov. 30, 1988, Ser. No. 277,713
Int. Cl.[4] A61B *17/00*
U.S. Cl. 606—133 **8 Claims**



1. A depilatory device comprising:
a portable housing having an outer portion adapted to be juxtaposed to an area of a user's skin from which hair sprouts,
an elongated elastically bendable member having a longitudinal axis, connected to the housing at said outer portion and having at least one edge formed with a plurality of slits and the slits being normally closed,
drive means in the housing for periodically bending the member laterally relative to said longitudinal axis and generally parallel to the user's skin and then reversing the direction of the bending thereby opening and closing the slits whereby some of the hairs are engaged in the slits when open are trapped when the slits close and are pulled out by moving the member relative to the user's skin.

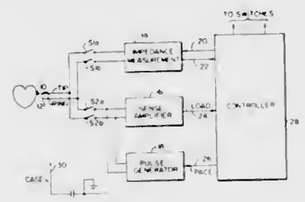
4,901,724
LIGHT RAY RADIATION DEVICE FOR USE IN MEDICAL TREATMENT
Kei Mori, 3-16-3-501,, Kaminoge, Setagaya-ku, Tokyo, Japan
Filed Mar. 16, 1988, Ser. No. 168,839
Claims priority, application Japan, Apr. 30, 1987, 62-108178
Int. Cl.[4] A61N *5/00*
U.S. Cl. 128—372 **2 Claims**



1. A light ray radiation device according to claim 2, wherein said first and said second directions are rotational directions with said longitudinal axis of said enclosure means being the center thereof.

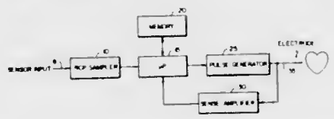
4,901,725
MINUTE VOLUME RATE-RESPONSIVE PACEMAKER
Tibor A. Nappholz, Englewood; John R. Hamilton, Littleton, and James C. Hansen, Denver, all of Colo., assignors to Telectronics N.V., Curacao, Netherlands
Filed Jan. 29, 1988, Ser. No. 150,038
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 PG **19 Claims**

1. A rate-responsive pacemaker comprising means adapted to a patient'heart for pulsing at a controlled rate; a bipolar lead having tip and ring electrodes for coupling said pulsing means to the patient's heart, said pulsing means extending pacing current pulses to said tip electrode, said tip electrode being positionable on the heart wall and said ring electrode being positionable in a blood vessel in the vicinity of the patient's pleural cavity; means for periodically applying measuring current pulses between said ring electrode and a reference point in said pacemaker; means for measuring the blood impedance between said tip electrode and said reference point



responsive to the application of a measuring current pulse between said ring electrode and said reference point, as the blood impedance varies as a function of the patient's pleural pressure; means responsive to said measuring means for determining the patient's minute volume; and means for changing said controlled rate in accordance with the patient's minute volume.

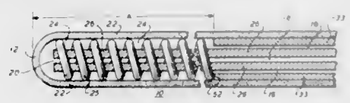
4,901,726
RATE-RESPONSIVE, DISTRIBUTED-RATE PACEMAKER
James C. Hansen, Denver, Colo., assignor to Telectronics N.V., Curacao, Netherlands Antilles
Division of Ser. No. 150,037, Jan. 29, 1988, Pat. No. 4,856,522.
This application May 22, 1989, Ser. No. 355,275
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 PG **6 Claims**



1. A control system comprising means for measuring a value of a controlling parameter; means for adjusting a controlled parameter; and control means for (a) calculating a total percentage of time, over an interval which is much longer than the response time of the system, that said controlling parameter is equal to or less than each of at least several values, (b) for representing a desired controlled-parameter distribution which for each of different percentages of time indicates said controlled parameter equal to or greater than that which is desired, and (c) responsive to a measured value of said controlling parameter, for relating said calculated total percentage of time for that controlling parameter to said desired controlled parameter for that percentage of time and for causing said adjusting means to adjust said controlled parameter to equal said desired controlled parameter for that percentage of time.

4,901,727
MICRO-PROBE FOR GAS SAMPLING
Brian Goodwin, Mountainside, N.J., assignor to The BOC Group, Inc., New Providence, N.J.
Filed May 5, 1988, Ser. No. 190,549
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—632 **11 Claims**

1. A blood gas catheter probe having a distal end for introduction into a patient's blood stream; said catheter probe comprising:
(a) an inlet for receiving a carrier gas;
(b) an outlet for removing carrier gas and blood gas contained therein from said catheter probe;
(c) an equilibration chamber at said distal end of said catheter probe forming a continuous gas flow path between said inlet and said outlet;
(d) a gas permeable membrane affixed to said catheter probe and surrounding said equilibration chamber, said membrane adapted to contact the patient's blood and allow equilibration of blood gases passing through said membrane into said carrier gas within said equilibration chamber and carrier gas passing through said membrane into the patient's blood stream to create a defined bolus of blood gases within said equilibration chamber;
(e) said equilibration chamber comprising an elongated tortuous path having a high ratio of surface area through which blood gases and carrier gases pass through said permeable membrane to unit volume of carrier gas in said equilibration chamber.

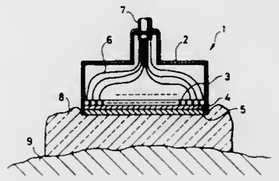


4,901,728
PERSONAL GLUCOSE MONITOR
Donald P. Hutchison, Knox County, Tenn., assignor to EOL, Inc., Oak Ridge, Tenn.
Continuation-in-part of Ser. No. 200,130, May 31, 1988, abandoned. This application May 1, 1989, Ser. No. 345,662
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—633 **9 Claims**



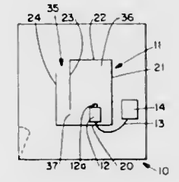
1. A device for the non-invasive determination of the concentration of blood glucose in a patient, which comprises:
a first source of infra-red light of a selected wavelength;
means for repetitively producing two alternating linearly-polarized orthogonal states of said infra-red light, said two states being equal in amplitude;
means for directing said two states of said infra-red light through a selected tissue of said patient;
polarizing means for receiving said two states subsequent to passage through said selected tissue of said patient;
means for detecting the intensity of said polarized light of each of said states passing through said polarizing means; and
means for determining a differential change in said intensity of said two states passing through said polarizing means as a result of rotation of said two states by glucose in said selected tissue of said patient to derive a signal related to concentration of said glucose.

4,901,729
ULTRASONIC PROBE HAVING ULTRASONIC PROPAGATION MEDIUM
Koetsu Saitoh, Tokyo, and Masami Kawabuchi, Yokohama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 10, 1988, Ser. No. 166,339
Claims priority, application Japan, Mar. 10, 1987, 62-54555
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—662.03 **5 Claims**



1. An ultrasonic probe assembly comprising:
(a) a body of an ultrasonic probe having means for transmitting and receiving ultrasonic waves; and
(b) an ultrasonic propagation medium attached to said means for transmitting and receiving, made of rubber containing a cross-linking agent, an amount of a main component of said cross-linking agent being less than 0.8 parts by weight, for 100 parts of said rubber.

4,901,730
THERMOGRAPHIC IMAGING ENCLOSURE
Ronald J. Vitori, Bethpage, and Edward M. Altchek, Riverhead, both of N.Y., assignors to New York Chiropractic College, Old Brookville, N.Y.
Filed Jan. 9, 1989, Ser. No. 294,819
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—664 **6 Claims**



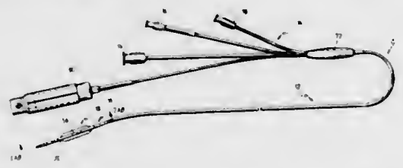
1. An enclosure system for the thermographic imaging of a patient in an examination room, including:
a plurality of vertical walls of cloth erected within an examination room to form an enclosure and an opening therein, said walls being sufficiently spaced apart so that the patient may stand within said enclosure, and said opening being sufficiently large so that the patient may walk therethrough;
a vertical wall of cloth connected to said enclosure and extending outwardly therefrom to form with one of said enclosure walls a passageway for the patient to walk therein, said passageway leading to said opening and protecting said opening from direct air currents arising exterior to said enclosure and within said room; and
an infra-red thermographic camera positioned within said enclosure to take a thermographic image of the patient and a display means to show a visual image of said thermographic image, said display means being exterior of said enclosure and within said examination room;

4,901,731

SINGLE SENSOR PRESSURE DIFFERENTIAL DEVICE

Huntly D. Millar, Houston, Tex., assignor to Millar Instruments, Inc., Houston, Tex.

Filed Apr. 27, 1988, Ser. No. 186,898
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—675 **29 Claims**



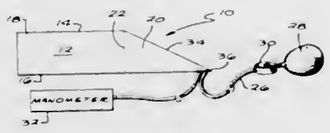
1. An apparatus for sensing the fluid pressure differential between two spaced apart locations in a fluid-filled biological vessel, comprising:
an elongated housing;
transducer means coupled to the ho using at a first location for sensing fluid pressure, and having a member which deforms in response to a fluid pressure differential thereacross and elongated leads operatively coupled to the member, the member presenting opposed outer and inner surfaces;
an elongated catheter body coupled to the bousing for receiving the leads; and
structure defining a conduit coupled to the housing and having one end opening at a second location spaced from the first location and the other end adjoining the inner surface of the member,
the housing being adapted for immersion in a fluid-filled biological vessel, with the housing immersed in the vessel, the second location being disposed within the biological vessel and the transducer means being operable for sensing the pressure differential between the fluid adjoining the outer surface of the transducer means and the fluid within the conduit adjoining the inner surface.

4,901,732

DELTA CUFF

Richard B. Williams, 1733 La Senda PL, South Pasadena, Calif. 91030

Filed Jan. 15, 1988, Ser. No. 144,203
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—686 **8 Claims**



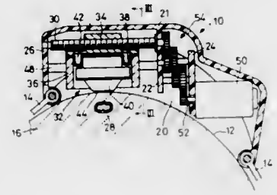
1. A sphygmomanometer comprising:
a. elongated bladder means for encircling the limb of a patient having first and second portions, one of said first and second portions having relatively converging sides with the convergence commencing at approximately midpoint of said bladder means and terminating at an apex;
b. means for inflating and deflating at least a portion of said bladder means including said relatively converging sides;
c. means for affixing said bladder means to a limb of a patient with said relatively converging sides overlying an artery in the limb of the patient;
d. said convergence being such that when said apex is disposed proximate said patient's lateral epicondyle bone the width of said bladder means at said patient's brachial artery is equal to substantially forty percent (40%) of the circumference of said patient's arm; and
e. means connected to said bladder means for measuring the blood pressure of said patient.

4,901,733

PULSE WAVE DETECTING APPARATUS

Noriyuki Kaida, Kakamigahara; Hifumi Yokoe, Kosai; Chikao Harada; Minoru Niwa, both of Nagoya, and Masanobu Yasui, Kyoto, all of Japan, assignors to Colin Electronics Co., Ltd., Aichi, Japan

Filed Feb. 21, 1989, Ser. No. 312,178
Claims priority, application Japan, Feb. 23, 1988, 63-22490[U]
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—687 **6 Claims**



1. A pulse wave detecting apparatus comprising:
a pulse wave sensor for detecting pulse wave produced from an arterial vessel of a subject, said pulse wave sensor being movable along a cross line crossing said arterial vessel so as to be positioned in place relative to said arterial vessel, and pressed against a body surface of said subject so as to detect said pulse wave produced from said arterial vessel;
a frame member for being set on said body surface of said subject;
guide means supported by said frame member, for guiding said pulse wave sensor within a predetermined length along said cross line;
a feeding screw supported by said frame member, said feeding screw being rotatable about a longitudinal axis thereof extending parallel to said cross line, said feeding screw being threadedly engaged with said pulse wave sensor;
a drive motor supported by said frame member such that said drive motor is located adjacent to said body surface when said frame member is set on the body surface of said subject; and
a transmission device provided between said drive motor and said feeding screw, said transmitting device transmitting rotating force of said drive motor to said feeding screw, so as to move said pulse wave sensor along said cross line.

4,901,734

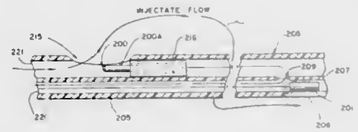
DUAL-THERMISTOR THERMODILUTION CATHETER

Joseph C. Griffin, Atco, and James L. Skaggs, Indian Mills, both of N.J., assignors to Nova Medical Specialties, Indian Mills, N.J.

Continuation-in-part of Ser. No. 85,552, Aug. 17, 1987, abandoned. This application Jun. 30, 1988, Ser. No. 214,002
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—692 **6 Claims**

1. A multilumen catheter for accurate single catheterization thermodilution measurement of cardiac output comprising:
an elongate multiple lumen catheter body having a distal end and a proximal end;
manifold means located at the proximal end of said catheter body for separately connecting the lumens of said catheter body to sources of fluid, sources of gas and instrumentation and measuring means;

a plurality of electrical connection means located in one of said lumens communicating with said instrumentation and measuring means and including at least two thermistors;
a first one of said thermistors being connected to at least one of said electrical connection means and being located adjacent the exterior surface of the catheter body near the distal end of said catheter body in a manner so as to be capable of sensing the temperature of fluids adjacent said exterior surface;
at least one other of said thermistors being connected to at least one other of said electrical connection means and



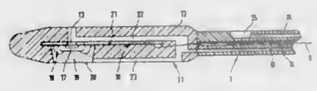
located proximally of said first thermistor by means of passage of said one other thermistor and attached electrical connection means from said one lumen containing said plurality of electrical connection means into a second of said lumens at a point adjacent said distally located first thermistor, and said one other thermistor being located at a predetermined locus proximal of said distally located first thermistor and affixed in said second lumen, said one other thermistor accurately sensing the temperature of fluid adapted to be present in said second lumen that is adapted to contact said one other thermistor.

4,901,735

PRESSURE METER CATHETER WITH IN-SITU ZERO SETTING

Peter von Berg, Neukeferloh, Fed. Rep. of Germany, assignor to Peter von Berg Extrakorporale Systeme - Medizintechnik GmbH, Kirchseeon/Eglharting, Fed. Rep. of Germany

Filed Oct. 20, 1988, Ser. No. 260,055
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1988, 3833723
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—748 **6 Claims**



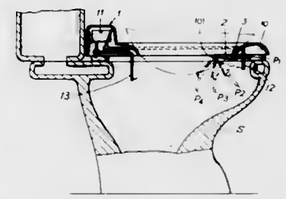
1. A pressure meter catheter comprising:
a hollow catheter tube whose lumen is open at both ends;
a fitting adapted to receive a gas pressure source connected to said lumen at or near one of said ends;
a measuring tip disposed at the other end, the measuring tip comprising:
a measuring tip body having a cavity,
a first opening at said measuring tip body, at which opening said cavity is connected with the lumen of said catheter tube,
a second opening at said measuring tip body open to the outside thereof,
an inflatable balloon, closely covering the outside of said measuring tip body and sealingly covering the second opening, a third opening in said measuring tip body connecting the inside of said balloon with the cavity of said measuring tip body,
a strain gauge, positioned on a support and sealingly covering a through bore in that support, which bore connects said cavity of said measuring tip body with said second opening, and being connected to electric measuring leads which pass through said catheter tube, said strain gauge sensing the difference between the pressure in the inside of said cavity and at the outside of said balloon,
said strain gauge being in a position of zero adjustment when said balloon is inflated by means of a gas pressure source.

4,901,736

TOILET HAVING URINE TESTER

Chuan-Chih Huang, P.O. Box 10160, Taipei, Taiwan

Filed Jun. 6, 1988, Ser. No. 202,419
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—760 **5 Claims**



1. A toilet having urine tester comprising:
a toilet seat seating on a toilet bowl, a warm water supplier for supplying warm water, a front nozzle for spraying warm water supplier from said supplier for flushing a user's genitals portion and a rear nozzle for spraying water from said supplier for flushing a user's anus;
a urine tester having a test medium stored therein, said test medium being selected from a plurality of floatable balls of different weights and colors for measuring specific gravity of an urine as filled in said tester, or a test paper, or a test reagent for visual detection of some disease symptoms directly from the tester; and
a positioning operator pivotally securing said tester on the toilet seat for operatively biasing said tester for receiving urine as passed from a user into said tester, or for positioning the tester for detection, or for flushing the tester as water-sprayed by said nozzles,
the improvement which comprises:
said urine tester including a test tube having the test medium filled therein, and a hopper portion secured on an opening of the tube, said hopper having a plurality of drain holes formed in a bottom of said hopper portion for passing a collected urine liquor through said drain holes into said tube, and having a lug for connecting said positioning operator; and said positioning operator including a link connecting the lug of said tester to normally pose said tester under a front portion of said toilet seat, a rotating knob secured on a side arm portion of said link, and a positioning locker mounted on the toilet seat for selectively biasing said link and said tester for testing or flushing operations.

4,901,737

METHOD AND THERAPEUTIC APPARATUS FOR REDUCING SNORING

Kent J. Toone, 1551 Elka Ave., San Jose, Calif. 95129

Filed Apr. 13, 1987, Ser. No. 37,609
Int. Cl.[4] A61P *5/56*
U.S. Cl. 128—848 **12 Claims**

1. A therapeutic appliance for reducing adult oro-pharyngeal occlusion-induced snoring and obstructive sleep apnea during sleep periods, adapted to fit between the maxillary and mandibular dentition in the adult oral cavity, comprising in operative combination:

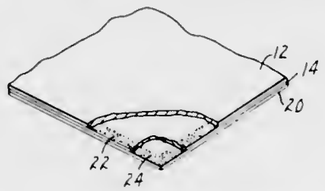
(a) a pair of generally V-shaped spacer members, each having a truncated apex and a base spaced from said apex, said spacers being adapted to be positioned in an adult oral cavity between the maxillary and mandibular dentition with the apex toward the posterior of the dental arches;
(b) said V-shaped spacers being disposed in a spaced-apart, side-by-side relationship removably insertable and matingly engaging at least one of the maxillary bicuspids and molars and the alveolar process of the maxilla and at least one of the mandibular dentition of an adult patient and the alveolar process of the mandible;
(c) said V-shaped spacers being oriented with said base of each adjacent the bicuspids and the apex of each adjacent the molars of the dental arch;
(d) an arcuate member bridging the space between the base of said spacers and extending to cover the lingual surfaces of the mandibular incisors;
(e) said arcuate member having a lip portion extending over a portion of the labial surface of the mandibular incisors, the incisors being matingly embedded in said lip portion;
(f) a first pair of flanges, each extending from said V-shaped spacers along the lingual surface of the mandible; and



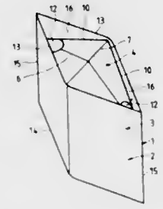
(g) a second pair of flanges, each extending from said V-shaped spacers along the palatal surface of at least one of said maxillary bicuspids and molars, and having a forward margin;
(h) an arcuate cingulum wire disposed to bridgingly join the forward margins of said second pair of flanges;
(i) a molar clasp disposed at the first maxillary molars, left and right;
(j) said palatal flanges are connected by at least one means for lateral stiffening;
(k) said spacers and said arcuate bridge member being adapted;
(i) to provide a substantial vertical distance between the maxillary and mandibular dentition to create an open mouth position;
(ii) to maintain the mandible in said open mouth position within the range of from about 10 to about 20 mm inferior and from about 3 to about 6 mm anterior as compared to the normal closed position of the mandible to create an open oral airway to permit functional breathing through the oral cavity; and
(iii) to cause both anterior and inferior repositioning of the tongue to reduce incidence of tongue-induced obstructive sleep apnea and snoring associated therewith.

4,901,738
LASER SHIELD
Robert H. Brink; James H. C. Harper, and Steven T. Link, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 33,004, Mar. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 865,518, May 21, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 285,324
Int. Cl.[4] A61F *13/00*; **A61B** *17/36*; **B32B** *31/00*; **B60R** *13/00*
U.S. Cl. 128—849 **26 Claims**

1. A laser-resistant surgical drape comprising an opaque, flexible, fabric sheet having one major surface juxtaposed with a reflective surface of a metal foil, said fabric sheet having about 40 or less pieces of lint/cm^2; said metal foil having a thickness sufficient to resist puncture by a CO^2 laser beam, 0.4 mm in diameter, using 20 watts of power for at least one second; and said fabric sheet and said metal foil having thicknesses sufficient to provide said laser-resistant surgical drape with a rigidity of less than about 0.1 kg·mm.



4,901,739
FOLDING, DISPOSABLE RECEPTACLE FOR RUBBISH, SUCH AS AN ASHTRAY OR A WASTE BIN
Roberto Benavente, 13, Rue deL'Abbee Rousseau, F-78000 Versailles; Jean-Baptiste Lacoudre, 21, Rue du Fanbourg Sainte Antoine, F-75011 Paris, and Catherine Vialatel, 21, Rue du Fanbourg Sainte Antoine, F-75011 Paris, all of France
Filed Jun. 2, 1988, Ser. No. 201,550
Claims priority, application France, Jun. 3, 1987, 87 07766
Int. Cl.[4] A24D *1/00*
U.S. Cl. 131—231 **11 Claims**



6. The receptacle of claim 1, wherein said sheet material consists of or contains fire-resistant paper.

4,901,740
APPARATUS FOR THREADING WEBS IN CIGARETTE ROD MAKING MACHINES AND THE LIKE
Uwe Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany
Filed Dec. 14, 1983, Ser. No. 561,224
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1982, 3248149
Int. Cl.[4] A24C *5/20*
U.S. Cl. 131—280 **20 Claims**

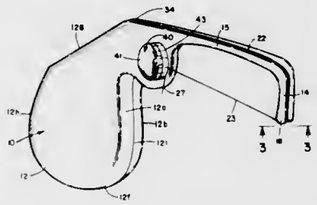
1. Apparatus for threading an elongated flexible web through a processing machine, particularly for threading a web of cigarette paper through a cigarette rod making machine, wherein the properly threaded web advances in a predetermined direction along a predetermined path and wherein a portion of said path includes of constitutes an expandible obstruction whose width normally suffices solely for advancement of the web therethrough, comprising an endless flexible conveyor having a portion extending along said path; means for driving said conveyor in said direction; entraining means provided on said conveyor and arranged to engage the leader of a web which is to be threaded through the machine; and means for expanding the obstruction of the path, at least while said entraining means advances the leader along said portion of said path, so that the expanded obstruction does not interfere



with advancement of the entraining means along said portion of said path.

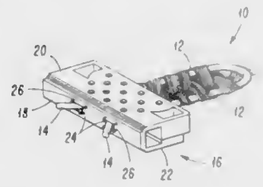
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ture member having first and second tips each formed to guide the floss across the tips of the armature member;
said handle portion, barrel portion, and armature portion defining a path for a length of dental floss paid out from said spool so that said floss travels from said spool through said housing, along said barrel portion, around one side of said armature, and over its tip to the other tip of said armature;



anchor means mounted on said armature for anchoring the free end of said floss;
cutting means mounted on said housing for cutting said dental floss; and
detente means for selectively preventing said spool from turning whereby dental floss may be selectively paid out from said spool.

4,901,741
HAIR WAVING DEVICE
Martha Kelsey, Fairfield, Iowa, assignor to Uptown Products, Inc., Fairfield, Iowa
Filed Jun. 20, 1988, Ser. No. 208,681
Int. Cl.[4] A45D *6/14, 6/16*
U.S. Cl. 132—251 **9 Claims**



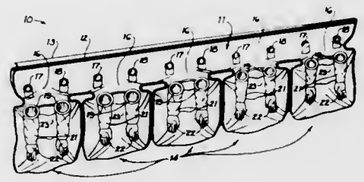
1. A hair waving device comprising a U-shaped curler having generally parallel legs joined at their inner ends and open at their free ends, an end clip removably combined with the free ends of the curler to retain in place hair wound on the curler, the end clip having a first thin wall and a second thin wall hingedly secured to the first wall to form a hinged connection so that the walls are moveable toward and away from each other, a pair of openings between the first and second walls along the hinged connection between them, the openings being spaced apart a distance to receive the legs of the curler and to allow the end clip to be slid onto the legs of the curler, and locking means for securing the first and second walls together when moved toward each other to cover the ends of the hair wound on the curler.

4,901,742
DENTAL FLOSSER-DISPENSER
Mary Lou C. Olson, 1147 Ivyhill Dr., Mendota Heights, Minn. 55118
Filed Apr. 28, 1988, Ser. No. 187,331
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—325 **5 Claims**

1. A dental floss dispensing and holding device comprising:
a pistol-shaped housing including a hollow handle portion and a barrel portion, said handle portion sized to be gripped in the palm of a human hand, said handle portion having rotatably mounted therein a spool of dental floss;
a floss holding a U-shaped armature member mounted on the end of said barrel portion so that the plane of the armature is generally orthogonal to said barrel portion, said arma-

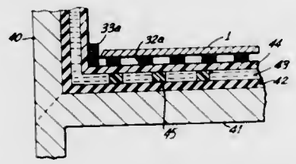
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4,901,743
SAFETY GLOVE BAG
Kurt Hittler, Atlanta, Ga., assignor to Grayling Industries, Inc., Alpharetta, Ga.
Filed Dec. 2, 1988, Ser. No. 278,732
Int. Cl.[4] B08B *15/02*
U.S. Cl. 134—172 **12 Claims**



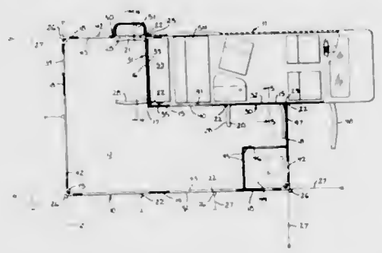
1. An apparatus for use in removing hazardous material from an elongated pipe said apparatus comprising
a containment bag having an elongated, substantially tubular manifold sized to be loosely mounted about the pipe for insuring continuous removal of hazardous material along the entire length of elongated pipe,
a plurality of debris collection pouches depending from said manifold, each of said pouches being joined to said manifold by a neck portion,
adjacent pouches being joined by a series of mutually spaced annular portions of said manifold,
means for tieing the extreme ends of said manifold tightly to the pipe,
and means for supporting said annular portions of said manifold loosely about the pipe.

4,901,744
METAL PICKLING BATH TANK
Lars J. Hansen, West Alexander, Pa., assignor to Hansen Engineering, Inc., West Alexander, Pa.
Filed Aug. 12, 1988, Ser. No. 231,781
Int. Cl.[4] B08B *3/10*
U.S. Cl. 134—64 R **9 Claims**



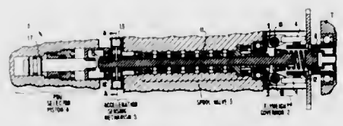
1. A system for the chemical cleaning of metal including:
a tank in which the metal is cleaned by a liquid chemical;
means to introduce said liquid chemical into said tank and maintain the temperature of said liquid in excess of 180°;
means to move said metal within said tank so that the liquid chemical flows over the surface of said metal;
wherein said tank comprises a metal outer shell having interior and exterior faces and a plastic resin inner shell which fits within the outer shell, holds said liquid, is not adhered to said outer shell and which is free to contract and expand relative to said outer shell, and further including a layer of rubber-like material covering the inner face of the outer shell and adhered thereto and not adhered to said inner shell.

4,901,745
TENT ASSEMBLY FOR ATTACHMENT TO A VAN
Dale D. Rice, 3500 W. Tillman St., Appleton, Wis. 54914
Filed Jul. 12, 1989, Ser. No. 378,643
Int. Cl.[4] E04H *15/06*
U.S. Cl. 135—88 **14 Claims**



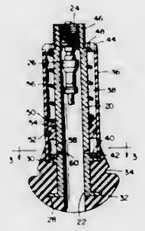
1. A tent assembly for attachment to a van-type vehicle or for freestanding use comprising:
a generally L-shaped enclosure including a roof, side walls, and a floor;
said side walls including a pair of interior walls on the interior of the L shaped enclosure disposed generally perpendicular to one another and having a common vertical edge defining an interior corner and opposite vertical edges, and outer wall means extending between the opposite vertical edges of said interior side walls;
said interior side walls having upper horizontal edges;
demountable attachment means on the upper horizontal edges of the interior side walls for attachment to the rear and one side of the vehicle to support a part of the tent assembly;
first tent support means operatively attached to the outer wall means for supporting the remainder of the tent assembly; and,
second tent support means adapted to cooperate with said demountable attachment means in the absence of said vehicle to support said part of the tent.

4,901,746
ANTICIPATING OVERSPEED GOVERNOR
Jeffrey D. Metcalf, Albion, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Jun. 27, 1988, Ser. No. 211,876
Int. Cl.[4] G05D *13/34*
U.S. Cl. 137—48 **5 Claims**



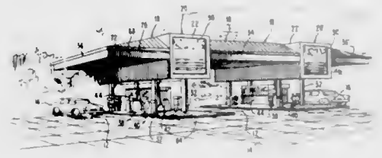
1. A speed responsive control device comprising speed responsive means for activating a member as a function of the speed of movement of said speed responsive means, acceleration responsive means for activating said member as a function of the acceleration of said speed responsive means, coupling means for moving the acceleration responsive means with the sp-ed responsive means, said coupling means including said member, wherein the movement of said speed responsive means is rotary movement, said coupling means rotating the acceleration responsive means with the speed responsive means, wherein said acceleration responsive means includes a flywheel adapted to be rotated with said member of said coupling means and cam means between said flywheel and said member for axially moving said member in response to an acceleration of said speed responsive means, wherein said cam means includes at least one cam slot in one of said flywheel and said member and at least one cam follower on the outer of said flywheel and said member and extending into said cam slot, said at least one cam slot including respective portions which are angled in opposite directions, and means for adjusting the axial position of the flywheel with respect to the member for positioning the at least one cam follower in a selected one of said respective angled portions of the at least one cam slot depending upon the direction of rotation of said speed responsive means, member and flywheel.

4,901,747
TIRE INFLATION VALVE WITH PRESSURE INDICATOR
Enrique M. Yabor, Miami, Fla., assignor to David Moliver, Miami, Fla., a part interest
Filed Jun. 29, 1988, Ser. No. 212,907
Int. Cl.[4] F16K *37/00*; **B60C** *23/00*
U.S. Cl. 137—227 **4 Claims**



1. A tire inflation valve and air pressure indicating device comprising an elongated rigid main stem having an axial bore extending therethrough and open at its respective inner and outer ends, a normally closed tire valve mounted in the outer end portion of said main stem, an external cylindrical sleeve mounted on the main stem in concentrically spaced relation and in sealed relation to the stem, a piston slidably and sealingly mounted in the space between the stem and sleeve, spring means within the sleeve to bias the piston in one direction, an air chamber in the space between the sleeve and stem in communication with the bore through the main stem thereby communicating air pressure in the tire with the air chamber for moving the piston against the spring means, said sleeve being transparent to enable visual observation of the movement of the piston and graduated scale means on the sleeve associated with the piston to indicate air pressure within the tire, said stem including an inner flange, said sleeve having an inner end seated on the flange and a sealing gasket between the inner end of the sleeve and the flange, and air passages extending radially from the interior bore of the stem to the air chamber immediately outwardly of the inner end of the sleeve, said spring means being a calibrated coil spring between the piston and the outer end of the sleeve.

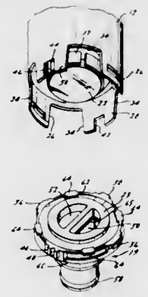
4,901,748
FILLING STATION STRUCTURE
Albert Shotmeyer, 1 Valley St., Hawthorne, N.J. 07506
Filed May 18, 1984, Ser. No. 611,986
Int. Cl.[4] B60S *5/02*
U.S. Cl. 137--234.6 **20 Claims**



1. A filling station structure comprising:
(a) a canopy for covering an area for refueling vehicles, said canopy being disposed above ground level and above the level of the vehicles to be refueled; and
(b) at least one fuel storage vessel holding fuel to be dispensed to the vehicles, said fuel storage vessel being contiguous with said canopy and being disposed above ground, whereby said canopy and above-ground fuel storage vessel together form an integrated, covered, above-ground filling station.

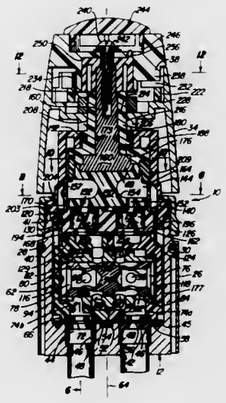
4,901,749
REVERSIBLE BOTTOM VALVE CARTRIDGE WITH AN ORIENTING MECHANISM
Joe D. Hutto, Indianapolis, Ind., assignor to Masco Corporation of Indiana, Taylor, Mich.
PCT No. PCT/US87/01561, § 371 Date Feb. 24, 1989, § 102(e) Date Feb. 24, 1989, PCT Pub. No. WO88/10386, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 25, 1987, Ser. No. 369,562
Int. Cl.[4] F16K *11/06, 25/00*
U.S. Cl. 137--270 **13 Claims**

8. A cartridge for a faucet valve that regulates the flow rate of liquid from a supply inlet to said faucet, said cartridge characterized by:
a main shell;
an operating mechanism mounted to said shell;
a movable valve element operably connected to said operating mechanism;
a separate reversible bottom member mounted to said shell;
said bottom member includes a fixed valve seat to cooperate with said movable valve element;
an orienting and indicating means for assuring a single standard orientation of said bottom member; and



means for overriding said orienting and indicating means for deliberate reversing of the orientation of said bottom member.

4,901,750
TEMPERATURE AND VOLUME CONTROL VALVE ASSEMBLY
James R. Nicklas, Noblesville, Ind., and Robert D. MacDonald, Scottsdale, Ariz., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Sep. 30, 1988, Ser. No. 251,627
Int. Cl.[4] F16K *11/12, 51/00*
U.S. Cl. 137—270 **22 Claims**



13. A mixing valve characterized by:
a valve housing having a first and econd supply port and a mixed fluid discharge port;
a valve means for controlling the proportion of flow from each respective supply port to said mixed fluid discharge port by having a first position wherein said first supply port is open and said second supply port is closed and movable to a second position wherein said second supply port is open and said first supply port is at least partially closed;
an operating stem connected to said valve means for adjusting the proportion of flow from each respective supply port;
a handle operably connected to said stem;

limit means for limiting the movement of said handle with respect to said valve housing;

said valve means constructed so that when fluids supplied to the respective first and second ports are interchanged said valve means can be moved such that it undergoes a reverse function wherein an initial position opens said second port and closes said first port and a final position opens said first port and at least partially closes said second supply port;

an orienting insert means interposed between said operating stem and said handle to orient the handle with respect to said housing such that said handle has a first position and is movable to a second position when said valve means is in one of its first position and initial position and is movable to one of its second position and final position respectively; and

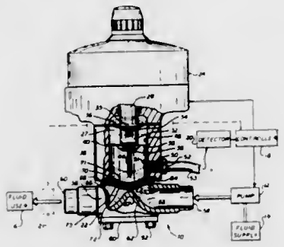
a positive engaging means affixed to said orienting insert means and allowing said insert to be positioned with respect to said handle in only a first position and being removable to allow said handle to be deliberately oriented with respect to said stem and insert in an alternate position.

4,901,751

FLUID CONTROL VALVE AND SYSTEM WITH LEAK DETECTION AND CONTAINMENT

Carl E. Story, Capertino; Jerry A. Nichols, San Jose, and Byron C. Cady, Gilroy, all of Calif., assignors to Systems Chemistry, Inc., Milpitas, Calif.

Filed Jun. 15, 1989, Ser. No. 366,729
Int. Cl.[4] G01M *3/08, 3/38;* **F16K** *37/00, 51/00*
U.S. Cl. 137—312 **10 Claims**



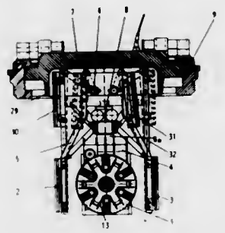
responsive to said leak detection signal and operative to cause said actuator means to close said valve and terminate the flow of fluid from said source to said user to prevent any contamination in the chamber from entering into the fluid flow.

4,901,752

APPARATUS FOR MAINTENANCE OF BALL VALVE

Knut Horvei, Sandnes, Norway, assignor to Statoil, Norway

PCT No. PCT/NO88/00062, § 371 Date May 4, 1989, § 102(e) Date May 4, 1989, PCT Pub. No. WO89/01584, PCT Pub. Date Feb. 23, 1989
PCT Filed Aug. 15, 1988, Ser. No. 346,023
Claims priority, application Norway, Aug. 17, 1987, 873446
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—315 **10 Claims**



1. In a fluid control system including control means and valve means responsive thereto for controlling the flow of fluid between a source and a user, an improved valve means comprising:

a valve including a valve seat and closure means carried by a first diaphragm means for engaging said valve seat to terminate flow through said valve, said valve seat being formed by the top of a weir and said closure means including a rib formed in a surface of said first diaphragm means and extending across a diameter thereof so that substantially equal surface areas of said first diaphragm means are disposed on opposite sides of said weir, said rib being adapted to engage said valve seat to effect closure of the fluid flow path through said valve;

secondary diaphragm means and housing means cooperating with said first diaphragm means to form a closed containment chamber;

actuator means extending through said chamber to selectively cause said closure means to move between an open state and a closed state; and

leak detector means disposed in sealed communication with said chamber to detect the presence of any fluid entering said chamber and operative to generate a leak detection signal which can be used to provide an immediate indication of a leak into said chamber, said control means being

1. Apparatus for maintenance of a ball valve's moveable pipe seat sleeve (52), with its seating surfaces and seals characterized in that the apparatus comprises a bonnet (7) designed in order to be secured to and form a tight connection with a valve flange (53) of a valve body, said apparatus being secured to the underside of the bonnet (7) within said valve housing, said apparatus comprising:

a grinding tool (1) for grinding spherical seating surfaces (56) and conical sealing surfaces (51) of said seating surfaces in said valve housing;

a dismounting tool (3) for the dismounting of old sealing rings (26*a*) on the pipe sleeves (52);

a mounting tool (2) for the mounting of new sealing rings (26*b*) on the pipe sleeves (52); and

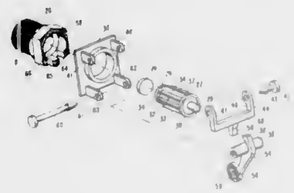
a turning mechanism for rotating the grinding tool (1) and the pipe sleeves (52) through a range of 90° to orient the grinding tool (1) in the required position for grinding of said valve seat.

4,901,753

FLOAT ASSEMBLY VALVE

Bernard A. Barker, 339 S. Cedar, Monticello, Iowa 52310

Continuation-in-part of Ser. No. 320,331, Mar. 7, 1989, abandoned. This application Jul. 11, 1989, Ser. No. 378,467
Int. Cl.[4] F16K *43/00, 31/26, 33/00*
U.S. Cl. 137—315 **27 Claims**

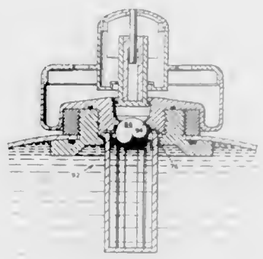


4,901,754

VALVE IMPROVEMENTS

Chester A. Sible, Rancho California; Lawrence V. Maldarelli, Tustin; Henry Church, Whittier, and Roy Graboff, Granada Hills, all of Calif., assignors to Anthony Industries, Inc., City of Commerce, Calif.

Division of Ser. No. 202,208, Jun. 3, 1988, which is a division of Ser. No. 919,890, Oct. 15, 1986, Pat. No. 4,778,595. This application May 2, 1989, Ser. No. 346,135
Int. Cl.[4] F16K *31/22, 33/00, 25/00*
U.S. Cl. 137—433 **9 Claims**



4. A valve comprising in combination:

a valve body having a passageway and including a port;

a valve member having a spherical surface;

an annular channel in said valve body and about said port, said annular channel including an inclined wall describing a conical surface having a diameter decreasing toward said passageway, said inclined wall terminating at a channel wall adjacent said inclined wall;

an O-ring having an inside diameter smaller than the diameter of the spherical surface of said valve member, said O-ring being in contact with said inclined wall for sealing said port when said spherical surface of said valve member is forced against said O-ring wherein said O-ring is caused to roll upon and wedge against said inclined wall without contacting said adjacent wall; and

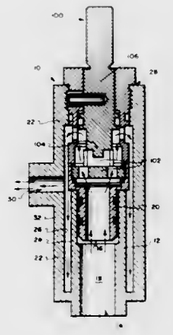
support means for supporting said valve member when said spherical surface of said valve member is not in contact with said O-ring.

4,901,755

VALVE HOUSING FOR CARTRIDGE TYPE FAUCETS

Harvey B. Rodstein, deceased, late of Los Angeles, Calif., and by Barbara L. Rodstein, executrix, 1171 Robert La., Los Angeles, Calif. 90024

Continuation of Ser. No. 212,085, Jun. 27, 1988, abandoned, which is a continuation of Ser. No. 101,772, Sep. 28, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 325,042
Int. Cl.[4] F16K *27/06*
U.S. Cl. 137—454.5 **4 Claims**



4. The combination of a cartridge type valve assembly and a housing for removably receiving said valve assembly while retaining adjustability of the turning torque for operating the valve independently of seating said valve assembly in said housing, comprising:

said housing being integrally formed and having a generally elongated tubular wall adapted to be vertically disposed, said tubular wall having an open upper end which is interiorly threaded, said wall having an opening formed therein about midway of its length to provide an outlet port;

said valve assembly having a threaded base received in said interiorly threaded upper end of said wall of said housing, said valve assembly being of the disc type and having a lower end which projects into the lower portion of said housing and having a disc retainer threadably supported thereon which may be axially adjusted for adjusting the turning torque for operating the valve, and for removal and replacement of the discs of said valve assembly; and

the interior upper surface of said lower portion of said housing wall being drilled to a larger diameter than the interior surface of the lower extremity thereof, and said valve assembly lower end extending into said drilled portion of said housing wall but not the full length of said drilled portion, so that said lower end of said valve assembly is slidably and sealingly received therein with room for axial adjustment by threadably advancing or retreating said threaded base along said lower end of said valve assembly and thereby permitting selected adjustment of the turning torque between the discs of said valve assembly for operation of the valve.

4,901,756

I/P CONVERTER WITH SIMULATED COMPENSATION

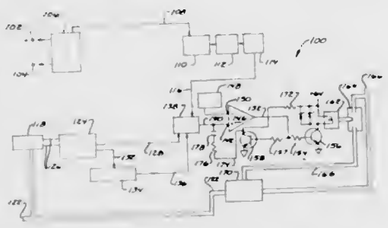
Bruce D. Rovner, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed May 11, 1989, Ser. No. 350,246
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—487.5 **15 Claims**

1. A converter controlling a line pressure according to a signal received by the converter indicating a desired pressure, comprising:

sensing means for sensing the line pressure and the signal, the sensing means receiving compensation and providing a compensated output representative of the line and desired pressures;

first driver means for providing an actuator drive as a function of the compensated output;



actuator means for controlling the line pressure as a function of the actuator drive, the actuator means presenting an actuator load to the actuator drive;

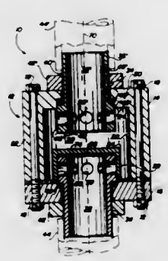
a simulation circuit including a simulated load simulating a desired portion of the actuator load and a second driver providing drive thereto as a function of the compensated output and generating the compensation representative of the actuator drive but isolated from the actuator load.

4,901,757

ONE WAY VALVE

Robert W. Clark, Jr., 2232 W. Joan de Arc Ave., Phoenix, Ariz. 85029

Filed Jan. 23, 1989, Ser. No. 299,419
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—496 **7 Claims**



1. A one way valve comprising:

a valve housing having inner wall means forming a valve chamber;

an inlet port mounted in the housing, a portion of the inlet port projecting into the valve chamber, said inlet port including a passage through which fluids can flow into the valve chamber;

an outlet port mounted in the housing, a portion of the outlet port projecting into the valve chamber, said outlet port including a passage through which fluids can flow into the valve chamber, the outlet port being a substantial duplicate of the inlet port and the portions of the inlet port and the outlet port projecting into the valve chamber being spaced apart a predetermined distance from each other;

seal means mounted on the inner wall means of the valve housing and around the portion of the inlet port projecting into the valve chamber;

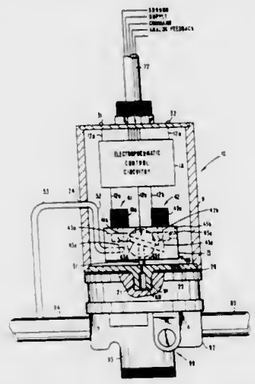
valve cap means movably mounted on the inlet port, said valve cap means having a free edge and a first and a second position, said valve cap means in its first position contacting the portion of the outlet port projecting into the valve chamber to permit fluids to flow through the passage of the inlet port through the valve chamber and into the outlet port; the free edge of the valve cap means engaging the seal means to prevent fluids from flowing from the outlet port through the valve chamber into the passage of the inlet port when the valve cap means is in its second position; the only forces acting to move the valve cap between its first and second positions being do to accelerations to which the valve is subjected and the difference between the pressure of the fluid in the valve space and the pressure of the fluid in the passage of the inlet port.

4,901,758

DEVICE FOR THE REMOTE CONTROL OF PNEUMATICALLY OPERATED MECHANISMS, WHICH HAS FAST, HIGH RESOLUTION RESPONSE OVER A BROAD RANGE OF PRESSURES AND WHICH IS INSENSITIVE TO POSITION OR VIBRATION

Daniel E. Cook, 300 N. Leland, Fortville, Ind. 46040, and Edward D. Lewis, 6042 Schoolwood Dr., Speedway, Ind. 46224

Filed Jun. 27, 1986, Ser. No. 879,455
Int. Cl.[4] G05D *9/12*
U.S. Cl. 137—487.5 **7 Claims**



1. A device for the remote control of a pneumatically operated mechanism, the mechanism having a pneumatic input port, said mechanism operating in response to the pressure applied to its pneumatic input port; said device comprising:

(a) input/output means for defining an output control pressure port, an input supply pressure port, an output vent port, and an electrical connection port, said output control pressure port being configured to interlock in fluid communication with the pneumatic input port of said mechanism, said electrical connection port including a supply voltage connection and a signal voltage connection;

(b) a transducer, said transducer having a pneumatic input pressure sensor in fluid communication with said output control pressure port, said transducer including means for receiving a supply voltage from said supply voltage connection, said transducer further including means for generating an electrical signal output in proportion to the pressure sensed by said sensor;

(c) a pressure supply valve, said pressure supply valve having a first port in fluid communication with said input supply pressure port and a second port in fluid communication with said output control pressure port;

(d) a pressure vent valve, said pressure vent valve having a first port in fluid communication with output control pressure port and a second port in fluid communication with said output vent port;

(e) said pressure supply valve and said pressure vent valve being characterized by three static states; an open state in which said valves are fully open, a closed state in which said valves are fully closed, and a seeping state in which said valves seep;

(f) control circuitry, said control circuitry including means for receiving a supply voltage from said supply voltage connection, means for receiving a signal voltage from said signal voltage connection and means for receiving the electrical signal output from said transducer, said control circuitry further including means for comparing said signal voltage from said signal voltage connection with said electrical signal output from said transducer and means for generating a control output signal corresponding to the compared difference;

(g) said pressure supply valve being responsive to said control output signal by opening when said control output signal indicates said signal voltage to be greater than said electrical signal output by more than a specified difference, and by closing when said control output signal indicates said signal voltage to be less than said electrical signal output by more than said specified difference;

(h) said pressure vent valve being responsive to said control output signal by closing when said control output signal indicates said signal voltage to be greater than said electrical signal output by more than specified difference, and by opening when said control output signal indicates said signal voltage to be less than said electrical signal output by more than specified difference;

(i) said pressure supply valve being responsive to said control output signal by seeping when said control output signal indicates said voltage to be greater than said electrical signal output by less than said specified difference, and by closing when said control output signal indicates said signal voltage to be less than said electrical signal output by less than said specified difference; and

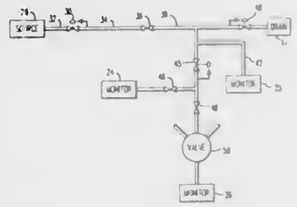
(j) said pressure vent valve being responsive to said control signal by closing when said control output signal indicates said signal voltage to be greater than said electrical signal output by less than a specified difference, and by seeping when said control output signal indicates said signal voltage to be less than said electrical signal output by less than a specified difference.

4,901,759

CONSTANT FLOW AND CONSTANT PRESSURE FLUID REGULATOR

James C. Bellows, Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 20, 1988, Ser. No. 196,695
Int. Cl.[4] F16K *11/10*
U.S. Cl. 137—505.12 **9 Claims**



1. A flow and pressure regulator, comprising:

fluid supply means for supplying a fluid;

regulation means for transferring the fluid at a constant outlet pressure and constant inlet flow from said fluid supply means without exposure of the fluid to atmosphere; and

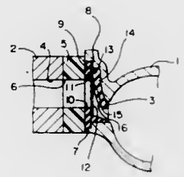
a drain coupled to said regulation means and receiving a variable amount of the fluid as both the constant outlet pressure and constant inlet flow are maintained.

4,901,760

REED VALVE MEANS

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Mitaka, Japan

Filed Mar. 10, 1988, Ser. No. 166,536
Claims priority, application Japan, Mar. 18, 1987, 62-39703[U]
Int. Cl.[4] F16K *15/14*
U.S. Cl. 137—514 **2 Claims**



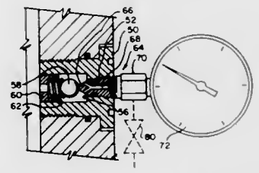
1. Reed valve means arranged between an upstream member and a downstream member for opening and closing a fluid flow port comprising a valve plate held at one end thereof by a valve seat member of a resilient material and an open position regulating member of a resilient material, an inner contour of said fluid flow port is formed so as to be complementary to the outer shapes of said reed valve means so that the reed valve means is held press-fitted against the interior of said fluid flow port by said upstream and downstream members.

4,901,761

CLOSURE APPARATUS WITH PRESSURE TEST DEVICE

William T. Taylor, P.O. Box 309, Warren, Tex. 77664

Filed Oct. 6, 1988, Ser. No. 254,147
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—/557 **8 Claims**



1. A closure valve apparatus having a pressure test device and adapted for threaded connection between a drilling kelly and a drillpipe, the apparatus including a tubular upper body having a valve seat, a tubular lower body threadedly connected to said upper body, a closure check valve movably mounted in spring loaded relation within said lower body to be normally seated in closed relation against said valve seat and to permit flow of fluids under pressure only from said kelly into said drillpipe, and a pressure test device connected into a side port formed in said lower body between said valve seat and drill pipe connected to said lower body, said pressure test device comprising:

(a) a generally cylindrical test body threaded into sealed relation into said side port with said test valve body having an exterior stop flange disposed in an exterior counter bore formed in said side port;

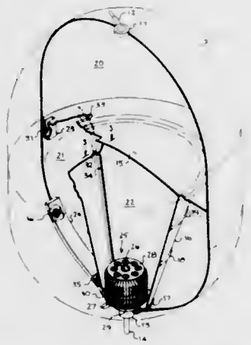
(b) a test bore and a test counter bore axially formed through said test valve body;
(c) a spring retainer sleeve in threaded connection in said test counter bore;
(d) a check test valve urged by a spring into closed position against a test valve seat formed between said test bore and said test counter bore, said spring being disposed in compression between said test check valve and said retainer sleeve;
(e) a test probe body having a probe nose adapted to push said test valve away from said test valve seat as said test probe body is threaded into connection within said test bore;
(f) said test probe member having a fluid pressure passageway extending from said probe nose to a pressure gauge connected to said test probe member; and
(g) said test probe member being adapted to transmit fluid pressure from said lower body past said test valve to said pressure gauge when said probe nose has been extended to push said test valve away from said test valve seat.

4,901,762

LIQUID-PROPELLANT MANAGEMENT APPARATUS

John A. Miller, Jr., San Jose, and R. K. Grove, Los Altos, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Oct. 3, 1988, Ser. No. 251,736
Int. Cl.[4] B64G *1/00*
U.S. Cl. 137—574 **32 Claims**



1. A liquid management system for a spacecraft, said system comprising:
(a) a tank;
(b) partitions dividing said tank into at least three interior chambers; and
(c) port structures interconnecting said interior chambers of said tank, said port structures being configured and being positioned adjacent an interior surface of said tank so that said interior chambers can be emptied of liquid in sequence under substantially all conditions of acceleration.

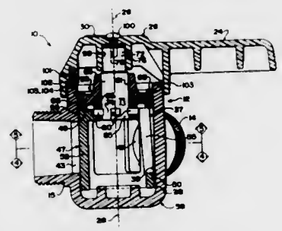
4,901,763

FLUID VALVE APPARATUS

Blayney J. Scott, 306 Dallas Road, Victoria, British Columbia, Canada (V8V 1A7)

Filed Dec. 13, 1988, Ser. No. 283,830
Int. Cl.[4] F16K *25/00, 11/085*
U.S. Cl. 137—625.47 **20 Claims**

1. A fluid valve apparatus having:
(a) a body having a spool cavity defined by a cavity sidewall, the sidewall having inlet and outlet ports therein spaced peripherally around the cavity sidewall,
(b) a spool mounted for rotation within the spool cavity, the spool having interconnected spool inlet and outlet portions which are spaced peripherally around the spool and are registrable with the inlet and outlet ports to pass fluid through the valve, the spool having a spool closure portion spaced peripherally between the spool inlet and outlet portions, relative angular spacing between the inlet and outlet ports of the body being similar to relative angular spacing between the closure portion and the inlet portion



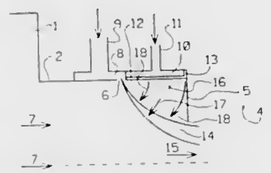
of the spool so that the outlet port can be closed by the closure portion when the inlet port is aligned with the inlet portion,
(c) the spool also being mounted for limited essentially radial movement for seating the spool closure portion against the outlet port when positioned adjacent the outlet port, fluid pressure acting on the spool forcing the closure portion against the outlet port for sealing therewith.

4,901,764

DYNAMIC CONFINEMENT AND CONTACTLESS DOCKING

Francois Meline, Paris, France, assignor to Societe Generale Pour les Techniques Nouvelles -SGN-, Saint Quentin En Yvelines Cedex, France

Filed Oct. 18, 1988, Ser. No. 259,302
Claims priority, application France, Oct. 20, 1987, 87 14469
Int. Cl.[4] F24F *9/00*
U.S. Cl. 137—803 **8 Claims**



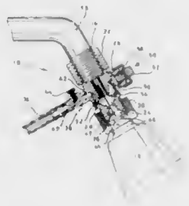
1. An apparatus for isolating an enclosure from external pollution, said enclosure being associated with a tube having one end opening out into said enclosure and having its opposite end open, the apparatus comprising:
at least one slot provided in the inside wall of said tube in the vicinity of its open end, said slot being disposed in a plane perpendicular to the axis of said tube and sloping towards said opening, means for feeding said slot with gas so as to blow a continuous sheet of said gas into said tube;
at least one porous plate disposed on the inside wall of said tube between said slot and said open end, and said plate being fed with a gas which forms a small flow of gas suitable for overcoming the pressure reduction formed by the sheet of gas leaving from said slot; and
means for maintaining said enclosure at a pressure which is slightly higher than its surroundings so as to create a flow of gas running along said tube and deflecting the sheet(s) of gas leaving said slot towards said open end.

4,901,765

COUPLING FOR MIXING LOTIONS OR OTHER LIQUIDS WITH SHOWER WATER

Frank C. Poe, 300 Second St., Maryville, Tenn. 37801

Filed Oct. 31, 1988, Ser. No. 264,861
Int. Cl.[4] B01F *5/04*
U.S. Cl. 137—893 **2 Claims**



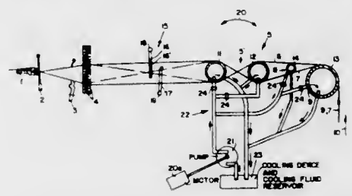
1. A coupling for being mounted between the threaded end of the arm of a shower through which water flows, and the showerhead for mixing liquid contained in a remote reservoir into shower water, said coupling comprising:
a coupling body defining an inlet portion for threadably receiving said end of said shower arm, and an outlet portion for being threadably connected to said head, said coupling body being provided with a first flow path extending from said inlet to said outlet portions to allow water and mixed liquids to flow therethrough, said first flow path defining a first section of reduced dimension terminating in a first orifice, a mixing chamber wherein said liquid is mixed with water exiting said first section of said first flow path, and a further section downstream from said mixing chamber, said further section being dimensioned less than said chamber and greater at its downstream end than said first section to enhance the mixing of said liquid and said water, said further section including a restricted flared bore between said mixing chamber and said downstream end of said further section;
a fitting integrally formed with said body for receiving said liquid, said fitting defining a further flow path terminating in a second orifice which is in fluid communication with said mixing chamber at a point upstream from said first orifice of said first section of said first flow path; whereby venturi means are defined by said body for generating a vacuum at a location proximate said second orifice of said further flow path for drawing said liquid into said mixing chamber, and whereby said further section enhances the vacuum generated by said venturi means; and
vacuum control means for commencing and venting the vacuum generated by said venturi means for mixing and terminating the mixing of liquid with said shower water, said vacuum control means including a further fitting integrally formed with said coupling body and defining a third flow path therethrough terminating in a third orifice which is positioned in fluid communication with said mixing chamber, said third orifice being upstream from said first orifice, said vacuum control means further including a vacuum activator button for controlling the flow of air through said third flow path, said flow path being vented proximate and around said button until said button is depressed at which time a vacuum is created for drawing fluid from said further flow path to mix liquid with said shower said vacuum activator button being biased towards an open position which allows venting of said vacuum in and around button through said third flow path and wherein said vacuum activator button remains closed under biasing forces of said vacuum.

4,901,766

METHOD AND APPARATUS FOR COOLING WARP THREADS IN A LOOM

Valentin Krumm, Hergensweiler, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau/Bodensee, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 276,216
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 3807556
Int. Cl.[4] D03J *1/02*
U.S. Cl. 139—36 **10 Claims**



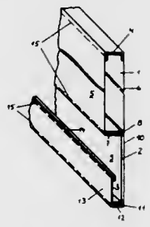
5. The apparatus of claim 1, further comprising pipe means and spray nozzle means for spraying or blowing a cooling medium onto said warp threads.

4,901,767

SUPPORTING BAR OF A HEDDLE FRAME

Bernhard Koch, Horgenberg, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland

PCT No. PCT/CH88/00007, § 371 Date Sep. 21, 1988, § 102(e) Date Sep. 21, 1988, PCT Pub. No. WO88/05837, PCT Pub. Date Aug. 11, 1988
PCT Filed Jan. 11, 1988, Ser. No. 264,949
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702524
Int. Cl.[4] D03C *9/06*
U.S. Cl. 139—92 **8 Claims**



1. In a heddle frame assembly for a loom of the type which includes upper and lower supporting bars vertically spaced by side frame members, said supporting bar comprising a frame stave and a heddle carrying rod and a connecting part for connecting said carrying rod to said frame stave to extend at a distance parallel to said frame stave, said frame stave forming a hollow body and having longitudinal narrow sides and broad sides and a substantially rectangular outer cross-section wherein said frame stave, said connecting part and said heddle carrying rod comprise sheet metal sections and form a welded structure, said longitudinal broad sides of said frame stave comprising thin sheet metal sections welded to said frame stave narrow sides, said narrow sides having a material thickness several times greater than that of said broad sides, said connecting part being welded to one of said frame stave narrow sides, and the heddle carrying rod being welded to said con-

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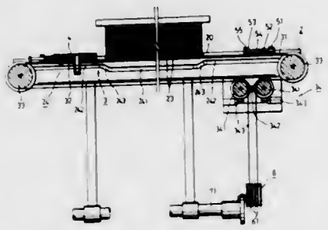
necting part via a rod located between said connecting part and said heddle carrying rod.

4,901,768

PICKING APPARATUS FOR A LOOM

Huang Chi-Shuang, No. 23, Lane 235, Kai-San Rd., Tainan, Taiwan

Filed Apr. 28, 1989, Ser. No. 345,007
Int. Cl.[4] D03D *49/44*
U.S. Cl. 139—134 8 Claims



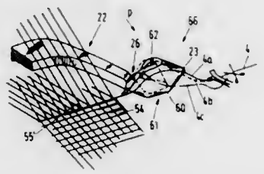
1. A picking apparatus for a loom comprising:
a sley with a reed assembly fixed thereon;
a raceway formed in an upper surface of said sley;
means for generating a magnetic force which moves along said raceway; and
a shuttle attractable by said magnetic force to fly along said raceway;
wherein said sley has a slot formed therein along said raceway, said shuttle having an engagement hole, said magnetic force-generating means having an extendable and retractable gripping means which can retract into said engagement hole of said shuttle immediately after a picking motion has been finished.

4,901,769

TUCK-IN NEEDLE FOR A SELVAGE FORMING DEVICE

Hans Zollinger, Taan-Ruti, and Mario Tamaro, Rüti, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 1, 1989, Ser. No. 345,978
Claims priority, application Switzerland, Apr. 29, 1988, 01612/88
Int. Cl.[4] D03D *47/48*
U.S. Cl. 139—434 14 Claims



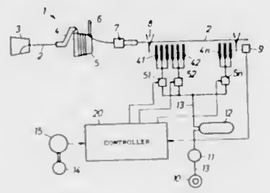
10. A tuck-in needle for a selvage forming device of a loom comprising
an inclined ramp for passing under and lifting an end of a weft yarn extending from a shed;
a setback downstream of said ramp for receiving the weft yarn from said ramp during a forward motion of said ramp; and
a trough for catching and receiving the weft yarn from said setback during a rearward motion of said ramp.

4,901,770

AUTOMATIC PICKING CONTROLLING METHOD

Yujiro Takegawa, Ishikawa, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

Filed May 6, 1988, Ser. No. 191,277
Claims priority, application Japan, May 12, 1987, 62-113497
Int. Cl.[4] D03D *47/30*
U.S. Cl. 139—435 R 8 Claims



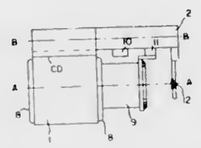
1. An automatic picking controlling method for controlling the picking operation of a picking device having a main nozzle for picking a weft yarn by a jet of fluid, and a plurality of subnozzles arranged in groups which assist a picked weft yarn for running along a running path by jets of fluid, the method comprising the following steps:
a storing step for initially storing a plurality of accessible jetting patterns for each of the groups of the plurality of subnozzles, each of the patterns respectively corresponding to a running mode of the picked weft yarn;
a detecting step for detecting the actual running mode of the picked weft yarn during a picking operation;
a reading step for selectively reading a jetting pattern corresponding to the actual detected running mode selected from among the initially stored jetting patterns; and
a controlling step for controlling the operation and duration of operation of the subnozzles according to the selected jetting pattern.

4,901,771

CASING FOR WEFT STORAGE AND FEEDING DEVICE

Bruno Maina, Valdengo, Italy, assignor to ROJ Electrotex S.p.A., Biella, Italy

Filed Oct. 11, 1988, Ser. No. 261,249
Claims priority, application Italy, Oct. 12, 1987, 22527 B/87
Int. Cl.[4] D03D *47/36*
U.S. Cl. 139—452 5 Claims



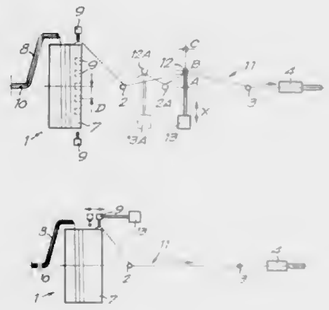
1. Casing for a weft storage and feeding device, for use in weaving looms, comprising a central body adapted to house a motor of said feeding device; and a peripheral arm for guiding and supporting a brake unit and a sensor detecting a yarn reserve and a yarnguide eyelet of said feeding device; wherein said casing comprises at least one extruded section length.

4,901,772

METHOD FOR ADJUSTING THE LENGTH OF THE WEFT THREAD TO BE INSERTED INTO THE SHED OF WEAVING LOOMS AND DEVICES USED FOR THIS OBJECT

Philippe Van Bogaert, Schaarbeek, and Ampe Frank, Leffinge-Middelkerke, both of Belgium, assignors to Picanol N.V., Belgium

Filed May 16, 1989, Ser. No. 355,127
Claims priority, application Belgium, Sep. 23, 1986, 2/61057
Int. Cl.[4] D03D *47/36*
U.S. Cl. 139—452 6 Claims



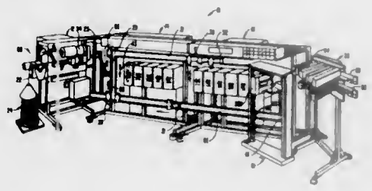
1. In a method of controlling insertion of a weft thread into a weaving loom shed, said method including the steps of: (i) releasing the thread from an accumulator to allow insertion of a length of thread into the shed by an insertion device, and (ii) stopping release of the thread from the accumulator after a predetermined length of thread has been released, the improvement comprising the step of adjusting the length of a path traversed by the thread between the accumulator and the insertion device such that the length of thread inserted into the shed is different from said predetermined length released from the accumulator.

4,901,773

HIGH VOLTAGE COIL WINDING MACHINE

James W. Marshall, Towson; Somers H. Smith, III, Cockeysville, both of Md.; Clair E. Platt, Bronson, Mich.; Rickey W. Bryant, Lexington, Ky.; Donald S. Lee, Kingsville, Md.; Herbert J. Macemon, Versailles, Ky.; Robert B. Wood, Jr., Stewartstown, Pa., and Ricky L. Wallace, Baltimore, Md., assignors to Kuhlman Corporation, Troy, Mich.

Filed Oct. 24, 1988, Ser. No. 260,579
Int. Cl.[4] B21F *3/00*
U.S. Cl. 140—92.1 111 Claims



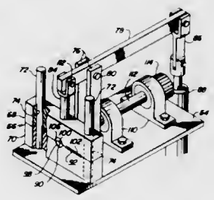
1. A machine for winding interconnected coil bundles comprising:
a plurality of separate winding forms, each such winding form having a winding cavity;
transfer means for independently moving each of said coil winding forms from a winding station, to a coil removal station, and thereafter, to return said coil winding form to said winding station;
fly winding means for winding wire into said winding cavities of sequential ones of said winding forms at said winding station thereby forming said interconnected coil bundles; and
removing means for removing said wound coil bundles at said coil removal station with said coil bundles remaining interconnected and assembling said wound coil bundles in a relationship for functioning together as a continuous winding.

4,901,774

APPARATUS FOR MAKING FISHING LURES

David J. Goulet, 1609 Fifth Ave., Moline, Ill. 61265

Filed May 1, 1989, Ser. No. 345,867
Int. Cl.[4] B21F *1/06*
U.S. Cl. 140—104 17 Claims



1. Apparatus for forming a closed eye in a length of wire, comprising: shaping mechanism for receiving a straight length of wire and including a movable element for bending the wire into the shape of a V having first and second coplanar legs converging to a rounded apex so that the legs join opposed portions of the apex respectively at radii to give the apex the form of a C-shaped loop, twisting mechanism including a holder for holding the first leg of the V so that the loop projects free of the holder, said twisting mechanism including a rotatable means engaging and twisting the loop to cause the second leg of the V to wrap around the first leg for converting the loop to a closed eye; means for driving the movable element, and means for driving the rotatable means, in which the holder is a block like-member having a top and front and rear faces, the top is configured to receive the first leg of the V with the loop projecting beyond the front face, the front face has a cavity therein coaxial with the received first leg of the V for accommodating the wrap of the second leg as the loop is twisted,
and clamping means cooperating with the block-like member for confining the first leg of the V to the block-like member.

4,901,775

AUTOMATIC SEAL MACHINE FOR BANK BAGS AND THE LIKE

Ernest D. Scott, Delray; Gregory W. Scott, Jacksonville Beach, both of Fla., and Donald L. Tedder, Carrollton, Ga., assignors to Edge Technology Corporation, Boca Raton, Fla.

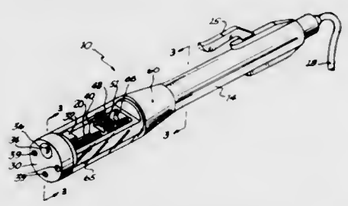
Filed Jan. 30, 1989, Ser. No. 303,463
Int. Cl.[4] B21F *09/02*
U.S. Cl. 140—123.5 7 Claims

1. An apparatus for tensioning a bundling strap about an item to be bundled, comprising:
(a) a reversible hand-held unit having a motor and a rotatable output shaft means coupleable to one end of an elongated external screw threaded shaft supported for rotation at its opposite end by an end cap means;

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said end cap means being integrally connected to said hand-held unit;

(b) a guide block means adapted for linear reciprocal movement along said shaft between said hand-held unit and said end cap means and having threads corresponding to screw



threads on said shaft, said guide block means having connected thereto means for gripping said bundling strap;

(c) power means for energizing said hand-held unit and reversing or halting the direction of rotation of said output shaft means upon the exertion of a predetermined force upon said guide block.

4,901,776

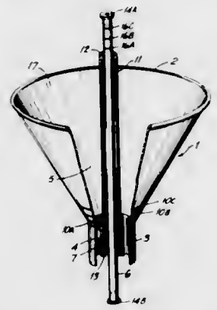
FUNNEL WITH FILL INDICATOR

Ron Attinello, 228 Garfield Pl., Brooklyn, N.Y. 11215

Filed Oct. 12, 1988, Ser. No. 256,507

Int. Cl.[4] G01F *23/06*; B67C *11/00*

U.S. Cl. 141—95 **5 Claims**



1. A funnel to prevent overflow from the overfilling of containers having different diameter round openings with circular lips by indicating to the user that the container has been filled with liquid, said funnel comprising:

a body member of plastic resin having an imaginary axis and having a cone-shaped funnel portion and a nozzle portion without indicia thereon, said funnel portion and nozzle portion each having an exterior and an interior wall;

a plurality of spaced funnel indicia on the external wall of said funnel portion proximate the junction of said funnel portion and said nozzle portion, each of said plurality of funnel indicia being spaced perpendicular to said axis, each of said plurality of funnel indicia being adapted to meet with the respective lip of a different one of said openings;

an elongated sleeve member within the interior wall of said nozzle portion, connected to said interior wall and parallel to said axis, said sleeve member being hollow and having an interior wall forming an elongated bore therethrough, said sleeve member having a bottom orifice through which said liquid may flow;

an elongated hollow and liquid-tight float member at least partly positioned within said bore of the sleeve member and having a top end, said float member rising within the sleeve member bore as the container is filled; a plurality of float member indicia on said float member proximate the top end of said float member to indicate when the container is filled, comprising a plurality of spaced lines which are spaced along the float member with the same spacing as between the said plurality of funnel indicia on the external wall of the funnel portion; and

a plurality of spacer means positioned between the interior wall of said sleeve member and said float member to prevent the float member from touching said sleeve member inside wall.

4,901,777

VENEER LATHE

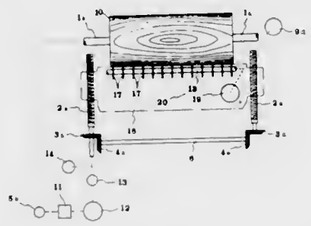
Masaru Koike, Obu, Japan, assignor to Meinan Machinery Works, Inc., Obu, Japan

Filed Mar. 21, 1989, Ser. No. 326,624

Claims priority, application Japan, Mar. 26, 1988, 63-73002

Int. Cl.[4] B27L *5/02*

U.S. Cl. 144—213 **9 Claims**



1. A veneer lathe comprising:

a pair of spindles for holding therebetween a peeler log at its opposite ends;

one spindle of said pair being powered to impart rotating torque to said log and the other spindle being non-powered and rotatable with said log;

a knife carriage having a cutting knife supported thereon;

means for feeding said knife carriage toward said log;

first detecting means for detecting the angular velocity of said non-powered spindle and providing a detect signal representing that velocity of said non-powered spindle;

control means operable in response to said detect signal for controlling said feeding means in such a way that said knife carriage is fed for a given distance for each rotation of said non-powered spindle.

4,901,778

SYSTEM FOR REPLACING FEEDROLL INSERTS

David S. Fenton, General Delivery, Grovedale, Alberta, Canada (T0H 1X0)

Filed Dec. 12, 1988, Ser. No. 282,637

Int. Cl.[4] B27G *13/00*

U.S. Cl. 144—230 **5 Claims**

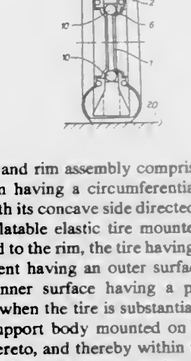
1. A feedroll for conveying lumber or the like, comprising:

a cylindrical body;

said body forming a plurality of outwardly opening longitudinally extending, spaced apart grooves;

at least one insert positioned in each groove;

the surface of each of the grooves being configured so as to support the insert so that a portion thereof protrudes from the peripheral surface of the body;



a wedge positioned in each of the grooves, said wedge engaging the lower portion of each insert to clamp it against the adjacent side wall of the groove; and

a releasable fastener securing the wedge to the body.

4,901,780

METHOD FOR PRODUCING FIBER REINFORCED METAL COMPOSITION

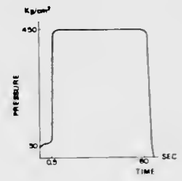
Masayoshi Sasaki, Ayase; Fumio Saeki, Atsugi, and Harumichi Hino, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Atsugi Motor Parts Company, Atsugi, both of, Japan

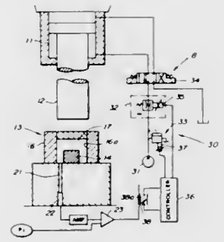
Filed Jul. 28, 1988, Ser. No. 225,208

Claims priority, application Japan, Jul. 28, 1987, 62-189670

Int. Cl.[4] B22D *19/14*

U.S. Cl. 164—4.1 **20 Claims**





1. A method of producing a fiber reinforced metal composition, comprising the steps of:

preparing a pre-assembly of a reinforcement fiber;

setting said reinforcement fiber pre-assembly in a cavity of a casting mold;

filling a molten metal matrix in said cavity of said casting mold;

impregnating said molten metal matrix into said reinforcement fiber pre-assembly by exerting a first substantially constant pressure;

rapidly increasing pressure to a second maximum pressure; and

pressure casting at the second maximum pressure for solidification of said metal matrix.

17. An apparatus of pressure casting a fiber reinforced metal composition, comprising:

a casting mold defining a desired configuration of a casting cavity, in which a said reinforcement fiber pre-assembly fabricated into a desired configuration is set and a molten metal matrix is filled;

a pressure means for exerting a pressure on said molten metal for performing pressure casting, said pressure means varying pressure exerted on said molten metal;

a pressure sensor means for monitoring molten metal matrix pressure to produce a pressure indicative signal; and

means for controlling said pressure means for adjusting the pressure to be exerted on said molten metal matrix, said controlling means initially controlling said pressure means to exert a first limited pressure to said molten metal matrix and responsive to said pressure indicative signal representing the molten metal matrix pressure higher than a predetermined pressure to rapidly increase said pressure means to exert a maximum pressure.

4,901,779

SAFETY TIRE ASSEMBLY FOR VEHICLE

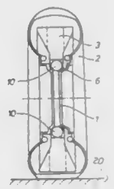
Walter Holzer, Drosteweg 19, Meersburg, Fed. Rep. of Germany (7758)

Filed Jun. 15, 1988, Ser. No. 207,175

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720022

Int. Cl.[4] B60C *17/04*

U.S. Cl. 152—158 **7 Claims**



1. Safety tire and rim assembly comprising,

a circular rim having a circumferential surface forming a channel with its concave side directed radially outwardly,

a circular inflatable elastic tire mounted concentrically on and secured to the rim, the tire having a tread element, the tread element having an outer surface and an inner surface, the inner surface having a predetermined radial dimension when the tire is substantially inflated,

an annular support body mounted on the rim in rotatable relation thereto, and thereby within the tire, and

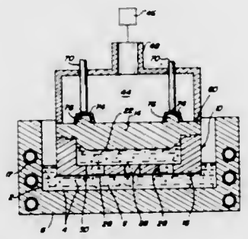
bearing means interposed between the rim and support body and operable for enabling the support body to overrun the rim in one direction only, while preventing it from so overrunning in the other direction.

4,901,781

METHOD OF CASTING A METAL MATRIX COMPOSITE

Gary F. Ruff, Farmington Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1988, Ser. No. 238,321
Int. Cl.[4] B22D *18/06, 19/14*
U.S. Cl. 164—63 **4 Claims**



1. A method of casting a metal matrix composite having solid reinforcing particles substantially uniformly dispersed in a metal matrix, comprising:

(a) providing a mold having a mold cavity and an ingate passage extending upwardly from a bottom side of said mold into communication with the mold cavity,

(b) countergravity filling the mold cavity from an underlying melt initially having solid reinforcing particles substantially uniformly dispersed in a molten metal, including (1) immersing the bottom side of the mold in the melt, (2) establishing a differential pressure between the mold cavity and the melt when said bottom side is immersed in the melt sufficient to urge the melt upwardly through the ingate passage into the mold cavity to countergravity fill the mold cavity with the melt and (3) inductively stirring the melt during countergravity filling of said mold cavity with the melt such as to substantially maintain said uniform dispersion and to minimize subsequent agglomeration of the reinforcing particles therein during filling of said mold cavity, and

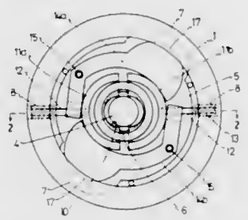
(c) inductively stirring the melt in said mold cavity after countergravity filling thereof to minimize subsequent agglomeration of the reinforcing particles in the melt filling the mold cavity.

4,901,782

CENTRIFUGAL CASTING MOLD

Okazaki Kazuhiro, Okayama, Japan, assignor to Michihiro Giken Company, Okayama, Japan

Filed May 12, 1989, Ser. No. 351,447
Claims priority, application Japan, May 29, 1987, 62-134627
Int. Cl.[4] B22D *13/04, 13/10*
U.S. Cl. 164—293 **3 Claims**



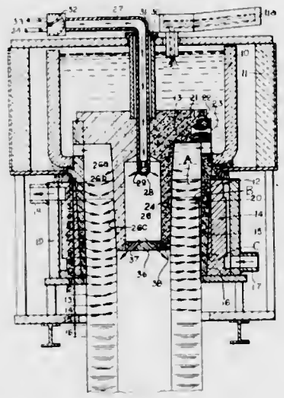
1. A centrifugal casting mold comprising radially plurality divided core mold sections; separating means for respectively separating said divided core mold sections at predetermined intervals when the mold is in a stationary state; and centrifugal pendulums serving as uniting means for displacing the respective divided core mold sections inwardly to thereby combine them integrally when the mold is rotating, which centrifugal pendulums are supported with the centers of gravity being one-sided, while one end of each pendulum is adapted to force the rear side of the corresponding core mold section against said separating means.

4,901,783

CONTINUOUS CASTING APPARATUS

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Continuation of Ser. No. 687,503, Jan. 4, 1985, abandoned, which is a continuation of Ser. No. 466,619, Feb. 15, 1983, abandoned. This application Apr. 20, 1989, Ser. No. 342,636
Int. Cl.[4] B22D *11/04*
U.S. Cl. 164—421 **4 Claims**



1. In a continuous casting apparatus wherein molten metal flows through a die progressively and is solidified in the die and withdrawn from the die, a die and cooling assembly comprising

a tubular die having an external tapered surface which is uniformly tapered radially inwardly in the direction of movement of metal to the die,

a cooling sleeve having an internal surface adapted to be complementary to the external surface of the die and in substantial intimate surface contact with the external surface of said die,

an annular cooling shell surrounding said cooling sleeve and having portions thereof spaced from said sleeve to define a cooling chamber,

the cooling sleeve being made of a material having a greater coefficient of expansion than the coefficient of expansion of the material of said tubular die,

at least one inlet to said chamber,

at least one outlet from said chamber,

said tubular die having an internal surface which is uniformly tapered radially inward in the direction of movement of metal to the die such that as the molten metal flows progressively through the die and is solidified and contracts, substantially intimate contact is maintained between the internal surface of the tubular die and the solidified metal so that improved heat transfer is achieved,

the tapered external surface of said tubular die having greater external diameters at ambient temperature before assembly and at operating temperature after assembly than the corresponding tapered internal surface of the cooling sleeve at ambient temperature before assembly and at operating temperature after assembly such that when said cooling sleeve is heated to a temperature above the operating temperatures of the die and cooling sleeve, telescoped over the tubular die, and permitted to cool and be shrunk fit on said tubular die, the tubular die is in compression at both ambient and operating temperatures and when the die and cooling sleeve is utilized at operating temperatures, the tubular die remains in compression and intimate contact is maintained between the cooling sleeve and the tubular die at the operating temperatures,

the diameter of the cooling sleeve being determined by the factor of the coefficient of expansion of the sleeve and the temperature of the sleeve at the operating temperatures so that upon expansion, the internal surface of the cooling sleeve will maintain contact with the external surface of the die,

a mandrel associated with said tubular die for forming tubular products, said mandrel including an internal chamber to which said coolant is directed, said mandrel including openings in the end thereof for directing said coolant from said chamber toward the interior surface of the product being formed;

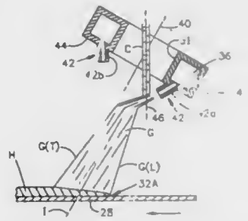
said mandrel including a tapered external surface extending from the freezing zone such that substantial intimate contact is maintained by the tapered surface with the internal surface of the tubular product being formed.

4,901,784

GAS ATOMIZER FOR SPRAY CASTING

Sankaranarayanan Ashok, Bethany, and Harvey P. Cheskis, North Haven, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Mar. 29, 1989, Ser. No. 330,049
Int. Cl.[4] B22D *23/00*
U.S. Cl. 164—429 **26 Claims**



1. In a molten metal gas-atomizing spray-deposition apparatus, the combination comprising:

(a) means for producing a stream of molten metal;

(b) a gas atomizer for converting said stream of molten metal into a divergent spray pattern, said gas atomizer including an annulus through which said stream of metal flows, said annulus having a plenum chamber therein for receiving pressurized atomizing gas,

(c) outlets in said annulus communicating with said plenum chamber and spaced around the stream of molten metal, and

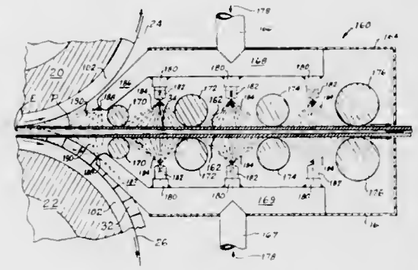
(d) a substrate moving in a given direction and having a spray deposit receiving area in a plane substantially perpendicular to the axis of the stream of the molten metal passing through said annulus, the arrangement of said outlets and manifold being such that the central axis of the divergent spray pattern produced by the atomizing gas acting upon the molten stream is inclined with respect to the moving substrate in a direction downstream of the moving substrate.

4,901,785

TWIN-BELT CONTINUOUS CASTER WITH CONTAINMENT AND COOLING OF THE EXITING CAST PRODUCT FOR ENABLING HIGH-SPEED CASTING OF MOLTEN-CENTER PRODUCT

Charles D. Dykes, Milton, Vt.; Sabah S. Daniel, Pittsburgh, Pa., and J. F. Barry Wood, 303 Shore Rd., Burlington, Vt. 05401, assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.; USX Corporation, Pittsburgh, Pa. and J. F. Barry Wood, Burlington, Vt.

Filed Jul. 25, 1988, Ser. No. 224,058
Int. Cl.[4] B22D *11/06, 11/24*
U.S. Cl. 164—481 **24 Claims**



1. In a method for achieving high-speed casting in a continuous casting installation for steel wherein a twin-belt casting machine having upper and lower casting belts revolving respectively around upper and lower exit pulley rolls is producing steel cast product for feeding into a regular rolling mill having minimum rolling speed requirements, wherein the respective revolving casting belt travels past a final backup roller located upstream from the respective exit pulley roll between the revolving casting belts and wherein the cast steel product is issuing from an exit located between said exit pulley rolls, the method comprising the steps of:

causing each casting belt to hug the product being cast in the region between said final back-up roller and the respective exit pulley roll,

applying first opposed rolling contact to the cast product within less than twelve inches from said exit for supporting and containing the cast steel product,

applying at least second and third opposed rolling contact to the cast product downstream from said first opposed rolling contact spaced on centers less than ten inches between successive rolling contact for further supporting and containing the cast steel product,

directly impinging first water spray onto the cast steel product between said exit and said first rolling contact for cooling the cast steel product,

directly impinging at least second and third spray onto the cast steel product upstream from the second and third opposed rolling contact, respectively, for further cooling the cast steel product.

11. In a continuous casting installation for steel wherein a twin-belt casting machine having upper and lower casting belts revolving respectively around upper and lower exit pulley rolls is producing steel cast product for feeding into a regular rolling mill having minimum rolling-speed requirements, wherein the respective revolving casting belt travels past a final backup roller located upstream from the respective exit pulley roll, wherein the cast steel product is issuing from between the revolving casting belts at an exit between said exit pulley rolls and wherein said cast steel product includes a solidified shell enclosing a molten steel interior, a system for achieving high-speed casting by said twin-belt casting machine for meeting the minimum rolling-speed requirements of said regular rolling mill comprising:

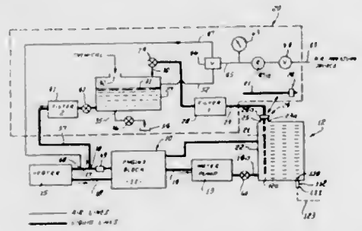
means for causing each casting belt to hug the product being cast in the region between said final backup roller and the respective exit pulley roll,
a pair of opposed rollers in rolling contact with said solidified shell downstream from said exit,
said pair of opposed rollers being positioned at a bulge-resisting-effective distance from said exit for resisting significant bulging of said solidified shell,
spray nozzle means positioned above and below the cast steel product for applying cooling sprays of water to said solidified shell from above and from below in a region between said exit and said pair of opposed rollers, and
said spray nozzle means being aimed toward said solidified shell in an aiming direction at an acute angle relative to said solidified shell and said aiming direction being inclined upstream toward said exit for cooling the solidified shell adjacent to said exit.

4,901,786

ENGINE COOLANT FLUSH-FILTERING USING EXTERNAL GAS PRESSURE AND RADIATOR VALVING

Marcel Vataru, Los Angeles, and James L. Baylor, Fontana, both of Calif., assignors to Wynn Oil Company, Fullerton, Calif.

Continuation-in-part of Ser. No. 87,696, Aug. 20, 1987, Pat. No. 4,793,403. This application Oct. 3, 1988, Ser. No. 256,328
Int. Cl.[4] F28G *13/00*
U.S. Cl. 165—1 **17 Claims**



1. In the method of treating coolant liquid in an internal combustion engine cooling system, the steps that include:
(a) forcing the coolant liquid from the cooling system to the exterior of that system,
(b) treating the coolant liquid in a zone or zones outside the cooling system, said treating including removing contaminant from the coolant liquid, and
(c) returning the treated coolant liquid to the cooling system,
(d) said forcing step including supplying a pressurized gas to the cooling system to drive coolant liquid therefrom,
(e) the cooling system including a heat radiator including a container having a coolant liquid fill opening, and a valve controlled discharge port proximate the bottom of the radiator, and said forcing step including employing said gas to drive coolant liquid from the radiator via said discharge port,
(f) and including controllably venting fluid including gas from said container, during said step of returning the treated coolant liquid to the cooling system.

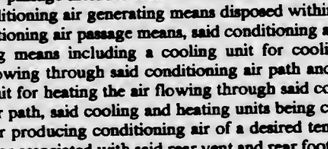
4,901,787

REGENERATIVE HEAT EXCHANGER AND SYSTEM

Bruce L. Zornes, Bothell, Wash., assignor to Balanced Engines, Inc., Tacoma, Wash.

Filed Aug. 4, 1988, Ser. No. 228,707
Int. Cl.[4] F28D *17/02*
U.S. Cl. 165—4 **21 Claims**

17. A heat exchanger comprising:
a set of alternating thermally insulating and thermally conductive layers each having an array of passageways through its thickness which communicate with respective passageways in adjacent of said layers, there being at least three of said thermally conductive layers, two of which are at opposite ends of said set, and the remainder of which are intermediate regenerative layers;



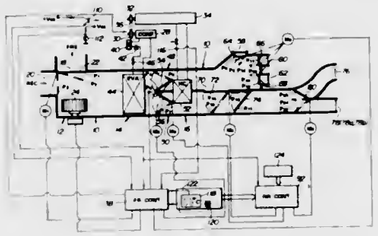
the passageways in said thermally conductive layers having a different cross-sectional area than respective communicating passageways in said thermally insulating layers.

4,901,788

AIR CONDITIONER SYSTEM FOR AUTOMOTIVE VEHICLE

Koichi Doi, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 5, 1988, Ser. No. 190,119
Claims priority, application Japan, Jun. 15, 1987, 62-148362
Int. Cl.[4] F25B *29/00*; B60H *3/00*; B61D *27/00*
U.S. Cl. 165—24 **16 Claims**



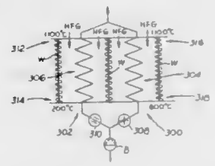
5. An air conditioner system for automotive vehicles comprising:
conditioning air passage means defining a conditioning air path which branches into front and rear air paths, which rear air path includes rear vent and rear foot air outlets which open into a vehicular cabin near the back seat for discharging conditioning air into said vehicular cabin in the vicinity of the occupant on the back seat and the front air passage includes front vent and front foot air outlets;
conditioning air generating means disposed within said conditioning air passage means, said conditioning air generating means including a cooling unit for cooling the air flowing through said conditioning air path and a heating unit for heating the air flowing through said conditioning air path, said cooling and heating units being cooperative for producing conditioning air of a desired temperature;
a door associated with said rear vent and rear foot air outlets operable between a first position in which said door fully closes said rear vent air outlet and fully opens said rear foot air outlet in a first operation mode of the air conditioner system, a second position in which said door fully opens said rear vent air outlet and fully closes said rear foot air outlet in a second operation mode of the air conditioner system, and a third position in which said door opens said rear vent and rear foot air outlet in a third operation mode of the air conditioner system; and
manually operable switch means for selecting one of said operation modes in an ON position, and controlling said door position as a function of an opening condition of said front vent and said front foot air outlets in an OFF position.

4,901,789

HEAT REGENERATORS

Adrianmus J. Hengelmolen, Dreumel, Netherlands, assignor to Copermill Limited, Nottingham, England

Filed Mar. 21, 1988, Ser. No. 170,748
Claims priority, application United Kingdom, Mar. 26, 1987, 8707277
Int. Cl.[4] F28D *17/00*; F28F *27/02*
U.S. Cl. 165—101 **4 Claims**



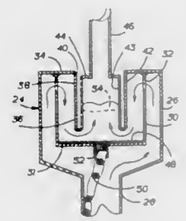
1. A heat regenerator for the extraction of heat from hot exhaust gases and the transference of that heat to a fluid comprising:
first and second chambers, each of said chambers comprising an inlet end for the inflow of said exhaust gases, an outlet end for the outflow of said exhaust gases, and a wall means extending between said inlet and outlet ends; with said wall means being at least partially comprised of a heat resistant material;
first and second path means through which said fluid passes, each of said path means comprising an inlet means for said fluid, an outlet means for said fluid and a pipe means extending between said inlet and output means;
with each of said path means passing at least partially through each of said chambers, and valve means for diversion of said fluid to either first or second of said path means for the passage of said fluid therethrough;
wherein said wall means of said first and second chambers is corrugated to accommodate said path means.

4,901,790

SELF-HEATED DIFFUSER ASSEMBLY FOR A HEAT PIPE

Roelf J. Meijer, Ann Arbor, Mich., assignor to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Filed May 22, 1989, Ser. No. 354,857
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.27 **8 Claims**



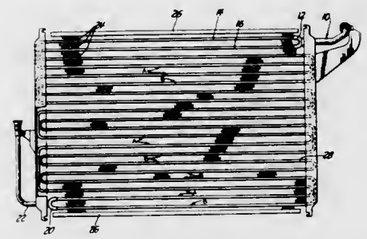
1. A heat pipe having a housing defining a closed cavity containing a condensible heat transfer medium and defining an evaporator section for vaporizing said medium in response to a heat input and a condensor section where said medium condenses thereby giving off heat, said heat pipe including a diffuser assembly for eliminating non-condensing gases from within said heat pipe comprising:
a diffuser housing communicating with said heat pipe housing defining a working fluid flow path and a collection cavity such that said non-condensing gases collects in said collection cavity due to flow of said working fluid vapor, and
wall means defined by said diffuser housing for transferring heat from said working medium flowing in said diffuser housing to wall portions defining said collection cavity thereby causing the permeability of said collection cavity wall portions to increase allowing said non-condensing gases to escape from said heat pipe.

4,901,791

CONDENSER HAVING PLURAL UNEQUAL FLOW PATHS

Durgaprasad S. Kadle, Getzville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1988, Ser. No. 223,984
Int. Cl.[4] F28F *1/10*
U.S. Cl. 165—150 **3 Claims**



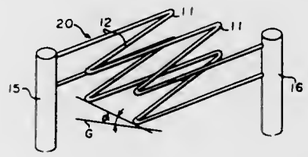
1. A condenser for a refrigeration system, the condenser having an inlet and an outlet, comprising;
at least two parallel flow passages all laying in a common plane and connecting the inlet to the outlet, each flow passage comprising a serpentine path having a sufficient number of passes across the condenser so that each passage extends from the inlet to the outlet,
the flow passages having different numbers of passes thereby having unequal lengths.

4,901,792

PIPE ELEMENT FOR A HEAT EXCHANGER AND A HEAT EXCHANGER WITH THE PIPE ELEMENT

Jujiro Komiya, Fujisawa, Japan, assignor to Shinwa Sangyo Co., Ltd., Tokyo, Japan

Filed May 24, 1988, Ser. No. 197,972
Claims priority, application Japan, May 28, 1987, 62-079687
Int. Cl.[4] F28F *1/00*
U.S. Cl. 165—150 **5 Claims**



1. A heat exchanger which comprises a first header for supplying a liquid to be cooled, a second header for discharg-

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ing the cooled liquid and a plurality of substantially horizontal pipe elements communicatively connected between said first and second headers in juxtaposition, each of said pipe elements comprising at least one bent portion and at least two linear portions connected to said bent portion, respective ones of said linear portions being connected to said first and second headers, wherein an angle formed by two adjacent ones of said linear portions is in a range of from about 30° to 3° and wherein said linear portions are disposed in a plane inclined at an angle of 2°–3° with respect to a horizontal plane such that said linear portion connected to said first header is higher than said linear portion connected to said second header, whereby a cooling liquid will drain from said pipe elements to said second header.

4,901,793

NO-TURN TOOL FOR A PUMPING SYSTEM

Weber, James L., P.O. Box 938, Weyburn, Saskatchewan, Canada (S4H 2L2)

Division of Ser. No. 80,754, Jul. 31, 1987, Pat. No. 4,811,785.
This application Dec. 21, 1988, Ser. No. 287,876
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—68.5 **11 Claims**





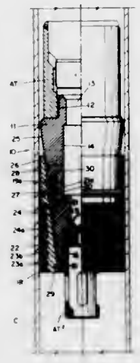
1. Means to pump oil from an oil well having a casing therein, said means comprising in combination a production string having stationary production tubing and a rotary pump drive means therein, a screw-type pump at the lower end of said string, said pump including a stator casing coupled to the production tubing and a screw-type rotor rotatable in the stator casing and coupled to the pump drive means, and a no-turn tool operatively secured to the lower end of said stator casing, said no-turn tool comprising means for engaging an associated well casing to prevent right-hand rotation of the no-turn tool, said stator casing and said production tubing, said engaging means including vertically oriented slip means engageable with said well casing.

4,901,794

SUBTERRANEAN WELL ANCHORING APPARATUS

John L. Baugh, Houston, and Sidney K. Smith, Jr., Huntsville, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jan. 23, 1989, Ser. No. 300,436
Int. Cl.[4] E21B *33/129*
U.S. Cl. 166—118 **19 Claims**



1. Apparatus for anchoring of equipment within the interior bore of a section of a subterranean well conduit, comprising:
(1) a cylindrical housing;
(2) a conically tapered surface around the exterior of said housing, said surface being radially enlarged at its upper end and tapering to a radially smaller lower end;
(3) a seal body carried exteriorly around said housing and having its interior tapered and reverse to that of said conically tapered surface around said housing and selectively longitudinally movable relative to said housing from a first, unset position on said conduit section to a second, set position on said conduit section and radially expandable during said movement relative to said housing;
(4) anchoring means carried exteriorly around said seal body for securing said apparatus to said conduit section against upward and downward movement of said apparatus;
(5) a carbide grit-like material disposed on the exterior of said anchoring means;
(6) ratcheting means between said housing and said seal body permitting movement between said housing and said seal body in one direction and resisting movement between said housing and said body in the opposite direction; and
(7) means for transferring downward force applied upon said apparatus through said housing, said ratcheting means, said seal body and said anchoring means, to said conduit section, and means transferring upward force applied upon said apparatus through said housing, said seal body and said anchoring means to said conduit section when said apparatus is in said engaged position within said conduit section.

4,901,795

METHOD FOR IMPARTING SELECTIVITY TO OTHERWISE NONSELECTIVE POLYMER CONTROL GELS

Craig H. Phelps, Carrollton; E. Thomas Strom, Dallas, both of Tex.; Dennis H. Hoskin, Lawrenceville, N.J.; Thomas O. Mitchell, Pennington, N.J., and Paul Shu, West Windsor, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 917,324, Oct. 9, 1986, Pat. No. 4,834,180. This application Dec. 25, 1988, Ser. No. 284,626
The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.
Int. Cl.[4] E21B *33/138, 43/22, 43/24*
U.S. Cl. 166—270 **23 Claims**

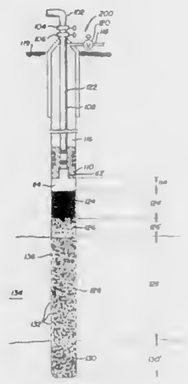
1. A method for the sequential gellation profile control treatment of a formation having zones of varying permeabilities comprising:
(a) making an aqueous gellable mixture containing components for a first stage gel in an amount sufficient to selectively enter pores in a formation's zone of greater permeability which gel forms ex-situ and is shear thinning;
(b) placing into said aqueous mixture a second gellable mixture sufficient to form an in-situ gel comprised of:
(i) 0.2 to 5.0 wt. percent of a cross-linkable polymer or mixtures of cross-linkable polymers having at least one functional group selected from a member of the group consisting of an amine, an amide, a hydroxyl, or a thiol group, and
(ii) 0.02 to 50.0 wt. percent of a partially methylated aminoplast resin or an organic cross-linker and mixtures thereof which cross-link with said polymer so as to form a non-selective second stage gel in-situ;
(c) allowing the aqueous mixture sufficient time for form ex-situ said first stage gel; and
(d) injecting said first stage gel containing said second gellable mixture into said zone of greater permeability where said first stage gel selectively enters the zone of greater permeability, reheals and forms under formation conditions a solid gel having the characteristics of the in-situ gel which gel is substantially more resistant to formation conditions than said first stage gel.

4,901,796

WELL PACKING SYSTEM

Raymond F. Drnevich, Clarence Center, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 19, 1988, Ser. No. 286,174
Int. Cl.[4] E21B *43/04, 35/00*
U.S. Cl. 166—278 **14 Claims**



1. A well packing structure for use in an injection well having a casing or in a gas or light oil production well having a casing, wherein said packing structure is positioned beneath ground level within at least some of the casing and wherein said packing particle diameter maximum size is defined by the equation:

$$Dp = \frac{0.17W - a(OD - 2th_w)}{OD}$$

wherein,
Dp = diameter of a spherical shaped particle (in.)
W = weight of the well casing (lb/ft.)
OD = outside diameter of the well casing (in.)
th_w = thickness of the casing wall (in.) and wherein "a" is at least about 0.002 and at most about 1.0.

4,901,797

METHOD FOR PLUGGING SUBTERRANEAN FORMATIONS WITH SILICEOUS GELS

Laine E. Summers, Katy, Tex., and Joe D. Allison, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jun. 26, 1989, Ser. No. 372,396
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—292 **7 Claims**

1. A process for selectively plugging a permeably zone in a subterranean formation which comprises injecting into said zone a high pH aqueous solution of colloidal silica or alkali metal silicate and an inorganic fluoride salt which hydrolyzes to form hydrofluoric acid, said inorganic fluoride salt being present in sufficient concentration to reduce the pH of the aqueous solution and effect gelling of the colloidal silica or alkali metal silicate in situ.

4,901,798

APPARATUS AND METHOD FOR REMOVAL OF ACCUMULATED LIQUIDS IN HYDROCARBON PRODUCING WELLS

Mahmood Amani, P.O. Box 409, Kingsville, Tex. 78364

Continuation-in-part of Ser. No. 867,191, May 27, 1986, Pat. No. 4,791,990. This application Jul. 29, 1988, Ser. No. 226,264
The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.
Int. Cl.[4] E21B *34/10, 43/12*
U.S. Cl. 166—311 **16 Claims**

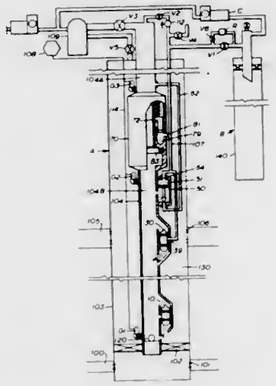
1. A method of removing accumulated liquids from a hydrocarbon producing well having a casing with perforations at a producing formation and perforations at a water bearing formation, said casing further having a string of well tubing disposed within it, the method of liquid removal comprising:
(a) sealing off a portion of said casing between a lower hydrocarbon producing formation and an upper water bearing formation;
(b) producing well fluids comprising hydrocarbon fluids and secondary fluids through the well tubing;
(c) providing a first flow control valve connected to the well tubing below the surface of the earth, said first flow control valve being normally open to allow well fluid production therethrough;
(d) providing a supply conduit to supply pressurized gas from a pressurized gas source to the well tubing, said supply conduit extending in the annulus between the tubing and the casing of said producing well and communicating with said well tubing through a port means below said first flow control valve;
(e) providing a passageway connected to the well tubing, through which liquid can be forced from the well tubing into the casing annulus;
(f) providing a second flow control valve means connected

to the well tubing below said passageway to prevent downward flow of secondary fluids into the hydrocarbon producing formation;

(g) monitoring the pressure within the well tubing during hydrocarbon fluid production to the surface;

(h) actuating said first flow control valve to its closed position when said pressure inside the well tubing exceeds a predetermined amount to encapsulate the fluids in that portion of the well tubing between the first flow control valve and second flow control valve means;

(i) injecting pressurized gas through said supply conduit into the well tubing below the closed closure means of said first flow control valve to pressurize the fluid therein;



(j) forcing the secondary fluids from the well tubing through said passageway to the casing annulus with said pressurized gas to remove said secondary fluid from said well tubing and to displace said secondary fluids into the water bearing formation above the hydrocarbon producing formation;

(k) monitoring the pressure inside said well tubing due to the removal of said secondary fluid from the tubing;

(l) stopping the flow of said pressurized gas into said supply conduit to stop fluid removal when the pressure in said well tubing is at a desired level;

(m) opening said first flow control valve; and

(n) opening the well tubing to surface facilities for production.

4,901,799

SPRINKLER HEAD HAVING PROTUBERANT RIDGE VALVE SEAT

Jerome S. Pepi, North Attleboro, Mass., and James M. Martin, East Greenwich, R.I., assignors to Grinnell Corporation, Exeter, N.H.

Filed Jun. 24, 1988, Ser. No. 210,827
Int. Cl.[4] A62C *37/08*
U.S. Cl. 169—39 **11 Claims**

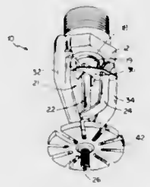
1. A fire protection sprinkler head comprising a base adapted for connection to a source of fire retardant fluid under pressure, a throat in said base having an exit orifice through which fire retardant fluid can flow, a valve seat defined by said base about the periphery of said throat exit orifice, and a resiliently flexible valve disk element disposed across said throat and impressed upon said valve seat in sealing engagement,

said valve seat comprising an arcuate profile segment beginning at said throat exit orifice in said base, with a protuberant ridge disposed about the periphery of said throat and immediately adjacent thereto, defining a valve seat surface in the region of the crest of said protuberant ridge, and said valve seat further comprising a recessed surface segment disposed radially outwardly of said throat exit orifice and of said protuberant ridge, the recessed surface being divergent from said protuberant ridge, and

said valve disk element comprising a disk spring having a sealing surface adapted to be impressed upon the valve seat surface of said protuberant ridge in sealing engagement over an annular region inward of the peripheral edge of said valve disk,

said disk element maintaining sealing engagement in said region of said crest during flexing of said disk element,

the diameter of sealing engagement of said seat surface remaining at all times closely adjacent to the diameter of the throat exit orifice.

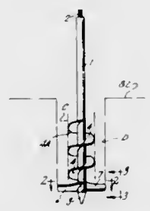


4,901,800

CULTIVATOR TOOL FOR PLANTING SEEDLINGS

Alvin K. Wilson, P.O. Box 162, Elmira, Oreg. 97437

Filed Jul. 11, 1988, Ser. No. 216,962
Int. Cl.[4] A01B *35/28, 23/00*
U.S. Cl. 172—25 **5 Claims**



1. A cultivating tool comprising in combination,

a shaft having mixing blade means thereon and adapted to be rotated,

elongate radically projecting digging blades below said mixing blade means and having inner ends secured to the shaft below said mixing blade means and adjacent a ground penetrating end of said shaft, each of said digging blades having a distal outer end,

means securing each of said digging blades to said shaft, and

said digging blades each having an upper surface and a horizontal major axis and being of a length so as to dispose the digging blade outer ends radically outwardly from a cylindrical projection containing the outer extremities of the mixing blade means, said digging blades having a span between their distal outer ends substantially twice the diameter of said mixing blade means, said mixing blade means serving to cultivate earthen material above said digging blades.

4,901,801

HAND IMPLEMENT HAVING ALTERNATELY USABLE TOOTH AND BLADE ASSEMBLIES

Andrew G. Popivalo, Sanger, Calif., assignor to James R. Walton, Sanger, Calif., a part interest

Filed Feb. 26, 1988, Ser. No. 161,043
Int. Cl.[4] A01B *1/20*
U.S. Cl. 172—375 **4 Claims**



1. An implement for working the surface of the earth in a variety of earth working movements, the implement comprising:

a handle, extending substantially along a longitudinal axis, for grasping by an operator to move the implement in said variety of earth working movements; and

a substantially flat plate mounted on said handle having bends formed therein extending along three spaced courses disposed in substantially right angular relation to said longitudinal axis of the handle, an outer two of said bends being convex in a direction substantially facing away from said handle to form two spaced substantially parallel fulcrum surfaces and a central one of said bends being convex in a direction substantially facing toward said handle and portions of said plate outwardly from said outer two of said bends forming distinct earth working tools deployed for earth working movement selectively individually using said fulcrum surfaces.

4,901,802

METHOD AND APPARATUS FOR PERFORATING FORMATIONS IN RESPONSE TO TUBING PRESSURE

Flint R. George, 6118 Magnolia, Katy, Tex. 77449, and Kevin R. George, P.O. Box 172, Columbus, Tex. 78934

Filed Apr. 20, 1987, Ser. No. 40,217
Int. Cl.[4] E21B *43/116, 43/1185;* F42B *3/00*
U.S. Cl. 175—4.52 **13 Claims**

1. An apparatus for perforating a well, comprising:

a packer;

a first tool string extending through said packer and including at least one perforating assembly, said perforating assembly comprising,

a tubing string;

a first firing head assembly in fluid communication with said tubing string,

a second firing head assembly in fluid communication with said tubing string,

a perforating gun assembly including at least one perforating gun, said assembly operatively coupled proximate one end to said first firing head and operatively coupled proximate a second end to said second firing head; and

a second tool string providing a passageway for the flow of fluid from a location beneath said packer to the surface.

6. A firing head for a perforating gun, comprising:

a housing including first and second chambers and adapted to be positioned within a well, said first chamber in fluid communication with a tubing string and said second chamber in fluid communication with said well surrounding said firing head;

an actuator piston movably responsive to fluid pressure in said first chamber in said housing; and

a detonation assembly, comprising,

a striking piston,

a locking assembly means for retaining said striking piston in a first position in said housing, said locking assembly releasable by movement of said actuating piston, and

means for causing movement of said striking piston from said first position to a second position in response to pressure in said second chamber of said housing after said locking assembly is released.

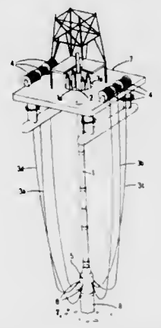


4,901,803

METHOD AND EQUIPMENT FOR PERFORMING DRILLING OPERATIONS AND SERVICING IN AN UNDERWATER WELL FROM A FLOATING SURFACE INSTALLATION

Jean-Francois Levier, Croissy sur Seine, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jun. 27, 1988, Ser. No. 211,875
Claims priority, application France, Jun. 26, 1987, 87 09034
Int. Cl.[4] E21B *7/12, 19/09, 43/013*
U.S. Cl. 175—5 **4 Claims**



1. A method for performing drilling operations and servicing of an underwater well from a surface installation, wherein a piece of equipment for a wellhead is positioned from the installation by being lowered into the water at the lower end of a riser-type string comprising a main string connecting the top of the wellhead to the surface installation, and the piece of equipment, in addition, is connected to the installation by auxiliary

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hoses for servicing and remote control, said method comprising the following successive steps:

connecting said piece of equipment in a removable manner to the lower end of a first section of the main string, supporting from the surface installation and connecting laterally with respect to said piece of equipment, the lower ends of the auxiliary hoses for servicing and remote control, the upper ends of which are held on said installation at a distance from said main string, with the interposition of curvature-limiting elements directed downwardly, in the vicinity of said piece of equipment so that under the action of gravity each of said auxiliary hoses forms a catenary at a distance from said main string between said piece of equipment and the surface installation,

gradually lowering said piece of equipment from the surface installation by connecting successive sections of said main string and causing a sufficient length of said auxiliary hoses to advance from the surface installation until the piece of equipment is connected to the top of the wellhead, and

adjusting the length of said auxiliary hoses from the surface installation, thus modifying the distance separating said catenaries from the bottom of the water.

2. Apparatus for performing drilling operations and servicing of an underwater well from a surface installation, comprising a piece of equipment for an underwater wellhead, a riser connecting the top of the piece of equipment to the surface installation, said riser comprising a main string, and a plurality of auxiliary hoses for servicing and remote control that connect said piece of equipment to said installation, means for allowing disconnection of said main string from said piece of equipment in a way that is totally independent of said auxiliary hoses and means for suspending said auxiliary hoses from said installation independently of said main string and at a distance from the main string and for making possible the continuous advance of said hoses, the length of which is adjusted in service so that under the effect of gravity the hoses form a plurality of catenaries which surround at a distance, at least partially, said main string and each one of which has a first end supported by the surface installation, the second end of a catenary being connected to said piece of equipment of the wellhead and means for limiting curvature of each of said hoses, connected to and directed downwardly from said piece of equipment.

4,901,804

ARTICULATED DOWNHOLE SURVEYING INSTRUMENT ASSEMBLY

Theodore G. Thometz, Salt Lake City, and Charles D. Barron, Sandy, both of Utah, assignors to Eastman Christensen Company, Salt Lake City, Utah

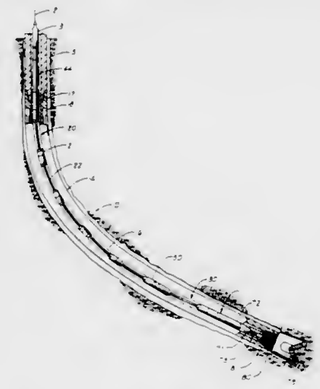
Filed Aug. 15, 1988, Ser. No. 232,471
Int. Cl.[4] E21B *47/00*
U.S. Cl. 175—40 **16 Claims**

1. A flexible downhole measuring instrument assembly for use within a wellbore, comprising:

(a) a plurality of instrument components, said components divided into at least two groups;

(b) a plurality of longitudinally separated generally cylindrical housings each enclosing at least one of the groups of instrument components; and

(c) a coupling extending longitudinally between and interconnecting said housings, said coupling being laterally flexible but generally longitudinally rigid and including a



portion which is smaller in at least one transverse dimension than the diameter of said housings.

4,901,805

UNIT FOR BOREHOLE RUNNING AND PULLING OPERATIONS

Vagif A. Ali-Zade; Eldar Tarik ogly Zeinalov; Nariman Gusein Kuli ogly Kurbanov, and Vladimir A. Kartashev, all of Baku, U.S.S.R., assignors to Nauchno-Issledovatelsky I Proektno-Konstructorsky Institut Neftyanogo Mashinostroenia, Baku, U.S.S.R.

Filed Aug. 11, 1988, Ser. No. 230,991
Claims priority, application U.S.S.R., Aug. 17, 1987, 4296684
Int. Cl.[4] E21B *19/20*
U.S. Cl. 175—85 **7 Claims**

1. A unit for borehole running and pulling operations with drill rods or pipes, comprising:

an inclined mast;

a racking platform pivotally mounted on said inclined mast;

said racking platform having a central opening at the side of said inclined mast;

a crown pulley supported at the top of said inclined mast;

a split travelling block connected with said crown pulley;

an elevator suspended from said split travelling block;

cables of a hoist line connecting said split travelling block with said crown pulley;

a centralizer mounted intermediate said racking platform and said crown pulley for vertical reciprocation together with and for interaction with said split travelling block;

sheave means of said centralizer adapted for cooperation with said cables of said hoist line in the movement of said centralizer therealong;

guides for vertical reciprocation of said centralizer in its interaction with said travelling block, pivotally mounted at the upper part of said inclined mast, said guides being rigid;

carriage means mounted on said centralizer for its interaction with said guides for vertical reciprocation of said centralizer;

stop means on said guides for vertical reciprocation of said centralizer, situated intermediate said racking platform and centralizer, immediately above the racking platform for fitting said centralizer;

guideways for horizontal displacement of said centralizer,

accommodated in said central opening of said racking platform symmetrically with respect to the axis thereof,





for cooperation with respective ones of said guides for vertical reciprocation of said centralizer.

4,901,806

APPARATUS FOR CONTROLLED ABSORPTION OF AXIAL AND TORSIONAL FORCES IN A WELL STRING

John Forrest, Houston, Tex., assignor to Drilex Systems, Inc., Houston, Tex.

Filed Jul. 22, 1988, Ser. No. 223,461
Int. Cl.[4] E21B *4/02*
U.S. Cl. 175--321 **22 Claims**



1. An apparatus for the controlled absorption of axial and torsional forces associated with the drilling work loads applied to a drill string, said apparatus adapted for series connection in a drill string to formation cutting means, said apparatus comprising:

an outer casing connected at its upper end to the drill string, said outer casing having an axial opening formed at its lower end;

an inner mandrel assembly having the formation cutting means connected to the lower end thereof and an axial fluid passageway for the controlled supply of drilling fluid from the drill string to the formation cutting means, said inner assembly telescopingly received in said outer casing such that the lower end of said assembly extends through said axial opening of said outer casing;

upper and lower pistons on said inner assembly adapted to sealingly engage an inner surface of said outer casing, said pistons forming an enclosed fluid chamber therebetween; and

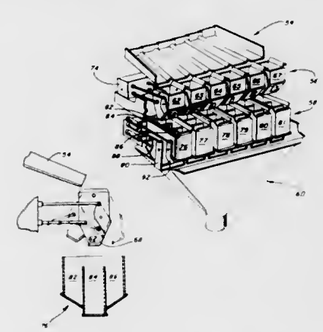
a torque retractor assembly disposed within said fluid chamber between said upper and lower pistons, said torque retractor assembly adapted to absorb the torsional forces associated with said drill string.

4,901,807

COMBINATION WEIGHER WITH MULTIPLE COMPARTMENT WEIGHING RECEPTACLES

Robert L. Muskat, Lake Forest; Robert H. Connors, Chicago, and King Klopfenstein, Prospect Heights, all of Ill., assignors to Triangle Package Machinery, Chicago, Ill.

Filed Oct. 31, 1986, Ser. No. 926,005
Int. Cl.[4] G01G *13/00*
U.S. Cl. 177—25.18 **4 Claims**



1. A weighing machine for providing a quantity of product having a predetermined weight, comprising:

feeder means to transport product supplied by a product source;

a plurality of accumulating means to receive product from said feeder means, hold said product and selectively discharge said product therefrom, said accumulating means including an accumulating chamber pivotally mounted to selectively channel said product discharge in one of a plurality of directions, a door in said accumulating chamber to discharge product therefrom and a door operating means to selectively open and close said door;

a plurality of weighing means, each comprising a multiple compartment weighing receptacle, to receive discrete amounts of product from said feeder means, and a weight determining means to determine the weight of the product in each compartment of each said weighing receptacle; and

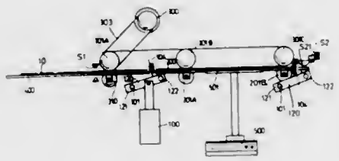
collecting means to receive discrete amounts of product from any of said weighing means, consolidate them, and direct them to another location.

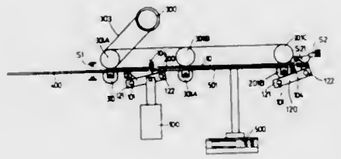
4,901,808

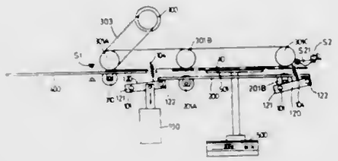
DEVICE FOR AUTOMATICALLY WEIGHING OBJECTS IN CONVEYANCE

Sheng J. Wu, P.O. Box 1-79, Taipei, Taiwan (10602)

Filed Aug. 3, 1988, Ser. No. 227,887
Int. Cl.[4] G01G *19/00, 23/22*
U.S. Cl. 177—145 **9 Claims**







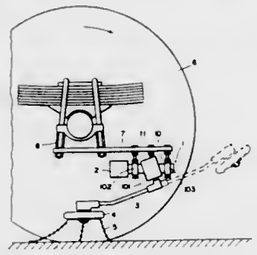
1. A device for weighing objects during the conveyance of said objects comprising:
means for conveying an object to a weighing position;
means for driving said conveying means;
means for sensing said object's location at said weighing position;
said conveying means including a movable and vertically displaceable stand for supporting said object and responsive to said sensing means sensing said object at said weighing position for moving said object from a first horizontal weighing position to a second lower horizontal weighing position;
means for weighing said object in said second lower horizontal weighing position, and
wherein said movable stand includes an opening, whereby said means for weighing is received through said opening thereby separating said object from said conveying means during weighing.

4,901,809

DEVICE FOR POSITIONING AND ATTACHING AN AUXILIARY SNOW-CHAIN DEVICE FOR MOTOR VEHICLES

Hans Tschannen, Gorgier, Switzerland, assignor to Bekin St. Aubin S.A., St. Aubin, Switzerland

Filed Mar. 17, 1989, Ser. No. 325,265
Claims priority, application Switzerland, Mar. 25, 1988, 1136/88
Int. Cl.[4] B60C *27/02;* **F16J** *3/04;* **B60T** *1/04*
U.S. Cl. 180—16 **15 Claims**



1. A snow-chain device intended to be arranged under a motor vehicle, having an engaged and a retracted position, and comprising a plurality of lengths of chain, a chain-wheel having a circular rim defining a geometric plane, said rim being adapted to press against one wheel of said vehicle in said engaged position, a swivel arm, support means, and motor means held by said support means and arranged for rotating said swivel arm about a first axis of rotation having a predetermined direction with respect to said support means, said chain-wheel being freely-pivotally mounted at a free end of said arm to rotate about a second axis of rotation perpendicular to said plane and having a predetermined direction with respect to said arm, and said plurality of lengths of chain being distributed around said chain-wheel, with one end of each chain secured to said wheel, wherein said support means comprises a cage enclosing said motor means, said cage comprising at least two suspension locations at predetermined positions within said cage, the device further comprising a plurality of locking and attachment components, said components being arranged for cooperating with said suspension locations to allow securing of said cage under said vehicle and adjusting the position of said cage such that said second axis of rotation and said plane have predetermined positions with respect to said one vehicle wheel when said swivel arm extends in said engaged position under the influence of said motor means.

4,901,810

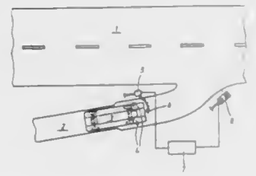
SAFETY DEVICE FOR SELECTIVITY TRACK-GUIDED OR ROAD TRAVELLING VEHICLES

Hubertus Christ, Langenargen; Klaus Nieman, Weizheim, and Herbert Mehren, Freiberg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,123
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 3707732
Int. Cl.[4] B62D *1/26*
U.S. Cl. 180—131 **12 Claims**

1. Safety device for selectively track-guided or non track-guided road travelling vehicles with sensing rollers rolling on lateral transverse guide bars of a track-guided road section, said sensing rollers being adjustably controlled and actuated by auxiliary power for movement between a work position near the ground when used in track-guided operation and a retracted rest position when used in non track-guided operation, said safety device comprising:

an optical indicator device disposed behind an exit point of a track-guided road section, said optical indication device being switchably controllable between a normal stop mode signal warning an approaching vehicle drive not to proceed on to an adjacent non-track guided road section and a go mode signal advising a vehicle driver that the vehicle may safely proceed onto the non track-guided road section;



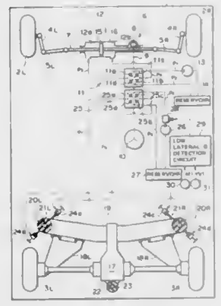
monitoring means for monitoring whether the sensing rollers are in the work position or in the retracted rest position;
and control signal means responsive to the monitoring means for controlling the optical indicator device in such a manner as to switch the optical indicator device to the go mode signal only when the sensing rollers are in the retracted rest position.

4,901,811

VEHICLE STEERING SYSTEM FOR ADJUSTING TIRE CHARACTERISTIC

Takaaki Uno, Kawasaki; Hiroyasu Kan, Sagamihara, and Hiroshi Tonomura, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed May 13, 1988, Ser. No. 196,217
Claims priority, application Japan, May 14, 1987, 62-115887; May 25, 1987, 62-127332
Int. Cl.[4] B62D *5/06, 6/04*
U.S. Cl. 180—140 **16 Claims**



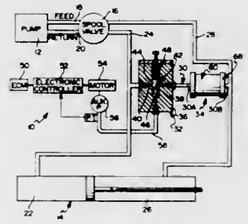
1. A vehicle comprising;
front wheels each equipped with a front tire and rear wheels each equipped with a rear tire having a rear tire characteristic which is different from a front tire characteristic of said front tire,
a rear wheel steering system for steering the vehicle by varying a rear wheel steer angle, and
controlling means for adjusting said rear tire characteristic by varying said rear wheel steer angle in a predetermined first cornering condition of the vehicle, wherein each of the front and rear tire characteristic is a relationship between cornering force and tire slip angle, and the front and rear tire characteristics are different in tire slip angle at maximum cornering force which is a tire slip angle at which the cornering force is increased to a maximum.

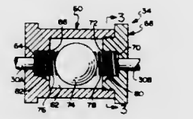
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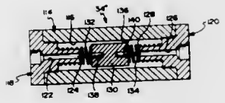
VARIABLE EFFORT STEERING SYSTEM

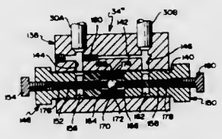
Michael A. Ferguson, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1988, Ser. No. 272,023
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—142 **6 Claims**









1. In a bypass type variable effort power steering system including
a steering assist fluid motor having a first working chamber and a second working chamber,
a pump,
a steering control valve connected to said pump and to said first working chamber and to said second working chamber operative to port one of said said first and said second working chambers to said pump while concurrently porting the other of said said first and said second working chambers to a low pressure fluid exhaust, and
a bypass valve in a bypass duct connected to said first working chamber and to said second working chamber having a closed position wherein said bypass duct is blocked and an open position wherein said bypass duct is open for bypass fluid flow from said one working chamber to said low pressure fluid exhaust,
the improvement comprising:
a throttling valve housing including a center chamber having a first opening to said bypass duct and a second opening to said bypass duct spaced from said first opening,
means in said center chamber defining a first valve seat at said first opening to said bypass duct and a second valve seat at said second opening to said bypass duct,
a valve element disposed in said center chamber for move-

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ment between a centered position generally mid-way between said first and said second valve seats and a seated position engaging one of said first and said second valve seats, and

spring means between said valve element and said throttling valve housing normally maintaining said valve element in said centered position,

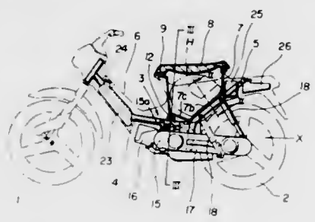
said valve element in said centered position thereof cooperating with said center chamber in said throttling valve housing in defining a bypass flow path between said first and said second valve seats having a flow area calculated to induce a pressure force on said valve element exceeding the force exerted by said spring means when said bypass fluid flow rate exceeds a transition flow rate characteristic of a substantial pressure difference between said one working chamber and said low pressure fluid exhaust so that said valve element is moved by said pressure force to said seated position wherein said bypass flow path is blocked.

4,901,813

MOTORCYCLE

Katsumi Kimura, Saitama; Masamitsu Anzawa, Tokyo; Masamichi Uchida, Tokyo, and Tomohiko Akashi, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,766
Claims priority, application Japan, Aug. 8, 1987, 62-198724
Int. Cl.[4] B62M *7/02*
U.S. Cl. 180—230 **15 Claims**



1. A motorcycle comprising:

a longitudinally extending frame;

a front wheel and a rear wheel connecting with said frame at opposite ends thereof;

an engine;

a transmission extending generally horizontally and rearwardly from said engine to operatively connect said engine and said rear wheel, said transmission being contained in a case that mounts said engine and that is pivotally attached to said frame;

a box-like receiving chamber with an open upper end carried by said frame rearwardly of said engine and in overlying relation to said transmission in close proximity thereto; and

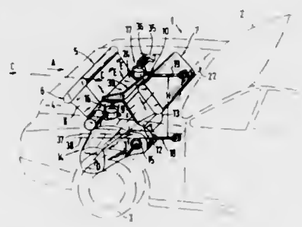
a seat pivotally attached to said receiving chamber for opening and closing the upper end thereof.

4,901,814

MOUNTING OF AN INTERNAL COMBUSTION ENGINE

Ulrich von Broock, Weissach; Ruediger Fischle, Leonberg, and Rolf von Sivers, Rutesheim, all of Fed. Rep. of Germany, assignors to Porsche AG, Weissach, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 213,301
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721507
Int. Cl.[4] B60K *5/12*
U.S. Cl. 180—297 **23 Claims**



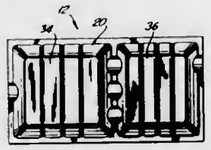
1. A mounting for an internal combustion engine with a transmission secured at one end of the engine, comprising bearing support means and torque support means for retaining the transmission and internal combustion engine at relatively fixed parts, said bearing support means including a first bearing support means and a second bearing support means, the weight of the transmission and the internal combustion engine being hangingly suspended solely by the first and second bearing support means, the first bearing support means is arranged above but not far from a horizontal plane that passes horizontally through the center of gravity of the engine as well as adjacent a vertical plane that passes vertically through the center of gravity of the internal combustion engine, the second bearing support means is attached to the internal combustion engine adjacent a side thereof that is opposite to the end with the transmission, and wherein the torque support means counteracts torque forces from the transmission and internal combustion and includes at least two horizontally directed torque support means that are provided offset to one another in height and wherein at least one of said two torque support means extends between fixed parts and the internal combustion engine.

4,901,815

STAMP FORMED MUFFLERS

Jon W. Harwood, Toledo, Ohio, and Wayne A. Karlgaard, Dyersburg, Tenn., assignors to Parts Manufacturing Company, Toledo, Ohio

Division of Ser. No. 259,176, Oct. 18, 1988, Pat. No. 4,847,965.
This application Mar. 20, 1989, Ser. No. 325,650
Int. Cl.[4] F01N *7/18*
U.S. Cl. 181—282 **8 Claims**



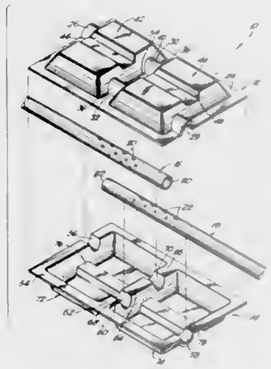
1. A system of comprising a plurality of stamp formed mufflers, each said muffler in said system comprising a first plate stamp formed to define an array of channels at selected locations therein, at least one portion of said channels being characterized by at least one aperture of a selected size extending therethrough, a second plate secured in generally face to face contact with said first plate such that the second plate and the channels in said first plate define an array of tubes at locations corresponding to the locations of the channels, said tubes comprising an inlet to the muffler and an outlet from the muffler, an external shell formed to define at least one chamber surrounding said aperture in said first plate, each said muffler in said system being formed such that the locations of the tubes therein are substantially identical, but such that the sizes of the apertures in the first plates of selected mufflers of said system are different from the sizes of the apertures in the first plates of other mufflers in said system, whereby the apertures in said first plates can be formed for producing selected mufflers in said system with different acoustical characteristics from other mufflers in said system.

4,901,816

LIGHT WEIGHT HYBRID EXHAUST MUFFLER

David Garey, Toledo, Ohio, assignor to AP Parts Manufacturing Company, Toledo, Ohio

Filed Jan. 23, 1989, Ser. No. 300,417
Int. Cl.[4] F01N *7/18*
U.S. Cl. 181—296 **7 Claims**



1. A method for forming an exhaust system assembly, said method comprising the following steps:

forming first and second external shells such that each said external shell comprises a peripheral portion dimensioned and configured such that the peripheral portion of the first external shell can be placed generally in register with the peripheral portion of the second external shell, the forming of said external shells further defining a plurality of chambers extending from the peripheral portions, with each said external shell comprising at least one baffle crease unitary with said external shell and separating the chambers therein, said baffle creases being formed to extend between spaced apart locations on said peripheral portions and comprising generally planar portions and generally nonplanar portions dimensioned to engage at least one pipe, the planar portions of each baffle crease in the first external shell being disposed to be placed generally in register with the planar portions of the respective baffle crease in the second external shell, said first and second external shells further being formed to define at least one inlet for receiving an exhaust pipe and at least one outlet for receiving a tail pipe;

positioning the first and second external shells generally in register with one another;

securely connecting said first and second external shells to one another;

providing an elongated exhaust pipe having opposed first and second ends and an elongated tail pipe having opposed first and second ends;

forming aperture means in at least one of said exhaust pipe and said tail pipe in proximity to the first end thereof for permitting expansion of exhaust gas therefrom;

slidably inserting the first end of said exhaust pipe and the first end of said tail pipe into the respective inlet and outlet openings of said muffler at least a sufficient distance for the respective inlet and outlet pipes to be supported by at least one of said nonplanar portions of said baffle creases and a sufficient distance for the aperture means to be disposed in the muffler, the second ends of said exhaust pipe and said tail pipe being disposed externally of said muffler; and

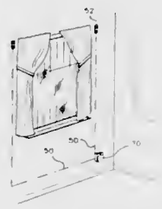
securely connecting portions of said exhaust pipe and said tail pipe intermediate the respective ends thereof to at least one of said external shells generally adjacent the respective inlet and outlet thereto.

4,901,817

EXPLOSIVE RELEASE WINDOW GRILLE

Fernando M. Carrasco, 1225 Broadway #1101, Chula Vista, Calif. 92011

Filed Jun. 26, 1989, Ser. No. 371,632
Int. Cl.[4] E06C *9/10;* **E06B** *3/68*
U.S. Cl. 182—21 **6 Claims**



1. An explosive release window grille system comprising:

a window grille formed from a plurality of laterally spaced vertical bars each having a top end and a bottom end, a top horizontal bar is rigidly secured to said vertical bars adjacent their top ends, the bottom ends of said vertical bars have an eyelet loop formed on them, a bottom horizontal bar passes through said eyelet loops to function as a hinge about which said window grille can pivot downwardly about to provide an escape exit through a window that the window grille normally covers;

said bottom horizontal bar having a first end and a second end;

a pair of mounting bracket assemblies; one mounting bracket assembly is for securing the first end of said bottom horizontal bar to the wall of a house or building beneath a window covered by the window grille, the other mounting bracket is for securing the second end of the bottom horizontal bar to the wall of the house or building;

said top horizontal bar having a first end and a second end; and

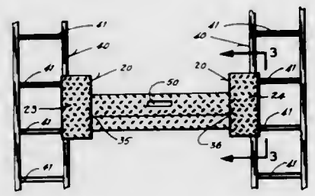
a pair of explosive release bracket assemblies for securing the respective first and second ends of said top horizontal bar to the wall of a house or building above a window covered by the window grille.

4,901,818

FIRE FIGHTING ROOF LADDER ACCESSORY

Kevin P. Schmitt, 2403 Liberty Pl., Manitowoc, Wis. 54220

Filed Jan. 17, 1989, Ser. No. 297,517
Int. Cl.[4] E06C *5/32, 7/08*
U.S. Cl. 182—117 **2 Claims**



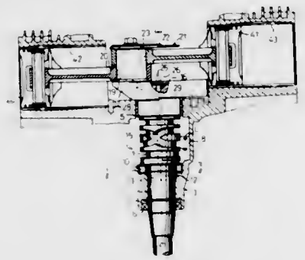
1. A device to be supported between two roof ladders comprising:
a supporting beam having two ends;
a pair of run engaging fasteners secured to each said end;
said beam being capable of being supporting between said roof ladders by said pair of fasteners;
said beam having at least two flat angularly related foot support surfaces extending along said beam;
whereby a firefighter may place his foot on the beam to steady himself as he ventilates the roof of a burning building.

4,901,819

LUBRICATION DEVICE FOR VERTICAL CRANK SHAFT ENGINE

Shinichi Tamba, Kakogawa; Yoshiro Yamane, Akashi, and Tetsuhiro Yamakawa, Kakogawa, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed May 25, 1988, Ser. No. 198,236
Claims priority, application Japan, May 29, 1987, 62-136508
Int. Cl.[4] F01M *9/00, 1/00*
U.S. Cl. 184—6.18 **6 Claims**



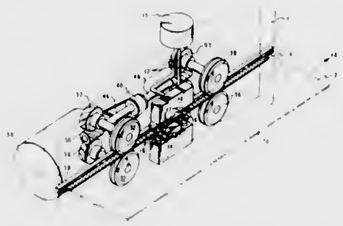
1. A lubrication device for an engine having a crank case and a crank shaft, said crank shaft extending vertically in said crank case and having a lower portion thereof supported by a bearing in said crank case; said lubrication device comprising: an oil reservoir formed between said crank case and said crank shaft and including a lowest portion just above said bearing, a discharge port in the form of a relatively small void at said bearing, and a pumping member having a fixing portion fixed to a peripheral portion of said crank shaft for rotation therewith and located in said lowest portion just above said void, said pumping member having blade means for pressurizing oil in said reservoir into said void, said blade means depending downwardly from a horizontal plane defining a top member of the pump.

4,901,820

GOLD TAB LUBRICATION

Boyd M. Fry, Georgetown; Pratap Singh, Round Rock; Joseph T. Spalik, Gerogetown, and Kerry D. Sweazea, Leander, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 28, 1988, Ser. No. 250,463
Int. Cl.[4] F16N *7/12, 7/16, 7/24, 25/04*
U.S. Cl. 184—64 **11 Claims**



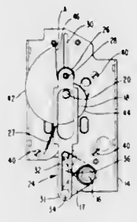
1. Apparatus for applying uniform amounts of liquid lubricant to electrical contact tabs located along at least an edge of a printed circuit card comprising:
first free rolling lubricant applicator means;
means for conveying said printed circuit card along a linear path at a predetermined, constant rate of speed in wiping contact past said lubricant applicator means;
a supply of lubricant; and
means, including at least one wicking member, connecting said lubricant supply to said applicator means.

4,901,821

MOTOR OPERATOR FOR A STORED ENERGY OPERATING MECHANISM

W. Dale Robbins, Snellville, Ga., assignor to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Oct. 13, 1988, Ser. No. 257,483
Int. Cl.[4] F03G *1/00;* **H01H** *3/30;* **F16H** *25/14*
U.S. Cl. 185—40 R **4 Claims**



1. A mechanism for supplying energy to a circuit breaker of the type including means for storing energy and a transfer shaft for transferring energy to the means for storing energy, the mechanism for supplying energy comprising:
a support means;
a first shaft adapted to be coupled to the transfer shaft, wherein the first shaft is rotatably supported by the support means;
a second shaft rotatably supported by the support means;

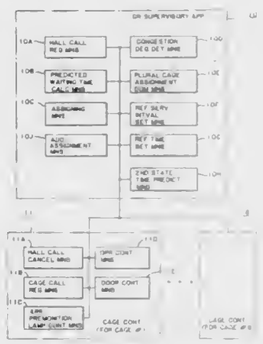
a cam supported by the second shaft;
a motor for producing rotational motion;
means for transferring the rotational motion of the motor to the second shaft;
a member including a slot and a cam follower, wherein the member is slidably supported by the support means such that contact between cam follower and cam is maintainable;
an arm including an extension slidably engaging the slot, wherein the arm is fixed to the first shaft; and
means for maintaining the cam follower in engagement with the cam;
the cam including a cam surface having a rise portion followed by a return portion which drops back to the beginning of the rise portion,
the extension engaging the slot such that:
the arm rotates the first shaft from a first position to a second position when the cam is rotated and the cam follower is in contact with the rise portion;
the arm does not rotate the first shaft when the cam is rotated and the cam follower is in contact with the return portion, and
the arm does not rotate the first shaft when the shaft is in the second position.

4,901,822

GROUP SUPERVISORY APPARATUS FOR ELEVATOR

Shintaro Tsuji, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 2, 1988, Ser. No. 227,602
Claims priority, application Japan, Aug. 6, 1987, 62-197015; Aug. 26, 1987, 62-211933; Aug. 26, 1987, 62-211934
Int. Cl.[4] B66B *1/20*
U.S. Cl. 187—127 **15 Claims**



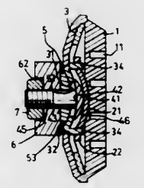
1. A group supervisory apparatus for an elevator for selecting and assigning a cage to be serviced from a plurality of cages to respond to a hall call comprising:
plural cage assignment command means for commanding the assignment of a plurality of cages for said hall call of the hall when the congestion of the hall is detected;
reference service interval setting means for setting a reference value of a period from when the cage to be previously serviced in the hall of congestion becomes a first state of one of operating states of the cage generated upon operation of the cage to when the cage to be similarly serviced later becomes a second state of one of the above-described states of the cage in response to the traffic volume of the hall of congestion,
reference time setting means for setting a reference value of a time when the other cage becomes said second state in said hall of congestion in response to the number of cages to be additionally assigned on the basis of the first state time when the cage becomes the first state and the reference service interval,
second state time predicting means for predicting a time when the cage becomes the second state in the hall of congestion, and
additional assignment means for selecting and assigning the cage having a small deviation between the second state predicting time of the hall of congestion and the reference time of the cage to be additionally assigned upon reception of the command from said plural cages assignment command means.

4,901,823

BRAKE MECHANISM

Morgan Chang, No. 291, Sec. 1, Chang Nan Rd., Chang Hwa City, Taiwan

Filed Nov. 10, 1988, Ser. No. 269,897
Int. Cl.[4] F16D *65/06*
U.S. Cl. 188—73.1 **3 Claims**



1. A brake mechanism attached to a bicycle brake arm, comprising:
a brake block made of rigid plastic and a plurality of grooves formed thereon to increase frictional force to stop a bicycle wheel;
a positioning member engageable with said brake block having a bore centrally formed thereon, so that a bolt is interposable therebetween;
said bolt having a head, a rod connected to said head and a threaded end following said rod; said head having an outer surface and a concave face; and said rod having two flat faces provided thereon;
a semi-circular portion having a convex face, a central hole shaped corresponding to said rod so as to prevent relative rotation therebetween, and one side of said semi-circular portion having radial serrations thereon;
said brake block and said positioning member being engageable together so that said bolt is interposed therebetween and said rod is passable through said bore of said positioning member to receive said semi-circular portion by mounting on said rod;
a curvature of said concave face of said head matching a curvature of a margin of said bore; said curvature of said margin matching a curvature of said convex face of said semi-circular portion; a curvature of said outer surface of said head being greater.

4,901,824

BICYCLE BRAKE SHOE HAVING SLIT SURFACES

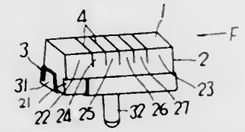
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 11, 1984, Ser. No. 680,466
Int. Cl.[4] F16D *69/00, 65/00*
U.S. Cl. 188—73.1 **6 Claims**

1. A brake shoe for a bicycle brake, said brake shoe for making press contact with a rim of a bicycle wheel to apply a braking force against rotation of the wheel, said brake shoe comprising:
a shoe body disposed adjacent said rim and elongated in a rotation direction of said rim, said shoe body having a

braking surface opposite to a braked surface of said rim, and

a bolder holding said shoe body and mounting said shoe body to said brake, said shoe body having a plurality of slits, each slit extending in a direction transverse to a longitudinal dimension of said braking surface and extending from said braking surface toward a position at which said shoe body is held by said holder, each slit comprising adjacent slit surfaces, each slit being approximately zero in



width when no braking action is being applied by said brake shoe against said rim, said adjacent slit surfaces of said slits contacting each other when braking action is being applied by said brake shoe against said rim, said brake shoe comprising elastically deformable surface portions between said slits, said surface portions having edge parts which rise as a result of elastic deformation in response to rotation of said rim relative to said brake shoe when said braking action is being applied.

4,901,825

SPOT-TYPE DISC BRAKE INCLUDING CALIPER RETENTION ARRANGEMENTS

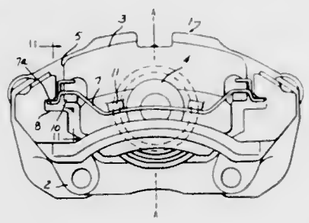
Rolf Weiler, Frankfurt am Main, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 25, 1986, Ser. No. 889,215

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1985, 3532975

Int. Cl.⁴ F16D *65/38;* **B60T** *11/00*

U.S. Cl. 188—73.35 **7 Claims**



1. A spot-type disc brake for an automotive vehicle, comprising a carrier adapted to be mounted to the wheel suspension of said vehicle, a brake housing slidably mounted to said carrier, said brake housing including two circumferentially spaced apart angularly disposed bores, brake pad actuating means associated with said housing, and a retaining arrangement for preventing the brake housing from being lifted clear of said carrier, said retaining arrangement including a wire element having opposite ends mounted in said angularly disposed bores in the brake housing, said wire element forming at least one projection which engages into at least one axially extending recess provided in the brake carrier, said recess defined by substantially parallel confining walls.

4,901,826

VEHICLE EQUIPPED WITH AIR-COOLED WHEEL BRAKES

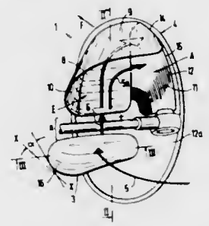
Michael Preiss, Vaihingen-Enz/Aurich, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Feb. 9, 1989, Ser. No. 307,956

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803801

Int. Cl.⁴ F16D *65/847*

U.S. Cl. 188—264 A **10 Claims**



1. An air guiding arrangement for a wheel brake of a motor vehicle, having a profiled air deflecting element which is positioned against an arriving air current, wherein the arrangement comprises the profiled air deflecting element, held by and extending in a transverse direction of the vehicle and arranged below and spaced from an adjacent and separate air catching and guiding element which is circumferentially open in a forward driving direction of a vehicle and has an air inlet area (E), facing the deflecting element and an air outlet area (A) located opposite an opening in a brake protection plate of the wheel brake.

4,901,827

SLIDE TYPE EXHAUST BRAKE SYSTEM

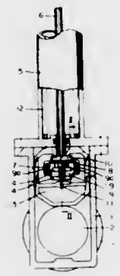
Ryoichi Suzuki, Mishima, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Sunto, Japan

Filed Feb. 23, 1989, Ser. No. 314,643

Claims priority, application Japan, Mar. 11, 1988, 63-58037

Int. Cl.⁴ F02D *9/06;* **F16K** *3/02*

U.S. Cl. 188—273 **5 Claims**



1. A slide type exhaust brake system comprising:

an exhaust brake body;

a tabular valve member having its surface formed with exhaust pressure adjusting holes;

a housing including a reciprocatory passageway of said valve member housed in said housing which communicates with an exhaust passageway having its two side ends

from which a connecting wall leading to an exhaust pipe is protruded;

an air cylinder unit connectively provided at one side end of said reciprocatory passageway;

a piston rod penetrating a partition wall apart from said air cylinder unit;

a fixed block member engaging with said valve member secured to the top of said piston rod;

a support frame assuming a C-shape in section and mounted on the front surface of said block member; and

a liner accommodated in said support frame, having its two lengthwise ends bent upwards and sliding on the bottom wall surface of said valve member, characterized by an auxiliary valve mechanism composed of said support frame and said liner and locked to said piston rod, said auxiliary valve mechanism permitting said liner to close said exhaust pressure adjusting holes when closing said exhaust passageway by use of said valve member while said valve member is thrust in one direction by the top of said piston rod, and permitting said liner to open said exhaust pressure adjusting holes when opening said exhaust passageway to thereby move said auxiliary valve mechanism in the other direction while engaging with said valve member, wherein said valve member includes said plurality of exhaust pressure adjusting holes disposed in its movable direction, wherein at least one through-hole is formed in said liner sliding on the bottom wall surface of said valve member, and wherein said respective exhaust pressure adjusting holes are opened with the movement of said liner when opening said exhaust passageway.

4,901,828

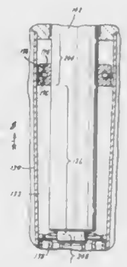
METHOD AND APPARATUS FOR CONTROLLING DISPLACEMENT OF A PISTON IN A SHOCK ABSORBER

Robert J. Schmidt, Toledo, Ohio, and Jerome J. Zawada, Jr., Crestwood, Ill., assignors to Monroe Auto Equipment Company, Monroe, Mich.

Filed May 31, 1989, Ser. No. 361,720

Int. Cl.⁴ F16F *9/48*

U.S. Cl. 188—288 **9 Claims**



1. A shock absorber for damping the movement of the body of an automobile comprising:

a pressure cylinder forming a working chamber operable to store damping fluid, said pressure cylinder having a tapered portion;

a reciprocating piston disposed in said working chamber operable to divide said working chamber into first and second portions;

an axially extending piston rod disposed in said working chamber and connected to said piston; and

means for controlling the displacement of said piston being disposed on said piston rod at a position axially displaced from said reciprocating piston, said means for controlling the displacement of said piston comprising:

a. an annular collar disposed on said piston rod, said annular collar having a plurality of flow passages operable to permit damping fluid to flow through said annular collar,

b. a radially extending groove disposed on the periphery of said annular collar, said groove extending through said flow passages, and

c. a split ring partially disposed within said groove and having at least one flow passage disposed therein, said split ring operable to control the flow of damping fluid through said flow passages in said annular collar in response to the position of said split ring with respect to said tapered portion, said split ring being single piece and having a first surface operable to engage said pressure cylinder, said first surface having a circular cross-section whereby the position of said split ring in said tapered portion of said pressure cylinder is operable to control the flow of damping fluid through said flow passage in said annular collar by controlling the position of said flow passage of said split ring with the flow passages of said annular collar.

4,901,829

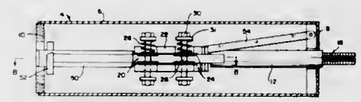
FRICTIONAL SHOCK ABSORBER ENCLOSED WITHIN A HOUSING

George H. East, Jr., Sudbury; Robert E. Roemer, Bolton, and Karl A. Chapsky, Newton, all of Mass., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Filed Mar. 17, 1988, Ser. No. 169,325

Int. Cl.⁴ F16F *11/00;* **B60T** *7/12;* **F16L** *3/00*

U.S. Cl. 188—381 **18 Claims**



1. A shock absorbing device comprising:

a shaft having a first end, to be attached to an object to be supported by a means of attachment, and a frictional surface of uniform width at a second end, said shaft adapted to move axially, without rotational movement, when said object to be supported is subjected to motion;

a housing to be attached to a non-moveable support and comprising a means for receiving at least a portion of the shaft;

a brake assembly located within the housing and operatively connected to the housing and comprising at least one frictional surface engaging means, adapted to engage under pressure the frictional surface of the shaft to thereby at least partly restrain the axial movement of the shaft, and an adjustment means for adjusting the pressure of the frictional surface engaging means against the frictional surface to provide variable uniform resistance to linear motion depending on load amplitude.

4,901,830

CLUTCH AND BRAKE APPARATUS OPERABLE BY COMPRESSIBLE FLUID, ESPECIALLY PNEUMATICALLY

Henrik Dolby, Horsens, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jul. 22, 1988, Ser. No. 222,759

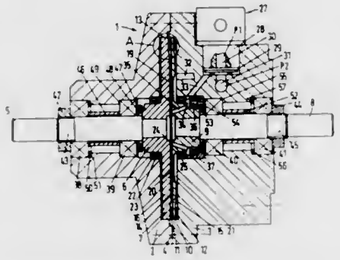
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727173

Int. Cl.⁴ F16D *67/04*

U.S. Cl. 192—18 A **17 Claims**

1. A clutch and brake apparatus operable by compressible fluid, comprising a housing having wall means that at least in part define a clutch chamber and includes axially opposite first and second end walls, an output shaft, an input shaft, means

mounted by the housing for mounting the shafts for rotation about coextensive rotary axes, the input and output shafts having adjacent first ends, a clutch flange mounted to the input shaft adjacent end to rotate therewith, a clutch plate mounted to the output shaft adjacent end to rotate the output shaft, the clutch plate and flange each having a radial inner and radial outer portion, the clutch flange and plate extending within the clutch chamber to provide a first operating chamber axially between the flange and plate, a second operating chamber, the plate being axially between the first and second chambers, and axially between the clutch flange and the second end wall, control means for creating a pressure differential between the first and second operating chambers to selectively operate the clutch plate to a braking condition and to a driving condition,



each of the end walls having a radial inner and a radial outer portion, at least two of the radial outer portions of the clutch plate, the clutch flange and one of the end walls radial outer portions having a first and a second depression respectively that is axially spaced from the other of the first and second depression, and a first and a second friction liner mounted by at least one of the radial outer portions of the clutch plate, the clutch flange and one of the end walls to extend axially within the first and second depression respectively and at least one of the clutch plate and the clutch flange extending between the friction liners, the axial dimension of the clutch chamber radial outer portions being less than the combined axial thickness of the clutch plate and clutch flange radially inward of the depressions, and the friction liners.

4,901,831
CLUTCH

Kenichiro Ito, Shizuoka; Hiromi Nojiri, and Kenro Adachi, both of Iwata, all of Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

Filed Oct. 7, 1988, Ser. No. 254,749
Claims priority, application Japan, Oct. 9, 1987, 62-255212; Jan. 22, 1988, 63-13421; Mar. 7, 1988, 63-53307; May 27, 1988, 63-130770
Int. Cl.[4] F16D *15/00, 43/20*
U.S. Cl. 192—38 **1 Claim**



1. A clutch comprising:

an outer member formed on its inner periphery with a first cam surface;

an inner member coaxially mounted in said outer member and formed on its outer periphery with a second cam surface;

a cage interposed between said outer member and said inner member and thus between said first cam surface and said second cam surface and formed with a plurality of pockets;

means for providing a clearance in the direction of rotation between said cage and one of said outer member and said inner member;

a torque-setting elastic member mounted between said cage and one of said outer member and said inner member to hold said means for providing a clearance in a neutral position with said clearance left therebetween so as to be deformed until said clearance disappears when it is subjected to a torque larger than a predetermined torque;

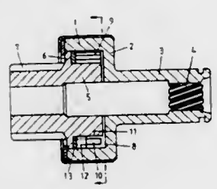
cam members mounted in said respective pockets formed in said cage and adapted to come into engagement with said first and second cam surfaces when said cage is turned with respect to said one of said two members by a predetermined angle; and

elastic means for biasing said cam members in the circumferential direction of said cage.

4,901,832
FREEWHEEL DRIVE FOR THE STARTER OF AN INTERNAL COMBUSTION ENGINE

André G. Werner, Jona, Switzerland, assignor to EEA Eastern Engineering Assoc. AG, Bremgarten, Switzerland

PCT No. PCT/CH86/00144, § 371 Date Jun. 14, 1988, § 102(e) Date Jun. 14, 1988, PCT Pub. No. WO88/02816, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 15, 1986, Ser. No. 224,916
Int. Cl.[4] F16D *16/00*
U.S. Cl. 192—42 **6 Claims**

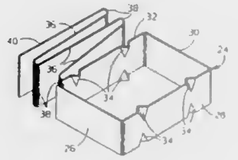


1. A freewheel drive for a starter of an internal combustion engine, said drive comprising: a pair of inner and outer ring members arranged coaxially to one another, the outer ring member having a circular inner peripheral surface positioned opposite an outer peripheral surface of the inner ring member, wherein the outer peripheral surface of the inner ring member includes a plurality of cam tracks, the cam tracks defined by arcs having respective arc centers that are each offset from the axis of the drive; a plurality of roller bodies disposed between the circular inner peripheral surface of the outer ring member and the outer peripheral surface of the inner ring member; spring members disposed between the inner and the outer ring members, each of said roller body being biased by an associated spring member into a clamping position which permits relative rotation of the ring members in one direction only; a driving pinion connected to one ring member; and a sleeve connected to the other ring member for reception of a drive shaft; wherein the inner ring member is integrally united with the driving pinion and includes an integrally formed flange, which integrally formed flange extends substantially radially to the inner peripheral surface of the outer ring member to close off one transverse end of an annular space defined between the mutually coaxial ring members and to center the inner ring member relative to the outer ring member.

4,901,833
COMBINED ROLLER CLUTCH CONTROL CAR AND SPRING

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 5, 1989, Ser. No. 402,737
Int. Cl.[4] F16D *41/06*
U.S. Cl. 192—45 **3 Claims**



1. For use in an overrunning roller clutch of the type that has a series of generally box-shaped roller pockets disposed circumferentially about a central axis, each pocket having a pair of axially opposed parallel side rails between which a roller moves circumferentially back and forth as said clutch operates, a combined roller control car and energizing spring unit, comprising,

a generally box-shaped control car portion within which a roller may be retained so as to move therewith as said clutch operates, said control car being sized so as to fit between said pocket side rails with a predetermined axial clearance, and,

an accordion spring portion having a series of spring leaves including a front spring leaf formed integrally with said control car portion, intermediate leaves forming a series of V-shaped loops, and a free rear leaf, said spring loops, in a free state, being tipped at an angle in one axial direction relative to said control car portion, said rear leaf further being sufficiently longer than said intermediate spring leaves so as to extend axially outboard of said control car portion in said one axial direction by more than said predetermined axial clearance,

whereby, when said unit is installed in a respective pocket, said spring portion rear leaf contacts one pocket side rail so as to flex said spring portion out of its free state in the opposite axial direction to create a post installation prestress on said control car portion toward the opposite pocket side rail, and when said roller and control car portion moves as said clutch operates to compress said spring portion, a side thrust in said one axial direction opposed to said prestress will be induced on said control car portion, by virtue of said angle of tip, thereby allowing said spring portion and control car portion to operate substantially independently, as said spring portion longer rear leaf prevents said loops from rubbing on said one pocket side rail.

4,901,834
OVERRUNNING ROLLER CLUTCH WITH SECURE, SPRING INDEPENDENT ROLLER RETENTION

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 9, 1989, Ser. No. 391,009
Int. Cl.[4] F16D *41/06*
U.S. Cl. 192—45 **3 Claims**

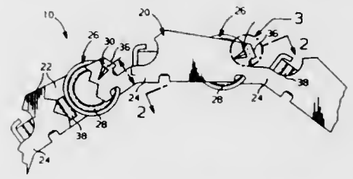
1. An overrunning roller clutch of the type that is adapted to be installed to a cam race having a plurality of sloped cam ramps before a pathway race having a cylindrical pathway is installed by pushing it coaxially over said clutch and simultaneously twisting it through a partial turn, said roller clutch comprising,

a cage adapted to be installed non-turnably to said cam race, said cage having a pair of parallel side rails,

a plurality of cylindrical rollers, each of which is located between said side rails with each end of said roller proximate a respective side rail, and with at least one said roller end having a depression formed therein, and,

a plurality of axially flexible projections formed in at least one of said side rails, each said projection extending into a respective roller end depression so as to retain said roller to said cage, each of said projections also being located so as to hold said roller on a respective cam ramp after said cage is installed with the outer surface of said roller disposed slightly radially beyond the installed position of said pathway,

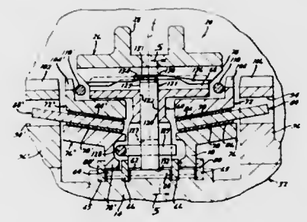
whereby, when said pathway race is installed and turned, its pathway will contact said roller outer surfaces and simultaneously shift said rollers down said cam ramps, thereby flexing said side rail projections out of said roller end depressions to release said rollers.



4,901,835
TRANSMISSION SYNCHRONIZER WITH SHIFT INHIBITOR

Barry L. Frost, DeWitt, N.Y., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 27, 1989, Ser. No. 343,719
Int. Cl.[4] F16D *23/06*
U.S. Cl. 192—53 F **6 Claims**



1. In a synchronizer clutch and gear assembly comprising; a longitudinally extending main shaft having an externally splined hub fixed thereon, a first speed gear journally mounted on said shaft adjacent one axial side of said hub, said first speed gear having an annular portion thereon formed with an externally splined surface, a sleeve having internal splines slidably coupled to said hub external splines and slidable thereon in one direction to an operative position such that upon said sleeve internal splines being moved into engagement with said first speed gear splined surface said clutch operative to couple said engaged speed gear in rotation with said shaft, a blocker ring having internal cone surface means disposed in a radially outward manner defining a clearance with associated external cone surface means adapted for positive rotational movement with said main shaft, and resilient load means for moving said blocker ring toward said first speed gear during the axial shifting operation of said clutch sleeve toward said speed gear to effect frictional engagement of said internal and external cone surface means, the improvement wherein:

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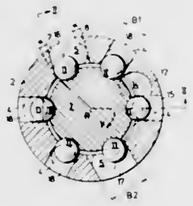
said hub formed with a first pair of diametrically opposed radially extending keyways, each said keyway having one of a first pair of blocking keys slidably received therein, a first substantially half circular-shaped wire biasing spring having diametrically opposed connecting means formed at each of its free ends, said first spring concentrically disposed about said shaft, each said connecting means engaging an associated one of said first pair of keys so as to urge said first pair of keys inwardly under a predetermined spring force preventing said keys from contacting associated stop means on said sleeve thereby allowing said sleeve to be shifted axially in said one direction into synchronized engagement with said first speed gear splined surface, such that rotation of said shaft at a predetermined speed causing a centrifugal force to be exerted on said keys sufficient to overcome said first spring and cause said first pair of keys to move radially outwardly a predetermined distance wherein said keys are adapted to engage associated stop means on said sleeve, whereby said sleeve is prevented from being shifted in said one direction into engagement with said first speed gear splined surface.

4,901,836

SETTABLE SLIP CLUTCH

Dag Stenmark, and Sören Gudmundsson, both of Ödsmål, Sweden, assignors to S & L Maskin AB, Stenungsund, Sweden

Filed Sep. 1, 1987, Ser. No. 91,649
Claims priority, application Sweden, Sep. 10, 1986, 8603796
Int. Cl.[4] F16D 7/06
U.S. Cl. 192—56 R **7 Claims**



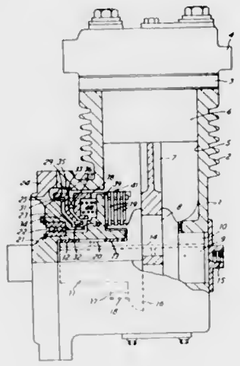
1. A settable slip clutch or coupling between a driving shaft (1) having a cylindrical surface and a driven shaft (2) to which torque is applied, particularly for tap holders, and including a plurality of engagement balls (11) of a given number and disposed in recesses (3) corresponding to the number of balls, each of said balls having a center, a radius and a diameter (D), the recesses being made in the driving shaft and connected by a groove (19) made in the cylindrical surface of the driving shaft and shallower than the recesses, which have a radius corresponding to the radius of the balls, and where the balls (11) thrust into a plurality of chambers (15–18) defined in the driven shaft and having spaced-apart walls and having a number corresponding to the number of balls (11), which in normal operation are kept urged into the recesses (3) by spring bias, which is settable to a desired value of the torque at which the driving shaft shall be disengaged from the driven shaft, characterized in that at least half the number of said chambers (15–18) have a width being mainly restricted to the diameter (D) of the ball (11) belonging thereto and the walls of each one of these chambers are parallel to each other and to a radius drawn through a center of the chamber and through the central axis (R) of said driving and driven shafts (1,2) while at least one (16,17) of the chambers (15–18) in the driven shaft (2) has an increased width (B2) which is greater than the diameter (D) of its associated ball (11) so that said chambers have different shapes determined by the widths thereof and in that a reverse lock is formed by at least one of the walls (7,8; 12,15) of the chambers (16,17; 15,18).

4,901,837

CLUTCH DRIVEN COMPRESSOR ASSEMBLY

Paul N. M. Wheeler, Pirton Nr. Hitchin, England, assignor to Allied-Signal Inc., Morristown, N.J.

Filed Mar. 29, 1988, Ser. No. 174,488
Claims priority, application United Kingdom, Mar. 26, 1987, 8707271; May 30, 1987, 8712748
Int. Cl.[4] F16D 25/08; F04B 49/00
U.S. Cl. 192—85 CA **6 Claims**



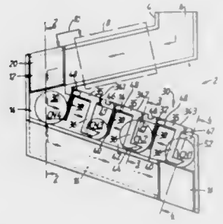
1. A clutch driven compressor assembly comprising a housing defining a cylinder therewithin, a piston slidably mounted in said cylinder for reciprocation therewith, a crankshaft member, means rotatably supporting said crankshaft member in said housing, means for drivably engaging the piston with the crankshaft member for rotating the latter upon reciprocation of the piston, said rotatably supporting means including an input member, first bearing means supporting said input member in said housing, and second bearing means rotatably supporting said crankshaft member relative to said input member, clutch means for providing selective driving engagement between said input member and said crankshaft member, said housing including openings circumscribing said first bearing means and cooperating with the latter to define an island portion of the housing, said clutch means including driving and driven clutch plates plates on said members, an annular clutch shell within said housing and rotatable with one of said members, said shell being shiftable between clutch engaged and clutch disengaged positions, spring means acting on said shell yieldable urging the latter to a clutch engaged position, and a release member slidably mounted on said island portion and cooperating with the latter to define a pressure chamber therebetween, means connecting said release member with said shell for shifting the latter between said clutch engaged and disengaged positions in response to movement of said release member, and means for selectively communicating fluid pressure into said pressure chamber, said release member and said clutch shell cooperating with said housing to define a passage communicating said cylinder with said openings.

4,901,838

COIN HANDLING SYSTEM FOR TELEPHONE PAY SYSTEM EMPLOYING LEVERS TO REGULATE COIN MOVEMENT

Thomas Crossman, Liverpool, Great Britain, assignor to GEC Plessey Telecommunications, Ltd., Coventry, England

Filed Oct. 14, 1987, Ser. No. 108,853
Claims priority, application United Kingdom, Oct. 30, 1986, 8626013
Int. Cl.[4] G07F 1/04
U.S. Cl. 194--346 **12 Claims**



1. A coin handling system, comprising:
a coin entry means, electronic control means including a coin validator means for checking the validity of a coin entered into the coin entry means, accept/reject gate means having first and second exists and controlled by the coin validator means for passing accepted coins to said first exit and rejected coins to said second exit;
a coin store coupled to said first exit of said coin entry means to receive accepted coins from said first exit, the coin store including a coin path along which coins move;
a plurality of lever means positioned along the coin path for defining coin positions along the coin path, and axis means extending in the direction of the coin path about which the lever means are pivoted;
each said lever means comprising first and second interconnected levers, the first lever being positioned forward of the second lever in the direction of the coin path and the levers being arranged such that as the first lever moves out of the coin path, the second lever moves into the coin path;
the coin store including a stop means at the end of the coin path for a first coin position;
whereby in operation a first coin entering the coin store moves along the coin store into abutment with said stop means in which position the first lever of a first lever means is moved out of the coin path by said first coin while the second lever moves into the coin path behind the first coin to define a second coin position, so that a second coin entering the coin store moves to the second coin position at which position the first lever of said second lever means is moved out of the coin path by said second coin while the second lever is moved into the coin path behind the second coin to define a third coin position.

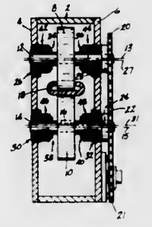
4,901,839

SELF ADJUSTABLE ESCALATOR HANDRAIL DRIVE

Gerald E. Johnson, Farmington, and James A. Rivera, Bristol, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Feb. 28, 1989, Ser. No. 316,629
Int. Cl.[4] B65G 15/00
U.S. Cl. 198--335 **5 Claims**

1. A handrail drive assembly for a moving handrail, said assembly comprising:
(a) a pair of drive rollers mounted on rotatable drive roller shafts, said drive rollers forming a nip through which the handrail passes;
(b) rotatable end bearings supporting opposite ends of said drive roller shafts said end bearings being mounted eccentrically of said drive roller shafts; and
(c) drive means for rotating said drive rollers and drive roller shafts in said end bearings whereby the axes of said



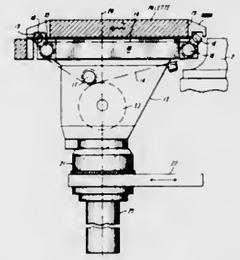
drive rollers move toward each other due to the eccentricity of said shafts and bearings, to increase nip pressure on the handrail responsive to resistance to movement of the handrail.

4,901,840

APPARATUS FOR TRANSFERRING WORK-SUPPORTING PALLETS

Werner Babel, Pfronten, Fed. Rep. of Germany, assignor to Maho Aktiengesellschaft, Pfronten, Fed. Rep. of Germany

Continuation of Ser. No. 23,672, Mar. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 734,322, May 15, 1985, abandoned. This application May 4, 1989, Ser. No. 351,305
Claims priority, application Fed. Rep. of Germany, May 28, 1984, 8416193[U]
Int. Cl.[4] B65G 37/00
U.S. Cl. 198—346.1 **6 Claims**



1. An apparatus for transferring pallets having workpieces clamped thereto in a straight line between a pallet terminal and a work support of a machine tool, said apparatus comprising
a pallet carrier including longitudinal guides,
said pallet carrier being disposed between the pallet terminal and the work support and being supported by means for rotation about its vertical axis between a non-aligned inoperative position, in which the pallet carrier is not enabled to transfer a pallet between the pallet terminal and the work support, and an aligned transfer position, in which the pallet carrier is enabled to transfer a pallet between the pallet terminal and the work support,
said pallet carrier including motor-actuated pushers for transportation of the pallets,
said pushers being mounted at predetermined spaced intervals on at least one driven endless chain which is longitudinally guided in the pallet carrier,

a bottom region of said pallets including abutments for successive engagement by the pushers,

said pallet carriers being arranged so that at least a first said pusher engages a leading abutment of a pallet for pulling said pallet onto said pallet carrier and for moving said pallet at least part way along said longitudinal guides,

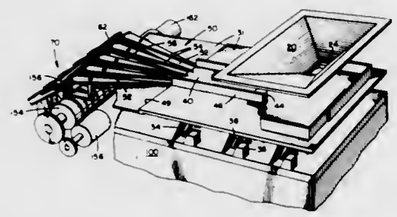
said pallet carrier being further arranged so that a final said pusher engages a rearward abutment of the pallet and thereby moves the pallet further along said longitudinal guides and onto either of said work terminal or said pallet terminal.

4,901,841

PARTS SORTER

Matthew K. Haggerty, Medford, Mass., and David G. Jansson, Bryan, Tex., assignors to Kirby Lester, Inc., Stamford, Conn.

Filed Apr. 13, 1987, Ser. No. 37,608
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—358 **22 Claims**



1. An apparatus for sorting a plurality of substantially identical parts, comprising:

(a) a source of parts for said apparatus;

(b) a means of forward translation for forwarding said parts;

(c) a channel having a width of approximately nx, where n is an integer greater than one and x is the width of a characteristic dimension of said parts based on a preferred orientation of said parts due to translation, where said channel accepts a plurality of parts from said source of parts, and together with said means for forward translation arranges the parts into a substantially two dimensional plane of parts of no more than n abreast in said channel and forwards the parts towards a chute;

(d) a fluted chute having n flutes each of a width of at least x, each flute diverging one from another as they extend from said channel, said fluted chute for dividing said substantially two dimensional plane of parts into n one dimensional lines of parts, such that said parts may be individually handled;

(e) means for adjusting the width of said channel to accommodate a change in the width x of said characteristic dimension of said parts;

(f) means for adjusting the widths of said flutes where said fluted chute accepts said parts from said channel; and

(g) means for sensing the width of said parts and outputting a signal representative thereof, wherein

said means for adjusting the width of said channel includes means for automatically adjusting the width of said channel in response to a signal related to said signal output by said means for sensing, and

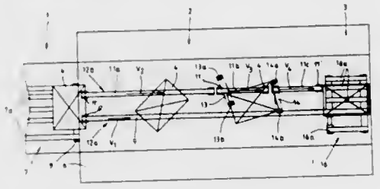
said fluted chute includes finger means for defining said flutes, and said finger means is adjustable.

4,901,842

APPARATUS FOR TURNING STACKS AND CONVEYORS THEREFOR

Horst Lemboke, Hamburg, and Wolfram Wolf, Bilsen, both of Fed. Rep. of Germany, assignors to E.C.H. Will GmbH, Neddderfeld, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 195,076
Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3718206
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—415 **13 Claims**



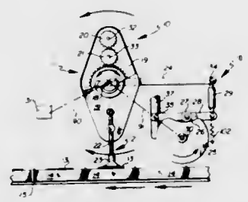
1. Apparatus for transporting and simultaneously changing the orientation of bulky commodities, particularly stacks of paper sheets and the like, comprising a plurality of substantially parallel transporting units each including at least one endless belt conveyor; and means for driving said conveyors in the same direction but at different speeds so that a commodity which is deposited onto said transporting units to simultaneously rest on conveyors which are driven at different speeds is compelled to change its orientation while advancing in said direction, said conveyors having upper reaches which carry the commodities during movement in said direction and are disposed in or close to a common plane, said conveyors further having outer sides which are contacted by the commodities resting on said upper reaches and the outer side of at least one of said conveyors having at least substantially parallel bristles which make oblique angles with said plane to enhance the predictability of transport and reorientation of said commodities.

4,901,843

ADVANCING MOTION ROTARY APPARATUS

Jeffrey A. Lashyro, Deerwood, Minn., assignor to Minnesota Automation, Inc., Crosby, Minn.

Continuation-in-part of Ser. No. 847,327, Apr. 2, 1986, abandoned. This application May 19, 1988, Ser. No. 198,724
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—418.3 **19 Claims**



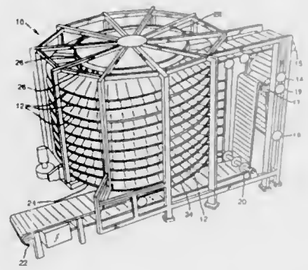
1. In an article transfer device having at least one article transfer mechanism to pick, place and tranfer articles via apex positions of travel and having a synchronized travel control base member in positive rotational communication with the article transfer mechanism, an advancing assembly reciprocatingly operative on said travel control base member, said advancing assembly being synchronized with said article transfer mechanism at an apex position of travel and being constructed and arranged to vary the rotational speed of the article transfer mechanism at a predetermined position of travel, whereby the reciprocating movement of said advancing assembly controls the accurate positioning of the article transfer mechanism.

4,901,844

LOW TENSION PLASTIC CONVEYOR BELT SYSTEM

Eric K. Palmaer, Rancho Cordova, and Karl V. Palmaer, Folsom, both of Calif., assignors to KVP Systems, Inc., Rancho Cordova, Calif.

Filed Oct. 3, 1988, Ser. No. 251,743
Int. Cl.[4] B65G *13/02*
U.S. Cl. 198--778 **5 Claims**



1. A low tension conveyor belt system with a plastic conveyor belt, comprising,

a driving tower or drum on a substantially vertical axis, with a wearstrip belt support platform arranged in a helical path around the driving tower,

an endless plastic conveyor belt positioned on a wearstrip belt support and extending tangentially off the wearstrip belt support and away from the driving tower, with means separate from the driving tower for engaging the belt and feeding it in a return path back to the driving tower and onto the wearstrip belt support at an opposite axial end of the driving tower from the position at which the belt exited the driving tower, and

said plastic conveyor belt being assembled from a series of plastic belt modules each having end members at its ends, and the adjacent belt modules being interconnected by rods passing through openings in the modules in interdigited projections of the adjacent modules, said end members having substantially smooth surface structure which engages frictionally against the exterior surfaces of the driving tower, said surface structure being substantially uninterrupted along its line of contact with the driving tower surfaces so that the exterior surfaces of the driving tower frictionally drive the conveyor belt along said helical path,

whereby the plastic conveyor belt operates smoothly around the driving tower and is efficiently driven, without snagging and without excessive wear of exposed components on the edge of the belt engaged by the driving tower.

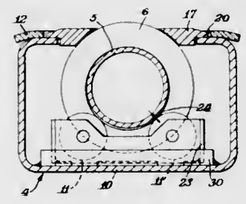
4,901,845

FRICTION ROLLER CONVEYOR

Karl H. Zöndebel, Reichelsheim, Fed. Rep. of Germany, assignor to Carl Schneck AG, Fed. Rep. of Germany

Filed May 24, 1988, Ser. No. 197,969
Claims priority, application European Pat. Off., Jun. 9, 1987, 87108282.2
Int. Cl.[4] B65G *13/02*
U.S. Cl. 198--780 **8 Claims**

1. A friction roller conveyor comprising at least one housing, a removable cover for the housing having spaced apart openings therein, a plurality of friction rollers mounted in the housing partially extending through the openings in the cover, a pair of opposed U-shaped box sections spaced apart and generally parallel to one another with the housing connected to and extending therebetween, a drive shaft in the housing upon which the friction rollers are loosely mounted such that they are capable of axially moving along said drive shaft,



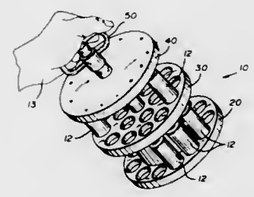
bearings secured to the U-shaped box sections rotatably supporting the drive shaft, drive means disposed in at least one of the U-shaped box sections connected to drive the drive shaft, and, replacable guide elements not fixedly attached but releasably connected to the housing cover at the periphery of the openings therein for preventing axial movement of the friction rollers on the drive shaft.

4,901,846

ARTIST'S PAINT CARRIER SYSTEM

Charles W. Lehman, 608 Hawkeye La., Kentland, Ind. 47951

Filed Aug. 25, 1989, Ser. No. 398,624
Int. Cl.[4] B05C *17/00*
U.S. Cl. 206—1.8 **9 Claims**



1. An artist's paint carrier system for carrying a plurality of paint bottles of a predetermined shape, size and height comprising:

at least one tray defining a plurality of shallow depressions sized and shaped to loosely receive the base of the paint containers or bottles;

a removable top sized and shaped to conform to said one tray and having a bottom surface and an upper side;

means for removably mounting said top above and aligned with said one tray at a displacement above said one tray wherein the bottom surface of said top is approximately that of the predetermined height of the paint bottles when the same are placed in said shallow wells or depressions of said tray;

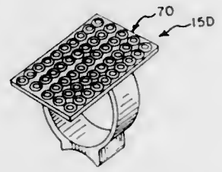
a handle;

means for manually latching said top, said handle and said one tray in an assembled configuration with said top above and aligned with said tray and said handle at the upper side of said top such that said handle, said top and said one tray may be picked up and carried together by said handle with any paint containers in said wells or depressions of said one tray releasably captivated between said tray and said top, said means for manually latching

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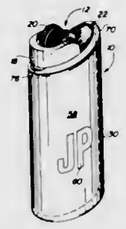
also allowing for manual unlatching of said one tray and said top so that they can be disassembled and any paint containers or bottles captivated therein released for easy removal therefrom for use.

4,901,847
LIGATURE DISPENSER
Peter C. Keeling, LaPorte, Ind., assignor to TP Orthodontics, Inc., Westville, Ind.
Filed Feb. 3, 1989, Ser. No. 306,840
Int. Cl.[4] A61B *19/02*
U.S. Cl. 206—63.5 **26 Claims**



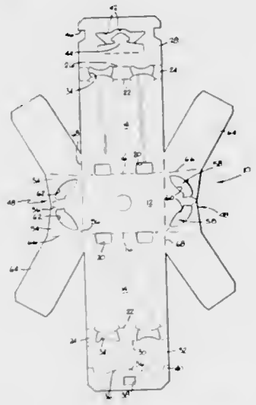
1. A dispenser including a plurality of endless stranded elastic ligatures used in orthodontic treatment comprising, a supporting member having at least one surface on which said ligatures are disposed, and adhesive means on said supporting member surface only for releasably securing said ligatures to the member, whereby the ligatures may be easily removed one at a time by a suitable instrument leaving only a negligible residue on said ligature.

4,901,848
CASE FOR PERSONAL ACCESSORY ITEMS
Joseph R. Parren, 19638 N. 34th Dr., Phoenix, Ariz. 85027
Filed Nov. 9, 1988, Ser. No. 269,061
Int. Cl.[4] F23Q *25/00*; A47G *29/10*
U.S. Cl. 206—86 **12 Claims**



1. A case for a disposable gas lighter of the type having a body with a gas control lever, flint wheel and flame adjustment wheel thereon, said case comprising:
(a) a generally longitudinal body having a front section and opposite sides and a top and bottom edge defining a longitudinal opening extending from the said top to the bottom edges adapted to slidably receive the lighter therein; and
(b) said body being configured having a shield thereon extending to at least correspond to the position of the gas control lever with the lighter fully inserted in the opening to minimize inadvertent actuation of the gas valve lever.

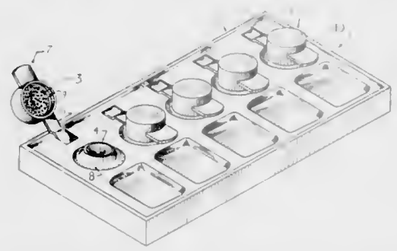
4,901,849
WRAP-AROUND ARTICLE CARRIER WITH END PANEL LOCK
Jerry F. Wilson, West Monroe, La., assignor to Manville Corporation, Denver, Colo.
Continuation of Ser. No. 112,582, Oct. 26, 1987, abandoned.
This application Aug. 15, 1988, Ser. No. 232,063
Int. Cl.[4] B65D *65/06*
U.S. Cl. 206—148 **4 Claims**



1. A wrap-around article carrier, comprising:
a top panel having side edges and end edges;
side panels foldably connected to the side edges of the top panel;
a bottom panel connecting the side panels;
the carrier containing two adjacent rows of articles, the tops of which extend substantially to the top panel;
end panels at least partially covering the ends of the carrier; and
tuck flap means for holding the end panels in place, the tuck flap means being foldably connected to the end edges of the top panel and to the end panels;
the tuck flap means including first edge portions overlying the tops of adjacent contained articles and engaging the top panel of the carrier and second edge portions adjacent the sides of the articles;
the tuck flap means at each end of the carrier comprising a generally triangular center tuck flap foldably connected to the associated end edge of the top panel and two generally triangular end tuck flaps foldably connected to the center tuck flap along fold lines, the first and second edge portions of the tuck flap means being connected to the fold lines;
the fold lines connecting the end tuck flaps to the center tuck flap being interrupted by a cutout having spaced opposed edges, one of the spaced opposed edges of each cutout defining the first edge portions of the tuck flap means and the other spaced opposed edge of each cutout defining the second edge portions of the tuck flap means.

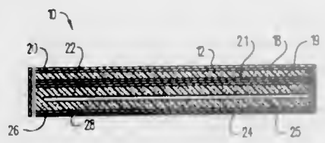
2. A production blank for forming a wrap-around carrier adapted to carry two adjacent rows of articles, the tops of which are at least closely adjacent to the underside of the top panel, comprising:
a top panel section having end edges and side edges;
side panel sections foldably connected to the side edges of the top panel section and to bottom panel sections;
generally triangular center tuck flaps foldably connected to the end edges of the top panel section;
generally triangular end tuck flaps foldably connected to the center tuck flaps;
the foldable connections between the center tuck flaps and the end tuck flaps containing cutout portions defining spaced opposed edges, one of the opposed edges of the cutout comprising an edge of the center tuck flap and the other opposed edge comprising an edge of the foldably connected end tuck flap;
the cutout edges of the center tuck flap being adapted to extend between the top panel of a carrier formed from the blank and the tops of adjacent articles carried by the carrier; and
the cutout edges of the end tuck flaps being adapted to terminate adjacent the sides of the adjacent articles carried in the carrier.

4,901,850
"KOLOR KEEPER" AIR-TIGHT ARTIST'S PALETTE
Eual R. McIntosh, Rt. 8, Benton, Ky. 42025
Filed Apr. 17, 1989, Ser. No. 340,089
Int. Cl.[4] B65D *81/24*
U.S. Cl. 206--205 **5 Claims**



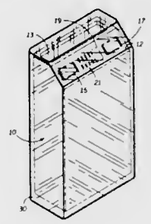
1. An air-tight artists' palette comprising a tray containing a plurality of wells for receiving a painting medium, an individual cover for each well located adjacent thereto, a means for receiving liquid cooperating with each cover for sealing each well, so that no air will contact the painting medium.

4,901,851
CLEANING PACKAGE
Martincic Gerry, Ljubo Mrakovcic 10, 51417 Moscenicka Draga, Yugoslavia
Filed Mar. 29, 1988, Ser. No. 330,169
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206--223 **3 Claims**



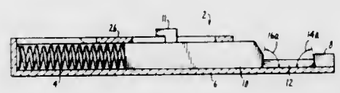
1. A cleaning implement, comprising:
an outer package formed from a water proof material;
a first packet in said outer package formed from a water proof material;
a first sponge in said first packet, said first sponge having a first absorbent surface having an irregular surface formed by a dense array of continuous, transversely extending, longitudinally evenly spaced wave form ridges and a second water proof surface formed by a thin soft flexible plastic film;
said first sponge treated with sterilized water and a mild soap;
a second packet in said outer package formed from a water proof material;
a second sponge in said second packet, said second sponge treated with sterilized water and a subtle fragrance;
said first and second packets disposed in overlying relation within said outer package; and
said first and second packets and said outer package each having a removable cap portion secured by an encircling tear strip.

4,901,852
PROTECTIVE COVER FOR A PAGEN
Jeffrey S. King, Boynton Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 24, 1989, Ser. No. 341,877
Int. Cl.[4] B65D *85/38, 65/02*
U.S. Cl. 206—320 **9 Claims**



1. A protective cover for a pager comprising a film of transparent, stretchable plastic formed to cover major openings and at least partially surround and adhere to surfaces of said pager, said film being formed to cover the top, four sides and at least a portion of the bottom of said pager and including an opening at the bottom for inserting and removing said pager, said film also including a thicker portion positioned adjacent the bottom edge of said pager when said film is positioned in surrounding adherence to the surfaces of the pager.

4,901,853
SUBSTRATE TRANSPORT BOX
Christopher J. Maryatt, Santa Clara, Calif., assignor to Avantek, Inc., Milpitas, Calif.
Filed May 26, 1989, Ser. No. 358,404
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—334 **11 Claims**



1. A device for securing and protecting generally planar electrical circuit substrates during transport or storage comprising:
a planar support member;
a substrate stop mounted on the support member and having a face for contacting an edge of the electrical circuit substrate;
resilient means mounted on the support member opposite to the substrate stop for resiliently biasing the electrical circuit substrate against the support member and the substrate stop, and wherein the substrate stop and the resilient means cooperate together to force the electrical circuit substrate against the planar support member while simul-

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taneously preventing lateral movement of the electrical circuit substrate relative to the planar support member.

4,901,854

LOOP CONNECTED ATTACHMENTS

Arnold R. Bone, Needham, and Donald L. Bourque, Millis, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Sep. 29, 1988, Ser. No. 250,885
Int. Cl.[4] B65D *85/24*
U.S. Cl. 206—343 **19 Claims**



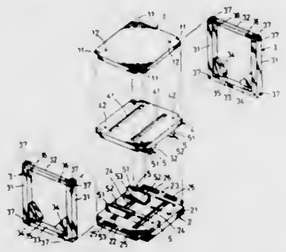
1. An improved loop attachment comprising a pair of filaments and a pair of object-penetrating parts, one at an end of each filament, the ends of said filaments opposite said object-penetrating parts being joined by a seamless connector, the improvement wherein each object penetrating part is flattened proximate its junction with the filament, and at least a portion of said filament proximate said junction has a flattened cross-sectional shape with a minor axis parallel to an axis of elongation of the associated object penetrating part, thereby to facilitate the bending of the filament against the object penetrating part.

4,901,855

ROLL CARGO TRANSPORTATION CONTAINER AND APPARATUS FOR PREVENTING ROLL CARGO FROM DIVERGENCE OF ROLL CORE

Shigesobu Furukawa, 7-10, Tsubol 3-chome, Ondo-cho, Aki-gun, Hiroshima, 737-12, Japan

Filed Nov. 30, 1988, Ser. No. 278,009
Claims priority, application Japan, Nov. 30, 1987, 62-303779; Mar. 3, 1988, 63-50000; Jun. 17, 1988, 63-81068[U]
Int. Cl.[4] B65D *85/66*
U.S. Cl. 206—389 **12 Claims**



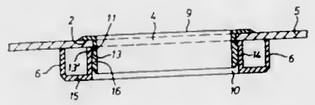
1. A roll cargo transporting container comprising;
top frame member which is removably installed between upper ends of a plurality of main pillar frame members erected on four corners of bottom frame member;
sliding frame member which is capable of sliding itself in the vertical direction in a range covering upper half of said main pillar frame member; and
a plurality of bracket members which are provided with arc-shaped surfaces coming into contact with roll cargo, wherein said bracket members are slidably installed to the upper surface of said bottom frame member and the bottom surface of said sliding frame member.

4,901,856

PACKING FOR RECORDING MEDIUM

Hartmut Thiele, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellshcaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,104
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 8632020
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—397 **4 Claims**



1. A support device for holding providing a protruberant hub centrally positioned in a flat member capable of sliding insertion comprising:
a flat member having at least two folds to provide a central section and at least two side sections foldable inwardly to overlie an inner surface of the central section,
a centrally positioned aperture formed in said central section of the flat member,
a cylindrical hub consisting of a synthetic material secured in said aperture and comprised of
a first part consisting of a ring having a peripheral flange extending from one edge
a second part consisting of cylinder,
said first and second parts dimensioned so that the outer diameter of the ring fits into engagement and engages with the inner diameter of the cylinder, and the flange extends radially equal to or less than the outer diameter of the cylinder,
said flange lying against the outer surface of the central section of the flat member circumferentially around the aperture
and the cylinder abuts inner surface of the flat member circumferentially of the aperture,
whereby the outer diameter of a supporting surface of the cylinder lying against the inner surface of the central section is the same dimension or greater than the outer diameter of a supporting surface of the flange lying against the outer surface of the flat member.

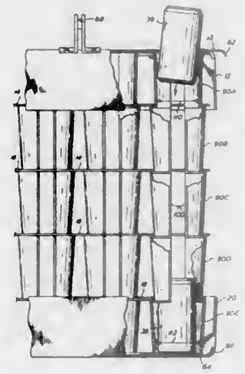
4,901,857

BEVERAGE CAN CADDY

Richard W. Emerick, 129 W. Squire Dr., #7, Rochester, N.Y. 14623

Filed Oct. 24, 1988, Ser. No. 261,332
Int. Cl.[4] B65D *75/00*
U.S. Cl. 206—427 **20 Claims**

1. A extensible and collapsible storage rack for beverage cans comprised of a top movable frame member, a top cover slidably attached to said top movable frame member, a bottom movable frame member, a bottom cover slidably attached to said bottom movable frame member, means for movably connecting said top frame member with said bottom frame member, and means for limiting the movement of said top frame member and said bottom frame member, wherein:
(a) each of said top frame member and said bottom frame member is comprised of a front wall, a back wall, and side walls;
(b) said top frame member comprises a top wall comprised of a multiplicity of orifices, and said bottom frame member comprises a bottom wall comprised of a multiplicity of orifices;
(c) said means for movably connecting said top frame member with said bottom frame is extensible and collapsible, the top of said means is connected to said top wall of the to frame member, and the bottom of said means is connected to said bottom wall of the bottom frame member; and
(d) said means for limiting the movement of said top frame member and said bottom frame member is attached to said means for movably connecting said top frame member to said bottom frame member; and
(e) each of said top cover and said bottom cover is comprised of a multiplicity of orifices.

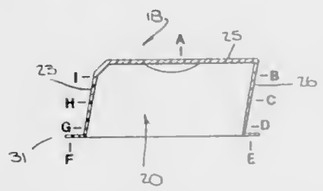


4,901,858

SELF-SUPPORTING DISPLAY BLISTER PACKAGE

Jeffrey B. Anderson, Newmarket, Canada, assignor to Bristol-Myers Canada, Inc., Toronto, Canada

Filed Aug. 24, 1988, Ser. No. 235,582
Claims priority, application Canada, Oct. 2, 1987, 548474
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—461 **19 Claims**



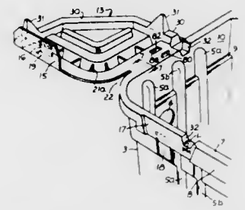
1. A self-supporting display package comprising:
a molded, cup-shaped plastic product enclosure having a generally vertical forward wall, a side wall including a bottom side wall section forming with said forward wall an edge having an acute interior angle with the interior of said forward wall, and an opening, said enclosure extending in one generally horizontal direction from said opening, and the portion of the side wall opposite said bottom side wall section forming an obtuse interior angle with the interior of said forward wall, said side wall being thicker proximate said forward wall than proximate said opening, and means for covering said opening to retain a product within said enclosure, said opening covering means having a bottom in substantially the same plane as said edge, said edge cooperating with said bottom of said opening covering means to support the display package in an upright position.

4,901,859

CONTAINER

David L. Jones, 16 High Street South, Ruskington, Sleaford Linds NG34 9DP, England

Filed Jul. 1, 1988, Ser. No. 214,685
Claims priority, application United Kingdom, Jul. 4, 1987, 8715775; May 6, 1988, 8810735
Int. Cl.[4] B65D *21/06*
U.S. Cl. 206—506 **13 Claims**



1. A container comprising a body having a base and a side wall extending upwardly from the base, at least one support member movable selectively between a first position in which a further container can be stacked inside the body, and a second position in which the support member can support a further container above the base, said at least one support member being provided with at least one strengthening formation, and said side wall being provided with a respective load receiving formation for each strengthening formation, each load receiving formation having a support surface and being adapted to receive its respective strengthening formation with said strengthening formation in contact with said support surface whereby loads applied to the at least one support member can be transferred to said respective support surface, and said side wall is provided with strengthening means in the form of at least one strengthening rib which extends along the side wall from the vicinity of a respective one of the side wall formations to the vicinity of the base, whereby loads applied to said support surface can be transferred to the base through said strengthening means.

4,901,860

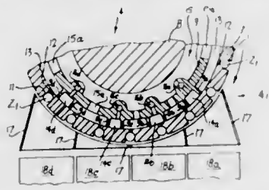
APPARATUS FOR TESTING AND CLASSIFYING CIGARETTES OR THE LIKE

Günter Wahle, Reinbek, and Willi Filter, Hamburg, both of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 363,394, Mar. 29, 1982, Pat. No. 4,484,591.
This application Jul. 19, 1984, Ser. No. 322,432
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1981, 3115021
Int. Cl.[4] B07C *5/00*
U.S. Cl. 209—535 **19 Claims**

1. Apparatus for testing and classifying cigarettes or analogous rod-shaped articles which constitute or from part of smoker's products comprising means for transporting a succession of randomly distributed satisfactory and defected articles along a common path; a plurality of testing devices adjacent to a first portion of said path and each comprising means for monitoring successive articles for the presence of a different defect and for generating defect signals denoting the detection of articles exhibiting the respective defect; means for segregating defective articles from satisfactory articles in a second portion of said path in response to said defect signals, including

a discrete segregating unit for each of said testing devices; and means for displaying the transmission of defect signals from said testing devices to said segregating means so that each of the thus delayed defect signals initiates the segregation of that



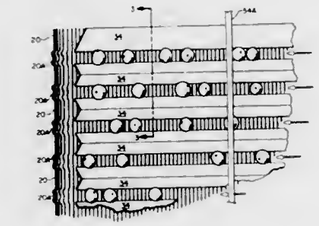
defective article which has caused the generation of such signal, said delaying means being arranged to transmit delayed defect signals to the respective segregating units so that each such unit segregates only articles exhibiting the defect detected by the corresponding testing device.

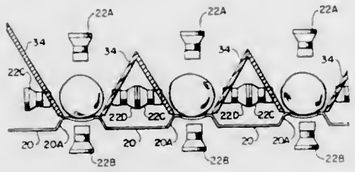
4,901,861

ASYNCHRONOUS FRUIT SORTER APPARATUS

Martin D. Cicchelli, Durham, N.C., assignor to Clayton Durand Manufacturing Company, Durham, N.C.

Filed Feb. 22, 1989, Ser. No. 313,796
Int. Cl.[4] B07C *5/02, 5/36*
U.S. Cl. 209—539 **10 Claims**





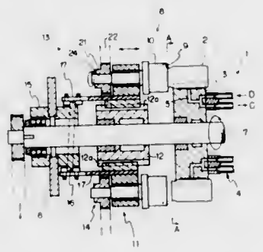
1. In a high speed asynchronous fruit sorting apparatus for sorting aligned and randomly spaced articles of fruit according to whether each article of fruit is satisfactory and comprising a plurality of driven conveyor belts arranged in a cascading configuration so that said conveyor belts drop fruit successively from one conveyor belt to the next successive conveyor belt, said plurality of conveyor belts each having a plurality of laterally spaced and longitudinally extending fruit receiving channels each spaced transversely thereacross, an optical detection system operatively associated with a last one of said conveyor belts and adapted to scan, each article of fruit both horizontally and vertically to determine whether said article of fruit is satisfactory, and an air ejection system operatively associated with said last conveyor belt and said optical detection system for addressing each of said articles of fruit by either allowing satisfactory articles of fruit to proceed along said last conveyor belt or ejecting unsatisfactory articles of fruit from said conveyor with an air pulse, the improvement wherein said fruit receiving channels in at least said last conveyor belt comprise a plurality of vertically raised channels upon which the fruit rides and which are adapted to facilitate both horizontal and vertical optical scanning of each of said articles of fruit, and including sorting means above each of said plurality of conveyor belts for directing and entraining said articles of fruit onto said fruit receiving channels of said conveyor belts.

4,901,862

INSPECTION APPARATUS FOR FLANGED OR CURLED OPEN END PARTS OF CANS

Shigeru Tachibana, Takaoka; Minoru Takegoshi, and Takashi Danzuka, both of Toyama, all of Japan, assignors to Takeuchi Press Industries Co., Ltd., Toyama, Japan

Filed Sep. 7, 1988, Ser. No. 241,429
Claims priority, application Japan, May 12, 1988, 63-115543
Int. Cl.[4] B07C *5/344*
U.S. Cl. 209—567 **1 Claim**



1. An inspection apparatus for an open end of a can having a cylindrical body open at one end thereof comprising:
(a) a can feeding duct from which cans are fed,
(b) a ratchet wheel shaped can holder having a periphery facing the outlet of the can feeding duct and including means for receiving and removably holding cans fed from the can feeding duct, said can holder being rotatable about an axis and the speed of rotation of the can holder controlling the rate at which cans are fed to the can holder,
(c) a plurality of sensor holders with each sensor holder mounting a plurality of eddy current sensors in a position facing the open end of a can to be inspected,
(d) locating means for positioning each sensor holder at a predetermined location relative to the open end of a can to be inspected,
(e) rotary driving means for rotating each sensor holder relative to the open end of a can being inspected,
(f) discriminating means responsive to an output of the eddy current sensors and discriminating as to whether there is a defect in a can being inspected by the output of the eddy current sensors, and
(g) discharge means responsive to said discriminating means and which discharges a can with a defect at a prescribed position and a can without defect at another prescribed position.

4,901,863

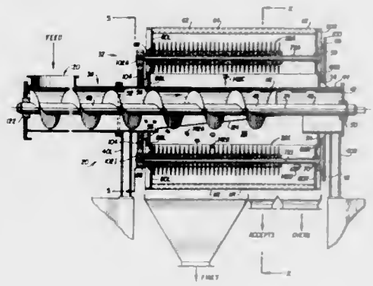
METHOD AND APPARATUS FOR SORTING WOOD CHIPS

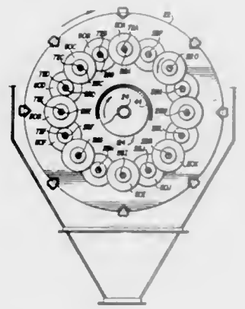
James G. Lancaster, 3291 Hillard Dr., Birmingham, Ala. 35243

Filed Sep. 28, 1987, Ser. No. 101,422
Int. Cl.[4] B07B *1/14, 1/22*
U.S. Cl. 209—664 **18 Claims**

1. An apparatus for sorting particle matter such as wood chips, said apparatus comprising:

means for defining a sorting chamber, said sorting chamber having an interior axis;
a plurality of rotatable shafts, each of said shafts having a plurality of discs mounted at intervals along at least a portion of an axial length of said shaft;
means for mounting said rotatable shafts in a manner whereby said rotatable shafts are arranged at intervals essentially completely about said interior axis of said sorting chamber and in a manner whereby discs of adjacent shafts intermesh radially defining axial spaces therebetween;
means for rotating said rotatable shafts about their respective axes;





means for revolving said plurality of rotatable shafts about said interior axis of said sorting chamber whereby said discs have a circuit of travel about said interior axis, and whereby a plurality of discs mounted on differing shafts share essentially the same circuit of travel; and,
inlet means for introducing an infeed of particle matter at a location included in said shared circuit of travel in a manner whereby particle matter having thickness in a desired range has opportunity to pass through said axial spaces existing between intermeshing discs of adjacent shafts and thereby be sorted.

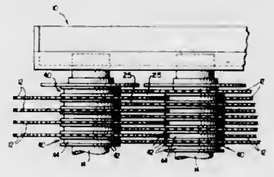
4,901,864

GROOVED SPACER FOR DISC SCREEN WOOD CHIP SORTER

William D. Daugherty, Hattiesburg, Miss., assignor to International Paper Company, Purchase, N.Y.

Filed Aug. 16, 1988, Ser. No. 232,733
Int. Cl.[4] B07B *13/04*
U.S. Cl. 209—672 **6 Claims**

1. A disc screen apparatus for sorting wood pulp chips by size said apparatus including a plurality of parallel shafts, each shaft being rotatable and carrying a plurality of uniformly spaced parallel discs, each of said discs having teeth disposed about its periphery, each tooth having a radially outermost portion including a tip, a portion of the periphery of any one of said discs on one of said shafts being sandwiched by side portions of a corresponding pair of the discs of a next adjacent shaft, and the sandwiched discs being spaced so as to define the maximum size of wood chips which are to pass through said disc screen apparatus, there being a minimum radial clearance between the tips of the teeth of any disc and a corresponding next adjacent shaft, each said tip following a circular path, said path including a location where the tips approach an adjacent shaft to define said minimum radial clearance, there being a



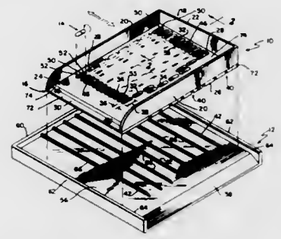
lateral clearance between a radially outermost side surface portion of the teeth of any disc and the side portions of two corresponding discs which sandwich it, said lateral clearance being equal to the spacing between said sandwiched discs, and means at the locations where the tips of said teeth of any disc approach an adjacent shaft for substantially diminishing the lateral clearance between the radially outermost side surface portions of the teeth and the side portions of the discs which sandwich them, by substantially filling the lateral clearance therebetween, whereby said means effectively prevents larger than desired wood chips from being compressed by the teeth and being forced through said radial clearance.

4,901,865

CAPSULE-INSPECTION APPARATUS

Stephen G. Staples, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 23, 1988, Ser. No. 289,215
Int. Cl.[4] B07C *7/04;* **B65B** *67/00*
U.S. Cl. 209—703 **28 Claims**



1. A capsule-inspection apparatus comprising
a plate member having top and bottom surfaces, the plate member being formed to include at least one pocket having a capsule-receiving opening in the top surface and a floor under the capsule-receiving opening for supporting a capsule disposed in the pocket and a passageway for each

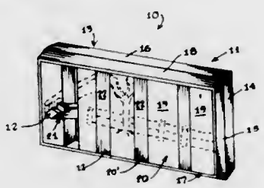
pocket having an inlet opening in the bottom surface and an outlet opening in the floor to provide access to the pocket through the inlet opening in the bottom surface during inspection of a capsule disposed in the pocket.

4,901,866

CONCEALED COAT RACK APPARATUS

Edward M. Barella, 5741 W. 111th Ave., Broomfield, Colo. 80020

Filed Jan. 31, 1989, Ser. No. 304,537
Int. Cl.[4] A47B *53/00*
U.S. Cl. 211—1.3 **1 Claim**



1. A concealed coat rack apparatus that gives the appearance of a conventional wall hanging when not in use wherein the apparatus consists of:

a housing unit including a housing member having a plurality of vertically disposed spaced free panel segments having a decorative pattern in the form of portions of a pictorial representation; and,

a plurality of support units including a plurality of generally trapezoidal support arms pivotally secured to said housing member and having an elongated rectangular face panel provided with a decorative pattern which matches the decorative pattern on the spaced face panel segments on said housing member; wherein each of the generally trapezoidal support arms have an angled top and bottom surface; wherein, the top surface forms a hook member and wherein the bottom surface forms an angled stop member; and, wherein the housing member is provided with an interior vertical wall surface and the angled stop member on each of the support arms is adapted to come into contact with said interior vertical wall surface to limit the pivotal movement of the support arms relative to the housing member and to deploy the support members at an upwardly inclined angle relative to said vertically disposed face panel segments.

4,901,867

COLLAPSIBLE WIRE RACK

O. L. Petty, Jr., Cameron, Tex., assignor to Royal Seating Corporation, Cameron, Tex.

Filed Jul. 25, 1988, Ser. No. 223,347
Int. Cl.[4] A47F *7/16*
U.S. Cl. 211—46 **9 Claims**

1. A collapsible wire rack for holding computer printout and the like comprising in an operational positional:

a. two substantially identical ends, each being substantially planar and formed of covered wire and including:

i. a rectangularly shaped center piece having joined together two horizontal wire members and two vertical wire members;

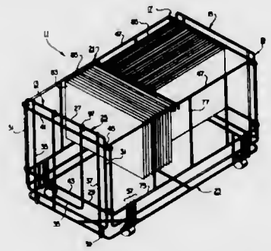
ii. a pair of substantially vertical wire members having a bent hook structure at their respective lower ends for receiving a bottom; said vertical wire members being affixed to said rectangular shaped center piece at each crossing of said horizontal wire members and being adapted to removably receive said bottom;

iii. a pair of said horizontal wire members having at both ends thereof a bent hook-eye structure for pivotally receiving a respective said end wire member to allow collapsibility, said horizontal wire members being connected with said end;

b. two substantially identical sides, each being substantially planar and formed of covered wire and including:

i. an elongate rectangularly shaped center piece having joined together two horizontal wire members and two vertical wire members; and having an upper, more elongate member defining a supporting top;

ii. two sets arranged one at each end of each side of three shortened vertical wire members, two of each set being bent in a U-shaped configuration for carrying a nut means for screwingly, removably receiving a threaded shaft of a caster; and one of each set having bent hook structure at its lower end and disposed substantially with said bent hook structure of said vertical wire member of each said end for receiving said bottom; said sets of three shortened wire members being connected with said side;



iii. a plurality of substantially horizontal wire members connected with said elongate rectangularly shaped center and said respective sets adjacent each end without interfering with the collapsibility of said wire rack;

c. a plurality of adjustable and removable cross members that each have at each end a bent hook structure for hooking over said top to suspendingly hold in place a computer printout or the like;

d. a bottom comprising an elongate rectangular covered wire structure adapted to removably fit interiorly of said ends and sides in normal operation and be received within said bent hook structure of said vertical wire members; said wire having sufficient diagonal bracing to impart rigidity to said collapsible wire rack when in place and to be removed to allow said wire rack to be collapsed for shipping, storing and the like.

4,901,868

STIMULABLE PHOSPHOR SHEET STACKING TRAY

Isao Utsumi; Yasuhiro Kawai; Kaoru Tamura, all of Kanagawa; Yasunori Maehara, Tochigi; Sigeme Fujiwara, Tochigi, and Katsuhide Koyama, Tochigi, all of Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Continuation of Ser. No. 5,664, Jan. 21, 1987, abandoned, which is a division of Ser. No. 808,174, Dec. 12, 1985, abandoned. This application Jul. 25, 1988, Ser. No. 224,287
Claims priority, application Japan, Dec. 13, 1984, 59-263500; Dec. 13, 1984, 59-263501; Dec. 13, 1984, 59-263502
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—51 **6 Claims**

1. A stacking tray for stacking stimulatable phosphor sheets one by one in parallel with an inner wall facing an opening face of said stacking tray, said stacking tray comprising:

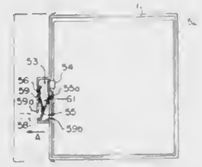
tray member having an inner wall adapted to support a plurality of parallel sheets in a stacked relationship; and

sheet fall preventing means for preventing sheets from falling outwardly of said opening face when said tray member is disposed at such a position that the sheets inside of said stacking tray stand erect, said sheet fall preventing means being movable between a stop position and a retracted position relative to said tray member, said sheet fall preventing means comprising:

a stopper selectively movable between said stop position and said retracted position which correspond to movement of said stopper inwardly and outwardly, respectively, of a side of said opening face, wherein in said stop position said stopper permits removal of the sheets by an external pulling action, said stopper projects into an interior region of said tray member at an intermediate position of said side of said opening face and remains a predetermined and constant distance away from said inner wall regardless of the presence or amount of sheets, and said stopper contacts of sheets when the sheets stand erect;

means for projecting said stopper into said interior region; and

supporting means for supporting said stopper for selective movement between said stop position and said retracted position.

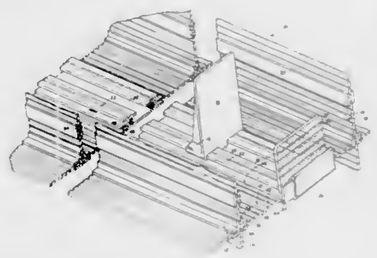


4,901,869

MERCHANDISE DISPLAY RACK OF VARIABLE SIZE

Rodney B. Hawkinson, 1919 Valencia St., Napa, Calif. 94558, and Julius A. Sarto, 383 N. Autumn St., San Jose, Calif. 95110

Filed Aug. 26, 1988, Ser. No. 236,742
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211--59.3 **9 Claims**



1. A forward-feeding display rack for merchandise in containers arranged in a row front to rear comprising:

a slideway;

a slide slidably mounted in said slideway;

an upright push plate carried on said slide;

a front stop at the front end of said slideway engageable by said push plate;

a tension member biasing said push plate toward said front end of the slideway;

an extender slot along each side of said slideway;

first lips along the outer edges of said extender slots;

a first lateral extension panel of selected width;

said first lateral extension panel having a plurality of parallel, land strips across the width thereof, including an inner land strip along one side edge of said lateral extension panel and an outer land strip along the opposite side edge; said land strips being separated by grooves in both the top and the bottom surfaces of said extension panel;

said inner land strip of said first lateral extension panel being received in the extender slot on one side of said slideway with said first lips along the edges of said one extender slot being received in a pair of said grooves;

an elongated side connector member having four sides, each side forming a C-shaped receptacle with second lips along the outer edges thereof, said outer land strip of said first lateral extension panel being received in one of said horizontal C-shaped receptacle with said second lips along the edges of said receptacle being received in a pair of said grooves; and

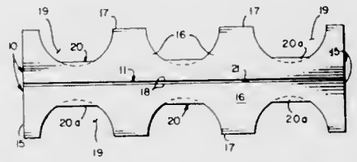
a vertical side plate received in an upright one of said C-shaped receptacle with said second lips along the edges of said receptacle being received in a pair of said grooves.

4,901,870

SPACER FOR SUPPORT OF CYLINDRICAL ROLLS

Tim E. Wright, and Catherine E. Helten, both of P.O. Box 1407, both of Pasco, Wash. 99301

Filed Nov. 14, 1988, Ser. No. 270,367
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—59.4 **8 Claims**



1. A cross support for a spaced array of a plurality of elongate cylindrical elements such as rolls of sheet material, comprising in combination:

an elongate support of rectilinear cross-section formed of resiliently deformable material and defining a plurality of indentations in one elongate surface, each indentation being arcuate and being defined by a substantially constant radius of curvature and extending through an angle less than 180 degrees, thereby defining a shape of less than half of a cylindrical element to be supported thereby, all of said indentations being defined in parallel spaced adjacency, and

a bridging element formed of resiliently deformable material, said bridging element extending substantially the length of each indentation parallel to its axis and further extending a spaced distance into each indentation from the medial innermost portion of the surface defining that indentation to compress to support a cylindrical element carried in an indentation.

4,901,871

DRYING RACK

Heinz J. Ohm, Limburg, and Peter Tiwi, Nassau, both of Fed. Rep. of Germany, assignors to Leifheit, Nassau, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 276,365
Claims priority, application European Pat. Off., Nov. 24, 1987, 87117264.9
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—86 **10 Claims**

1. A dryer for laundry, which is adapted to be clamped onto a stationary member such as a radiator, railing, door, window frame or the like, comprising:

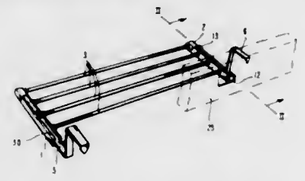
a pair of spaced apart carrier members, said carrier members each having an internal elongated guiding channel formed therein;

hanging means coupled between said spaced apart carrier members and adapted to receive laundry or the like thereon;

a pair of elongated adjustable clamping members respectively coupled to said carrier members and slidably mounted in said guiding channel of said respective carrier members, said clamping members each having mounting means at an end thereof for mounting the appliance to a stationary member;

said adjustable clamping members each having a bent portion at the end thereof which is opposite to said mounting means, and which is received in said guiding channel, said bent portion comprising a springy tongue means;

an elongated open slot formed in a portion of each of said carrier members and extending along a given portion of said elongated guiding channel of the respective carrier member, said slot opening to and communicating with said elongated guiding channel;



a plurality of cut-outs formed in at least one surface of each of said carrier members which defines a surface of said slot;

a manually operable slidable catch means coupled to each of said springy tongue means and slidably mounted in said open slot of the respective carrier means in which said clamping member is received, and said catch means being releasably engageable in said cut-outs formed in said respective carrier members so as to be selectively slidable throughout the length of said slot, relative to said carrier members, together with said respective clamping member, for adjustably locking said clamping members relative to said carrier members when said catch means is engaged in a cut-out; and

said springy tongue means biasing said respective catch means toward said cut-outs and said catch means being manually operable to be moved out of engagement with said cut-outs against said biasing force.

4,901,872

MULTI-TIER TOWER

Franz J. Lang, Kelkheim, Fed. Rep. of Germany, assignor to Display-Design GmbH fur moderne Verkaufsforderungsmittel and Raumausstattung, Kelkheim, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 220,023

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 3726590

Int. Cl.[4] A47F *3/14*

U.S. Cl. 211—133 **13 Claims**

1. A multi-tier tower for goods display, comprising:

at least two platforms (10), each platform comprising a base plate 14 surrounded by a framing wall arrangement (18, 22, 24, 24'), each base plate having an upper main face, and a lower main face, the platforms arranged one above the other and detachably connected with one another by a plurality of spacing supports (12),

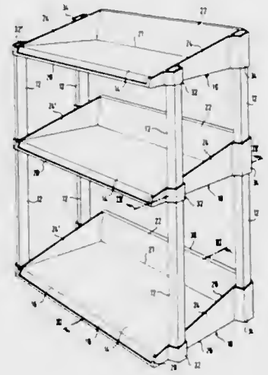
means for providing a standing surface for setting up said tower on a substantially horizontal standing base,

said framing wall arrangement (18, 22, 24, 24') comprising along a first edge (16) of the base plate (14), a first wall (18) directed substantially downwards therefrom such that said upper main face is substantially open along said first edge (16) in a direction extending beyond said first edge (16) perpendicularly with respect to said first edge (16) and parallel to said upper main face, and along a second edge (21) of the base plate (14), a second wall (22) directed substantially upwards therefrom such that said lower main face is substantially open along said second edge (21) in a direction extending beyond said second edge (21) perpendicular with respect to said second edge (21) and parallel to said lower main face, said base plate (14) being inclined downward from said first edge (16) to said second edge (21), when the standing surface is supported on the standing base,

said framing wall arrangement (18, 22, 24, 24') further comprising two side walls (24, 24') of wedge shaped configuration above said upper main face,

a lower edge (26) of each side wall (24, 24') extending substantially horizontally, when the standing surface is supported on the standing base,

an upper edge (28) of each side wall (24) extending substantially rectilinearly from the level of said upper main face (14) in the region of said first edge (16) to an upper edge (30) of said second wall (22), when the standing surface is supported on the standing base,



said base plate (14) possessing a substantially rectangular outline,

adjacent platforms (10) being connected with one another by a total of four spacing supports (12) of which two are arranged in the vicinity of the first wall (18) and two are arranged in the vicinity of the second wall (22),

each side wall (24, 24') being provided with two double sockets (32, 34) for the reception of the lower end of an upper spacing support (12) and the upper end of a lower spacing support (12),

said double sockets (32, 34) being divided each by a middle wall (32e, 34e) into upper and lower socket pockets (32 I, 32 II, 34 I, 34 II),

the middle walls (32e) of said double sockets (32, 32') in the vicinity of said first wall (18) and the middle walls (34e) of said double sockets (34, 34') in the vicinity of said second wall (22) being situated in each case in one common horizontal plane, when the standing surface is situated on the standing base, such that all spacing supports (12) of adjacent platforms (10) have equal lengths.

4,901,873

CONTAINER WITH INSERT HAVING A FULLY OR PARTIALLY ENCAPSULATING SEAL WITH A FRANGIBLE WEB FORMED AGAINST SAID INSERT

Gerhard H. Weiler, South Barrington, Ill., assignor to Automatic Liquid Packaging, Inc., Woodstock, Ill.

Division of Ser. No. 69,851, Jul. 6, 1987, Pat. No. 4,821,897, which is a division of Ser. No. 845,199, Mar. 28, 1986, Pat. No. 4,699,748, which is a division of Ser. No. 402,982, Aug. 3, 1982, Pat. No. 4,596,110, Continuation-in-part of Ser. No. 296,368, Aug. 26, 1981, Pat. No. 4,707,966. This application Apr. 17, 1989, Ser. No. 338,996

Int. Cl.[4] B65D *1/00, 41/62, 47/10*

U.S. Cl. 215—32 **6 Claims**



1. A container formed from thermoplastic material and comprising:

a body defining an opening at one end;

an insert article positioned at said body opening which insert article is a dispensing nozzle having a base seated on said body in said body opening and having a discharge conduit projecting above said base; and

a closure structure unitary with said body and encapsulating at least a portion of said insert article to seal closed the container;

said closure structure including a peripheral wall extending around said nozzle and encapsulating said discharge conduit, having first and second portions joined together by a frangible web that abuts said insert article about a peripheral surface of said nozzle;

said closure structure first wall portion being a lower portion of said peripheral wall and said closure structure wall second portion being an upper portion of said peripheral wall and defining an exterior thread; and

said container further including a cap that has an internal thread and that is threadingly engaged with said closure structure wall second portion.

4,901,874

BOTTLE HOLDER

Gdalia Glazer, 66/10 Jabotinsky St., Rishon LeZion, Israel

Filed Dec. 5, 1988, Ser. No. 279,605

Claims priority, application Israel, Dec. 8, 1987, 84746

Int. Cl.[4] B67B *7/44*

U.S. Cl. 215—226 **11 Claims**

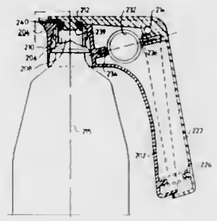
1. A bottle holder for a bottle having a neck formed with external threads for receiving a cap, said bottle holder comprising:

a handle manually graspable by a user;

an attachment member fixed to one end of the handle, said attachment member having internal threads at one end for threading onto the external threads of the neck of the bottle, and being open at the opposite end;

a closure movably mounted to said attachment member either to a closed position closing said open end of the attachment member, or to an open position with respect thereto; and

an operator carried by said handle and mechanically coupled to said closure to enable the operator, when operated by the user, to move said closure to either its open position or to its closed position with respect to the open end of said attachment member;



said closure including a stem carrying a sealing ring receivable within the neck of the bottle in the closed position of the closure;

said stem being formed with an annular groove receiving said sealing ring, the face of said sealing ring disposed inwardly of the bottle neck being formed with an annular recess defining an outer annular skirt deflectable outwardly by the pressure within the bottle to enhance the sealing effected by said sealing ring.

4,901,875

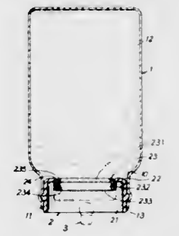
BOTTLE SEALER SERVING AS A TEMPERATURE BUFFER

Hsieh-Yih Teng, P.O. Box 10160, Taipei, Taiwan

Filed Nov. 9, 1988, Ser. No. 269,876

Int. Cl.[4] B65D *51/00*

U.S. Cl. 215—271 **1 Claim**



1. A bottle sealer made of elastomer materials sealably inserted in a bottleneck of a bottle comprising:

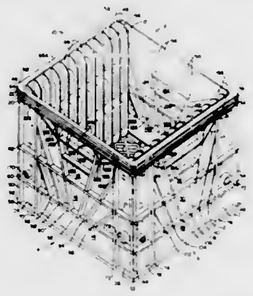
an inner annular portion sealably inserted in a bottleneck;

a cylindrical skirt portion protruding outwardly from said inner annular portion to seal an outer edge of the bottleneck; and a telescopic expansible hollow extension joined to said inner annular portion having one end portion of said extension closed and having means for contacting a liquid filled inside the bottle and operatively expansible within the bottleneck when subjected to a cold environment temperature below zero degree centigrade for absorbing a volume expansion of the liquid inside the bottle, without breaking the bottle made of glass or the like;

said telescopic expansible hollow extension including a flip-flop extension concave outwardly from the inner annular portion to form an outer cylinder portion defining an outer edge of the outer cylinder portion which is then convex inwardly opposite to an outer edge of the bottle-

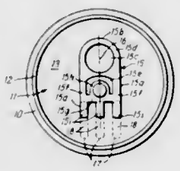
neck to form an inner cylinder portion having a base portion generally coplanar to a surface of the inner annular portion, a cylindrical aperture being defined between the inner cylinder portion and the outer cylinder portion of said hollow extension, said base portion of said inner cylinder portion being embedded with a transparent bottom plate therein.

4,901,876
ALL-PURPOSE UTILITY CRATE
Thomas Box, Shrewsbury, N.J., assignor to Spectrum International, Inc., Shrewsbury, N.J.
Filed May 6, 1988, Ser. No. 190,776
Int. Cl.[4] B65D *25/00*
U.S. Cl. 220—22.3 **18 Claims**



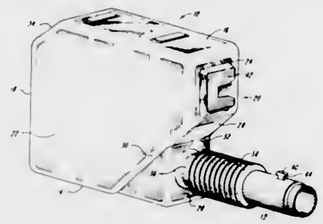
1. A crate for storing file folders and combinations of records, cassettes or compact discs, comprising:
two longitudinal sides,
two lateral sides,
a bottom,
an array of attachment holes strategically located in the longitudinal sides, lateral sides and bottom,
an insert divider for partitioning the crate into a plurality of storage areas, said insert divider comprised of a base having a plurality of substantially linear and parallel strips, a centrally disposed dividing strip running perpendicular to the parallel strips, a plurality of substantially parallel segments along the upper portion, and a series of pins along the outer most parallel strips or along the outer segments for insertion into the attachment holes in the crate to attach the insert divider to the crate, and
a rib structure surrounding the longitudinal and vertical sides.

4,901,877
BEE PROOF BEVERAGE CONTAINER
John R. Hall, 3920 Brandy Station Ct., Atlanta, Ga. 30339
Filed Jul. 7, 1989, Ser. No. 376,845
Int. Cl.[4] B65D *17/32*
U.S. Cl. 220—90.4 **8 Claims**



1. A beverage container comprising, a container body for containing a liquid and a lid for closing said container body for confining said liquid in said container body, the improvement comprising, said lid being provided with a plurality of spaced scorelines for defining individually outlined, displaceable lugs in said lid, a tab having detent means carried on said lid, said detent means including means for simultaneously engaging the outer surfaces of all of said lugs and for urging said lugs simultaneously downwardly into said container, thereby providing in said lid a plurality of spaced juxtaposed slots through which the liquid can be discharged when the container is tilted.

4,901,878
RIGID FLUID CONTAINER
Romilly H. Humphries, Dover, Mass., assignor to S.A.Y. Industries, Inc., Leominster, Mass.
Continuation-in-part of Ser. No. 26,024, Mar. 16, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 239,699
Int. Cl.[4] B65D *83/00, 23/10, 25/46*
U.S. Cl. 220—94 A **21 Claims**



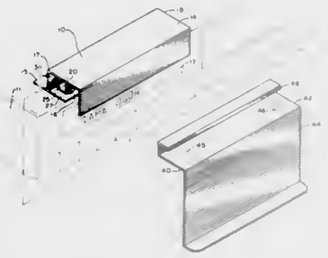
1. A container for fluids comprising a single piece, integrally formed, thin walled, self-supporting member defining a non-collapsible rigid hollow body of fixed shape having orthogonally related end walls spaced by a wall segment at an acute angle to each forming a hand grip section, and a second pair of orthogonally adjacent end walls opposite said first pair and having an elongated nozzle extending from one of said end walls adjacent the intersection of said second pair with said nozzle having means for flexing to and from a storage position adjacent said one of said end walls.

13. A container for fluids comprising:
a single piece, integrally formed, thin-walled, self-supporting member defining a non-collapsible rigid hollow body of fixed shape having rigid continuous substantially flat side walls, self-supporting top bottom end walls, and self supporting rear and front end
an elongated tubular nozzle integral with and extending from an inset portion of said front end wall, said nozzle being adapted to be moved between storage pouring positions, said nozzle having a flexible segment being adapted to remain in a substantially rigid horizontal position extending outwardly from said container when in a pouring position and adapted to be flexed to other pouring positions when under the influence of an external force;
said front end wall comprising said inset an portion, an outset portion and a slanted portion extending between said inset and outset portions, said outset portion of said front end wall extending forwardly beyond the inset portion such that when said nozzle is in its storage position the free end of the nozzle is vertically adjacent to said outset portion and the sharpness of the bend in said nozzle required to store it adjacent to said outset portion is reduced and such that the major portion of said nozzle is substantially parallel to said rear end wall;
said top and rear end walls being connected by a second slanted wall section opposing said slanted portion of said front end wall, said second slanted wall section forming a handle means; and,

means for securing said nozzle in said storage position adjacent said outset portion of said front end wall.

19. In a container having an integrally formed flexible, elongated nozzle extending therefrom with said nozzle adapted to be flexed to and from a storage position adjacent a wall of said container, means for locking said nozzle in said storage position including a male and female component with one of said components formed on said nozzle and the other formed on said wall, said female component including an opening tapering from an open wide end toward a closed end and said male component having a cross sectional shape to frictionally engage said opening as said male component is moved toward said closed end.

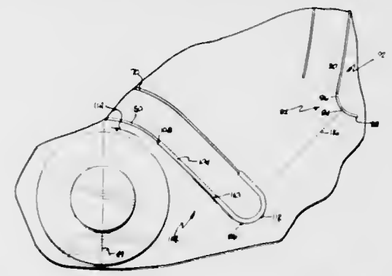
4,901,879
VCR COVER
Jerry Clemente, Jr., 714 Second Ave., Troy, N.Y. 12182
Filed May 17, 1988, Ser. No. 194,808
Int. Cl.[4] B65D *51/18*
U.S. Cl. 220—256 **9 Claims**



1. A child-resistant video cassette recorder door guard assembly comprising:
(a) an elongated channel bracket mountable horizontally on a video cassette recorder,
(b) a video cassette recorder door cover having a body portion and a skirt portion depending therefrom, the body portion being receivable through an end of the bracket channel in interfitting longitudinally relatively slidable engagement for carrying the skirt portion to cover and uncover the video cassette recorder door, and
(c) securing means including a first rigid member carried by the channel bracket and a second rigid member carried by the cover for engagement with the first rigid member to limit motion of the cover relative to the channel bracket.

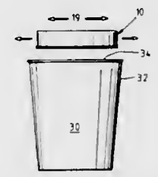
4,901,880
SCORE LINE GROOVE FOR CONTAINER END MEMBERS
Richard L. Tatham, Evergreen, and Alan D. Hunter, Littleton, both of Colo., assignors to Adolf Coors Company, Golden, Colo.
Filed Jan. 9, 1989, Ser. No. 294,399
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—269 **18 Claims**

1. A container end member or the like for sealed association with a container member to provide a sealed container and which is provided with a system for forming an opening therein comprising:
a one piece metallic end member having a cylindrical peripheral rim wall portion and a central axis;
an annular outer rim portion on said metallic end member for sealed association with the container member;
a central end wall portion integrally connected to said rim portion and extending generally transversely to said central axis and having an outer surface and an inner surface;
a severable tab portion integral with said central end wall portion;
a hinge portion integral with said central end wall portion and having spaced apart ends;
at least one severable score line groove having a main body portion and end portions defining said spaced apart ends of said integral hinge portion and defining said severable tab portion so that said severable tab portion may be pushed axially inwardly into said container in response to applied axially inwardly directed forces and form an outlet opening in said central end wall portion;
a pull tab secured to said central end wall portion by a rivet;



said at least one severable score line groove having a curved portion generally concentric with and spaced a short distance from said rivet;
retaining means comprising said hinge portion for retaining said severed tab portion attached to said central end wall portion;
one end portion of said severable score line groove extending in a linear direction from said curved portion and transverse to the direction of extent of said integral hinge portion; and
the other end portion of said severable score line groove extending in an arcuate direction away from said linearly extending one end portion, said other end portion has an arcuate extent of about 90 degrees.

4,901,881
METHOD AND APPARATUS FOR CLOSING CONTAINERS
Steven G. McElroy, 2500 Enfield, No. 3, Austin, Tex. 78703
Continuation of Ser. No. 107,371, Oct. 9, 1987, abandoned. This application Sep. 12, 1988, Ser. No. 244,626
Int. Cl.[4] B65D *51/00*
U.S. Cl. 220—287 **14 Claims**



1. An elastic container lid, stretchably adjustable to cover an opening of any of a plurality of disposable non-rigid containers each having a readily deformable opening wall defining a mouth configuration for an opening of the container, each container opening having a diameter ranging from a minimum of approximately three inches to a maximum of approximately six inches, comprising;

a closure panel having a predetermined surface area of approximately two and one-half inches in diameter in an unstretched condition, the closure panel having a predetermined thickness ranging from approximately two-eight thousands (0.002 to 0.008) inches to enable the closure panel to have sufficient elasticity to be stretchable over said maximum container diameter of approximately six inches to cover any of aid container openings;

a gripping zone extending transversely from the periphery of the closure panel, the gripping zone having a width ranging from approximately one-eighth to one-half inches and a thickness ranging from approximately two-eight thousands (0.002 to 0.008) inches, the gripping zone further including an annular bead along the periphery of the gripping zone for engaging the opening wall of any container of the plurality when the closure panel and gripping zone are resiliently stretched over the opening wall of the container, wherein in a stretched condition the closure panel seals the container while leaving the mouth configuration of the container opening substantially undisturbed;

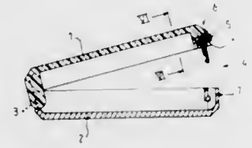
the closure panel and the gripping zone being formed of a latex elastomeric material that substantially retains its resiliency during use.

4,901,882

CASE WITH A HINGED COVER

Antonin Goncalves, Montmorency, France, assignor to L'Oreal, Paris, France

Filed Feb. 23, 1989, Ser. No. 314,106
Claims priority, application France, Feb. 24, 1988, 88 02220
Int. Cl.[4] B65D *45/16*
U.S. Cl. 220—324 **12 Claims**



1. A case including a base and a lid, joined to one another by joint means and provided with a closure device, which is located in a zone remote from the joint means and which includes at least one movable element cooperating with fixed elements located on the lid and the base of the case, the lid having a front edge and a window therethrough, the movable element including a control element that projects outside the case in the closing position of the case, wherein:

the movable element is a T-shaped tilting pushbutton comprising a top beam and a central leg, said top beam including, toward the front of the case, the control element projecting at the front edge of the lid in the closing position through said window and on the back thereof having, toward the joint means of the case, pivot means, the control element having a mean plane and the mean plane of the control element being substantially parallel to the axis of the pivot means but external to said pivot means of said control element, said central leg comprising a latching prong and a lower end that has a hooking means;

the fixed elements of the closure device carried by the lid define, on the front edge of the lid, said window for the control element of the tilting pushbutton, and including a front cradle which supports the pivot means of the control element of the tilting pushbutton, said front cradle being carried on the inside by a front edge of the lid and also, on the one hand, a back stop on which the tilting pushbutton comes to rest when the control element is subjected to a thrust oriented toward the inside of the case, at least one elastic tongue which rests on the tilting pushbutton on the back side of the control element, in order to push said control element back toward the front of the case and to keep the pivot means resting against said front cradle; and

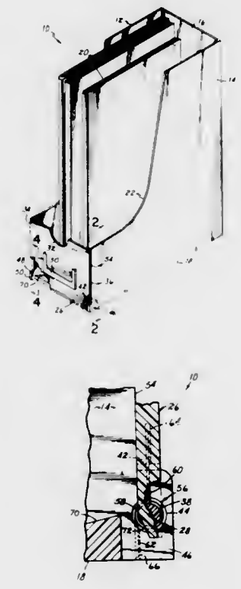
other fixed elements of the closure device that are located on the base of the case define a recess located against the front edge of the base of the case, said recess receiving the latching prong when the case is in the closing position, the wall of the recess perpendicular to the base of the case and located toward the inside of the case including a retention means complementary to the hooking means of the latching prong.

4,901,883

FILE BOX WITH FRONT DOOR

Ronald J. Hoffman, Collierville, Tenn., assignor to The Huffman Group Division of The Ron Hoffman Group, Collierville, Tenn.

Filed Mar. 23, 1989, Ser. No. 327,799
Int. Cl.[4] B65D *51/00*
U.S. Cl. 220—337 **12 Claims**



1. A file box comprising,

two spaced parallel side walls, a rear wall and a bottom, said walls and bottom joined to define a box with a front opening,

a door for at least partially closing said front opening, said door hinged for rotation about an axis parallel to said bottom,

said door having opposite side edges and first and second stub axles projecting from it perpendicular to said side edges, and

a spring having two outwardly projecting ends,

said door having a recess receiving and holding one said end of said spring,

said box having a fixed hole receiving and holding the other said end of said spring,

one said side wall having a socket for receiving and journaling said first stub axle,

the other said side wall having a slot for receiving and journaling said second stub axle,

said stub axles being engageable in said socket and slot by inserting said first stub axle into said socket and sliding the second stub axle into said slot,

said spring yieldably biasing said door toward an upright closed position between said side walls.

12. A file box locatable in a shelf space having limited vertical access, said file box comprising:

(a) two mutually spaced upright side walls, an upright rear wall adjoining said side walls, and a generally horizontally disposed bottom adjoining said side walls and rear wall to form a box having at least a front opening;

(b) a door normally positioned across a lower portion of said front opening, means pivotally mounting said door to said box for rotation about an axis lying substantially parallel to said bottom for movement between an open position no higher than said floor and an upright closed position, said door extending between said side walls and only partially closing the vertical extent of said front opening while in said closed position permitting at least partial viewing of articles within the box through an upper portion of said front opening above said door, and

(c) spring means operably connected between said box and said door biasing said door toward said closed position to assist in retaining the contents of the box behind said door until said door is moved to said open position,

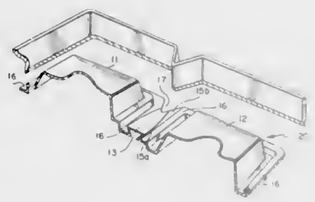
whereby articles such as magazines may be viewably retained within the box when said door is in said closed position but can be removed by pivoting said door to said open position and withdrawing said articles while avoiding blockage by said door of access to items which may be stored on a shelf, adjacent the box.

4,901,884

THERMOFORMED PACKAGE

James R. Kallenbach, Janesville, Wis., assignor to Prent Corporation, Janesville, Wis.

Filed Mar. 14, 1989, Ser. No. 322,936
Int. Cl.[4] B65D *5/02*
U.S. Cl. 220—339 **7 Claims**



1. A one-piece thermoformed package blank comprising complementary first and second portions connected by a hinge, and having a flange in one plane surrounding said portions and said hinge, wherein said hinge in its central zone is above said plane a greater height than in its end zones, and wherein said hinge comprises a roof and a pair of sidewalls supporting said roof, the sidewalls having a negative draft undercut slant in said central zone and a positive draft opposite slant in said end zones.

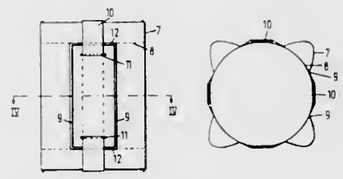
3. A one-piece thermoformed package comprising complementary first and second portions connected by a hinge, and having a flange which, when the package is in the open mode, is in one plane surrounding said portions, wherein said hinge in its central zone is above said plane a greater height than in its end zones, and wherein said hinge extends across the package from one edge of the flange to the opposite edge thereof.

4,901,885

CONTAINER FOR FREE-FLOWING, FLUID, AND LIKE MATERIALS

Gerardus A. M. Boots, Boskriek 72, 5401 LP Uden, Netherlands

Filed Jan. 13, 1988, Ser. No. 143,630
Claims priority, application Netherlands, Jan. 13, 1987, 8700063
Int. Cl.[4] B65D *90/04*
U.S. Cl. 220—402 **7 Claims**



1. A container for free-flowing, fluid and the like material, comprising:

a tubular outer envelope defining a wall of a predetermined height and circumference including at least four circumferentially spaced wall portions, said outer envelope being closeable at opposite ends transverse to the wall;

a tubular inner member having a circumference considerably smaller than that of the outer envelope and including at least four contact portions, the tubular inner member engaging, and being affixed to, the outer envelope only at said contact portions, said contact portions being of a width considerably less that the width of the respective wall portion, at said contact portions pockets being formed extending lengthwise of the outer envelope, the inner member having a height of about 30 to 100% of the height of the outer envelope; and

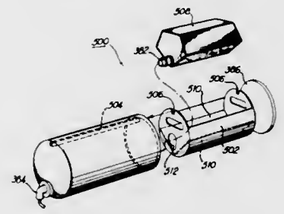
stiffening means extending over the height of the outer envelope, having a relatively high stiffness or tear resistance, and being in contact with the inner member, said stiffening means being located in said pockets.

4,901,886

BAG-IN-TANK CONCENTRATE SYSTEM FOR POSTMIX JUICE DISPENSER

Jonathan Kirschner, Powder Springs, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 164,364, Mar. 4, 1988, Pat. No. 4,860,923, which is a continuation of Ser. No. 137,309, Dec. 23, 1987, which is a continuation of Ser. No. 924,381, Oct. 29, 1986, abandoned. This application May 13, 1988, Ser. No. 193,848
Int. Cl.[4] B67D *5/56*
U.S. Cl. 222—1 **5 Claims**



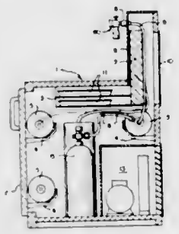
1. A concentrate supply system for a postmix juice dispenser comprising:

(a) a pressurizable canister having an opening at one end and

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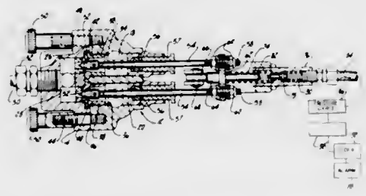
having a canister concentrate fitting at the other end thereof;
(b) a bag of concentrate having a bag outlet fitting and adapted to be received in said canister;
(c) a lid for said canister for closing said opening;
(d) a bag carrier adapted to slide inside of said canister and adapted to receive and hold said bag of concentrate;
(e) means for orienting said carrier in said canister to position said carrier in a predetermined orientation in said canister;
(f) bag outlet fitting holding means on said carrier for holding said bag outlet fitting in a predetermined position relative to said carrier;
(g) said bag outlet fitting holding means and said canister concentrate fitting being located relative to each other such that when said carrier is fully inserted into said canister with said bag supported therein, said bag outlet fitting will be matingly coupled to said canister concentrate fitting.

4,901,887
BEVERAGE DISPENSING SYSTEM
John W. Burton, #4 Woodland Dr., Pittsburgh, Pa. 15228
Filed Aug. 8, 1988, Ser. No. 229,397
Int. Cl.[4] B67D *5/64, 5/62*
U.S. Cl. 222—131 **15 Claims**



1. A beverage storage and dispensing system for dispensing fluids from a pressurized container and able to dispense said fluids at a near freezing temperature, comprising:
(a) a refrigerator having an integral freezer and a storage compartment of sufficient size to contain at least one beverage reservoir,
(b) a tower attached to the refrigerator adjacent to the freezer and extending outward from the refrigerator, said tower having an interior cavity of sufficient size to contain fluid lines and an ice strip,
(c) at least one dispensing valve attached to the tower,
(d) at least one fluid line connected to said at least one dispensing valve running through the tower and into the refrigerator and of sufficient size and length to be connected to at least one beverage reservoir within the refrigerator storage compartment, and
(e) an ice strip immediately adjacent to the fluid lines and extending from within the interior cavity of the tower into the freezer in a manner which permits the artificial ice strip to be frozen by the freezer and to cool the at least one fluid lines in the tower.

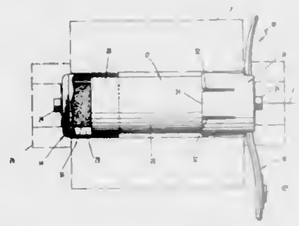
4,901,888
MULTIPLE COMPONENTS FLOW GUN
Ronald E. Standlick, Rochester, Mich., assignor to Jesco Products Company, Inc., Sterling Heights, Mich.
Continuation of Ser. No. 748,707, Jun. 25, 1985, abandoned, which is a division of Ser. No. 411,902, Aug. 26, 1982, abandoned. This application Jan. 6, 1986, Ser. No. 817,152
Int. Cl.[4] B67D *5/60*
U.S. Cl. 222—145 **7 Claims**



1. In a system for mixing and dispensing two or more fluids, a flow gun comprising:
a housing having at least two inlet chambers and an outlet chamber,
means for fluidly connecting a first fluid to one inlet chamber and a second fluid to the other inlet chamber,
a first fluid passageway for fluidly connecting said one inlet chamber to said outlet chamber,
a second fluid passageway for fluidly connecting said other inlet chamber to said outlet chamber,
an outlet fluid passageway having one end open to said outlet chamber and its other end open exteriorly of said housing,
valve means movable between an open and a closed position for simultaneously opening and closing said first and second fluid passageways,
wherein said housing comprises a first part and a second part, said housing parts abutting together along a plane open to said outlet chamber,
means for detachably securing said housing parts together,
wherein said outlet chamber is wholly formed in said second housing part,
wherein said valve means are wholly attached to said first housing part so that, upon detachment of said housing parts and actuation of said valve means, the dispensing ratio of said fluids can be measured.

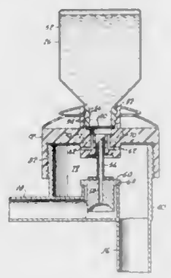
4,901,889
APPARATUS FOR MOUNTING A TISSUE ROLL AND DISPENSING A FLOWABLE SUBSTANCE
Joseph Mitchell, 303 S. Hampshire Dr., Deptford, N.J. 08096
Filed Jan. 18, 1989, Ser. No. 298,121
Int. Cl.[4] B67D *5/06*
U.S. Cl. 222—153 **20 Claims**

1. Apparatus for rotatably mounting a roll of tissue in a holder and for dispensing a flowable substance, comprising:
a canister comprising a body containing a flowable substance, and a discharge nozzle at one end of said body, said canister adapted to be coaxially disposed within a core of a tissue roll,
support means mounted on said canister body and including first and second support members disposed at opposite ends of said canister body, said first and second support members carrying first and second mounting means, respectively, which are coaxial and rotatably mountable in a holder, and
a dispensing handle mounted on said second support member and extending laterally outwardly therefrom, said handle including:
an aperture receiving said canister nozzle, and
a passage extending laterally of said aperture, one end of said passage communicating with said aperture and another end of said passage defining an outlet opening adjacent an outer end of said handle,



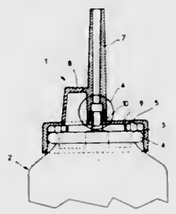
said dispensing handle being movable relative to said second support member to cause said canister nozzle to be depressed and emit a flowable substance which travels through said passage and exits through said discharge outlet.

4,901,890
WATERING SYSTEM AUTOMATIC ADDITIVE DISPENSER KIT
Michael B. Mivelaz, P.O. Box 2085, Stockton, Calif. 95201-2085
Division of Ser. No. 211,455, Jun. 24, 1988, Pat. No. 4,846,403. This application May 1, 1989, Ser. No. 345,445
Int. Cl.[4] B05B *7/28;* **B65D** *47/10*
U.S. Cl. 222—395 **10 Claims**



1. An automatic additive dispenser kit for converting an anti-syphon valve into an automatic additive dispenser system, said kit comprising:
a container means for holding a supply of additive and having a rupturable seal;
a cap adapted for replacing an existing cap of an anti-syphon valve, said cap including means for releasably attaching the container means, with additive, thereto; and
means for rupturing said rupturable seal when the container is attached to the cap, and introducing a stream of water inside said container means to flush substantially all of the additive therein out of said container means in response to flow of water through the anti-syphon valve.

4,901,891
END FITTING FOR DISPENSING A FOAMING PRODUCT
Antoain Goncalves, Groslay, France, assignor to L'Oreal, Paris, France
Filed Apr. 15, 1987, Ser. No. 38,747
Claims priority, application France, Apr. 30, 1986, 86 06273
Int. Cl.[4] B65D *83/14*
U.S. Cl. 222—402.13 **10 Claims**



1. In an end fitting for dispensing a foaming product contained in a pressurized container fitted with an emergent stem carried by a valve cup having a crimped bead, the said end fitting comprising:
(a) fixing means for holding the end fitting on the container;
(b) dispensing means movable relative to said fixing means, said dispensing means defining firstly an internal bore arranged in slidably contacting relationship with said emergent stem of the valve to sealingly receive said stem and secondly a dispensing tube whose internal duct communicates with said bore, the top of said emergent stem of the valve occupying in the bore a first level, termed the lower one, when the dispensing means in not subjected to any force by the user and a second level, termed the upper one, when a user acts on the dispensing means to produce the dispensing,
the improvement wherein the lower wall of the said bore has a portion defining at least one groove the top of which is disposed between said upper and lower levels and the bottom of which opens above the valve cup in a zone of the bore which is not closely by the emergent stem of the valve; said emergent stem having a longitudinal axis and said at least one groove extending generally parallel to said longitudinal axis and being movable with said dispensing means between a first position, corresponding to when a user acts on the dispensing means to produce the dispensing, and wherein flow through said at least one groove is blocked by said emergent stem and a second position, corresponding to release of said dispensing means, wherein flow through said at least one groove is permitted.

4,901,892
TAMPER EVIDENT CONTAINER CLOSURE
John S. Song, Evanston, Ill., assignor to Magenta Corporation, Chicago, Ill.
Filed Jul. 22, 1988, Ser. No. 222,936
Int. Cl.[4] B65D *5/72*
U.S. Cl. 222—498 **14 Claims**

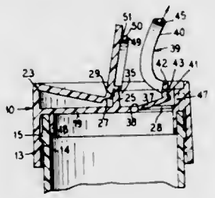
1. A tamper evident container closure comprising a skirt for attachment to the mouth end of a container and a closure crown panel supported by said skirt, and a cover on the closure over the crown panel displaceable for exposing the crown panel;
a well on the closure crown panel normally closed by said cover, said well having a floor comprising part of the crown panel and with a dispensing opening in said floor;
said crown panel having a lip structure projecting above said crown panel and carrying said cover displaceably;
said crown panel has a partition dividing said well from a

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cavity defined by said partition and said lip; said crown panel having reinforcing means associated with said partition within said cavity;

a rip-out tamper evident element fixed in closing relation to said opening and requiring destructive removal for dispensing access to said opening;

a digitally manipulatable handle attached to said element and confined within said well in the closed condition of said cover and accessible when the cover is displaced from



said well for pulling the handle out of the well and forcibly destructibly displacing said element from said opening; and

said cover having hingedly connected portions one portion of which covers said cavity and a second portion which covers said well; a hinge connecting said one cover portion to said lip, and said second cover portion fulcruming on said partition and swinging open when said one cover portion is pressed into said cavity.

4,901,893

DISPLAY DEVICE

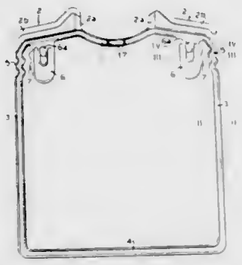
Sebastian Conran, and Antony Anderson, both of London, Great Britain, assignors to Marks and Spencer p.l.c., Great Britain

Filed Aug. 5, 1988, Ser. No. 229,332

Claims priority, application United Kingdom, Aug. 7, 1987, 8718737

Int. Cl.[4] A47F *7/22*

U.S. Cl. 223—66 **8 Claims**



1. A display device suitable for the support and display of a garment having a neck aperture and first and second shoulder portions comprising,

a first support element adapted to pass across said first and second shoulder portions of said garment outside said neck aperture, said first support element having a first end and a second end,

first and second auxiliary support elements attached to said first support element and adapted to pass through said neck aperture of said garment, said first auxiliary support element adapted to be located inside said first shoulder portion and said second auxiliary support element adapted to be located inside said second shoulder portion,

at least two vertical side bars each having a transverse cross-sectional shape with enlarged rounded rigidifying edges, one of said vertical side bars extending downward from said first end of said first support element and said other of said vertical side bars extending downward from said second end of said first support element,

at least two flat tab members, each of said tab members extending downward from said first support element adjacent to one of said vertical side bars, and having a first edge proximate to said adjacent one of said vertical side bars, and

clip means separably connected to said tab members to receive and retain an upwardly folded lower portion of said garment.

4,901,894

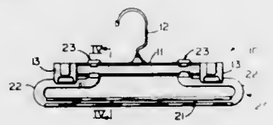
SNAP ON AUXILLARY BAR FOR HANGERS

Russell O. Blanchard, Zeeland, Mich., assignor to Batts, Inc., Zeeland, Mich.

Filed Jul. 22, 1988, Ser. No. 222,789

Int. Cl.[4] A47G *25/48*

U.S. Cl. 223—96 **11 Claims**



1. In combination an auxiliary garment support bar of molded plastic and a garment clamping hanger, said hanger having an elongated molded plastic body and support means therefor intermediate its ends, a pair of clamps, one on each side of said support means, said support bar having an elongated portion wider than the combined length of said body and clamps over which a garment can be draped, the end portions of said bar being shaped to extend upwardly and toward each other, said end portions being of rectangular cross-sectional shape and each having a greater dimension extending upwardly and generally parallel to the body of the hanger to support loads imposed on the support bar and the lesser dimension of said cross-sectional shape extending from front to back, permitting the end portions to seat against the rear face of the hanger body and the support bar to assume a position depending in a plane immediately behind the hanger body, the free ends of said end portions having anchor portions adapted to engage and be supported by said hanger body, said anchor portions being resiliently deflectable and having elements capable of interlocking with said hanger body.

4,901,895

TRUCK REAR BUMPER-STORAGE COMPARTMENT ASSEMBLY WITH FACILITY FOR SHEET MATERIAL STORAGE AND DISPENSING, SUCH AS TRUCK BED COVER TARPAULINS, TENTS AND THE LIKE

Norman M. Gancarz, Albee Rd., Dudley, Mass. 01570

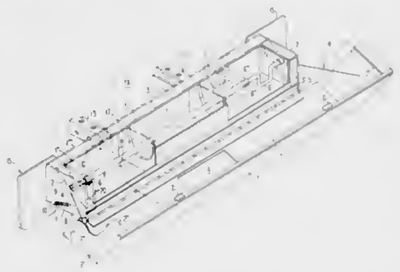
Filed Feb. 26, 1988, Ser. No. 160,999

Int. Cl.[4] B60R *11/00, 19/48;* **B60P** *7/04*

U.S. Cl. 224—42.03 A **19 Claims**

1. Truck rear-bumper storage-compartment tarpaulin-dispensing apparatus, comprising:

a rectangular metal housing defining a storage compartment and having a base with integral rear, bottom and end walls coextensive with the rear bumper area of a truck, a cover with integral front and top walls, means behind the base rear wall for securing the housing to a frame of the truck, and a hinge pivotally connecting a lower edge of the cover front wall with an adjacent edge of the base bottom wall such that the cover is pivotable upwardly about the hinge to close the storage compartment and thus to serve as a bumper and pivotable downwardly about the hinge to open the storage compartment and permit storage access within the storage compartment; bearing means carried by the base end walls of the housing; an axle extending longitudinally within the storage compartment and rotatable in the bearing means; and means for enabling mounting a a tarpaulin roll upon the axle, with the tarpaulin being withdrawable from the storage compartment about the axle when the housing cover been pivoted downwardly, to serve such purposes as a cover has for a bed of the truck or an external tent or shelter behind the truck, and, in the former case, to permit the cover to be re-closed for bumper service while the withdrawn portion of the tarpaulin is serving as the truck bed cover.



4,901,896

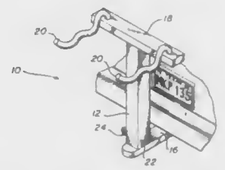
APPARATUS FOR CONNECTING ARTICLE CARRIERS TO A TRAILER HITCH BALL

William W. Speer, 3333 Esters Rd., #1112, Irving, Tex. 75062

Filed Oct. 7, 1988, Ser. No. 254,828

Int. Cl.[4] B60R *9/10;* **B60D** *1/06*

U.S. Cl. 224—42.07 **8 Claims**



5. Apparatus for connecting article carriers, such as a bicycle carrier to a trailer hitch ball wherein the hitch ball includes a generally spherically top portion, a neck portion of reduced diameter and an enlarged base portion of non-circular cross-section mounted on a draw bar, the apparatus comprising:

a tubular member of non-circular cross-section having an interior dimension to closely receive in telescoping relationship the top, and non-circular base portions of said hitch ball to prevent rotation of said tubular member relative to the hitch ball;

means for releasably connecting said tubular member to the hitch ball; and,

means for preventing vertical movement between the hitch ball and tubular member.

4,901,897

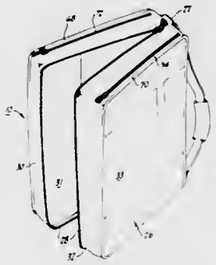
CONVERTIBLE GARMENT BAG WITH ALTERNATE CARRYING MEANS

Marcia Briggs, P.O. Box 3696, Chico, Calif. 95927, and Roulette W. Smith, P.O. Box 4061, Stanford, Calif. 94305

Filed Sep. 24, 1985, Ser. No. 779,627

Int. Cl.[4] B65D *85/18;* **A45C** *9/00*

U.S. Cl. 224—153 **16 Claims**



1. A convertible garment bag comprising:

a. an elongated garment casing with a backside and a front-side with opening and closure means on the front side for inserting clothes in the garment casing, said casing having means for suspending garments on conventional hangers within the casing;

b. a perimeter closure means for converting said elongated garment casing into a compact unitary pack, wherein the garment casing is folded into at least two segments with three juxtaposed open perimeter edges and a folded edge, said closure means comprising a perimeter zipper for securing said open edges together continuously along the three perimeter edges wherein a unitary closed pack is formed;

c. a back pack harness connected to the backside of the casing on one of said folded segments of said unitary pack, said harness being arranged for carrying said pack when said garment bag is converted into a pack.

4,901,898

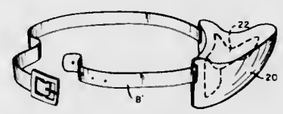
WAIST-MOUNTED INFANT CARRIER

Richard J. Colombo, and Margaret A. Colombo, both of 7769 Dryer Rd., Victor, N.Y. 14564

Filed Sep. 14, 1988, Ser. No. 244,027

Int. Cl.[4] A47C *5/12*

U.S. Cl. 224—159 **3 Claims**



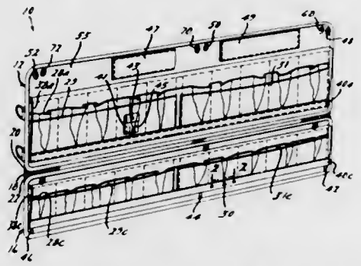
1. A waist-mounted infant carrier adapted to be worn about the waist of an adult for supporting and transporting an infant in a position in which the legs of the infant straddle the waist of the adult, said carrier comprising a compressible contoured member adapted to provide support for the buttocks and upper leg portions of an infant seated thereon, said member having embedded therein a reinforcing element of V-shaped cross-section defined by a pair of angularly disposed legs, one of said legs being contoured to the hip region of the adult, and the other of said legs being contoured to receive the buttocks of an infant, said compressible contoured member extending laterally outward from each side of said one leg to resiliently support and take the shape of such upper leg portions.

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4,901,899
UNIVERSAL EQUIPMENT CARRIER

Garret D. Barrett, 42450 Garfield, Mt. Clemens, Mich. 48044

Filed Jun. 7, 1988, Ser. No. 203,713
Int. Cl.[4] A01K *97/04*; A45F *5/00*
U.S. Cl. 224—223 1 Claim



1. A customizeable foldable fishing tackle carrier having selectively replaceable carrier portions comprising:

a first carrier including atop edge, two side edges, a lower terminal edge, a backing side and a pocket forming side, means on said first carrier adaptable for attaching a handle for carrying of said fishing tackle carrier, a first zipper portion on a lower terminal edge of said first carrier for cooperation with a zipper portion on a separate carrier, said means on said first carrier including a pair of spaced 'd' rings on each of the side edges thereof and a single pair of spaced "d" rings centrally located on the backing side;

at least one intermediate carrier, said intermediate carrier including, a second and third cooperating zipper portion on upper and lower edges of said intermediate carrier respectively, said second zipper portion cooperating with said first zipper portion on said first carrier to provide for releasable attachment thereto; and

a terminal carrier having a fourth zipper portion along its upper end for cooperating with said third zipper portion or with said first zipper portion to provide for releasable attachment to either said first carrier or one of said intermediate carriers;

each of said carriers including at least one row of horizontally disposed pouches, each of said pouches including a bottom crimped seam wherein the pouch forming sheet is folded upon itself and a pair of opposed parallel side seams whereby a voluminous pouch is formed thereon, said bottom crimped seam including a portion thereof defining a drain opening for drainage and ventilation of each of said pouches;

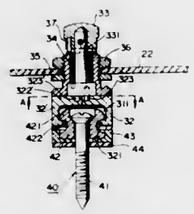
a pouch cover securable over the open ends of said pouches for simultaneously covering all of the pouch openings and the pouches themselves in a horizontal row of said pouches, said pouch cover and said pouches being formed from a substantially transparent micropore material for allowing visual recognition of lures contained in said pouches and said micropore material allowing for breathing of fishing tackle contained in said pouches for preventing oxidation thereof; and

a handle removably attached to at least one pair of "d" rings; said fishing tackle carrier being foldable along the zippers for storage in a first folded position and having a means for securing said fishing tackle carrier in said first folded position, wherein said handle may be attached to said centrally located pair of "d" rings for temporarily carrying said fishing tackle carrier in the first folded position, said carrier being foldable along a central vertical line wherein said pairs of "d" rings on said sides of said first carrier are adjacent to one another such that said handle may be attached to secure said pairs of "d" rings together for securing the fishing tackle carrier in a second more compactly folded position for carrying thereof.

4,901,900
CONNECTOR FOR STRING INSTRUMENT AND HARNESS

Takao Goto, Isezakishi, Japan, assignor to Gotoh Gut Yugen Kaisha, Gunmaken, Japan

Filed Apr. 18, 1988, Ser. No. 182,894
Claims priority, application Japan, Apr. 20, 1987, 62-60775[U]
Int. Cl.[4] A45F *3/14*; G10D *3/00*
U.S. Cl. 224—257 3 Claims



1. A connector for a string instrument and a harness, comprising:

an engaging member which has a casing provided with an engaging chamber which is open toward a string instrument side, at least two engaging pieces which are accommodated in said engaging chamber for movement forward and backward in the radial direction of said chamber, a resetting spring which biases said engaging pieces toward each other, an operation knob engagable with said engaging pieces for retracting said engaging pieces against the bias of said resetting spring when the knob is manually rotated in the circumferential direction, and a mounting means for positioning said casing at a position inside a harness and said operation knob on the outside of the harness;

a fixing member which has a protrusion having a top part which has a size for causing said engaging pieces to retract against said resetting spring when said protrusion is pushed into said engaging chamber of said engaging member and having an engaging recess positioned at a position nearer the string instrument than the top part and shaped for being engaged by said engaging pieces when said protrusion is pushed into said engaging chamber;

an elastic cover on the base of said protrusion and extending along the sides of said protrusion toward said engaging member, said elastic cover being adapted to be engaged between the edge of said casing of said engaging member and a string instrument when said protrusion is engaged inside said engaging chamber of said engaging member; and

means for fixing said protrusion to a string instrument.

4,901,901
SHOPPING CART DESK

Peggy B. Reitenour, P.O. Box 241, Augusta, Mich. 49012

Filed Feb. 13, 1989, Ser. No. 309,489
Int. Cl.[4] B62B *5/00*
U.S. Cl. 224—277 11 Claims

1. A shopping cart having front, back and sidewalls and being desk securable to a shopping cart of a predetermined width and length, said desk comprising,

a first rigid plate formed with parallel exterior and interior surfaces, and

a geometrically equal second rigid plate formed with exterior and interior surfaces pivotally mounted in edge to edge orientation relative to said first plate by an elongate hinge, and

a first handle formed medially to an outer edge of said first plate spaced from said hinge and a second handle formed medially to an outer edge of said second plate spaced from said hinge wherein said first and second handle and said first and second plates are aligned with one another when said plates are pivoted from a first position horizontally aligned with one another and a second vertical position wherein said first and second plates are aligned in confronting interior face to interior face relationship relative to one another, said plates being dimensioned to extend substantially across said predetermined width overlapping said side walls and over a portion of said predetermined length of said shopping cart when said plates are in said first position, and

a first securement flap formed on said outer edge of said first

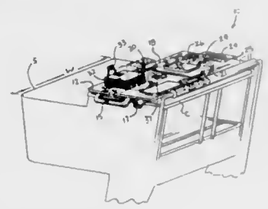


plate spaced from said first handle on one side of said first handle, and

a first attachment patch aligned with said first securement flap when said first and second plates are in the second position and wherein said first attachment patch is formed on an outer edge of said second plate spaced from said second handle, and

said first attachment patch and said first securement flap each include cooperative hook and loop fasteners, and

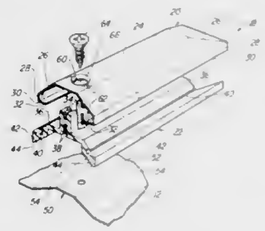
latch means slidably mounted to the interior face of said first and second plate for securement of the first and second plate in said first position, and

accessory means formed in said interior surfaces of said first& and second plate to assist an individual in shopping.

4,901,902
LONGITUDINAL SLAT FOR LUGGAGE CARRIER

Craig Stapleton, Port Huron, Mich., assignor to Huron/St. Clair Company, Port Huron, Mich.

Continuation of Ser. No. 15,782, Feb. 17, 1987, abandoned. This application Jul. 28, 1988, Ser. No. 225,554
Int. Cl.[4] B60R *9/04*
U.S. Cl. 224—326 11 Claims



1. A load supporting slat for a vehicle luggage carrier adapted to be mounted to a surface of a vehicle, said slat comprising:

an elongated slat body having a top load-bearing wall substantially parallel to the vehicle surface;

an integral insulator disposed beneath said slat body and extending substantially the length of said slat body, said insulator including a longitudinally extending central support beam which extends vertically between the vehicle surface and said load-bearing wall of said slat body to provide support substantially over the length of said load-bearing wall and integral flange portions extending laterally outwardly from opposite sides of the bottom end of said longitudinally extending central support beam; and

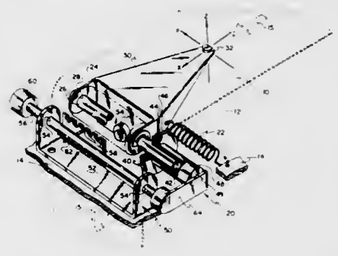
means for securing said slat body and insulator to the vehicle surface;

said central support beam of said insulator having an H-shaped cross-sectional configuration with a pair of substantially parallel support legs extending between the vehicle surface and said load-bearing wall of said slat body and a cross support member extending between intermediate points of and perpendicular to said legs of said central support beam, said flange portions extending outwardly from the bottom end of said legs at least partially along the vehicle surface to engage the outer edges of said slat body.

4,901,903
WEB GUIDING APPARATUS

Douglass L. Blanding, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 900,654, Aug. 26, 1986, Pat. No. 4,795,070. This application Nov. 21, 1988, Ser. No. 274,100
Int. Cl.[4] B65H *23/02*
U.S. Cl. 226—196 6 Claims



1. Apparatus for guiding a moving web of material in a predetermined path of travel relative to a stationary frame, including

a compliant roller mounted on a roller shaft on a supporting yoke for rolling contact with said web, said yoke being pivotally connected to said frame for movement about mutually orthogonal X Y and Z axes;

an edge guide rotatably mounted on said roller shaft and axially slidable relative thereto, said edge guide including a disk portion having an outside diameter larger than that of said roller; and

an edge guide adjustment mechanism, including a stationary member and a laterally movable control member, said control member adapted for abutting engagement with said edge guide and for selective locking engagement with said stationary member.

4,901,904
METHOD OF PRODUCING BRAZING METALS

Nobuo Tsuno, Kasugai, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

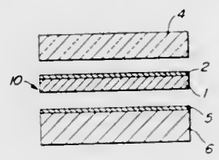
Continuation of Ser. No. 886,367, Jul. 17, 1986, abandoned. This application Apr. 12, 1988, Ser. No. 183,309
Claims priority, application Japan, Jul. 22, 1985, 60-160329
Int. Cl.[4] B23K *35/22*, *35/40*
U.S. Cl. 228—56.3 12 Claims

1. A method of producing brazing metals having a layered structure for joining ceramic members mutually or a ceramic member and a metallic member to each other comprising:

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adjusting at least one surface of a metal substrate to a surface roughness of center line average height of Ra of 0.5–2.0 microns; and

applying at least one active metal layer, which has a melting point higher than that of the metal substrate, on said at least one surface of said metal substrate by a process selected from the group consisting of physical vapor deposition, chemical vapor deposition, and metal plating, to a thickness of 5×10^{-4}–0.1 mm, such that a thickness ratio or a thickness to diameter ratio of the active metal layer to the metal substrate is in a range of $1\times10^{-2}-1\times10^{-1}$ and a weight ratio of the active layer to the metal substrate is in a range of 0.7–4.4%.



4,901,905

CHARGING SYSTEM IN THE EXPLOSION WELDING OF PLANAR OR CURVED WORKPIECES

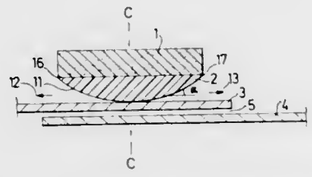
Ingemar Persson, Nora, Sweden, assignor to Exploweld AB, Nora, Sweden

Filed Sep. 27, 1988, Ser. No. 249,960

Claims priority, application Sweden, Sep. 28, 1987, 8703731

Int. Cl.[4] B23K *20/08*

U.S. Cl. 228—107 **7 Claims**



1. A charging system for seam welding two or more workpieces by means of explosion welding, comprising an explosive charge and an inert impulse-transmitting body located between the explosive charge and the surface of the one of said workpieces nearest said charge, wherein the surface of the inert body facing the said surface of said one workpiece is so configured in a plane at right angles to the longitudinal extension of the ultimate welding seam that the angle α between said surface of the inert body and the adjacent surface of the one workpiece varies from the center line of the inert body perpendicularly to the said surface of the one workpiece and outwards from said center line, and wherein said charge has a constant thickness and is located on top of the inert body and the charge extends across the whole width of the inert body.

4,901,906

METHOD FOR FORMING COMPOSITE METAL ARTICLES

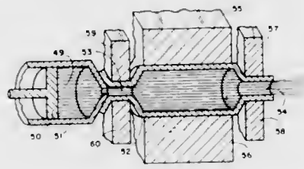
Robert C. Kvavle, Rte. 4, Box 891, Hillsboro, Oreg. 97123

Continuation of Ser. No. 155,609, Feb. 12, 1988, Pat. No. 4,815,652. This application Nov. 14, 1988, Ser. No. 270,278

Int. Cl.[4] B23K *20/02*

U.S. Cl. 228—176 **10 Claims**

1. A method of making a containerized ingot having an outer metal shell and a metal core, the metal of the core having a higher thermal coefficient of expansion and a lower melting point than the metal of the shell, the method comprising: making the metal which is to constitute said shell in the shape of an enclosure with at least one injection port and at least scavenging port, injecting the core metal in a molten condition with an excess of said metal by way of said at least one injection port into said shell, ejecting said excess of said core metal with oxides and other contaminants from said shell by way of said at least one scavenging port, closing said scavenging port, closing said at least one injection port.



4,901,907

HEAT EXCHANGER CORE MADE OF ALUMINUM AND METHOD FOR APPLICATION OF FLUX DURING PROCESS OF SOLDERING THEREOF

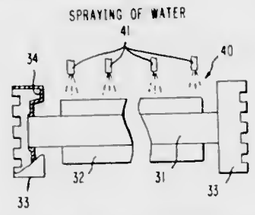
Hiroaki Enokido, Kanagawa; Takayuki Hatanaka, Fujisawa, and Takashi Kozono, Narashino, all of Japan, assignors to Nihon Radiator Co. Ltd. and Pacific Machinery and Engineering Co. Ltd., both of Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,195

Claims priority, application Japan, Feb. 27, 1987, 62-44421; Mar. 30, 1987, 62-78749

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—183 **15 Claims**



1. A method for the application of flux in a process of soldering a heat exchanger core of aluminum including the steps of

(1) alternately disposing tubes and fins, wherein tubes and fins are formed of aluminum material and wherein the tubes and fins are coated on their surfaces with an oven soldering material; and

(2) placing simultaneously seat plates at opposite ends of said tubes, wherein the seat plates are coated on their surfaces with an oven soldering material and wherein the seat plates are formed of aluminum material thereby forming a preassembled core;

(3) applying a non-corrosive flux on said core;

(4) heating said core in an oven thereby soldering the joints between said tubes, fins, and seat plates; which method is characterized by

(5) spraying water on said preassembled core such as to prevent the sprayed water from landing on annular grooves on tank sides of said seat plates;

(6) spraying said non-corrosive flux in powdery state on said core in such a manner as to prevent the sprayed flux from landing on said annular grooves on tank sides of said seat plates; and

(7) drying the wet preassembled heat exchanger core after the spraying and after completion of the application of the non-corrosive flux powder;

(8) subjecting the preassembled heat exchanger now coated with the non-corrosive flux to a soldering treatment in an oven after completion of the drying step.

4,901,908

ALUMINUM MATERIAL FOR BRAZING, METHOD OF MANUFACTURING SAME, AND METHOD OF MANUFACTURING HEAT EXCHANGER MADE OF ALUMINUM ALLOY

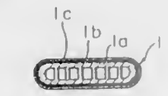
Kengi Negura, Kariya; Ken Yamamoto, Ohu; Shigeo Ito, Anjo, and Masahiro Shimoya, Chita, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

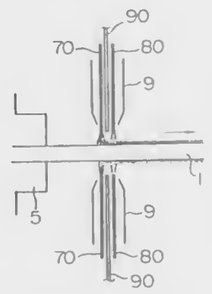
Filed Sep. 6, 1988, Ser. No. 240,639

Claims priority, application Japan, Sep. 9, 1987, 62-225880; Aug. 26, 1988, 63-212829

Int. Cl.[4] B23K *1/12, 1/20*

U.S. Cl. 228—183 **4 Claims**





2. A method of manufacturing an aluminum alloy heat exchanger comprising:

a first step of forming a tube through which a heat exchange fluid is made to flow by extruding aluminum or an alloy of aluminum;

a second step of forming a first coated layer by spraying zinc or an alloy of zinc-and-aluminum on the surface of the just extruded core;

a third step of forming a second coated layer by spraying a brazing alloy on the surface of said first coated layer forming a coating having a zinc concentration gradient, wherein said second layer has a melting point higher than said first layer and wherein the outer surface of said second layer has a zinc concentration lower than the inner surface of said first layer.

a fourth step of forming fins made of aluminum alloy which fins are to be bonded to said tube;

a fifth step of forming an assembly by contacting said fins with said tube with said first and second coated layers being formed thereon; and

a sixth step of brazing said tube and said fins by heating said assembly in a furnace to a temperature which is the melting point of said second coated layer or above and which is less than the melting point of said tube.

4,901,909

FLUX AND PROCESS FOR BRAZING ALUMINUM MATERIAL

Gary W. George, Mentor, Ohio, assignor to Fusion Incorporated, Willoughby, Ohio

Continuation-in-part of Ser. No. 233,567, Aug. 18, 1988. This application Jun. 27, 1989, Ser. No. 372,287

Int. Cl.[4] B23K *35/363*

U.S. Cl. 228—223 **37 Claims**

1. A flux for brazing the metal surfaces of an aluminum material, the flux consisting essentially of a particulate blend of aluminum fluoride, potassium fluoride, and the chloride of at least one Group 1A metal having an atomic number of either 37 or 55, the weight fraction of the total fluorides being between about 3/10 and about 9/10, the weight ratio of the aluminum fluoride to the potassium fluoride being between 4:1 and 0.4:1.

4,901,910

PERFLUORINATED PROPYL DERIVATIVE COMPOUNDS FOR VAPOR BATH SOLDERING

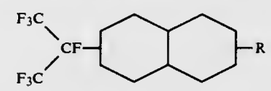
Frank K. Schweighardt, Allentown; Webb I. Bailey, Fogelsville; John T. Lileck, Tamaqua; John K. Graybill, Macungie, and Eugene G. Lutz, Drums, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 89,293, Aug. 25, 1987, Pat. No. 4,873,315. This application Mar. 27, 1989, Ser. No. 329,122

Int. Cl.[4] B23K *35/36, 35/38*

U.S. Cl. 228—242 **9 Claims**

1. In a method of soldering wherein a component to be soldered is immersed in a vapor bath to melt the solder, and the component is then withdrawn from the vapor bath, the improvement comprising that the vapor bath is composed substantially of compounds having the formula:



wherein the carbon rings are fully fluorinated and R is selected from the group consisting of fluorine, $-CF_3$ or $-CF(CF_3)_2$.

4,901,911

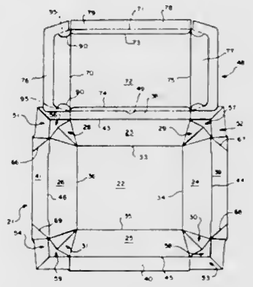
FOLDABLE CARTON

Gerrit K. Drexhage, P.O. Box 349, Cazadero, Calif. 95421

Filed Sep. 6, 1988, Ser. No. 240,513

Int. Cl.[4] B65D *5/54*

U.S. Cl. 229—114 **23 Claims**



1. In a foldable carton formed from a one-piece sheet-like blank and having a bottom panel; side panel means foldably joined to and extending completely around the periphery of

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said bottom panel, said side panel means including side web means formed for folding of said side panel means to an elevated position relative to said bottom panel to provide a seamless volume; and extension panel means foldably joined to an outer periphery of said side panel means for folding to an inward position relative to said side panel means; the improvement in said carton comprising:

said extension panel means includes extension web means connecting portions of said extension panel means together as a continuous band completely encircling said outer periphery of said side panel means; and

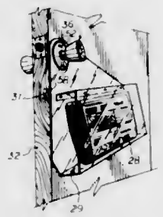
relief opening means formed in said blank between said side web means and said extension web means and adapted for folding of said extension panel means to said inward position.

4,901,912

NEWSPAPER CONTAINER

Gaston O. Pinard, 635, rue Roby, Drummondville, Quebec, Canada (J2C 5N3)

Filed Jul. 18, 1989, Ser. No. 381,267
Int. Cl.[4] A47G *29/12*
U.S. Cl. 232—1 C **6 Claims**



1. A container for articles adapted to be mounted on a door having a door knob assembly and surrounded by a door jamb, said container comprising:

a main hollow body for receiving articles, said main body having a back panel adapted to rest against a door, said body being provided with a first opening for inserting said articles into said body, and a second opening adapted to abut against said door jamb when said door is closed for closing said second opening and preventing removal of said articles from said container, a plate extending from said back panel of said main body, said plate having an aperture adapted to hook said plate on said door knob assembly and to retain said plate against said door and for closing the second opening against the door jamb.

4,901,913

DAMAGE-RESISTANT MAILBOX

Glenn N. Fischer, 7595 E. Singer Rd., Dayton, Ohio 45424

Division of Ser. No. 766,380, Aug. 16, 1985, Pat. No. 4,888,823.
This application Jul. 11, 1989, Ser. No. 378,540
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—17 **4 Claims**

1. A security latch assembly for a mailbox for receiving delivered mail, said mailbox including a box-like housing having first and second opposed side walls and defining an opening at one end of said walls, a substantially planar door for closing said opening, and means for mounting said housing in a fixed location, the latch assembly comprising:

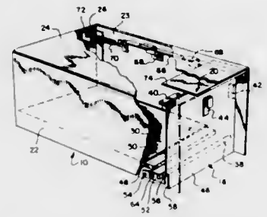
a shaft rotatably mounted between said walls along one side of said opening;

said door being connected to said shaft such that said door pivots with said shaft to open and close said opening, and such that said door extends beyond said shaft opposite said opening to define a tail portion for said door;

said shaft defining a slot extending across said shaft perpendicular to its axis, adjacent to said first wall, said slot being disposed on said shaft downwardly when said door is closed;

said door defining a notch in said tail portion along a side edge thereof adjacent said first wall and generally aligned with said slot; and

a leaf spring having first and second ends, said spring being of a thickness less than the width of either of said slot and said notch;



said leaf spring being connected at said first end to an inner surface of said first wall to extend along and, when in a normal position, generally outwardly from said first wall in a direction generally perpendicular to said shaft, said spring being connected so that said second end is normally disposed beneath but substantially adjacent to said shaft and adjacent to said tail portion;

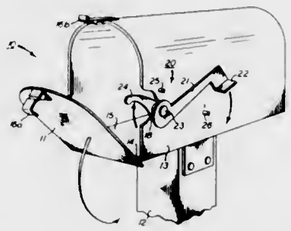
said spring being movable by exertion of force thereon into said slot.

4,901,914

MAIL BOX SIGNAL

Robert J. Burger, 4240 Ontario Center Rd., Walworth, N.Y. 14568

Filed Oct. 27, 1988, Ser. No. 263,061
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—35 **8 Claims**



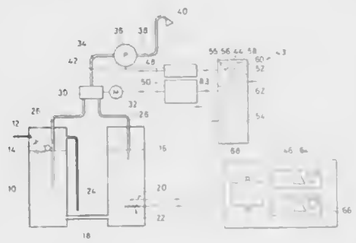
1. In a mail box or similar container which is opened at one end, said box having a door hinged along one edge of said open end for closing said opening, the improvement comprising a self canceling signal positioned on a side wall of said mail box near said open end, said signal having a crankshaft which extends through an opening in said side wall to the exterior of and to the interior of said mail box and to each end of the crankshaft is a crank arm, each arm being perpendicular to said crankshaft and in an offset direction to the other crank arm, said crank arm on the interior of said box extending from said crankshaft through the plane of said door when in the closed position, said arm on the exterior of said box having at it's end opposite said crankshaft a combination weight and position indicator.

4,901,915

CONTROL APPARATUS FOR WATER TEMPERATURE AND WATER FLOW RATE

Shigeru Sakakibara, Aichi, Japan, assignor to Inax Corporation, Tokoname, Japan

Filed Aug. 24, 1988, Ser. No. 235,545
Claims priority, application Japan, Aug. 31, 1987, 62-132659[U]
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—12.12 **6 Claims**



1. A control apparatus for water temperature and water flow rate comprising:

a mixing valve adapted to be supplied with hot water and cold water from a hot water source and a cold water source, respectively, and deliver mixed water;

a flow rate control means disposed to a system for delivering the mixed water from said mixing valve to a place where it is required; and

a controller for operating said mixing valve and said flow rate control means wherein

said controller comprises: discharge of water;

a setter for the water flow rate and the water temperature of the mixed water;

a standard value memory means for storing the standard water temperature and the standard water flow rate of the mixed water;

a selected value memory means for storing the water temperature and the water flow rate selected by said setter;

a timer which is started upon a water stopping operation of said switch; and

a signal selection means that outputs an operation amount signal based on selected values when the water discharge operation is made before the elapse of a predetermined amount of time after the water stopping operation to the mixing valve and to the flow rate control means, and operation amount signals based on the standard values when the water discharging operation is made after the elapse of a predetermined amount of time after the water stopping operation to the mixing valve and the flow rate control means.

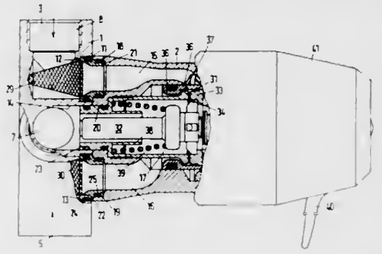
4,901,916

THERMOSTATIC MIXING VALVE

Rolf I. Avelöv, Mjölby, Sweden, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jan. 6, 1989, Ser. No. 295,066
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1988, 3800303; Jun. 7, 1988, 3819420
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—12.16 **11 Claims**

11. A thermostatic mixing valve, comprising a connection housing having a first dividing surface, cold water and warm water inlet and mixing water outlet connections and mixing water inlet, and warm water and cold water outlet apertures opening to the mixing water outlet and warm water and cold water inlet connections respectively for conducting fluid therebetween; the cold and warm water outlet apertures and the mixed water inlet aperture opening through the first surface; an attachment housing having a second dividing surface for abutting against the first surface, cold, warm and mixed water passages, warm water, cold water and mixed water bores opening through the second surface for placing the cold water and warm water outlet and mixed inlet water apertures in fluid communication with the cold, warm and mixed water passages respectively, operable valve means mounted within the housing for controlling the relative quantity of cold water and warm water flow from the cold and warm water pasages to the mixing water passage, and quantity and temperature control means, including a thermostatic element extending within the mixed water passage and mounted on the attachment housing for independently controlling the quantity and temperature of mixed water flowing out of the mixed water passage; securing means for removably attaching the housings together with the first and second surface in removable abut-



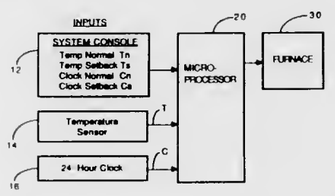
ting relationship and the cold, warm and mixed water bores opening to the cold water outlet, warm water outlet and mixed water inlet apertures respectively, the first and second surfaces being planar, the cold and warm water outlet apertures and mixed water inlet connections being arranged in a row and having parallel central axes that are normal to the first surface, the attachment housing having an annular wall portion defining the respective bore and a plug sleeve for each bore that is in fluid sealing engagement with the wall portion defining the respective bore, each sleeve having a first sleeve section in the respective bore and a second sleeve section in the respective cold and warm water outlet aperture and the mixed water inlet aperture that the bore opens to, the plug sleeve in the mixed water bore being made in a single piece and having at least one of a valve seat that form a part of the control means and a limiting abutment for limiting the movement of the thermostatic element in one direction.

4,901,917

ANTICIPATING DUAL SET-POINT BISTABLE THERMOSTAT

Charles C. Littell, III, 3405 E. 5th St., Dayton, Ohio 45403

Filed Mar. 21, 1989, Ser. No. 328,652
Int. Cl.[4] F23N *5/20*
U.S. Cl. 236—46 R **9 Claims**



1. A method of predicting the time required to change the

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temperature of a zone from a setback temperature to a normal temperature, in a transition from a standby mode to a normal mode, used in a controller for a space conditioning system to modify the temperature of a zone within a structure wherein the system includes a thermal unit which is a bistable or on-off heat source, means for selectively transferring heat between the thermal unit and said zone with a normal mode and a setback mode, wherein the controller includes a system clock and a temperature sensor which measures the temperature in said zone, means providing system operating parameters comprising a normal temperature setting, a setback temperature setting, a clock normal setting and a clock setback setting, wherein during the normal mode the temperature of the zone is to be maintained in a range around the normal temperature at times beginning with the clock normal setting and ending with the clock setback setting, and wherein during the standby mode the temperature of the zone is to be maintained in a range around the setback temperature at times beginning with the clock setback setting and ending with the clock normal setting, with said ranges established by "temperature on" and "temperature off" set-points which control turning the thermal unit on and off, a clock normal offset being used as a time for changing operation to the normal mode in an attempt for the temperature of said zone to reach the normal temperature at the time designated by the clock normal setting;

said method comprising the steps:

measuring "clock dwell begin" and "clock dwell end" times indicated by the clock when the "temperature on" and "temperature off" setpoints respectively occur as determined by comparison to readings from said temperature sensor during the standby mode;

calculating a prediction of the amount of time required to adjust the temperature of the zone to the normal temperature using "clock dwell begin" and "clock dwell end" times as determined by said measuring step during the offset mode and using that prediction to set the clock normal offset time for the system to commence operation in the normal mode;

wherein calculating a prediction during the standby mode comprises, following each occurence of "clock dwell begin" followed by "clock dwell end", calculating clock dwell time by subtracting the "clock dwell end" time from the "clock dwell begin" time and using the resulting value to obtain a clock dwell factor which indicates the time required to heat the zone from the "temperature on" setpoint to the "temperature off" set-point, forming a temperature ratio as the range between the normal and setback temperatures divided by the range between the "temperature on" set-point to the "temperature off" set-point, forming a product of the temperature ratio multiplied by the clock dwell factor, subtracting that product from the clock normal setting, and using the result in the prediction to set the clock normal offset time.

4,901,918

ADAPTIVE ANTICIPATOR MECHANISM FOR LIMITING ROOM TEMPERATURE SWINGS

Eric W. Grald, Maple Plain, and J. Ward MacArthur, Minneapolis, both of Minn., assignors to Gas Research Institute, Chicago, Ill.

Filed Feb. 27, 1989, Ser. No. 315,850

Int. Cl.[4] G05D *15/00*

U.S. Cl. 236—178 D **16 Claims**

1. An adaptive cycle rate thermostat control comprising:

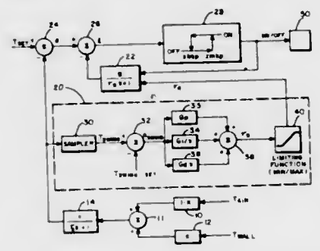
(a) a thermostat including a switch and a means for heat anticipation which operates responsively to an anticipator time constant and a first error signal;

(b) means for sensing room temperature and providing an electronic signal corresponding to the room temperature to the thermostat;

(c) means for sampling the electronic signal from the sensing means, the sampling means being connected to the output of the sensing means;

(d) means for calculating the room temperature swing based on discerning the maximum and minimum temperatures sampled in the sampling means;

(e) means for comparing the calculated room temperature swing to a predetermined value so as to provide a second error signal;



(f) means for modifying the anticipator time constant wherein the modifying means is responsive to the value of the second error signal; and

(g) means for providing an activation signal to the switch responsive to the heat anticipation means.

4,901,919

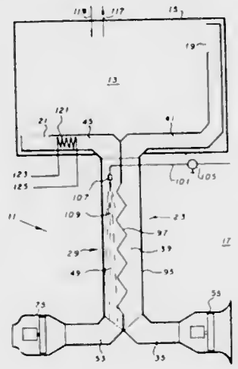
AIR CONDITIONING INDIRECT HEATING AND RECUPERATIVE VENTILATION SYSTEM

Christopher E. Wainwright, 1246 West Kiowa Cir., Mesa, Ariz. 85202

Continuation-in-part of Ser. No. 778,412, Sep. 20, 1985, Pat. No. 4,713,943, which is a continuation-in-part of Ser. No. 550,771, Nov. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 305,397, Sep. 25, 1981, abandoned. This application Dec. 18, 1987, Ser. No. 134,962

Int. Cl.[4] F24F *7/00*; **F28D** *5/00*

U.S. Cl. 237—81 **7 Claims**



1. A method of heating an enclosed space comprising the steps of:

supplying ambient air from the external environment;

heating said ambient air by means of an air to air heat exchanger to become heated supply air;

supplying said heated supply air from said air to air heat exchanger to said enclosed space;

moving said heated supply air through said enclosed space;

heating said enclosed space with said heated supply air;

reducing the temperature of said heated supply air in said enclosed space to become cold return air;

withdrawing said cold return air from said enclosed space;

heating said cold return air by means of an air heating means to become heated return air;

reducing the temperature of said heated return air in said air to air heat exchanger to become exhaust air;

discharging said exhaust air to said external environment;

wherein, said ambient air is heated and said heated return air is cooled by means of an exchange of heat energy with each other in said air to air heat exchanger.

4,901,920

SNOW MAKING APPARATUS AND METHODS

Goesta Wollin, Clyde, N.C., assignor to Snow Machines Incorporated, Midland, Mich.

Filed Feb. 13, 1989, Ser. No. 309,703

Int. Cl.[4] A01G *15/00*

U.S. Cl. 239—2.2 **30 Claims**



29. A method of making snow comprising applying to each of the blades of a rotary fan an amount of water sufficient to enable the water to flow across the surface of such blade toward its trailing edge and toward its tip, the blades of said fan being composed of a plurality of sets of blades each set of which includes at least three blades and each trailing one of which is longer than the immediately preceding blade; and rotating said fan at a speed sufficient to cause water from each of said blades to be cascaded over the tip thereof and impinge on the next following blade of equal or greater length.

4,901,921

PARTICLE INJECTION DEVICE FOR THERMAL SPRAYING

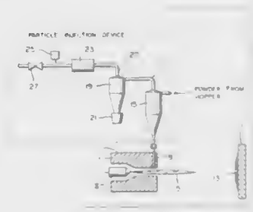
Serge Dallaire, Longueuil; Denis Spino, and Blaise Champagne, both of Boucherville, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation of Ser. No. 41,448, Apr. 23, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 314,231

Claims priority, application Canada, Apr. 25, 1986, 507649

Int. Cl.[4] B05B *1/24*

U.S. Cl. 239—11 **5 Claims**



1. In a method wherein particles and a carrier gas are injected under pressure into a plasma flame, said particles being substantially completely melted and are thereafter propelled onto a substrate to produce a coating thereon, the improvement which comprises circulating said particles including associated fine dust and carrier gas through a cyclone and adjusting gas pressure therein so as to slow down the speed of said particles as they penetrate into said flame, substantially homogenize momentum of each particle as the particles meet the plasma flame, substantially separate said fine dust from said particles and introduce said particles into said plasma flame along a path induced by said cyclone at an outlet thereof, thereby achieving substantial interaction essentially between said particles, in the center of the plasma flame, without substantial deflection of said particles on the one hand, and with the substrate on the other hand.

4,901,922

METHOD AND APPARATUS FOR CREATING A SPECTACULAR DISPLAY

Herman P. M. Kessener, Van Slichtenhorststraat 13, 6524 JH Nijmegen, and Georgius J. C. L. Bruls, Van Somerenstraat 26, 6521 BS Nijmegen, both of Netherlands

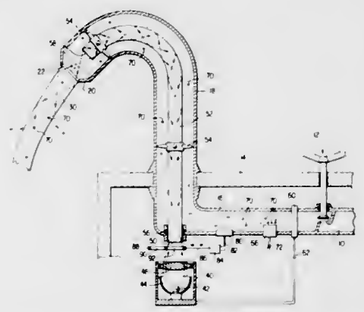
Continuation-in-part of Ser. No. 822,417, Dec. 30, 1985, Pat. No. 4,749,126. This application May 26, 1988, Ser. No. 200,518

Claims priority, application Netherlands, May 9, 1984, 8401479; Australia, Mar. 18, 1985, PG9786

The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.

Int. Cl.[4] B05B *17/04, 17/08*

U.S. Cl. 239—12 **36 Claims**



1. The method of creating a spectacular display comprising the steps of forming an elongated stream comprising a body of liquid medium having a first index of refraction into a medium which is ambient atmosphere having a second index of refraction lower than the first index of refraction to provide a substantially smooth continuous outer boundary surface enclosing the stream and contacting the ambient atmosphere, introducing light of a certain intensity directly into the body of liquid forming the stream closely adjacent the formation of the stream at its emergence into ambient atmosphere and in the direction of liquid flow in the stream in such a manner that light striking the outer boundary surface at an angle of incidence greater than or equal to the critical angle for the media is initially guided downstream within the liquid at substantially the same intensity by the phenomenon of total internal reflection of light in the stream, and creating a spectacular display by controlling the exit of light from the stream.

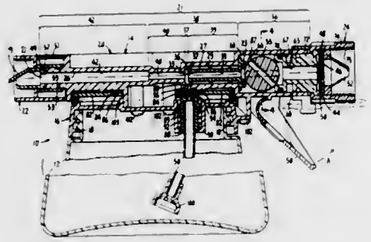
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4,901,923

VARIABLE DILUTION RATIO HOSE-END ASPIRATOR SPRAYER

Peter K. McRoskey, Del Mar, and Paul M. Havlovitz, Escondido, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 11, 1988, Ser. No. 255,814
Int. Cl.[4] B05B 7/04, 7/30
U.S. Cl. 239—123 23 Claims



1. A multiple dilution ratio aspirator sprayer adapted to be connected to a hose for directly mixing and diluting a liquid with pressurized water from the hose to provide a spray of the mixture, comprising:

a container for housing the liquid to be mixed with the water;

a mixing head removably attachable to said container including a cylindrical bore having a single axis extending longitudinally therethrough, said bore terminating in a spray nozzle at one end and means for attachment to a water supply hose at the other end thereof;

a mixing chamber formed within said mixing head;

said single axis cylindrical bore including an upstream motive tube and a downstream motive tube formed upstream and downstream, respectively, with respect to the mixing chamber, said mixing chamber having a larger diameter than said motive tubes, and said mixing chamber being intermediate the ends of said motive tubes;

said upstream motive tube being defined by a sleeve insertable within said mixing head, the length and internal diameter of said sleeve defining the size of the mixing chamber and the diameter of the upstream motive tube, respectively;

tubing means for communicating liquid from said container to inlet means into said mixing chamber in an undiluted form;

a rotatable control disk having a plurality of apertures therein mounted in said mixing head for rotation in a plane parallel to said cylindrical bore;

said disk being interposed between said tubing means and said mixing chamber inlet such that a selected one of said plurality of apertures of differing areas in alignable with said tubing means for controlling the flow of liquid from said container into said mixing chamber;

means for flowing water through said motive tubes to create a vacuum in said mixing chamber and through said control disk aperture to draw undiluted liquid from said container through said tubing means and into said mixing chamber for dilution with pressurized water at a dilution ratio determined by the area of the aperture that is aligned with the tubing means and the volume of said mixing chamber; and

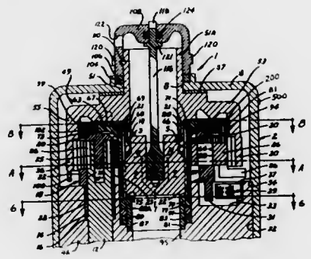
ball valve means for shutting off the flow of pressurized water through said motive tubes and said mixing chamber, the upstream end of said sleeve forming a valve seat for a ball element of the ball valve means.

4,901,924

SPRINKLER DEVICE WITH ANGULAR CONTROL

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Filed Apr. 19, 1988, Ser. No. 183,071
Int. Cl.[4] B05B 3/16
U.S. Cl. 239—242 69 Claims



1. A rotary drive sprinkler comprising a sprinkler housing for receiving a supply of water, a nozzle assembly means for directing water therefrom, said nozzle assembly means having a nozzle, said sprinkler housing having an output shaft means, said output shaft means connected to said nozzle assembly means, a rotary gear drive assembly in said housing, said rotary gear drive assembly having an output gear means for driving said output shaft means, said rotary gear drive assembly having a reversing mechanism including means for reversing the direction of rotation of said output gear means to obtain oscillation of said output shaft means, said output shaft means having two angular limit contact means carried thereby and rotatable therewith for setting a desired angle of oscillation of said nozzle assembly means, said reversing mechanism having actuation means for engagement by said two angular limit contact means carried by said output shaft means for changing the direction of rotation of said output shaft means, said output shaft means including means mounting said two angular limit contact means for relative rotational movement to change the desired angle of oscillation of said output shaft means and nozzle assembly means, setting means on said nozzle assembly means for rotating one of said angular limit contact means to obtain a desired angle of oscillation, wherein said setting means is for rotating one of said angular limit contact means in either direction to increase or decrease the angle of oscillation at any rotational position of said nozzle assembly means to obtain a desired angle of oscillation without first repositioning said nozzle assembly means.

4,901,925

FOAM GENERATING DEVICE

Joseph W. Blake, III, 88 Main St., New Canaan, Conn. 06840

Filed Jun. 2, 1987, Ser. No. 57,037
Int. Cl.[4] B05B 7/32
U.S. Cl. 239—343 14 Claims

1. A foam generating article, for use in foam dispensing articles, for production of foams from foamable liquids and pressurized gases, supplied thereto from external sources, said article comprising:

(a) a housing comprising:

(1) a first hollow chamber surrounded by;

(i) a large opening at one end comprising a first discharge port for said foam;

(ii) at the opposite end an upper wall comprising gas inlet means, in fluid connection with the external pressurized gas source; and

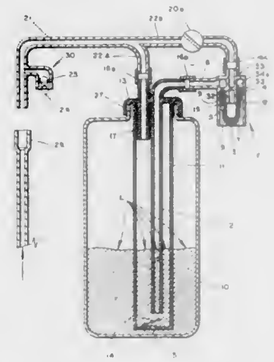
(iii) a first annular side wall descending from the edge of said upper wall comprising liquid inlet means in fluid connection with the external foamable liquid source;

(b) a partially porous element comprising a second hollow chamber within said first hollow chamber and spaced from the side walls thereof and in fluid connection with said gas inlet means to receive gas passed thereto from its source through said gas inlet means, said second hollow chamber being defined by;

(1) a large top opening through which the gas passed through the gas inlet means enters the second hollow chamber;

(2) a closed non-gas permeable end opposite said opening; and

(3) a partially porous second side wall separating said opening and closed end, the top of said side wall being



in sealable contact with the upper wall of the housing and spaced between said gas inlet means and the side wall of the housing;

wherein the portion of said side wall adjacent said non-gas permeable end is also non-gas permeable; and

(c) a mixing chamber comprising a third hollow chamber comprising the space defined by the housing upper wall, the portions of the first side wall and the wall of the porous element, between the liquid inlet means and the bottom opening of the housing, and the bottom opening of the housing, wherein the foamable liquid, entering the first hollow chamber through the liquid inlet means, and gas, diffusing from the hollow chamber of the porous element into the mixing chamber, mix to form the foam which is discharged through said discharge port.

4,901,926

WHIRLPOOL TUB WITH AUTOMATIC PRE-FLUSHING OF THE SYSTEM

Manfred Klotzbach, Düren, Fed. Rep. of Germany, assignor to Hoesch Metall & Kunststoffwerk GmbH & Co., Kreuzau-Schneidhausen, Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 284,546
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742432
Int. Cl.[4] B05B 7/12
U.S. Cl. 239—411 9 Claims

1. An automatically closing nozzle for introducing a water-and-air mixture into a tub having a tub wall, comprising:

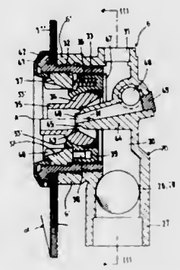
(a) a valve body including a prechamber;

(b) a support ring connected to said valve body for retaining said valve body against the tub wall;

(c) a retaining ring which is releasably connected to said support ring and which is axially displaceable relative to said support ring;

spring means for resiliently urging said retaining ring toward said prechamber;

(e) a nozzle body having a generally tubular mouth and a ball-shaped portion which is spherically curved about a center of curvature, said nozzle body having a bore therein communicating with said prechamber and an annular sealing element bounding an inner perimeter portion of said bore; said nozzle body being pivotably retained in said valve body by said retaining ring; and



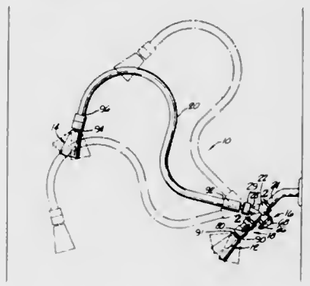
(f) an air supply line having a mouth which protrudes into said bore in said nozzle body, said air supply line being disposed externally of the tub; said mouth having an outer surface portion having a generally spherical surface against which said annular sealing element of said nozzle body is urged by said spring means; whereby seating of said annular sealing element of said nozzle body against said generally spherical surface of said mouth substantially closes fluid communication between said prechamber and said generally tubular mouth of said nozzle body.

4,901,927

DUAL SHOWER HEAD ASSEMBLY

Jesse Valdivia, 6627 Crossway Dr., Pico Rivera, Calif. 90660

Filed Feb. 13, 1989, Ser. No. 309,832
Int. Cl.[4] B05B 1/16
U.S. Cl. 239—446 7 Claims



1. A dual shower head assembly comprising a substantially "S"-shaped conduit defining an upper end and a lower end, a first shower head communicating with and pivotally mounted on the upper end of said conduit, a diverter valve assembly having a water inlet, a first water outlet, a second water outlet and selector means for selectively communicating said water inlet with either said first water outlet or with said first and second water outlets, said water inlet being adapted for fluid communication with a shower outlet fitting and said lower end of said conduit communicating with and being pivotally mounted on said second water outlet, a second shower head communicating with and being pivotally mounted with respect

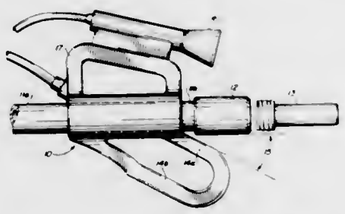
to said first water outlet, and an adjustable shut-off valve for selectively interrupting water flow from said second shower head, whereby through coordinating said selector means and said shut-off valve, water can be directed through said diverter valve to said first shower head, said second shower head, said first and second shower heads concurrently or to neither of said shower heads and upon pivoting said conduit with respect to said diverter valve, the height and angular orientation of said first shower head can be adjusted with respect to said second shower head for concurrent independent showering by two persons.

4,901,928

PRESSURE HOSE HANDLE AND SYSTEM

Kenneth E. Abbott; Patrick J. Lyons, and Richard M. Satariano, all of Tucson, Ariz., assignors to Stripping Technologies Inc., Tucson, Ariz.

Filed Oct. 4, 1988, Ser. No. 253,237
Int. Cl.[4] B24C *5/02*
U.S. Cl. 239—530 **3 Claims**



1. Handle system for a pressure hose comprising:
(a) a stop mechanism attached substantially at a first end of the pressure hose;
(b) an operator's handle totally enclosing said stop mechanism, said handle encircling said hose such that said hose rotates within said handle, and wherein said stop mechanism presses against said handle during pressurization of said hose; and,
(c) a dead-man switch located on said operator's handle and wherein pressure within said pressure hose is reduced during deactivation of said dead-man switch.

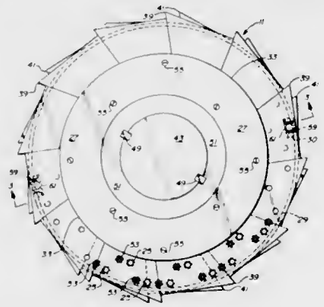
4,901,929

ROTARY SHEARING WHEEL WITH INDIVIDUALLY REPLACEABLE CUTTING SEGMENTS

Randel L. Barclay, 5616 Carpenter Rd., Stockton, Calif. 95205

Filed May 8, 1989, Ser. No. 349,587
Int. Cl.[4] B02C *4/08*
U.S. Cl. 241—236 **21 Claims**

1. A rotary shearing wheel comprising,
an annular member having a central axis of rotation and opposed first and second side faces separated by an outer rim, the first side face having a mounting region located near said outer rim, and
a first plurality of at least five tool members removably mounted to the mounting region of the first side face in successive abutting relation, each tool member having opposed inner and outer major surfaces separated by opposing leading and trailing edges, the leading and trailing edges separating a radially outward facing upper surface and a radially inward facing lower surface, the inner major surface contacting the first side face, the leading and trailing edges of successive tool members mounted with the leading edge of one tool member abutting the trailing edge of an adjacent tool member in an offset manner, each tool member having a tooth portion extending beyond said outer rim, with each abutment of successive tool members forming a single radially extending tooth, the number of teeth about the annular member



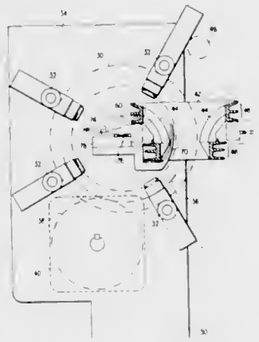
equalling the number of tool members mounted to the mounting region.

4,901,930

WINDING APPARATUS FOR DEFLECTION YOKE

Kuniaki Takahashi; Kazuyoshi Kajiwara, and Masatoshi Itoh, all of Kisakata, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,253
Int. Cl.[4] H01F *41/08*
U.S. Cl. 242—4 BE **14 Claims**



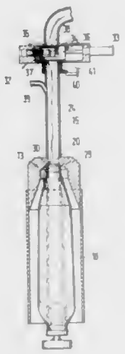
1. A winding apparatus for a deflection yoke having a cylindrical spool, said winding apparatus comprising:
(a) a rotor arranged in a manner to surround a portion of the cylindrical spool of said deflection yoke, said cylindrical spool having an inner surface formed with longitudinal slots; and
(b) means for rotating said rotor so as to cause a wire to be introduced into said longitudinal slots of said cylindrical spool,
wherein:
(c) said rotor is formed into an annular shape;
(d) said rotor is provided with a plurality of rollers for guiding the wire to said longitudinal slots of said cylindrical spool.

4,901,931

THREAD SEEKING ARRANGEMENT

Kresimir Misia, Heusenstamm, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,056
Int. Cl.[4] B65H *54/00, 69/04*
U.S. Cl. 242--18 R **12 Claims**



1. A thread seeking apparatus for handling thread wound on a core of a cop, comprising:
a forwarding means for moving said cop in a vertical orientation;
a cop holding arrangement rotatably mounted on said forwarding means about a vertical axis;
an axially symmetrical housing chamber for containing said cop, said housing chamber being sized to have an annular space remaining between the outside of the cop and the inside of the housing chamber, said housing chamber including a pair of half-shells for encompassing said cop along its length and operable to laterally reciprocate between an open position and a closed seeking position;
a streaming channel for receiving the thread taken from the circumference of the cop, said streaming channel being positioned to communicate with the upper end of said housing chamber;
an inlet jet mounted at one end of said housing chamber for communicating with said annular space in said housing chamber and causing an airflow therein; and
a headpiece connected with said streaming channel and bordering said housing chamber, said headpiece having a bell-shaped mouth for embracing the upper end of said cop, said headpiece being reciprocatable between an engaged and disengaged position while said half-shells are in said closed seeking position.

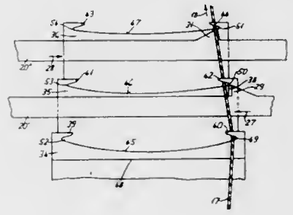
4,901,932

TRAVERSE WINDING APPARATUS FOR A MACHINE PRODUCING CROSS-WOUND BOBBINS

Heinz Kamp, Wegberg, and Rolf Becker, Mönchengladbach, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 240,945
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729472
Int. Cl.[4] B65H *54/28, 57/28*
U.S. Cl. 242—43 A **9 Claims**

1. In a machine producing cross-wound bobbins or cheeses including a drum winding a yarn travelling in a given yarn travel direction on a cheese over a given traverse winding width with reverse points along a yarn running line, a traverse winding apparatus comprising:
a traction mechanism transmission having an endless traction mechanism, rollers over which said traction mechanism is guided defining a first traction mechanism segment movable in a given traverse winding direction and a second traction mechanism segment movable in a direction opposite to said given direction at the same speed;
said traction mechanism including yarn entrainers having upper ends and being spaced apart by at least substantially twice the given traverse winding width;
first, second and at least one further yarn guide means disposed laterally of said traction mechanism for supporting the yarn during traverse winding and for transferring the yarn at the reversal points from said yarn entrainer of one of said traction mechanism segments to said yarn entrainer of the other of said traction mechanism segments;
each of said yarn guide means having a concavely curved yarn guide contour contacted by the travelling yarn, at least one of said contours lifting the travelling yarn over said upper end of one of said yarn entrainers at the reversal points permitting the yarn sliding along said at least



one contour to be entrained by said entrainer moving in the opposite direction;
said first yarn guide means being disposed upstream of said first traction mechanism segment as seen in the given yarn travel direction, said second yarn guide means being disposed between said first and said second traction mechanism segments, and said at least one further yarn guide means being disposed downstream of said second traction mechanism segment;
said contour of said first yarn guide means having a greater curvature than said contour of said second yarn guide means, and said contour of said second yarn guide means having a greater curvature than said contour of said at least one further yarn means, the travelling yarn sliding along and looping part way around said contour of said first yarn guide means; and
said contours being shaped and aligned relative to one another and to the yarn running line causing the yarn to travel from said contour of said first yarn guide means toward the yarn running line with loop-free contact with said contour of at least said second yarn guide means over a portion of the traverse winding width.

4,901,933

ENDLESS LOOP TRANSPORT AND STORAGE SYSTEM

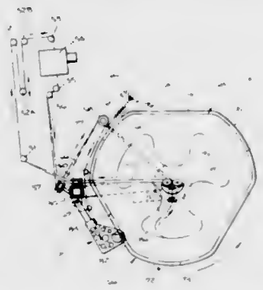
Clark F. Crites, 14371 Mulholland Dr., Los Angeles, Calif. 90077

Continuation of Ser. No. 777,150, Sep. 18, 1985, abandoned. This application Nov. 23, 1987, Ser. No. 123,742
Int. Cl.[4] B65H *20/26*
U.S. Cl. 242—55.19 R **22 Claims**

1. A method for continuously storing a strip of material on edge in a coil on a flat platter rotating at a selected speed about an axis, comprising the step of:
during each cycle of revolution of the platter, continuously applying an incoming strip of material at the peripheral

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margin of the platter at a varying rate per degree of rotation and along a selected path having alternating sections



of greater distance from the axis and lesser distance from the axis, the sections being substantially equal sectors of the platter.

4,901,934

DEVICE FOR WINDING A CONTINUOUS LENGTH OF MATERIAL

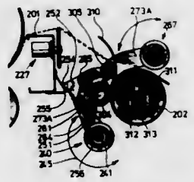
Heinrich Schnell, Schwanheimerstrasse 78a, 6930 Eberbach, Fed. Rep. of Germany

Continuation of Ser. No. 855,817, Aug. 10, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 182,773

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429463; Aug. 10, 1984, 3429462

Int. Cl.⁴ B65H *18/16*

U.S. Cl. 242—56 R **3 Claims**



1. In an apparatus for winding successive sections of a web of flexible material around successive cores of a series of cores, the combination of means for advancing the web in a predetermined direction along a predetermined path; a source of cores at one side of said path; a rotary winding member at the other side of said path; means for repeatedly cutting the web downstream of said winding member so that the web is subdivided into a succession of sections each having a leader, said cutting means being movable to and from an operative position; means for transferring cores from said source into engagement with successive sections whereby the sections set the cores in rotary motion, including means for urging the sections against the winding member by way of the respective cores so that the leader of each section extends in said direction beyond the respective core; means for draping each of the leaders around the respective core including at least one first draping member, means for displacing the first draping member into engagement with the first portion of the leader downstream of the winding member so that a second portion of the leader projects beyond the first draping member, at least one second draping member movable relative to the first draping member toward an operative position to thus move the second portion of the leader of a freshly formed section against the core downstream of the first draping member, as seen in the direction of rotation of the core; and means for bodily moving of the second draping member and the cutting means to its operative position in response to movement of the other of said operative position.

4,901,935

APPARATUS FOR UNWINDING PRINTED PRODUCTS WOUND IN CONJUNCTION WITH A WINDING BAND IN IMBRICATED FORMATION UPON A WINDING CORE

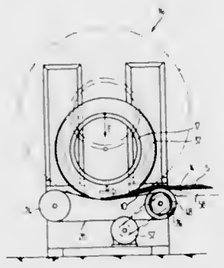
Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed May 20, 1988, Ser. No. 196,487

Claims priority, application Switzerland, May 27, 1987, 02 044/87

Int. Cl.⁴ B65H *18/16, 16/10*

U.S. Cl. 242—68.7 **17 Claims**



1. An unwinding apparatus for unwinding printed products wound in conjunction with a winding band in imbricated formation upon a winding core, comprising:

support means for supporting the product package wound upon the winding core;

a rotatably mounted and drivable band spool for winding-up the winding band unwound from the product package;

a continuous conveyor for the outfeed of the unwound imbricated formation of printed products;

said support means comprising at least one endless, revolvingly drivable support band;

at least two rotatably mounted rolls;

said at least one endless revolvingly drivable support band being guided about said at least two rotatably mounted rolls;

the product package to be unwound being rotatably supportable upon said at least one endless revolvingly drivable support band;

said at least one endless revolvingly drivable support band having a supporting active-run; and

said supporting active-run of said at least one endless revolvingly drivable support band possessing a throughhang upon placement of the product package or the winding core upon said supporting active-run.

4,901,936

CORE FOR FILM SPOOL

Edward Buelens, Kontich; Roger F. De Smedt, Tielrode, and Wilfried E. Muylle, Schoten, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Nov. 29, 1988, Ser. No. 277,646

Claims priority, application European Pat. Off., Dec. 10, 1987, 87202471.6

Int. Cl.⁴ G03B *21/32*

U.S. Cl. 242—74.1 **13 Claims**

1. A cylindrical core for receiving windings of a photographic film web equipped with a peripheral opening for receiving an end of the film web and means for resisting circumferential slippage of a wound film web over the core, wherein said core (1) comprises a hub (3) having an axially extending

re-entrant channel (11), an elongated insert (4) fitting into said channel (11) and engaged therein to define with the channel (11) a slot (20) for receiving an end of a film web (2), cooperating detent means (19), (25) for resisting relative axial movement between the hub (3) and the insert (4) when the latter is



fitted into said channel (11), the insert (4) incorporating means (24) projecting into said slot for engaging at least one marginal perforation of said film web end to prevent circumferential slippage of the film web (2) and being disposed so as to disengage from such film web perforations when the film web extends radially of the hub periphery on unwinding.

4,901,937

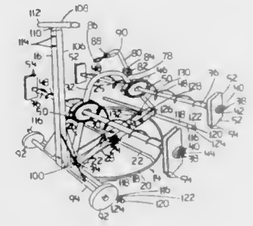
CABLE REEL BEARER AND DOLLY

Lamec E. Mendoza, 2654 N. Frederic St., Burbank, Calif. 91504

Filed Jun. 20, 1988, Ser. No. 208,753

Int. Cl.⁴ B65H *17/40, 17/46*

U.S. Cl. 242—86.5 R **11 Claims**



1. A cable reel bearer assembly comprising:

A base,

A frame rotatably mounted of said base and having an axis of rotation extending vertically upward from said base, said frame comprising a horizontal channel member pivotally mounted on said base, and an arcuate member secured to said channel member and extending vertically upward from said channel member,

At least one crossarm mounted on said frame and extending perpendicularly outward from said frame,

End pieces releaseably secured to the end of said crossarm and removable to permit cable reels to be mounted on said crossarm,

Resilient brake means mounted on said frame and serving to urge cable reels mounted on said crossarm toward said end pieces.

4,901,938

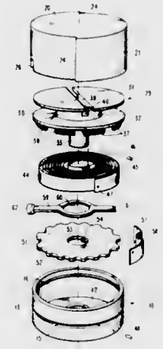
ELECTRICAL CORD RETRACTOR

Donald G. Cantley, 45 Munson La., West Sayville, N.Y. 11796, and Camie Alexander, 11 Norwood Ave., Glen Rock, N.J. 07452

Filed Nov. 21, 1988, Ser. No. 274,465

Int. Cl.⁴ B65H *75/48*

U.S. Cl. 242—107.1 **9 Claims**



1. An electrical cord retractor for use with an electrical cord already possessed by the user of the retractor, the retractor comprising:

a closed hollow case separate from any apparatus with which an electrical cord may be used, the closed case containing no electrical cord,

winder means within the case rotatable with respect to the case,

a spring within the case for constantly urging rotation of the winder means in one direction with respect to the case,

latch means within the case for preventing rotation of the winder means when the spring is tensioned, the latch means including a toothed wheel rotatable with the winder means, and a detent of springy material adapted to engage the teeth of the wheel to prevent rotation thereof,

manually-operable means for releasing the latch, said means including a single actuator element slidable with respect to the case, one end of the actuator being adjacent to the detent and the other end being exposed on the exterior of the case, the actuator being slidable in a direction transverse to the axis of rotation of the winder for engaging the detent and causing disengagement between the detent and the toothed wheel,

the case including a base and a cover,

means for releasably securing the cover to he base so that the case can be opened at will to permit an electrical cord to be wound upon the winder means, after which the case can be reclosed, and

passageway means in the closed case through which an electrical cord can pass rom the winder means within the case to the exterior of the case for connection to an apparatus independent of the case,

the passageway means being so formed that an electrical cord extending from the winder means can be inserted into the passageway means as the case is closed.

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4,901,939

REEL

Donald L. Obst, Hickory, and R. E. Shrum, Newton, both of N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Aug. 7, 1986, Ser. No. 893,917
Int. Cl.[4] B65H *75/14*
U.S. Cl. 242—118.4 **5 Claims**



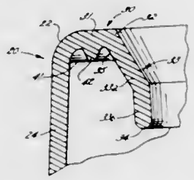
1. A reel comprising:
(a) first and second spaced apart flanges, each having a free edge;
(b) a first tubular member disposed between and attached to the first and second flanges at a point spaced apart from the free edge of each flange so that the first tubular member and a portion of the flanges partially delimit a first space;
(c) a second tubular member coaxially disposed inside of and spaced apart from the first tubular member and affixed to the flanges, the first and second tubular members delimiting a second space therebetween; and,
(d) a first aperture in the first flange, said first aperture directly communicating with and juxtaposed to said first and second spaces.

4,901,940

PLASTIC YARN CONE HAVING REINFORCED NOSE FOR DAMAGE PROTECTION

Samuel F. Adams, and Hans-Peter Bolz, both of Greenville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Jun. 20, 1989, Ser. No. 369,004
Int. Cl.[4] B65H *75/10, 75/18*
U.S. Cl. 242—118.31 **14 Claims**



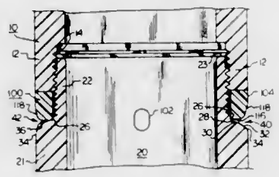
1. A lightweight yarn carrier adapted to be mounted on a winding machine and have yarn wound thereon to form a yarn package, said yarn carrier comprising:
a generally hollow tube having opposite ends and a relatively thin peripheral wall defining an outer surface for receiving yarn to be wound thereon;
a relatively thin annular end wall extending radially inwardly from one of said ends of said peripheral wall and terminating at an inner periphery;
an annular flange extending from said inner periphery of said end wall and extending toward the opposite end of said tube, said peripheral wall, said end wall, and said annular flange collectively defining an end portion of said carrier and an inside annular channel within said carrier formed therebetween;
a plurality of circumferentially spaced apart ribs extending across said inside annular channel to reinforce said end portion of said carrier; and
at least one circumferential rim extending from said end wall and circumferentially around said inside annular channel and intersecting with each of said ribs to provide additional reinforcing strength for said end portion of said carrier such that said carrier is relatively lightweight with a reinforced end portion to withstand a substantial impact and avoid cracking and chipping.

4,901,941

REUSABLE WINDING TUBE

Stephen S. Powel, 4305 Tallwood Dr., Greensboro, N.C. 27410, and Robert J. Darby, 2517-A Patriot Way, Greensboro, N.C. 27408, assignors to Stephen S. Powel and Robert J. Darby, both of Greensboro, N.C.

Filed Mar. 6, 1989, Ser. No. 321,162
Int. Cl.[4] B65H *75/28*
U.S. Cl. 242—125.1 **9 Claims**



1. A reusable yarn carrier comprising:
(a) a hollow tube having an outer, substantially cylindrical surface adapted to carry a fibrous or filamentary yarn thereon;
(b) an end cap having an outer cylindrical surface substantially coextensive with the outer surface of said hollow tube, thread means for releasably mounting said end cap on at least one end of said hollow tube;
(c) an intermediate ring slidably retained on said end cap between said end cap and said one end of said tube, and locking means for preventing rotation of said ring with respect to said cap;
(d) confronting walls of said end cap and said ring defining a peripheral starting groove therebetween encircling said yarn carrier;
(e) a cavity formed by the combination of a recess in the surface of said cap and a recess in the surface of said ring, said cavity extending through the starting groove formed between said cap and said ring;
(f) whereby the cavity facilitates severing of the transfer tail and waste bunch, and said confronting walls of said intermediate ring and said end cap, when assembled form said starting groove, yet are separable to loosen remaining trapped fibers and facilitate cleaning for reuse.

4,901,942

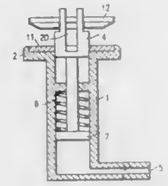
WARPING MILL AND DISK THREAD BRAKE

Jurgen Beitz, Neumunster; Karl-Heinz Erren, Aukrug-Homfeld, and Gunter Mobius, Westerronfeld, all of Fed. Rep. of Germany, assignors to Norddentsche Faserwerke GmbH, Neumunster, Fed. Rep. of Germany

Filed Sep. 3, 1987, Ser. No. 95,435
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1986, 3629928
Int. Cl.[4] B65H *59/27;* **F16D** *65/24*
U.S. Cl. 242—150 R **5 Claims**

1. In a warp mill for warping a plural number of threads, a clamping brake for each of the threads, comprising:
(a) a first brake disk:
(b) a second brake disk mounted on a spindle;

(c) a thread guide slot positioned in said spindle between said first and second brake discs, whereby a thread will be braked when said first and second brake discs are in proximity to one another, and
(d) means for selectively moving said second brake disk relative to said first brake disk between a first position



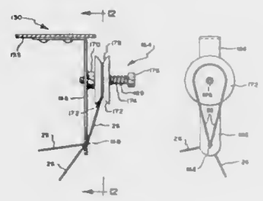
where said first and second brake discs are in proximity to one another and a second position where said first and second brake discs are not in proximity to one another, wherein said means for moving include means in fluid communication with all of said clamping brakes for applying a force of a pressurized gas to said second brake disc.

4,901,943

APPARATUS FOR DISPENSING THREAD FROM A SPOOL

Domenico Candino, 2100 Finnegan Dr., Elma, N.Y. 14059

Division of Ser. No. 28,181, Mar. 19, 1987, Pat. No. 4,771,798. This application Aug. 3, 1988, Ser. No. 227,553
Int. Cl.[4] B65H *59/22*
U.S. Cl. 242--150 R **4 Claims**



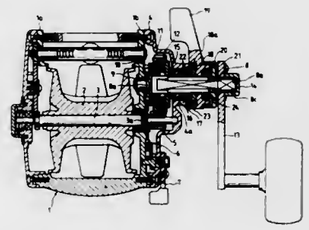
1. An apparatus for dispensing at least one thread to the head of a recipient of a hair replacement unit for interweaving the thread with the recipient's natural hair comprising:
housing means including means defining a front, a back, a top, a bottom and side walls between which is defined a cavity for supporting a spool of thread, said front wall defining an opening;
at least one thread-tensioning means including means mounted within said cavity and against the top wall of said housing means defining a thread-accepting aperture, a pair of washers mounted adjacent said thread-accepting aperture each having a convex surface and arranged so that the convex surfaces face and engage one another so as to define an annular groove therebetween, and means for biasing the washers in engagement with one another;
a spool containing thread; and
said thread extending from said spool and being routed through said thread-tensioning means so that the thread extends though said thread-accepting aperture in one direction, around only the washers and so as to extend continuously along a major portion of the circumferential length of the annular groove defined therebetween, and back through said thread-accepting aperture in the other direction at an acute angle with respect to the first direction and out of said front wall opening to provide tension on the thread dispensed to the recipient's head.

4,901,944

FISHING REEL HAVING A SPOOL SHAFT SUPPORTED AT BOTH ENDS THEREOF

Atsuhito Aoki, Hiroshima, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

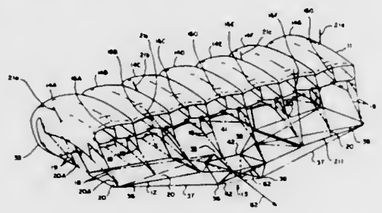
Filed Nov. 23, 1988, Ser. No. 274,563
Claims priority, application Japan, Nov. 24, 1987, 62-179516[U]; Nov. 26, 1987, 62-1800870[U]
Int. Cl.[4] A01K *89/02, 89/015*
U.S. Cl. 242—260 **12 Claims**



1. A fishing reel having a spool shaft supported at both ends thereof comprising:
a body having a side wall;
a spool shaft mounted on said body for rotation about a first axis;
a spool fixedly mounted on said spool shaft for rotation therewith;
a master gear shaft having first and second ends wherein said first end is attached to said side wall, said master gear being rotatable about a second axis;
a master gear rotatably mounted on said master gear shaft and disposed adjacent to said side wall;
a handle secured to said second end of said master gear shaft so as to be unrotatable relative to said master gear shaft to rotate said master gear about said second axis;
a pinion engageably and disengageably mounted on said spool shaft and meshingly engaging said master gear;
clutch means for coupling said pinion to said spool shaft so as to rotate said pinion together with said master gear;
a plurality of drag washers including friction plates being mounted on said master gear shaft;
a drag spring washer mounted adjacent to a central portion of said master gear shaft;
a first ball bearing mounted on said master gear shaft for movement therealong;
axially urging means for urging said drag washers toward said master gear by pushing said first ball bearing and said drag spring washer;
a drag adjustment lever rotatably mounted on said master gear shaft for operating said axially urging means to urge said drag washers toward said master gear, said drag adjustment lever being movable along said master gear shaft;
a second ball bearing mounted on said master gear shaft for operating therealong; and
a drag preset member mounted on said second end of said master gear shaft, said second ball bearing being interposed between said drag preset member and said drag adjustment lever, said drag preset member being operated along said master gear shaft to urge said drag washers toward said master gear by pushing said second ball bearing, said drag adjustment lever, said axially urging means, said first ball bearing, and said drag spring washer.

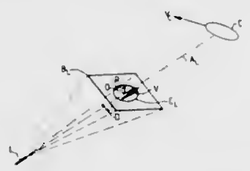
VOL 1111 ISS 3 FE 20 1990 UMI

4,901,945
HYBRID WING ASSEMBLY
Frank L. Hodgson, 223 Hedge Rd., Menlo Park, Calif. 94025
Filed Feb. 16, 1988, Ser. No. 155,868
Int. Cl.[4] B64C *39/08*
U.S. Cl. 244—2 **9 Claims**



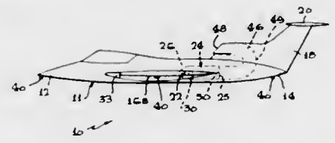
1. A hybrid wing assembly comprising a load supporting center frame assembly, an elongated fabric covered wing frame which extends laterally outwardly in opposite directions from the load supporting center frame assembly, said wing frame comprising a plurality of lateral sections extending outwardly and articulated with respect to one another to form a flexible wing, a parafoil, said wing frame extending substantially the width of said parafoil, flexible lines for attaching the parafoil to the wing frame whereby when the hybrid wing assembly is in flight the parafoil is spaced above and supports the wing frame and load supporting center frame assembly, and a plurality of rods which extend upwardly from the edges of the wing frame and engage the parafoil to support the parafoil in operating position above the wing when the hybrid wing assembly is at rest.

4,901,946
SYSTEM FOR CARRIER GUIDANCE BY LASER BEAM AND PYROTECHNIC THRUSTERS
Philippe Arnaud, Orleans La Source, and Marc Bernard, Marcilly en Villette, both of France, assignors to Thomson-Brandt Armements, Boulogne Billancourt, France
Filed Feb. 6, 1989, Ser. No. 307,341
Claims priority, application France, Feb. 12, 1988, 88 01684
Int. Cl.[4] F41G *7/24*
U.S. Cl. 244—3.13 **14 Claims**



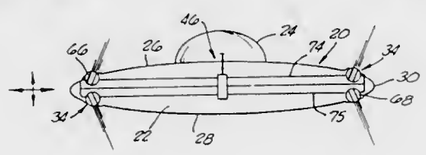
1. A system for guidance of a carrier for hitting a target, comprising a firing station provided with means for launching said carrier and means for tracking said target and guiding said carrier by means of a beam of radiant energy which provides said carrier with an indiation of its ideal flight path, said carrier comprising:
- pyrotechnic thrusters, each of said thrusters being capable of producing a thrust for modifying the flight path of said carrier;
- means for detection of said beam;
- means utilizing said detection for determining the position of the carrier with respect to said ideal flight path and the carrier radial velocity of approach to said ideal path;
- means for producing ignition of one of said thrusters when the distance from said carrier to said ideal flight path is greater than a predefined distance threshold and said radial velocity is below a predefined velocity threshold value.

4,901,947
REVERSE ENGINE VSTOL
Daniel P. Raymer, Sylmar, Calif., assignor to Lockheed Corporation, Calabasas, Calif.
Filed Feb. 27, 1989, Ser. No. 316,210
Int. Cl.[4] B64C *29/04*
U.S. Cl. 244—12.5 **5 Claims**



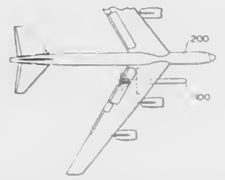
1. A vertical takeoff and landing aircraft comprising:
- an airframe having aerodynamic lift and flight control surfaces;
- an engine mounted in said airframe aft of the center of gravity of the aircraft having a front face facing towards the rear of the aircraft and an exhaust nozzle means located generally at said center of gravity of the aircraft, said nozzle means comprising a pair of exhaust nozzles rotatably mounted to the engine, rotatable from a vertically downward position to a horizontal rearward facing position; and
- an engine inlet duct means mounted in said airframe having an inlet opening facing toward the front of the aircraft and an outlet coupled to said front face of said engine.

4,901,948
CONTROL SYSTEM FOR JET PROPELLED VEHICLE
Peter M. Panos, 10692 Meads Ave., Orange, Calif. 92669
Filed Nov. 4, 1988, Ser. No. 267,324
Int. Cl.[4] B64C *15/02, 39/06*
U.S. Cl. 244—23 C **10 Claims**



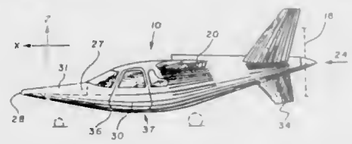
10. A vertical take off and landing vehicle capable of omnidirectional movement when airborne comprising:
- a saucer shaped body having upper and lower convex surfaces and an annular edge, said body also including a cockpit therein with a transparent canopy covering said cockpit;
- a jet engine mounted within said body for propelling said body through the discharge of exhaust therefrom;
- a plurality of pairs of non-stationary adjustable omni directional jet nozzle means mounted on and peripherally around said upper and lower surfaces one above the other adjacent the edge thereof, said nozzles adapted to receive and discharge the jet exhaust to effect movement of said body; and
- a single control means including a plenum chamber communicating with said jet engine to receive said exhaust and control the distribution of said exhaust to said jet nozzles, and jet nozzle directional adjustment means also mounted on said control means to omnidirectionally rotate said jet nozzles.

4,901,949
ROCKET-POWERED, AIR-DEPLOYED, LIFT-ASSISTED BOOSTER VEHICLE FOR ORBITAL, SUPRAORBITAL AND SUBORBITAL FLIGHT
Antonio L. Elias, Fairfax, Va., assignor to Orbital Sciences Corporation II, Fairfax, Va.
Filed Mar. 11, 1988, Ser. No. 167,189
Int. Cl.[4] B64C *3/38*
U.S. Cl. 244—49 **47 Claims**



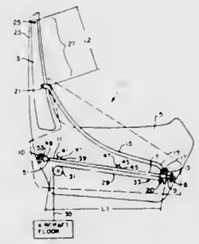
1. A rocket booster vehicle adapted for launch by being released from a carrier aircraft while in flight, comprising:
- thrust means for propelling and providing trajectory control of said vehicle;
- expendable wing means for providing aerodynamic lift and trajectory control for said vehicle; and
- carrying means for releasably carrying said vehicle with said carrier aircraft;
- wherein said wing means provides trajectory control during a first predetermined period after release by said carrying means of said vehicle from said carrier aircraft, and said thrust means provides trajectory control after said first predetermined period.

4,901,950
AIRCRAFT FUSELAGE
Richard J. Judge, 1241 SE. 13th Ter., Fort Lauderdale, Fla. 33316
Continuation-in-part of Ser. No. 948,197, Dec. 31, 1986, abandoned. This application Sep. 12, 1988, Ser. No. 242,500
Int. Cl.[4] B64C *1/00*
U.S. Cl. 244—119 **6 Claims**



1. An aircraft having an X-axis in alignment with the line of thrust of the aircraft, a Y-axis transverse to said X-axis, the Y-axis in parallel with the length of a single main wing, and a Z-axis transverse to a plane defined by said X and Y axes, the aircraft comprising:
- (a) a fuselage having Y-axis symmetry about said thrust line and substantially having X-axis symmetry about a line defined by the forward edge of said main wing;
- (b) said fuselage assembly further having a substantially conical nose, said nose having its root at the beginning of the pilot's cabin, said nose subtending a vertex in the range of about 15 to 25 degrees, and having an X-axis length to Z-axis base diameter ratio in the range of about two to three, the bottom profile of said fuselage assembly arcing downward from the prop of the aircraft to the middle of the pilot's cabin and, thereafter, arcing upward away from the pilot's cabin to the tip of the nose of the aircraft;
- (c) a single prop located at the extreme aft end of said fuselage, said prop generating the thrust of the aircraft;
- (d) said single main wing secured on top of the upper fuselage, the XY plane of said wing in alignment with the line of thrust of said aft-located prop; and
- (e) a tailfin system comprising three separate tailfins, a first of said fins directed downwardly in the negative Z direction and perpendicularly to the plane of said fixed wing; and second and third tailfins directed upwardly and disposed respectively symmetrically about the XZ plane of the aircraft, each of said second and third fins disposed at an angle, relative to the plane of said fixed wing, in the range of 30 to 60 degrees, each of said second and third fins having about twice the length of said first fin, said prop of the aircraft located aft of said tailfin system.

4,901,951
YAW FIN DEPLOYMENT APPARATUS FOR EJECTION SEAT
Anthony T. Tran, Gaithersburg, Md.; Chi R. Tung, Plymouth Meeting, and Peter W. Yost, Telford, both of Pa., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jul. 5, 1988, Ser. No. 215,139
Int. Cl.[4] B64D *25/10*
U.S. Cl. 244—122 A **12 Claims**



1. Deployment apparatus for a fin attached to an aircraft ejection seat by a pivotal connection, said apparatus comprising: means for applying a continuous deployment force to the fin during deployment, wherein said continuous deployment force means include:
- a track including a fore end and an aft end, said track defining a track length, said track being connected to the ejection seat,
- movable means for following said track, said track following means being in sliding engagement with said track and including a split ring therein,
- a strut connected between the fin and said track following means,
- means for connecting said strut to said track following means,
- means for connecting said strut to the fin, said fin to strut connecting means being located at a position along the fin, said position being displaced from the seat by a distance defining a fin lever arm, said fin lever arm being rotatable around the pivotal connection between the fin and the seat, the pivotal connection serving as a fulcrum for said fin lever arm,
- means for continuously moving said track following means along said track, said moving means being connected to said track following means through said split ring which permits said moving means to separate from said track following means after complete fin deployment.

4,901,952

CONTROL APPARATUS

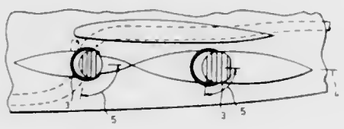
Neil J. Curtis, Kingston-upon-Thames, England, assignor to British Aerospace Public Limited Company, London, England

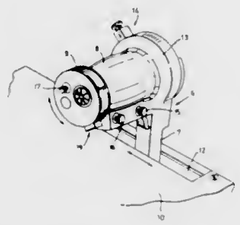
Continuation of Ser. No. 42,749, Apr. 27, 1987, abandoned. This application Jun. 23, 1988, Ser. No. 220,933

Claims priority, application United Kingdom, Apr. 29, 1986, 8610481

Int. Cl.[4] B64C *13/04*

U.S. Cl. 244—234 16 Claims





1. A control apparatus for an aircraft of the vectored thrust type arranged to produce control signals in response to control movements, including:

a fixed housing;

a manually movable stick member supported with respect to said fixed housing and arranged to provide a first control signal corresponding to thrust magnitude demand, said thrust magnitude demand being determined by the location of said stick member with respect to said housing;

said stick member including a grip to enable it to be gripped and moved manually with respect to said fixed housing so as to vary said thrust magnitude demand; and

a rotatable collar mounted on said grip and arranged to provide a second control signal corresponding to thrust vector angle demand, said thrust vector angle demand being determined by an angular orientation of said collar.

4,901,953

CONTROLLER FOR RAILWAY VEHICLES

Kazuyoshi Munetika, Kobe, Japan, assignor to Nippon air Brake Co., Ltd., Kobe, Japan

Filed Jun. 8, 1988, Ser. No. 204,067

Claims priority, application Japan, Jun. 12, 1987, 62-91036[U]

Int. Cl.[4] B60T *13/66*

U.S. Cl. 246—182 R 15 Claims

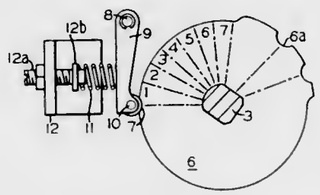
1. A railway vehicle controller apparatus, said controller apparatus comprising:

(a) a housing;

(b) a rotatable shaft having a first portion positioned within said housing and having a second portion extending out of said housing;

(c) a control mechanism connected to said second portion of said rotatable shaft which is operated by an operator of such railway vehicle, said control mechanism includes a star wheel portion and a roller portion, said star wheel portion has a substantially uniform surface which in combination with said roller portion defines a plurality of step positions of said controller apparatus, said star wheel portion further includes at least one groove portion to clarify at least one position of said controller apparatus;

(d) at least one detection means positioned within said housing for detecting a rotational position of said rotatable shaft, said detection means including a means for providing an electrical signal indicative of said rotation position



of said rotatable shaft, said electrical signal being usable as one of an acceleration and deceleration command signal; and

(e) a control resistance means engageable with said rotatable shaft for providing a controlled resistance to rotation of said rotatable shaft.

4,901,954

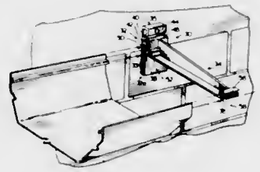
EAVESTROUGH HANGER

Donald F. Fairgrieve, Islington, and Vince J. McGowan, Thornton, both of Canada, assignors to GSW Inc., Barrie, Canada

Filed Aug. 10, 1988, Ser. No. 230,420

Int. Cl.[4] E04D *13/06*

U.S. Cl. 248—48.2 15 Claims



1. A one piece plastic eavestrough hanger for supporting an eavestrough comprising a cored base and a forwardly extending cantilevered arm extending from said base, said arm being of an inverted 'T' shape in cross section and including a front opening locking slot at a free end thereof and an opposite opening slot at a lower edge of said arm spaced from, but adjacent said base, said base and said arm joining at a flange perpendicular to said inverted 'T' shaped section and generally centered thereon and closing said inverted 'T' section at one end of said arm, said cored base being generally of a box-like configuration with a plurality of interior partitions, said box-like configuration being open at the sides with a number of said partitions visible at the open sides, and wherein said base, at the point of junction of said base and said flange, has two spaced members which are generally at right angles to said flange and which join the arm and the base, said two spaced members cooperating to provide sufficient rigidity between said base and said arm without relying on such eavestrough for support; such that deflelction ofo said arm relative to said base during normal use in an eavestrough system is not significant.

4,901,955

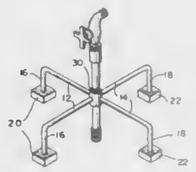
FAUCET OR YARD SPRINKLER SUPPORT

Mac W. Bynum, Rte. 3, Box 423, Taylorsville, Miss. 39168

Filed Feb. 17, 1989, Ser. No. 311,804

Int. Cl.[4] F16L *3/00*

U.S. Cl. 248—49 3 Claims



1. A faucet or yard sprinkler underground holder support which comprises:

a central support means for connecting a water supply thereto and from which water is expended;

two pair of outwardly extending support arms secured at one end thereof to said central support means for supporting said central support means in place;

a leg secured to each outwardly extending arm at an angle relative thereto, with each of said legs extending in the same direction and substantially parallel with each other;

a foot secured to each of said legs on a bottom end thereof;

whereby said arms and said two pairs of legs extend in a direction such that they may be placed underground with said arms substantially parallel with the ground surface with said central support means supported below ground level in a vertical position with said legs and said foot secured thereto below said two pair of legs.

4,901,956

METHOD OF MANUFACTURING GAS TIGHT AND WATER TIGHT CABLE TRANSITS AND METHOD OF MAKING SAME

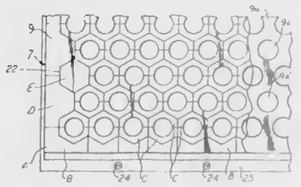
Clas T. Jacobsen, Braaten 25A, Drammen, Norway

Filed Aug. 12, 1986, Ser. No. 895,905

Claims priority, application Norway, Aug. 12, 1985, 85.3167

Int. Cl.[4] F16L *5/00*

U.S. Cl. 248—56 9 Claims



1. A gas tight and water tight cable transit comprising: first and second elements each having first and second body portions of a rigid material and a layer of resilient sealing material interposed between said first and second body portions of said elements and formed integrally with at least one of said body portions, and said elements being adapted to be assembled together with opposing surfaces defining a cable receiving through bore extending transversely to the plane of said layer of sealing material, and means clamping said first and second elements together thereby compressing said sealing material between said rigid body portions, causing a portion of said sealing material to expand radially inwardly into the through bore to provide a seal between an inner surface of the bore and an outer surface of a cable extending through the bore defined by said elements.

4,901,957

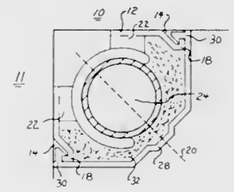
MODULAR CONDUIT SYSTEM

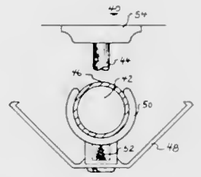
Robert V. Daigle, Deerfield Beach, Fla., and Gordon J. Grice, Janesville, Wis., assignors to Creative Systems Engineering, Inc., Janesville, Wis.

Filed Jun. 27, 1988, Ser. No. 211,967

Int. Cl.[4] F16L *3/00*

U.S. Cl. 248—62 10 Claims





1. A modular pipe system for securement to a constructional surface, comprising:

(a) a back bracket having a back surface proportioned for securement to said constructional surface and having a front surface comprising resilient nestable rigidly securing means having a partially open face geometry in a direction opposite from said constructional surface, said back plate further comprising, along the edges thereof, longitudinal first complemental coupling means;

(b) a pipe portioned for complemental coupling to said nesting means of said back plate; and

(c) a front plate proportioned cross-section to said back plate and having, along the edges thereof, longitudinal second complemental coupling means proportioned for mating complemental engagement with said first complemental coupling means, whereby a modular pipe system may be formed by coupling said pipe to said nesting means and by mutually engaging said first and second complemental coupling means of said respective back and front plates.

4,901,958

APPARATUS AND METHOD FOR SUSPENDING PIPE RACK

Michael V. Kelso, 27 Hornsilver Pl., The Woodlands, Tex. 77381

Filed Oct. 11, 1988, Ser. No. 255,589

Int. Cl.[4] F16L *3/00*

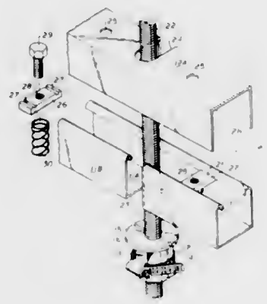
U.S. Cl. 248—59 19 Claims

1. An interlocking pipe rack assembly for mounting on one or more shafts without passing over the end of the shafts comprising;

two elongate separable channel members, each said channel member having slots extending transversely inward from longitudinal side edges thereof, said channel members being adapted for assembly together on a shaft with the slots of each channel member overlapped in laterally opposed relation to form a pair of generally circular open-

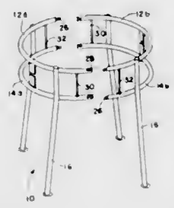
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ings surrounding a shaft received therein and extending completely therethrough, and



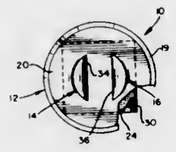
fastening means for relasably securing said channel members together in the assembled condition adapted to surround said one or more shafts.

4,901,959
COLLAPSIBLE SUPPORT STAND FOR FLEXIBLE TRASH BAG
Jack W. Stage, 100 Mount Lyell Dr., San Rafael, Calif. 94903
Filed Jul. 26, 1988, Ser. No. 224,390
Int. Cl.[4] A63B 55/04
U.S. Cl. 248—97 2 Claims



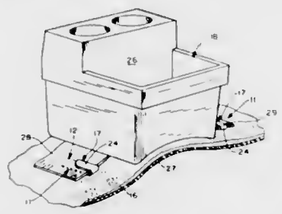
1. A support stand for a flexible trash bag comprising:
a pair of top and bottom rings;
four support legs supporting said rings above the ground in generally horizontal position;
each of said rings being formed in just two identical approximately semi-circular sections, with two of said support legs fixed to and joining each pair of parallel semi-circular sections in parallel relationship; and
complementary male and female coupling means releasably joining the ends of said semi-circular sections, the male coupling means being at one end and the female coupling means being at the other end of each semi-circular section.

4,901,960
DECORATIVE LIGHT HOLDER
Lonnie F. Gary, Lubbock, Tex., assignor to Gary Products Group, Inc., Lubbock, Tex.
Filed Oct. 13, 1988, Ser. No. 257,392
Int. Cl.[4] A47B 96/00
U.S. Cl. 248—205.3 2 Claims



1. An injection molded thermoplastic holder adapted to frictionally engage and support the outwardly facing surface of a decorative light socket, said holder comprising a base member and socket support means;
said base member comprising a substantially planar mounting surface;
said socket support means comprising opposed and spaced apart socket support arms projecting outwardly from said base member, said socket support arms having facing surfaces that taper in slightly toward each other near said base member so as to frictionally engage said decorative light socket;
said holder further comprising unitarily molded brace means, said brace means comprising at least two brace members providing structural support between said base member and said support arms, each brace member being substantially perpendicular to said base member and to the facing surface of one of said support arms.

4,901,961
CARPET ENGAGING SUPPORT DEVICE
Donald A. Gish, 3107 Frandoras Cir., Oakley, Calif. 94561
Filed Oct. 26, 1987, Ser. No. 112,551
Int. Cl.[4] E04G 3/00
U.S. Cl. 248—217.2 9 Claims



1. A carpet engaging support device comprising a body,
first and second pairs of elongated prong means rigidly fixed to the underside of said body, each of said prong means terminating in a sharp point capable of penetrating a carpet,
said prong means being formed to extend below said body for hooking under said carpet and removably securing said body thereto,
one of said pairs of prong means extending initially at a slight angle to parallel to said body in one direction from points of merger with said body, to penetrate the carpet so that the carpet is disposed between said prongs and said body;
the other pair of said prong means initially extending downward from said body and substantially perpendicular thereto with the tips thereof extending slightly in the direction opposite to said one direction, and being bendable so that driving said body downwardly against said carpet with said initially downward extending prong means substantially fully penetrating said carpet and engaging a hard, impenetrable carpet supporting surface bends said other pair of prong means below said carpet in said opposite direction to a position generally parallel to said body to lock said pairs of prong means against withdrawal from said carpet; and
mounting means fixed on the upper side of said body formed for securing an object thereto.

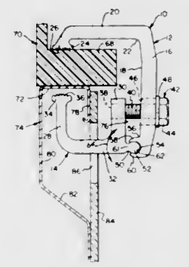
4,901,962
CLIP FOR HOLDING PAPERS TO A WALL
David A. Greer, 181 Ada Ave. #46, Mountain View, Calif. 94043
Filed Dec. 14, 1988, Ser. No. 284,351
Int. Cl.[4] E04G 3/00
U.S. Cl. 248—218.3 6 Claims



1. A clip for holding substantially planar objects to a wall that is covered with a fabric outer layer, comprising:
a single, continuous, wire-like member having two ends;
said member having at least one straight portion formed proximate a first end of said two ends;
said member being bent into a looped portion proximate said straight portion, said looped portion comprising an arc of greater than 180 degrees, such that said looped portion curves back toward said straight portion;
an outwardly-curved portion formed in said member proximate said looped portion, such that a narrow gap is formed at the point of closest approach of said outwardly-curved portion with said straight portion;
said outwardly-curved portion of said member curving away from said straight portion, such that a larger second gap is formed between said outwardly-curved portion and said straight portion;
said first end and a segment of said straight portion extending downwardly below said second gap;
said first end being formed into a pointed shape to facilitate penetration of said fabric covering of said wall.

4,901,963
ADJUSTABLE CLAMP
Ronald L. Yoder, Topeka, Ind., assignor to Universal Consolidated Methods, Inc., Topeka, Ind.
Filed Jun. 20, 1985, Ser. No. 747,122
Int. Cl.[4] B25B 5/00
U.S. Cl. 248—231.5 2 Claims

1. An adjustable clamp comprising:
a first extrusion comprising a body portion with a hole therethrough, an arm extruded along one edge of the body portion extending substantially perpendicular therefrom, and a first pressure pad on the arm;
a U-shaped second extrusion comprising a first side, a second side with a hole therethrough, a bight joining the first side to the second side, and a second pressure pad on the first side facing the first pressure pad;
a retaining structure comprising a first retaining member comprising a surface portion extruded along the body portion of the first extrusion adjacent the edge of the body portion remote from the arm, and a second retaining member extruded along the second extrusion, the second retaining member comprising an integrally extruded web terminating in an integrally extruded bead of greater thickness than the thickness of the web, the web of the second retaining member extending from the second extrusion near the intersection of the second side and the bight and substantially perpendicular to the second side, the other retaining member comprising a pair of integrally extruded portions partially enclosing a channel of larger cross-sectional size than the bead, the integrally extruded portions extending partially together and defining therebetween a gap having a width that is greater than the thickness of the web and less than the thickness of the bead, whereby the bead can be inserted lengthwise into the channel to join the first and second members together, the body portion and the second side thereby comprising juxtaposed members with said second side extending substantially perpendicular to said arm with the end of said



second side being spaced from said arm thereby to provide a space for receiving a workpiece and the hole through the body portion being in alignment with the hole through the second side, the hole through the body portion being a clearance hole located between the first retaining member and the arm and the other of said holes being threaded and located in the second side of the second extrusion, the body portion of the first extrusion facing the second side of the second extrusion being generally flat and substantially coplanar with the deepest part of the channel;
a bolt comprising a head and a threaded shaft extending through the clearance hole and threadedly engaging the threaded hole to urge the juxtaposed members toward each other, whereby the first and second extrusions pivot relatively to each other about the bead, said arm of said first extrusion and said second side being transversely located and separated.

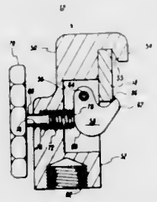
4,901,964
RAIL CLAMP
Bernard E. McConnell, Rte. 2, Box 87, Greenville, Tex. 75401
Filed Jan. 22, 1985, Ser. No. 693,145
Int. Cl.[4] B25B 5/04
U.S. Cl. 248—231.5 2 Claims

1. A clamp for attaching support apparatus onto a side rail of the type having exterior side surfaces formed along common edges comprising, in combination:
a clamp body having an attachment portion adapted for coupling engagement with support apparatus, a fixed jaw member projecting from said clamp body for engaging said side rail, and having a cavity for receiving a compression member;
said fixed jaw member having a first flange portion projecting transversely with respect to said clamp body, and having a second flange portion attached to said first flange portion and projecting transversely thereto;
said clamp body having a planar surface for engaging a major exterior side surface of said side rail, and said first

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flange portion having an inside planar surface joining said clamp body planar surface substantially at a right angle, and said second flange portion having an inside planar surface inclined with respect to the planar surface of said clamp body for engaging an edge portion of said rail;

a compression member being mounted within said clamp body cavity for movement away from said fixed jaw member to an open, retracted position allowing positioning of said fixed jaw member and said compression member about opposite exterior side surfaces of said rail, and for movement from the retracted position to an extended

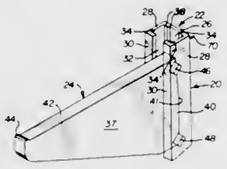


position allowing confinement and engagement of said rail on opposite exterior side surfaces thereof by said fixed jaw portion and said compression member;

said compression member being mounted on said clamp body for pivotal movement to and from its extended and retracted positions, said compression member comprising a cam for engaging said drive means and a jaw carried by said cam having an inside planar surface for engaging an edge portion of said side rail; and,

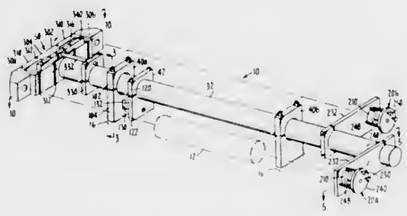
means coupled to said clamp body for driving said compression member from its open, retracted position to its extended position.

4,901,965
CONTINUOUS HEIGHT ADJUSTMENT WALL STANDARD AND ANCHOR ASSEMBLY
Thomas C. Bowman, 410 Glen Oak Dr., N.W., Grand Rapids, Mich. 49504
Filed Feb. 21, 1989, Ser. No. 312,200
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—246 **15 Claims**



1. A continuously adjustable support assembly comprising a standard and a support bracket, the standard having a pair of parallel opposed surfaces extending longitudinally thereof, at least one of the surfaces including longitudinally extending rib means, the support bracket being adapted to extend outwardly from the standard and having a rear mounting portion, and a pair of vertically spaced locking tabs projecting laterally from one side of the mounting portion, the locking tabs being adapted to be received between the opposed surfaces of the standard, the locking tabs being disposed to respectively engage the opposed surfaces, at least one of the locking tabs having an edge portion disposed for interlocking engagement with the rib means to retain the support bracket at a preselected height relative to the standard.

4,901,966
KINEMATIC RESONATOR SUPPORT
Wayne S. Mefferd, Los Altos Hills, Calif., assignor to Coherent, Inc., Palo Alto, Calif.
Division of Ser. No. 42,272, Apr. 24, 1987, Pat. No. 4,818,089.
This application Nov. 21, 1988, Ser. No. 273,567
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—299 **9 Claims**



1. A kinematic assembly for mounting a bar to a frame in a manner to stabilize the bar while isolating the bar from external forces on the frame that might tend to distort the bar comprising:

first and second brace members mounted to said frame in spaced apart relationship, each said brace member having a bearing surface for supporting the bar while allowing limited longitudinal and rotational movement thereof;

clamp member securely mounted to said bar adjacent the first brace member; and

means for connecting the clamp member to said first brace member in a manner to constrain only the remaining longitudinal and rotational movement of the bar.

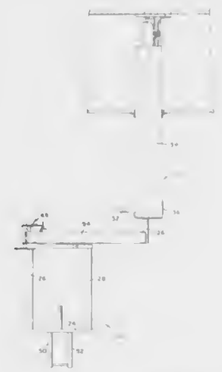
4,901,967
PATIENT EQUIPMENT TRANSPORT AND SUPPORT SYSTEM
John H. Petre, Cleveland Heights, Ohio, assignor to The Cleveland Clinic Foundation, Cleveland, Ohio
Division of Ser. No. 886,207, Jul. 15, 1986, Pat. No. 4,795,122.
This application Sep. 29, 1988, Ser. No. 251,191
Int. Cl.[4] A61B *19/00*
U.S. Cl. 248—327 **1 Claim**

1. A hospital service column for association with an equipment transport bracket including a bracket post including:

a pivotable support arm having a latching block assembly disposed for locking reception of the transport bracket, the block assembly including a post receiving tube adapted to receive the bracket post for pivotable reception of the bracket and having a latch plate and locking pin assembly;

a piston and cylinder assembly in association with said support arm for selective powered positioning of the support arm, said support arm being mounted to a shaft coupled to said piston and cylinder assembly;

selectively operable valve means for operation of said piston and cylinder assembly; and,





a housing sized to contain said piston and cylinder assembly and including service outlet means for the communication of power and gas sources.

4,901,968
BASS BOAT SEAT BRACKET
John W. Ellis, and John W. Ellis, Jr., both of P.O. Box 48, Pensacola, Fla. 32591
Filed Feb. 15, 1989, Ser. No. 310,692
Int. Cl.[4] B60N *1/02*
U.S. Cl. 248—407 **4 Claims**

1. In combination with a boat deck, a vertically adjustable seat bracket for fishing boats, comprising:

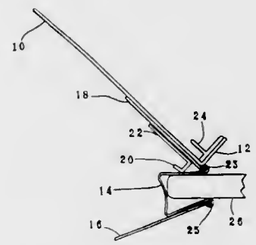
a deck mount assembly for securement to said boat deck, a substantial portion of said deck mount extending below said deck;

a seat support shaft assembly received telescopingly within said deck mount assembly such that said shaft will disappear within said deck mount and below said boat deck when in a lower, retracted position;



and a seat mount assembly received telescopically within the upper end of said seat support shaft assembly.

4,901,969
BOOK SUPPORT WITH MEANS OF TEMPORARY ATTACHMENT ONTO A DESK
Ivan Yaeger, 1277 NW. 88th St., Miami, Fla. 33147
Filed Sep. 6, 1988, Ser. No. 241,048
Int. Cl.[4] A47G *1/24*
U.S. Cl. 248—455 **7 Claims**



4. A device as in claim 1, wherein a third operative position is defined by one exposed outer surface of said clamping means and said handle means positioned in supporting engagement on said work surface and another, outer exposed surface of said clamping means disposed in supporting, confronting relation to said backrest.

4,901,970
FISHING POLE HOLDER WITH UNIVERSALLY ADJUSTABLE MOUNT
Douglas M. Moss, 3301 Moritiz Dr., Huntington Harbor, Calif. 92649, and Stanley W. Levashef, 8222 Drybank Dr., Huntington Beach, Calif. 92646
Filed Jan. 30, 1989, Ser. No. 302,930
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—514 **9 Claims**

1. A universal directional holder comprising:

a. a boss having a rotational position indexing means comprising at least one flat on the outer surface of said boss and an internally threaded central bore;

b. a directional indexing block having a central through aperture with coating rotational position indexing means

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comprising multiple flats on the interior wall of said through aperture received over said boss with said multiple flats indexed to a preselected rotational position on said boss;

c. first and second planar clamp brackets received over said directional indexing block and having sufficient length and breadth to extend over substantially all of said indexing block member, each of said clamp brackets having a groove in one of its flat planar faces and coextensive one dimension thereof, said first and second planar clamp brackets mounted together with their respective grooves



aligned and opposed to each other, defining a clamp passage therebetween;

d. a single through aperture centrally positioned in the first of said clamp brackets and aligned with said internally threaded bore;

e. a threaded fastener extending through said bore and threadably received in said internally threaded bore of said boss; and

f. clamp fastener means securing said first and second clamp brackets together to compressively secure a supporting object within said clamp passage.

4,901,971

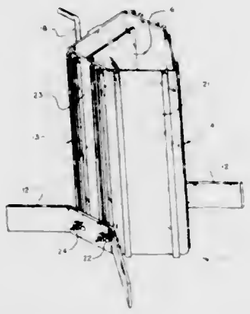
CHRISTMAS TREE STAND

Richard E. Connelly, 15 Township Rd. 1400, Jeromesville, Ohio 44840

Continuation-in-part of Ser. No. 157,601, Feb. 19, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 307,064

Int. Cl.[4] A47G *7/02*

U.S. Cl. 248—523 **14 Claims**



1. A stand for holding a Christmas tree comprising components which include:

an elongate cannister;

a free-floating push plate;

push plate adjusting means, and

two support legs,

said push plate being disposed within said canister, and said support legs being attached to said canister, wherein said cannister has interconnected panels comprising: a rear wall, two parallel side walls, two converging walls, and a bottom in sealing relationship to the lower end of said walls, said walls defining a tube whose interior is adapted to receive the lower trunk of said tree, and wherein said push plate is not fastened to other components of said stand and is dimensioned to be received and moved within said tube, parallel to said side walls, and wherein further, said push plate adjusting means is mounted on said rear wall and adapted to adjust the position of said plate relative to the corner formed by the juncture of said converging walls, said adjusting means being operable to move said plate toward said corner to force said trunk into said juncture, and wherein still further, said support legs are adapted for being fastened adjacent to the lower end of said cannister so as to enable it to be supported in a generally vertical position.

4,901,972

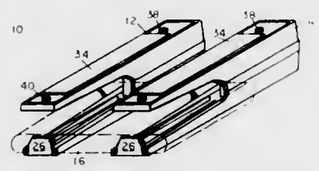
KEYBOARD STORAGE WITH SLIDING SHELF

Thomas W. Judd, and Edward L. Hames, both of Peterborough, N.H., assignors to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Continuation-in-part of Ser. No. 299,749, Jan. 19, 1989. This application Mar. 9, 1989, Ser. No. 321,513

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—918 **14 Claims**



1. A keyboard storage apparatus for supporting a keyboard and for moving the supported keyboard between a storage, non-use position and an extended, use position, which apparatus comprises:

(a) an elongated keyboard support element having sides, a top and bottom and one and other end, the support characterized by a generally side inverted, U-shaped opening extending from the one end inwardly toward the other end, said opening sufficient to store a keyboard therein and defining an inner bottom surface of said support element;

(b) an elongated, slidably movable shelf means to support the keyboard and having a one and other end and extending substantially the length of the support element, the shelf adapted for slidable movement of the shelf means on the inner bottom surface between a keyboard non-use storage position wherein the shelf means with the keyboard are stored within the said opening and the shelf means extends into said hollow space and a keyboard use position wherein a part of the shelf means and the keyboard extend beyond the one end of the support element to permit use of the keyboard; and

(c) retention means on the shelf means at the one and other end to retain securely the keybaord on the shelf means between the keyboard non-use storage and keyboard use positions.

4,901,973

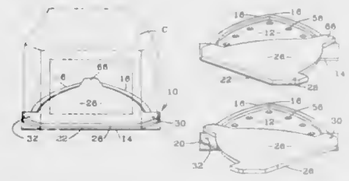
SUPPORT BASE FOR AN AIR TRAFFIC CONTROLLER'S CONSOLE OR THE LIKE

Daniel A. Ferrara, Jr., Looking Glass Hill, Bantam, Conn. 06750

Filed May 31, 1989, Ser. No. 359,369

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—922 **8 Claims**



1. A support base for an air traffic controller's console or the like comprising:

a. at least two stacked generally planar elements, a lower one adapted to be supported, an upper one adapted to support the console, the elements having aligned coextensive frontal margins with a corner at each frontal end,

b. pivot means at each corner serving selectively as fixed pivot points for the upper element to permit it to be pivoted with respect to the lower element about said fixed pivot points selectively,

c. anti-friction means between the upper and lower elements,

d. restraining means assuring that any pivoting movement between the upper and lower elements will be at the selected pivot points.

4,901,974

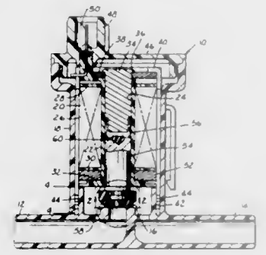
CANISTER PURGE SOLENOID VALVE

John E. Cook, and William C. Gillier, both of Chatham, Canada, assignors to Siemens-Bendix Automotive Electronics Limited, Chatham, Canada

Filed May 11, 1989, Ser. No. 350,430

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.15 **4 Claims**



1. In a solenoid actuated valve that comprises a valve seat disposed between an inlet and an outlet, a solenoid assembly that comprises a bore which is coaxial with said valve seat, a stator that is disposed in said bore, an armature that is disposed in said bore between said stator and said valve seat and reciprocates within said bore in response to the energizing and de-energizing of said solenoid assembly, and an elastomeric valve head member that is on said armature externally of said bore and that seats on and unseats from said seat as said armature reciprocates within said bore, the improvement characterized in that an elastomeric limit stop is disposed between said stator and said armature to absorb impact between said armature and said stator as the armature moves away from said seat, said valve head member radially overlaps the solenoid assembly around said bore and is thick enough not only to abut said seat but also to abut said solenoid assembly around said bore as the armature is reciprocated within said bore, and when the armature is retracted into said bore, said valve head member initially contacts the solenoid assembly to initially absorb momentum of the armature, and thereafter the final impact absorption is shared by said valve head member acting against said solenoid assembly around said bore and by said limit stop acting between said stator and said armature.

4,901,975

FLUID DELIVERY EQUIPMENT

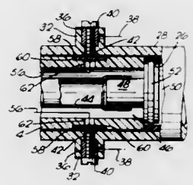
David C. Gill, Keynsham, and Gary K. Pressey, Mangotsfield, both of Great Britain, assignors to Nomix Manufacturing Company Limited, Bristol, United Kingdom

Filed Jul. 19, 1988, Ser. No. 221,285

Claims priority, application United Kingdom, Jul. 20, 1987, 8717046

Int. Cl.[4] F16K *51/00*

U.S. Cl. 251—148 **8 Claims**



1. A coupling between first and second components which are each provided with electrical leads and fluid passageway for conveying a liquid, the components being telescopically engageable with each other to bring the respective fluid passageways into communication with each other, the first component being provided with an electrically conductive element to which the lead of the first component is connected, the second component having an electrically conductive internally screwthreaded bush, to which the lead of the second component is connected, the components being secured together in the engaged position by an electrically conductive screwthreaded fastener which makes electrical contact with both the electrically conductive element and the electrically conductive bush thereby to connect the leads to each other.

4,901,976

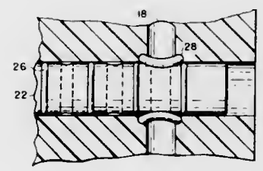
FLOW CONTROL VALVE

Richard J. Smith, 4334-J Valley Ave., Pleasanton, Calif. 94566

Division of Ser. No. 242,600, Sep. 12, 1988, Pat. No. 4,881,575. This application Aug. 28, 1989, Ser. No. 398,965

Int. Cl.[4] F16K *3/26*

U.S. Cl. 251—206 **4 Claims**



1. In a fixture having a tubular conduit for the passage of a fluid, valve means for controlling the flow of the fluid comprising:

a valve rod having an arcuate surface, said rod longitudi-

nally movable through a tubular hole through the fixture to intercept the conduit at substantially right angles;

at least one diametrical valving aperture through said valve rod, said aperture being alignable with said conduit;

a pair of O-rings in grooves around said valve rod, said grooves located on each side of said aperture to prevent fluid leakage between said conduit and the exterior of said fixture; and

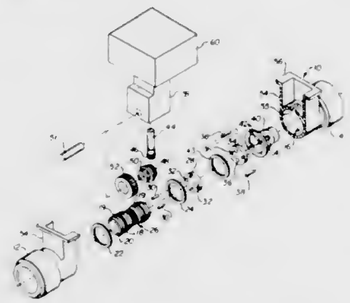
first and second saddle O-rings surrounding said conduit and conforming to the arcuate surface of said valve rod, said saddle O-rings positioned at the junction of said conduit with opposite arcuate surfaces of said valve rod.

4,901,977

GEAR DRIVE FOR A DISK

Fred W. Hendrick, Cerritos, Calif., assignor to Automatic Control Components, Inc., Denver, Colo.

Filed Jun. 2, 1989, Ser. No. 360,779
Int. Cl.[4] F16K *31/53, 25/00*
U.S. Cl. 251—249.5 **9 Claims**



1. A valve for controlling the flow of fluid, said valve including:

a valve body having an inlet port and an outlet port separated by an internal cavity;

an elongated rotator spool extending a substantial distance within said internal cavity having a fluid passageway extending longitudinally therethrough for conducting fluid from the inlet port of the valve body;

gear means carried by said rotator spool for rotating said spool about an axis extending along the length of the internal cavity of the valve body;

an upstream disk affixed to a downstream side of said rotator spool as an assembly unit within said internal cavity, said upstream disk having a fluid passageway extending therethrough for conducting fluid from the fluid passageway of the rotator spool;

a downstream disk supported by the valve body in a confronting, face-to-face relationship with the upstream disk, said downstream disk having a fluid passageway extending therethrough for conducting fluid from the fluid passageway of the upstream disk; and

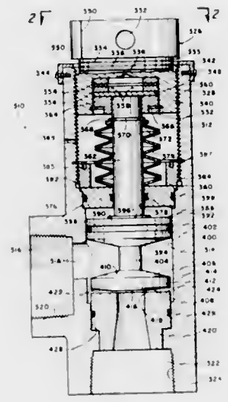
drive means including gear teeth meshing with said gear means of the rotator spool for rotating the rotator spool and the upstream disk affixed thereto, such that the fluid passageways of the rotator spool and the upstream disk may be moved into and out of a fluid-conducting relationship with the fluid passageway of the downstream disk.

4,901,978

FLOW CONTROL VALVE

Eugene P. Feild, Webb City, Mo., assignor to Laminar Fluid Controls, Inc., Webb City, Mo.

Filed Jun. 20, 1988, Ser. No. 209,284
Int. Cl.[4] F16K *31/12, 39/00*
U.S. Cl. 251—282 **37 Claims**



1. A flow control valve comprising:

a housing;

a first valve member mounted on said housing and having a working face formed thereon;

a bore formed in said housing, said bore being in communication with said first valve member working face;

a second valve member received in said bore and having a first side directed toward said first valve member and a second side opposite thereto, said first side having a working face formed thereon;

a shaft substantially coaxially received in said bore, said shaft being connected to said second side of said second valve member;

inlet means formed in said housing for permitting a flow of fluid to fluid to a location adjacent the outer peripheries of said working faces;

one of said valve members having an orifice extending thereinto from its working face, said faces being engageable with each other near the orifice to prevent fluid flow through the orifice;

outlet means coupled with said housing for permitting a flow of fluid out of said orifice;

means for substantially balancing the upward and downward pressures applied to said shaft when said valve is in operative condition; and

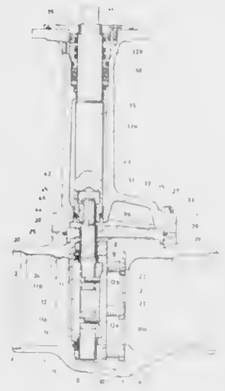
means for sealing between the radially outer surface of said shaft and the radially inner surface of said bore, said sealing means comprising a substantially planar disk coaxial with said bore and having a central bore therethrough for receiving said shaft.

4,901,979

BUTTERFLY VALVE OF INSPECTABLE TYPE

Gean-Claude Garrigues, Cadaujac, and Rene Laulhe, Villenave d'Ornon, both of France, assignors to Applications Mecaniques et Robinetterie Industrielle (A. M. R. I.), Bagnolet Cedex, France

Continuation-in-part of Ser. No. 128,613, Dec. 4, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 361,138
Claims priority, application France, Dec. 5, 1986, 86 17031
Int. Cl.[4] F16K *1/22*
U.S. Cl. 251—306 **9 Claims**



1. A butterfly valve of inspectable type comprising:

a tubular body, the central portion of which defines a shutoff chamber, communicating with the outside through a lateral orifice forming an inspection trap;

a first annular inner radial face in said tubular body;

a second inner radial face in said body confronting said first face,

an annular pre-body in said chamber,

said pre-body adapted to pass through said orifice,

said pre-body provided with two substantially radial boreholes which are diametrically opposite each other with the axis of the said boreholes passing through the said orifice;

extensible clamping means between said pre-body and said second face axially clamping a first radial flank of said pre-body against said first radial face by exerting a force moving said radial flank toward said first radial face to removably fasten said pre-body in said body:

a butterfly valve member;

shaft means positioned in said boreholes and mounting said valve member for rotation;

sealing means adapted to cooperate with one of said body and pre-body and with the said butterfly valve member to provide upstream/downstream tightness of the valve; and

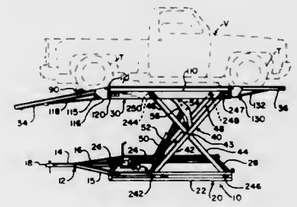
a cap adapted to be mounted on said body in such a manner as to tightly and removably close said orifice, said cap having a passage in which said shaft means is rotatably mounted.

4,901,980

PORTABLE CAR HOIST AND TRAILER WITH REMOVABLE WHEELS

N. Larry Hansen, Ft. Collins, Colo., assignor to Johnson Industries, Inc., Salina, Kans.

Filed Apr. 29, 1987, Ser. No. 44,819
Int. Cl.[4] B60P *1/48*
U.S. Cl. 254—9 C **31 Claims**



1. Portable hoist apparatus for lifting a vehicle above the ground, comprising:

a base frame assembly;

a platform frame assembly positioned above the base frame assembly, all of said platform frame assembly being moveable upwardly and downwardly in relation to said platform frame assembly;

lift means connected to the base frame assembly and to the platform frame assembly for lifting and lowering the entire platform frame assembly in relation to the base frame assembly;

axle mans connected to said base frame assembly in such a manner that said axle means is moveable upwardly and downwardly in relation to said base frame assembly and a wheel rotatably mounted on said axle means for supporting the base frame assembly when attached, said axle mans being attached to said base frame assembly in such a manner that it is moveable upwardly and downwardly in relation to said base frame assembly, and wherein said lift means includes a component that bears on said axle means in such a manner that pushes said axle means downwardly in relation to said base frame assembly when said platform frame assembly is lowered and allows said axle means to raise upwardly in relation to said base frame assembly when said platform frame assembly is raised;

hitch means attached to the base frame assembly for towing the hoist apparatus; and

vehicle support means on said platform frame assembly for supporting a vehicle on the hoist.

4,901,981

DEVICE FOR REMOVING A STAPLE FROM A STAPLED BUNDLE OF SHEETS

Antonius A. Knippels, Venlo, and Thomas T. C. van Gerwen, Veldhoven, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

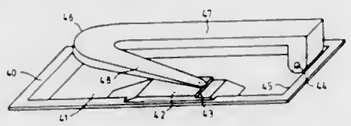
Filed Jan. 15, 1988, Ser. No. 144,459
Claims priority, application Netherlands, Jan. 16, 1987, 8700094
Int. Cl.[4] B25C *11/00*
U.S. Cl. 254—28 **8 Claims**

1. A device for removing a staple from a stapled bundle of sheets, compromising a strip projecting freely to a wedge-like tapered end, said end capable of being inserted between the bundle and the staple present therein, said device including a supporting means having a contact surface on which surface the wedge-like tapered end of the strip is pressed at an acute angle of at most 20° relative to the contact surface, said device further including a fastening means for connecting the strip movably to the supporting means such that the bundle may be inserted between the supporting means and the strip and pulled

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backwards relative to the direction of insertion of said bundle to remove the staple by means of the strip,

wherein the fastening means comprises an arm and a shaft, said arm having one U-shaped end rigidly attached to the strip, the arm being bent over the strip and extending



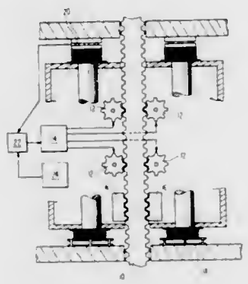
beyond the edge of the strip that faces away from the acute angle, the other end of the arm being bent with a portion thereof extending below the level of the contact surface and being rotatably mounted on the shaft, the shaft being perpendicular to the strip and fitted at a fixed location with respect to the supporting means.

4,901,982

METHOD INTENDED TO FACILITATE DISENGAGEMENT OF MECHANISMS APPLYING HIGH STRESS TO ONE ANOTHER

Jean Havard, Carquefou, and Christian Ravet, Nantes, both of France, assignors to Brissonneau et Lotz Marine, Puteaux, France

Division of Ser. No. 157,074, Feb. 3, 1988, abandoned, which is a continuation of Ser. No. 788,048, Oct. 16, 1985, abandoned. This application Oct. 31, 1988, Ser. No. 266,295
Claims priority, application France, Oct. 16, 1984, 8415965
Int. Cl.[4] B66F *3/02*
U.S. Cl. 254—95 **4 Claims**



1. A method of facilitating disengagement of a vertically displaceable rack and a locking member of an offshore platform lifting mechanism, the locking member having teeth in locked engagement with complementary teeth of the rack with a high vertical stress between the engaged teeth of the locking member and the rack, the locking member being displaceable transversely away from the rack to disengage therefrom and transversely toward the rack to lockingly engage therewith, said method comprising the steps of:

measuring vertical stress between the rack and the locking member, converting the measured vertical stress into an electrical control signal, and applying a force to the rack in response to the control signal, said force substantially offsetting the measured vertical stress so that the rack and the locking member may be disengaged with substantially no vertical stress therebetween.

4,901,983

BLAST PIPE FOR METALLURGICAL PROCESSES HAVING REFRACTORY COATED SURFACES

Arne Larsson, Stockholm, Sweden, assignor to Oxy-Tuben AB, Hofors, Sweden

PCT No. PCT/SE87/00394, § 371 Date Apr. 29, 1988, § 102(e) Date Apr. 29, 1988, PCT Pub. No. WO88/01721, PCT Pub. Date Mar. 10, 1988
PCT Filed Sep. 2, 1987, Ser. No. 193,453
Claims priority, application Sweden, Sep. 3, 1986, 8603698
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—270 **13 Claims**

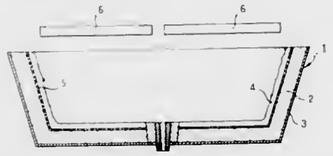
1. A blast pipe which is intended for delivering a material which can be a gas, or a solid, to molten metal in metallurgical processes and which is capable of withstanding high temperatures, said blast pipe having internal and external surfaces and including at least one layer of refractory material on at least one of said surfaces comprising: a refractory mixture of solid refractory particles and an alkali silicate based binder, wherein the improvement being that the major constituent of said binder is a polymerized alkali silicate.

4,901,984

METHOD FOR COATING A METALLURGICAL VESSEL AND A COATING OBTAINED

Jean C. Daussan, Metz; Gérard Daussan, and André Daussan, both of Longeville les Metz, all of France, assignors to Daussan et Compagnie, Woippy, France

PCT No. PCT/FR87/00208, § 371 Date Feb. 10, 1988, § 102(e) Date Feb. 10, 1988, PCT Pub. No. WO87/07545, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 10, 1987, Ser. No. 162,389
Claims priority, application France, Jun. 10, 1986, 86 08621
Int. Cl.[4] G21B *7/06*; B05D *7/22*
U.S. Cl. 266—280 **5 Claims**



1. Method for coating the interior of a metallurgical vessel (1) provided with a permanent refractory lining (2), in which there is deposited on said permanent lining (2) a refractory wearing layer (4) which is constituted by an aqueous slurry containing inorganic particles and a binder, characterized in that a layer (5) impenetrable to water and corresponding to a deposit of dry material of the order of 50 to 800 g per m^2 is applied on the permanent lining (2) prior to deposition of said wearing layer (4) and that, after application of the wearing layer (4), all the layers are subjected to sufficient drying to remove the water and the compounds containing hydrogen.

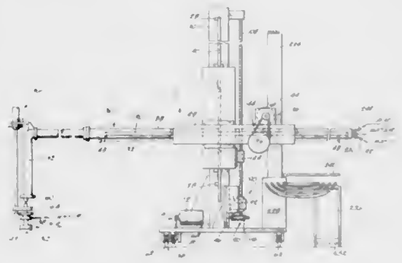
5. A metallurgical vessel (1) having on its interior a permanent refractory lining (2) and a refractory wearing layer (4) which overlies said lining (2) and is constituted by an aqueous slurry containing inorganic particles and a binder, characterized in that it includes a layer (5) impenetrable to water between the refractory lining (2) and the wearing layer (4).

4,901,985

APPARATUS FOR SPRAYING REFRACTORY LINING

Madjid Soofi, St. Charles, Ill., assignor to Magneco/Metrel, Inc., Addison, Ill.

Filed Nov. 10, 1988, Ser. No. 269,924
Int. Cl.[4] L21B *7/04*
U.S. Cl. 266—281 **10 Claims**



1. A gunning apparatus which is adapted to move along the inside of a tundish or ladle having a generally closed lower end, enclosed sides, and an open other end, and which sprays the sides and lower end thereof with refractory gunning material, said apparatus comprising a base,

an upright support beam attached to said base,

means for moving said base horizontally along the tundish parallel to one of said sides,

a horizontal boom extending generally perpendicularly to the direction of travel of said base and extending over the open upper end of the tundish,

a cradle slidably mounted on said support beam and slidably supporting said boom,

means for moving said boom horizontally relative to said cradle perpendicular to the direction of travel of said base,

means for moving said cradle vertically relative to said support beam,

a lance attached to said boom and perpendicular thereto, which extends generally into the tundish, and which has a lower end,

a nozzle having an inlet and an outlet,

means for rotatably mounting said nozzle on said lance lower end so that said nozzle outlet is generally perpendicular to said lance,

means for rotatably moving said nozzle relative to said lance,

means for supplying fluidized refractory material to said nozzle inlet,

means for wetting the fluidized material before said nozzle outlet, and

means for supplying water to said wetting means.

4,901,986

AIR BLADDER CONTROLLED HYDRAULIC ENGINE MOUNT

Stanley E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 165,158, Mar. 7, 1988, abandoned. This application Jan. 19, 1989, Ser. No. 298,717
Int. Cl.[4] F16F *9/50*
U.S. Cl. 267—140.1 **3 Claims**

1. A hydraulic mount assembly for mounting an engine in a vehicle, comprising:

a pair of mounting members;

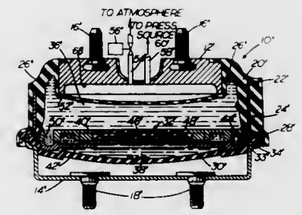
a hollow elastomeric body connected to said mounting members;

an elastomeric diaphragm closing said hollow body and forming therewith a closed cavity that is filled with hydraulic fluid;

means for partitioning said cavity into a primary chamber and a secondary chamber enclosed by said diaphragm;

an orifice in said partitioning means connecting said chambers so as to effect damping;

an expandable elastomeric bladder mounted within said primary chamber on one of said mounting members, said one mounting member having a piston surface at one side of said primary chamber, said bladder extending entirely across said piston surface so as to effectively buffer the entire piston surface and thereby isolate said one mounting member from the fluid in said primary chamber so that only elastomeric body stretching and not damping fluid movement occurs when said bladder deflates;



communicates means for providing fluid communication between said bladder and the atmosphere;

valve means for selectively opening and closing said communication means;

variable pressure fluid supply means connected to said bladder to positively control the fluid pressure within said bladder;

vehicle mounted transducer means for sensing vehicle operating conditions and resulting vibrations; and

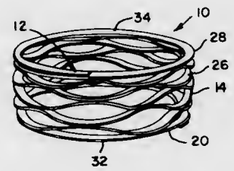
microprocessor means for selectively controlling said valve means and said variable pressure fluid supply means in response to signals from said transducer means whereby the damping and dynamic rate characteristics of said mount assembly may be tuned as desired especially for relatively high frequency vibrations.

4,901,987

CREST-TO-CREST COMPRESSION SPRING WITH CIRCULAR FLAT SHIM ENDS

Charles Greenhill, Northbrook, and Michael Greenhill, Deerfield, both of Ill., assignors to Smalley Steel Ring Company, Wheeling, Ill.

Filed May 3, 1988, Ser. No. 189,651
Int. Cl.[4] F16F *1/06*
U.S. Cl. 267—166 **22 Claims**



1. In a crest-to-crest compression spring formed from a continuous elongate flat wire strip which is generally spirally wound in a circle around a longitudinal spring axis and a com-

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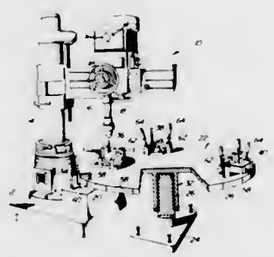
mon edge of the strip to form a plurality of individual spring turns lying adjacent each other so as to form a multiturn compression spring, each spring turn comprising a plurality of successive waves which waves include separate wave crest and wave trough portions, the improvement comprising three distinct wave regions wherein the amplitude of the waves disposed in one region generally differs from the amplitude of the waves in the other two regions, the first wave region being disposed in approximately the center turns of said compression spring and including one or more spring turns, the amplitude of all of the waves in the first wave region being a constant amplitude, the second wave region including two separate second wave region portions disposed generally adjacent to and outwardly of said first wave region on opposite ends thereof and having a free height, said second wave region portions each including at least one spring turn, the amplitude of all the waves in the second region being variable and generally unequal to the first wave region amplitude, said second wave region wave amplitude varying from the first wave region amplitude down to a zero wave amplitude uniformly within said second wave region, the third wave region beginning where said second wave region wave amplitude reaches said zero wave amplitude, said third wave region including two separate third wave region portions disposed generally adjacent to and outwardly of said two second wave region portions, each third wave region including between three quarter and one and one-half spring turns, the amplitude of the wave in each said third wave region being a constant zero amplitude so as to form a flat wave in each of said third wave region portions, whereby said third wave region portions form flat circular shim portions having a substantially uniform thickness at opposite ends of said compression spring which are generally perpendicular to said spring longitudinal axis and which are generally parallel to each other.

4,901,988

AUXILIARY TABLE FOR USE WITH A MACHINE TOOL

Larry E. Wright, and Paul E. Hartley, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 20, 1985, Ser. No. 811,257
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—16 **5 Claims**



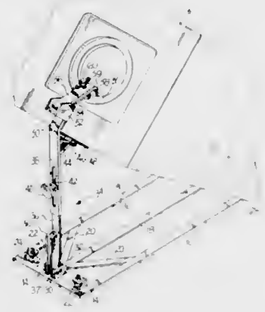
1. In combination with a machine tool having a vertically shiftable spindle and a horizontal table located beneath said spindle, an auxiliary table comprising: a table top support; a horizontal table top; low friction means mounting the table top to the support for horizontal movement along a path extending beneath said spindle and above and very close to the table of the machine tool with an elongate area of said table top being positioned for movement along said path; a clamp means mounted to the table of the machine tool at a location adjacent said path for releasably clamping said table top downwardly against the machine tool table at any one of a plurality of preselected positions, the machine tool table thereby providing additional support for the table top; and a plurality of fixtures mounted to the table top in said elongate area and respectively being associated with said plurality of preselected positions such that when the table top is in one of the preselected positions the associated fixture will be positioned for holding a part correctly for being worked on by a tool carried by the spindle.

4,901,989

APPLIANCE REPAIR TILT STAND AND METHOD OF SUPPORTING AN APPLIANCE IN FORWARDLY TILTED CONDITION FOR SERVICING

Richard J. Stellato, 12425 S.E. River Rd. #2, Milwaukee, Oreg. 97222

Filed Nov. 21, 1988, Ser. No. 274,291
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—17 **6 Claims**



1. An appliance repair tilt stand for use in supporting an appliance to be serviced, the tilt stand comprising:
(a) an elongated base configured for operational disposition on a ground surface, the base having one longitudinal end arranged to be slid under an appliance to be serviced from the front of the latter,
(b) an appliance stop member mounted on the base adjacent the said one end, the stop member arranged to abut a front lower frame of an appliance positioned over the base,
(c) elongated support arm means pivotally connected at one of its ends to the base adjacent the end opposite said one end,
(d) appliance support means on the elongated support arm means, the appliance support means configured to engage and support the outer front wall of an appliance positioned on the base and tilted forwardly against the appliance support means, and
(e) appliance engaging means on the elongated support arm means, the appliance engaging means configured to securely engage the appliance and positively hold the appliance on the stand with its front wall supported by said appliance support means.

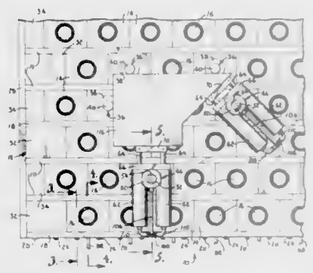
4,901,990

MACHINE TOOL FIXTURE WITH AIR SUPPLY SYSTEM

Simon P. Frechette, 1641 Buchanan St., Topeka, Kans. 66604

Filed May 26, 1987, Ser. No. 54,309
Int. Cl.[4] B23Q *7/00*
U.S. Cl. 269—25 **12 Claims**

1. A machine fixture for locating a workpiece relative to a machine tool, said fixture comprising:
a table having a working surface;
a plurality of openings in said working surface arranged in a grid pattern thereon;
a plurality of pegs each having a body portion and a size and shape to be inserted in each of said openings with the body portion of the peg disposed out of the opening;
a power operated actuator mounted on the body portion of each peg, said actuators having respective guide elements movable by the actuators into engagement with selected portions of the workpiece to hold the workpiece in a selected location on the table for machining operations carried out by the tool; and



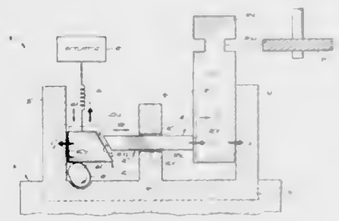
means for applying power to each actuator when the corresponding peg is inserted in any opening, said power applying means being operable to apply power to each of said openings and through any peg inserted therein to the actuator mounted on the peg.

4,901,991

WORKPIECE CLAMPING DEVICE

Ritchie G. Bonkowski, 160 S. "A" St., Tustin, Calif. 92680

Filed Jan. 6, 1988, Ser. No. 141,327
Int. Cl.[4] B25B *5/04*
U.S. Cl. 269—234 **19 Claims**



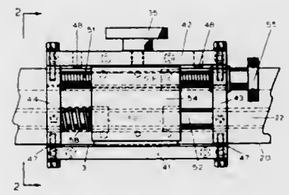
1. A clamping device comprising:
a fixture having a force containing portion of a generally U-shaped cross section, wherein opposed vertically directed segments of the U-shaped force containing portion define first and second fixture walls;
a first movable jaw piece, mounted to a fixture between the first and second fixture walls so as to reciprocate laterally toward and away from the fixture walls and having an inclined portion facing one of the walls;
a movable wedge, disposed between the first jaw piece and the first fixture wall, the wedge being adapted to reciprocate vertically and being shaped to include a first inclined portion which faces one of the walls and is engagable with the inclined portion of the first jaw piece to thereby drive the first jaw piece in the lateral direction; and
actuator means, coupled to the wedge, for driving the wedge in the vertical direction.

4,901,992

STOCK STOP

Nicholas J. Dobeck, Wausau, Wis., assignor to Quantum Machine Services, Inc., Wausau, Wis.

Filed Jun. 30, 1986, Ser. No. 880,474
Int. Cl.[4] B23Q *15/00*
U.S. Cl. 269—315 **2 Claims**



1. A device for error correcting positioning of a piece of stock upon which a machine operation is to be performed, comprising:
stock support means; adjacent track means; a stop assembly which partially surrounds and slides along said track means; a stop against which an end of a piece of stock resting on said stock support means may be positioned, said stop being mounted on said stop assembly for limited movement with said assembly such that said stop may be moved a limited distance within said stop assembly; a means for securing said stop assembly at any point along said track means; a fine adjustment mechanism within said stop assembly for moving said stop a limited distance within said stop assembly to re-position said stop after an initial operation and error measurement whereby said stop positions said piece of stock so that said machine operation is subsequently performed at a desired position along said piece of stock; means for manually activating said fine adjustment mechanism;
said fine adjustment mechanism comprising:
a block; said stop being mounted on said block and comprising a bar extending perpendicular to said block; a screw extending through said block and horizontally mounted within said stop assembly with one end of said screw extending through one side of said stop assembly; a means for receiving said screw mounted within said block such that when screw is turned, said block moves along said screw; a rod horizontally mounted within said stop assembly parallel to said screw and passing through said block; and a spring surrounding said rod between an end of said block and a side of said stop assembly such that said spring removes any slack between said screw and said receiving means.

4,901,993

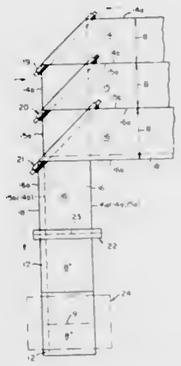
METHOD OF PRODUCING A MULTI-SHEET FOLDED PRINTED PRODUCT

Egon Hänsch, Wetzikon, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Continuation of Ser. No. 929,907, Nov. 13, 1986, abandoned, which is a division of Ser. No. 555,688, Nov. 28, 1983. This application Mar. 13, 1989, Ser. No. 322,295
Claims priority, application Switzerland, Dec. 13, 1982, 7251/82
Int. Cl.[4] B41F *13/56*
U.S. Cl. 270—21.1 **16 Claims**

1. A method of producing a multi-sheet folded printed product, comprising the steps of:
forming at least two printed product strands such that each one of said strands defines a predetermined longitudinal edge;
superposing said at least two printed product strands such

that one printed product strand thereof provided with information intended for an innermost printed sheet in an intermediate folded printed product is positioned such that said longitudinal edge of said one printed product strand laterally protrudes past the other printed product strand;



cutting said superposed at least two printed product strands in a direction extending transversely relative to said longitudinal edges thereof conjointly in order to form an intermediate product comprising superposed printed sheets with their cut edges being in alignment; and

conjointly folding said superposed printed sheets such that one printed sheet formed from said one printed product strand forms said innermost printed sheet.

4,901,994

COPYING APPARATUS HAVING A SORTER WITH A SHEET STAPLING FUNCTION

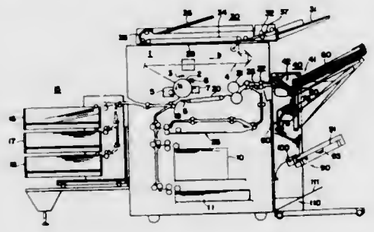
Kuniaki Ishiguro, and Takuma Ishikawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 8, 1988, Ser. No. 216,701

Claims priority, application Japan, Jul. 10, 1987, 62-172387; Jul. 10, 1987, 62-172388; Jul. 11, 1987, 62-173536; Aug. 21, 1987, 62-208491; Sep. 16, 1987, 62-231497; Sep. 16, 1987, 62-231502; Jan. 12, 1988, 63-5580

Int. Cl.[4] B42B *1/02*

U.S. Cl. 270—53 **13 Claims**



1. A copying apparatus having a function of stapling sheets having document images formed thereon by image forming means and comprising:

means for inputting the number of copy sets which inputs the number of copies to be prepared from one document;

sorting means having a plurality of bins capable of independently moving up or down, wherein sheets are sorted into said bins sequentially from the top bin to the bottom bin;

take-out means disposed below said sorting means and capable of taking the stored sheets out of each bin;

means for stapling the sheets taken out of each bin;

first control means which, after the sorting operation, moves each bin having sheets stored to the position where sheets are taken by said take-out means; and

second control means which, during the sorting operation, moves bins other than those assigned for the input number of copy sets, below said take-out means.

4,901,995

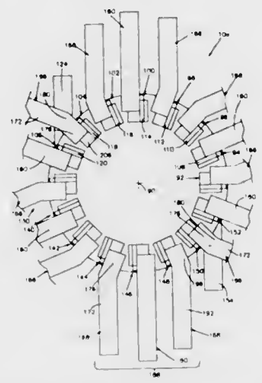
APPARATUS FOR USE IN FORMING SHEET MATERIAL ASSEMBLAGES

Edward L. Kempisty, Rouses Point, N.Y., assignor to AM International Incorporated, Chicago, Ill.

Filed Jun. 13, 1988, Ser. No. 206,000

Int. Cl.[4] B65H *39/02*

U.S. Cl. 270—54 **9 Claims**



1. An apparatus for use in forming sheet material assemblages, said apparatus comprising a plurality of feed stations disposed in an arcuate array, a circular array of pockets, means for sequentially moving each pocket in said circular array of pockets through a lower portion of each of said feed stations, feed means at an upper portion of each of said feed stations for feeding sheet material downwardly into each of said pockets in turn to form sheet material assemblages, delivery conveyor means for receiving a sheet material assemblage from a lower portion of each of said pockets in turn and conducting sheet material assemblages away from said circular array of pockets, and loader conveyor means for supplying sheet material to a feed means at one of said feed stations, said loader conveyor means being disposed above and extending across said delivery conveyor means to said one feed station, said loader conveyor means including a first conveyor section having a central axis which, as viewed in a horizontal plane, is skewed relative to a radius of said circular array of pockets and extends through said one feed station, a second conveyor section having an central axis which, as viewed in a horizontal plane, extends parallel to said radius through said one feed station, and a bend section which interconnects said first and second sections, said first, second and bend sections of said loader conveyor means including surface means for supporting the sheet material in a continuous stream which extends through said bend section, said loader conveyor means further including guide surface means extending between said first and second sections for engaging and turning the continuous stream of sheet material as it moves through said bend section.

4,901,996

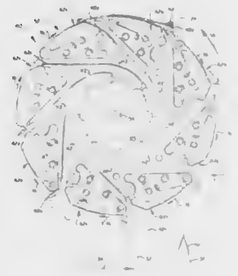
APPARATUS AND METHOD FOR FEEDING SHEET MATERIAL FROM A STACK FOR A COLLATING CONVEYOR

James R. Schlough, Morrisonville, N.Y., assignor to AM International Incorporated, Chicago, Ill.

Continuation of Ser. No. 928,896, Nov. 10, 1986, abandoned. This application Sep. 15, 1988, Ser. No. 244,937

Int. Cl.[4] B65H *3/42, 5/00, 5/32*

U.S. Cl. 271—10 **22 Claims**



1. An apparatus for feeding signatures from a hopper, said apparatus comprising:

a rotatable drum;

first feed means mounted on said drum for feeding a first signature from the hopper during rotation of said drum through a predetermined arcuate distance; and

second feed means mounted on said drum for partially feeding a second signature from the hopper during rotation of said drum through a second arcuate distance during the feeding of the first signature from the hopper;

said second feed means including means for engaging the second signature and initiating feeding of the second signature from the hopper while said first feed means is feeding the first signature from the hopper;

said first feed means including first belt means for feeding the first signature from the hopper to said drum;

said second feed means including second belt means for feeding the second signature from the hopper to said drum; and

means driven with said first belt means for feeding the first signature from the drum.

4,901,997

PLAY ENCLOSURE FOR ARTWORK, PAPERWORK, SAND AND WATER PLAY USE

Nevada Varga, R.D. #2, Box 401 A, Milford, N.J. 08848

Continuation of Ser. No. 180,524, Apr. 12, 1988, Pat. No. 4,817,935. This application Mar. 9, 1989, Ser. No. 321,167

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] A63G *31/00*

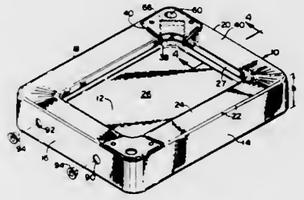
U.S. Cl. 272—1 A **11 Claims**

1. An enclosure for interchangeable use for more than one of artwork, paperwork, sand play, water play and the like, comprising:

a receptacle structure with an open top;

a shelf extending from upper edges of the open top, the shelf having a top surface wide enough to define one of a seat and a table surface, the shelf having at least one area for receiving inserts; and,

at least two interchangeable insert elements removably engageable with said areas for receiving inserts, the interchangeable insert elements being different from one another and individually having means useful specifically for



at least one of said artwork, paperwork, sand play and water play.

4,901,998

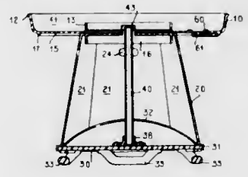
MULTI-FUNCTIONAL ACTIVITY TABLE

Betty L. Griffith, 507 Nelson Ferry Rd., Decatur, Ga. 30030

Filed Mar. 23, 1989, Ser. No. 327,683

Int. Cl.[4] A63G *31/00*

U.S. Cl. 272—1 A **12 Claims**



1. A multi-functional activity table comprising:

(a) a reversible top having a generally flat section with a hole formed therein and a pair of annular collars which surround the hole, the collars projecting from the flat section in opposite directions relative to each other;

(b) a pedestal that is in the form of a hollow frustrum of a regular pyramid, the pedestal having a through passageway which extends the length of the pedestal; the minimum width of a transverse cross-section of the passageway at a first end thereof being slightly greater than the outer diameter of each of the annular collars, so that each of the collars can be inserted into said first end of the pedestal;

(c) a base;

(d) an elongated structure;

(e) means connected to the base for anchoring the elongated structure thereto, the elongated structure extending upwardly along said passageway from the base and through the hole in the top; and

(f) means detachably connected to the elongated structure above the hole for holding the top in a fixed relationship to the base.

4,901,999

HAND, WRIST, AND FOREARM FRICTION RESISTANCE EXERCISE DEVICE

Lawrence A. Schott, 15940 Warwick, Detroit, Mich. 48223

Filed Nov. 9, 1988, Ser. No. 269,077

Int. Cl.[4] A63B *23/00*

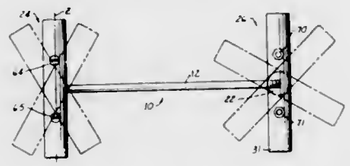
U.S. Cl. 272—67 **7 Claims**

2. An isometric exercise device for the hand, wrist, and forearms which requires equal and opposite forces to move the device from and to initial positions, comprising:

(a) an elongate bar,

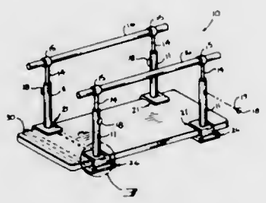
VOL 1111 ISS 3 FE 20 1990 UMI

(b) handles encompassing each end of said bar disposed in position generally transverse of said bar,
(c) means on said bar and on each said handle to mount said handles for manual movement about the ends of said bar for essentially universal motion, and



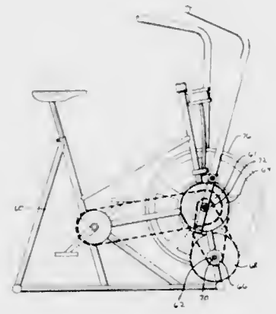
(d) said means including an adjustable torque control to provide resistance to said manual movement to require muscular effort to achieve said movement.

4,902,000
TODDLER WALKING TRAINER
Robert D. Starks; John H. Starks, Jr., and Nola Zarate, all of 81 So. 24th St., Kansas City, Kans. 66102
Filed Feb. 16, 1989, Ser. No. 310,887
Int. Cl.[4] A63B *1/00*
U.S. Cl. 272—70 **4 Claims**



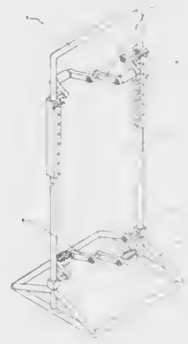
1. A toddler walking trainer apparatus comprising, in combination,
a first horizontal rail spaced from a second horizontal rail, and each rail including a rod pair including a first and second spaced rod orthogonally secured at an upper terminal end of each rod to a respective first and second rail, and
each first and second rod slidably mounted within a respective first and second support post, and
the respective first support posts aligned relative to one another, and
the respective second support post aligned relative to one another, and
each first and second support post secured at a lowermost end to a rigid "U" shaped jaw, and
opposed "U" shaped jaws secured to the spaced first and second posts to comprise a clamp pair, and
wherein each clamp pair is slidingly received within and aligned by a connecting member, and a resilient mat secured and received within each "U" shaped jaw of each clamp pair and positioned between the opposing "U" shaped jaws to provide a protective cushion surface below the rails.

4,902,001
CYCLE EXERCISER
Joseph Balbo, 2450 E. Sprague Rd., Broadview Heights, Ohio 44147
Filed Oct. 30, 1987, Ser. No. 114,856
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—73 **11 Claims**



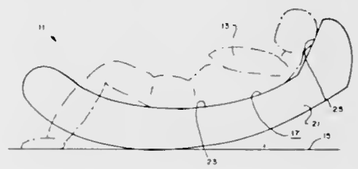
1. A cycle exerciser including:
a frame;
a seat mounted on said frame;
rotational energy absorbing means mounted on said frame;
a substantially horizontal first drive shaft having two ends rotatably carried by said frame;
first drive means connecting said first drive shaft to said energy absorbing means to cause rotation thereof in response to rotation of said first drive shaft;
a first pair of drive crank arms each secured to opposite end portions of said first drive shaft and extending laterally therefrom in opposite directions;
two foot pedal arms;
connecting means through which each said foot pedal arm is fixedly secured to the outer end of a respective said first drive crank arm to permit rotation of said drive shaft by foot operation;
a substantially horizontal second drive shaft having two ends rotatably carried by said frame;
a second pair of crank arms each secured to opposite end portions of said second drive shaft and extending laterally therefrom in opposite directions;
second drive means connecting said second drive shaft to said energy absorbing means to cause rotation thereof in response to rotation of said second drive shaft;
a portion of said first drive means being common to a portion of said second drive means, that portion not being common to the said two drive means comprising a synchronous drive means operatively engaging said first drive shaft with said second drive shaft, which said synchronous drive means causes said two drive shafts to turn synchronously;
two handlebar arm levers pivotally mounted on said frame for oscillating movement about a mounting pivot thereof;
and means rotatably and slidably attaching each said arm lever to each respective said second drive crank arm to permit rotation of said energy absorbing means by hand operation of said arm levers.

4,902,002
EXERCISE APPARATUS
Kou-Min Huang, #181, Lane 412, Chen-hsing Rd., Tai-Chung, Taiwan
Filed Oct. 28, 1988, Ser. No. 264,064
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—73 **7 Claims**



2. An exercise apparatus comprising:
a supporting frame having a vertical stand having a first leg and second leg and a base, the legs of the stand being received by and supported in an upright position by the base, the stand having an upper part and a lower part;
a hand exercising mechanism rotatably mounted on the upper part of the stand transversely between the legs of the stand;
means for adjusting the vertical position of the hand exercising mechanism with respect to the base as desired to meet the requirements of the user wherein said means for adjusting the vertical position of the hand exercising mechanism comprises a first and a second position adjusting device, each position adjusting device being mounted on the upper part of the stand on the first leg and on the second leg respectively, each position adjusting device having a rectangular body having a vertical slotted opening therein, the slotted opening having a first side and an opposite second side, further having a series of vertically spaced semi-circular pockets communicating with the first side of the slotted opening, each pocket having a diameter, the second side of the slotted opening further communicating with a series of vertically spaced tapped screw holes, the screw holes being aligned opposite to the pockets, a threaded screw rod with handle removably received by the screw hole such that the screw rod with handle may be disposed in the screw opening and communicate with the pocket opposite thereto, the hand exercising mechanism having a first shaft and a second shaft, each shaft having an outside diameter less than the diameter of the pocket in the position adjusting device such that the shafts of the hand exercising mechanism may be received in the desired pockets in the position adjusting device and may be secured therein with the screw rod with handle;
a foot exercising mechanism rotatably mounted on the lower part of the stand transversely between the legs; and
such that the hand exercising mechanism and the foot exercising mechanism are substantially parallel to one another, the hand exercising mechanism and the foot exercising mechanism being both independently operable and operable concurrently.

4,902,003
EXERCISE DEVICE AND METHOD
Nick J. Buoni, 3655 Southern, Apt. D, Memphis, Tenn. 38111
Filed Sep. 23, 1985, Ser. No. 778,665
Int. Cl.[4] A63B *23/02*
U.S. Cl. 272—93 **3 Claims**



1. An exercise device for use by an exerciser doing sit-up type exercises to stress the exerciser's stomach muscles, said device comprising:
(a) support means for supporting the exerciser's body with the majority of the exerciser's trunk maintained at a first curve and with the exerciser's neck maintained at a second curve having a smaller radius than said first curve as the exerciser does sit-up type exercises, said support means having a curved supporting surface for causing the exerciser's back to curve forwardly and for preventing the exerciser's back from straightening from the curved position during the sit-up type exercises, said curved supporting surface having a first curved position for supporting the majority of the exerciser's trunk and a second curved portion for supporting the exerciser's head, said second curved portion having a smaller radius than said first curved portion; and
(b) base means attached to said support means for allowing said support means to rock back and forth on a floor surface along a plane substantially aligned with the longitudinal axis of the exerciser's trunk while preventing said support means from rocking back and forth on the floor surface along any plane not substantially aligned with the longitudinal axis of the exerciser's trunk as the exerciser does sit-up type exercises and for allowing the exerciser's shoulder to rock forward while preventing the exerciser's back from straightening from the curved forwardly position, while keeping the exerciser's knees bent and while keeping the exerciser's feet on the floor surface.

4,902,004
EXERCISE HOOP
Michael J. Gerlach, 13461 Lake Shore Dr., Herndon, Va. 22071
Filed Sep. 28, 1988, Ser. No. 250,172
Int. Cl.[4] A63B *25/08*
U.S. Cl. 272—114 **45 Claims**

1. An exercise device for bouncing a user carried by the device from a utility surface, comprising:
a non-metallic annular resilient spring means having a peripheral annulus of a selected diameter, radial thickness, and axially extending width for bouncing a user within a predetermined weight range off the utility surface engaged by the annulus upon the flexing of the annulus in response to a jumping motion of the user;
elongate means having first and second end portions defining a longitudinal axis extending therebetween, the elongate means being fixedly mounted adjacent the first and second end portions thereof to the annulus at respective diametrically opposed first and second locations, the first and second end portions being compressible and expandable toward and away from one another respectively along the defined longitudinal axis, the elongate means maintaining substantial symmetry of flexure of the annulus in response to a compressive and recovery force in the direction of the defined longitudinal axis;

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a foot support mounted on either one of said annulus and said elongate means for supporting the weight of a user at times when the annulus is upright and engaging the utility surface at the first location, said support being mounted to



move with the annulus adjacent the second location and relative to the annulus adjacent the first location; and

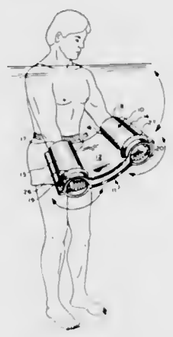
a handle means mounted spaced from the foot support for grasping by a user standing on the foot support.

4,902,005

WATER RESISTANCE TYPE EXEXERCISE MACHINE FOR ARMS

Michael R. McNeill, 2 Circle Dr., Hawthorn Woods, Ill. 60047

Filed Dec. 2, 1988, Ser. No. 279,025
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—116 **21 Claims**



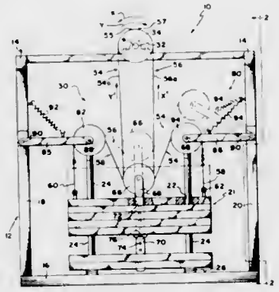
1. A water exercise device for use under water including a main body comprised of a light weight synthetic plastic, the body having a fan-shaped intermediate body section, a pair of tubular sections at opposite margins of the fan-shaped body section, the tubular sections having diverging axes that are closer at inner ends of the body, the tubular sections having inner and outer open ends and with the tubular sections being of such diameter for receiving hands and forearms of a person when extended through the inner ends of the tubular sections, and hand grips held in each of said tubular sections generally at the outer ends thereof, the hand grips being grasped when the arms are extended through the inner ends into the tubular sections and then into contact with the hand grips.

4,902,006

ARM EXERCISE APPARATUS

Glenn E. Stallings, Jr., 5706 Fair Ave., #213, N. Hollywood, Calif. 91601

Filed May 20, 1988, Ser. No. 196,671
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **15 Claims**



1. An arm exercise machine comprising:

a frame;

a weight stack comprised of individual weight plates mounted on said frame for vertical movement thereon;

means for moving selected ones of said weight plates between lowered positions and elevated positions comprising:

drive means rotatably mounted on said frame;

first and second idler sheaves rotatably mounted on said frame;

a third idler sheave;

means for mounting said third idler sheave on said weight stack including means for selectively detachably coupling said third idler sheave to any selected one of weight plates such that said selected one of said weight plates and all of said weight plates thereabove are concurrently moved upwardly and downwardly between said lowered positions and said elevated positions;

first line means coupled at one end to the uppermost one of said weight plates and at its opposite end to said drive means and trained around said first and third idler sheaves;

second line means having one end coupled to said uppermost weight in said stack and the opposite end thereof coupled to said drive means and trained around said second and third sheaves such that when said drive means is rotated in one direction said selected weight plates will be moved by said first line means between said lowered positions and said elevated positions and when said drive member is rotated in the opposite direction said selected weight plates will be moved by said second line means between said lowered positions and said elevated positions.

4,902,007

EXERCISING MACHINE OPERABLE TO ASSIST OR RESIST THE EXERCISE

Carlo V. G. Ferrari, Alicante, Spain, assignor to Fittagym Ltd., London, United Kingdom

Continuation of Ser. No. 14,070, Mar. 30, 1987, abandoned. This application Sep. 12, 1988, Ser. No. 243,439
Claims priority, application United Kingdom, Jun. 6, 1985, 8514360; PCT Int'l Appl., Jun. 6, 1986, PCT/GB86/00326
Int. Cl.[4] A63B *21/00, 21/06, 21/22*
U.S. Cl. 272—126 **7 Claims**

1. An exercise machine comprising:

(a) a base support,

(b) a seat mounted on the base support and a back rest mounted adjacent thereto and cooperating therewith to support a user in an exercising position,

(c) a load member pivotably connected to the base support and having resistance means selectively and continuously movable theralong to bias the load member about its pivot by a selectively variable couple load,

(d) a first exercise member movable by a part of the body to cause the load member to pivot against said resistance means and provide resistance exercise,

(e) a second exercise member movable by another part of the body,

(f) a rigid linkage connectable between the second exercise member and the load member in first and second selectively available configurations,



(g) the linkage in said first configuration being so arranged that force applied to said second member assists movement of the load member against the resistance means,

(h) the linkage in said second configuration being so arranged that force applied to said second member in the same direction as said assisting force resists movement of the load member against the resistance means,

(i) said second exercise member being a pivotable lever so mounted that in said first configuration said linkage is connected to the lever on one side of its pivot axis and in said second configuration said linkage is connected to the lever on the other side of its axis, and

(j) manual actuating means including groove-and-stud engageable means for selective engagement of the linkage to the lever on respective opposite sides of the pivot axis of the lever, whereby the linkage may be readily interchanged between said first and second configurations.

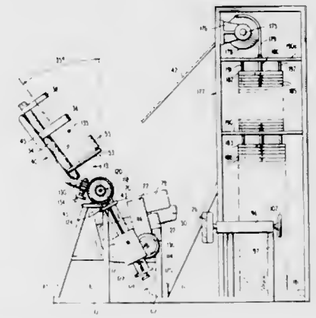
4,902,008

METHOD AND APPARATUS FOR TESTING OR EXERCISING MUSCLES OF THE LOWER TRUNK OF THE HUMAN BODY

Arthur Jones, 1155 N.E. 77th St., Ocala, Fla. 32670

Division of Ser. No. 60,679, Jun. 11, 1987, Pat. No. 4,836,536.
This application Oct. 18, 1988, Ser. No. 259,305
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **20 Claims**

1. A method of testing or exercising muscles of the lower trunk of a human for purposes of testing the strength of or exercising said muscles comprising the steps of: restraining the pelvis against movement to thereby substantially prevent movement of the gluteus and hamstring muscles and applying with the muscles of the lower trunk a force to urge the upper body against the bias of a resistance, and wherein said force urges the upper body against an object of resistance, and



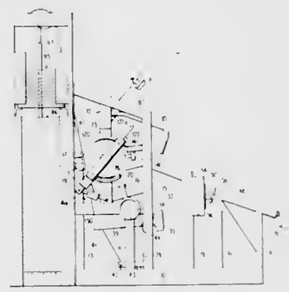
wherein the arms and head are held in fixed positions relative to the object of resistance.

4,902,009

MACHINE FOR EXERCISING AND/OR TESTING MUSCLES OF THE LOWER TRUNK, AND METHOD

Arthur Jones, 1155 NE. 77th St., Ocala, Fla. 32670

Continuation-in-part of Ser. No. 60,679, Jun. 11, 1987, Pat. No. 4,836,536, which is a continuation-in-part of Ser. No. 181,372, Apr. 14, 1988, Pat. No. 4,834,365. This application Aug. 25, 1988, Ser. No. 236,367
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **36 Claims**



1. In a machine for exercising the muscles of the lower trunk of the human body, the machine including in combination, a seat for receiving the body in sitting position, a movement arm mounted for pivotal movement about a generally horizontal first axis, a resistance pad mounted to the movement arm to be engaged by an upper trunk portion of the body to pivot the movement arm through forces applied by said muscles, said pad being movable relative to the movement arm about a generally horizontal axis to accommodate different angular positions of the trunk relative to the movement arm, and means associated with the pad for measuring the angular position of said pad relative to the movement arm for determining the effective force applied to the movement arm to pivot the same about said first axis.

10. In a machine for exercising muscles of the lower trunk of the human body, apparatus for preventing movement of the pelvis during such exercise, the apparatus including in combination, a seat for receiving the body in sitting position, a pelvic

pad located rearwardly of the seat for engaging and restraining the pelvis at the rear thereof, a strap overlying the seat for engaging and restraining the thighs of the body to prevent upward movement of the thighs off said seat, and a leg pad in front of the seat and engageable against the front of the legs at an upward angle relative to the horizontal to drive and maintain the pelvic-ends of the femurs downwardly with the belt acting as a fulcrum to thereby prevent movement of the pelvis.

22. A machine for testing or exercising muscles of the lower trunk of the human body, the machine comprising in combination, a seat for seating a subject whose muscles are to be tested or exercised, a movement arm mounted for pivotal movement about a horizontal axis and positioned relative to the seat to be engaged by the trunk of the subject for pivoting the movement arm upon application of a force by said muscles, an adjustable counterweight assembly including a counterweight carrier including at least one counterweight, means mounting the carrier for vertical movement relative to the pivotal axis of said movement arm, and means for releasably connecting the counterweight carrier to the movement arm for counterbalancing the moment of the torso mass of the subject on the movement arm when the subject is seated on said seat said last defined means including securement means on the carrier and movable relative to the carrier for releasably engaging the movement arm.

36. A machine for exercising the muscles of the lower trunk of the human body comprising in combination a shaft a movement arm mounted for rotation about said shaft under a force applied by said muscles, a resistance weight to be moved upon pivotal movement of said movement arm, and means for operatively connecting the movement arm to said resistance weight including a sprocket mounted for movement about said shaft, a cable trained at one end about said sprocket and connected at the opposite end to the resistance weight, a drive arm pivotally mounted to said shaft and connected to said movement arm to move with said movement arm, said drive arm having means engageable with said sprocket to drive the sprocket upon rotation of said movement arm and being releasable from said sprocket to disengage said sprocket from said movement arm, said drive arm being pivotal relative to said shaft in one direction for engaging the sprocket and in an opposite direction for disengaging the sprocket from the movement arm.

4,902,010

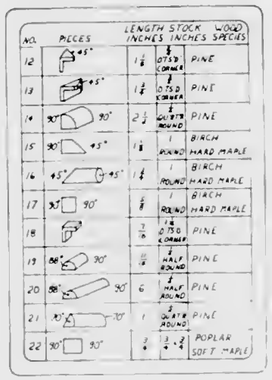
BALANCING SKILL GAME

Jean A. Davis, 3174 Briarhill, Milford, Mich. 48042, and William R. McDunnough, 6240 Bullard Rd., Fenton, Mich. 48430

Continuation of Ser. No. 894,284, Aug. 7, 1986, abandoned. This application Nov. 16, 1988, Ser. No. 272,227
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—1 GF **5 Claims**

1. Parlor game sets of blocks, each set being identical to the other sets and comprising individual sets of blocks each having a plurality of differing solid geometric shapes, surface textures and at least some of said blocks in each set appearing to be of common shape but actually differing from the common shape an amount not easily discernable to the eye, said differences from the common shape being identical to the corresponding blocks of the other sets of blocks for the same parlor game,

the blocks further differing in the density of the materials from which the blocks are constructed and in each set at least one of the blocks includes at least two parallel planar surfaces with a uniform cross-section therebetween and the center of gravity of the block so located that level placement of the block on one of the two parallel planar



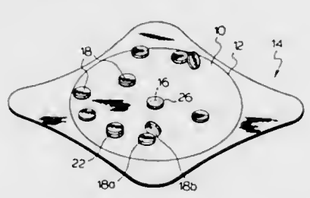
surfaces causes the block to topple whereas level placement on the other planar surface leaves the block stable.

4,902,011

MAGNETIC GAME APPARATUS

Douglas D. Seaton, 482 Wellington St. W., Toronto, Ontario, Canada (M5V 1E3)

Filed Jul. 13, 1988, Ser. No. 220,436
Claims priority, application Canada, Oct. 17, 1986, 520721
Int. Cl.[4] A63B *9/00*
U.S. Cl. 273—1 GD **3 Claims**



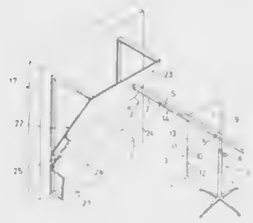
1. A magnetic game consisting, in combination, of, a planar playing surface having a predetermined boundary defining a playing area, a surface location marked on said playing surface, a first set of a plurality of imperforate magnetic playing pieces each in the shape of a two sided circular disc and having a north polarity on one side and a south polarity on the other side, a second set consisting of a single imperforate magnetic playing piece in the shape of a two sided circular disc and having a north polarity on one side and a south polarity on the other side said single playing piece being marked to distinguish said single playing piece from the first set of playing pieces, and intended to be seated on said surface location, said planar surface being provided by a rough-textured surface selected from a surface from the group consisting of the surfaces of a leather sheet, canvas sheet, plastics sheet, etched glass plate, plywood and paper board, and said first set of playing pieces and said second set of a single piece having means for identifying the said north and south polarities and having sufficient pole strengths for balancing of a playing piece obliquely on its edge in proximity to but spaced from a flat-lying, unrestrained disc of like upward-facing polarity randomly located within the playing area.

4,902,012

BALL GAME PRACTICE APPARATUS

Shigeru Kita, 2-2-3, Showa-cho, Abeno-ku, Osaka, Japan

Filed Jan. 11, 1988, Ser. No. 142,528
Int. Cl.[4] A63B *69/38*
U.S. Cl. 273—29 A **6 Claims**



1. A ball game practice apparatus comprising:

a ball;

an elongated horizontally extending frame member supported above a support surface by support means;

a first elongated elastic member having first and second ends, said ends being spaced apart and fixed to said frame member at spaced locations thereon, said first elastic member extending substantially along the length of said frame member;

a second elastic member having a first end and a second end, said first end of said second elastic member being fixed to said first elastic member at a point located between said first and second ends of said elastic member and said second end of said second elastic member being fixed to said ball, said second elastic member thereby suspending said ball;

limiting means on said frame between said first and second end of said first elastic member for limiting downward movement of said first elastic member intermediate said first and second ends; and

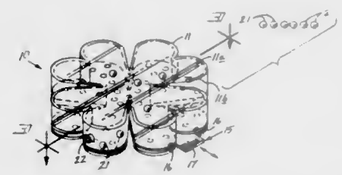
a rebounding board having a surface against which said ball can rebound when struck, said surface including a plurality of arbitrarily arranged rebounding faces positioned adjacent at least one end of said elongated frame member.

4,902,013

LOTTERY NUMBER SELECTION DEVICE

Ronald E. Salerno, 851 Pauline Ave., Columbus, Ohio 43224

Filed Nov. 7, 1988, Ser. No. 268,062
Int. Cl.[4] A63F *7/04*
U.S. Cl. 273—138 R **6 Claims**



1. A lottery number selection device for selecting a random series of numbers from a finite group, said device comprising,

a transparent housing means for enabling visual observation of an interior defined by said housing, and

said housing including a top, sides, and projection means underlying said sides for slotting securement of a bottom member, said bottom member including a plurality of numbered depressions, and a further plurality of spheres wherein said plurality of depressions substantially exceeds the further plurality of spheres wherein said spheres are selectively positionable within said housing and,

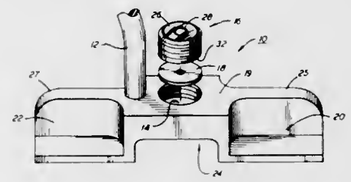
wherein said bottom member is of a like configuration to said top, and further includes a stem extending outwardly of said bottom member and projects outwardly of said housing when said bottom member is positioned within said housing.

4,902,014

GOLF PUTTER WITH SIGHTING DEVICE

Anthony J. Boatomase, 7586 Rome Rd., and David A. Bontomase, Rt. 3, R.D. #2, both of Pulaski, N.Y. 13142

Continuation-in-part of Ser. No. 81,699, Oct. 5, 1987, abandoned. This application Jun. 30, 1988, Ser. No. 213,366
Int. Cl.[4] A63B *69/36, 53/04*
U.S. Cl. 273—162 B **7 Claims**



1. A golf putter including a sighting device comprising, in combination:

(a) a golf putter blade having an essentially planar upper surface attached to an elongated shaft with handle portion;

(b) a circular, internallly threaded cavity extending into said blade upper planar surface;

(c) a cylindrical, externally threaded core of substantially the same diameter as said said cavity and including two essentially planar end surfaces; and

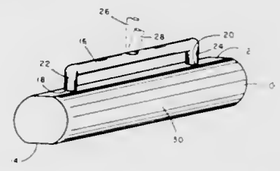
(d) a circular liquid level of substantially the same diameter as, and affixed to one of said end surfaces of, said core.

4,902,015

GOLF PUTTER

David G. Nebbia, York Harbor, Me., assignor to Panther Golf Corporation, Reading, Mass.

Filed May 31, 1988, Ser. No. 200,550
Int. Cl.[4] A63B *53/02*
U.S. Cl. 273—168 **2 Claims**



1. An improved golf putter of the type having a club shaft attached thereto comprising:

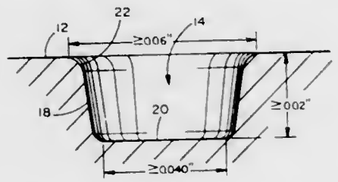
a putter head being generally cylindrical in shape having a flattened top and bottom forming an upper flat face and a lower flat face, first and second ends, and curved front and rear faces;

a bracket member having a top and bottom with first and second extension members extending downward form the ends thereof, said extension members disposed at right angles to said bracket member, said bracket member hav-

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ing a length approximatley three-quarters the length of said putter head;
a pair of apertures defined in said upper flat face of said putter head, said apertures being disposed equidistant from the ends of the putter head and spaced apart the same distance as the distance said bracket extension members are spaced apart from one another;
said bracket extension members inserted into said pair of apertures on the upper flat face of said putter head and affixed to said putter head;
a shaft aperture defined in a the center of the top of said bracket member for receipt of the shaft of the club.

4,902,016
GOLF CLUB HEAD HAVING A HIGH FRICTION STRIKING SURFACE
David D. Boone, El Toro, Calif., assignor to Lynx Golf, Inc., City of Industry, Calif.
Filed Aug. 8, 1988, Ser. No. 229,265
Int. Cl.[4] A64B *53/04*
U.S. Cl. 273—175 **2 Claims**

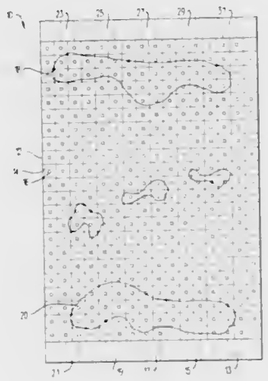


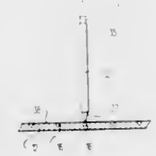
1. An improved golf club head of the type having a planar ball striking surface; the improvement comprising:
a plurality of spaced dimples in said face, each said dimple being at least 0.02 inches in depth and having a truncated circular conical cross-section;
wherein each said dimple comprises a generally planar base having a diameter of at least 0.04 inches; and
wherein each said dimple comprise a curved rim portion which merges tangentially into the adjacent ball striking surface to form a surface diameter of at least 0.06 inches.

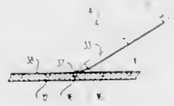
4,902,017
WAR SIMULATION BOARD GAME
John Grammatico, 1836 Bolker Pl., San Pedro, Calif. 90731
Filed Jul. 10, 1989, Ser. No. 377,335
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—240 **20 Claims**

1. A war simulation board game, comprising:
a playing board having a grid pattern formed by a plurality of segments;
indicia identifying a target zone on each of said segments;
at least two opposing game pieces for movement on said grid;
and
a writing implement for determining simulated projectile path lines on said playing board between said target zones.

11. A method of playing a war simulation board game, comprising the steps of:
providing:
a playing board having a grid pattern formed by a plurality of segments;
indicia identifying a target zone on each of said segments;
at least two opposing game pieces for movement on said grid;
an elongated writing implement having an operative tip portion and an opposite butt portion;
sequentially moving said game pieces on said segments by game players;
and
selectively simulating firing at opposing game pieces by placing said tip portion of said writing implement on a target zone of one of said segments, standing said writing implement in a generally vertical position supported solely by player contact with said butt portion applying an





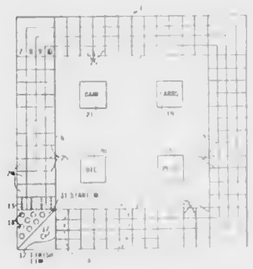


external force to said writing implement forcing said tip portion to slide freely away from said target zone and thereby causing the release of player contact with said butt portion, friction between said sliding tip portion and playing board surface forming a simulated projectile shot path indicia on said playing board toward a target zone of a segment occupied by an opposing game piece.

4,902,018
METHOD OF PLAYING A MODIFIED CRIBBAGE GAME UTILIZING CARDS AND DICE
Vicki M. Morse, P.O. Box 135, St. Albans, Me. 04971
Division of Ser. No. 124,684, Nov. 24, 1987, Pat. No. 4,854,586.
This application Mar. 30, 1989, Ser. No. 331,270
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—249 **3 Claims**

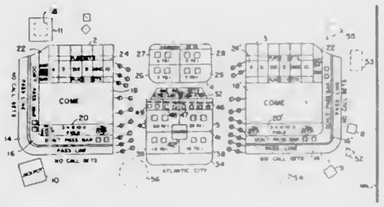
1. A method for playing an improved game of cribbage, comprising the following steps:
(a) using, in combination with fifty-two playing cards including four suits of cards with diamonds, spades, clubs and hearts, wherein an ace equals one point, two to ten each equal face value, and jacks, queens and kings each equal

ten points for introducing first chance elements into the game by establishing cribbage score points, at least one die for introducing second chance elements into the game, score keeping means in the form of action locations along tracks, said action locations determining extra score points and a winning score number, at least some action locations having different determined characteristics for introducing third chance elements into the game, and at least two game bits for each player,
(b) throwing said die to determine which player deals,



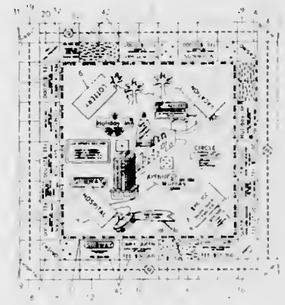
(c) moving each player's game bits along the action locations only of his track in accordance with said cribbage score points and,
(d) thereafter upon landing on one of said action locations, determining said extra score points by throwing said die and additionally moving each player's game bits along the action locations according to the die throw in response to a specified game situation, and
(e) combining said extra score points with said cribbage score points until one player has a total score corresponding to said winning score number.

4,902,019
GAMING LAYOUT ARRANGEMENTS HAVING JACKPOT AREAS
Robert Berman, 1227 Gordon Rd., Jenkintown, Pa. 19046, assignor to John A. DePasquale, New York, N.Y.; George Bradbury, Southport, Conn. and Robert Berman, Jenkintown, Pa.
Filed Dec. 15, 1988, Ser. No. 285,429
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—256 **28 Claims**



17. A gaming layout having gaming possibilities, said layout comprising:
a flat surface having game indicia thereon corresponding to a conventional game having said gaming possibilities;
at least one marker means for throwing on said flat surface to indicate respective ones of said gaming possibilities in accordance with said game indicia;
at least one defined area on said flat surface for receiving said at least one marker thrown on said flat surface, said at least one defined area being provided in addition to said game indicia of said conventional game, said at least one defined area being sufficiently large as to completely contain said at least one marker when said marker is at rest on said flat surface; and
means for designating said at least one defined area a jackpot area when said at least one marker is thrown into and comes to rest in said at least one defined area.

4,902,020
INVESTMENT FRANCHISEMENT GAME AND METHOD OF ADVERTISEMENT
David Auxier, 3405 Hewitt Ave., Silver Spring, Md. 20906
Filed Aug. 2, 1988, Ser. No. 227,868
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—256 **27 Claims**



1. A board game including a playing surface comprises of spaces to which player's tokens are moved according to chance selection during play, comprising:
means for altering chance selected spaces during play of the game to dynamically alter said play, said means including a plurality of preselected cards:
said cards representing business entities for installation by players on one or more of said spaces previously acquired by the player during the course of the game, the acquisition of said spaces and said cards being achieved through a fantasy barter system by the players according to rules of the game; and
said cards bearing indicia identifying contemporary businesses which have purchased the right to be included as part of the game as a means for advertisement, said purchases being the means for preselecting said cards through normal, nonfantasy business practices of barter for real value such as money.

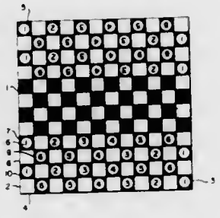
16. A method of playing a board game of the type including a playing surface comprised of spaces over which player's tokens are moved during play, including the steps of:
acquiring said spaces by purchasing them with play money according to the rules of the game;
purchasing with play money, cards representing real contemporary business entities including advertising indicia which was paid for with real money by the business, and
installing said purchased cards on one or more of said spaces previously acquired during the course of the game.

4,902,021
CHECKER AND DICE GAME
Robert C. Burroughs, 20400 Frederick Rd., Lot 1-2, Germantown, Md. 20874
Filed Apr. 11, 1989, Ser. No. 336,914
Int. Cl.[4] A63F *3/02*
U.S. Cl. 273—260 **8 Claims**

1. A checker and dice game comprising a game board, checkers and at least one die, said game board having a checkered layout to position said checkers, said checkers being

numbered individually to match individual corresponding numbers on the face sides of said die, the movement of said checkers having a corresponding function with the throw of said die.

8. A method of playing a checker and dice game comprising the steps of:



providing a checkerboard, at least one die, each face of said die having identifying indicia, and a plurality of checkers, each being marked with one of said identifying indicia;

rolling said die to determine which correspondingly marked checkers is to be moved.

4,902,022

GAME APPARATUS INCLUDING FREE FLOATING GAME ELEMENTS

James E. Salmon, North Vancouver, Canada, assignor to Fanstick Products International, Inc., Vancouver, Canada

Filed Dec. 29, 1988, Ser. No. 291,910

Int. Cl.[4] A63B *67/00*

U.S. Cl. 273—317 **16 Claims**



1. Game apparatus, comprising:

a plurality of game pieces, each of the game pieces being formed of a lightweight material and configured to have an aerodynamic characteristic that provides each of the plurality of game pieces with a wind-resistant profile to cause each of the game pieces to affect a floating action when allowed to fall freely through the air toward the earth;

the plurality of game pieces including first and second numbers of game pieces, the first number of game pieces being substantially identically shaped and configured and of a configuration different from that of the second number of game pieces; and

a resilient spheroid.

4,902,023

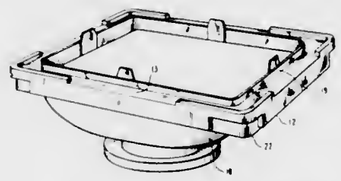
VACUUM SEALING GASKET

Stephen T. Opresko, Lancaster, and Walter E. Root, Strasburg, both of Pa., assignors to Thomson Consumer Electronics, Indianapolis, Ind.

Filed Dec. 12, 1988, Ser. No. 283,441

Int. Cl.[4] H01J *29/87*

U.S. Cl. 277—12 **4 Claims**



1. In a resilient, non-porous gasket for a substantially rectangular vacuum chamber having corners, said gasket having an inner lip for protecting the inside surface of a support frame of said vacuum chamber and an outer lip for positioning and holding said gasket on said support frame, said gasket having corners for protecting said corners of said frame, said gasket having a sealing surface for receiving an object having a sealing edge for pressing into and deforming said sealing surface when outside pressure presses on said object during evacuation of said vacuum chamber; an improvement for enabling said gasket to creep during said gasket deformation and for enhancing the sealing of said sealing edge against said sealing surface in the presence of curvature of said sealing edge wherein the corners of said outer lip are removed.

4,902,024

SPHERICAL SEALING BODY USED FOR THE EXHAUST PIPE JOINTS AND A METHOD OF MANUFACTURING THEREOF

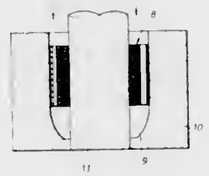
Yukinori Takenoshita, Nakatsu, Japan, assignor to Oiles Corporation, Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,027

Claims priority, application Japan, Jan. 19, 1988, 63-9413

Int. Cl.[4] F16J *15/12*; B32B *31/06*

U.S. Cl. 277—204 **4 Claims**



1. A method of manufacturing a spherical sealing body for use in exhaust pipe joints, comprising the steps of;

laminating a first flexible refractory sheet and a flexible wire net to each other,

winding said laminated first refractory sheet and said wire net such that said wire net is situated at the outermost circumference to thereby form a cylindrical member,

laminating a second flexible refractory sheet and an unsintered tape or film made of a polytetrafluoroethylene resin to each other,

compressing to integrate said laminated second refractory sheet and said unsintered tape or film in a direction of the thickness thereof to thereby form a sliding face member,

winding said sliding face member to an outer circumferential surface of said cylindrical member such that said unsintered tape or film is situated to an outside to thereby form a cylindrical preform body, and

applying compression to said preform body in an axial direction of said preform body so as to form a main body of said sealing body by entangling to integrate said first refractory sheet and said wire net and so as to form a surface layer made of said resin to a spherical portion of said main body by integrating said cylindrical member with said sliding face member.

4,902,025

SELF-CLAMPING OR SELF-TIGHTENING CHUCK

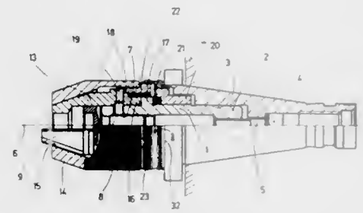
Arno W. Zinndars, Ostfildern, Fed. Rep. of Germany, assignor to Joseph Albrecht, Bohrfutterfabrik GmbH & Co., Esslingen, Fed. Rep. of Germany

Filed Nov. 8, 1988, Ser. No. 268,510

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1987, 3744589

Int. Cl.[4] B23B *31/04*

U.S. Cl. 279—64 **13 Claims**



1. Self-clamping or self-tightening chuck having

an at least partly cylindrical base body (1);

a back-up spindle means (8, 11) coaxially secured to the base body;

a plurality of clamping or holding jaws (9) abutting against the terminal end of the spindle means and coupled thereto for rotational movement therewith;

a holding sleeve means (13, 14, 18) surrounding said jaws, and retaining said jaws in position, including a rotation-symmetrical coaxial sleeve (18) extending over said base body (1);

said holding sleeve means being rotatably positioned on the base body; and

selectively engageable coupling means (22) located between said holding sleeve means (13, 14, 18) and said base body (1) which, upon relative rotation in the first direction of the holding sleeve means and the base body, release engagement between the holding sleeve means and the base body and, further, upon selective relative rotation in an opposite or second direction, engages and couples the holding sleeve means to the base body to thereby provide for tightening of the jaws about a tool held in the chuck,

wherein, in accordance with the invention,

said coupling means (22) comprises

a surrounding spring clutch or coupling including a spiral spring (22) coaxially located about the base body;

a first rotation-symmetrical zone (24) being located on the base body (1);

a second rotation-symmetrical zone (25) being located on the holding sleeve means (13, 14, 18) and positioned axially adjacent said first zone (24);

said spiral spring (22) spanning both said first and second zones (24, 25) for selectively connecting or disconnecting said base body and said holding sleeve means; and

selectively operable coupling control means (23, 28) operatively associated with the spiral spring (22) for controlling release of coupling engagement of said spiral spring with both said zones.

4,902,026

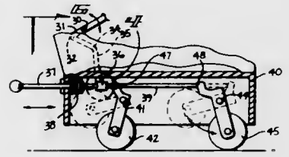
CONVERTIBLE CAR SEAT APPARATUS

Robert L. Maldonado, 7516 Frederick La. SW, Albuquerque, N. Mex. 87105

Filed Feb. 16, 1989, Ser. No. 310,932

Int. Cl.[4] B62B *7/12*

U.S. Cl. 280—30 **7 Claims**



1. A convertible car seat apparatus comprising:

an "L" shaped seat including a first flange side and a second flange side positioned on either side of the seat with an underlying downwardly depending skirt positioned under the seat, a first pair of spaced wheels and a second pair of spaced wheels, said first and second pair of wheels being mounted for pivotal movement between a retracted position within said skirt and an extended position, said first pair of wheels including a first wheel rod and said second pair of wheels including a second wheel rod, said first wheel rod being spaced rearwardly of and parallel to said second wheel rod, an actuator rod pivotally mounted orthogonally to said first wheel rod and said second wheel rod, a "U" shaped frame means including a first arm and a second arm pivotally mounted to said first and second sides respectively for pivotal movement from a lowered first position forwardly of said seat to a raised second position above said seat, said frame means including a connection link forming a handle and secured between the forward terminal ends of said first and second arms for maintaining said arms in a spaced parallel relationship, each of said first and second arms including a rear arm projection with an actuator bar extending therethrough, said actuator bar being pivotally mounted to the upper leg of a bell crank, the lower leg of the bell crank extending into a socket, said actuator rod being secured to the forward end of said socket, an indicator rod extending rearwardly through a rear wall of said skirt for movement between retracted and extended positions relative to said skirt, the forward end of said indicator rod being secured to the rearward end of said socket, wherein movement of said "U" shaped frame between said first and said second positions results in movement of said wheels and said indicator rod between said retracted and said extended positions respectively.

4,902,027

ALL TERRAIN DOLLY FOR WHEELED DEVICES

Billie J. Skelly, 1100 28th Ave. N., Naples, Fla. 33940

Filed Jul. 21, 1988, Ser. No. 222,025

Int. Cl.[4] B62D *39/00, 61/06*; B62B *3/00*

U.S. Cl. 280—33.998 **6 Claims**

1. An all terrain dolly for supporting a vehicle with front wheels and rear wheels having insufficient surface bearing for a terrain to be traversed comprising:

a front axle and a rear axle;

at least one large surface bearing area wheel rotatably mounted on said front axle;

a pair of large surface bearing area wheels rotatably mounted on said rear axle;

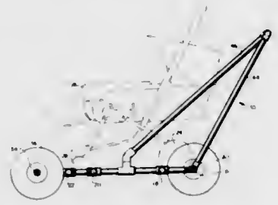
longitudinally extending frame members having connections to said front and rear axles;

said longitudinally extending frame members including lon-

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gitudinal length adjustment means for changing the distance between said front and rear axles;

a first laterally extending frame member adjacent to but spaced from said rear axle and connected at each end to said longitudinally extending frame members, whereby said first laterally extending frame member and said rear axle provide a means for supporting the rear wheels of the supported vehicle, wherein the rear wheels fit between and contact said laterally extending frame member and said rear axle;



a pair of longitudinally spaced laterally extending frame members disposed adjacent to but spaced from said front axle and connected at each end to said longitudinally extending frame members, whereby said pair of longitudinally spaced laterally extending from members provide a means for supporting the front wheels of the supported veicle, wherein the front wheels fit between and contact said pair of longitudinally spaced laterally extending frame members;

a laterally extending handle connected to said longitudinally extending frame members by a pair of handle supports.

4,902,028

FRONT AND REAR WHEEL STEERING APPARATUS FOR MOTOR VEHICLES

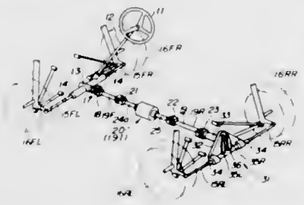
Mitsuya Serizawa; Tetsurou Hamada, and Norio Ukai, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,465

Claims priority, application Japan, Sep. 16, 1987, 62-231406; Nov. 12, 1987, 62-286158

Int. Cl.[4] B62D *7/14*

U.S. Cl. 280—91 **11 Claims**



1. An apparatus for steering the front and rear wheels of a motor vehicle, comprising:

a steering wheel;

front and rear wheels;

a front wheel steering mechanism for steering said front wheels in response to operation of said steering wheel;

a rear wheel steering mechanism for steering said rear wheels at least in the same direction as the direction in which said froot wheels are steered;

connector means disposed between and operatively interconnecting said front and rear wheel steering mechanisms for transmitting rotation of said steering wheel to said rear wheel steering mechanism through said front wheel steering mechanism; and

a rotation control mechanism mounted on said connector means for applying a resistive force dependent on the speed of rotation of said steering wheel to said connector means.

4,902,029

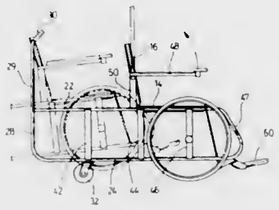
WHEELCHAIR WITH LUGGAGE CARRIER

Jerome G. Gain, Islington; Brian McLuckie, Brampton, and Gerhard R. Giehler, Orangeville, all of Canada, assignors to Wheel Assist Limited, Brampton, Canada

Filed Aug. 11, 1988, Ser. No. 231,350

Int. Cl.[4] B62B *3/12*

U.S. Cl. 280—304.1 **5 Claims**



1. A wheelchair and carrier for a disabled person comprising:

a wheelchair portion having a seat and back, and wheels for supporting the same said wheels being spaced apart at predetermined first distance;

a carrier portion integrally formed therewith extending rearwardly at the back of said seat and back having side bar means defining a carrier space, and spaced apart a predetermined distance greater than said first distance;

support wheels on said carrier portion for supporting the weight of items on said carrier portion;

a support platform means on said carrier portion;

recesses in said support platform means defined by spaced apart bars, said recesses being spaced apart on opposite sides of said platform means, for receiving the wheels of a further wheelchair portion nested therewith, and,

handle means associated with said carrier portion whereby a person can push said wheelchair portion and carrier as a single unit.

4,902,030

SHORT HITCH WITH VARIABLE GEOMETRY AND LINKAGE SUPPORT BEARINGS MOVABLE IN A CIRCULAR ARC FOR SO-CALLED BALANCED TRAILERS AND SEMI-TRAILERS

Jean L. Andre, Dangolsheim, France, assignor to Lohr Industrie, S.A., Hangenbieten, France

Filed Jun. 16, 1988, Ser. No. 207,587

Claims priority, application France, Jun. 18, 1987, 87 08689

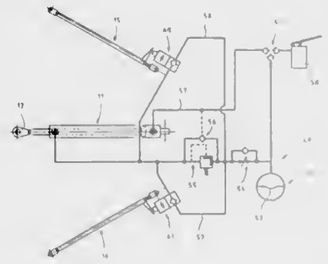
Int. Cl.[4] B60D *1/22*

U.S. Cl. 280—455.1 **10 Claims**

1. A hitch system for interconnecting a tractor vehicle having a longitudinally extending axis, and a trailer vehicle having a longitudinally extending axis, wherein said longitudinal axes of said tractor and trailer vehicles are normally coaxially disposed with respect to each other under straight-line operating conditions of said tractor-trailer vehicles so as to define a common longitudinal axis between said vehicle, comprising:

an elongated drawbar, having a longitudinal axis and which is axially extensible along said longitudinal axis, fixedly secured to said trailer vehicle such that said longitudinal axis of said elongated drawbar is always coaxialiy disposed with respect to said longitudinal axis of said trailer vehicle during both said straightline and turning operating conditions of said tractor and trailer vehicles, and pivotably connected to said tractor vehicle;

a first longitudinally extensible bar pivotably connected at one end thereof to said tractor vehicle at a location located upon a first lateral side of said longitudinal axis of said tractor vehicle and upon a first lateral side of said common axis defined between said tractor and trailer vehicles, and pivotably connected at a second end thereof to said trailer vehicle at a location located upon a first lateral side of said longitudinal axis of said trailer vehicle



and upon said first lateral side of said common axis defined between said tractor and trailer vehicles; and

a second longitudinally extensible bar pivotably connected at one end thereof to said tractor vehicle at a location located upon a second lateral side of said longitudinal axis of said tractor vehicle and upon a second lateral side of said common axis defined between said tractor and trailer vehicles, and pivotably connected at a second end thereof to said trailer vehicle at a location located upon a second lateral side of said longitudinal axis of said trailer vehicle and upon said second lateral side of said common axis defined between said tractor and trailer vehicles.

4,902,031

TOE UNIT OF A SAFETY SKI BINDING

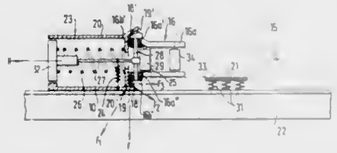
Martin Bogner, Ostfildern, Fed. Rep. of Germany, assignor to Geze Sport International GmbH, Leonberg, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,455

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734492

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—625 **14 Claims**



1. Toe unit of a safety ski binding, for use with a ski boot and a ski, the ski having a front and rear portion and a top surface, , the toe unit comprising a housing, secured to the ski, including an inclined surface (19) fixed relative to the housing, and including two substantially vertical axes of rotation disposed on both sides of a vertical central longitudinal plane of the housing; a sole clamp which supports a front part of a sole of the ski boot from the front of, the sides of and from above the ski boot sole when the ski boot is attached to the ski binding; a spring (26) acting between the housing and the sole clamp for generating a substantially forwardly directed spring force; the sole clamp being pivotable against the substantially forwardly directed spring force about a respective one of said two substantially vertical axes of rotation such that on an occurrence of predetermined lateral forces at the front part of the sole, the sole clamp pivots outwardly about one of said axes of rotation lying in a direction of such lateral force and releases the ski boot, with the sole clamp being displaceable relative to the housing in a direction of the axes of rotation and being resiliently biased in this direction towards the front part of the sole of the ski boot, wherein the sole clamp further includes a downwardly and forwardly facing abutment (18) in a chosen one of a region between the axes of rotation (17) and on a part movable with the sole clamp along the axes of rotation (17) and cooperates with said inclined surface (19), extending downwardly and rearwardly in such a way that when the ski boot (15) is inserted into the binding, the ski boot sole (14) holds the sole clamp (16) against a downwardly directed spring bias at a level at which the abutment (18) is located at at least a small distance from the inclined surface (19) so as to exert no forces on the inclined surface (19); and wherein the ski boot (15) is downwardly yieldingly supported on the ski (22) in such a way that with forward inclination of a skier using the binding, at least a portion of the sole (14) engaging the sole clamp (16) moves downwardly such that the abutment (18) on the sole clamp (16), which follows the movement of the sole (14), abuts on the inclined surface (19) at least during a simultaneous sideways release movement of the sole clamp (16), to generate a counterforce to a sole clamp resetting force generated by the substantially forwardly directed spring force, the counterforce being dependent on an inclination of the inclined surface (19) and the resilient bias of the sole clamp (16) in the downward direction, and being smaller than the sole clamp resetting force.

4,902,032

MOTOR VEHICLE STEERING

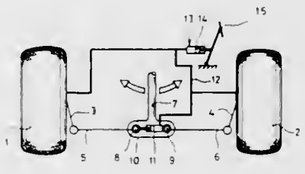
Peter Krehan, Russelsheim, and Werner Oppelt, Trebur, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 23, 1988, Ser. No. 290,651

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744089

Int. Cl.[4] B22D *17/00*

U.S. Cl. 280—661 **5 Claims**



1. In a motor vehicle steering system including a pair of tie rods attached to a steering arm by means of a pair of resilient tie rod bushes, the combination comprising, a cylinder means disposed between said tie rod bushes, a piston means slidably disposed in said cylinder means, and fluid conduit means connecting said cylinder means to a fluid pressure braking system of said motor vehicle so that said piston means and said cylinder means expands between said tie rod bushes to move said tie rod bushes apart when said fluid pressure braking system of said motor vehicle is pressurized.

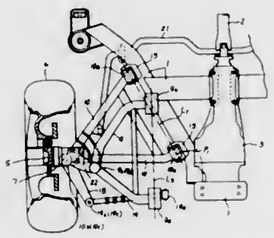
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4,902,033

DOUBLE WISHBONE REAR SUSPENSION

Hiroshi Tonomura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jun. 24, 1988, Ser. No. 211,044
Claims priority, application Japan, Jun. 26, 1987, 62-157938
Int. Cl.[4] B60G 3/20
U.S. Cl. 280—690 5 Claims



1. A double wishbone rear suspension for a vehicle comprising:

an upper control arm in the form of an A-shaped frame having bifurcated pivot ends which are connected to a vehicle body and an oscillatory end;

a lower control arm in the form of an A-shaped frame having bifurcated pivot ends which are connected to the vehicle body and an oscillatory end; and

support means for supporting a tire on the oscillatory ends of said upper and lower control arms;

said pivot ends of said lower control arm pivoting about axes which are coaxial with respect to a straight line (L1);

said straight line (L1) extending forwardly and laterally outwardly and forwardly and upwardly with respect to the vehicle body;

a rear one of said pivot ends of said lower control arm being located substantially on a straight line extending from said oscillatory end of said lower control arm inwardly with respect to the vehicle body and intersecting a longitudinal axis of the vehicle body at right angles;

said pivot ends of said upper control arm pivoting about axes which are coaxial with respect to a straight line (L3);

said straight line (L3) being parallel with a longitudinal axis of the vehicle body and located on a horizontal plane;

said oscillatory end of said upper control arm being located rearward of said oscillatory end of said lower control arm and adjacent to and inward of the upper end portion of the tire.

4,902,034

ELECTRICALLY CONTROLLED SHOCK ABSORBER

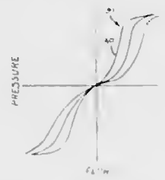
Gene A. Maguran, West Bloomfield, and Keaneth R. Meloche, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 240,281, Sep. 6, 1988, abandoned. This application Jan. 13, 1989, Ser. No. 296,870
Int. Cl.[4] B60G 17/00
U.S. Cl. 280—707 1 Claim

1. A shock absorber apparatus for a motor vehicle comprising shock members attached to sprung and unsprung masses of the motor vehicle, the shock members being relatively vertically movable and comprising pumping chambers containing an incompressible fluid, a piston movable to vary the volume of the pumping chambers and thereby pump the incompressible fluid with relative movement of the shock members, check valve apparatus effective to direct the pumped incompressible fluid in a single direction through a passage to a reservoir chamber regardless of direction of movement of the shock members, and an electrically controlled valve apparatus controlling flow through the passage and comprising, in combination:

a valve housing fixed externally to one of the shock members, the valve housing defining an inlet chamber and a control chamber, a horizontal inlet valve opening to the inlet chamber from the pumping chambers with a surrounding face valve seat within the inlet chamber, a horizontal outlet valve opening from the control chamber to the reservoir chamber with a surrounding face valve seat outside the control chamber, an outlet from the inlet chamber open to the reservoir chamber, and an opening from the inlet chamber to the control chamber;

an inlet valve member with an inlet orifice therethrough in the inlet chamber horizontally reciprocable between closed and open positions with respect to the face valve seat of the inlet valve opening but closing the opening from the inlet chamber to the control chamber except for the inlet orifice, the inlet valve member being biased toward its closed position by bias apparatus providing an essentially constant bias independent of the position of the inlet valve member, the inlet orifice providing fluid flow into the control chamber with relative movement of the shock members regardless of the position of the inlet valve



member and a resulting pressure drop across the inlet valve member with the fluid flow therethrough effective to substantially cancel the bias of the bias apparatus so that opening of the inlet valve is controlled by the pressure in the control chamber, the orifice further providing damping for the inlet valve member; and

a pilot valve member outside the control chamber horizontally reciprocable between closed and open positions with respect to the face valve seat of the outlet valve opening, the pilot valve member being activated by an electromechanical actuator providing a valve closing force with an electric input current which opposes the hydraulic force of fluid flow out of the control chamber, the valve closing force due to any given electric input current varying less with variations in opening displacement or fluid flow therethrough than corresponding variations in the hydraulic force due to the fluid flow pressure drop across the outlet valve opening so as to produce stable pilot valve member operation with a fluid pressure within the control chamber as a function of electric input current, whereby the damping force of the shock absorber is controlled by the fluid pressure in the control chamber and therefore by the electric input current independently of fluid flow from the shock members.

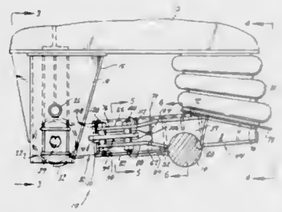
4,902,035

SUSPENSION SYSTEM WITH AXLE SEAT REMOVABLE FROM UNIVERSAL TORQUE BEAM

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Continuation-in-part of Ser. No. 10,632, Feb. 4, 1987. This application Dec. 23, 1988, Ser. No. 289,043
Int. Cl.[4] B60G 11/26
U.S. Cl. 280—713 12 Claims

1. A vehicle suspension system for a vehicle having a chassis and an axle comprising a torque beam having a first end and a second end, means for supporting the first end of the torque beam from the chassis, an axle seat assembly, means for connecting the axle seat assembly to the axle, spring means connected between the axle seat assembly and the chassis, and a telescoping component on the axle seat assembly adapted to telescopingly fit onto the second end of the torque beam, said telescoping component including separated sections of the axle seat assembly having opposed flanges spaced from one another, a plurality of bolts and spacers for connecting the opposed flanges of the axle seat assembly with the spacers positioned between the flanges to prevent excess bending of the flanges upon tightening the bolts, and means on said torque beam engageable with the bolts for positively locking the telescoping component against sliding movement relative to the torque beam.

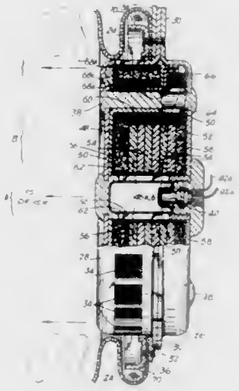


4,902,036

DEFLECTOR RING FOR USE WITH INFLATORS WITH PASSIVE RESTRAINT DEVICES

Ronald Zander, Mesa; Dennis J. Wells, Phoenix; Leon Merkley, Mesa, all of Ariz., and Dean Esterberg, Mountain Lakes, N.J., assignors to Talley Automotive Products, Inc., Phoenix, Ariz.

Continuation of Ser. No. 145,449, Jan. 15, 1988, abandoned. This application Mar. 15, 1989, Ser. No. 325,087
Int. Cl.[4] B60R 21/16, 21/26, 21/08
U.S. Cl. 280—736 23 Claims



23. A vehicle passive restraint device comprising:

(a) air bag means positioned between an occupant of said vehicle and an interior portion thereof for protecting said occupant from an impact with said interior portion in the event of a collision involving said vehicle;

(b) generator means for producing a sufficient quantity of a gaseous combustion product to inflate said air bag means in an interval occurring between said collision and said impact in order to prevent said impact; and

(c) deflector ring means positioned between said air bag means and said generator means for attaching said bag to said generator and extending a sufficient distance into an interior portion of said bag for preventing hot combustion gases and particulates produced within said generator means from impinging directly against an inner surface of said bag means, wherein said deflector ring is mounted such that a shorter leg portion of said ring is positioned adjacent said generator means whereupon the remaining longer leg portion is positioned at a location relatively removed from said generator means;

and wherein said deflector ring means is stamped from a relatively light weight material utilizing conventional stamping equipment without the necessity of subjecting said ring means to any machining treatment and wherein said ring means possesses sufficient structural strength to position and maintain said air bag means in relation to said generator means when said generator means is actuated in order to inflate said air bag means;

wherein said generator means comprises

(a) a housing constructed of a relatively light weight, corrosion resistant, high tensile strength material, defining at least three concentric toroidal zones, whereby a first zone contains means for igniting a gas generating composition; a second zone contains a solid gas generating composition operable upon ignition to produce gas and particulate reaction products; and a third zone contains filtration means to cool said gas and to trap said reaction products, said third zone being further provided with gas discharge orifice means;

(b) base plate means;

(c) diffuser plate means having a peripheral portion thereof sealingly connected to a corresponding portion of said base plate means so as to form a portion of a housing for the generator,

(d) means for engaging said base plate means with said diffuser plate means, said engaging means passing perpendicularly through both said diffuser plate means and said base plate means capable of permitting a minimal separation between both said plate means in the event of an overpressurization of said generator to safely direct gas away from said housing,

(e) means for igniting said solid gas-generating composition, said ignition means located in an aperture in a central portion of said base plate means;

(f) an enhancer packet comprising a homogeneous mixture of an ignition enhancing material and an autoignition composition located in said first zone of said housing means;

(g) spacer means between said solid gas-generating composition and said housing to prevent abrasion of said composition due to contact with an inner surface of the housing;

(h) prefiltering means located along a peripheral portion of said first zone between said solid gas generating composition and said third zone;

(i) filtering means located in said third zone and comprising a first portion for removal of a major portion of said particulate reaction products from said gas, and a second portion for removing substantially all of any remaining particulate reaction products from said gas, whereby said gas passes through said first portion of said filtering means prior to passing through said second portion; and

(j) gas discharge orifice means comprising a plurality of diffusion ports located along said peripheral portion of said diffuser plate means;

wherein said solid gas generating composition is in the form of a plurality of pressed toroidal discs in stacked relation, each disc having means to permit air to circulate around at least a portion of one of its surfaces and whereby the gas produced by the combustion of said toroidal discs is cooled and cleaned by passing through said prefiltering means and thereafter through said filtering means.

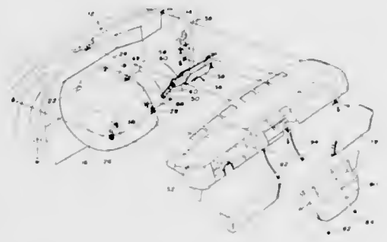
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4,902,037

KNEE RESTRAINT REMOVABLE FOR ENGINE SERVICE

James S. Groce, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 17, 1988, Ser. No. 258,427
Int. Cl.[4] B60R 21/04
U.S. Cl. 280—751 4 Claims



1. An occupant knee restraint apparatus for a motor vehicle of the type having an occupant knee space between a side panel structure of the vehicle body and an engine compartment protruding rearwardly into the passenger compartment and covered by an engine cover panel removable to enable service of the engine, comprising:

a knee restraint member of adjustable length having ends adapted for respective attachment to the side panel structure of the vehicle body and to the engine cover panel;

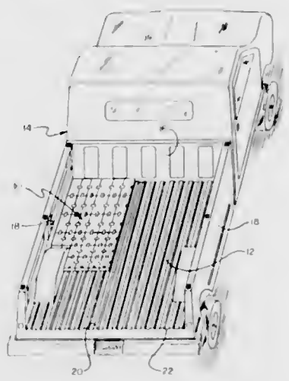
and removable fastening means removably attaching the ends of the knee restraint member to the side panel structure of the vehicle body and to the engine cover panel so that the knee restraint member may be disassembled from at least the engine cover panel to enable service of the engine.

4,902,038

INTERLOCKING WEIGHT SYSTEM FOR VEHICLE CARGO COMPARTMENTS

Bruce D. Grover, 2525 NW. Fifth Street, Minot, N. Dak. 58701

Filed Aug. 25, 1988, Ser. No. 236,609
Int. Cl.[4] B62D 63/00
U.S. Cl. 280—759 24 Claims



1. A traction enhancing interlocking weight system for use in the cargo compartment of a vehicle, said cargo compartment having a length, a width, and a height, said interlocking weight system comprising:

a plurality of plates, each said plate having a height, a width, and a length, said height being substantially less than said width and said length, each plate having a pair of opposing side edges and a pair of opposing end edges;

means associated with each said plate for engagingly and removably interlocking said plate with a like one of said plates when said plate and said like plate are positioned in close confronting contact along an adjacent pair of said side edges or said end edges of the plate and the like plate, to interconnect said plurality of plates in an array, said array having a length and a width less than the length and the width of the cargo compartment, whereby the plates may be arranged and interconnected in the array within the cargo compartment so as to provide additional traction weight for the vehicle;

the width of each said plate being measured between the opposing side edges, and each said plate having a front end edge and a back end edge, the length of each said plate being measured between said front edge and said back end edge, each said plate further including a top surface and a bottom surface, the height of each plate being measured between said top surface and said bottom surface;

said means for interlocking the plate with the like plates comprising:

a flange member extending from and connected to one of the side edges of the plate;

a groove defined by the opposing side edge of the like plate to be connected to the plate, said groove being sized to receive said flange member, whereby the flange member of the plate may be engagingly and removably received within the groove of the like plate to interconnect the plates; and

wherein the groove has a depth measured from the top surface of the like plate and the flange member has a thickness, the flange member extending generally downwardly relative to the top surface of the plate a distance generally less than or equal to the depth of the groove on the like plate and spaced apart from the side edge of the plate by a second groove, said second groove having a depth measured from the bottom surface of the like plate and a width, the like plate further having a second flange member having a thickness less than or equal to the width of the second groove and a height measured from the bottom surface of the like plate less than or equal to the depth of the second groove, whereby the second flange member of the like plate may be engagingly received within the second groove of the plate.

4,902,039

PASSIVE SEAT BELT SYSTEM

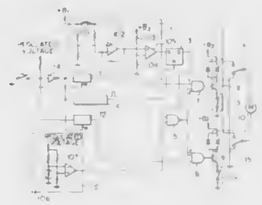
Osamu Kawai, and Shunzi Mizumura, both of Fujisawa, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1987, Ser. No. 94,451
Claims priority, application Japan, Sep. 11, 1986, 61-212783
Int. Cl.[4] B60R 22/38
U.S. Cl. 280—802 44 Claims

1. A passive seat belt system for automatic fastening or unfastening of a seat belt in response to the boarding or alighting of a vehicle occupant, comprising:

overload detecting means for detecting the presence of an overload in the movement of a movable anchor of said seat belt, and

control means for reversing and then stopping a drive motor for said movable anchor in response to the detection of an



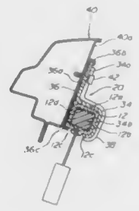
overload in the movement of said movable anchor by said overload detecting means.

4,902,040

GUIDE RAIL MOUNTING ASSEMBLY FOR AUTOMOTIVE PASSIVE SEAT BELT SYSTEM

Kazumi Hira; Kenro Otsuka, both of Yokohama, and Shunichi Kiyono, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama and NSK-Warner Kabushiki Kaisha, Tokyo, both of, Japan

Filed Sep. 25, 1987, Ser. No. 100,819
Claims priority, application Japan, Sep. 26, 1986, 61-146524[U]
Int. Cl.[4] B60R 21/10
U.S. Cl. 280—804 21 Claims



1. A mounting assembly for mounting a member on a stationary base, which comprises:

a rigid bracket including an upper planar portion and a lower shaped portion shaped to support said member; and

elastic means including an upper portion for engaging the upper planar portion of the rigid bracket and a lower portion for being deformed away from said bracket sufficient for inserting said member into the shaped portion and toward said bracket sufficient for retaining said member in said shaped portion.

4,902,041

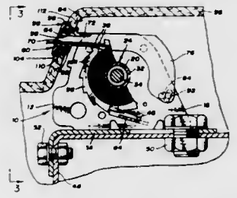
BEZEL ASSEMBLY FOR RETRACTOR

Thomas J. Corbett, Sterling Heights; Chris C. McGowen, Clarkson; Michael S. Mortier, Rochester Hills, and Michele A. Smith, Davisburg, all of Mich., assignors to Saturn Corporation, Troy, Mich.

Filed Feb. 27, 1989, Ser. No. 316,130
Int. Cl.[4] B60R 22/34
U.S. Cl. 280—807 8 Claims

1. In a seat belt retractor mounted on a vehicle body behind a vehicle body trim panel and having a belt extending and retracting from a reel and passing through an aperture in the trim panel, the improvement comprising:

a bezel assembly having a tubular sleeve portion defining a belt passage therethrough, said tubular sleeve portion having an outer end extending through the aperture of the trim panel and an inner end extending beyond the trim panel and into proximity with the reel, and means mounting the inner end of the tubular sleeve on the retractor in



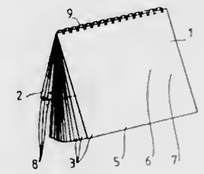
a manner permitting movement of the tubular sleeve portion to align with the path of belt between the reel and the aperture of the trim panel.

4,902,042

CALENDAR

Antti E. Rassi, Helsinki, Finland, assignor to Outokumpu Oy, Helsinki, Finland

PCT No. PCT/FI86/00050, § 371 Date Jan. 5, 1988, § 102(e) Date Jan. 5, 1988, PCT Pub. No. WO87/06886, PCT Pub. Date Nov. 19, 1987
PCT Filed May 16, 1986, Ser. No. 145,765
Int. Cl.[4] B42D 5/04, 15/00; B41L 1/24; G09D 3/04
U.S. Cl. 283—2 11 Claims



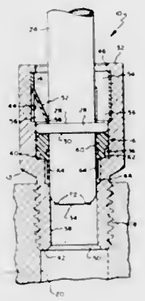
1. A calendar comprising:

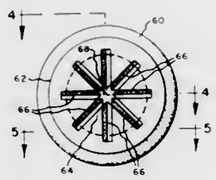
a plurality of sheets each having at least a first portion, which bears calendar information, and a second potion, which bears other than calendar information,

attachment means whereby the sheets are attached together so that successive sheets can be revealed by turning the preceding sheets, the attachment means engaging the second portions of the sheets but not the first portions thereof, and the first portion of each sheet consisting of at least first and second parts weakened along two perpendicular lines allowing ready detachment of the first part and second part of the first portion from the second portion thereof to form a book comprising the attachment means and the second portion of the sheets, and

a cover which is engaged by the attachment means and of which the size and shape correspond substantially to the second portion of each sheet.

4,902,043
FLUID COUPLING AND SEAL ASSEMBLY
Steven R. Zillig, 8828 Main St., Williamsville, N.Y. 14221, and James E. Caroll, Clarence, N.Y., assignors to John T. Hoskins and Steven R. Zillig
Continuation-in-part of Ser. No. 777,031, Sep. 17, 1985, Pat. No. 4,749,214. This application Sep. 8, 1986, Ser. No. 904,142
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[4] F16L *35/00, 37/00*
U.S. Cl. 285—4 33 Claims



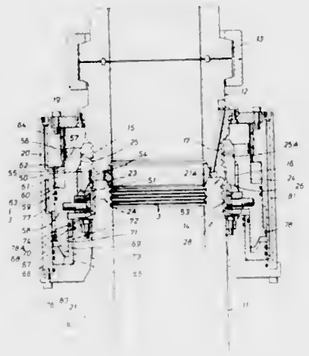


1. A seal assembly comprising an annular seal formed of a rubber-like material and a tearable diaphragm integral with and of the same material as the annular seal and capable of blocking the passage of fluid through the annular seal, the tearable diaphragm being provided with weakened portions which permit a central portion of the tearable diaphragm to tear when a tubular fluid line is inserted into the annular seal, the weakened portions not extending entirely about a central portion of the diaphragm whereby the central portion will be retained by the annular seal after tearing.

32. A resilient retainer for use in a fluid coupling assembly to which a fluid line having an outwardly extending flange may be connected, said resilient retainer comprising:

a generally cylindrically shaped radially compressible body portion which is C-shaped in cross section, said body portion being formed of resilient metal or the like, a plurality of prongs formed of the same material as the body portion, one end of each of the prongs being integral with the body portion, the prongs extending inwardly in the same direction at an acute angle to the adjacent surface of the body portion, and a plurality of skirt portions between the prongs, which skirt portions are coextensive extensions of the body portion, the skirt portions all being at least as long as the prongs.

4,902,044
WELL APPARATUS
Gregory D. Williams, The Woodland, and Larry E. Reimert, Spring, both of Tex., assignors to Drill-Quip, Inc., Houston, Tex.
Filed May 4, 1989, Ser. No. 347,760
Int. Cl.[4] E21B *43/013;* F16L *21/08, 37/08*
U.S. Cl. 285—18 8 Claims



1. A subsea wellhead connector, comprising

a first tubular member adapted to be mounted on the upper end of a first subsea wellhead member,

a second tubular member adapted to be suspended from the lower end of a second subsea wellhead member for lowering therewith into end-to-end relation with the first tubular member,

said first tubular member having a first set of locking grooves thereabout and said second tubular member having a second set of locking grooves thereabout,

circumferentially spaced apart locking segments each having first and second sets of locking teeth which are carried by the second tubular member for radial movement between expanded positions in which the first set of teeth may be moved past the end of the first tubular member for disposal opposite and spaced from the first grooves, when said second member is lowered into end-to-end relation with the first member, and contracted positions in which the first and second sets of teeth are in locking engagement with the first and second sets of grooves, respectively,

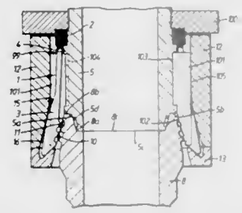
at least one set of said teeth having tapered surfaces thereon which are slidable over tapered surfaces of the corresponding set of grooves to urge the ends of said members into tight engagement with one another as the locking segments move to contracted position,

a cam ring arranged about the locking segments for axial movement between a first position in which the cam ring permits the locking segments to move to expanded positions and a second position in which the cam ring is slidable over the locking segments to wedge them into contracted position,

means including dogs carried by the cam ring for extension radially inwardly between the ends of adjacent locking segments and having surfaces thereon slidable over surfaces on the ends of the segments in order to spread said segments apart and thereby withdraw the teeth on the segments from the grooves, as the cam ring is moved from its second to its first position, and

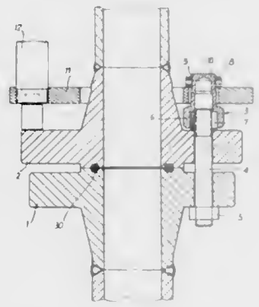
means for moving said cam ring between said positions.

4,902,045
CONNECTORS
John D. McGagan; Michael J. Mackie, and Norman Buckley, all of Aberdeen, Scotland, assignors to Hunting Oilfield Services Limited, Aberdeen, Scotland
Filed Dec. 3, 1987, Ser. No. 128,104
Int. Cl.[4] F16D *1/10;* F16L *21/06, 21/08, 37/00*
U.S. Cl. 285—24 29 Claims



1. A connector comprising a first coupling assembly comprising a first coupling member for coupling to a second coupling member, an annular body provided on said first coupling member for connecting said first coupling member to said second coupling member, said annular body having a plurality of radially flexible fingers extending generally axially therefrom, said fingers being provided in end portions thereof with first engagement means for engagement with corresponding second engagement means on said second coupling member, said fingers being radially flexible between an inoperative position and an operative position in which said first and second engagement means are engaged, a locking ring axially movable relative to the annular body of the first coupling assembly between a disengagement position and a locking position in which said locking ring extends around said fingers so as to prevent disengagement of said first and second engagement means, and a plurality of members each said guide member extending between a pair of said fingers and adapted to prevent contact between said first and second engagement means when said fingers are in their inoperative position.

4,902,046
CONNECTOR WITH QUICK RELEASE UNDER LOAD
René Maloberti, Nogent, France, assignor to Coflexip, Paris, France
Filed Jul. 15, 1987, Ser. No. 73,656
Claims priority, application France, Jul. 16, 1986, 86 10352
Int. Cl.[4] F16L *35/05*
U.S. Cl. 285—34 12 Claims



1. A connector assembly for joining together ends of two flanged pipes, capable of quickly releasing the pipes even when they are in tension, comprising two flanged pipes having ends at least one connecting device for holding said ends in apposition, said device comprising

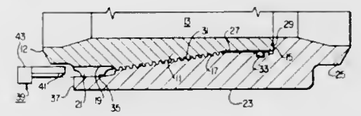
an annular retaining ring assembly for engaging one of said flanges comprising at least two separate arcuate segments, each having a serrated internal surface thereon,

a rod having at one end an outside surface with serrations thereon corresponding to those of the ring, and normally engaged thereby over at least a part of the height of the ring, and having at its other end means for engaging the other of said pipe flanges, and

a sleeve adapted to fit over said ring and axially movable in relation to it between a first position in which the segments are held together by the sleeve so as to retain said rod between them and a second position in which the segments are released to free said rod;

said connector assembly further comprising an annular plate movably mounted around one of said pipes, and having therein an aperture, said sleeve being mounted in said aperture and abutment means on said sleeve for engagement by said plate, and actuating means mounted on the one of said pipes for moving said plate into engagement with said abutment means and thus said sleeve axially with respect to said ring from said first position to said second position.

4,902,047
THREAD CONNECTOR ANTI-ROTATION DEVICE
Dale B. Marietta, Singapore, Singapore, and Alistair MacDonald, Cowiewynd, Scotland, assignors to Vetco Gray Inc., Houston, Tex.
Filed Apr. 14, 1989, Ser. No. 338,178
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—39 5 Claims



1. In a connection joint of the type including a first pipe having a pin member which has a longitudinal axis and an exterior surface containing a set of external threads for mating engagement with a second pipe containing a box member having a rim, an internal surface extending axially from the rim and containing a set of internal threads, an improved means for preventing the pin and box members from rotating relative to each other after make-up, comprising in combination:

a lip section in the box member, the lip section being located in the internal surface and extending from the rim to the internal threads, the lip section having a smooth, continuous generally cylindrical configuration;

a locking section on the pin member, the locking section having a smooth cylindrical configuration closely spaced from the lip section and extending axially from the external threads;

a longitudinal slot formed in the locking section, extending from the rim toward the external threads parallel to the axis of the pin member, the slot and the internal surface of the pin member defining a cavity; and

a key inserted into the cavity, the key having a slightly greater radial dimension than the radial extent of the cavity, so as to provide a gripping force.

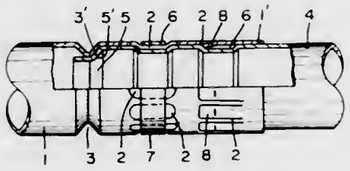
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4,902,048

JOINT STRUCTURE FOR JOINTING METAL PIPES AT THEIR ENDS

Katsushi Washizu, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Mar. 24, 1988, Ser. No. 172,692
Claims priority, application Japan, Mar. 31, 1987, 62-47931[U]; Mar. 31, 1987, 62-47932[U]
Int. Cl.⁴ F16L *17/04*
U.S. Cl. 285—319 **13 Claims**



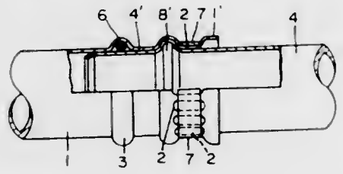
1. A joint structure for joining ends of first and second metal pipes, said first pipe having a first annular seating means spaced from the end thereof and defining a smaller cross section than said end, and a plurality of slots arrayed circumferentially in the wall of said first pipe intermediate the end thereof and the first annular seating means; the second pipe having second annular seating means formed generally at its end, the portion of said second pipe adjacent said end being disposed in the end of the first pipe such that the second seating means is abutting against said first seating means, at least one inwardly formed engagement groove formed in the circumferential wall of said second pipe axially spaced from said second seating means and in line with said slots, annular engagement means disposed in said second pipe, said first pipe further being formed with a retaining pawl projecting inwardly and axially away from the end of said first pipe to retain said annular engagement means of said second pipe, and fastening means for deforming the portions of said slots radially inwardly and into said engagement groove to securely join said pipes together, wherein said first pipe is axially pulled by the deformation caused by the fastening means to generate a facial pressure between said first and second seating means thereby to tightly join said pipes.

4,902,049

STRUCTURE HAVING INTERCONNECTED METAL TUBES

Kazumasa Umehara, Ohhito, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka Prefecture, Japan

Division of Ser. No. 171,651, Mar. 22, 1988, Pat. No. 4,850,621. This application May 24, 1989, Ser. No. 356,798
Int. Cl.⁴ F16L *17/02*
U.S. Cl. 285—347 **4 Claims**



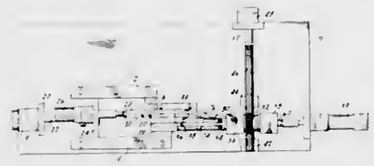
1. A structure comprising:
a first tube of generally uniform thickness having a substantially cylindrical end portion generally adjacent one axial end, and a circumferential stopper wall spaced from said end and defining an external diameter greater than the diameter of the cylindrical end portion of the first tube;
a second tube of generally uniform thickness having a cylindrical tubular wall portion spaced from one axial end slidably disposed over the end portion of said first tube, said second tube having a step portion intermediate the tubular wall portion and the end of the second tube, the step portion extending outwardly from the cylindrical tubular wall portion of the second tube and being in abutting relationship with the stopper wall of said first tube, an enlarged wall portion intermediate the step portion and the end of the second tube, said enlarged wall portion defining an internal diameter at least as great as the external diameter of the stopper wall of the first tube, a plurality of spaced apart slots formed in said enlarged wall portion and defining a circumferential array of slots thereabout, portions of said second tube intermediate the slots therein being deformed inwardly and engaging the first tube at a location adjacent the stopper was such that the stopper wall is intermediate the deformed portion of the second tube and the step portion thereof;
a generally annular seal disposed intermediate the second tube and the cylindrical portion of the first tube; and
a circumferentially extending fastening means engaging the inwardly deformed portion of said second tube, whereby the slots in said second tube enable the fastening means to deform the second tube inwardly into the first tube for securely fastening said first and second tubes together.

4,902,050

KNOT TYING DEVICE

Eugene E. Sobeck, Minnesota City, and Edward L. Steele, Winona, both of Minn., assignors to Lake Center Industries a division of Guy F. Atkinson Company, South San Francisco, Calif.

Filed Aug. 15, 1988, Ser. No. 232,142
Int. Cl.⁴ B65H *69/04*
U.S. Cl. 289—1.5 **10 Claims**



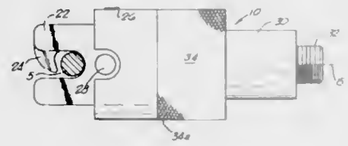
1. A method of tying a knot in an elongated flexible member such as a string or rope including the steps of:
(1) providing an elongated flexible member of a desired length,
(2) clamping the elongated flexible member at a location spaced a predetermined distance from an end thereof while rotating the clamped location to form a loop with the end thereof crossing over the loop,
(3) moving the elongated flexible member end through the loop and clamping the end thereof after it has moved through the loop, and
(4) releasing the clamping pressure applied at the spaced location on the elongated flexible member and pulling the elongated flexible member away from the loop while maintaining clamping pressure on the clamped end thereof to form a knot.

4,902,051

ROD END LOCK

L. Richard Foe, Long Beach, Calif., assignor to The Hartwell Corporation, Placentia, Calif.

Filed Sep. 2, 1987, Ser. No. 92,049
Int. Cl.⁴ E05C *19/10*
U.S. Cl. 292—127 **9 Claims**



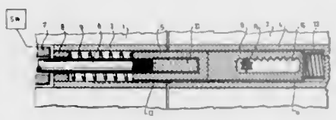
1. A rod end lock for latching a keeper, comprising:
a barrel having a mounting end and a latch end;
a mount connection attached to the mounting end of said barrel and coaxial with said barrel;
a bite portion attached to the latch end of said barrel, said bite portion having a substantially U-shape for acccommodating a rod of the keeper such that when inserted into said bite portion, the rod of the keeper is centered about a centerline of said barrel;
a locking element pivotally attached to said barrel and having an open and a closed position, said locking element including a pivot point centered on the centerline of said barrel, and a hook portion pivoting about said pivot point wherein when the locking element is in the closed position, said hook portion and said bite portion form an enclosed space therenbetween for latching the rod of the keeper;
a biasing means for urging said locking element into the closed position; and
a means for actuating said locking element between the opened and closed positions.

4,902,052

LOCKING DEVICE

Yrjö T. Laine, Kauniainen, Finland, assignor to Airi Laine, Kauniainen, Finland

Filed Jul. 29, 1988, Ser. No. 225,894
Claims priority, application Finland, Jul. 31, 1987, 873345
Int. Cl.⁴ E05C *1/06*
U.S. Cl. 292—144 **2 Claims**



1. A locking device for locking a door with regard to a door frame, each of which has a corresponding edge disposed in confronting adjacency one with the other when the door is shut, and disposed out of such confronting adjacency when the door is open, and each of which has a respective socket opening through the respective said edge thereof, the door having an inner side and an outer side, said locking device including:
a bolt mountable in said socket in said frame for longitudinal reciprocable movement, between a thrust, locking position wherein said bolt projects part way into said socket in said door so as to dispose a respective one end thereof in said socket of said door, and a retracted, unlocked position wherein said bolt, including said one end thereof, is completely withdrawn from said socket in said door;
a first spring operatively bearing against said bolt for tending to maintain said bolt in, and to return said bolt to, said thrust, locking position;
means operatively associated with said bolt selectively operable from said outer side of said door for forcibly reciprocating said bolt to said retracted, unlocked position and for maintaining said bolt, when retracted, in said retracted, unlocked position against restoration force exerted on said bolt by said first spring;
said selectively operable means from said outer side of said door for forcibly reciprocating said bolt to, and for maintaining said bolt in, said retracted, unlocked position comprises an electrical solenoid including said bolt, and switch means accessible from said outer side of said door when said door is shut for operating said electrical solenoid to forcibly reciprocate said bolt to, and maintain said bolt in said retracted, unlocked position;
a counterbolt mountable in said socket in said door for longitudinal reciprocable movement, between a thrust position wherein a respective one end thereof is closer to said edge of said door, and a retracted position wherein said one end of said counterbolt is disposed further back in said socket of said door relative to said edge of said door;
a second spring operatively bearing against said counterbolt for tending to maintain said counterbolt in, and to return said counterbolt to, said thrust position;
said second spring having a spring constant which is less than that of said first spring;
said bolt, first spring, counterbolt and second spring being so disposed that, in use, when the door exists in a shut condition with regard to the door frame, and said selectively operable means for reciprocating said bolt to, and for maintaining said bolt in, said retracted, unlocked position is not being operated, said bolt normally exists in said thrust, locking position with said one end of said bolt engaging said one end of said counterbolt and said first spring, acting via said bolt, thereby maintaining said counterbolt in said retracted position of said counterbolt; and
a mechanical displacement-providing means engageable, in use, with said counterbolt, through the door, from the inner side of the door, and then being selectively operable for forcibly reciprocating said counterbolt towards said thrust position thereof sufficiently to forcibly retract said bolt towards said retracted position of said bolt sufficiently to expel said bolt from said socket of said door, so that said door may be opened and said bolt held retracted by said selectively operable means for reciprocating said bolt to, and for maintaining said bolt in, said retracted, unlocked position.

4,902,053

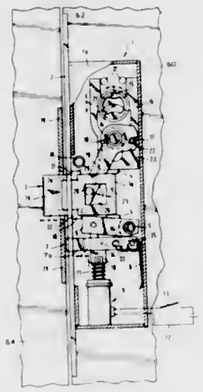
DOOR LOCK

Reijo Hakkarainen; Keijo Lehikoinen, and Paavo Piiroinen. all of Joensuu, Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland

Continuation of Ser. No. 176,839, Apr. 4, 1988, abandoned. This application Jul. 5, 1989, Ser. No. 376,168
Claims priority, application Finland, Apr. 13, 1987, 871601
Int. Cl.⁴ E05C *5/02*
U.S. Cl. 292—144 **18 Claims**

1. A door lock suitable for installation in a door that is turnable about a predetermined axis, said door lock comprising:
a lock casing having a front plate formed with an opening,
a latch bolt comprising a latch bolt body and a latch bolt member, the latch bolt being movable linearly in directions perpendicular to the turning axis of the door between a retracted position in which substantially the entire latch bolt is inside the lock clasing and a projecting position in which the latch bolt body is inside the lock casing and a wedge portion of the latch bolt member projects

from the lock casing through the opening in the front plate, the latch bolt member extending beyond the latch bolt body in the direction of movement of the latch bolt from the retracted position towards the projecting position and being connected to the latch bolt body in a manner permitting pivotal movement of the latch bolt member relative to the latch bolt body about a pivot axis parallel to the turning axis of the door, and said wedge portion of the latch bolt member being defined by two opposite faces that converge in a direction away from the pivot axis



towards an end that extends substantially parallel to said pivot axis, said opposite faces converging over substantially the entire amount by which the latch bolt member projects from the lock casing when the latch bolt is in its projecting position,

spring means urging the latch bolt towards the projecting position, and

dead locking means selectively operable when the latch bolt is in the projecting position to prevent movement of the latch bolt towards the retracted position.

4,902,054

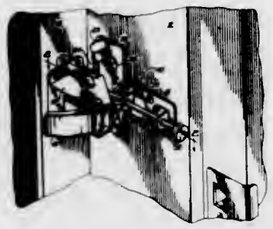
SAFETY DEVICE FOR DISABLING A SCREEN DOOR LATCHING MECHANISM

David A. Swanson, 1217 W. Fourth St., Phoenix, Ariz. 85281

Filed Mar. 20, 1989, Ser. No. 325,369

Int. Cl.[4] E05B *15/00*

U.S. Cl. 292—254 **6 Claims**



1. In a door latching mechanism of the type wherein mechanism having a movable vertical latch bar mounted on the surface of a door jamb between inner and outer doors for engagement with latching means located on the outer door, said latch bar having an extended position for engagement wherein said latch bar is spaced by a first distance from said jamb, the improvement which comprises:

(a) guide means for movably receiving a barrier member therein;

(b) means for mounting said guide means to said jamb proximate to said latch bar; and

(c) an elongate barrier member having first and second ends, said barrier member having a length greater than the distance between the inner door and the latch bar, said barrier member being movably mounted and aligned in said guide means, said second end being contacted by ther inner door upon closure to urge said first end beneath said latch bar when in said extended position, the movement of the barrier member beneath said latch bar limiting movement thereof and preventing the opening of the outer door.

4,902,055

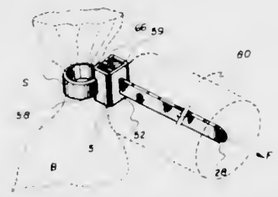
BUNDLING STRAP SECURITY STRUCTURE

Ernest D. Scott, Delray; Gregory W. Scott, Jacksonville Beach, both of Fla., and Donald L. Tedder, Carrollton, Ga., assignors to Edge Technology Corporation, Boca Raton, Fla.

Filed Jan. 30, 1989, Ser. No. 303,464

Int. Cl.[4] B65D *33/34*

U.S. Cl. 292—319 **5 Claims**



1. A combination self-clinching bundling strap and security cap means therefore for bundling bank bags, comprising:

a self-clinching bundling strap having a head-end portion, a tapered tail-end portion and a body portion therebetween, said head-end portion defining a transverse aperture therethrough, said aperture having an axial center and a resilient semi-rigid tongue having one end portion thereof imbedded in said head-end with its opposite end portion extending into said aperture and across the axial center thereof at an acute angle thereto presenting a line edge transversely of the axial center of said aperture adapted for locking the body portion of said strap against relative reverse movement when looped upon itself and fed through said aperture,

a security cap means comprised of a four-sided housing means adapted to surround said head-end portion in securing engagement and having body segments which when moved relative to each other will fracture apart so as to expose said head-end to tampering.

4,902,056

LOCKING FITTING IN PARTICULAR FOR THE SLIDING LEAF

Gérard Prevot, Willerwald, and Daniel Vigreux, Biberkirch, both of France, assignors to Ferco International, Sarrebourg, France

Filed Sep. 14, 1987, Ser. No. 95,648

Claims priority, application France, Sep. 16, 1986, 86 13044

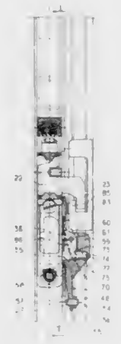
Int. Cl.[4] E05C *1/06*

U.S. Cl. 292—335 **15 Claims**

1. A locking fitting for a closure, said closure being movable between an open position and a closed position relative to a fixed frame, said closure comprising means mounted thereon for latching said closure to said fixed frame, said means for latching being mounted with respect to said closure between a

locked position and an unlocked position, said locking fitting comprising:

(a) means for blocking movement of said means for latching to its locked position, said means for blocking being adapted for mounting on said closure in spaced cooperation with said means for latching on said closure;



(b) means for positioning said means for blocking on said closure in spaced cooperation with said means for latching on said closure; and

(c) means for maintaining said means for blocking on said closure in spaced cooperation with said means for latching on said closure.

4,902,057

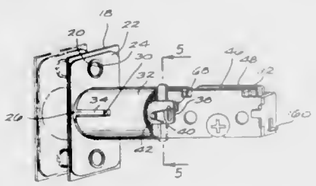
ADJUSTABLE DEADLATCH

Hui P. Ching, Mei Foo Sun Chuen, Hong Kong, assignor to Hing Wai Metal Factory Ltd., Kwai Chung, Hong Kong

Filed Jul. 17, 1989, Ser. No. 380,538

Int. Cl.[4] E05C *1/16*

U.S. Cl. 292--337 **20 Claims**



1. An adjustable deadlatch for a lockset for adjusting to either of two backset positions for the lockset including,

a first cylindrical member having a first particular diameter,

a second cylindrical member having a second diameter larger than the first diameter and with the first and second cylindrical members located in a telescopic arrangement for allowing longitudinal telescopic adjustment between the cylindrical members,

first longitudinal adjustment means interconnected between the first and second cylindrical members and including a first vertical slot and a first pin member and with the first pin member located within the first vertical slot and further including a first rotatable member for supporting the first pin member in a radial position away from the axis of rotation of the first rotatable member so that rotation of the first rotatable member provides for a camming action of the first pin member within the first vertical slot to produce longitudinal telescopic adjustment between the cylindrical members,

a deadbolt located within the first cylindrical member and including a longitudinal opening in the deadbolt,

an actuating member including a longitudinal portion located within the longitudinal opening in the deadbolt,

second longitudinal adjusting means coupled between the deadbolt and the actuating member and including a second vertical slot and a second pin member received within the second vertical slot and with the second pin member mounted on a second rotatable member at a radial position away from the axis of rotation of the second rotatable member and with rotation of the second rotatable member providing for camming action between the second pin member and the second vertical slot to produce longitudinal movement between the actuating member and the deadbolt, and

means interconnecting the first adjustment means and the second adjustment means so that rotation of either of the adjustment means provides for rotation of the other of the adjustment means for coordinating the longitudinal adjustment between the cylindrical members and between the deadbolt and the actuating member and thereby providing for an adjustment corresponding to the two backset positions.

4,902,058

DOOR LOCK

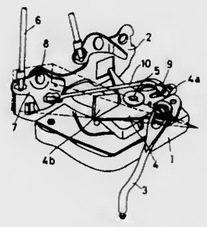
Masao Ohhashi, Kariya, and Yoshimasa Ishiguro, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Dec. 16, 1988, Ser. No. 285,444

Claims priority, application Japan, Dec. 17, 1987, 62-191567[U]

Int. Cl.[4] E05C *3/26*

U.S. Cl. 292—337 **1 Claim**



1. A door lock having an open lever linked with an open rod and pivotally mounted on a base plate and a locking lever linked with a locking link and pivotally mounted on a sub plate, said open lever and said locking lever being linked with each other through a locking rod so that a door is selectively locked and unlocked by the pivotal motion of said open lever which is caused by the pivotal motion of said locking lever, wherein the improvement comprises a protective wall in the shape of an upright wall which is formed integral with the side surface of said open lever which faces said locking lever.

4,902,059

VEHICLE BUMPER SYSTEM FOR FORMING PART OF ENGINE COOLING ASSEMBLY

Richard F. Tritton, 46880 Crawford St., Fremont, Calif. 94539

Filed Sep. 19, 1988, Ser. No. 246,553

Int. Cl.[4] B60R *19/48*

U.S. Cl. 293—117 **19 Claims**

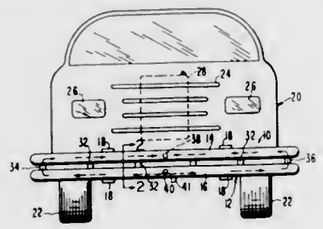
1. A bumper system for a vehicle having an engine block with coolant receiving means comprising:

a tubular bumper member having means thereon for coupling the same to the vehicle with the bumper being adjacent to one end of the vehicle and extending transversely of the path of travel of the vehicle;

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said bumper member having a fluid inlet and a fluid outlet spaced from each other; and

means coupled to the inlet and outlet for placing the bumper member in fluid communication with the engine block of



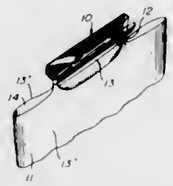
the vehicle for receiving coolant therefrom, whereby the coolant can flow through the bumper member and be placed thereby in heat exchange relationship with the ambient air.

4,902,060

DETACHABLE BAG-CARRYING HANDGRIP DEVICE

Jamshid Nobakht, 6800 MacDonald Avenue, Montreal, Quebec, Canada (H3X 3Z2)

Filed Feb. 13, 1989, Ser. No. 309,483
Int. Cl.[4] A45F *5/10*
U.S. Cl. 294—171 **6 Claims**



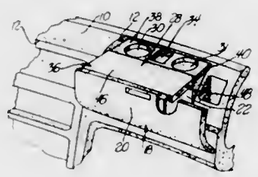
1. A detachable bag-carrying handgrip device for hand-carrying one or more bags having flexible handle portions, said handgrip device comprising an elongated handle member defined by integrally formed opposed outwardly extending thin flexible rectangular side walls merging in a bottom trough section, said handle member having an open top end for receiving a bag handle portion, an end wall at opposed ends of said side walls and defined by a pair of retaining flanges at opposed ends of said side walls and having a slot defined therebetween leading to an enlarged aperture capable of accommodating one or more of said bag handle portions passing therethrough, said enlarged aperture extending into an end portion of said bottom trough section and defining a curved end wall, each said retaining flanges having an outwardly tapered bottom end wall section, said pair of flanges defining a funnel-shape gap therebetween, each said flange also defining a strengthening portion extending angularly inwards from a top end thereof and having a sloped upper edge merging into a respective side of said funnel-shape gap to guide said flexible handle portion into said gap and to strengthen said end wall.

4,902,061

GLOVE BOX WITH CONVENIENCE TRAY

Richard G. Plavetich, Royal Oak, and Roy F. Tiesler, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1988, Ser. No. 267,595
Int. Cl.[4] B62D *25/00*
U.S. Cl. 296—37.12 **5 Claims**



1. A glove box apparatus housed in an opening of a motor vehicle instrument panel comprising:

a closure;

means movably mounting the closure on the instrument panel for movement between a closed position closing the opening and presenting a generally flush relationship with the instrument panel, and an open position moved rearwardly and away from the instrument panel;

a tray;

means slidably mounting the tray on the instrument panel for movement between a retracted position in which the tray is concealed behind the closure and an extended position in which the tray is cantilevered rearwardly from the instrument panel;

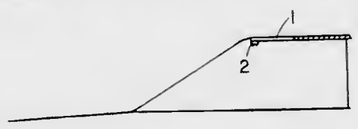
and support means carried respectively by the closure and the tray, said support means being engageable with one another upon rearward sliding movement of the tray so that the closure supports the tray in the extended position.

4,902,062

ELECTRICALLY DRIVEN SUN VISOR

Pavo Pusic, Moluntska 6, Dubrovnik, Yugoslavia (50000), and Palma M. Puzzuoli, 17 Oxford Dr., East Hanover, N.J. 07936

Filed Jan. 18, 1989, Ser. No. 297,680
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.4 **5 Claims**



1. An electrically operated sun visor apparatus for a vehicle having a roof and a windshield, comprising:

a hollow housing having a curved internal storage compartment for storing a sliding panel in a retracted position, said storage compartment including driving cylinders and supporting cylinders, each of said cylinders arranged along both horizontal walls of said storage compartment in a line parallel to the longitudinal extension of said housing, said housing externally shaped in a rectangular prism form and horizontally mounted beneath a front edge of the vehicle roof on either side of said vehicle parallel to the longitudinal extension of said vehicle windshield;

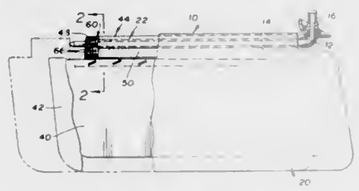
said sliding panel having elevated end-points and the same curvature as said storage compartment, said curvature being approximately equal to the curvature of the vehicle windshield, said sliding panel mounted inside said storage compartment between said driving and said supporting cylinders and driven into extended position by said driving cylinders over said supporting cylinders.

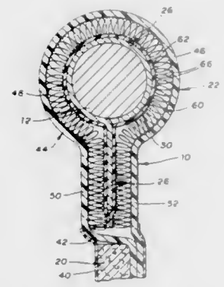
4,902,063

SLIDING SUN VISOR

Robert E. Crink, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1988, Ser. No. 272,963
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.11 **3 Claims**





1. A vehicle sun visor comprising:

support means mounted on the vehicle body,

a sunshade panel,

a sunshade carrier encircling the support means in radially spaced relation therefrom and having the sunshade panel mounted thereon,

and a low friction slide element interposed in the radial space between the carrier and the support means, said slide element including a base having a plurality of radially projecting resiliently flexible friction slippable fingers projecting to fill the radial space and enable movement of the sunshade panel relative to the support means by virtue of frictional slip and resilient flex of the fingers.

4,902,064

TARP COVER SYSTEM INCLUDING BUMP-RAIL AND COVER TENSIONING MEANS

James R. Tuerk and Robert P. Tuerk, both of Indianapolis, Ind., assignors to Aero Industries, Inc., Indianapolis, Ind.

Filed Dec. 21, 1988, Ser. No. 287,071
Int. Cl.[4] B62D *25/06*
U.S. Cl. 296—105 **7 Claims**

1. A tarp system for covering a load arranged on a flat bed vehicle, comprising:

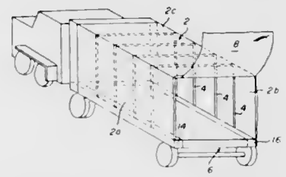
(a) a pair of longitudinal guide tracks adapted for mounting adjacent the opposite sides of the vehicle flat bed;

(b) a plurality of longitudinally arranged inverted U-shaped bow members each having a first generally horizontal portion extending transversely in spaced relation above the vehicle flat bed, and a pair of downwardly depending vertical leg portions the lower ends of which terminate adjacent said guide tracks, respectively;

(c) a plurality of carrier means connecting the lower ends of said bow leg portions for sliding movement relative to the associated guide track, respectively, said bow members normally having an expanded condition relative to each other in which said bow members are spaced longitudinally of the flat bed vehicle;

(d) a sheet-like flexible tarp cover member supported by said bow members to enclose at least a portion of the space above the flat bed vehicle when said bow members are in said expanded condition, said tarp member having a top portion supported by said bow horizontal positions, and a pair of side portions extending downwardly adjacent the external surfaces of said bow leg portions, respectively;

(e) means for relatively displacing said bow members between said expanded condition and a collapsed condition



in which said bow members are adjacent each other and said tarp member is collapsed to uncover said flat bed portion;

(f) bump rail means extending laterally from each side of said flat bed parallel with, spaced upwardly from and horizontally outwardly beyond said guide tracks, respectively, thereby to protect said guide tracks and said bow carrier means; and

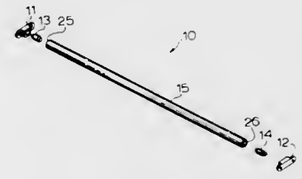
(g) load fastening means extending transversely of said flat bed between said bump rails for fastening a load to said flat bed.

4,902,065

ROOF BOW SUPPORT FOR COVERS ON TRUCK BEDS

Ed Thralls, Rte. 2, Box 271, Mitchell, Ind. 47446

Filed Feb. 23, 1989, Ser. No. 313,907
Int. Cl.[4] B60J *7/08*
U.S. Cl. 296—104 **4 Claims**



1. A roof bow unit to support a cover for the bed of a truck or other vehicle wherein the bed of said vehicle contains an edge, wherein said roof bow unit is comprised of:

a. a pair of upwardly angled mounting members wherein each member is angled upward wherein each member contains a C-shaped socket containing a bottom arm and an upper arm, wherein each arm contains an inwardly facing lip, wherein each lip projects toward the other lip, and wherein each said member is securable to the edge of the bed of the vehicle;

b. a pair of connecting end pieces each containing a rounded end, each end shaped to fit within the C-shaped socket of the mounting member; and

c. a bendable tubular bar with an opening at each end into which the connecting end pieces are secured.

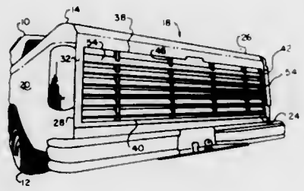
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4,902,066

DIRECTIONAL FLOW TAILGATE

Jerry D. Norman, P.O. Box 1375, Seminole, Tex. 79360

Filed Oct. 27, 1987, Ser. No. 114,077
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—180.1 **1 Claim**



1. A pickup having:
a. a cab,
b. an open top box bed,
c. a metal tailgate at the rear of the bed,
d. said metal tailgate having:
i. a gate bottom edge,
ii. a gate top edge,
iii. two gate side edges,
iv. an inside panel having a panel area,
v. an outside panel spaced from the inside panel;
e. wherein the improvement comprises:
f. a rectangular opening having an area of about 70% of the area of the inside panel,
g. an opening top and bottom edge in the inside and outside panels,
h. metal top and bottom strips extending from the inside panel to the outside panel at the opening top and bottom edges,
j. tubular stanchions extending from the top strip to the bottom strip,
k. alignment plugs in each end of the stanchions,
l. a bolt extending through each stanchion alignment plug, and holes in the bottom strip and said bolts threaded into
m. nuts on the top strip,
n. each stanchion having slots extending upward at about 45° from the outside edge of the stanchion to near the inside of the stanchion, and
o. a louver slat in each of the slots in the stanchions,
p. holes in each of the louver slats,
q. said bolts extending through the holes in the louver slats,
r. The rear edge of the louver slats bent downward to form a tab,
s. whereby air is directed downward from the bed and whereas vision is prohibited from the rear of the bed into the bed.

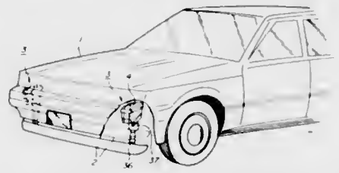
4,902,067

AIR SPOILER RETRACTING DEVICE

Kunio Sakai; Hiromitsu Nishikawa, and Masaharu Matsumoto, all of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Mar. 3, 1989, Ser. No. 318,568
Claims priority, application Japan, Mar. 5, 1988, 63-50617; Mar. 23, 1988, 63-37197[U]
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—180.1 **16 Claims**

1. An air spoiler retracting device comprising:
a casing;
a reversible electric motor disposed in said casing and having a drive shaft;
a carry bar held by said casing and axially movable in parallel with the axis of said drive shaft, said carry bar having a first end to which a spoiler proper is connected;
a first transmission mechanism including a first gear driven by said drive shaft of the motor and a second gear meshed with said first gear;
a second transmission mechanism for converting the rotational movement of said second gear to the axial movement of said carry bar;



first means for permitting a pivotal movement of said carry bar relative to said second transmission mechanism; and
second means for assisting the function of said first means, said second means including at least one elastomeric member sandwiched between attached two parts.

4,902,068

MODULAR HEADLINER ASSEMBLY

James D. Dowd, and Darrel Hampton, both of Farmington Hills, Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Jun. 10, 1988, Ser. No. 205,139
Int. Cl.[4] B60J *7/00*
U.S. Cl. 296—214 **34 Claims**



1. A snap-in modular headliner assembly for use with a motor vehicle which comprises:
a headliner substrate formed to fit within the interior of the motor vehicle;
a first sunshade assembly;
a second sunshade assembly;
a first sunshade fastener mounted to the substrate and including means for securing the first sunshade thereto and first snap-in fastener means extending therefrom;
a second sunshade fastener mounted to the substrate and including means for securing the second sunshade thereto and second snap-in fastener means extending therefrom; and
snap-in fastener receiving means in the motor vehicle for receiving said second snap-in fastener means.

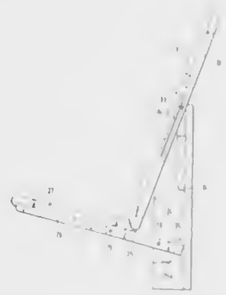
4,902,069

SEAT ESPECIALLY FOR A FLIGHT ATTENDANT

Franzrudolf Lehnert, Weiskirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 3, 1989, Ser. No. 375,391
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1988, 3822574
Int. Cl.[4] A47C *9/06*
U.S. Cl. 297—14 **9 Claims**

1. A seat, especially for a flight attendant, comprising a frame, a seat section and a backrest section, pivoting guide means for securing an upper end of said backrest section to said frame for permitting a tilting motion and a linear motion of an upper end portion of said backrest section relative to said frame, first journal means for journalling a lower end portion of said backrest section to a rear portion of said seat section at a common journal axis, support and guide means for operatively securing said seat section and said backrest section to said frame, said support and guide means having a free end journalled to said common journal axis, and second journal means journalling said support and guide means intermediate its ends to said frame at a fixed journal axis in said frame, said support and guide means cooperating with said backrest section in the manner of a crank drive.

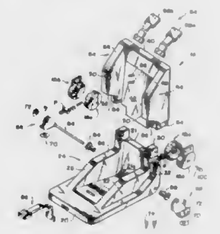


4,902,070

FOLDABLE AUTOMOBILE CONVERTIBLE SEAT

Rudy J. Casale, and Neil Messina, both of Brooklyn, N.Y., assignors to Child Riding Incorporated, Garden City, N.Y.

Filed Sep. 16, 1988, Ser. No. 244,430
Int. Cl.[4] A47C *15/00*
U.S. Cl. 297—238 **11 Claims**



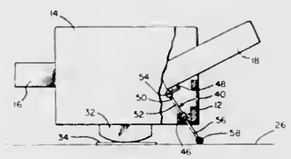
1. An adult to infant convertible seat for automobiles and other moving vehicles having a storage compartment behind the convertible seat comprising:
(a) a back rest section and a seat section, and a storage compartment behind said back rest section;
(b) a child seat pivotally mounted about fixed pivot means for movements between retracted and extended positions in relation to the storage compartment, said child seat including an upper back rest portion and a lower seat portion which are selectively connected and locked to each other in one of folded and unfolded conditions to move together in the folded condition as a single unit between said extended and retracted positions, said child seat being substantially retractable within said storage compartment when folded, and said child seat being substantially extendable exterior of said storage compartment when unfolded for receiving a child by positioning said movable back rest portion generally proximate to said back rest section and said lower seat portion generally proximate to said seat section;
(c) restraining means for restraining a child placed in said child seat in the extended position of said child seat;
(d) movable pivot means for pivotally connecting said back rest and seat portions for movements between said folded and unfolded conditions; and
(e) locking means for locking said back rest and seat portions to each other in each of said folded and unfolded conditions, said child seat in said folded condition having a clearance radius about said fixed pivot means smaller than in said unfolded condition, whereby retracting of said child seat in said folded condition into smaller storage compartments and areas of smaller dimensions is facilitated or made possible.

4,902,071

LIFT RECLINER-ROCKER

Danny C. McGee, Rt. 1, Box 9, Big Creek, Miss. 38914, and Harold G. McMahan, P.O. Box 267, Calhoun City, Miss. 38916

Filed Apr. 11, 1989, Ser. No. 336,332
Int. Cl.[4] A47C *3/02*
U.S. Cl. 297—270 **8 Claims**



1. In a lift chair having a lift base, guide means adjustably supporting said chair from said lift base and including force means connected between said lift base and chair to selectively raise and lower said chair with respect to said lift base, accessory base means supported from said chair and positioned to contact the floor before said lift base is fully raised relative to said chair so that full raising of said lift base relative to said chair elevates said lift base above the floor, said accessory base means including rocker assembly means incorporating rocker means mounted from said chair and floor engageable rocker plate disposed beneath and rockably connected to said rocker means for rockably supporting said rocker means and chair from said rocker plate means and thus the floor from which said rocker plate means is supported, whereby when said lift base is fully raised said chair will be supported from the floor by said accessory base means and be rockable relative to said floor, said chair comprising a recliner chair including a frame from which said rocker means of said rocker assembly means is supported, a seat portion supported from said frame, a back portion supported from said frame for swinging of said back portion between an upstanding position and a reclining position relative to said frame, and rear prop means shiftably supported from said frame and operatively connected to said back portion for downward extension and upward retraction of said prop means relative to said frame responsive to shifting of said back portion between said reclined and upstanding positions, respectively, said prop means, when extended downwardly relative to said frame, being engageable with said floor rearward of said rocker means to prevent rearward rocking of said frame when said back portion is in the reclined position thereof and when upwardly retracted being ineffective to engage said floor and thus ineffective to prevent rearward rocking of said frame when said back portion is in the upstanding position.

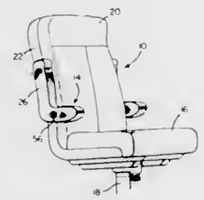
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4,902,072

CHAIR WITH PIVOTAL ARM EXTENSION

Charles W. Chancellor, Jr., Midland, Tex., assignor to Tela Flynt Chancellor, Midland, Tex.

Filed Mar. 15, 1989, Ser. No. 323,835
Int. Cl.[4] A47C *7/54*
U.S. Cl. 297—417 3 Claims



1. In an office chair having a seat and backrest supported in rigid relation to each other, a pair of armrests mounted in cantilever fashion on the chair backrest, means pivotally mounting at least one of the armrests from the backrest for movement between an operative generally horizontal position spaced in parallel relation above the seat of the chair to a generally vertical inoperative stored position alongside the side edge of the chair backrest with the end of the armrest remote from the pivotal mounting means being disposed above the pivotal mounting means, the improvement comprising an extension on the end of the pivotal armrest adjacent the pivotal mounting means, said extention being relatively short as compared to the length of the pivotal armrest, being rigid therewith and being generally perpendicular thereto for movement between a generally vertical inoperative position depending from the armrest when the armrest is in said operative position to a generally horizontal operative position extending forwardly from the backrest in cantilever fashion in generally spaced parallel relation above the seat when the armrest is moved to said inoperative stored position to provide a support for the elbow region of an arm forwardly of the backrest while enabling lateral access to be had to a desk driver drawer or other area from the side edge of the chair seat and backrest of the chair with the upwardly extending armrest limiting rearward movement of the elbow region on the extension, said means pivotally mounting the armrest and extension to the side edge of the chair backrest including means positively and releasably retaining the armrest and extension in both of their positions.

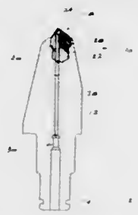
4,902,073

CUTTER PICK FOR MINING USING HYDRAULIC STREAM

Peter N. Tomlinson, 315 Enford Road, Mondeor, Johannesburg, Transvaal, and Klaus Tank, 9 Warbleton Avenue, Essexwold, Bedfordview, Transvaal, both of South Africa

Filed Oct. 26, 1988, Ser. No. 263,009
Claims priority, application South Africa, Oct. 26, 1987, 87/8016
Int. Cl.[4] F21B *10/60*; F21C *35/18*
U.S. Cl. 299—81 6 Claims

1. A cutter pick for a mining machine, the cutter pick comprising: (a) a lug; (b) a cutting insert at a forward end of the lug, the cutting insert including a forward layer of hard, abrasion resistant material presenting a planar cutting face carried by a carbide backing, said carbide backing secured to a carbide body which is secured to the lug; and (c) a passage extending forwardly through the lug from the rearward end of the lug, through the carbide backing and through the forward layer so as to vent through the cutting face, the passage at its rearward end being connectable to a source of high pressure liquid and with its forward end, at a location inside the carbide backing, undergoing a reduction in cross-section so that, in use, a high



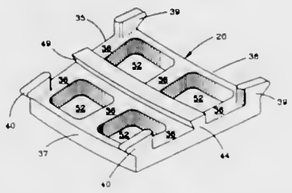
pressure jet of liquid issues through the cutting face to impinge on and degrade a rock face ahead of the cutting insert.

4,902,074

SPACER BLOCK

Robert A. DeRegnaucourt, Centerville, and Lee Reichel, Kettering, both of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Filed Jan. 30, 1989, Ser. No. 302,776
Int. Cl.[4] B60B *11/06*
U.S. Cl. 301—13 SM 6 Claims



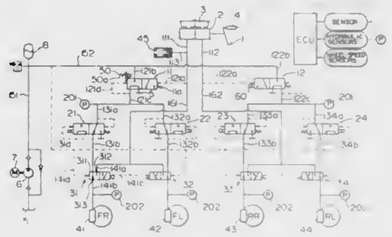
1. A spacer block for dual inner and outer tire carrying rims when mounted on a wheel:
said wheel having a hub element, a plurality of spokes extending radially of said hub, and an axially oriented surface on the outer end of each spoke extending inwardly from the face of a spoke to intersect a beveled inner rim mounting surface;
said wheel further having a spacer block keeper groove on said outer end of each spoke formed radially inward from said axially oriented surface between a spoke face and a beveled surface;
said wheel further carrying a plurality of bolt supported clamp lugs for seating and locking said spacer block and said dual rims on the wheel after mounting, each said clamp lug having a beveled outer rim mounting surface;
said spacer block having a medial portion with a radially inward surface coincident with an axially oriented surface on said end of each spoke and parallel sides each carrying axially projecting flanges adapted for engagement with and seating under rim gutter flanges on said outer and inner rims, during tightening of said clamp lugs;
said spacer block medial portion further having a transverse bar with a depending keeper tang projecting radially inwardly from said transverse bar for selective positioning within a keeper groove on the end of a spoke.

4,902,075

BRAKING APPARATUS FOR VEHICLE

Haruhiko Uno, Okazaki; Yuzo Imoto; Tetuya Izumi, both of Kariya, and Toshihiro Takei, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 21, 1988, Ser. No. 247,392
Claims priority, application Japan, Sep. 24, 1987, 62-239496
Int. Cl.[4] B60T *8/32*
U.S. Cl. 303—14 5 Claims



1. A braking apparatus for a vehicle, comprising:
a master cylinder for generating a pressure by the operation of a brake pedal;
an auxiliary pressure source for accumulating a pressure;
a booster means for receiving as a pilot pressure the pressure of said master cylinder via a pilot pipe and for regulating the pressure supplied from said auxiliary pressure source to a level predetermined times said pilot pressure and then delivering the thus regulated pressure, said booster means including piston means movable by said pilot pressure and an initial pressure raising means including spring means biasing said piston means in one direction and an electromagnetic means responsive to an initial operation of said brake pedal to vary a force of said spring means for thereby allowing said piston means to move whereby the output pressure of said booster means is speedily raised to an initial pressure of a predetermined level; and
a wheel cylinder for generating a braking force upon receipt of an output pressure of said booster means.

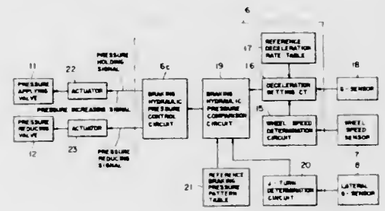
4,902,076

ANTILOCK BRAKE CONTROL METHOD FOR MOTOR VEHICLE

Takayuki Urihijima; Katsumasa Igarashi; Seiichi Ishizeki, and Hideki Ishido, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,123
Claims priority, application Japan, Feb. 9, 1988, 63-27948; Feb. 9, 1988, 63-27949; Feb. 9, 1988, 63-27950
Int. Cl.[4] B60T *8/58*
U.S. Cl. 303—100 6 Claims

1. In an antilock brake control method for motor vehicles, comprising the steps of:
detecting an actual wheel speed of each wheel of a vehicle by means of a wheel speed sensor;
setting a reference vehicle speed by computation of the wheel speed;
determining a reference wheel speed which is lower than the reference vehicle speed;
determining that the wheel is to lock when the actual wheel speed becomes a predetermined value below said reference wheel speed as a result of braking operation;
decreasing braking hydraulic pressure acting on the wheel, when the actual wheel speed becomes a predetermined value below the reference wheel speed, to allow the actual wheel speed to increase due to the reaction force from the road surface;
reincreasing braking hydraulic pressure when the actual wheel speed exceeds said reference wheel speed to indicate that the actual wheel speed recovers to a sufficient speed; and
carrying out control of the braking hydraulic pressure by decreasing and increasing the pressure in dependency on the reference wheel speed:
the improvement comprising the steps of:



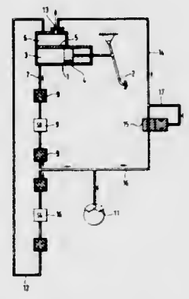
detecting at least a phenomenon occurring in the vehicle in a J-turn state thereof;
determining whether or not the phenomenon is exceeds a predetermined value; and
carrying out the control of the braking hydraulic pressure under another antilock brake control condition for the J-turn state when the phenomenon exceeds the predetermined value.

4,902,077

HYDRAULIC BRAKE SYSTEM

Juan Belart; Werner Volkmar, both of Walldorf; Bernd Schoett, Oberursel, and Peter Stahlheber, Wiesbaden, all of Fed. Rep. of Germany, assignors to Alfred Teves, GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,623
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323500
Int. Cl.[4] B60T *8/02*
U.S. Cl. 303—113 13 Claims



1. A hydraulic brake system with slip control, wherein at least one wheel brake of an automotive vehicle is connected to a master cylinder, wherein a normally opened inlet valve is inserted in the connection between the master cylinder and the wheel brake, said inlet valve adapted to be switched into a closed position, and wherein the supply reservoir of the master cylinder includes an opening tightly closed by a filling device, wherein a connection is established between the supply reservoir (6) and the wheel brake (11) which is controlled by a first directional control valve (15), said first valve (15) having a control input responsive to hydraulic pressure in said supply reservoir (6) to switch said first valve (15) between open and

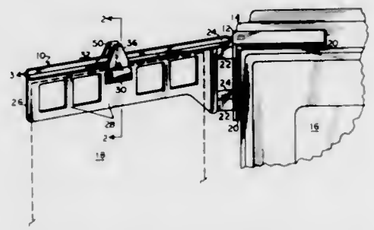
closed positions and being arranged in said brake system to by-pass said inlet valve.

4,902,078

DOCUMENT HOLDER CLIP

Thomas W. Judd, Peterborough, N.H., assignor to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Filed Jul. 12, 1989, Ser. No. 378,635
Int. Cl.[4] A47B *81/06*
U.S. Cl. 312—7.2 **9 Claims**



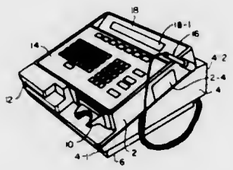
1. A document holder clip adapted to hold a document adjacent a monitor screen, which comprises in combination:
(a) a support bracket means to be secured adjacently to a monitor screen or other fixed support;
(b) an extending arm having a one and other end and an upper edge with a front and back surface and having slightly raised flange elements extending outwardly from the front and rear surfaces and substantially the length of the extending arm and slightly below the upper edge of either side of the arm;
(c) means to provide for the pivotable movement of the extending arm at the one end thereof so as to permit the extending arm to be pivotably moved between a use and a non-use position; and
(d) a slidably mounted document clip means to retain a document, which holder means comprises:
(i) a pair of generally parallel clip arm elements having a one and an other end, that the one end forming opposing jaws on either side of the extending arm;
(ii) a resilient hinge means generally intermediate the generally parallel clip arm elements;
(iii) a clip retaining means between the clip arm elements and below the hinge means which extend and fit over flanges of the arm to retain the clip means on the arm and to permit the slidable movement along the upper edge of the arm of the document clip in use;
(iv) a resilient, bent spring finger at the other end of one of the clip arm elements, the spring finger inclined inwardly toward the hinge means; and
(v) a spring finger retainer at the other end of the other arm clip element whereby the one end of the resilient spring finger is engaged in the spring finger retainer so that the opposing jaw elements are biased in closed, inward, document retaining position adjacent to the surface of the extending arm so as to retain a document between at least one jaw end and the surface of the extending arm and whereby upon the application of finger pressure on the ends of the clip arm element, one end of the spring finger moves downwardly toward the hinge means and away from the retaining stop to place the opposing jaws in an open position for the removal of the document.

4,902,079

WALL OR DESK MOUNTED DATA COLLECTION TERMINAL

Jay A. Kaplan, Wayland, and Peter Place, Ashland, both of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Continuation of Ser. No. 538,049, Sep. 30, 1983, abandoned. This application Jan. 30, 1986, Ser. No. 823,919
Int. Cl.[4] A47B *67/02*
U.S. Cl. 312—245 **2 Claims**



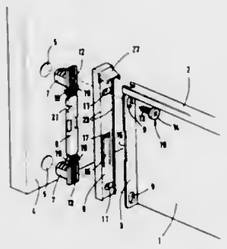
1. A data entry terminal for wall mounting or desk mounting which comprises:
base plate means for mounting a first plurality of electronic circuit components;
shroud means coupled to said base plate means having a first side and a second side wherein said first side has a small thickness dimension and said second side has a large thickness dimension, said first side being opposite to said second side; and
front panel means fastened to said shroud means and having a plurality of openings for mounting input/output equipment, wherein said front panel means is mounted to said shroud means in a first orientation with said first side to the front of said terminal to facilitate access to said input-/output equipment for said desk mounting and mounted in a second orientation with said first side to the top of said terminal to facilitate access to said input/output equipment for said wall mounting.

4,902,080

ADJUSTABLE DRAWER-FRONT MOUNT ASSEMBLY

Horst Berger, Bielefeld, Fed. Rep. of Germany, assignor to Hagenbenrich GmbH & Co. KG, Verl, Fed. Rep. of Germany

Filed Jan. 9, 1989, Ser. No. 295,222
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1988, 3801195
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—348.4 **11 Claims**



1. An assembly comprising a drawer side panel and a drawer front panel, for adjustably mounting the side panel to a back face of the front panel;
the side panel having an upright front edge flange formed with at least one throughgoing hole and normally extending parallel to the back face of the front panel and the back face being formed with a pair of vertically spaced bores;
a vertically elongated anchor unitarily formed with a pair of forwardly projecting inserts engaged in the bores of the front panel;
a vertically elongated adaptor between the flange and the anchor, formed with at least one horizontally elongated hole aligned with the hole in the sidepanel front flange, and extending horizontally outward of the front flange, the adaptor being formed with first means for permitting the adaptor to move vertically on the flange while preventing the adaptor from moving horizontally on the flange;
the adaptor and the flange having horizontally extending and interengaging second means for normally retaining the adaptor against relative vertical displacement, but deformable to permit such displacement; and
at least one screw engaging through the hole in the flange and through the hole in the adaptor, threaded into the anchor, and having a head bearing forward on the flange and a shaft passing through the hole in the flange and substantially smaller both vertically and horizontally than the hole in the flange but vertically generally of the same size as the hole in the adaptor.

4,902,081

LOW EMISSIVITY, LOW SHADING COEFFICIENT LOW REFLECTANCE WINDOW

Russell Huffer, Owatonna, Minn., assignor to Viracon, Inc., Owatonna, Minn.

Filed May 22, 1987, Ser. No. 53,033
Int. Cl.[4] G02B *5/28*
U.S. Cl. 350—1.7 **4 Claims**



1. A low emissivity, low shading coefficient, low reflectance window consisting of an outside pane of glass having an inside surface and an outside surface, and an inside pane of glass having an inside surface and an outside surface, the outside pane of glass having a space between it and the inside pane of glass,
the inside surface of the outside pane of glass having an infrared reflecting coating having a plurality of layers of metal and metal oxides forming a low emissivity coating on the glass, to reflect long wave infrared radiation and transmit visible radiation and short wave infrared radiation,
a visible light absorbing coating on the infrared reflecting coating having a metal nitride layer to absorb the visible light energy and short wave infrared energy and convert it to heat energy which is conducted through the low emissivity coating to the outside pane, where said heat energy can be conducted and radiated away.

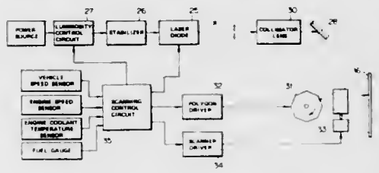
4,902,082

PROJECTOR DEVICE FOR VEHICULAR DISPLAY

Shigeru Okabayashi, and Junichi Fukano, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jun. 30, 1986, Ser. No. 880,034
Claims priority, application Japan, Jul. 1, 1985, 60-142434
Int. Cl.[4] G02B *5/32; G03H 1/22*
U.S. Cl. 350—3.7 **12 Claims**

1. A display system comprising:
a hologram of a substantially flat surface;
a reference beam source generating a coherent reference beam which irradiates the entire surface of said hologram;
a scanning beam source generating a coherent scanning beam having a different degree of collimation from the reference beam so as to interfere therewith;
scanning means for scanning the scanning beam across said hologram according to a predetermined pattern; and
a display controller for deriving a display image to be formed and turning the scanning beam source on and off



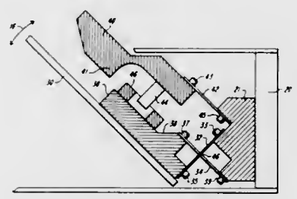
so as to irradiate only a plurality of selected points on the surface of said hologram with said scanning beam which are simultaneously irradiated by the reference beam, said selected points cumulatively forming a pattern having the same shape as the display image derived by said display controller.

4,902,083

LOW VIBRATION RESONANT SCANNING UNIT FOR MINIATURE OPTICAL DISPLAY APPARATUS

Benjamin A. Wells, Newton, Mass., assignor to Reflection Technology, Inc., Waltham, Mass.

Filed May 31, 1988, Ser. No. 200,645
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.6 **26 Claims**

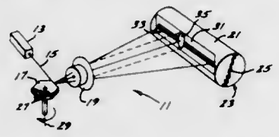


15. A miniature optical display device for generating a raster image to display selected information, said display device comprising:
a linear array of light-emitting devices;
a mirror;
an optical system located between said linear array and said mirror, said optical system projecting a virtual image of said linear array via said mirror;
a base;
first spring means connecting said mirror to said base so as to allow said mirror to oscillate relative to said base, said mirror and said first spring means forming a first spring-/mass system having a first mechanical resonant oscillation frequency and imparting a first reaction force to said base;
a counterbalance mass;
second spring means connecting said counterbalance mass to said base so as to allow said counterbalance mass to oscillate relative to said base, said counterbalance mass and said second spring means forming a second spring/mass system having a second mechanical resonant oscillation frequency substantially equal to said first mechanical resonant oscillation frequency and imparting a second reaction force to said base; and
driving motor means for imparting opposite motions to said

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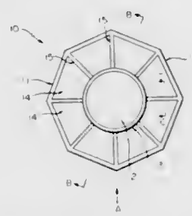
mirror and to said counterbalance mass whereby said virtual image of said linear array is swept by the motion of said mirror to produce a raster display, said first and second reaction forces substantially cancelling each other at said base.

4,902,084
OPTICAL SCANNING SYSTEM
Oren Aharon, Shikun 23rd, Romema, Haifa, Israel
Filed Jul. 29, 1988, Ser. No. 225,744
Int. Cl.[4] G02B *26/10, 5/00*
U.S. Cl. 350—6.8 **10 Claims**



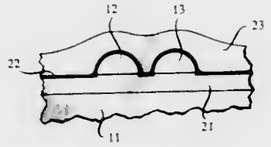
1. Optical scanning apparatus comprising:
source means for providing a collimated beam of light;
a drum including a photosensitive cylindrical surface with a central longitudinal axis and further including means for controllably rotating the cylindrical surface about its longitudinal axis;
scanning means for repeatedly scanning the collimated beam of light longitudinally along the cylindrical surface of the drum, in synchronism with rotation of the surface about its longitudinal axis; and
aperture means defining an elongated aperture of substantially uniform width, oriented adjacent to and substantially parallel with the longitudinal axis of the cylindrical surface, for transmitting the collimated beam of light from the scanning means to the cylindrical surface, while limiting the width of the beam in a cross-scan direction, perpendicular to the scan direction, to a predetermined maximum amount;
wherein the aperture means is controllably rotatable about the axis of the elongated aperture, to controllably adjust the width of the aperture in the cross-scan direction and thereby controllably adjust the width of the portion of the beam of light transmitted to the cylindrical surface.

4,902,085
POLYGON MIRROR
Kazuhiko Murakoshi, and Toshio Shimura, both of Hachiojl, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Jan. 1, 1988, Ser. No. 201,076
Claims priority, application Japan, Jun. 4, 1987, 62-141203
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **12 Claims**



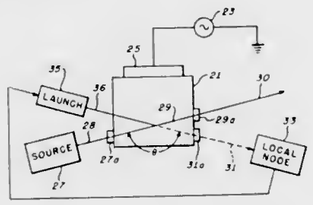
1. A rotatable polygonal mirror comprising a boss at a center of a polygon and having a hole therein,
side members each constituting a side of said polygon, an outer surface of each of said side members forming a mirror surface, each of said side members having ends at a boundary between adjacent side members, each of said side members having a center intermediate said ends, the thickness of said side members gradually decreasing from said ends toward said center,
a plate between said boss and each of said side members, and a rib extending radially from said boss to each said boundary.

4,902,086
DEVICE INCLUDING A SUBSTRATE-SUPPORTED OPTICAL WAVEGUIDE, AND METHOD OF MANUFACTURE
Charles H. Henry, Skillman, and Roland A. Levy, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Mar. 3, 1988, Ser. No. 163,687
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.12 **12 Claims**



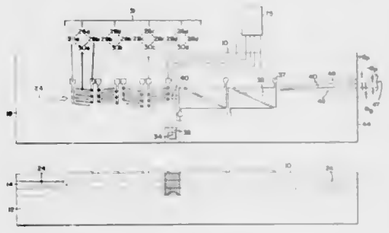
1. A device comprising a substrate-supported optical waveguide, said waveguide comprising a waveguide core on a portion of a first waveguide cladding layer on a substrate,
characterized in that a core-cladding wetting layer is on at least a portion of said first waveguide cladding layer adjoining the interface between said waveguide core and said cladding layer, said wetting layer consisting of a material which is essentially the same as the material of said waveguide core.

4,902,087
FIBER OPTIC BYPASS SWITCH
Stanley J. Lins, Bloomington, and David L. Fleming, Edina, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.
Filed Sep. 19, 1988, Ser. No. 245,593
Int. Cl.[4] G02F *1/11*
U.S. Cl. 350—96.13 **16 Claims**



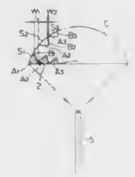
1. An optical switching device comprising:
means for applying electrical signals;
means responsive to said electrical signals for providing acoustical signals; and
switch means operable in first and second modes in response to said acoustical signals for coupling light signals from a first input port to a first output port in said first mode and for coupling light signals from said first input port to said second output port and from said second input port to said first output port in said second mode.

4,902,088
INTEGRATED OPTIC DEVICE FOR LASER BEAM SCANNING
Anil K. Jain, New Brighton; Warren T. Boord, Brooklyn Park; Steven M. Arnold, Minneapolis, and Muhammad A. Khan, White Bear Lake, all of Minn., assignors to APA Optics, Inc., Blaine, Minn.
Continuation-in-part of Ser. No. 843,718, Mar. 25, 1986, abandoned. This application Mar. 18, 1988, Ser. No. 170,141
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.14 **22 Claims**



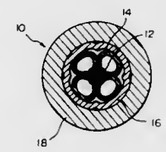
1. A device for scanning a laser beam, comprising:
(a) substrate
(b) a waveguide supported by said substrate suitable for guiding the laser beam, comprising an electro-optic layer;
(c) a Bragg grating electrode array in operative contact with said waveguide, comprising a plurality of grating electrodes, wherein said grating electrodes can be individually selected and energized to change the refractive index of said electro-optic layer over a small localized region to create a spatially-variable diffracted beam at predetermined discrete angles relative to the incident angle of the laser beam; and
(d) deflecting means, operatively connected to said waveguide, for deflecting the laser beam, wherein said deflecting means changes the refractive index of said electro-optic layer over a localized region by varying a signal to said deflecting means, whereby the diffracted beam is deflected about said discrete angles so as to scan the beam, in a continuous angular manner, between said predetermined discrete angles.

4,902,089
SOLAR RAY-COLLECTING DEVICE
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan
Filed Oct. 11, 1988, Ser. No. 255,913
Claims priority, application Japan, Feb. 4, 1988, 63-25358
Int. Cl.[4] G02B *5/172*
U.S. Cl. 350—96.18 **1 Claim**



1. A solar ray-collecting device comprising a Fresnel lens for focusing the sunlight, an optical coupling means having a frusto-conical configuration with a large light-receiving end and a small light-emitting end, said large light-receiving end being spaced from said Fresnel lens and being disposed at the focal position of said Fresnel lens such that the sun's light rays focused by said Fresnel lens are guided into said large light-receiving end of said coupling means and are reflected by the circumferential surface of said coupling means as said light rays propagate toward said small light-emitting end of said coupling means, an optical cable having a light-receiving end, and optical adhesive means adhesively connecting said light-receiving end of said optical cable to said small light-emitting end of said coupling means such that the collected rays are transmitted from said coupling means to said optical cable without loss of reflection, said Fresnel lens having a plurality of lens sections disposed generally in a single plane, each of said lens sections having a lens surface part and an oblique part disposed at an oblique angle relative to said single plane such that said lens surface parts are effective to transmit usable light rays and said oblique parts are ineffective to transmit usable light rays, said Fresnel lens having a numerical aperture equal to that of said optical cable, said coupling means enabling use of a Fresnel lens of a minimized numerical aperture with minimized oblique angles of said oblique parts, an optical cable of a maximized numerical aperture, and an optical cable of a minimized diameter in which the loss of reflection at the light-receiving end of said optical cable is eliminated by said optical adhesive means which adhesively connects said light-receiving end of said optical cable to said small light-emitting end of said coupling means.

4,902,090
OPTICAL FIBER FIXING DEVICE
Toshiyasu Tanaka, Yokohama; Toshimi Nagaishi, and Mituyoshi Suzuki, both of Machida, all of Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jan. 23, 1989, Ser. No. 295,415
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **9 Claims**



1. A fiber mixing device for fixing an optical fiber comprising:
a plurality of tubular fixing members for arranging around the optical fiber; and
means for holding the fixing members around the optical fiber in a compressed state, the holding means shaped such that when the fixing members are arranged around the optical fiber, the fixing members must be forced to be inserted into the holding means, thereby, causing the fixing members to plastically deform and make contact with the optical fiber at many points elastically holding the optical fiber.

4,902,091

LIGHT WAVEGUIDE FEEDTHROUGH FOR OPTOELECTRONIC MODULES AND METHOD FOR THEIR MANUFACTURE

Hans-Ludwig Althaus, Lappersdorf; Joachim Bialas, Deisenhofen; Helmut Haltenorth, Munich; Ewald Hoermann, Holzkirchen; Evelyn Keil, and Edmund Sobota, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 29, 1989, Ser. No. 330,328

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811033

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 9 Claims



1. A hermetic light waveguide feedthrough for an optoelectrponic module for passing a light waveguide fiber including a general coextensive outer coating tightly through a metal tubule in an opening in a housing wall of the module, the feedthrough comprising a relatively thick-walled elongated metal tubule having an axis coextensive with the light waveguide fiber, the light waveguide fiber is affixed by adhesion in a rear portion of the metal tubule and enclosed by a glass glazing in a front portion of the metal tubule, the elongated metal tubule having a relatively high coefficient of thermal expansion compared to the glass glazing so as to produce a compressional force thereon for providing a hermetic seal and a mechanically rigid feedthrough.

4,902,092

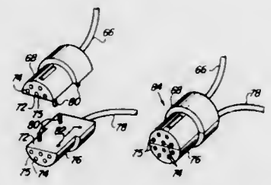
MULTI-PIECE CONNECTOR AND RECEPTACLE THEREFOR

Mark E. Grandy, Port Huron, Mich., assignor to Prestolite Wire Corporation, Farmington Hills, Mich.

Filed Jan. 4, 1988, Ser. No. 140,721

Int. Cl.[4] G02B *6/36, 7/26*

U.S. Cl. 350—96.20 30 Claims



1. In a cable connection system having a unified connector receivable in a receptacle, said unified connector comprising:
a first cable segment having at least one conductor;
a first connector member connected to one end of said first cable segment, said first connector member having one end of said at least one conductor in said first cable segment connected to an electrical terminal in said first connector member;
a second cable segment having at least one conductor;
a second connector member connected to one end of said second cable segment, said second connector member having one end of said at least one conductor of said second cable connected to an electrical terminals in said second connector member, said first and second connector members being laterally joinable to each other to form said unified connector receivable in said receptable; and
means for retaining said first connector member in said laterally joined relationship with said second connector member prior to being received in said receptacle.

4,902,093

LASER DIODE TO FIBER REFLECTIVE COUPLING

Terry P. Bowen, Etters, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 22, 1988, Ser. No. 223,033

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 15 Claims



1. A combination comprising:
a spherical mirror having a one to one imaging plane,
a semiconductor laser diode having an emission facet located closer to said mirror than said one to one imaging plane, and
an optical fiber having an entrance face located farther from said mirror than said one to one imaging plane,
said mirror being positioned to couple radiation from said emission facet of said laser diode into said entrance face of said fiber.

4,902,094

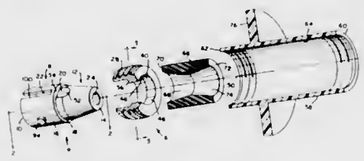
HYBRID PLUG ASSEMBLY

Jeffrey B. Shank, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Aug. 18, 1988, Ser. No. 233,388

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 19 Claims



1. A hybrid plug assembly comprising:
a first coupling comprising a cylindrical portion at one end and a conical portion at an opposite end, said cylindrical portion including an outer surface having at least one flat area, said cylindrical portion comprising a first cylindrical cavity at said one end, said conical portion comprising a second cylindrical cavity at said opposite end, said second cylindrical cavity being of smaller diameter than said first cylindrical cavity, and a conical cavity extending within said first coupling, said conical cavity tapering from said first cylindrical cavity to said second cylindrical cavity; and,
a second coupling comprising an externally threaded cylindrical member having an internal cylindrical surface defining a cylindrical chamber extending from a first end of said threaded cylindrical member to an opposite second end of said threaded cylindrical member and including at least one flat region, said first coupling extending through said cylindrical chamber such that said at least one flat area is keyed to said at least one flat region, said conical portion extends from said opposite second end, said cylindrical portion extends from said first end, and said first cylindrical cavity, said second cylindrical cavity, said conical cavity and said cylindrical chamber are concentric.

4,902,095

OPTICAL FIBRE CABLE CONNECTOR

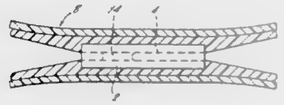
James C. Baker, Lechlade, United Kingdom; Geraldine M. Lang, Bishopbriggs, Scotland; Stephen A. Clift, Swindon, England, and Leslie J. Allen, Menlow Park, Calif., assignors to Focas Limited, United Kingdom

Filed Dec. 15, 1987, Ser. No. 132,308

Claims priority, application United Kingdom, Dec. 17, 1986, 8630058; Nov. 2, 1987, 8725639

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 13 Claims



1. An optical fibre connector including a first member having a portion with a bore defined therein to receive a bared end portion of an optical fibre cable; a body of sealant material on the connector formed with an interior surface to guide an optical fibre into said bore from at least one input end of the first member; and a second member of heat-recoverable material enclosing the body of sealant material, the heat-recoverable material overlapping portions of the first member and an optical fibre after insertion of a bared end thereof into the bore.

4,902,096

OPTICAL FIBER CABLE WITH FIBER ENCLOSING TUBES IN TRANSPARENT CORE

Pietro Calzolari, Milan, and Antonio Portinari, Sesto San Giovanni, both of Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

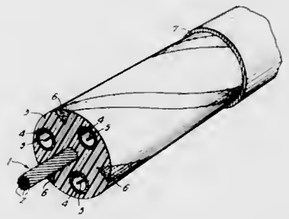
Filed Jun. 20, 1988, Ser. No. 209,230

Claims priority, application Japan, Jun. 30, 1987, 21105 A/87

Int. Cl.[4] G12B *6/44*

U.S. Cl. 350—96.23 10 Claims

1. An optical fiber cable comprising:
an elongated core of transparent plastic material;
at least one tube of a dull material embedded in said core and disposed along a path extending longitudinally of said core, said tube being disposed radially inwardly of the periphery of said core but being visible from externally of said core by reason of the transparency of said transparent plastic material of said core;
at least one optical fiber loosely received in said tube; and
said core having at least one cutting blade guiding groove therein adjacent but spaced from said tube and at the peripheral surface of the core, said groove following a path parallel to the path of said tube and being free of a material which can prevent insertion of a blade in said groove and cutting of the core parallel to said tube for separating said tube from said core independently of cutting of the remainder of the core



whereby said groove provides a guide for a cutting blade for separating a tube from said core without completely cutting said core into two parts in a plane extending transversely to the length of said core.

4,902,097

OPTICAL FIBRE CABLES

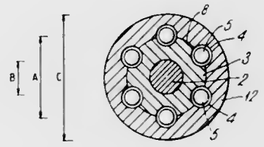
Peter Worthington, Marchwood, and John N. Russell, Ringwood, both of Great Britain, assignors to STC PLC, London, England

Filed Jun. 15, 1987, Ser. No. 62,727

Claims priority, application United Kingdom, Jun. 17, 1986, 8614671

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 8 Claims



1. An optical fibre cable including a tubular tensile strength member defining a longitudinal chamber and, within said chamber, an optical fibre cable element comprising: a plurality of optical conductors each having over the bare conductor a first protective coating which is relatively thin; a central string wire having a buffer coating into which the fibres have been embedded with a zero angle of lay and so that they are spaced from the central string and from each other, and a second extruded buffer coating enveloping the embedded fibres, said cable having a longitudinal water blocking material in the gap between the element and the longitudinal chamber.

4,902,098

DEVICE FOR CORRECTING THE TOTAL DISTORTION CAUSED BY THE SHAPE OF A TRANSPARENT WALL

Joël Rollin; Jean-Claude Perrin, both of Vanves, and Fernand Loy, Sceaux, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 26, 1988, Ser. No. 263,098

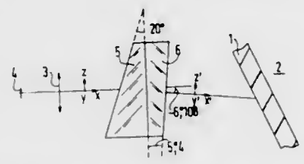
Claims priority, application France, Oct. 27, 1987, 87 14831

Int. Cl.[4] G02B *5/04, 27/00*

U.S. Cl. 350—286 3 Claims

1. A modular optical system for correcting image distortion which results from viewing an object through a wall which is transparent in a given spectral band and which has a shape producing non-rotationally symmetrical distortion comprising:

a single prism disposed adjacent said wall, said single prism having first and second parts, cemented together, having different refractive indicia forming an achromatic assembly, providing a deviation function for correcting a curvature distortion produced by said wall in elevation, and producing an anamorphous function in elevation; and,



a receiver for viewing a parallel beamed image from said prism having a focal length which in combination with said single prism provides for an anamorphotic function which corrects for line length variations imposed by said wall.

4,902,099

TRACE ELEMENT SPECTROMETRY WITH PLASMA SOURCE

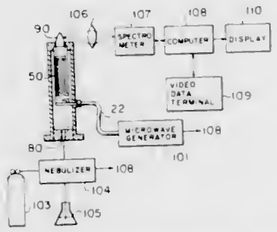
Yukio Okamoto, Sagamihara; Makoto Yasuda, Kodaira; Seiichi Murayama, Kokubunji, and Masataka Koga, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,754

Claims priority, application Japan, Dec. 18, 1987, 62-318813

Int. Cl.[4] G01N *21/73*

U.S. Cl. 356—316 **6 Claims**



1. A plasma trace element spectrometer comprising:

microwave generation means for generating microwave power;

microwave feed means for guiding and transforming the generated microwave power into microwave power of TE_{01} mode and supplying the microwave power of TE_{01} mode;

plasma production means having, at one end, an introduction port for a carrier gas and a sample and at the other end an opening and being cooperative with the supplied microwave power of TE_{01} mode to produce plasma of the carrier gas and sample introduced through said introduction port; and

spectrometer means for analyzing constituent elements of said sample by measuring the produced plasma by way of said opening.

4,902,100

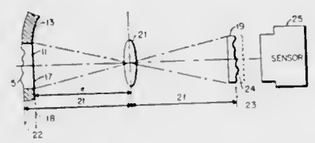
METHOD AND APPARATUS FOR REMOVING PHASE ABERRATIONS IN WINDOWS USING BROADBAND PHASE CONJUGATION

George O. Reynolds, Waban, and Donald A. Servaes, Burlington, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 2, 1986, Ser. No. 869,519

Int. Cl.[4] G02B *27/56, 27, 40, 5/32*

U.S. Cl. 350—320 **17 Claims**



1. A method of removing complex phase aberrations in a window comprising the steps of:

a. making a hologram based on the wavefront created by the window,

b. reading out the spatial phase information encoded on the hologram,

c. calculating the conjugate wavefront from the spatial phase information,

d. transferring the conjugate wavefront onto a corrector plate, and

e. placing the corrector plate on one side of the window,

f. whereby phase aberrations caused by the window will be removed when a scene is viewed with incoherent light through the window and the corrector plate.

4,902,101

AUTOMATIC FOCUSING METHOD

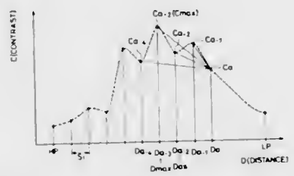
Tadafumi Fujihara, and Yoshihiro Shimada, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 108,936

Claims priority, application Japan, Oct. 16, 1986, 61-246188

Int. Cl.[4] G02B *27/00*

U.S. Cl. 350—320 **7 Claims**



1. An automatic focusing method of bringing into focus by adjusting a distance between an object and an objective lens so that the maximum contrast of the object is brought about, comprising the steps of:

(a) measuring contrast while moving stepwise one of said object and said objective lens along an optical axis of said objective lens in a normal direction with a first constant pitch width from a reference point and storing the contrast at each position where one of said object and said objective lens has been moved;

(b) comparing a difference between a contrast value measured at a present position where one of said object and said objective lens has been just moved and a contrast value stored at each position where one of said object and said objective lens has been already moved, with a preset judgment value; and

(c) judging that a position of the maximum contrast has been passed in relation to operation with said first pitch width when each of comparison results obtained by said step (b) is a positive value.

4,902,102

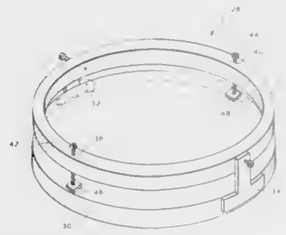
ASPHERIC OPTICAL TEST PLATE ASSEMBLY

Robert S. Breidenthal, Bolton, Mass., assignor to Litton Systems, Inc., Lexington, Mass.

Filed Mar. 28, 1988, Ser. No. 173,796

Int. Cl.[4] G02B *7/00*

U.S. Cl. 350—321 **4 Claims**



1. An aspheric optical test plate assembly for comparing the contour of an aspheric optical surface at a first location with the known contour of an aspheric optical surface at another location, said aspheric optical test plate assembly including:

A. An optical test plate having the shape of a segment of a sphere, said optical test plate including a top surface, a bottom surface and an edge between said top surface and said bottom surface;

B. A pair of adjustable members for selectively applying pressure to the top surface of said optical test plate at locations near the edge of said optical test plate; and

C. A fixture for retaining said optical test plate, said fixture including a reaction ring positioned above said optical test plate, said reaction ring having a diameter substantially equivalent to the diameter of said optical test plate, a pair of brackets for supporting said reaction ring above said optical test plate, each of said brackets having a first end fastened to said reaction ring and a second end fastened to the edge of said optical test plate, said brackets being spaced 180° apart from each other on said reaction ring and on the edge of said optical test plate, said reaction ring further including means for receiving a pair of adjustable members to permit said adjustable members to be adjusted to selectively apply pressure to said optical test plate, each of said adjustable members being spaced substantially 90° apart from one of said brackets on said reaction ring;

Whereby the comparison between the contour of an aspheric optical surface at said first location with the known contour of the optical surface at another location may be made by first placing the optical test plate assembly on the aspheric optical surface at said another location and adjusting the shape of said optical test plate to the shape of said aspheric optical surface at said another location by adjusting said adjustable members to selectively deform the bottom surface of said optical test plate and thereafter moving said aspheric optical test plate assembly to said first location and using a light source to produce an interference pattern at said first location to compare the contour of the aspheric optical surface at the first location with the shape of the bottom surface of said optical test plate.

4,902,103

COLOR LIQUID-CRYSTAL DISPLAY UNIT WITH ELECTRODES INTERLEAVED IN VERTICAL AND HORIZONTAL DIRECTIONS

Kazuyuki Miyake; Atsuhiko Murata, and Yujl Yoshimoto, all of Shizuoka, Japan, assignors to Kolto Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 230,804

Claims priority, application Japan, Aug. 10, 1987, 62-198309

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—336 **7 Claims**



1. A color liquid-crystal display unit comprising: upper and lower light-transmissible substrates disposed in opposition to each other; a plurality of scanning and signal electrodes formed in a matrix pattern on said upper and lower substrates on respective surfaces thereof opposing one another; color filters for predetermined colors formed at a predetermined repetition interval on at least one of upper and lower surfaces of said signal electrodes, intersecting portions of said scanning and signal electrodes on which said color filters are formed defining picture elements, in each of said picture elements a first of said signal electrodes having portions interleaved with a second of said signal electrodes in both horizontal and vertical directions; and a liquid crystal enclosed between said upper and lower substrates.

4,902,104

DISPLAY CELL WITH ALKYL MERCAPTAN ALIGNMENT LAYER

Johannes J. Ponjee, and Antonius B. Voermans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jul. 22, 1988, Ser. No. 223,468

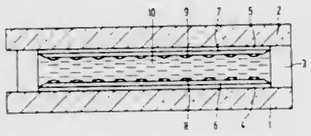
Claims priority, application Netherlands, Jul. 23, 1987, 8701737

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—340 **7 Claims**

1. A display cell comprising two parallel, closely spaced transparent substrate plates which are interconnected at the periphery by means of a seal, the plates being provided with an electrode at the facing surfaces and with an orientation layer which is applied to the electrode and which imposes a homeo-

tropic or tilted orientation on a liquid crystalline compound which is provided in the space bounded by the plates and the



seal, wherein the orientation layer is a monolayer of an alkyl mercaptan.

4,902,105

LIQUID CRYSTAL DISPLAY DEVICE

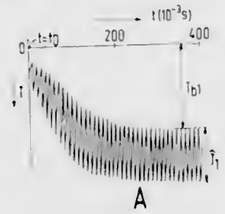
Theodorus L. Welzen, and Adrianus J. S. M. De Vaan, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 772,239, Sep. 3, 1985, abandoned. This application Apr. 5, 1988, Ser. No. 180,605

Claims priority, application Netherlands, Sep. 19, 1984, 8402864

Int. Cl.⁴ G02F *1/133*; G09G *3/34*

U.S. Cl. 350—346 **11 Claims**



1. A method of driving a display device having at least one display cell, said method comprising the steps of

providing at least one liquid crystal display device having a matrix of display cells, said display device having a plurality of line electrodes at one side of said display device and a plurality of column electrodes at an opposite side of said display device.

periodically applying a line selection pulse of value V_l to a number of said line electrodes,

applying voltage pulses of value $\pm Vc$ to all said column electrodes, where V_l is greater than V_c,

wherein within said number of line electrodes, selected cells have a voltage (V_l+V_c) applied, and non-selected cells have a voltage (V_l-V_c) applied, and wherein all other cells have a voltage $\pm Vc$,

switching said selected cells from a first stationary "off" condition to a second stationary "on" condition, said second condition optically differing from said first condition,

providing at least one display cell in said first condition during a frame time t_f, said first condition being formed by superposition of a background level of transmission response of said display cell of T_{b2} and peak response of said transmission response with a peak height T_2,

providing said at least one display cell in said second condition, said second condition being formed by superposition of a background level of said transmission response of T_{b1} and a peak response of said transmission response with a peak height T_1, and

switching from said first condition to said second condition by a transmission response formed by superposition to said background level T_{b1} and peak response with said peak height T_1, respectively,

wherein said peak height T_1 is larger than or equal to 0.5 $(T_{b1}-T_{b2})$.

4,902,106

BISTABLE FERROELECTRIC SMECTIC LIQUID CRYSTAL DISPLAY DEVICE HAVING PARTICULAR ORIENTATION FILM

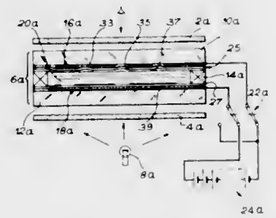
Jean Dijon, and Christine Ebel, both of Grenoble, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 30, 1988, Ser. No. 175,296

Claims priority, application France, Apr. 10, 1987, 87 05134

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—350 S **36 Claims**



1. Liquid crystal display device incorporating A tight cell inserted between two crossed rectilinear polarizers and comprising first and second insulating walls, whereof at least one is transparent, said walls being respectively coated by first and second electrodes with an appropriate shape for the display and between which is inserted a ferroelectric smectic liquid crystal film having parallel smectic layers and each constituted by chiral molecules having a longitudinal axis and a dipole moment perpendicular to said axis, the first and second molecules of each smectic layer being respectively positioned facing the first and the second walls and means for producing between the first and second electrodes an electric field for orienting the dipole moment of the liqud crystal molecules, said device being characterized in that the first wall is covered by a first material able to orient, independently of the direction of the electrical field produced between the electrodes, the longitudinal axis of said molecules in a first direction forming an angle t with $0<t\leqq\theta$ and with respect to a plane parallel to the walls and whose projection in said plane forms with a second direction contained in said plane an angle near to 0°, said first material comprising a film of a mixture of a long chain organosilane and a short chain organosilane in contact with the crystal film, said organosilanes being substituted or unsubstituted, and in that the second wall is covered with a second material able to orient the longitudinal axis of the molecules in a third direction parallel to said plane and whose projection in said plane forms with the second direction an angle near $+\theta$ or $-\theta$, with respect to the direction of the electric field produced between electrodes.

4,902,107

FERROELECTRIC LIQUID CRYSTAL OPTICAL DEVICE HAVING TEMPERATURE COMPENSATION

Akira Tsuboyama, Tokyo; Shinjiro Okada; Osamu Taniguchi, both of Kawasaki, and Masahiko Enari, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 853,162, Apr. 17, 1986, abandoned.

This application May 15, 1989, Ser. No. 352,609

Claims priority, application Japan, Apr. 26, 1985, 60-90123; Apr. 26, 1985, 60-90124

Int. Cl.⁴ G02F *1/133*

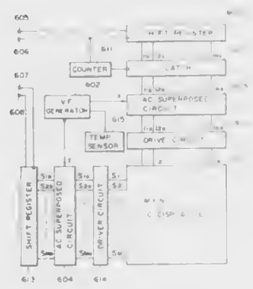
U.S. Cl. 350—350 S **11 Claims**

1. A liquid crystal optical device, comprising:

(a) a liquid crystal cell comprising a matrix electrode structure composed of a first group of electrodes and a second group of electrodes intersecting the first group of electrodes with a ferroelectric smectic liquid crystal having a negative dielectric anisotropy disposed between the first and second groups of electrodes;

(b) means for applying a scanning selection signal to at least one electrode of the first group of electrodes and a scanning nonselection signal to at least one of the other of the first group of electrodes;

(c) means for applying information signals in parallel to the second group of electrodes, said information signals being repeated alternating electric fields: such that repeated



alternating electric fields are applied to at least some intersections of the first group of electrodes and the second group of electrodes so as to place the ferroelectric smectic liquid crystal in a bistable memory orientation state with an increased tilt angle;

(d) means for raising the frequency of the alternating electric field in accordance with a temperature increase in said liquid crystal cell; and

(e) means for detecting an optical difference between light rays which have passed through the ferroelectric smectic liquid crystal oriented to a plurality of different orientation states.

4,902,108

SINGLE-COMPARTMENT, SELF-ERASING, SOLUTION-PHASE ELECTROCHROMIC DEVICES, SOLUTIONS FOR USE THEREIN, AND USES THEREOF

Harlan J. Byker, Holland, Mich., assignor to Gentex Corporation, Zeeland, Mich.

Filed Mar. 31, 1986, Ser. No. 846,354

Int. Cl.⁴ G02F *1/01*

U.S. Cl. 350—357 **16 Claims**

1. A single-compartment, self-erasing, solution-phase electrochromic device which comprises, as the medium of reversibly variable transmittance to light, a solution which comprises

(A) a solvent;

(B) at least one cathodic electrochromic compound which, in a voltammogram done in the solvent at room temperature, displays at least two chemically reversible reduction waves, with the first of said reductions accompanied by an increase in molar extinction coefficient at at least one wavelength in the visible range;

(C) at least one anodic electrochromic compound which, in a voltammogram done in the solvent at room temperature, displays at least two chemically reversible oxidation waves, with the first of said oxidations accompanied by an increase in molar extinction coefficient at at least one wavelength in the visible range; and

(D) if all cathodic and anodic compounds in their zero-potential equilibrium states in the solution are not ionic, an inert current-carrying electrolyte.

4,902,109

ELECTROCHROMIC DEVICE

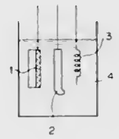
Shinichi Kawate, Tokyo; Ryoji Fujiwara, Kamakura, and Etsuro Kishi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1987, Ser. No. 43,805

Claims priority, application Japan, May 2, 1986, 61-100825; May 2, 1986, 61-100826; Aug. 22, 1986, 61-195300; Aug. 25, 1986, 61-198410

Int. Cl.⁴ G02F *1/17*

U.S. Cl. 350—357 **6 Claims**



1. An electrochromic device employing a metal oxide film layer as an oxidative-coloration layer, said metal oxide film layer being prepared by an anodic oxidation process which comprises:

applying alternating potentials continuously to a metallic film layer during a first period and at least one subsequent period,

wherein the step of applying alternating potentials includes the step of applying a first potential at a first amplitude during said first period and applying a second potential at a second amplitude during said at least one subsequent period, said second amplitude being larger than said first amplitude.

4,902,110

VARIABLE TRANSMISSION OPTICAL DEVICE

Mino Green, London, United Kingdom, assignor to National Research Development Corp., United Kingdom

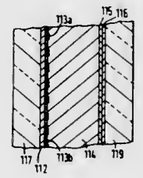
Filed Sep. 4, 1985, Ser. No. 772,455

Claims priority, application United Kingdom, Sep. 4, 1984, 8422262

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.⁴ G02F *1/01, 1/17*

U.S. Cl. 350—357 **17 Claims**



1. A variable transmission optical device comprising

a first layer of a transparent electrically conductive material,

a first layer of an electrochromic material comprising a metal-sensitive compound which is capable of dissolving guest metal atoms and which changes colour in so doing,

a layer of a transparent, solid electrolyte, the solid electrolyte being a fast ion conductor in which a fast ion is an ion of the metal which dissolves in the said metal-sensitive compound to change the colour thereof,

a discontinuous transparent guest metal sink layer comprising a compound which is capable of dissolving the same metal atoms as the first electrochromic layer which guest

metal sink layer comprises a distributed multitude of small areas at least substantially free of said compound,

a second layer of transparent electrically conductive material,

the said layers being positioned in the order specified, the said layer of solid electrolyte being in contact with the layer of electrochromic material and the guest metal sink layer, and the said first and second conductive layers being in contact with the electrochromic layer and the guest metal sink layer respectively,

there being provided in the device a quantity of the said guest metal colouration atoms which may be transferred reversibly from the guest metal sink layer to the electrochromic layer by application of a potential difference between the said first and second electrically conductive layers, the layer of electrochromic material and the guest metal sink layer being chosen such that a given quantity of metal colouration atoms produces a colouration of greater density when dissolved in the electrochromic layer than when dissolved in the discontinuous guest metal sink layer, whereby the overall optical absorption of the device can be varied by transfer of metal atoms between the layer of electrochromic material and the guest metal sink layer.

4,902,111

METHOD AND DEVICE FOR DRIVING ELECTRO-OPTICAL LIGHT SHUTTER ARRAY

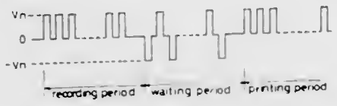
Ken Matsubara; Itaru Saito; Hirohisa Kitano; Konichi Shingaki, and Tomohiko Masuda, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 26, 1988, Ser. No. 262,606

Claims priority, application Japan, Oct. 27, 1987, 62-272377; Jan. 22, 1988, 63-13224

Int. Cl.[4] G02F *1/01, 1/03*

U.S. Cl. 350—393 **15 Claims**



1. A method of driving a light shutter array having a plurality of light shutter elements aligned in line, each of the light shutter elements having an electro-optical effect to polarize an incident light by applying an electric field thereto, the light shutter array including a plurality of individual electrodes each of which is provided on the wall of the respective light shutter elements and a common electrode provided on the opposite walls of the light shutter elements electrically in common so as to oppose the individual electrodes, the method comprising:

a first step of applying a first pulse voltage to the individual electrodes of the light shutter elements to be activated according to data for turning ON/OFF the respective light shutter elements at a periodical timing; and

a second step of applying a second pulse voltage having the same polarity as said first pulse voltage to said common electrode in synchronism with completion of the pulsate application of said first pulse voltage in the first step.

4,902,112

VARIABLE DENSITY LIGHT TRANSMITTING DEVICE

Gregory E. Lowe, 4172 Piedra Ct., Boulder, Colo. 80301

Filed Apr. 17, 1986, Ser. No. 853,200

Int. Cl.[4] G02B *5/30*

U.S. Cl. 350—396 **11 Claims**

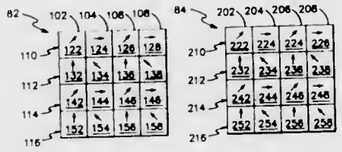
3. A variable density light transmitting device comprising:

a first light polarizing layer having at least three adjacently positioned, equal width light polarizing bands; each band having parallel linear light transmission axes throughout the band; the angle of orientation of the linear transmission axes in each band with respect to the linear transmission axes of an adjacent band being such that each succeeding band has a transmission axis angle of orientation a constant incremental amount smaller than that of the immediately succeeding band;

a second light polarizing layer substantially identical to said first light polarizing layer;

mounting means for holding said first layer in selectively movable generally parallel relationship with said second layer;

whereby said first and second light polarizing layers comprise at least a first, second, and third layer alignment



positions provided by relatively shifting said layers one band width between said first and second alignment position and one band width between said second and third alignment positions in which a different density light transmission through overlying portions of said two layers is provided in each said alignment position and in which the angular relationship between linear transmission axes of oppositely positioned bands on said two layers is a constant value throughout all overlying portions of the two sheets, whereby the degree of transmission of unpolarized light throughout said overlying portions of said two layers is a constant value for any of said at least three alignment positions.

4,902,113

OBJECTIVE LENS AND IMAGING OPTICAL SYSTEM FOR OPTICAL INFORMATION RECORDING AND READOUT DEVICE

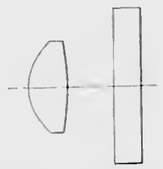
Hiroshi Ishiwata, Kanagawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1989, Ser. No. 320,571

Claims priority, application Japan, Mar. 8, 1988, 63-52749; Mar. 18, 1988, 63-63617

Int. Cl.[4] G02B *13/18*

U.S. Cl. 350—432 **4 Claims**



1. An objective lens for an optical memory device designed as a single-element lens having a first aspherical surface and a second aspherical surface expressed by the formula shown below when the direction along the optical axis is taken as the x axis and the direction perpendicular to the optical axis is taken as the y axis:

$$x = \frac{y^2/r}{1 + \sqrt{1 - P(y/r)^2}} + \sum_{i=1} A_{2i} y^{2i}$$

wherein the reference symbol r represents radius of curvature on the vertex of the aspherical surface, the reference symbol P designates the conic constant and the reference symbol A_{2i} denotes the coefficient of aspherical surface of the 2i'th order, and so designed as to satisfy the following conditions (1) through (4):

(1) $n < 1.65$

(2) $0.25 < d/nf < 0.4$

(3) $-0.5 < P_1 < 0.5$

(4) $P_2 < -20$

wherein the reference symbol n represents refractive index of the objective lens, the reference symbol f designates focal length of the objective lens, the reference symbol d denotes thickness of the objective lens, and the reference symbols P_1 and P_2 represent the conic constants of the first surface and the second surface respectively.

4,902,114

OBJECTIVE LENS FOR AN OPTICAL DISK

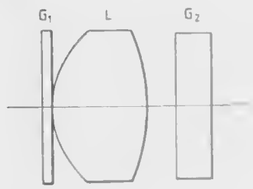
Norikazu Arai, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 226,378

Claims priority, application Japan, Jul. 29, 1987, 62-187734

Int. Cl.[4] G02B *13/18*

U.S. Cl. 350—432 **2 Claims**



1. An objective lens for an optical disk comprising a single lens having biconvex surfaces characterized in that both said surfaces are aspherical, and the biconvex surface on the light source side of said lens is represented by

$$X = \frac{ch^2}{1 + \sqrt{1 - (1 + k)c^2h^2}} + \sum_{i=1}^{4} A_{2i}h^{2i}$$

where

x: The distance from a contact plane of an aspherical top to a point on an aspherical surface where the height h forms an optical axis

h: height from an optical axis

c: curvature of a reference rotational secondary curved surface

k: conical coefficient of a reference rotational secondary curved surface

A_{2i}: aspherical coefficient of the 2i order (i is an integer of 1 or more)

and fulfills the following condition

$$|c|f < 0.9$$

where

f: focal length of a single lens.

4,902,115

OPTICAL SYSTEM FOR ENDOSCOPES

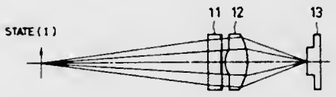
Susumu Takahashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1987, Ser. No. 99,814

Claims priority, application Japan, Sep. 22, 1986, 61-224536

Int. Cl.[4] G02F *1/13;* **G02B** *13/18, 21/02*

U.S. Cl. 350—449 **34 Claims**



1. An optical system for endoscopes comprising:

stop means having an aperture and including means for varying an area of the aperture thereof, and

a lens system having a lens component arranged in the vicinity of or conjugate with said stop means, said lens having a plurality of lens surface portions corresponding to the areas of the varied apertures of said stop means, each said portion having a different focal length from each other said portion.

4,902,116

HELMET DISPLAY SYSTEMS

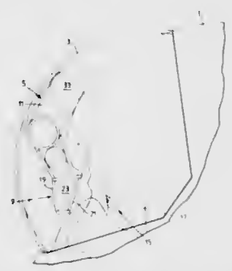
Stafford M. Ellis, East Preston, England, assignor to GEC-Marconi Limited, United Kingdom

Filed May 27, 1988, Ser. No. 199,537

Claims priority, application United Kingdom, Jun. 3, 1987, 8713021

Int. Cl.[4] G02B *17/08, 27/10, 23/10, 23/04*

U.S. Cl. 350—501 **6 Claims**



1. A helmet display system including a display arrangement comprising: right and left collimating eyepieces; and projector means which in operation projects bright data for reflection by the right and left eyepieces to respective right and left eye positions; each eyepiece comprising first and second light transmissive/light reflective laminar elements defining a generally downwardly tapering space and defining at a position adjacent the wider end of the tapering space a principal focal plane of the eyepiece which is coincident with a respective one of two image planes formed by the projector means, and each eyepiece being supported at a respective one of two ports of a housing arrangement containing light paths leading from a bright data source of the projector means to the eyepieces by way of an optical system of the projector means including a relay lens and reflective elements serving in operation to direct rays from the bright data source so as to form images at the said two image planes; and wherein at at least one of the said ports of the housing arrangement, there is a light transmissive portion of the housing, the lower edge of which is contiguous with the upper edge of the light transmissive/light reflective ele-

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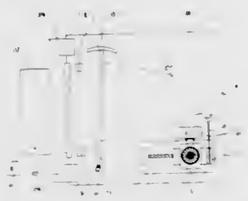
ment of the eyepiece at that port which is remote from the eye position associated with that eyepiece, thereby to extend upwardly the angular range of the field of view available from that eye position; and wherein the optical system includes a partially light transmissive, partially light reflective first planar element positioned substantially midway between and above said eyepieces onto which rays for both said eyepieces are directed from said source via a common path, said first element serving to split said rays between a first path which includes a reflective second planar element parallel to said first element to direct the rays through substantially 90 degrees and thence downwardly to the one of the said ports at which said transmissive portion is located and a second path which includes reflective third and fourth planar elements in parallel spaced relation in planes at right angles to the plane of said first element to direct the rays through two successive turns of substantially 90 degrees in the opposite sense and thence downwardly to the other one of said ports; and wherein said rays for both said eyepieces are incident on said first element in a direction substantially parallel to a straight line joining said eyepieces for passage along said first path after transmission through said first element and passage along said second path after reflection by said first element.

4,902,117

CLOTHING IMAGE MIRROR PROJECTION SYSTEM

Endre K. Papp, Oakland, Calif., assignor to Tryomatics, Inc., Los Angeles, Calif.

Filed Sep. 6, 1988, Ser. No. 240,544
Int. Cl.[4] G02B *5/08;* **G03B** *21/26*
U.S. Cl. 350—601 **6 Claims**



1. A system for providing a composite image of a projected image of an article of clothing and a superimposed reflected image of a viewer's face, said system comprising:

a projector arranged for projecting photographic images of a plurality of said articles of clothing;

a projector screen positioned for receiving said projected photographic images of said plurality of articles of clothing;

a two-way mirror having respective reflective and transmissive surfaces, said two-way mirror positioned adjacent to said projector screen and disposed with said transmissive surface thereof facing said projector screen whereby a viewer positioned opposite to said reflective surface of said two-way mirror is able to view a composite image of said projected image of an article of clothing and the reflected image of said viewer in said two-way mirror; and

an anamorphic lens assembly having means for adjusting the linear dimensions of said projected photographic image of an article of clothing along an axis substantially parallel to the plane of said projected photographic image of an article of clothing, said anamorphic lens assembly being positioned between said projector and said projector screen.

4,902,118

INFANT OBSERVATION MIRROR FOR CAR TRAVEL

Sherryll Harris, 1617 Richardson St., Victoria, B.C., Canada (V8S 1R5)

Continuation-in-part of Ser. No. 69,880, Jul. 6, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 225,715
Int. Cl.[4] G02B *7/18;* **B60R** *1/04*
U.S. Cl. 350—631 **6 Claims**



1. A mirror assembly for use in observing an infant during travel in a vehicle in which the infant is located in a rear seat and faces toward a back of the vehicle, comprising:

(a) a plate having a mirrored surface;

(b) a plate support having a plate receptacle on one side for holding an image forming surface of said plate in an outwardly exposed position, said plate support having a tapered cross section in a plane substantially perpendicular to said plate with a thickness at a top of said support being larger than that at a bottom; and

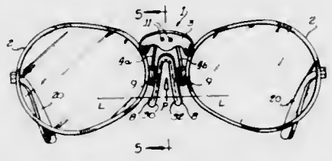
(c) strap means connected to said support and capable of being coupled to a rear seat back so as to hold said support in a selected lateral and vertical position on said seat back.

4,902,119

EYEGLASSES FRAME WITH ARTICULATED RESILIENT NOSE PIECE

Ferdinand A. Porsche, Gries, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.

Filed Aug. 31, 1988, Ser. No. 239,196
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729588
Int. Cl.[4] G02C *5/12*
U.S. Cl. 351—137 **17 Claims**



1. An eyeglass frame including ring-like lens mounting portions joined together by a bridge member extending between the lens mounting portions, comprising:

a nose engaging saddle piece of flexible material including nose engaging pad portions for engaging the sides of a wearer's nose, joined together by an intermediate bight portion and including means for biasing the nose pad portions away from each other;

a pair of opposed hinge arms connected together by interlocking hinge means, each arm having a free end for engagement with the nose engaging saddle piece;

the interlocking hinge means comprising first and second hinge members on respective ones of said hinge arms;

the first hinge member including a tongue-like projection with concave recess portions on either side of said tongue-like projection and with rounded camming projections on either side of said concave recesses;

the second hinge member including a pair of channel-defining finger portions receivable in respective ones of said concave recess portions and defining a channel therebetween for receiving said tongue-like projection, said second hinge member further including concave edges on either side of said finger portions;

said tongue received in said channel and said fingers received in said concave recess portions when said free ends of said hinge arms are moved toward and away from each other;

means for mounting the hinge means to the bridge member including a first pivot mounting member adjacent the tongue-like projection of the first hinge member and a second pivot mounting member adjacent the projection-receiving channel of the second hinge member; and

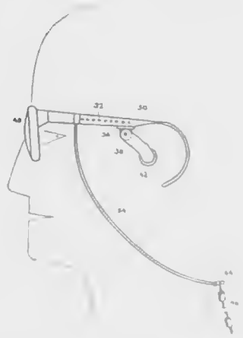
means for connecting free ends of the arms to spaced-apart portions on the saddle piece, adjacent the nose pad portions thereof.

4,902,120

EYEGLASS HEADPHONES

Frank M. Weyer, 81 Toilsome Ave., Norwalk, Conn. 06851

Filed Nov. 22, 1988, Ser. No. 274,491
Int. Cl.[4] G02C *1/00*
U.S. Cl. 351—158 **10 Claims**



1. Earpiece support means for attaching headphone earpiece means to temples of eyeglasses comprising:

attachment means attachable to and slidably mounted on said temples; and

positioning arm means pivotally attached to said attachment means, said positioning arm means comprising headphone earpiece means, said positioning arm means capable of adjustably positioning, maintaining and supporting said headphone earpiece means adjacent to an eyeglass wearer's ear.

4,902,121

RANGE DETECTOR FOR EYE INSTRUMENT HAVING INTERROGATING BEAM

Alan L. Shinn, Berkeley, Calif., assignor to Allergan Humphrey, San Leandro, Calif.

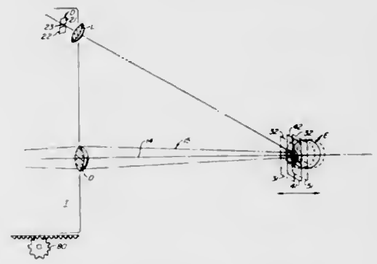
Filed Oct. 4, 1988, Ser. No. 253,005
Int. Cl.[4] A61B *3/14*
U.S. Cl. 351—208 **2 Claims**

1. In an optical instrument emanating an interrogating optical beam along an instrument axis with respect to an instrument objective, said interrogating optical beam being utilized by the instrument to interrogate, interpret and permit the recordation of the optical properties of an eye through attached sensor apparatus, an apparatus for ranging the eye with respect to the instrument objective utilizing the interrogating optical beam for a serendipitous ranging function comprising:

a detector having at least two photosensitive surfaces with a boundary therebetween;

said detector placed off axis with respect to said instrument axis;

said detector positioned with said photosensitive surfaces being directed towards said interrogating beam and the boundary between said surfaces being normal to a plane including the instrument axis and said detector;



a relay lens for relaying a conjugate image of said detector to a position along the axis of said interrogating beam in the vicinity of the eye being examined and forming an image of said detector at the distance from the objective of said instrument where positioning of the eye to be interrogated is desired; and

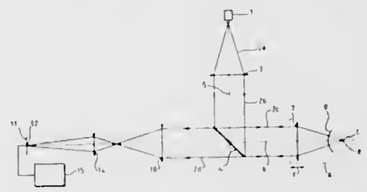
means for detecting a signal between the photosensitive surfaces of said detector whereby towards and away positioning of said instrument relative to said eye occurs.

4,902,122

OPTICAL SYSTEM FOR DETERMINING THE VARIATION OF CURVATURE OF AN OBJECT ON A ZONE OF SMALL DIMENSIONS

Alain Azema; Jean Botineau, and Gérard Moulin, all of Nice, France, assignors to Synthelabo, Paris, France

Filed Jun. 29, 1988, Ser. No. 213,122
Claims priority, application France, Sep. 4, 1987, 87 12302
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—212 **10 Claims**



1. An optical system for determining the curvature or the variation of curvature of an object (9) in a zone of small diameter, comprising:

(a) a light source (1);

(b) first optical means (3) for forming a first parallel light beam (2*b*) from the beam emitted by said source;

(c) a semi-reflecting element (4) disposed on the path of said first parallel light beam and transmitting a second parallel light beam (2*c*);

(d) second optical means (7) for focusing said second parallel light beam (2*c*), said second optical means (7) being movable parallel to the direction of propagation of said second light beam and having an image focus (8) which may be brought to merge at least substantially with the center of

curvature (C) or the surface (S) of said object (9), said object (9) reflecting the light beam focused by said second optical means, in the direction of said second optical means (7) which forms a third light beam (2*d*) addressed to said semi-reflecting element (4);

(e) third optical means (10) receiving said third light beam (2*d*) coming from said semi-reflecting element (4) and focussing said third light beam (2*d*) for forming an image (12) of said object (9); means for detecting (11) said image and

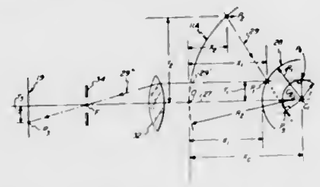
(f) means (15) for displaying said image (12), said second optical means (7) being moved in order that said image (12) on said displaying means be clear.

4,902,123

TOPOGRAPHY MEASURING APPARATUS

Paul R. Yoder, Jr., Wilton, Conn., assignor to Taunton Technologies, Inc., Monroe, Conn.

Filed Nov. 25, 1987, Ser. No. 125,240
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—212 **35 Claims**



1. A contour measuring apparatus to measure the three-dimensional contour of a surface, comprising:

a contour measuring structure having a multi-point light source to direct a plurality of individual light beams each corresponding to individual light points of the multi-point light source onto the surface being measured, said surface being the anterior surface of a cornea;

a photodetector receiving reflections of the individual light beams from said surface for generating electrical output signals corresponding to electro-optically measurable optical images, each of said images corresponding to one of said light points;

means disposed between said surface being measured and said photodetector for focusing the reflected beams of light from the surface being measured onto the photodetector to form the measurable optical images;

means between the focusing means and said photodetector for limiting the cone angle of the rays of the individual light beams reflected from the surface whereby each of said reflected rays closely approximates a telecentric principal ray corresponding to a light point;

said focusing means comprising a lens having an optical axis extending through said contour measuring structure;

said photodetector including a photodetector surface into which said reflected light beams are focused, said photodetector surface being disposed transverse to said optical axis;

means receiving said electrical output signals from said photodetector for measuring the position of each optical image in the photodetector and for determining both the local radius of curvature of the measured surface at each point of incidence of the individual corresponding light beams and the average radius of curvature of the measured surface;

calibration means for reducing instrument errors of the apparatus, said calibration means including:

a calibration surface with a known contour to be positioned in substitution of said surface being measured;

means for determining the magnification of said lens; and

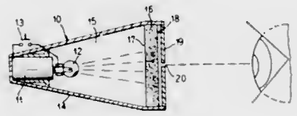
fiducial target means on the calibration surface being reflected as a fiducial target image onto the photodetector whereby comparison of the size of the reflected fiducial target image with the actual fiducial target image enables the magnification of said lens to be determined.

4,902,124

CATARACT MONITORING METHOD AND MEANS

Frederick H. Roy, Sr., and Frederick H. Roy, Jr., both of 1800 Arch St., Little Rock, Ark. 72206

Filed Sep. 6, 1988, Ser. No. 242,431
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—223 **2 Claims**



1. A hand-held opthamological device for monitoring the progression or growth of fixed opacities in the human eye, comprising:

a generally cylindrical housing disposed on a longitudinal axis and sized to be held in the hand of a user;

a light source means supported inside one end of said housing and disposed on the central longitudinal axis of said housing, thereby to project a beam of light longitudinally in the direction of said longitudinal axis towards the opposite end of said housing;

a translucent diffusing filter spaced from said light source means and mounted in said other end of said housing to form a projection plane disposed in perpendicular alignment with said axis for intercepting the longitudinally projected beam of light directly from said light source and diffusing the same uniformly over said projection plane; and

a base member forming a cover closing said other end of said housing,

said cover having a single centered pin hole formed therein and disposed on said central longitudinal axis in alignment with said projection plane;

whereby a user may manually adjust the pin hole on and along the visual axis of the user's eye so that the opacities in the eye are focused as discernibly defined shapes for monitoring the progression or growth thereof.

4,902,125

OPTICAL SYSTEM HAVING BEAM AMPLIFICATION

Wayne H. Keene, South Natick; Albert V. Jelalian, Bedford, both of Mass., and David B. McVicker, Merrimack, N.H., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 30, 1988, Ser. No. 213,816
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—4 **27 Claims**



1. A laser radar system for transmitting an optical beam toward a target and for detecting the target-reflected portion of said beam, said system including:

a laser for producing a beam of optical energy along a first path;

a beamsplitter in said first path for transmitting a first portion of said beam along said first path and for reflecting a second portion of said beam along a second path;

means in said first path for altering the polarization of said first portion of said beam transmitted toward said target, and for further altering the polarization of said target-reflected portion of said beam;

means in said first path responsive to the polarization of said first beam portion for transmitting said first beam portion therethrough, and responsive to the polarization of said target-reflected beam portion altered by said altering means for reflecting said target-reflected portion along a third path;

a beam combiner for providing a combined beam from said second beam portion and said target-reflected portion on said third path, and for directing said combined beam along a fourth path;

detector means responsive to said combined beam on said fourth path; and

means in at least one of said first and third paths for amplifying the optical energy in said at least one path.

4,902,126

WIRE OBSTACLE AVOIDANCE SYSTEM FOR HELICOPTERS

Walter Koechner, Great Falls, Va., assignor to Fibertek, Inc., Herndon, Va.

Filed Feb. 9, 1988, Ser. No. 154,026
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—5 **15 Claims**



1. An obstacle detection and avoidance system for helicopters, comprising

(a) solid state laser transmitter means for generating at least one laser beam in the near infrared wavelength region;

(b) means for dividing said laser beam into a plurality of lobes and for directing said lobes in different directions to define a field of coverage, said laser beam lobes being intercepted by an obstacle in the field of coverage at various locations thereof, said intercepted beam lobes being reflected from the obstacle as return signals;

(c) means for receiving and detecting said return signals; and

(d) means connected with said receiving means and with said laser transmitter means for comparing said return signals with said transmitted laser beam lobes, the difference being a function of the range of the obstacle relative to the helicopter;

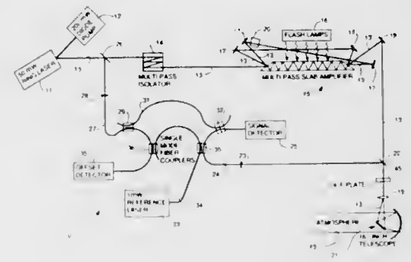
(e) and further comprising a directional control servo mechanism for altering the directions of transmission of said plurality of lobes, whereby the field of coverage defined by said generated laser beam lobes may be changed in accordance with a change in the direction of travel of the helicopter.

4,902,127

EYE-SAFE COHERENT LASER RADAR

Robert L. Byer, Stanford, and Thomas J. Kane, Palo Alto, both of Calif., assignors to Board of Trustees of Leland Stanford, Jr. University, Stanford, Calif.

Filed Mar. 22, 1988, Ser. No. 171,562
Int. Cl.[4] G01C *3/08*; G01P *3/36*
U.S. Cl. 356—5 **27 Claims**



1. In a method for coherently detecting returned eye-safe laser radiation, the steps of:

optically pumping a solid state laser gain medium with optical pumping radiation emanating from a semiconductive diode;

resonating lasant radiation emanating from the optically pumped laser gain medium to produce coherent output lasant radiation of an eye-safe wavelength in excess of 1.5 μm;

amplifying the coherent output lasant radiation in an optical amplitier to produce amplified coherent eye-safe output lasant radiation;

transmitting the amplified output eye-safe lasant radiation from a transmitter station;

receiving at a receiving station the lasant radiation returned from a target intercepted by the transmitted lasant radiation;

collecting the received eye-safe lasant radiation and propagating the same over a single mode fiber-optic waveguide; and

mixing the received lasant radiation as propagated over the single mode fiber-optic waveguide with reference coherent lasant radiation to derive a difference frequency output signal representative of parameters associated with the target.

4,902,128

APPARATUS FOR HARMONIZING A PLURALITY OF OPTICAL/OPTRONIC AXIS OF SIGHTING APPARATUS TO A COMMON AXIS

Hans Siebecker, Heidelberg, and Wolfgang Weigel, Dossenheim, both of Fed. Rep. of Germany, assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 641,525, Aug. 16, 1984, abandoned. This application Sep. 3, 1986, Ser. No. 903,877
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1983, 3329590
Int. Cl.[4] G01B *11/26*; G01C *3/08*; H01L *25/00*
U.S. Cl. 356—152 **19 Claims**
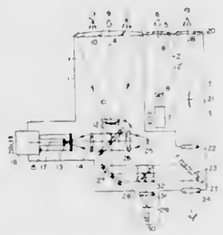
1. An aiming apparatus, said aiming apparatus comprising:

a laser transmitter having a first optical axis;

a thermal imaging device having a second optical axis; said first and said second optical axes being substantially parallel one to the other, said imaging device further comprising an IR radiation telescope, a scanning mirror disposed within said second optical axis, and an IR sensor row array having a preceding IR objective, said row array

comprising a plurality of linearly disposed detectors operable for detecting IR radiation reflecting from said mirror, said apparatus being operable for displacing a thermal radiation image of a scene including a target by means of a thermal image reproduction channel upon an image plane of an eyepiece for aligning said second optical axis upon said target, said sensor row array being disposed relative to said mirror for receiving portions of said scene radiation reflecting from said mirror and passing through said IR objective continuously and consecutively, said sensor row array further being disposed to receive reflected laser pulses emitted by said laser transmitter when said mirror is in a predetermined angular position relative to said array, said apparatus further comprising:

a day sight channel having a third optical axis substantially



parallel to said first and said second optical axes, said day sight channel comprising a day reticle perpendicularly disposed to said third optical axis and parallel to said image plane;

a sensor operable for sensing said laser pulses and said thermal image, said sensor being operatively coupled to a selected one or ones of said detectors for sensing the IR radiation detected therein; and

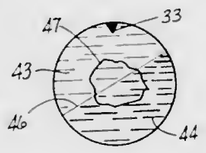
an integral thermal image reticle operable for being imaged upon said image plane for aligning said row array with said first optical axis, said thermal image reticle further being alignable with said day reticle whereby said second and said third optical axis are harmonized one with the other by temporarily superimposing said day reticle and said thermal image reticle one upon the other with an adjusting means.

4,902,129

ORIENTATION INDICATOR FOR A FLEXIBLE FIBERSCOPE OR ENDOSCOPE INCLUDING METHOD OF MANUFACTURE

Walter P. Siegmund, Windham, Conn., and Anthony F. Szwarc, Sturbridge, Mass., assignors to Schott Fiber Optics, Southbridge, Mass.

Filed Sep. 6, 1988, Ser. No. 240,501
Int. Cl.[4] G02B *23/26*; G01C *9/20*
U.S. Cl. 356—241 **4 Claims**



1. An orientation indicator for a flexible fiberscope or an endoscope comprising:

a first elongated fiber optic image bundle for observing a remote object,

at least one fiber optic light bundle for illuminating said object,

both said bundles being subject to torque or twisting stresses,

observation means at a proximate end of said image bundle for viewing said object, and,

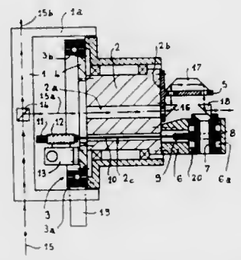
indicator means at a distal end of said image bundle, observable via said observation means, for indicating the rotational orientation of said distal end relative to said proximate end of said bundles, said indicator means defining a cell containing two immiscible fluids, each fluid having a different color and a different specific gravity whereby the line of demarcation between the two fluids is visible clearly.

4,902,130

LASER RAY PROJECTOR AND REMOTE MEASURING DEVICE COMPRISING AT LEAST TWO OF THESE PROJECTORS

Lucien Bouillot, 26 Rue du Pré d'Elle, Meylan, France (38240), and Bernard Barthelemy, 50 la Chanteraie, Claix, France (38640)

Filed Jun. 13, 1988, Ser. No. 205,840
Claims priority, application France, Jul. 24, 1987, 87 10715
Int. Cl.[4] G01C *9/02*
U.S. Cl. 356—248 **11 Claims**



1. A laser ray projector for selectively projecting a laser ray from a source comprising a fixed casing, a spindle mounted within said casing so as to be rotatably moved with respect thereto about a first geometrical axis, said spindle having inner and outer portions, a head mounted to said outer portion of said spindle, means for rotating said head about a second geometrical axis generally perpendicular to said first geometrical axis, a bore through said spindle and oriented along said first geometrical axis, optical means for directing the laser ray from the source through said bore and thereafter into said second geometrical axis of said head, and a prism carried by said head for reflecting the laser ray from said optical means in a moveable plane containing said first geometrical axis of said spindle.

4,902,131

SURFACE INSPECTION METHOD AND APPARATUS THEREFOR

Yuichiro Yamazaki, Yokohama; Motosuke Miyoshi, Fujisawa; Shigeru Ogawa, and Katsuya Okumura, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1986, Ser. No. 844,601
Claims priority, application Japan, Mar. 28, 1985, 60-64896; Dec. 10, 1985, 60-277545
Int. Cl.[4] G01N *21/01*
U.S. Cl. 356—336 **17 Claims**

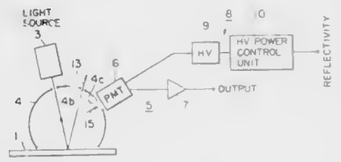
1. A method of inspecting a substrate surface having a known reflectivity to detect the diameters of particles on the substrate surface, comprising the steps of:

irradiating light on said substrate surface,

collecting scattered light from said particles,

detecting said scattered light collected, and

compensating for detection sensitivity of said scattered light in accordance with a compensation control signal on the



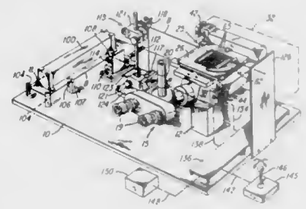
basis of intensity of said scattered light from said particles corresponding to reflectivity of said substrate surface so that the particle diameters on the substrates can be detected correctly even when the reflectivities of the substrate surface differ from a standard.

4,902,132

AUTOMATED CAPILLARY SCANNING SYSTEM

Martin J. Murphy, Jr., Dayton; Jack B. Stubbs, Waynesville, and Thomas A. Leonard, Dayton, all of Ohio, assignors to Hipple Cancer Research Corporation, Dayton, Ohio

Filed Jun. 13, 1988, Ser. No. 205,725
Int. Cl.[4] G01N *21/51*; C12M *1/34*
U.S. Cl. 356—339 **23 Claims**



1. Apparatus for scanning and detecting the contents of a capillary tube, comprising an optical sensor having a predetermined optical axis, means for supporting said capillary tube with its longitudinal axis substantially intersecting said optical axis, means for producing relative movement between said optical sensor and said supporting means to move said capillary tube axially across said optical axis, means for generating a precision light beam, means for directing the light beam towards said capillary tube at a substantial angle relative to a plane perpendicular to the axis of said tube for illuminating the contents of said capillary tube without producing significant reflection and refraction of light by said capillary tube to said optical sensor, and said optical sensor including means for detecting differences in the light reflected by the illuminated contents of said capillary tube along the length of said tube.

4,902,133

METHOD AND AN APPARATUS FOR ALIGNING FIRST AND SECOND OBJECTS WITH EACH OTHER

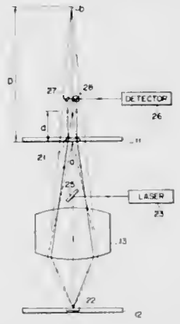
Toru Tojo, Kanagawa; Osamu Kuwabara, Yokohama; Masashi Kamiya, and Hisakazu Yoshino, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba and Tokyo Kogaku Kikai Kabushiki Kaisha, both of Kawasaki, Japan

Filed Sep. 30, 1988, Ser. No. 251,842
Claims priority, application Japan, Sep. 30, 1987, 62-246202
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—356 **49 Claims**

1. A method for aligning first and second objects with each other, which objects are moved relative to each other and in parallel, so as to be aligned, a projection lens being disposed between said first and second objects, a first mark formed on said first object, said first mark including a diffraction grating region having two diffraction points, each capable of diffracting a light beam applied thereto, the two diffraction points spaced at predetermined distance from each other, a second mark formed on said second objects, said second mark including a diffraction grating region,

said method comprising steps of:

directing an alignment light beam emitted from a light source to said first mark, the alignment light beam diffracted by the two diffraction points of said first mark, so that two diffracted light beams or predetermined orders emerge individually from the two diffraction points in such a manner that the respective optical axes of the two predetermined-order diffracted light beams, which are directed opposite to the advancing direction of the diffracted light beams, intersect each other on a first intersection point at a predetermined distance from said first mark;



transferring the two predetermined-order diffracted light beams through the projection lens toward said second mark, so that the two diffracted light beams are converged by the projection lens and are incident on the diffraction grating region of said second mark in such a manner that the respective optical axes of the two diffracted light beams, which are directed to the advancing direction of said diffracted light beams, intersect each other on a second intersection point at a predetermined distance ($=d_1 \geqq 0$) from said second mark, whereby the two diffracted light beams are diffracted by the diffraction grating region of said second mark, and two re-diffracted light beams of predetermined orders emerge from the diffraction grating region of said second objects;

detecting the predetermined-order re-diffracted light beams and generating a detection signal; and

adjusting said first and second objects relative to each other in response to the detection signal, thereby aligning said first and second objects with each other.

4,902,134

OPTICAL AMPLIFIER AND METHOD FOR AMPLIFYING OPTICAL POLARIZATION STATE CHANGE EFFECTS

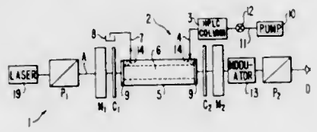
Richard F. Spanier, Chester, N.J., assignor to Rudolph Research Corporation, Flanders, N.J.

Filed Feb. 3, 1988, Ser. No. 152,005
Int. Cl.[4] G01J *4/00*
U.S. Cl. 356—364 **23 Claims**

1. An optical amplifier for amplifying optical polarization state change effects comprising means for providing polarized light and means for passing at least a portion of said polarized light through a material a plurality of times such that changes

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in polarization state of the polarized light from the respective passes of the light through said material are cumulative, wherein said means for passing includes means for reflecting at least a portion of said polarized light back and forth on itself a plurality of times along an optic axis which extends through



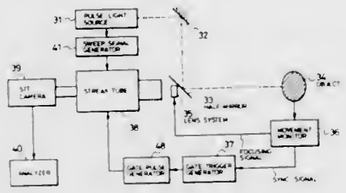
said material thereby forming an optical cavity, and wherein said means for passing inverts the polarization state of the polarized light between passes through said material so that the changes in the polarization state in successive passes are cumulative.

4,902,135

OBJECT MOVEMENT MEASURING APPARATUS

Yoshihiro Takiguchi, Shizuoka, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Apr. 27, 1988, Ser. No. 187,009
Claims priority, application Japan, Apr. 28, 1987, 62-105270
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—373 12 Claims



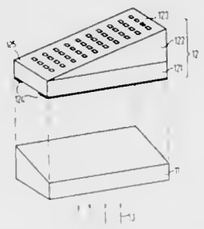
1. An object movement measuring apparatus, comprising:
a pulse light source;
an optical system for illuminating an object under measurement with a light beam emitted by said pulse light source;
a streak tube having a photocathode and a pair of vertical deflection electrodes, for detecting a reflection light beam or a transmission light beam from said object and outputting a streak image output;
a sweep signal generator for receiving a part of said light beam emitted by said pulse light source and providing a sweep signal to said pair of vertical deflection electrodes of said streak tube;
an image-forming lens system for focusing said reflection light beam or said transmission light beam on said photocathode of said streak tube;
a movement monitor for detecting movement of said object and producing a synchronizing signal which is synchronous with said movement; and
a gate trigger signal generator for producing a sequential gate trigger signal to trigger said streak tube according to said synchronizing signals sent from said movement monitor.

4,902,136

ARRANGEMENT FOR HIGH-RESOLUTION SPECTROSCOPY

Rudolf Müeller, Soecking, and Wolfgang Albertshofer, Geltendorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 24, 1988, Ser. No. 261,489
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1987, 3736204; Dec. 18, 1987, 3743131
Int. Cl.[4] G01J *3/51*
U.S. Cl. 356—419 15 Claims



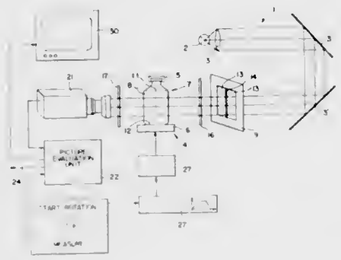
1. An arrangement for high-resolution spectroscopy, comprising:
a wavelength-selective diode array including diode elements arranged side-by-side, said diode elements having different spectral sensitivities;
an interference filter having transmission regions corresponding to spacing of sensitivity maximums of individual ones of said diode elements, said interference filter being tunable to cover an entire wavelength region of said diode array to improve resolution.

4,902,137

METHOD AND APPARATUS FOR THE DETERMINATION OF FOREIGN BODIES IN FLUIDS

Gunther Krieg; Gerhard Barth, both of Karlsruhe; Eberhard Vaas, Pforzheim, and Manfred Reiser, Winnenden-Hertmannsweiler, all of Fed. Rep. of Germany, assignors to Harro Hofliger Verpackungsmaschinen GmbH, Allmersbach im Tal, Fed. Rep. of Germany

Filed Feb. 4, 1988, Ser. No. 152,329
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1987, 3703306
Int. Cl.[4] G01N *21/89, 21/90*
U.S. Cl. 356—427 16 Claims



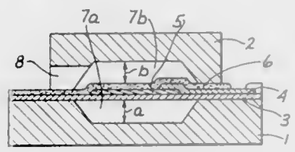
1. The method for detecting particles in a moving fluid provided in a stationary containment vessel and comprising the following steps:
providing light transparent windows in the fluid containment vessel one of which windows is an entry window and has a generally convex external surface and the other window being an exit window and oriented on an optical axis through said windows,
directing a polarized beam along the optical inspection axis and through the entry and exit windows provided on this axis,
masking the window in an area where the light beam is generally perpendicular said convex window surface so that all of the polarized light entering the moving fluid is refracted at least slightly by the stationary convex entry window,
cross polarizing the light exiting the exit window so that the light beam consists only in that part of the polarized light beam that has been unpolarized by particles in the fluid or by defects in or on the transparent windows,
providing a video camera for the cross polarized light beam,
comparing the video output from successive video frames to provide an indication of the particles in the moving fluid.

4,902,138

MEASURING COMPONENT CONCENTRATION IN A GAS BLEND

Heinz-Dieter Goeldner, Schwalbach/Ts.; Bertold Horn, Friedrichsdorf; Thomas Liedtke, Oberursel; Wolf-Ruediger Marx, Bad Vilbel/Gronau, and Werner Schaefer, Kronberg, all of Fed. Rep. of Germany, assignors to Hartmann & Braun AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 176,888
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711511
Int. Cl.[4] G01N *31/00, 25/18*
U.S. Cl. 374—44 9 Claims



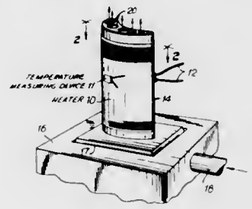
1. Sensor for measuring the thermal conductivity in a gas blend in order to determine and measure concentration of components of and in that blend comprising:
a Silicon carrier being a few hundred micrometers thick and being provided with an electrically insulating layer:
a sputtered on or vapor deposited meander shaped thin film resistance on the insulating layer;
a pit in said carrier underneath said resistance and said insulating layer, there being at least one perforation in the insulation layer to permit access of gas to the interior of the pit;
a cover plate made also of Silicon of comparable thickness dimensions as the carrier and also having a pit of comparable dimensions as the first mentioned pit, the cover plate being disposed above said carrier so that said pits are aligned and constitute a common measuring chamber; and
a diffusion channel in the cover plate for feeding a gas through diffusion to the measuring chamber is defined by said two communicating pits when taken together.

4,902,139

APPARATUS AND METHOD FOR MEASURING THE THERMAL PERFORMANCE OF A HEATED OR COOLED COMPONENT

Eugene F. Adiutori, Westchester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 13, 1988, Ser. No. 180,919
Int. Cl.[4] G01N *25/00, 25/11;* G01K *13/02*
U.S. Cl. 374—137 42 Claims



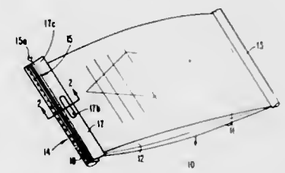
1. An apparatus for measuring the thermal performance of a component, comprising:
a means for applying a predetermined amount of heat flux to a predetermined outer surface of the component;
a means for applying a cooling fluid flow having predetermined characteristics to the component and
a means for measuring a temperature distribution on a preselected surface of the component while the predetermined amount of heat flux and the cooling fluid flow having predetermined characteristics are being applied to the component.

4,902,140

DETACHABLE HANDLE FOR SHIPPING SACKS

Mark E. Branson, Shelbyville, Ind., assignor to KCL Corporation, Shelbyville, Ind.

Filed Apr. 6, 1989, Ser. No. 334,696
Int. Cl.[4] B65D *33/08*
U.S. Cl. 383—25 5 Claims



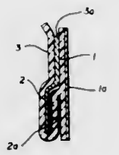
1. A shipping sack having side walls defining a mouth through which the contents of the sack may be removed, comprising:
a non-reclosable stitched separable closure fastener across and closing the mouth of the sack and adapted for manual separation to remove said stitched fastener and open the mouth of the sack; and
a rip tape for facilitating removal of said stitched fastener, said rip tape being removably joined to the sack by said stitched fastener and including;
an integral handle, said handle being manually graspable to carry the sack when said rip tape is joined to the sack; and
a manually accessible integral free end, said free end being adapted to be manually pulled to remove said rip tape, whereby as said rip tape is removed said stitched fastener is separated from the shipping sack.

4,902,141

RESEALABLE FLEXIBLE PACKAGING AND SEALING TAPE THEREFOR

Ron Linnewiel, P.O. Box 63, Ramat Gam, Israel

Filed Dec. 28, 1987, Ser. No. 138,188
Claims priority, application Israel, Dec. 30, 1986, 81120
Int. Cl.[4] B65D *33/16, 33/18, 33/30, 5/42*
U.S. Cl. 383—61 **4 Claims**



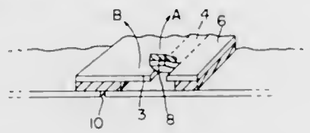
1. A plastic sealing tape for resealable flexible packaging comprising a tape having a first section provided with a permanent high-tack adhesive, and a second section being provided with a low-tack adhesive and being folded onto itself with the interposition of a layer of silicone, said second section having a free end being adhesive free.

4,902,142

ADHESIVE TAPE AS RECLOSEABLE CLOSURE

Rolf Lammert, Bönningstedt; Friedrich Rambow, Hamburg, and Cort Herager, Birker d, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,543
Claims priority, application Fed. Rep. of Germany, May 5, 1987, 3714843
Int. Cl.[4] B65D *33/20*
U.S. Cl. 383—78 **8 Claims**



1. Adhesive tape for the reclosable closure of a tubular bag or the like, comprising a base coated with a longitudinal line of adhesive and having a tab running in the longitudinal direction of the adhesive tape and laterally extending past said line adjoining the base of adhesive, the tab (3), continues into a tear-open region (4) which, in the manner of an original closure, can be torn open in the longitudinal direction of the adhesive tape (1), and the tear-open region, adjoining the tab, continues into adhesive region (6) coated with another longitudinal line of adhesive, the tear-open region being formed by strong stretching of the base in the longitudinal direction of the adhesive tape.

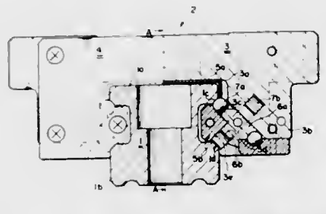
4,902,143

RECTILINEAR MOTION ROLLING GUIDE UNIT

Kunihiko Morita, Koganei, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1989, Ser. No. 397,678
Claims priority, application Japan, Dec. 19, 1988, 63-318650
Int. Cl.[4] F16C *31/06*
U.S. Cl. 384—43 **4 Claims**

1. A rectilinear motion rolling guide unit comprising:
a long track rail (1) having an almost I-shaped cross section;
a casing (3) having an almost inverse U-shaped cross section; and
a number of rolling elements (7*a* and 7*b*) which are interposed between said track rail (1) and said casing (3),
wherein the casing (3) has a cavity portion (3*a*) having an almost inverse U-shaped cross section in an almost central lower portion of the casing and is arranged so as to ride over said track rail (1) through said cavity portion (3*a*),
lower corner portions of upper projecting portions (1*a*) and upper corner portions of lower projecting portions (1*b*) which are provided on both sides of the track rail (1) are respectively chamfered into inclined surfaces, thereby forming two upper and lower rail side track surfaces (1*c* and 1*d*),
two upper and lower casing side track surfaces (3*c* and 3*d*) are formed on an inner peripheral surface of said cavity portion (3*a*) of the casing (3) at positions corresponding to said two upper and lower rail side track surfaces (1*c* and 1*d*),
said rolling elements (7*a* and 7*b*) are inserted between said corresponding rail side and casing side track surfaces (between 1*c* and 3*c* and between 1*d* and 3*d*), thereby allowing the relative free slide motion between the track rail (1) and the casing (3) which rides over the track rail to be executed,



rolling element return passageways (8*a* and 8*b*) for said two upper and lower casing side track surfaces (3*c* and 3*d*) are respectively formed in the casing,
side plates (4) each having two direction turning passageways (6*a* and 6*b*) for the rolling elements (7*a* and 7*b*) which roll and run on the two upper and lower casing side track surfaces (3*c* and 3*d*) are respectively attached to both end portions in the longitudinal direction of the casing,
the two upper and lower casing side track surfaces (3*c* and 3*d*) and the return passageways (8*a* and 8*b*) corresponding thereto are respectively coupled, thereby forming two endless rolling element circulating passgeways (9*a* and 9*b*) into the casing (3),
said two endless circulating passageways (9*a* and 9*b*) are arranged so as to perpendicularly cross each other when they are seen in a cross sectional view of the casing,
lengths of load track surfaces (10*a* and 10*b*) of said endless circulating passageways (9*a* and 9*b*) are set to be substantially equal,
ball rolling elements (7*a*) are rolled on the load track surfaces (10*b*) and roller rolling elements (7*b*) which are arranged in parallel are rolled on the other load track surface (10*a*).

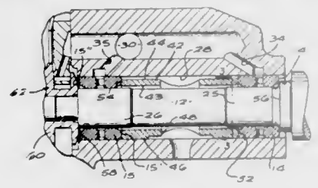
4,902,144

TURBOCHARGER BEARING ASSEMBLY

Dennis F. Thoren, Garden Grove, Calif., assignor to Allied-Signal, Inc., Morris County, N.J.

Filed May 2, 1989, Ser. No. 345,990
Int. Cl.[4] F16C *17/18*
U.S. Cl. 384—398 **11 Claims**

1. A turbocharger bearing assembly for rotatably supporting a turbocharger shaft within a bearing bore formed in a turbocharger center housing, said assembly comprising:
a pair of rotationally floating journal bearings within said bearing bore and rotationally supporting said shaft;
a generally cylindrical, rotationally floating bearing spacer carried about said shaft and axially interposed between said journal bearings, said spacer having opposite ends defining a pair of axially outwardly presented inboard thrust surfaces for engaging axially inboard faces of said



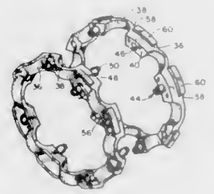
journal bearings to maintain said journal bearings in precision axial spaced relation; and
a pair of axially inwardly presented outboard thrust surfaces defined by a pair of thrust members carried with said shaft for engaging axially outboard faces of said journal bearings;
said inboard and outboard thrust surfaces having outer diameters substantially less than the outer diameters of said journal bearings.

4,902,145

BALL SEPARATOR FOR BEARING ASSEMBLY

James P. Johnson, Sugar Grove, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 12, 1989, Ser. No. 364,878
Int. Cl.[4] F16C *33/38, 33/44*
U.S. Cl. 384—530 **11 Claims**



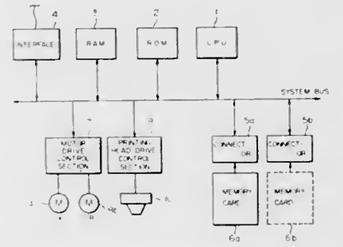
1. A ball separator for a ball bearing assembly having inner and outer raceways defining cylindrical lands, comprising:
a pair of like members of generally annular configuration joined together, each member having a plurality of spaced open ended pockets having a generally semi-cylindrical configuration;
a plurality of spaced studs extending axially from each member and alternating axially directed bores;
each stud having a terminal portion of a diameter substantially the same as a diameter of a bore and a second portion of a diameter in excess of a diameter of a bore; and
a plurality of circumferentially spaced skis extending outwardly from the circumference of each member and between each pocket;
said axially extending studs of one member being received in the bores of the other member and integrated therewith when said members are subjected to ultrasonic vibrations and pressure to weld the members together;
each stud being melted under said ultrasonic vibrations and pressure so that said second portion thereof conforms to the diameter of the bore in which it is received.

4,902,146

ELECTRONIC APPARATUS WITH MEMORY CARD

Takao Ishikawa, Ohme, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 25, 1988, Ser. No. 223,509
Claims priority, application Japan, Jul. 31, 1987, 62-191654
Int. Cl.[4] B41J *29/02, 5/44*
U.S. Cl. 400—61 **6 Claims**



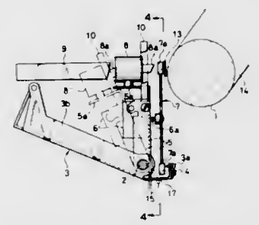
1. An electronic apparatus, comprising:
a memory card for storing a plurality of information portions;
a plurality of identifiers coupled to said memory card;
detect means for detecting the identifiers;
memory means for storing relationships between each of the identifiers and a corresponding one of the plurality of information portions stored in said memory card; and
select means for reading out said corresponding relationship from said memory means in response to the detection of said detect means and for selecting the corresponding one of information portions in said memory means in response to said corresponding relationship.

4,902,147

PRINTING APPARATUS WITH A CARRIAGE AND A PRINTING MEANS HOLDER MOVABLE RELATIVELY TO THE SAME

Tatsuji Imai, Ichinomiya, and Kazuo Nakamura, Iwakura, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 4, 1988, Ser. No. 140,757
Claims priority, application Japan, Jan. 6, 1987, 62-463[U]
Int. Cl.[4] B41J *1/30*
U.S. Cl. 400—144.2 **10 Claims**



1. A printing apparatus, comprising: a platen;
a carriage movable in a carriage transfer direction along a printing line extending along the longitudinal direction of the platen;
printing means including a type carrier movable with the carriage and having a number of type elements, said type elements being located selectively at a printing point on the platen for printing operation;

a holder bearing at least part of the printing means thereon and swingable between a printing position, situated close to the platen, in order to allow the printing means to perform the printing operation, and a retracted position which is situated wide apart from the platen;

said carriage and said holder being slidably supported on a common guide shaft extending in the carriage transfer direction, said swingable movement of said holder being effected around said common guide shaft;

coupling means for connecting the holder and the carriage, said coupling means causing the holder to move as one with the carriage, in the carriage transfer direction along the printing line, and allowing the holder to move relatively to the carriage, in a direction transverse to the carriage transfer direction between the printing position and the retracted position;

said coupling means including a coupling plate attached to one of the holder and the carriage and having a surface substantially parallel to the carriage transfer direction, an opening formed in the coupling plate, and a plate like engaging member attached to the other of the holder and the carriage and extending transverse to the carriage transfer direction so as to engage the opening:

said engaging member having a surface extending along the carriage transfer direction and a predetermined width along the carriage transfer direction; and

said opening of said coupling plate having a width in the carriage transfer direction substantially equal to the width of the engaging member.

4,902,148

TYPEWRITER WITH A PRINT WHEEL AND HAMMER DRIVEN BY ONE MOTOR

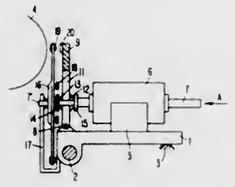
Rudolf Schmeykal, Hembofen, and Johannes Haftmann, Schwabach, both of Fed. Rep. of Germany, assignors to Ta Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 227,536

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729309

Int. Cl.[4] B41J *1/30*

U.S. Cl. 400—144.2 **3 Claims**



1. A typewriter or similar machine comprising:

a print wheel having a plurality of characters thereon;

a hammer for printing the characters on the print wheel; and

means including a reciprocation-rotation motor, having a shaft, for driving the rotational positioning of the print wheel by rotation of the shaft and for driving the pivoting movement of the hammer by the axial movement of the shaft to directly cause the hammer to impact the print wheel to print.

4,902,149

PRINTER FOR PRINTING A PARTICULAR CHARACTER AT A DESIRED POSITION

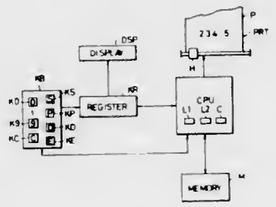
Hideo Matsuzaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 894,742, Aug. 11, 1986, abandoned, which is a continuation of Ser. No. 623,338, Jun. 22, 1984, abandoned. This application Jun. 17, 1988, Ser. No. 208,782

Claims priority, application Japan, Jun. 29, 1983, 58-116111

Int. Cl.[4] B41J *19/50*

U.S. Cl. 400—279 **11 Claims**



1. A printer comprising:

printing means for printing a plurality of characters including a designated character;

input means for inputting the plurality of characters;

first means for storing as a designated character any of the plurality of characters;

second means for designating a particular position on a print paper at which the designated character is to be printed;

third means for storing characters to be printed as an ordered string, including the designated character within the string;

count means for counting the number of characters stored by said third means before the input thereby of the designated character;

print start-position calculation means for calculating a printing start position of a first character of said stored characters on the basis of the position designated by said second means for the designated character and the number of characters counted by said count means; and

control means for controlling said printing means after the ordered string of characters to be printed are stored in said third means such that said printing means starts printing said first character of the ordered string of characters at the printing start position, the designated character thus being printed at the designated position.

4,902,150

PRINTING APPARATUS WITH AN ELONGATED SIGNAL-TRANSMITTING FLEXIBLE MEMBER

Tatsuji Imai, Ichinomiya, and Masaya Funamoto, Higashi, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 140,774, Jan. 4, 1988, abandoned. This application Apr. 14, 1989, Ser. No. 338,430

Claims priority, application Japan, Jan. 6, 1987, 62-462[U]

Int. Cl.[4] B41J *25/30*

U.S. Cl. 400—320 **5 Claims**

1. A printing apparatus comprising:

a printer body;

a platen, supported on said printer body, for supporting a printing medium;

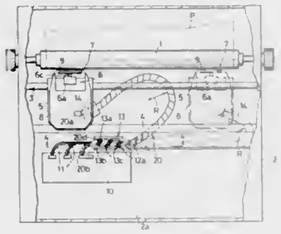
a carriage supported on said printer body so as to be reciprocally moved along a printing line on said platen and having a printing mechanism facing said platen and operable to print on said printing medium in cooperation with said platen;

a stationary control unit, disposed on said printer body, for sending a control signal for operating said printing mechanism;

an elongated signal-transmitting flexible member coupled at one end to said printing mechanism of said carriage and at the other end to said control unit on said printer body for transmitting said control signal from said control unit to said printing mechanism, comprising a plurality of bundled wires and a protective tube for covering said wires over substantial by the whole length of the flexible member, said protective tube being constituted by a plurality of turn portions wound around said bundled wires in spiral form;

said flexible member having a first end portion at a proximity of said other end thereof and a second end portion at a proximity of said other end thereof;

a connecting member for pivotally holding said first end



portion on said carriage, said connecting member having a clamp section which clamps the first end portion and is pivotable around one pivoting point positioned closer to said one end of the flexible member than said clamp section; and

guide means provided in said printing body, having a pair of side walls located on both sides of said second end portion of the flexible member along a length wise direction thereof, thereby restricting free movement of the second end portion of the flexible member along a transverse direction of the flexible member, and having a stopper wall which is located between said side walls and is inclined with a predetermined angle with respect to said side walls so as to loosely engage some of said turn portions of the protective tube, thereby restricting free movement of the second end portion of the flexible member along a lengthwise direction of the flexible member.

each of said at least two component writing instruments including:

a body portion having front and rear ends, and a longitudinal axis;

a holder section attached to said front end of said body portion, means on said holder section for holding a pen component, and the longitudinal axis of said holder section extending substantially parallel to the longitudinal axis of said body portion;

a pen component held in said means for holding a pen component;

a front a reception hole defined in said front end of said body portion, and the longitudinal axis of said front reception hole being substantially parallel to the longitudinal axis of said holder section;

a rear reception hole defined in said rear end of said body portion, and the longitudinal axis of said rear reception hole being colinear with the longitudinal axis of said holder section;

an engagement projection attached to said rear end of said body portion, and the longitudinal axis of said engagement projection being colinear with the longitudinal axis of said front reception hole;

attaching means on said body portion for detachably engaging each one of said holder section and said engagement projection alternatively with each one of said front and rear reception holes; and

wherein, said holder section of a first one of said at least one two component writing instruments is received in the front reception hole of a second one of said at least two component writing instruments when the holder section of the second one of said at least two writing instruments is received in the front reception hole of the first one of said at least two component writing instruments, said holder section of a first one of said at least two component writing instruments is received in the rear reception hole of a second one of said at least two component writing instruments when the engagement projection of the second one of said at least two component writing instruments is received in the front reception hole of the first one of said at least two component writing instruments, and said engagement projection of the first one of said at least two component writing instruments is received in the rear reception hole of the second one of said at least two component writing instruments when the engagement projection of the second one of said at least two component writing instruments is received in the rear reception hole of the first one of said at least two writing instruments.

4,902,151

WRITING INSTRUMENT WITH PLURAL ELEMENTS

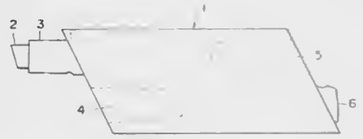
Katsuo Asano, Ishioka, and Shigeo Oka, Tokyo, both of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 226,089

Claims priority, application Japan, Jul. 29, 1987, 62-116375[U]; Jul. 29, 1987, 62-116376[U]

Int. Cl.[4] B43K *27/00, 27/08, 23/00*

U.S. Cl. 401—34 **10 Claims**



1. A connectable writing instrument comprising at least two component writing instruments of the same configuration,

4,902,152

NAIL ENAMEL PEN

David Seidler, Forest Hills, N.Y., assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 873,007, Jun. 11, 1986, abandoned. This application Sep. 9, 1988, Ser. No. 243,130

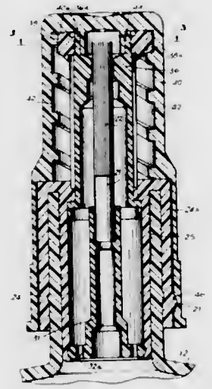
Int. Cl.[4] A45D *34/00;* **A46B** *11/02*

U.S. Cl. 401—117 **9 Claims**

1. A liquid applicator for applying a liquid to a surface comprising a squeezable container having an open neck adapted to hold said liquid, a container plug having an opening therethrough supported on said neck, an inward wall of said container plug having serrations formed therein, a brush holder having an opening extending therethrough supported in said container plug along the opening in said container plug, a hollow brush having an opening therein in fluid communication with the opening in said brush holder supported in said brush holder and extending out of said container plug, sleeve means disposed intermediate said container plug and said brush and brush holder and displaceable between a first position where said brush is exposed for use and a second position where said sleeve means surrounds said brush, said sleeve means including an elongated opening therethrough through

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which said brush extends, said liquid flowing into said brush holder opening and into said brush through the opening in said brush for application when said sleeve means is in said first position, said brush being exposed to said liquid both externally along the opening in said sleeve means and internally through the opening in said brush when said sleeve means is in said second position to prevent drying out of said brush, said sleeve means further including a series of ribs on an outer surface thereof which mate with said serrations in said container plug inward wall, and rotatable cap means removably coupleable to



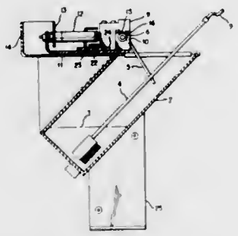
said container plug for moving said sleeve means between its first and second positions when rotated, said sleeve means including an upper surface, the upper surface of said sleeve means including an annular ring projecting inwardly contacting said brush and forming a base for a dish-shaped reservoir which encircles said brush, said cap means including sealing means which engages the reservoir in the upper surface of said sleeve means when said sleeve means is in its second position to seal said brush in the liquid environment of said container to prevent said brush from drying out.

4,902,153

CONTROL FOR FOAM BRUSH FOR COIN OPERATED CAR WASH

Milton Luke, 6911 Station Rd., Erie, Pa. 16510

Filed Sep. 30, 1987, Ser. No. 102,661
Int. Cl.[4] B43K *23/02*
U.S. Cl. 401—131 **18 Claims**



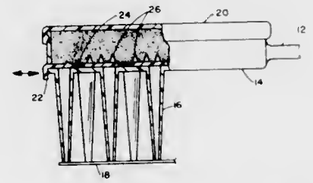
1. A self-service car wash bay comprising
a brush having a line for supplying a liquid detergent solution to the brush,
a holder for the brush,
means for locking the brush in the holder,
and coin controlled means for turning the said line "on" and said locking means "off" at the beginning of an interval paid for by coin deposit and for turning said line "off" and said locking means "on" at the end of said interval.

4,902,154

DISPENSING BRUSH WITH BARB MEANS TO RUPTURE MATERIAL PACKET

Michael A. Valenza, 737 Glen Rd., Jenkintown, Pa. 19046

Continuation of Ser. No. 892,132, Jul. 30, 1986, abandoned. This application May 2, 1988, Ser. No. 191,843
Int. Cl.[4] A46B *11/00*; **A01K** *13/00*
U.S. Cl. 401—132 **5 Claims**



1. A material dispensing brush for receiving, opening and dispensing material from a material packet, said brush comprised essentially of:
a molded body portion defining a material holding hollow for receiving said material packet, said body portion having a slot in one end thereof adjacent to the inner lower surface of said hollow and a plurality of integrally molded, flexible, bristles which are arrayed in a plurality of rows adjacent the outer lower surface of said hollow with at least some of said plurality of bristles being hollow core bristles having a first end in direct communication with the hollow, a second end for dispensing material and a hollow core providing a passage way for directing material from said hollow to the second material dispensing end of the respective hollow core bristle;
a sliding material release control means, including a plurality of barbs which project upwardly therefrom to engage and open said packet, extending through said slot in said body portion, said means having a plurality of apertures therein which are equal in number to said hollow core bristles, each of said apertures positioned to communicate with a respective hollow core bristle and to provide a continuous passage from said hollow to said material dispensing end of the hollow core bristle in a first position and to interrupt said continuous passage in a second position.

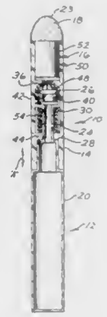
4,902,155

LIQUID DISPENSER

Sallie Q. Buschemeyer, 254 Ridgeway Corner, Louisville, Ky. 40207

Filed Jul. 21, 1988, Ser. No. 222,560
Int. Cl.[4] B43K *5/00*
U.S. Cl. 401—206 **17 Claims**

1. A liquid dispenser comprising:
a bottle for containing a supply of liquid to be dispensed;
means defining an outlet for the liquid at one end of the bottle;
a sleeve having a longitudinal axis coaxially located with the central axis of the outlet defining means of the bottle and receiving therein the outlet defining means of the bottle, and selectively movable along the coaxis of the bottle outlet defining means and the sleeve in both directions;
first valve means associated with the sleeve for closing the liquid outlet of the bottle when the sleeve has moved in a first direction along the coaxis, and for opening the liquid outlet of the bottle when the sleeve has moved in a second direction along the coaxis;
biasing means for biasing the sleeve in the first direction closing the liquid outlet of the bottle;
means defining a metered liquid reservoir in the sleeve for receiving liquid from the bottle when the sleeve is moved in the second direction causing the first valve means to open the liquid outlet of the bottle;



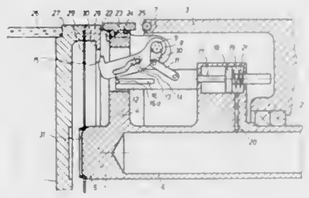
a porous dauber tip in liquid-flow communication with the reservoir for receiving liquid therefrom; and,
second valve means in the path of liquid communication between the reservoir and dauber tip operable between an open position and a closed position for controlling the flow of liquid from the reservoir to the dauber tip.

4,902,156

MOUNTING DEVICE FOR IMAGE CYLINDERS

Manfred Deisler, Flintbek; Ralf Balzeit, Preetz; Reinhard Gesell, Schoenkirchen; Bernd Lassen, Kitzeberg, and Wolfgang Dinse, Kiel, all of Fed. Rep. of Germany, assignors to Dipl. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

PCT No. PCT/DE88/00084, § 371 Date Oct. 18, 1988, § 102(e) Date Oct. 18, 1988, PCT Pub. No. WO88/06389, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 18, 1988, Ser. No. 272,890
Claims priority, application European Pat. Off., Feb. 21, 1987, 87102480
Int. Cl.[4] F16D *33/06*
U.S. Cl. 403—24 **7 Claims**



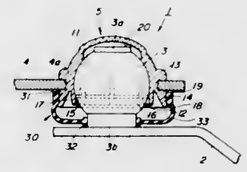
1. A device for central, cantilevered mounting of an image cylinder on an end of a shaft of a drum scanner, said device comprising the image cylinder having a membrane at a mounting end and a tension ring with a projection, said membrane having a centrally extending center bore; said shaft having a stub end with a cone, said shaft having a flange adjacent said stub end; seating surfaces for the tension ring of the image cylinder being arranged on said flange; a plurality of clamping levers being mounted on the flange at circumferentially distributed positions by eccentric shafts having lever arms, each clamping lever having a link-like guide and a book-shaped end facing toward the image cylinder, each clamping lever having a slide with a pin engaged in the link-like guide, each slide being mounted for a straight line movement parallel to the axis of the shaft and being engaged by a spring urging it in one direction, each slide having a coupler hinged thereto and extending to the lever arm for the clamping lever and each slide having a piston received in a pneumatic working cylinder, means evacuating one side of said cylinder to shift said piston against said spring so that releasing the vacuum in each cylinder allows the spring to shift the piston to a position to move the clamping levers into a gripping position for gripping the projection on the tension ring.

4,902,157

SEALING STRUCTURE FOR A BALL JOINT OF A WIPER LINK MECHANISM

Masaru Ishikawa, and Yuichi Itoh, both of Kamakura, Japan, assignors to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 18, 1987, Ser. No. 98,450
Claims priority, application Japan, Sep. 19, 1986, 61-219418
Int. Cl.[4] F16C *11/06*; **F16J** *15/52*
U.S. Cl. 403—50 **4 Claims**



1. A sealed ball joint assembly for a wiper link mechanism comprising a spherical ball with a cylindrical shank connected to a link arm and a ball retainer connected to a connecting rod, said ball retainer having flange means surrounding an opening for receiving said ball in said ball retainer and a skirt with a peripheral projection on a free end of the retainer surrounding said flange means, said retainer, skirt and flange means being of one piece construction with a substantially V-shaped groove between said skirt and said flange means and an annular sealing member extending between said retainer and said shank and having an annular projection at one end engaging said skirt between said rod and said peripheral projection to hold said sealing member in engagement with said retainer without additional clamping means, wherein said flange means is provided with a plurality of cutouts to permit flexure of said flange means to facilitate assembly of said ball in said retainer.

4,902,158

ASSEMBLY OF A BALL JOINT SHANK AND A TUBE

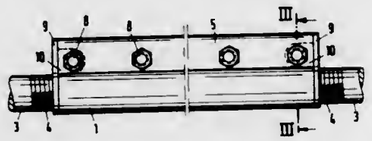
Lothar Broszat, Monheim; Andreas Merklinger, Krefeld, and Fritz Busse, Hilden, all of Fed. Rep. of Germany, assignors to TRW Ehrenreich GmbH & Co., Dusseldorf, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 271,007
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738432
Int. Cl.[4] F16C *11/00*
U.S. Cl. 403—77 **12 Claims**

1. An assembly especially for track and tie rods of motor vehicles, comprising a ball joint shank (3) and a tube (1, 16, 20), the ball joint shank (3) having an outer thread (4) to be screwed into an inner threaded portion (2) of the tube (1, 16, 20), and clamping means for securing the ball joint shank with the tube and acting circumferentially of the tube (1, 16, 20), the clamping means comprising two radially extending portions on the tube (1, 16, 20) and at least one fastener (8) for clamping the

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radially extending portions together, characterized in that the radially extending portions are side walls (6) of a fold (5, 17, 21)



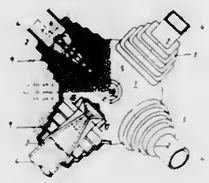
of the tube, the fold extending radially outwardly and having a portion closing the area between said radially extending portions from the outside.

4,902,159

JOINT CONNECTION FOR FRAME STRUCTURES

Erich Frantl; Peter Hofstätter; Willibald Zemler; Albert P. Rauscher, and Werner Frantl, all of Vienna, Austria, assignors to Dipl.-Ing. Manfred Beer, Modling, Austria

Filed Jan. 13, 1987, Ser. No. 2,901
Claims priority, application Austria, Jan. 14, 1986, 67/86
Int. Cl.[4] F16B *7/00*
U.S. Cl. 403—171 **6 Claims**



1. A joint for frame structures, said joint comprising:
a metal casing having a plurality of openings therein, said plurality comprising at least three openings;
a corresponding plurality of tubular projecting members, each of said members being affixed to said casing in axial alignment over an associated one of said openings, said projecting members having outer walls and inner walls, said inner walls tapering in step-wise fashion from an enlarged portion affixed to said casing to a narrow portion remote from said casing; and
at least three elongate members, each having an end portion which extends through an associated projecting member and opening to within the interior of said casing, said end portions each comprising a crimped portion, said casing being adapted to be filled with a hardenable grout for providing a positive connection for said end portions received in said casing.

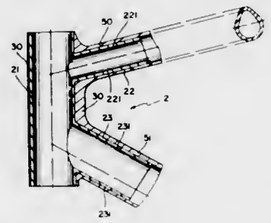
4,902,160

JOINT FOR A BICYCLE FRAME

Tom Jeng, Taipan, Taiwan, assignor to Giant Manufacturing Co., Ltd., Taiwan

Filed Feb. 14, 1989, Ser. No. 309,876
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—205 **1 Claim**

1. A joint for bicycle frame comprising a first tubular member of a composite material, a metal second tubular member having an outer surface and a laterally extending insertion portion on which an end portion of said first member is sleeved, an adhesive applied between an outer surface of said insertion portion of said second member and an inner surface of said end portion of said first member, and a coating of said composite material applied onto said outer surface of said second member except for an end portion of said insertion portion which is engaged within said first member in such a manner that said joint looks like a unitary composite material frame, said insertion portion of said second member being



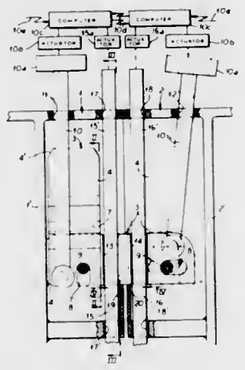
closely engaged with said end portion of said first member and both said end portion of said first member and said coating on said insertion portion of said second member having abutting end surfaces of the same size so that outer surfaces of said first member and said coating may be adjoined to form a smooth outer surface of said joint.

4,902,161

HERMAPHRODITE CONNECTOR FOR LAND AND SEAS AND AIR AND SPACE APPLICATIONS

Boris Novoselsky, 6601 110th St., Forest Hills, N.Y. 11375

Filed Jul. 1, 1988, Ser. No. 214,666
Int. Cl.[4] B25G *3/18*
U.S. Cl. 403—322 **18 Claims**



1. A connector system for a first article and a second article formed respectively with a first and a second connector, each of said connectors comprising:
a support formed on the respective one of said articles;
a respective connecting member having a tongue and a cavity at opposite ends of said connecting member and swingably mounted on the respective support for displacement between a first position wherein said tongue is retracted toward the respective one of said articles and said cavity is open toward the other of said articles to receive a tongue of the connector thereof, and a second position wherein said tongue of said connecting member projects beyond said support and is positioned to engage in the cavity of the connector of the other of said articles;
an actuating rod operatively connected to said connecting member and actuatable on said one of said articles for displacing said connecting member between said positions, said connecting member being provided with at least one engaging formation; and
a locking member engaging said formation and adapted to brace against said other article at at least two locations straddling said connecting member for retaining said other article locked to said one of said articles until said locking member is withdrawn from engagement with said formation.

4,902,162

SHAFT AND ROTATABLE MACHINE ELEMENT ASSEMBLY

James M. Watt, Montgomery County, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 19, 1988, Ser. No. 183,657
Int. Cl.[4] F16D *1/06*
U.S. Cl. 403—355 **14 Claims**



1. An improved structure for assembling a rotatable machine element member to a shaft to be rotatably mounted comprising:
a rotatable shaft;
a projection member arranged to extend radially from the periphery of said rotatable shaft;
a rotatable machine element including a portion fixed thereto slidably mounted on said shaft with one side face of said portion having a recessed area therein so that said recessed area of said portion can be positioned in interfacing relation adjacent one side face of said projection member extending radially from said shaft; and
interlocking fastening means including a nesting member part physically separate and initially independent from said projection member and said recessed area in said portion of said rotatable machine element, said fastening means being cooperable with the other side face of said projection member and said recessed area in said adjacent face of said portion of said machine element to assemble said shaft and machine element, restraining rotational movement of said machine element relative said shaft.

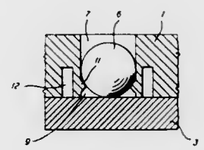
4,902,163

TWO PARTS SECURED BY BALL ST40 CONNECTION

Jan M. Van De Griend, Dordrecht, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 935,061, Nov. 21, 1986, Pat. No. 4,752,026, which is a continuation of Ser. No. 797,742, Nov. 7, 1985, abandoned, which is a continuation of Ser. No. 508,222, Jun. 27, 1983, abandoned. This application Mar. 8, 1988, Ser. No. 165,871
Claims priority, application Netherlands, Jun. 28, 1982, 8202597
Int. Cl.[4] B25G *3/00*; E05D *7/00*
U.S. Cl. 403—375 **10 Claims**

1. An article of manufacture, comprising:
a first part having a first surface, said first surface being smoothly extending and free of protrusions;
a second part for attachment to said first part, said second part having a second surface to be secured against said first surface; and
a spherical attachment stud having a predetermined diameter fixed directly to said first surface of said first part, said stud having a hemispherical surface facing said first part,
said second part having a cylindrical bore for receiving said spherical stud, said bore extending into said second part from said second surface and said bore having an inner surface, the diameter of said bore being chosen such that said bore inner surface is in contact with said spherical stud when said stud is received in said bore, and



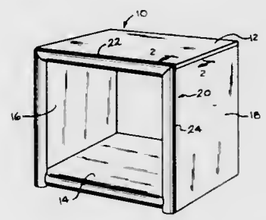
said second part having a protrusion on said inner surface of said bore, said protrusion being spaced from said second surface and sized such that when said spherical stud is received in said bore and said second surface is in contact with said first surface, said protrusion engages said hemispherical stud surface for holding said first surface against said second surface and securing said first part to said second part, and said second part in the region of said protrusion being resilient for allowing the passage of said protrusion over the diameter of said spherical stud when said first part is assembled on said second part.

4,902,164

MITERED JOINT ASSEMBLY

Myrl D. Sauder, Archbold, Ohio, assignor to Sauder Woodworking Co., Archbold, Ohio

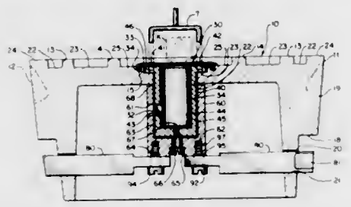
Continuation-in-part of Ser. No. 937,742, Dec. 4, 1986. This application Jun. 28, 1988, Ser. No. 212,436
Int. Cl.[4] B25G *3/36*
U.S. Cl. 403—402 **3 Claims**



1. A mitered joint assembly for ready-to-assemble furniture having first and second components, said components each having edges, said components being angularly positioned to one another, said furniture components defining interior surfaces, which are not visible from a location exterior of the assembled furniture, said furniture components having longitudinally extending pilot grooves extending along said interior surfaces, said interior surfaces containing said pilot grooves lying in the same plane, said pilot grooves being aligned with one another at a mitered joint, a planar bracket having a first leg and a second leg, said legs being angularly positioned with respect to one another, said bracket having an outer surface and an inner surface, said planar bracket defining an outwardly extending tongue means along said inner surface, said inner

surface of said planar bracket being mounted adjacent such interior surfaces of said furniture components, said tongue means being received in said pilot grooves for aligning such furniture components, at least one opening in each one of said first and second legs for receiving fasteners which extend through such openings into such longitudinally extending pilot grooves to hold said furniture components in such mitered joint, said tongue means comprising a plurality of tapered projections extending along said inner surface of said bracket.

4,902,165
LOCKING VALVE COVER
Lewis A. Embree, 338 Atwood St., Longmont, Colo. 80501
Filed Feb. 19, 1988, Ser. No. 157,912
Int. Cl.[4] B65D *55/14*; E02D *29/14*
U.S. Cl. 404—25 **23 Claims**

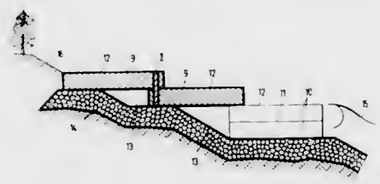


1. In locking cover apparatus, wherein the cover is comprised of a top plate positioned on, and closing the top end of a downwardly extending ring, and a plurality of radially moveable, elongated lugs positioned under the top plate and extending radially through respective holes through the ring, the improvement comprising:
a rotatable driver extending through, and rotatably mounted in, a hole in the top plate;
crank means under said top plate and adjacent said rotatable driver and connected to said lugs for radially extending and retracting said lugs in relation to said rings, and
lock means positioned in said driver and accessible and operable from above the top plate for releasably connecting said driver to said crank means.

17. A method for locking valve covers that are adapted for placement of said valve covers in receiver means such as a pipe, said receiver means having retention means, the method comprising the steps of:
locking said valve cover by rotating a lock cylinder so as to extend a lock cylinder tongue through apertures in a rotor and a crank, so that said rotor and said crank rotate as a unit;
rotating said rotor so as to rotate said crank, in turn moving locking lugs radially into a fully extended position;
engaging retention means by said locking lugs so that the valve cover is held forcibly in place by said locking lugs; then
securing said valve cover by rotating said lock cylinder in a direction so as to disengage said lock cylinder tongue from the aperture of said crank so that the crank no longer rotates as a unit with said rotor, and rotation o said rotor will not in turn retract said locking lugs.

4,902,166
SYSTEM FOR CONSTITUTING BREAKWATERS, JETTIES, WITH JUXTAPOSED ELEMENTS
Pedro S. Bores, Vegafria 1, T.1., 28035 Madrid, Spain
Filed Dec. 18, 1987, Ser. No. 135,136
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—30 **10 Claims**

1. A jetty system comprising a plurality of vertically-extending shallow modular fluid-impermeable elements having parallel upper and lower planar faces, said elements being in a vertically layered, horizontally offset and cantilevered juxtaposition to define a three-dimensional network characterized by vertical gaps between portions of some of said elements,



vertically contiguous elements having all overlapping portions of their respective overlapping upper and lower planar faces contiguous.

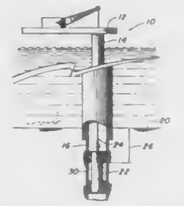
4,902,167
LAND FILL FOR WASTE MATERIALS AND METHOD OF MAKING THE SAME
Paul G. Shelton, Hoffman Estates, Ill., assignor to American Colloid Company, Arlington Heights, Ill.
Filed Mar. 3, 1989, Ser. No. 318,627
Int. Cl.[4] E02D *15/00*
U.S. Cl. 405—128 **8 Claims**



1. A method of storing and containing waste materials within the earth to prevent pollution therefrom comprising the steps of:
excavating a quantity of water-swellable, colloidal clay from a naturally occurring deposit thereof to form a pit;
retaining a surface layer of naturally compacted, water-swellable, colloidal clay over substantially the entire area of said pit in an essentially undisturbed condition in a thickness sufficient to prevent permeation through said layer by said waste materials and fluids tending to leach therefrom; and
placing waste materials on the top of said surface layer of said pit for eventually filling a substantial portion of the volume of said pit.

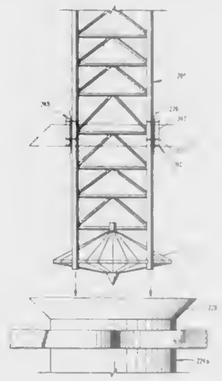
4,902,168
METHOD FOR REMOVING OBSOLETE OFFSHORE PLATFORMS
Frank S. Wang, Katy, Tex.; Charles T. Gautreau, Nine Mile Point; Robert W. Heels, Metairie, both of La., and Norman W. Hein, Jr., Katy, Tex., assignors to Conoco Inc., Ponca City, Okla.
Filed Sep. 26, 1988, Ser. No. 249,633
Int. Cl.[4] E02D *9/04*
U.S. Cl. 405—195 **3 Claims**

1. A method for removing an offshore platform anchored to the seabed by hollow pilings comprising:
(a) establishing an annulus inside one of said pilings at a level below the top of said seabed by lowering a cylindrical member down into said piling and sealing at least the top of said member against the interior of said piling, the interior surface of said piling defining the outer circumference of said annulus,
(b) injecting a chilling agent into said annulus in an amount



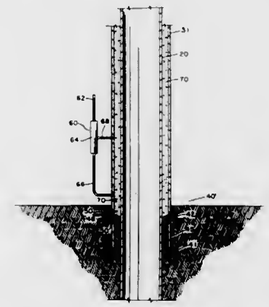
sufficient to reduce the toughness of said piling against brittle fracture; and
(c) applying a force to said piling to fracture said piling adjacent said annulus.

4,902,169
JACK-UP TYPE PLATFORM INCLUDING ADJUSTABLE STOP ASSEMBLY
John R. Sutton, P.O. Box 32, Beaumont, Tex. 77704
Filed May 17, 1989, Ser. No. 353,253
Int. Cl.[4] E02B *17/00*; E02D *25/00*
U.S. Cl. 405—204 **20 Claims**



1. A marine structure comprising:
a jack-up platform assembly having a platform and at least three support legs, each leg having a generally cylindrical adapter at a lower end thereof;
a support assembly including a receptacle for each of said support legs, said receptacle mating with said support leg adapter and supporting said platform assembly enabling said platform to be jacked above an ocean surface;
anchoring means for anchoring said support assembly at a desired location so that said receptacle is at a fixed height above an ocean floor;
a stop assembly removably attached to each of said support legs, said stop assembly being spaced from said support leg adapter and including a stationary part which mechanically engages a portion of said receptacle when said support leg adapter penetrates a predetermined distance into said receptacle; and
securing means for securing said stop assembly to said receptacle.

4,902,170
GROUTING METHOD - CHEMICAL METHOD
L. Carter Knox, and Clayton A. Moore, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Filed Nov. 16, 1988, Ser. No. 272,674
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—225 **17 Claims**

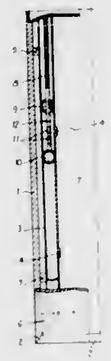


1. A method of grouting an annular space formed by an annular support member having an pile seal assembly thereon and a pile driven therethrough of an offshore platform, said annular space being located between said annular support member and said pile, said method comprising the steps of:
injecting particulate material into said annular space above said pile seal assembly;
injecting an alkali silicate material which floculates upon contact with a di- or multivalent cation fluid into said annular space above said pile seal assembly; and
injecting cement or grout into said annular space above said pile seal assembly.

4,902,171
PROCESS FOR REINFORCING A DRIVEN TUBULAR PILING, THE PILING OBTAINED BY THIS PROCESS, AN ARRANGEMENT FOR IMPLEMENTING THE PROCESS
Jean-Paul Geffriaud, Paris, and Hervé Barthelemy, Croissy-sur-Seine, both of France, assignors to Soletanche, Nantarre, France
Filed Feb. 8, 1988, Ser. No. 153,227
Claims priority, application France, Feb. 9, 1987, 87 01541
Int. Cl.[4] E02D *3/12*
U.S. Cl. 405—232 **5 Claims**

1. Apparatus for injecting grout into a driven tubular piling comprising at least one duct extending from the base of said piling at least the surface of the ground into which said piling has been driven; a grout injection line disposed within said duct and containing at least one grout delivery orifice therein; at

least one inflatable valve disposed within said grout injection delivery line to permit successive injections of grout into the



interior of said tubular piling through check valves communicating between said duct and the interior of said driven piling.

4,902,172

MULTI-RODS TYPE APPARATUS FOR GROUND IMPROVEMENT

Kosei Fukuda, Yokohama, Japan, assignor to Tenox Corporation, Tokyo, Japan

Filed Sep. 27, 1988, Ser. No. 249,684
Claims priority, application Japan, May 26, 1988, 63-129298
Int. Cl.[4] E02D *3/12*
U.S. Cl. 405—269 **3 Claims**



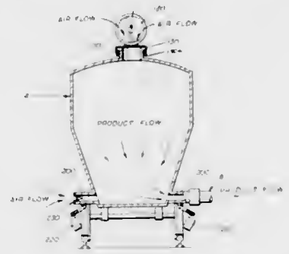
1. A multi-rods type of ground improvement apparatus wherein excavation blades are fixed to and injection openings for a solidifying agent are provided on end portions of respective plural rotatable rods, plural steps of agitating blades are fixed to respective ones of said rods above an upperside of said excavation blades and said injection openings, at least one link arm is loosely mounted to connect said rods, a stationary corotating prevention wing is loosely mounted on said rods between said excavation blades and a lowest positioned one of said agitating blades to connect said rods, and opposite end portions of said stationary corotating prevention wing are extended in opposite directions from a center of an adjacent one of said rods such that each extended end portion of said corotating prevention wing is the same length as a radius of the excavation blade therebeneath, so that said stationary corotating prevention wing prevents rotation of soil clods with said rotating excavation blades, without outer ends of said stationary corotating prevention wing colliding with a side wall of the ground being excavated, and without soil clods running off through the wing outer ends and the ground side wall, whereby said stationary corotating prevention wing and said excavation blades cause full crushing of the soil clods for mixing of the excavated soil with the solidifying agent by the agitating blades.

4,902,173

SYSTEM AND FILTER FOR PREVENTING CONTAMINATION OF PARTICULATE MATERIAL IN RAILROAD CAR DURING TRANSPORTATION AND UNLOADING

Alfred W. Hendee; Michael A. Click, and Ralph E. Gerstung, all of Houston, Tex., assignors to Hendee Enterprises, Inc., Houston, Tex.

Filed May 20, 1988, Ser. No. 197,026
Int. Cl.[4] B65G *53/24*
U.S. Cl. 406—145 **9 Claims**



1. A system for transporting and unloading a railroad hopper car loaded with particulate material while preventing contamination of the particulate material during the transportation and unloading, comprising the steps of:

removing an originally installed metal cover from each originally provided opening in a hopper car to be used for unloading particulate material which has been loaded into the car prior to transportation;

placing a bag filter on each opening from which a metal cover has been removed;

replacing the originally installed metal cover on each opening;

then transporting said car to its unloading destination with the bag filters and metal covers in place to prevent contamination of the particulate material from external sources during such transportation;

thereafter removing the metal cover and bag filter from a first of said openings and attaching a vacuum hose thereto for unloading the particulate material;

removing the originally installed metal cover from a second of said openings;

leaving the bag filter on the second of said openings during the unloading of the material; and

then unloading the particulate material from said car by applying a vacuum through said first opening and thereby drawing air in through said bag in said second opening.

4,902,174

MAIN LINE TAPPING APPARATUS

Clifford F. Thompson, Bradford, and Lawrence F. Thompson, Tottenham, both of Canada, assignors to Cliffside Utility Contractors Ltd., Scarborough, Canada

Filed Apr. 6, 1989, Ser. No. 333,970
Int. Cl.[4] B23B *47/18*
U.S. Cl. 408—101 **8 Claims**

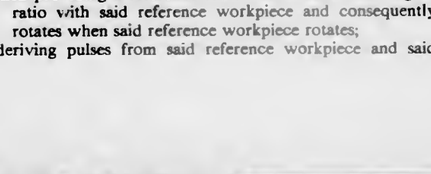
1. An apparatus for tapping live pipes and the like, the apparatus comprising:

adaptor means constructed so that it can be affixed to a pipe being tapped, said adaptor means including a threaded collar which, when the adaptor means is affixed to a pipe, projects substantially perpendicularly away from the axis of the pipe, the adaptor defining an internal passage through which a cutting device can be passed, the adaptor means also incorporating closure means by which said internal passage can be closed to prevent the escape of fluid from the pipe,

an adjusting screw having at one end a threaded portion adapted to engage said threaded collar of the adaptor means, the adjusting screw further having a smooth internal bore and a threaded exterior concentric with said bore,

an elongate adjusting nut having at one end an internal thread engaging said threaded exterior of the adjusting screw, whereby rotation of the adjusting nut with respect to the adjusting screw causes the former to move axially of the latter,

a stop sleeve having an internal bore which is aligned with the bore of the adjusting screw and which has substantially the same inner diameter as the inner bore of the adjusting screw, the stop sleeve being positioned at least partly within the other end of the adjusting nut,



retention means restraining the stop sleeve against movement away from said adaptor means with respect to the adjusting nut, but permitting rotation of the stop sleeve with respect to the adjusting nut,

a cylindrical drive shaft snugly but slidably received in the bores of the stop sleeve and the adjusting screw, the drive shaft having a plurality of diametral boreholes at spaced-apart locations therealong

the stop sleeve having a pair of aligned transverse apertures located to allow registry with any one of said diametral boreholes,

a pin sized to pass simultaneously through said pair of apertures and one of said diametral boreholes,

a cutting device affixed to the end of the drive shaft which is directed toward the pipe,

first rotatable means for rotating said adjusting nut with respect to said adjusting screw,

and second rotatable means for rotating the drive shaft.

4,902,175

METHOD AND APPARATUS FOR DETERMINING THE ANGULAR POSITION OF A WORKPIECE AND POSITIONING THE SAME

Ingo Faulstich, and Wolfgang Müller, both of Ludwigsburg, Fed. Rep. of Germany, assignors to Hermann Pfauter GmbH & Co., Ludwigsburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 649,914, Sep. 12, 1984, Pat. No. 4,657,447. This application Nov. 28, 1986, Ser. No. 935,949
The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.
Int. Cl.[4] B23Q *15/26, 17/00*
U.S. Cl. 409—12 **9 Claims**

1. A method of automatically and accurately determining an angular position of a workpiece, and positioning said workpiece, relative to at least one tool, said workpiece having at least one set of teeth; said method in sequence comprising the steps of:

first determining the angular position of a reference workpiece manually centered, having the same set of teeth as the workpiece to be machined, using a measuring device;

then providing a reference shaft which has a known gear ratio with said reference workpiece and consequently rotates when said reference workpiece rotates;

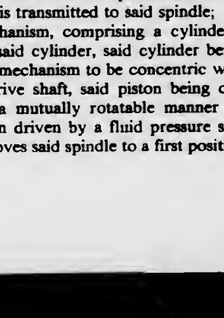
deriving pulses from said reference workpiece and said reference shaft as both the reference workpiece and said reference shaft rotate;

undertaking a first phase measurement between said pulses as a reference result;

thereafter storing the reference result of said first phase measurement as a reference value;

exchanging said reference workpiece by completely removing said reference workpiece that was taken for determining the reference value and replacing said reference workpiece with a further workpiece which is still to be finish machined subsequently thereto;

undertaking a second phase measurement between further said pulses derived from said reference shaft and said



further workpiece as both the further workpiece and said reference shaft rotate;

comparing said stored reference value of said first phase measurement with the result of said second phase measurement to determine the difference between the first phase measurement and second phase measurement; and

adjusting accurately the centering and angular positioning of said further workpiece quickly prior to machining said further workpiece by turning said further workpiece relative to said reference shaft in conformity to the difference between said reference value and said result of said second phase measurement so that subsequently the further workpiece is machined with the tool in a desired manner.

4,902,176

PROCESSING APPARATUS WHICH MAY BE SELECTIVELY SET IN TWO POSITIONS IN ACCORDANCE WITH FLUID PRESSURE

Takara Sugino; Noboru Kawanishi, both of Namerikawa, and Kazuyuki Ishikawa, Uozu, all of Japan, assignors to Sugino Machine Limited, Uozu, Japan

Filed Nov. 2, 1988, Ser. No. 266,005
Claims priority, application Japan, Apr. 8, 1988, 63-46863
Int. Cl.[4] B23B *47/18*
U.S. Cl. 409—231 **7 Claims**

1. A processing apparatus which may be selectively set in two positions in accordance with a fluid pressure, comprising:

a spindle rotatably and movably disposed within a main body in an axial direction thereof and having a distal end with a processing head mounted thereon;

a drive shaft concentrically coupled to a proximal end of said spindle in such a way that said drive shaft is movable in parallel to an axis of said spindle, and the rotation of said drive shaft is transmitted to said spindle;

a piston mechanism, comprising a cylinder and a piston located in said cylinder, said cylinder being disposed in said piston mechanism to be concentric with said spindle and said drive shaft, said piston being coupled to said spindle in a mutually rotatable manner such that said piston when driven by a fluid pressure supplied to said cylinder moves said spindle to a first position toward said

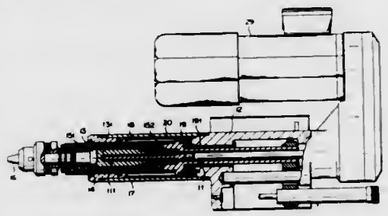
VOL 1111 ISS 3 FE 20 1990 UMI

distal end of said spindle where said processing head is mounted or to a second position opposite to said first position;

an abutting member movable with said piston;

a shock-absorbing member disposed in such a way that said abutting member is abutted thereto, said abutting member being released from abutting said shock-absorbing member when said piston moves toward said second position;

a magnetic member made of a magnetic material and engaging said abutting member when said piston moves toward



said first position from said second position to be movable with said abutting member in a direction of said first position, said abutting member receiving force exerted on said magnetic member by a spring in the direction of said second position; and

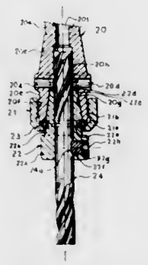
a magnet, fixed on said main body in such a way that said magnetic member contacts said magnet when said piston is at said second position, for attracting and holding said magnetic member when said piston is at said second position.

4,902,177

RAPID CHANGE TOOL CUTTER AND DRIVING SYSTEM

Lauren W. Burnett, Blue Springs, Mo., assignor to Terry K. Aitkens, Lee's Summit, Mo. and Emmett A. Yates, Leawood, Kans.

Filed Oct. 27, 1988, Ser. No. 263,418
Int. Cl.⁴ B23B *31/20, 5/26*
U.S. Cl. 409—234 **12 Claims**



1. Apparatus for swiftly attaching and releasing machine tool holding parts with respect to one another, comprising, in combination:

(1) a chuck removably mountable on the rotary power drive member of a machine tool power unit;

(2) said chuck having upper means thereon for engagement by said machine tool drive member and a lower end construction thereof operable to removably receive therewithin at least an upper portion of a collet;

(3) said collet adapted to removably carry one of a tool and another tool holder;

(4) the said lower end collet receiving construction of said chuck including a central, inwardly tapered, upwardly extending, substantially frusto-conical recess;

(5) said chuck recess adapted to removably receive at least a portion of the said collet upper end in a close fit therein; the lower outer end of said chuck being externally threaded to receive a nut thereon;

(6) means cooperating between an upper portion of the collet and an upper portion of said chuck within said lower recess to removably couple said chuck and said collet for rotary movement integral with one another with the chuck driving the collet, the chuck itself being driven by the machine tool power unit drive member;

(7) a somewhat downwardly angled first bearing face circumferentially positioned on said collet in an intermediate portion thereof said intermediate portion positioned closely below that upper portion of the collet receivable within said chuck;

(8) a nut threadable on the lower outer end portion of said chuck;

(9) said nut having a circumferentially inwardly inclined bearing flange at the lower end thereof, said flange providing an inwardly inclined, somewhat upwardly facing, circumferential, second bearing face operable to oppose, in substantially parallel orientation, the first bearing face on the collet when the collet is received in said chuck;

(10) said two bearing faces approaching one another when the said nut is threaded upwardly on the chuck lower end and vice versa and

(11) a coil compression spring normally received within a greater internal diameter zone within said nut above said second bearing face in a position normally freeing said chuck lower end recess and nut for insertion and removal of said collet upper end therethrough and therefrom;

(12) said nut lower inner end, chuck lower end and collet first bearing surface so configured that, upon threading said nut upwardly on said chuck after the collet is received therewithin, the said coil compression spring is inwardly and downwardly moved onto said second bearing surface and brought between and to strongly bear against said two opposed first and second bearing surfaces;

whereby the tightening down of said nut on said chuck lower outer end thread to the limit of hand tightness fixes the relative positions of said nut, chuck and collet with respect to one another until said nut is backed off.

4,902,178

RAPID FIXATION DEVICE

Guy Neyret, 11, rue du Fort, 69340 Francheville, France

Filed Oct. 31, 1988, Ser. No. 264,362
Claims priority, application France, Nov. 6, 1987, 87 15745; Nov. 6, 1987, 87 15746
Int. Cl.⁴ B23C *5/26;* **B23B** *31/00*
U.S. Cl. 409—234 **7 Claims**

1. A rapid securement device for a tool or workpiece holder, comprising an elongated stem, an elongated axle extending through said stem for axial movement relative to the stem, the axle having a head thereon, said head having a hole therethrough that registers with holes through said stem, a peg for holding a tool or a workpiece holder, said peg extending through said holes and having a flat surface that engages with a flat surface on said head, and spring means urging said axle in a direction relative to said stem to engage said flat surfaces



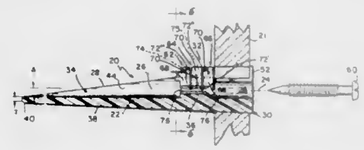
forcibly together thereby releasably to retain said peg in said holes.

4,902,179

DRYWALL FASTENER

Brian G. Harker, Granger, Ind., assignor to JTB, Inc., South Bend, Ind.

Filed Jul. 8, 1987, Ser. No. 70,897
Int. Cl.⁴ F16B *13/04*
U.S. Cl. 411—21 **39 Claims**



1. An expansion fastener for securing a retaining member, comprising:

a generally cylindrical, longitudinally extending body portion;

said body portion including a tapered portion at one end thereof;

said body portion including a flange portion which expands circumferentially in response to insertion of said retaining member into said body portion; and

prior to said expansion of said flange portion, said flange portion projects radially outward from said body portion.

4,902,180

INSET PANEL FASTENER

Richard F. Gauron, 26020 SE. 158th, Issaquah, Wash. 98027

Division of Ser. No. 946,515, Dec. 22, 1986, Pat. No. 4,812,193.
This application Dec. 27, 1988, Ser. No. 290,519
Int. Cl.⁴ F16B *39/02;* **E04B** *1/38*
U.S. Cl. 411—82 **9 Claims**

1. For molded-in installation by use of a potting resin, into a cavity formed in a sandwich panel of composite material, inwardly of a skin opening that is smaller in diameter than the cavity, a fastener element including a portion to which a screw fastener or the like is secured for in that manner connecting an object to the panel, said fastener element further comprising:

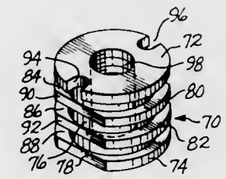
an outer end disk sized to be snugly received within the skin opening;

a circular stem extending inwardly from the outer end disk, said stem being substantially smaller in diameter than the outer end disk;

a plurality of axially spaced apart flow control disks on the stem, defining flow passageways around the stem axially between adjoining flow control disks and axially between the outer end disk and an adjacent flow control disk, each flow control disk having an axial dimension which is substantially smaller than the stem diameter in said flow passageways;

each said flow control disk having flat chord surfaces on diametrically opposite sides of the fastener element, and, circumferentially between the chord surfaces, being circular and of a diameter substantially equal to the diameter of the outer end disk;

wherein when the fastener element is positioned within the cavity with the outer end disk within the skin opening, first and second cavity spaces exist on opposite sides of the



fastener element, laterally outwardly from the chard regions of the fastener element;

said outer end disk having a fill opening which is in substantial alignment with said cavity space on a first side of the fastener element;

said outer end disk having a vent opening diametrically across the fastener element from the fill opening, and in substantial alignment with the cavity space on the second side of the fastener element; and

said fastener element being constructed from a resin material to which the potting resin will make a cohesive bond;

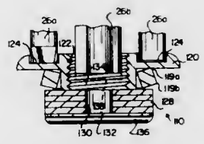
whereby when potting resin is injected through the fill opening it will first flow into the first cavity space, and then around the fastener element, including through the flow passageways and around the stem, to the second cavity space, and then axially through said second cavity space to the vent opening.

4,902,181

SPRING ACTION FASTENER

Anthony D. Moulton, 305 Melbourne, Columbia, Mo. 65201

Division of Ser. No. 632,050, Jul. 18, 1984, Pat. No. 4,812,097.
This application Feb. 10, 1989, Ser. No. 308,614
Int. Cl.⁴ F16B *21/00*
U.S. Cl. 411—347 **6 Claims**



1. A fastener for installation through an aperture extending through a pair of parts to be fastened, said fastener comprising:

a fastener body having opposite ends and carrying on one end a head having a size greater than the aperture to prevent entry of said head into the aperture;

a first spring section connected with said body and having a

size greater than the aperture in an undeformed condition, said first spring section being retractable to a size less than the aperture upon application of torsional force thereto; and

a second spring section connected with said first spring section and having a size greater than the aperture in an undeformed condition; said second spring section being retractable to a size less than the aperture upon application of torsional force thereto,

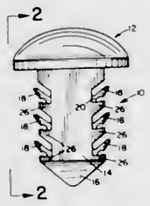
whereby torsional force can be applied to said spring sections to permit entry of said first spring section into the aperture and passage of said second spring section through the aperture, said spring sections expanding toward the undeformed conditions upon release of the torsional force to fasten the parts between said head on one side and said second spring section on the other side with said first spring section expanding to engage at least one of the parts at a location within the aperture.

4,902,182

PUSH-IN FASTENER

Jeffrey C. Lewis, Hubbardston, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 6, 1988, Ser. No. 254,405
Int. Cl.[4] F16B *19/00*
U.S. Cl. 411—510 **2 Claims**



1. A push-in fastener for use in a preformed rectangular opening in a workpiece comprising:

an elongated rigid shank with a central axis and terminating in a free end, said shank having a rectangular cross-sectional shape in planes perpendicular to said axis which is sized for free receipt in said preformed opening;

a series of wing members formed integrally with said shank and extending laterally therefrom in axially spaced relationship aligned along a first flat side of said shank, said wing members having a terminal end extending parallel to the first side of said shank and being joined to said shank by hinge means comprising a thin web section which can freely flex along a line parallel to the first side of said shank for permitting flexure movement of said wing members in directions axially of said shank; and,

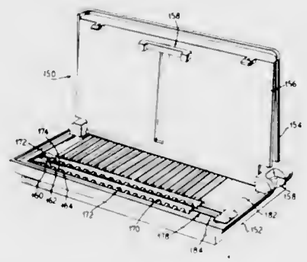
stop means comprising rigid projections extending outwardly from said shank and positioned between adjacent ones of said wing members for engaging an associated wing member along a line parallel to the first side of said shank and laterally outwardly of said hinge means and said shank at a point of maximum thickness of said associated wing member and limiting flexure movement of said wing members in directions toward said free end when said wing members are in their position of maximum lateral extent.

4,902,183

METHOD AND APPARATUS FOR BINDING MATERIALS WITH A CURLED-FINGER RING-TYPE BINDER

Alfredo J. Vercillo, Harwood Heights, and Thomas T. Battisti, Buffalo Grove, both of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Filed May 3, 1989, Ser. No. 346,918
Int. Cl.[4] B42B *5/08*
U.S. Cl. 412—7 **23 Claims**



10. An apparatus for use in forming a bound booklet by applying a curled-finger ring-type edge binder to prepunched sheets comprising:

a base for receiving a binder holding and delivering cartridge;

a cover hingedly associated with the base and defining a sheet aligning and delivering slot; and

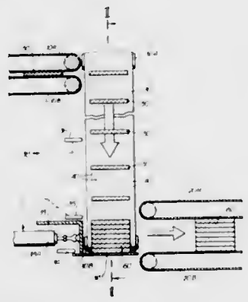
means defining a binding position cooperatively associated with one of said base or cover and at which a binder is adapted to be positioned for binding to said prepunched sheets.

4,902,184

APPARATUS FOR GROUPING OF PACKAGES

Günther Fritz, Glasbronnenstrasse 22, D-7131 Neubärental, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,538
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 8709053[U]
Int. Cl.[4] B65B *35/44, 35/50, 35/54*
U.S. Cl. 414—790.3 **2 Claims**



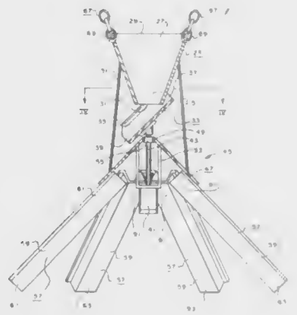
1. An apparatus for grouping packages, comprising: horizontal delivery means composed of upper and lower transfer belts for sequential high speed delivery of the packages; vertical conveyor means disposed for receiving the individual packages from said horizontal delivery means, conveying the individual packages vertically and arranging the individual packages in groups for transfer to a horizontal output device, wherein said vertical conveyor means comprise two parallel-extending endless belts and a plurality of parallel rows of brushes carried by each said belt and disposed for engaging each individual package received by said vertical conveyor means from below and supporting each individual package as it is being conveyed vertically; a horizontal bottom plate disposed at the lower end of said vertical conveyor means for receiving the individual packages conveyed by said conveyor means until successive packages are stacked to form one package group; a pusher displaceable parallel to the plane of said bottom plate and between said endless belts for transferring each package group to the horizontal output device, said pusher having a horizontally extending upper portion located above, and spaced vertically from said bottom plate for temporary storage and pre-grouping of packages conveyed by said vertical conveyor means; and a light barrier connected to control the operation of said pusher and disposed at a height above said bottom plate that corresponds to the desired height of one package group.

4,902,185

GRAIN SPREADER

Carl R. Dixon, Rte. 2, Box 24A, Weiner, Ark. 72479, and Jackie R. Auschultz, Box 213, Fisher, Ark. 72427

Filed Aug. 1, 1985, Ser. No. 761,583
Int. Cl.[4] B65G *65/32*
U.S. Cl. 414—301 **5 Claims**



1. A grain spreader for use with a grain bin including roof structure having an inlet opening for allowing grain to be introduced into the interior of the grain bin, said grain spreader comprising:

(a) hopper means positioned beneath the inlet opening in the roof structure of the grain bin and non-rotatably mounted relative to said grain bin for initially receiving grain being introduced into the interior of the grain bin through the inlet opening; said hopper means having a substantially open funnel-shaped interior, an unblocked upper inlet opening and an unblocked lower discharge opening; said inlet opening being larger than said outlet opening;

(b) chute means positioned beneath said hopper means for receiving grain from said hopper means; said chute means comprising a single elongated open-trough body having a first end positioned substantially beneath said outlet opening of said hopper means for receiving grain from said hopper means and having a second end located outwardly and downwardly from said outlet opening of said hopper means for discharging grain therefrom outward and downward from said outlet opening of said hopper means;

(c) motor means attached to said chute means for causing said chute means to slowly rotate; and

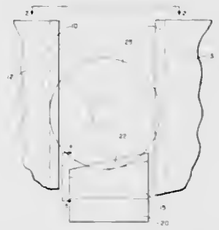
(d) deflector means positioned beneath said chute means and non-rotatably mounted relative to said grain bin for receiving grain from second end of said chute means as said chute means rotates and for directing the grain received from said chute means outward from said hopper means, said deflector means including a cone member positioned beneath said chute means for receiving grain from said second end of said chute means as said chute means rotates and for directing the grain received from said chute means outward and downward from said hopper means.

4,902,186

DISK GUIDE FOR A DISK HANDLING SYSTEM

Minoru Akagawa, Fremont, Calif., assignor to Intelmatec Corporation, Fremont, Calif.

Filed Dec. 9, 1988, Ser. No. 282,202
Int. Cl.[4] B65B *21/02*
U.S. Cl. 414—417 **3 Claims**



1. A disk guide for lifting a disk accurately to a predetermined position, said disk guide comprising

a pair of sidewalls having mutually parallel vertical U-shaped grooves which face each other and are separated from each other such that said disk can be supported thereby and can move vertically therealong,

a disk holder means having a disk-supporting top surface, said top surface being sloped so as to cause a disk supported thereon to lean against one of said vertical sidewalls and against the base portion of one of the said U-shaped grooves, and

lifting means for causing said disk holder means to move vertically.

4,902,187

DRUM DOLLY ATTACHMENT APPARATUS

Kenneth E. Rousseau, Wichita, Kans., assignor to Harper Truck, Inc., Wichita, Kans.

Filed Aug. 29, 1988, Ser. No. 237,339
Int. Cl.[4] B62B *1/06*
U.S. Cl. 414—456 **4 Claims**



1. A drum attachment assembly connectable to an upright

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support tube on a dolly truck assembly and operable to be releasably connected to a main rim portion on a drum member, comprising:

(a) a drum contact member of generally V-shape operable to contact an upper side wall of the drum member adjacent the main rim portion to provide abutment and prevent movement of the drum member in one lateral direction;

(b) a drum attachment assembly connected to a support member on a dolly truck assembly for adjustable vertical movement thereon;

(c) said drum attachment assembly includes a stationary drum connector engagable with an upper inner portion of the main rim portion of the drum member and an actuator drum connector assembly engagable with a lower outer portion of the main rim portion of the drum member;

(d) said drum attachment assembly includes a main support housing assembly slidably mounted on said support member having said stationary drum connector secured thereto;

(e) an attachment handle member secured to said main support housing assembly operable to be grasped for vertical movement of said drum attachment assembly on said upright support tube of said dolly truck assembly;

(f) said stationary drum connector includes a drum contact member which is inclined toward said housing, and said drum contact member having an inclined edge section engagable with an upright inner portion of the main rim portion of the drum member; and

(g) said actuator drum connector includes an actuator contact member pivotally connected to said main support housing assembly and having a bias member to bias said actuator contact member into a position which is inclined away from said housing so as to be adjacent to and substantially aligned with said drum contact member and into contact with an outer lower portion of the main rim rim portion on the drum member.

4,902,188

TROLLEY CARRIER

Robert Page, 71 Dwyer Avenue, Little Bay, N.S.W. 2036, Australia

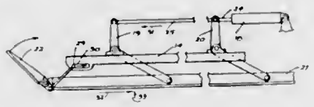
PCT No. PCT/AU85/00298, § 371 Date Jul. 29, 1986, § 102(e) Date Aug. 15, 1986, PCT Pub. No. WO86/03168, PCT Pub. Date Jun. 5, 1986

PCT Filed Nov. 29, 1985, Ser. No. 890,842

Claims priority, application Australia, Nov. 29, 1984, PG8360

Int. Cl.⁴ B60P *1/02*

U.S. Cl. 414—495 **15 Claims**



1. A vehicle comprising:

a wheeled body,

a tray swingably movable by link means mounted on said wheeled body for movement between an upper transportation position and a lower ground engaging loading position,

a connecting means for connecting said tray to said wheeled body such that said tray retains the substantially same horizontal orientation throughout its movement between said upper transportation position and said lower loading position,

a rear ramp pivotally positioned at the rear of said tray and movable between a generally horizontally extending ground engaging position and a raised generally vertical position generally blocking the rear of said tray, and

a mechanical leverage means connected between said tray and body for lowering said ramp to said ground engaging position in response to said tray being lowered to said lower loading position and for raising said ramp to said raised position in response to said tray being raised to said transportation position.

4,902,189

GATHERING AND GUIDING ARRANGEMENT FOR THE LOADING AND UNLOADING OF CONTAINERS OR PLATFORMS ONTO VEHICLES

Reijo J. Raisio, Shrewsbury, United Kingdom, assignor to Multilift Limited, United Kingdom

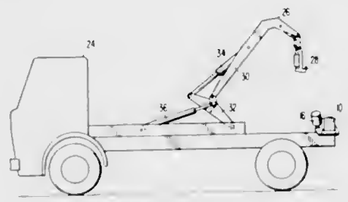
PCT No. PCT/GB85/00044, § 371 Date Oct. 3, 1985, § 102(e) Date Oct. 3, 1985, PCT Pub. No. WO85/03482, PCT Pub. Date Aug. 15, 1985

PCT Filed Jan. 30, 1985, Ser. No. 786,968

Claims priority, application United Kingdom, Feb. 3, 1984, 8402963

Int. Cl.⁴ B60P *1/64*

U.S. Cl. 414—498 **20 Claims**



1. A vehicle for carrying a load-carrying means and having a lifting mechanism for loading the load-carrying means onto the vehicle over the rear of the vehicle, there being roller means rotatable about a substantially horizontal axis and located at the rear of the vehicle, characterized in that a gathering and guiding means constituted by a rotatable roller whose rotation axis extends, in a direction outwardly of the vehicle, upwardly and forwardly, is located at each side of the vehicle forwardly of the roller means and is positioned to be encountered by and to guide and centralize the load-carrying means during a loading operation.

4,902,190

FORK POSITIONING ATTACHMENT FOR LIFT TRUCKS

Marshall K. House, Portland, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 95,632, Sep. 14, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 275,664

Int. Cl.⁴ B60P *1/50*

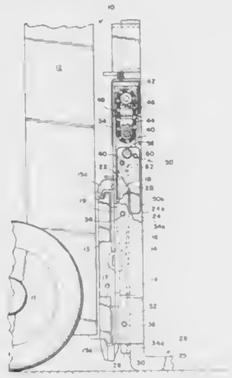
U.S. Cl. 414—667 **6 Claims**

1. A fork-positioning attachment mounted upon a vertically-movable load-lifting carriage slidably mounted on the mast of a forklift truck having means for moving said carriage, said carriage being of the type having an elongate, transversely-extending fork-supporting member with an upwardly-facing, transversely-extending fork-supporting surface thereon for supporting a pair of load-lifting forks having upstanding portions engaged by said upwardly-facing fork-supporting surface, said forks having forwarldy-protruding load-lifting portions protruding from said upstanding portions, said attachment comprising:

(a) upstanding frame means mounted on said carriage in rearwardly-overlapping relation to said fork-supporting member for extending forwardly therefrom to substantially no greater an extent than the forward extremities of the upstanding portions of said forks while said upstanding portions are engaged by said fork-supporting surface; and

(b) fork-positioning means mounted on said frame means for

detachably engaging said upstanding portions of said forks to move them selectively toward and away from each other in a transverse direction while said upstanding portions are engaged by said fork-supporting surface, said frame means including means for mounting said fork-positioning means such that said fork-positioning means extend forwardly to substantially no greater an extent than said forward extremities of said upstanding portions of said forks while said upstanding portions are engaged by said fork-supporting surface;



(c) said fork-positioning means comprising a pair of inverted U-shaped means, each having a base from which a pair of transversely-spaced legs depend, for detachably engaging the respective tops of said upstanding portions of the respective forks such that the bases of the respective U-shaped means are positioned above the tops of said upstanding portions in rearwardly-overlapping relationship thereto and the legs of each of said respective U-shaped means depend downwardly along the transversely-opposed sides of a respective upstanding portion of a fork, also in rearwardly-overlapping relationship thereto.

4,902,191

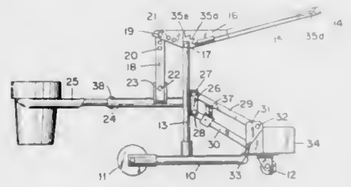
PAIL LIFTER

Joseph B. Cumbest; Johnnie L. Briggs, and Francis R. Jones, all of Amarillo, Tex., assignors to Asarco Incorporated, New York, N.Y.

Filed Dec. 9, 1985, Ser. No. 806,868

Int. Cl.⁴ B66C *1/00*

U.S. Cl. 414—729 **6 Claims**



1. A motile truck for moving containers and other articles comprising a base, supporting standards at opposite sides of the base, said standards having upper and lower ends, a handle pivotally attached at the upper ends of the standards, a lift supporting member pivotally attached to the handle and to a suitable lifter arm, the lifter arm having attached at one end a lifting device and the other end of the lifter arm being pivotally attached to a connecting bar, with the other end of the connecting bar being pivotally attached to the truck base.

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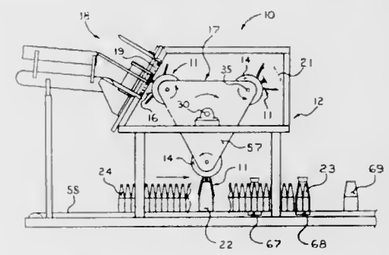
ARTICLE CONTROL ASSEMBLY FOR ARTICLE TRANSFER DEVICE

Kelly W. Ziegler, Crosby, Minn., assignor to Minnesota Automation, Inc., Crosby, Minn.

Filed May 19, 1988, Ser. No. 195,776

Int. Cl.⁴ B66C *1/02*

U.S. Cl. 414—732 **16 Claims**



1. An article control assembly for an article transfer mechanism of a transfer device for transferring articles onto a synchronized conveyor comprising:

a. at least one articulated member for engaging the articles,

b. synchronization means operative on said articulated member for controlling the movement of said articulated member with respect to the article transfer mechanism, said synchronization means further comprising a rotational velocity control mechanism, and

c. rotational acceleration control means operative on said articulation member comprising a cam structure, a cam follower and a connecting structure between said cam follower and said articulated member, said rotational velocity control mechanism further having means to rotate said cam structure with respect to the article transfer mechanism of the transfer device, whereby said velocity control mechanism and said rotational acceleration control means cause said articulated member to contact and control the transfer of articles.

4,902,193

DEVICE FOR THE REARRANGEMENT OF A PILE OF PICTURES

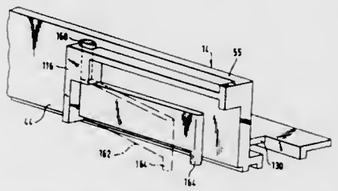
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Continuation of Ser. No. 888,327, Jul. 11, 1986, Pat. No. 4,784,556. This application Aug. 10, 1988, Ser. No. 230,744

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441463; PCT Int'l Appl., Nov. 12, 1985, PCT/EP85/00616

Int. Cl.⁴ G09F *11/30*

U.S. Cl. 414—788.8 **17 Claims**



1. Apparatus for the cyclic rearrangement of a pile of sub-

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stantially rectangular sheets by removing a sheet from one end of said pile and returning it to an opposite end of said pile, said apparatus comprising:

a first frame part and a second from part for receiving said pile of sheets, said second frame part being movable relative to said first frame part along a displacement path parallel to the principal plane of the pile of sheets held by said frame parts from a first end position to a second end position, each of said first and second frame parts having stop means, said stop means on said first frame part cooperating with said stop means on said second frame part to define said end positions; and

means coupling said first and second frame parts for, when said second frame part is being moved in a direction of motion along said displacement path from one of said first and second end positions to the other of said first and second end positions, preventing reversal of the direction of motion of said second frame part at least in one portion of said displacement path; wherein:

said second frame part is a slider including struts which extend in said direction of motion and define a space to be occupied by said pile of sheets; and

said reversal preventing means is disposed outside said space.

4,902,194

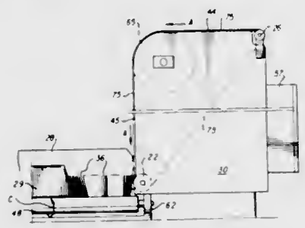
COLLECTING AND STACKING APPARATUS

Donald A. Lane, Wakefield, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jun. 27, 1988, Ser. No. 214,028

Int. Cl.[4] B65H *29/24*

U.S. Cl. 414—798.5 **7 Claims**



1. Apparatus for stacking tickets in a horizontal array, comprising:

a horizontal stacking area having an input end and bordered by a side plate extending along a horizontal stacking axis;

a back stop for retaining tickets stacked on edge in the stacking area, said back stop being movable away from the input end to accommodate variable numbers of tickets;

a plurality of disks mounted on a roller at said input end, said roller and disks being driven so as to urge tickets into the input end;

a vacuum transport belt assembly, comprising movable transport belts for conveying tickets and releasing them at the disks;

a housing having top and front surfaces with a plurality of apertures forming an air pervious grid, the top and front surfaces defining an opening;

a rotatable drum having a plurality of apertures forming an air pervious grid in its periphery, the drum being located within the opening with its circumference proximate to the front and top housing surfaces; and

means for evacuating the housing to subatmospheric wherein said transport belts travel in a path around said top housing surface, said rotatable drum, said front housing surface, and said roller, wherein said transport belts advance the tickets along a path past said top housing surface, said rotating drum, and said front housing surface, to said roller.

4,902,195

DEVICE FOR AUTOMATICALLY PILING UP FLAT ELEMENTS

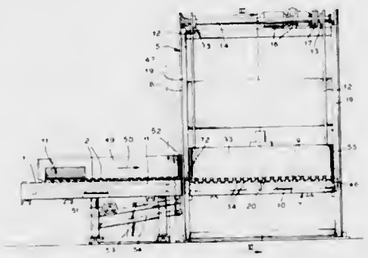
Raymond Lucas, Villandraut-Prechac, France, assignor to Bobst SA, Switzerland

Filed Mar. 5, 1984, Ser. No. 586,048

Claims priority, application France, Mar. 11, 1983, 83 04185

Int. Cl.[4] B65G *57/10*

U.S. Cl. 414—799 **11 Claims**



1. A device for piling up successive layers of batches of blanks, such as batches of cardboard box blanks, on a support surface, said device comprising delivery means for moving batches of blanks into said device, a frame, a horizontal table having parallel extending rollers and means to drive said rollers, said table being mounted in said frame for vertical movement, means for moving said table between a fixed loading level to receive a layer of batches from the delivery means and a variable unloading level for unloading the batches onto the support surface at a first side of the frame, said rollers coacting with the delivery means to transfer the layer of batches from the delivery means to the table, and unloading means in the table for transferring the layer in a direction parallel to the axes of the rollers from the table onto the support surface including a row of fork members extending parallel to the rollers of the table and spaced to be received between the rollers, first means for shifting the fork members between a retracted position below a horizontal plane of the rollers to an elevated position above the plane, second means for shifting the fork members in the direction parallel to the axes of the rollers between a first position above the rollers and a second position projecting out of the first side of the frame and above said support surface, and comb means being mounted for movement between a retractable position allowing movement of the fork members with a layer thereby and a blocking position for holding the layer on the support surface as the fork members are moved from the second position back to the first position.

4,902,196

GAS-MOVING DEVICE

Geoffrey C. M. Byrd, Warrington, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 47,521, May 4, 1987, abandoned, which is a continuation of Ser. No. 775,362, Sep. 12, 1985, abandoned. This application Dec. 14, 1988, Ser. No. 284,808

Claims priority, application United Kingdom, Sep. 12, 1984, 8423045

Int. Cl.[4] F04D *29/26*

U.S. Cl. 415—90 **4 Claims**

1. A gas moving device comprising:

(a) a rotor which comprises a plurality of flexible radially directed members comprising fibres, filaments, strands, tapes, ribbons, strips or sheet members which are formed from a plastic materials, and which are mounted on a hub member, such that said plastic members move in one or more planes which are substantially transverse to the axis of rotation of the rotor, and draw gas into the device and cause it to flow away from said axis towards the radially outer periphery of the rotor, the volume of the radially directed members being between 1 and 4% of the swept volume;

(b) housing means for surrounding said rotor;

(c) a gas inlet formed in said housing means;



(d) a gas outlet formed in said housing means;

(e) means for rotating the rotor; and

(f) delivery means within the housing positioned between said gas inlet and said hub member and adjacent said rotor for supplying a fluid spray essentially axially against said radially directed members,

wherein said inlet is disposed opposite said hub member; and has a cross-sectional area greater than the cross-sectional area of said hub member and has a cross-sectional area greater than the cross-sectional area of said hub member.

4,902,197

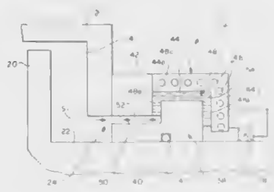
SEAL ARRANGEMENT FOR A CENTRIFUGAL TYPE OF PUMP

Richard O. Rhodes, San Francisco; Stephan Sears, Menlo Park, and Dan M. Pomeroy, Redwood City, all of Calif., assignors to Superstill Technology, Inc., Redwood City, Calif.

Continuation of Ser. No. 911,965, Sep. 25, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 206,212

Int. Cl.[4] F01D *11/00*

U.S. Cl. 415—111 **36 Claims**



1. In a pump including impeller or other such means located within a pump housing and connected to a power driven shaft assembly extending through a generally axially extending cooperating opening in said housing from outside thereof so as to rotate with said shaft assembly about the axis of the latter relative to said housing, whereby to cause fluid within said housing to be pressurized, the improvement comprising a sealing arrangement for preventing said fluid within said housing from escaping from said housing through said opening, said arrangement including means forming part of said shaft assembly and part of said housing for providing an axially static continuous liquid seal extending circumferentially around an axial section of said shaft assembly within said opening and radially between said axial shaft section and said housing during operation of the pump whereby to seal said opening against the passage of said fluid from within said housing, said fluid within said housing being steam and said liquid seal being water and said seal providing means including means for condensing some of said steam to use as said water seal.

4,902,198

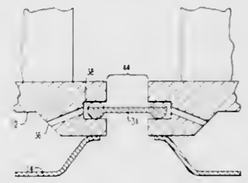
APPARATUS FOR FILM COOLING OF TURBINE VAN SHROUDS

William E. North, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1988, Ser. No. 238,942

Int. Cl.[4] F01D *5/18*

U.S. Cl. 415—115 **14 Claims**



1. A gas turbine of the type having a turbine cylinder containing a plurality of stationary vanes and rotating blades, said vanes and blades defining an annular flow path therebetween, said vanes circumferentially disposed in a row surrounding a rotating shaft and extending into said annular flow path;

each of said vanes having a radially inboard end, there being an inner shroud at each of said radially inboard ends;

each of said inner shrouds having first and second approximately axially oriented edges, said first and second edges of each pair of adjacent inner shrouds forming a circumferential gap, a slot being formed in each of said first and second edges;

each of said inner shrouds having inner and outer surfaces, said inner surfaces of said inner shrouds forming a shroud cavity;

a supply of high pressure air to said shroud cavity;

means for regulating the leakage of said high pressure air from said shroud cavity through each of said circumferential gaps between adjacent inner shrouds, characterized by:

a strip seal for each of said circumferential gaps, each of said strip seals having two longitudinal edges;

a sealing surface along each of said longitudinal edges, said sealing surfaces of each of said strip seals residing in said slots of two of said inner shrouds which are adjacent, one of said sealing surfaces residing in one of said slots and the other of said sealing surfaces residing in the other one of said slots whereby each of said strip seals spans one of said circumferential gaps; and

a plurality of intermittent reliefs in each of said sealing surfaces, the size and quantity of which being variable to obtain the leakage flow desired.

4,902,199

UNIVERSAL BLOWER

Russell McDonald, Rochester; John A. Wargo, Macedon; Glenn M. Herbert; Kenneth P. Moore, both of Rochester, and John D. Gramlich, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 14, 1986, Ser. No. 918,456

Int. Cl.[4] F04D *29/30*

U.S. Cl. 415—143 **8 Claims**

1. An apparatus for moving air, including:

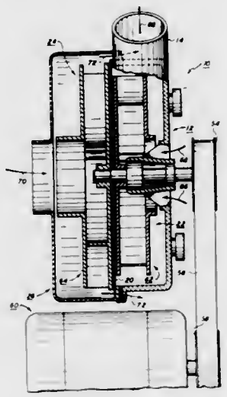
a housing defining a pair of chambers for receiving air therein;

a vacuum assembly mounted in said one of the chambers in said housing, said vacuum assembly being readily replaceable with another vacuum assemble having a different capacity than said first mentioned vacuum assembly so as

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to enable the air pressure in said one of the chambers to be adjusted without adjusting the size of said one of the chambers in said housing; and

a pressure assembly mounted in said other one of the chambers in said housing, said pressure assembly being readily



replaceable with another pressure assemble having a different capacity than said first mentioned pressure assembly so as to enable the air pressure in said other one of the chambers to be adjusted without adjusting the size of said other one of the chambers in said housing.

4,902,200

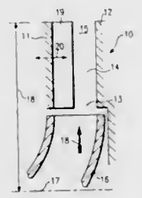
VARIABLE DIFFUSER WALL WITH RIBBED VANES

Phiroze Bandukwalla, Olean, and Colin Osborne, Allegany, both of N.Y., assignors to Dresser-Rand Company, Corning, N.Y.

Filed Apr. 25, 1988, Ser. No. 186,001

Int. Cl.[4] F01D *17/12*

U.S. Cl. 415—148 **11 Claims**



1. In a diffuser adapted to a centrifugal compressor, the diffuser having a hub wall and a shroud wall, the improvement comprising:

a shroud wall portion, movable with respect to the hub wall, the shroud wall having a plurality of ribbed vanes attached thereto; and

the ribbed vanes extending no further than about half the maximum separation between the hub wall and shroud wall, whereby the efficiency of the diffuser is maximized over a larger volumetric flow range for partial-load rates.

4,902,201

RUPTURE PROTECTION RING FOR AN ENGINE CASING

Horst Neubert, Unterhaching, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 25, 1989, Ser. No. 343,166

Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3814954

Int. Cl.[4] F01D *25/24*

U.S. Cl. 415—197 **15 Claims**



1. A rupture protection ring for an engine casing, comprising a structure made at least partially of fiber compound materials, said structure including two flexurally stiff supporting end rings which are axially spaced apart to form ring edges, a plurality of fiber cloth layers jointly wrapped around said stiff supporting rings, a resin impregnation in said fiber cloth where it is wrapped around said stiff supporting end rings, said fiber cloth being free of resin in an area between said stiff supporting end rings (*2a, 2b*), said fiber cloth (**4**) having fiber orientations which include angles within the range of about 15° to about 45° between fibers extending in one direction in one layer and fibers slanted in another direction in a different layer relative to said one direction.

4,902,202

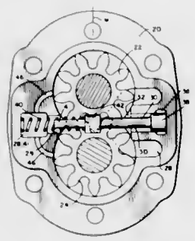
VARIABLE DISCHARGE GEAR PUMP WITH ENERGY RECOVERY

Charles J. Bowden, Battle Creek, Mich., assignor to Hydreco, Inc., Augusta, Ga.

Continuation-in-part of Ser. No. 79,010, Jul. 29, 1987, Pat. No. 4,824,331. This application Jul. 20, 1988, Ser. No. 220,234

Int. Cl.[4] F04C *29/08;* **F04B** *49/02, 49/08*

U.S. Cl. 417—310 **10 Claims**



1. A variable discharge gear pump comprising:

an inlet chamber and outlet chamber;

a pair of gears rotatable about parallel axis in opposite direction and having an intermeshing area between said inlet and outlet chambers, said intermeshing area having a meshing area of decreasing displacement at said outlet chamber and a demeshing area of increasing displacement at said inlet chamber;

outlet adjustment means in fluid communication with said outlet chamber for adjustably providing high pressurized fluid from said outlet chamber to selected portions of said demeshing area adjacent said meshing area of said intermeshed gears to vary the discharge flow of the pump and vary the amount of energy recovery;

inlet adjustment means connecting said inlet chamber and said demeshing area for variably controlling fluid flow between said inlet chamber and said demeshing area to vary the amount of energy recovery; and

coordinating means for coordinating said inlet adjustment means and said outlet adjustment means whereby said fluid flow between said inlet chamber and said demeshing area decreases with decreased discharge flow thereby increasing energy recovery.

4,902,203

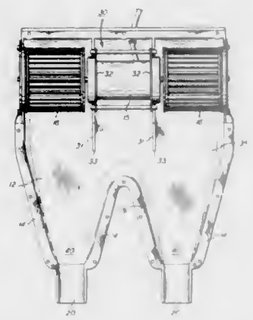
HOUSING FOR DUAL OUTLET, DUAL ROTOR BLOWER

Harold W. Sager, 5925 Webster Rd., Orchard Park, N.Y. 14127

Filed Nov. 3, 1988, Ser. No. 266,518

Int. Cl.[4] F04B *39/06*

U.S. Cl. 417—350 **10 Claims**



1. A two-part cast housing for a dual outlet, dual rotor blower, said housing having a volute region containing a motor and both rotors of said blower, said cast parts having internal partitions dividing said volute region between a central region containing said motor and end regions containing said rotors, and said housing comprising:

a. a pair of flanges extending radially outward around end regions of said motor, between said motor and said rotors, said flanges having an uninterrupted engagement with said partitions to block air flow between said end regions containing said rotors and said central region containing said motor;

b. a discharge plenum communicating with each of said rotors and extending throughout the distance between said rotors, said partitions extending into said plenum;

c. a discharge region of said plenum being divided by a U-shape into a pair of nozzles aligned respectively with said rotors, a rounded end of said U-shape being spaced from and oriented to confront said partitions, and legs of said U-shape forming sides of said nozzles, each of which converges toward a discharge end;

d. a vent opening in said central region so that air from said plenum can pass between said partitions around said motor and out through said vent opening; and

e. confronting flanges of said cast parts being arranged around said U-shape between said nozzles and along outside edges of said nozzles opposite said legs of said U-shape, said cast parts being fastened together along said confronting flanges.

4,902,204

VERTICAL SUBMERSIBLE PUMP ASSEMBLY

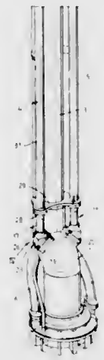
Åge Hofstad, Tranby, Norway, assignor to Kvaerner-Eureka A/S, Tranby, Norway

Filed Oct. 17, 1988, Ser. No. 258,665

Claims priority, application Norway, Oct. 26, 1987, 874456

Int. Cl.[4] F04B *35/00*

U.S. Cl. 417—360 **3 Claims**



1. A vertical submersible pump assembly, comprising a pump assembly casing which contains a hydraulic drive motor with a drive shaft, a pump housing which is secured on said pump assembly casing, a pump rotor positioned within the pump housing and connected with the drive shaft, a transport conduit extending upwardly from the pump housing, and two driving medium conduits which extend upwardly from the pump assembly casing, wherein the pump housing is radially divided along a first circumference outside the pump rotor into inner and outer pump housing portions, said pump housing including an external ring-shaped portion connected to the transport conduit, and each drive medium conduit, comprising a releasable conduit means, said releasable conduit means when removed permitting a unit comprising said pump assembly casing to be displaced upwardly together with the drive motor, the pump rotor and the inner pump housing portion.

4,902,205

OIL PUMP FOR A HORIZONTAL TYPE ROTARY COMPRESSOR

Caio M. F. N. DaCosta, Rua Eduardo Miers 142 ap. 603,89200; Dietmar E. B. Lilie, Rua Adriano Schondermack 365,89200, and Marcos G. D. DeBortoli, Rua Rio do Sul, 344,89200, all of Joinville-SC, Brazil

Filed Sep. 28, 1987, Ser. No. 101,930

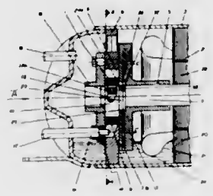
Claims priority, application Brazil, Sep. 30, 1986, PI8604804; May 13, 1987, PI8702433

Int. Cl.[4] F04B *39/02;* **F04C** *29/02*

U.S. Cl. 417—372 **20 Claims**

1. A Horizontal Crankshaft Hermetic Compressor, comprising a compressor unit having a cylinder which houses a piston, the piston being driven by a crankshaft which is supported by a main bearing and a sub bearing; an oil pump defined around a portion of the crankshaft and in fluid communication with a lubricant oil sump and with parts of the unit requiring lubrication; and a hermetic shell enclosing the compressor unit, the electric motor, the oil pump and the lubricant oil sump, said oil pump comprising a cylindrical and eccentric portion (**23**) of the crankshaft (**7**) which is disposed in such a way as to slip within a cylindrical housing (**26**), said housing (**26**) being concentric to the geometric axis of the crankshaft (**7**); at least a curved and lengthened blade element (**25**) with a width corresponding to an axial length of the cylindrical housing (**26**), said

blade element (25) having at least one edge attached at an attachment location (31) in an interior surface of the housing (26) and being inserted at an area of contact (28) between the cylindrical housing (26) and the eccentric portion (23) so as to define an admission chamber (29) and a pressure chamber (30) in each space of the cylindrical housing (26) defined between





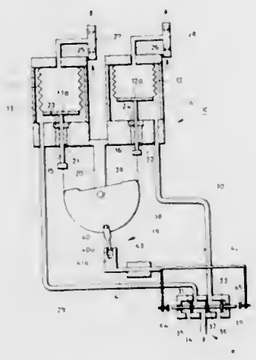
the attachment location (31) of the blade element (25) and the area of contact (28), the admission chamber (29) and the pressure chamber (30) being in fluid communication respectively with the lubricant oil collected in the oil sump and with the part of the crankshaft (7) and bearings (5 and 6) requiring lubrication.

4,902,206

BELLOWS PUMP

Takao Nakazawa, Suginami; Jisaburo Naito, Shinjuku; Hiroyuki Horiki, Chiba, and Tatomu Kawashima, Koto, all of Japan, assignors to Haluna Kabushiki Kaisha and Nisso Engineering Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,462
Int. Cl.[4] F04B *23/06, 45/02*
U.S. Cl. 417—394 5 Claims



1. A bellows pump having two bellows made of a plastic material and provided with liquid inlet and outlet ports for transferring a liquid by expanding and contracting the bellows, comprising:

cylinder cases set in parallal in each of which the bellows is vertically expandably and contractably contained and mounted at its access port side to a ceiling of said cylinder case;

gas pumping means for alternately feeding a compressed gas from lower ends thereof into said cylinder cases;

a pair of rods passed through bottoms of the cylinder cases and fixed to the lower ends of the bellows, and adapted to be moved in response to the expansion and contraction of said bellows, and

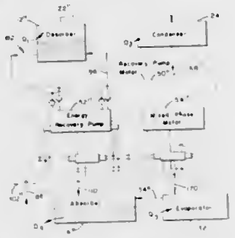
actuating means for alternating said gas pumping means adapted to be operated in response to the up and down movement of said rods.

4,902,207

ENERGY RECOVERY APPARATUS

Richard D. Hembree, and David E. E. Carmein, both of Minneapolis, Minn., assignors to Recovery Engineering, Inc., Minneapolis, Minn.

Division of Ser. No. 62,232, Jun. 15, 1987, Pat. No. 4,793,153. This application Dec. 23, 1988, Ser. No. 289,924
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—403 10 Claims



1. Energy recovery apparatus, comprising:

a pump with a driving chamber and a pumping chamber and first means for reciprocating to simultaneously increase the size of one of said driving and pumping chambers and decrease the size of the other, said pump having means for filling said pumping chamber with a first liquid of first pressure, said pump further having means for driving said first reciprocating means in a pumping stroke with a second liquid at a second pressure in said driving chamber, said pump including means for releasing said first liquid from said pumping chamber during said pumping stroke, said pump also including first means for returning said first reciprocating means and filling said pumping chamber with more of said first liquid in a filling stroke, said pump further including first means for exhausting said second liquid from said driving chamber during said filling stroke;

a motor with a main chamber and a second means for reciprocating which divides said main chamber into first and second portions, said motor including means for placing said first portion in fluid communication with a third liquid at a third pressure to move said second reciprocating means through a hydraulic power stroke, said motor further having means for allowing expansion of said third liquid into both said first and second portions to change phase and form a vapor and liquid mixture to drive said second reciprocating means in an expansion power stroke, said motor including second means for exhausting spent vapor and liquid at a pressure lower than said third pressure from said second portion during said hydraulic power stroke;

means for connecting said first and second reciprocating means for simultaneous movements; and

means for switching from one of said pumping and filling strokes to another and from one of said hydraulic and expansion power strokes to another at the same time;

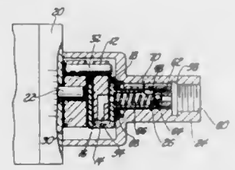
whereby said pump and said motor recover energy from said second and third liquids to pump said first liquid.

4,902,208

PUMP HAVING PISTON AND CYLINDER ROTATABLE RESPECTIVELY ABOUT SPACED AXES TRANSVERSE TO THE RECIPROCATING AXIS

R. A. Ray Wood, 3396 Marine Dr., West Vancouver, B.C., Canada (V7V 1M9)

Continuation of Ser. No. 534,776, Sep. 22, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 713,563
Int. Cl.[4] F04B *19/02*
U.S. Cl. 417—462 14 Claims



1. A pump assembly (10) comprising; piston and cylinder pumping members (12, 14) in telescoping relationship with one another for reciprocating movement relative to one another along a reciprocating axis to define a single pumping chamber (16) therebetween, piston support means (20, 22, 30, 32) supporting said piston member (12) for rotation about a first axis extending transversely to said reciprocating axis, cylinder support means (24) supporting said cylinder member (14) for rotation about a second axis extending transversely to said reciprocating axis so that said piston member (12) rotates about said first axis in conjunction with said cylinder member (14) rotating about said second axis, said cylinder member (14) being open to receive and enclose said piston member (12) to establish one pumping chamber (16) between said piston and cylinder members (12, 14), said cylinder member (14) closing said pumping chamber (16) at all positions of relative reciprocation and of rotation of said piston and cylinder members (12, 14) about said first and second axes, commutating valve means for establishing fluid flow into said closed pumping chamber (16) during one portion of each revolution to charge said chamber (16) and for establishing fluid flow from said pumping chamber (16) during the remainder of each revolution, said commutating valve means including a fluid passage extending from said pumping chamber (16) to a single radial port (48) rotatable about one of said first and second axes and first and second fixed ports (50, 52) spaced circumferentially from one another for independent fluid communication with said radial port (48) during the rotation thereof, whereby fluid flows into said radial port (48) from one of said fixed ports (50, 52) and out of said radial port (48) and into the other of said fixed ports (50, 52).

4,902,209

SLIDING SEGMENT ROTARY FLUID POWER TRANSLATION DEVICE

Howard A. Olson, 18 Court St., Plum City, Wis. 54761

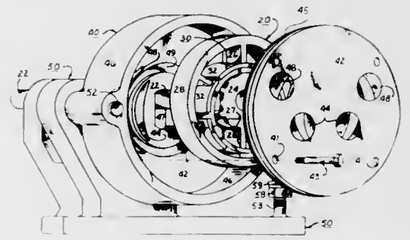
Filed Mar. 4, 1988, Ser. No. 164,479
Int. Cl.[4] F01C *1/344, 1/356, 11/00*; F02B *53/04*
U.S. Cl. 418—6 8 Claims

1. An improved, adjustable, rotary vane device of the type comprising:

a main rotor having a central hub mounting a plurality of fixed vanes and a containment ring being concentrically affised to said fixed vane extremities, rotatably mounted between opposed working fluid confinement plates which provides a segments rotor bearing rotatably supporting

a segments rotor comprising overlapping arcuate segments penetrated by said fixed vanes, said segments rotor forming a circular, normally eccentrically disposed working fluid barrier lying substantially within the major diameter of said main rotor and dividing the internal volume of said main rotor into work cycles, said work cycles being further divided into chambers by said fixed vanes; said chambers provided with access to working fluid inlet and outlet ports by rotation of said main rotor;

wherein the improvement comprises; said confinement



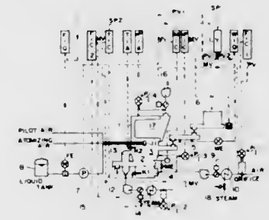
plates can be repositioned as a tandem assembly relative the axis of said main rotor by a lateral adjustment means comprising a plurality of threaded boltlike members and said main rotor is rotatably supported by a mounting means essentially independent of said confinement plates.

4,902,210

CONTINUOUS FLUIDIZED-BED GRANULATING APPARATUS

Takeo Shibata, Shizuoka, Japan, assignor to Kabushiki Kaisha Okawaraseisakusho, Haibaragun, Japan

Filed Aug. 19, 1988, Ser. No. 233,759
Claims priority, application Japan, Aug. 20, 1987, 62-205126
Int. Cl.[4] B29C *67/02*
U.S. Cl. 425—6 5 Claims



1. In a continuous fluidized-bed granulating apparatus in which a granulated product is continuously introduced in a substantially constant amount at a time into a classifying section through a lower wall of a fluidizing chamber whereby the granulated product is classified by classifying means so that granules granulated to particle sizes greater than a desired size are selected and delivered and ungranulated powder is returned to said fluidizing chamber, the improvement comprising:

means for detecting a fluidizing air pressure drop of a fluidizing bed within said fluidizing chamber;

means for adjusting a charging rate of a material to be granulated in accordance with a deviation between a detected value of said pressure drop and a set value;

means for detecting a moisture content of the material to be granulated in said fluidizing chamber; and

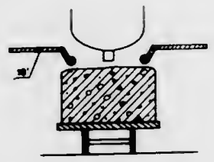
means for adjusting a feed rate of a binding liquid in accordance with a deviation between said moisture content detected value and a set value.

4,902,211

PROCESS AND PLANT FOR MANUFACTURE OF AERATED CONCRETE

Göte Svanholm, Örebro, Sweden, assignor to Svanholm Engineering AB, Örebro, Sweden

Continuation of Ser. No. 875,215, Jun. 17, 1986, abandoned, which is a division of Ser. No. 572,545, Jan. 20, 1984, Pat. No. 4,613,472. This application Aug. 5, 1988, Ser. No. 229,779
Claims priority, application Sweden, Jan. 24, 1983, 8300342
Int. Cl.[4] B28B *15/00, 7/04, 13/02*
U.S. Cl. 425—88 **14 Claims**



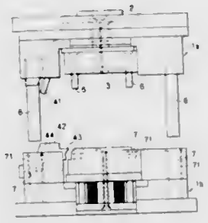
1. A plant for the manufacture of aerated concrete products, comprising: casting station means for the preparation of quick-stiffening mixtures of at least one silica containing material, at least one calcareous binder, a rising agent, and water, the casting station means including means for pouring mixtures at periodic intervals that are spaced apart by a pacing time; and a plurality of molds to receive the pourings and retain them for a stiffening time until they harden to semiplastic bodies in the molds, the stiffening time being shorter than the pacing time between two consecutive pourings; wherein the molds are upwardly open and include a single wall arrangement disposed at the pouring means and a plurality of bottoms transportable past the pouring means, the bottoms being each in turn connected with the wall arrangement only during pouring and stiffening, and wherein the plant further includes means for swinging the wall arrangement away from the bottoms to permit transport of the semiplastic bodies on the bottoms.

4,902,212

SELF-LUBRICATING METALLIC MATRIX FOR INJECTION MOLDING

Susumu Nakamura, and Koichi Yokoi, both of Yamanashi, Japan, assignors to Sankyo Engineering Co., Ltd., Yamanashi, Japan

Filed Dec. 5, 1988, Ser. No. 279,766
Claims priority, application Japan, Jun. 22, 1988, 63-152133
Int. Cl.[4] B29C *45/33*
U.S. Cl. 425—107 **5 Claims**



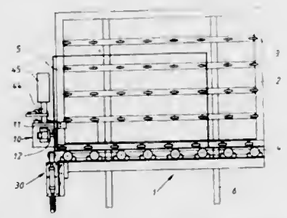
1. A self-lubricating metallic matrix for injection molding, comprising:
a core side metallic matrix element;
a cavity side metallic matrix element, said core and cavity side metallic matrix elements being movable toward and away from each other for closing and opening a mold cavity;
means for injecting a molten material into the closed mold cavity to form a molded article in the mold cavity, the molded article being removable when the matrix elements are moved to open the cavity;
at least one of said core and cavity side metallic matrix elements having a plurality of lubrication requiring surfaces which slide with respect to each other in a slide direction, during opening and closing of the cavity, each of said surfaces having a plurality of receiving holes distributed in a positional relationship so that said holes at least partially overlap each other during movement in the slide direction; and
a solid lubricant received in each of said receiving holes for lubricating said lubrication requiring surfaces, and solid lubricant selected from the group consisting of graphite, molybdenum disulfide, paraffin, and tetrafluoridecontaining resin.

4,902,213

APPARATUS FOR CLOSING OPENINGS IN SPACER STRIPS

Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria

Filed Sep. 15, 1988, Ser. No. 244,855
Claims priority, application Austria, Sep. 16, 1987, 2341/87
Int. Cl.[4] B29C *47/02*
U.S. Cl. 425—113 **8 Claims**



1. Apparatus (1) for closing openings in spacer strips arranged between the glass sheets of insulating glass elements (5), comprising a frame, a nozzle (11) with an orifice for the delivery of sealing compound, this nozzle being movably held on said frame of the apparatus (1), the nozzle (11) having an extension (21) for introduction into the opening to be sealed; and drive means (18) by which the nozzle (11) and said extension can be introduced, in the direction of its nozzle orifice into the opening to be sealed, and can again be pulled out of this opening during the dispensing of sealing compound through the nozzle into the opening.

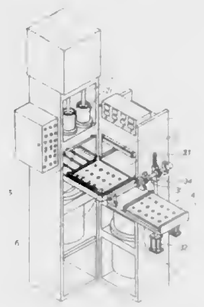
4,902,214

AUTOMATIC MULTICOLOR RUBBER MOLDING MACHINE

Chang Y. Min, 7th Fl. No. 5 Alley 40, Lane 190 Te Hsin E. Rd., and Yi-Shen Chang, 3rd Fl. No. 3 Alley 1, Lane 1544, Min Chuan E. Rd., both of Taipei, Taiwan

Filed Feb. 23, 1989, Ser. No. 314,660
Int. Cl.[4] B29C *33/34*
U.S. Cl. 425—195 **2 Claims**

1. An automatic multicolor rubber molding machine comprising:
a feed unit consisting of a plurality of tanks for rubber materials of different colors;
a heating and pressing unit having upper and lower electric heaters;
a mold opener;
a mold unit consisting of at least one distributing board;
a female mold and a male mold, said distributing boards being mounted on the bottom of the rubber material tanks and having a plurality of gates, paths and ports, said female mold being capable of traveling into the feed unit and heating and pressing unit, said male mold being attached to the mold opener when not in use and positioned so that the female mold can enter the feed unit for the rubber materials of different colors to flow from the tanks



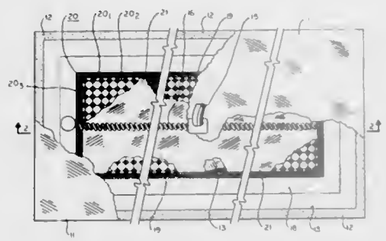
through the gates, paths and ports of the distributing board into the cavities of the female mold, retreat for the mold opener to put on the male mold, enter again the heating and pressing unit for heating and vulcanizing, and retreat again for removing the final products from the molds after being opened by the mold opener, so that the multicolor rubber products are made in an integrated operation.

4,902,215

PLASTIC TRANSFER MOLDING TECHNIQUES FOR THE PRODUCTION OF FIBER REINFORCED PLASTIC STRUCTURES

William H. Seemann, III, 26 Montacilla, Ocean Springs, Miss. 39564

Continuation of Ser. No. 203,806, Jun. 8, 1988, abandoned. This application Mar. 30, 1989, Ser. No. 333,747
Int. Cl.[4] B29C *43/02, 43/20, 43/18*
U.S. Cl. 425—406 **14 Claims**



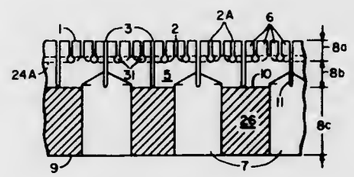
1. In apparatus useful for the formation of fiber reinforced plastic structures wherein is included
a fluid impervious outer sheet,
a resin inlet in said fluid impervious outer sheet,
a mold surface upon which can be supported a lay up of one or more layers of a fiberous material, and over which can be placed said fluid impervious outer sheet and its edges marginally sealed upon said mold surface to form a chamber, and
a vacuum outlet for drawing a vacuum upon said chamber,
the improved combination which further includes
a resin distribution medium for location between said fabric lay up and said fluid impervious outer sheet constituted of spaced-apart lines running crisscross one with another, and an open array of separated raised segments on the surface of said the distribution medium which act as vertical pillars to prop apart the upper surface of said fabric layup and the lower face of said impervious outer sheet, to simultaneously maintain a network of connecting upwardly faced vertical openings and connecting lateral passageways through which resin introduced via the resin inlet into the resin distribution medium can flow freely from the point of resin introduction to the marginal edges of the resin distribution medium and thence downwardly over the entire area thereunder through the fabric lay up when vacuum is applied upon said chamber and said impervious outer sheet is collapsed upon the mold surface the resin inlet being contiguous with a pervious conduit disposed to function as a resin distribution means extending across said resin distribution medium.

4,902,216

EXTRUSION DIE FOR PROTRUSION AND/OR HIGH CELL DENSITY CERAMIC HONEYCOMB STRUCTURES

George M. Cunningham, Horseheads; Rodney I. Frost, and Irwin M. Lachman, both of Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,148
Int. Cl.[4] B29C *47/30*
U.S. Cl. 425—463 **5 Claims**



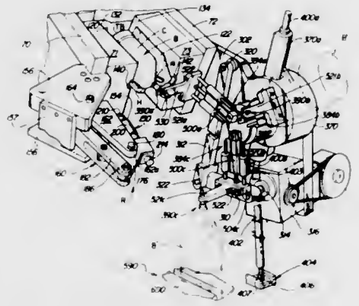
1. An extrusion die for forming honeycomb structures with intersecting cell walls from extrudable material, which comprises
a die body having an inlet face and an outlet face,
a plurality of feed holes extending within the body from the inlet face toward the outlet face,
the feed holes directly communicating only with each of a plurality of transversely crisscrossed primary discharge slots defined by a plurality of primary core members of the body and extending within the body from the outlet face toward the inlet face, with inner end portions of the feed holes communicating longitudinally and transversely in overlapping manner with inner end portions of the primary discharge slots, and
characterized by the improvement comprising secondary discharge slots extending within the primary core members from the outlet face toward the inlet face and into direct transverse communication with the primary discharge slots, the secondary discharge slots dividing the primary core members into secondary core members defining the secondary discharge slots, said secondary discharge slots not directly communicating with said feed holes and the inner ends of at least some of the secondary discharge slots being provided with enlarged extensions constituting feed reservoirs extending along and communicating with said inner ends.

4,902,217

ROTARY BLOW MOLDING MACHINE WITH ROTARY TAKE-OUT MECHANISM HAVING EXPANDIBLE TAKE-OUT PIN

M. Warren Martin, Saline, and Lawrence H. Weber, Ypsilanti, both of Mich., assignors to R & B Machine Tool Company, Saline, Mich.

Filed Oct. 3, 1988, Ser. No. 252,805
Int. Cl.[4] B29C *49/70*
U.S. Cl. 425—537 **46 Claims**



1. A rotary blow molding machine comprising:
(a) a base,
(b) a carousel rotatably supported on the base about an axis of revolution,
(c) means for rotating the carousel,
(d) a plurality of mold stations mounted on the carousel in circumferentially spaced apart relation thereon, said mold stations each comprising a pair of mold sections closeable and openable by relative movement toward and away from one another for defining, when closed, a blowing cavity in which a parison is blown to form a blown article and a mold mouth communicating with the blowing cavity and through which the blown article is accessible, and
(e) means for opening and closing the mold sections of each mold station, and
(f) a take-out mechanism for removing the blown article from a respective pair of mold sections as they are rotated therepast, said take-out mechanism comprising a take-out member for gripping the blown article when said respective pair of mold sections is closed, means for rotating the take-out member about the axis of revolution of the carousel in synchronism therewith to cause the take-out member gripping the blown article between the closed mold sections to track rotation of said mold sections as they are opened, and means for rotating the take-out member gripping the blown article between the opened mold sections about another axis of revolution to remove the blown article from between the opened mold sections.

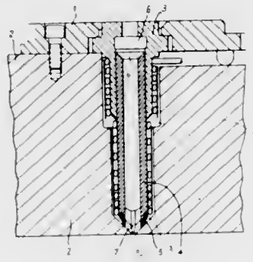
4,902,218

NOZZLE FOR PLASTIC INJECTION MOULD

Roland Leonard, Maisons-Laffitte, and Louis Ramond, Cergy, both of France, assignors to Société à Responsabilité Limitée dite: Delta Project, Saint-Ouen-L'Aumone, France

Filed Dec. 22, 1988, Ser. No. 288,451
Claims priority, application France, Dec. 24, 1987, 87 18173
Int. Cl.[4] B29C *45/20*
U.S. Cl. 425—549 **7 Claims**

1. Mold nozzle for injecting plastic material, the mold nozzle being positioned in a mold, said mold having an interior and a thickness, the mold nozzle including a cylindrical body forming sleeve associated with heating means and integrated in a receiving housing provided in the thickness of the mold, said mold nozzle having an upstream orifice and a downstream orifice, the mold nozzle opening out via said downstream orifice to the interior of the mold and said mold nozzle being adapted to receive via said upstream orifice material injected from a molding machine nozzle, and the mold nozzle having a first fixed cylindrical sleeve (3) immobilized in the mold, said first fixed cylindrical sleeve comprising said upstream orifice for admission of the material, the upstream orifice being adapted to receive in abutment an injection end of the molding machine nozzle, the mold nozzle further comprising a second slidable sleeve (4) colinear with respect to the first fixed cylindrical sleeve, said second slidable sleeve mounted to slide



telescopically inside of the first fixed cylindrical sleeve, a first end (5) of the second sleeve, opposite a second end engaged in the first sleeve, coming into abutment against a wall (9) of a receiving housing (8) provided in the thickness of the mold (2), said receiving housing constituting an opening for emergence of the material molded in the mold, the injected material exerting a pressure on an upstream section (6') of the second slidable sleeve (4) thus tending to apply the first end (5) of this sliding sleeve against the wall (9) of the housing, ensuring tightness therebetween.

4,902,219

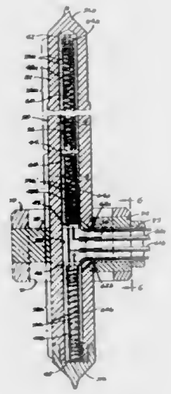
PLASTIC INJECTION MOLDING SYSTEM WITH MULTIPLE TIP TORPEDO HEATER

David Leverenz, Elk Grove Village, Ill., assignor to Fast Heat Element Manufacturing Company, Inc., Elmhurst, Ill.

Division of Ser. No. 913,020, Sep. 29, 1986, Pat. No. 4,755,126, which is a continuation-in-part of Ser. No. 817,008, Jan. 8, 1986, abandoned. This application Feb. 25, 1988, Ser. No. 160,162
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[4] B29C *45/22*
U.S. Cl. 425—549 **12 Claims**

1. A plastic injection molding system comprising means defining a generally cylindrical bore with tapered opposite ends communicating with respective small diameter gates through which fluid plastic material is directed,
means defining a mold cavity in communication with at least one of said gates,
a composite torpedo heater comprising an elongated, metal casing having a non-electrically heatable, exposed outer surface with a tapered, pointed tip at opposite outermost ends thereof,
means supporting said torpedo heater concentrically in said bore with said tips each in closely adjacent relation to one said gates and with said outer exposed casing surface and said bore defining an unobstructed annular fluid plastic flow passageway about each said tip and a portion of said casing adjacent said tip and substantially along the entire length of said casing through which fluid plastic material is directed at an elevated temperature, said annular flow passageway having a radial width defined by the distance between the outer perimeter of said casing and the inner perimeter of the cylindrical bore that is less than the diameter of said casing;

said casing being formed with an internal bore at the location of each said tip, said casing having an outer diameter of about twice the diameter of said casing bore so as to define a thick casing wall about the bore,
electrical heating means disposed in the bore of each tip, said heating electrical means comprising a core with a resistance wire disposed thereon and heat transmitting material surrounding the wire and core, said heat transmitting material being compacted about the resistance wire and core for filling all air voids therebetween and effecting efficient heat transfer;



means exiting said casing intermediate the ends thereof for electrically coupling said heating means to a power source for enabling heating of said heating means and heat conduction outwardly through said thick casing wall for heating fluid plastic material directed through said flow passageway and over said tips to a desired temperature independent of temperature conditions external to said casing, and
means for controlling the temperature of said heating means and thus the temperature of said tips and fluid plastic material directed through said passageway and over said tips.

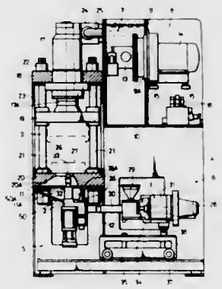
4,902,220

VERTICAL INJECTION MOLDING MACHINE

Tatsuzi Nakagawa, Sagamihara, Japan, assignor to Aida Engineering, Ltd., Kanagawa, Japan

PCT No. PCT/JP86/00570, § 371 Date Jun. 29, 1988, § 102(e) Date Jun. 29, 1988, PCT Pub. No. WO88/03470, PCT Pub. Date May 19, 1988
PCT Filed Nov. 10, 1986, Ser. No. 219,157
Int. Cl.[4] B29C *45/68*
U.S. Cl. 425—574 **16 Claims**

1. A vertical injection molding machine having a pair of dies and a die closing device for opening and closing said dies in a vertical direction, vertical injection molding machine comprising:
(a) frame means;
(b) an injection unit having an injection nozzle which faces said die closing device disposed in said frame means;
(c) means for shifting said injection unit to a predetermined position; and
(d) a link mechanism having a cylinder, said cylinder being connected to said frame means and said injection nozzle, said cylinder supporting said injection nozzle and moving said injection nozzle from said die closing device in cooperation with said shifting means, and said link mechanism



further including link bars which guide said nozzle to move outside of said frame means.

4,902,221

BURNER ASSEMBLY FOR COAL FIRED FURNACES

Raymond L. Collins, Jr., Hudson, and Stephen A. Bryk, Mogadore, both of Ohio, assignors to Control Systems Company, Stow, Ohio

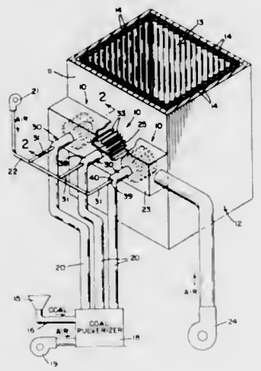
Filed May 12, 1987, Ser. No. 48,794
Int. Cl.[4] F23M *9/00*; F23D *1/00*
U.S. Cl. 431—183 **8 Claims**

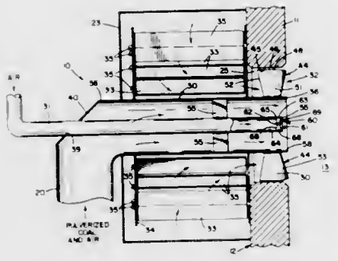
1. A burner assembly for the combustion of pulverized coal in furnaces and the like comprising:
feeding means for delivering a pulverized coal funnel through a port in the wall of said furnace and directly into the interior thereof, said feeding means having a mouth extending through said port;
means for providing a first flow of air to the interior of said furnace separate from said feeding means and said pulverized coal funnel prior to passage into said interior;
means for supplying a separate, second flow of air through said feeding means and into said furnace separate from said first flow of air and said pulverized coal funnel prior to entrance into said furnace interior; and
swirler means having a plurality of overlapping blades extending radially outwardly from said feeding means foreclosing direct axial passage of the majority of said first separate flow of air therethrough, and terminating a short distance from said port to provide a narrow axial space for the passage of a minor portion of said first separate flow of air.

7. A method for supplying pulverized coal and air to furnaces and the like through a burner assembly resulting in increased combustion efficiency comprising the steps of:
delivering a pulverized coal funnel through a port in the wall of said furnace and directly into the interior thereof with fuel feeding means;
providing a first flow of air into the interior of said furnace separate from said pulverized coal funnel and said fuel feeding means;
supplying a second flow of air through said feeding means and into said furnace interior separate from said first flow of air and said pulverized coal funnel prior to entrance into said furnace interior;
interrupting said first flow of air to provide a major portion and a minor portion;
directing said major portion through a plurality of curved slotted passageways formed by a plurality of overlapping blades which foreclose direct axial passage between adjacent blades along their entire length;
allowing said major portion of air to expand radially as it passes through said curved slotted passageways;

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directing said minor portion around the circumferential edge of said blades to combine with said radially expanding air as said major and minor portions move forward into said furnace interior; and





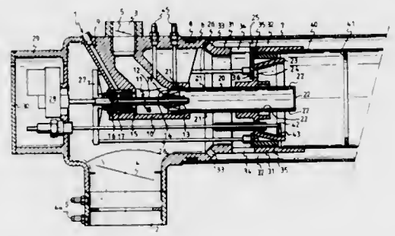
encompassing said pulverized coal funnel with said first flow of air as said coal funnel enters said furnace while simultaneously expanding said coal funnel with said second flow of air whereby both said flows break up said coal funnel within said furnace.

4,902,222
GAS BURNER

Arie van Belle, Am Gouda, Netherlands, assignor to Flameco-Eclipse B.V., Gouda, Netherlands

Filed Sep. 13, 1988, Ser. No. 243,899
Claims priority, application Netherlands, Sep. 15, 1987, 8702191
Int. Cl.[4] F23C *5/06*
U.S. Cl. 431—186 **6 Claims**

1. A gas burner with a flue conduit provided with means for adjustably supplying a combustible gas, and an excess of combustion air comprising a by-pass conduit for a portion of the combustion air which is not used for the formation of a combustible gas/air/mixture, which by-pass conduit is connected with the flue conduit at a point spaced from the burner, the gas burner being further provided with a built-in gas control valve and with a built-in air control valve, which are coupled so as to be moveable in synchronism, the air control vale provided with means for adjustably dividing the combustion air into a first amount, which is used for formation of the gas/air/mixture, and a second amount for flow through the by-pass con-

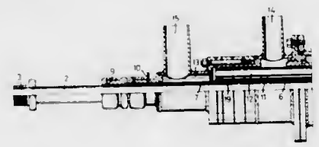


duit, such that when the first amount increases the second amount decreases accordingly and vice versa.

4,902,223
OXY-FUEL BURNER FOR BURNING PULVERIZED FUEL

Philip J. Young, Belton Cottage, Wrexham Road, Whitchurch, Salop, England

Filed Jun. 20, 1988, Ser. No. 209,456
Claims priority, application United Kingdom, Jun. 26, 1987, 8715030
Int. Cl.[4] F23Q *9/00*
U.S. Cl. 431—284 **4 Claims**

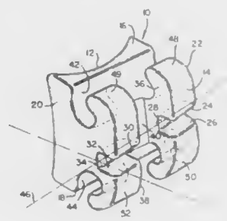


1. An oxy-fuel burner comprising in combination:
a generally cylindrical housing having a first and second end and an elongated longitudinal axis;
disposed within said housing a generally cylindrical elongated central pulverized fuel delivery tube assembly comprising in combination a tube within tube device defining a pressurizable chamber between said tubes, said central pulverized fuel delivery tube assembly having a longitudinal axis coincident with the longitudinal axis of said housing;
a generally elongated tube spaced apart from and disposed between said housing and said pulverized fuel tube assembly thereby defining a first or large annular passage between said outer wall of said tube and said elongated housing and a second smaller annular passage between said inner wall of said elongated tube and the pulverized fuel delivery tube assembly;
a plurality of tubes disposed in said large annular passage parallel to said axis of said housing and distributed evenly around said annular passage;
means to deliver oxygen to said large annular passage; and
means to deliver natural gas to said tubes and said smaller annular passage; said burner so constructed and arranged so that said fuel, said oxygen and said natural gas are delivered to said burner housing at or adjacent said first end thereof and said pulverized fuel, oxygen and natural gas exit said second end of said housing adapted to be the flame end of said burner.

4,902,224
CRYSTALLINE ORTHODONTIC BRACKET

Paul R. Collins, Washougal, Wash., and Larry R. Rothrock, Poway, Calif., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Dec. 19, 1988, Ser. No. 286,168
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—8 **9 Claims**

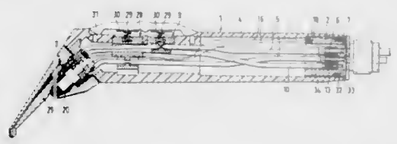


1. An orthodontic bracket comprising a body comprising crystalline material having crystalline planes of the group consisting of zirconia, yttria, magnesia and strontium titanate having a base face intended to face a tooth and an opposing front face defining a longitudinal arch wire groove.

4,902,225
DENTAL SPRAY HANDPIECE

Gerd Löhn, Biberach/Rissegg, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Biberach/Riss, Fed. Rep. of Germany

Filed Sep. 27, 1988, Ser. No. 249,902
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 3734861
Int. Cl.[4] A61C *17/00*
U.S. Cl. 433—80 **16 Claims**



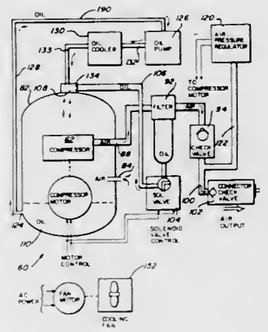
1. Dental spray handpiece comprising a gripping sleeve having a detachable and interchangeable media inlet connecting piece insertable at one end thereof and a media discharge arrangement at the other end thereof; air and water media conduits in said gripping sleeve leading from the media inlet connecting piece to the media discharge arrangement, said media connecting piece including connectors for media consisting of air and water; an air-shutoff valve for air being arranged in the media conduit for air, a branch line for air in said connecting piece branching off from the media conduit for air downstream of said air-shutoff valve, and said connecting piece possessing the connectors for air and water being provided with a dummy plug for sealing off said branch air line.

4,902,226
DENTAL AIR SUPPLY SYSTEM

Raymond D. Elliott, 1569 S. Pearl St., Denver, Colo. 80210, and Herbert G. Cooper, 922 S. Vrain St., Denver, Colo. 80219

Filed Apr. 29, 1988, Ser. No. 188,498
Int. Cl.[4] A61C *1/02*
U.S. Cl. 433—104 **17 Claims**

1. A quiet, high capacity, pressurized clean air system for a portable dental delivery system, said portable dental delivery system having a plurality of modules which can be joined together in a stacked arrangement forming a work console, said console including air powered tools and accessories for use by a dentist, said pressurized system being built into one of said modules and connected so as to power said tools and accessories, said air system comprising:
(a) a modified hermetically enclosed refrigeration-type compressor unit having a power driven gas compressor, said compressor unit being totally enclosed within a single thin shell housing means, said housing means containing a predetermined quantity of a suitable liquid coolant for absorbing heat energy and maintaining the temperature of said compressor unit during operation;
(b) an external cooling loop means attached to said housing means, said loop means including conduit means having an inlet end attached to a lower portion of said housing means and a return end attached to the upper portion of said housing means, said loop means further including a pump means attached to said conduit means near said inlet end for circulating the liquid coolant from the lower to the upper portion of the housing means, the return end of the conduit means being attached at a precise predetermined location on said housing means so that the returning liquid



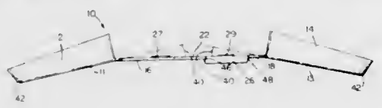
coolant impinges directly upon the top portion of the gas compressor whereby the coolant will absorb heat energy from the compressor unit and maintain the temperature within the housing means at a suitable operating level;
(c) said housing means having an air inlet and outlet means connected to said compressor unit, the air outlet means being connected to an oil coalescer means and a check valve means to prevent pressurized air from moving toward the compressor unit, said check valve means being arranged downstream of said coalescer means with the outlet means being terminated by a coupling means for quick coupling the air outlet means to a pressure storage tank; and
(d) said coalescer means including means for separating liquid coolant from the pressurized outlet air and collecting said coolant in a reservoir area, valve means connected to the coalescer means in communication with said reservoir area, said valve means being closed during operation of the air supply system and opened upon shut-down of the compressor unit to unload air pressure from the outlet means and in turn force the collected coolant through a second conduit means connected between said valve means and the return end of said conduit means attached to the upper portion of said housing means.

4,902,227

DENTAL TREATMENT TRAY

Lawrence C. Smith, Sumner, Wash., assignor to Pascal Company, Inc., Bellevue, Wash.

Filed May 4, 1988, Ser. No. 190,104
Int. Cl.[4] A61C *5/00*
U.S. Cl. 433—215 12 Claims



1. A dental treatment tray for applying medication to a patient's teeth, wherein said tray comprises:

a pair of troughs; wherein each of said troughs has an exterior trough bottom; wherein one of said troughs is sized to receive said patient's upper teeth; wherein the other of said troughs is sized to receive said patient's lower teeth; and wherein said troughs are also sized to be adapted to receive said medication;

a resilient trough handle extending outwardly from each trough; and

a pair of resilient elongated locking flanges;

wherein each of said locking flanges extends along a respective lateral edge portion of one of said trough handles; wherein each of said locking flanges defines an elongated locking recess that is sized and shaped to be adapted to receive a corresponding lateral edge of the other of said handles; wherein each of said locking flanges is sized and shaped to be adapted to resiliently engage its said corresponding lateral edge of the other of said handles in its said elongated locking recess, to releasably hold said troughs in an assembled relationship with said trough bottoms facing each other; and wherein when each of said locking flanges has engaged its said corresponding lateral edge of the other of said handles, a top portion of each of said locking flanges extends over a corresponding top portion of its said corresponding lateral edge of the other of said handles.

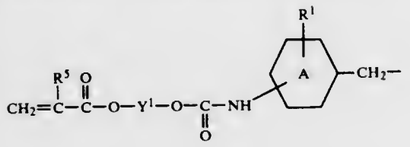
4,902,228

(METH)-ACRYLIC ACID DERIVATIVES OF TRIISOCYANATES IN DENTISTRY

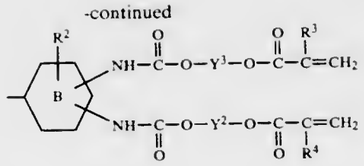
Jürgen Reiners, Leverkusen; Wolfgang Podszun, Cologne; Carlhans Süling, Odenthal, and Jens Winkel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 106,091, Oct. 7, 1987, Pat. No. 4,868,325.
This application Feb. 16, 1989, Ser. No. 311,546
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636189
Int. Cl.[4] A61K *5/01*
U.S. Cl. 433—228.1 8 Claims

1. A polymer containing units on the basis of (meth)-acrylic acid derivative of a triisocyanate of the formula



-continued



in which

R^1 and R^2 are identical or different and respresent hydrogen or a lower alkyl radical,

R^3, R^4 and R^5 are identical or different and denote hydrogen or methyl,

Y^1 to Y^3 are identical or different and denote divalent straight-chain or branched hydrocarbon radicals, having 2 to 15 carbon atoms, which may contain 1 to 3 oxygen bridges and can be substituted by 1 to 4 additional (meth)-acryloyl-oxy radicals, and

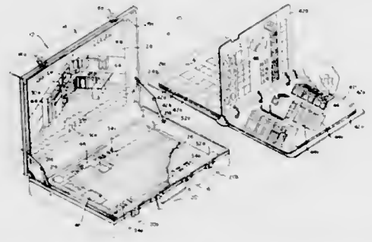
the rings A and B are identical or different and can be aromatic or saturated.

4,902,229

MODULAR LAYOUT ASSEMBLY

Chris S. Pedersen, and Sue M. Merkel, both of Bismarck, N. Dak., assignors to EZ Designer, Inc., Bismarck, N. Dak.

Division of Ser. No. 572,757, Jan. 23, 1984, Pat. No. 4,806,102.
This application Jan. 16, 1986, Ser. No. 819,493
Int. Cl.[4] G09B *25/00*
U.S. Cl. 434—80 10 Claims



1. A modular layout assembly for facilitating an arrangement of furniture pieces within a three-dimensional space, said assembly comprising:

(a) layout means for providing a mounting surface bearing a pattern comprised of a first floor line, a second floor line and a third corner line disposed in a perspective arrangement with respect to each other, said first and second floor lines defining a floor of the three-dimensional space, said first floor line and said third corner line defining a first side wall of the three-dimensional space, and said second floor line and said third corner line defining a second side wall of the three-dimensional space; and

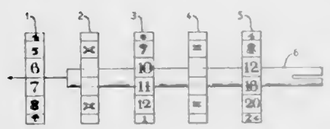
(b) first and second modules configured and dimensionally scaled to represent the furniture pieces and adapted to be disposed on said layout means in said arrangement of furniture pieces, said first module comprising a first portion bounded by lines disposable in parallel to said first and second floor lines respectively to represent a first furniture surface lying parallel to said floor, said second module comprising a second portion bounded by lines disposable in parallel to said second floor line and said third corner line respectively to represent a second furniture surface lying parallel to said second side wall, said first and second modules adapted to lie directly on said mounting surface so that said first and second portions fit together to represent a furniture piece having said first and second furniture surfaces.

4,902,230

ROTATIONAL EDUCATIONAL APPARATUS

Stephen P. Jones, 12 Maddox Street, Alexandria, New South Wales 2015, Australia

Filed Oct. 18, 1988, Ser. No. 259,516
Claims priority, application Australia, Oct. 19, 1987, PI4988
Int. Cl.[4] G09B *1/20*
U.S. Cl. 434—206 3 Claims



1. A relational, rotational structure comprising a plurality of disc-shaped elements mounted in juxtaposed relation and rotatable on a common axis; individual ones of said elements having indicia located on the periphery of each said element such that the relationship between indicia on different ones of said elements can be viewed with respect to indicia on others of said elements; and wherein the number of said elements is five, the first of said elements including indicia comprising numerals, the second of said elements including indicia selected from the set of symbols "X, +, −, ÷", the third of said elements including indicia comprising numerals, the fourth of said elements including indicia being an "=" sign, the fifth of said elements including indicia comprising numerals selected from the answers to individual ones of the equations resulting from aligning indicia on all of said elements; said fifth of said elements having check indicia located on an external end face; said check indicia being identical to said indicia on said third element and being located on said end face so that respective ones of said check indicia match with respective ones of said indicia on said third element; the choice of said fifth element being dependent on the choice of said first element and said second element whereby appropriate check indicia and appropriate said indicia are provided on said fifth element.

4,902,231

LEARN TO TYPE VIA MNEMONIC DEVICES, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Clare W. Freer, 9554 Brady, Redford Township, Wayne County, Mich. 48239

Filed Nov. 7, 1988, Ser. No. 267,805
Int. Cl.[4] G09B *13/00*
U.S. Cl. 434—227 18 Claims



1. An educational device for teaching touch typewriting, comprising:

a chart adapted to be positioned within the view of the student typist;

said chart showing a representation of a standard keyboard;

said chart including mnemonic means for remembering the location of the individual keys on said keyboard; and

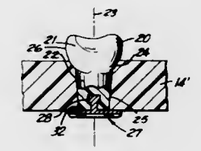
said mnemonic means includes a color coding of said keys and pictures which are indicative of phrases that aid in remembering the location of certain keys.

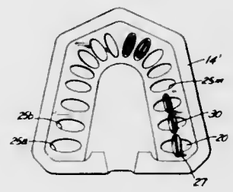
4,902,232

DENTAL TRAINING MODEL WITH ARTIFICIAL TEETH SET

Irving Neustadter, 8971 S. Hollybrook Blvd., Pembroke Pines, Fla. 33025

Filed Sep. 19, 1988, Ser. No. 246,340
Int. Cl.[4] G09B *23/34*
U.S. Cl. 434—263 5 Claims





1. A dental model comprising an artificial lower jaw and an artificial upper jaw, each having upper exposed faces with gum-like portions thereon and bottom faces, and a plurality of artificial teeth removably inserted into each of said artificial jaws;

each of said jaws having a plurality of socket holes to receive said artificial teeth with one socket hole for each tooth; each of the socket holes having an imaginary central axis extending through a jaw and comprising a lower portion and an upper portion, said upper portion having an orifice at said jaw upper face and said lower portion having an orifice at said jaw bottom face; the cross-sections of said socket hole lower portion taken perpendicular to said axis being oval and said lower portion being tapered along said axis;

each of said teeth having an upper crown portion which resembles a natural tooth and which fits into said socket hole and protrudes above said jaw upper face, and a root portion which fits into said lower socket hole portion, each root portion having a bottom face, each of said root portions being oval in shape perpendicular to said axis and being tapered along said axis;

a quarter-turn fastener pivotally secured in said root portion and turnable relative to said tooth about said axis a quarter turn to lock said tooth in said socket hole, said fastener including a locking head portion which fits through said socket hole lower portion orifice when in unlocked orientation, said locking head portion having an exposed lower face having turning means thereon and having an upper face which contacts, cams and locks against the bottom face of the jaw adjacent said socket hole when said fastener is in a rotated and locked orientation.

4,902,233

CONNECTOR ASSEMBLY FOR ELECTRONIC MEMORY CARDS, AND READ/WRITE APPARATUS MAKING USE THEREOF

Jean C. Maillot, Ecouen, France, assignor to Schlumberger Industries, Montrouge, France

Filed Nov. 20, 1987, Ser. No. 123,555
Claims priority, application France, Nov. 21, 1986, 8616202
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—62 **7 Claims**



1. A connector assembly for a read/write apparatus in which an electronic memory card can be inserted, said memory card including a plurality of electrical contact tabs on one of its main faces, the assembly comprising:

a connector, comprising a support having first and second faces and a plurality of electrical conductors in the form of resiliently deformable blades, said conductors being fixed to said support and each blade having a curved end with a portion for making a contact with a tab of said card and projecting beyond said first face and a second end which projects beyond said second face;

an electronic circuit comprising an insulating support having a first face for making a contact with said second face of the connector and having a second face provided with electrical connections and with electronic components, and having means for receiving said second ends of the blade-shaped electrical conductors when said connector is fixed to said electronic circuit;

means for positioning and for fixing said connector to said insulating support; and

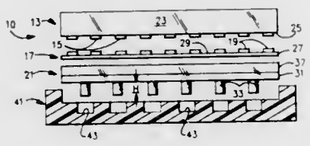
means for establishing electrical connections between said electical connections of the electronic circuit and said second ends of said conducting blades.

4,902,234

ELECTRICAL CONNECTOR ASSEMBLY INCLUDING PRESSURE EXERTION MEMBER

William L. Brodsky, Binghamton; Wesley J. Buyck, Owego, and Alan D. Knight, Newark Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1988, Ser. No. 266,538
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—67 **20 Claims**



1. An electrical connector assembly comprising:

a first circuit member including a plurality of electrical conductors;

a second circuit member including a plurality of electrical conductors;

a pressure exertion member for exerting a predetermined pressure against said second circuit member to cause each of said electrical conductors of said second circuit member to electrical contact a respective one of said electrical conductors of said first circuit member, said pressure exertion member including a substantially rigid base plate, a plurality of compressible elements located on a first side of said base plate for providing said predetermined pressure when compressed, and a resilient member located on a second side of said base plate for compensating for variations in surface elevations in said first and/or second circuit members during exertion of said predetermined pressure against said second circuit member; and

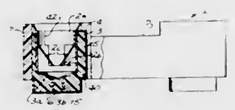
means for retaining said pressure exertion member against said second circuit member to cause said compression of said compressible elements and said exertion of said predetermined pressure.

4,902,235

SOCKET, CONNECTION SYSTEM AND METHOD OF MAKING

Takashi Tonooka, Shizuoka, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 20, 1988, Ser. No. 221,709
Claims priority, application Japan, Jul. 31, 1987, 62-193091
Int. Cl.[4] H01R *9/09;* **H05K** *1/00*
U.S. Cl. 439—72 **13 Claims**



1. A connecting device for an electrical component comprising a support, and a contact of resilient electrically conductive material with which an electrical element of the component is connectable in an easily detachable manner, the support comprising a member of electrically insulating material having an electrically conductive metal layer thereon secured to the electrically insulating support material to cover two selected spaced surface portions of the support and to extend over the support between said spaced surface portions, the contact being disposed in resilient electrical engagement with the metal layer on one of said surface portions to resiliently electrically engage a component element to electrically connect the element to the metal layer, the metal layer extending to the other selected surface of the support to be electrically connected at said other support surface in an electrical circuit at the prescribed location.

4,902,236

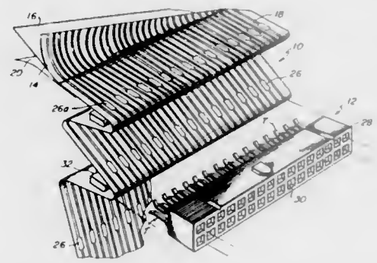
FLEX CIRCUIT AND CABLE ASSEMBLY

Alexander W. Hasircoglu, Lancaster, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1988, Ser. No. 271,153
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—77 **14 Claims**

1. A flex circuit cable assembly comprising:

a flex circuit including a flexible insulating substrate having a conductive ground plane formed on one side thereof and first and second sets of longitudinally extending conductive traces on the other side thereof, the traces of said first and second sets alternating with and laterally spaced from one another, an array of connection pads formed on the conductive trace for connection to an electrical connector, said array defined by a first set of laterally enlarged connection pads associated with each conductive trace of the first set of conductive traces and formed along a first lateral axis and defined by a second set of laterally enlarged connection pads associated with each conductive trace of the second set of conductive traces and formed along a second lateral axis longitudinally spaced from the first lateral axis said flex circuit being folded about a fold axis intermediate each of said first and second lateral axes; and



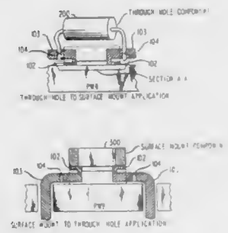
an electrical connector having a housing and first and second sets of electrical contacts therein, the contacts having respective tails extending from the housing, the tails of the first set electrically connected to the connection pads of the first set of traces and the tails of the second set electrically connected to the connection pads of the second set of traces.

4,902,237

ADAPTOR FOR SURFACE MOUNT AND THROUGH-HOLE COMPONENTS

Curtis L. Hoetson, Denver, Colo., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Mar. 30, 1989, Ser. No. 331,214
Int. Cl.[4] H01R *9/09;* **H05K** *3/34*
U.S. Cl. 439--83 **8 Claims**



1. An electrical component adaptor comprising

first means adapted to receive a surface mount component when said component adaptor is oriented in a first position relative to a printed circuit board, said first means also adapted to electrically interconnect said adaptor to said printed circuit board when said adaptor is oriented in a second position relative to said printed circuit board,

second means adapted to receive a through-hole component when said adaptor is oriented in said second position relative to said printed circuit board, said second means also being adapted to electrically interconnect said adaptor to said printed circuit board when said adaptor is oriented in said first position relative to said printed circuit board, and

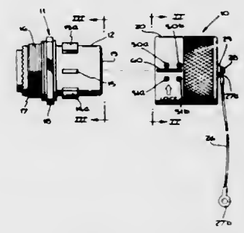
means for electrically interconnecting said first and second means.

4,902,238

ELECTRICAL CONNECTOR RECEPTACLE COVER

Cesidio R. Iacobucci, La Crescenta, Calif., assignor to Glenair, Inc., Glendale, Calif.

Filed Jan. 12, 1989, Ser. No. 296,526
Int. Cl.[4] H01R *13/44, 13/62*
U.S. Cl. 439—135 **22 Claims**



1. A protective cover for a multiple pin type electrical connector receptacle having an insert shell and one or more locking keys on said shell, said cover comprising:

a cap like body having an insert shell receiving bore and one or more locking lands within said bore for engaging with said one or more locking keys to prevent relative axial movement of said shell and body when said body is fitted over and rotated into a cover to shell locking position, wherein said antirotational locking means comprises:

a detent means provided upon one of said body and shell for releasably holding said body and shell against relative rotation, said detent means being overrideable by intentional manual release rotation of said cap like body relative said shell, wherein said detent means comprises:

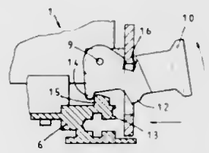
a spring mounted to said body within said body bore having a detent portion of said spring extending into said bore relative said body to resiliently ride over one of said locking keys when said cap like body is fitted over and rotated relative said shell to said cover to shell locking position.

4,902,239

ROTATABLE MANIPULATOR FOR A PLUG BOARD

Walter A. Schindler, Benglen, Switzerland, assignor to Elma Electronic AG, Wetzikon, Switzerland

Filed Jun. 8, 1988, Ser. No. 204,075
Claims priority, application Switzerland, Sep. 1, 1987, 3345/87
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—153 **6 Claims**



1. In combination

a support;

at least one spring strip mounted in said support;

at least one vertically disposed plug board slidably mounted in said support and having at least one plug connector for slidably engaging with said spring strip;

a front plate secured to said plug board on a side opposite said plug connector to extend vertically above and below said board and having at least one slot-like recess at one end of said plate; and

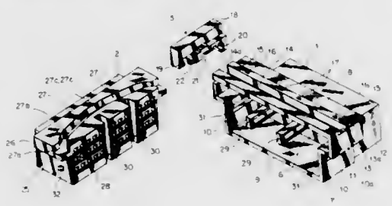
at least one manipulator pivotally mounted on said plug board at a predetermined location within the vertical extend of said board and extending through said recess of said plate, said manipulator having a first lug for engaging a push-out surface of said support in response to pivoting of said manipulator in one direction to cause movement of said plug board away from said spring strip to disengage said plug connector from said spring strip, said manipulator having a second lug for engaging a plug-in surface of said support in response to a counter-pivoting of said manipulator to cause movement of said plug board towards said spring strip to engage said plug connector with said spring strip.

4,902,240

MULTI-TERMINAL CONNECTOR

Katsutoshi Kuzuno; Shigeo Ishizuka, and Kazuaki Sakurai, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jan. 10, 1989, Ser. No. 295,338
Claims priority, application Japan, Jan. 14, 1988, 63-4951
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—157 **21 Claims**



1. A multi-terminal connector comprising,

a male housing having a plurality of female terminals stored therein;

a female housing having a plurality of male terminals stored therein and provided with an enlarged body for accomodating said male housing;

a plurality of guide rails including at least two main guide rails and one supporting rail running in parallel therebetween disposed along the longer side of the enlarged body of said female housing, and also intersecting at right angles against the axis of said male terminals;

a pair of sliders each slidably engageable with said guide rails, having a cam follower downwardly projecting from the lower surface thereof;

a longitudinal slot formed between said at least two of rails for permitting each of said cam followers to protrude therethrough;

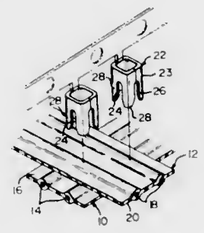
a pair of cam tracks arranged in the upper surface of said male housing and symmetrically extending in a diagonnally rearward direction from lateral ends thereof to engage with said respective cam followers through said slot.

4,902,241

ELECTRICAL INTERCONNECTION SYSTEM

Joseph L. Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 401,197, Jul. 23, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,225
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—395 **24 Claims**



1. An electrical cable assembly comprising:

an electrical interconnection harness having a main electrical bus means including a multiplicity of electrical conductors isolated from one another by insulating jacket means, a branch electrical bus means including less electrical conductors than said main bus means isolated from one another by insulating jacket means, said branch electrical bus means crossing said main electrical bus means, and further having electrical conductor-interconnecting means each interconnecting a preselected electrical conductor of said branch electrical bus means to a respective preselected electrical conductor of said main electrical bus means at a crossing of said conductors, and dielectric means applied to the terminated section of said harness insulating the electrical interconnections thereof;

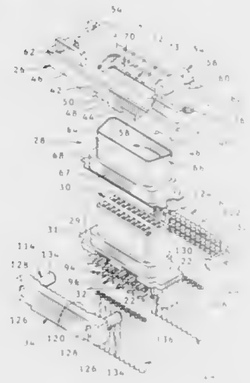
said electrical conductor-interconnecting means each having a body section disposed adjacent a first one of said main and said branch electrical bus means at said crossing and four leg members extending substantially downwardly from the periphery of said body section, said four leg members being positioned at substantially spaced locations about said periphery, said four leg members each associated with a respective one of four corners of a respective said crossing and defining conductor-receiving slots therebetween, whereby four-point stability is provided during application of said electrical conductor-interconnecting means to said main and said branch electrical bus means such that no housing is required to support and guide said conductor-interconnecting means during insulating jacket means penetration, each of said leg members penetrating the insulating jacket means of said first one and a second one of said bus means at a respective said corner of said crossing, first conductor-engaging means being disposed on one of said body section and said leg members for electrically engaging a said preselected conductor of said first one of said bus means, and second conductor-engaging means being disposed on at least one of said leg members for electrically engaging a said preselected conductor of said second one of said bus means.

4,902,242

PANEL MOUNT, CABLE TERMINABLE CONNECTOR WITH DIE CAST HOUSING AND DRAWN SHELL

Wayne S. Davis, Harrisburg, and Robert N. Whiteman, Jr., Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 31, 1989, Ser. No. 359,233
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—404 **8 Claims**



1. An electrical connector for terminating to conductors of a cable and for mounting through an aperture in a panel, said electrical connector comprising:

an electrically conductive die cast housing adapted to be mounted to the panel proximate the aperture therein, said housing having an aperture therein;

a drawn shell having an aperture, said drawn shell adapted to be received in the die cast housing and electrically commoned therewith, said drawn shell adapted to be received in the panel aperture;

an insulating insert adapted to be received and secured in the drawn shell aperture, said insert having terminals disposed in two rows therein, said terminals each having a mating portion and a cable conductor engaging portion, said cable conductor engaging portions adapted to be terminated to respective conductors of the cable; and

a rear face on said insert, said terminals each defining an axis, each said cable conductor engaging portion extending beyond said rear face and formed to be an insulation displacing member having a slot therein, said slot extending beyond said die cast housing,

whereby the shell provides shielding for the terminals with the die cast housing being electrically commoned with the shell and providing an electrical path to ground on the panel.

4,902,243

HIGH DENSITY RIBBON CABLE CONNECTOR AND DUAL TRANSITION CONTACT THEREFOR

Wayne S. Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

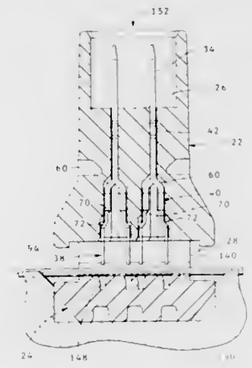
Filed Jan. 30, 1989, Ser. No. 303,798
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—405 **25 Claims**

1. A high density ribbon cable connector for terminating to a ribbon cable having close, uniformly spaced conductors surrounded by insulation, said connector comprising:

an insulative housing having a cable receiving face and a plurality of passages extending into the housing from said cable receiving face;

each of said passages having an electrical terminal secured therein, said terminal comprising a mating section, an intermediate section, an insulation displacement section, a first transition section, and a second transition section, said first transition section between the mating section and the intermediate section, said first transition section displacing the mating section from the intermediate section in a first direction, said second transition section between the intermediate section and the insulation displacement section, said second transition section displacing the insulation displacement section from the intermediate section in a second, opposite direction from the first direction, a portion of said insulation displacement section extending beyond said cable receiving face for termination thereto of the ribbon cable; and

a termination cover securable to said housing, whereby when the termination cover is positioned in a pretermination position with a ribbon cable between the cover and the insulation displacement section of the terminals, pressing on the termination cover will terminate conductors of the ribbon cable to respective insulation displacement sections of said terminals.

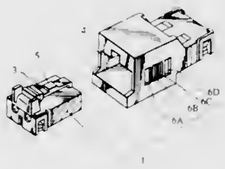


4,902,244

CONNECTOR

Takayoshi Endo; Shigemitsu Inaba, and Shigemi Hashizawa, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed May 19, 1989, Ser. No. 354,360
Claims priority, application Japan, May 20, 1988, 63-123573
Int. Cl.[4] H01R *3/00*
U.S. Cl. 439—489 **10 Claims**



1. A connector, comprising:

a female housing having a side wall, a hollow chamber and an entrance opening to the hollow chamber;

a male housing having an insertion section which is slidably inserted through the entrance opening of the female housing into the hollow chamber thereof when the male and female housings are to be fitted to each other; and

means for detecting a fitting state of the male and female

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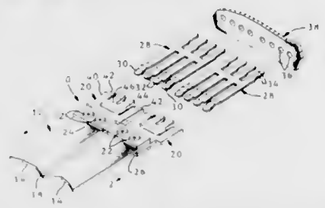
housings, the fitting state detecting means comprising a bar code means arranged on the housings so as to be readable by a bar code reader.

4,902,245

METHODS AND APPARATUS FOR TERMINATING AND INTERCONNECTING FLAT POWER CABLES

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 21, 1989, Ser. No. 341,526
Int. Cl.[4] H01R *17/06*
U.S. Cl. 439—492 **42 Claims**



1. A termination of an electrical terminal to an end of a flat power cable having at least one flat conductor member, comprising:

an end section of a flat power cable having at least one flat conductor member therein, said end section including a plurality of holes punched therethrough of selected diameter at selected locations;

metal terminal means having plate section means and contact section means extending forwardly from said plate section means, said plate section means coextending with said cable end section and adjacent thereto and including a like plurality of apertures therethrough corresponding to said punched cable holes and having like diameters and aligned therewith; and

cylindrical insert members extending through said aligned punched cable holes and terminal apertures, said insert members being of low resistance metal and having end sections protruding outwardly from outwardly facing surfaces of said terminal plate section means and said cable end section,

said insert end sections having been staked to enlarge said protruding insert end sections defining respective mechanical joints joining said terminal means to said cable end section, and to enlarge the diameters of said insert members within said holes and apertures to tightly engage edge surfaces of said at least one cable conductor and said terminal plate section means thereat defining gas-tight electrical connections between said insert members and said at least one cable conductor and said terminal means.

4,902,246

SNAP-N-SEAL COAXIAL CONNECTOR

Edward J. Samchisen, Lowman, N.Y., assignor to LRC Electronics, Horseheads, N.Y.

Continuation-in-part of Ser. No. 257,401, Oct. 13, 1988, Pat. No. 4,834,675. This application Jan. 6, 1989, Ser. No. 294,280
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—578 **6 Claims**

1. A snap-n-seal coaxial connector for mechanically and electrically interconnecting a coaxial cable to an electronic device having a threaded interface connector, the coaxial cable including a center conductor, a dielectric insulator encasing the center conductor, at least one braided shield disposed about the dielectric insulator and a jacket covering the at least one braided shield, comprising:

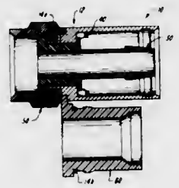
connector body means for coaxially receiving the coaxial cable, said connector body means including

means for forming a moisture-proof seal between elements of said connector body means,

nut member means adapted for rotatably engaging the threaded interface connector of the electronic device, and

means for mechanically and electrically engaging the at least one braided shield of the coaxial cable; and

compression sleeve means for snap engaging into said connector body means to mechanically connect the coaxial



cable to said connector body means, said compression sleeve means in combination with said connector body means forming a 360 degree uniform compressive moisture-proof seal between said compression sleeve means and the jacket of the coaxial cable, said compression sleeve means including

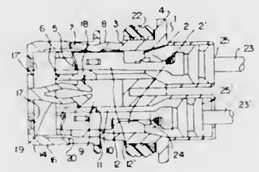
means for forming a 360 degree uniform compressive moisture-proof seal between said compression sleeve means and said connector body means.

4,902,247

ELECTRICAL CONNECTOR

Izumi Suzuki, and Hideki Ogawa, both of Suzuka, Japan, assignors to Sumitomo Wiring Systems, Japan

Filed Jun. 13, 1988, Ser. No. 206,222
Claims priority, application Japan, Jun. 16, 1987, 62-149830
Int. Cl.[4] H01R *13/40*
U.S. Cl. 439—595 **10 Claims**



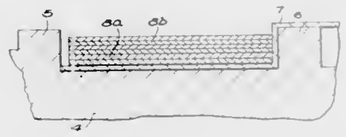
1. An electrical connector comprising a housing having an outer wall, a housing cap adapted to cover a front end of said housing by movement along a longitudinal path located radially outward of said housing, at least one wire assembly having a terminal recess on an inside surface thereof, said assembly having a terminal adapted to enter said housing from a rear end remote from said front end, said housing having at least one receiving passage extending longitudinally therethrough and having an inner wall and an inner surface, a deflectable arm in said outer wall, a blocking portion on said housing and projecting into said passage, said blocking portion forcing said deflectable arm outwardly into said path as said assembly is inserted into said passage until said assembly reaches a predetermined position wherein said assembly is fully seated, whereupon said blocking portion is received in said terminal recess and is no longer in said path, whereby said cap cannot be seated on said front end unless said assembly is in said predetermined position.

4,902,248

ADAPTORS

Michael W. Robertson, Truro, England, assignor to Staeng Ltd., Cornwall, United Kingdom

Filed Dec. 16, 1988, Ser. No. 285,731
Int. Cl.[4] H02G *15/02*
U.S. Cl. 439—610 **19 Claims**



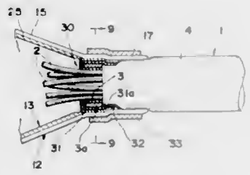
1. A connector backshell adaptor which comprises a body portion, a rotatable coupling nut at one end, and spring means in the form of a spiral coil arranged to wrapped around the body portion to rigidly secure a sheathing to the body portion of the adaptor, said spiral coil including a resilient ribbon arranged to be wrapped about the body in a plurality of overlapping turns.

4,902,249

ASSEMBLY OF ELECTRICAL CONNECTOR AND A SHIELD CABLE

Yoshimasa Morishita, Hyogo, and Yoshitaka Shobara, Osaka, both of Japan, assignors to Nippon Acchakutanshi Seizo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 2, 1989, Ser. No. 360,218
Claims priority, application Japan, Jun. 4, 1988, 63-74624[U]
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—610 **2 Claims**



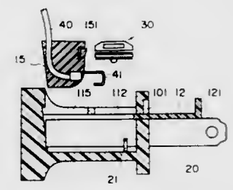
1. An assembly of electrical connector and a shield cable against electromagnetic interference, the assembly comprising a shield cover comprising a pair of halved shells of electric conductor, each shell having a connector receiving section at its front end and a cable receiving section at its rear end, the cable receiving sections of the shells joined maintaining a shield meshwork uncovered from the shield cable, wherein the shield meshwork is fastened by a first ferrule, with its top portion being turned back so as to wrap the first ferrule, a metal foil placed over the turned shield meshwork, an second ferrule fitted around the cable receiving section under compression so as to fasten the cable receiving section, thereby effecting electrical connection between the connector and the shield cable.

4,902,250

ELECTRICAL PLUG AND SOCKET

Jeng-Shyong Wu, No. 133, Tungshing Road, Toufun, Maulli, Taiwan

Continuation of Ser. No. 942,502, Dec. 16, 1986, Pat. No. 4,768,979, which is a continuation-in-part of Ser. No. 894,349, Aug. 7, 1986, Pat. No. 4,770,647, which is a continuation-in-part of Ser. No. 693,015, Jan. 18, 1985, abandoned. This application Mar. 29, 1988, Ser. No. 174,720
The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.
Int. Cl.[4] H01R *13/68*
U.S. Cl. 439—622 **18 Claims**



1. An electrical plug comprising: an insulating housing defining a central channel, said housing having at least a first and second opening; first and second contact prongs, each of said contact prongs extending into said insulating housing and, a portion of each of said contact prongs communicating with said channel; a conductor assembly including a conductor body having a resilient lip portion, a first and second conductor mounted within the conductor body, and a first and second conductor terminal, said conductor assembly positionable within one of the openings in said housing, said resilient lip engaging a portion of said housing so as to retain the conductor assembly within said housing; and, a securing body insertable within said housing through the other of the openings through said housing, said securing body carrying a pair of fuse elements, the securing body being disposed within said housing so as to position one fuse element in electrical connection with the second prong and in electrical connection with the second conductor terminal.

4,902,251

LAMP SOCKET TERMINAL

Karl R. Grzena, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 289,896, Dec. 27, 1988, abandoned. This application Sep. 13, 1989, Ser. No. 406,194
Int. Cl.[4] H01R *13/502*
U.S. Cl. 439—699 **10 Claims**



1. A terminal for use in a lamp socket for a lamp bulb having a wedge base which includes a central vent tube bounded by laterally extending side wings, a pair of contact wires extend-

ing out of the respective ends of the side wings and bent over onto first sides of the respective side wings which are on opposite sides of the wedge base, and a pair of laterally extending troughs in second sides of the respective side wings which are on opposite sides of the wedge base, the terminal comprising:

a receptacle portion

having a base wall and side walls forming a channel for receiving one side wing of the wedge base of the lamp bulb;

a spring contact arm integrally connected to a forward edge of one side wall of the channel in cantilever fashion and projecting rearwardly into the interior of the channel to engage a contact wire extending out of the end of the one side wing of the wedge base, and

a spring detent arm integrally connected to the other side wall of the channel and projecting inwardly to engage a trough in the one side wing of the wedge base for lamp bulb retention.

4,902,252

HIGH VOLTAGE ELECTRICAL CONNECTOR

Jere D. Whorton, and Carl O. Gellenthin, Jr., both of Houston, Tex., assignors to Signeon Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 265,029, Oct. 31, 1988. This application Apr. 17, 1989, Ser. No. 339,026

Int. Cl.[4] H01R *11/09*

U.S. Cl. 439—796 **5 Claims**



1. A high voltage electrical connector for connecting two electrical conductors together comprising,

a plastic enclosure for providing a protective covering,

a tubular glass insulator positioned inside of the enclosure for providing high voltage protection,

a tubular electrically conductive metal liner positioned in the glass insulator, said liner including first and second inwardly biased electrical contacts,

first and second metal connectors positioned inside of the metal liner, said connectors each including an opening in the inside and a longitudinal channel on the outside, the opening and channel of each connector adapted to receive the bare end of an electrical conductor, and the channel of the first and second connectors coacting with the first and second biased electrical contacts, respectively, for providing an electrical connection between the electrical conductors.

4,902,253

RE-TERMINATING INACCESSIBLE ALUMINUM CONDUCTORS

Ezra L. Schacht, 1620 W. Main St., Houston, Tex. 77006

Filed Jul. 21, 1987, Ser. No. 76,164

Int. Cl.[4] H01R *4/18*

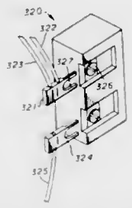
U.S. Cl. 439—877 **4 Claims**

1. An electrical connector for re-terminating at least one previously installed solid aluminum conductor, of the type now outlawed, at a pair of conductor-securing screws, of the same polarity, of a duplex-receptacle, the connector comprising:

a block of electrically high-conductive material, in the general shape of a rectangular parallelopiped, having a front, a back, a top, bottom, and two sides;

stub-like electrical conductors, integral with said block, on centers equivalent to those of said receptacle screws, projecting perpendicularly from said front, said stubs of a length suitable for securing said block to said receptacle, when each of said stubs is engaged with one of said screws;

said parallelopiped having at least one cylindrical bore, from top to bottom of the block, said bore slightly larger than the diameter of said previously-installed conductor, now to be installed therein; and



said block being positioned within retaining means and indentable from said front and said back, in chisel-tip fashion along a predetermined length of said conductor, said chisel tips in centered alignment with said conductor, into intimate contact with the entire surface of said conductor, and further indenting cylindrical surface of said conductor into a figure-eight like cross-sectional area, said indentations acting as a couple to prevent rotation of said aluminum conductor within said bore of said connector block.

4,902,254

PROPULSION DEVICE WITH CONDITIONED INERTIA

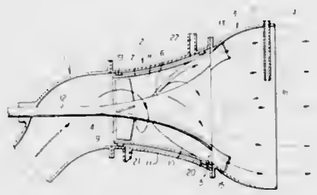
Jean-Bernard Chas, Villa Des Haules B. P. 23, 76 790 Etretat, France

Continuation-in-part of Ser. No. 57,057, May 4, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 248,741

Claims priority, application PCT Int'l Appl., Sep. 2, 1986, PCT/FR86/00294

Int. Cl.[4] B63H *11/02*

U.S. Cl. 440—38 **9 Claims**



1. Hydrojet propelling device including:

a pump section comprising an elongated hollow housing with an inlet opening at one end and an outlet opening at the opposite end said housing containing at least a vaned rotor member in which a peripheral annular diverging passageway is defined between the inlet opening end and the outlet opening end through which water flow is associated, said rotor being keyed on a driving shaft; and,

a discharge section comprising a stationary cup shaped wall projecting from the outlet opening of the pump section, said wall having a concave face curving oppositely to divergence of a surface forming the outer passageway of the pump section, this face having a variable curvature which is substantially tangent to the flow exhausted at the outlet opening of the pump section and substantially parallel to a straight direction along an axis of elongation at its free end, this concave face being provided with curved vanes having smooth curvatures in the axial direction providing arcuate surface portions whereby the flow exhausting from the pump section is divided in a plurality of water jets progressively and smoothly straightened from their diverging trajectory to a trajectory substantially parallel to said straight direction, said vanes being constituted by internal surfaces of tubes extending along said cup shaped wall.

4,902,255

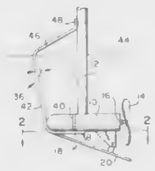
WEEDGUARD FOR ELECTRIC TROLLING MOTOR

Richard E. Faunda, P.O. Box 1858, Leesburg, Fla. 32749

Filed Feb. 2, 1989, Ser. No. 305,937

Int. Cl.[4] B63H *5/16*

U.S. Cl. 440—71 **8 Claims**



1. A weedguard for attachment to electric trolling motors having a motor housing and a motor support shaft and comprising a lower triangular frame member portion and an upper arm portion, said triangular frame portion having means for attachment to said motor housing so that said triangular frame portion has one apex toward the front of said motor housing and extends downwardly and rearwardly from said apex with respect to said motor housing; said upper arm portion being secured to said triangular frame portion at said apex and extending upwardly and forwardly therefrom, a rearward extension member extending from said upper arm portion toward said motor shaft for attachment to said motor shaft, said upper arm portion including a lower rearward extension for extending along and beneath said motor housing, and said triangular frame portion including a cross member extending between two sides thereof and a flange member upstanding from said cross member for attachment to a skeg on said motor housing.

4,902,256

WATER SKI WEDGE

Randy E. Berglund, 9675 Laughlin Way, Redwood Valley, Calif. 95470

Filed Nov. 15, 1988, Ser. No. 271,292

Int. Cl.[4] A63C *15/00*

U.S. Cl. 441—68 **12 Claims**



1. In a water ski having a top surface and at least one binding adapted to retain a foot of a water skier therein, the improvement comprising a wedge on said water ski including a heel portion adapted to support a heel of said foot and a forward portion forward of said heel portion adapted to support portions of said foot forward of said heel of said foot, said forward portion terminating at a forward termination rearward of a ball of said foot whereby said ball may directly engage said top surface of said water ski when said heel of said foot is on said heel portion, said forward portion of said wedge being tapered from a thickest region adjacent said heel portion to a thinnest region at said forward termination.

4,902,257

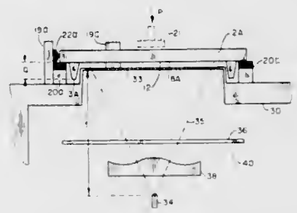
METHODS AND APPARATUS FOR MAKING FLAT TENSION MASK COLOR CATHODE RAY TUBES

Robert Adler, Northfield; James R. Fendley, Arlington Heights; Howard G. Lange, Prospect Heights; Charles J. Prazak, III, Elmhurst; Johan Steiner, Des Plaines, and Paul Strauss, Chicago, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 22, 1988, Ser. No. 223,475

Int. Cl.[4] H01J *9/20*

U.S. Cl. 445—4 **35 Claims**



1. For use in the manufacture of a color cathode ray tube having a shadow mask with a central pattern of apertures mounted in tension on a transparent flat front panel with the mask aperture pattern in registration with a corresponding cathodoluminescent screen pattern on an inner surface of the panel, wherein the shadow masks and front panels are respectively interchangeable, the method comprising:

providing screen reference means associated with a screen pattern on a front panel which is indicative of a geometric parameter of said screen pattern;

providing mask reference means associated with a mask aperture pattern on a shadow mask which is indicative of a corresponding geometric parameter of said mask pattern;

altering the geometric parameter of one of said mask and screen patterns relative to the other; and

with a feedback system responsive to said mask reference means and said screen reference means and thus to the said geometrical parameters of said screen pattern and said mask pattern, controlling said altering so that said mask reference means attains a predetermined relationship to said screen reference means.

4,902,258

ROBOTIC ASSEMBLY SYSTEM

John Dunsmore, Renfrewshire, Scotland, and David C. Teale, Winchester, England, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 30, 1985, Ser. No. 792,998

Claims priority, application European Pat. Off., Oct. 30, 1984, 84307461.8

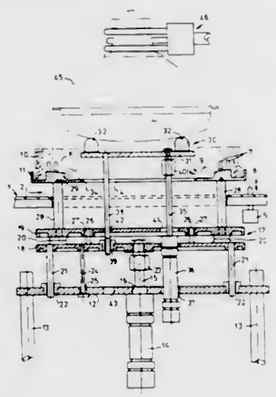
Int. Cl.[4] H01J *9/00*

U.S. Cl. 445—23 **8 Claims**

1. A robotic assembly system in which pallets, on each of which an article is to be assembled, are transported by a conveyor from one workstation to the next, at each of which an assembly operation is to be performed by a robot, characterized in that at each workstation means are provided for stopping and coarsely positioning a pallet supplied thereto, and each said workstation includes a linear lift mechanism operable

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to engage and lift a pallet coarsely positioned thereat from the conveyor, along an axis, into a precisely located vertical position, said lift mechanism including compliant means operable to provide said pallet with lateral compliance in all directions within a plane which is substantially normal to said axis while supported by said mechanism in said vertical position, the system further including means at the workstation to cause said



lift mechanism to lift and support the pallet in said vertical position for a subsequent assembly operation performed by a robot, the pre-programmed operating characteristics of which have been determined with reference to said vertical position of the pallet, and upon completion of the assembly operation to lower the pallet onto the conveyor for transportation out of the workstation.

4,902,259

CONNECTABLE POLYGONAL CONSTRUCTION MODULES

James T. Ziegler, Calgary, Canada, assignor to Novation Design Ltd., Ontario, Canada

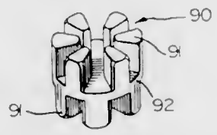
Continuation of Ser. No. 908,919, Sep. 19, 1986, Pat. No. 4,731,041, which is a continuation-in-part of Ser. No. 698,698, Feb. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 312,638, Jul. 11, 1983, abandoned. This application Feb. 22, 1988, Ser. No. 158,467

Claims priority, application Canada, Mar. 30, 1983, 424896

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[4] A63H *33/04, 33/06, 33/08;* **E04C** *1/10*

U.S. Cl. 446—117 **6 Claims**



4. A toy construction element comprising a body portion having a connector hub projecting upwardly from at least one face thereof for establishing a friction fit with a like connector hub of another toy construction element in face-to-face interlocking engagement, said connector hub comprising a series of fin projections of substantially the same uniform height arranged in a uniform circular configuration, each fin being sectoral in cross-section with radial side walls and the fin projections being radially spaced so as to engage substantially identical fin projections of said like connector hub therebetween in interlocking engagement solely by frictional contact between engaging fin side walls sufficient to retain the element and said another element adjacent one another.

4,902,260

AMPHIBIAN TOY CAR

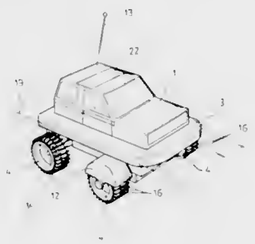
Tae-Kyu Im, Seoul, Rep. of Korea, assignor to Bando Sports, Ltd., Buchan, Rep. of Korea

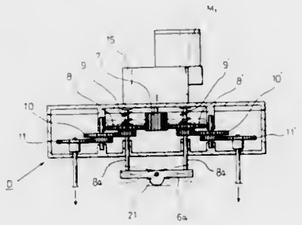
Filed Dec. 28, 1988, Ser. No. 291,102

Claims priority, application Rep. of Korea, Mar. 8, 1988, 1988-2386

Int. Cl.[4] A63H *23/04*

U.S. Cl. 446—154 **5 Claims**





1. An amphibian toy car which can be operated by a remote controller comprising:

a car body including upper and lower car bodies;

front and rear wheels rotatably mounted on said lower car body;

an annular buoy mounted on a connection between said upper and lower car bodies, said buoy being provided with seal rings;

a wheel driving unit disposed in the interior of the car bodies, said wheel driving unit including a steering device, a main drive motor, and a differential device;

said steering device including a tapered sliding cam and I-shaped steering lever operatively connected to said sliding cam, said steering lever having a pair of operating arms;

said differential device including a drive gear connected to said main drive motor, a pair of steering gears engaged with said drive gear, a pair of intermediate gears each engaged with one of said steering gears, and a pair of driven gears each engaged with one of said intermediate gears; and

a pair of sliding shafts each carrying one of said steering gears, said shafts being operatively connected to one of said operating arms of said steering lever and being always exerted by a spring in the direction that each one of said steering gears is engaged with the corresponding intermediate gear, so that a forward movement and right and left turning of said toy car can be carried out, as desired, under the condition that wheels are fully submerged in water.

4,902,261

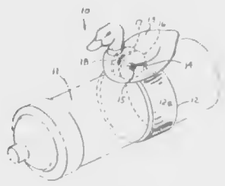
NURSING AID

Jolie W. Pratt, and Mark S. Pratt, both of 4615 S. Ong, Amarillo, Tex. 79110

Filed Feb. 16, 1989, Ser. No. 310,892

Int. Cl.[4] A63H *33/00, 3/00;* **B65H** *75/48;* **B65D** *23/12*

U.S. Cl. 446—227 **3 Claims**



1. A nursing aid for securement about an infant nursing bottle comprising, in combination,

a securement band for securement about an outer surface of the bottle, and

a toy member including an extensible and retractable tether line mounted interiorly of the toy at one end of the tether line, and

the tether line selectively securable to the band at a further end of the tether line remote from the toy, and

wherein the securement band is formed of elastomeric material for resilient grasping of the bottle and includes an exterior friction surface formed of filament material, and

wherein the toy member includes a spool including a plurality of spaced collars about a central axle wherein the spool is formed with a captured spring to bias the spool in a first position with a tether line wound about the spool, and wherein the tether line is retractable from interiorly of the toy to a second position wherein the tether line is withdrawn from the spool in an extended orientation relative to the spool, and

wherein the tether line is formed with an enlarged positioning head at the further end, and the positioning head is formed with an outwardly extending fastener plug directed outwardly of the positioning head, and

wherein the band includes a securement boss for receiving the plug of the positioning head wherein the securement boss is formed with a cavity provided with a tapered entrance to capture the plug when directed within the cavity.

4,902,262

POWER UNIT AND BATTERY PACK FOR TOYS

David W. Lunsford, 3317 Mackey La., Shreveport, La. 71118

Filed Jul. 27, 1987, Ser. No. 78,877

Int. Cl.[4] A63H *3/00, 33/00, 29/22, 5/04*

U.S. Cl. 446—268 **16 Claims**

1. A power unit and battery pack for a toy, said power unit comprising an electric motor having a rotating shaft; a motor housing for containing said electric motor, with said shaft of said electric motor projecting from said motor housing; adaptor means carried by said shaft of said electric motor, accessory stabilizer means provided on said motor housing and an opening provided in said accessory stabilizer means, said opening provided substantially in alignment with said shaft and said adaptor means for receiving an accessory having an accessory shaft and operating the accessory responsive to coupling of the



accessory shaft to said adaptor means; and handle means carried by said motor housing for grasping said power unit; and further comprising battery pack means adapted for attachment to the toy, said battery pack means further adapted to receive at least one source of electrical energy for poweringsaid power unit and electric wiring connecting the source of electrical energy to said electric motor for energizing said electric motor and operating said power unit.

4,902,263

COIN LIFTING DEVICE

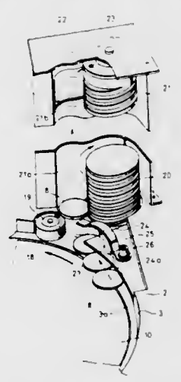
Tsuyoshi Ito, and Masaharu Shirasawa, both of Tochigi, Japan, assignors to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Jun. 24, 1988, Ser. No. 210,787

Claims priority, application Japan, Jun. 26, 1987, 62-157770

Int. Cl.[4] G07D *1/00, 9/00*

U.S. Cl. 453—49 **5 Claims**



5. A coin lifting device comprising

a rotating disk which rotates about an upright axis so as to feed coins placed thereon;

a rotating body formed with a spiral groove, in which groove only the periphery of the coins fed in a horizontal posture by said rotating disk is inserted, said rotating body being rotatable about an upright axis;

upright guide means disposed at the outer periphery of said rotating body and adapted to constrain the coins inserted in said spiral groove to remain in said spiral groove and to prevent the coins from revolving about said rotating body; and

a laterally-opening coin discharge port formed in an upper portion of said guide means, said guide means terminating

upwardly at a lower edge of said discharge port, whereby coins reaching the discharge port lose the constraint of said guide means and are discharged through said discharge port in a direction away from said rotating body.

4,902,264

LOST-GRAIN DETECTOR FOR HARVESTING MACHINE

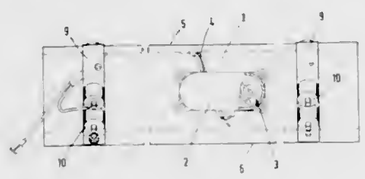
Norbert Diekhans, Gütersloh, and Willi Bennke, Steinhagen, both of Fed. Rep. of Germany, assignors to Class oHG, Herse-winkel, Fed. Rep. of Germany

Filed Sep. 14, 1988, Ser. No. 244,486

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 3731080

Int. Cl.⁴ A01D *73/00*

U.S. Cl. 460—5 **11 Claims**



I. In combination with a harvesting machine having an output passage, a grain-loss detector comprising:

an impact plate having a front face exposed in the passage for direct contact with crop exiting the machine and an opposite back face;

an electroacoustic piezoelectric quartz crystal transducer capable of converting vibration into an electrical output and having a side directly engaging the back face of the impact plate;

means retaining the side of the transducer in direct contact with the back face of the impact plate; and

means including electronic elements spaced from the transducer for converting the output of the transducer into a usable data signal.

4,902,265

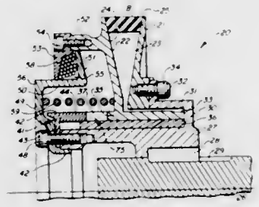
VARIABLE SPEED PULLEY

Hiroshi Takano, Miki, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Sep. 1, 1988, Ser. No. 239,511

Int. Cl.⁴ F16H *11/02*

U.S. Cl. 474—13 **23 Claims**



1. A variable speed pulley comprising:

a first sheave half;

means for fixedly mounting the first sheave half on a rotatable shaft defining an axis of rotation;

a second sheave half;

means for coaxially mounting said second sheave half on said shaft for rotative and axial movement on said shaft adjacent said first sheave half to define a belt receiving groove therebetween;

biasing means for biasing said second sheave half axially of the shaft to vary the width of said belt-receiving groove;

torque means for moving said second sheave half rotatively and axially of the shaft with the force of the biasing means when the torque of a load operatively connected to the pulley is increased; and

urging means for urging said second sheave half axially of the shaft against the biasing force of said biasing means with a force proportional to the speed of rotation of said shaft to vary the width of said belt-receiving groove,

said urging means comprising means movable with said second sheave half defining a movable surface,

means fixedly associated with said shaft defining a fixed surface,

force applying means extending between said movable surface and said fixed surface and having a variable extension parallel to said shaft axis proportional to the centrifugal force acting thereon as a result of said speed of rotation of the shaft.

4,902,266

TENSIONER FOR A CHAIN, A BELT OR THE LIKE

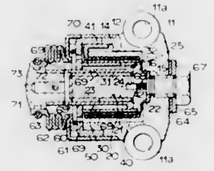
Juji Ojima, Aikawa; Kazuo Ishii, and Fumio Numakura, both of Miyata, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Nov. 9, 1988, Ser. No. 268,918

Claims priority, application Japan, Nov. 9, 1987, 62-282648; Aug. 31, 1988, 63-216794; Aug. 31, 1988, 63-216796; Aug. 31, 1988, 63-216797; Aug. 31, 1988, 63-216798

Int. Cl.⁴ F16H *7/08*

U.S. Cl. 474—111 **14 Claims**



1. In a tensioner for a chain, a belt or the like which comprises a male screw member and a female screw member installed within a casing in a screwed state, a spring which provides a rotation force to said male member and a bearing into which the female screw member is inserted so that the female screw may advance in a axial direction by the rotation of the male screw member together with constraining the rotation of said female member;

said tensioner being charaterized in that said female screw member is screwed with said male screw member at the outside thereof and said spring is provided at the outside of the same female screw member thereby forming a triple construction.

4,902,267

BELT TENSIONER, KIT THEREFOR AND METHODS OF MAKING THE SAME

Dewey D. Henderson, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

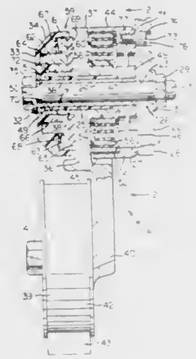
Filed Jun. 12, 1989, Ser. No. 364,284

Int. Cl.⁴ F16H *7/12*

U.S. Cl. 474—133 **25 Claims**

I. In the combination of a support means having a mounting surface means, a single bolt means, and a belt tensioner having a housing means secured to said support means in abutting relation to said mounting surface means thereof by said single bolt means that is carried by said housing means and said

support means, said support means having opening means interrupting said mounting surface means in offset relation to said bolt means, said housing means having a certain removable pin means extending therefrom and being received in said opening means of said support means to orient said tensioner relative to said support means and to prevent rotation of said



housing means on said bolt means, the improvement wherein said housing means has a plurality of mounting arrangements each being adapted to have a removable pin means attached thereto for being received in an opening means of a support means, said certain removable pin means being attached to one of said mounting arrangements.

4,902,268

BELT TENSIONING DEVICE

Steffen Hertrich, Herzogenaurach, and Dieter Goppelt, Aurachtal, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 337,947

Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816885

Int. Cl.⁴ F16H *7/08*

U.S. Cl. 474—135 **10 Claims**



1. A tensioning device for belts, chains and the like particularly for the camshaft drive of an internal combustion engine, with a tension pulley supported on a movable carrier, with a control element, by means of which in the case of heating, the carrier can be moved via an actuating element against the action of a pressure spring in the slackening direction of the belt characterized in that, the control element consists of a hollow cylindrical sleeve closed at the one end by a bottom and on the other end has a flange extending radially inwards, against which from the inside a washer abuts, which in its center receives a longitudinally movable and sealed pressure piston, in a annular hollow space between a bore of the sleeve and the pressure piston, the pressure spring is arranged whereby it is supported on one hand on the washer and on the other hand on the pressure piston, between the bottom and the pressure piston, whose end face is at a distance from the bottom, a further pressure spring is arranged which with lower resilience opposes the action of the first mentioned pressure spring and the whole inner area of the sleeve is filled with a gas-free expansion fluid.

4,902,269

DEVICE FOR THE SEALING OF A PORT OR FITMENT ON A THERMOPLASTIC FILM

Etienne Susini, Villecresnes, France, and Pierre Soubrier, Brussels, Belgium, assignors to Baxter International Inc., Deerfield, Ill.

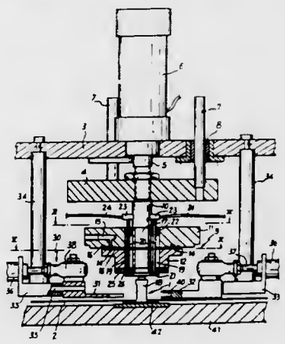
PCT No. PCT/FR87/00170, § 371 Date Mar. 2, 1988, § 102(e) Date Mar. 2, 1988, PCT Pub. No. WO87/07205, PCT Pub. Date Dec. 3, 1987

PCT Filed May 20, 1987, Ser. No. 155,924

Claims priority, application France, May 21, 1986, 86 07206

Int. Cl.⁴ B31B *1/84, 21/90;* **B65H** *37/04*

U.S. Cl. 493—380 **18 Claims**



1. A device for sealing a fitment on a thermoplastic film, comprising a chassis, a support plate attached to the chassis and movable with respect to the chassis, a welding head rigidly connected to the support plate, at least one ring-shaped heating resistance which defines an aperture for receiving a portion of the fitment during sealing and is carried by the welding head, means for feeding current to the welding head joined to the welding head at two diametrically opposed points on the welding head, and means for the diffusion of a cooling fluid to the point where the means for feeding current are joined to the heating resistance.

4,902,270

CENTRIFUGE TUBE

Paul V. Comeau, Wayne County, and Richard A. Leoncavallo, Pittsford, both of N.Y., assignors to Nalge Company, Rochester, N.Y.

Filed Oct. 3, 1988, Ser. No. 251,855

Int. Cl.⁴ B65D *39/00;* **B04B** *5/02;* **B01L** *3/00*

U.S. Cl. 494—16 **10 Claims**

1. A centrifuge tube assembly for holding a fluid sample, said centrifuge tube assembly comprising:

a centrifuge tube having an elongated cylindrical central portion of uniform shape, an enclosed bottom portion integrally formed with said central portion, an enclosed top portion integrally formed with said central portion which narrows down to a narrow opening, and a neck portion integrally formed on and protruding from said top

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portion at said narrow opening which is capable of receiving a liquid to fill a chamber formed by said central portion, said bottom portion and said top portion, said neck portion having an inner longitudinal section having an inner cylindrical surface, said inner cylindrical surface having an inside diameter of a first predetermined value, said neck portion having an outer longitudinal generally cylindrical section adjacent said inner longitudinal section having a first outer cylindrical surface, said inner longitudinal section and said outer longitudinal generally cylindrical section forming a shoulder at their junction which extends radially outwardly from said inside diameter of said inner longitudinal section, said shoulder being disposed at an angle in the range of 10° to 25°, said first outer cylindrical surface being disposed at an angle so that the cross sectional diameter increases toward the outer end of said outer longitudinal generally cylindrical section;

an insert made of a pliable material, said insert having an inner cylindrical section, a closed bottom section integrally formed with said inner cylindrical section and a second outer cylindrical section integrally formed at the outer end of said inner cylindrical section, said inner cylindrical section, outer section cylindrical section and closed bottom section having substantially the same thickness, said inner cylindrical section having an outer diameter substantially equal to said inside diameter of said inner longitudinal section, said second outer cylindrical section having an outer diameter greater than said outer diameter of said inner cylindrical section of said insert and forming a shoulder at the junction thereof, said inner cylindrical section of said insert forms an inner bore of a first diameter



and said outer cylindrical section forms a second bore of a second diameter, said second diameter being greater than said first diameter;

a rigid plug for placement within said insert and forcing said insert against the inside surface of said neck portion so as to form a secure sealing relationship therewith, said plug having a first generally cylindrical inner end of a first diameter which extends within said inner bore of said insert and said inner longitudinal section of said neck portion, a first conical section integrally formed with the outer end of said first generally cylindrical inner end disposed at a first angle substantially parallel to the angle at which said shoulder of said neck portion is disposed such that when said plug is placed within said insert and neck portion said first conical section is disposed opposite said shoulder portion of said neck portion, a second conical section integrally formed with said first conical section which increases in diameter as it proceeds axially outwardly toward its outer end, said outer end of the second conical section having a diameter of a predetermined size greater than said inside diameter of said insert in said second outer cylindrical section but less than the diameter of said first outer cylindrical surface of said outer longitudinal generally cylindrical section of said neck portion so as to pinch said pliable insert between said plug and neck portion, adjacent said second conical section and integrally formed with said plug is an outer shank portion having a diameter substantially less than the diameter of said second conical section at its outer end, said shank and said outer end of said second conical section forms a recess at their junction.

4,902,271

RADIO CONTROLLED STEERING DEVICE FOR A TWO-WHEELED VEHICLE TOY

Yousuke Yoneda, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Feb. 8, 1989, Ser. No. 307,465
Claims priority, application Japan, Feb. 12, 1988, 63-17240[U]
Int. Cl.⁴ A63H *17/21*
U.S. Cl. 446—440 **8 Claims**



1. A radio controlled steering device for a two-wheeled vehicle toy, comprising:

a body having a forward portion and rearward portion;

a front wheel rotatably mounted in the forward portion of the body for rotation on a fork which rotates about an inclined axis the wheel being rotatable about a horizontal axis and rotates with the fork;

a rear wheel mounted on the rearward portion of the body in a frame, the frame being mounted for rotation about a substantially horizontally axis, the rear wheel being aligned with a center of gravity of the vehicle toy prior to initiating a turn;

drive means operatively connected to the rear wheel; and

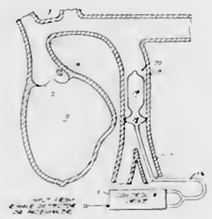
means for rotating the frame about its horizontal rotational axis to initiate a turn while the vehicle toy is moving in response to radio control signals to tilt the frame and thus shift the center of gravity of the vehicle toy thereby inducing the fork to rotate about the inclined axis in the direction of the shifted center of gravity.

4,902,272

INTRA-ARTERIAL CARDIAC SUPPORT SYSTEM

Fredric L. Milder, Brookline; Robert T. V. Kung, Andover; David M. Lederman, Marblehead, and Param I. Singh, Lexington, all of Mass., assignors to Abiomed Cardiovascular, Inc., Danvers, Mass.

Filed Jun. 17, 1987, Ser. No. 63,648
Int. Cl.⁴ A61B *19/00*
U.S. Cl. 600—18 **13 Claims**



1. A pumping system for assisting the pumping of a natural heart comprising,

a first pumping balloon having a volume greater than about one-half times the volume of the natural heart stroke, for positioning within the descending aorta;

a second balloon for positioning within said aorta on the distal side of said first balloon, the distal side being the side furthest from the heart when said balloon is positioned within said descending aorta, said second balloon, when inflated being large enough to substantially block blood flow from the upper aorta to the lower arterial system,

catheter means for insertion from outside of the patient's body connecting to said balloons providing gas flow to selectively inflate either of said first and second balloons, and

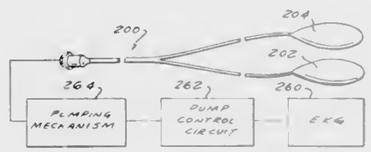
control means responsive to signals indicative of the beginning of systole and diastole of said heart to control the inflation of said first and second balloons in sequence so as to provide pumping away from said heart during the systole of the natural heart and toward said heart during diastole of said heart.

4,902,273

HEART ASSIST DEVICE

Daniel S. J. Choy, 892 Riverbank Rd., Stamford, Conn. 06903, and Robert B. Case, 130 E. 75th St., New York, N.Y. 10021

Division of Ser. No. 809,164, Dec. 16, 1985, Pat. No. 4,771,765, which is a continuation-in-part of Ser. No. 582,118, Feb. 21, 1984, Pat. No. 4,685,446. This application Mar. 22, 1988, Ser. No. 171,807
Int. Cl.⁴ A61B *19/00*
U.S. Cl. 600—18 **22 Claims**



1. A heart assist device, comprising:

a catheter with a proximal end and a distal end, the catheter having a first lumen running between the proximal end and the distal end;

a first tube with a first end and a second end, the first end of the first tube being connected to the distal end of the catheter;

a second tube with a first end and a second end, the first end of the second tube being connected to the distal end of the catheter;

a first inflatable intraventricular balloon, the first intraventricular balloon being connected to the first tube at the second end of the first tube, the interior of the first intraventricular balloon communicating with the first lumen through the first tube;

a second inflatable intraventricular balloon, the second intraventricular balloon being connected to the second tube at the second end of the second tube, the interior of the second intraventricular balloon communicating with the first lumen through the second tube;

pumping means for inflating and deflating the first intraventricular balloon and for inflating and deflating the second intraventricular balloon, the pumping means being connected to the catheter at the proximal end of the catheter.

4,902,274

MULTIPLE AFFERENT SENSORY STIMULATION DEVICE

William J. Gleeson, III, 2319 W. Rapallo Way, Tucson, Ariz. 85741

Filed Oct. 11, 1988, Ser. No. 255,480
Int. Cl.⁴ A61M *21/00*
U.S. Cl. 600—27 **14 Claims**



1. A multiple afferent sensory stimulation device providing audio and visual sensory stimulation to a subject person's ears and eyes to induce sensory reactions in the subject person comprising:

a play back device adapted to receive a prerecorded program and to emit visual stimulation control signals having an AC component from a first and second output and to emit audio stimulation signals from a third and fourth output;

visual processing circuit mean operably connected to said playback device first output to receive the visual stimulation control signals, said visual processing circuit means including an operational amplifier having an input and an output, said operational amplifier input operably connected to said playback device first output to amplifier the visual stimulation control signals, and a pulse stretching circuit operably attached to said operational amplifier output to stretch the amplified visual stimulation control signals;

audio circuit means operably connected to said playback device third output to receive the audio stimulation signals and to provide audio stimulation to at least one of the subject person's ears; and

visual display circuit means to display visual stimulation to at least one of the subject person's eyes, said visual display circuit means operably connected to said visual processing circuit means receiving the amplified and stretched visual stimulation control signals whereby audio and visual stimulation is provided to a subject person in accordance with the prerecorded program to induce sensory reactions into the subject person.

4,902,275

COTTON APPLICATOR

Karl Fassbind, Mannedorf, Switzerland, assignor to Fassbind & Fassbind, Mannedorf, Switzerland

Continuation of Ser. No. 635,189, Jul. 27, 1984, abandoned, which is a continuation-in-part of Ser. No. 581,195, Feb. 17, 1983, abandoned. This application Sep. 8, 1987, Ser. No. 96,267
Claims priority, application Sweden, Mar. 1, 1983, 1123/83
Int. Cl.⁴ A61M *35/00*
U.S. Cl. 604—1 **1 Claim**

1. A cotton applicator for use in a cavity defined by an ear and the like comprising

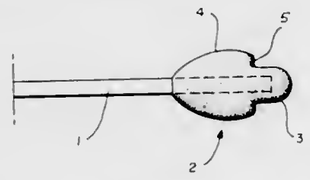
a unitary rod being disposed on a longitudinal axis so as to be linear along its entire length,

a pledget of cotton on said supporting end adapted for unitary rotation therewith,

said pledget of cotton including a forward generally cylindrical section of uniform diameter throughout its length, a

generally bulbous rearward section having a major diameter approximately twice as large as the diameter of the cylindrical section and an annular wall extending transversely between the cylindrical and bulbous sections

said supporting end of said rod extending axially through the bulbous section and terminating at the approximate midpoint of the cylindrical section to enhance support for the cylindrical section during rotary use of the applicator about said longitudinal axis and thereby avoid separation of the cynlindrical section from the bulbous section,



said bulbous section tapering decreasingly from the major diameter of said annular wall to the diameter of said cylindrical section rearwardly thereof,

said annular wall having inner and outer diameters the same as the diameter of said cylindrical section and the major diameter of said bulbous section, respectively,

said annular wall engagable with an outside perimeter of the cavity and thereby limit penetration of the cylindrical section into the cavity.

4,902,276

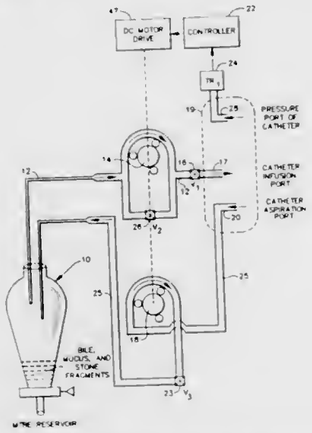
APPARATUS AND METHOD FOR REMOVING OBSTRUCTIONS IN BODILY ORGANS OR CAVITIES

Salam F. Zakko, Farmington, Conn., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 871,775, Jun. 9, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 180,099

Int. Cl.[4] A61M *1/00, 5/00*

U.S. Cl. 604—28 **35 Claims**



1. Apparatus for removal of a soluble obstruction in a bodily organ or cavity, comprising:

source reservoir means for containing a fluid capable of dissolving said obstruction;

first and second fluid conduits attached to and forming a fluid circuit with said reservoir means and said organ or cavity and providing fluid communication between said reservoir means and said organ or cavity;

pump means associated with each of said conduits to move said fluid in said conduits around said circuit;

means for detecting and measuring fluid pressure in said organ or cavity, said means adapted to classify said pressure as high, normal or low according to predetermined physiological criteria; and

means operatively connecting said means for detecting and measuring pressure and each of said pump means and responsive to said organ or cavity fluid pressure to cause said pump means to maintain forward fluid flow at low and normal pressure and to decrease or reverse fluid flow at high pressure.

4,902,277

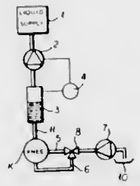
CIRCULATING A LIQUID THROUGH A JOINT

Burkhard Mathies, Givrins; Didier Misse, Grand-Saconnex; Claude Guignard, St. Genis-Pouilly, and Paul Pidoux, Bassins, all of Switzerland, assignors to Orthoconcept, Meyrin, Switzerland

Filed Aug. 26, 1987, Ser. No. 89,740

Int. Cl.[4] A61M *1/03*

U.S. Cl. 604—67 **11 Claims**



1. An apparatus for circulating a physiological liquid at a pressure and flow rate through a body cavity for an endoscopic resection or examination of the cavity, the apparatus comprising:

a source of the liquid;

an input pump connected to the source and having a feed conduit for extending into the cavity for supplying the liquid to the cavity;

sensor means for detecting pressure in the cavity and for generating an output corresponding to the detected pressure;

generator means for generating an output corresponding to a reference pressure;

means including an input-pump comparator connected to the input pump and having inputs connected to the sensor means and to the generator means for receiving the outputs therefrom and for operating the input pump such that the detected pressure corresponds at least generally to the reference pressure;

a suction pump having a main suction conduit extending into the cavity for aspirating the liquid therefrom; and

suction control means for operating the suction pump at a predetermined generally uniform rate, said suction pump being a volumetric pump having a drive motor, the suction control means including

a tachometer connected to the motor,

means for generating a motor-speed set point, and a suction pump comparator having inputs connected to the set-point generating means and to the tachometer for comparing the actual motor speed detected with the motor-speed set point and having an output operatively connected to the motor for slowing the motor when the actual speed exceeds the set point and for speeding up the motor when the actual speed drops below the set point.

4,902,278

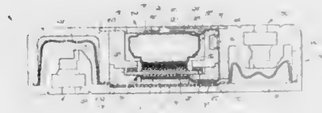
FLUID DELIVERY MICROPUMP

Henri J. R. Maget, Los Altos, and Paul K. Krejci, San Diego, both of Calif., assignors to IVAC Corporation, San Diego, Calif.

Filed Feb. 18, 1987, Ser. No. 16,019

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—132 **21 Claims**



1. A prime move module, comprising:

a housing

means for introducing an electrochemically active material into said housing from a first region;

an electrolytic membrane disposed in said housing and having first and second membrane surfaces;

a first material-pervious electrode disposed on said first membrane surface and a second material-pervious electrode disposed on said second membrane surface; and

an electrical power source disposed in said housing and having a pair of electrodes, one of said power source electrodes being integral with said first material-pervious electrode and having electrical communication means disposed within said housing for providing electrical communication between the other of said power source electrodes and said second material-pervious electrode, for establishing a voltage gradient across said electrolytic membrane to ionize said electrochemically active material at said first material-pervious electrode, transport said ions through said electrolytic membrane to said second material-pervious electrode, and reconvert said ions to molecules of said electrochemically active material which are evolved at said second material-pervious electrode into a second region, said power source including power source material that undergoes a chemical reaction which converts chemical energy into electrical energy when said power source material is exposed to said electrochemically active material.

4,902,279

LIQUID MEDICAMENT SAFETY INJECTOR

William B. Schmidtz, and William L. Schmitz, both of Hemet, Calif., assignors to Autoject Systems Inc., Hemet, Calif.

Filed Oct. 5, 1988, Ser. No. 254,262

Int. Cl.[4] A61M *5/20*

U.S. Cl. 604—134 **31 Claims**



1. A hypodermic syringe safety injector apparatus for use with a conventional medical syringe comprising a cylindrical barrel having a syringe axis, a lateral projection on the barrel, a hypodermic needle carried by and in fluid connection with one end of the barrel, the needle having a tip extending a fixed distance relative to the lateral projection, a fluid expelling plunger in the barrel and having a portion extending from an opposite end of the barrel, the injector apparatus comprising:

(a) an elongated body for receiving the syringe, the body having a forward end for the needle and a rearward end for the extending portion of the plunger;

(b) a trigger member supported by the body and having a trigger surface projecting forward of the forward end of the body, the trigger member being adapted for rearward movement from an extended position relative to the body in response to pressure exerted against the trigger surface by the flesh of a patient;

(c) receiver means for holding the syringe in axial alignment with the body;

(d) stop means for limiting movement of the syringe barrel from a rearward first position to a forward second position relative to the body, the tip of the needle being located rearwardly of the trigger surface in the first position when the trigger member is in the extended position, the needle being projected beyond the trigger surface in the second position for piercing the flesh of a user;

(e) actuator means for moving the plunger in a direction toward the forward end of the body;

(f) catch means for preventing operation of the actuator means;

(g) release means activated by the trigger member for releasing the catch means, whereby the plunger is projected forwardly within the barrel and the syringe is moved from the first position to the second position in response to movement of the plunger; and

(h) safety latch means for preventing operation of the release means except when the syringe is fully seated in the receiver means.

4,902,280

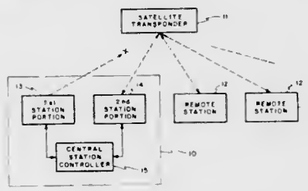
TROCAR

Jack R. Lander, Danbury, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 920,509, Oct. 17, 1986. This application Jul. 14, 1989, Ser. No. 380,094

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—165 **16 Claims**



1. A trocar comprising

a first housing;

a stylet secured to and extending from said first housing, said stylet having a sharp tip at a distal end;

a protective tube slidably mounted in said first housing between an extended position and a retracted position, said protective tube being disposed concentrically about said stylet;

a spring in said first housing biasing said protective tube outwardly of said first housing into said extended position;

latch means in said first housing for locking said protective tube in said extended position;

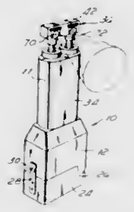
a slider slidably mounted in and projecting from said first housing for releasing said latch means to permit movement of said protective tube into said retracted position;

a second housing coaxial of said first housing to define a handgrip therewith; and

a guide tube secured to and extending from said second housing with said protective tube slidably mounted therein, said slider projecting from said first housing against said second housing, whereby squeezing of said housings together pushes said slider into said first housing to release said latch means.

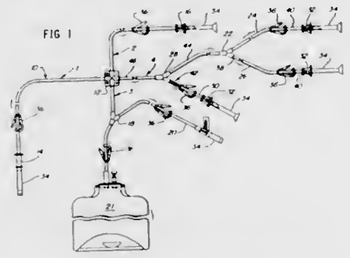
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4,902,281
FIBRINOGEN DISPENSING KIT
Donald R. Avoy, Los Gatos, Calif., assignor to Corus Medical Corporation, Costa Mesa, Calif.
Filed Aug. 16, 1988, Ser. No. 232,915
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—191 **14 Claims**



1. A dispenser for separately dispensing each of two biological fluids contained therein for intermixing at a remote site to produce hemostasis or a tissue adhesive, comprising:
a housing having a dispenser head thereon for separately dispensing each of two fluids;
a first and second pump in the housing;
a first hollow aspirating needle in the housing, in fluid communication with the first pump;
a second hollow aspirating needle in the housing, in fluid communication with the second pump; and
a chamber in the housing for removably receiving a first and a second reservoir of biological fluids to be dispensed,
wherein each of the first and second aspirating needles extends into the chamber for providing fluid communication with each of the first and second reservoirs of biological fluid, respectively, so that activation of the first and second pump produces a flow of biological fluid from the first and second reservoirs through the first and second aspirating needles and out of the dispenser head for intermixing at a remote site outside of the dispenser.

4,902,282
TUNED CYCLER SET
Marc Bellotti, Winnetka, Ill.; Ralph Davis, Burlington, Wis., and Arthur Lueders, Mundelein, Ill., assignors to Baxter Travenol Labs. Inc., Deerfield, Ill.
Continuation of Ser. No. 659,206, Oct. 9, 1984, abandoned. This application Jun. 23, 1986, Ser. No. 877,061
Int. Cl.[4] B01D *31/00;* **A61M** *5/00*
U.S. Cl. 604—258 **1 Claim**



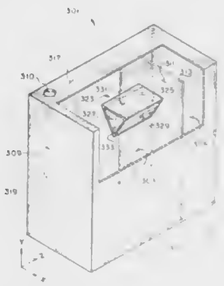
1. An administration set for use in association with a peritoneal dialysis cycler machine having predetermined locations for supporting first, second, and third peritoneal dialysis solution containers, said administration set comprising:
first, second, third, and fourth branch conduits each having essentially the same interior diameter, said first and second branch conduits being essentially equal in length, said third branch conduit being longer than said fourth branch conduit,
a first junction joining an end of said first branch conduit and an end of said second branch conduit in common flow communication with an end of said third branch conduit, the other ends of said first and second branch conduits being individually attachable in flow communication with, respectively, the first and second containers of peritoneal dialysis solution,
a second junction joining the other end of said third branch conduit in flow communication with an end of said fourth branch conduit, the other end of said fourth branch conduit being attachable in flow communication with the third container of peritoneal dialysis solution, and
means defining a bushing located within said fourth branch conduit for restricting fluid flow so that, when the first, second, and third containers are located at their predetermined locations on the cycler machine, the resistance to fluid flow between the third container and said second junction is automatically made essentially equal to the resistance to fluid flow between either the first or second container and said second junction.

4,902,283
ABSORBABLE CLEANING MITT FOR WIPING BABIES
Josef Rojko; Maria Rojko, both of Lienz, Austria; Norbert Leopoldi, Chicago, and Roy A. Weidemann, Lake Bluff, both of Ill., assignors to L.R.W. Enterprises, Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 193,259, May 11, 1988, and a continuation-in-part of Ser. No. 224,431, Jul. 26, 1988. This application Oct. 17, 1988, Ser. No. 258,686
Int. Cl.[4] A61M *35/00*
U.S. Cl. 604—290 **16 Claims**



1. A baby-wipe for wiping and cleaning babies of waste products, and for use in cleaning and wiping invalids, and the like, comprising:
a first and a second layer of water-resistant, flexible material, each of said first and second layers defining a first and a second transverse end edge, and a first and a second longitudinal side edge; said first and second layers being joined together along at least a portion of each of said first end edges and said first and second side edges, and disconnected along at least a portion of each of said second end edges to form thereby a hollow interior volume having an open mouth allowing access therein for the insertion of a hand therein;
a third outer layer of soft, absorbable material having a first and a second transverse end edge, and a first and a second longitudinal side edge; said third outer layer being joined to said first layer along at least a portion thereof;
each of said first and second layers comprising a flap portion at a respective said second transverse end edge, each said flap portion projecting longitudinally outwardly beyond said second transverse end edge of said third layer to define a skirt portion, said skirt portion comprising a line of perforations about at least a lower circumferential portion thereof for use after everting said layers after wiping for tying and closing off the everted layers at the everted open mouth thereof; said line of perforations extending less then the full circumference of said lower circumferential portion of said skirt portion.

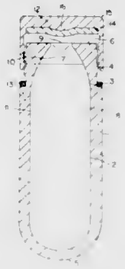
4,902,284
DRY BOTTLE DRAINAGE SYSTEM
Nicholas F. D'Antonio, and Nicholas J. D'Antonio, both of Liverpool, N.Y., assignors to Pfizer Inc., New York, N.Y.
Division of Ser. No. 58,573, Aug. 6, 1987, which is a continuation of Ser. No. 642,564, Aug. 20, 1984, Pat. No. 4,715,855. This application Dec. 27, 1988, Ser. No. 290,158
Int. Cl.[4] A61B *19/00*
U.S. Cl. 604—320 **3 Claims**



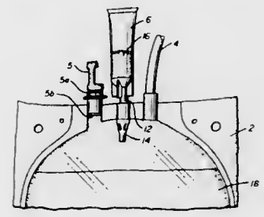
1. A system for draining fluids from a portion of the body, said system comprising:
a container for receiving the fluids, said container including a fluid collection chamber including an entrance port for admitting fluids from the body to said chamber, and said chamber having a center of gravity on a horizontal plane; and an inclined, liquid conduit from said fluid collection chamber, said conduit including a lowermost entrance portion in said chamber disposed at said center of gravity.

4,902,286
CONTAINER FOR FERTILIZATION OF HUMAN OVOCYTES IN THE ABSENCE OF CO_2-ENRICHED AIR
Claude Ranoux, 7 Rue des Grands Champs, 77330 Lesigny, France
PCT No. PCT/FR86/00378, § 371 Date Jul. 6, 1987, § 102(e) Date Jul. 6, 1987, PCT Pub. No. WO87/02879, PCT Pub. Date May 21, 1987
PCT Filed Nov. 7, 1986, Ser. No. 80,537
Claims priority, application France, Nov. 8, 1985, 85 16558
Int. Cl.[4] A61B *19/00*
U.S. Cl. 604—403 **30 Claims**

1. A container for in-vitro fertilization of ovocytes and intravaginal culture, said container being of a size and configuration suitable for accommodation in a human vagina, said container comprising a hollow body containing a culture medium suitable for use in fertilization and culture of human ovocytes and having an orifice, said hollow body having rounded inner walls that are smooth over their entire extent, rupturable sealing means closing said orifice and hermetically sealing off the interior of the hollow body containing culture medium, said rupturable sealing means when ruptured permitting the introduction of ovocytes and spermatozoa into the container body, and a closure means cooperable with the container body and adapted to overlie the orifice, and resealing means operatively disposed between the container body and the closure means for hermetically resealing the container after rupture of the rupturable sealing means and introduction of ovocytes and spermatozoa to permit in-vitro fertilization of the ovocytes and intravaginal culture, the container when hermetically resealed having rounded outer walls that are smooth over their entire extent.



4,902,287
STERILIZABLE SYSTEM FOR BLOOD STORAGE
Raleigh A. Carmen, Concord, and Chi-Yong Chong, San Francisco, both of Calif., assignors to Miles Inc., Elkhart, Ind.
Filed Sep. 24, 1987, Ser. No. 100,647
Int. Cl.[4] A61J *1/00*
U.S. Cl. 604—416 **8 Claims**



1. In a closed, heat sterilizable, blood bag system comprising at least one flexible bag adapted to receive and store a blood component, the improvement comprising a squeezable, resilient compartment extending from the bag vis a conduit and containing a solid, pH buffering material within the compartment, the solid material being separated from the interior of the flexible bag by means of an externally manipulable closure system located outside of the conduit which, when opened, permits the mixture of the solid pH buffering material with the contents of the bag, thereby assuring pH control of the bag contents over prolonged periods of time, the squeezable, resilient compartment providing means for drawing the contents of the flexible bag into the compartment when the closure system is opened.

4,902,288
IMPLANTABLE IMMUNOTHERAPY SYSTEM USING STIMULATED CELLS
Marylou Ingram, 371 Patrician Way, Pasadena, Calif. 91105
Filed Dec. 3, 1985, Ser. No. 804,068
Int. Cl.[4] A61K *9/22, 35/12*
U.S. Cl. 604—891.1 **7 Claims**

1. A method of treating a patient having a tumor comprising,
defining an area occupied by a tumor,
introducing into said area immunologically active cells

which are antagonistic to said tumor with said active cells being carried by a body implantable matrix,
said matrix being biocompatible supporting said cells and being a clot.
7. A method of treating a patient having a tumor comprising,
defining an area occupied by said tumor, introducing into said area immunologically active cells which are antagonistic to said tumor with said active cells being carried by a body implantable matrix,
said cells being antitumor white effector cells and said matrix is a semi-solid to solid matrix from which active effector cells can migrate,
said matrix being biocompatible and supporting said cells.

4,902,289

MULTILAYER BIOREPLACEABLE BLOOD VESSEL PROSTHESIS

Ioannis V. Yannas, Newton Center, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 3,178, Jan. 12, 1987, Pat. No. 4,787,900, which is a continuation of Ser. No. 369,614, Apr. 19, 1982, abandoned. This application Aug. 9, 1988, Ser. No. 230,110
Int. Cl.⁴ A61F *1/24*
U.S. Cl. 623—1 **16 Claims**

1. A multilayer blood vessel prosthesis comprising: a first inner conduit defining a relatively smooth walled lumen, said inner layer is crosslinked aminopolysacchride ride having a mean pore diameter below 10 microns, a wall thickness between 0.1 to 5.0 mm, and a number average molecular weight between crosslinks of between 2000 and 12,000 daltons and
a second outer layer on said first layer, said outer layer formed a crosslinked freeze dried collagen-aminopolysascharide polymer having a mean pore diameter of at least 50 microns and a thickness of at least 1.0 mm.

4,902,290

PROCESS FOR THE PREPARATION OF A VESSEL PROSTHESIS IMPREGNATED WITH CROSSLINKED GELATIN

Peter Fleckenstein, Fuldabrück, and Heinz-Helmut Werner, Melsungen, both of Fed. Rep. of Germany, assignors to B. Braun-SSC AG, Emmenbrucke, Switzerland

Division of Ser. No. 21,129, Mar. 3, 1987, Pat. No. 4,784,659. This application Jul. 29, 1988, Ser. No. 226,434
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608158
Int. Cl.⁴ A61F *2/06*
U.S. Cl. 623—1 **10 Claims**

1. A process for producing impregnated vessel prostheses, wherein a porous vessel prosthesis is impregnated with an aqueous gelatin solution, the gelatin solution is allowed to gel, the gelatin solution is then carefully partially dehydrated and then the impregnating coating obtained is crosslinked with a diisocyanate.

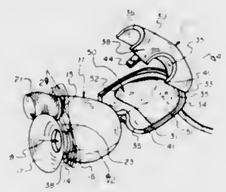
4,902,291

COLLAPSIBLE ARTIFICIAL VENTRICLE AND PUMPING SHELL

Willem J. Kolff, Salt Lake City, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah

Filed Jan. 31, 1989, Ser. No. 286,620
Int. Cl.⁴ A61F *2/22*
U.S. Cl. 623—3 **19 Claims**

1. An artificial ventricle for use as part of a total artificial heart for implantation within a living being as part of its circulatory system, said ventricle comprising:
a soft and flexible blood pumping sac having extended (diastolic) and contracted (systolic) configurations and wall structure sufficient in size to develop adequate stroke volume for sustaining life within the living being, said blood sac having sufficient flexibility to collapse to a substantially flattened, squeezed or rolled up soft structure of reduced size to facilitate surgical implantation within restricted space of the chest cavity of the living being;
an inlet port positioned within the wall structure and having means for attachment to the atrium or other soft tissue of the circulatory system to form a continuous flow line therewith, said inlet port including means for receiving a oneway valve;
an outlet port positioned within the wall structure and having means for attachment to the aorta, pulmonary artery or other soft tissue of the circulatory system to form a continuous flow line therewith, said outlet port including means for receiving a one-way valve;
a semi-rigid shell structurally separable from the blood pumping sac and having closure means for developing closed and open configurations respectively permitting insertion around and removal from the blood pumping sac in situ with the circulatory system;



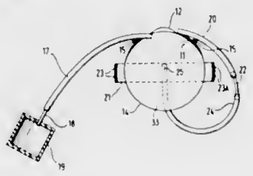
said closure means and shell providing a closed shell configuration slightly larger in shape and size at an interior surface than the extended configuration of the wall structure of the blood pumping sac and being structured to totally enclose the sac;
said shell including an opening for the inlet and outlet ports and sealing means to provide a circumferential seal at respective junctures of the shell with the inlet and outlet ports;
said closure means and shell further providing an open configuration enabling insertion of the contracted sac through a shell opening and removal of the shell from around the sac without affecting attachment of the sac as part of the circulatory system; and
pump means coupled through the rigid shell to enable alternating extension and collapse of the blood pumping sac in recurring pumping manner when the shell is in the closed configuration to allow inflow and expulsion of blood from the blood sac.

4,902,292

VITREOUS BODY PROSTHESIS DEVICE

Neil H. Joseph, P.O. Box 8241, Dhahran 31311, Saudi Arabia, Saudi Arabia

Filed Mar. 14, 1988, Ser. No. 167,352
Claims priority, application United Kingdom, Mar. 30, 1987, 8707503
Int. Cl.⁴ H61F *2/14, 2/16*
U.S. Cl. 623—4 **21 Claims**



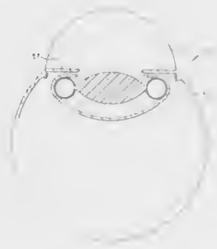
1. A vitreous body prosthesis device for the replacement of a natural vitreous body comprising a thin-walled, inflatable and substantially spherical balloon having a posterior portion adapted for apposition to the retina of the eye and an anterior portion, said balloon being made of bio-compatible material; means for stabilizing and fixing the balloon within the vitreous cavity of the eye; an inflow tube made of bio-compatible material and in fluid-tight co mmunication with the interior of the balloon; and, means for introducing fluid into the inflow tube, and for removing fluid from the inflow tube, whereby the degree of inflation of the balloon can be controlled.

4,902,293

INTRAOCULAR LENS WITH INFLATABLE HAPTIC

Fred T. Feaster, 800 8th Ave., Suite 234, Fort Worth, Tex. 76104

Filed Apr. 13, 1989, Ser. No. 337,260
Int. Cl.⁴ A61F *2/16*
U.S. Cl. 623—6 **2 Claims**



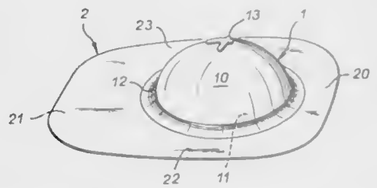
1. An intraocular implant suitable for use as an artificial lens implant in a human eye comprising:
a non-inflatable, non-expandable optic member having a central axis and an outer periphery, and
inflatable haptic means coupled to and circumferentially surrounding said outer periphery of said optic member for engaging the tissue of a human eye and positioning said optic member in the eye when said haptic means is inflated.

4,902,294

IMPLANTABLE MAMMARY PROSTHESIS ADAPTED TO COMBAT THE FORMATION OF A RETRACTILE SHELL

Olivier Gosserez, Quartier Didier Allée de la Louisiane, 97200 Fort de France, Martinique, France

Filed Nov. 30, 1987, Ser. No. 124,856
Claims priority, application France, Dec. 3, 1986, 86 16893
Int. Cl.⁴ A61F *2/12*
U.S. Cl. 623—8 **16 Claims**



1. Implantable mammary prosthesis adapted to combat the formation around it of a retractile shell in reaction to a foreign body, comprising a flexible pocket having a generally circular base, made from a surgical grade biocompatible film material and being dome shaped when filled with an appropriate fluid, and a substantially flat flexible sheet of surgical grade biocompatible film material, said circular base being integral with said flexible sheet, a base perimeter being defined on the flexible sheet at the perimeter of the circular base; wherein the improvement comprises a flexible peripheral flange formed by the flexible sheet extending continuously circumferentially around the base perimeter and extending outwardly therefrom a distance equal to at least one fifth the radius of said circular base, whereby said flexible periphery flange prevents fibrous membrane from causing capsular contraction about said mammary prosthesis.

4,902,295

TRANSPLANTABLE ARTIFICIAL TISSUE

Bennie J. Walthall, El Sobrante; Yvonne E. McHugh, Berkeley, and Houston F. Voss, Pleasanton, all of Calif., assignors to Hana Biologics, Inc., Alameda, Calif.

Continuation of Ser. No. 770,027, Aug. 26, 1985, abandoned. This application Nov. 6, 1987, Ser. No. 118,280
Int. Cl.⁴ A61F *2/02*
U.S. Cl. 623—11 **7 Claims**

1. A matrix composition comprising viable cells incorporated throughout a porous matrix of non-toxic biocompatible polymer substantially free from fibroblasts, said biocompatible polymer consisting essentially of the product of the polymerizations of a matrix polymer precursor and a reversible gel polymer, the matrix having a particle size of from 0.02 to 3 mm; a pore structure and size permitting cell movement throughout the matrix, movement of host cells into the matrix, diffusion of nutrients and macromolecules into and out of the matrix; wherein the composition is free from encapsulation in a semi-permeable membrane.

4,902,296

USE OF DEMINERALIZED BONE MATRIX IN THE REPAIR OF SEGMENTAL DEFECTS

Mark E. Bolander, Washington, D.C., and Gary Balian, Charlottesville, Va., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Division of Ser. No. 924,513, Oct. 29, 1986, Pat. No. 4,743,259. This application Oct. 29, 1987, Ser. No. 114,002
Int. Cl.⁴ A61F *2/28;* A61K *35/12;* A01N *1/02*
U.S. Cl. 623—16 **4 Claims**



1. Biological grafting material, comprising:
milled bone initially coated with guanidine-extracted bone proteins which are dialyzed from solution, wherein unbound bone proteins are removed; and
subsequently coated with anti-coagulated plasma containing plasma proteins, wherein unbound plasma proteins are removed.

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4,902,297

COMPOSITE IMPLANT PROSTHESIS

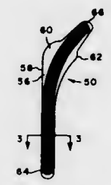
Thirumalai N. C. Devanathan, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

Continuation of Ser. No. 277,531, Nov. 28, 1988, abandoned, which is a continuation of Ser. No. 835,486, Mar. 3, 1986, abandoned. This application Jun. 21, 1989, Ser. No. 373,645

Int. Cl.[4] **A61F** *2/28, 2/32;* **B05D** *3/02;* **D04C** *1/00*

U.S. Cl. 623—16 **2 Claims**

1. A composite implant prosthesis comprising a core formed by a plurality of substantially unidirectional strands of fiber, each fiber extending substantially over the complete length of the core, an inner casing defined by a braided material enclosing the core over its entire length to form a rigid member, and an outer casing enclosing the inner casing and defining an outer surface contour for the composite implant prosthesis, the core and the inner casing defining a substantially uniform width from one end to the other end while the outer casing defines an



irregular width from the one end to the other end to accommodate disposition of the prosthesis adjacent a bone.

4,902,298

TANNING COMPOSITION AND ITS USE IN THE TANNING AND POST-TANNING OF ANIMAL HIDES

Mauro D'Elia, San Donato Milanese, and Angelo Romano, Cesano Maderno, both of Italy, assignors to Prodeco S.p.A., Milan, Italy

Filed Dec. 27, 1988, Ser. No. 290,442

Claims priority, application Italy, Jan. 15, 1988, 19079 A/88

Int. Cl.[4] **C14C** *3/08*

U.S. Cl. 8—94.33 **9 Claims**

1. Tanning composition containing:

(a) from 25 to 40% by weight of an aluminum chlorohydroxide, definable by means of the general formula:

$$Al_2(OH)_{1.5-3.0}Cl_{4.5-3.0}$$

(b) from 5 to 20% by weight of the product of condensation of dicyandiamide and formaldehyde, containing free methylol groups;

(c) from 35 to 55% by weight of basic chrome sulphate, expressed as an aqueous solution at 12% by weight of chrome oxide (Cr_2O_3); and

(d) from 5 to 15% by weight of polyacrylic acid, polymethacrylic acid or a copolymer of acrylic and methacrylic acid with a molecular weight comprised within the range of from 1,000 to 100,000.

4,902,299

NYLON FABRICS WITH CUPRIC SALT AND OXANILIDE FOR IMPROVED DYE-LIGHTFASTNESS

Anthony Anton, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1989, Ser. No. 316,638

Int. Cl.[4] **D06P** *5/02*

U.S. Cl. 8—442 **1 Claim**

1. An improved dyed nylon fabric that is suitable for use in automotive upholstery, and is provided with dye-lightfastness by the presence of a cupric salt, the improvement being characterized by the presence of oxanilide, in addition to the cupric salt.

4,902,300

SIMULTANEOUSLY DYED AND FLAME-RETARDED FABRIC BLENDS

James R. Johnson, McLeansville, N.C., and Randolph L. Finley, Florence, S.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 52,937, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 870,892, Jun. 5, 1986, abandoned. This application May 19, 1988, Ser. No. 195,858

Int. Cl.[4] **D06M** *9/00*

U.S. Cl. 8—532 **25 Claims**

1. A process for simultaneously dyeing and imparting flame resistance to a polyester/cellulosic blend fabric, containing at least 35% by weight polyester, comprising the successive steps of:

(1) applying a dyebath containing a tinctorial amount of at least one dye for the polyester fibers, a tinctorial amount of at least one dye for the cellulosic fibers, and a flame retarding amount of a cyclic phosphonate ester flame retardant to the polyester/cellulosic blend fabric;

(2) drying the fabric and heating the fabric to allow the polyester dye and flame retardant to thermosol into the polyester fibers;

(3) treating the fabric to fix the dye on to the cellulosic fibers; and

(4) washing the fabric to remove any unfixed dye or components of the dyebath from the fabric.

4,902,301

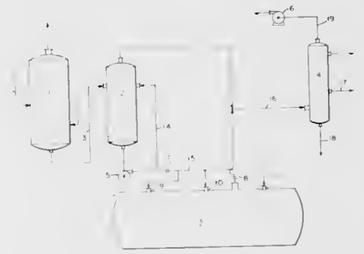
PROCESS FOR SHIPMENT OF SODIUM CYANIDE SLURRIES

Janet M. Rogers, Cordova, Tenn., and Harold F. Porter, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 25, 1988, Ser. No. 186,043

Int. Cl.[4] **C01D** *1/30;* **C01C** *3/08*

U.S. Cl. 23—302 T **6 Claims**



1. A process for preparing sodium cyanide for shipment comprising, (a) forming a slurry of sodium cyanide crystals to be shipped which has a concentration greater than 58 wt. % total sodium cyanide at a temperature above about 35° C. and contains from about 1 to 5 wt. % of a base selected from sodium hydroxide or sodium carbonate, and (b) evaporatively cooling the slurry in a shipping container while minimizing the settling out of said crystals to a temperature below the anhydrous/dihydrated transition temperature to form a sodium cyanide dihydrate product having no more than about 5 wt. % liquid.

4,902,302

CONSERVATION OF MOMENTUM IN A BARRIER OXIDATION DITCH

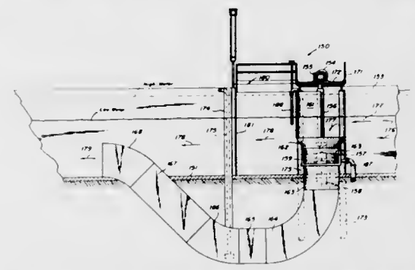
John H. Reid, 1211 Caroline St., Fredericksburg, Va. 22401

Continuation of Ser. No. 795,238, Nov. 5, 1985, abandoned, which is a continuation of Ser. No. 282,592, Jul. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 848,705, Nov. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 649,995, Jan. 19, 1976, abandoned. This application Jun. 17, 1987, Ser. No. 63,257

The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.

Int. Cl.[4] **C02F** *3/22*

U.S. Cl. 210—628 **4 Claims**



1. A method of propelling and heterogeneously aerating mixed liquor flowing in an endless channel of an oxidation ditch, said endless channel having a bottom, said method comprising the steps of:

(a) providing means for propelling a portion of said mixed

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liquor downwardly to a depth beneath the bottom of said endless channel;

(b) disposing a barrier means, having an opening therethrough, across said endless channel and downstream of said propelling means;

(c) permitting the remaining portion of said mixed liquor within said endless channel to flow past said downwardly propelling means and to flow through said opening in said barrier means without a substantial change in direction of flow thereof;

(d) supplying an oxygen-containing gas to said downwardly propelled mixed liquor; and

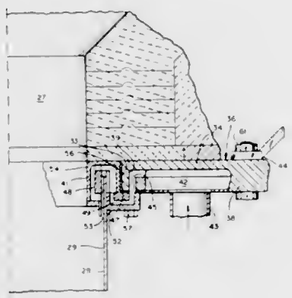
(e) redirecting said downwardly propelled mixed liquor toward the direction of flow of said flowing mixed liquor to form a combined flow with said remaining portion.

4,902,303

SEPARABLE QUENCH RING AND DISTRIBUTION CHANNEL FOR A GASIFICATION REACTOR

Alfred L. Den Bleyker, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 10, 1988, Ser. No. 269,325
Int. Cl.[4] C10J *3/82*
U.S. Cl. 48—69 **6 Claims**



1. In a gasification reactor (10) for combusting a carbonaceous fuel mixture to produce a hot effluent stream comprised primarily of a usable gas, said reactor including:

a reactor shell (11),

a refractory lined combustion chamber (12) in said shell,

a burner (14) extending through said shell into the combustion chamber and communicated to a means for supplying a pressurized carbonaceous fuel mixture, for discharging a flow of the fuel mixture into the combustion chamber, whereby to combust the mixture and form a said hot effluent stream,

means in said shell forming a quench chamber (26) including a liquid bath (21) beneath said combustion chamber (12),

means forming a constricted throat (27) in said shell interconnecting the combustion chamber (12) to said quench chamber (26) for conducting said hot effluent stream, from the combustion chamber to the quench chamber,

a dip tube (29) positioned in said shell (11) defining an effluent guide passage, said dip tube having an inlet positioned adjacent to said constricted throat (27) for guiding said hot effluent stream from said combustion chamber into the liquid bath 21, of the quunch chamber, the improvement therein of

a multi-segment quench ring assembly (36) depending from said shell and positioned in alignment with said constricted throat to receive the hot effluent stream therefrom, including;

a first toroidal ring segment (34) having an annular coolant passage (42) connected to a pressurized liquid supply means, and having an internal rim (33) defining a recessed receptacle, (41)

a second ring segment removably registered in said recessed receptacle, (41) having an internal manifold channel (48) in fluid communication with said annular coolant passage (42) and having at least one means forming a discharge port (53) in liquid communication with said internal manifold channel (48) and directed onto said dip tube and

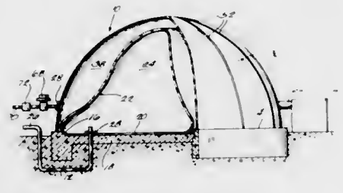
fastening means (57) removably registering said second ring segment in the recessed receptacle (41) of said first toroidal ring segment.

4,902,304

SEPARATE LOW PRESSURE GAS STORAGE SYSTEM

Walter R. Hallen, Oconomowoc, Wis., assignor to Envirex Inc., Waukesha, Wis.

Continuation of Ser. No. 860,613, May 7, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 147,585
Int. Cl.[4] F17B *1/14, 1/26*
U.S. Cl. 48—174 **10 Claims**



1. A gas storage system comprising:

a floor;

anchor means surrounding the floor;

a flexible floor membrane positioned upon said floor and having a periphery being substantially co-extensive with said anchor means;

a flexible gas storage membrane overlying said flexible floor membrane and having a periphery sealingly secured to the periphery of said flexible floor membrane, said flexible gas storage membrane and said floor membrane forming a flexible gas storage chamber therebetween;

gas inlet and outlet means connecting said gas storage chamber to a supply of gas;

a flexible air membrane having an exterior and encompassing said gas storage membrane and having a periphery sealingly secured to said periphery of said flexible gas storage membrane, said flexible air membrane overlying said flexible gas storage membrane to form a flexible cover over said flexible gas storage membrane and to form an air chamber over said gas storage chamber;

air supply means;

air inlet means connecting said air chamber with said air supply means;

air outlet means for venting air from said air chamber; and

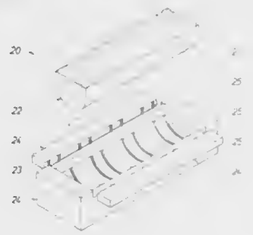
a plurality of flexible restraining members extending over the flexible air membrane for restraining the inflated flexible air membrane, said flexible restraining members each having two ends and positioned against the exterior of said flexible air membrane so that at least one of said ends is secured to said anchor means.

4,902,305

SEMI-CYLINDRICAL METAL POLISHING ELEMENT

Sachiko Ihata, Osaka, Japan, assignor to Nippon Tenshashi Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 60,589, Jun. 11, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,720
Int. Cl.[4] C23F *1/02*
U.S. Cl. 51--293 **1 Claim**



1. A semi-cylindrical metal polisher made by the process comprising the steps of:

providing a flat metal matrix having a plurality of polishing teeth raised and integrally formed on a surface thereon;

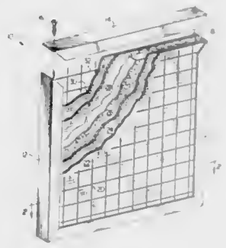
shaping said flat metal matrix with a die set comprising a semi-cylindrical die having a plurality of circumferentially extending convex line portions on its face to thereby provide a semi-cylindrical metal matrix having a plurality of circumferential grooves on its surface with the polishing teeth present on said flat metal matrix in the regions of said convex line portions of said female die being crushed and flattened at the bottom of said grooves as said semi-cylindrical metal polisher is shaped.

4,902,306

DUAL-DIPOLE ELECTROSTATIC AIR FILTER

Gilbert W. Burnett, and Paul D. Jackson, both of Rockwall, Tex., assignors to Air Purification Products International, Inc., Royse City, Tex.

Filed Aug. 9, 1988, Ser. No. 230,075
Int. Cl.[4] B03C *3/02*
U.S. Cl. 55--6 **4 Claims**



4. A method of filtering air comprising the steps of:

filtering air through a first positively charged woven polypropylene electrostatic filtering element and a first negatively charged woven polypropylene electrostatic filtering element adjacent said first positively charged woven polypropylene electrostatic filtering element;

filtering the air through an open cell polyurethane foam layer after said steps of filtering the air through said first positively charged and said first negatively charged electrostatic filtering elements; and

filtering air through a second positively charged woven polypropylene electrostatic filtering element and a second negatively charged woven polypropylene electrostatic filtering element adjacent said first positively chargeable woven polypropylene electrostatic filtering element after filtering the air through said polyurethane foam layer.

4,902,307

SYNTHESIS OF SiO_2 MEMBRANE ON POROUS SUPPORT AND METHOD OF USE OF SAME

George R. Gavalas, Altadena, Calif., and Constantin E. Megiris, Eemnes, Netherlands, assignors to California Institute of Technology, Pasadena, Calif.

Filed Nov. 18, 1988, Ser. No. 273,241
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **14 Claims**



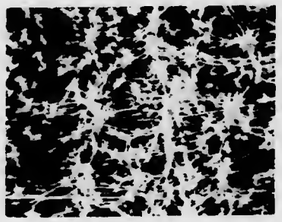
1. A method of separating hydrogen from a gaseous mixture comprising passing the mixture into a membrane comprising a porous support tube having a non-porous film of amorphous SiO_2 in the pores of said tube, said film having been formed by flowing a first reactant inside said support tube and a second reactant outside said support tube, and causing said reactants to diffuse in opposite directions and meet within said pores.

4,902,308

COMPOSITE MEMBRANE

Robert S. Mallouk, Box 332, R.D. #1, Chadds Ford, Pa. 19317, and Phillip A. Branca, 132 Country Flower Rd., Newark, Del. 19711

Filed Jun. 15, 1988, Ser. No. 206,884
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **12 Claims**



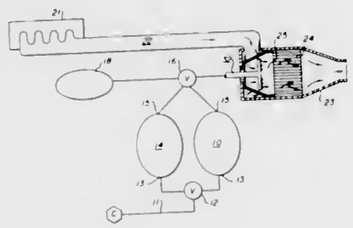
12. The method of avoiding false-positive detection of the presence of organic nerve gas agents by a sensor adapted to detect said presence by employing in said sensor a porous composite membrane comprising a film of porous, expanded polytetrafluoroethylene whose surfaces, both exterior and within its pores, are coated with a metal salt of a perfluorocation exchange polymer, said composite acting as a scavenger of unwanted gas components which cause said false-positive signals.

4,902,309

IMPROVED METHOD FOR THE IGNITION AND COMBUSTION OF PARTICULATES IN DIESEL EXHAUST GASES

George T. Hempenstall, 520 Woodlake Dr., Louisville,, Ky. 40223

Continuation of Ser. No. 65,837, Jun. 24, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 266,076
Int. Cl.[4] B01D *53/04, 39/20*
U.S. Cl. 55—33 15 Claims



1. A process for low temperature combustion of diesel particulates trapped in a vehicle emission filter using compressed air produced by compressor means in the vehicle air brake system comprising the steps of:

a. adsorbing oxygen from compressed air used to actuate a vehicle air brake system by allowing the compressed air to flow into an adsorber means within a container;

b. venting the compressed oxygen depleted air from the container into the vehicle air brake system;

c. desorbing the sorbed oxygen enriched air so that it has an enriched oxygen content ranging from 30 to 60% O_2;

d. feeding the pressurized enriched oxygen into exhaust gases entering a diesel filter comprising a plurality of cells so that the combined gases in the cells have an enriched oxygen content which is greater than 20.8% O_2; and

e. burning the oxygen enriched exhaust gases to a temperature range from 250° to 400° C. for combustion of filter particulates.

3. Apparatus for removing particulates from a flow of exhaust gas exhausted from a diesel engine and trapped in a filter comprising:

means for producing compressed air,

oxygen saturation means connected to the means for producing compressed air comprising at least one container provided with oxygen adsorber means receiving said compressed air and adsorbing oxygen therefrom; means to desorb oxygen from said oxygen adsorber means to form oxygen enriched air having more than 20.8% O_2,

conduit means providing communication of said oxygen saturation means with a filter, said filter comprising a porous ceramic monolithic structure defining a plurality of cells which extend through the structure, and

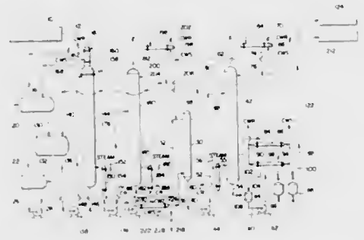
valve means positioned in said conduit means to selectively direct oxygen enriched air of at least 20.8% O_2 into the cells of said filter which with the exhaust gases passing into said filter provide for combination of particulates trapped in said filter.

4,902,310

PROCESS FOR REMOVING HALOGENATED HYDROCARBONS FROM SOLVENT STREAMS

Thomas E. Vara, and Jerald L. Mestemaker, both of Vero Beach, Fla., assignors to Vara International, Inc., Vero Beach, Fla.

Continuation-in-part of Ser. No. 286,655, Dec. 19, 1988. This application May 16, 1989, Ser. No. 352,479
Int. Cl.[4] B01D *5/00*
U.S. Cl. 55—46 18 Claims



1. A process for recovering halogenated hydrocarbons from solvent streams including water and at least one impurity, comprising the steps of:

(a) separating the solvent stream into a halogenated hydrocarbon rich fraction containing water and impurity, and a water rich fraction containing impurity and halogenated hydrocarbon;

(b) separating impurity from the halogenated hydrocarbon rich fraction of step (a), said separation including liquid-liquid extraction with water;

(c) separating said impurity and halogenated hydrocarbon from said water fraction of step (a), said separation step including distillation and producing a product water;

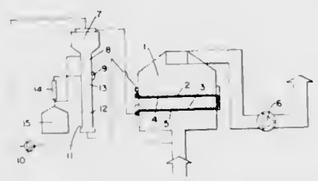
(d) recycling said product water from step (c) to the liquid-liquid extraction of step b) for contact with said halogenated hydrocarbon rich fraction.

4,902,311

AIR PURIFICATION PROCESS

Kent Dingfors, Upplands Väsby; Christer Heinegård, Karlskoga, and Sven Nilsson, Deje, all of Sweden, assignors to Nobel Chematur AB, Karlskoga, Sweden

Filed Oct. 13, 1988, Ser. No. 256,955
Claims priority, application Sweden, Oct. 14, 1987, 8704005
Int. Cl.[4] B01D *53/12*
U.S. Cl. 55—60 7 Claims



1. A method for removing and recovering organic substances, primarily solvents, from contaminated industrial ventilation air from which said organic substances upon passage of the air through a mobile, fluidized bed are adsorbed by a particulate, regeneratable adsorbent whose particle size, pore volume and density are selected with respect to the construction of the fluidized bed, whereas the pore size of said particles, the pore size distribution, the specific surface area and the chemical properties of the surfaces of said particles are selected with respect to the organic substances to be adsorbed by said particles, and in which method the adsorbent, subsequent to contact with industrial ventilation air, is fed further to a stripper in which the adsorbent is regenerated by supplying heat thereto and from which the resultant solveot vapour is passed to a cooler such as to obtain a solvent condensate, which is recovered, said method comprising the steps of:

selecting said adsorbent in the form of a particulate, macroporous polymer and introducing said adsorbent into a cycle flow between the fluidized bed for adsorption of solvent from the industrial ventilation air and said stripper in which the macroporous polymer is desorbed while being passed through the stripper during the successive application of heat;

removing the solvent vapours generated in said stripper together with air which is fed through the stripper in counterflow to the polymer;

withdrawing the resultant solvent-air mixture from the stripper subsequent to having passed one or more mutually different zones within which the macroporous polymer is heated to such an extent as to reach temperatures which correspond to the desorption of solvents of mutually different boiling points;

feeding solvent-air mixture withdrawn from respective zones to a respective cooler in which the solvent vapours are condensed and the solvents recovered while air containing residual solvent vapours are fed back to the stripper at a location at which the absorbent is still cold; and

sucking the air supplied to the stripper as a vehicle medium for the solvent vapours in through the stripper outlet through which the polymer particles desorbed in the stripper exit therefrom, said air thereby cooling the polymer particles leaving the stripper ready to be returned to the fluidized bed while, at the same time, progressively heating the air itself.

4,902,312

CARBON MOLECULAR SIEVES FOR PURIFICATION OF CHLOROFLUOROCARBONS

Chin-Hsiung Chang, Palatine, Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jan. 30, 1989, Ser. No. 304,060
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—71 9 Claims

1. A process for the removal of hydrofluoric and hydrochloric acids from chlorofluorocarbons comprising contacting said chlorofluorocarbons at removal conditions with a sufficient amount of a carbon molecular sieve having an average pore size of about 3.5 Angstroms with no more than about 5% of the pores having a size less than 3.2 Angstroms and no more than about 5% of the pores having a size greater than 4.2 Angstroms.

4,902,313

APPARATUS AND METHOD OF REDUCING POLLUTION FOR TIRE BUFFING EQUIPMENT

Albert P. Penter, 427 Pintail Dr., Loveland, Ohio 45140

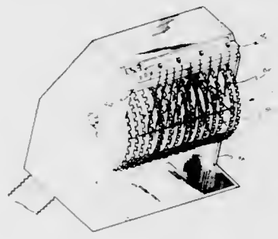
Filed Apr. 17, 1989, Ser. No. 334,821
Int. Cl.[4] B01D *47/12*
U.S. Cl. 55--84 14 Claims

14. A method of reducing pollution during tire buffing comprising the steps of:

placing a tire into position for contacting the blades of a rotating rasp and defining a tread grinding area;

directing a narrow air stream curtain across the cutting width of the rasp and onto the blades immediately ahead of the tread grinding area; and

directing a water mist between the air curtain and the rasp blades for mixing with the air to congeal or coagulate dust



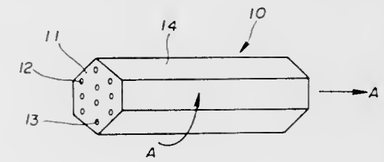
and tread particles created during buffing into larger size particles.

4,902,314

GAS FILTER

Hiroshi Mizukami, 2-6-14, Takatori, Sawaraku, Jukuoka-Shi, Hukuoka, and Hideo Tukazaki, Toride, both of Japan, assignors to Hidetoshi Nakajima, Tokyo; Hiroshi Mizukami, Hukuoka and Kuniaki Watanabe, Chiba, all of, Japan

Continuation-in-part of Ser. No. 125,620, Nov. 25, 1987, abandoned. This application May 22, 1989, Ser. No. 354,708
Int. Cl.[4] B01D *39/20*
U.S. Cl. 55—97 5 Claims



1. A gas filter for removing dust from a dry gas used in the manufacture of semiconductor devices, the gas filter comprising a ceramic honeycomb structural body with a number of gas flow holes with a generally circular cross-section and a fine ceramic film coated onto the inner surfaces of the gas flow holes, said body including a support layer having a thickness of more than about 2 mm and provided with pores having a diameter between about 10 and 15 μm formed between two adjacent gas flow holes to provide a bulkhead therebetween, wherein the gas to be filtered is passed from the outer peripheral surface of the honeycomb structural body toward the gas flow holes.

4,902,315

NEGATIVE PRESSURE ASBESTOS REMOVAL WITH LOCALIZED MAKE-UP AIR

R. Christopher Spicer, 236 Merion Ave., Haddonfield, N.J. 08033

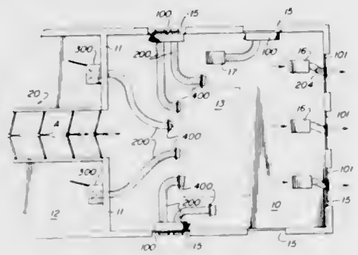
Continuation of Ser. No. 126,390, Nov. 30, 1987, abandoned. This application May 26, 1989, Ser. No. 358,276
Int. Cl.[4] B01D *46/42*
U.S. Cl. 55—97 12 Claims

1. A method of removing airborne contaminant material from a work area where contaminant material is being removed, said method comprising the steps of:

isolating said work area from the surrounding environment;

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providing at least one entrance into said isolated work area;
creating a negative pressure differential between said isolated work area and the area outside said work area;
introducing air into said isolated work area directly to the vicinity where said contaminant material is being removed in order to entrain airborne contaminant material created when said contaminant material is being removed;
providing manifold means between said isolated work area and said area outside said work area for controlling the introduction of air into said work area and for directing the flow of air to the vicinity where said contaminant material is being removed, said manifold means being comprised of:
a backboard positioned between said work area and the area outside said work area, said backboard having at least one opening therethrough,



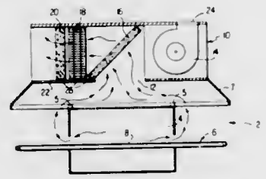
duct means extending into said work area to the vicinity where said contaminant material is being removed for providing air directly thereto,
sleeve means connected to said duct means and in communication with said opening through said backboard extending into said work area for connecting said duct means to said backboard in communication with said opening, and
air flow control means within said sleeve means for controlling the flow of air from outside said work area into said work area through said sleeve means and said duct means; and
filtering the air within said isolated work area to remove said entrained contaminant material therefrom.

4,902,316

OVEN INCLUDING A VENTLESS EXHAUST SYSTEM

William O. Giles, Sr., Montgomery; William T. McNeal, Prattville, and Ted W. Giles, Montgomery, all of Ala., assignors to Giles Enterprises, Inc., Montgomery, Ala.

Continuation-in-part of Ser. No. 183,681, Apr. 19, 1988, Pat. No. 4,854,949. This application Oct. 28, 1988, Ser. No. 281,664
Int. Cl.[4] B03C *3/01*
U.S. Cl. 55—126 **10 Claims**



1. Apparatus for cooking food comprising:
oven means for baking food, said oven means comprising conveyor means for moving food through the oven means;
hood means comprising an opening for receiving fumes from the oven means;
filter means for receiving and cleaning substantially all the fumes entering the hood means from the oven means, said filter means comprising electrostatic precipitator means for removing particulates from the fumes passing therethrough;
fan means for moving said fumes through the filter means and for recirculating cleaned, filtered air having less the 0.1 gram/cubic foot impurities into interior room space.

4,902,317

PURIFYING APPARATUS FOR GASEOUS FLUIDS

Paul Gutermuth, Augustastrasse 48 D 6456, Langenselbold, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,661
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 8712092[U]; Mar. 16, 1988, 8803568[U]
Int. Cl.[4] B01D *45/08*
U.S. Cl. 55—257.2 **14 Claims**



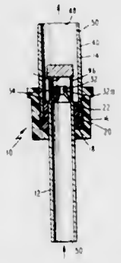
1. An apparatus for purifying gaseous fluids by separating contaminants existing therein comprising at least a first profile section with free longitudinal edges of borders of the profile section overlapping free longitudinal edges of the borders of a second profile section, said first and second profile sections being arranged in two opposite rows open in cross-section and channel-shaped to form separator areas, and projections starting at inner surfaces of the profile section and extending in the longitudinal direction, characterized in that the apparatus comprises a closed body with inflow and outflow openings for the fluid whose outer surfaces are formed by the separator areas which acts as the fluid inflow openings.

4,902,318

INLET APPARATUS FOR GAS-AEROSOL SAMPLING

Robert K. Stevens, Raleigh, and Charles Stone, Carrboro, both of N.C., assignors to The United States of America as represented by Administrator U.S. Environmental Protection Agency, Washington, D.C.

Filed May 25, 1988, Ser. No. 201,242
Int. Cl.[4] B01D *53/30*
U.S. Cl. 55—270 **12 Claims**



1. A gas-aerosol sampling system, comprising
(a) an inlet comprising an elutriator column having an inlet at one end for admitting a gas-aerosol sample and an impact accelerator jet outlet at the other end opposite said one end, the inner surface of said elutriator column being provided with a coating of polytetrafluoroethylene-containing polymer and an impactor member connected with said elutriator column at the other end of said column, said impactor member including
(i) a housing surrounding the impact accelerator jet outlet, the inner surface of said housing being provided with a coating of polytetrafluoroethylene-containing polymer, and
(ii) an impactor surface arranged within the housing and opposite the impact accelerator jet outlet, the impact accelerator jet outlet delivering the gas-aerosol sample to said impactor surface to achieve separation of large size particles from said gas-aerosol sample; and
(b) a filter member connected with the impacted member housing, wherein the gas-aerosol sample from which the larger size particles have been removed is passed from the housing to the filter member for collection of the fine particles.

4,902,319

GAS FILTER

Yoshihisa Kato, Toyota; Takashi Ogawa, Kariya, and Hideo Tsukazaki, Toride, all of Japan, assignors to Kuniaki Watanabe and Hidetoshi Nakajima, both of, Japan

Filed Apr. 5, 1989, Ser. No. 333,224
Claims priority, application Japan, Apr. 14, 1988, 63-49385
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—523 **5 Claims**



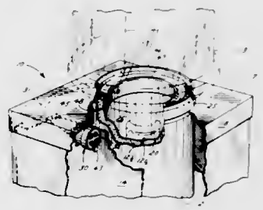
1. A gas filter, for mounting in a casing having a gas inlet and a gas outlet, comprising:
a ceramic honeycomb body having a plurality of interior gas passages, a gas permeable exterior wall and gas inlet and gas outlet ends;
a sealing glass film attached to the face of the gas outlet end of the ceramic honeycomb body said sealing glass film having a plurality of openings allowing filtered gas to exit said passages;
a fine ceramic porous film coating on the inside surface of each of said gas passages;
a porous sealing member adhered to the face of the gas inlet end of the ceramic honeycomb body to seal off said gas passages, the sealing member being made of a fine ceramic material the pores of which are smaller than the pores of said fine ceramic film coatings, the sealing member having a gas flow channel in its side facing outwardly of said body so that gas which is introduced through the gas flow channel may pass into said gas passages through said exterior wall of the ceramic honeycomb body when said filter is mounted within the casing.

4,902,320

BOTTLED WATER COOLER AIR FILTER

William L. Schroer, Freeport, and Kraig S. Kniss, Lanark, both of Ill., assignors to Elkay Manufacturing Company, Oak Brook, Ill.

Division of Ser. No. 115,813, Nov. 2, 1987, Pat. No. 4,834,267. This application Feb. 13, 1989, Ser. No. 310,234
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—385.1 **10 Claims**



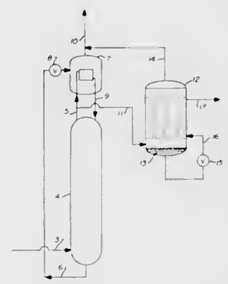
1. An air filtering system for permitting clean air intake to an otherwise air sealed region comprising, in combination, a gasket forming a portion of what defines said air sealed region, a valve and filter housing, a conduit connecting the interior of said housing to and through said gasket for transmitting air from the housing to said region, a filter element carrying a filter medium removably fitted on said housing so as to otherwise close the interior of the housing except for said conduit, a normally closed valve in said housing for sealing said conduit from the interior of said housing, and means on said filter element for opening said valve when the element is fitted on said housing, whereby air can pass through said filter medium, through said conduit and into said region, said valve being closed when the filter element is removed from the housing.

4,902,321

CRYOGENIC RECTIFICATION PROCESS FOR PRODUCING ULTRA HIGH PURITY NITROGEN

Harry Cheung, Buffalo, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 16, 1989, Ser. No. 324,444
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—24 **11 Claims**



1. Process for producing ultra high purity nitrogen comprising.
(a) introducing compressed feed air into a cryogenic rectification zone;
(b) separating the compressed feed air by cryogenic rectification to produce higher pressure nitrogen-rich vapor containing lower boiling impurities;
(c) partially condensing nitrogen-rich vapor to produce

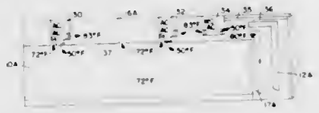
nitrogen-richer liquid and vapor enriched with lower boiling impurities;
(d) expanding the nitrogen-richer liquid to produce lower pressure nitrogen-richer fluid;
(e) passing the resulting lower pressure nitrogen-richer fluid in indirect heat exchange with the nitrogen-rich vapor to carry out the partial condensation of step (c) and to produce nitrogen-richer vapor; and
(f) recovering nitrogen-richer vapor a ultra high purity nitrogen product.

4,902,322

SUPPLEMENTAL AIR CONDITIONING SYSTEM FOR BUILDING

Ronald Grinblat, 230 Parsells La., Closter, N.J. 07624

Filed Dec. 21, 1988, Ser. No. 287,837
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—259.1 **4 Claims**



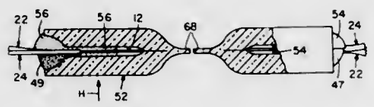
1. A supplemental air conditioning system for a space in a building to lower the costs of using the building condenser water, used to cool the condensers of water cooled air conditioning units, said building having a core and a plurality of floor spaces and supplying said condenser water and cooled air, each floor space having a ceiling plenum formed by a drop ceiling, air conditioning ducts within the ceiling plenum to conduct said cooled air from the building core to the floor spaces, and air return means to draw heated air from the ceiling plenum and conduct said heated air to the building core, said building having a supply of said condenser water, characterized in that the supplemental air conditioning system comprises at least one air-cooled air conditioner unit and at least one water-cooled air conditioner unit having a condenser cooled by said building condenser water and located within said floor space to lower the temperature thereon in the range of 2°–10° F., each of said units blowing out cold air, with the ratio of tons of air conditioning capacity between said respective units being in the range of 85:15 to 70:30 and with the water-cooled unit blowing cold air into the ceiling plenum and the air-cooled unit blowing cold air to the floor space below said drop ceiling.

4,902,323

METHOD OF MAKING FIBER OPTIC COUPLER

William J. Miller, and Eric H. Urruti, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,693
Int. Cl.[4] C03C *25/02;* **C03B** *23/207, 37/027*
U.S. Cl. 65—3.11 **14 Claims**



1. A method of making a fiber coupler comprising the steps of
providing a glass tube having first and second opposite end portions and a midregion, a longitudinal aperture extending from a first end of said tube to a second end thereof,
disposing within said longitudinal aperture at least two glass optical fibers, each comprising a core, cladding, and protective coating, at least one end of each of said fibers extending beyond the respective end of said tube, thereafter
removing from those portions of said fibers that are located within said aperture at least a portion of the coating that is disposed thereon, thereafter
collapsing the midregion of said tube onto said fibers, and drawing at least a portion of said midregion.

4,902,324

METHOD OF REPRODUCIBLY MAKING FIBER OPTIC COUPLER

William J. Miller, and Carlton M. Truesdale, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,423
Int. Cl.[4] C03C *25/02;* **C03B** *23/207, 37/027*
U.S. Cl. 65—3.11 **10 Claims**



1. A method of making a fiber optic coupler comprising the steps of
providing a glass tube having first and second opposite end portions and a midregion, a longitudinal aperture extending from a first end of said tube to a second end thereof, said aperture being formed of n flat surfaces, wherein n is at least 3, the cross-sectional configuration of said aperture being symmetrical about a plane through the longitudinal axis of said tube,
disposing within said longitudinal aperture att least two glass optical fibers, each having a core and cladding, said fibers extending beyond each of said ends of said tube,
holding said fibers taut to effect a tension therein,
heating the midregion of said tube to collapse said midregion around said fibers, and
drawing at least a portion of said midregion.

4,902,325

METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER

Michihisa Kyoto; Minoru Watanabe; Shigeru Tanaka, all of Yokohama, and Motohiro Nakahara, Mito, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Nippon Telegraph and Telephone Corporation, Tokyo, both of, Japan

Continuation of Ser. No. 746,062, Jun. 18, 1985, abandoned.
This application Nov. 10, 1986, Ser. No. 928,727
Claims priority, application Japan, Jun. 18, 1984, 59-123783
Int. Cl.[4] C03B *37/027*
U.S. Cl. 65—3.12 **5 Claims**

1. A method for producing a glass preform for an optical fiber comprising:
forming a fine glass particle mass by flame hydrolysis of a glass raw material,
dehydrating the fine glass particle mass in an atmosphere including essentially only oxygen and 1 to 20% by mole chlorine or a chlorine containing compound at such temperature that the perform is not considerably shrunk, and
heating the preform at a temperature at which the preform is sintered and made transparent.

4,902,326

METHOD FOR MAKING FIBER REINFORCED GLASS MATRIX COMPOSITE ARTICLE HAVING SELECTIVELY ORIENTED FIBER REINFORCEMENT

David C. Jarmon, Kensington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 2, 1988, Ser. No. 266,034
Int. Cl.[4] C03C *27/00*
U.S. Cl. 65—4.1 **5 Claims**



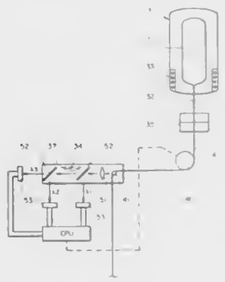
1. A method for making a fiber reinforced glass matrix composite article, comprising:
impregnating a fiber preform with a colloidal suspension to form a colloid-impregnated fiber preform, wherein the fiber preform comprises reinforcing fibers, the reinforcing fibers are disposed in selected relative orientations, and the colloidal suspension comprises inorganic particles suspended in a continuous medium,
cooling the colloid-impregnated fiber preform to a temperature about equal to or below the freezing point of the continuous medium to precipitate the inorganic particles and form a rigidized fiber preform,
removing the continuous medium from the rigidized fiber preform to form a dry rigidized fiber preform,
impregnating the dry rigidized fiber preform with heated glass matrix material to form a glass impregnated rigidized fiber preform, and
cooling the glass impregnated rigidized fiber preform to form the fiber reinforced glass matrix composite article, wherein the fiber reinforced glass matrix composite article comprises the reinforcing fibers within a glass matrix and the reinforcing fibers substantially remain in the selected relative orientations.

4,902,327

MONITORING FIBER BEND LOSS CHARACTERISTICS DURING MANUFACTURE

Frank H. Levinson, Redwood City, Calif., assignor to Raynet Corporation, Menlo Park, Calif.

Filed Apr. 27, 1988, Ser. No. 186,521
Int. Cl.[4] C03B *37/07, 37/02, 37/028, 37/025*
U.S. Cl. 65—13 **15 Claims**



1. An apparatus for forming an optical fiber so as to reduce a variation of a bend loss characteristic along a length thereof, comprising:
means for drawing an optical fiber from a preform using heat;
means for monitoring the bend loss characteristic of the fiber after it is drawn from the preform as the preform is being drawn, the monitoring means including means for generating a bend in the drawn fiber having a radius small enough such that light escapes the fiber at the bend, the monitoring means including means for detecting the light escaping the fiber at the bend; and
means for using feedback control, which has an input connected to an output of the detecting means, to vary a manner in which remaining fiber is to be drawn from the preform so as to minimize the variation in the bend loss characteristics of the optical fiber thereafter drawn and previously drawn along a length thereof.

4,902,328

METHOD OF MANUFACTURING SHAPED BODIES FROM CERAMICS OR GLASS

Karl-Georg Knauff, Aachen, and Benno Schmidl, Simmerath-Lammersdorf, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 109,788, Oct. 16, 1987, abandoned.
This application Nov. 7, 1988, Ser. No. 268,654
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635842
Int. Cl.[4] C03B *37/016, 19/06*
U.S. Cl. 65—17 **9 Claims**

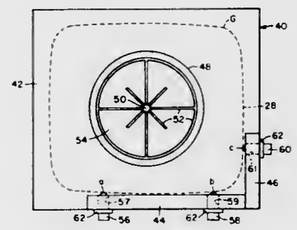
1. A method of manufacturing a shaped ceramic body comprising:
(a) shaping into a desired shape a wet green body formed of a plastic mass comprising microdispersed solid particles and water as a dispersing liquid;
(b) immersing said shaped wet green body in a water-miscible organic liquid having a lower surface tension and a lower heat of vaporization than water, until the water in the green body has at least been substantially replaced by the organic liquid, and then
(c) drying and sintering said shaped body.

4,902,329

METHOD OF USING EXTERNAL SYSTEM FOR LOCATING THE GEOMETRIC CENTER OF AN INTERNAL LENS ELEMENT

Donald J. Lopata, Horseheads, and Robert L. Mathew, Elmira, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 22, 1988, Ser. No. 223,169
Int. Cl.[4] C03B *00/00*
U.S. Cl. 65—29 **12 Claims**



1. A method for locating the geometric center of an internal lens element which comprises:
forming an internal lens element with an external reference surface which is concentric with a center line through said internal lens element;
selecting and locating three reference points which are not all in a straight line on said reference surface such that said

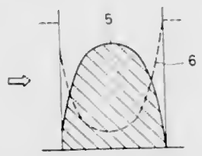
three points lie within a plane at a predetermined distance offset from the center of said lens element;
providing a fixture having a central chuck configured to receive and complement said internal lens element, and a plurality of positioning pins positioned to correspond with said three reference points on said reference surface for positioning the center line of said internal lens element concentric with the center of said chuck;
positioning said internal lens element on said chuck with said external reference surface in contact with said alignment pins positioned to locate said three reference points on said reference surface;
firmly securing said lens element to said chuck and grinding and polishing a flat surface on an external surface opposite said internal lens element while said element is held in said fixture;
grinding and polishing said external surface within a plane parallel to the plane formed by said three reference points and to a predetermined lens element thickness; and
by utilizing the ground and polished external surface which is accurately located parallel to the plane of said three reference points and at a known center line distance with reference to said internal lens element, together with said three reference points on the external reference surface, locating the geometric center of the inside lens element.

4,902,330

METHOD OF PRODUCING GRADIENT-INDEX LENS

Hiroyuki Sakai; Yoshiyuki Asahara, both of Tokyo; Shigeaki Omi, Saitama; Shin Nakayama, and Yoshitaka Yoneda, both of Tokyo, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,780
Claims priority, application Japan, Mar. 29, 1985, 60-63697
Int. Cl.[4] C03C *21/00*
U.S. Cl. 65—30.13 **6 Claims**



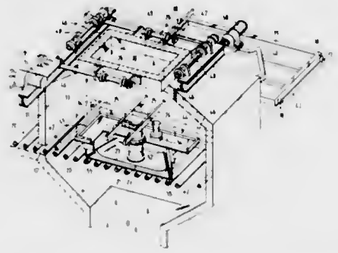
1. A method of producing a gradient-index lens comprising the following steps:
providing a glass body containing first ions and having a shape and optical properties suitable for forming a lens;
first completely immersing said glass body into molten salt containing second ions, which provide said glass body with a refractive index higher than that provided by the first ions in said glass body, to perform ion diffusion into said glass body for sufficient time and at sufficient temperature to thereby exchange first ions in said glass body for said second ions and to thereby uniformly increase the refractive index of said glass body throughout the glass body, such that the increased refractive index of the exchanged glass body is uniform throughout the glass body; and
second completely immersing said glass body obtained from said first immersing step into molten salt containing third ions, which provide said glass body with a refractive index lower than that provided by said second ions, for sufficient time and at sufficient temperature to thereby exchange said second ions in said glass body for said third ions so as to form a predetermined refractive index distribution symmetrically in said glass body such that a gradient index lens is provided;
wherein said first ions permit formation of said glass body into a more stable glass body then would be formed if the second ions were present in the glass body instead of said first ions.

4,902,331

PROCESS FOR BENDING A GLASS SHEET AND SUPPORT DEVICE ADAPTED TO THIS PROCESS

Luc Vanaschen, Eupen, Belgium; Hans-Werner Kuster, Aachen, Fed. Rep. of Germany, and Herbert Radermacher, B-Raeren, Belgium, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Jul. 5, 1988, Ser. No. 214,958
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3721863
Int. Cl.[4] C03B *23/025*
U.S. Cl. 65—106 **3 Claims**



1. A process for bending a glass sheet in a horizontal position heated to a bending temperature, which comprises:
conveying a glass sheet to a bending station by a conveyor;
lifting the glass sheet by a pressure difference acting on the bottom face of the glass sheet;
pressing the glass sheet against a bending form placed above the conveyor by directing a hot gas current from below toward the glass sheet wherein the pressure difference used to lift the glass sheets above the conveyor is obtained by means of a box, under a regulated partial vacuum, having walls surrounding the bending form with an opening on the bottom of said box corresponding to the shape of the glass sheet, the opening delimiting an annular contact surface; and
contacting a bottom face of said walls of said box with edges of the glass sheet wherein lifting up of the glass sheet to the bending form for bending by the raising of the box and the hot gas current is established at the moment the glass sheet touches the bending form.
3. A device for bending a glass sheet comprising:
a conveyor which includes a plurality of horizontal rollers;
a bending form located above the conveyor surrounding a bending station and a pipe through which a vertical hot gas current is passed, directed upwardly against the bending form, and;
a box positioned so as to surround the bending form and in which a partial vacuum is established, said box being provided with a lower opening for suction, said opening corresponding to the shape of the glass sheet and being slightly smaller than said glass sheet and wherein the box is mounted so as to be vertically mobile relative to the bending form.

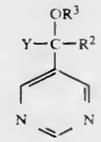
4,902,332

PYRIMIDINE DERIVATIVES

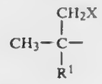
Raymond Elliott; Brian K. Snell, both of Reading, and Raymond S. Gairns, Whitefield, all of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Filed Aug. 22, 1988, Ser. No. 234,651
Claims priority, application United Kingdom, Aug. 20, 1987, 8719694; Dec. 18, 1987, 8729583
Int. Cl.[4] A01N *43/40; A61K 31/505; C07D 239/26*
U.S. Cl. 71--76 **9 Claims**

1. A pyrimidine derivative having the general formula (I):


(I)

and stereoisomers thereof, wherein Y is optionally substituted cyclopropyl or optionally substituted 1-methylcyclopropyl or is the group:


(II)

wherein R^1 is hydrogen or methyl; X is hydrogen or halogen; R^2 is a group:

$$-(CH_2)_m-C\equiv C-A \quad \text{(III)}$$

or

$$-(CH_2)_n-CH=CH-A \quad \text{(IV)}$$

or

$$-(CH_2)_p-A \quad \text{(V)}$$

wherein A is an optionally substituted phenyl group, m is an integer from 0 to 2, n is an integer from 0 to 2 and p is an integer from 2 to 4; and R^3 is hydrogen, an alkyl group containing from 1 to 4 carbon atoms, an alkenyl group containing from 3 to 4 carbon atoms or an alkynyl group containing from 3 to 4 carbon atoms and agrochemically acceptable salts, esters and metal complexes of the compounds of formula (I) wherein R^3 is hydrogen

8. A method of regulating plant growth which comprises applying to the plant, to the seed of the plant, or to the locus of the plant or seed of a plant growth regulating amount of a pyrimidine derivative according to claim 1.

4,902,333

CONTROL OF UNDESIRABLE VEGETATION

Paul C. Quimby, Jr., Leland, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 30, 1987, Ser. No. 114,952
Int. Cl.[4] A01N *63/04*
U.S. Cl. 71--79 **19 Claims**

1. In a method of applying a herbicidally effective amount of fungal pathogen to undesirable host vegetation, the improvement comprising spraying an additive-containing invert water-in-oil emulsion on said vegetation at the same time or immediately after application of said fungal pathogen to enable water which reaches said vegetation to remain thereon with minimal loss through evaporation, thereby supplying necessary moisture for fungal germination and growth, said oil being compatible with said pathogen, said additive selected from the group consisting of (a) a wax selected from the group consisting of paraffin wax, beeswax, and natural plant wax, (b) lecithin in combination with calcium chloride or acetate, and (c) mixtures of (a) and (b).

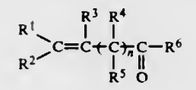
4,902,334

REGULATION OF PLANT METABOLISM BY ALPHA, BETA-OR BETA, GAMMA-UNSATURATED CARBOXYLIC ACIDS OR DERIVATIVES THEREOF

Shizuo Azuma, Iwakuni; Toshiyuki Hiramatsu, Iwakuni; Teizo Yamaji, Iwakuni, and Yataro Ichikawa, Tokorozawa, all of Japan, assignors to Teijin Limited, Osaka, Japan

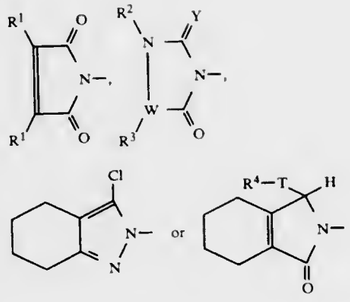
Filed Oct. 31, 1984, Ser. No. 666,633
Claims priority, application Japan, Dec. 21, 1983, 58-239698; Feb. 10, 1984, 59-21560; Sep. 10, 1984, 59-188106; Sep. 10, 1984, 59-188107; Sep. 10, 1984, 59-188108
Int. Cl.[4] C07C *101/02, 69/73, 149/20, 67/02*
U.S. Cl. 71—88 **25 Claims**

1. A plant metabolism regulating agent comprising an active ingredient in an amount effective to regulate plant metabolism and an inert carrier, said active ingredient being a compound represented by the formula (I) below

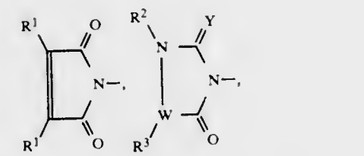

(I)

wherein R^1 represents a hydrogen atom or a linear or branched aliphatic hydrocarbon group which has 1 to 5 unsaturated bonds selected from carbon-carbon double and triple bonds and in which the main chain has 2 to 15 carbon atoms;
wherein said aliphatic hydrocarbon group may be substituted by at least one substituent selected from the group consisting of a halogen atom, a cyano group, a nitro group, an epoxy group, a tetrahydropyranyloxy group, a cycloalkyl or cycloalkenyl group having 5 to 7 carbon atoms as ring members and the group $-OR^{11}$,
wherein R^{11} represents a hydrogen atom, a hydrocarbon group having 1 to 15 carbon atoms or a hydrocarbon-carbonyl group having 2 to 16 carbon atoms,
wherein the hydrocarbon group or moiety for R^{11} may be substituted by a substituent selected from the group consisting of alkyl groups having 1 to 7 carbon atoms, alkenyl groups having 2 to 7 carbon atoms, cycloalkyl or cycloalkenyl groups having 5 to 7 carbon atoms as ring members, a phenoxy group, an unsubstituted naphthoxy group and a pyridyloxy group,
wherein the phenoxy group and the pyridyloxy group as the substituent of said hydrocarbon group or moiety may be substituted by a halogen atom, a cyano group, a nitro group, an unsubstituted or halogen-substituted alkyl group having 1 to 4 carbon atoms or the group OR^{11};
R^2 represents a group selected from the group consisting of a hydrogen atom, halogen atom, a cyano group, a nitro group, an alkenyl or alkynyl group having 2 to 7 carbon atoms which may be substituted by said substituent for the hydrocarbon group or moiety for R^{11}, a cycloalkyl or cycloalkenyl group which has 3 to 7 carbon atoms as ring members and may be substituted by said substituent for the hydrocarbon group or moiety for R^{11}, or a phenyl group which may be substituted by said substituent for the hydrocarbon group or moiety for R^{11}, and groups OR^7, in which R^7 represents a hydrogen atom, a hydrocarbon group having 1 to 15 carbon atoms, a hydrocarbon-carbonyl group having 2 to 16 carbon atoms, a hydrocarbon-sulfonyl group having 1 to 15 carbon atoms or the group HSO_2-, wherein the hydrocarbon group or moiety for R^7 may be substituted by said substituent for the hydrocarbon group or moiety for R^{11};

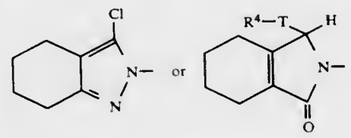
R^3 represents a group selected from said groups represented by R^2;
R^4 and R^5 are identical or different and each represents a group selected from said groups represented by R^2;
R^6 represents a group selected from the group consisting of groups OR^{10} and groups NR^8R^9, in which R^{10} represents a hydrogen atom, one equivalent of a cation, or a hydrocarbon group having 1 to 15 carbon atoms which may be interrupted by an oxygen atom and R^8 and R^9 are identical or different, and each represents a hydrogen atom, a hydrocarbon group having 1 to 10 carbon atoms, a hydrocarbon-carbonyl group having 2 to 10 carbon atoms or a hydrocarbon-sulfonyl group having 1 to 10 carbon atoms, or R^8 and R^9 together may form a saturated, 5 to 6-membered ring containing, as a single heteroatom, the nitrogen atom to which they are bonded, wherein said one equivalent of a cation is selected from the group consisting of an alkali metal cation, one half of an alkaline earth metal cation and a primary, secondary, tertiary or quaternary ammonium cation of NH_4^+ (in which R's are identical or different and each represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a phenyl group or a benzyl group), and said hydrocarbon group for R^{10}, R^8 and R^9 may be substituted by said substituent for the hydrocarbon group or moiety for R^{11}; and
n is 0 or 1 provided that (1) in the case of n=0, R^1 cannot be a hydrogen atom or a methyl group and when R^1 has as the unsaturated bond a double bond conjugated with the double bond between the carbon atoms to which R^1 and R^3 are bonded, the number of carbon atoms of the main chain of R^1 cannot be more than 4, and (2) in the case of n=1, when R^1, R^2 and R^4 are hydrogen atoms at the same time, R^5 cannot be a hydrogen atom or an unsubstituted hydrocarbon group having 1 to 15 carbon atoms, and when R^1 is a hydrogen atom and R^2 is an alkyl group having 1 to 2 carbon atoms, R^4 cannot be a hydrogen atom or an alkyl group having 1 to 2 carbon atoms.
however, at least one of R^1, R^2, R^3, R^4 and R^5 is a hydrocarbon group or moiety substituted by a phenoxy group or an unsubstituted naphthoxy group or a group having such a hydrocarbon group or moiety.



in which
R^1 is methyl or both R's together form tetramethylene,
R^2 and R^3 together represent tetramethylene or $-CH_2CH{=}CHCH_2-$,
R^4 is hydrogen, C_1-C_4-alkyl, C_1-C_4-alkylcarbonyl or phenyl,
Y is O or S,
W is



T is O, S, —NY— or



or
R^4—T— may represent chlorine,
Z is O or S,
X is hydrogen or halogen, and
R is pyridyl optionally substituted with amino, C_1-C_4-alkylamino, di(C_1-C_4-alkyl)-amino, formylamino, C_1-C_4-alkylcarbonylamino, halogen, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-alkyl, halogeno-C_1-C_4-alkyl or C_1-C_4-alkoxy-C_1-C_4-alkyl.

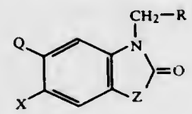
4,902,335

BENZO-FUSED CYCLIC COMPOUNDS

Toyohiko Kume; Toshio Goto; Atsumi Kamochi; Akihiko Yanagi; Shigeki Yagi; Hiroshi Miyauchi, and Katsuhiko Shibuya, all of Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 209,170
Claims priority, application Japan, Jun. 22, 1987, 62-155093; Sep. 17, 1987, 62-231063; Oct. 15, 1987, 62-258462
Int. Cl.[4] C07D *417/14;* A01N *43/78*
U.S. Cl. 71—90 **8 Claims**

1. A benzo-fused cyclic compound of the formula



(I)

wherein
O is

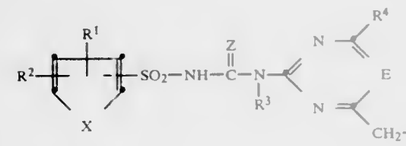
4,902,336

HERBICIDAL COMPOSITIONS

Werner Töpfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 919,514, Nov. 24, 1986, Pat. No. 4,786,315, which is a division of Ser. No. 641,091, Aug. 15, 1984, Pat. No. 4,639,264. This application Sep. 19, 1988, Ser. No. 245,601
Claims priority, application Switzerland, Aug. 26, 1983, 4669/83
Int. Cl.[4] A01N *43/54;* C07D *239/69, 401/12, 409/12*
U.S. Cl. 71—90 **20 Claims**

1. An N-arylsulfonyl-N'-(4-mercaptomethylpyrimidinyl-urea of the formula I

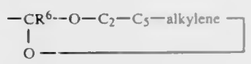


(I)

wherein
E is —CH=,
X is oxygen, sulfur, $-NR^3-$, $-N{=}CR^3-$, —CH=CH— or



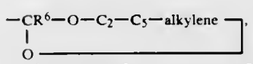
Z is oxygen or sulfur.
R^1 is hydrogen, halogen, nitro, ethinyl, $-NR^{16}R^{17}$, $-CR^6$—di-C_1-C_4-alkoxy,



$-CW-R^6$, $-SO_2-NR^7R^8$, $-CO-R^9$, $-Y_m-R^{10}$, $-SO_2-R^{11}$ or $O-SO_2R^{12}$, in which m is zero or 1,
R^2 is hydrogen, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkyl or nitro,
R^3 is hydrogen, C_1-C_4-alkyl, C_3-C_4-alkenyl or C_1-C_4-alkoxy,
R^4 is hydrogen, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkyl, C_1-C_4-haloalkoxy, C_1-C_4-alkylthio, C_2-C_4-alkoxyalkyl, C_2-C_4-alkoxyalkoxy, cyclopropyl, $-NH_2$, C_1-C_4-alkylamino, di-C_1-C_4-alkylamino, or a saturated 5- to 7-membered nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine,
R^5 is cyano, $-CZ-R^{13}$,



or an unsaturated heterocycle selected from imidazole, triazole, pyridine, pyrimidine, thiazole, oxazole, thiadiazole, oxadiazole, pyridazine, thiophene or furan, as well as partially unsaturated derivatives thereof which are unsubstituted or substituted by a radical selected from the group comprising: halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy or C_1-C_4-haloalkyl,
R^6 is hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_4-C_7-cycloalkylalkyl or C_2-C_4-alkoxyalkyl,
R^7 and R^{16} independently of one another are hydrogen, C_1-C_4-alkyl, C_1-C_4-cyanoalkyl or C_1-C_4-alkoxy,
R^8 and R^{17} independently of one another are hydrogen, C_1-C_4-alkyl, C_3-C_4-alkenyl or C_1-C_4-alkoxy, or
R^7 and R^8 as well as R^{16} and R^{17} independently of one another form, together with the nitrogen atom binding them, a 5- to 7-membered saturated nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine,
R^9 is C_1-C_4-alkoxy, C_3-C_6-alkenyloxy, C_3-C_6-alkinyloxy, C_2-C_6-haloalkoxy, C_1-C_4-cyanoalkoxy, C_1-C_4-alkylthio, C_3-C_4-alkenylthio, C_3-C_4-alkinylthio, C_5-C_6-cycloalkoxy, C_4-C_7-cycloalkylalkoxy, $-NR^7R^8$ or C_2-C_6-alkoxyalkoxy,
R^{10} is C_3-C_4-alkinyl, C_2-C_4-alkenyl, C_1-C_4-alkyl, C_2-C_4-alkenyl mono- or polysubstituted by halogen, cyano, C_1-C_4-alkoxy or $-SO_n-C_1$-C_4-alkyl, or is C_1-C_4-alkyl mono- or polysubstituted by halogen, cyano, nitro, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-haloalkylthio, $-SO_n-C_1$-C_4-alkyl, —T—CX—R^{18},



—CO—R^6, —CO—R^9 or $-SO_2-NR^7R^8$, in which n is zero, 1 or 2,
R^{11} is C_2-C_4-haloalkoxy,
R^{12} is C_1-C_4-alkyl, C_1-C_4-haloalkyl or $-NR^{16}R^{17}$,
R^{13} is C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, phenyl, di-C_1-C_4-alkylamino, or a saturated 5- to 7-membered nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine,
R^{14} and R^{15} independently of one another are C_1-C_4-alkyl, C_1-C_4-alkoxy, C_3-C_4-alkoxyalkoxy, C_3-C_4-alkenyloxy, C_1-C_6-alkylthio, C_1-C_4-alkylamino or di-C_1-C_4-alkylamino,
R^{18} is C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio or $-NR^{16}R^{17}$,
T is oxygen or sulfur,
W is oxygen or $=N-O-R^3$, and
Y is oxygen, sulfur, —SO— or $-SO_2-$;
or a salt of said compound.

16. A method of controlling undesirable plant growth, which method comprises applying thereto or to the locus thereof a herbicidally effective amount of an active substance of claim 1.

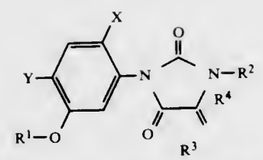
4,902,337

HERBICIDAL HYDANTOIN DERIVATIVES

Kenji Hirai; Takamasa Fuchikami; Atsuko Fujita, all of Kanagawa; Hiroaki Hirose; Masahiro Yokota, both of Chiba, and Shoin Nagato, Tokyo, all of Japan, assignors to Sagami Chemical Research, Tokyo; Kaken Pharmaceutical Co., Ltd., Osaka and Chisso Corporation, Tokyo, all of, Japan

Filed Sep. 2, 1987, Ser. No. 92,193
Claims priority, application Japan, Sep. 2, 1986, 61-205065; Sep. 2, 1986, 61-205066
Int. Cl.[4] A01N *43/50;* C07D *233/96*
U.S. Cl. 71—92 **4 Claims**

3. A herbicidal composition comprising an agriculturally acceptable carrier an a herbicidally effective amount of a hydantoin derivative represented by the formula:



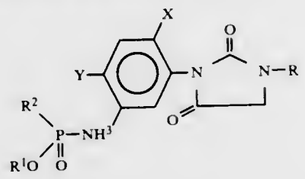
wherein x and Y are independently halogen atoms, R^1 represents a hydrogen atom, a C_3-C_4 alkenyl group or a C_3-C_4 alkynyl group, R^2 represents a hydrogen atom, a methyl group or an ethyl group, and R^3 and R^4 independently represent a hydrogen atom or a C_1-C_3 alkyl group.

4,902,338
PHOSPHORYLAMINOPHENYLHYDANTOIN HERBICIDES

George Theodoridis, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 267,486, Nov. 4, 1988, abandoned. This application Mar. 17, 1989, Ser. No. 328,820
Int. Cl.[4] A01N *57/32;* **C07F** *9/65*
U.S. Cl. 71—92 **21 Claims**

1. A compound of the formula



in which
X and X are independently F, Cl, or Br;
R is lower alkyl or lower haloalkyl;
R^1 is selected from lower alkyl, lower haloalkyl, cycloalkyl of 3 to 7 ring carbon atoms, lower alkyl, lower halogalkenyl, lower alkynyl, lower haloalkynyl, and benzyl which is unsubstituted or substituted on the phenyl ring with one or more substituents selected from halogen, lower alkyl, lower alkoxy, lower alkoxycarbonyl, cyano, and nitro;
R^2 is independently selected from among —OR^1 or is hydroxy, amino, lower alkylamino, or lower dialkylamino;
R^3 is H, lower alkyl, or lower alkenyl; or
a base addition salt of the compound as defined above in which R^2 is hydroxy.

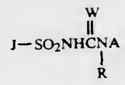
20. A herbicidal composition comprising an herbicidally effective amount of the compound of claim 1 in admixture with a suitable carrier.

4,902,339
HERBICIDAL SULFONAMIDES

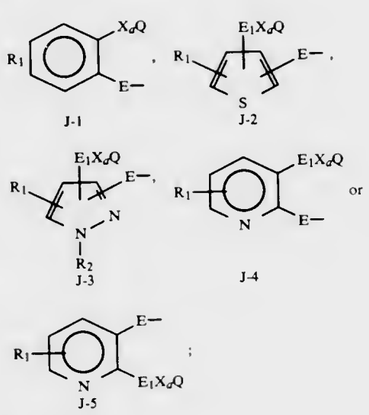
Joel R. Christensen, Wilmington, and Morris P. Rorer, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 842,295, Mar. 26, 1986, Pat. No. 4,801,327, which is a continuation-in-part of Ser. No. 739,232, May 30, 1985, abandoned. This application Aug. 30, 1988, Ser. No. 238,099
Int. Cl.[4] C07D *401/12, 403/12;* **A01N** *43/66, 43/70*
U.S. Cl. 71—93 **30 Claims**

1. A compound of which is

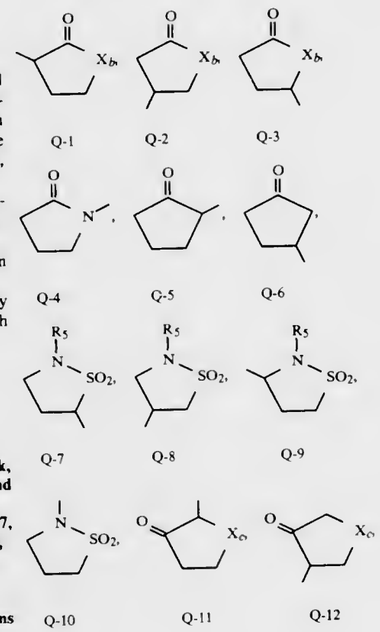


wherein
J is



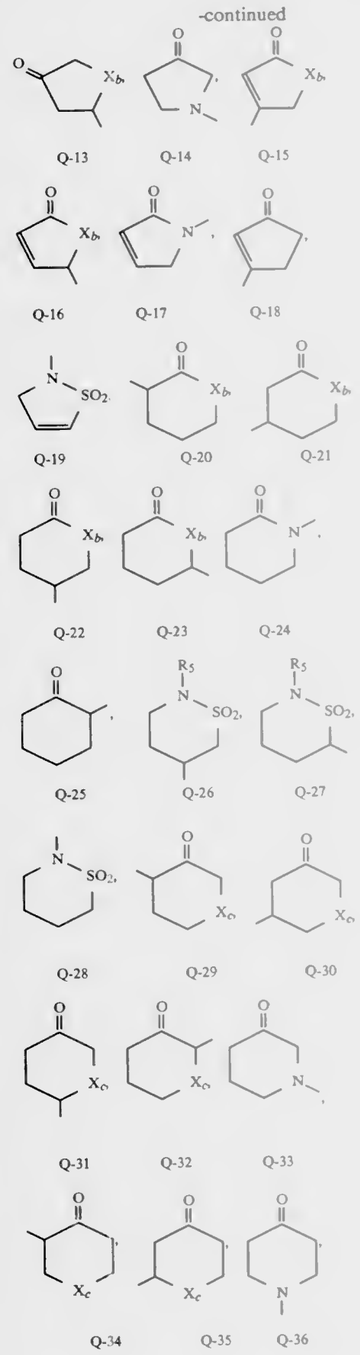
J-1 J-2 J-3 J-4 J-5

W is O or S;
R is H or CH_3;
E_1 is O, S, SO, SO_2 or a single bond.
X_a is CH_2, $CH(CH_3)$, CH_2CH_2, $CH_2CH_2CH_2$ or CO;
E is a single bond, CH_2 or O;
Q is selected from



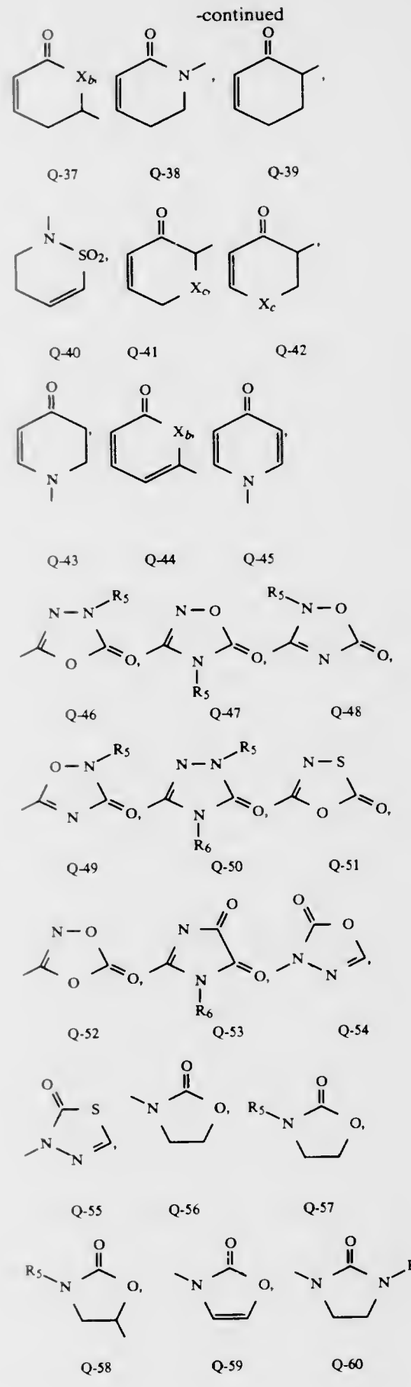
Q-1 Q-2 Q-3 Q-4 Q-5 Q-6 Q-7 Q-8 Q-9 Q-10 Q-11 Q-12

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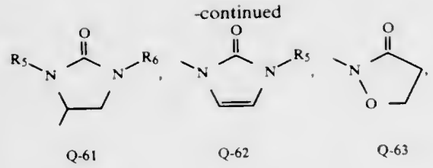
Q-13 Q-14 Q-15 Q-16 Q-17 Q-18 Q-19 Q-20 Q-21 Q-22 Q-23 Q-24 Q-25 Q-26 Q-27 Q-28 Q-29 Q-30 Q-31 Q-32 Q-33 Q-34 Q-35 Q-36

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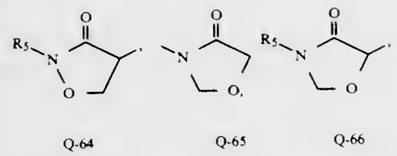


Q-37 Q-38 Q-39 Q-40 Q-41 Q-42 Q-43 Q-44 Q-45 Q-46 Q-47 Q-48 Q-49 Q-50 Q-51 Q-52 Q-53 Q-54 Q-55 Q-56 Q-57 Q-58 Q-59 Q-60

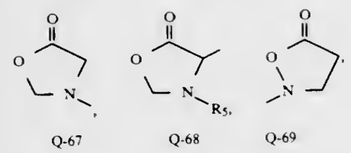
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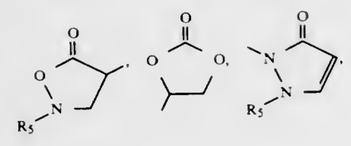
Q-61 Q-62 Q-63



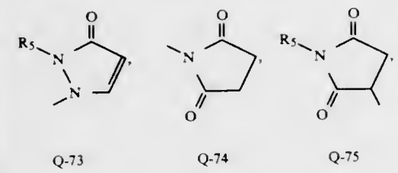
Q-64 Q-65 Q-66



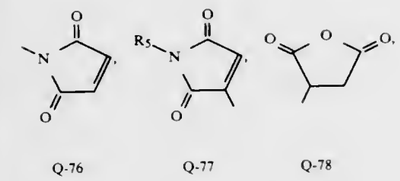
Q-67 Q-68 Q-69



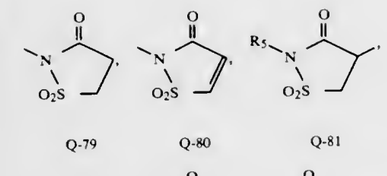
Q-70 Q-71 Q-72



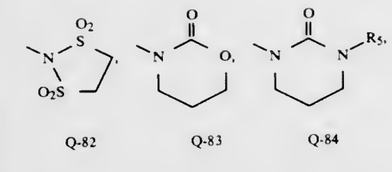
Q-73 Q-74 Q-75



Q-76 Q-77 Q-78

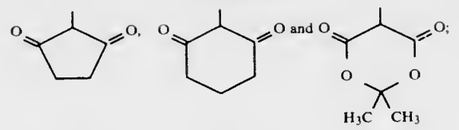


Q-79 Q-80 Q-81



Q-82 Q-83 Q-84

-continued



Q-85 Q-86 Q-87

wherein

Q-1 through Q-87 may be optionally substituted with 1 or 2 groups selected from C_1–C_2 alkyl or C_1–C_2 haloalkyl;

R_5 and R_6 are independently H or C_1–C_3 alkyl;

X_b is O or NR_5; and

X_c is O, S, SO, SO_2 or NR_5.

R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro, C_1–C_3 alkoxy, $SO_2NR_aR_b$, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CH_2CN, CN, CO_2R_c, C_1–C_3 haloalkoxy, C_1–C_3 haloalkylthio, C_2–C_4 alkoxyalkyl, C_2–C_4 alkylthioalkyl, CH_2N_3 or NR_dR_e;

R_a is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;

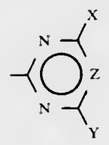
R_b is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or

R_a and R_b may be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;

R_c is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_2–C_3 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;

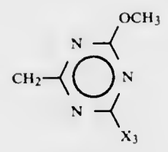
R_d and R_e are independently H or C_1–C_2 alkyl;

A is



A-1

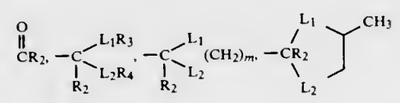
or



A-6

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino or C_3–C_5 cycloalkyl;

Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_1–C_4 haloalkyl, C_2–C_4 alkynyl, azido, cyano, C_2–C_5 alkylsulfinylalkyl, C_2–C_5 alkylsulfonylalkyl,



or $N(OCH_3)CH_3$;

m is 2 or 3;

L_1 and L_2 are independently O or S;

R_2 is H or C_1–C_3 alkyl;

R_3 and R_4 are independently C_1–C_3 alkyl;

Z is N, and;

X_3 is CH_3 or OCH_3;

and their agriculturally suitable salts; provided that

(a) when Q contains 2 heteroatoms selected from 0–2 oxygen and 0–2 sulfur, said heteroatoms are not bonded directly to one another unless in the form O—SO_2, and when Q contains 3 nitrogen heteroatoms, only two of these may be bonded directly together;

(b) when J is J-2 or J-3, the substituent E_1X_aQ and the sulfonylurea bridge are on adjacent carbon atoms;

(c) when E is O, then J is J-1 and W is O;

(d) when W is S, then R is H, A is A-1, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or 1,3-dioxolan-2-yl;

(e) when the total number of carbon atoms of X and Y is greater than four, then the number of carbons of R_1 must be less than or equal to two, and the number of carbons of the substituent on Q must also be less than or equal to two;

(f) when A is A-1 and J is J-1 wherein E is a single bond, X_a is CH_2, $CH(CH_3)$ or CH_2CH_2 and Q is a 5-membered heterocyclic ring containing one endocyclic double bond or a 6-membered heterocyclic ring containing 1 or 2 endocyclic double bonds which is unsubstituted or substituted by one or more C_1–C_4 alkyl groups then said heterocycle must contain at least one nitrogen and be bound to X_a through nitrogen; and

(g) when X_a is CO then E_1 is a single bond.

21. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,902,340

USE OF QUINOLINE DERIVATIVES FOR THE PROTECTION OF CULTIVATED PLANTS FROM HERBICIDES

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

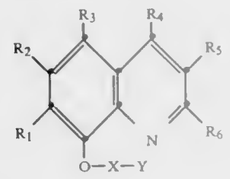
Continuation of Ser. No. 663,739, Oct. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 539,604, Oct. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 490,912, May 2, 1983, abandoned. This application May 27, 1986, Ser. No. 868,372

Claims priority, application Switzerland, May 7, 1982, 2841/82

Int. Cl.[4] **C07D** *215/24;* **A01N** *43/42*

U.S. Cl. 71—94 15 Claims

1. A compound of the formula I



(I)

in which

R_1, R_2, R_4, R_5 and R_6 are hydrogen,

R_3 is hydrogen or chlorine,

X is $—CH_2—$ or $—CH(CH_3)—$, and

Y is $—COOR_7$ or $—COSR_8$, wherein

R_7 is hydrogen or C_1–C_{18}-alkyl;

C_1–C_{10}-alkyl which is substituted by one to three halogen atoms, or one substituent selected from the group nitro, cyano, hydroxyl, C_1–C_8-alkoxy, C_1–C_4-alkoxyethoxy, C_2–C_6-hydroxyalkoxy, C_2–C_6-hydroxyalkylthio, C_1–C_4-alkoxycarbonyl, C_2–C_4-dialkylamino or phenoxy;

C_1–C_6-alkyl, which is substituted by phenyl, tetrahydrofuranyl, tetrahydropyranyl, furanyl, pyridinyl or phenyl which is substituted by C_1–C_3-alkoxy;

C_3–C_{10}-alkenyl;

C_3–C_6-alkynyl, which is unsubstituted or substituted by halogen or hydroxyl;

C_3–C_8-cycloalkyl, which is unsubstituted or substituted by C_1–C_3-alkyl; phenyl, which is unsubstituted or substituted by one or two halogen, nitro, C_1–C_4-alkyl or C_1–C_4-alkoxy; or naphthyl;

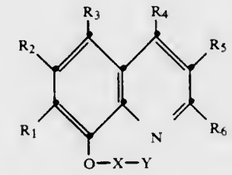
R_8 is C_1–C_{18}-alkyl; or

phenyl, which is unsubstituted or substituted by halogen;

including herbicidally acceptable acid addition salts and metal complexes thereof,

with the proviso that if, at the same time that X is $—CH_2—$ and Y is $—COOR_7$, then R_7 is not hydrogen or C_1–C_5-alkyl.

11. A composition for protecting cultivated plants from the harmful effects of herbicidal agrochemicals, which contains, as the active component, an effective amount of a compound of the formula I



(I)

in which

R_1, R_2, R_4, R_5 and R_6 are hydrogen,

R_3 is hydrogen or chlorine,

X is $—CH_2—$ or $—CH(CH_3)—$, and

Y is $—COOR_7$ or $—COSR_8$, wherein

R_7 is hydrogen or C_1–C_{18}-alkyl;

C_1–C_{10}-alkyl which is substituted by one to three halogen atoms, or one substituent selected from the group nitro, cyano, hydroxyl, C_1–C_8-alkoxy, C_1–C_4-alkoxyethoxy, C_2–C_6-hydroxyalkoxy, C_2–C_6-hydroxyalkylthio, C_1–C_4-alkoxycarbonyl, C_2–C_4-dialkylamino or phenoxy;

C_1–C_6-alkyl, which is substituted by phenyl, tetrahydrofuranyl, tetrahydropyranyl, furanyl, pyridinyl or phenyl which is substituted by C_1–C_3-alkoxy;

C_3–C_{10}-alkenyl;

C_3–C_6-alkynyl, which is unsubstituted or substituted by halogen or hydroxyl;

C_3–C_8-cycloalkyl, which is unsubstituted or substituted by C_1–C_3-alkyl;

phenyl, which is unsubstituted or substituted by one or two halogen, nitro, C_1–C_4-alkyl or C_1–C_4-alkoxy; or naphthyl;

R_8 is C_1–C_{18}-alkyl; or

phenyl, which is unsubstituted or substituted by halogen; including herbicidally acceptable acid addition salts and metal complexes thereof,

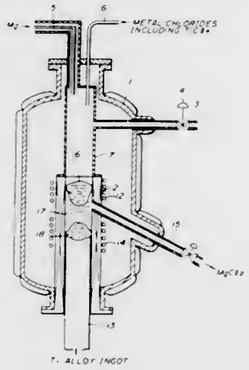
together with an agriculturally acceptable carrier or other inert adjuvant.

4,902,341

METHOD FOR PRODUCING TITANIUM ALLOY

Shigenori Okudaira, Ninomiya; Takefumi Irie; Hiroshi Uchida, both of Chigasaki; Eiichi Fukasawa, Samukawa; Kazuhiko Kobayashi, Chigasaki, and Masanori Yamaguchi, Nakai, all of Japan, assignors to Toho Titanium Company, Limited, Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 234,529
Claims priority, application Japan, Aug. 24, 1987, 62-208184
Int. Cl.[4] C22B *34/12*; C22C *1/00*
U.S. Cl. 75—10.18 **12 Claims**



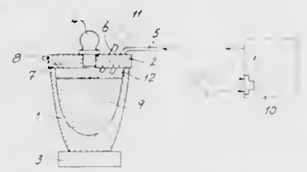
1. A method for producing a titanium alloy comprising titanium and at least one other alloy component metal, in which titanium tetrachloride is reduced using a reducing metal agent, comprising the steps of: maintaining a reaction zone in a reaction vessel at a temperature above the melting point of the titanium alloy to be produced and at above the vapour pressure of the reducing metal agent at that temperature; supplying the titanium tetrachloride, the reducing metal agent and the alloy component metals in metal form or in compound form to the reaction zone for reaction to produce the titanium alloy product and a chloride by-product of the reducing metal agent; separating the product and by-product from each other in the molten state; collecting the titanium alloy product at the bottom of the vessel; and continuously drawing out the titanium alloy product from the reaction vessel.

4,902,342

METHOD FOR THE MANUFACTURE OF NON-ALLERGY CREATING PRECIOUS METAL OBJECTS

Hans G. E. Wahlbeck, S-150 32 Stallarholmen, Nybble, Sweden

Continuation of Ser. No. 626,876, Jun. 27, 1984, abandoned. This application Sep. 21, 1987, Ser. No. 99,661
Claims priority, application Sweden, Oct. 29, 1982, 8206158
Int. Cl.[4] C22B *11/00*
U.S. Cl. 75—83 **4 Claims**



1. A method for manufacturing a non-allergenic metal object which can be safely worn next to the skin, comprising the steps of:

(i) providing an optimum pure starting material selected from the group consisting of pure noble metals and optimum pure noble-metal alloys;

(ii) creating a protective atmosphere, at atmospheric pressure, and consisting of water-free hydrocarbons incompletely combusted with pure oxygen and free of oxygen, hydrogen, nitrogen and nitrogen oxides;

(iii) melting said starting material in said protective atmosphere;

(iv) molding a molded object from said starting material in said protective atmosphere; and

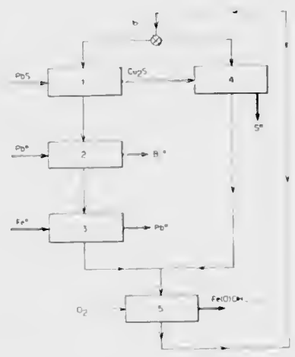
(v) solidifying and cooling said molded object in said protective atmosphere.

4,902,343

HYDROMETALLURGICAL PROCESS FOR THE TREATMENT OF SULPHIDIZED COMPOUNDS CONTAINING LEAD

Jean-Michel Demarthe, Viroflay, and André Georgeaux, Rambouillet, both of France, assignors to Societe Miniere et Metallurgique de Penarroya, Trappes, France

Continuation of Ser. No. 333,797, Dec. 23, 1981, abandoned, which is a continuation of Ser. No. 158,447, Jun. 11, 1980, abandoned, which is a continuation of Ser. No. 896,356, Apr. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 817,380, Jul. 20, 1977, abandoned. This application Sep. 22, 1982, Ser. No. 421,088
Claims priority, application France, Jul. 20, 1976, 76 22138; Apr. 15, 1977, 77 11451
Int. Cl.[4] C22B *3/00*
U.S. Cl. 75—101 R **23 Claims**



1. A process for obtaining lead chloride from sulfide ores containing lead sulfide comprising:

(a) leaching the ore with an aqueous solution containing cupric chloride under reaction conditions of temperature, time, pH, total copper concentration and total chloride ion concentration selected so as to convert a substantial portion of the lead sulfide to lead chloride while leaving the remainder of the ore substantially unreacted and wherein the cupric chloride leach solution does not solubilize all of the lead chloride so that a portion of the lead chloride precipitates from the leach solution; and

(b) separating solids comprising lead chloride, unreacted ore, sulfur and gangue from the leach solution.

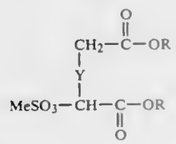
4,902,344

FERRIC CHLORIDE LEACH OF A METAL-SULPHIDE BEARING MATERIAL

Bernard H. Lucas, Nepean, and David Y. Shimano, Hull, both of Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Oct. 27, 1988, Ser. No. 264,147
Claims priority, application Canada, Nov. 20, 1987, 552378
Int. Cl.[4] C22B *3/00*
U.S. Cl. 75—101 R **20 Claims**

1. A process for leaching a complex, metal-sulphide bearing material, wherein said material is contacted with an aqueous ferric chloride leach solution whereby metal values are brought into solution as chlorides thereof, characterized in that said material is contacted with said leach solution in the presence of an effective amount of a leaching aid comprising one or more compounds of general formula (I)



wherein

Me is an alkali metal,

Y is a single carbon to carbon bond or an alkylene chain of not more than 4 carbon atoms and

the R's, the same or different, each represents an alkyl group of 3 to 8 carbon atoms,

said effective amount being at least about 100 ppm relative to said material.

4,902,345

TREATMENT OF REFRACTORY CARBONACEOUS AND SULFIDIC ORES OR CONCENTRATES FOR PRECIOUS METAL RECOVERY

Brian Ball, and Rong-Yu Wan, both of Salt Lake City, Utah, assignors to Newmont Gold Co., Carlin, Nev.

Filed Jan. 12, 1989, Ser. No. 296,486
Int. Cl.[4] C22B *11/04*
U.S. Cl. 75—118 R **11 Claims**

1. A method for the recovery of a precious metal from carbonaceous and sulfidic ores or concentrates which comprises:

(a) forming an aqueous slurry of said ores or concentrates;

(b) pretreating said aqueous slurry in an autoclave with an oxygen-containing gas;

(c) leaching said precious metal with thiourea in the presence of added carbon; and

(d) recovering said precious metal.

4,902,346

FILLER FOR DISINTEGRATING PROJECTILE

Johan S. Leermans, Rosmalen, Netherlands, and Heinz J. Dorweiler, Wegberg, Fed. Rep. of Germany, assignors to NWM de Kruithoorn B.V., Netherlands

Filed Jun. 3, 1987, Ser. No. 57,080
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1986, 3618205
Int. Cl.[4] F42B *5/22*
U.S. Cl. 75—251 **2 Claims**

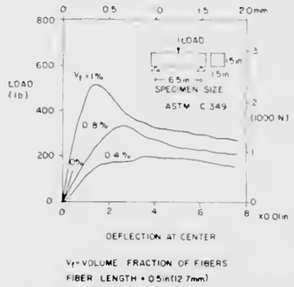
1. Filler for disintegrating projectiles for training ammunition composed essentially of a screened low carbon, unalloyed steel powder having been produced by atomizing a corresponding steel melt to form a steel powder, subsequently subjecting the powder to a reducing soft annealing treatment at a temperature of between about 900° and 1050° C., and subjecting the annealed product to a comminuting process followed by screening, wherein the comminuting process lasts longer than 60 minutes and said screened powder having a grain size below 0.315 mm, an uncompressed density of between 3.9 and about 4.6 g/cm^3, and being compressible in such a manner that the resulting density of a pressed body to be incorporated into the disintegrating projectile lies between about 6.5 and 7.15 g/cm^3.

4,902,347

POLYAMIDE FIBERS, MICROSILICA AND PORTLAND CEMENT COMPOSITES AND METHOD FOR PRODUCTION

Parviz Soroushian, and Mohamad Z. Bayasi, both of East Lansing, Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Mar. 28, 1988, Ser. No. 174,207
Int. Cl.[4] C04B *14/38*
U.S. Cl. 106—99 **19 Claims**



1. In a plastic cementitious composition which cures to a rigid hardened cementitious composite is produced by incorporating in a mixture Portland cement, a superplasticizer, discontinuous polyamide fibers, water and up to 75% of the composite volume of aggregates and wherein fly ash may be substituted for part of the Portland cement, wherein the superplasticizer reduces than amount of water necessary to produce the plastic cementitious composition, the improvement which consists essentially of:

microsilica coated on the fibers in the plastic, wherein the microsilica aids in the dispersion of the fibers in the plastic cementitious composition and forms a thin coating on the fibers in a mixture of water and a portion of the superplasticizer prior to admixture with the cement, wherein particles of the microsilica have an average size between about 0.05 and 1 micron, wherein the microsilica retards alkaline deterioration of the polyamide fibers over time in the rigid hardened cementitious composite and wherein the rigid hardened cementitious composite with the microsilica exhibits greater flexural loading and tensile strength than a similar composite with the fibers and without the microsilica.

4,902,348

REINFORCED PLASTERBOARD AND METHOD OF FORMING

Gert Kossatz; Heinz Sattler, both of Braunschweig; Rüdiger Kammerer, Bad Honnef; Hanns I. Sachs, and Dietmar Schäpel, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 78,359, Jul. 28, 1987, abandoned. This application Oct. 12, 1988, Ser. No. 256,885
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626048
Int. Cl.[4] C04B *24/12, 18/26*
U.S. Cl. 106—111 **13 Claims**

1. A process for the manufacture of plasterboard comprising combining a mixture consisting essentially of a gypsum binder

capable of rehydration, water and wood chips having a length of 1 to 10mm wherein the ratio by weight of said wood chips to said gypsum binder is about 0.25:1 to 0.35:1, and subsequently pressing the resulting mixture, said process additionally comprising of adding a polyisocyanate to the mixture before pressing and applying polyisocyanate to the surface of the plasterboard after pressing and wherein the ratio of wood chips and gypsum to water is in the range of 2.6:1 to 3.2:1.

9. The plasterboard produced in accordance with claim 1.

4,902,349

ASPHALT/POLYOL EMULSION AND PROCESS FOR PREPARATION THEREOF

Saburo Wakizaka; Hiraku Hayasaka; Kazuki Hashimoto; Kentaro Shiojiri, and Toshiaki Suzuki, all of Tokyo, Japan, assignors to Toa Dora Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1987, Ser. No. 100,097

Int. Cl.[4] C08L *95/00*

U.S. Cl. 106—277 **15 Claims**

1. An asphalt/polyol emulsion formed by emulsifying asphalt with an emulsion of a polyalkylene glycol and a mixture of at least one surface active agent and a plasticizer, with the proviso that the molecular weight of the polyalkylene glycol is such that the asphalt and glycol are immiscible, wherein the asphalt constitutes 30 to 65% by weight of the asphalt emulsion, the weight % of the mixture of surface active agent is 1.5–6% based on the weight of asphalt, the weight % of the plasticizer is 2.5 to 15% based on the weight of asphalt and the remainder is polyalkylene glycol.

4,902,350

METHOD FOR RINSING, CLEANING AND DRYING SILICON WAFERS

Ricky B. Steck, West Jordan, Utah, assignor to Robert F. Orr, Salt Lake City, Utah

Filed Sep. 9, 1987, Ser. No. 94,549

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[4] B08B *3/10*

U.S. Cl. 134—1 **10 Claims**

1. A method of cleaning, rinsing and drying relatively thin, plate-like articles which can be supported edgewise, said method comprising the steps of:

(a) maintaining a body of hot, deionized water contained in a tank;

(b) placing articles to be cleaned, rinsed and dried in a slotted carrier wherein the articles are supported edgewise along the opposite sides of said slotted carrier in spaced, parallel, coaxial relation;

(c) submerging said slotted carrier and the articles which are to be cleaned, rinsed and dried in the body of hot, deionized water contained in the tank;

(d) introducing hot, deionized water into said tank through a diffuser to create a laminar flow of hot, deionized water upwardly through said tank and about said articles and slotted carrier which are submerged in the body of hot, deionized water;

(e) producing a beam of sonic energy in the body of hot, deionized water in said tank above said articles and slotted carrier;

(f) slowly raising a lift element upwardly through an opening in the bottom of said slotted carrier to (1) engage the bottom edges of said articles, (2) slowly lift the articles out of the slotted carrier, (3) slowly move the articles through the beam of sonic energy in the body of water and (4) slowly move the articles through the surface of the body of hot, deionized water in said tank to a position above the surface of the body of hot, deionized water in said tank; and

(g) slowly raising the slotted carrier upwardly such that the slotted carrier (1) follows at a spaced distance the respective lift element and articles through the body of hot, deionized water and the surface of the body of hot deionized water in said tank and then (2) reengages the articles at a position above the surface of the body of hot, deionized water in said tank,

wherein the movement of said slotted carrier and said lift element is sufficiently slow that the deionized water is drawn from the articles and the slotted carrier by water surface tension as the articles and slotted carrier move across the interface with the surface of the deionized water.

4,902,351

METHOD FOR DECONTAMINATING RADIOACTIVELY CONTAMINATED SURFACES OF METALLIC MATERIALS

Siegmar Kunze, Gernsbach, and Gunter Losch, Leimersheim, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 417,895, Sep. 14, 1982, abandoned. This application Sep. 20, 1984, Ser. No. 652,397

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1981, 31434401

Int. Cl.[4] C23G *1/02*

U.S. Cl. 134—3 **2 Claims**

1. Method for decontaminating radioactively contaminated surfaces of metallic materials with the use of nitric acid and hydrofluoric acid, comprising subjecting for at least four hours the surfaces to be decontaminated to a vapor mixture of water vapor, hydrogen fluoride vapor and nitric acid vapor, with the ratio of hydrogen fluoride vapor concentration to nitric acid vapor concentration in the vapor phase corresponding to a ratio of 2:1 to 4:1, as measured by the number of moles HF/l to number of moles HNO_3/l in a condensate formed by condensing the vapor mixture, and wherein the concentration of hydrogen fluoride vapor in the vapor mixture corresponds to a concentration in the range between 0.1 mol/l and 1.0 mol/l, as measured in a condensate formed by condensing the vapor mixture, and the concentration of nitric acid vapor in the vapor mixture corresponds to a concentration in the range between 0.05 mol/l and 0.5 mol/l measured in a condensate formed by condensing the vapor mixture.

4,902,352

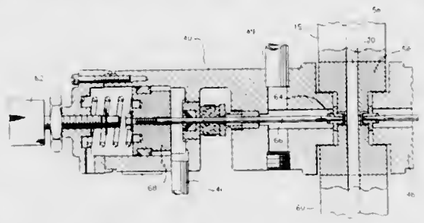
PAINT COLOR CHANGE SYSTEM

Robert L. Christian, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 904,167, Sep. 5, 1986, Pat. No. 4,881,563. This application May 19, 1988, Ser. No. 196,640

Int. Cl.[4] B08B *5/00*

U.S. Cl. 134—22.12 **3 Claims**



1. A method of cleaning the paint supply line of a paint color change system which includes a paint atomizer being fed with paint by said supply line and a first source of paint of a first color and a second source of paint of a second color adapted to be selectively connected to said supply line, said method comprising the steps of connecting said supply line to said first source of paint to fill said supply line with the first color paint to allow said atomizer to paint an article, disconnecting said supply line from said first source of paint when the remaining paint in the supply line is sufficient to complete the painting of the article, feeding said remaining paint in the supply line to said atomizer until the supply line is essentially empty after which the atomizer is bypassed and the supply line is connected to an exhaust line, connecting said supply line to a source of pressurized air and a metered flow of solvent at a point upstream of said first source so as to cause said pressurized air to atomize said solvent, propelling said atomized solvent through said supply line by said high pressure air at a velocity sufficient to clean the walls of the inner passage in the supply line, and disconnecting said supply line from said solvent and said source of high pressure air and said exhaust line and connecting said supply line to said second source of paint so as to fill said supply line with the second color paint to allow said atomizer to again paint an article.

4,902,353

METHOD FOR MAKING LITHOPLATE

Elwin L. Rooy; Gerald R. Petrey, both of Pittsburgh, Pa.; James R. Weaver, Bettendorf, Iowa; Douglas A. Granger, Murrysville, Pa.; Raymond T. Richter, Davenport, Iowa, and H. Gray Reavis, Jr., Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 939,318, Dec. 8, 1986. This application Oct. 19, 1988, Ser. No. 259,738

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] C22F *1/04*

U.S. Cl. 148—2 **9 Claims**



1. A method for producing lithoplate, comprising:

providing a molten aluminum alloy consisting essentially of the following elements in percent by weight: Cu-0 to 0.20%; Si - 0.055 to 0.085%; Fe - 0.55 to 0.75%; Mn - 0 to 0.20%; Mg - 0.40 to 0.70%; Zn - 0 to 0.25%; Cr - 0 to 0.10%; Ti - 0 to 0.05% (when cast); V - 0 to 0.025%; other elements - 0 to 0.05%, not to exceed 0.15% total; and the remainder Al;

casting the alloy into a mold to form an ingot;

homogenizing the ingot at a suitable temperature for a period of time suitable to ensure homogenization of the ingot;

hot rolling the ingot to produce a reroll stock;

cold rolling the reroll stock to a finished gauge workpiece; and

graining at least one surface of the workpiece.

4,902,354

HIGH TEMPERATURE ELECTRIC ARC FURNACE AND METHOD

Richard M. Poorman, and Deborah D. Schmidt, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 13, 1988, Ser. No. 205,898

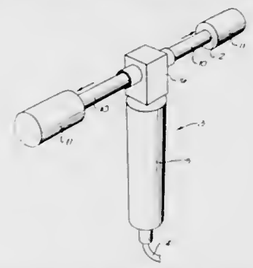
Int. Cl.[4] C21D *1/09*

U.S. Cl. 148—4 **1 Claim**

1. A process for improving the microstructure of an electrically conducting material, said material having a thickness of at least three (3) millimeters, comprising the steps of:

a. in a zero-gravity environment, heating said material to a molten state throughout said thickness, said heating occurring during a period of approximately five (5) seconds;

b. while maintaining a zero-gravity environment, allowing said material to cool and resolidify while using at least two heat sinks in contact with said material, said cooling and



resolidification occurring during a period of approximately ten (10) seconds;

whereby said heat sinks induce temperature gradients in said material during said cooling step sufficient to cause grain growth in the direction of said temperature gradients.

4,902,355

METHOD OF AND A SPRAY FOR MANUFACTURING A TITANIUM ALLOY
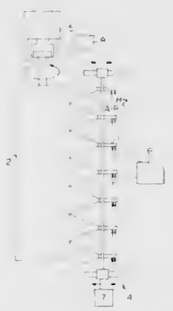
Robert I. Jaffee, Palo Alto, Calif.; Herbert H. Puschnik, Kapfenberg, Austria; Johann Fladischer, Kapfenberg, Austria; Johann Mayerhoffer, Tragoss, Austria, and Heimo Jager, Bruck/Mur, Austria, assignors to Bohler Gesellschaft m.b.H., Kapfenberg, Austria

Filed Aug. 30, 1988, Ser. No. 238,050

Claims priority, application Austria, Aug. 31, 1987, 2181/87

Int. Cl.[4] C22F *1/18*

U.S. Cl. 148—11.5 F **20 Claims**



1. A method of manufacturing $\alpha+\beta$ Titanium alloys with a content of about six percent by weight of Aluminum, about four percent by weight of Vanadium, and impurities associated with the process, comprising:

annealing a molten workpiece of an $\alpha+\beta$ Titanium alloy having a content of about six percent by weight of Aluminum and about four percent by weight of Vanadium, at 1040°–1060° C. to set the β-phase and produce a preform grain structure with a lamellar matrix of $\alpha+\beta$-phase;

converting the grain structure to one of a fine lamellar $\alpha+\beta$-phase and a very fine $\alpha+\beta$-phase during a first cooling step by spraying the workpiece with streams of one of water and an water-air mixture;

hot forming the workpiece with a degree of deformation of at least 60% at a temperature of about 850°–1000° C. to produce a high dislocation density;

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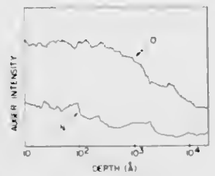
controlling recrystallization of grain structure setting by subjecting the workpiece to a heat treatment at about 950° C. to establish a β-matrix with a finely divided globulitic α-phase;
subjecting the workpiece to a subsequent cooling step to achieve substantial martensitic breakdown of the β-matrix; and
subjecting the workpiece to a subsequent annealing step to convert the martensitic matrix to a lamellar $\alpha+\beta$-phase.

4,902,356
EPITAXIAL SUBSTRATE FOR HIGH-INTENSITY LED, AND METHOD OF MANUFACTURING SAME
Masahiro Noguchi; Hideki Gotoh, and Kenji Shimoyama, all of Ushiku, Japan, assignors to Mitsubishi Monsanto Chemical Company and Mitsubishi Kasei Corporation, both of Tokyo, Japan
Filed Jan. 19, 1989, Ser. No. 299,094
Claims priority, application Japan, Jan. 21, 1988, 63-12355
Int. Cl.[4] H01L *21/20*
U.S. Cl. 148—33.4 **9 Claims**



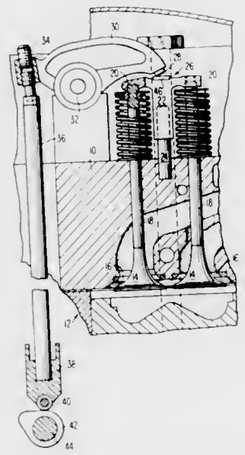
1. An epitaxial substate for a high-intensity LED, comprising:
a double-hetero structure epitaxial layer formed by vapor phase epitaxy; and
an epitaxial layer formed by liquid phase epitaxy on said double-hetero structure epitaxial layer;
said double-hetero structure epitaxial layer being formed by removing a compound semiconductor substrate after said double-hetero structure epitaxial layer has been formed thereon.

4,902,357
METHOD OF MANUFACTURE OF PERMANENT MAGNETS
Nobuo Imaizumi, Hino, Japan, assignor to Namiki Precision Jewel Co., Ltd., Tokyo, Japan
PCT No. PCT/JP86/00327, § 371 Date Apr. 26, 1988, § 102(e) Date Apr. 26, 1988, PCT Pub. No. WO88/00387, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 27, 1987, Ser. No. 188,393
Int. Cl.[4] H01F *1/02*
U.S. Cl. 148—101 **21 Claims**



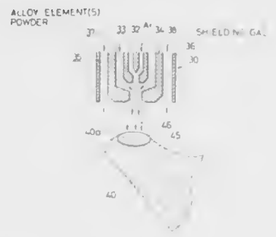
1. A method for the manufacture of a permanent magnet from a permanent magnet alloy powder having the composition $R(T,M)_z$, wherein R is at least one rare earth element selected from the group consisting of Nd, Pr, La and Dy; T is a transition metal selected from the group consisting of Fe and a mixture of Fe and Co; M is boron; and z=4 to 9, including the steps of:
(a) pressure forming said powder to form a green body;
(b) sintering said green body at a temperature in the range 900° to 1200° C.;
(c) machining the sintered green body into a utilizable shape;
(d) solution treating the machined body formed in step (c) at a temperature in the range of 900° to 1200° C. in an atmosphere of a gas selected from the group consisting of nitrogen, oxygen and mixtures of nitrogen and oxygen at a pressure in the range of 10^{-8} to 1.0 Torr; and
(e) aging the solution treated machined body formed in step (d) at a temperature in the range of 300° to 900° C. to form a corrosion resistant permanent magnet.

4,902,358
CERAMIC TO METAL BRAZING
Buel D. Napier, Columbus, Ind.; George W. Wolter, Whitehall, Mich., and Renita G. King, Brownstown, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.
Continuation of Ser. No. 49,092, May 13, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 273,754
Int. Cl.[4] C21D *5/00*
U.S. Cl. 148—127 **12 Claims**



1. A method for forming a ceramic and cast iron component for use in an internal combustion engine, including the steps of:
a. metallizing a portion of the surface of a silicon nitride ceramic element;
b. applying an alloy consisting essentially of titanium, copper and silver to said metallized portion of the ceramic element;
c. applying a cast iron element to the portion of said ceramic element covered with said alloy to form said engine component;
d. simultaneously brazing said ceramic element to said cast iron element and austenitizing the microstructure of said cast iron element by heating said component in a vacuum to a temperature of about 1600 degrees F. to 1750 degrees F. for about one hour, and
e. quenching said heated component in a gas selected from the group consisting of nitrogen and argon to cool said heated component at a controlled rate, thereby producing a core hardness of about 26 RC to about 31 RC in the cast iron element.

4,902,359
WEAR-RESISTANT TITANIUM OR TITANIUM-ALLOY MEMBER AND A METHOD FOR MANUFACTURING THE SAME
Yukoh Takeuchi, Nagoya; Yoshihisa Kato, Tsushima; Hitoshi Hayakawa, Tohkai; Masaru Nagata, and Shinji Nakayama, both of Nagoya, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya and Fuji Valve Co., Ltd., Tokyo, both, Japan
Continuation of Ser. No. 50,496, May 13, 1987, abandoned. This application Sep. 6, 1988, Ser. No. 241,786
Claims priority, application Japan, May 18, 1986, 61-113165; May 18, 1986, 61-113166
Int. Cl.[4] C22C *14/00*
U.S. Cl. 148—133 **15 Claims**



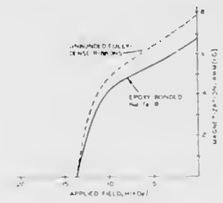
1. A method for manufacturing a wear-resistant member, comprising a step of melt-hardening the surface of a member made of a material selected from the group consisting of titanium and titanium alloy, while spraying the member surface with a plasma jet containing, as a working gas, a gas mixture of an inert gas and a hardening gas, thereby providing a Vickers hardness number of 390 to 1,200 and a hardened layer depth of 0.1 to 2.0 mm.

4,902,360
PERMANENT MAGNET ALLOY FOR ELEVATED TEMPERATURE APPLICATIONS
Bao-Min Ma, Pittsburgh, and Kalathur S. V. L. Narasimhan, Monroeville, both of Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 10,738, Feb. 4, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 266,226
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—302 **18 Claims**

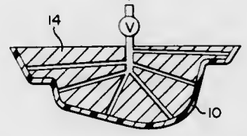
1. A permanent magnet alloy consisting essentially of $R_2Fe_{14}B$, wherein R is a combination of rare earth elements consisting essentially of, in atomic percent, Nd 3 to 11 and balance Ho, said alloy exhibiting in combination α less than -0.01% per °C. over the temperature range of $-50°$ C. to 250° C. and M_r greater than 7500 Gauss at room temperature.

4,902,361
BONDED RARE EARTH-IRON MAGNETS
Robert W. Lee, Troy, and John J. Croat, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Continuation of Ser. No. 492,629, May 9, 1983, abandoned. This application Feb. 10, 1986, Ser. No. 827,911
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—302 **5 Claims**

1. A bonded, magnetically isotropic permanent magnet comprising a bonding agent interspersed with melt-spun, finely crystalline particles comprising, on an atomic percent basis, at least about 10 to about 40 percent of one or more rare earth elements taken from the group consisting of neodymium and praseodymium, at least about 0.5 to about 10 percent boron, and at least about 50 to about 90 percent iron.



4,902,362
APPLIQUE ASSEMBLY METHOD FOR AUTOMOTIVE INSTRUMENT PANELS
Patrick J. Stewart, Kettering; James L. Webber, Spring Valley; Thomas E. Wylie, Brookville; Bill R. Otto, Tipp City, and Jay C. Kellogg, Vandalia, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 30, 1988, Ser. No. 277,747
Int. Cl.[4] B32B *5/20, 7/10*
U.S. Cl. 156—79 **2 Claims**



1. In a method of making a composite foam part with preformed components having a three dimensional fit including adhering a foam applique to a rigid retainer member at three dimensional points thereon, the improvement comprising:
forming the retainer member;
forming a foam applique member by placing an outer skin portion and an inner barrier film portion in a mold, pouring a precursor of the foam material therebetween, foaming and setting the foam material to form the integral foam member;
and then applying contact curable adhesive monomer to at least one of the retainer member or barrier film portion of the foam member;
applying an accelerator component of said adhesive monomer to the other of the retainer member or barrier film portion of the foam member;
and clamping the retainer member against the barrier film portion of the foam applique member to capture and activate the adhesive monomer and the accelerator component therebetween to form a bond of sufficient strength.

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4,902,363

METHOD USING COMPRESSIBLE TEMPORARY SUPPORT FOR TRANSFER LAYER

William E. Delaney, Hockessin, Del., and Helmut H. Frohlich, Heusenstamm, Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1988, Ser. No. 176,438

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 3706528

Int. Cl.⁴ B44C *1/24*

U.S. Cl. 156—230 **8 Claims**

1. In a process for applying a supported transfer layer to a permanent support, comprising the steps of:
   (a) providing a transfer layer sheet comprising a temporary support, a transfer layer, and, optionally, one or more auxiliary layers,
   (b) applying the transfer layer sheet to the permanent support, with the transfer layer in surface-to-surface contact with the permanent support, and,
   (c) removing the temporary support, whereby the transfer layer is transferred to the permanent support,

the improvement wherein the temporary support consists essentially of a compressible material, which has a compressibility of at least 15%.

4,902,364

HEAT TRANSFER DECORATIONS WITH PATTERNED METALLIZATION

Tim Parker, Shrewsbury, Mass., and Dennis R. Benoit, Woonsocket, R.I., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Aug. 2, 1988, Ser. No. 227,217

Int. Cl.⁴ B44C *1/165*

U.S. Cl. 156—233 **8 Claims**

1. A method of transferring a design to an article comprising the steps of:
   (a) coating a heat stable release coating onto a carrier sheet;
   (b) coating an ink layer in a pattern on the heat stable release coating so that at least portions of the release coating remain uncovered with ink;
   (c) applying a metallic layer over the release coating so that at least a portion of the metallic layer is in direct contact with and adheres directly to the release coating;
   (d) applying a heat activatable adhesive layer over the metallic layer, said release layer, ink layer and metallic layer forming a transferable laminate,
   (e) transferring said transferable laminate from the carrier to an article at heat transfer temperatures in a range from 200° F. to 500° F., the transferred laminate on the article having a bright metallic appearance.

4,902,365

METHOD FOR MAKING A COMPOSITE SHEET-LIKE STRUCTURE

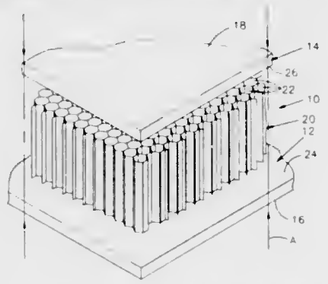
Edward F. Westlake, Sr., 116 Deerfield Rd., Broomall, Pa. 19008

Filed Dec. 3, 1987, Ser. No. 128,289

Int. Cl.⁴ B32B *31/20*

U.S. Cl. 156—273.9 **23 Claims**

14. A method for fabricating a rigid composite structure having outwardly facing thermoplastic sheets and a porous inner core having at least some open inner core pores with said inner core protruding into said thermoplastic sufficiently far that exteriorly facing pores in the inner core are retained by said plastic and said structure has essentially the resistance to flexure of said inner core standing alone, comprising:
   a. positioning said thermoplastic sheets on either side of said inner core;
   b. heating said inner core by application of electrical voltage thereto until surfaces thereof facing said thermoplastic sheets and contiguous inner portions of said inner core, of thickness equal to depth to which said inner core penetrates said thermoplastic, to at least the glass transition temperature of said thermoplastic to permit said inner core to penetrate said thermoplastic sufficiently so that said inner core is retained by said thermoplastic when said thermoplastic has solidified; and
   c. pressing said thermoplastic on either side of said inner core until said inner core penetrates said thermoplastic by said distance sufficient to permit said thermoplastic to retain said inner core when said thermoplastic solidifies.



4,902,366

PROCESS AND APPARATUS FOR BONDING AND EMBOSSING SHEET MATERIALS, PARTICULARLY FIBER MATTING

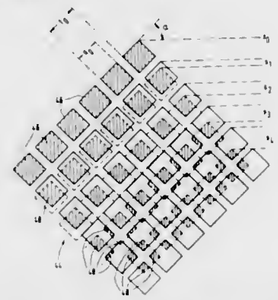
Hans Bader, Hanover, Fed. Rep. of Germany, assignor to Corovin GmbH, Peine, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,544

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3700609

Int. Cl.⁴ B32B *5/00*

U.S. Cl. 156—296 **7 Claims**



1. A method for processing sheet material comprising:
inserting the sheet material into a gap between two parallel rotating calender rollers, each of said rollers having a raised pattern formed on the surface thereof by opposed elements thereon;
forming an embossed pattern on said sheet by pulling said inserted sheet material through said gap by the rotation of said calender rollers, said embossed pattern corresponding to an initial overlap in said gap between said opposed elements on said calender rollers; and
varying the extent of overlap between said opposed elements on said raised pattern from said initial overlap while forming said embossing pattern by initially aligning and driving said rollers at identical speeds to produce said initial overlap and thereafter varying the extent of overlap between said opposed elements from said initial overlap by temporarily varying the speed of one of said calender rollers in relation to the speed of the other calender rollers from said identical speed for a time to allow a change in overlap and subsequently readjusting said speed to the initial identical speed to maintain said charge in overlap to thereby produce a varied embossing pattern on said sheet material.

4,902,367

APPARATUS AND METHOD FOR THE PREPARATION OF MOSAIC FLOOR DECORATIONS

Ho J. Park; Jin Y. Choi, both of Cheongju; Seong C. Park, Bucheon, and Gi H. Yang, Cheongju, all of Rep. of Korea, assignors to Lucky, Ltd., Seoul, Rep. of Korea

Filed Jun. 8, 1988, Ser. No. 204,023

Claims priority, application Rep. of Korea, Jun. 19, 1987, 87-6232; Jun. 19, 1987, 87-6233

Int. Cl.⁴ B32B *31/10*

U.S. Cl. 156—297 **10 Claims**



1. A process for the preparation of a mosaic floor, which comprises:
   coating a substrate with base sol,
   dispersing and uniformly arranging chips upon the substrate by supplying the chips through a sliding-table having a plurality of slopes having many different incline angles and which is operatively associated with a fixed-arrangement plate at an end of the sliding-table,
   heating the arranged chips, and
   applying an effective amount of pressure to the chips for fusing the chips.

4,902,368

VIBRATION-DAMPING SUBSTITUTED AROMATIC SILANE COMPOUNDS AND DAMPING METHOD EMPLOYING SAME

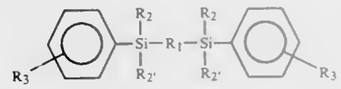
Susan L. Oldham, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 13, 1988, Ser. No. 218,787

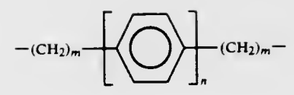
Int. Cl.⁴ C09J *5/10*

U.S. Cl. 156—306.9 **7 Claims**

1. A method for reducing the transmission of vibratory motion between a first body and a second body having opposing surfaces comprising providing a layer of a selected material between said opposing surfaces of said first body and said second body wherein said material comprises a cured polymer of a compound having the formula

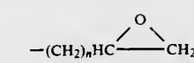


where:
   R_1 is selected from the group consisting of:
   (a) an aliphatic hydrocarbon group containing 2 to 10 carbon atoms, and
   (b) a group having the formula



where
   n = 1 to 3
   m = 0 to 5

R_2 and R_2' are each selected from the group consisting of an alkyl group containing 1 to 4 carbon atoms, an unsubstituted aryl group, and a substituted aryl group; and R_3 is:



n = 0 to 10

4,902,369

METHOD FOR THE PROCESSING OF LIQUID CRYSTAL POLYMERS

Nadka V. Avramova, and Stoyko C. Fakirov, both of Sofia, Bulgaria, assignors to University of Delaware, Newark, Del.

Filed Jun. 23, 1988, Ser. No. 210,260

Claims priority, application Bulgaria, Sep. 29, 1987, 81313

Int. Cl.⁴ B32B *31/20, 31/04, 31/12;* **C09K** *19/38*

U.S. Cl. 156—308.2 **4 Claims**

1. The process of laminating liquid crystal polymer films having a high degree of molecular orientation as formed while maintaining the molecular orientation which comprises:
   cooling the films as formed to a temperature of around 0° C., and thereby freezing the molecular orientation, and
   contacting a multiplicity of said films at a temperature of at least 100° C. but below the melting point of the polymer and at a pressure of about 0.05–5 MPa for about 3–10 hours.

4,902,370

SYNTHETIC BASED COLD SEAL ADHESIVES

Richard A. Dust, Maidenhead, and Peter Causton, Buckinghamshire, both of England, assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 183,025, Apr. 18, 1989. This application Aug. 17, 1989, Ser. No. 394,996

Int. Cl.⁴ C09J *3/14*

U.S. Cl. 156—327 **6 Claims**

1. A method for forming a cold seal bond on a substrate comprising
   (i) coating all or a portion of said substrate with an effective amount of emulsion containing a cold seal adhesive composition, wherein said cold seal adhesive composition comprises about 45 to 70% (by wt.) of a synthetic base polymer and about 30 to about 55% (by wt.) of a synthetic secondary polymer, wherein the base polymer comprises a synthetic polymer, a synthetic copolymer, or any mixture thereof characterized in that it possesses a Tg of about −40° to about −60° C. and a Williams plasticity number of about 2.5 to about 2.9; and secondary polymer comprises a styrene-acrylic copolymer, a stryene-acrylic resin, or any mixture thereof, or an admixture of one or more styrene-acrylic copolymers, styrene-acrylic resins, or any mixture thereof, with one or more synthetic polymers, synthetic copolymers, or synthetic resins characterized in that it possesses a Tg of about −25° to about +5° C. and a plasticity number of about 5.0 to about 5.6;
   (ii) drying said emulsion to form a dried film; and
   (iii) subsequently bringing the coated portions of the substrate into contact with each other such that a bond is effected.

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4,902,371

MASK SHOCK ABSORBING SYSTEM AND METHOD OF USING THE SAME

Gerald St. Andris, Poughkeepsie, and John P. Gauci, Putnam Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1988, Ser. No. 283,437
Int. Cl.[4] B32B *31/16*
U.S. Cl. 156—344 22 Claims



16. A method for controlled separation of a mask from a structure comprising the steps of:

(a) placing a mask having at least one opening over said structure,

(b) applying a fluidic medium over said mask so that at least a portion of said fluidic medium passes through said opening in said mask and covers at least a portion of said structure, and

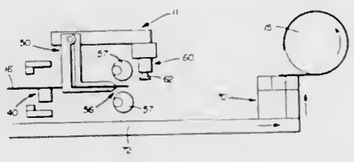
(c) simultaneously separating said structure from said mask and applying a counter force over said mask so that said mask separates from said structure in a controlled manner.

4,902,372

INNERLINER APPLICATOR

Ronald L. Mick, Jr., Clinton, and Kent K. Kipling, Solon, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Continuation of Ser. No. 96,774, Sep. 14, 1987, abandoned, which is a continuation of Ser. No. 424,740, Sep. 27, 1982, abandoned. This application Aug. 1, 1988, Ser. No. 226,944
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—361 1 Claim



1. An apparatus for use in connection with a system employing a plurality of drums having varying circumferences for applying a portion of a continuous length of innerliner material to a selected one of said drums comprising:

(a) transport means including a suction manifold moveable longitudinally generally horizontally in a forward direction for transporting said innerliner material from said continuous length to said drum and being moveable generally vertically towards and away from said drum for applying one end of said innerliner material to said drum, said suction manifold being moveable in a longitudinal rearward direction for stretching said innerliner material after said one end has been applied to said drum and prior to application of a second end of a remaining portion of said innerliner material to said drum by said suction manifold;

b) cutting means for severing a portion of said innerliner material from said continuous length;

c) measuring means for measuring the angular displacement of said drum and providing an output thereof;

d) calculating means for calculating the length of innerliner material required to completely wrap around the drum based upon the measured angular displacement of said drum;

e) centering means for centering the innerliner material with respect to said drum after said one end has been applied to the drum by the suction manifold and prior to the suction manifold applying the second end of the remaining portion of said innerliner material to said drum; and

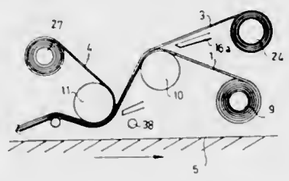
f) control means in communication with said measuring means and calculating means for causing said cutting means to sever a portion of said innerliner material from said continuous length, said portion being shorter than the circumference of the smallest drum in the system, and for causing said innerliner material to be stretched by the suction manifold before it is applied to said drum and for causing said suction manifold to transport said stretched portion of innerliner material toward said drum and to apply said stretched portion to said drum.

4,902,373

PROCESS AND APPARATUS FOR ASSEMBLING TWO FILMS, IN PARTICULAR FILMS OF A FEW MICRONS THICKNESS

Robert Regipa, Toulouse, France, assignor to Centre National d'Etudes Spatiales (C.N.E.S.), Paris, France

Division of Ser. No. 24,435, Mar. 11, 1987, Pat. No. 4,812,189.
This application Dec. 5, 1988, Ser. No. 280,022
Int. Cl.[4] B65H *16/00*
U.S. Cl. 156—467 15 Claims



1. Apparatus for joining two films (1, 2) and of the type comprising an assembly table (5) to spread out the films, film-supply means (9), means (24, 25, 27) supplying reinforcing bands (3, 4) and a movable unit (6, 7) which is longitudinally displaceable above the assembly table (5) and holding on one hand positioning means (10, 11, 26, 33, 34) designed to align the edges to be joined of the films (1, 2) and the reinforcing band (3, 4) and on the other hand heatsealing means (14, 15, 16, 17) for said films and reinforcing band, said apparatus comprising: the supply means (24, 25, 27) of reinforcing band (3, 4) comprising means (24, 25) supplying a junction tape (3) and means (27) supplying a plane, so-called positioning tape, the heat-sealing means (14, 15, 16, 17) are designed to: seal the junction tape (3) on the longitudinal edge of a so-called first film (1), seal the positioning tape (4) or the longitudinal edge of a so-called second film (2) to that side of the junction tape (3) which is opposite the first film (1), the positioning means (10, 11, 26, 33, 34) comprise: guide means (10, 11, 26) designed to position within the same alignment a longitudinal edge of the first film (1), the junction tape (3) and the positioning tape (4), positioning means (33, 34) for the positioning tape (4) which are designed to position within the same alignment the longitudinal edge of the first film (1) hemmed by the junction tape (3) and the positioning tape (4) on one hand and on the other an edge

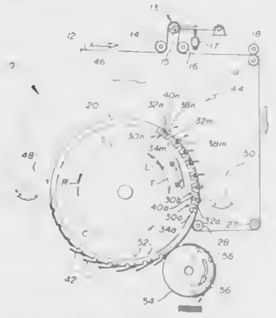
to be joined of the second film (2), means (31, 35, 36, 37) for separating the positioning tape (4) from the junction tape (3) are mounted on the movable unit (6, 7) in order to separate said junction tape (3) from the said positioning tape (4) in such a manner as make possible the joining of the edges of two films (1, 2) aligned by the positioning means (33, 34) of the positioning tape (4).

4,902,374

BAG MAKING MACHINE

David A. Smith, Midland; Herbert B. Geiger, Bay City, and R. Douglas Bear, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 2, 1988, Ser. No. 188,884
Int. Cl.[4] B23B *31/00*; F16H *55/48*; F16G *1/28*
U.S. Cl. 156—515 15 Claims



1. An apparatus for the continuous production of bags from a folded web of thermoplastic material comprising:

a source of a continuous folded web of thermoplastic material;

a rotatable drum having a plurality of sever and seal stations located about the outer periphery thereof for forming individual bags, said sever and seal stations including means for clamping said web of thermoplastic material to the surface of the drum, said clamping means including a plurality of seal bar asssemblies secured to an endless conveyor positioned adjacent said sever and seal stations;

means for continuously feeding said folded web of thermoplastic material onto the surface of said drum; and means mounted on adjacent sever and seal stations and positioned therebetween for tucking said web of material inwardly from the periphery of said drum to control the width of said bags, said tucking means being mounted on respective seal bar assemblies.

4,902,375

APPARATUS FOR ASSEMBLING A CONTINUOUS STREAM OF COMPOSITE LABELS

Terry L. Holmes, Monona; Daniel A. Thiemann, Windsor, and Charles Schroeder, deceased, late of Madison, all of Wis. (by Ruth Schroeder, administrator), assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed May 28, 1986, Ser. No. 868,214
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—516 12 Claims

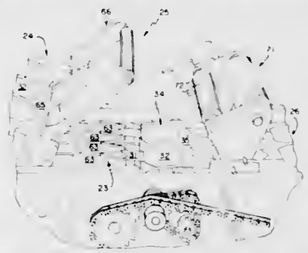
1. An apparatus for assembling a continuous stream of composite labels, comprising:

means for supporting and conveying a substantially continuous web of backing material, said backing material supporting and conveying means having an upstream end portion and a downstream area;

means for cutting a length of ribbon into ribbon segments and for depositing said ribbon segments into a substantially continuous stream of spaced ribbon segments, said ribbon segment depositing means includes pusher assembly means for engaging and moving each ribbon segment between said ribbon cutting means and toward a ribbon segment conveying assembly;

said ribbon segment conveying assembly including means for supplying said substantially continuous stream of spaced ribbon segments toward said upstream end portion of the backing material supporting and conveying means, said ribbon segments supplying means having an off-feed end;

means for supplying a substantially continuous stream of spaced labels toward said upstream end portion of the backing material supporting and conveying means, said labels supplying means having an off-feed end; and



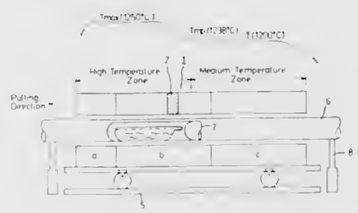
transfer means for operatively connecting together said off-feed end of the ribbon segments supplying means, said off-feed end of the labels supplying means and said upstream end portion of the backing web supporting and conveying means, said transfer means further being for positioning one of said ribbon segments below at least a portion of one of said labels while positioning said label onto said web of backing material in order to thereby form on said backing web a composite label product of ribbon segment at least partially under the label.

4,902,376

MODIFIED HORIZONTAL BRIDGMAN METHOD FOR GROWING GAAS SINGLE CRYSTAL

Tzer-Perng Chen; Yih-Der Guo, both of Hsinchu, and Tsun-Tsai Chang, Taichung, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Dec. 28, 1988, Ser. No. 290,994
Int. Cl.[4] C30B *11/04, 29/40, 29/42, 29/44*
U.S. Cl. 156—616.2 2 Claims



1. A process for growing a gallium arsenide single crystal from a polycrystalline gallium arsenide by the horizontal Bridgman technique comprising:

(a) melting the polycrystalline gallium arsenide in a quartz boat which contains a seed and which is placed in a sealed quartz tube heated by a furnace, at a temperature greater than 1238 deg C. but lower than the melting point of quartz;

(b) cooling the melt from the seed end to start the crystal growing by moving the furnace; and

(c) annealing the crystallized gallium arsenide during the

crystal growth process at a temperature of 1100–1220 deg C.;

(d) cooling the annealled gallium arsenide to room temperature;

wherein said steps are carried out in the absence of a separate As vapor pressure controlling zone additionally comprising the step of introducing a small amount of arsenic into said quartz tube before sealing the quartz tube to maintain the stoichiometric composition. Said amount of arsenic being equal to that calculated by the ideal gas law as being lost by dissociation of GaAs at its melting point.

4,902,377

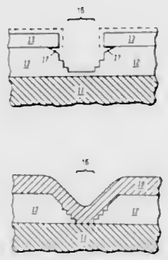
SLOPED CONTACT ETCH PROCESS

Robert K. Berglund, Mesa, Ariz., and Karl E. Mautz, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 23, 1989, Ser. No. 355,574

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **B29C** *37/00*

U.S. Cl. 156—643 **13 Claims**



1. A method for making electrical contact between a first conductive layer and a second conductive layer of a semiconductor device wherein an insulating layer separates the first conductive layer and the second conductive layer, the method comprising the steps of: forming a masking film with a predetermined pattern on the surface of the insulating layer; isotropically etching a portion of the insulating layer exposed by the pattern; anisotropically etching the exposed portion of the insulating layer using the masking film as a mask; completing removal of the exposed portion of the insulating layer, thus exposing a portion of the first conductive layer, by repeating the steps of isotropically etching the masking film in a horizontal direction and anisotropically etching the insulating layer in a vertical direction; removing the masking film; and forming the second conductive layer on top of the insulating layer in electrical contact with the first conductive layer.

4,902,378

POLYMER WITH REDUCED INTERNAL MIGRATION

Andrew J. Ouderkirk; John T. Simpson; Robert W. Warner, and Douglas S. Dunn, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 27, 1988, Ser. No. 187,028

Int. Cl.[4] B44C *1/22*

U.S. Cl. 156—643 **7 Claims**

1. A process for reducing the migration of migratory materials from film comprising a semicrystalline polymer, said process comprising modifying the surface of a semicrystalline polymer by irradiating at least one surface of a semicrystalline polymer composition containing at least one migratory ingredient with radiation which is absorbed by said composition, controlling the intensity and fluence of said radiation exposure so that semicrystalline polymer on said surface is melted and there is ablation or volatilization of less than 0.1% by weight of the total weight of the polymer in melted areas, and allowing said melted polymer to cool at a rate which will form a quasi-amorphous polymeric area on said at least one surface, and then coating said at least one surface with a polymer that is less penetrable by said migratory ingredient in said composition than is said composition.

4,902,379

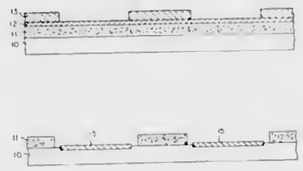
UHV COMPATIBLE LIFT-OFF METHOD FOR PATTERNING NOBEL METAL SILICIDE

Howard E. Rhodes, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,372

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/02*

U.S. Cl. 156—643 **3 Claims**



1. A method of forming a pattern of a noble metal silicide on a silicon substrate, comprising the steps of:

(a) forming a first UHV (ultra High Vacuum)=compatible inorganic layer of a first material on the silicon substrate;

(b) forming a second UHV (ultra High Vacuum)=compatible layer of a second material on the first layer;

(c) removing selective regions of the second inorganic layer and the underlying first layer exposing the surface of the silicon substrate;

(d) undercutting portions of the first layer so that the second layer overhangs the first layer;

(e) depositing a noble metal at a pressure of 10^{-8} Torr or less and heating the deposited material at a temperature of 250° C. to 800° C. to form metal silicide where the deposited metal contacts the exposed silicon; and

(f) removing the second layer to lift-off the unreacted metal.

4,902,380

TIRE ENVELOPE EXPANDER

John C. Olson, 3315 S. Vandecar Rd., Mt. Pleasant, Mich. 48858

Filed Jul. 6, 1988, Ser. No. 215,744

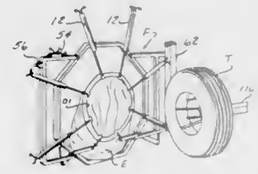
Int. Cl.[4] B29D *30/54*

U.S. Cl. 156—909 **12 Claims**

1. An envelope expander for mounting an annular envelope of a flexible resilient material upon a tire supported upon a tire support means with the tire axis in a horizontal position, said envelope having a pair of axially aligned central openings at opposite sides of said envelope of a diameter approximately equal to the inner diameter of said tire and said envelope being adapted to enclose the outer surfaces of said tire;

said expander comprising a rigid gate-like frame lying in a general vertical plane and having an unobstructed opening therethrough generally symmetrical about a central horizontal axis normal to said general plane and of a size sufficient to accommodate the free passage of said tire therethrough with the axis of the tire generally coaxial to said central axis;

a plurality of expanding means mounted on said frame at respective locations spaced around the periphery of said central axis movable between respective extended radially inner end limits of movement at distances from said central axis approximately equal to the inner radius of said tire and respective retracted radially outer end limits of movement at distances from said central axis greater than the outer radius of said tire, said expanding means being adapted to engage said envelope at circumferentially spaced locations around the periphery of one of said central openings to expand said one of said central openings upon movement of said expanding means from said respective radially inner end limits to a size accommodating movement of said tire axially through said one of said central openings when said expanding means are at said respective radially outer end limits;



first powered means for driving said expanding means in coordinated movement between said radially inner and outer end limits, and second means operable when said one of said central openings in said envelope has been expanded by said expanding means for horizontally moving said frame and tire support means relative to each other to move a tire on said support means through the expanded one of said central openings in said envelope and said unobstructed opening in said frame into the interior of said envelope.

4,902,381

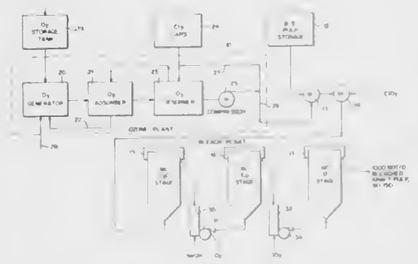
METHOD OF BLEACHING PULP WITH OZONE-CHLORINE MIXTURES

Michael D. Meredith, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Dec. 9, 1988, Ser. No. 281,752

Int. Cl.[4] D21C *9/12, 9/147, 9/153, 9/14*

U.S. Cl. 162--65 **10 Claims**



1. A method of chlorine bleaching cellulosic fibrous material pulp at a consistency between about ½–15% solids during the production of kraft pulp without significantly affecting the degree of delignification produced by chlorine bleaching, comprising the step of: in the chlorine bleaching of kraft pulp at a consistency of about ½–15%, substituting ozone for a portion of the chlorine by providing a mixture of chlorine and ozone applied to the pulp simultaneously, the amount of ozone in the mixture being between 1–40% by volume.

4,902,382

PROCESS FOR PRODUCING A NEUTRAL PAPER

Takao Sakabe, Niigata; Akira Honma, Nagaoka; Takao Miyamura, Niigata; Hiroshi Suzuki, Niigata, and Yoshihito Meguro, Niigata, all of Japan, assignors to Hokuetsu Paper Mills, Ltd., Niigata, Japan

Filed Sep. 29, 1988, Ser. No. 251,715

Claims priority, application Japan, Oct. 2, 1987, 62-250474

Int. Cl.[4] D21H *3/28*

U.S. Cl. 162—175 **2 Claims**

1. A process for producing a neutral paper which comprises adding to a stock slurry comprising filler and pulp comprising 0 to 100 weight percent high yield pulp having a pH ranging from 6 to 9, first a cationized starch and thereafter bentonite and colloidal silica either simultaneously or successively with a time interval of at most 60 seconds, then pouring the stock slurry over the wire of a paper making machine to form a web layer, and drying the web layer, wherein the bentonite has a swelling degree (grams of water-swelled bentonite/gram of bentonite) of at least 5, the amount of bentonite is in the range of 0.05 wt. % to 2 wt. % based on cellulose, the amount of colloidal silica is in the range of 0.01 wt. % to 1.0 wt. % based on cellulose, the weight ratio of colloidal silica/bentonite is in the range of 1/0.5 to 1/15, and the weight ratio of colloidal silica/cationized starch is the range of 1/1 to 1/25.

4,902,383

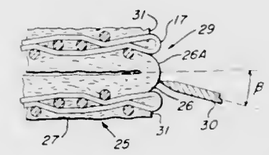
METHOD OF MAKING A PAPERMAKER'S FELT WITH NO FLAP SEAM

Patrick H. Peuven, Clinton, S.C., assignor to Asten Group, Inc., Charleston, S.C.

Continuation of Ser. No. 177,670, Apr. 5, 1988, abandoned. This application Apr. 28, 1989, Ser. No. 346,373

Int. Cl.[4] D21F *7/10, 3/00*

U.S. Cl. 162—199 **4 Claims**



1. A method of forming a seam splice in a papermaker's felt having at least one batt layer affixed thereto, said method comprising the steps of:

(a) determining the intended running direction of said felt on the papermaking machine;

(b) opening the fabric seam;

(c) providing a support means for supporting the felt in the area adjacent the seam;

(d) orienting the felt on said support means with the batt layer in a topmost position;

(e) folding the felt back upon itself to expose the bottom surface of said batt through said open seam; and

(f) cutting said batt layer directly adjacent said open seam in a directing opposite to the running direction of the felt so as to create an angled splice beginning at the bottom of said batt layer adjacent to the seam and angling outwardly by at least 10 degrees from a perpendicular through the seam.

4,902,384

WET PRESS WITH VIBRATION CONTROL

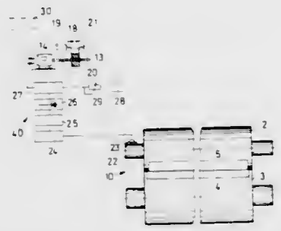
Helmut Anstötz, Tönisvorst; Bernhard Brendel, Grefrath 2-Müllhausen, and Günter Schrörs, Tönisvorst, all of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co KG, Krefeld, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 202,094

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719828

Int. Cl.⁴ D21F *3/02, 1/24*

U.S. Cl. 162—252 **9 Claims**



4. A wet press of a paper-making machine for treating a paper web comprising:

(a) a pair of first rolls defining a roll gap through which the paper web is conducted;

(b) second rolls defining a closed loop path which includes said roll gap;

(c) a belt-shaped felt guided by and revolving around said second rolls in the closed loop path, with the paper web and said felt being simultaneously conducted through the roll gap;

(d) said second rolls including a tightening roll pivotally supported at one end, said felt being looped around said tightening roll with a section of the felt running toward the tightening roll and a section of the felt running away from the tightening roll;

(e) a controllable positioning device connected to the other end of the tightening roll, said controllable positioning device being operable to tilt the tightening roll about said one end by a given tilt angle which lies in a plane located in the space between said felt sections and which passes through the longitudinal axis of the tightening roll; and

(f) means for automatically varying the tilt angle including a controller operably coupled to said controllable positioning device and a vibration sensor operably connected to at least one of said first rolls, said vibration sensor generating a signal indicative of the actual vibration of said at least one first roll, said controller operating said controllable positioning device as a function of the signal of the vibration sensor.

4,902,385

PROCESS FOR THE PURIFYING DISTILLATION OF CRUDE SEC-BUTYL ALCOHOL

Gunther Osterburg, Rheurdt, Fed. Rep. of Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 233,775

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728428

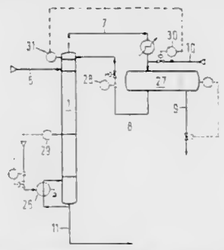
Int. Cl.⁴ B01D *3/36;* **C07C** *29/82*

U.S. Cl. 203—96 **7 Claims**

1. A process for the continuous purifying distillation of crude sec-butyl alcohol obtained by catalytic hydration of n-butenes at elevated temperature and elevated pressure and by separation of unreacted olefin from the reaction product, wherein the crude sec-butyl alcohol containing di-sec-butyl ether and tertiary butyl alcohol together with higher and lower boiling components is introduced to the upper part of a distillation column, the energy required for distillation is supplied at the bottom of the column, azeotropes formed in the presence of water are distilled of overhead, and dry sec-butyl alcohol is withdrawn at the bottom of the column, said process comprising:

(a) feeding at the top of the column the amount of water required for forming the azeotropes;

(b) supplying sufficient energy to the base of the column to maintain a temperature between 87.5° C. and 99.5° C. at a temperature control point in the middle of the column,



(c) feeding the crude sec-butyl alcohol to the distillation column at a point below the top of the column and above the temperature control point;

(d) condensing the azeotropes and lower boiling components distilled overhead forming a water rich phase and an alcohol and ether rich phase and returning as reflux to the top of the column the water rich phase and a sufficient amount of the alcohol and ether rich phase to maintain the desired reflux ratio for distillation of all of the azeotropes; and

(e) withdrawing part of said alcohol and ether rich phase as the top product from the distillation.

4,902,386

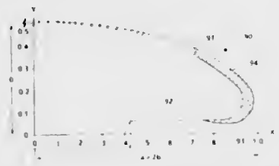
ELECTROFORMING MANDREL AND METHOD OF FABRICATING AND USING SAME

William G. Herbert, Williamson; Edouard E. Langlois; Duane C. Basch, both of Rochester, and Peter J. Schmitt, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1989, Ser. No. 388,418

Int. Cl.⁴ C25D *1/02*

U.S. Cl. 204—9 **24 Claims**



1. A cylindrical electroforming mandrel comprising a substantially cylindrical mandrel core having substantially parallel sides and at least one tapered end having curved sides which converge toward an apex, and a plated metal coating on said parallel sides and said tapered end, the profile of an axial cross section of said tapered end from the intersection between said curved sides and said parallel sides to about said apex having the shape of half an ellipse defined by the formula:

$$y = \pm b/a \sqrt{(a^2 - x^2)}$$

where:

a = ½ the length of the major axis of said ellipse and has a value between about 2.3b and about 1.7b,

b = ½ height of the minor axis of said ellipse and has a value at least about 1,000 times greater than the thickness of said plated metal coating on said parallel sides, and

x and y define a point lying along the outer surface of said ellipse measured from the center of the ellipse.

4,902,387

CHROMATE-TREATED ZINC-PLATED STEEL STRIP AND METHOD FOR MAKING

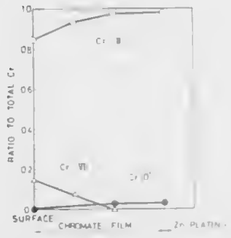
Yuko Takeuchi; Yuki Nakahara; Hajime Kimura, and Shinobu Okano, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 20,015, Feb. 26, 1987, Pat. No. 4,804,587. This application Aug. 17, 1987, Ser. No. 86,230

Claims priority, application Japan, May 21, 1986, 61-116642

Int. Cl.⁴ C25D *7/06, 11/38*

U.S. Cl. 204—28 **4 Claims**



1. A method for preparing a chromate-treated zinc-plated steel strip, comprising

effecting cathodic electrolysis on a zinc-plated steel strip in a bath containing 2.6 to 78 grams per liter of hexavalent chromium, 0.5 to 50 grams per liter, calculated as SiO_2, of colloidal silica, and 0.05 to 5.0 grams per liter, calculated as F, of a fluoride, and substantially free of sulfate and chloride, at a current density of 1 to 50 A/dm² and to an electricity quantity of 5 to 100 C/dm².

4,902,388

METHOD FOR ELECTROPLATING NICKEL ONTO TITANIUM ALLOYS

Donald E. Fornwalt, South Windsor; Gary M. Lomasney, New Britain, and Kostas Routsis, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 3, 1989, Ser. No. 375,231

Int. Cl.⁴ C25D *5/38*

U.S. Cl. 204—32.1 **4 Claims**

1. A method for electroplating a layer of nickel onto a titanium base alloy containing refractory metal element, comprising the steps of etching the component surface in a solution having a composition corresponding to, by volume, about 4–6% of 70% HF and 94–96% of 36–38% HCl, and then cathodically plating a layer of nickel onto the etched surface.

4,902,389

PROCESS FOR PRODUCING ALUMINUM SUPPORT FOR PRINTING PLATE

Atsuo Nishino, and Tsutomu Kakei, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

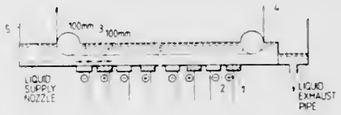
Filed Nov. 17, 1988, Ser. No. 272,330

Claims priority, application Japan, Nov. 27, 1987, 62-297835

Int. Cl.⁴ C25F *3/04*

U.S. Cl. 204—129.1 **7 Claims**

1. A process for producing an aluminum-containing support for a printing plate which involves electrochemical graining of the support comprising (i) passing said support through an acidic electrolyte in an electrolytic cell along a path of travel maintained a distance above alternatingly distributed anodes



and cathodes in a face-to-face relationship with said aluminum-containing support and (ii) simultaneously applying d-c voltage between said anodes and cathodes to produce an electrochemically roughened support.

4,902,390

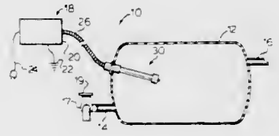
ELECTROSTATIC WATER TREATMENT

Tore C. Arnesen, 158 Rexway Drive, Georgetown, Ontario, Canada (L7G 1S1)

Division of Ser. No. 906,245, Sep. 12, 1986. This application Mar. 9, 1988, Ser. No. 166,012

Int. Cl.⁴ C25B *11/00*

U.S. Cl. 204—149 **2 Claims**



1. A method of operating a liquid-containing system, said system comprising

a. a liquid-containing receptacle

b. a source of direct current high voltage having a high voltage connection and a grounding connection;

c. an electrode adapted for mounting through an opening in a wall of the recrerptacle and comprising

an elongated conductive tubular member having a proximal end and a distal end,

a sleeve fitted in insulative and protective relation over said tubular member,

a distal bushing positioned in sealing relation at the distal end of said tubular member,

a conductive proximal bushing having a hollow interior and two ends, the first end being positioned over and engaging said tubular member in the region adjacent the proximal end and the second end extending past the proximal end of the tubular member, said proximal bushing including means for mounting the electrode such that said proximal bushing is in electrical contact with the receptacle and said tubular member extends into the receptacle,

a high voltage terminal located within the interior of said proximal bushing,

means for connecting said high voltage terminal to the interior of said tubular member,

insulating means within the interior of said proximal bushing to insulate said proximal bushing from said high voltage terminal,

a conductive closure member having an inner surface disengagably engagable with and positioned to cover the second end of said proximal bushing,

a grounding terminal located on the inner surface of said closure member,

said closure member being engaged by means of a conduc-

tive engaging member extending between the closure member and the proximal bushing to provide electrical contact of the closure member and hence the grounding terminal with said proximal bushing; and d. an insulated high tension lead connecting said high voltage connection of the high voltage source to said high voltage terminal and a grounding lead connecting said grounding connection to said grounding terminal,

said method including the steps of:

energizing said electrode at a predetermined voltage, so as to generate a predetermined electrostatic filed in said receptacle;

and circulating said liquid through said electrostatic field.

4,902,391

METHOD AND DEVICE FOR IONIZING FLUID

Jack K. Ibbott, 17-7 Nishiazabu 4-chome, Minato-ku, Tokyo 106, Japan

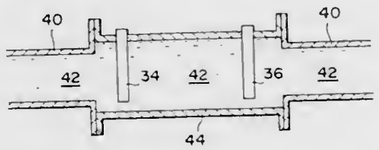
PCT No. PCT/JP87/00277, § 371 Date Dec. 30, 1987, § 102(e) Date Dec. 30, 1987, PCT Pub. No. WO87/06925, PCT Pub. Date Nov. 19, 1987

PCT Filed May 1, 1987, Ser. No. 150,428

Claims priority, application Japan, May 6, 1986, 61-103439; Aug. 5, 1986, 61-182732

Int. Cl.⁴ C02F *1/46*

U.S. Cl. 204—150 **11 Claims**



1. A method of ionizing an electroconductive fluid, said method comprising:

providing a first electroconductive member and a second electroconductive member having different electrochemical potentials in a spaced apart relationship; and

electroconductively connecting said first and said second members by only disposing electroconductive fluid therebetween to develop an electric potential between said members that causes the fluid to be ionized.

4,902,392

HYDROCRACKING PROCESS

Brent A. Aufdembrink, Voorhees, N.J.; Thomas F. Degnan, Yardley; Richard F. Socha, Newtown, both of Pa., and Michael R. Stapleton, Pennington, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1987, Ser. No. 139,545

Int. Cl.⁴ C10G *17/00*

U.S. Cl. 208—110 **34 Claims**

1. A process for hydrocracking a petroleum fraction to lighter hydrocarbons comprising providing a feedstock containing a relatively heavy petroleum fraction and contacting said feedstock with a catalyst in the presence of hydrogen under hydrocracking conditions including an elevated temperature, the catalyst composition including titanometallate layered metal oxide material comprising a layered metal oxide and pillars of a chalcogenide of at least one element selected from Groups IB, IIB, IIIA, IIIB, IVB, VA, VB, VIA, VIIA and VIIIA of the Periodic Table of the Elements separating the layers of the metal oxide, wherein each layer of the metal oxide has the general formula

$$[M_x[\ ]_y]^{2-(x+y)}O_4]^{q-}$$

wherein M is at least one metal of valance n wherein n is an integer between 0 and 7, [ ] represents a vacancy site, Z is a tetravalent titanium metal, and wherein

$q=4y-x(n-4)$

$0<x+y<2$

and (b) at least one hydrogenating metal selected from Groups IVA, VIA and VIIIA.

4,902,393

PROCESS FOR THE PRODUCTION OF 1,1,2-TRICHLORO-2-METHYLPROPANE

Dieter J. Müller, Marl, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,466

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3330609; Apr. 25, 1984, 3415334

Int. Cl.⁴ C07G *13/00*; C07C *17/04*

U.S. Cl. 204—158.12 **18 Claims**

1. A process for the production of 1,1,2-trichloro-2-methylpropane, comprising reacting 1-chloro-2-methylpropene with sulfuryl chloride wherein the 1-chloro-2-methylpropene contains less than about 10 ppm of a stabilizer therefor which stabilizer in greater amounts would interfere with said reaction whereby 1,1,2-trichloro-2-methylpropane is produced essentially selectively and in high yield.

3. A process of claim 1, wherein the reaction is carried out in the presence of actinic radiation.

4,902,394

SPUTTERING METHOD AND APPARATUS

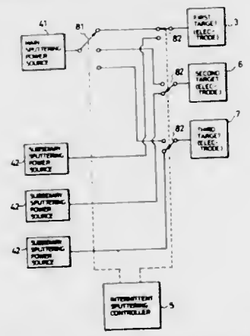
Akihiro Kenmotsu, Fujisawa; Shigeru Kobayashi, Setagaya; Kunihiko Watanabe, Yokohama; Eiji Matsuzaki, Yokohama; Yoshifumi Yoritomi, Yokohama; Toshiyuki Koshita, Yokohama, and Mitsno Nakatani, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 20, 1988, Ser. No. 146,031

Claims priority, application Japan, Jan. 23, 1987, 62-12343

Int. Cl.⁴ C23C *14/34*

U.S. Cl. 204—192.12 **11 Claims**



1. A sputtering method for forming a film by using a plurality of targets wherein a period for producing the film is controlled, comprising the steps of:

changing a power output of a sputtering power source, setting the output to a high level so as to deposit the film of a predetermined quality and setting the output to a low level to maintain a predetermined minimum plasma around a target;

applying said power output of said sputtering power source to one of said plurality of targets; and

depositing said film to a thickness corresponding to an integrated value of the sputtering power supplied to said one of said plurality of targets during a production period.

4,902,395

METHOD OF MANUFACTURING SURFACE COATED CARBO-NITRIDE TITANIUM-BASE CERMET MATERIALS FOR INSERTS OF HIGH-SPEED CUTTING TOOLS

Hironori Yoshimura, Tokyo, Japan, assignor to Mitsubishi Kinzoku Kabushiki, Tokyo, Japan

Continuation-in-part of Ser. No. 118,452, Nov. 9, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 266,487

Claims priority, application Japan, Nov. 25, 1986, 61-280268

Int. Cl.⁴ C23C *14/32*

U.S. Cl. 204—192.3 **9 Claims**

1. A method of manufacturing a surface-coated TiCN-base cermet material for inserts of cutting tools, comprising the steps of:

(a) preparing a substrate of a TiCN-base cermet; and

(b) coating over surfaces of said substrate a hard surface layer formed on one of a single layer of one compound selected from the group consisting of TiC, TiN, and TiCN, and a composite layer of at least two compounds selected from the same group, by means of an ion plating method under the following conditions:

Reaction Temperature: 700° to 1000° C.;

Voltage Appplied On Substrate: negative voltage of 100 to 1000 volts; and

Pressure of Reaction Atmosphere: 1×10^{-5} to 1.5×10^{-4} torr, whereby said hard surface layer has a mean thickness of from 0.5 to 10 microns and a mean grain size of not more than 0.05 microns.

4,902,396

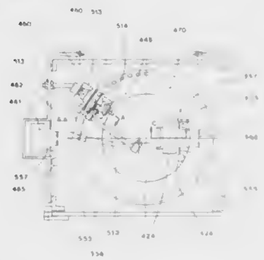
PHYSICAL VAPOR DEPOSITION DUAL COATING APPARATUS AND PROCESS

Harbhajan S. Randhawa, and Jeffrey M. Buske, both of Boulder, Colo., assignors to Vac-Tec Systems, Inc., Boulder, Colo.

Filed Aug. 25, 1988, Ser. No. 236,648

Int. Cl.⁴ C23C *14/34, 14/32*

U.S. Cl. 204—192.38 **40 Claims**



34. A method for depositing multiple thin film coatings on a substrate, comprising the steps of:

(a) placing the substrate in a chamber;

(b) evacuating the chamber;

(c) activating a CAPD target/cathode in the chamber;

(d) depositing a thin CAPD film on the substrate;

(e) injecting a process gas into the chamber;

(f) activating a magnetron sputtering target/cathode in the chamber;

(g) creating a plasma discharge in the chamber; and

(h) depositing a thin sputtering film on the substrate.

4,902,397

ELECTROLYTIC CELL WITH DIFFERENTIAL GAS PRESSURE CONTROL DEVICE

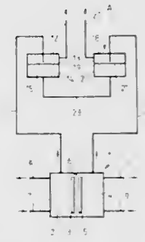
Stephen F. Kelham, Warrington, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Jun. 22, 1988, Ser. No. 209,941

Claims priority, application United Kingdom, Jun. 25, 1987, 8714903

Int. Cl.⁴ C25B *9/00, 15/08*

U.S. Cl. 204—256 **10 Claims**



1. A differential gas pressure control device for an electrolytic cell which cell comprises at least one anode compartment containing at least one anode at which in operation a gas is generated, at least one cathode compartment containing at least one cathode at which in operation a gas is generated, a separator positioned between each anode and adjacent cathode, a pipe leading from the anode compartment(s) of the cell through which in operation anode gas passes and a pipe leading from the cathode compartment(s) of the cell through which in operation cathode gas passes, in which the control device comprises a moveable flow controller positioned so as to control the flow of anode gas in said pipe and a moveable flow controller positioned to control the flow of cathode gas in said pipe, in which the flow controllers are operatively connected, and in which in operation the anode and cathode gases independently act upon the flow controllers which control the flow of cathode gas and of anode gas respectively.

4,902,398

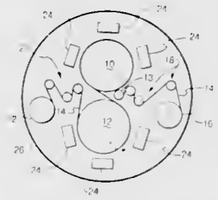
COMPUTER PROGRAM FOR VACUUM COATING SYSTEMS

Larry E. Homstad, Minneapolis, Minn., assignor to American Thim Film Laboratories, Inc., St. Paul, Minn.

Filed Apr. 27, 1988, Ser. No. 186,590

Int. Cl.⁴ C23C *14/34*; G06F *15/46*

U.S. Cl. 204—298 **16 Claims**



1. A roll coater and program control system for deposition coating, comprising in combination:

a vacuum chamber;

a pair of rotatable chill drums which are oppositely positioned one above the other so as to form a top drum and a lower drum and relative to each other such that a material to be coated lays flat on surface portions of each of the drums as the material moves over the drums;

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a feed roll positioned to one side of the drums for supplying a length of flexible material to be run over the drums and coated;
a take-up roll positioned to the other side of the drums for receiving the coated material after it has run over the chill drums;
drive means for moving the material from the feed roll and over the chill drums;
a roll of flexible material carried on the feed roll and extending to the lower portion of the top drum on the side thereof on which the feed roll is positioned, the material extending upwardly, over the top of the top drum, down the other side of the top drum and crossing the space between the top and lower drum to extend downwardly over the side of the lower drum which the feed roll is positioned, around the bottom of the lower drum and upwardly over the other side of the lower drum and then to the take-up roll whereby the material is fed over the top drum in a first direction and is subsequently fed over the lower drum in a second and opposite direction, the drums counter rotating as the material moves over them to the take-up roll, opposite sides of the material being exposed on the respective drums for being coated as the material moves over the drums;
means for positioning one or more source targets near each of the drums, to each side and at the top of the top drum and to each side and at the bottom of the lower drum whereby the angle of incidence of the source target surface of each source target maybe maintained substantially normal to that surface portion of the respective drums to which a source target is closest, and
program means for operating said system, said program means comprising further means for:
accessing a file of run data used to control the processing of the deposition at various times during a run;
initiating the evacuation of the system chamber by operation of pump means;
determining, by means of input signals to the program from sensor means, when the desired pressure has been reached in the system chamber;
throttling valve means connected to the system chamber to a predetermined close point by means of output signals from the computer program;
controlling the introduction of a gas into the system chamber, said program monitoring the chamber to maintain the gas at the predetermined value established by said run data;
moving the flexible material through the system;
turning "on" at least one source target at a predetermined power setting, said power setting determined by said run data, and
depositing single or multiple layer coatings onto one or both sides of the flexible material as the material moves through the system.

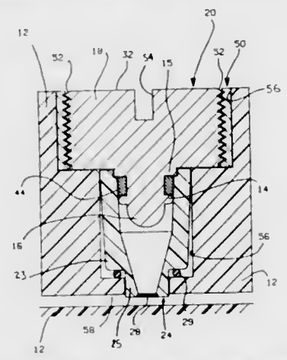
4,902,399

FLOW-THROUGH ELECTROCHEMICAL SENSOR

Benton A. Durley, III, Antioch; Steven G. Schultz, Winthrop Harbor, and Charles M. Galitz, Grayslake, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Apr. 12, 1989, Ser. No. 337,007
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—409 **17 Claims**

1. Apparatus for use in measuring an unknown concentration of an electrolyte in a sample comprising:
a test cartridge having a flow passage adapted to pass a sample, and first socket means in communication with said passage;
first cup means, adapted to hold a sensor fill solution of known ion concentration, having an open top and a bottom defining an orifice;
a first electrode, secured to said first cup means at said top adapted to be in contact with said sensor fill solution and being further adapted to be removably mounted in said first socket means of said test cartridge, said first socket means also providing electrical contact between said test cartridge and said first electrode;
a first membrane covering said first orifice, and disposed



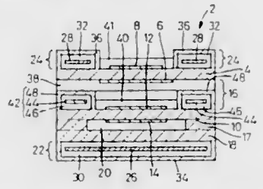
between said flow passage and said first cup means whereby contact of said sample with said first membrane creates a potential difference between said first electrode and said sample which is related to the unknown concentration of electrolyte in said sample.

4,902,400

GAS SENSING ELEMENT

Jun Usami, Aichi; Akinobu Hattori, Yokkaichi, and Takeshi Kajita, Aichi, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 25, 1987, Ser. No. 30,050
Claims priority, application Japan, Mar. 28, 1986, 61-71729
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—426 **7 Claims**



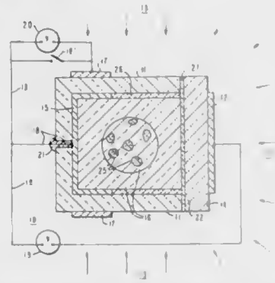
1. A gas sensing element having a co-fired laminar structure, comprising:
at least one electrochemical cell, each of which includes a planar solid electrolyte body, and at least two electrodes disposed of said planar solid electrolyte body;
means for defining a planar diffusion chamber into which a measurement gas diffuses from an external space under a predetermined diffusion resistance;
at least one of said at least two electrodes of said at least one electrochemical cell being substantially exposed to said measurement gas in said diffusion chamber;
a first and a second, generally planar heater for heating said at least one electrochemical cell, said first and second heaters being formed on opposite sides of said at least one electrochemical cell, respectively, and being spaced apart from each other in a direction perpendicular to a plane of said at least one planar solid electrolyte body, each of said first and second heaters including a heat generating element, a porous electrically insulating layer in which said heat generating element is substantially embedded, and a gas-tight layer which covers said porous electrically insulating layer and thereby isolates said heat generating element from said measurement gas in said external space; and
generally planar thermosensitive means incorporated in said laminar structure, said generally planar thermosensitive means comprising an electrically resistive thermosensitive element, and a porous electrically insulating layer in which said thermosensitive element is embedded, such that said thermosensitive element is electrically insulated from said planar solid electrolyte body, said thermosensitive element being juxtaposed in substantially the same plane as said planar diffusion chamber to detect a temperature of the laminar structure in the vicinity of said planar diffusion chamber, and providing an output for controlling power supplied to said first and second heaters.

4,902,401

DUAL GAS SENSOR HAVING SOLID ELECTROLYTE CONTAINED IN AN OXIDE MATRIX

Ching-Yu Lin, Monroeville, and Richard P. Kunkle, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 25, 1989, Ser. No. 301,412
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—427 **10 Claims**



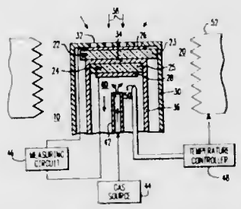
1. A solid electrolyte dual gas sensor for measuring two selected component gases of a monitored gas environment by generating electrical signals on the basis of a difference in the partial pressure between (a) the two selected component gases of the monitored gas environment at first and second monitor electrodes in contact with the monitored gas environment and solid electrolyte, and (b) corresponding component reference gases at reference electrode means in contact with a reference gas environment and solid electrolyte; comprising a single reference electrode surrounded by a first solid electrolyte and a separate second solid electrolyte and being isolated from the monitored gas environment, the reference electrode being physically contacted by both electrolytes, the first electrolyte being oxygen ion conductive, and the second electrolyte having a composition conductive to sodium or potassium ions, one monitor electrode contacting the first solid electrolyte and, the other monitor electrode contacting the second solid electrolyte, where the second solid electrolyte is a single component composition disposed within a separate, ceramic oxide, interconnected skeletal matrix having a melting point greater than 1,600° C. and pores therein having approximate diameters of up to 150 micrometers, which is 35% to 95% porous prior to electrolyte impregnation, which matrix contains continuous interconnected pores filled with the second solid electrolyte, allowing a continuous ionic conduction path through the second solid electrolyte within the matrix, which second solid electrolyte is adapted upon heating to dissociate and provide the sole source of constant partial pressures of self-generated reference gases, at the reference electrode corresponding to the selected component gases to be measured in the monitored gas environment, to provide a unitary, dual gas sensor.

4,902,402

CHLORIDE CONTAINING SOLID ELECTROLYTE GAS SENSING APPARATUS

Alfred R. Pebler, Wilkinsburg; Ching-Yu Lin, Monroeville, and Richard P. Kunkle, Irwin, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1989, Ser. No. 330,548
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—427 **14 Claims**



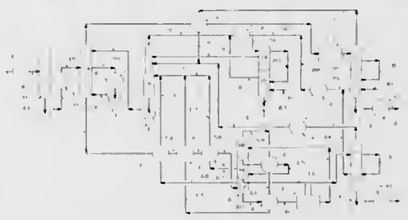
1. A solid electrolyte gas sensor for measuring a component gas of a monitored gas environment, by generating an electrical signal on the basis of a difference in the partial pressure between the selected component gas of the monitored gas environment at a monitor electrode in contact with the monitored gas environment and a solid electrolyte, and a corresponding component gas of a reference gas environment at a reference electrode in contact with the reference gas environment and a second solid electrolyte, where the reference electrode is isolated from the monitored gas environment, the improvement characterized in that both solid electrolytes consist essentially of a material selected from the group consisting of NaCl, KCl, and mixtures thereof, both solid electrolytes are of the same composition throughout, at least about 95% dense, and said electrolytes are effective to allow measurement of either an oxygen or chlorine containing component gas.

4,902,403

HEAT TREATMENT OF EXCHANGERS TO REMOVE COKE

Joe D. Turner, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 115,782, Oct. 30, 1987, abandoned. This application Oct. 20, 1988, Ser. No. 262,182
Int. Cl.[4] C10G *9/12, 9/16*
U.S. Cl. 208—48 R **12 Claims**



1. A process for preparing furfural coke for removal from metallic surfaces comprising: heating said furfural coke without causing an evolution of heat capable of undesirably altering metallurgical properties of said surfaces in the presence of a gas containing molecular oxygen at a sufficient temperature below 800° F. (427° C.) for a sufficient time to change the crush strength of the coke so as to permit removal with a water jet at a pressure of five thousand pounds per square inch.

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4,902,404

HYDROTREATING PROCESS WITH CATALYST STAGING

Teh C. Ho, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 5, 1988, Ser. No. 215,093
Int. Cl.[4] C10G *45/08, 47/04*
U.S. Cl. 208—57 7 Claims

1. A process for hydrotreating a hydrocarbonaceous feed, which process comprises:
(a) contacting the feed in a first catalyst zone at a temperature from about 200° C. to about 450° C., in the presence of hydrogen and a catalyst comprised of at least one metal selected from Group VIB and at least one metal selected from Group VIII of the Periodic Table of the Elements on an inorganic oxide support material; and
(b) contacting the treated feedstream from said first catalyst zone in a second catalyst zone at a temperature from about 200° C. to about 450° C., in the presence of hydrogen and a catalyst represented by the formula MM'_aS_x where M is Cr or one or more divalent promoter metals selected from the group consisting of Mn, Fe, Co, Ni, Cu, and Zn; M' is one or both of Mo and W; x is 0.5 to 9, and a = 1 when one of the metals represented by M is not Cr, and $1 < a \leqq 1.5$ when one of the metals represented by M is Cr, wherein said catalyst is derived from a precursor selected from the formula:

$$ML(Mo_yW_{1-y}A_4)_a$$

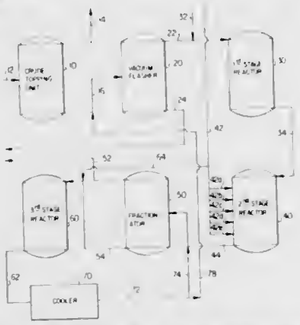
where M is Cr, or one or more divalent promoter metals selected from the group consisting of Mn, Fe, Co, Ni, Cu, and Zn; L is one or more neutral, nitrogen-containing ligands at least one of which is a chelating polydentate ligand; $0 \leqq y \leqq 1$; A is O or S; and a is as defined above.

4,902,405

FIXED BED HYDROCRACKING PROCESS

Alison J. MacLean; Richard L. Holloway; Valerie A. Lawson, all of Bellingham, and John W. Cronen, Ferndale, all of Wash., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 13, 1988, Ser. No. 297,160
Int. Cl.[4] C10G *65/12*
U.S. Cl. 208—59 16 Claims



1. A process for converting a gas oil range petroleum feedstock into lighter petroleum products, said process consisting essentially of:
(a) charging said gas oil range petroleum feedstock and hydrogen to a first fixed bed hydrocracking zone containing a hydrocracking catalyst at hydrocracking conditions to produce a first hydrocracking zone product stream;
(b) separating said first fixed bed hydrocracking zone product stream in a fractionation zone into a petroleum products stream and a bottoms stream;
(c) charging said bottoms stream and hydrogen to a second fixed bed hydrocracking zone containing a hydrocracking catalyst at hydrocracking conditions to produce a second fixed bed hydrocracking zone product stream;
(d) cooling said second fixed bed hydrocracking zone product stream to a temperature below about 250° F.;
(e) recycling a first portion of said cooled second fixed bed hydrocracking zone product stream to said fractionation zone;
(f) removing materials having a boiling range from about 500° to about 650° F. and a heavy bottoms stream having a boiling point above about 1050° F. from a second portion of said cooled second fixed bed hydrocracking zone product stream to product a treated second portion; and
(g) recycling said treated second portion to said first fixed bed hydrocracking zone.

4,902,406

SYNTHESIS OF ZEOLITE ZSM-22

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 373,452, Apr. 30, 1982, abandoned.
This application Jul. 10, 1984, Ser. No. 629,743
Int. Cl.[4] C10G *11/05;* C01B *33/28*
U.S. Cl. 208—118 35 Claims

1. A process for preparing a siliceous porous crystalline ZSM-22 zeolite material having the X-ray diffraction pattern of Table 1, which material is substantially 100% ZSM-22, which process comprises preparing a reaction mixture capable of forming said crystalline ZSM-22, said reaction mixture being comprised of sources of an alkali or alkaline earth metal, alumina, silica, RN and water, and having the following composition, in terms of moles ratios of oxides:

SiO_2/Al_2O_3	=	20 to infinity
H_2O/SiO_2	=	10 to 100
OH^-/SiO_2	=	0 to 0.3
M^+/SiO_2	=	0 to 2.0
RN/SiO_2	=	0.01 to 2.0

wherein RN is a C_2 to C_{12} alkane diamine of the formula $H_2N-(CH_2)_n-NH_2$, where n = 2 to 12, and M is an alkali or alkaline earth metal, and maintaining the mixture at sufficient crystallization conditions until crystals of said zeolite are formed.

21. A process for cracking hydrocarbons using as a catalyst a composition comprising a siliceous porous crystalline ZSM-22 zeolite material having a composition, expressed in terms of moles of anhydrous oxides, as follows:

$$(y)M_{2/n}: (z)L_2O_3: 100SiO_2$$

wherein M is an alkali or alkaline earth metal having a valence n, y = 0 to 2.0, z = 0 to 5, and L is aluminum (Al), and having an X-ray diffraction pattern of Table D as follows:

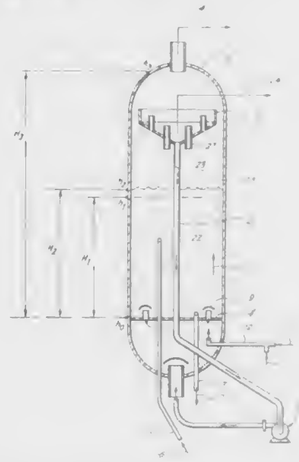
	(D)
d(Å)	I
10.9 ± 0.2	M-VS
8.7 ± 0.16	W
6.94 ± 0.10	W-M
5.40 ± 0.08	W
4.58 ± 0.07	W
4.36 ± 0.07	VS
3.68 ± 0.05	VS
3.62 ± 0.05	S-VS
3.47 ± 0.04	M-S
3.30 ± 0.04	W
2.74 ± 0.02	W
2.52 ± 0.02	W

4,902,407

CATALYST INVENTORY CONTROL IN AN EBULLATED BED PROCESS

Ting Y. Chan, and John C. Strickland, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 9, 1988, Ser. No. 204,318
Int. Cl.[4] C10B *31/02, 31/12*
U.S. Cl. 208--152 6 Claims



1. An improved method of maintaining a selected weight of catalyst in a reactor in a continuous process for treating a fluent hydrocarbon feedstock with a hydrogen-containing gas at elevated catalytic reaction temperatures and pressures in the presence of a bed of particulate solid catalyst, said process comprising introducing the hydrogen-containing gas and feedstock into the lower end of a generally vertical catalyst containing reaction vessel at sufficient velocity whereby the catalyst is placed in random motion within the fluent hydrocarbon whereby the catalyst bed is expanded to a volume greater than its static volume, wherein the mixture of feedstock, gas and catalyst constitutes a turbulent zone from which zone aged catalyst is removed and fresh catalyst is added, the upper portion of which turbulent zone is defined by an interface with a substantially catalyst depleted zone from which zone hydrocarbon is removed, wherein the improvement comprises:
1. determining an interface height (H_2) from a point adjacent the bottom of the bed (h_o) to a point corresponding to the interface (h_2),
2. determining an effective bed height (H_1) from a point adjacent the bottom of the bed (h_o) to an intermediate fixed point (h_1) in the bed adjacent the interface,
3. determining a reactor height (H_3) from a point adjacent the catalyst depleted zone top (h_3) to the point adjacent the bottom of the bed (h_o),
4. measuring a differential pressure (DP_2) between the point adjacent the catalyst depleted zone top (h_3) and the intermediate fixed point (h_1),
5. determining a value for a catalyst inventory characterization factor (W_c) in accordance with the general formula:

$$W_c = \frac{H_2 DP_2}{K_1(H_2 - H_1)} - \frac{H_2 K_2 (H_3 - H_1)}{K_1(H_2 - H_1)}$$

wherein:
$K_1 =$

$$\frac{(1 - E_c)(r_s - r_f)}{A \quad r_c}$$

$K_2 = r_f$

E_c = fresh catalyst void fraction
r_c = fresh catalyst bulk settled density
r_s = reactor equilibrium single particle catalyst density
r_f = reactor total fluid density
A = reactor cross-sectional area,
6. removing aged catalyst, thereby changing the value of said catalyst inventory characterization factor (W_c), and
7. adding fresh catalyst in an amount to return to said value of catalyst inventory characterization factor (W_c).

4,902,408

PROCESS FOR REMOVING HYDROGEN SULPHIDE USING METAL COMPOUNDS

Günther Reichert, and Christian Wegner, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 27, 1988, Ser. No. 224,972
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726917
Int. Cl.[4] C10G *29/00*
U.S. Cl. 208—239 3 Claims

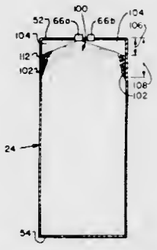
1. A process for removing hydrogen sulphide from mineral oil-containing liquids comprising contacting said liquid with a solution or dispersion in a hydrocarbon or in a mixture of hydrocarbons of iron 2-ethylhexanoate.

4,902,409

NOZZLE FOR SCREEN APPARATUS

Jack W. Clark, Lewisburg, Pa., assignor to Sprout-Bauer, Inc., Muncy, Pa.

Filed Jan. 19, 1988, Ser. No. 145,603
Int. Cl.[4] B07B *1/06*
U.S. Cl. 209—250 9 Claims



1. A pressure fed sieve screen apparatus comprising:
a housing having a longitudinal dimension;
a screen having longitudinal and width dimensions mounted within the housing to define a solids zone and an effluent zone on respective solids and effluent sides of the screen;
at least two nozzle blocks mounted within the housing along the width dimension of the screen, each block having an inlet aperture for admitting slurry into the nozzle and outlet means fluidly connected to the inlet aperture, the outlet means extending in the width direction of the screen a distance no greater than one half the width dimension of the screen, for distributing the slurry onto the solids side of the screen in a fan-shaped flow pattern that spreads out along and substantially spans the width dimension of the screen; and
means for supplying slurry under pressure to each nozzle inlet aperture, whereby each nozzle can be operated alone in alternation to discharge slurry over the full width of the screen.

4,902,410

INTERCEPTOR FOR THE CONTINUOUS REMOVAL OF SOLID MATTER FROM A MIXTURE OF SOLIDS AND LIQUID

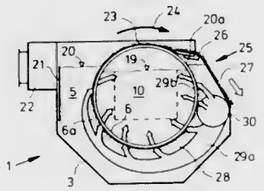
Bertram Botsch, Karlsruhe, Fed. Rep. of Germany, assignor to Maschinenfabrik Hellmut Geiger GmbH. & Co. KG, Karlsruhe, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 190,817

Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3715022

Int. Cl.[4] B01D *21/34, 33/06, 33/36*

U.S. Cl. 210—104 **7 Claims**



1. An interceptor apparatus for the continuous removal of solid matter containing granular particles from a mixture of solids and liquid, said apparatus comprising:

a screening drum including a drum jacket;

means for rotating said drum in a given direction of rotation;

a tank to receive a mixture of solids and liquid, said tank surrounding at least the lower half of said drum and defining therewith a flow chamber for the mixture;

inlet means connected to said tank for introducing the mixture into said tank such that the mixture flows along the outer surface of said drum jacket substantially in the same direction as said given direction of rotation of said drum and such that the mixture fills said tank outwardly of said drum to an upper mixture level, said inlet means including an orifice opening into said tank at a location below the mixture level and adjacent a line of immersion of said drum into the mixture as said drum rotates, whereby the liquid from the mixture is cleansed by passing through said drum jacket to the interior of said drum and the solid matter is retained on said outer surface of said drum jacket;

solid matter discharge means for removing the retained solid matter from said outer surface of said drum jacket, said solid matter discharge means being located at a position downstream of the topmost portion of said drum, with respect to the direction of rotation thereof, said solid matter discharge means comprising a stripper abutting said outer surface of said drum jacket;

outlet means for removing the cleansed liquid from said interior of said drum; and

mixture level control means for controlling the mixture level in said tank and liquid level control means for controlling the level of the cleansed liquid within said interior of said drum such that the mixture level is higher than the cleansed liquid level, such that at least one half of said drum is immersed in the mixture, and such that the difference between the mixture level and the cleansed liquid level is less than half the diameter of said drum.

4,902,411

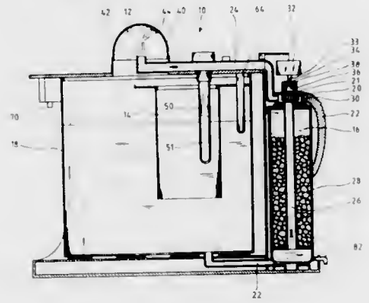
DRINKING WATER PURIFIER

Frank W. G. Lin, No. 1-6 Tyan Sin Tsu, Hsien Hsiao Lih, Tan Shui Town, Taipei Hsien, Taiwan

Filed Oct. 24, 1988, Ser. No. 262,434

Int. Cl.[4] B01D *36/00*

U.S. Cl. 210—104 **8 Claims**



1. A water purifier system comprising:

an upstanding water tank;

a water filtration unit located alongside said water tank;

an air-water contact means located directly above said water tank;

an ultraviolet lamp means located within said tank;

means for circulating water from the tank through the filtration unit, air-water contact means, and back into the tank; said circulating means comprising a motor-operated pump, and a conduit extending from the filtration unit to the air-water contact means;

means for introducing make-up water to the purifier system, comprising a solenoid valve;

means for withdrawing purified water from the system comprising a diverter valve located in said conduit; and

control means for continuously operating the motor-operated pump except when the solenoid valve is opened to introduce make-up water into the system.

4,902,412

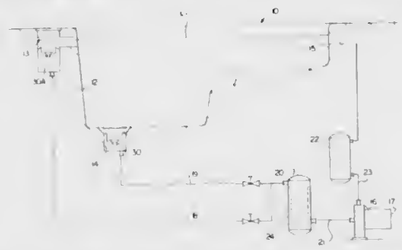
SWIMMING POOL WATER RECIRCULATION SYSTEM

William O. Surber, III, and Robert E. Gartin, both of Houston, Tex., assignors to Wizzz-Rd Corp., Houston, Tex.

Filed Jun. 27, 1988, Ser. No. 212,275

Int. Cl.[4] E04H *3/20*

U.S. Cl. 210—169 **11 Claims**



1. In a swimming pool water recirculation system including conduit means connecting one or more drain openings in the pool with an inlet thereto, a pump in the conduit means for recirculating water from each drain opening to the inlet, and a filter in the conduit means downstream of the pump, the improvement comprising a screen across a passageway forming a continuation of the drain opening, cutter means including at least one blade mounted for rotation across the upstream side

of the screen, and means responsive to the flow of water through the passageway for rotating the cutter means.

4,902,413

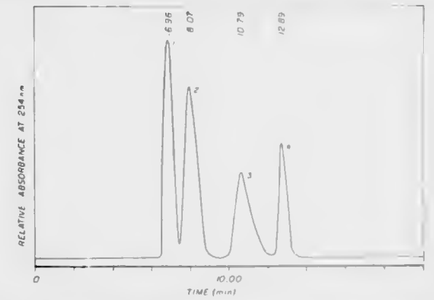
ORGANIC-BASED POROUS MICROSPHERES FOR HPLC

Richard W. Stout, and Henry J. Leibu, both of Wilmington, Del., assignors to E. I. Du Pont De Nemours & Co., Wilmington, Del.

Division of Ser. No. 191,220, May 6, 1988. This application Feb. 24, 1989, Ser. No. 315,297

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210--198.2 **8 Claims**



1. A process for forming porous organic microparticles comprising the steps of:

a. forming a sol of inorganic colloidal particles in a polar liquid, the colloidal particles having hydroxylated surfaces and being dispersible in the polar liquid;

b. forming a mixture of the sol with a polymerizable organic material comprising formaldehyde and a second organic material selected from the group consisting of urea and melamine;

c. polymerizing the organic material in said mixture to cause coacervation of the organic material and said colloidal particles into microparticles having a diameter of about 0.5 to about 20 microns; and

d. subjecting the microparticles so formed to a solution of a reagent of suitable composition and of sufficient strength to remove all of the inorganic component.

4,902,414

LIQUID CHROMATOGRAPH APPARATUS

Phillip A. James, Mepal, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 106,083, Oct. 7, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 339,936

Claims priority, application United Kingdom, Oct. 10, 1986, 8624325

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210--198.2 **4 Claims**

1. A liquid chromatograph apparatus comprising:

a plurality of solvent sources,

pump means for pumping solvent,

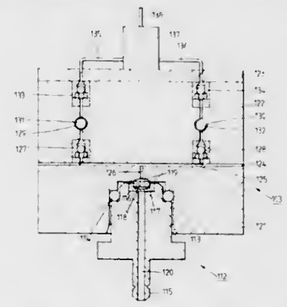
proportioning valve means for feeding solvent from said plurality of solvent sources to said pump means, said proportioning valve means having a separate inlet for each solvent from said plurality of solvent sources, said separate inlet for each solvent from said plurality of solvent sources providing a low impedance path by being free of filters, and said proportioning valve means having a single outlet,

first means for coupling said single outlet of said proportioning valve means to an inlet of said pump means, said first means including a sintered filter disc,

a chromatographic separating column,

second means for coupling an outlet of said pump to an inlet of said chromatographic separating column,

third means for providing a sample to said chromatographic separating column, and



detecting means for detecting constituents eluding from chromatographic separating column.

4,902,415

FILTRATION ASSEMBLY FOR PERIDURAL ANESTHESIA

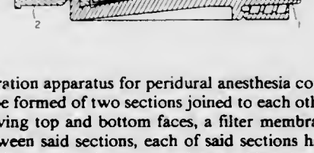
Jean Lemonnier, Le Vesinet, France, assignor to Millipore Corporation, Bedford, Mass.

Filed Jul. 19, 1988, Ser. No. 221,148

Claims priority, application France, Jul. 23, 1987, 87 10479

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—321.84 **11 Claims**



1. A filtration apparatus for peridural anesthesia comprising an envelope formed of two sections joined to each other, each section having top and bottom faces, a filter membrane positioned between said sections, each of said sections having an inlet or outlet opening that communicates with a chamber and having membrane support elements, characterized in that the membrane support elements of each of the two sections have a membrane support surface that forms an acute angle with respect to the axes of the inlet and outlet openings and that one face of one of the two membrane support surfaces includes a plane peripheral crown that is devoid of any projection beyond said peripheral crown.

4,902,416

MEMBRANE SEPARATION DEVICE

Lawrence R. Schroeder, Danville, and Terrence L. Caskey, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 123,088, Nov. 20, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 303,505

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—321.67 **16 Claims**

1. A hollow fiber membrane device comprised of:

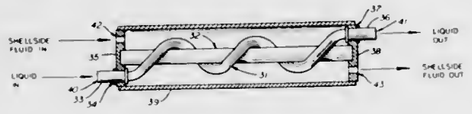
(1) a plurality of non-woven hollow fiber membranes formed into at least one non-random bundle wherein the membranes are capable of separating at least one of the components from a liquid feed mixture;

(2) at least one tubesheet comprised of a thermoplastic or thermoset material wherein the end(s) of the hollow fiber bundle(s) are embedded in the tubesheet(s);

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(3) at least one core wherein at least one non-woven hollow fiber bundle is wrapped in a spiral fashion about at least one core in such a manner that the non-woven hollow fiber bundle(s) is first formed and then wrapped spirally about the core(s) as a completed bundle(s) such that the fibers comprising the bundle(s) may expand and contract without substantial damage to the fibers;

(4) a means for introducing the feed into the membrane device;



(5) a means for removing the non-permeate from the membrane device;

(6) a means for removing the permeate from the membrane device; and

(7) a case which contains the hollow fiber bundle(s), core(s) and tubesheet(s) wherein the case allows the hollow fibers to expand and contract without substantial damage to the fibers, wherein there is substantial void volume within the case external to the hollow fiber bundle(s) which is nonuniformly distributed.

4,902,417

SPIRAL-WOUND MEMBRANE CARTRIDGE WITH RIBBED AND SPACED CARRIER LAYER

Larry A. Lien, Solana Beach, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

Filed Jan. 14, 1988, Ser. No. 206,560
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—321.74 **16 Claims**



1. A spiral wound membrane cartridge for separating a first component from a fluid mixture of the first component and a second component, which cartridge comprises

a porous sheetlike membrane having pores sized to allow passage of the first component in a generally transverse direction while rejecting passage therethrough of the second component, said membrane being spirally wound about a central tube,

a feed carrier layer of non-woven channel material having a plurality of generally parallel ribs of similar size of extruded polymeric material spaced apart from one another, said ribs being interconnected by smaller filaments which extend transverse to said ribs and maintain said spacing and form feed-carrying channels extending in a direction of flow parallel to the axis of said tube, said filaments having a thickness less than one-half the thickness of said ribs and being aligned generally perpendicular to said ribs, said feed carrier layer being disposed adjacent a supply surface of said membrane; and

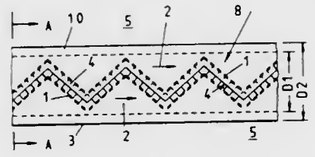
a permeate carrier layer disposed adjacent a discharge surface of said membrane, said permeate carrier extending spirally inward to said central tube which is adapted to conduct the discharge flow of the first component from said cartridge.

4,902,418

ELEMENT HAVING A POROUS WALL

Heinrich Ziegler, Rutschwil, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 6, 1986, Ser. No. 927,849
Claims priority, application Switzerland, Nov. 22, 1985, 4993/85
Int. Cl.[4] B01D *13/00, 25/02*
U.S. Cl. 210—321.77 **20 Claims**



1. In combination,

a vessel defining a flow path for conducting a fluid flow therethrough, said vessel having a wall for separating the fluid flow from the exterior of said vessel; and

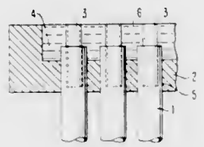
at least one element of plate-like cross-section disposed in and longitudinally of said vessel and shaped to define a corrugated shape across said flow path for generating turbulence in the fluid flow within said vessel, said element having an inner chamber of constant width communicating with said exterior of said vessel through said vessel wall, a semi-permeable wall bounding said inner chamber at least in part and being permeable for a proportion of the fluid flow in said vessel for use in a micron, submicron or molecular range and a support mesh supporting said semi-permeable wall thereon.

4,902,419

PRODUCT AND METHOD FOR FASTENING SOFT POROUS TUBES

Yoshihiko Shibata; Yoshihiro Chikamori, and Yoichi Shimizu, all of 123, Minamigata, Yoshinaga-cho, Wake-gun, Okayama-ken 709-02, Japan

Filed Apr. 21, 1989, Ser. No. 341,345
Claims priority, application Japan, Apr. 22, 1988, 63-98187
Int. Cl.[4] B01D *13/00;* **B29C** *65/40*
U.S. Cl. 210—321.89 **4 Claims**



1. A method for fastening soft porous polymer tubes to a fastening seat comprising the steps of:

(a) hardening an end of each said tubes by filling the pores of said ends of each said tube.,

(b) inserting said filled and hardened end of each said tube into holes inlet into said fastening seat so as to project above said fastening seat.,

(c) fastening in place said tubes into said seat by filling the open volume into which said tubes project with an adhesive.

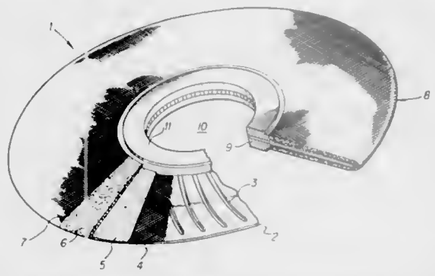
4. An assembly of soft porous polymer tubes fastened in place to a fastening seat by a method of claims 1, 2, or 3.

4,902,420

SEGMENTED FILTER DISC WITH SLOTTED SUPPORT AND DRAINAGE PLATE AND SUPPORT SPACER

David B. Pall, Roslyn Estates, and John D. Miller, Ithaca, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Continuation of Ser. No. 30,576, Mar. 27, 1987, abandoned. This application Mar. 17, 1989, Ser. No. 325,002
Int. Cl.[4] B01D *29/16*
U.S. Cl. 210—346 **26 Claims**



1. A filter segment of a segment filter unit, having a central hub, an outer edge, and a filtering surface comprising:

a drainage and support plate having an upper and a lower surface and formed with unobstructed and continuous slots passing through said plate from said upper surface to said lower surface and extending generally from the hub toward the outer edge of the filter segment, and increasing in cross-sectional area perpendicular to the radius with increasing distance from the hub so as to give substantially uniform flow through filtering media adjacent thereto,

a filtering medium adjacent each of the upper and lower plate surfaces, and

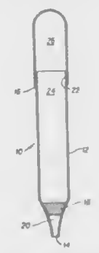
a means for acting in cooperation with the filter medium to provide drainage of a filtrate to the plate slots.

4,902,421

FILTER DEVICE

Frank R. Pascale, and Vlado I. Matkovich, both of Glen Cove, N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Continuation of Ser. No. 929,352, Nov. 12, 1986. This application May 19, 1988, Ser. No. 201,284
Int. Cl.[4] B01D *29/00*
U.S. Cl. 210—416.1 **29 Claims**



1. A device for reducing the amount of contaminant in a liquid sample comprising:

a hollow elongate member having first and second opening means;

hydrophobic depth filter means fixedly positioned in said hollow elongate member, said depth filter in combination with said hollow elongate member defining a reservoir between said depth filter and said first opening means; and

means associated with said first opening means for generating a pressure differential between the interior of said hollow elongate member and the exterior thereof, for introducing a contaminant-containing liquid into the reservoir in said hollow elongate member exclusively through said second opening means, for drawing liquid through said depth filter into said reservoir, and for removing a liquid with a reduced amount of contaminant from said elongate member exclusively through said depth filter and said second opening, whereby contaminant is trapped within said depth filter.

4,902,422

DEFECT-FREE ULTRAHIGH FLUX ASYMMETRIC MEMBRANES

Ingo Pinnau, and William J. Koros, both of Austin, Tex., assignors to Board Regents The University of Texas System, Austin, Tex.

Filed Dec. 6, 1988, Ser. No. 280,708
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—500.23 **20 Claims**

11. An ultrahigh flux asymmetric membrane having an apparent skin thickness of less than about 0.2 micron and a selectivity for separating fluid mixtures greater than 80% of the theoretical value for defect-free films of said polymer, said membrane being prepared by:

forming a film or a fiber of a polymer solution;

evaporating solvent from said film or fiber by forced convection to obtain a defect-free, phase separated asymmetrical structure;

contacting said defect-free, phase separated asymmetrical structure with a precipitation liquid to obtain a final phase inverted asymmetrical structure; and

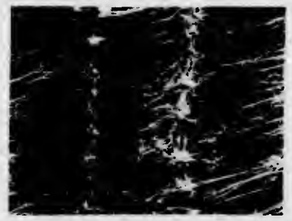
drying said final phase inverted asymmetrical structure to obtain a membrane with an apparent skin thickness of less than about 0.2 micron and a selectivity for separating fluid mixtures greater than 80% of the theoretical value for defect-free films of said polymer.

4,902,423

HIGHLY AIR PERMEABLE EXPANDED POLYTETRAFLUOROETHYLENE MEMBRANES AND PROCESS FOR MAKING THEM

John E. Bacino, Landenberg, Pa., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Feb. 2, 1989, Ser. No. 305,839
Int. Cl.[4] B01D *13/00, 29/08*
U.S. Cl. 210—500.36 **7 Claims**



1. A thin, low density, porous polytetrafluoroethylene membrane having an open structure defined by small nodes interconnected with fibrils, said membrane characterized by having a porosity equal to or greater than 90%, a density of 0.2 g/cc or less, and permeabilities to air between Frazier numbers of 100 and 350.

4,902,424

ULTRAFILTRATION THIN FILM MEMBRANES

Wolfgang J. Wrasidlo, LaJolla, Calif., assignor to Memetc North America Corp., Timonium, Md.

Division of Ser. No. 920,365, Oct. 26, 1986, Pat. No. 4,814,082. This application Aug. 9, 1988, Ser. No. 232,930

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—500.36 13 Claims



1. An ultraporous membrane consisting essentially of a cross linked polymeric thin film membrane having a thickness of from about 1.2 to 150 nanometers and a cross link density sufficient to provide a limiting pore size corresponding to molecular weight cutoff values of from about 500 to about 1,000,000.

4,902,425

REMOVAL OF HUMATES FROM BAYER PROCESS LIQUORS

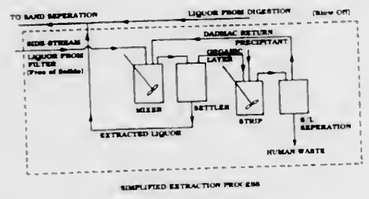
Mark E. Keeney, Booragoon, Australia, assignor to Commonwealth Scientific & Industrial Research, Campbell, Australia

Filed Dec. 22, 1987, Ser. No. 136,657

Claims priority, application Australia, Dec. 24, 1986, PH09678

Int. Cl.[4] C01F *7/02*

U.S. Cl. 210—634 15 Claims



1. A process for reducing the concentration of humate type organic impurities in Bayer process liquors, which method comprises diverting part of a stream of Bayer process liquor into a side-stream which is free from solids, adding an organic cationic compound which is immiscible with the process liquor and forming an emulsion of cationic compound in said process liquor, whereby to form a two phase system, one phase containing an insoluble adduct formed by reaction between the cationic compound and the humate type organic impurities together with any remaining unreacted cationic compound and the other phase containing the soluble aluminium compounds, separating the two phases, returning the separated other phase to the stream of Bayer process liquors and treating the separated one phase to recovery the cationic compound for recycling.

4,902,426

ION EXCHANGE COMPOSITIONS

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20817; Theodore A. Litovitz, 3022 Friends Rd., Annapolis, Md. 21401, and Hamid Hojaj, ., Bethesda, Md., assignors to Pedro B. Macedo, Bethesda and Theodore Aaron Litovitz, Annapolis, both of, Md.

Continuation-in-part of Ser. No. 68,133, Jun. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 932,882, Nov. 20, 1986, abandoned. This application May 20, 1988, Ser. No. 196,904

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—656 18 Claims

1. A process for chromatographically separating from each other rare earth ions or actinide ions or mixtures thereof in solution which comprises passing said solution through an ion exchange material to separate said rare earths or actinides or mixtures thereof, said ion exchange material having a surface area of about 5–1500 m^2/g, said ion exchange material containing at least 50 mol % silica, said ion exchange material having been impregnated with a liquid containing alkali metal cations, Group Ib metal cations, ammonium cations, organic amines, or mixtures thereof at a pH range above about 9, and collecting a plurality of fractions of said solution as said solution passes through said ion exchange material.

4,902,427

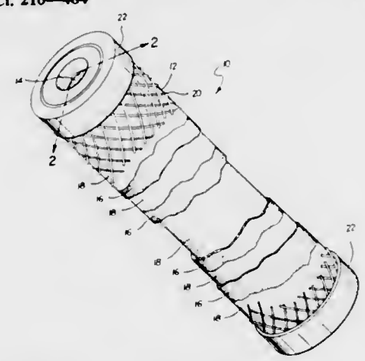
FILTER FOR REMOVING HEAVY METALS FROM DRINKING WATER

Michael F. Szczepanik, Melvindale, Mich., assignor to Ebonex Corporation, Melvindale, Mich.

Filed Apr. 25, 1988, Ser. No. 185,799

Int. Cl.[4] B01D *23/14, 29/48*

U.S. Cl. 210—484 3 Claims



1. A filter cartridge for removing heavy metals from water comprising:

a hollow, porous central core;

means for absorbing heavy metal comprising a fibrous substrate and a bone char impregnated filter layer helically interwound around said central core so as to form a generally cylindrical filter element;

a porous outer cage disposed about at least a portion of said filter element distal said core; and

an end cap bonded to each end of the filter element, at least one of said end caps having an opening therethrough for establishing fluid communication with the central core.

4,902,428

METHOD AND APPARATUS FOR SEPARATING MAGNETIC MATERIAL

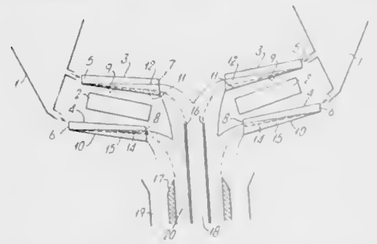
Henry E. Coken, Middlesex, England, assignor to GEC Mechanical Handling Limited, England

Continuation of Ser. No. 90,251, Jul. 27, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 280,573

Claims priority, application United Kingdom, Dec. 10, 1985, 8530360

Int. Cl.[4] B03C *1/08*

U.S. Cl. 210—695 17 Claims



1. A method of separating an admixture of particles or fluids into separate products of relatively higher magnetic susceptibility and relatively lower or zero magnetic susceptibility, comprising the steps of:

(a) feeding a stream of the admixture along a pinched annular sluice from a wider input end to a narrower outlet end;

(b) stratifying the stream into contacting layers, one upon another, each layer mainly incorporating a different component of the admixture and extending between the input and outlet ends of the pinched annular sluice by subjecting the stream to a magnetic field which produces a differential force on components of the admixture having different magnetic susceptibilities, as they are fed along the pinched annular sluice, sufficient to produce a stratification of the stream to form said layers; and

(c) directing the layers of the stream into respective output channels.

4,902,429

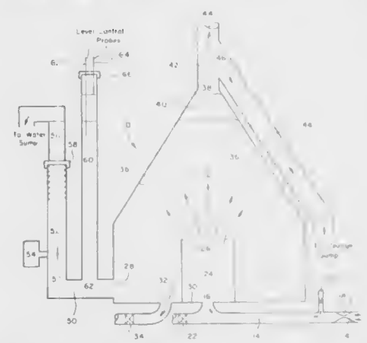
GAS ASSISTED FLOTATION PROCESS

Robert K. Carpenter, Herculaneum, and Harrison F. Lyman, Jr., Clayton, both of Mo., assignors to Redux Corporation, Fenton, Mo.

Filed Jun. 20, 1988, Ser. No. 209,173

Int. Cl.[4] L02F *1/24*

U.S. Cl. 210—704 9 Claims



1. A continuous process for separating solids particles from a liquid in a slurry comprising

injecting a gas into said slurry under sufficient pressure to induce the formation of gas bubbles which tend to attach to said solids particles,

passing said slurry containing solids particles and liquid under pressure through a pressure relief valve whereby the pressure on the gas-containing slurry is reduced to a lower pressure sufficient only to keep the slurry system moving with the consequent formation of multiple gas bubbles which tend to attach to the solids particles,

passing said slurry into the lower chamber portion of a gas assisted flotation cell where it is retained temporarily to reduce the flow velocity and reduce turbulance to provide sufficient retention time for said solids particles to coagulate and flocculate and to allow time for gas bubbles to attach to and be absorbed in and on said solids particles,

thereafter allowing said slurry to enter the main chamber of said gas assisted flotation cell whereby said solids particles with gas bubbles separate from said liquid and float upward in said slurry,

floating said solids particles with gas bubbles upward into a narrowing portion of said gas assisted flotation cell as they separate from said liquid which creates a greater concentration of solids particles with gas bubbles and tends to partially dry said solids particles with gas bubbles as they are separated from said liquid,

passing said concentrated solids particles with gas bubbles through an opening in the apex of said narrowing portion of said gas assisted flotation cell where the solids particles exit through a discharge line and the gas bubbles exit through a gas line while the liquid phase is being discharged from said gas assisted flotation cell through a discharge line connected to said gas assisted flotation cell,

said discharge line for said liquid having incorporated therein a valve whereby the discharge of liquid from said gas assisted flotation cell is periodically reduced or entirely interrupted while said incoming slurry continues to enter said cell without reduction or interruption, thereby causing the liquid level in said cell to rise within the cell, forcing the separating solids particles and gas bubbles upward through the narrowing portion of said cell until they exit through said discharge lines at the apex of said cell with minimum associated liquids, subsidence of the liquid level in said cell being brought about by the periodic reopening of said liquid discharge line controlled to take place prior to the time when said liquid rising in said cell would otherwise flow out of said discharge line for solids particles or said gas line for gas bubbles.

4,902,430

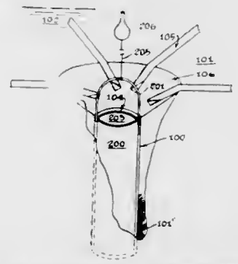
METHOD FOR CLEANING CERTAIN ESTUARIES, HARBORS, AND LAKES

Melvin N. A. Peterson, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jan. 30, 1989, Ser. No. 303,414

Int. Cl.[4] E02B *8/02*

U.S. Cl. 210—747 3 Claims



1. A method for the isolation, containment and removal of toxic sedimentary material from the top layer of sedimentary material deposited over a submerged strata layer of a selected

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large body of water having relatively slow moving and variable currents including harbors, bays, estuaries and lakes; wherein, the method consists of the following steps:

(a) forming a plurality of generally elongated generally cylindrical bore holes at spaced locations in at least the sedimentary layer which overlies said submerge strata;

(b) inserting a like plurality of generally cylindrical sediment trap receptacles dimensioned to be received within said bore holes to effect the gradual accumulation of the current borne suspended particles of toxic sedimentary material from the said top layer of sedimentary material; and,

(c) disposing sleeve elements intermediate said bore holes and said sediment trap receptacles;

(d) providing means for the withdrawal of said sediment trap receptacles from said bore holes;

(e) and providing each of said bore holes with a conical depression which extends outwardly from the mouth of each bore hole and providing said concial depressions with a plurality of radially disposed grooves, formed in the sedimentary layer surrounding said concical depressions; wherein said radial grooves extend into the mouths of said conical depressions.

4,902,431

METHOD FOR TREATING WASTEWATER SLUDGE

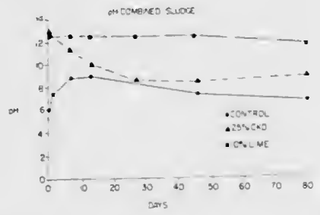
John P. Nicholson, Toledo, and Jeffrey C. Burnham, Maumee, both of Ohio, assignors to N-Viro Energy Systems Ltd., Toledo, Ohio

Filed Jan. 28, 1988, Ser. No. 149,575

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] C02F *11/14*

U.S. Cl. 210—751 **8 Claims**



1. A method of treating wastewater sludge to provide a fertilizer for agricultural lands which can be applied directly to the lands which consists essentially of the following steps:

mixing said sludge with at least one alkaline material;

wherein the amount of added material mixed with said sludge being sufficient to raise the pH of said mixture to at least 12 and to hold the pH of greater than 12 for at least 7 days,

and drying said mixture for at least 30 days and until a minimum solids concentration of 65% solids is reached,

the amount of added material being also sufficient to maintain the pH above 12 until the sludge solids achieve at least 60% solids by weight,

the amount of added material mixed with said sludge and the length of time of drying being sufficient to reduce significantly offensive odor of the sludge to a level that is tolerable; to reduce animal viruses therein to less than one plaque forming unit per 100 ml of said sludge; to reduce pathogenic bacteria therein to less than three colony forming units per 100 ml of said sludge; to reduce parasites therein to less than one viable egg per 100 ml of said sludge; to reduce vector attraction to said sludge; and to prevent significant regrowth of the pathogenic microorganisms.

4,902,432

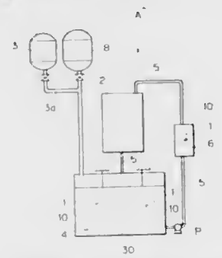
TREATING METHOD OF PREVENTING PUTREFACTION AND EMISSION OF RANCIDITY OF WATER-CONTAINED CUTTING OR GRINDING OIL AND TREATING BAG MEMBER FOR USE IN THE SAME

Toyohiko Kuno, Kyoto, Japan, assignor to Kinki Pipe Giken Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 15, 1989, Ser. No. 311,160

Int. Cl.[4] C02F *1/68*

U.S. Cl. 210—764 **10 Claims**



1. A treating method comprising: preventing putrefaction and emission of rancidity of water-contained cutting or grinding oil used, by wrapping a solid comprised of any one or a mixture of lumps, granules and powders of water-soluble glass composition containing monovalent Ag in the composition thereof in water-permeable fiber cloth and steeping said solid in cutting or grinding oil diluted with water to dissolve the glass inside the wrapping fiber cloth in the water through a gelled state of the glass to make Ag^+ ion flow out into the water and hold the Ag^+ ion in the gelled glass while preventing the suspended substances and suspended solids in the oil from infiltrating through the texture of the water-permeable fiber cloth, and thereafter causing the Ag^+ ion to flow out gradually through the texture of the fiber cloth into the rest of water outside the wrapping cloth.

4,902,433

EQUIPMENT AND METHOD FOR FILTRATION USING A FABRIC OF POLYACRYLONITRILE FIBERS

David E. Graham, Fleet; Malcolm T. McKechnie, Egham, and David G. Thompson, East Twickenham, all of United Kingdom, assignors to The British Petroleum Company p.l.c., London, United Kingdom

Continuation of Ser. No. 436,382, Oct. 25, 1982, abandoned. This application Sep. 2, 1987, Ser. No. 93,129

Claims priority, application United Kingdom, Nov. 13, 1981, 8134218

Int. Cl.[4] B01D *39/04*

U.S. Cl. 210—791 **9 Claims**

1. A backwashable filter element suitable for the filtration of sea water, consisting of a fabric of polyacrylonitrile fibres wherein the diameter of the fibres is in the range 10 to 50 microns and the density of the element is in the range 0.05 to 0.50 g/cc, the filter element having been made by a needle punch process.

4,902,434

FABRIC TREATMENT

Lyndel D. Dickerson, Centerville, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Filed Oct. 21, 1988, Ser. No. 261,053

Int. Cl.[4] D06M *1/00*

U.S. Cl. 252—8.6 **18 Claims**

1. A dry composition useful for treating fibers comprising:

(a) 0.01–2% salt of at least one divalent transition metal compound;

(b) 0–10% of at least one conventional additive selected for the group consisting of agglomerating, fragrancing and processing agents; and

(c) q.s. to 100% of at least one inorganic alkali or alkaline earth metal compoind as a carrier.

4,902,435

GREASE WITH CALCIUM SOAP AND POLYUREA THICKENER

John A. Waynick, Bolingbrook, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 830,710, Feb. 18, 1986, abandoned, and a continuation of Ser. No. 53,262, May 22, 1986, Pat. No. 4,787,992. This application Jul. 22, 1988, Ser. No. 223,268

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl.[4] C10M *125/00, 135/10*

U.S. Cl. 252—18 **6 Claims**

1. A lubricating grease comprising:

a base oil;

an additive package comprising a combined carbonate and phosphate additive package, said combined additive package comprising both a carbonate and a phosphate in the absence of sulfur-containing compounds comprising arylene sulfide polymers, said carbonate selected from the group consisting of a carbonate of a Group 2*a* alkaline earth metal and a carbonate of a Group 1*a* alkali metal, said phosphate selected from the group consisting of a phosphate of a Group 2*a* alkaline earth metal and a phosphate of a Group 1*a* alkali metal, said alkaline earth metal selected from the group consisting of beryllium, magnesium, calcium, strontium, and barium, and said alkali metal selected from the group consisting of lithium, sodium, and potassium, and

a blended thickener comprising

a urea-containing thickener selected from the group consisting of monourea, diurea, and polyurea; and

a calcium-containing thickener comprising an anhydrous simple calcium soap.

4,902,436

PROCESS FOR PRODUCING A MIXTURE OF SULFIDES OF ALKALINE EARTH METAL SALTS OF ALKYLHYDROXYBENZOIC ACID AND ALKYLPHENOL

Takashi Hori; Sanae Ueda, both of Saitama; Yoshihiro Kojima, Ibaraki, and Hitoshi Kumagai, Saitama, all of Japan, assignors to Cosmo Oil Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,488

Claims priority, application Japan, Jul. 24, 1987, 62-185057

Int. Cl.[4] C10M *159/22*

U.S. Cl. 252—33.2 **31 Claims**

1. A process for producing a mixture of sulfides of alkaline earth metal salts of an alkylhydroxybenzoic acid and an alkylphenol, said process comprising the steps of: reacting a mixture of a phenol, a dihydric alcohol and an alkaline earth metal oxide and/or hydroxide (hereinafter referred to as an alkaline earth metal reagent) in an amount of no more than 0.99 gram equivalents per gram equivalent of said phenol; distilling off water and the dihydric alcohol until the amount of the dihydric alcohol becomes no more than 0.6 moles per mole of the alkaline earth metal reagent; reacting the resulting distillation residue with carbon dioxide; and reacting the resulting product with elemental sulfur in an amount of 0.1–4.0 moles per mole of the alkaline earth metal reagent to conduct sulfurization.

4,902,437

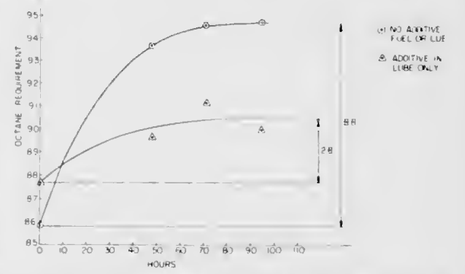
ENGINE LUBRICATING OIL COMPRISING A QUATERNARY AMMONIUM HYDROXIDE

Joseph Vardi, Demarest; Nicholas Feldman, Woodbridge; Jacob J. Habeeb, and Morton Beltzer, both of Westfield, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

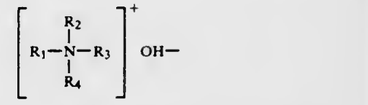
Continuation-in-part of Ser. No. 130,524, Dec. 9, 1987, abandoned. This application Dec. 29, 1988, Ser. No. 290,401

Int. Cl.[4] C10M *133/04*

U.S. Cl. 252—34 **42 Claims**



1. An improved engine lubricating oil composition comprising a mixture of a major amount of a lubricating base oil and a minor amount of a quaternary ammonium hydroxide having the general formula:



wherein R_1 is a hydrocarbon radical or a hydroxy terminated radical having from 1 to 24 carbon atoms, R_2 is a hydrocarbon radical having from 1 to 24 carbon atoms, and R_3 and R_4 are hydrocarbon radicals having from 4 to 24 carbon atoms.

4,902,438

LUBRICATING OIL COMPOSITIONS CONTAINING ANTI-WEAR/EXTREME PRESSURE ADDITIVES

Sean P. O'Connor, North Humberside, United Kingdom, assignor to Bp Chemicals Limited, London, United Kingdom

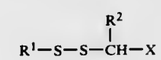
Filed May 5, 1988, Ser. No. 190,595

Claims priority, application United Kingdom, May 12, 1987, 8711191

Int. Cl.[4] C10M *135/24, 135/26*

U.S. Cl. 252—48.2 **11 Claims**

1. Compounds suitable for use as EP/AW additives in lubricating oil compositions which compounds have the formula:



(I)

wherein

X is independently a carboxylic acid group, a hydroxyl group or the group YZ wherein Z is a carboxylic acid group or a hydroxyl group is an alkylene group,

R^1 is an alkyl group having at least 6 carbon atoms, and

R_2 is hydrogen, a methyl, ethyl or propyl group or the group YZ.

7. A finished lubricating oil composition comprising a lubricating oil base stock and an EP/AW improving amount of a compound of the formula (I) as claimed in claim 1.

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DETERGENT COMPOSITION FOR WASHING OFF DYEINGS OBTAINED WITH FIBRE-REACTIVE DYES, PROCESS FOR THE PREPARATION THEREOF AND USE THEREOF

Heinz Abel, Reinach, and Hans-Ulrich Berenut, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 15, 1988, Ser. No. 181,797

Claims priority, application Switzerland, Apr. 15, 1987, 1494/87-0

Int. Cl.[4] C11D *10/02*

U.S. Cl. 252—174.25 13 Claims

1. A detergent composition consisting of as active ingredients

(A) 10–50% by weight of an alkali aluminium silicate,
(B) 15–65% by weight of a trihydric to hexahydric alcohol,
(C) 0–10% by weight of an anionic surfactant,
(D) 0–5% by weight of a non-ionic surfactant, and
(E) 0–0.4% by weight of a graft polymer of acrylamide and the adduct of propylene oxide and glycerol.

4,902,440

UV-CURABLE RESIN COMPOSITIONS

Hidekazu Takeyama, Hiratsuka; Yoshinobu Obashi, Odawara; Shuji Okagawa, Ichihara; Masayuki Nishimoto, Ichihara, and Masao Nishimura, Ichihara, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1987, Ser. No. 75,795

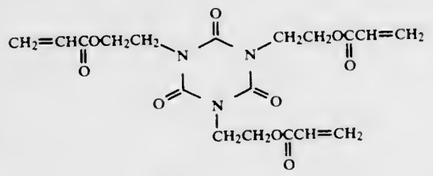
Claims priority, application Japan, Jul. 21, 1986, 61-169772; Apr. 30, 1987, 62-104354

Int. Cl.[4] C09K *3/00;* C08J *5/34*

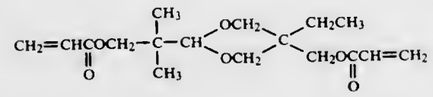
U.S. Cl. 252—182.18 8 Claims

1. A UV-curable resin composition which comprises blending 100 parts by weight of a urethane acrylate, which has been prepared by reacting 4,4'-dicyclohexylmethane diisocyanate with both ends of polytetramethylene glycol having a molecular weight of 650–1300 and then reacting the reaction product with a compound having a hydroxyl group and an acryloyl group in one molecule, with 10–140 parts by weight of a compound having the below-mentioned formula (1) or of a compound having the formula (1) and a compound having the below-mentioned formula (2):

(1)



(2)



4,902,441

SELF MOISTENING COMPOSITION FOR DEACTIVATING TOXIC SUBSTANCES AND METHOD OF USE

Robert E. Pelleaberg, Silver Spring, Md., and Homer W. Carhart, Annadale, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1988, Ser. No. 176,057

Int. Cl.[4] D06L *3/02, 3/06;* C01B *11/06*

U.S. Cl. 252—187.26 20 Claims

1. A self moistening, powdered, toxic-substance inactivating agent comprising an intimate admixture of a sufficient amount of at least one hygroscopic material to cause said agent to moisten and self dissolve and at least one oxidizing material.

4,902,442

STABILIZED MIXTURES OF COLLOIDAL SILICA AND SOLUBLE SILICATE AND A METHOD OF PRODUCING POROUS SILICA COMPOSITIONS THEREFROM

Juan M. Garces, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1988, Ser. No. 261,431

Int. Cl.[4] C07F *7/02;* C04B *35/14;* C09K *3/00*

U.S. Cl. 252—313.2 8 Claims

1. In a method of preparing a porous silica composition with uniform pore size, wherein aqueous colloidal silica is blended with a soluble silicate and a gelating agent and the blend is subsequently polymerized to produce the porous silica composition, the improvement which comprises preblending at least one of the aqueous collodial silica solution and the soluble alkali silicate solution with an effective stabilizing amount of a substituted nitrogen-containing siliconate whereby the blend is stabilized against premature polymerization of silicate.

4,902,443

DICARBOXYLIC ACID MONO-(2-HYDROXYDODECYL)-ESTERS, THEIR SALTS AND THEIR USE AS CORROSION INHIBITORS IN AQUEOUS SYSTEMS

Josef Penninger, Hilden, and Volker Wehle, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 12, 1987, Ser. No. 61,856

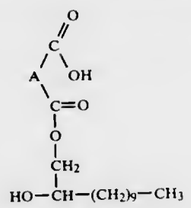
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1986, 3619804

Int. Cl.[4] C09K *3/00;* C07C *69/80, 69/40, 69/42, 69/593*

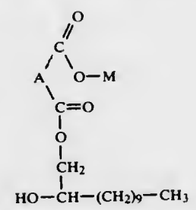
U.S. Cl. 252—388 27 Claims

1. A dicarboxylic acid mono-(2-hydroxydodecyl)-ester corresponding to the following formula

(I)



and a salt thereof corresponding to the following formula



wherein A represents the radicals



and M represents an alkali metal or ammonium.

4. A composition containing an ester or salt thereof as in claim 1 including a complexing agent selected from the group consisting of ethylenediamine tetraacetic acid, nitrilotriacetic acid, citric acid, phosphoric acid ester of an ethoxylated sugar, phosphonic acid, and a water-soluble salt thereof, said ester or salt thereof and said complexing agent being present in said composition in an amount sufficient so that upon dilution of said composition in water said ester or salt thereof and said complexing agent are present in said water in an amount of from about 1 to about 100 ppm.

4,902,444

CONDUCTIVE FLUOROPOLYMERS

Robert J. Kolouch, Vienna, W. Va., assignor to E. I. DuPont De Nemours and Company, Wilmington, Del.

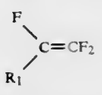
Continuation-in-part of Ser. No. 169,993, Mar. 18, 1988, abandoned, which is a continuation-in-part of Ser. No. 149,152, Jan. 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 109,033, Oct. 16, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 253,520

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—511 10 Claims

1. A composition consisting essentially of

(a) a melt-processible tetrafluoroethylene copolymer comprising recurring units of tetrafluoroethylene comonomer and recurring units of a comonomer represented by the formula



wherein R is R_f —R'$_f$—X, or O—R_f or —O—R'$_f$—X in which R_f is a perfluoroalkyl radical of 1–12 carbon atoms, R'$_f$ is $—(CF_2)_n—$, were n = 1–12, or the same diradical containing ether oxygen; and X is H or Cl; and wherein said copolymer has been fluorinated by subjecting it to a fluorinating agent until the number of unstable end groups is less than 70 per 10^6 carbon atoms; and

(b) a conductive carbon black present in an amount of between 1 and 20 weight percent of the composition.

4,902,445

FIBER BOARD, A METHOD FOR MAKING IT, AND A BINDER COMPOSITION

Georg Björhasg, ÅmÅl; Göran Embring, Väröbacka, and Karl-Gunnar Stål, Karlstad, all of Sweden, assignors to Nova Scand Utveckling AB, Sweden

Division of Ser. No. 804,645, Jan. 21, 1986, Pat. No. 4,761,342. This application Apr. 25, 1988, Ser. No. 185,468

Claims priority, application Sweden, Mar. 16, 1984, 8401467

Int. Cl.[4] C09K *21/00;* B32B *21/04, 21/06*

U.S. Cl. 252—607 12 Claims

1. A binder composition for use in bonding wood fibers, said composition consisting essentially of:

(a) 50–90 parts by weight of an alkali silicate solution;
(b) 0.5–10 parts by weight of a sulphur component; and
(c) 10–40 parts by weight of a metal component selected from the group consisting of calcium compounds, magnesium compounds and mixtures thereof.

4,902,446

METHOD FOR REDUCING THE VOLUME OF RADIOACTIVELY LOADED LIQUIDS, AND FINNED BODY FOR USE IN THE PROCESS

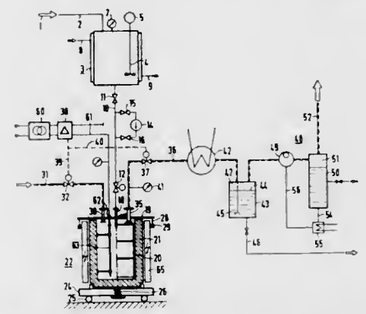
Dietmar Erbse, Rodenbach; Lydia Fuchs, Aschaffenburg; Dietmar Bege, Erlangen; Horst Queiser, Bruchköbel, and Siegfried Meisinger, Altenstadt, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,506

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432103

Int. Cl.[4] G21F *9/08*

U.S. Cl. 252—632 16 Claims



1. An intermittent method of operation for reducing the volume of radioactively loaded liquids, particularly evaporator concentrates, to a solid block of residue which substantially fills a storage container, which comprises

(a) heating radioactively loaded liquids in a storage container discontinuously in heating periods separated from each other in time by introducing the heat directly into the container contents,
(b) intermittently drawing off generated vapors,
(c) venting the storage container in between such times of vapor withdrawal,
(d) replenishing the storage container with radioactively loaded liquids, and
(e) continuing said heating, said vapor withdrawal, said venting and said replenishing to substantially fill the storage container with a solid block of residue remaining after removal of the vapors from the radioactively loaded liquids.

4,902,447

PROCESS FOR THE PRODUCTION OF ALPHA-6-DEOXYTETRACYCLINES AND HYDROGENATION CATALYST USEFUL THEREIN

Jagmohan Khanna; Kiran Bala, and Inder P. S. Grover, all of New Delhi, India, assignors to Ranbaxy Laboratories Limited, New Delhi, India

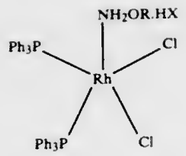
Filed Oct. 28, 1988, Ser. No. 263,721

Int. Cl.[4] C07C *103/19*

U.S. Cl. 552—207 12 Claims

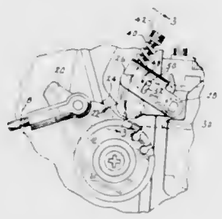
1. In a process for the preparation of an alpha-6-deoxytetracycline by the hydrogenation of a substrate selected from the group consisting of an 11a-chloro-6-deoxy-6-demethyl-6-methylenetetracycline, a 6-deoxy-6-demethyl-6-methylenetetracycline and salts thereof, the improvement comprising conducting the hydrogenation in the presence of a homogeneous hydrogenation catalyst comprising

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wherein
ph is phenyl
R is hydrogen or C_1–C_4 alkyl; and
X is chloro, bromo, or iodo.

4,902,448
CAM AND IDLE SPEED ADJUSTMENT
George E. Phillips, Oshkosh, Wis., assignor to Burnswick Corporation, Skokie, Ill.
Filed Feb. 3, 1989, Ser. No. 306,347
Int. Cl.[4] F02M *1/10*
U.S. Cl. 261—65 **7 Claims**



1. In a marine carburetor of the type in which the pivotal movement of a throttle shaft mounted throttle plate is controlled by the movement of a throttle lever engaged by a cam follower pivotally mounted on the throttle shaft and moving along the contoured surface of an operator actuated throttle cam, a combined cam and idle speed adjustment comprising,

adjustment means mounted on the throttle lever and engagement with a notch disposed on the surface of the cam follower so that movement of said adjustment means in a first direction urges the cam follower into engagement with the surface of the throttle cam, at which point continued movement of said adjustment means in said first direction results in movement of the throttle lever so that the throttle plate may be adjusted to an idle position.

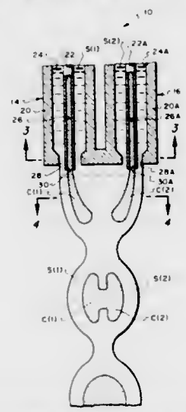
4,902,449
EVAPORATIVE COOLER PAD AND METHOD OF FORMING SAME
Claude C. Hobbs, Waco, Tex., assignor to Hobbs Bonded Fibers, Groesbeck, Tex.
Filed Sep. 22, 1988, Ser. No. 247,845
Int. Cl.[4] B01F *3/04*; B32B *1/00, 3/00*
U.S. Cl. 261—94 **14 Claims**

1. An evaporative cooler pad having opposing faces and comprising a substantially noncompressible batt of substantially uniformly distributed natural cellulosic lightweight elongate segments, oriented in generally horizontal planes extending substantially parallel to the opposing faces of the pad with the elongate segments in each plane extending in various directions with respect to each other and forming interconnecting interstices and passageways throughout the pad such that air directed toward the pad may flow generally freely therethrough from one face to the other of the pad,

said pad also comprising a preformed hydrophilic foam directly coating substantially all the surfaces of the individual elongate segments, said hydrophilic foam coating having a thickness substantially less than the thickness of the elongate segments so as to increase the cross-section of the segments without interconnecting the segments to each other and without bridging between the segments so that the interstices and passageways throughout the batt remain substantially intact and unobstructed, said hydrophilic foam coating and its surface having a minute cellular structure which serves for producing a capillary type effect when contacted by water to wick the water throughout the pad along the surfaces of the elongate segments so as to substantially increase the evaporative efficiency of the pad over the pad prior to the coating thereof, and

an open mesh net fabric intimately engaging said batt in surrounding relation to facilitate handling of the foam coated pad formed therefrom.

4,902,450
MULTI-ELEMENT SPHERICAL SHELL GENERATION
Andrew D. Morrison, Altadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Sep. 28, 1988, Ser. No. 250,195
Int. Cl.[4] B29B *9/10*
U.S. Cl. 264—4 **16 Claims**



1. In a multi-element spherical shell generation system, a nozzle assembly comprising:

(a) a first nozzle having an inner orifice adapted to discharge a first filler material in a first inner stream and an outer annular orifice separated from and defined in concentric relation about said inner orifice and adapted to discharge a first shell material in a first annular outer stream, said first nozzle including an outer cylindrical wall and an inner cylindrical tube disposed concentrically within and spaced inwardly from said outer wall, said outer orifice of said first nozzle being defined between outer ends of said outer wall and inner tube and said inner orifice of said first nozzle being defined by said outer end of said inner tube;

(b) a second nozzle having an inner orifice adapted to discharge a second filler material in a second inner stream and an outer annular orifice separated from and defined in concentric relation about said inner orifice and adapted to discharge a second shell material in a second annular outer stream, said second nozzle including an outer cylindrical wall and an inner cylindrical tube disposed concentrically within and spaced inwardly from said outer wall, said outer orifice of said second nozzle being defined between outer ends of said outer wall and inner tube and said inner orifice of said second nozzle being defined by said outer end of said inner tube; and

(c) a web portion extending between and rigidly interconnecting said first and second nozzles adjacent said respective outer orifices at said outer ends of said outer walls thereof so as to provide an outer end bridge extending between said outer orifices which causes said first and second outer streams of said first and second shell materials to couple together and combine into a single stream for subsequently generating a single shell wall which, in turn, causes said first and second inner streams to coalesce and form a pair of discrete core inclusions for subequently generating a single core inclusion within the single shell wall.

8. A multi-element spherical shell generation method, comprising the steps of:

(a) discharging a pair of annular outer streams of first and second fluid materials;

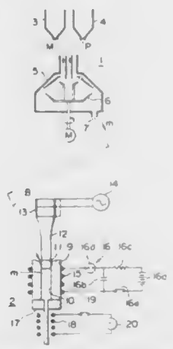
(b) coalescing said annular outer streams such that they merge with one another after discharge from the outer orifices to generate a shell wall;

(c) discharging a pair of inner streams of first and second fluid materials such that they are encapsulated by said annular outer streams upon discharge;

(d) coalescing said inner streams such that they generate two discrete core inclusions within the shell wall; and

(e) merging the two discrete core inclusions into a single inclusion within the shell.

4,902,451
METHOD OF PREPARING A FRICTIONAL MATERIAL
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawaken, Japan
Filed Nov. 2, 1984, Ser. No. 668,171
Claims priority, application Japan, Feb. 18, 1982, 57-25452
Int. Cl.[4] B06B *3/00*
U.S. Cl. 264--24 **18 Claims**



1. A method of preparing a member operating as a machine part with a surface in frictional sliding contact with another part in a machine, the method comprising the steps of:

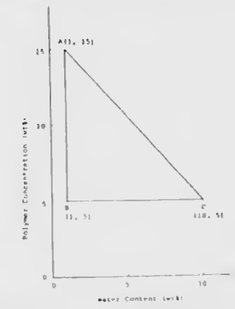
(a) mixing uniformly in a preselected proportion magnetic particles with a resinous frictional substance;

(b) subjecting the mixture resulting from step (a) to an external magnetic field while shaping the mixture to form said member with said surface, said magnetic field being oriented, relative to said mixture being shaped to form said member, in a predetermined directional relationship with said surface of said member and having a magnetic-field strength sufficient for said member to acquire a maximum frictional anisotropy having an extreme value of frictional coefficient in the direction of said surface, by

(b1) cold-shaping said mixture under pressure in said external magnetic field to form a compacted body of the mixture of predetermined configuration and size, and

(b2) subsequently heating the body to allow the resinous substance in pulverized form to coalesce and said magnetic particles to be bonded together and to said coalescing resinous particles to yield said frictional material.

4,902,452
PROCESS FOR PRODUCING AN ACRYLIC FIBER HAVING HIGH FIBER CHARACTERISTICS
Yoshihiro Nishihara; Yoshifumi Furutani, both of Hiroshima; Masaaki Toramaru, and Toshiyuki Yasunaga, both of Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Filed Jul. 28, 1987, Ser. No. 78,510
Claims priority, application Japan, Jul. 28, 1986, 61-175492; Sep. 24, 1986, 61-223811; May 6, 1987, 62-110155
Int. Cl.[4] D01F *6/18*
U.S. Cl. 264—28 **6 Claims**



1. A process for producing an acrylic fiber having a strength of at least 10 g/d, a modulus of at least 180 g/d, at least 95% X-ray orientation, and X-ray crystallinity parameter of up to 0.8 degree and a knot strength of at least 4 g/d, comprising the steps of:

(a) producing a polymer having a weight-average molecular weight of at least 5×10^5 wherein a mixture of 10–70 wt % of a polymerizable unsaturated monomer mixture containing acrylonitrile of at least 80%, 15–60 wt % of an organic solvent selected from dimethylformamide, dimethylacetamide, γ-butyrolactone or dimethylsulfoxide and 15–60 wt % of water is polymerized in the presence of a radical initiator and further polymerized with at least one of said water and organic solvent in a total amount of 1–10 parts by weight per part by weight of the charge polymerizable monomer,

(b) dissolving said polymer in a spinning solution comprising water and dimethylformamide or dimethylacetamide at a polymer concentration of 15–50 wt % to provide the spinning solution having a viscosity of 500–1,500 poises at 45° C., wherein the concentrations of said water and polymer in the spinning solution using dimethylformamide as a spinning solvent are within amounts defined by an area bounded by straight lines connecting points A, D and C which have coordinates of (1, 15), (1, 5) and (10, 5), respectively, or wherein the concentration of said water and polymer on the spinning solution using dimethylacet-

amide as a spinning solvent are within amounts defined by an area bounded by straight lines connecting points A', B' and C' which have coordinates of (1, 15), (1, 5) and (5, 5), respectively, on a rectangular coordinates system in which the water concentration is plotted on the x-axis and the polymer concentration is plotted on the y-axis,

(c) extruding the spinning solution into a gaseous medium to form filaments;

(d) introducing the filaments into a coagulation bath comprising water and at least one of dimethylformamide and dimethylacetamide at 0° C. or below; and

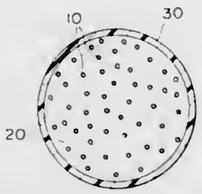
(e) stretching the coagulated filaments to draw a ratio of at least 10.

4,902,453

PROCESS FOR THE PREPARATION OF A FIBER-REINFORCED CARBON COMPOSITE

Akimitsu Okura, Tokyo; Toshoku Cho, Chiba; Takao Nakagawa, Kashiwa; Shimpei Gomi, Tokyo, and Takaya Ueda, Zushi, all of Japan, assignors to Across Co., Ltd., Japan

Division of Ser. No. 78,978, Jul. 29, 1987, Pat. No. 4,772,502.
This application Jun. 2, 1988, Ser. No. 201,451
Claims priority, application Japan, Aug. 2, 1986, 61-182483
Int. Cl.[4] B29C *47/02*
U.S. Cl. 264—29.2 **6 Claims**



1. A process for the preparation of a fiber reinforced carbon composite, comprising the steps of: continuously passing a multiplicity of inorganic reinforcing fibers through a bed of a mixed powder including a finely divided carbonaceous binder pitch and a finely divided coke so that the mixed powder is taken in the interstices between said fibers;

assembling said mixed powder-carrying fibers to form a tow with said mixed powder being held between said fibers;

extruding a thermoplastic resin over said tow to form a sleeve surrounding said tow; and

carbonizing the assembled tow, powder and sleeve by heating to thereby produce the fiber-reinforced carbon composite.

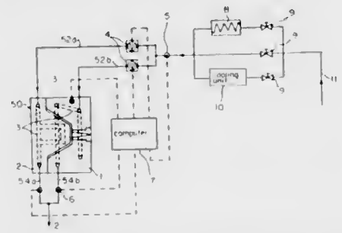
4,902,454

PROCESS OF TEMPERING PLASTIC INJECTION MOLDING TOOLS

Georg Steinbichler, Rottermann; Erhard Smek, and Alfred Lampl, both of Schwertberg, all of Austria, assignors to Engel Maschinenbau Gesellschaft m.b.H., Schwertberg, Austria

Continuation-in-part of Ser. No. 907,723, Sep. 15, 1986, abandoned. This application Aug. 10, 1988, Ser. No. 219,286
Claims priority, application Austria, Sep. 16, 1985, 2691/85
Int. Cl.[4] B29C *45/78*
U.S. Cl. 264—40.6 **2 Claims**

1. A method for use with plastic injection molding tools, each plastic injection molding tool having a conduction circuit for circulation of a coolant, a coolant inflow duct and a coolant discharge duct connected to the conduction circuit, one of the inflow and discharge ducts of each plastic injection molding tool including at least one valve having an open state allowing a volumetric rate of flow of coolant and a closed state in which there is no volumetric rate of flow of the coolant, a temperature sensor being associated with each plastic injection molding tool for sensing the temperature of each plastic injection molding tool, the method comprising the steps of: continuously performing working cycles including closing the plastic injection molding tools, injecting the plastic injection molding tools with plastic material and opening the plastic injection molding tools; continuously measuring the temperature of the plastic injection molding tools, initiating a cooling term by opening the valves upon sensing the temperature of the plastic injection molding tools reaching a predetermined nominal value, said cooling term having a time duration of at least one of said



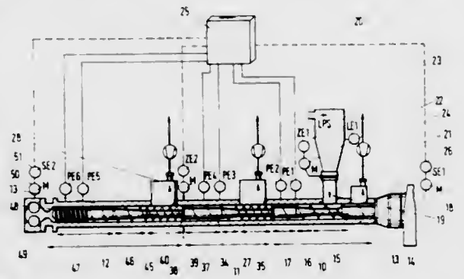
working cycles; storing a temperature difference between said nominal value at which time said cooling term was initiated and the temperature at the end of said cooling term in a computer; initiating a second term in which the valves are closed, said second term having a time duration equal to said cooling term; storing the temperature change between the initiation of said second term and the end of said second term; and, controlling the opening and closing of said valves as a function of said stored information to maintain the temperature of said molding tools within a predetermined tolerance range.

4,902,455

METHOD AND EXTRUSION APPARATUS FOR DEGASSING THERMOPLASTIC PLASTICS MATERIAL MELTS

Hans Wobbe, Burgdorf, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 27, 1988, Ser. No. 290,488
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744193
Int. Cl.[4] B29C *47/00, 47/76, 47/92*
U.S. Cl. 264—40.7 **8 Claims**



1. A method of degassing a thermoplastic plastic material melt in a degassing extruder comprising a plurality of degassing extruder sections connected in series with one another, each said degassing extruder section including housing means, screw means rotatable within said housing means, and means for rotating said screw means, said screw means including core means having a periphery and flight means of a predetermined depth helically disposed around the periphery of said core means, said screw means defining, within said housing means, a degassing region and a metering region disposed downstream of said degassing region in each said section, said degassing region including degassing means, said degassing means comprising degassing port means formed in said housing, means for producing a reduced pressure at said degassing port means and means for conveying said melt within said housing past said degassing port means at a minimal extrusion pressure; said metering region including means for producing an elevated pressure to be applied to said degassed melt and means for determining a pressure gradient in said metering region, comprising the steps of feeding said melt successively into and through each said section wherein said melt is degassed and subsequently subjected to said elevated pressure, determining said pressure gradient in each said metering region of each said section, comparing said measured pressure gradient, and controlling the height and length with which said flight means are filled with melt in each said degassing section in dependence upon said measured pressure gradient so as to cause said desired pressure gradient to be attained, the melt being conveyed at substantially the same throughput through each said degassing section.

6. A degassing screw extruder for degassing a thermoplastic plastic material melt comprising a plurality of longitudinally spaced degassing extruder sections, each section comprising housing means and screw means rotatable within said housing means, each said screw means comprising a core portion, having a periphery and flight means helically disposed around the periphery of said core portion, said screw means defining, within said housing, a degassing region and a metering region disposed downstream of said degassing region in each said section, said degassing region including degassing means, said degassing means comprising degassing port means formed in said housing and means for producing a reduced pressure at said port means and means for conveying said melt past said degassing port means at a minimal extrusion pressure, each said metering region including means for producing an elevated extrusion pressure to be applied to said degassed melt and at least two pressure measurement devices longitudinally spaced apart from one another for measuring the pressure of said melt in said metering region such that the pressure gradient between said measuring devices is determined, drive means for rotating said screw means in at least the upstream extruder section, means for adjusting the rate of rotation of said screw means, flow restrictor means disposed between two adjacent said extruder sections for controlling throughflow; means associated with said flow restrictor means for adjusting the throughflow cross-section of said restrictor means, melt pump means disposed at the downstream end of said extruder, said melt pump means including a melt pump, drive means for rotating said melt pump and means for adjusting the rate of rotation of said melt pump means; control means connected to said screw rotation rate adjustment means, to said throughflow cross-section adjustment means and to said melt pump rotation rate adjustment means; said control means also being connected to each said pressure measurement device whereby said pressure measurements from each said metering section are transmitted to said control device and are compared therein with a desired pressure gradient whereby disparity between said measured and said desired pressure gradient in any said metering section causes said control device to regulate at least one of said screw rotational rate adjustment means, said free throughflow cross-section adjustment means and said melt pump rotational speed adjustment means, said screw means having a substantially equal number of flights, depth of flight and flight pitch in each said degassing extruder section.

4,902,456

FLUOROCARBON MEMBRANES AND PROCESS FOR MAKING FLUOROCARBON MEMBRANES

Larry Y. Yen, Tewksbury, and George Lopatin, Newton Centre, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed May 4, 1988, Ser. No. 190,285
Int. Cl.[4] C08L *9/26*; B01D *13/00*
U.S. Cl. 264—41 **3 Claims**



1. A process for forming a microporous polymericfluorocarbon membrane which comprises:

(a) forming a melt-blend of a polymer selected from the group consisting of poly (tetrafluoroethyleneco-perfluoro(alkyl vinyl ether)) and poly(tetrafluoroethyleneco-hexafluoropropylene) and a chlorotrifluoroethylene oligomer solvent containing between about 10 and 35 weight percent of polymer based upon the weight of the blend,

(b) shaping said melt-blend to form a shaped precursor to said membrane,

(c) cooling said shaped precursor to a temperature at which said solvent separates from the polymer by phase separation to form a gel film,

(d) selectively extracting said solvent formed from said gel film in step (c) to form a microporous membrane of said polymer and

(e) drying said membrane from step (d).

4,902,457

METHOD FOR MANUFACTURING A POROUS MATERIAL OR A COMPOSITE SINTERED PRODUCT COMPRISING ZIRCONIUM OXIDE AND A CARBIDE

Takahiro Wada; Seiji Adachi, and Toshihiro Mihara, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 7, 1987, Ser. No. 41,810
Claims priority, application Japan, Apr. 7, 1986, 61-79705; Sep. 29, 1986, 61-230309; Dec. 19, 1986, 61-304195; Dec. 19, 1986, 61-304197
Int. Cl.[4] C04B *35/64*
U.S. Cl. 264—43 **31 Claims**

1. A method for manufacturing a porous material comprising zirconium oxide and a metal carbide, comprising

mixing a zirconium alloy powder, a metal oxide powder and a carbon powder, wherein the zirconium alloy is an alloy of zirconium and aluminum, yttrium or magnesium;

shaping the mixture in a desired form; and

igniting a portion of the shaped mixture in an atmosphere which is inert to a combustion reaction of the shaped mixture so that the combustion reaction starts in said portion of said mixture and continues throughout the shaped mixture by the heat of the reaction, wherey the zirconium alloy powder is converted to a solid solution comprising zirconia and the metal oxide powder is converted to a metal carbide throughout the shaped mixture to attain a porous body substantially made of the zirconia solid solution and the metal carbide.

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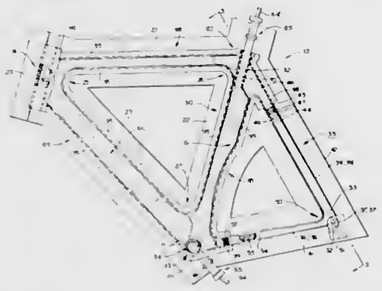
METHOD OF MOLDING COMPOSITE BICYCLE FRAMES

Brent J. Trimble, 8025 Sundi Way, Anchorage, Ak. 99502

Continuation-in-part of Ser. No. 53,370, May 12, 1987, Pat. No. 4,850,607, which is a continuation-in-part of Ser. No. 861,983, May 12, 1986, abandoned. This application Nov. 20, 1987, Ser. No. 123,338

Int. Cl.[4] B29C *43/18, 43/10*

U.S. Cl. 264—46.6 **26 Claims**



1. A method of making a generally hollow bicycle frame component connecting at least two of a steering support means for supporting a fork assembly, a seat support means for supporting a seat assembly, a pedal support means for supporting a pedal assembly, and a wheel support means for supporting a wheel assembly, said method comprising:

forming a tube section comprising at least one elongated strip of fibrous material impregnated with a synthetic resin and two junction sections each comprising at least one patch of fibrous material impregnated with a synthetic resin, said junction patches and said tube strip each being separate pieces of said resin impregnated fibrous material such that said sections are separate from each other;

placing at least a portion of a corresponding one of two of said support means in each of said junction sections;

placing said separate sections adjacent to each other with one of said junction sections adjacent to each end of said tube section, said junction sections each having a connection part and said tube section having an end part at each end thereof arranged to be overlapped with the connection part of a corresponding one of said junction sections when said junction sections are adjacent to each end of said tube section;

transversely overlapping each end part of said tube section with the connection part of said corresponding junction section to form a generally hollow shell extending longitudinally between said two corresponding support means and having two pairs of overlapped parts one pair between said tube section and each of said junction sections, the synthetic resin of at least one part of each of said pairs being substantially uncured and said generally hollow shell having an interior cavity for receiving a pressing means for causing compression of said uncured parts of said shell against a molding means;

placing said pressing means in said interior cavity of said shell and said uncured parts of said shell adjacent to a molding means;

activating said pressing means to compress said overlapped parts together and said uncured parts of said shell against said molding means; and,

curing said uncured parts of said shell while under said compression to cause said two pairs of overlapped parts to form two corresponding pressure molded junctures integrally uniting said elongated tube strip and said junction patches to provide a unitary wall of substantially continuous resin impregnated fibrous material, said unitary wall forming a generally hollow bicycle frame component which alone structurally connects said two corresponding support means and has a generally hollow tubular portion corresponding to said tube section integrally connected to a pair of generally hollow junctions corresponding to said junction sections.

4,902,459

METHOD OF MAKING CERAMIC ARTICLES

Saburo Matsubara, Yokohama, and Shinichi Yagi, Kawasaki, both of Japan, assignors to Nippon Oil Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 706,018, Feb. 27, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 6,288

Claims priority, application Japan, Feb. 29, 1984, 59-36166

Int. Cl.[4] C04B *35/64*

U.S. Cl. 264—63 **4 Claims**

1. A method of making a dense fired ceramic article which comprises the steps of mixing a ceramic powder with an organic binder mixture of (A) 90 to 10% by weight of an isobutylene polymer of number average molecular weight of the order of 300 to 3,000 and (B) 10 to 90% of an acrylic polymer having a glass transition temperature in the range of −70 degrees C. to 190 degrees C. and being selected from the group consisting of arcylic homopolymers and acrylic copolymers and copolymers of acrylic monomers and vinyl monomers in an amount of 0.2 to 20 parts by weight per 100 parts by weight of the ceramic powder, granulating the resulting powder-binder mixture, forming a green body of the resulting granulated admixture, and firing the green body provide a dense fired product.

4,902,460

PROCESS FOR PREPARATION OF MOLECULARLY ORIENTED, SILANE-CROSSLINKED ULTRA-HIGH-MOLECULAR-WEIGHT POLYETHYLENE MOLDED ARTICLE

Kazuo Yagi, Obtake, and Hitoshi Mantoku, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 934,701, Nov. 25, 1986, Pat. No. 4,870,136. This application Apr. 14, 1988, Ser. No. 181,698

Claims priority, application Japan, Nov. 30, 1985, 61-268356; Oct. 8, 1986, 62-237,887

Int. Cl.[4] D01F *1/10, 11/00*

U.S. Cl. 264—83 **27 Claims**

1. A process for the preparation of a molecularly oriented, silane-cross-linked ultra-high-molecular-weight polyethylene molded article, which comprises (i) melt-kneading a mixture of (a) an ultra-high-molecular-weight polyethylene having an intrinsic viscosity (η) of at least 5 dl/g, (b) 0.1 to 10 parts by weight, per 100 parts by weight of the component (a), of a silane compound having both of a radical-polymerizable organic group and a hydrolyzable organic group, (c) 0.01 to 3 parts by weight, per 100 parts by weight of the component (a), of a radical initiator and 9900 to 33 parts by weight, per 100 parts by weight of the component (a), of a diluent, (ii) melt-extruding the resultant kneaded composition through a spinneret or a die to form an undrawn molded article, (iii) subjecting the obtained undrawn molded article of the silane-grafted ultra-high-molecular-weight polyethylene to a drawing treatment so that the drawn molded article has an orientation degree(F) of at least 0.90, (iv) impregnating the molded article with a silanol condensation catalyst during or after the drawing step (iii), and (v) contacting the drawn molded article impregnated with the catalyst with water to effect cross-linking.

4,902,461

METHOD FOR HEATING AN ADVANCING YARN

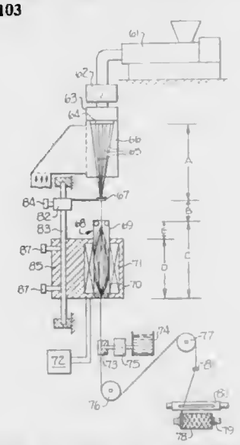
Heinz Schippers, Remscheid, Fed. Rep. of Germany, assignor to Barmag, AG, Remscheid, Fed. Rep. of Germany

Filed Mar. 17, 1988, Ser. No. 169,311

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709233; May 19, 1987, 3716650; Jun. 19, 1987, 3720337; Jul. 21, 1987, 3724095

Int. Cl.[4] D01D *5/088, 10/02*

U.S. Cl. 264—103 **11 Claims**



1. A method for the melt spinning of a highly oriented yarn composed of a plurality of continuous filaments of a thermoplastic polymer or the like, and comprising the steps of

extruding a polymeric melt through a plurality of orifices of a spinning die so as to provide a plurality of separate filaments,

withdrawing the filaments emerging from the spinning die while cooling the withdrawn filaments in a cooling zone below said spinning die to a temperature below their solidification temperature to provide a bundle of advancing solidified filaments,

advancing the solidified bundle from the cooling zone at a speed sufficient to apply a resistance force to the bundle from contact with the ambient air,

applying a drawing force to the bundle of advancing solidified filaments and against said resistance force to effect drawing of the filaments in a drawing zone and so as to impart a draw ratio of at least 1:2 to the filaments and so as to produce a highly oriented resulting yarn, and with the drawing zone defining an initial drawing point at which the drawing commences,

heating the bundle of advancing solidified filaments by guiding the same through a tubular heating tube, and including positioning the tube so that said initial drawing point is located within said tube, and selecting the temperature and length of the tube and positioning the heating tube so that the initial drawing point is located at a selected position within the length of the tube so as to achieve desirable physical properties in the resulting yarn, and

winding the resulting yarn onto a cross-wound package.

4,902,462

METHOD OF PRODUCING POLYPROPYLENE YARNS

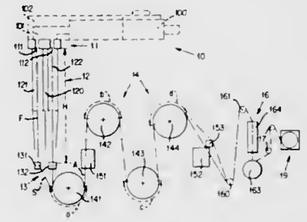
Paolo Bert, Cassano Magnago, Italy, assignor to Filteco S.p.A., Italy

Filed Apr. 5, 1988, Ser. No. 177,775

Claims priority, application Italy, Apr. 6, 1987, 19990 A/87; European Pat. Off., Oct. 2, 1987, 87810568.3

Int. Cl.[4] D01D *5/16;* **D01F** *6/06*

U.S. Cl. 264—103 **12 Claims**



1. A method of producing polypropylene yarns composed of a plurality of continuous and substantially oriented individual filaments by melt spinning and stretching them in an integral process, comprising the steps of:

(a) simultaneously extruding a sufficient number of said individual filaments for forming at least 8 continuous filament yarns, each consisting of at least 10 filaments, at an extrusion speed of at least 400 meters per minute into an essentially vertical air quenching zone for solidification of said filaments;

(b) arranging said filaments to form a substantiallly planar array of parallel and mutually distance yarn strands in a number corresponding to step (a);

(c) together stretching said filaments to achieve said substantial orientation by passing said yarn strands, while maintaining them in said array, over peripheral surface portions of a sequence of rotating cylinders each having a diameter greater than about 300 mm and all having parallel axes of rotation, each strand passing over said surface portions along a discrete path which is substantially defined by a plane intersecting perpendicularly with the rotation axis of any cylinder; each strand being in frictional contact with said peripheral surface portions for a contact path length of from 1.0 to 6.5 meters; at least 50 percent of said path length of frictional contact being provided on a total number of from 2 to 6 cylinders; and

(d) finally winding said yarn strands obtained as product yarns at a speed of at least 1000 meters per minute.

4,902,463

ELASTIC ABSORBENT AND PROCESS FOR PRODUCTION THEREOF

Toyoaki Tanaka, Yokohama; Katuzi Ohira, Sagamihara; Akira Nakamura, Chigasaki; Ryosuke Kamei, and Akihiro Hashimoto, both of Yokohama, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 44,373, Apr. 30, 1987, Pat. No. 4,822,668. This application Jan. 31, 1989, Ser. No. 304,088

Claims priority, application Japan, Jul. 18, 1986, 61-167884; Jul. 31, 1986, 61-178945; Aug. 13, 1986, 61-188698; Dec. 11, 1986, 61-293485; Dec. 22, 1986, 61-303934; Jan. 5, 1987, 62-1; Feb. 13, 1987, 62-29525

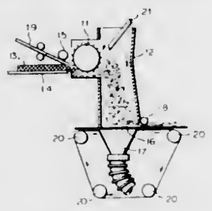
Int. Cl.[4] B32B *3/04*

U.S. Cl. 264—122 **3 Claims**

1. A process for the preparation of elastic absorbents, which comprises subjecting a split yarn obtained by splitting a tape-form oriented laminate comprising at least one layer of a synthetic resin having a high melting point and at least one layer of a synthetic resin having a low melting point, in which the

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layer of the synthetic resin having a low melting point is at least partially exposed to the surface, and sheet-like cellulose pulp simultaneously to an action of one combing roll to cut the split yarn into staple fibers and simultaneously disintegrate the sheet-like cellulose pulp to pulverized pulp, dry-blending the staple fibers of the split yarn with the pulverized cellulose pulp



to obtain a mixed web, and heating the mixed web to obtain an elastic absorbent in which at the crossing points of the staple fibers of the split yarn, the synthetic resin having a low melting point is at least partially fusion-bonded and the staple fibers of the split yarn are connected to one another in the state where the cellulose pulp is partially enclosed therein.

4,902,464

CROSS-LINKED POLYVINYL BUTYRAL

George E. Cartier, Springfield, and Peter H. Farmer, Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 933,837, Nov. 24, 1986, Pat. No. 4,814,529. This application Dec. 7, 1988, Ser. No. 280,808

Int. Cl.[4] B29C *47/36*

U.S. Cl. 264—211.24 **13 Claims**

1. A process for increasing the viscosity of polyvinyl butyral which comprises having a cross-linking agent present before or during acetalization of polyvinyl alcohol with butyraldehyde to lightly cross-link the acetalized product through adjacent polyvinyl alcohol chains, the extent of cross-linking being adequate to increase the viscosity of the polyvinyl butyral by about 2% to about 85% over its viscosity in the absence of said cross-linking agent, said polyvinyl butyral containing 65 to 95 weight % vinyl butyral units.

8. A method of forming polyvinyl butyral sheet which comprises:

a. acetalizing polyvinyl alcohol with butyraldehyde in the presence of a cross-linking agent to produce polyvinyl butyral resin containing 65 to 95 weight % vinyl butyral units which is lightly cross-linked through stable intermolecular linkages, the extent of cross-linking being adequate to increase the viscosity of the polyvinyl butyral resin by about 2% to about 85% over its viscosity in the absence of said cross-linking agent;

b. mixing said resin with plasticizer and other optional additives to form an extrusion formulation; and

c. extruding said formulation in melt form through an extrusion opening without rupturing said cross-links to form said sheet.

4,902,465

PROCESS FOR FORMING DUST CONTROL MAT WITH NON-CLEATED BORDERS

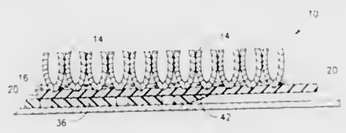
Robert C. Kerr, and John H. Murray, both of LaGrange, Ga., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 216,970, Jul. 11, 1988. This application Sep. 14, 1988, Ser. No. 244,184

Int. Cl.[4] B27N *3/12*; B29C *43/00*

U.S. Cl. 264—257 **2 Claims**

1. A method of forming a unitary dust control mat having a pile fiber upper surface and a rubber-like backing extending beyond at least two edges of the pile fiber upper surface comprising the steps of: placing a perforated silicone-like rubber material having a width less than that of the desired dust control mat on the surface of a conveyor belt, placing a strip of rubber-like material on top of the perforated silicone-like pad so that its longitudinal edges overlap the edges of the silicone-like material, placing a layer of pile fabric on top of the rubber-like material to form a form a layered structure, indexing the layered structure into a heated press molding machine, applying pressure to the layered structure in the press molding



machine to vulcanize the rubber-like material and cause the rubber-like material to pass through the perforations in the silicone-like material to form cleats, causing the longitudinal edges of the rubber-like material to bend over the edges of the silicone-like material to form uncleated portions of a thickness greater than that of the body of the rubber-like material, indexing the vulcanized and adhered layered structure to a stripping station outside the press molding machine and stripping the composite structure from the conveyor belt and the silicone-like material.

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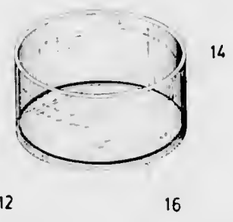
PROCESS FOR MAKING LIPID FILMS SUITABLE FOR LIPOSOMES

Say-Jong Law, Westwood, Mass., assignor to Ciba Corning Diagnostics Corp., Medfield, Mass.

Filed Dec. 11, 1986, Ser. No. 940,571

Int. Cl.[4] G01N *33/92*

U.S. Cl. 264—299 **3 Claims**



3. A process for forming liposomes by hydration of a lipid film comprising adding a liquid to a lipid film made by depositing a lipid solution in a stationary vessel having a substantially level horizontal surface, then evaporating the liquid so as to form a lipid film while maintaining the vessel in a stationary horizontal position.

4,902,467

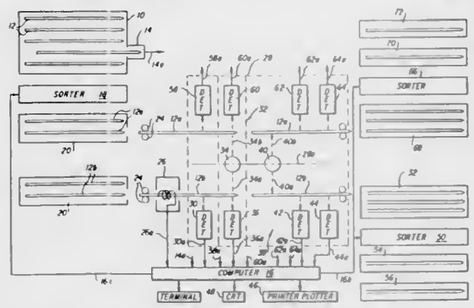
NON-DESTRUCTIVE TESTING OF NUCLEAR FUEL RODS

Fred C. Schoenig, Wilmington, N.C.; Bruce J. Kaiser, Kennewick, Wash.; Carl P. Raiz, Fremont, Calif., and Frank S. Moore, Jr., Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 31, 1988, Ser. No. 238,659

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—159 **9 Claims**



1. A method for non-destructively testing both poisoned and non-poisoned nuclear fuel rods, said method comprising the steps of:

A. uniformly conveying poisoned and non-poisoned fuel rods serially along respective first and second linear, mutually parallel test channels;

B. measuring the concentration of poison content of each poisoned fuel rod at each of a multiplicity of data points distributed along the length thereof during movement along said first test channel by detecting variations in fuel paramagnetic susceptibility and generally therefrom point-by-point poison contraction data;

C. irradiating each poisoned and non-poisoned fuel rods from a source of gamma rays centrally located relative to said first and second test channels;

D. measuring the attenuation of said gamma rays by each poisoned and non-poisoned fuel rod at a multiplicity of data points distributed along the length thereof while moving along said first and second test channels, respectively, to develop first point-by-point density data indicating the density of each poisoned fuel rod and second point-by-point density data indicating the density of each non-poisoned fuel rod;

E. measuring the background radioactivity at a multiplicity of data points distributed along the length of each poisoned and non-poisoned fuel rod while moving along said first and second test channels by detecting gamma ray emissivity to develop first point-by-point background data indicating the background radioactively of each poisoned fuel rod and second point-by-point background data indicating the background radioactivity of each non-poisoned fuel rod;

F. irradiating each poisoned and non-poisoned fuel rod with neutral flux from a source centrally located relative to said first and second test channels;

G. measuring the neutron-induced radioactivity at a multiplicity of data points distributed along the length of each poisoned and non-poisoned fuel rod while moving along said first and second test channels to develop first point-by-point enrichment data for each poisoned fuel rod and second point-by-point enrichment data for each non-poisoned fuel rod; and

H. processing said first and second enrichment data utilizing a common computer program preforming the steps of (1) applying said poison concentration data, said first density data and said first background data to said first enrichment data on corresponding point-by-point bases to correct said first enrichment data for poison concentration, variations in fuel density from theoretical density and background radioactivity and (2) applying said second density data and said second background data to said second enrichment data on corresponding point-by-point bases to correct said second enrichment data for variations in fuel density from theoretical density and background radioactivity.

4,902,468

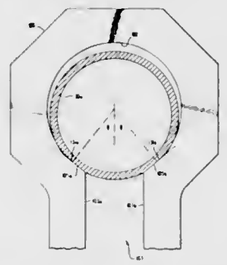
CONTROL ROD SUPPORT HAVING PLANAR WEAR SURFACES

Luciano Veronesi, O'Hara Twp., Allegheny County, and Larry A. Shockling, Plum Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1987, Ser. No. 110,985

Int. Cl.[4] G21C *7/00, 19/00*

U.S. Cl. 376—327 **16 Claims**



1. A combination, comprising:

(a) a longitudinally extending rod guide;

(b) a support for a control rod, said support being positioned within the rod guide and intended to receive and minimize scarring of the control rod;

(c) a cylindrical control rod having a convex surface and being held by a spider including vanes;

said support being relatively flat and thin, and having a predetermined exterior cross-sectional configuration and including

(i) a control rod opening formed in the support and having a predetermined configuration and cross-sectional area,

(ii) a channel formed in the support to receive one of the vanes and communicate with the control rod opening, said channel forming a respective pair of junctures with the control rod opening;

the control rod opening including a pair of planar wear surfaces, each parallel to the axis of the control rod opening and extending laterally from the respective junctures to afford a planar-to-convex interface between the convex surface of the control rod and the planar wear surfaces of the support when the convex surface of the control rod abuts said junctures.

4,902,469

STATUS TREE MONITORING AND DISPLAY SYSTEM

Craig D. Watson, Monroeville; Mary C. Eastman, Pittsburgh; David D. Woods, Murrysville; John P. Carrera, Greensburg; James R. Easter, Pittsburgh; Melvin H. Lipner, Monroeville; William C. Elm, Monroeville, and A. Dean Mundy, Gibsonia, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 859,406, May 5, 1986, abandoned. This application Jul. 7, 1988, Ser. No. 217,117

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—259 **26 Claims**

17. An apparatus for producing a discrete state display for a pressurized water nuclear reactor process, comprising:

data acquisition and status tree computation means for sampling process control data, determining a value of a discrete process parameter and creating first through third

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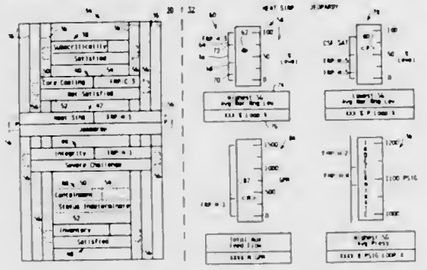
accessible displays in dependence on the parameter value; and

display means for displaying the first through third displays independence upon the parameter and an operator request, said first display comprising:

a reference scale providing a plurality of parallel reference lines indicating the discrete values of the parameters;

at least two simultaneously displayed horizontal status bars transverse to the parallel lines, the bars centered in said reference scale, each bar representing the value of a respective discrete parameter and having a plurality of fixed sizes, each of the sizes dependent on the value of the parameter, each bar having a color, status wording and a procedure name in dependence upon the parameter value, the procedure name indicating a procedure performed by the operator in dependence on the parameter value, and having a status bar name identifying the process represented by the status bar and a priority indicated vertically;

a data quality indicator spatially associated with each



status bar indicating the quality of the process control data;

a meter image spatially associated with status bars and including an actual value indicator indicating an actual value of an item of the process control data and the quality of the item; and

variable range brackets spatially associated with said meter image indicating ranges for the actual value, the brackets having a color in dependence on the parameter value indicated thereby and including variable value range change threshold markers;

said second display comprising:

a status tree for said status bars and having a highlighted active path;

a miniature of said first display spatially associated with said status tree; and

said third display comprising:

a status tree node equation representation and sensor values; and

a miniature of said first display spatially associated with said representation and said sensor values.

4,902,470

CONTROL ROD

Robert C. Dixon, Morgan Hill; James E. Cearley, San Jose; Paul Van Diemen, San Jose; Edwin D. Sayre, Los Gatos, and Gerald M. Gordon, Soquel, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 30, 1987, Ser. No. 31,633

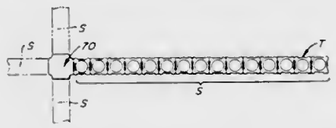
Int. Cl.[4] G21C *7/10*

U.S. Cl. 376—333 **21 Claims**

1. In a nuclear reactor control rod having elongate planar members for absorption of neutrons within a nuclear reactor for control of the nuclear reaction, said elongate planar members being formed of a plurality of tubes arranged side-by-side in abutting contact and joined together, each said tube comprising in combination:

a tube defining a cylindrical pressure vessel for containment of neutron absorbing poisons, said tube defining constant side wall thickness sufficient to define therewithin a cylindrical volume for the containment of neutron absorbing poisons and having sufficient side wall thickness to retain said poisons under all anticipated pressures from decomposition of said neutron absorbing poisons; and

said tube integrally defining in addition to said cylindrical pressure vessel four discrete right angle corner sections placed at 90° intervals to the side wall of said constant side wall thickness tube, said four corner sections defining four



areas of increased thickness wall with four areas of constant thickness of said tube wall defined therebetween whereby said tube of constant side wall thickness is joined to adjacent tubes by said corner sections to form said elongate flat planar members of said control rod without interference with said cylindrical pressure vessel which completely surrounds said cylindrical volume for the containment of said neutron absorbing poisons; and,

neutron absorbing poisons confined within said tube for absorption of neutrons for control of said nuclear reaction.

4,902,471

METHOD FOR PRODUCING METAL CARBIDE GRADE POWDERS

Joseph J. Penkunas, and Theodore E. Smith, Jr., both of Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 11, 1989, Ser. No. 405,707

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—33 **5 Claims**

1. A method for producing metal carbide grade powders, said method comprising:

(a) forming a wax mixture consisting essentially of in percent by weight about 10 to about 60 of an organic compound which is a solid at room temperature and said organic compound containing a C═O group, about 5 to about 50 oils, and the balance paraffin;

(b) heating said wax mixture to a temperature above the melting point of said mixture and maintaining said temperature;

(c) forming a powder-mixture consisting essentially of metal carbide powder, a binder metal selected from the group consisting of cobalt, nickel, and combinations thereof, and said wax mixture while heating said carbide powder, said binder metal and said wax mixture to a temperature above the melting point of said wax mixture and maintaining said temperature to result in a uniform distribution of said wax mixture on said carbide and binder metal particles;

(d) forming a slurry of the powder-wax mixture and water;

(e) attritor milling said slurry at a temperature below the melting point of said wax; and

(f) removing the water from the resulting attritor milled powder-wax mixture and agglomerating said attritor milled powder-wax mixture to produce said metal carbide grade powder wherein a densified article made therefrom exhibits essentially no pores that are greater than about 10 micrometers in diameter after sintering at about 1350° C. to about 1540° C.

4,902,472

HIGH STRENGTH STAINLESS STEEL

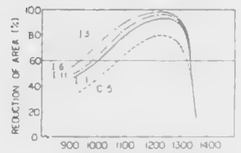
Susumu Isobe, Nagoya, and Hisao Kamiya, Kariya, both of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 887,773, Jul. 21, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 208,784

Claims priority, application Japan, Jul. 19, 1985, 60-159536

Int. Cl.[4] C22C *38/42*

U.S. Cl. 420—49 **3 Claims**



1. A high strength stainless steel comprising 0.01–0.15 wt% in total of at least one of C and N, 1.0–4.0 wt% of Cu, 9.5–10.9 wt% of Ni, 12.0–17.0 wt% of Cr, 0.5–2.5 wt in total of at least one of Al and Ti, 0.005–0.011 wt% of B, 0.02–0.2 wt% of Be and the balance of being Fe and inevitable impurities, and having a temperature (Md_{30}) of transforming 50% of austenite into martensite under a true strain of 0.3 within a range of from room temperature to −196° C. and a tensile strength of not less than 230 kgf/mm^2 through aging treatment after the working.

4,902,473

ROTARY BRAKE DISC

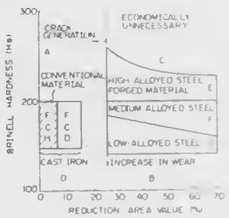
Hiroto Arata; Kenji Shiga, both of Kitakyushu; Daihachiro Sakurai, Tokyo; Kazuo Fujisawa, Kitakyushu; Isao Souma, Hanyu; Yusiyo Watanabe, Hanyu, and Akira Tanaka, Iwatsuki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 725,081, Apr. 19, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 122,570

Claims priority, application Japan, Apr. 28, 1984, 59-87250

Int. Cl.[4] C22C *38/22*

U.S. Cl. 420—105 **6 Claims**



1. A steel brake disc for a truck consisting essentially of 0.1–0.5 percent of carbon, from 1.2 to 10 percent of chromium, from 0.1 to 1 percent of molybdenum, and the balance of essentially iron and unavoidable impurities, said disc being disposed in a rotary disc brake assembly.

4,902,474

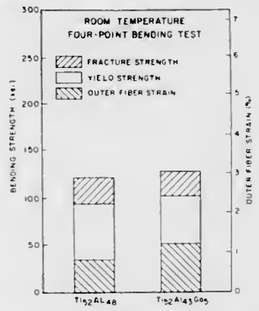
GALLIUM-MODIFIED TITANIUM ALUMINUM ALLOYS AND METHOD OF PREPARATION

Shyh-Chin Huang, Latham, and Michael F. Xavier, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1989, Ser. No. 293,035

Int. Cl.[4] C22C *14/00*

U.S. Cl. 420—418 **12 Claims**



1. A gallium modified titanium aluminum alloy consisting essentially of titanium, aluminum and gallium in the following approximate atomic ratio:

$Ti_{52-47}Al_{42-46}Ga_{3-7}$

4,902,475

ALUMINUM ALLOY AND MASTER ALUMINUM ALLOY FOR FORMING SAID IMPROVED ALLOY

Diran Apelain, Penn Valley, Pa., and Jung-Jen A. Cheng, East Brunswick, N.J., assignors to Metallurgical Products & Technologies, Inc., Exton, Pa.

Filed Sep. 30, 1987, Ser. No. 102,839

Int. Cl.[4] C22C *21/02*

U.S. Cl. 420—548 **4 Claims**



1. A master alloy for use in a hypereutectic casting alloy for improving grain refinement and eutectic modification consisting essentially of 76 to 88 weight percent aluminum; 8 to 4 weight percent titanium and 16 to 8 weight percent of silicon.

4,902,476

HEAT EXCHANGER AND BLOOD OXYGENATOR APPARATUS

Lucas S. Gordon, Laguna Beach, and Richard L. Bringham, San Clemente, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 767,060, Aug. 19, 1985, abandoned, which is a continuation of Ser. No. 457,875, Jan. 14, 1983, abandoned. This application May 29, 1987, Ser. No. 56,135

Int. Cl.[4] A61M *1/14*

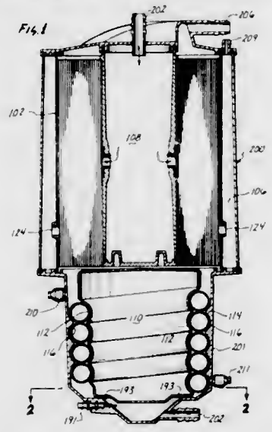
U.S. Cl. 422—46 **4 Claims**

1. An apparatus for changing the temperature of blood comprising:

a housing having at least a first inner wall defining an enclosed chamber through which blood may be directed from a blood inlet portion to a blood outlet portion;

a heat exchanger tube, formed from a tubular body having external and internal surfaces, which is wound in a helical arrangement to provide a plurality of adjacently positioned windings having a top and bottom end, said helically wound tube being dimensioned to be received in the chamber to position at least an outwardly facing portion of said external surface of each of said windings to face said at least a first inner wall, said heat exchanger tube having a plurality of individual circumferentially extending external ribs thereon and reduced cross-sectional area regions between said ribs;

an inner member formed to fit within said coil and having a surface confronting a portion of said external surface of said tube opposite said at least a first housing inner wall;



said at least a first inner wall having a surface facing said external surface of said windings and formed with a complimentary shape of alternating depressions and protrusions for receiving at least a portion of said heat exchanger tube;

said at least a first housing inner wall and said inner member being placed in substantial engagement with said ribs of said heat exchanger tube while remaining spatially separated at said top and bottom ends of said heat exchanger tube to define an open pathway therebetween;

means for directing said blood between said housing inner wall and said inner member surface over said top end of said heat exchanger tube; and

means for directing a heat exchange fluid through said heat exchange tube.

4,902,477

ANNALYTICAL ELEMENT FOR QUANTITATIVE ANALYSIS OF BILIRUBIN

Harumi Katsuyama; Shigeki Kageyama, both of Saitama, and Kumiko Sato, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 578,284, Feb. 8, 1984, abandoned. This application Nov. 17, 1988, Ser. No. 273,631

Claims priority, application Japan, Feb. 9, 1983, 58-21171

Int. Cl.⁴ G01N *21/78, 33/72*

U.S. Cl. 422—56 **4 Claims**

1. An analytical element for the quantitative analysis of bilirubin in a liquid sample by a diazo method which comprises:

a liquid impermeable, light-transmissive support;

a porous reagent layer comprising a nondiffusive aryldiazonium salt, the aryl group of which having at least one substituent selected from the group consisting of an alkoxycarbonyl group, an alkylaminosulfonyl group and an alkylaminocarbonyl group, which is contained in a porous matrix comprising solid fine particles and an acidic polymer binder; and

a liquid sample-spreading layer.

4,902,478

INDICATOR SHEET FOR AN AUTOCLAVE TEST PACK

Roger Hambleton, Stockport, England, assignor to The Victoria University of Manchester, Manchester, England

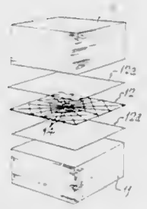
PCT No. PCT/GB87/00125, § 371 Date Sep. 7, 1988, § 102(e) Date Sep. 7, 1988, PCT Pub. No. WO87/04931, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 20, 1987, Ser. No. 235,897

Claims priority, application United Kingdom, Feb. 22, 1986, 8604463; May 27, 1986, 8612775

Int. Cl.⁴ G01N *31/00*

U.S. Cl. 422—56 **9 Claims**



1. An indicator sheet for an autoclave test pack, the sheet bearing on at least one of its faces, a pattern of indicator markings which, under steam sterilizing conditions, undergo a visual change to indicate the presence of air or of excessive moisture, or both, the markings being formed from at least two substances which provide different indications, one being sensitive to air and the other to excessive moisture.

4,902,479

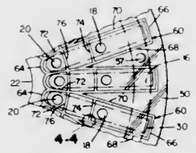
CENTRIFUGAL ANALYZER ROTOR

Romas A. Bri kus, Brookline, Mass., assignor to Fisher Scientific Company

Filed Nov. 7, 1983, Ser. No. 549,593

Int. Cl.⁴ G01N *21/90*

U.S. Cl. 422—72 **16 Claims**



1. A multicuvette rotor for use in a centrifugal analyzer, said rotor defining a circumferential array of elongated radially extending cuvettes and comprising a one-piece body member of transparent material that has a planar upper surface and that defines a circumferential array of elongated cuvette recesses, and

a one-piece cover member of transparent material that has a planar lower surface parallel to said planar upper surface of said body member,

seal means including continuous seal structure extending around each said cuvette recess between said planar upper and lower surfaces to define said circumferential array of analytical cuvettes,

each said elongated cuvette including structure defining a first chamber for receiving a first constituent and a loading port in said cover member through which said first constituent may be introduced into said first chamber region,

structure defining a second chamber region for receiving a second constituent and a loading port in said cover member through which said second constituent may be introduced into said second chamber region, structure defining a radially outer wall, and structure adjacent said radially outer wall defining an analysis region,

said seal means further including barrier structure in each cuvette, each said barrier being connected to said lower surface of said cover and located between the loading ports of said first and second chamber regions and extending from said seal structure at least to the upper edge of a sidewall of said cuvette adjacent the junction between said cover and body members for inhibiting wicking movement along said cove member of a constituent stored in one of said chamber regions to the other chamber region and premature mixing of said constituents, and

divider structure between said first and second chamber regions in each cuvette, each said divider structure being connected to the upper surface of a bottom wall of said cuvette recess and having a crest portion spaced from said lower surface of said cover member so that a transfer passage between said first and second chamber regions is defined between said crest portion and said lower surface of said cover member through which said first constituent may be flowed into said second chamber regions for forming a reaction product with said second constituent.

4,902,480

LENGTH CONTROL SEAL MEMBER

James F. Keys, West Bloomfield, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Filed Jan. 24, 1989, Ser. No. 301,181

Int. Cl.⁴ C09U *7/02*

U.S. Cl. 428—295 **19 Claims**



1. A sealing weather strip comprising:

a means for sealing a door, window, body or the like, said sealing means being elongated, defining a longitudinal axis and formed from an elastomeric material, said sealing means including a surface for coupling said sealing means along said longitudinal axis;

one or more length control members positioned on said coupling surface along said longitudinal axis; and

heat activated means for coupling to said coupling surface, said heat activated means covering said longitudinal length control members and being heated to bond to said surface such that said heat activated means fixedly secures to said surface to form a laminate weather strip.

4,902,481

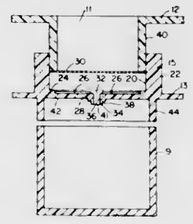
MULTI-WELL FILTRATION TEST APPARATUS

Phillip Clark, Malden; Carolyn Lee, Sudbury; Donald B. Rising, Stow, and Thomas Zermani, Concord, all of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Dec. 11, 1987, Ser. No. 131,952

Int. Cl.⁴ B01D *25/02;* **B01L** *3/00;* **C12M** *1/12, 1/20*

U.S. Cl. 422—101 **8 Claims**



1. A filtration apparatus comprising

a first plate having at least one first well, each of said first wells having a first open end, a second end and an outside peripheral surface,

a second plate having at least one second well having a first open end, a second closed end, said closed end having a hole extending through the closed end thickness and an inside peripheral surface,

said second plate being secured to said first plate between said outside peripheral surface of said first plate and said inside peripheral surface of said second plate,

a filter, positioned between said second end of said first plate and said second end of said second plate, and

an open spout having an open end, said spout being in fluid communication with said hole, said spout having an inner diameter between 0.1 and 3.0 mm and a smallest outer diameter between 0.1 and 5.0 mm., and a collar on the outer surface of said spout extending in a direction substantially perpendicular to the vertical axis of said spout, said spout outer surface and said collar in combination forming a larger outer surface of said spout of varying diameter which functions to prevent migration of liquid emanating from said spout along said larger outer surface, said collar having an outer diameter between 0.5 and 7 mm.

4,902,482

DEVICE AND RECEPTACLE FOR INHIBITING CONTAMINATION FOR INFECTIONS WASTE

Paul A. Faust, 26 Grantwood, St. Louis, Mo. 63123

Filed Jul. 28, 1987, Ser. No. 78,862

Int. Cl.⁴ B65D *90/28*

U.S. Cl. 422—121 **28 Claims**

1. A lid device for inhibiting contamination from an infectious waste receptacle, particularly while waste is being deposited therein, the device comprising:

a frame;

means on the frame for supporting and positioning an open-ended waste receptacle within the lid device;

a lid;

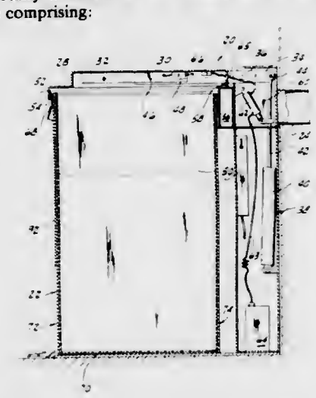
means for pivotally mounting the lid on the frame for pivotal movement between a closed position in which the lid closes the open end of a receptacle received in the supporting and positioning means and an open position in which the open end of the receptacle is exposed for deposition of waste, the means for mounting the lid comprising at least one lid arm having a forward end supporting the lid and a rearward end, and means for pivotally mounting the lid arm intermediate its ends to the frame;

means for remotely pivoting the lid between its closed and

open positions; the means for remotely pivoting the lid comprising a solenoid connected to the rearward end of the lid arm and means for remotely actuating the solenoid to move the lid arm to move the lid; and

means for establishing a substantially bacteria-free interface between waste deposited in the receptacle and the surrounding environment.

20. A receptacle for use with a lid device having a frame and two forwardly extending laterally spaced support arms extending from the frame for receiving and supporting the receptacle and a pivotally mounted lid for closing the receptacle, the receptacle comprising:



a bottom;

a front wall;

a back wall;

and two opposing sidewalls, each side having a side flap defined by a first fold line at the top edge of the sidewall, each side flap having a second fold line closely spaced to the first fold line and separating the side flap into a relatively smaller first portion adjacent the sidewall adapted to extend over the top of a support arm, and a relatively larger second portion adapted to extend over the exterior side of the support arm, each side flap extending rearwardly beyond the back wall of the receptacle.

4,902,483

POLYMERIZATION IN SEVERAL STAGES OF ALPHA-OLEFINS IN THE GAS PHASE

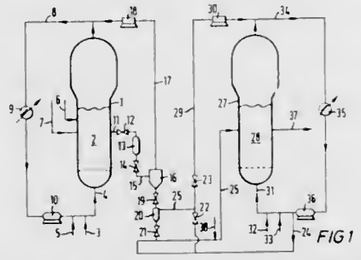
Charles Raufast, Saint Julien Les Martigues, France, assignor to BP Chemicals Limited, London, United Kingdom

Division of Ser. No. 828,966, Feb. 12, 1986, Pat. No. 4,703,094. This application Jul. 2, 1987, Ser. No. 69,244

Claims priority, application France, Feb. 19, 1985, 85 02345

Int. Cl.[4] C08F *2/34*; B01J *12/02*

U.S. Cl. 422—134 **3 Claims**



1. Apparatus for the gas phase polymerization of alpha-olefins comprising, at least first and second serially disposed reactors, each of said reactors having cooling means associated therewith and recycle means; said first reactor having catalyst inlet means, an olefin inlet means at a lower end thereof, an outlet means at an upper end thereof and said recycle means of said first reactor being connected to said inlet and outlet means of said first reactor; olefin feed means connected to said recycle means of said first reactor; said second reactor having an outlet at the upper end connected to said recycle means of said second reactor, said second reactor recycle means connected to said second reactor at bottom and side inlets thereof; powder transfer means connected to said first reactor means at a first end thereof; said powder transfer means comprising in seriatim, a first conduit section, a first valve means, a discharge vessel, a second valve means, a decompression means having an upper discharge connection connected to the recycle means of said first reactor and a lower discharge connection connected via a third valve to a compression chamber, said compression chamber having first and second outlet members, said first outlet member connected to and communicating with said recycle means of said second reactor; fourth and fifth valve means in said recycle means of said second reactor upstream and downstream of the point of connection of said first outlet member; and, said second outlet member connected and communicating directly with said side inlet.

4,902,484

OXYGEN INJECTOR MEANS FOR SECONDARY REFORMER

Richard R. Martin, and Earl W. Schnell, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Continuation of Ser. No. 756,915, Jul. 18, 1985, abandoned, which is a continuation of Ser. No. 518,090, Jul. 28, 1983, abandoned. This application Jan. 28, 1988, Ser. No. 150,448

Int. Cl.[4] B05B *1/06*

U.S. Cl. 422—189 **2 Claims**

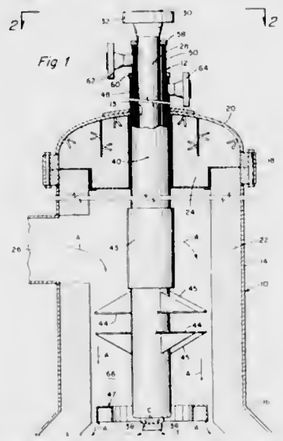


Fig 1

1. Apparatus for reforming a hot effluent stream consisting essentially of carbon monoxide, hydrogen and methane from a primary reformation process to reform methane with steam to form anhydrous ammonia, comprising

a refractory lined housing formed of an upper cylindrical portion closed at its top and connected to an outwardly flared bottom portion;

inlet means in the upper cylindrical portion to receive said effluent from said primary reformation process;

an oxygen delivery tube and flow assembly centrally disposed through and from the top of the housing to a terminal end that is contiguous to the junction of the cylindrical portion and the outwardly flared bottom portion creating an annular zone opposite said cylindrical portion for downward flow of the effluent stream; the flow assembly comprising

a closure means attached at the bottom of the oxygen delivery tube and formed of an inverted cylindrical metallic container of diameter less than the inside diameter of the oxygen delivery tube and extending concentrically upward into the interior thereof to a top closure and thus forming an annular passageway substantially of constant width between the delivery tube and said metallic container, the container being filled with refractory which terminates about and below the end of the bottom of the oxygen delivery tube;

a plurality of oxygen discharge ports through the oxygen delivery tube adjacent the terminal end of the annular passageway, the ports oriented to create jets of oxygen in a downwardly and outwardly direction;

a cooling jacket concentrically spaced from and separately disposed around the outer periphery of the oxygen delivery tube forming a static gas space, the bottom of the jacket being disposed slightly above the oxygen discharge ports, the jacket including a concentrically arranged first passageway for flowing a coolant fluid in a downwardly direction for communication at the bottom with a second passageway for return flow of the coolant fluid in a reverse direction; and

means to cause the flow of the coolant fluid into said cooling jacket.

4,902,485

PROCESS FOR THE PRODUCTION OF TITANIUM DIOXIDE PIGMENTS

Eckhard Bayer, and Günter Lailach, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 78,503, Jul. 28, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,299

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627655

Int. Cl.[4] C01G *23/04*

U.S. Cl. 423--82 7 Claims

1. In a process for the production of TiO2 pigments by the sulfate process comprising digestion of titanium-containing raw materials with sulfuric acid, hydrolysis of the titanyl sulfate formed, purification of the hydrolyzate and calcination of the purified hydrolyzate in rotary kilns, the improvement comprising measuring the SO_2-content of the calcination offgases and adjusting the SO_2 content of the calcination offgases issuing from the rotary kilns used for calcination to a constant value said constant value being from 2 to 3.5 g SO_2/m^3 or from 4 to 8 g SO_2/m^3.

4,902,486

NOVEL GALLIUM ARSENIDE PRECURSOR AND LOW TEMPERATURE METHOD OF PREPARING GALLIUM ARSENIDE THEREFROM

Klaus H. Theopold, Ithaca, N.Y., and Erin K. Byrne, Bridgewater, N.J., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 116,212, Nov. 3, 1987. This application Feb. 9, 1989, Ser. No. 307,995

Int. Cl.[4] C01F *15/00*

U.S. Cl. 423--122 8 Claims

1. Process for preparing gallium arsenide comprising the steps of reacting an arsinogallane with an alcohol which is present in stoichiometric excess and has the formula $R''(OH)_x$ wherein R'' is alkyl containing from 1 to 10 carbon atoms and x ranges from 1 to 3, at a temperature ranging from −20° C. to 60° C. under water free conditions to form solid gallium arsenide which precipitates and by-products which are liquid or dissolved under the reaction conditions, said arsinogallane having the formula $R_2GaAs(SiR'_3)_2$ wherein R is selected from the group consisting of cycloaliphatic group, alkyl substituted cycloaliphatic group and alkyl substituted aromatic group and R' is alkyl.

4,902,487

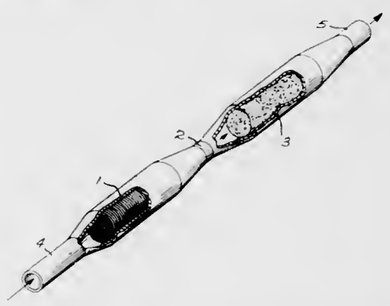
TREATMENT OF DIESEL EXHAUST GASES

Barry J. Cooper, Radnor; Hyun J. Jung, Wayne, and James E. Thoss, West Chester, all of Pa., assignors to Johnson Matthey, Inc., Valley Forge, Pa.

Filed May 13, 1988, Ser. No. 193,529

Int. Cl.[4] B01D *53/34*

U.S. Cl. 423—215.5 **9 Claims**



1. In a process wherein diesel exhaust gas is passed through a filter to remove particulate therefrom before discharge and particulate deposited on the filter is combusted, the improvement which comprises combusting the particulate with a gas containing NO_2.

4,902,488

PROCESS FOR NITROGEN OXIDES REDUCTION WITH MINIMIZATION OF THE PRODUCTION OF OTHER POLLUTANTS

William R. Epperly, New Canaan; John H. O'Leary, Danbury; James C. Sullivan, Norwalk, and Barry N. Sprague, West Haven, all of Conn., assignors to Fuel Tech, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 50,198, May 14, 1987, Pat. No. 4,780,289, and Ser. No. 90,962, Aug. 28, 1987, abandoned. This application Jun. 15, 1988, Ser. No. 207,382

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[4] C01B *21/00*

U.S. Cl. 423—235 **41 Claims**

1. A process for reducing the concentration of nitrogen oxides in an effluent while minimizing the production of other pollutants, the process comprising:

a. determining the condition of the effluent which exists at a location for introduction of a treatment agent;

b. effecting a treatment regimen which comprises introducing a treatment agent comprising an ammonium salt of an organic acid having a carbon to nitrogen ratio of greater than 1:1 into the effluent to reduce the nitrogen oxides concentration in the effluent under said determined effluent conditions while minimizing the production of other pollutants;

c. monitoring the condition of the effluent until a significant alteration in the condition of the effluent is observed;

d. adjusting said treatment regimen by varying at least one of the following parameters

(i) dilution and introduction rate of said hydrocarbon treatment agent;

(ii) composition of said hydrocarbon treatment agent; and

(iii) relative presence of the components of said hydrocarbon treatment agent,

to effect an adjusted treatment regimen, wherein said adjusted treatment regimen operates under conditions effective to reduce the nitrogen oxides concentration in

the effluent under said altered effluent conditions while minimizing the production of other pollutants.

4,902,489

METHOD FOR DEODORIZING AND CLEANING OFFENSIVE ODOR GAS

Toshihiro Watanabe, Tokyo, Japan, assignor to Sankyo Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,088

Int. Cl.[4] B01J *8/00;* **C10H** *23/00;* **C01B** *17/16;* **C01C** *3/00*

U.S. Cl. 423—245.1 **11 Claims**

1. A method for deodorizing and cleaning offensive composite malodorous gas containing basic ingredients and sulfur compounds, which comprises the steps of washing the gas with an organic acid solution to remove basic offensive ingredients and then treating with a lignin-sulfonate solution.

4,902,490

ESSENTIALLY PURE/COLORLESS P_2NOCL_5

Guy Pagniez, Poey de Lescar, and Philippe Potin, Billere, both of France, assignors to Atochem, Puteaux, France

Filed Mar. 10, 1988, Ser. No. 166,367

Claims priority, application France, Mar. 10, 1987, 87 03251

Int. Cl.[4] C01B *25/10*

U.S. Cl. 423—300 **4 Claims**

1. A process for the preparation of N-(dichlorophosphoryl)-trichlorophosphazene (P_2NOCl_5), comprising (i) reacting phosphorus pentachloride with ammonium chloride in the presence of $POCl_3$, (ii) treating the resulting medium of reaction, containing P_3Cl_{12}, with SO_2 to obtain P_2NOCl_5 and $SOCl_2$, and (iii) thin film evaporating said medium of reaction to eliminate SO_2, $POCl_3$ and $SOCl_2$ values therefrom.

4,902,491

PHOSPHATE FEED MATERIAL FOR PHOSPHORUS ELECTRIC FURNACES AND PRODUCTION OF SAME

Joseph H. Finley, Metuchen, N.J.; Lewis L. Hammermeister, Pocatello, Id., and Jared S. Sproul, Belle Mead, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 86,014, Aug. 17, 1987, Pat. No. 4,822,583.

This application Apr. 18, 1989, Ser. No. 339,772

Int. Cl.[4] C01B *25/01*

U.S. Cl. 423—322 **6 Claims**

1. A phosphate material, suitable as a charge for a phosphorus furnace, produced by the steps of:

1. forming a homogeneous mixture of calcined phosphate fines and phosphoric acid binder,
2. compacting the mixture into green shaped articles; and
3. curing the green shaped articles to increase their crush strength.

4,902,492

NOVEL SPINNING METHOD

Herbert Beneke, Castrop-Rauxel; Gerd Collin, Duisburg; Manfred Meinbreckse, Friedrichsdorf, and Gerhard Wilhelm, Ladenburg, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,394

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736494

Int. Cl.[4] D01F *9/12*

U.S. Cl. 423—447.4 **4 Claims**

1. In a process for the production of carbon fibers from high boiling bituminous substances in which a purified and polymerized concentrated carbon fiber precursor is spun into fibers which are oxidized and then carbonized and optionally graphitized, the improvement comprising adding to the carbon fiber precursor just before spinning 2 to 10% by weight of a solvent in which the precursor is insoluble or only slightly soluble under normal conditions and mixing the resulting mixture under hypercritical conditions for the solvent for at least 10 minutes to dissolve the solvent in said precursor.

4,902,493

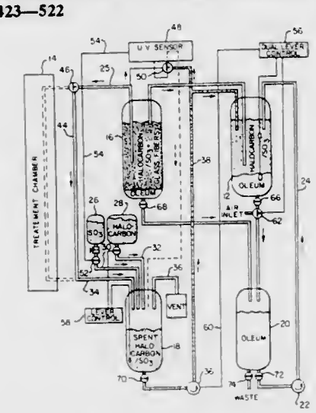
PROCESS FOR THE GENERATION OF SULFUR TRIOXIDE REAGENT AND SULFONATION OF THE SURFACE OF POLYMERIC RESINS

Wilhelm E. Walles, Freeland; David R. Near, Midland, and Donald L. Tomkinson, Auburn, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 4, 1988, Ser. No. 190,312

Int. Cl.[4] C01B *17/98, 17/90;* **C01F** *11/04;* **C07B** *45/02*

U.S. Cl. 423—522 **10 Claims**



1. A process for regenerating a reagent of sulfur trioxide in a carrier comprising the steps of:

(a) introducing sulfur trioxide, a carrier selected from the group consisting of non-reactive liquid halocarbons and non-reactive gases, and oleum into a reagent generator,
(b) contacting said sulfur trioxide, said carrier, and said oleum to form a reagent phase containing a reagent of sulfur trioxide in a carrier and an oleum phase containing impurities,
(c) removing said reagent from said reagent phase generator,
(d) thereafter utilizing said reagent to treat a surface and form a spent reagent,
(e) thereafter recycling said spent reagent to said reagent generator for regeneration,
(f) removing said oleum phase from said reagent generator,
(g) regenerating the oleum in said oleum phase to remove said impurities, and
(h) recycling the regenerated oleum to said reagent generator.

4,902,494

PROCESS FOR PREPARING HYDRATED ALUMINA CONSISTING ESSENTIALLY OF SPHERICAL PARTICLES BY HOMOGENEOUS PRECIPITATION

Franco Montino, Alessandria, and Giuseppe Spoto, Torino, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 143,265, Jan. 6, 1988, abandoned, which is a continuation of Ser. No. 840,675, Mar. 18, 1986, abandoned. This application May 26, 1989, Ser. No. 357,675

Claims priority, application Italy, Mar. 19, 1985, 19959 A/85

Int. Cl.[4] C01F *7/02*

U.S. Cl. 423—625 **17 Claims**

1. In a process for homogeneously precipitating hydrated alumina from an aqueous solution comprising aluminum sulphate having an SO_4/Al^{3+} ratio greater than 1 and compounds capable of releasing hydroxy ions so as to avoid local saturation of hydroxy ions in the solution, said hydrated alumina consisting of spherical particles having a diameter of from 0.06 to 3.0 microns and a polydispersion index dw/dn less than or

equal to 2, the improvement that comprises carrying out said precipitation in the presence of cationic polyelectrolytes in concentrations at which no separate solution forms, said cationic polyelectrolytes having a mean molecular weight greater than 1.0×10^6 and an ionicity of at least 3 milliequivalents per gram.

4,902,495

IGE FC DIRECTED DELIVERY SYSTEM

Michael A. Kaliner, Bethesda, and Howard Boltansky, Baltimore, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jul. 22, 1986, Ser. No. 888,059

Int. Cl.[4] A61K *49/02, 39/395*

U.S. Cl. 424—1.1 **7 Claims**

1. An immunotoxin comprising a conjugate of a toxin with immunoglobulin E (IgE) or a part thereof, said conjugate being capable of binding specifically with IgE Fc receptors with an affinity of equal or greater than 10^9M^{-1}, said conjugate being suitable for use in vivo, wherein said toxin is bismuth^{212} or indium^{111}.

7. A method of detecting mast cell tumors, benign mastocytosis or mast cell number comprising systemically delivering an effective amount of a conjugate of IgE Fc and a radiolabeled agent to a host suspected of having a mast cell tumor, benign mastocytosis or disease process involving mast cells, and obtaining a radiographic image of said host or of a body part thereof

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4,902,497

ORAL COMPOSITIONS

Mark M. Crisanti, Cincinnati; Anthony C. Lanzalaco, Fairfield, and Richard J. Sunberg, Oxford, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 1, 1988, Ser. No. 162,524

Int. Cl.[4] A61K *7/16, 7/18*

U.S. Cl. 424—52 **5 Claims**

1. A method effective in reducing calculus comprising applying to dental enamel of subjects susceptible of forming calculus a safe and effective amount of a toothpaste composition containing:

(a) at least 1000 ppm stannous ions from stannous chloride;
(b) a mono or di carboxylic acid or polyhydric alcohol complexing agent having an equilibrium binding constant for stannous of less than about 10^5 which is gluconic acid or a water soluble salt thereof;
(c) an acceptable toothpaste carrier; wherein the pH of said composition is from about 3.5 to about 7.0.

4,902,498

ORAL COMPOSITIONS

Francis O. Agricola, Cincinnati, and William E. Cooley, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 1, 1988, Ser. No. 200,996

Int. Cl.[4] A61K *7/18, 7/20*

U.S. Cl. 424—52 **8 Claims**

1. In an oral composition containing fluoride and a water-soluble chlorite chlorous acid liberating antiplaque antigingivitis component, a safe and effective improvement, effective to obtain fluoride ion enhanced anti-demineralization without causing demineralization of dental enamel below pH of about 5.5, wherein a base containing the soluble fluoride ion salt and water soluble chlorite is kept separate, prior to mixing, from an activator containing at least one acid selected from the group consisting of citric, malic, tartaric, glycolic, mandelic, aspartic, salicylic, phosphoric and carbonic acids and glycine in an amount sufficient to lower the pH of the composition from about 2 to about 5 and a water soluble indium salt anti-demineralization agent.

4,902,499

HAIR CARE COMPOSITIONS CONTAINING A RIGID SILICONE POLYMER

Raymond E. Bolish, Jr., Maineville; Daniel S. Cobb, Loveland, both of Ohio; Vincent J. Kwasniewski, Minneapolis, Minn.; Michael A. Snyder, Fairfield, and David M. Stentz, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 848,414, Apr. 4, 1986. This application Mar. 27, 1987, Ser. No. 31,480

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.[4] A61K *7/075, 7/08, 7/11*

U.S. Cl. 424—70 **35 Claims**

1. A hair care composition comprising:

(a) from about 0.01% to about 10% of a rigid silicone polymer having a complex viscosity of at least 1×10^7 poise, and
(b) a volatile carrier wherein if water is the sole carrier a surfactant is also present.

4,902,500

STABILIZATION OF ANTIBODIES

Theodorus Jansen, Venray; Engelbertus J. M. Janssen, ZL Groesbeek, and Lammert Cornelius, KP Boxmeer, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 23, 1988, Ser. No. 275,250

Claims priority, application Netherlands, Nov. 27, 1987, 8702848

Int. Cl.[4] A61K *31/74, 31/745, 39/00, 39/12*

U.S. Cl. 424—78 **11 Claims**

1. Stable aqueous solution of antibodies, comprising antibodies and at least one polyoxypropylene-polyoxyethylene block polymer and at least one phospholipid in amounts effective to prevent the formation of antibody aggregates or antibody sedimentation.

4,902,501

PHARMACEUTICAL COMPOSITIONS ENDOWED WITH SEQUESTERING ACTIVITY FOR THE BILIARY ACIDS, CONTAINING COLESTYRAMIN AS THEIR ACTIVE PRINCIPLE, AND PROCESS FOR PREPARING THEM

Gianluigi S. Bandi, Milan, and Mauro Valenti, Magenta, both of Italy, assignors to Prodotti Formenti S.r.L., Milan, Italy

Filed Jun. 12, 1987, Ser. No. 61,302

Claims priority, application Italy, Jun. 16, 1986, 20799 A/86

Int. Cl.[4] A61K *31/74*

U.S. Cl. 424—79 **18 Claims**

1. A pharmaceutical composition for oral administration at

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improved and reduced therapeutically efficacious dosage levels of cholestyramine said composition possessing sequestering activity of the biliary acids, and comprising colestyramin particles around each of said particles is a homogeneous dispersion of an antimicrobial agent and a suspending or coating agent, said antimicrobial agent being present in an amount ranging from 0.001 to 0.05 gram per gram of colestyramin and said suspending or coating agent being present in an amount ranging from 0.01 to 10 grams per gram of colestyramin.

4,902,502

PREPARATION OF A POLYMER/INTERLEUKIN-2 CONJUGATE

Danute E. Nitecki, Berkeley; Nandini Katre, El Cerrito; Robert J. Goodson, Albany, and Lois Aldwin, San Mateo, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Jan. 23, 1989, Ser. No. 299,235

Int. Cl.[4] A61K *31/745, 31/74, 39/00, 37/00*

U.S. Cl. 424—83 **25 Claims**

1. A method for producing a PEG/IL-2 conjugate or a polyoxyethylated polyol/IL-2 conjugate, comprising:

a. contacting a PEG or a polyoxyethylated polyol, which has at least one hydroxyl group, with a chloroformate under the appropriate reaction conditions to form a PEG or a polyoxyethylated polyol active ester; and

b. contacting the PEG or the polyoxyethylated polyol active ester with IL-2 under the appropriate reaction conditions to form a PEG/IL-2 conjugate or a polyoxyethylated polyol/IL-2 conjugate.

4,902,503

ANTIMICROBIAL LATEX COMPOSITION

Yoshihiro Umemura; Yasuhiko Ozaki, and Akihito Kawaide, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Nov. 23, 1988, Ser. No. 275,307

Claims priority, application Japan, Nov. 25, 1987, 62-297106; Nov. 25, 1987, 62-297108

Int. Cl.[4] A61K *31/745, 31/74, 31/78;* **A01N** *55/02*

U.S. Cl. 424—83 **14 Claims**

1. An antimicrobial latex composition comprising a homogeneous mixture of a natural rubber latex or a synthetic polymer latex and protein silver.

4,902,504

USE OF DIBUTYL SUCCINATE, DIMETHYL DISULFIDE AND MIXTURES OF SAME AS MOSQUITO ATTRACTANTS

Richard A. Wilson, Westfield, N.J.; Jerry F. Butler, Gainesville, Fla.; Donald Withycombe, Lincroft, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ira Katz, West Long Branch, N.J., and Kenneth R. Schrankel, Tinton Falls, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Continuation of Ser. No. 901,647, Aug. 29, 1986, Pat. No. 4,818,526. This application Jun. 30, 1988, Ser. No. 213,686

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[4] A01N *25/00*

U.S. Cl. 424—84 **3 Claims**

1. A method of attracting Culicidae to an insect trap comprising the step of exposing the environment surrounding said trap to an insect attractant-containing polymer which consists of a mixture of polymer and from about 1% up to about 45% by weight of said polymer of:

(i) dibutyl succinate; or

(ii) a mixture of dimethyl disulfide and dibutyl succinate,

said polymer being compatible with said composition of matter.

4,902,505

CHIMERIC PEPTIDES FOR NEUROPEPTIDE DELIVERY THROUGH THE BLOOD-BRAIN BARRIER

William M. Pardridge, Pacific Palisades, Calif., and Paul R. Schimmel, Lexington, Mass., assignors to Alkermes, Pa. and Regents of University of California, Calif.

Continuation-in-part of Ser. No. 891,867, Jul. 30, 1986, Pat. No. 4,801,575. This application Apr. 25, 1988, Ser. No. 185,702

Int. Cl.[4] A61K *45/02, 37/02;* **C07K** *17/00, 7/00*

U.S. Cl. 424—85.7 **18 Claims**

1. A chimeric peptide adapted for delivering a neuropharmaceutical agent into the brain by transcytosis through the blood-brain barrier, said chimeric peptide comprising a transportable peptide capable of crossing the blood-brain barrier by transcytosis conjugated with said neuropharmaceutical agent, wherein said transportable peptide is histone.

13. A method for delivering a neuropharmaceutical agent into the brain of an animal by transcytosis through the blood-brain barrier comprising the step of introducing a chimeric peptide according to claim 1 into the bloodstream of said animal in a sufficient amount to provide transport of said chimeric peptide across said blood-brain barrier.

4,902,506

IMMUNOGENIC CONJUGATES

Porter W. Anderson, and Ronald J. Eby, both of Rochester, N.Y., assignors to The University of Rochester, Rochester, N.Y.

Continuation-in-part of Ser. No. 511,048, Jul. 5, 1983, Pat. No. 4,673,574, which is a continuation-in-part of Ser. No. 298,102, Aug. 31, 1981, abandoned. This application May 5, 1986, Ser. No. 859,975

Int. Cl.[4] A61K *39/02, 39/09, 39/102;* **C07K** *15/04*

U.S. Cl. 424—92 **32 Claims**

1. An immunogenic conjugate comprising the reductive amination product of a capsular polymer fragment having a chain length of from about 10 to about 30 monomeric units and at least two carbonyl groups, which fragment is derived from the capsular polymer of a *Streptococcus pneumoniae* or *Haemophilus influenzae* bacterium, and a bacterial toxin or toxoid, said conjugate comprising a crosslinked conjugate.

4,902,507

TOXIC STRAINS OF THE BACTERIUM *BACILLUS THURINGIENSIS* FOR CONTROL OF THE BERTHA ARMYWORM *MAMESTRA CONFIGURATA*

Oswald N. Morris, and Marc R. Trottier, both of Manitoba, Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Aug. 14, 1987, Ser. No. 85,172

Int. Cl.[4] A01N *63/00;* **C12N** *1/20;* **C12R** *1/07*

U.S. Cl. 424—93 **9 Claims**

1. A method for killing the larvae of *Mamestra configurata* on a plant characterized in that a larvicidal amount of an insecticidal substance of at least one selected strain of *Bacillus thuringiensis* is applied to said plant,

said insecticidal substance comprising delta-endotoxin of said strain,

said strain of *Bacillus thuringiensis* being selected from the class of strains consisting of

Bacillus thuringiensis var. *aizawai* strain HD-133;
Bacillus thuringiensis var. *aizawai* strain HD-131;
Bacillus thuringiensis var. *aizawai* strain HD-127;
Bacillus thuringiensis var. *aizawai* strain HD-113;
Bacillus thuringiensis var. *aizawai* strain HD-135;
Bacillus thuringiensis var. *kurstaki* strain HD-262;
Bacillus thuringiensis var. *kurstaki* strain HD-337; and
Bacillus thuringiensis var. *kenyae* strain HD-551.

4,902,508

TISSUE GRAFT COMPOSITION

Stephen F. Badylak; Leslie A. Geddes, both of West Lafayette; Gary Lantz, Lafayette, and Arthur C. Coffey, Indianapolis, all of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Jul. 11, 1988, Ser. No. 217,299

Int. Cl.[4] A65R *35/38*

U.S. Cl. 424—95 **4 Claims**

1. A tissue graft composition comprising the tunica submucosa, the muscularis mucosa and the stratum compactum of the tunical mucosa, of a segment of small intestine of a warm-blooded vertebrate, said tunica submucosa, muscularis mucosa and stratum compactum being delaminated from the tunica muscularis and the luminal portion of the tunica mucosa of said section of small intestine.

4,902,509

PROCESS FOR THE ISOLATION OF CHICKEN EGG CYSTATIN, ANTIVIRAL AGENTS CONTAINING IT AND ITS USE AS VIRAL PROTEASE INHIBITOR

Vito Turk, and Joze Brzin, both of Ljubljana, Yugoslavia, assignors to KRKA, tovarna zdravil, n.sol.o., Yugoslavia

Division of Ser. No. 818,307, Jan. 13, 1986, abandoned. This application Oct. 29, 1987, Ser. No. 113,963

Claims priority, application Yugoslavia, Jan. 16, 1985, P58/85

Int. Cl.[4] A61K *35/48, 37/02*

U.S. Cl. 424—105 **4 Claims**

1. A method of treating picornaviral infection in a mammal or bird which comprises administering a therapeutically effective, and physiologically acceptable, amount of chicken egg white cystatin to a mammal or bird suffering from a picornaviral infection.

4,902,510

ECTOPARASITICIDAL POUR-ON FORMULATION

Alan R. Garden, Rochester, England, assignor to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

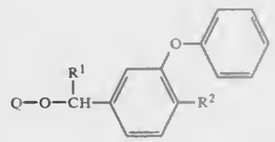
Filed Oct. 3, 1988, Ser. No. 251,856

Claims priority, application United Kingdom, Oct. 5, 1987, 8723347

Int. Cl.[4] A01N *25/00*

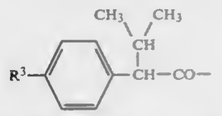
U.S. Cl. 424—405 **12 Claims**

1. A pour-on formulation comprising at a concentration of 7.5 to 75 kg/m^3, a pyrethroid insecticide, which has the formula



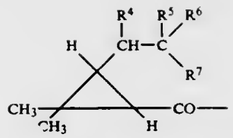
(I)

wherein R^1 represents a hydrogen atom or a cyano group, R^2 is a hydrogen or fluorine atom and Q is a group of formula



(II)

wherein R^3 is a chlorine atom or a difluoromethoxy group, or Q is a group of formula



(III)

wherein R^4 and R^5 together represent a single chemical bond or each represents a bromine atom and R^6 and R^7 are independently selected from fluorine, chlorine and bromine atoms, and methyl, trifluoromethyl and 4-chlorophenyl groups; a C_{6-15} alkanol diester of adipic or phthalic acid at a concentration of 150 to 800 kg/m^3; a spreading agent selected from the group consisting of a polyoxyethylene polyol fatty acid ester and a silicone oil at a concentration of 25 to 300 kg/m^3; other additives at a concentration of 0 to 55 kg/m^3, the balance being at least 67.5 kg/m^3 of a verterinarily-acceptable mineral or vegetable oil having a kinematic viscosity at 40° C. not greater than 35×10^{-6} m^2/s (35 cSt).

4,902,511

FIBROUS AND CARTILAGINOUS TISSUE REPLACEMENT

Joseph H. Kronman, 27 Oakland Ave., Needham, Mass. 02192

Division of Ser. No. 78,823, Jul. 28, 1987. This application Jul. 24, 1989, Ser. No. 384,393

Int. Cl.[4] C07J *9/26;* **A61K** *31/00*

U.S. Cl. 424—423 **20 Claims**



1. A biocompatible implant for replacement of fibrous connective tissue comprising a hydrophilic polymeric material having pores of a single controlled pore size randomly distributed throughout the body of said implant, substantially all of said pores comprising a single pore size in a selected range of about 300 to about 450μ in diameter, said pores being formed in said polymeric material by:

A. dispersing water-dissolvable salt crystals of a size corresponding to said single pore size of about 300 to 450μ in diameter in an unpolymerized monomer of a hydrophilic polymerizable material;

B. polymerizing said monomer with said salt crystals dispersed therein to form a polymeric material with said salt crystals randomly dispersed throughout substantially all of said implant;

C. subjecting said polymeric material with salt crystals dispersed therein to an aqueous solution whereby said salt crystals are dissolved, and form said pores in said polymerical material at locations previously occupied by said salt crystals; and

D. shaping said polymeric material into said implant.

4,902,512

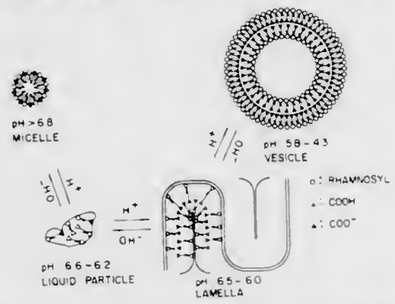
RHAMNOLIPID LIPOSOMES

Yutaka Ishigami; Yasuo Gama; Hitoshi Nagahora, all of Tsukuba; Tetsuhiko Hoagu, Yokohama, and Muneo Yamaguchi, Tsukuba, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology and Shin-Etsu Chemical Co., Ltd., Japan

Filed Jan. 19, 1988, Ser. No. 145,040

Int. Cl.[4] A61K *37/00, 37/22, 9/66;* B01J *13/02*

U.S. Cl. 424—450 6 Claims



1. A liposome formed of rhamnolipid A, rhamnolipid B or a salt thereof.

4,902,513

ORAL SUSTAINED RELEASE MEDICAMENT

Jean Carvais, 201 Longview Dr., Alexandria, Va. 22314

Continuation of Ser. No. 79,969, Jul. 31, 1987. This application Dec. 30, 1987, Ser. No. 139,540

Int. Cl.[4] A61K *9/66*

U.S. Cl. 424—455 2 Claims

1. A liquid oral sustained release medicament capable of providing even blood levels of theophylline in the bloodstream of a patient over a prolonged period of time, which comprises a suspension comprising microcapsule of said theophylline suspended in a saturated solution of said theophylline, the sustained level of said theophylline being maintained over a prolonged period of time for sustained release to the bloodstream and at a substantially constant level by means of the dissolution of the microcapsule into solution to replace the theophylline that leaves said solution, wherein said liquid oral sustained release medicament is soluble in water and said suspension is an aqueous suspension.

4,902,514

DOSAGE FORM FOR ADMINISTERING NILVADIPINE FOR TREATING CARDIOVASCULAR SYMPTOMS

Brian L. Barclay, Sunnyvale; Patrick S. L. Wong, Palo Alto; Jeri D. Wright, Dublin, and Jerry D. Childers, Fremont, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Jul. 21, 1988, Ser. No. 222,476

Int. Cl.[4] A61K *9/24*

U.S. Cl. 424—473 9 Claims

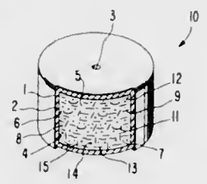
1. A dosage form for administering nilvadipine to a patient, wherein the dosage form comprises:

(a) a wall that surrounds;

(b) a compartment;

(c) a composition in the compartment comprising nilvadipine and a polymer, which composition in the presence of fluid that enters the compartment forms a dispensable formulation;

(d) a composition in the compartment comprising a polymer that expands in the presence of fluid that enters the compartment and pushes the dispensable formulation from the dosage form; and,



(e) at least one exit passageway in the wall connecting the exterior with the interior of the dosage form for delivering the dispensable nilvadipine formulation to the patient.

4,902,515

POLYLACTIDE COMPOSITIONS

Gary L. Loomis, Drexel Hill, Pa., and Joseph R. Murdoch, Wilmington, Del., assignors to E. I. DuPont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 187,350, Apr. 28, 1988, Pat. No. 4,800,219, which is a division of Ser. No. 108,531, Oct. 15, 1987, Pat. No. 4,766,182, which is a division of Ser. No. 944,588, Dec. 22, 1986, Pat. No. 4,719,246. This application Oct. 12, 1988, Ser. No. 256,471

Int. Cl.[4] A61K *9/14, 13/00*

U.S. Cl. 424—486 4 Claims

1. A process for encapsulating a biologically active ingredient in interlocked segments of poly(R-lactide) and poly(S-lactide) which comprises intimately contacting segments of poly(R-lactide) and poly(S-lactide) at a temperature below the melting temperature of the highest melting phase in the presence of the biologically active compound until interlocking occurs.

4,902,516

BINDER-FREE GRANULES WITH DELAYED RELEASE OF THE ACTIVE COMPOUND

Werner Korsatko, and Brigitta Korsatko-Wabnegg, both of Graz, Austria, assignors to Chemie Holding Aktiengesellschaft, Linz, Austria

Filed Apr. 6, 1988, Ser. No. 178,107

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712095

Int. Cl.[4] A61K *9/16*

U.S. Cl. 424—497 10 Claims

1. Binder-free granules for oral and parenteral administration with delayed release of the active compound consisting of a pharmaceutical active compound or granules thereof and poly-D(−)-3-hydroxybutyric acid having a molecular weight of about 50,000 to about 800,000, wherein the active compound or granules thereof is/are coated with an amount of 1 to 20% by weight of said poly-D(−)-3-hydroxybutyric acid, based on the total weight.

4,902,517

PROCESSES FOR PRODUCING MILK-DERIVED ALCOHOLIC BEVERAGES

Nakagawa, Yoshikatsu, Kanagawa, and Syuzi Kitamura, Tokyo, both of Japan, assignors to The Calpis Food Industry Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1988, Ser. No. 224,264

Claims priority, application Japan, Dec. 28, 1987, 62-329993; Dec. 28, 1987, 62-329994; Dec. 28, 1987, 62-329995

Int. Cl.[4] C12G *3/06*

U.S. Cl. 426—11 19 Claims

1. A process for producing milk-derived alcoholic beverages, which comprises adding, to lactic acid fermented milk or acid-added milk, at least one edible osmotic pressure-increasing solute in an amount effective to increase the osmotic pressure of said lactic acid fermented milk or acid-added milk by the same magnitude of osmotic pressure as that of a 15 to 50% by weight solution of sucrose in pure water, and subjecting the mixture thus obtained to fermentation by at least one kind of alcohol yeast capable of alcoholic fermentation of said at least one osmotic pressure-increasing solute.

4,902,518

LOW ALCOHOL WINE

Timothy R. Lang, Pymble, and Donald J. Casimir, Castle Cove, both of Australia, assignors to Bioquip Australia Pty. Limited, St. Leonards and Commonwealth Scientific and Industrial Research Organization, Campbell, both of, Australia

Continuation-in-part of Ser. No. 780,646, Sep. 26, 1985, abandoned. This application Nov. 9, 1987, Ser. No. 117,878

Claims priority, application Australia, Sep. 27, 1984, PG7363

Int. Cl.[4] C12G *1/00*

U.S. Cl. 426—14 9 Claims

1. A method for the production of low alcohol wine, comprising the steps of crushing a fruit, separating the crushed fruit into juice and skins, freezing the separated juice to form a slush, separating the slush into a liquid high sugar fraction and a solid low sugar fraction, the volume ratio of said high sugar to said low sugar fraction being from 40:60 to 70:30, each fraction having a sugar content of from 2 to 30% by weight, melting the low sugar fraction, stripping volatile components in an amount of from 1 to 15% by volume from either the juice obtained after crushing the fruit or the high sugar fraction obtained after slush separation and adding resultant stripped volatile components to the low sugar fraction, forming a skin extract by extracting the skins with water or low sugar fraction, adding the resultant skin extract to the low sugar fraction, and fermenting the low sugar fraction.

4,902,519

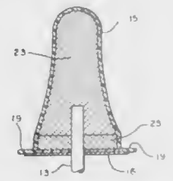
LOLLIPOP-TYPE CONFECTION FORMED AND PACKAGED IN AN ELASTIC MOLD

Ronald L. Ream, North Aurora, and David M. Moore, Wheaton, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Continuation of Ser. No. 3,952, Jan. 16, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 246,915

Int. Cl.[4] A23G *3/00, 3/12*

U.S. Cl. 426—91 15 Claims



1. A lollipop-type confection comprising:

an elastic mold with an opening and an internal surface;

a water soluble candy product which is contained in and has hardened within the elastic mold so that the product has a shape conforming to the internal surface;

a continuous layer of chewing gum which layer of chewing gum is contained in and has hardened within the opening of the elastic mold such that one side of said gum is adjacent to the candy product and the opposite side of said gum is exposed to air, and such that said layer of chewing gum is adhered to the elastic mold along the entire perimeter of the opening to completely close the opening and seal the candy product within the elastic mold and to provide a moisture barrier for said candy product; and

a stick which passes through the layer of chewing gum and into the candy product;

said chewing gum comprising sweetener, said sweetener consisting essentially of a non-hygroscopic sweetener so that the sweetener will not absorb significant amounts of water and interfere with the moisture barrier;

said mold having sufficient elasticity so that it can be pulled off said candy product and sufficient ability to retain its shape so that it can impart its shape to said candy product.

4,902,520

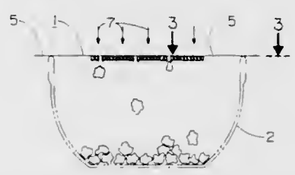
DEVICE AND METHOD TO POP CORN

Edward D. Dysarz, 11423 Triola La., Houston, Tex. 77072

Filed Oct. 11, 1988, Ser. No. 255,867

Int. Cl.[4] B65D *81/34*

U.S. Cl. 426—107 31 Claims



1. A popcorn sheet for containing and holding popcorn kernels close to the microwave source in a microwave oven, for the purpose of popping said popcorn kernels into popped corn and further holding said popped corn in a container further away from said microwave source to reduce the potential of burning said popped corn, and further preventing any unpopped popcorn kernels from mixing with said popped corn, comprising;

at least one popcorn kernel chamber, comprised of chamber walls, said chamber walls are fixed to said popcorn sheet;

a burst panel, said burst panel fixed to said chamber walls and further forming compartments to isolate and contain at least one popcorn kernel, said popcorn kernel to be heated by microwaves until said popcorn kernel pops into said popped corn and bursts through said burst panel and falls into said container, said unpopped popcorn kernel that does not pop when exposed to said microwaves remains in said popcorn kernel chamber.

4,902,521

FERMENTATION PRESSURE PACK

Kurt J. Rosenfeld, London, Great Britain, assignor to BKG Holdings Limited, London, England

PCT No. PCT/GB88/00056, § 371 Date Sep. 28, 1988, § 102(e) Date Sep. 28, 1988, PCT Pub. No. WO88/05815, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 29, 1988, Ser. No. 255,166

Claims priority, application United Kingdom, Jan. 29, 1987, 8701952

Int. Cl.[4] C12G *1/00, 3/00;* C12C *11/00, 13/00*

U.S. Cl. 426—112 8 Claims

1. A two component pressure resistant pack having a fermentation mix therein comprising an inner bag component and an outer bag component, the inner bag component being fluid-tight and formed of a flexible plastics, the inner bag component having an inlet including a pressure relief valve and having an outlet tap, the outer bag component being pressure resistant, the valve and the tap of the inner bag component protruding through holes therefor in the wall of the outer bag component, the inner bag component having a sealed margin about the sides thereof, the margin being folded so that upon an increase in pressure therein caused by fermentation of the fermentation

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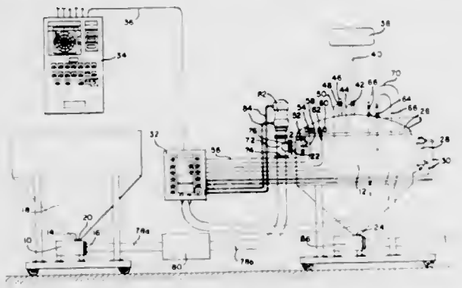
mix therein, the inner bag component will expand and trap the folded over margin between its wall and the facing inner wall of the outer bag at spaced apart locations where the outer bag component then supports the inner bag component against the pressure therein while allowing for portions of the bag wall between the supported locations to expand further.

4,902,522

MEAT VACUUMIZER SYSTEM AND PROCESS

Charles R. Rudibaugh, Chicago, Ill., assignor to Cozzini, Inc., Chicago, Ill.

Filed Jul. 10, 1989, Ser. No. 377,465
Int. Cl.[4] A23B *4/00*; G01N *33/02*
U.S. Cl. 426—231 **5 Claims**



5. A process for vacuumizing pre-cut meat in a pressurized vessel, the steps of the process comprising:

a) sensing that the supply of meat in said pressure vessel has reached a predetermined lower limit;

b) drawing a vacuum in said pressure vessel;

c) opening an expansion valve disposed between said pressure vessel and a variable speed transfer pump in communication with a supply of pre-cut meat;

d) energizing said transfer pump to deliver a supply of pre-cut meat to said pressure vessel through said expansion valve until the meat has reached a predetermined upper level;

e) closing said expansion valve;

f) deenergizing said transfer pump;

g) sealing said pressure vessel;

h) holding said vacuum in said pressure vessel at a static range of between 27"–29" Hg. for between approximately 30 and 60 seconds;

i) venting said pressure vessel to atmosphere; and

j) energizing a feed pump in communication with an outlet of said pressure vessel to withdraw vacuumized meat from said vessel and transport it to another location for further processing.

4,902,523

APPARATUS AND METHOD FOR PRODUCING A CHEESE PRODUCT

Stuart J. Fritchen, Columbus; George H. Hall, Jr., Beaver Dam, and Scott C. Ehlenfeldt, Columbus, all of Wis., assignors to Stainless Steel Fabricating, Inc., Columbus, Wis.

Filed May 31, 1989, Ser. No. 359,248
Int. Cl.[4] A23C *19/00*; B29F *3/02*
U.S. Cl. 426—231 **13 Claims**

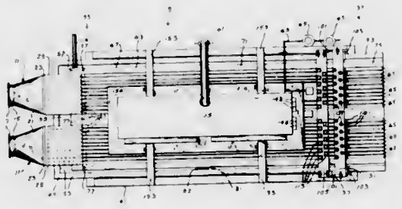
8. A method for producing a cheese product, comprising the steps of:

extruding cheese through a plurality of extrusion apertures to form the cheese into a plurality of ropes;

forcing each cheese rope through one of a plurality of extensions of a constant internal diameter to begin to cool the cheese, said extensions being upstream of and connected to each extrusion aperture;

guiding the ropes of cheese onto a canal table having a feed end and an opposite discharge end with a plurality of flumes extending between said feed and discharge ends, said canal table being positioned such that the cheese ropes exiting said extrusion apertures are individually received into said flumes;

channeling a brine solution into said flumes to further cool the cheese ropes and to aid in moving the cheese ropes along said flumes;



sensing the presence of the leading end of each cheese rope in said flumes; and

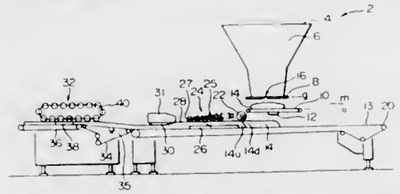
cutting a predetermined length of each cheese rope based on the sensed presence of the leading end of each cheese rope within each flume.

4,902,524

METHOD FOR CONTINUOUSLY PRODUCING AT A SUBSTANTIALLY CONSTANT FLOW RATE A STRIP OF DOUGH OF SUBSTANTIALLY UNIFORM DIMENSIONS

Michio Morikawa, and Torahiko Hayashi, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Tokyo, Japan

Division of Ser. No. 175,103, Mar. 30, 1988. This application Jan. 9, 1989, Ser. No. 295,189
Claims priority, application Japan, Apr. 1, 1987, 62-80290
Int. Cl.[4] A21D *6/00*; A23P *1/10*
U.S. Cl. 426—503 **1 Claim**



1. A method of continuously producing, at a substantially constant flow rate, a strip of dough of substantially uniform dimensions, comprising:

dividing a dough mass into portions;

weighing each of said dough portions;

placing said weighing dough portions serially on a feed conveyor so as to cause each of said weighed dough portions to occupy a space substantially proportional to the weight of each said weighed dough portion, each weighed dough portion having a downstream edge and an upstream edge, and each said space being calculated such that each said upstream edge contacts each succeeding downstream edge, and

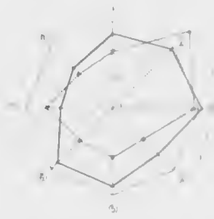
regulating the width and thickness of each said weighed dough portion such that each said weighed dough portion is stretched to substantially cover its respective calculated space, thereby bringing into contact each upstream edge with each successive downstream edge to form said dough portions into a continuous dough strip of uniform dimensions.

4,902,525

SWEETENER COMPOSITION

Tsutomu Kondou, Sagamihara, Japan, assignor to Mitsubishi Chemical Industries Limited and Nikken Chemicals Company, Limited, both of, Japan

Filed Apr. 12, 1988, Ser. No. 180,480
Claims priority, application Japan, Apr. 14, 1987, 62-91599
Int. Cl.[4] A23L *1/236*
U.S. Cl. 426—548 **6 Claims**



1. A sweetener composition comprising one part by weight of mesoerythritol, and at least one non-sugar sweetener selected from the group consisting of 0.0006 to 0.004 parts by weight of stevioside, or 0.001 to 0.014 parts by weight of aspartame.

4,902,526

PROCESS FOR PREPARING HIGH-FAT SOYBEAN MILK

Ryosei Sudo, 5-11, Hamuramachimatsubaracho 2-chome, Nishitama-gun, Tokyo, and Toshimitsu Ueda, 306 A-1, Ninomiya, Akigawa-shi, Tokyo, both of Japan

Filed Jun. 27, 1988, Ser. No. 211,636
Int. Cl.[4] A23L *1/36*
U.S. Cl. 426—598 **4 Claims**

1. A process for preparing high-fat whole soybeam milk which comprises the folllowing consecutive steps A to D:

step A, immersing soybean in water for 12 hours or more without heat treatment to avoid denaturation of proteins in said soybean;

step B, grinding the soybean which has been immersed in step A at a temperature of not lower than 80° C. to inactivate lipoxydase and to form a slurry having a solids content of 10 to 15% containing finely divided soybean particles of 50 μ or smaller;

step C, adding a vegetable fat in an amount ranging from 3 to 40% and an emulsifier in an amount ranging from 0.1 to 1% to the slurry obtained in step B and maintaining the mixture under stirring for 3 to 10 minutes at a temperature ranging from 95° to 100° C. to form a high-fat slurry, the vegetable fat protecting and stabilizing the protein during stirring; and

step D, homogenizing the high-fat slurry obtained in step C in an ultra-high-pressure homogenizer at a pressure ranging from 400 to 1000 kg/cm^2 to produce high-fat whole soybean milk possessing improved curdling property, gel strength and emulsion stability without the removal of okara.

4,902,527

CONFECTIONERY FATS

Hendrik Galenkamp, Amsterdam, and Geert Torenbeek, Heerde, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed May 10, 1988, Ser. No. 192,420
Claims priority, application United Kingdom, May 14, 1987, 8711431
Int. Cl.[4] A23D *5/00*; C11C *3/12*
U.S. Cl. 426—607 **12 Claims**

1. Fat suitable for use in confectionery comprising hardened lauric fat selected from palm kernel oil and its fractions and unsaturated fatty acid content of which comprises at least 25% transacid and contains more unsaturated than saturated C_{18} acid.

4,902,528

PREPARATION OF DRIED PRECOOKED RICE PRODUCT

Cheryl Groesbeck, Shelton; Jan Y. Hsu, Brookfield, and Gary J. Larson, New Milford, all of Conn., assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 84,621, Aug. 12, 1987, abandoned. This application Jul. 27, 1988, Ser. No. 224,817
Int. Cl.[4] A23L *1/18*
U.S. Cl. 426—625 **17 Claims**

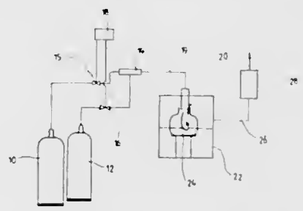
1. A process for producing a dried precooked rice product comprising cooking rice grains with moisture at a temperature and for a time sufficient for providing cooked rice grains having a moisture content of from 55% to 75% by weight and then drying the cooked rice grains at a temperature of from 140° C. to 185° C. in two stages, firstly under stationary conditions to a moisture content of from 20% to 35% and secondly under agitated conditions to a moisture content of from 3% to 15%, for providing a dried precooked rice product having a bulk density of from 37 g/100 cm to 42 g/100 cm.

4,902,529

PROCESS FOR THE FLUORINATION OF SYNTHETIC RESIN ARTICLES

Dieter Rebhan, Geretsried, and Reinhard Strigl, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 275,870
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739994
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—37 **8 Claims**



1. A process of fluorinating a synthetic resin article of manufacture in order to reduce permeability with respect to gases and vapors, said process comprising inserting said article into a treatment chamber that can be sealed gastight, passing into the treatment chamber a basic gas mixture comprising an inert gas and a fluorine-containing chemical compound capable of being converted to elemental fluorine, splitting the fluorine-containing compound with an electric arc of a plasma torch to produce a gas containing elemental fluorine, and fluorinating said article.

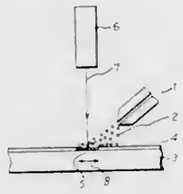
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4,902,530

METHOD OF CORRECTING A PATTERN FILM

Anto Yasaka; Yoshitomo Nakagawa, and Mitsuyoshi Sato, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 157,922
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—38 **5 Claims**



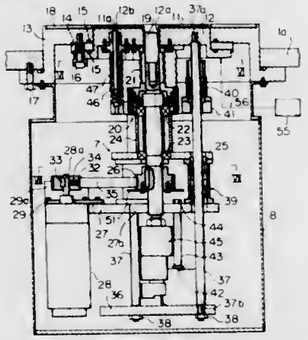
1. A method of correcting a defect in the form of an opening in a pattern film on a substrate by depositing a film at the defect comprising steps of irradiating an ion beam on the pattern film to generate secondary charged particles from the pattern film, the secondary charged particles having an intensity distribution, displaying a mask pattern image based on the intensity distribution of the secondary charged particles, calculating a required film deposition area, directing a chemical compound vapor at the defect by a gas gun for depositing said chemical compound on the defect, concurrently irradiating and scanning an ion beam of a constant intensity at a constant speed for forming a film on the defect, and blanking the ion beam during scanning when the ratio of film deposition area to ion beam current for said organic compound is lower than a predetermined value whereby elongating the time duration for depositing said chemical compound.

4,902,531

VACUUM PROCESSING METHOD AND APPARATUS

Izumi Nakayama, Hiratsuka; Akitoshi Suzuki; Hiroyuki Nawa, both of Chigasaki, and Motohiro Kaneko, Fujisawa, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 27, 1987, Ser. No. 113,117
Claims priority, application Japan, Oct. 30, 1986, 61-259458; Oct. 31, 1986, 61-261190; Nov. 1, 1986, 61-261697; Nov. 4, 1986, 61-263583; Nov. 5, 1986, 61-264663
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—39 **6 Claims**



1. In a vacuum processing method for a vacuum chamber comprising an electrode member which is electrically insulated from a wall of the vacuum chamber and supplied with an AC voltage for generating a plasma by a glow discharge in the vacuum chamber and a supporting member for supporting at least one substrate to be processed by said plasma, the improvement comprising controlling a DC bias to be generated on the surface of said supporting member or the surface of the substrate with respect to said AC voltage by varying the distance between the electrode member and the supporting member.

4,902,532

METHOD FOR PREPARING LEAD-ACID ELECTROCHEMICAL CELL ELECTRODE PLATES

Eddie T. Seo, Littleton, Colo., assignor to Gates Energy Products, Inc., Gainsville, Fla.

Filed Aug. 3, 1989, Ser. No. 390,318
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—58 **6 Claims**

1. A method for preparing an electrode plate for a lead-acid electrochemical cell, comprising the steps of:
(a) mixing an electrochemically active lead material, an aqueous-based vehicle and an ionic water soluble organic dispersant to form an extrudable paste slurry;
(b) providing a substrate; and
(c) extrusion coating said paste slurry on to said substrate.

4,902,533

METHOD FOR SELECTIVELY DEPOSITING TUNGSTEN ON A SUBSTRATE BY USING A SPIN-ON METAL OXIDE

Ted R. White, and Jeff L. Klein, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 19, 1987, Ser. No. 63,891
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—99 **8 Claims**

1. A method for selectively depositing tungsten on a semiconductor substrate during formation of an electronic device, comprising the sequential steps of:
providing a substrate material;
forming a layer either of aluminum oxide or titanium oxide above the substrate material;
forming a contact/via area with the substrate material by removing the layer of either aluminum oxide or titanium oxide in a predetermined area above the substrate material and elsewhere maintaining either the aluminum oxide or titanium oxide exposed at a top surface of the device;
placing the device in a chemical vapor deposition reactor and heating the substrate to a predetermined temperature;
coupling tungsten hexafloride, a predetermined reducing gas, and a predetermined inert carrier gas into the reactor; and
selectively depositing tungsten on the substrate material to a predetermined thickness by vapor deposition substantially without depositing the tungsten either on the aluminum oxide or titanium oxide at the top surface of the device.

4,902,534

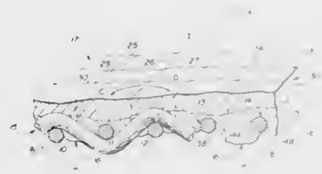
METHOD FOR PRODUCING PLIABLE WALLCOVERING TO REPLICATE AGED, CRACKED PLASTER WALL FINISH

Ralph E. Miller, 216 S. 5th Ave., Phoenix, Ariz. 85003

Filed Oct. 24, 1988, Ser. No. 261,494
Int. Cl.[4] B05D 5/00
U.S. Cl. 427—257 **13 Claims**

1. A method for making a pliable wallcovering which replicates the appearance of aged, cracked plaster wall finishes,

which can be readily hung over an existing wall, and which is durable and wear resistant, said method comprising the steps of
(a) weaving water absorbent strands of material in a coarse weave to form a pliable stretchable fabric sheet with interstitial openings extending between the strands from the top to the bottom of said sheet, said strands being comprised of a plurality of threads;
(b) mixing joint compound, water, and water soluble glue to form a spreadable joint compound mixture;
(c) spreading a first layer of said joint compound mixture over the top of said woven sheet to force said joint compound mixture into and through at least certain of said interstitial openings to the back of said sheet, said strands absorbing water and water soluble glue from said joint compound mixture;



(d) spreading a second layer of said joint compound mixture over said first layer to cover said top of said woven sheet;
(e) drying said first and second layers of joint compound and said strands of material;
(f) stressing said dried layers of joint compound to form a plurality of cracks each extending through said layers to said pliable woven sheet, each of said cracks acting as hinge members which can be folded about said sheet;
(g) applying a liquid oil base coloring agent coating to said cracked dried second layer to penetrate and seal the surfaces of each of said cracks to inhibit the sealing together of said crack surfaces when water is applied to said wall covering.

4,902,535

METHOD FOR DEPOSITING HARD COATINGS ON TITANIUM OR TITANIUM ALLOYS

Diwakar Garg, Macungie; Carl F. Mueller, Easton; Leslie E. Schaffer, Macungie, and Paul N. Dyer, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 31, 1987, Ser. No. 139,891
Int. Cl.[4] B05D 1/36, 3/12, 7/00
U.S. Cl. 427—292 **7 Claims**

1. A method for depositing a hard outer coating onto titanium or titanium alloys, said method comprising: (1) treating the titanium or titanium alloy substrate with a mild abrasive to remove oxides from its surface. (2) depositing at least one thin non-reactive noble metal interlayer onto the titanium or titanium alloy substrate, wherein at least the noble metal interlayer which is immediately adjacent to the titanium or titanium alloy substrate is deposited onto the substrate by means of an electroless plating technique, (3) subjecting the noble metal coated substrate to a heat treatment by heating the substrate and noble metal interlayer(s) to a temperature in the range of about 200° to about 300° C. in the presence of air or a temperature in the range of about 200° to about 475° C. in the presence of an inert gas selected from the group comprised of argon, helium, and mixtures thereof, then (4) depositing a hard outer coating selected from the group consisting of a ceramic, a hard metal, a hard metal compound and a diamond-like carbon onto the non-reactive noble metal interlayer.

4,902,536

METHOD OF PRODUCING A PROTECTIVE LAYER ON A STRUCTURAL PART

Werner Huether, Karlsfeld, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen GmbH, Munchen, Sweden

Filed Jul. 28, 1987, Ser. No. 79,166
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1986, 3628363
Int. Cl.[4] B05D 3/12; F26B 5/06, 5/10
U.S. Cl. 427—350 **16 Claims**

1. A method of producing a protective layer on a structural part comprising:
forming a suspension of a powder, which is to form a protective layer for a structural part, in a dispersing liquid,
maintaining the suspension at a temperature above the freezing point of the dispersing liquid,
maintaining the structural part to be coated at a temperature below the freezing point of the dispersing liquid,
immersing the structural part into the suspension for a length of time so that a layer of the powder in the suspension freezes on the structural part,
removing the thus coated structural part from the suspension and
freeze drying the coating on the structural part.

4,902,537

METHOD FOR SURFACE TREATMENT OF CARBON FIBERS FOR REINFORCEMENT

Takashi Yamada; Ryusuke Hayashi, and Yoshio Nakazawa, all of Kawasaki, Japan, assignors to Nippon Steel Corporation and Nippon Steel Chemical Co. Ltd., both of Tokyo, Japan

Filed Aug. 16, 1988, Ser. No. 232,648
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—386 **4 Claims**

1. A method for surface treatment of carbon fibers for reinforcement comprising the step of coating or impregnating carbon fibers or carbon fiber strands with an emulsion of epoxy resin having an effective amount of colloidal silica added thereto so as to harden the same.

4,902,538

PROCESS FOR THE PROTECTION OF STONE MATERIALS, MARBLE, BRICKS AND CONCRETE FROM ATMOSPHERIC AGENTS AND POLLUTANTS AND FOR THE PROTECTION OF THE SURFACE OF SUCH MATERIALS FROM THE DECAY CAUSED BY MURAL WRITINGS WITH PAINTS, AND THE LIKE

Franco Piacenti, Florence; Manganelli Del Fa' Carlo, Grosseto; Giovanni Moggi; Adolfo Pasetti, both of Milan, and Andrea Scala, Florence, all of Italy, assignors to Ausimont S.p.A., Milan and Consiglio Nazionale Della, Rome, both of, Italy

Filed Jul. 20, 1988, Ser. No. 221,592
Claims priority, application Italy, Jul. 27, 1987, 21468 A/87; Dec. 11, 1987, 22950 A/87
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—393.6 **17 Claims**

1. Process for the protection of stone materials, marble, bricks and concrete, and of structures obtained with such materials, from atmospheric agents and pollutants, by the application of protective agents on the surface of said materials and structures, characterized in that the protective agents comprise a mixture of:
(1) polytetrafluoroethylene, or a tetrafluoroethylene copolymer containing up to 12 mol % of other perfluorinated monomers, said homopolymer or copolymer being used as a fine powder;
(2) a perfluoropolyether not bearing functional groups; and/or;
(3) a perfluoropolyether or a fluoropolyether having a chain end, or both chain ends, constituted by a functional group capable of forming a chemical and/or physical bond with

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the material to be protected, or a product of polycondensation or ethylenic polymerization of the said functionalized perfluoropolyether or fluoropolyether;

wherein the amount of (1) present is 2–30% by weight of the mixture, and the weight ratio of (3) to (2) is 0.1–0.6 when (2) and (3) are both present.

2. Process according to claim 1, characterized in that the average size of the primary particles of tetrafluoroethylene homopolymer or copolymer is within the range of from 0.05 to 0.5 micron.

13. Process according to claim 1 or 2, characterized in that the perfluoropolyether not bearing functional groups and/or the perfluoropolyether or the fluoropolyether having a chain end, or both chain ends, constituted by a functional group, are used in the form of a solution thereof in a chlorofluorocarbon or a fluorocarbon.

4,902,539

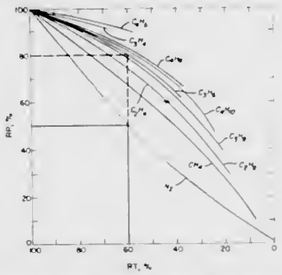
FUEL-OXIDANT MIXTURE FOR DETONATION GUN FLAME-PLATING

John E. Jackson, Brownsburg, Ind., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 110,841, Oct. 21, 1987, abandoned. This application Feb. 4, 1988, Ser. No. 146,723

Int. Cl.[4] B05D *1/10*

U.S. Cl. 427—423 **29 Claims**



1. In a process of flame plating with a detonation gun, the improvement wherein a gaseous fuel-oxidant mixture is used which comprises: (a) an oxidant and (b) a fuel mixture of at least two combustible gases selected from the group of saturated and unsaturated hydrocarbons and wherein the combustion temperature of the fuel mixture is lower than the combustion temperature of one of the combustible gases.

4,902,540

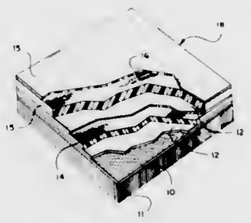
MODULAR ATHLETIC TURF

Louis D. Martino, 3 Oak Hill La., Rome, Ga. 30161

Continuation-in-part of Ser. No. 272,512, Nov. 17, 1988. This application Jan. 24, 1989, Ser. No. 301,046

Int. Cl.[4] A63B *69/36*

U.S. Cl. 428—17 **9 Claims**



1. Modular athletic turf comprising a plurality of polygonal tiles, each tile of said plurality of tiles having a simulated grass surface and padding to simulate earth, said tile including a backing fabric, tufts in said backing fabric to simulate grass, a first coating on said backing fabric for locking said tufts in said backing fabric, a second coating formed on said first coating and adhered thereto, and a plurality of fibrous sheets within said first coating and said second coating, said plurality of fibrous sheets extending parallel to said backing fabric, said first coating comprising a cured in place polyurethane, one of said plurality of fibrous sheets being embedded within said first coating, said second coating comprising a foamed polyurethane adhered to said first coating, and another of said plurality of fibrous sheets being embedded within said second coating, said tufts in said backing fabric consisting of strips of material simulating grass, said first coating encapsulating said tufts to hold said tufts to said backing fabric.

4,902,541

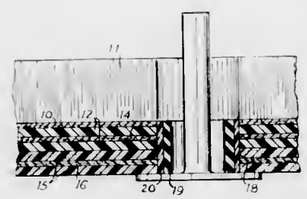
GOLF RANGE MAT

Louis D. Martino, 3 Oak Hill La., Rome, Ga. 30161

Filed Nov. 17, 1988, Ser. No. 272,512

Int. Cl.[4] A63B *69/36*

U.S. Cl. 428—17 **9 Claims**



1. Athletic turf comprising a simulated grass surface and padding to simulate earth, said turf including a backing fabric, tufts in said backing fabric to simulate grass, a first coating on said backing fabric for locking said tufts in said backing fabric, a second coating formed on said first coating and adhered thereto, and a plurality of fibrous sheets within said first coating and said second coating, said plurality of fibrous sheets extending parallel to said backing fabric, said first coating comprising a cured in place polyurethane, one of said plurality of fibrous sheets being embedded within said first coating, said second coating comprising a foamed polyurethane adhered to said first coating, and another of said plurality of fibrous sheets being embedded within said second coating, said tufts in said backing fabric consisting of strips of material simulating grass, said first coating encapsulating said tufts to hold said tufts to said backing fabric.

4,902,542

CUSHION AND METHOD OF MANUFACTURING THE SAME

Takeshi Minegishi, Sagamihara; Yasuo Yoneshige, Kawasaki; Toshihiro Takehana, Yokohama, and Toru Sakai, Tokyo, all of Japan, assignors to NHK Spring Co. Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 811,521, Dec. 20, 1985, abandoned. This application Jul. 16, 1987, Ser. No. 77,041

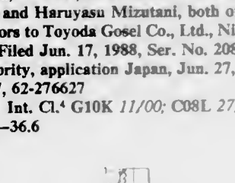
Claims priority, application Japan, Dec. 28, 1984, 59-281080

Int. Cl.[4] B32B *29/14*

U.S. Cl. 428—198 **18 Claims**

1. A cushion comprising:

a main body comprising organic synthetic fibers having a denier of 1 to 20 which are stereoscopically intertwined; and



a cured polyurethane resin which binds the fibers at intersectiosn thereof.

4,902,543

DISPOSABLE RADIOGRAPHIC ENVELOPE TO RETARD SPREAD OF INFECTION

Patricia A. Ernst, P.O. Box 3, Asbury Park, N.J. 07712

Filed Mar. 2, 1988, Ser. No. 163,309

Int. Cl.[4] B32B *22/00*

U.S. Cl. 428—35.2 **12 Claims**

1. A radiographic envelope comprising:

first and second sheets of material, with each being provided with a layer impervious to body fluids on one side thereof, with each being secured together with said impervious layers facing, with each being dimensioned to form a pocket enclosure when secured together, and an x-ray cassette within said pocket enclosure.

4,902,544

LEAK RESISTANT ABSORBENT PRODUCT

Dai W. Kim, Chatham, N.J., and Albert R. Cowling, Rosemont, Pa., assignors to Sheen Kleen, Inc., King of Prussia, Pa. and Hoechst Celanese Corporation, Somerville, N.J.

Filed May 24, 1988, Ser. No. 198,107

Int. Cl.[4] B32B *3/06*

U.S. Cl. 428—36.1 **26 Claims**

1. An article for use in absorbing fluids which comprises a flexible tubular casing of liquid permeable fabric sealed at each end and containing therein discrete particles of a crosslinked hydrocolloid insoluble in water but capable of absorbing water in admixture with other particulate matter which is insoluble in water but is capable of absorbing water and organic liquids.

4,902,545

BOOT FOR AUTOMOBILE

Satoshi Ohta, Konan; Mashiro Takimoto, Mie; Yoshio Yamazaki, and Haruyasu Mizutani, both of Aichi, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jun. 17, 1988, Ser. No. 208,076

Claims priority, application Japan, Jun. 27, 1987, 62-160543; Oct. 30, 1987, 62-276627

Int. Cl.[4] G10K *11/00*; **C08L** *27/00*

U.S. Cl. 428—36.6 **12 Claims**



1. A boot for an automobile, comprising two terminal annular parts and a barrel part intervening between said two terminal annular parts and obtained by injection molding a flexible polyvinyl chloride (PVC) material, said PVC material consisting essentially of 100 parts by weight of a polymer, component, 80 to 130 parts by weight of a plasticizer and a stabilizer, said polymer component being a mixture of a high polymerization degree and low polymerization degree PVC's respectively possessing average polymerization degrees in the range of 1,500 to 2,200 and 400 to 700, and the mixing ratio of the former to the latter (by weight ratio) being in the range of 65/35 to 90/10.

4,902,546

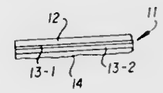
TRANSFER METALLIZATION LAMINATE

David J. White, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Apr. 16, 1986, Ser. No. 852,581

Int. Cl.[4] A61F *13/02*; **E04F** *15/16*; **B44C** *1/16*

U.S. Cl. 428—40 **9 Claims**



1. A transfer metallization laminate, which comprises a cellulosic carrier;

a first thermoset layer upon said carrier;

a second thermoset layer upon said first layer and a metal film upon said second layer.

4,902,547

REINFORCING HANG TABS

David M. Good, Peachtree City, Ga., assignor to Voxcom, Inc., Peachtree City, Ga.

Filed May 13, 1988, Ser. No. 193,667

Int. Cl.[4] B32B *7/06*

U.S. Cl. 428—40 **17 Claims**



1. A method of reinforcing hang tabs, said method comprising:

a. adhering a flexible hang tab strip to a release liner to form a supply web for making hang tabs;

b. advancing said supply web from a supply roll to a die that cuts said hang tabs;

c. separating an adhesive surface of said tab strip from said liner between said supply roll and said die;

d. while said tab strip and said liner are separated, securing a reinforcing band to said adhesive surface along a reinforced region of said tab strip; and

e. rejoining said liner with said tap strip and said reinforcing band before said supply web reaches said die.

4,902,548

REINFORCING MEMBER

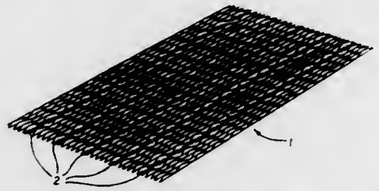
Gérard Cholat-Serpoud, St-Etienne de St-Geoirs, France, and Franz Scherübl, Radstadt, Austria, assignors to Atomic Skifabrik A. Rohrmoser, Wagrain, Austria

Continuation of Ser. No. 16,001, Feb. 18, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 251,047

Claims priority, application Switzerland, Feb. 21, 1986, 709/86

Int. Cl.⁴ B32B *3/06*

U.S. Cl. 428—102 **13 Claims**



11. In a laminated ski structure including a resin layer, said structure incorporating a reinforcing member comprising elastomeric ribbons embedded, at least in part, in said resin layer, the improvement whereby said reinforcing member further comprises non-elastomeric filaments interwoven with said elastomeric ribbons such that said non-elastomeric filaments are in contact with said resin layer.

4,902,549

SEALING AND TRIMMING STRIPS

Robert G. Bright, and Erich Weimar, both of Viersen, Fed. Rep. of Germany, assignors to Draftex Industries Limited, Edinburgh, Scotland

Filed Nov. 18, 1988, Ser. No. 273,204

Claims priority, application United Kingdom, Nov. 26, 1987, 8727690

Int. Cl.⁴ E06B *7/16*

U.S. Cl. 418—122 **9 Claims**



1. A channel-shaped sealing or finishing strip for fitment to a mounting flange running around an opening closable by a closure member, comprising

longitudinally extending flexible material in which is embedded a metal carrier,

the flexible material being generally channel-shaped in cross-section and defining a lip extending longitudinally of the channel on the inside of one of the sidewalls thereof and directed obliquely from that side wall towards the mouth of the channel from the inside of the channel, the carrier also being generally channel-shaped in cross-section and embedded within the channel-shaped flexible material,

the sidewalls of the channel-shaped flexible material and the carrier being initially splayed apart to facilitate mounting on the flange and to prevent any contact between the distal edge of the lip and the flange bending the lip inwardly of the channel, the splayed-apart side walls being adapted to be thereafter pressed towards each other, by the application of force, into a subsequently resiliently retaining configuration embracingly gripping the mounting flange and with the distal edge of the lip pressed into sealing engagement with the mounting flange,

the strip being retained on the mounting flange solely by the resilience of the carrier and the frictional contact between the flexible material and the mounting flange.

4,902,550

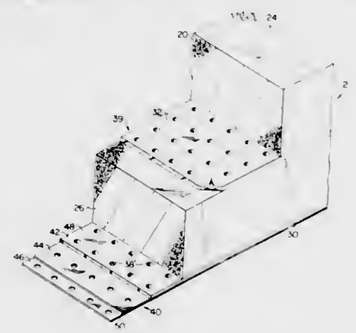
LAMINATED INSULATING MATERIAL

Robert J. Shickel, Essex, Conn., assignor to EIGI Corporation, Essex, Conn.

Filed Mar. 29, 1989, Ser. No. 330,597

Int. Cl.⁴ B32B *3/26*

U.S. Cl. 428—137 **16 Claims**



1. A laminated insulating material for use between a cold side environment and a warm side environment, said material comprising:

a first layer formed by an insulation medium having a first face and an opposite second face;

a second layer of material formed by a plastic sheet having closed cells of entrapped air and having a first surface and a second opposite surface, said second layer first surface being fixed to said first layer second surface;

a third layer formed by an insulation medium having a first face and a second opposite face, said third layer first face being fixed to said second layer of second surface;

said second layer further having passages extending therethrough from said second layer first surface to said second layer second surface to permit, when said first face of said first layer is positioned adjacent a warm side environment and said second face of said third layer is positioned adjacent a cold side environment, vapor within the insulation medium of said first layer to pass through said second layer and into said third layer of insulation medium and subsequently out into said cold side environment and to regulate the passage of thermal energy through said first, second and third layers.

4,902,551

PROCESS FOR TREATING COPPER SURFACE

Akishi Nakaso, Oyama; Toshiro Okamura; Haruo Ogino, both of Shimodate; Tomoko Watanabe, Ibaraki, and Yuko Kimura, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,911

Claims priority, application Japan, Dec. 14, 1987, 62-315750

Int. Cl.⁴ B32B *3/10;* **B44C** *1/22*

U.S. Cl. 428—137 **14 Claims**

1. A process for treating a copper surface which comprises

forming a copper oxide layer on a copper surface by treating with an aqueous solution containing an oxidizing agent, and

treating the copper oxide layer with an aqueous aldehyde solution having a pH of 9.0 or higher to reduce the copper oxide,

said treatment of the copper oxide layer being carried out

(a) while applying a potential of −1000 mV to −400 mV in terms of Ag-AgCl electrode to the copper oxide layer, or

(b) after contacting the copper oxide layer with a contacting piece made of copper or a metal nobler than copper, or

(c) after contacting the copper oxide layer with an aqueous solution containing an alkali borohydride so as to make the potential of copper in the range of −1000 mV to −400 mV in terms of Ag-AgCl electrode.

8. A copper-clad laminate obtained by

subjecting one or both surfaces of copper foil to the surface treatment process of claim 1,

laminating one or more of the surface treated copper foils and one or more sheets of glass cloth or paper impregnated with an epoxy resin, a phenol resin or a polyimide resin or one or more sheets of an epoxy resin, a phenol resin or a polyimide resin mixed with glass fibers, or laminating one or more of the thus surface treated copper foils coated with an epoxy resin, and

subjecting the resulting multiple layers to heating and pressing treatment to form a laminated unit having copper layers on the outermost surfaces.

4,902,552

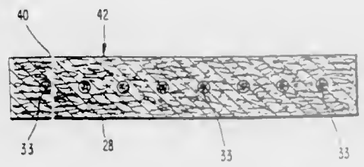
REINFORCED DRY LAID FIBROUS WEBS

Wayne P. Sorenson, Appleton, Wis., assignor to James River-Norwalk, Inc., Norwalk, Conn.

Division of Ser. No. 723,863, Apr. 16, 1985, Pat. No. 4,806,190. This application Nov. 4, 1988, Ser. No. 267,345

Int. Cl.⁴ D06H *7/04*

U.S. Cl. 428--152 **8 Claims**



1. A reinforced, dry laid fibrous web comprising:

(a) one or more layers of dry cellulosic fibers; and

(b) a plurality of relaxed, bulked yarns dispersed within the layers of the dry cellulosic fibers to reinforce the strength of the layers and to increase the absorbency of the web.

4,902,553

DISPOSABLE PRODUCTS

Kirk K. Hwang, and Linda W. Suszko, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 128,793, Dec. 4, 1987, Pat. No. 4,824,718. This application Nov. 18, 1988, Ser. No. 272,009

Int. Cl.⁴ B32B *3/10, 7/02, 7/04, 33/00*

U.S. Cl. 428--156 **18 Claims**



11. A rattle-free, liquid impermeable, vapor permeable, microporous film comprising a crystallizable thermoplastic polymer, a nucleating agent and a rattle-reducing additive material partially filling said micropores and uniformly distributed through said film, said film having a moisture vapor transmission rate of at least 1000 grams per square meter per 24 hours at 23° C. and 50% relative humidity and an air permeability Gurley number of less than 500 seconds per 50 cc, and said film being embossed such that said embossing forms translucent regions up to about 50% of the total surface area of said film.

4,902,554

VULCANIZED RUBBER ARTICLE, METHOD FOR PRODUCTION OF SAME, AND LABEL TO BE USED FOR THE METHOD

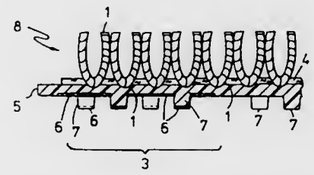
Aage Lang, Kolind, Denmark, assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 13, 1988, Ser. No. 257,319

Claims priority, application Denmark, Jun. 30, 1988, 3642/88

Int. Cl.⁴ B32B *3/00*

U.S. Cl. 428—195 **7 Claims**



1. A service mat having an upper textile layer with a pile surface and a lower backing layer of a rubber material vulcanized thereto, the improvement comprising: information indicia of a rubber material compatible with the rubber material of the backing material vulcanized directly to the backing material and having a color different than that of the backing material so that the indicia can be readily read.

4,902,555

HYBRID CIRCUIT ELEMENT AND METHOD OF MANUFACTURING THE SAME

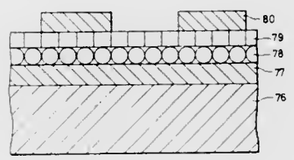
Satoru Isoda; Osamu Tomisawa, and Hiroaki Kawakubo, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1987, Ser. No. 72,305

Claims priority, application Japan, Jul. 11, 1986, 61-164191; Jul. 11, 1986, 61-164198

Int. Cl.⁴ B32B *9/00*

U.S. Cl. 428—195 **6 Claims**



4,902,556

MULTI-LAYER POLYNORBORNENE AND EPOXY LAMINATES AND PROCESS FOR MAKING THE SAME

George M. Benedikt, Macedonia, and David M. Aleksa, Parma, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 27, 1989, Ser. No. 302,206
Int. Cl.[4] B32B *3/00*; H05K *1/00*; B44C *1/22*; C23F *1/02*
U.S. Cl. 428—209 43 Claims

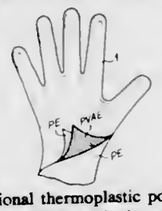
37. A multi-layer printed circuit wiring board comprising at least one epoxy layer laminated to at least one polynorbornene layer, an etched conductive metal pattern between the epoxy layer and the polynorbornene layer and a conductive metal film on at least one major surface of the laminate; said epoxy layer comprising at least one epoxy prepreg and said polynorbornene layer comprising at least one polynorbornene prepreg.

4,902,557

THERMOPLASTIC POLYOLEFIN COMPOSITE STRUCTURE

Frank Rohrbacher, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 25, 1988, Ser. No. 147,971
Int. Cl.[4] B32B *27/08*; C08J *7/04*; B28B *9/00*
U.S. Cl. 428—215 25 Claims



1. A three dimensional thermoplastic polyolefin composite useful as an exterior auto or truck body part consisting essentially of the following components:

1. a multilayer coating consisting essentially of
   a. a 10–125 micron thick layer of a glossy clear thermoplastic finish formed from a clear coating composition bonded firmly to
   b. a 5–75 micron thick layer of a thermoplastic pigment containing paint firmly bonded to
   c. a 1–25 micron thick size layer of a thermoplastic chlorinated polyolefin containing 15–50% by weight chlorine;

   said multilayer coating formed by applying a layer of a clear coating composition to a polymeric film, applying a paint layer to the layer of clear coating composition and then applying a layer of the thermoplastic chlorinated polyolefin to the paint layer and curing the multilayer coating; said multilayer being firmly bonded by lamination to
2. a 250–1250 micron thick layer of a flexible extruded sheet of a thermoplastic polyolefin having a flexural modulus of about 175–2100 MPa and a melt flow rate of about 0.5–2.0 g/10 min.; wherein the chlorinated polyolefin layer of the multilayer coating is in contact with the sheet of thermoplastic polyolefin and the polymeric sheet is removed after lamination to leave a smooth glossy surface on the clear layer and the resulting flexible sheet having the multilayer coating is thermoformed into a three dimensional structure that is bonded to
3. a 500–25,000 micron thick rigid layer of a thermoplastic polyolefin resin having a modulus of about 175–2100 MPa and a melt flow rate of about 4.0–8.0 g/10 min. formed by injection molding said resin to the flexible sheet having a three dimensional structure;

wherein layers a. and b. of the multilayer form the exterior surface of the composite and have a gloss of at least 60 measured at 20° and a distinctness of image of at least 60.

4,902,558

METHOD FOR PROTECTING SKIN FROM HAZARDOUS CHEMICALS

Henning R. Henriksen, 25, Dronningensgade, Copenhagen, Denmark (DK-1420)

Division of Ser. No. 785,094, Oct. 4, 1985, which is a continuation of Ser. No. 557,159, Nov. 9, 1983, abandoned. This application Sep. 29, 1988, Ser. No. 250,944
Int. Cl.[4] B32B *7/02*
U.S. Cl. 428—220 17 Claims



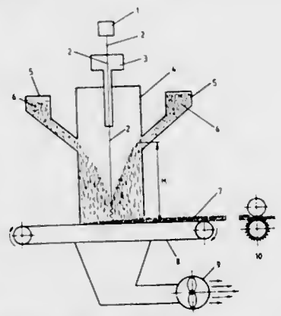
1. A method for protecting skin against exposure to hazardous chemicals comprising positioning a protective garment adjacent to the skin, said protective garment comprising a substantially water insoluble polymer material, said polymer material being a copolymer of C_{2-5} alkene substituted with up to four hydroxy groups and a C_{2-5} alkene, or a homopolymer of a C_{3-5} alkene substituted with up to four hydroxy groups.

4,902,559

ABSORBENT BODY OF NONWOVEN MATERIAL AND A METHOD FOR THE PRODUCTION THEREOF

Helmut Eschwey, Gorxheimertal; Lothar Hackler, Abtsteinach; Ludwig Hartmann, Weinheim; Michael Kauschke, Waldfischbach-Burgalben; Bernhard Klein, Birkenau-Lo; Thomas Kümpel, Bretten; Hans-Achim Kunkel, Reichelsheim; Torsten Nahe, Mannheim, and Ivo Ruzek, Kaiserslautern, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,854
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720031
Int. Cl.[4] A61F *13/16*; D04G *1/56*, *1/72*
U.S. Cl. 428—224 14 Claims



1. An absorbent body comprising:

a nonwoven material of hydrophilic or oleophilic fibers of 1 to 50 mm length in a single-layer network having a total density of 0.05 to 0.5 g/cm^3 and a matrix of thermoplastic endless filaments of circular cross section and a high degree of orientation, arranged in a three-dimensional random texture in which the fibers are distributed in a spatially uniform manner in an amount of 40 to 90 wt.- % of the total body.

4,902,560

IMPROVING THE PHYSICAL PROPERTIES OF GLASS COMPOSITE POLYDICYCLOPENTADIENE BY HEAT TREATMENT

Paul A. Silver, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jun. 1, 1988, Ser. No. 200,889
Int. Cl.[4] B27C *45/02*; B29C *45/14*; B32B *17/10*, *27/32*
U.S. Cl. 428--273 20 Claims

1. A method of preparing a glass fiber-reinforced crosslinked, polymer comprising saturating an uncoated, unsized woven glass fabric with a polymerizable liquid comprised of dicyclopentadiene, subjecting said saturated fabric to polymerization conditions, and, thereafter, post-curing the resultant structure at a temperature greater than about 225° C.

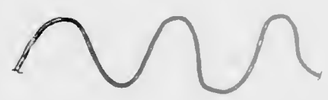
18. A glass fiber-reinforced, crosslinked polymer of metathesis polymerized units of dicyclopentadiene and uncoated, unsized woven glass fabric, which has been post-cured at a temperature greater than 225° C.

4,902,561

LOCK SET STRUCTURE

Francis P. McCullough, Jr., Lake Jackson; R. Vernon Snelgrove, Damon, both of Tex., and Bhuvenesh C. Goswami, Clemson, S.C., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 163,923, Mar. 4, 1988, abandoned. This application Apr. 27, 1989, Ser. No. 344,327
Int. Cl.[4] D04H *1/08*
U.S. Cl. 428--280 5 Claims



1. A densified batting structure comprising a batting of linear and non-linear first carbonaceous fibers having an LOI value greater than 40, a reversible deflection ratio greater than 1.2:1 and an aspect ratio greater than 10:1 and a substantially permanently heat set non-flammable second carbonaceous fiber densifying said batting and locking said batting into a densified structure.

4,902,562

ELECTRICALLY CONDUCTIVE MATERIALS

Hardev S. Bahia, Coventry, United Kingdom, assignor to Courtaulds PLC, United Kingdom

Filed Jul. 7, 1988, Ser. No. 216,112
Claims priority, application United Kingdom, Jul. 9, 1987, 8716199
Int. Cl.[4] B02B *5/16*
U.S. Cl. 428--283 19 Claims

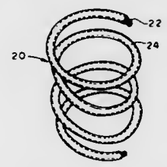
1. A process for increasing the electrical conductivity of a filled polymer material selected from the group consisting of a textile material comprising filaments of a fibre-forming polymer filled with a particulate conductive material or sheet material of a polymer filled with a particulate conductive material, said process comprising treating said filled polymer material with an organic liquid to increase the electrical conductivity of the filled polymer material.

4,902,563

CARBONACEOUS FIBER OR FIBER ASSEMBLY WITH INORGANIC COATING

Francis P. McCullough, Jr.; Steven L. Brewster, both of Lake Jackson; R. Vernon Snelgrove, Damon, all of Tex., and George C. Higgins, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 4, 1988, Ser. No. 163,919
Int. Cl.[4] B32B *18/00*, *27/02*, *27/30*; D04H *1/06*
U.S. Cl. 428—284 10 Claims



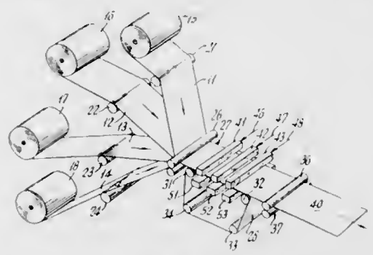
1. An oxygen and thermally stable flexible fiber batting structure comprising carbonaceous fibers with a ceramic surface coating thereon, said carbonaceous fibers comprising resilient shaped reforming elongatable non-linear non-flammable carbonaceous fibers, said fibers having a reversible deflection ratio or greater than 1.2:1 and an aspect ratio greater than 10:1.

4,902,564

HIGHLY ABSORBENT NONWOVEN FABRIC

Joseph Israel, Greenville, and Stuart P. Suskind, Greer, both of S.C., assignors to James River Corporation of Virginia, Richmond, Va.

Filed Feb. 3, 1988, Ser. No. 151,913
Int. Cl.[4] B32B *5/06*
U.S. Cl. 428—284 12 Claims



1. A method of making a highly absorbent nonwoven fabric consisting essentially of wood pulp and staple length synthetic fibers which comprises forming a wet-laid web containing 50 to 75 weight percent wood pulp basis the dry weight of the fibers and 25 to 50 weight percent synthetic fibers having a fiber length in the range of from about one-quarter inch to about one inch, forming a compacted highly absorbent web of entangled fibers by subjecting the fibers in the wet-laid web to hydroentanglement, and drying said web to form said nonwoven fabric.

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4,902,565

WATER ABSORBENT STRUCTURES

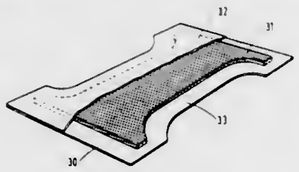
Michael G. Brook, Chessington, England, assignor to Fulmer Yarsley Limited, Surrey, England

Filed Jul. 28, 1988, Ser. No. 225,204

Claims priority, application United Kingdom, Jul. 29, 1987, 8717949

Int. Cl.[4] B32B *3/26, 7/12*

U.S. Cl. 428—315.5 **9 Claims**



1. A water-absorbent structure which is capable of absorbing and retaining, at least, several times its dry weight of water aqueous liquide and which comprises:
   (a) a flexible, porous substrate which is substantially unaffected by water and which is impregnated with:
   (b) a solid, water-insoluble, water-absorbing material which is capable of absorbing at least 30 times its dry weight of water, and
   (c) a hydrophilic binder retaining the water-absorbing material in the substrate, said binder comprising a substantially non-cross-linked, water-insoluble, hydrogel-forming polymer.

4,902,566

WATER-DISPERSED EPOXY/ACRYLIC COATINGS FOR PLASTIC SUBSTRATES

James T. K. Woo, Medina, and Richard M. Marcinko, North Royalton, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Division of Ser. No. 229,461, Aug. 8, 1988. This application Jun. 19, 1989, Ser. No. 367,644

Int. Cl.[4] C08L *63/00, 33/14*

U.S. Cl. 428—319.9 **2 Claims**

1. A plastic substrate which has been coated with a paint coating composition containing a thermosetting polymeric binder comprising on a polymer weight basis:
   between 20% and 99% acrylic copolymer of copolymerized ethlenically unsaturated monomers comprising by weight 50% and 90% acrylic monomer, between 1% and 25% carboxyl functional monomer, between 1% and 30% of tertiary amine functional monomer, with the balance being other ethylenically unsaturated monomer, where said acrylic copolymer is self-neutralizing and dispersible into water due to the tertiary amino functional groups of the copolymerized tertiary amine functional monomer;
   between 1% and 80% epoxy resin comprising the coreaction product of three to five molecules of epichlorohydrin reacted with one molecule of sorbitol, where said epoxy resin is adapted to crosslink with said acrylic copolymer upon curing, said epoxy resin coreacted with sufficient alkanolamine compound to render the epoxy resin water dispersible;
   where said acrylic copolymer and said epoxy resin are dispersed into water; and
   said coating composition is applied to said plastic substrate and said polymeric binder is thermoset at ambient temperatures.

4,902,567

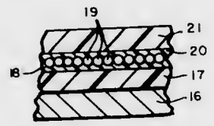
ELECTROLUMINESCENT LAMP DEVICES USING MONOLAYERS OF ELECTROLUMINESCENT MATERIALS

Edward T. Ellertsen, Corinth, Vt., and Gordon R. Fleming, Hanover, N.H., assignors to Loctite Luminescent Systems, Inc., Lebanon, N.H.

Filed Dec. 31, 1987, Ser. No. 139,980

Int. Cl.[4] H05B *33/12;* **B32B** *17/06*

U.S. Cl. 428—328 **13 Claims**



1. An electroluminescent lamp element comprising a layer of phosphor particles retained in a binder material in a substantially uniform monolayer arrangement to form a luminescent means, the sizes of said particles being controllably pre-selected, in accordance with the electric field strength which is to be used to activate said luminescent means, to lie within a selected range of sizes so as to produce a high luminous efficiency, said layer being insulatively coupled to electrode means.

4,902,568

RECORDING MEDIUM AND RECORDING METHOD BY USE THEREOF

Naoya Moroboshi, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1987, Ser. No. 8,915

Claims priority, application Japan, Feb. 7, 1986, 61-026462; May 23, 1986, 61-119440; Jul. 4, 1986, 61-158177

Int. Cl.[4] B41M *5/00*

U.S. Cl. 428—331 **18 Claims**

1. A recording medium comprising a substrate and an ink receiving layer provided on said substrate, wherein the ink receiving layer contains spherical silica and a silicon-containing water-soluble polymer.

4,902,569

NOVEL ADHESIVES AND TAPES INCLUDING SAME

Samuel J. Chen, Lexington, Mass., assignor to Kendall Company, Lexington, Mass.

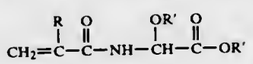
Filed Oct. 29, 1987, Ser. No. 114,463

The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.

Int. Cl.[4] C08F *265/04*

U.S. Cl. 428—344 **13 Claims**

1. An adhesive tape comprising a backing sheet material carrying a layer of adhesive adapted for meeting Underwriters Laboratories specifications for metal foil adhesive tapes for use with rigid fiberglass air ducts, said adhesive comprising an internally crosslinked copolymer of:
   (1) from about 1.5 to about 2.5 parts by weight of an activated ester-containing vinyl monomer of the formula:



   wherein R is hydrogen or methyl; and R′ is alkyl having one to six carbon atoms, or 2-hydroxyalkyl having two to six carbon atoms;
   (2) from about 11 to about 14 parts by weight of at least one ethylenically unsaturated carboxylic acid containing 3–5 carbon atoms;
   (3) from about 70 to about 80 parts by weight of at least one acrylic or methacrylic acid ester of a non-tertiary alcohol having 10–14 carbon atom; and,
   (4) from about 6 to about 15 parts by weight of at least one vinyl ester of a saturated carboxylic acid.

4,902,570

PROCESS FOR PREPARING HIGHLY DISPERSED METAL OXIDES WHOSE SURFACES ARE MODIFIED BY AN AMMONIUM-FUNCTIONAL ORGANOPOLYSILOXANE AS A POSITIVE CHARGEABLE CONTROLLING AGENT FOR TONERS

Mario Heinemann; Johann Bindl, both of Burghausen; Johann Doppelberger, Emmerting, and Hans P. Scherm, Kempten, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,286

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707226

Int. Cl.[4] G03G *9/10*

U.S. Cl. 428—405 **17 Claims**

1. A process for preparing highly dispersed metal oxides having their surfaces modified by an ammonium-functional organopolysiloxane as a positive charged controlling agent for toners, which comprises reacting highly dispersed metal oxides with an organopolysiloxane containing silicon-bonded terminal groups selected from the group consisting of hydroxyl groups, alkoxy groups, and mixtures thereof, diorganosiloxane units, in which the organic radicals are monovalent hydrocarbon radicals, and siloxane units in which the organic radicals contain a positive charged nitrogen which is bonded to silicon via carbon.

4,902,571

MOISTURE SENSITIVE RESISTIVE ELEMENT

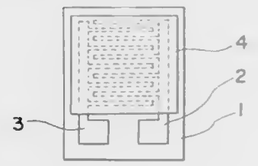
Shuji Miyoshi, Osaka; Takashi Sugihara, Tenri, and Masaya Hijikigawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 393,339, Jun. 29, 1982, abandoned. This application May 15, 1984, Ser. No. 609,537

Claims priority, application Japan, Jul. 8, 1981, 56-107292; Jul. 8, 1981, 56-107293

Int. Cl.[4] H01L *7/00;* **B32B** *15/08;* **G01N** *25/64*

U.S. Cl. 128—411.1 **3 Claims**



1. A highly stable moisture sensitive film useful in the production of a moisture sensitive electrically resistive element sensitive to a change of moisture content in the atmosphere ranging from 0 to 100% relative humidity, said film comprising a mixture of a polymeric material having the formula:

$$[-CH(C_6H_4SO_3X)-CH_2-]_n$$

wherein X is any one of a hydrogen atom, metal atom, ammonium, urea, triethylenediamine, tetramethyleneguanidine and hexamethylenediamine; and n is greater than 50; and a hydrophilic polymer.

4,902,572

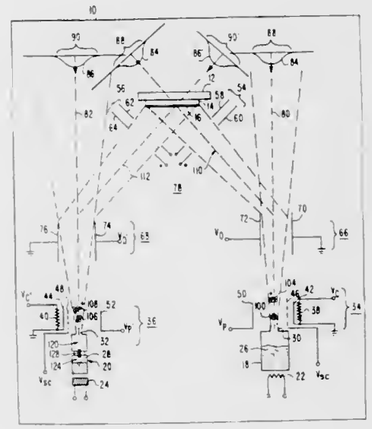
FILM DEPOSITION SYSTEM

William E. Horne, and Arthur C. Day, both of Renton, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 19, 1988, Ser. No. 183,132

Int. Cl.[4] B05D *3/06;* **B32B** *15/00*

U.S. Cl. 428—409 **47 Claims**



1. A film deposition system for depositing a film of material onto a target comprising:
   a housing within which the target is located and within which a high vacuum region may be formed;
   at least one crucible containing material to be deposited;
   means for vaporizing said material in said crucible;
   a nozzle for ejecting vaporized material from said crucible therethrough into said high vacuum region to form non-ionized atomic clusters by adiabatic expansion, the clusters traveling in a first direction through said high vacuum region, the direction being non-coincident with said target;
   means for converting a percentage of said non-ionized clusters into ionized clusters;
   means for accelerating said ionized clusters; and
   means for deflecting said ionized clusters in a second direction coincident with said target.

23. A method for depositing a film of material onto a target comprising the steps of:
   placing the material to be deposited in a crucible;
   vaporizing said material in said crucible;
   ejecting the vaporized material through a nozzle of said crucible into a high vacuum region to expand the material adiabatically and to form non-ionized atomic clusters traveling in a first direction non-coincident with the target;
   converting a selected percentage of said non-ionized clusters into ionized clusters;
   deflecting said ionized clusters to travel in a second direction coincident with said target; and
   accelerating said ionized clusters traveling in said second direction.

4,902,573

METHOD FOR ANTISTATIC FINISHING OF ADHESIVE THERMOPLASTIC COATINGS

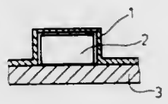
Friedrich Jonas, Aachen, and Werner Waldenrath, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 235,065

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729875

Int. Cl.[4] B05D *5/10*

U.S. Cl. 428—411.1 **12 Claims**



1. A method for the production of a shaped plastic part provided with an antistatic adhesive thermoplastic coating, which comprises the steps: (a) coating an adhesive thermoplastic coating with a solution which contains a binder and a suitable oxidant for the oxidative polymerization of a 5- or 6-membered heterocyclic compound which contains nitrogen or sulphur as the heteroatom, and (b) treating the coating thus obtained with a solution of the 5- or 6-membered heterocyclic compound.

4,902,574

METHODS OF USING FLUOROEPOXY COMPOUNDS AS ADHESIVES FOR FLUOROPLASTIC ADHERENDS AND PRODUCTS MADE THEREFROM

Sheng Y. Lee, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 14, 1987, Ser. No. 108,238

Int. Cl.[4] B05D *5/10*; **B32B** *27/08, 27/26, 27/38*

U.S. Cl. 428—422 **13 Claims**

1. A method of preparing a fluoroplastic adherend for adhesion to another body, including:

reacting a fluorodiepoxide resin with an effective curing agent for said resin in approximately stoichiometric amounts to form a fluorodiepoxide adhesive compound, said compound having a fluorine content of at least 41% by weight;

applying said compound, while it is sufficiently liquid to wet a fluoroplastic surface, to said fluoroplastic adherend so that said adhesive compound may be allowed to cure after contacting the coated surface of said fluoroplastic adherend with said another body.

4,902,575

METHOD OF APPLYING ALKYD PAINTS TO OXYALKYLENE POLYMERS HAVING A REACTIVE SILICON GROUP

Sadao Yukimoto; Toshifumi Hirose, and Katsuhiko Isayama, all of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1988, Ser. No. 288,177

Claims priority, application Japan, Dec. 26, 1987, 62-330891

Int. Cl.[4] B32B *9/04*

U.S. Cl. 428—447 **4 Claims**

1. A method of coating the cured product of an oxyalkylene polymer with an alkyd paint comprising

(a) combining an oxyalkylene polymer having at least one silicon-containing group that has a hydroxyl group or a hydrolyzable group bonded to a silicon atom and is capable of crosslinking by forming a siloxane bond with a high-molecular weight plasticizer, the amount of the plasticizer being 1-150 parts per 100 parts by weight of the polymer;

(b) curing the composition comprising the oxyalkylene polymer and plasticizer; and

(c) coating the cured product with an alkyd paint.

4. The coated product obtained by the method of claim 1.

4,902,576

HIGH TEMPERATURE SLIDING ELEMENT AND METHOD FOR PREVENTING HIGH TEMPERATURE SLIDING WEAR

Yoshio Shimura, Aichi; Yoshiyuki Mizutani, and Akio Isogai, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyoto Chuo Kenkyusho, Aichi, Japan

Filed Oct. 16, 1986, Ser. No. 919,455

Claims priority, application Japan, Oct. 17, 1985, 60-231866; Oct. 18, 1985, 60-233840; Oct. 7, 1986, 61-238229

Int. Cl.[4] C04B *41/87*

U.S. Cl. 428—472 **6 Claims**

1. A high temperature sliding element comprising

a carbide or nitride ceramic substrate member,

a metallic film of about 0.1 to 5 μm in thickness formed on said substrate member by physical vapor deposition, said metallic film being formed of at least one selected from the group consisting of nickel, manganese, chromium, and alloys thereof, and

a sliding surface layer to be slid against a counterpart ceramic member, said sliding surface layer being in the surface of said metallic film,

thereby preventing sliding wear of said sliding element when slid against said counterpart ceramic member at a temperature of 500° C. or higher in an oxygen containing atmosphere to provide an oxidized sliding surface layer of said metallic film.

4,902,577

INKABLE SHEET

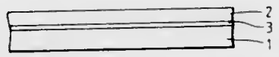
Alan Butters, Ipswich; Roger N. Barker, Clacton-On-Sea, and Graham A. Page, Ipswich, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Feb. 3, 1987, Ser. No. 10,487

Claims priority, application United Kingdom, Feb. 3, 1986, 8602594

Int. Cl.[4] B41M *5/00*

U.S. Cl. 428—483 **8 Claims**



1. An inkable sheet comprising a base sheet having on a surface thereof an ink-absorbent polymeric resin layer wherein the resin layer comprises an acrylic or methacrylic polymer containing free carboxylic acid groups and a plsticizer therefor, wherein the plasticizer comprises a polyglycol having a molecular weight not exceeding 350.

4,902,578

RADIATION-CURABLE COATING FOR THERMOPLASTIC SUBSTRATES

Stuart R. Kerr, III, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 31, 1987, Ser. No. 140,083

Int. Cl.[4] B05D *3/06*; **B32B** *27/30*

U.S. Cl. 428—522 **24 Claims**

1. A radiation curable coating composition for a thermoplastic substrate, which comprises:

(a) a polyfunctional acrylic monomer having a degree of functionality of at least about 4;

(b) a mono-, di-, or trifunctional acrylic monomer;

(c) an acrylic monomer-soluble, acrylic polymer compatible thermoplastic polymer, having a molecular weight greater than about 2000; and

(d) a polymerization initiation amount of a polymerization initiator;

wherein the polyfunctional acrylic monomer is used at a concentration sufficient to impart a topcoat-binding degree of surface unsaturation to the cured coating when cured to a hard, durable coating, wherein the thermoplastic polymer is in a surface-plasticizing amount, wherein the concentration of the polyfunctional acrylate ranges from about 5 to about 50% by wt. of the composition, the concentration of the thermoplastic polymer ranges from about 1 to about 30% by wt. of the composition, and the concentration of the mono- or difunctional acrylate ranges from about 10 to about 94% by wt. of the composition, exclusive of the polymerization initiator, wherein said initiator is employed in an amount ranging from about 0.01% to about 10% by wt. of the composition, and wherein the relative proportions of the polyfunctional acrylate, the mono-, di- or trifunctional acrylate and the thermoplastic polymer are controlled such that, upon curing, the surface of the coating has a degree of unsaturation of from about 5% to about 50%.

10. A process for coating a thermoplastic article which comprises the steps of (i) applying a thin coating of a composition comprising:

(a) a polyfunctional acrylic monomer having a degree of functionality of at least about 4;

(b) a mono-, di- or trifunctional acrylic monomer;

(c) an acrylic monomer-soluble, acrylic polymer compatible thermoplastic polymer, having a molecular weight greater than about 2000; and

(d) a polymerization initiation amount of a polymerization initiator;

wherein the polyfunctional acrylic monomer is used at a concentration sufficient to impart a topcoat-binding degree of surface unsaturation to the cured coating when cured to a hard, durable coating, wherein the thermoplastic polymer is in a surface-plasticizing amount, wherein the concentration of the polyfunctional acrylate ranges from about 5 to about 50% by wt. of the composition, the concentration of the thermoplastic polymer ranges from about 1 to about 30% by wt. of the composition, and the concentration of the mono-, di- or trifunctional acrylate ranges from about 10 to about 94% by wt. of the composition, exclusive of the polymerization initiator, wherein said initiator is employed in an amount ranging from about 0.01% to about 10% by wt. of the composition, and (ii) curing the coating from an amount of radiation sufficient to form a hard, durable coating, yet leave a topcoat binding surface unsaturation, wherein the residual unsaturation of the cured coating ranges from about 5% to about 50% and (iii) curing the coating with radiation.

4,902,579

AMORPHOUS METAL ALLOY COMPOSITIONS FOR REVERSIBLE HYDROGEN STORAGE

Robert K. Grasselli, Aurora; Michael A. Tenhover, Solon, and Jonathan H. Harris, PepperPike, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 143,493, Jan. 13, 1988, Pat. No. 4,814,002, which is a division of Ser. No. 717,428, Mar. 29, 1985, Pat. No. 4,728,580. This application Sep. 8, 1988, Ser. No. 242,095

Int. Cl.[4] B32D *5/14*; **B22F** *1/00*

U.S. Cl. 428—610 **15 Claims**

1. A reversible hydrogen storage structure having an active hydrogen absorption surface layer and a bulk hydrogen storage material, said active surface layer comprising a substantially amorphous metal alloy of the formula:

$$A_aM_bM'_c$$

wherein

A is at least one metal selected from the group consisting of Ag, Au, Hg, Pd and Pt;

M is at least one metal selected from the group consisting of Pb, Ru, Cu, Cr, Mo, Si, W, Ni, Al, Sn, Co, Fe, Zn, Cd, Ga and Mn; and

M' is at least one metal selected from the group consisting of Ca, Mg, Ti, Y, Zr, Hf, Nb, V, Ta and the rare earths; and

wherein

a ranges from greater than zero to about 0.80;

b ranges from greater than zero to about 0.70; and

c ranges from about 0.08 to about 0.95;

said bulk storage material comprising a crystalline reversible hydrogen storage material of the formula:

$$M_fM'_g$$

wherein

M is at least one metal selected from the group consisting of Ni, Mn, Cr and Co; and

M' is at least one metal selected from the group consisting of V and Zr; and

wherein

f ranges from about 0.26 to about 0.60; and

g ranges from about 0.40 to about 0.74, and

with the proviso that said M and M' of said surface layer are the same metals as said M and M' of said bulk storage material.

4,902,580

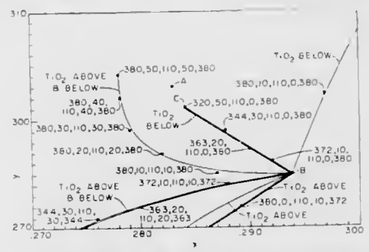
NEUTRAL REFLECTING COATED ARTICLES WITH SPUTTERED MULTILAYER FILMS OF METAL OXIDES

F. Howard Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 176,563, Apr. 1, 1988, Pat. No. 4,834,857. This application Oct. 21, 1988, Ser. No. 260,647

Int. Cl.[4] B32B *17/06*

U.S. Cl. 428—623 **10 Claims**



1. A visually neutral reflectance, high transmittance, low emissivity article comprising:

a. a transparent nonmetallic substrate;

b. a first transparent antireflective metal oxide film having a refractive index of about 2.0 deposited on a surface of said substrate;

c. a transparent metal oxide layer having a refractive index greater than 2.0 deposited on said first antireflective metal oxide film;

d. a transparent infrared reflective metallic film deposited on said metal oxide layer;

e. a transparent metal layer deposited on said infrared reflective metallic film; and

f. a second transparent antireflective metal oxide film deposited on said metal layer.

4,902,581

ARCHITECTURAL COATING WITH INTERFERENCE COLORS

Russell C. Criss, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 17, 1984, Ser. No. 682,136
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—627 **10 Claims**

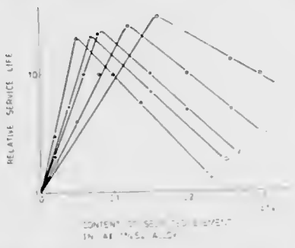
1. An article of manufacture for the reflectance of solar energy comprising:
a. a transparent substrate;
b. a transparent colored metal compound film which exhibits color by absorption and interference effects deposited on a surface of said substrate; and
c. a highly infrared reflective transparent metallic film deposited on said metal compound film.

4,902,582

ALUMINUM METALLIZED LAYER FORMED ON SILICON WAFER

Minoru Isoue, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 24,071, Mar. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 786,239, Oct. 10, 1985, abandoned. This application Jan. 23, 1989, Ser. No. 300,186
Claims priority, application Japan, Oct. 18, 1984, 59-217398
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—641 **9 Claims**



1. A semiconductor device comprising a metallized layer formed on a silicon substrate, wherein said metallized layer is an aluminum alloy consisting essentially of aluminum, silicon and at least one element selected from the group consisting of vanadium in an amount of at least 0.06% and less than 0.1% by weight, tungsten in an amount of at least 0.1% and less than 0.3% by weight, and phosphorus in an amount of at least 0.05% and less than 0.12% by weight, the amount of silicon being 1.0% to 3.0% by weight.

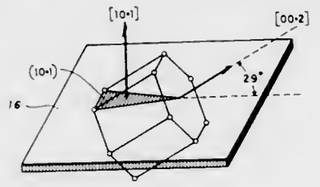
4,902,583

THICK DEPOSITED COBALT PLATINUM MAGNETIC FILM AND METHOD OF FABRICATION THEREOF

Charles F. Brucker, and Frederick E. Spada, both of 3985 Sorrento Valley Blvd., San Diego, Calif. 92121

Filed Mar. 6, 1989, Ser. No. 319,597
Int. Cl.[4] H01F *10/16, 41/18;* C23C *14/34;* G11B *5/64*
U.S. Cl. 428—665 **13 Claims**

1. An improved planar magnetic film of deposited close packed hexagonal polycrystalline CoPt, said magnetic film comprising:
a. a substrate,
b. a Cr overlayer deposited on said substrate, and
c. a CoPt film deposited on said Cr overlayer, said CoPt film having a thickness of from 3,000 to 10,000 angstroms, wherein throughout said thickness of said CoPt film, the C-axis of said polycrystalline CoPt lies substantially at an



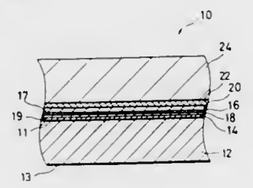
angle of 29 degrees with respect to the plane of said CoPt film.

4,902,584

OPTICAL RECORDING MEDIUM

Kenji Uchiyama; Hideki Ishizaki; Hajime Utsunomiya, and Suguru Takayama, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 136,971
Claims priority, application Japan, Dec. 25, 1986, 61-314948; Dec. 26, 1986, 61-313720; Jun. 19, 1987, 62-153028
Int. Cl.[4] G11B *5/66, 3/70;* B32B *9/00*
U.S. Cl. 428—694 **11 Claims**



1. A magneto-optical recording medium comprising:
a substrate,
a recording layer formed on the substrate, said recording layer having upper and lower surfaces disposed remote from and adjacent to the substrate, respectively, and
at least one protective layer formed adjacent to the upper or lower surface of said recording layer, said protective layer comprising silicon, at least one divalent metal selected from the group consisting of barium, calcium, magnesium and strontium, oxygen, and nitrogen wherein the silicon is present in the protective layer in an atomic ratio of silicon to the total of silicon and divalent metal of from about 3:10 to about 9:10, wherein the oxygen is present in the protective layer in an atomic ratio of oxygen to the total of oxygen and nitrogen of from about 4:10 to about 8:10.

4,902,585

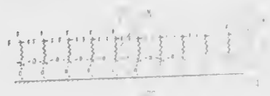
RECORDING MEDIUM AND METHOD OF PRODUCING THE SAME

Kazufumi Ogawa, Hirakata, and Hideharu Tamura, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1988, Ser. No. 159,291
Claims priority, application Japan, Mar. 9, 1987, 62-53301
Int. Cl.[4] G11B *5/64*
U.S. Cl. 428—694 **12 Claims**

1. A recording medium comprising:
a base body for said recording medium;
at least one recording layer formed on said base body; and
at least one protective layer formed on said recording layer for protecting said recording layer, said protective layer

being made from a silane surface active agent containing fluorine atoms by chemical adsorption in non-aqueous



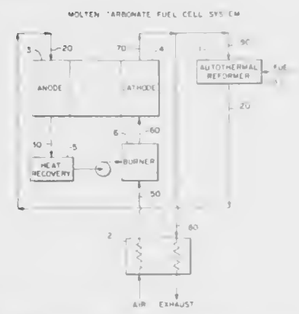
solvent containing said silane surface active agent and wherein CF_3—$(CF_2)m$—$(CH_2)n$—$SiCl_3$ (m, n: integer) is used as said silane surface active agent.

4,902,586

ONCE THROUGH MOLTEN CARBONATE FUEL CELL SYSTEM

Ronald J. Wertheim, Hartford, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Aug. 28, 1989, Ser. No. 399,674
Int. Cl.[4] H01M *8/14*
U.S. Cl. 429—20 **5 Claims**



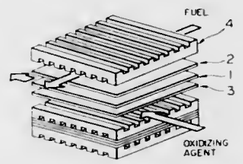
1. A fuel cell system, which comprises:
a. a plurality of fuel cells connected electrically through a load, each cell comprising a cathode electrode, an anode electrode, an electrolyte disposed therebetween, a cathode chamber, and an anode chamber;
b. a autothermal reformer for partial oxidation and steam reforming reactions;
c. means for introducing fuel wherein said fuel enters the system through the autothermal reformer;
d. means for delivering the gases from the autothermal reformer to the anode chamber;
e. means for delivering the gases from a heat recovery means to a burner;
f. means for introducing pre-heated air, said air being a source of oxygen and nitrogen for the system, to said burner wherein excess fuel is burned;
g. means for delivering the resulting gases to the cathode chamber;
h. means for delivering the effluent gases from said cathode chamber to said autothermal reformer;
i. means for exhausting excess gases from the system;
whereby the water produced in the anode chamber and the excess oxygen in the cathode chamber are utilized in the autothermal reformer for the partial oxidation and steam reformation reactions.

4,902,587

FUEL CELL

Toshihiro Saitoh, Hitachi; Keizou Ohtsuka, Katsuta; Shuhei Yamaguchi, Hitachi, and Toshiki Kahara, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 11, 1989, Ser. No. 295,905
Claims priority, application Japan, Jan. 14, 1988, 63-4726
Int. Cl.[4] H01M *4/86, 8/14*
U.S. Cl. 429—45 **8 Claims**



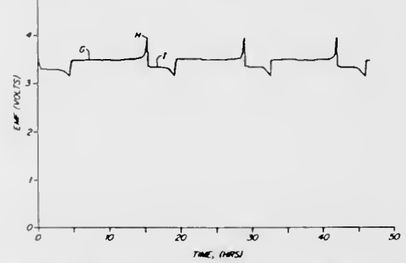
1. A fuel cell which comprises a laminate comprising an electrolyte holding material having pores for holding an electrolyte, an anode and a cathode provided to sandwich said electrolyte holding material and a separator provided with grooves for feeding a gas to said anode and cathode wherein said anode is a ternary anode which comprises nickel as a main component and additionally cobalt and chromium oxide.

4,902,588

ELECTROLYTE ADDITIVES TO IMPROVE VOLTAGE REGULATION IN THE LITHIUM-COPPER CHLORIDE RECHARGEABLE CELL

On-Kok Chang; John C. Hall, both of San Jose; Jeffrey Phillips, Saratoga, and Lenard F. Silvester, Scotts Valley, all of Calif., assignors to Altus Corporation, San Jose, Calif.

Filed Jun. 6, 1988, Ser. No. 202,265
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—50 **6 Claims**



1. In an electrochemical power cell employing lithium as an anode, lithium tetrachloroaluminate as an electrolyte, sulfur dioxide as a solvent, and high surface carbon black containing cupric chloride as a cathode, the improvement comprising adding an oxidizing agent to the electrolyte.

4,902,589

ELECTROCHEMICAL CELLS, ELECTRODES AND METHODS OF MANUFACTURE

Jeffery R. Dahn, Surrey, and David Wainwright, Vancouver, both of Canada, assignors to Moli Energy Limited, Canada

Filed Jun. 8, 1988, Ser. No. 204,072
Int. Cl.[4] H01M *6/10*
U.S. Cl. 429—94 **4 Claims**

1. An electrochemical cell including:
a first electrode having a convoluted substantially internally non-coherent layer of a particulate, electrochemically

active material, substantially devoid of interstitial binder connecting the particles of said active material to one another, overlying a convoluted sheet-like metallic foil support;
a counterelectrode space from said layer;
an electrolyte in contact with said layer and said counterelectrode; and



means for maintaining a compressive load on said substantially internally non-coherent layer of particulate materials;
wherein said compressive load maintains said particulate material in a coherent layer.

4,902,590

POLYACRYLIC ADHESIVE

David V. Adamson, East Grinstead, United Kingdom, assignor to Duracell Inc., Bethel, Conn.

PCT No. PCT/US87/00409, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/05918, PCT Pub. Date Oct. 8, 1987
PCT Filed Feb. 23, 1987, Ser. No. 141,357
Claims priority, application United Kingdom, Mar. 7, 1986, 8607793
Int. Cl.[4] C08K *5/05;* **C08L** *33/02;* **H01M** *2/14*
U.S. Cl. 429—94 **8 Claims**

1. An adhesive system comprising a blend of at least one polyacrylic acid of high molecular weight of between about 1.25 million to 5 million and at least one polyacrylic acid of low molecular weight of between about 2,000 and 500,000, in a solvent; wherein the high molecular weight polyacrylic acid comprises branched chains and the low molecular weight polyacrylic acid comprises substantially linear chains; and wherein the blend comprises amounts of high molecular weight polyacrylic acid and low molecular weight polyacrylic acid in ratios from 1:0.4 to 1:1.2 parts, respectively.

5. A cell separator comprising an absorbent non-woven sheet material laminated to a barrier material by an adhesive system as set forth in claim 1.

4,902,591

LEAD ACCUMULATOR WITH GAS RECOMBINATION

Guido Clerici, Milan, and Mario Maja, Turin, both of Italy, assignors to Industrie Magneti Marelli S.r.l., Milan, Italy

Filed Apr. 26, 1988, Ser. No. 186,255
Claims priority, application Italy, Jul. 21, 1987, 67636 A/87
Int. Cl.[4] H01M *10/08*
U.S. Cl. 429—204 **3 Claims**

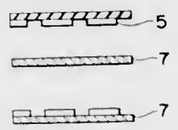
1. A normally sealed lead accumulator with gas recombination and an acid electrolyte, wherein said electrolyte includes at least one additive selected from the group consisting of organic compounds n-dodecylamine, 2,3,4-trimethoxybenzaldehyde and 3,5-diaminobenzoic acid, and wherein said at least one additive is present in said electrolyte in concentrations of from 50 to 1500 ppm.

4,902,592

PRODUCTION OF COLOR DISPLAY

Akira Matsumura, Hirakata; Masashi Ohata, Osaka, and Katsukiyo Ishikawa, Kuze, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jul. 18, 1988, Ser. No. 221,043
Claims priority, application Japan, Jul. 17, 1987, 62-179655
Int. Cl.[4] B44C *1/04;* **G02F** *1/13*
U.S. Cl. 430—7 **7 Claims**



1. A process for preparing a color display comprising the following steps:
(a) preparing an uncolored base plate comprising a base plate, an electroconductive layer formed on said base plate and a photosensitive resin layer formed on said electroconductive layer, said photosensitive resin layer being patterned by exposing it to light through a mask and developing it to let a portion of the electroconductive layer to be colored appear,
(b) forming a color layer by electrodeposition on the portion of the electroconductive layer to be colored,
(c) transferring the color layer onto a transfer plate, and
(d) further transferring and fixing the color layer onto a transparent substrate from the transfer plate,
wherein when the color display is colored with only one color, the step (c) is omitted to directly transfer the color layer onto the transparent substrate.

4,902,593

DYE IMAGE RECEIVING MATERIAL

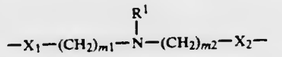
Leon L. Vermeulen, Herenthout; Ludovicus H. Vervloet, Kessel; Willy P. De Smedt, Mechlin, and Piet Kok, Ghent, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Sep. 13, 1988, Ser. No. 243,835
Claims priority, application Belgium, Sep. 29, 1987, 87201865
Int. Cl.[4] G03C *5/54, 1/80, 1/76*
U.S. Cl. 430—10 **10 Claims**

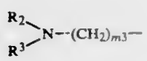
8. A laminar article comprising a dye image produced in an image-receiving material suitable for image production by dye diffusion transfer processing controlled by development of (an) image-wise exposed silver halide emulsion layer(s), wherein said image-receiving material contains a hydrophobic resin support coated with a subbing layer that is coated with said image-receiving layer containing gelatin in combination with a cationic polymeric mordant which is a basic polyurethane polyurea or polyurea-polyurethane consisting of from 0 to 30 mole % of recurring units derived from a modifying monomer selected from the group consisting of monofunctional and trifunctional alcohols, amines, and isocyanates and from 70 to 100 mole % of recurring units of the general formula

(—A—B—)

in which segment A corresponds to the general formula:



wherein:
R_1 represents a straight or branched chain alkyl, alkoxyalkyl, aralkyl or a disubstituted aminoalkyl group of the formula:



or an ethylene or 1,2-propylene group which is attached to X_1 or X_2 through the second bond with formation of a piperazine ring,
each of R_2 and R_3 (same or different) represents a C1–C4 alkyl group or together represent the atoms required to complete a pyrrolidine, pipeidine or morphiline ring, each of X_1 and X_2 (same or different) represents —O—, —NH—, —NR_4—, or a grup of the formula —NR_4—(CH_2)-m4—X_3— in which:
R_4 represents an alkyl group having from 1 to 4 carbon atoms or when only one of the groups X_1 or X_2 is —NR_4—(CH_2)m4—X_3—, R_4 may together with R_1 form an ethylene or a 1,2-propylene group,
X_3 represents —O—, —NH— or —NR_4— and may be the same as or different from X_1 or X_2, and
m1 to m4 represents 2 or 3, but in the case of m1 or m2 only the value 2 may occur when R_1 and R_4 together form an ethylene or 1,2-propylene group, and
wherein segment A contains up to 40% of the bivalent tertiary amino group quaternized with a quaternizing agent carrying glycidyl groups, and the remainder of the teritary amino groups being at least partially:
(i) quaternized with quaternizing agents absent glycidyl groups, or
(ii) neutralized with an acid, and
in which segment B corresponds to the formula:

—CO—Y—CO—

wherein Y represents , same or different, —O—R_5—O—, —NH—R_6—NH— or —NH—R_6—NH—CO—O—R-7—O—CO—NH—R_6—NH—,
wherein:
R_5 represents an alkylene group unsubstituted or subsstituted with alkyl or interrupted by ether oxygen atoms,
R_6 represents an alkylene group unsubstituted or substituted with alkyl groups, a cycloalkylene group or an arylene group, and
R_7 represents any divalent group not containing any Zerewitinoff active group or a group capable of reacting with isocyanate groups,
provided that Y can represent —OR_5O only when X_1, X_2 or X_3 are not —O—;
characterized in that the weight ratio of said polymeric mordant to gelatin in said image-receiving layer is between 25:1 to 1:1 and the gelatin is present therein at a converage of at least 0.1 g per m^2, and in that said subbing layer has been applied from an aqueous composition comprising a polyester-polyurethane wherein isocyanate groups still present in its structure have reacted with an ionomeric compound containing at least one active hydrogen atom and a carobxylate or sulphonate salt group forming an anionic polyesterpolyurethane, and wherein the image-receiving layer is enveloped between a vinyl chloride polymer support and a resin cover sheet fixed to the image-receiving layer by lamination using pressure and heat.

4,902,594

TRANSFERRABLE, THERMOPLASTIC, ANTIBLOCKING/ADHESIVE PROTECTING LAYER FOR IMAGES

Stephan J. W. Platzer, Califon, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Oct. 21, 1988, Ser. No. 261,383
Int. Cl.[4] G03C *11/00;* **B32B** *31/00*
U.S. Cl. 430—14 **11 Claims**

1. A method for protecting an image which comprises
(A) providing a colored image on a support;
(B) providing a protective layer disposed on a release surface of a temporary support; wherein said layer is a single, thin, transparent, flexible, nonself supporting, composition layer; wherein said layer is substantially nontacky at room temperature; and wherein said layer comprises at least a major amount based on the weight of the layer of one or more thermoplastic resins having a Tg of about 35° C. to about 110° C.; wherein said layer does not cohesively block at temperatures of about 50° C. or less; and
(C) laminating said layer directly to said colored image with pressure and heat at temperatures of between 60° C. and about 180° C.; and
(D) peeling away said temporary support thus leaving the protective layer on the colored image.

4,902,595

PHOTOSENSITIVE MEMBER HAVING AN OVERCOAT LYER AND PROCESS FOR MANUFACTURING THE SAME

Kenji Masaki; Izumi Osawa, both of Osaka; Yumiko Takedomi, Kobe, and Masanori Fujiwara, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 12, 1988, Ser. No. 218,821
Claims priority, application Japan, Jul. 15, 1987, 62-178047; Jul. 15, 1987, 62-178048; Jul. 15, 1987, 62-178049; Jul. 15, 1987, 62-178050
Int. Cl.[4] G03G *5/14*
U.S. Cl. 430—66 **11 Claims**

1. A photosensitive member comprising:
an electrically conductive substrate;
a photoconductive layer comprising an organic material; and
an overcoat layer formed on said photoconductive layer and comprising amorphous carbon containing hydrogen, said overcoat layer containing halogen atoms and at least one or more elements selected from the group consisting of chalcogen and elements of Group III, IV and V of the periodic table, wherein the amount of said chalcogen is about 0.01 to about 20 atomic %, the amount of said elements of Group III is about 0.01 to about 20 atomic %, the amount of said elements of Group IV is about 0.01 to about 40 atomic % and the amount of said elements of Group V is about 0.01 to about 20 atomic %, each amount based on all constituent atoms therein.

4,902,596

TONER FOR ELECTROPHOTOGRAPHY WITH THE CHANGE CONTROLLING AGENT DISPERSED THEREIN

Masumi Koishi, Sagamihara; Masuyuki Takada, Tokyo; Akio Kazama, Tokyo, and Yukio Kawashima, Tokyo, all of Japan, assignors to Toyo Ink Mfg, Co., Ltd, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,307
Claims priority, application Japan, Jan. 16, 1987, 62-7618
Int. Cl.[4] G03G *9/10*
U.S. Cl. 430—106.6 **9 Claims**

1. A toner for use in electrophotography comprising thermoplastic resin core particles (A) having an average particle size of from 1 to 15 μm, a charge controlling agent (B) and carrier particles (C) having an average particle size of from 0.05 to 2.0 μm, the charge controlling agent (B) being carried on the surfaces of the carrier particles (C), and the carrier particles (C) with the agent (B) carried thereon being embedded in the surfaces of the resin core particles (A) by mixing the core particles (A) and the carrier particles (C) with the agent (B) carried thereon while applying mechanical strain force to the mixed materials under such conditions that the resulting toner particles have an average particle size of from 1 to 20 μm.

4,902,597

CARRIER FOR ELECTROPHOTOGRAPHIC DEVELOPER

Masayuki Takeda; Masao Mochizuki; Koichi Kumashiro; Ikutaroh Nagatsuka; Masayoshi Shinoki, and Takayoshi Aoki, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,055
Claims priority, application Japan, Jul. 8, 1987, 62-168802
Int. Cl.[4] G03G *9/14*
U.S. Cl. 430—106.6 **4 Claims**

1. A negative charging carrier for electrophotographic developer comprising particles of binder resin having dispersed therein particles of a magnetic powder having an average particle diameter of from 0.05 to 5 μm and particles of a fluorine-containing resin fine powder having an average particle diameter of 0.01 to 10 μm, said fluorine-containing resin fine powder being present in an amount of from 5 to 50% by weight, based upon the total weight of the carrier.

4,902,598

PROCESS FOR THE PREPARATION OF SILICA CONTAINING CHARGE ENHANCING ADDITIVES

Francoise M. Winnik, Toronto, and Yves Deslandes, Gloucester, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1988, Ser. No. 214,351
Int. Cl.[4] G03G *9/10*
U.S. Cl. 430—110 **15 Claims**

1. A toner comprised of resin particles and a silica based charge enhancing additive prepared by reacting a tetraalkoxysilane with an alcoholic alkaline solution in the presence of a soluble charge enhancing additive to form silica particles having sorbed thereon said charge enhancing additive.

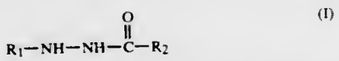
4,902,599

LIGHT-SENSITIVE MATERIAL

Soichiro Yamamoto; Toshiaki Aono; Koichi Nakamura, and Kozo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

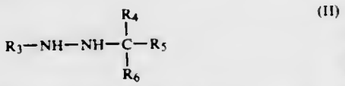
Filed Oct. 10, 1986, Ser. No. 917,755
Claims priority, application Japan, Oct. 12, 1985, 60-227527; Oct. 12, 1985, 60-227528
The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.
Int. Cl.[4] G03C *1/72, 1/06, 1/40*
U.S. Cl. 430—138 **16 Claims**

1. A light-sensitive material comprising a support having provided thereon a light-sensitive layer containing at least a light-sensitive silver halide, a developing agent, a polymerizable compound, a color image forming substance, and at least one of a hydrazine derivative represented by formula (I) and a hydrazine derivative represented by formula (II)



(I)

wherein R_1 represents a substituted or unsubstituted alkyl, aralkyl, aryl, alkenyl, alkynyl, or heterocyclic group; and R_2 represents a hydrogen atom or a substituted or unsubstituted alkyl, cycloalkyl, aralkyl, aryl, akenyl, alkynyl, heterocyclic, alkoxy, aryloxy, alkylthio, arylthio, or amino group;



(II)

wherein R_3 represents a monovalent group derived from a substituted or unsubstituted aromatic ring or aromatic heterocyclic ring; R_4 and R_5 each represents a substituted or unsubstituted aryl group; and R_6 represents a hydrogen atom or a substituted or unsubstituted alkyl, aryl, alkoxycarbonyl or carbamoyl group, wherein, after imagewise exposure to light, said color image forming substance is immobilized by heat development to polymerize or crosslink the polymerizable compound in the substantial absence of water.

4,902,600

LIGHT-SENSITIVE MATERIAL COMPRISING LIGHT-SENSITIVE LAYER PROVIDED ON SUPPORT WHEREIN THE LIGHT-SENSITIVE LAYER AND SUPPORT HAVE SPECIFIED PH VALUES

Shigehisa Tamagawa, Shizuoka, and Masayuki Kuroishi, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 108,235, Oct. 14, 1987, abandoned. This application Aug. 9, 1988, Ser. No. 230,290
Claims priority, application Japan, Oct. 14, 1986, 61-243552
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[4] G03C *1/72, 1/86*
U.S. Cl. 430—138 **8 Claims**

1. A light-sensitive material comprising a paper support and a light-sensitive layer containing silver halide grains, a reducing agent and an ethylenic unsaturated polymerizable compound, said silver halide grains and polymerizable compound being contained in microcapsules which are dispersed in the light-sensitive layer, wherein the light-sensitive layer has a pH value of not higher than 7 and the paper support has a pH value of from 5 to 9.

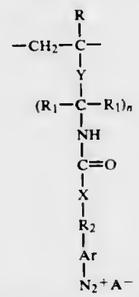
4,902,601

RADIATION SENSITIVE POLYMERIC DIAZONIUM SALT AND METHODS OF MAKING THE POLYMERIC DIAZONIUM SALT

Rodney M. Potts, Adel; Michael J. Pratt, Menston, and Keith M. Fletcher, Oakwood, all of England, assignors to Vickers PLC, London, England

Continuation of Ser. No. 13,497, Feb. 11, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 300,699
Claims priority, application United Kingdom, Feb. 12, 1986, 8603405
Int. Cl.[4] G03C *1/54;* **C07C** *113/00;* **C08F** *18/22, 20/34*
U.S. Cl. 430—175 **10 Claims**

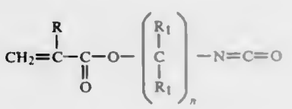
1. A radiation sensitive compound which comprises a polymer including a plurality of structural units represented by the formula:



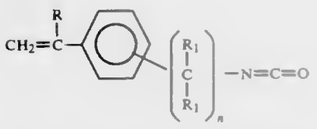
in which, R represents H or CH_3; each R_1, which may be the same or different represents H or alkyl; R_2 represents a single bond or a substituted or unsubstituted divalent radical; Ar represents a substituted or unsubstituted divalent radical derived from an aromatic or heteroaromatic compound; X represents O, S or NH; A represents an anion; Y represents a carbonyl oxy or aromatic radical; and n is an integer equal to or greater than 1.

7. A method of producing a radiation sensitive compound which comprises:

(i) polymerising a compound of the formula



or



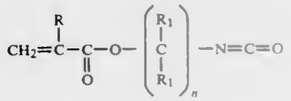
(ii) reacting the isocyanate groups of the resulting polymer with a compound containing a diazo group or diazo group precursor and an —OH, —SH, or $—NH_2$ group,

(iii) converting the diazo group precursors as necessary into diazo groups, and

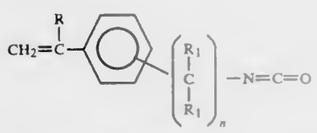
(iv) reacting the diazo groups with an acid of the formula HA or with a salt of such acid.

8. A method of producing a radiation sensitive compound which comprises:

(i) reacting a compound of the formula



or



with a compound containing a diazo group or diazo group precursor and an —OH, —SH, or $—NH_2$ group,

(ii) polymerising the resulting compound,

(iii) converting the diazo group precursors as necessary into diazo groups, and

(iv) reacting the diazo groups with an acid of the formula HA or with a salt of such acid.

4,902,602

LIGHT-SENSITIVE COMPOSITION AND PRESENSITIZED PLATE WITH LIGHT-SENSITIVE DIAZO RESIN, ACIDIC BINDER AND COMPOUND WITH PIVALOYL GROUP

Hiroshi Misu; Koichiro Aono, and Yoshimasa Aotani, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 15, 1988, Ser. No. 182,242
Claims priority, application Japan, Apr. 21, 1987, 62-98359
Int. Cl.[4] G03C *1/60*
U.S. Cl. 430—175 **14 Claims**

1. A light-sensitive composition comprising a mixture of (i) about 3 to about 30 weight % of a light-sensitive diazo resin of a condensate of an aromatic diazonium salt and an active carbonyl compound, (ii) about 70 to about 97 weight % of a binder of a substantially water-insoluble and film-forming organic high molecular weight compound having an acid value of about 10 to about 200, and (iii) about 0.1 to about 50 weight % based on the binder of a compound having a pivaloyl group selected from the group consisting of pivaloyloxystryene unit- or pivaloyloxy-α-methylstryene unit-containing polymers, vinyl pivalate unit-containing polymers, pivalic esters of phenol resins, pivalic esters of a condensate of a polyphenol and a ketone, and bispivalic esters of bisphenols.

8. A presensitized plate having on an aluminum support a light - sensitive composition comprising a mixture of (i) about 3 to about 30 weight % of a light-sensitive diazo resin of a condensate of an aromatic diazonium salt and an active carbonyl compound, (ii) about 70 to about 97 weight % of a binder of a substantially water-insoluble and film-forming organic high molecular weight compound having an acid value of about 10 to about 200, and (iii) about 0.1 to about 50 weight % based on the binder of a compound having a pivaloyl group selected from the group consisting of pivaloyloxystryene unit-or pivaloyloxy-α-methylstryene unit-containing polymers, vinyl pivalate unit-containing polymers, pivalic esters of phenol resins, pivalic esters of a condensate of a polyphenol and a ketone, and bispivalic esters of bisphenols.

4,902,603

PHOTORESIST COMPOSITIONS CONTAINING SELECTED 6-ACETOXY CYCLOHEXADIENONE PHOTOSENSITIZERS AND NOVOLAK RESINS

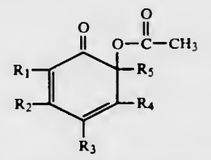
Sydney G. Slater, New Haven, and Stanley A. Ficner, Durham, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Oct. 5, 1987, Ser. No. 104,697
Int. Cl.[4] G03C *1/495, 1/76, 1/94*
U.S. Cl. 430—270 **12 Claims**

1. A light-sensitive mixture useful as a negative-working photoresist composition comprising:

(a) at least one novolak resin; and

(b) at least one 6-acetoxy cyclohexadienone compound of the formula (I) below:



(I)

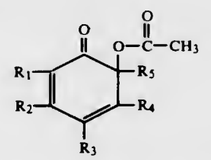
wherein R_1, R R_3, R_4 and R_5 are individually selected from hydrogen and lower alkyl groups having from 1 to 4 carbon atoms with the proviso that at least three of the R_1 to R_5 groups are lower alkyl groups.

10. The process of developing an image-wise exposed photoresist-coated substrate comprising:

(1) coating said substrate with a light-sensitive composition useful as a negative-working photoresist, said composition comprising:

(a) at least one novolak resin; and

(b) at least one 6-acetoxy cyclohexadienone compound of the formula (I) below:



(I)

wherein R_1, R_2, R_3, R_4 and R_5 are individually selected

from hydrogen and lower alkyl groups having from 1 to 4 carbon atoms with the proviso that at least three of the R_1 to R_5 groups are lower alkyl groups;

(2) subjecting said coating on said substrate to an image-wise exposure of radiant light energy; and

(3) subjecting said image-wise exposed coated substrate to a developing solution wherein the unexposed areas of said light-exposed coating are dissolved and removed from the substrate, having a negative image-wise pattern in the coating.

4,902,604

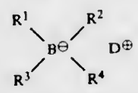
PHOTOPOLYMERIZABLE COMPOSITION CONTAINING SALTS OF ORGANIC CATIONIC DYES AND ORGANIC BORON COMPOUNDS

Jun Yamaguchi, Shizuoka; Masaki Okazaki, and Takanori Hioki, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1988, Ser. No. 251,419
Claims priority, application Japan, Sep. 30, 1987, 62-247479
Int. Cl.[4] G03C *1/68*

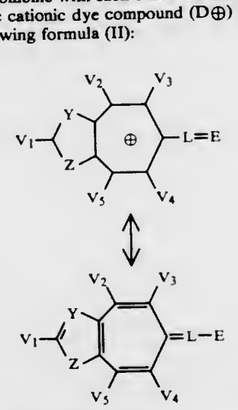
U.S. Cl. 430—281 **13 Claims**

1. A photopolymerizable composition which comprises a polymerizable compound having ethylenic unsaturated bonds, and a salt formed by an organic cationic dye compound (D⊕) and an organic boron compound anion, which is represented by the following formula (I):



(I)

wherein D⊕ represents a cationic dye compound, and R^1, R^2, R^3 and R^4, which may be the same or different, each represents an alkyl group, an aryl group, an aralkyl group, an alkaryl group, an alkenyl group, an alkinyl group, a alicyclic group, a heterocyclic group, an allyl group, or a group having carbon atoms less than 18, selected from the derivatives of these groups, and wherein two or more of the substituent groups R^1 to R^4 may combine with each other to form a cyclic structure, said organic cationic dye compound (D⊕) being represented by the following formula (II):



(II)

wherein E represents an auxochrome; L represents a methine group, which may be in the 4-, 5-, 6-, 7- or 8-position; V_1, V_2, V_3, V_4 and V_5, which may be the same or different, each represents a hydrogen atom, a halogen atom, an unsubstituted or substituted alkyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoly group, a sulfamoyl group, a carboxy group, a cyaro group, a hydroxyl group, an amino group, an acylamino group, an alkoxy group, an alkylthio group, an alkylsulfonyl group or an aryl group, and any two of V_2 to V_5 attached to two adjacent carbon atoms may combine with each other to form a condensed ring; and Y is a carbon atom represented by the formula



wherein V has the same meaning as V_1 to V_5 or a nitrogen atom represented by —N═, and Z is a chalcogen atom or a nitrogen atom represented by the formula



wherein R_{11} represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a heterocyclic group.

4,902,605

PHOTORESIST COMPOSITION COMPRISING CYCLOHEXYLENEOXYALKYL ACRYLATES

Gerald W. Klein, Pittsford; Robert C. McConkey, Rochester; Michel F. Molaire, Rochester, and John M. Noonan, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 24, 1987, Ser. No. 77,715
Int. Cl.[4] G03C *1/68*

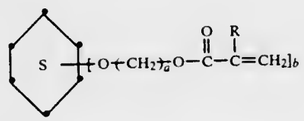
U.S. Cl. 430—285 **4 Claims**

1. A photoresist composition comprising

a polymeric binder,

a photoinitiator composition,

and a polymerizable monomer characterized by the structural formula



wherein R is H or CH_3,

a is an integer of from 1 to 10 and

b is 1 or 2.

4,902,606

COMPRESSIVE PEDESTAL FOR MICROMINIATURE CONNECTIONS

Nils E. Patraw, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 811,560, Dec. 20, 1985, abandoned. This application Aug. 1, 1988, Ser. No. 227,473
Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—314 **5 Claims**

1. A method of fabricating an upstanding electrical terminal coupled to a conductive pathway upon a surface of a substrate, comprising the steps of:

applying a layer of photoresist to a surface of a substrate;

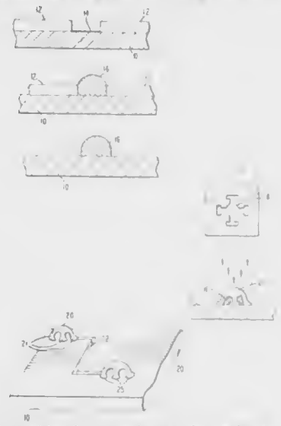
processing the photoresist layer in order to create an opening within the photoresist layer such that a portion of a conductive pathway upon the underlying surface is exposed;

filling the opening with a supersaturated solution comprised of KCl such that the filled opening has a positive meniscus;

drying the supersaturated solution of KCl such that the shape of the positive meniscus is maintained;

removing the photoresist layer;

depositing an electrically conductive layer over the dried KCl such that the conductive layer has a convex upper surface region and a plurality of downwardly extending leg portions, each leg portion being conductively coupled



through a wider foot portion to the pathway; and removing the dried KCl such that the deposited electrically conductive layer is left upstanding upon the substrate.

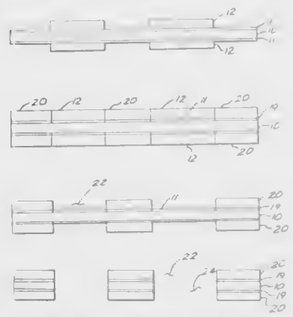
4,902,607

METAL-ETCHING PROCESS

Sai K. Lee, Sepulveda, Calif., assignor to American Etching & Manufacturing, Pacoima, Calif.

Filed May 6, 1987, Ser. No. 47,150
Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—323 **22 Claims**



1. A metlıod of etching portions of a metallic substrate, comprising the steps of

plating a first thin layer of metal onto the substrate;

coating the portions of the plated substrate to be etched with a temporary mask;

applying a second thin layer of metal onto the uncoated portions of the once plated and coated substrate and plating over this second layer with a third layer comprising phosphorous rich electroless nickel;

stripping the temporary mask; and

etching through the portions of the plated substrate uncovered by removal of the temporary mask sufficiently to etch through the substrate.

14. A method for etching portions of a metallic substrate, comprising in sequence the steps of:

applying a first thin layer of electrolytic nickel to the substrate;

applying a thin coating of photoresist material on the first thin layer of electrolytic nickel on the substrate;

applying a photomask over the coated substrate, leaving a portion of the coated substrate exposed to radiation penetrating through the photomask;

hardening the unmasked photoresist material by radiation;

developing the photoresist material;

applying a second thin layer of electrolytic nickel to the first thin layer of electrolytic nickel exposed on the substrate;

plating the second thin layer with phosphorous rich electroless nickel;

stripping the developed photoresist material; and

etching the portion of the plated substrate uncovered by removal of the photoresist material sufficiently to etch through the substrate.

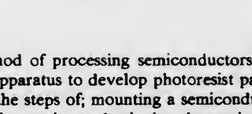
4,902,608

IMMERSION DEVELOPMENT AND RINSE MACHINE AND PROCESS

William E. Lamb, Bellaire; Jerome L. Kowaleski, Meadows; Vojtech Haikl, Houston; Alan R. Bittancourt, Rosenberg, and Harvey S. Daugherty, Richmond, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1987, Ser. No. 134,284
Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—325 **4 Claims**



1. A method of processing semiconductors in a two tank processing apparatus to develop photoresist patterns thereon, comprising the steps of; mounting a semiconductor on a vacuum chuck, immersing and spinning the semiconductor wafer upside down in a developer fluid in a first tank, circulating and filtering the developer in a controlled up-flow system, maintaining the developer solution at a constant developer strength, filling the space above the developer fluid with nitrogen while the wafer is being developed, removing the semiconductor wafer from the developer fluid, lowering the semiconductor wafer into a rinse bath in a second tank, then removing the semiconductor wafer from the rinse bath and spin drying it.

4,902,609

PHOTOGRAPHIC PRINT MATERIAL WITH INCREASED EXPOSURE LATITUDE

Paul T. Hahm, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1987, Ser. No. 87,276
Int. Cl.[4] G03C *7/20*

U.S. Cl. 430—504 **7 Claims**

1. A photographic print material for forming a positive multicolor dye image comprised of

a paper support,

a blue-sensitive, yellow-dye-image-forming silver halide emulsion layer,

a green-sensitized, magenta-dye-image-forming silver halide emulsion layer, and

a red-sensitized, cyan-dye-image-forming silver halide emulsion layer,

wherein the green-sensitized emulsion layer contains the red-sensitizing dye anhydro-3-ethyl-9,11-neopentylene-3'-(3-sulfopropyl)-thiadicarbocyanine hydroxide in an amount of from 5 to 15% by weight of the amount of red-sensitizing dye contained in the red-sensitized emulsion layer.

4,902,610

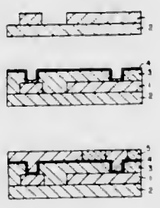
METHOD FOR MANUFACTURE OF MULTILAYER CIRCUIT BOARD

Charles R. Shipley, Newton, Mass., assignor to Shipley Company Inc., Newton, Mass.

Continuation of Ser. No. 761,843, Aug. 2, 1985, abandoned. This application May 20, 1987, Ser. No. 54,102

Int. Cl.[4] G03C *5/16*

U.S. Cl. 430—312 **7 Claims**



1. A process for the formation of a multilayer printed circuit board, said process comprising the steps of providing a non-conductive carrier having a circuit pattern over at least one of its surfaces, applying a first permanent photo dielectric coating over the circuit pattern, exposing the permanent photo dielectric coating to activating radiation in an image pattern comprising an array of openings at locations where interconnections are desired and developing said imaged photo dielectric coating to provide photoformed openings, selectively providing an electroless plating catalyst within said photoformed openings and plating electroless copper onto said electroless plating catalyst to render the photoformed openings conductive, applying a permanent photo mask over the metalized layer of interconnections, exposing the permanent photo mask to activating radiation in an image pattern comprising an array of conductors and interconnections at desired locations, developing said imaged photo mask to provide photoformed conductor lines where conductors are desired and photoformed openings where interconnections are desired and selectively providing an electroless plating catalyst within said photoformed openings and plating electroless copper onto said electroless plating catalyst to render said photoformed openings conductive and repeating the process sequentially until the desired number of layers are formed.

4,902,611

PREPARATION OF SILVER HALIDE EMULSIONS CONTAINING IRIDIUM

Ingo H. Leubner, and Weimer W. White, both of Eastman Kodak Co., Rochester, N.Y. 14650

Filed Jan. 6, 1989, Ser. No. 294,035

Int. Cl.[4] G03C *1/06*

U.S. Cl. 430—567 **11 Claims**

1. A process for preparing a silver halides emulsion by treating the emulsion, during or after precipitation of silver halide grains, with an aqueous solution of an iridium salt, wherein the iridium salt solution is a nitric acid solution of an iridium (IV) salt.

4,902,612

PHOTOGRAPHIC COATING SOLUTIONS

John L. Cawse, Old Barn Cottage, Rainow, Macclesfield, Cheshire SK10 5TY, and David Rowland, 4 Broom Field Close, Chelford, Macclesfield, Cheshire, both of England

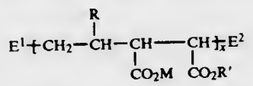
Filed Feb. 13, 1989, Ser. No. 310,593

Claims priority, application United Kingdom, Feb. 12, 1988, 8803282

Int. Cl.[4] G03C *1/02*

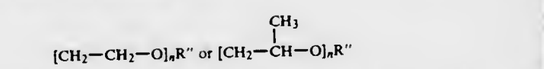
U.S. Cl. 430—628 **7 Claims**

1. An aqueous photographic coating solution which comprises an gelatino silver halide emulsion and a synthetic polymer latex and which is characterised in that it also comprises a compound of the general formula I:



I

wherein E^1 and E^2 represent the end groups of the polymer chain, R is a linear or branched alkyl group chain comprising 6 to 20 carbon atoms or is a phenyl group, R' is a polyether moiety of the formula



wherein R'' is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or CH_3CO— and n is 2 to 20, M is hydrogen or a monovalent cation, and x is 3 to 200, the ratio (by weight) of the compound of formula I to the synthetic polymer being from 0.1 to 50 of the compound of formula I to 100 of the synthetic polymer on a dry solids basis.

4,902,613

LYSING AGENT FOR ANALYSIS OF PERIPHERAL BLOOD CELLS

Chin-hai Chang, Los Altos, and Alex M. Saunders, San Carlos, both of Calif., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 610,152, May 14, 1984, Pat. No. 4,654,312. This application Dec. 8, 1986, Ser. No. 939,334

Int. Cl.[4] A01N *1/02;* **G01N** *31/00*

U.S. Cl. 435—2 **15 Claims**

1. A lysing agent for whole blood comprising a mixture of an aqueous solution of:

a. a short chain aliphatic aldehyde with carbon chain length of one to four

b. an alkali or alkaline earth salt of a weak acid, and

c. a polyhydric alcohol.

4,902,614

MONOCLONAL ANTIBODY TO HUMAN PROTEIN C

Kenji Wakabayashi; Yoshihiko Sumi, both of Hino; Yataro Ichikawa, Tokorozawa; Yoichi Sakata, Oyama; Jun Mimuro, Utsunomiya, and Nobuo Aoki, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 3, 1985, Ser. No. 804,255

Claims priority, application Japan, Dec. 3, 1984, 59-254186; Jun. 10, 1985, 60-124388

Int. Cl.[4] G01N *33/53, 33/577;* **C07K** *1/14;* **C12N** *1/00*

U.S. Cl. 435—7 **4 Claims**

1. A monoclonal antibody which is specific to human protein C which has calcium bound at the gamma-carboxyglutamic acid (Gla) domain and does not recognize human protein C which is not bound to calcium at the Gla domain.

4,902,615

DETECTION OF HUMAN CANCER CELLS WITH ANTIBODIES TO HUMAN CANCER NUCLEOLAR ANTIGEN P120

James W. Freeman, and Harris Busch, both of Houston, Tex., assignors to Biosciences Corporation of Texas, Richardson, Tex.

Filed Mar. 27, 1987, Ser. No. 32,007

Int. Cl.[4] G01N *33/53, 33/577;* **C12N** *15/00, 1/00*

U.S. Cl. 435—7 **13 Claims**

1. A human cancer cell associated nucleolar antigen substantially in purified form characterized by:

a pI on isoelectrofocusing of about 4.1 to about 4.8;

a molecular weight of about 120,000±5,000 daltons as measured by polyacrylamide gel electrophoresis;

being primarily localized in nucleoli of human cancer cells, but not detected in normal, non-proliferating cells;

being expressed in the early G_1 cell cycle phase; and

having a binding specificity to antibody derived from hybridoma ATCC HB 9346 deposit.

4,902,616

PROCESS FOR THE PREPARATION OF CAPSULAR POLYSACCHARIDES OF STAPHYLOCOCCI, THE POLYSACCHARIDES OBTAINED, USES OF THESE POLYSACCHARIDES AND STRAINS FOR CARRYING OUT OF THE PROCESS

Jean-Michel Fournier; Anne Bouvet, and Alain Bontonnier, all of Paris, France, assignors to Institut Pasteur, Paris, France

Filed Aug. 2, 1988, Ser. No. 227,137

Claims priority, application France, Aug. 3, 1987, 87 11006

Int. Cl.[4] C12P *19/04;* **C07C** *35/08, 35/18*

U.S. Cl. 435—101 **15 Claims**

1. A process for the preparation of capsular polysaccharides characteristic of *Staphylococcus aureus,* comprising using strains of coagulase-negative staphylococci which have the ability to produce capsular polysaccharides.

4,902,617

ENZYME AND PROCESS FOR PRODUCING THE SAME

Akiko Fujiwara; Tatsuo Hoshino, both of Kamakura, and Teruhide Sugisawa, Yokohama, all of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 29, 1987, Ser. No. 55,269

Claims priority, application United Kingdom, Jun. 3, 1986, 8613429; Apr. 14, 1987, 8708908

Int. Cl.[4] C12P *7/60;* **C12N** *9/02;* **C12R** *1/01*

U.S. Cl. 435—138 **7 Claims**

1. The enzyme L-sorbosone dehydrogenase as a pure single protein.

4. The process of producing 2-keto-L-gulonic acid comprising oxidizing L-sorbosone in an inert solvent medium to form 2-keto-L-gulonic acid, said oxidation being carried out in said solvent medium containing a catalyst system containing the enzyme L-sorbosone dehydrogenase as a pure single protein and a coenzyme selected from the group consisting of nicotinamide adenine dinucleotide, nicotinamide adenine dinucleotide phosphate and mixtures thereof.

4,902,618

PRODUCTION OF HYBRIDOMA ANTIBODIES FOR INTERFERON

Kurt F. Berg, Gentofte, Denmark, assignor to Wadley Technologies, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 586,019, Feb. 3, 1984, abandoned. This application Mar. 14, 1986, Ser. No. 840,136

Claims priority, application Denmark, Feb. 4, 1983, 487/83

Int. Cl.[4] C12N *15/00, 5/02;* **C12P** *21/00;* **A61K** *39/395*

U.S. Cl. 435—172.2 **2 Claims**

1. A process for a producing a hybridoma cell capable of producing monoclonal antibodies specific for least one antigenic determinant common to all species of Human Interferon-alpha, comprising the steps of:

(a) immunizing an animal with an immunogen comprising Human Interferon-alpha proteins admixed with an effective amount of sodium dodecyl sulfate to denature said proteins; and

(b) thereafter removing at least one antibody-producing cell from said animal and fusing genetic material from said antibody-producing cell with an immortal cell to form said hybridoma cell.

4,902,620

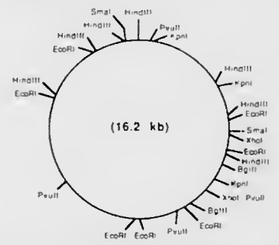
NOVEL DNA FOR EXPRESSION OF DELTA-AMINOLEVULINIC ACID SYNTHETASE AND RELATED METHOD

Martin Bard, Menomonee Falls, Wis., and Thomas D. Ingolia, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 25, 1985, Ser. No. 725,876

Int. Cl.[4] C12N *15/00, 1/18;* **C12R** *1/85*

U.S. Cl. 435—172.3 **7 Claims**



1. A method for maintaining and selecting a recombinant DNA-containing Saccharomyces cell comprising:

(a) transforming a delta-aminolevulinic acid deficient Saccharomyces cell with a recombinant DNA cloning vector carrying a gene encoding delta-amino-levulinic acid synthetase, expression of which results in the production of delta-aminolevulinic acid in said transformed cell, and

(b) culturing the cell transformed in step (a) in a delta-aminolevulinic acid-free culture medium under conditions suitable for growth and expression of said gene encoding synthetase, wherein said recombinant DNA cloning vector is selected from the group consisting of plasmid pIT300, pIT301, pIT302, pIT304, pIT305, and pIT306.

4,902,621

TEST REAGENT FOR AMYLASE DETERMINATION

Peter Witt, Neuenburg, Fed. Rep. of Germany, assignor to Akzo N.V., Arnhem, Netherlands

Filed Sep. 8, 1987, Ser. No. 93,936

Claims priority, application European Pat. Off., Sep. 10, 1986, 86.201556.7

Int. Cl.[4] C12N *9/96*

U.S. Cl. 435—188 **9 Claims**

1. An aqueous stabilized enzyme preparation to be used for measuring the amount of α-amylase in a liquid sample comprising:

(a). an oligosaccharide substrate for α-amylase comprising at least three glucose units, wherein the reducing-end glucose unit is coupled to a label cleavable by α- or β-glucosidase, said label being one that exhibits a measurable change upon cleavage, and wherein the terminal glucose unit is blocked to inhibit cleavage by exo-enzymes,

(b). at least two exo-enzymes being glucoamylase and at least one glucosidase selected from the group consisting of α- and β-glucosidase, and

(c). a stabilizing agent composition comprising:

a buffer,

a water-soluble metal salt of taurocholic acid,
albumin and
a polyhydric alcohol.

4,902,622

NOVEL α-1,6-GLUCOSIDASE AND PROCESS FOR PRODUCING THE SAME

Kuniharu Nakai, Chita; Masayoshi Shiozaki, Nagoya; Hiroji Tsuji; Shigeharu Mori, both of Nishiharu; Susumu Hirose, Kakamigahara; Nobumasa Yokoi, and Takaichi Ohya, both of Nishiharu, all of Japan, assignors to Amano Pharmaceutical Co., Ltd., Aichi, Japan

Filed Sep. 25, 1987, Ser. No. 100,730

Claims priority, application Japan, Sep. 26, 1986, 61-228904; Mar. 11, 1987, 62-56149

Int. Cl.⁴ C12N *9/44*

U.S. Cl. 435—210 **3 Claims**

1. A novel α-1,6-glucosidase having the following properties:

(1) Action: The enzyme acts on an α-1,6-glucoside bond to produce linear amylose;

(2) Substrate specificity: The enzyme has the following relative activity to polysaccharides:

Polysaccharide	Relative activity (%)
Pullulan	100
Maize soluble amylopectin	13.5
Soluble starch	6.7
Oyster glycogen	1.7
Hare glycogen	2.6
Maize amylopectin	3.8
Potato amylopectin	4.0

(3) Km value and Vmax to pullulan: The enzyme has Km value of 0.14 mg/ml and Vmax of 70.0 μmol/min/mg protein;

(4) Optimum pH: 5.0 to 5.5;

(5) pH stability: The enzyme is stable in the pH range of 4.5 to 6.5 for 30 minutes at 40° C. and in the pH range of 5.0 to 6.0 for 30 minutes at 50° C.;

(6) Optimum temperature: Approximately 55° C.;

(7) Thermal stability: Treatment at pH 4.5 for 30 minutes at different temperatures indicates that the enzyme retained 80% of the initial activity at 40° C. and 10% thereof at 60° C.;

(8) Influence of inhibitor: The enzyme is inhibited by at least 70% by p-chloromercuribenzoic acid or sodium dodecylsulfate, but is not inhibited by O-phenanthroline or potassium ferricyanide;

(9) Influence of metal salts: The enzyme is negligibly affected by Ni^{2+}, Ba^{2+}, Zn^{2+}, Cd^{2+} or Mn^{2+}; is inhibited by Fe^{3+}; and loses activity in the presence of Hg^{2+} or Ag^{2+}; and

(10) Molecular weight: About 95,500 (measured by SDS electrophoresis).

4,902,623

PLASMINOGEN ACTIVATOR

Eugene B. D. Dowdle, Cape Town, South Africa, assignor to South African Inventions Development Corporation, Pretoria, South Africa

Continuation-in-part of Ser. No. 843,405, Mar. 24, 1986, which is a continuation of Ser. No. 559,569, Dec. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 513,145, Jul. 12, 1983.

This application Oct. 3, 1986, Ser. No. 915,599

Claims priority, application South Africa, Dec. 14, 1982, 82/9168; Australia, Jan. 11, 1983, 10296/83

Int. Cl.⁴ C12N *9/24*; **A01N** *65/00*; **A61K** *35/78*

U.S. Cl. 435—226 **14 Claims**

1. A process for selectively and reversibly adsorbing tPA (tissue plasminogen activator), pro-tPA or mixtures of both, from an aqueous medium containing such substance or substances in solution which comprises intimately contacting said aqueous medium with an affinity reagent comprising an immobilized Kunitz type inhibitor, derivable from an Erythrina species, and having the following combination of characteristics:

(a) it is an inhibitor of the Kunitz type;

(b) it inhibits trypsin;

(c) it inhibits plasmin;

(d) it has no effect on urokinase;

(e) it inhibits tPA; and

(f) in its immobilized form, it is a selective adsorbent for tPA and its precursor pro-tPA,

to cause the tPA, pro-tPA or mixture of both to become selectively adsorbed on the affinity reagent.

4,902,624

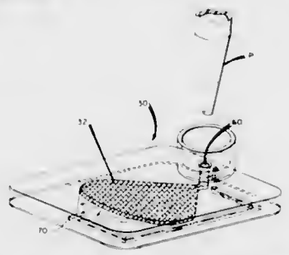
TEMPERATURE CYCLING CUVETTE

Richard L. Columbus, Rochester; Jeffrey L. Helfer; Johannes J. Porte, both of Webster, and Jeffrey A. Wellman, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 270,385, Nov. 9, 1988, abandoned, which is a continuation of Ser. No. 123,751, Nov. 23, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 273,781

Int. Cl.⁴ C12M *1/02*

U.S. Cl. 435—316 **26 Claims**



1. In a thermal cycling cuvette for controlled reaction of components of a liquid involving cycling through a temperature range of at least about 35° C., said cuvette having at least one liquid-confining chamber defined by two spaced-apart opposing walls each providing a major surface of contact, side walls connecting said two opposing walls, and means permitting the introduction of liquid into, and the removal of such liquid from, said chamber;

the improvement wherein said opposing walls and said side walls are dimensioned to provide (a) a spacing between said opposing walls of no less than 0.5 mm and (b) a predetermined surface-to-volume ratio of said chamber, at least one of said opposing walls being provided with a predetermined thermal path length and thermal resistance such that said ratio, path length and thermal resistance are effective to provide, for pure water contained within said chamber in contact with said opposing walls, a thermal time constant for such water that is no greater than about 10 seconds, for a liquid volume of no more than about 200 μl.

4,902,625

RAPID CORROSION TEST FOR ZIRCONIUM AND ZIRCONIUM ALLOY WELDMENTS

Donald W. Parker; Merle A. Parker, both of Columbia, S.C.; George P. Sabol, and Isabel K. Lloyd, both of Murrysville Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 680,423, Dec. 11, 1984, abandoned. This application May 16, 1989, Ser. No. 353,188

Int. Cl.⁴ G01N *17/00*

U.S. Cl. 436—6 **16 Claims**

1. A method of determining corrosion resistance of a zircaloy weld and heat affected zones comprising the steps of:

(a) immersing said zircaloy weld and heat affected zones into a fused salt bath having a temperature above about 400° C.;

(b) controlling the temperature of said fused salt bath and duration of said immersion to produce an essentially black oxide film in corrosion resistant zircaloy weld and heat affected zones, while producing a white oxide scale in noncorrosion resistant zircaloy welds and heat affected zones;

(c) removing said zircaloy weld and heat affected zones from said salt bath after said duration; and

(d) evaluating the oxide produced on said zircaloy weld and heat affected zones for the presence of a white scaling oxide.

4,902,626

PROCEDURE AND APPARATUS FOR ASSURING POSITIVE IDENTIFICATION OF SAMPLES FOR ANALYSIS

Kimmo J. Käymkö; Pekka V. J. Röönea, and Raimo K. Vaintola, all of Espoo, Finland, assignors to Kone Oy, Helsinki, Finland

Continuation of Ser. No. 654,638, Sep. 25, 1984, abandoned. This application May 26, 1987, Ser. No. 56,275

Int. Cl.⁴ G01N *35/04*

U.S. Cl. 436—48 **9 Claims**



1. An apparatus for assuring positive identification of samples during analysis of the samples, comprising:

a plurality of sample containers each for containing a sample material to be analyzed;

a sample register having multiple spaced-apart discrete openings provided therein, said openings being located at pre-determined positions in a first arrangement, and into which openings the sample containers are to be placed; and

a cover located above said sample register, said cover being provided with a plurality of discrete apertures which are so sized and located at predetermined positions in a second arrangement relative to the openings in said sample register that only a single aperture at a time can be aligned with one of said multiple openings in the sample register by movement of said sample register and said cover relative to each other, so as to allow insertion of one of said sample containers through the aperture into the aligned opening in the sample register.

4,902,627

METHOD FOR DETECTING AMINE-CONTAINING DRUGS IN BODY FLUIDS BY SIMS

David Kidwell, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 5, 1985, Ser. No. 698,476

Int. Cl.⁴ G01N *27/62*

U.S. Cl. 436—112 **6 Claims**

1. A method of analyzing for an amine-containing drug in a body fluid, comprising the steps of:

pre-selecting the drug which is to be analyzed for in said body fluid;

admixing said body fluid with a solvent to form a sample wherein any said pre-selected drug contained in said body fluid is dissolved in said solvent;

acylating said sample with an acylating reagent to acylate any primary and secondary amines contained in said sample;

adding an alkyl group to any said pre-selected drug in the sample by quaternizing any said pre-selected drug in the sample with a quaternizing reagent or alkylating any said pre-selected drug in the sample with a charged alkylating reagent to form an ionic derivative of any quantity of said pre-selected drug contained in said sample, thereby forming a derivatized sample;

depositing said derivatized sample upon a surface compatible with secondary ion mass spectrometry analysis techniques;

bombarding said derivatized sample with a particle beam to desorb any ionic derivative contained in said derivatized sample thereby forming a bombarded sample; and

analyzing said bombarded sample to determine the quantity of any desorbed ionic derivative using secondary ion mass spectrometry.

4,902,628

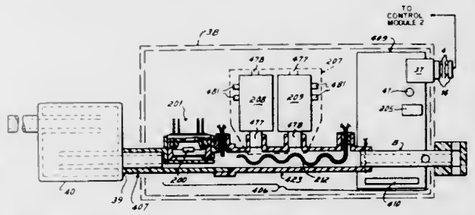
APPARATUS AND METHOD TO DETER CIRCUMVENTION OF A BREATH SOBRIETY TEST

R. Gregory Blair, Cincinnati, Ohio, assignor to Guardian Technologies, Inc., Cincinnati, Ohio

Filed Aug. 24, 1988, Ser. No. 236,010

Int. Cl.⁴ G01N *33/48*

U.S. Cl. 436—132 **20 Claims**



14. A sobriety interlock for a machine, said sobriety interlock, comprising:

(a) alcohol sensor means for detecting alcohol in the breath of a test subject;

(b) conduit means having an inlet for receiving a flow of breath from the test subject and for conducting a flow of breath delivered thru said inlet by the test subject to said alcohol sensor;

(c) flow sensing means operably connected to said conduit means for generating a first signal when a predetermined flow of breath is withdrawn from said inlet, and

(d) control means connected to said flow sensing means and said alcohol sensor means, and connectable to the machine to selectively enable operation of the machine provided at least one predetermined condition, including generation of said signal, is satisfied.

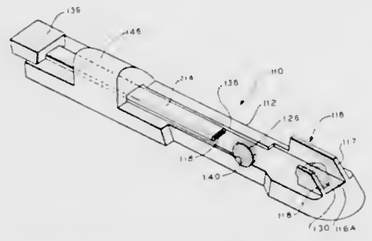
18. A breath sobriety test method comprising the steps of:
(a) sensing the flow of breath in a conduit connecting an inlet with alcohol sensor means and generating a first signal upon sensing a first predetermined flow of breath delivered into said conduit by way of said inlet and generating a second signal upon sensing a withdrawal of a second predetermined flow of breath from said conduit by way of said inlet, and
(b) generating a test pass signal indicating that a breath sobriety test has been passed only if:
(i) said first signal is generated indicating delivery of a breath sample to said alcohol sensor means, and
(ii) said alcohol sensor means detects less than a predetermined level of alcohol present in said breath sample, and
(iii) said second signal is generated within a predetermined time of said generation of said first signal.

4,902,629

APPARATUS AND PROCESSES FOR FACILITATING REACTION BETWEEN ANALYTE AND TEST REAGENT SYSTEM

Peter M. Meserol, Montville; Philip Bernstein, Glen Ridge; Rita C. Prodell, West Orange, and Thomas Palmieri, Paramus, all of N.J., assignors to Personal Diagnostics, Inc., Whippany, N.J.

Filed Oct. 6, 1987, Ser. No. 106,573
Int. Cl.[4] G01N *31/22*
U.S. Cl. 436—165 **61 Claims**



1. An apparatus for facilitating reaction between test reagent system and analyte contained in a sample, wherein one of said test reagent system and sample is a liquid and the other of said test reagent system and sample is either a liquid or a non-liquid, comprising:
a first capillary tube provided with a first bore having a non-circular cross-section for receiving said other of said test reagent system and sample,
reservoir means for receiving said one of said test reagent system and sample,
said first capillary tube dimensioned for entry into said reservoir means and said first capillary tube and said reservoir means mounted for at least relative movement towards each other and entry of said first capillary tube into said reservoir means to draw by capillary attraction said one of said test reagent system and sample from said reservoir means into said bore and to bring said test reagent system and sample into turbulent contact in said bore and facilitate said reaction.

35. A process of facilitating reaction between analyte contained in a sample and test reagent system, wherein at least one of said sample and test reagent system is a liquid, comprising the steps of:
placing said liquid one of said sample and test reagent system in reservoir means;
placing the other of said sample and test reagent system in a bore of non-circular cross-section provided in a capillary tube, said capillary tube dimensioned for entry into said reservoir means;
mounting said reservoir means and said capillary tube for at least relative movement towards each other and entry of said capillary tube into said reservoir means; and
providing said relative movement towards each other and entry of said capillary tube into said reservoir means to draw by capillary attraction said one of said sample and test reagent system from said reservoir means into said bore and to bring said analyte and test reagent system into turbulent contact in said bore and facilitate said reaction.

4,902,630

FLUORESCENCE POLARIZATION IMMUNOASSY AND REAGENTS FOR MEASUREMENT OF C-REACTIVE PROTEIN

Larry G. Bennett, Grayslake, and Enrico G. Chiapetta, Mundelein, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 58,645, Jun. 3, 1987, abandoned, which is a continuation of Ser. No. 757,822, Jul. 22, 1985, abandoned. This application Jul. 14, 1988, Ser. No. 219,618
Int. Cl.[4] G01N *33/566, 33/536, 33/542, 33/533*
U.S. Cl. 436—546 **4 Claims**

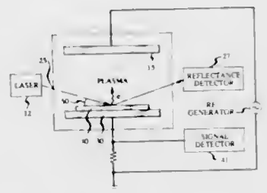
1. A method for determining the presence of concentration of C-reactive protein in a liquid sample of biological fluid, comprising intermixing the a sample of said biological fluid a fluorescent tracer comprising a conjugate of C-reactive protein and a fluorescent moiety, so as to be specifically recognizable by a common antibody or receptor binding site with a solution of an antibody capable of specifically recognizing the C-reactive protein in the sample and the tracer; and determining the amount of the tracer which becomes bound to the antibody by fluorescence polarization as a measure of the amount of C-reactive protein in the sample.

4,902,631

MONITORING THE FABRICATION OF SEMICONDUCTOR DEVICES BY PHOTON INDUCED ELECTRON EMISSION

Stephen W. Downey, Chatham, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 28, 1988, Ser. No. 264,240
Int. Cl.[4] H01L *21/00, 21/02, 21/306;* **B44C** *1/22*
U.S. Cl. 437—7 **12 Claims**



1. A process for fabricating a device comprising the steps of subjecting a substrate to a gas phase species to induce a change in said substrate and employing said changed substrate to effect said fabrication characterized in that during said change, said substrate is subjected to non-particle electromagnetic radiation that induces formation of free electrons in said substrate, said electrons are monitored and said change is either terminated, adjusted, or allowed to continue based on said monitoring wherein said change is induced by a source other than said non-particle electromagnetic radiation.

4,902,632

METHOD OF PREVENTING SUPERFICIAL ELECTRICAL DISCHARGES IN CHIPS OF SEMICONDUCTOR DEVICES DURING TESTING

Carmelo Oliveri, Castiglione Di Sicilia - Catania, and Carmelo Magro, Catania, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza (Milano), Italy.

Filed Dec. 21, 1988, Ser. No. 288,407
Claims priority, application Italy, Dec. 22, 1987, 6632 A/87
Int. Cl.[4] H01L *21/66;* **G01R** *31/26*
U.S. Cl. 437--8 **2 Claims**

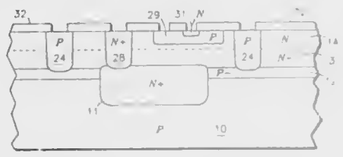
1. A method of preventing the occurrence of superficial electrical discharges in the chips of semiconductor devices during testing, which comprises subjecting the chips to chemical treatment with a silanized agent immediately before testing.

4,902,633

PROCESS FOR MAKING A BIPOLAR INTEGRATED CIRCUIT

Bertrand F. Cambou, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1988, Ser. No. 191,461
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437--31 **8 Claims**



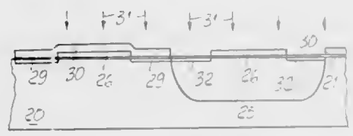
1. A process for making a bipolar integrated circuit, comprising: providing a substrate of a first conductivity type and having a first surface; selectively forming a buried layer of a second conductivity type in the substrate and extending from the first surface; providing a first epitaxial layer of the first conductivity type over the first surface; providing a second epitaxial layer of the second conductivity type over the first epitaxial layer; providing a third epitaxial layer of the second conductivity type over the second epitaxial layer and having a higher dopant concentration than the second epitaxial layer; selectively providing a dopant of the first conductivity type in the third epitaxial layer in a manner to surround the buried layer; selectively providing a dopant of the second conductivity type in the third epitaxial layer and positioned over a portion of the buried layer; and performing a diffusion to drive in the dopants selectively provided in the third epitaxial layer and simultaneously causing the buried layer to diffuse upwards.

4,902,634

PROCESS FOR MANUFACTURING CMOS DEVICES

Paolo Picco, Monza, Italy, assignor to SGS-Thomson Microelectronics S.p.A., Catania, Italy

Filed Jul. 18, 1988, Ser. No. 220,652
Claims priority, application Italy, Jul. 28, 1987, 21479 A/87
Int. Cl.[4] H01L *21/00, 21/02, 21/265, 29/78*
U.S. Cl. 437—34 **2 Claims**



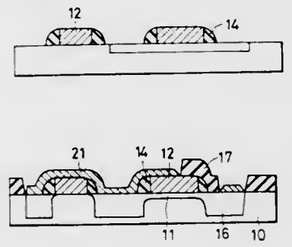
1. A process for manufacturing CMOS devices, comprising, for each CMOS device including a first and a second complementary MOS transistors having gate, drain and source regions, at least the steps of: forming, in a semiconductor substrate having a first conductivity type, an opposite conductivity zone; forming isolation regions in said substrate and in said opposite conductivity zone; forming an insulating material layer on said semiconductor substrate; depositing a semiconductor material layer above said insulating material layer; depositing first portions of photosensitive material above said semiconductor material layer at least at regions thereof adapted to form the gate regions of said first and second MOS transistors and at regions thereof overlying zones of said opposite conductivity zone adapted to form the source and drain regions of said second MOS transistor; shaping said semiconductor material layer to form the gate of said first transisotr; simultaneous and selective introduction of ions of a first type into said substrate for forming the drain and source regions of said first transistor and into said opposite conductivity zone for forming a biasing region; deposititing second portions of photosensitive material covering said semiconductor material layer at least at the gate of the first transistors, at regions of said semiconductor material layer adapted to form the gate regions of said second MOS transistor and at regions of said semiconductor material layer overlying the source and drain regions of said first MOS transistor; simultaneous and selective introduction of ions of a second type into said opposite conductivity zone for forming the drain and source regions of said second transistor adjacent to said biasing region and into said substrate for forming a further biasing region adjacent to said first transistor; depositing an insulating covering layer; and forming contacts, metallizations and passivations.

4,902,635

METHOD FOR PRODUCTION OF COMPOUND SEMICONDUTOR DEVICES

Toshinori Imamura; Masaru Miyazaki; Akihisa Terano; Nobutoshi Matsunaga, and Hiroshi Yanazawa, all of Kokubunji, Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 175,704
Claims priority, application Japan, Dec. 18, 1987, 62-318541
Int. Cl.[4] H01L *21/285, 21/316, 21/318, 29/80*
U.S. Cl. 437—44 **15 Claims**



1. A method for producing compound semiconductor devices which comprises: forming Schottky junction electrodes made of refractory metal on a semiconductor substrate; forming side walls consisting of a first insulating film adjacent to each side of said Schottky junction electrodes; selectively forming an N or P type active layer partially on the top surface of the said semiconductor; covering the whole surface of said semiconductor substrate with a second insulating film; providing openings in the said second insulating film above first predetermined portions of the said N or P type active layer and continuous openings above second predetermined portions of said N or P type active layer and above said Schottky junction

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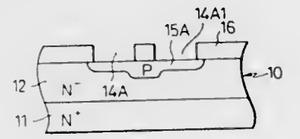
electrodes; coating an ohmic electrode material for an ohmic junction with said N or P type active layers on the whole surface of the said semiconductor substrate; lifting-off the ohmic electrode portion coated on other than said opening; and alloying said ohmic electrode to the N or P type active layer and the Schottky junction electrodes at said openings to provide a direct ohmic junction therebetween.

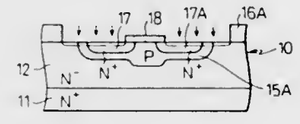
4,902,636

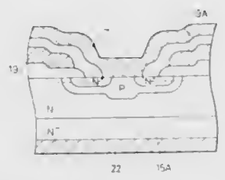
METHOD FOR MANUFACTURING A DEPLETION TYPE DOUBLE-DIFFUSED METAL-OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR DEVICE

Sigeo Akiyama, Neyagawa; Masahiko Suzumura, Ibaragi, and Takeshi Nobe, Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jan. 9, 1989, Ser. No. 294,787
Claims priority, application Japan, Jan. 18, 1988, 63-8993
Int. Cl.[4] H01L *21/265, 21/31*
U.S. Cl. 437—45 **2 Claims**







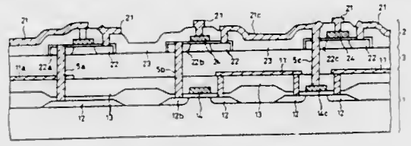
1. A method for manufacturing a depletion type DMOSFET device, comprising the steps of forming a first insulating layer on a silicon wafer; forming at least a first opening in a top surface of said insulating layer; carrying out a first diffusion of an impurity material of a different conductivity type from said wafer through said first opening; covering said first opening with a second insulating layer; forming a second opening in the insulating layer with a part outwardly adjacent said first opening; carrying out a second diffusion of the impurity material that is different from the conductivity type of the wafer through said second opening; sequentially carrying out a third diffusion of an impurity material of the same conductivity type as the wafer though a third opening to form in the wafer well and source regions including channel region of the different conductivity type from the wafer; removing the insulating layer on said well and source regions including the insulating layer on a part of the wafer outwardly adjacent the well region by at least 5 μm from outer peripheral edges of said third opening; providing a mask on an area including said central part of the well region and an adjacent part of the source region on which said source electrode is to be formed; carrying out an ion-implantation of an impurity of the same conductivity type as the wafer in said well and source regions including said channel region and said wafer part adjacent the well region from which the insulating layer has been removed, except for said area on which said mask is provided; removing said mask; forming gate electrodes with a gate oxide layer on said channel region of said well region; and forming a source electrode on a central part of said well region and adjacent parts of said source regions and a drain electrode on reverse side of the wafer.

4,902,637

METHOD FOR PRODUCING A THREE-DIMENSIONAL TYPE SEMICONDUCTOR DEVICE

Harufusa Kondou, and Masao Nakaya, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 158,847, Feb. 22, 1988, abandoned, which is a division of Ser. No. 21,315, Mar. 3, 1987, abandoned.
This application Jun. 23, 1989, Ser. No. 370,145
Claims priority, application Japan, Mar. 3, 1986, 61-45902
Int. Cl.[4] H01L *27/00*
U.S. Cl. 437—51 **8 Claims**



1. A method for producing a three-dimensional type semiconductor device comprising a first semiconductor integrated circuit layer, said first semiconductor integrated circuit layer including at least one first semiconductor elemental device having active regions, first insulating layers formed on said first semiconductor elemental device, and first interconnection layers formed on said first insulating layers and connected to the active regions in said first semiconductor elemental device, a second insulating layer formed on said first semiconductor integrated circuit layer, a second semiconductor integrated circuit layer formed on said second insulating layer, said second semiconductor integrated circuit layer including at least one second semiconductor elemental device having active regions, third insulating layers formed on said second semiconductor elemental device, and second interconnection layers formed on said third insulating layers and connected to the active regions in said second semiconductor elemental device, at least one contact hole formed straight to directly reach said first semiconductor integrated circuit layer from one of the active regions in said at least one second semiconductor elemental device, said contact hole penetrating the active region of said second semiconductor elemental device, and at least one interlayer interconnection directly connecting and penetrating one of the active regions in said second semiconductor elemental device and said first semiconductor integrated circuit layer through said contact hole, said method comprising

preparing said first semiconductor integrated circuit layer including said at least one first semiconductor elemental device having a gate electrode and active regions, first insulating layers formed on said first semiconductor elemental device and said first interconnection layers formed on said first insulating layers and connected to the active regions in said first semiconductor elemental device,

forming said second insulating layer on said first semiconductor integrated circuit layer,

forming said active regions which are to be included in at said least one second semiconductor elemental device on said second insulating layer,

forming said at least one straight contact hole to directly reach said first semiconductor integrated circuit layer from one of the active regions in said at least one second semiconductor elemental device, said contact hole formed so that it penetrates the active region of said second semiconductor elemental device and reaches at least one of said interconnection layer, said gate electrode and said active region in said first semiconductor integrated circuit layer,

forming said at least one interlayer interconnection directly connecting one of the active regions in said semiconductor elemental device and said first semiconductor integrated circuit layer through said contact hole,

forming said third insulating layers on said second semiconductor elemental device, and

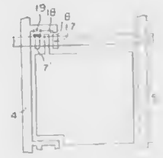
forming said second interconnection layers on said third insulating layers to be connected to the active regions in said second semiconductor elemental device.

4,902,638

THIN FILM TRANSISTOR, METHOD OF REPAIRING THE THIN FILM TRANSISTOR AND DISPLAY APPARATUS HAVING THE THIN FILM TRANSISTOR

Ryujiro Muto, Fujisawa, Japan, assignor to Asahi Glass Company, Ltd., Tokyo, Japan

Division of Ser. No. 219,871, Jul. 12, 1988, which is a continuation of Ser. No. 853,740, Apr. 18, 1986, abandoned. This application Apr. 24, 1989, Ser. No. 342,355
Claims priority, application Japan, Apr. 23, 1985, 60-85456
Int. Cl.[4] H01L *27/12, 21/88*
U.S. Cl. 437—51 **3 Claims**



1. A method of repairing a thin film transistor connected to a picture element displaying electrode formed on an insulating base plate so that a voltage is applied to said electrode, wherein said thin film transistor comprising a gate electrode, at least two drain electrodes, at least one of which is connected to said picture element displaying electrode, a source bus line, a plurality of source electrodes, at least one of said source electrodes adjacent to said one or more drain electrodes connected to said picture element displaying electrode being connected to said source bus line which applies a voltage to said source electrodes, wherein said drain electrodes are formed between said source bus line which functions by itself as a source electrode and one of said source electrodes or between said source electrodes adjacent to each other, each of which is other than said source bus line functioning as a source electrode, characterized in that a faulty portion of any electrode is separated from said source bus line or said picture element displaying electrode, and another set of said drain electrode and said source electrodes are connected to said source bus line and said picture element displaying electrode, if necessary.

4,902,639

PROCESS FOR MAKING BICMOS INTEGRATED CIRCUIT HAVING A SHALLOW TRENCH BIPOLAR TRANSISTOR WITH VERTICAL BASE CONTACTS

Jenny M. Ford, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 3, 1989, Ser. No. 388,885
Int. Cl.[4] H01L *21/283, 302*
U.S. Cl. 437—56 **16 Claims**

1. A method of fabricating a BiCMOS integrated circuit, comprising the steps of:

providing a semiconductor substrate;

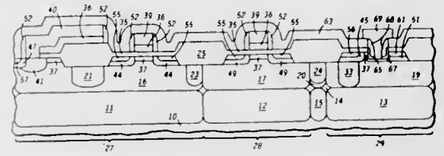
forming at least an isolated NMOS device region, at least an isolated PMOS device region and at least an isolated bipolar device region in the substrate;

forming a gate oxide layer and a polysilicon gate region over the isolated NMOS device region and over the PMOS device region;

forming a first source region and a first drain region in the isolated NMOS device region;

forming a second source region and a second drain region in the isolated PMOS device region, and forming a first extrinsic base region in the isolated bipolar device region;

forming an oxide layer over the substrate;



forming a shallow trench in the oxide and in the isolated bipolar device region of the substrate, wherein the shallow trench is etched slightly shallower than the depth of the first extrinsic base region and slightly overlapping the first extrinsic base region;

forming an active base region in the substrate at the bottom of the shallow trench;

forming sidewall spacers in the shallow trench opening; and

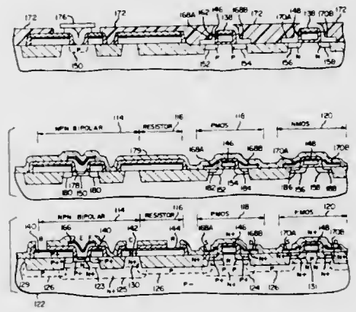
forming a polysilicon emitter region self-aligned in the shallow trench.

4,902,640

HIGH SPEED DOUBLE POLYCIDE BIPOLAR/CMOS INTEGRATED CIRCUIT PROCESS

Jack Sachitano, Portland, Oreg.; Hee K. Park, Seoul, Rep. of Korea; Paul K. Boyer, Beaverton, Oreg.; Gregory C. Eiden, Madison, Wis., and Tadanori Yamaguchi, Hillsboro, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 40,447, Apr. 17, 1987, Pat. No. 4,826,782. This application Aug. 19, 1987, Ser. No. 87,176
Int. Cl.[4] H01L *21/70, 27/00*
U.S. Cl. 437—57 **43 Claims**



1. A method of fabricating a mixed process integrated circuit including a metal-oxide-semiconductor field-effect transistor (MOSFET) and a bipolar transistor on a common substrate, comprising the following steps, steps (f) and (g) not necessarily being in the order stated:

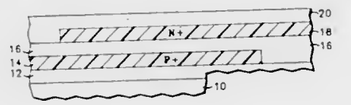
(a) providing a substrate of semiconductor material having a main face and containing impurity atoms that provide charge carriers of a first polarity;

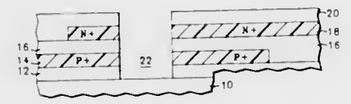
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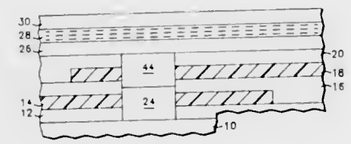
(b) forming and patterning a first conductive layer to provide:
(i) an elongate insulated gate structure of a predetermined height for the MOSFET on a first portion of the main face of said substrate, and first and second areas of the main face exposed along first and second opposite sides respectively of the gate structure, and
(ii) a base contact structure for the bipolar transistor on a second portion of the main face of the substrate in contact with the semiconductor material, including first and second base contact portions having opposed third and fourth sides spaced apart about a third exposed area of the main face;
(c) introducing impurity atoms that provide charge carriers of a second polarity, opposite the first polarity, into the substrate by way of said first and second areas of the main face to form a lightly-doped drain region in the MOSFET, the gate structure being effective to mask the region of the substrate immediately subjacent the gate structure from the impurity atoms;
(d) forming a sidewall of a material that is opaque to atoms of a selected impurity along said first and second sides of the gate structure, and said third and fourth sides of the base contact structure, whereby a strip of the main face along each said side of the gate structure and base contact structure is covered by the sidewall but other parts of the first, second and third areas of the main face remain exposed;
(e) introducing atoms of the selected impurity into the substrate by way of those portions of the first, second and third areas which are exposed adjacent said sidewalls, the atoms of said selected impurity providing charge carriers of said second polarity to form heavily doped source and drain regions under the first and second areas in the MOSFET and a base region under the third area in the bipolar transistor;
(f) forming a second layer of conductive material over said exposed portions of said first, second and third areas, and over the gate structure;
(g) removing the conductive material of said second layer over the gate structure that is at a height over the main face that is at least as great as the height of the gate structure so as to form two discrete source and drain contacts for the MOSFET overlying said first and second areas respectively of the main face;
(h) forming an emitter in the substrate under the third area for the bipolar transistor; and
(i) the portion of the second conductive layer formed over the exposed third area serving as an emitter contact so that complete, operative bipolar and MOSFET devices are fabricated on a common substrate with only two layers of conductive material.

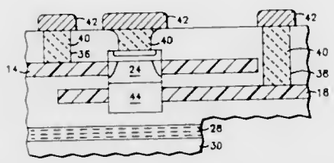
4,902,641
PROCESS FOR MAKING AN INVERTED SILICON-ON-INSULATOR SEMICONDUCTOR DEVICE HAVING A PEDESTAL STRUCTURE
Daniel N. Koury, Jr., Ithaca, N.Y., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 31, 1987, Ser. No. 79,984
Int. Cl.⁴ H01L *21/76, 21/20*
U.S. Cl. 437—62 **21 Claims**

1. A process for making an inverted silicon-on-insulator semiconductor device having a pedestal structure comprising the steps of:
providing a first substrate;
forming a first dielectric layer on said first substrate;
forming a first polysilicon layer on said first dielectric layer;
forming a second dielectric layer on said first polysilicon layer;
forming a second polysilicon layer on said second dielectric layer;
forming a third dielectric layer on said second polysilicon layer;
etching an opening through said dielectric layers and said polysilicon layers, said opening extending to said first substrate;
forming epitaxial region on said first substrate in said opening;









forming a last dielectric layer on said epitaxial region and said third dielectric layer;
bonding a second substrate to said last dielectric layer;
inverting said semiconductor device;
removing said first substrate;
etching a plurality of contact openings in said semiconductor device; and
forming electrical contacts in said contact openings.

4,902,642
EPITAXIAL PROCESS FOR SILICON ON INSULATOR STRUCTURE
Bor-Yen Mao, Richardson, and Richard L. Yeakley, Dallas, both of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.
Continuation of Ser. No. 82,898, Aug. 7, 1987, abandoned. This application Aug. 24, 1988, Ser. No. 238,974
Int. Cl.⁴ H01L *21/20, 21/324*
U.S. Cl. 437—83 **14 Claims**

1. A method of forming an epitaxial silicon layer on a single crystalline silicon film which is on an insulating layer, said method comprising:
implanting oxygen into the surface of a silicon material;
annealing the silicon material so that a single crystalline film is formed over a layer of silicon dioxide;

forming a layer of amorphous silicon on said single crystalline silicon film; and







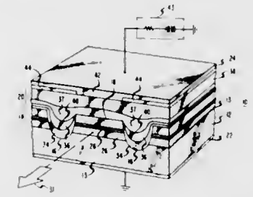
annealing all of said layer of amorphous silicon at substantially the same time to form a layer of single crystalline silicon.

4,902,643
METHOD OF SELECTIVE EPITAXIAL GROWTH FOR COMPOUND SEMICONDUCTORS
Hidenori Shimawaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Feb. 9, 1989, Ser. No. 308,027
Claims priority, application Japan, Feb. 9, 1988, 63-29472
Int. Cl.⁴ H01L *21/20*
U.S. Cl. 437—89 **12 Claims**

1. A method of selective epitaxial growth comprising the steps of:
forming a layer of group IV element semiconductor with a predetermined pattern on a compound semiconductor substrate; and
forming a compound semiconductor layer selectively on said compound semiconductor substrate by alternately supplying a first gas of a first compound containing a group III or II element and a second gas of a second compound containing a group V or VI element or to both surfaces of said layer of group IV element semiconductor and said compound semiconductor substrate.

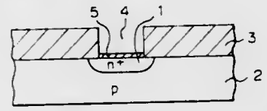
4,902,644
PRESERVATION OF SURFACE FEATURES ON SEMICONDUCTOR SURFACES
Daniel P. Wilt, Scotch Plains, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.
Division of Ser. No. 845,603, Mar. 28, 1986, Pat. No. 4,805,178.
This application Oct. 21, 1988, Ser. No. 260,842
Int. Cl.⁴ H01L *21/208*
U.S. Cl. 437—129 **17 Claims**

13. In a method of fabricating a laser, the steps comprising:
providing an InP body,
forming an optical grating on the body,
forming a thin protective coating containing a transition metal on the grating, and



epitaxially growing on the grating a heterostructure which includes a plurality of layers of InP and/or InGaAsP.

4,902,645
METHOD OF SELECTIVELY FORMING A SILICON-CONTAINING METAL LAYER
Takayuki Ohba, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Aug. 23, 1988, Ser. No. 235,403
Claims priority, application Japan, Aug. 24, 1987, 62-209534; Mar. 11, 1988, 63-058821
Int. Cl.⁴ H01L *21/00, 21/02;* **B05D** *3/06, 5/12*
U.S. Cl. 437—200 **21 Claims**



1. A method of forming a silicon-containing metal layer on a substrate with a surface of a conductor or a semiconductor and a surface of an insulator by a low pressure chemical vapor deposition using a metal halide gas and a silicon hydride gas as reaction gases, characterized in that a ratio of the flow rate of said silicon hydride gas to that of said metal halide gas is 2 or less and the deposition temperature is 200° C. or less, to selectively deposit said silicon-containing metal layer having a ratio of silicon to metal of 0.6 or less on said surface of the conductor or semiconductor of the substrate.

4,902,646
MESFET PROCESS EMPLOYING DUMMY ELECTRODES AND RESIST REFLOW
Hirofumi Nakano, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Nov. 28, 1988, Ser. No. 276,484
Claims priority, application Japan, May 13, 1988, 63-117778
Int. Cl.⁴ H01L *21/283, 21/312*
U.S. Cl. 437—203 **6 Claims**

1. A method for producing a semiconductor device including a metal pattern production process for producing a plurality of metal patterns on a semiconductor substrate having an active layer comprising:
disposing dummy metal patterns at a plurality of metal pattern production regions on a semiconductor substrate using a resist mark;
disposing on an entire surface of the substrate a resist pattern which has apertures at portions corresponding to selected metal pattern production regions, said production regions having gaps therebetween;
filling the gaps between said dummy metal patterns and said resist pattern with resist; and
removing said dummy metal patterns at the selected metal

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pattern production regions, depositing a metal layer over the entire surface of the partially completed device, and lifting off unwanted metal, thereby producing a desired metal pattern at the selected metal pattern production regions;

said step of disposing a resist pattern and subsequent steps for replacing said dummy metal pattern with said metal pattern being performed at least twice.

2. A method for making a field effect transistor having source, drain, and gate electrodes so that the spacing from the gate electrode to the other electrodes is accurately reproduced in a plurality of field effect transistors comprising:

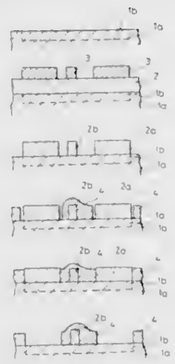
forming an electrically active region at a surface of a substrate;

depositing an electrically insulating layer on the surface of the substrate;

forming the electrically insulating layer, with a resist mask pattern, into portions covering regions of a substrate where (i) metal source and drain electrodes and (ii) a gate electrode are to be formed;

applying a first resist layer to the substrate and the portions;

removing the first resist layer by selective etching from only one of (i) the portion covering the gate electrode region and (ii) the portion covering the source and drain electrode region;



heating the first resist layer to fill any gaps between the first resist layer and the portion from which the first resist layer was not removed;

removing the portion not covered by the first resist layer to expose part of the surface and depositing an electrode metal on the exposed part of the surface and elsewhere on the incomplete device;

lifting off the metal from the incomplete device except from the portion from which the first resist layer was removed;

applying a second resist layer to the incomplete device and over the deposited metal;

removing the second resist layer by selective etching from the other of (i) the portion covering the gate electrode region and (ii) the portion covering the source and drain electrode region;

heating the second resist layer to fill any gaps between the second resist layer and the portion from which the second resist layer was not removed;

removing the portion not covered by the second resist layer to expose part of the surface and depositing an electrode metal on the exposed part of the surface and elsewhere on the incomplete device;

lifting off the metal from the incomplete device except from the portion from which the second resist layer was not removed.

4,902,647

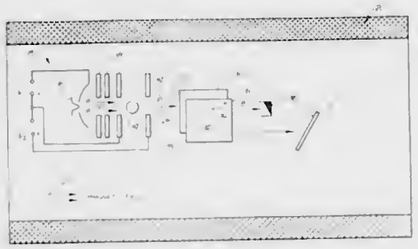
SURFACE MODIFICATION USING LOW ENERGY GROUND STATE ION BEAMS

Ara Chutjian, La Crescenta; Michael H. Hecht, Los Angeles, and Otto J. Orient, Glendale, all of Calif., assignors to The United States of American as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 21, 1988, Ser. No. 260,762

Int. Cl.[4] H01L *21/00, 21/02, 39/22;* **C23C** *15/00*

U.S. Cl. 437—239 **14 Claims**



1. A method of effecting changes at the surface of a semiconductor material in the fabrication of semiconductor devices comprising the steps of:

supplying a stream of molecules which will emit ions when bombarded with electrons;

bombarding the stream of molecules with electrons which have been accelerated to sufficient energy to produce a beam composed of ions in the ground state; and

directing the beam of ions in the ground state at the surface so as to effect changes at the surface without generating substantial heat.

4,902,648

PROCESS FOR PRODUCING A THERMOELECTRIC MODULE

Toshitaka Ohta, and Takenobu Kajikawa, both of Tsukuba, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jan. 3, 1989, Ser. No. 292,888

Claims priority, application Japan, Jan. 5, 1988, 63-573; Jan. 5, 1988, 63-574

Int. Cl.[4] H01L *35/28*

U.S. Cl. 437—247 **7 Claims**

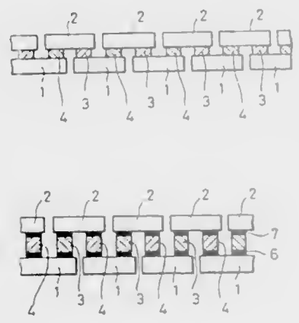
1. A process for producing a thermoelectric module, comprising the steps of:

disposing on a holder a plurality of electrode pieces to constitute a first electrode array, while separately disposing on another holder a plurality of electrode pieces to constitute a second electrode array;

forming a layer of a thermoelectric material of first conductive type on one end of the surface of each disposed electrode piece of said first electrode array, while separately forming a layer of a thermoelectric material of second conductive type, different from said first conductive type, on one end of the surface of each disposed electrode piece of said second electrode array;

positioning said first and second electrode arrays to alternately connect said electrode pieces of said first electrode array with said electrode pieces of said second electrode array in such a way that one end of each electrode piece of said first electrode array is connected with one end of an electrode piece of said second electrode array through the layer of said thermoelectric material of first conductive type while the other end of said each electrode piece of said first electrode array is connected with one end of another electrode piece of said second electrode array through the layer of said thermoelectric material of second conductive type; and

heating said positioned first and second electrode arrays and thermoelectric material layers to sinter said thermoelectric material layers to thereby form said thermoelectric module.



4,902,649

HARD TISSUE SUBSTITUTE COMPOSITION

Yoshitaka Kimura, Tokyo; Yuji Furuta, Shiojiri; Kunihiro Miyazaki, Shiojiri, and Tadashi Hiraiwa, Shiojiri, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 94,781

Claims priority, application Japan, Sep. 10, 1986, 61-211733; Nov. 1, 1986, 61-259617

Int. Cl.[4] C04B *35/00*

U.S. Cl. 501—1 **16 Claims**

1. A composition which is hardenable by a chelate reaction for use in forming a hard tissue substitute in situ comprising:

(A) a powder ingredient mainly comprised of $Ca_{n+2}(PO_4)_2O_{n-1}$ where n is from 1.9 to 4.8, and

(B) an aqueous solution of an organic acid or a polymer thereof,

wherein said aqueous solution (B) comprises from 25 to 60% by weight of said organic acid or polymer thereof, and wherein the composition is mixed in a ratio of 1.0 to 2.2 parts by weight of said powder ingredient (A) per 1.0 part by weight of said aqueous solution (B).

4,902,650

GRADIENT-INDEX GLASS

J. Brian Caldwell, and Duncan T. Moore, both of Rochester, N.Y., assignors to The University of Rochester, Rochester, N.Y.

Division of Ser. No. 59,960, Jun. 9, 1987, Pat. No. 4,797,376. This application Jul. 15, 1988, Ser. No. 219,503

Int. Cl.[4] C03C *4/00, 3/076, 3/083, 3/089*

U.S. Cl. 501—12 **5 Claims**

1. A gradient-index glass having a generally parabolic index of refraction about a central axis and which is produced from a sol-gel consisting essentially of at least three oxide components which are silicon dioxide (SiO_2) and, an index modifying dopant generally uniformly decreasing radially outward from the axis and consisting of a metal oxide selected from the group consisting of titanium oxide TiO_2) and zirconium oxide (ZrO_2) and at least one additional oxide element for gel modification selected from the group consisting of oxides of aluminum (Al_2O_3), boron (B_2O_3) and germanium (GeO_2), wherein said oxides are in an interconnected network and wherein the concentration of SiO_2 in the gel is between 60 and 98 mole percent of the total oxide content in the gel, the concentration of the index modifying dopant oxide in the gel is between 0.1 and 25 mole percent of the total oxide content in the gel, and the concentration of the additional metal oxide is less than 25 mole percent of the total oxide content in the gel.



4,902,651

MATERIAL FOR MAGNETIC HEAD SUBSTRATE MEMBER

Toshiaki Wada, Takatsuki; Mitsuhiko Furukawa; Masaharu Shiroyama, both of Fukuoka; Mitsuyoshi Nagano, Saga; Michito Miyahara, Fukuoka; Takashi Kitahira, Fukuoka, and Shigeki Mohri, Tosu, all of Japan, assignors to Sumitomo Special Metals, Co., Osaka and Nippon Tungsten Co., Ltd., Fukuoka, both of, Japan

Filed Mar. 3, 1987, Ser. No. 21,227

Claims priority, application Japan, Jun. 20, 1986, 61-144570; Sep. 5, 1986, 61-209100

Int. Cl.[4] C04B *35/56, 35/46, 35/10*

U.S. Cl. 501—87 **30 Claims**

1. A magnetic head substrate member having improved machinability and formed of a sintered material which is obtained by sintering a mixture consisting essentially of: 5 to 45% by weight of titanium carbide component; 0.2 to 10% by weight of zirconium oxide; 0.05 to 2% by weight of oxide of yttrium; 0.2 to 25% by weight of aluminum nitride; and the balance being Al_2O_3 component substituted with 0.5 to 8% by weight of at least one machinability agent selected from the group consisting of oxides of Mg, Ca, B, Ni and Cr and complex oxides thereof, wherein said oxide of yttrium is present in the form of a complex oxide with Al_2O_3 in the sintered material.

4,902,652

METHOD FOR PRODUCTION OF A SINTERED ARTICLE OF DIAMOND

Shoichi Kume, Tsushima; Haruo Yoshida, Nagoya; Kazutaka Suzuki, Nagoya; Yoshio Tasaki, Nagoya; Shiro Ikuta, Komaki; Masamitu Ishikawa, and Michihide Machida, both of Nagoya, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,307

Claims priority, application Japan, Jul. 10, 1987, 62-173386

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—90 **2 Claims**

1. A method for the production of a sintered article of diamond, which comprises (i) uniformly coating, by one method selected from the group consisting of ion sputtering

and ion plating, the surface of diamond particles with at least one member selected from the group consisting of the transition metals of Groups 4*a*, 5*a*, and 6*a* in the Periodic Table of Elements, boron, and silicon, to obtain coated diamond particles provided with 30 to 0.1% by volume of a coating layer; and (ii) solid-phase sintering said coated diamond particles, under temperature and pressure falling in the range in which diamond remains stable, to obtain a sintered article consisting of 70 to 99.8 volume % of diamond and 30 to 0.2 volume % of the carbide of said at least one member.

4,902,653

SILICON NITRIDE CERAMIC ARTICLE

Michiyasu Komatsu, and Hiroyasu Ohta, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 6, 1988, Ser. No. 203,648
Claims priority, application Japan, Dec. 25, 1985, 60-290718
Int. Cl.[4] C04B *35/50, 35/58*
U.S. Cl. 501—97 **1 Claim**

1. A sintered silicon nitride ceramic article, consisting essentially of not more than 10% by weight (excluding the 0 content) of an oxide of a rare earth element, not more than 5% by weight (excluding the 0 content) of hafnium oxide, not more than 5% by weight (excluding the 0 content) of aluminum nitride, and the balance being silicon nitride.

4,902,654

MIXED LANTHANIDE-MAGNESIUM ALUMINATES AND LASERS USING MONOCRYSTALS OF THESE ALUMINATES

Jean-Jacques Aubert, Le Fontanil; Anne-Marie Lejus, Montrouge; Bruno Viana, Mandres-les-Roses, and Daniel Vivien, Garches, all of France, assignors to Commissariat a l'Energie Atomique and Centre National de la Recherche Scientifique (CNRS), both of Paris, France

Filed Jun. 16, 1987, Ser. No. 62,882
Claims priority, application France, Jun. 16, 1986, 86 08660
The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.
Int. Cl.[4] C04B *46/02, 35/04*
U.S. Cl. 501—117 **7 Claims**

1. A mixed lanthanide-magnesium aluminate of the formula:

$$(La_{1-x}Tr_x)_{1-y-u}Mg_{1-z-t}Al_{11-u+y+2z/3}Cr_vO_{19-t-3v/2}$$

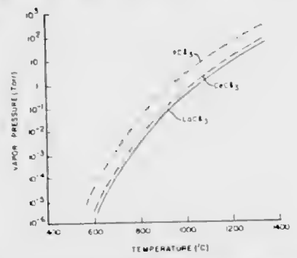
in which Tr represents (a) at least one single trivalent substance chosen from among yttrium, scandium and lanthanides other than lanthanum or (b) at least one pair of lanthanides other than lanthanum formed from a divalent element and a trivalent element, whilst retaining the electrical neutrality by adding aluminum or oxygen deficiencies, or any combination of said single substance and pairs; x represents a number such that $0 \leqq x < 1$; y and v represent numbers such that $0 \leqq y+v \leqq 0.4$; z and t represent numbers such that $0 \leqq z+t < 1$, provided that when $z+t=0$, $y+v$ is $\neq 0$ and when $y+v=0$, $z+t$ is $\neq 0$ for Tr representing a single trivalent lanthanide provided that t or v $\neq 0$ when Tr is a single trivalent lanthanide when $x=0$; u represents a number from 0 to 2, provided that when Tr represents Y^{3+} or Sc^{3+}, u is $\neq 0$, that when $x=0$ u is $\neq 0$ and that when $u=0$, x is $\neq 0$ said aluminate being a monophase and having the structure of magnetoplumbite.

4,902,655

PREPARATION OF PRECURSORS FOR YTTRIUM-CONTAINING ADVANCED CERAMICS

Thomas S. Snyder, Oakmont, and Richard A. Stolz, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1987, Ser. No. 121,012
Int. Cl.[4] C01F *7/00*
U.S. Cl. 501—152 **7 Claims**



1. A process for extracting a blend of rare earths for components of a ceramics principally comprising at least one of zirconia or hafnium from a rare earth ore containing rare earth values and using said blend or rare earths in preparing a composite for use in fabrication of an ceramics containing oxides of the blend of rare earths, said process comprising:

a. feeding at least a portion of the rare earth ore to a fluidized bed chlorinator at 800°–1250° C. to produce rare earth chlorides from said rare earth values contained in said ore;

b. separating a blend of yttrium-depleted rare earth chlorides from yttrium chloride by-product, with said yttrium chloride by-product being separated by differential condensation from said blend of rare earth chlorides at 725°–1200° C.;

c. anhydrously reacting said separated blend of rare earth chlorides with at least one of alkoxide reactant selected from the group consisting of the alkali metal alkoxides to produce blend rare earth alkoxides and separating said blended rare earth alkoxides from reaction by-products and excess reagents;

d. mixing said rare earth alkoxide with at least one of zirconium and hafnium alkoxide, to produce an alkoxide composite; and

e. polymerizing and processing said composite into ceramic.

4,902,656

METHOD FOR MANUFACTURE OF OXIDE CERAMIC BODIES WITH A HIGH SURFACE AREA-TO-MASS RATIO AND HIGH STRENGTH

Herbert E. Erkens, An der Esche 8, 4050 Mönchengladbach 2, Fed. Rep. of Germany

Continuation of Ser. No. 870,538, Jun. 4, 1986, abandoned. This application Sep. 23, 1988, Ser. No. 249,199
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3519932
Int. Cl.[4] C04B *35/10*
U.S. Cl. 501—153 **7 Claims**

1. A method for the manufacture of monocrystalline oxide ceramic bodies comprising:

forming a mixture of (1) an aluminumm oxide (2) a fluoride component consisting of one or more fluoride compounds selected from the group consisting of alkali metal-aluminum fluorides and alkaline earth metal-aluminum fluorides capable of forming a eutectic, eutectoid or peripectic phase system with said aluminum oxide, and (3) a halide component consisting of one or more halide compounds selected from the group consisting of alkaline earth metal chlorides, bromides and iodides and alkali metal chlorides, bromides and iodides;

melting said mixture to fuse the same and heating the fused melt to not more than 1300° C.;

cooling the fused mixture with uni-directional solidification; and

removing halides from the cooled mixture by solvent extraction.

4,902,657

SYNTHETIC ALKALI METAL ALUMINO-SILICATES, METHODS AND USES, COMPOSITIONS AND THEIR METHODS OF PREPARATION

Satish K. Wason, Macon, Ga., assignor to J. M. Huber Corporation, Rumson, N.J.

Division of Ser. No. 116,805, Nov. 3, 1987, Pat. No. 4,812,299, which is a continuation-in-part of Ser. No. 875,120, Jun. 17, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 299,278
Int. Cl.[4] B01J *20/16, 21/16*
U.S. Cl. 502—63 **11 Claims**

1. A catalyst composition comprising an ion exchanged alkali metal alumino-silicate composition, the alkali metal alumino-silicate having a composition in terms of mole ratio of oxides as follows:

$$xM_2O:Al_2O_3:ySiO_2:zH_2O$$

wherein x is the number of moles of alkali metal oxide and is an integer of 0.01 to 2.0, M is an alkali metal, y is the number of moles of SiO_2 associated with the compositions and is an integer of 2.0 and 20.0, and z is the number of moles of bound water and is an integer of 1.0 to 5.0, wherein primary particles of said alkali metal alumino-silicate comprise a core of clay platelets having an integral adjacent area of essentially amorphous alkali metal silicate base-kaolin clay reaction product, said alkali metal alumino-silicate composition having been ion exchanged with hydrogen or ammonium.

4,902,658

ALKOXYLATION USING HETEROGENEOUS CALCIUM CATALYSTS AND PRODUCTS THEREFROM

Stephen W. King, Scott Depot, and Robert J. Knopf, St. Albans, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1987, Ser. No. 102,939
Int. Cl.[4] B01J *31/06*
U.S. Cl. 502--159 **25 Claims**

1. A method for providing an alkoxylation catalyst comprising:

(a) preparing a catalyst precursor by reacting an organic polymer which has a crosslinked and microporous, macroporous or physically expanded structure with a carbocyclic or heterocyclic compound;

(b) solubilizing, at least partially, calcium oxide, calcium hydroxide, or mixtures thereof, by mixing any of them with an activator having the formula

$$Z_a—X—Q—Y—Z'_b$$

wherein X and Y are the same or different electronegative, hetero-atoms selected from the group consisting of oxygen, nitrogen, sulfur and phosphorus; a and b are the same or different integers satisfying the valency requirements of X and Y; Q is an organic radical which is electropositive or essentially neutral relative as to X and/or Y; Z and Z' are the same or different and are either hydrogen or an organic radical which does not prevent said solubilizing, thereby forming a calcium-containing, composition which has titratable alkalinity; and

(c) reacting the catalyst precursor with the calcium-containing composition under effective reaction conditions to chemically bond the calcium atom to the polymer through a carbocyclic or heterocyclic linkage.

4,902,659

PREPARATION OF IMPROVED NICKEL-CONTAINING CATALYST AND PROCESS FOR CONVERSION OF ALCOHOLS TO CARBOXYLIC ACIDS THEREWITH

Ashutosh A. Kelkar; Rengaswamy Jaganathan; Devidas S. Kolhe, and Raghunath V. Chaudhari, all of Pune, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Filed Jul. 12, 1988, Ser. No. 217,948
Int. Cl.[4] B01J *31/22*
U.S. Cl. 502—167 **37 Claims**

1. In a process for the preparation of an improved nickel-containing catalyst suitable for the conversion of alcohols to the corresponding carboxylic acids which involves combining a nickel compound, an N-containing organic compound and an iodine promoter, bringing the combination into contact with an alcohol in the presence of carbon monoxide and subjecting the mixture to a temperature and pressure sufficient to initiate carbonylation of the alcohol and the instantaneous production in situ of said catalyst as an interactive composite of the nickel compound, N-containing organic compound and iodine promoter, the improvement comprising employing isoquinoline as the N-containing organic compound.

4,902,660

CATALYST FOR OXIDATION OF CARBON MONOXIDE

Gary A. Delzer, Bartlesville, and John H. Kolts, Ochelata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 160,721, Feb. 26, 1988. This application Jan. 30, 1989, Ser. No. 303,888
Int. Cl.[4] B01J *21/04, 21/10, 23/89, 27/20*
U.S. Cl. 502—174 **35 Claims**

1. A composition of matter, which is active as a catalyst for the oxidation of carbon monoxide, comprising hydrotalcite as support material, platinum metal and iron oxide.

4,902,661

RHODIUM CATALYSTS, PROCESS FOR THEIR PREPARATION AND PROCESS FOR THE PREPARATION OF SUBSTITUTED OR UNSUBSTITUTED DIPHENYLAMINE BY USING THE RHODIUM CATALYSTS

Otto Immel, and Hans-Helmut Schwarz, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 9, 1989, Ser. No. 294,833
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1988, 3801754
Int. Cl.[4] B01J *21/18, 27/053, 20/00*
U.S. Cl. 502—184 **14 Claims**

1. A catalyst containing rhodium and at least one other platinum metal from the group consisting of palladium, platinum and iridium on supports containing the noble metals in a total amount of 0.05–5% by weight, the percentage by weight of rhodium with respect to all noble metals being 10–90%, and furthermore containing additives of 1–6% by weight of an alkali metal hydroxide and 1–6% by weight of an alkali metal sulphate, all percentages being based on the total weight of the catalyst.

4,902,662

PROCESSES FOR PREPARING AND REGENERATING A COPPER CONTAINING MERCURY COLLECTING SOLID MASS

Hervé Toulhoat, Houilles; Michel Roussel, Antony, and Philippe Varin, Massy, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 25, 1988, Ser. No. 198,792
Claims priority, application France, May 26, 1987, 87 07442; May 26, 1987, 87 07443
Int. Cl.[4] B01J *27/04, 20/08;* B01D *53/14, 15/06*
U.S. Cl. 502—216 15 Claims

1. A process for preparing a mercury recovery solid mass comprising a solid inorganic carrier and copper, at least partly as copper sulfide, characterized in that it comprises the steps of:

(a) incorporating at least one copper compound other than a sulfide with a solid inorganic carrier or dispersing agent,

(b) optionally roasting the product obtained in step (a) so as to convert at least partly the one or more copper compounds contained therein to copper oxide,

(c) incorporating with the resultant product from step (b) or from step (a) at least one organic polysulfide of formula $R\text{-}S_{(n)}\text{-}R'$, wherein n is an integer from 2 to 20, R is a hydrogen atom or an organic radical containing 1–150, carbon atoms, selected from the group consisting of saturated or unsaturated, linear or branched alkyl radicals, naphthenic radicals, aryl radicals, alkylaryl and arylalkyl radicals, and R' is an organic radical, identical to or different from R, having 1–150 carbon atoms, selected from the group of the organic radicals defined for R, and

(d) subjecting the resultant precursor product from step (c) to a thermal treatment in non-oxidizing atmosphere, under gas scavenging conditions, at a sufficient temperature and for a sufficient time to form copper sulfide.

4,902,663

ACTIVE AMORPHOUS MIXED OXIDES

Clarence D. Chang, Princeton, and Cynthia T-W. Chu, Princeton Junction, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Oct. 28, 1987, Ser. No. 113,317
Int. Cl.[4] B01J *21/00*
U.S. Cl. 502—242 11 Claims

1. A method for manufacturing an amorphous mixed oxide containing silica and having an Alpha Value of greater than 1 which comprises steps of (1) extruding a mixture of amorphous silica and one or more amorphous oxides of elements selected from the group consisting of Periodic Table groups IIA, IIIA, VA, VIII, IIIB, IVB and VB, (2) treating the extrudate of step (1) with an aqueous alkali solution or alkaline earth solution of from about 0.2M to about 10M at a temperature of from about 40° C. to reflux, (3) treating the product of step (2) with an aqueous ammonium exchange solution and (4) calcining the product of step (3).

4,902,664

THERMALLY STABILIZED CATALYSTS CONTAINING ALUMINA AND METHODS OF MAKING THE SAME

Chung-Zong Wan, Somerset, N.J., assignor to Engelhard Corporation, Edison, N.J.

Continuation of Ser. No. 85,903, Aug. 13, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 282,925
Int. Cl.[4] B01J *23/00*
U.S. Cl. 502—300 32 Claims

1. A catalyst comprising (a) activated alumina, (b) a substantially water-insoluble bulk stabilizer selected from the group consisting of one or more of strontium sulfate and barium sulfate, the bulk stabilizer being present in an amount sufficient to stabilize the activated alumina against thermal degradation; and (c) a catalytic component dispersed on the activated alumina.

4,902,665

REMOVAL OF HEAVY METALS AND HEAVY METAL RADIOACTIVE ISOTOPES FROM LIQUIDS

Geraldine S. Elftine, Morrison, Ill., assignor to Iso-Clear Systems Corporation, Oak Ridge, Tenn.

Division of Ser. No. 892,960, Aug. 4, 1986, Pat. No. 4,800,024, which is a continuation-in-part of Ser. No. 849,152, Apr. 7, 1986, Pat. No. 4,764,281. This application Jul. 29, 1988, Ser. No. 225,936
Int. Cl.[4] B01J *20/26*
U.S. Cl. 502—402 25 Claims

1. A method of manufacturing a heavy metal-removing mixture of a water-penetrable, insoluble carboxylated cellulose and a plurality of insoluble particles of a heavy metal interactant comprising:

dispersing solid particles of a heavy metal interactant in a carrier liquid;

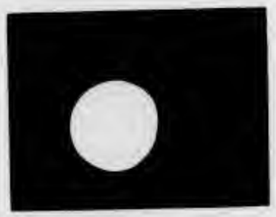
cross-linking a water-soluble form of a carboxylated cellulose to insolubilize the carboxylated cellulose while in close proximity to said heavy metal interactant particles and entrap some of the heavy metal interactant particles within the insolubilized carboxylated cellulose to form said heavy metal-removing mixture.

4,902,666

PROCESS FOR THE MANUFACTURE OF SPHEROIDAL BODIES BY SELECTIVE AGGLOMERATION

Andrew Rainis, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 881,156, Jul. 2, 1986, Pat. No. 4,737,478. This application Jan. 11, 1988, Ser. No. 142,892
Int. Cl.[4] B01J *35/08*
U.S. Cl. 502—439 8 Claims



1. A spheroidal agglomerate body having a polylobed external surface comprising a multiplicity of closely packed contiguous, substantially spherical agglomerates formed from micron-sized inorganic solid particles, said substantially spherical agglomerates each having a diameter ranging from about 0.05 mm to 0.2 mm, and said substantially spherical agglomerates being fused together at their areas of contact to form the resultant spheroidal polylobe agglomerate body with overall diameter of 0.5 mm or greater.

4,902,667

PRESSURE SENSITIVE CARBONLESS IMAGING SYSTEM INCORPORATING UNCOLORED FERRIC ORGANOPHOSPHATES AND UNCOLORED CHELATES

David R. Whitecomb, and Loren D. Albin, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 25, 1988, Ser. No. 236,659
Int. Cl.[4] B41M *5/16, 5/22*
U.S. Cl. 503—201 23 Claims

22. A method of generating a visible image on the surface of a substrate, said image comprising a representation of the characteristic pattern of raised and recessed portions of the external surface of the skin covering the hands, fingers, feet and toes of the human body, comprising:

(a) providing a first substrate, selected from the group consisting of the hands, fingers, feet and toes of the human body, having coated thereon a component comprising a colored chelate selected from aromatic or alkyl ligands having either neutral donors or at least one ionizable hydrogen, or both, and which react with iron (III) to form colored complexes;

(b) providing a second substrate having coated thereon a component comprising a colorless ferric iron compound selected from ferric organophosphates, ferric organophosphinates and ferric organophosphonates which react with said colorless chelate upon contact to form a visible color; and

(c) pressing said first and second substrates together such that said colorless chelate contacts said colorless ferric iron compound and reacts therewith to form a visible colored image on the surface of said second substrate comprising a representation of said characteristic pattern on the surface of said first substrate.

4,902,668

PRESSURE SENSITIVE CARBONLESS IMAGING SYSTEM INCORPORATING UNCOLORED FERRIC ORGANOPHOSPHATES AND COLORED CHELATES

David R. Whitcomb, Woodbury, and Loren D. Albin, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 25, 1988, Ser. No. 236,658
Int. Cl.[4] B41M *5/16, 5/22*
U.S. Cl. 503—201 22 Claims

21. A method of generating a visible image on the surface of a substrate, said image comprising a representation of the characteristic pattern of raised and recessed portions of the external surface of the skin covering the hands, fingers, feet and toes of the human body, comprising:

(a) providing a first substrate, selected from the group consisting of the hands, fingers, feet and toes of the human body, having coated thereon a component comprising a colored chelate selected from aromatic or alkyl ligands having either neutral donors or at least one ionizable hydrogen, or both and which react with iron (III) to form colored complexes;

(b) providing a second substrate having coated thereon a component comprising a colorless ferric iron compound selected from ferric organophosphates, ferric organophosphinates and ferric organophosphonates which react with said colored chelate upon contact to form a visible color; and

(c) pressing said first and second substrates together such that said colored chelate contacts said colorless ferric iron compound and reacts therewith to form a visible colored image on the surface of said second substrate comprising a representation of said characteristic pattern on the surface of said first substrate.

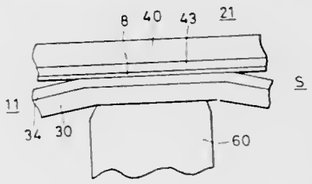
4,902,669

THERMAL DYE TRANSFER PRINTING SYSTEMS, THERMAL PRINTING SHEETS, AND DYE RECEIVING SHEETS

Hiromu Matsuda, Osaka; Nobuyoshi Taguchi; Akihiro Imai, both of Ikoma, and Keiichi Yubakami, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 24, 1986, Ser. No. 889,076
Claims priority, application Japan, Jul. 24, 1985, 60-163411; Jul. 24, 1985, 60-163413; Jul. 24, 1985, 60-163414; Jul. 24, 1985, 60-163415
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 2 Claims

1. A thermal printing system, comprising (a) a dye transfer sheet having a thin substrate and a dye carrier layer formed on the substrate, said dye carrier layer comprising a mixture of at least one sublimable dye and a binder, and (b) a dye acceptor sheet having a substrate and a dye-receiving layer formed on the substrate, the dye-receiving layer being capable of receiving the sublimable dye which sublimates on heating of the dye transfer sheet, the dye carrier layer and the dye-receiving layer being arranged to face one another with a slippage means therebetween during a thermal transfer printing process in which the dye transfer sheet is fed to a thermal printing means at a speed lower than the speed at which the dye acceptor sheet is fed to the thermal printing means, said slippage means comprising a lubricating layer formed on the dye-receiving layer, said lubricating layer being made of a composition comprising a cured resin and a liquid lubricant, whereby when the dye carrier layer is heated in an imagewise pattern, the sublimable dye sublimates from the dye carrier layer and deposits on the dye-receiving layer according to the imagewise pattern without sticking of the dye transfer sheet and the dye acceptor sheet.

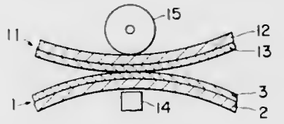


4,902,670

HEAT TRANSFER SHEET

Jumpei Kanto, Komae; Masanori Akada, Ota; Katsuhiro Kamakari, Shinjuku; Kenichi Asahina; Katsuaki Sakashita, both of Shiga, and Yoshihisa Watanabe, Uji, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo and Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, both of, Japan

Filed Dec. 11, 1987, Ser. No. 132,001
Claims priority, application Japan, Dec. 15, 1986, 61-298505; Feb. 27, 1987, 62-45463
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 4 Claims



1. A heat transfer sheet comprising a substrate sheet and a heat transfer layer laminated on the substrate sheet and containing a dye which can be caused to migrate by heating to be transferred onto a transfer receptor sheet, said heat transfer sheet containing a polyvinyl acetacetal resin as a binder component, the acetalated moiety of said polyvinyl acetacetal resin being 50% by weight or more based on the total amount of said resin, and 80% by weight or more of the repeating units of said resin are the acetal acetalated moiety.

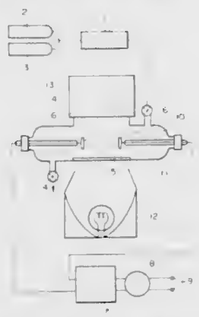
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4,902,671

MANUFACTURING METHOD OF CONDUCTIVE OR SUPERCONDUCTIVE THIN FILM

Hideomi Koinuma; Kazuo Fueki; Masashi Kawasaki, and Shunroh Nagata, all of Tokyo, Japan, assignors to Kawatetsu Mining Co. Ltd., Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 159,987
Claims priority, application Japan, Feb. 24, 1987, 62-39182
Int. Cl.[4] H01L *39/00*
U.S. Cl. 505—1 5 Claims



1. A manufacturing method of a conductive or superconductive thin film which comprises using a mixed oxide composition showing conductivity or superconductivity as a target material and sputtering it on a substrate to form a thin film, then irradiating the thin film with ultraviolet light or vacuum ultraviolet light in an oxygen atmosphere.

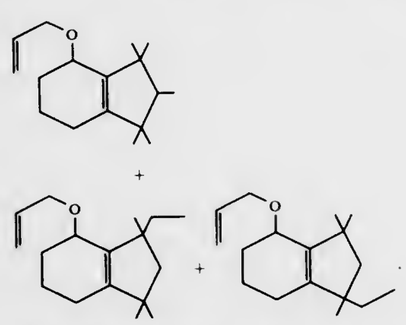
4,902,672

POLYALKYL INDANYL N-PROPYL AND ALLYL ETHERS AND PERFUMERY USES THEREOF

Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge, and Ronald S. Fenn, Bridgewater, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jun. 26, 1989, Ser. No. 371,294
Int. Cl.[4] A61K *7/46*
U.S. Cl. 512—19 4 Claims

1. A mixture of compounds defined according to the structures:



3. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of intimately admixing with a perfume base, a cologne base or a perfumed article base, an aroma augmenting or enhancing quantity of the composition of matter defined according to claim 1.

4,902,673

ENHANCING GROWTH OF BIFIDOBACTERIA USING SOYBEAN EXTRACT

Kunihiko Hayakawa, Tokyo; Teruhisa Masai; Yasuyuki Yoshida, both of Kanagawa; Takanobu Shibuta, and Hiroshi Miyazaki, both of Tokyo, all of Japan, assignors to The Calpis Food Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 943,206, Dec. 15, 1986, abandoned.
This application Nov. 9, 1988, Ser. No. 270,469
Claims priority, application Japan, Dec. 27, 1985, 60-292425
Int. Cl.[4] A61K *35/78*; C07K *3/02, 3/28*
U.S. Cl. 514—21 5 Claims

1. A method promoting the growth of bifidobacteria, comprising the steps of culturing bifidobacteria in the presence of a growth promoting amount of a bifidobacteria growth promoter produced by steps including:

mixing defatted soybean flakes with an aqueous solution of alcohol of a concentration of 20 to 80% by volume in the ratio 1:5 to 10 by weight;

stirring the mixture;

obtaining a supernatant alcohol-containing extract by removing insoluble materials from the mixture by filtration or centrifugation; and

concentrating the supernatant by distillation under reduced pressure.

4,902,674

METHOD FOR INHIBITING THE GROWTH OF SALMONELLA

Robert M. Speights, Arvada, Colo., assignor to Coors Biotech, Inc., Westminster, Colo.

Filed Oct. 13, 1987, Ser. No. 107,115
Int. Cl.[4] A61K *33/00, 31/70*
U.S. Cl. 514—23 23 Claims

1. A method for inhibiting the growth of Salmonella, comprising contacting said Salmonella with a composition comprising a fructo-oligosaccharide.

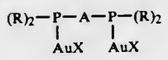
4,902,675

"2-PYRIDYL AND 4-PYRIDYL PHOSPHINE GOLD (I) ANTI TUMOR COMPLEXES"

David T. Hill, North Wales, and Randall K. Johnson, Ardmore, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 829,359, Feb. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 734,524, May 16, 1985, abandoned. This application Apr. 4, 1986, Ser. No. 848,670
Int. Cl.[4] C07F *1/12*; A61K *31/555, 31/70*
U.S. Cl. 514—24 20 Claims

1. A compound of the formula:



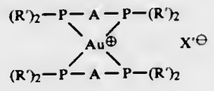
wherein:

R is 2-pyridyl or 4-pyridyl;

A is a straight or branched alkanediyl chain of from one to six carbon atoms; and

X is halo or thiosugar.

7. A compound of the formula:



wherein

R' is 2-pyridyl;

A is a straight or branched alkanediyl chain of from one to six carbon atoms; and

X' is halo.

9. A pharmaceutical composition which comprises an effective tumor cell-growth inhibiting amount of an active ingredient and an inert, pharmaceutically acceptable carrier or diluent, wherein said composition is useful for inhibiting the growth of animal tumor cells sensitive to the active ingredient, and wherein the active ingredient is a compound of claim 1.

17. A pharmaceutical composition which comprises an effective tumor cell-growth inhibiting amount of an active ingredient and an inert, pharmaceutically acceptable carrier or diluent, wherein said composition is useful for inhibiting the growth of animal tumor cells sensitive to the active ingredient, and wherein the active ingredient is a compound of claim 7.

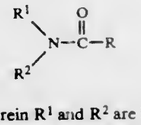
4,902,676

COMPOSITIONS COMPRISING N,N-DIALKYLALKANAMIDES

James V. Peck, Costa Mesa, and Gevork Minaskanian, Irvine, both of Calif., assignors to Nelson Research & Development Co., Irvine, Calif.

Filed Sep. 29, 1986, Ser. No. 912,947
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[4] A61K *31/56, 31/70, 31/165, 31/505*
U.S. Cl. 514—29 14 Claims

1. A method for enhancing penetration of an effective amount of a pharmaceutically useful agent through the skin or mucosal membrane of a human or animal and for retaining said agent in the body tissues, said method comprising contacting said skin or mucosal membrane with an effective amount of said pharmaceutically useful agent in the presence of an effective non-toxic penetration enhancing amount of at least 0.01% by weight of a compound having the structural formula:



wherein R^1 and R^2 are independently selected from the group consisting of alkyl and cycoalkyl radicals comprising from 1 to 20 carbon atoms and R is selected from the group consisting of alkyl and cycloalkyl radicals comprising from 1 to 30 carbon atoms; provided, however, that the total number of carbon atoms in said compound is 15 or more and the total number of carbon atoms in R^1 and R^2 is 5 or more.

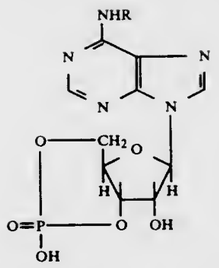
4,902,677

TREATMENT OF HEART FAILURE OF MAMMALS WITH N[6]-SUBSTITUTED CYCLIC ADENOSINE MONOPHOSPHATES

Shoichi Imai, Kanagawa; Shigehiro Kataoka, Kashiwa; Junko Isono, Matsudo; Nobuyuki Yamaji, and Motohiko Kato, both of Noda, all of Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Feb. 24, 1988, Ser. No. 159,747
Claims priority, application Japan, Feb. 25, 1987, 62-40121
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—47 9 Claims

1. A method for the treatment of heart failure of a mammal which comprises administering, per kilogram of body weight of said mammal, 0.002 to 60 mg per day of an N^6-substituted-adenosine-3',5'-cyclic phosphate represented by the following general formula or a physiologically acceptable salt thereof:



wherein R represents an alkyl group selected from the group consisting of ethyl, propyl, isopropyl, butyl, isobutyl, pentyl, isopentyl, hexyl, isohexyl, cyclohexyl, heptyl, isoheptyl, octyl, isooctyl, nonyl, isononyl, decyl, undecyl, dodecyl, tridecyl, and tetradecyl group, or an aralkyl group selected from the group consisting of furfuryl, benzyl, phenethyl, chlorobenzyl, hydroxybenzyl, methylbenzyl and methoxybenzyl.

4,902,678

ANTI-VIRAL COMPOSITIONS

Kendall O. Smith, San Antonio, Tex., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 892,750, Jul. 29, 1986, abandoned, which is a continuation of Ser. No. 780,727, Sep. 27, 1985, abandoned, which is a continuation of Ser. No. 544,835, Oct. 5, 1983, abandoned. This application Apr. 5, 1988, Ser. No. 175,643
Int. Cl.[4] A61K *31/70, 31/66, 31/52*
U.S. Cl. 514—45 11 Claims

1. A therapeutic composition having activity against herpes viral infections and comprising, in combiantion:

9-[[2-hydroxy-1-(hydroxymethyl)-ethoxy]methyl[guanine, as a first active component, and

a second active component selected from the group consisting of phosphonoacetic acid and pharmaceutically acceptable salts thereof, phosphonoformic acid and pharmaceutically acceptable salts thereof, acycloguanosine, and a 5-(2-halogenovinyl)2'-deoxyuridine;

said first and second active components being present in antivirally active relative synergistic amounts from a ratio of about 1:200 to about 1:1 on a molar basis.

4,902,679

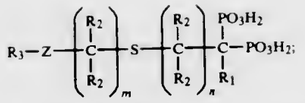
METHODS OF TREATING DISEASES WITH CERTAIN GEMINAL DIPHOSPHONATES

James J. Benedict, Norwich, N.Y., and Christopher M. Perkins, Cincinnati, Ohio, assignors to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Filed Dec. 13, 1985, Ser. No. 808,584
Int. Cl.[4] A61K *31/675*
U.S. Cl. 514—86 19 Claims

1. A method for treating a non-inflammatory disease characterized by abnormal calcium and phosphate metabolism selected from the group consisting of osteoporosis, Paget's disease, hyperparathyroidism, hypercalcemia of malignancy, osteolytic bone metastases, myositis ossificans progressiva and calcinosis universalis, comprising administering to a human or animal in need of such treatment a safe and effective amount of a pharmaceutical composition comprising from about 0.1 mg P to about 600 mg P of a geminal diphosphonic acid compound, or a pharmaceutically-acceptable salt or ester thereof, having the structure:

VOL 1111 ISS 3 FE 20 19 90 UMI



wherein Z is a 6-membered aromatic ring containing one or more nitrogen atoms; m +n is an integer from 0 to about 5; R_1 is hydrogen, substituted or unsubstituted amino, amido, hydroxy, alkoxy, halogen, carboxylate, substituted or unsubstituted, saturated or unsaturated alkyl having from 1 to about 6 carbon atoms, substituted or unsubstituted aryl, or substituted or unsubstituted benzyl, except that when n =0, then R_1 is hydrogen, substituted or unsubstituted, saturated or unsaturated alkyl having from 1 to about 6 carbon atoms, substituted or unsubstituted aryl, or substituted or unsubstituted benzyl; $R_2$is hydrogen, or substituted or unsubstituted, saturated or unsaturated alkyl having from 1 to about 4 carbon atoms; R_3 is one or more substituents selected from the group consisting of hydrogen, substituted and unsubstituted, saturated or unsaturated alkyl having from 1 to about 6 carbon atoms, substituted and unsubstituted aryl, substituted and unsubstituted benzyl, hydroxy, halogen, carbonyl, alkoxy, nitro, amido, amino, substituted amino, carboxylate, and combinations thereof.

4,902,680

TREATING CENTRAL NERVOUS SYSTEM DISEASES

Chaovanee Aroonsakul, 6907 S. Constance, Chicago, Ill. 60649

Continuation of Ser. No. 156,242, Feb. 16, 1988, which is a continuation-in-part of Ser. No. 666,254, Oct. 29, 1984, Pat. No. 4,791,099, which is a continuation-in-part of Ser. No. 852,645, Apr. 16, 1986, Pat. No. 4,727,041. This application Jan. 3, 1989, Ser. No. 293,017

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—171 **5 Claims**

1. A method for treating central nervous system diseases in human beings said diseases selected from Sensile Dementia Parkinson's disease, cerebral atrophy, Alzheimer's disease, cerebellar atrophy, senile tremor, and essential tremor, comprising:

including into the blood stream of the human being suffering from the disease an effective dose of at least one of a gonadatropin and chorionic gonadotropin.

4,902,681

INHIBITION OF IMMUNE CLEARANCE USING PROGESTERONE ANALOGUES

Alan D. Schreiber, Philadelphia, Pa., assignor to University of Pennsylvania, Philadelphia, Pa.

Filed Aug. 27, 1987, Ser. No. 89,790

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—177 **13 Claims**

1. A method of inhibiting the clearance of antibody-coated cells from the circulation of mammals comprising administering to a mammal exhibiting undesired clearance of antibody-coated cells an effective amount of a compound selected from the group consisting of 17-hydroxyprogesterone and 16-methylprogesterone.

4,902,682

W/O CREAM CONTAINING HYDROCORTISONE DIESTER

Henning Sattler, Hamburg, and Bodo Asmussen, Ammersbek, both of Fed. Rep. of Germany, assignors to Beiersdorf AG, Hamburg, Fed. Rep. of Germany

Filed Sep. 5, 1986, Ser. No. 904,538

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534742

Int. Cl.[4] A61K *47/00*

U.S. Cl. 514—179 **7 Claims**

1. A water-in oil cream containing hydrocortisone diester, characterized in that it contains

0.01–0.5% of hydrocortisone diester,

1–10% of beeswax or beeswax substitute,

1–25% of liquid paraffin,

25–75% of white vaseline,

0–2% of aluminium stearate,

2–20% of W/O emulsifier based on straight-chain and branched hydrocarbons, glyceryl oleate and wool wax alcohols or polyglyceryl-4 isostearate and hydrogenated castor oil,

0–2% of hydrated magnesium sulphate and

10–60% of water.

6. A method of treating a patient afflicted with a skin inflammation, psoriasis or eczema which comprises applying to such patient's skin an amount effective therefor of a cream according to claim 1.

4,902,683

CRYSTALLINE CEPHALOSPORIN HYDROHALIDE SALTS

Mahendra I. Amin, Kalamazoo, and Jay A. Campbell, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

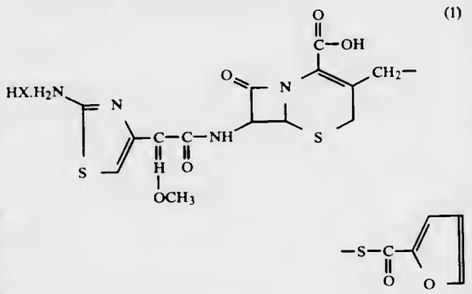
Continuation of Ser. No. 898,676, Aug. 21, 1986, abandoned, which is a continuation of Ser. No. 664,651, Oct. 25, 1984, abandoned. This application Feb. 17, 1989, Ser. No. 312,401

Int. Cl.[4] C07D *501/36;* **A61K** *31/545*

U.S. Cl. 514—206 **13 Claims**

1. A cephalosporin hydrohalide compound of the formula

(1)



where X is chloride or bromide.

4,902,684

BENZAZEPINE AND BENZOTHIAZEPINE DERIVATIVES

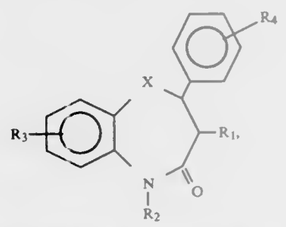
David M. Floyd, Pennington; John T. Hunt, Princeton; Spencer D. Kimball, East Windsor; John Krapcho, Somerset; Jagabandhu Das, Hamilton Square; George C. Rovnyak, Hopewell, all of N.J., and Joel C. Barrish, Holland, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 208,521, Jun. 20, 1988, abandoned. This application May 22, 1989, Ser. No. 353,806

Int. Cl.[4] A61K *31/55;* **C07D** *281/10, 223/16*

U.S. Cl. 514—211 **43 Claims**

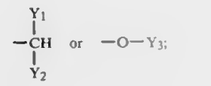
1. A compound having the formula



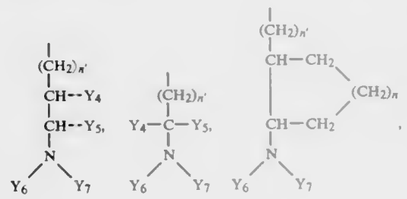
and the pharmaceutically acceptable salts thereof, wherein

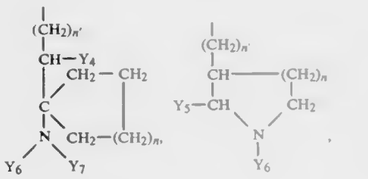
X is $-CH_2-$ or $-S-$;

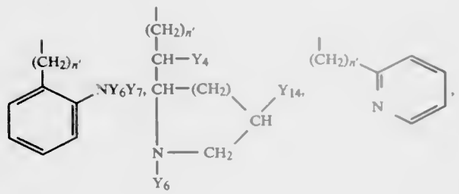
R_1 is



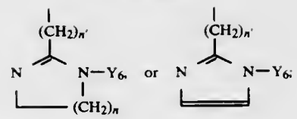
when X is $-CH_2-$, R_2 is



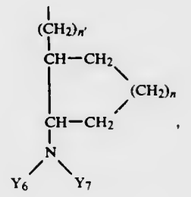


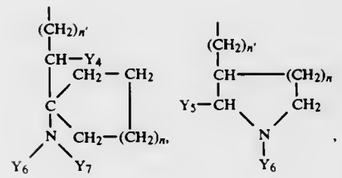


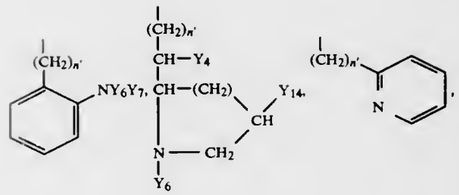
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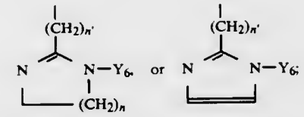


when X is $-S-$, R_2 is

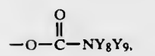




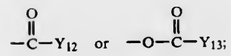




R_3 and R_4 are each independently hydrogen, halogen, alkyl, alkoxy, aryloxy, arylalkoxy, arylalkyl, cyano, hydroxy, alkanoyloxy,



fluoro substituted alkoxy, fluoro substituted alkyl, (cycloalkyl)alkoxy, $-NO_2$, $-NY_{10}Y_{11}$, $-S(O)_m$alkyl, $-S(O)_m$aryl,

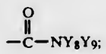


n or n' are independently 0, 1, 2 or 3; m is 0, 1 or 2;

Y_1 and Y_2 are independently hydrogen or alkyl, Y_1 is hydrogen and Y_2 is alkenyl, alkynyl, aryl, heteroaryl, or cycloal-

kyl, or Y_1 and Y_2 together with the carbon atom to which they are attached are cycloalkyl;

Y_3 is hydrogen, alkyl, alkanoyl, alkenyl, arylcarbonyl, heteroarylcarbonyl, or

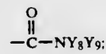


Y_4 and Y_5 are each independently hydrogen, alkyl, aryl or arylalkyl, provided that when both are present they are not both hydrogen, and provided further that when both are attached to the same carbon atom neither of them is hydrogen,

Y_6 and Y_7 are each independently hydrongen, alkyl, cycloalkyl or arylalkyl or Y_6 and Y_7 together with the nitrogen atom to which they are attached are azetidinyl, pyrrolidinyl, peperidinyl, or morpholinyl;

Y_8 and Y_9 are each independently hydrogen, alkyl, aryl or heteroaryl, or Y_8 and Y_9 together with the nitrogen atom to which they are attached are pyrrolidinyl, piperidinyl or morpholinyl;

Y_{10} and Y_{11} are each independently hydrogen, alkyl, alkanoyl, arylcarbonyl, heteroarylcarbonyl, or



Y_{12} is hydroxy, alkoxy, aryloxy, amino, alkylamino or dialkylamino;

Y_{13} is alkyl alkoxy or aryloxy; and,

Y_{14} is hydrogen, hydroxy, alkoxy, aryloxy or arylalkoxy.

wherein

the terms "alkyl" and "alkoxy" refer to both straight and branched chain groups having 1 to 10 carbon atoms;

the term "alkenyl" refers to both straight and branched chain groups having 2 to 10 carbon atoms;

the term "aryl" refers to phenyl and substituted phenyl wherein said substituents may be 1, 2 or 3 groups independently selected from amino, alkylamino, dialkylamino, nitro, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkanoyloxy, carbonyl, or carboxyl;

the term "alkanoyl" refers to groups having the formula



having 2 to 11 carbon atoms;

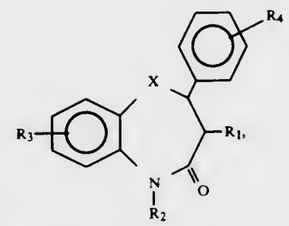
the term "heteroaryl" refers to an aromatic heterocyclic group selected from pyridinyl, pyrrolyl, imidazolyl, furyl, thienyl, oxazolyl and thiazolyl;

the term "cycloalkyl" refers to groups having 3,4, 5, 6 or 7 carbon atoms;

the term "halogen" refers to fluorine, chlorine, bromine and iodine; and,

the terms "fluoro substituted alkyl" and "fluoro substituted alkoxy" refer to alkyl and alkoxy groups in which one or more hydrogens have been replaced by fluorine atoms.

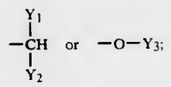
42. A method of treating a host having a disease susceptible to treatment with a vasodilator which comprises administering to said host an effective amount of a compound having the formula



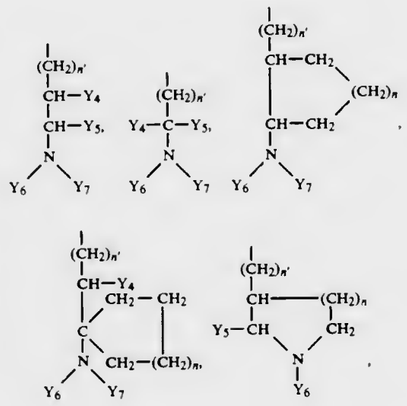
and the pharmaceutically acceptable salts thereof, wherein

X is $-CH_2-$ or $-S-$;

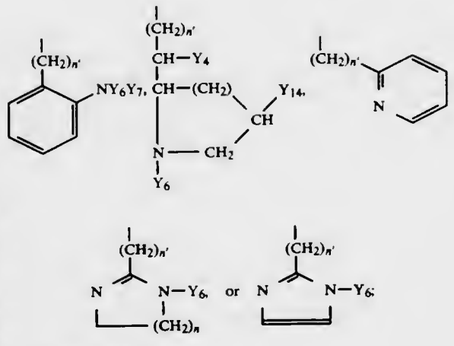
R_1 is

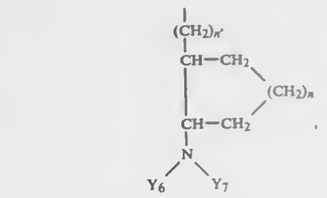


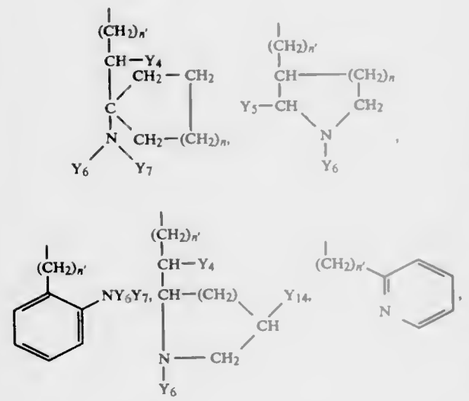
when X is $-C_22-$, R_2 is

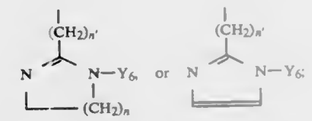


when X is $-S-$, R_2 is

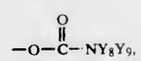




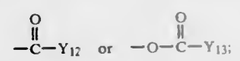




R_3 and R_4 are each independently hydrogen halogen, alkyl, alkoxy, aryloxy, arylalkoxy, arylalkyl,-cyano, hydroxy, alkanoyloxy,



fluoro substituted alkoxy, fluoro substituted alkyl, (cycloalkyl-)alkoxy, $-NO_2$, $-NY_{10}Y_{11}$, $-S(O)_m$aryl,

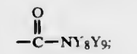


n or n' are independently 0, 1, 2 or 3;

m is 0, 1 or 2;

Y_1 and Y_2 are independently hydrogen or alkyl, Y_1 is hydrogen and Y_2 is alkenyl, alkynyl, aryl, heteroaryl, or cycloalkyl, or Yl and Y2 together with the carbon atom to which they are attached are cycloalkyl;

Y_3 is hydrogen, alkyl, alkanoyl, alkenyl, arylcarbonyl, heteroarylcarbonyl, or



Y_4 and Y_5 are each independently hydrogen, alkyl, aryl or arylalkyl, provided that when both are present they are not both hydrogen, and provided further that when both are attached to the same carbon atom neither of them is hydrogen;

Y_6 and Y_7 are each independently hydrogen, alkyl, cycloalkyl or arylalkyl or Y_6 and Y_7 together with the nitrogen atom to which they are attached are azetidinyl, pyrrolidinyl, piperidinyl, or morpholinyl;

Y_8 and Y_9 are each independently hydrogen, alkyl, aryl or heteroaryl, or Y_8 and Y_9 together with the nitrogen atom to which they are attached are pyrrolidinyl, piperidinyl or morpholinyl;

Y_{10} and Y_{11} are each independently hydrogen, alkyl, alkanoyl, arylcarbonyl, heteroarylcarbonyl, or



Y_{12} is hydroxy, alkoxy, aryloxy, amino, alkylamino or dialkylamino;

Y_{13} is alkyl, alkoxy or aryloxy; and,

Y_{14} is hydrogen, hydroxy, alkoxy, aryloxy or arylalkoxy.

wherein

the terms "alkyl" and "alkoxy" refer to both straight and branched chain groups having 1 to 10 carbon atoms;

the term "alkenyl" refers to both straight and branched chain groups having 2 to 10 carbon atoms;

the term "aryl" refers to phenyl and substituted phenyl wherein said substituents may be 1, 2 or 3 groups independently selected from amino, alkylamino, dialkylamino, nitro, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 Carbon atoms, alkanoyloxy, carbonyl, or carboxyl;

the term "alkanoyl" refers to groups having the formula



having 2 to 11 carbon atoms;

the term "heteroaryl" refers to an aromatic heterocyclic group selected from pyridinyl, pyrrolyl, imidazolyl, furyl, thienyl, oxazolyl and thiazolyl;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "halogen" refers to fluorine, chlorine, bromine and iodine; and,

the term "fluoro substituted alkyl" and "fluoro substituted alkoxy" refer to alkyl and alkoxy groups in which one or more hydrogens have been replaced by fluorine atoms.

4,902,685

2-AMINO-3-CYANO-BICYCLIC PYRIDINES/PYRAZINES AS INHIBITORS OF INTERLEUKIN 1

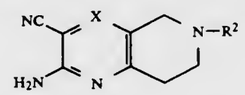
Jerauld S. Skotnicki, Chadds Ford, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 17, 1988, Ser. No. 233,182

Int. Cl.[4] **A61K** *31/495, 31/44;* **C07D** *471/04*

U.S. Cl. 514—249 **8 Claims**

1. A compound having the formula



wherein

X is CH or N; and

R^2 is hydrogen, lower alkyl, lower akenyl, lower alkynyl, or unsubstituted or substituted phenyl, naphthyl, pyridyl, pyrazinyl, primidinyl, quinolyl, quinazolinyl or quinoxali-

nyl, wherein the substituents are selected from halo, lower alkyl, lower alkoxy, carboxy, lower alkoxycarbonyl, lower alkylsulfonyl, cyano, nitro, trifluoromethyl, hydroxy, mercapto and lower alkylthio, with the proviso that when R^2 is substituted phenyl, the substituted is other than carboxy or lower alkoxycarbonyl.

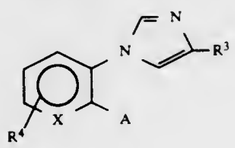
4,902,686

TRICYCLIC HETEROCYCLIC COMPOUNDS AND THEIR USE IN TREATING BENZODIAZEPIN RECEPTOR-RELATED AILMENTS

Frank Wiitjen, Vaerlose, and Holger C. Hansen, Ballerup, both of Denmark, assignors to A/S Ferrosan, Soborg, Denmark

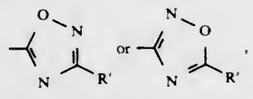
Division of Ser. No. 156,363, Feb. 16, 1988, Pat. No. 4,873,244.
This application Apr. 20, 1989, Ser. No. 340,901
Claims priority, application Denmark, Mar. 18, 1987, 1374/87
Int. Cl.[4] A61K *31/505, 31/695;* **C07D** *487/04;* **C07F** *7/10*
U.S. Cl. 514—250 **11 Claims**

1. A heterocyclic compound having the formula I



(I)

wherein
R^3 is



wherein R' is C_{1-6}-alkyl, C_{3-7}-cycloalkyl, or C_{1-6}-alkoxymethyl;
—A— is —C(=O)—NR'''—or —NR'''—C(=O)— wherein R''' is C_{1-6}-alkyl;
X is C or N; and
R^4 is hydrogen, halogen, CN, C_{1-6}-alkyl, C_{2-6}-alkynyl, trimethylsilyl-C_{2-6}-alkynyl, aryloxy which may be substituted with halogen, aralkoxy, C_{3-7}-cycloalkoxy which may be substituted with one or more C_{1-6}-alkyl groups, or NR''''R'''', wherein R'''' and R'''' independently are C_{1-6}-alkyl or together with the nitrogen atom form a piperidine ring, provided that R^4 is not hydrogen, methyl or halogen when A is —C(C=O)—NR'''— and R^3 is oxadiazole, R' is C_{1-6}-alkyl or C_{3-7}-cycloalkyl, and X is C, and that R^4 is not hydrogen, methyl or halogen when A is —NR'''—C(=O)—R^3 is oxadiazole, and X is C.

10. A method of treating a central nervous system ailment related to the benzodiazepin receptors in a subject in need of such treatment comprising the step of administering to said subject an amount of a compound of claim 1 which is effective for the alleviation of such ailment.

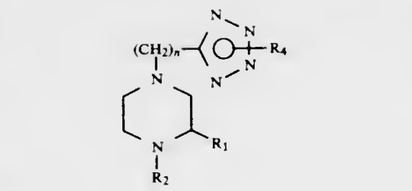
4,902,687

EXCITATORY AMINO ACID RECEPTOR ANTAGONISTS

Paul L. Ornstein, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

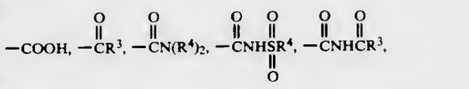
Filed Mar. 27, 1989, Ser. No. 328,848
Int. Cl.[4] A61K *31/495;* **C07D** *403/06, 403/14*
U.S. Cl. 514—253 **16 Claims**

1. A compound of the formula



I

wherein:
R_1 is



R_2 is hydrogen, C_1–C_4 alkyl, or phenyl-substituted C_1–C_4 alkyl;
M is 2 or 3;
each R^3 is independently C_1–C_{16} alkoxy, phenyl-substituted C_1–C_4 alkoxy, or an oral ester forming group;
each R^4 is independently hydrogen, C_1–C_{16} alkyl, phenyl-substituted C_1–C_4 alkyl, or phenyl; or
a pharmaceutically acceptable salt thereof.

7. A method of blocking one or more excitatory amino acid receptors in mammals which comprises administering to a mammal requiring decreased excitatory amino acid neurotransmission a pharmaceutically effective amount of a compound of claim 1.

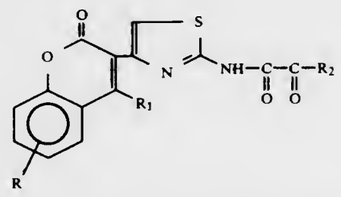
4,902,688

4-(3-COUMARINYL)-THIAZOLE-DERIVATIVES WITH ANTI-ALLERGIC, ANTI-ANAPHYLACTIC AND ANTI-ARTHRITIC ACTIVITY AND COMPOSITIONS CONTAINING THEM

Dario Chiarino, Monza; Gian Carlo Grancini, Nova Milanese; Viviana Frigeni, Monza, and Angelo Careazi, Busto Arsizio, all of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

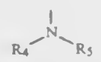
Filed Mar. 23, 1988, Ser. No. 172,230
Claims priority, application Italy, Mar. 25, 1987, 19846 A/87
Int. Cl.[4] A61K *31/495, 31/425;* **C07D** *417/04, 417/14*
U.S. Cl. 514—253 **8 Claims**

1. A compound of formula



(I)

wherein
R and R_1 represent hydroxy, a hydrogen or a halogen atom, a C_1–C_4 alkyl or alkoxy;
R_2 represents hydroxy, an OR_3 or a



R_3 represents a C_1–C_6 alkyl, a benzyl, a group of formula $—(CH_2—CH_2—O)_n—R_6$ wherein n represents an integer from 1 to 4 and R_6 represents a hydrogen atom or a C_1–C_4 alkyl;
R_4 and R_5, which are the same or different, represent a hydrogen atom, a C_1–C_4 alkyl, a benzyl, a phenyl, or R_4 and R_5 together with the nitrogen atom to which they are bonded, form a 1-piperidinyl, 1-piperazinyl, 4-methyl-1-piperazinyl radical;
and salts thereof with pharmaceutically acceptable acids or bases.

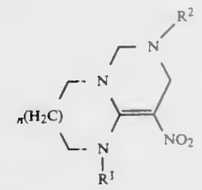
4,902,689

INSECTICIDAL 1,2,3,4-TETRAHYDRO-5-NITRO-PYRIMIDINE DERIVATIVES

Ernst R. Gesing, Erkrath-Hochdahl; Hilmar Wolf, Langenfeld; Benedikt Becker, Mettmann, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

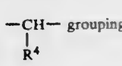
Filed Nov. 15, 1988, Ser. No. 271,551
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1987, 3739263
Int. Cl.[4] C07D *487/04;* **A01N** *43/90*
U.S. Cl. 514—258 **12 Claims**

1. A 1,2,3,4-tetrahydro-5-nitropyrimidine derivative of the formula



(I)

in which
(a) R^1 stands for hydrogen or for optionally substituted radicals from the group consisting of benzyl, picolyl (pyridylmethyl) and phenoxyalkyl, the optional substituents being selected from the group consisting of halogen and cyano,
n stands for the number 0 or 1 and
R^2 stands for the —A—R^3 group, in which
A stands for a direct bond or for the $—(CH_2)_m—$ or $—(CH_2)_x—Y—(CH_2)_z—$ groupings,
where
m stands for the numbers 1 to 4,
x and z stand for the numbers 0, 1 or 2, it being possible for x and z to be identical or different, and
Y stands for oxygen, sulphur or for the —NH— or



groupings,

where
R^4 stands for optionally alkoxycarbonyl-substituted C_1–C_4-alkyl, cyano, hydroxyl or for phenyl, and
R^3 stands for an optionally substituted radical selected from the group consisting of phenyl, naphthyl, anthryl, phenanthryl, pyridyl, furyl, thienyl, piperidyl and 1,3-benzodioxolyl, the optional substituents being selected from the group consisting of halogen, C_1–C_4-alkyl, halogeno-C_1–C_2-alkyl, C_1–C_2-alkoxy, halogeno-C_1–C_2-alkylthio, hydroxyl, di-C_1–C_2-alkylamino, carboxyl and phenyl, with the exception of the compounds (a), in which
(α) R^1 stands for the 2-chloro-pyridin-5-yl-methyl radical and
R^2 simultaneously stands for benzyl, 4-chlorobenzyl, 2-chlorobenzyl, pyridin-3-yl-methyl, furan-2-yl-methyl, phenethyl, thien-2-yl-methyl, 1-phenyl-ethyl or 3,4-dimethoxybenzyl, or
(β) R^1 stands for hydrogen and simultaneously R^2 denotes benzyl, pyridin-3-yl-methyl and 4-chlorobenzyl, or in which
(b) R^1 stands for hydrogen or for optionally substituted radicals from the group consisting of benzyl, picolyl and phenoxyalkyl, the optional substituents being selected from the group consisting of halogen and cyano,
n stands for the number 0 or 1 and
R^2 stands for the —A—R^3 group, in which
A stands for a direct bond or for the $—(CH_2)_m—$ or $—(CH_2)_x—Y—(CH_2)_z—$ groupings, where
m stands for the numbers 1 to 4,
x and z stand for the numers 0, 1 or 2, it being possible for x and z to be identical or different, and
Y stands for oxygen, sulphur or for the —NH— or

groupings,

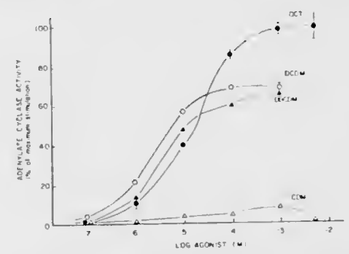
where
R^4 stands for optionally alkoxycarbonyl-substituted C_1–C_4-alkyl, cyano, hydroxyl or for phenyl, and
R^3 stands for halogeno-C_1–C_4-alkyl or for an optionally substituted radicals from the group consisting of phenyl, naphthyl, anthryl, phenanthryl, pyridyl, furyl, thienyl, piperidyl and 1,3-benzodioxolyl, the optional substituents being selected from the group consisting of halogen, C_1–C_4-alkyl, halogeno-C_1–C_2-alkyl, C_1–C_2-alkoxy, halogeno-C_1–C_2-alkylthio, hydroxyl, di-C_1–C_2-alkylamino, carboxyl and phenyl, or an addition salt thereof.

4,902,690

PEST CONTROLLING COMPOSITIONS

James A. Nathanson, Wellesley, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 605,845, May 1, 1984, abandoned. This application Jul. 6, 1988, Ser. No. 218,491
Int. Cl.[4] A01N *43/90, 43/50*
U.S. Cl. 514—213 **16 Claims**



1. A pest-controlling composition which comprises:
(A) a first compound capable of substantially inhibiting a phosphodiesterase enzyme (PDE) of said pest; and
(B) a second compound having pest-controlling activity towards said pest comprising a substantial octopamine agonist toward an octopamine receptor in said pest;

wherein said first and second compounds are present in an amount effective to control said pest.

4,902,691

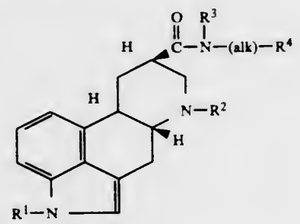
HETEROALKYLAMIDES OF (8-β)-1-ALKYL-6-(SUBSTITUTED)ERGOLINES USEFUL FOR BLOCKING 5HT$_2$ RECEPTORS

Marlene L. Cohen, Indianapolis, and David W. Robertson, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 19, 1988, Ser. No. 286,192
Int. Cl.[4] A61K *31/48;* **C07D** *457/06, 401/14*
U.S. Cl. 514—288 **25 Claims**

1. A compound of the formula

I



wherein:
- R^1 is C_1–C_4 alkyl;
- R^2 is allyl or C_1–C_4 straight chain alkyl;
- R^3 is hydrogen or C_1–C_4 straight chain alkyl;
- R^4 is pyridinyl or imidazolyl;
- alk is a divalent organic radical derived from a straight or branched C_1–C_5 alkane;

or a pharmaceutically acceptable acid addition salt thereof.

8. A method of blocking 5HT$_2$ receptors which comprises administering to a mammal having an excess of serotonin centrally or peripherally a 5HT$_2$ blocking dose of a compound of claim 1.

14. A method of treating hypertension in mammals which comprises administering to a hypertensive mammal a hypotensive dose of a compound of claim 1.

4,902,692

METHOD AND COMPOSITION FOR OPHTHALMIC ANESTHESIA USING RODOCAINE

Peter W. K. Chan, Culver City, Calif., assignor to Iolab Corporation, Claremont, Calif.

Filed Mar. 18, 1988, Ser. No. 169,665
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—299 **12 Claims**

1. A method for topically anesthetizing the eye which comprises administering a pharmaceutically effective amount of anesthetic selected from the group consisting of rodocaine or a pharmaceutically-acceptable, acid-addition salt thereof to the eye.

4,902,693

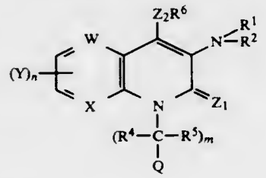
ANTI-ALLERGIC ESTERS, ACETAL ETHERS, THIOETHERS AND NITROGEN SUBSTITUTED DERIVATIVES OF BICYCLIC COMPOUNDS

David J. Blythin, North Caldwell, and Ho-Jane Shue, Pine Brook, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 76,450, Jul. 22, 1987, Pat. No. 4,794,116, which is a continuation-in-part of Ser. No. 760,196, Jul. 29, 1985, Pat. No. 4,684,727. This application Jul. 22, 1988, Ser. No. 223,458
Claims priority, application PCT Int'l Appl., Jul. 25, 1986, PCT/US86/01518
Int. Cl.[4] A61K *31/435;* **C07D** *47/04*
U.S. Cl. 514—300 **14 Claims**

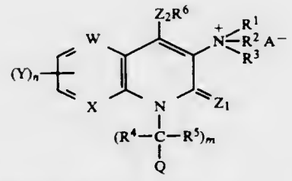
1. A compound having the structural formula Ia or Ib

Ia



or

Ib



a pharmaceutically acceptable salt or a solvate thereof, wherein:
- W and X may be the same or different and each independently represents —CH= or —N=;
- Z_1 and Z_2 are the same or different and each independently represents O or S;
- R^3, R^4 and R^5 are the same or different and each may be independently selected from the group consisting of H, alkyl having from 1 to 12 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, alkoxyalkyl having from 1 to 6 carbon atoms in the alkoxy portion and from 2 to 6 atoms in the alkyl portion thereof, hydroxyalkyl having from 2 to 8 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, acyloxyalkyl having from 1 to 6 carbon atoms in the acyloxy portion and from 2 to 8 carbon atoms in the alkyl portion thereof, and $—R^7—CO_2R^0$ wherein R^7 represents an alkylene group having from 1 to 6 carbon atoms and R^0 represents hydrogen or an alkyl group having from 1 to 6 carbon atoms, with the provisos that the OH of the hydroxyalkyl group and the acyloxy of the acyloxyalkyl group are not joined to the same carbon atoms as another heteroatom and that, when R^3 are alkenyl or alkynyl, there is at least one carbon-carbon single bond between the nitrogen atom and the carbon-carbon double or triple bond;
- one of R^1 or R^2 is an aromatic heterocyclic group having from 2 to 14 carbon atoms and at least one O, S, and/or N in the ring structure which can be substituted with from one to three substituents Y as defined below and the other can be one of the R^3, R^4 and R^5 groups listed above, or joined to R^3 to represent a moiety when taken together with the N to which they are attached represent a ring which can contain from 2 to 8 carbon atoms, said ring optionally containing an —O—, —S— and/or —NR^4— heteroatomic group (wherein R^4 is as defined above) and/or optionally containing a carbon-carbon double bond, and said ring optionally being substituted with one to three additional substituents R^8 which substituents may be the same or different and are each independently selected from OH with the proviso that OH is not on a carbon already joined to a hetero atom, —O-acyl having from 1 to 6 carbon atoms, hydroxyalkyl having from 1 to 8 carbon atoms, alkoxyalkyl having from 1 to 6 carbon atoms in each alkyl portion thereof, alkyl having from 1 to 6 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, $—COOR^9$ wherein R^9 represents H, alkyl having 1 to 6 carbon atoms or aryl having from 6 to 15 carbon atoms, or any two R^8 substituent groups may represent a hydrocarbon ring having from 4 to 8 total carbon atoms;
- R^6 represents $—CO—R^{10}$, $—CS—OR^{17}$, $—CS—NR^{15}R^{16}$, $—C(R^{11})_2—OR^{12}$, $—C(R^{11})_2—SR^{12}$ or $—C(R^{11})_2—NR^{12}R^{13}$;
- R^{10} represents aryl having from 6 to 15 carbon atoms, $—R^{14}$, aromatic heterocyclic having from 2 to 14 carbon atoms and at least one O, S and/or N in the ring structure, $—OR^{14}$ or $—NR^{15}R^{16}$;
- each R^{11} represents H, alkyl having from 1 to 6 carbon atoms, $—CCl_3$, $—COOR^9$ or aryl having from 6 to 15 carbon atoms;
- R^{12} represents $—R^{14}$, $—CO—R^{13}$ or $—CS—R^{17}$;
- R^{13} represents H, alkyl having from 1 to 6 carbon atoms or aryl having from 6 to 15 carbon atoms;
- R^{14} represents alkyl of from 1 to 12 carbon atoms;
- R^{15} and R^{16} each independently represents H, alkyl having from 1 to 6 carbon atoms or aryl having from 6 to 15 carbon atoms, or R^{15} and R^{16} together represent a divalent polymethylene group of from 4 to 6 carbon atoms, said polymethylene group being optionally substituted with a carboxy group or alkyl ester thereof;
- R^{17} represents $—R^{14}$ or aryl having from 6 to 15 carbon atoms;
- m is an integer of from 0 to 3;
- n is an integer of from 0 to 2;
- Q represents an aryl having from 6 to 15 carbon atoms or an aromatic heterocyclic group having from 2 to 14 carbon atoms and at least one O, S and/or N in the ring structure, which aromatic heterocyclic group can optionally be substituted with 1 to 3 substituents Y as defined below;
- each Y substituent is independently selected from the group consisting of hydroxy, alkyl having from 1 to 6 carbon atoms, halogen, NO_2, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, cyano, cycloalkyl having from 3 to 7 carbon atoms, alkenyloxy having from 3 to 6 carbon atoms, alkynloxy having from 3 to 6 carbon atoms, hydroxyalkyl having from 1 to 6 carbon atoms, $—S(O)_n—R^{18}$ (wherein R^{18} represents alkyl having from 1 to 6 carbon atoms and n is as defined above), $—SO_2NH_2$, $—CO—R^{19}$ (wherein R^{19} represents OH, $—NH—R^{18}$ or $—O—R^{18}$, wherein R^{18} is as defined above), $—O—B—COR^{19}$ (wherein B represents an alkylene group having from 1 to 4 carbon atoms and R^{19} is as defined above), $—NH_2$, —NHCHO, $—NH—CO—R^{19}$ (wherein R^{19} is as defined above, with the proviso that it is not hydroxy), $—NH—COCF_3$, $—NH—SO_2R^{18}$ (wherein R^{18} is as defined above), and $—NHSO_2CF_3$;
- A is a pharmaceutically acceptable counterion.

4,902,694

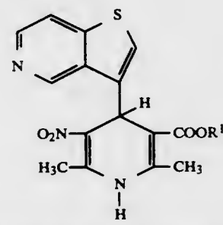
DIHYDROPYRIDINE CALCIUM CHANNEL MODULATORS

Donald R. Holland, Indianapolis, and James H. Wikel, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 11, 1988, Ser. No. 231,310
Int. Cl.[4] A61K *31/44;* **C07D** *495/04*
U.S. Cl. 514—301 **12 Claims**

1. A compound of the formula

I



and pharmaceutically acceptable salts thereof wherein R^1 is a straight or branched chain, saturated or unsaturated aliphatic radical containing from one to six carbon atoms, both inclusive, optionally substituted with one or more groups selected from phenyl, methoxy-substituted phenyl, phenoxy, methoxy or cyclopropyl; or R^1 is cyanoethyl.

4,902,695

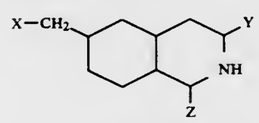
EXCITATORY AMINO ACID RECEPTOR ANTAGONISTS

Paul L. Ornstein, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

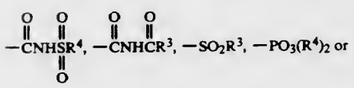
Filed Feb. 13, 1989, Ser. No. 309,562
Int. Cl.[4] A61K *31/47;* **C07D** *215/14, 215/36*
U.S. Cl. 514—307 **20 Claims**

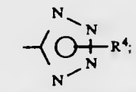
1. A compound of the formula

I

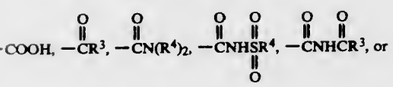


X is —COOH, ,

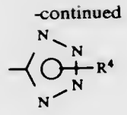




one of Y and Z is



-continued



and the other of Y and Z is hydrogen;

each R^3 is independently C_1–C_{16} alkoxy, phenyl-substituted C_1–C_4 alkoxy, benzyloxy substituted on the phenyl ring with halogen, C_1–C_4 alkyl, or C_1–C_4 alkoxy, C_1–C_5 alkanoyloxymethyl, or C_1–C_5 alkanoyloxymethyl substituted on the oxymethyl with C_1–C_4 alkyl or C_4–C_7 cycloalkyl;

each R^4 is independently hydrogen, C_1–C_{16} alkyl, phenyl-substituted C_1–C_4 alkyl, or phenyl; or

a pharmaceutically acceptable salt thereof.

8. A method of blocking one or more excitatory amino acid receptors in mammals which comprises administering to a mammal requiring decreased excitatory amino acid neurotransmission a pharmaceutically effective amount of a compound of claim 1.

4,902,696

SYNERGISTIC INTRAOCULAR PRESSURE LOWERING COMBINATIONS

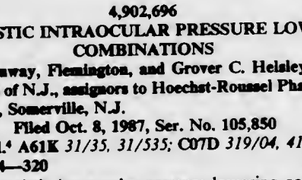
Paul G. Conway, Flemington, and Grover C. Helsley, Pluckemin, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Filed Oct. 8, 1987, Ser. No. 105,850

Int. Cl.[4] A61K *31/35, 31/535;* **C07D** *319/04, 413/06*

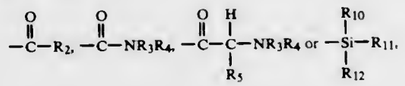
U.S. Cl. 514—320 **28 Claims**

1. A synergistic intraocular pressure lowering composition for topical application comprising a suitable vehicle and effective hyperemia suppressing and intraocular pressure lowering amounts of an ocular decongestant and a compound having the formula



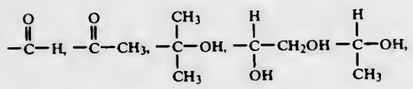
wherein

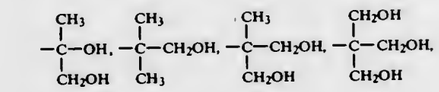
(a) R_1 is —H,



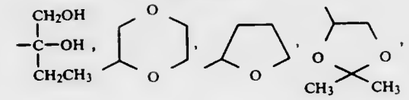
where

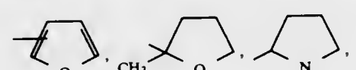
R_2 is hydrogen, loweralkyl,

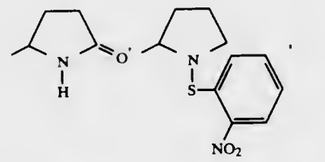


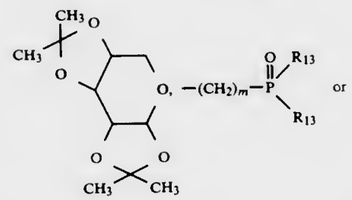


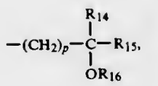
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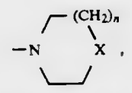




where

m is 1, 2 or 3, R_{13} is loweralkyl, p is 0, 1, 2 or 3, R_{14}, R_{15} and R_{16} are each independently hydrogen or loweralkyl;

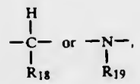
R_3 is hydrogen, loweralkyl, $—(CH_2)_qOR_{17}$ or $—CH_2CHOHCH_2OH$, where q is 0, 2 or 3 and R_{17} is hydrogen or loweralkyl; R_4 is hydrogen, loweralkyl or $—(CH_2)_rOH$ where r is 2 or 3, or alternatively $—NR_3R_4$ as a whole is



where n is 0, 1 or 2 and —X— is



—O—, —S—, —SO—, $—SO_2—$,

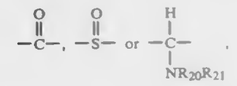


R_{18} being hydrogen, loweralkyl, loweralkoxy or loweralkylcarbonyloxy, and R_{19} being loweralkyl;

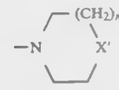
R_5 is hydrogen, loweralkyl, benzyl or hydroxymethyl; and

R_{10}, R_{11} and R_{12} are each independently loweralkyl;

(b) R_9 is hydrogen, or alternatively to the above, R_1 and R_9 taken together form



where R_{20} and R_{21} are each independently loweralkyl, or alternatively $—NR_{20}R_{21}$ as a whole is

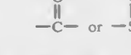


where n' has the same definition as n but is independent thereof and X' has the same definition as X but is independent thereof; and

(c) R_6 and R_7 are each independently —H,



or taken together form



where R_2', R_3', R_4' and R_5' have the same definitions as R_2, R_3, R_4 and R_5, respectively, but are independent thereof, respectively.

4,902,697

DERIVATIVES OF 2,2-DIMETHYL-CYCLOPROPANECARBOXYLIC ACID

Luigi Capuzzi; Franco Bettarini, both of Novara; Paolo Castoro, Vercelli; Pietro Massardo, Milan, and Vincenzo Caprioli, S. Martino Siccomario, all of Italy, assignors to Montedison S.p.A., Milan, Italy

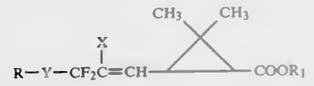
Filed Aug. 25, 1987, Ser. No. 89,303

Claims priority, application Italy, Aug. 27, 1986, 21532 A/86; Dec. 23, 1986, 22829 A/86

Int. Cl.[4] C07D *213/64;* **C07C** *69/74*

U.S. Cl. 514—351 **10 Claims**

1. Compounds having the formula



(I)

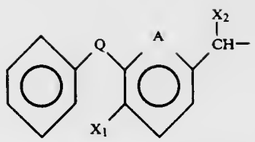
wherein

R represents an alkyl, cycloalkyl, alkenyl or alkynyl group containing from 1 to 8 carbon atoms, optionally substituted with halogen atoms or R represents an aryl group, optionally substituted with halogen atoms; alkyl or alkoxyl radicals;

Y represents O or S;

X represents H, F, Cl, Br, $—CH_3$ or $—CF_3$;

R_1 represents a group having the formula:



wherein X_1 is H or F; X_2 is H, —CN or —C ≡CH; Q is O or CH_2; A is CH or N when X_1 is H, X_2 is CN and Q is O.

10. Insecticide and acaricide compositions containing as active ingredient one or more compounds as claimed in claim 1, together with inert solid or liquid carriers.

4,902,698

BENZENESULPHONAMIDOPYRIDYL COMPOUNDS WHICH ARE USEFUL AS THROMBOXANE A_2 ANTAGONISTS

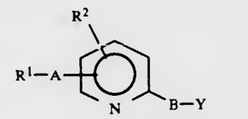
David G. Cooper, Letchworth, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Apr. 7, 1988, Ser. No. 178,663

Int. Cl.[4] C07D *213/42*

U.S. Cl. 514—351 **14 Claims**

1. A compound of the formula (I):



(I)

and salts thereof; wherein

A is a group NR^3SO_2 or SO_2NR^3; B is C_{1-6} alkylene;

Y is CO_2H, CN, C_{1-4} alkoxycarbonyl, carbamoyl, mono-C_{1-6} alkylcarbamoyl or di-C_{1-6} alkylcarbamoyl;

R^1 is unsubstituted phenyl or phenyl substituted by one or more substituents chosen from the group consisting of halogen, C_{1-4} alkyl, C_{1-6} acyl, C_{1-4} alkoxy, nitro and trifluoromethyl, provided that when R^1 is phenyl substituted by two or more substituents, no more than one substituent can be meta-trifluoromethyl;

R^2 is hydrogen or one or more C_{1-4} alkyl substituents; and R^3 is hydrogen or C_{1-6} alkyl.

4,902,699

OXIME OF 1, 2, 5, 6-TETRAHYDROPYRIDINE COMPOUNDS THEIR USE AS MEDICAMENTS AND THE COMPOSITIONS CONTAINING THEM

Emilio Toja, Milan; Carla Bonetti, Fontanella; Fernando Barzaghi, and Giulio Galliani, both of Monza, all of Italy, assignors to Roussel Uclaf, Paris, France

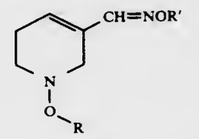
Filed Aug. 22, 1988, Ser. No. 234,627

Claims priority, application Italy, Aug. 21, 1987, 21691

Int. Cl.[4] A61K *31/44;* **C07D** *211/70*

U.S. Cl. 514—357 **10 Claims**

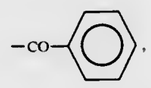
1. Compounds of the formula (I)



(I)

in which R is selected from the group consisting of hydrogen, methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, n-pentyl,

n-hexyl, tert-butyl, tert-pentyl, neopentyl, ethylene radical, acetylene radical, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl, cyclohexylmethyl, phenyl which is unsubstituted or substituted with halogen, alkyl having up to 8 carbon atoms or alkoxy having up to 8 carbon atoms, $-COCH_3$,



$-CONH-R_2$ and COR_1,

in which R_1 is selected from the group consisting of methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, alkoxy having up to 8 carbon atoms, n-pentyl, n-hexyl, tert-butyl, tert-pentyl, neopentyl, ethylene radical or acetylene radical, and

R_2 is selected from the group consisting of methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, n-pentyl, n-hexyl, tert-butyl, tert-phenyl, neopentyl, ethylene radical, acetylene radical, phenyl which is unsubstituted or substituted with halogen, alkyl having up to 8 carbon atoms or alkoxy having up to 8 carbon atoms, and phenalkyl, which is unsubstituted or substituted with halogen, alkyl having up to 8 carbon atoms or alkoxy having up to 8 carbon atoms, and

R' is selected from the group consisting of methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, n-pentyl, n-hexyl, tert-butyl, tert-pentyl, neopentyl, ethylene radical, acetylene radical, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl and cyclohexylmethyl.

4,902,700

THIAZOLE DERIVATIVE AND LEUKOTRIENE ANTAGONIST CONTAINING THE SAME AS THE EFFECTIVE INGREDIENTS

Yosio Hayasi; Tomei Oguri, both of Ushiku; Masaki Shimoda, Ibaraki; Mikio Tsutsui, Ibaraki; Kazuo Takahashi, Ibaraki, and Hitoshi Miida, Tsuchiura, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

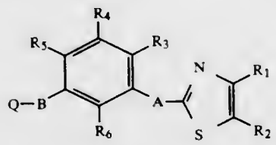
Continuation of Ser. No. 919,497, Oct. 16, 1986, abandoned. This application Nov. 28, 1988, Ser. No. 279,225

Claims priority, application Japan, Oct. 16, 1985, 60-228912

Int. Cl.[4] C07D *277/30, 277/64;* **A61K** *31/425*

U.S. Cl. 514—365 **6 Claims**

1. A thiazole derivative represented by the following formula and a pharmaceutically acceptable salt thereof:

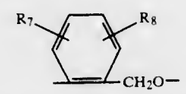


wherein R_1 and R_2 each independently represent a hydrogen atom, an alkyl group having 1 to 8 carbon atoms, a lower alkoxycarbonyl group or a phenyl group which is unsubstituted or substituted with a halogen atom, a lower alkoxy group, a lower alkoxycarbonyl group or an alkyl group of 1 to 3 carbon atoms or wherein R_1 and R_2 cooperate to represent a tetramethylene group corresponding to a fused cyclohexane ring or a butadienylene group which is unsubstituted or substituted with a halogen atom, a lower alkoxy group, a lower alkoxycarbonyl group or an alkyl group having 1 to 3 carbon atoms corresponding to a fused benzene ring; R_3, R_4, R_5 and R_6 each independently represent a hydrogen atom, a hydroxyl group, a lower alkoxy group, an alkyl group having 1 to 3 carbon atoms or a halogen atom; A is a linking group selected from the group consisting of $-CH=CH-$, $-CH_2CH_2-$, $-CH=CHCONH-$ and $-CH_2OCH_2-$; B is a group selected from the group consisting of (a) $-(CH_2)_n-CONH-$, wherein n is an integer of 0–3, (b) $-(CH_2)_n-NH-$, wherein n is an integer of 1–4, (c) $-(CH_2)_n-O-$, wherein n is an integer of 1–4, (d) $-(CH_2)_n-$, wherein n is an integer of 2–5,



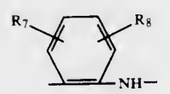
(e)

wherein R_7 and R_8 each independently represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms as defined above,



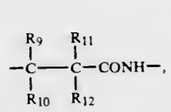
(f)

wherein R_7 and R_8 have the same meanings as defined above,



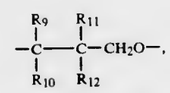
(g)

wherein R_7 and R_8 have the same meanings as defined above,



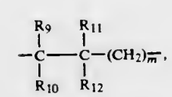
(h)

wherein R_9, R_{10}, R_{11} and R_{12} each independently represent a hydrogen atom, a phenyl group or an alkyl group having 1 to 6 carbon atoms,



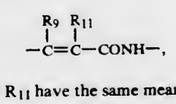
(i)

wherein R_9, R_{10}, R_{11} and R_{12} have the same meanings as defined above,



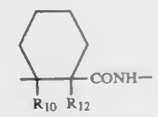
(j)

wherein R_9, R_{10}, R_{11} and R_{12} have the same meanings as defined above and m ranges from 0 to 3,



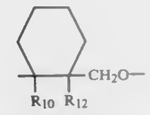
(k)

wherein R_9 and R_{11} have the same meanings as defined above,



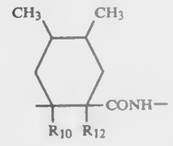
(l)

wherein R_{10} and R_{12} have the same meanings as defined above,



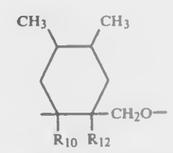
(m)

wherein R_{10} and R_{12} have the same meanings as defined above,



(n)

wherein R_{10} and R_{12} have the same meanings as defined above,



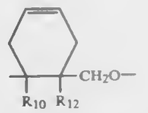
(o)

wherein R_{10} and R_{12} have the same meanings as defined above,



(p)

wherein R_{10} and R_{12} have the same meanings as defined above,



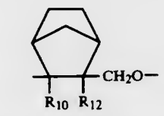
(q)

wherein R_{10} and R_{12} have the same meanings as defined above,



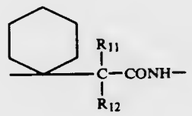
(r)

wherein R_{10} and R_{12} have the same meanings as defined above,



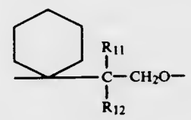
(s)

wherein R_{10} and R_{12} have the same meanings as defined above,



(t)

wherein R_{11} and R_{12} have the same meanings as defined above, and



(u)

wherein R_{11} and R_{12} have the same meanings as defined above and Q represents a carboxyl group, a lower alkoxy group, a hydroxyl group, an alkoxycarbonyl group having 2 to 6 carbon atoms or a 5-tetrazolyl group.

4,902,701

TETRAZOLYL SUBSTITUTED TRICYCLIC COMPOUNDS AND PHARMACOLOGICAL COMPOSITIONS THEREOF

John F. Batchelor, Beckenham; Richard M. Hyde, Croydon; William R. King, Bickley, and David J. Livingstone, Beckenham, all of England, assignors to Burroughs Welcome Co., Research Triangle Park, N.C.

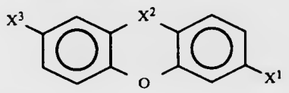
Division of Ser. No. 782,620, Oct. 2, 1985, abandoned, which is a division of Ser. No. 488,051, Jan. 25, 1983, abandoned. This application Sep. 3, 1986, Ser. No. 903,834

Claims priority, application United Kingdom, Apr. 27, 1982, 8212139; Oct. 21, 1982, 8230055

Int. Cl.[4] C07D *407/02;* **A61K** *31/41*

U.S. Cl. 514—381 **28 Claims**

1. Tricyclic compounds of formula (I)



(I)

wherein

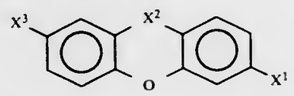
X^1 is a 5-tetrazolyl group

X^2 is a carbonyl or methylene

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X^3 is hydroxyl or a group $—X^4(C_nH_{2n})X^5$
where
X^4 is oxygen or sulphur
X^5 is hydrogen or a group $—OX^6$
where
X^6 is hydrogen, alkanoyl of 1 to 4 carbon atoms or a group $—(C_mH_{2m})X^7$
where
X^7 is hydrogen or a group $—OX^8$
where
X^8 is hydrogen or alkanoyl of 1 to 4 carbon atoms and m and n are each, independently, an integer from 1 to 4, together with pharmacologically acceptable salts thereof,
provided that when X_5 is a group $—OX^6$ then n is always greater than 1 and X^4 and X^5 are attached to different carbon atoms
and that when X^7 is a group $—OX^8$ then m is always greater than 1 and no single carbon atom in the radical $—(C_mH_{2m})—$ is attached to two oxygen atoms.

16. Tricyclic compounds of formula (I)



wherein
X^1 is a 5-tetrazolyl group
X^2 is a carbonyl or methylene
X_3 is hydroxyl or a group $—X^4(C_nH_{2n})X^5$
where
X^4 is oxygen or sulphur
X^5 is hydrogen or a group $—OX^6$
where
X^6 is hydrogen or alkanoyl of 1 to 4 carbon atoms and n is an integer from 1 to 4,
together with pharmacologically acceptable salts thereof,
provided that when X^5 is a group $—OX^6$ then n is always greater than 1 and X^4 and X^5 are attached to different carbon atoms.

25. A pharmaceutical formulation comprising a compound according to any of claims 1, 2 and 5 or a pharmacologically acceptable salt thereof, together with an acceptable carrier therefor.

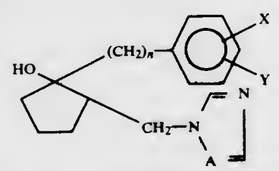
4,902,702

NOVEL AZOLE DERIVATIVE AND AGRICULTURAL/HORTICULTURAL FUNGICIDE CONTAINING SAID DERIVATIVE AS ACTIVE INGREDIENT

Hiroyuki Esari; Satoru Kunazawa; Susumu Shimizu; Atsushi Ito; Nobuo Sato, and Toshihide Saishoji, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,629
Claims priority, application Japan, Dec. 22, 1986, 61-305908
Int. Cl.⁴ A01N *43/653*; C07D *249/08*
U.S. Cl. 514—383 **3 Claims**

1. An azole derivative represented by the formula (I):



(I)

wherein X and Y independently represent a halogen atom, a phenyl group or a hydrogen atom, providing that at least one of X and Y is not a hydrogen atom, n represents an integer of 0, 1 or 2, and A represents a nitrogen atom.

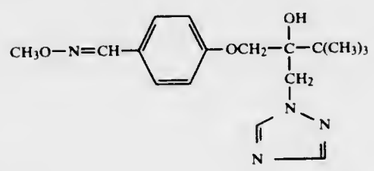
4,902,703

FUNGICIDAL ACTIVE COMPOUND COMBINATIONS

Wilhelm Brandes, Leichlingen; Helmut Kaspers; Hans Scheinpflug, both of Leverkusen, and Graham Holmwood, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

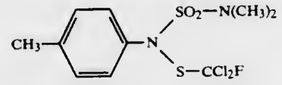
Filed Jan. 6, 1988, Ser. No. 141,879
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3700922
Int. Cl.⁴ A01N *41/02, 43/64*
U.S. Cl. 514—383 **2 Claims**

1. A fungicidal composition comprising a fungicidally effective amount of
(a) 3,3-dimethyl-2-(4-methoximinomethyl-phenoxymethyl)-1-(1,2,4-triazol-1-yl)-butan-2-ol of the formula



(I)

and
(b) N,N-dimethyl-N'-(fluorodichloromethylmercapto)-N'-(4-methyl-phenyl)-sulphamide of the formula



(II)

the weight ration of (I):(II) ranging from about 1:1 to 1:10.

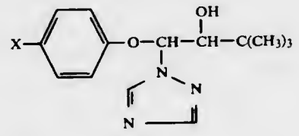
4,902,704

SYNERGISTIC FUNGICIDAL COMPOSITIONS

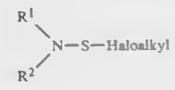
Wilhelm Brandes, Leichlingen; Helmut Kaspers, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinpflug, Leverkusen, and Wolfgang Krämer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 750,719, Jun. 28, 1985, which is a continuation of Ser. No. 526,933, Aug. 26, 1983, abandoned. This application Dec. 1, 1986, Ser. No. 936,416
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3234624
Int. Cl.⁴ A61K *31/425*
U.S. Cl. 514—383 **5 Claims**

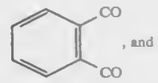
1. A fungicidal composition comprising a fungicidally active amount of
A. a 1,2,4-triasolyl-alkanol of the formula



in which
X is chlorine or phenyl, and
B. a polyhalogenoalkylthio derivative of the formula



wherein
R^1 represents dimethylamidosulphonyl, and
R^2 represents phenyl, or
R^1 and R^2 together represent



, and

Haloalkyl represents the groups $—CCl_3$, $—CCl_2F$ and $—CCl_2—CHCl_2$, the weight ratio of (A):(B) being between about 1:0.5 and 1:50.

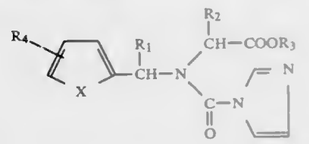
4,902,705

IMIDAZOLE DERIVATIVES, AN ANTIBACTERIAL AND ANTIFUNGAL AGENT COMPRISING SAID DERIVATIVES, AND A PROCESS FOR THE PRODUCTION OF SAID IMIDAZOLE DERIVATIVES

Yohjiro Hirota, Tokyo; Hiasao Sugiura; Nobuyuki Kuroda, both of Yamaguchi; Takuo Wada, and Kazukuki Tsujimoto, both of Kanagawa, all of Japan, assignors to UBE Industries, Ltd. and Hokko Chemical Industry Co., Ltd., both of, Japan

PCT No. PCT/JP85/00683, § 371 Date Jul. 21, 1987, § 102(e) Date Jul. 21, 1987, PCT Pub. No. WO87/03591, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 12, 1985, Ser. No. 90,684
Int. Cl.⁴ G07D *405/12*; A01N *43/50*
U.S. Cl. 514—397 **8 Claims**

1. An imidazole derivative represented by the formula (I):



(I)

wherein R_1 denotes a hydrogen atom or a lower alkyl group of 1 to 6 carbon atoms, R_2 denotes a lower alkyl group of 1 to 6 carbon atoms, R_3 denotes an alkenyl group of 2 to 10 carbon atoms, a cycloalkyl group of 3 to 6 carbon atoms, and an alkoxyalkyl group of 3 to 6 carbon atoms, R_4 denotes a hydrogen atom or a lower alkyl group of 1 to 6 carbon atoms, and X denotes an oxygen atom or a sulfur atom.

8. A method of disinfecting seeds of crop plants for prevention of fungal plant diseases, which comprises treating the seeds with an antifungally effective amount of an imidazole derivative of claim 7.

4,902,706

AMINOALKYLAMINOCARBONYL AMINODIOL AMINO ACID DERIVATIVES AS ANTIHYPERTENSIVE AGENTS

Gunnar J. Hanson, Skokie, and John S. Baran, Winnetka, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jul. 1, 1988, Ser. No. 214,234
Int. Cl.⁴ A61K *31/415*; C07D *233/64*
U.S. Cl. 514—400 **4 Claims**

4. A therapeutic method for treating hypertension, said method comprising administering to a hypertensive patient, or to a patient susceptible to hypertension, a therapeutically-effective amount of a compound selected from the group consisting of
O-{N-[2-(N,N-dimethylamino)ethyl]-N-methylaminocarbonyl}-3-L-phenyllactyl-L-histindineamide of (2S,3R,4S)-2-amino-1-cyclohexyl-3,4-dihydroxy-6-methylheptane; or a pharmaceutically-acceptable salt thereof; and
O-{N-[2-(N-methylamino)ethyl]-N-methylaminocarbonyl}-3-L-phenyllactyl-L-histidineamide of (2S,3R,4S)-2-amino-1-cyclohexyl3,4-dihydroxy-6-methylheptane or a pharmaceutically-acceptable salt thereof.

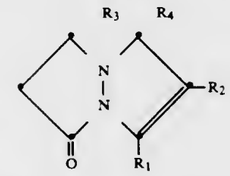
4,902,707

BICYCLIC PYRAZOLIDINONES, COMPOSITIONS AND USE

Louis N. Jungheim, and Sandra K. Sigmund, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 30, 1985, Ser. No. 729,009
The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.
Int. Cl.⁴ A01N *43/56*; A61K *31/415*; C07D *231/00*
U.S. Cl. 514—405 **19 Claims**

1. A compound of the formula:



wherein
either R_1 and R_2 is hydrogen, C_1 to C_6 alkyl, substituted C_1 to C_6 alkyl substituted with one or two halogen, hydroxy, protected hydroxy, amino, protected amino, C_1 to C_7 acyloxy, nitro, carboxy, protected carboxy, carbaoyl, carbamoyloxy, cyano, methylsulfonylanimo or C_1 to C_4 alkyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} phenylalkyl wherein the C_1 to C_6 alkyl portion is substituted C_1–C_6 alkyl as defined above and wherein; the phenyl group may also be substituted phenyl substituted by 1 or 2 groups chosen from the group consisting of halogen, hydroxy, protected hydroxy, nitro, C_1 to C_6 alkyl, C_1 to C_4 alkoxy, carboxy, protected carboxy, carboxymethyl, protected carboxymethyl, hydroxymethyl, protected hydroxymethyl, aminomethyl, protected aminomethyl, trifluoromethyl, and a methylsulfornylamino group; phenyl, substituted phenyl as defined above; nitro or cyano;
a group of the formula

$—CX_3$

wherein X is fluoro, chloro, bromo or iodo;
a group of the formula



wherein Z is 0, 1, 2 and R_5 is C_1 to C_6 alkyl, substituted C_1 to C_6 alkyl as defined above; phenyl, substituted phenyl as defined above; C_7 to C_{12} phenylalkyl, C_7 to C_{12} phenylalkyl substituted on the C_1 to C_6 alkyl portion as defined above, and wherein the phenyl portion is substituted phenyl as defined above;
a group of the formula

$—COR_6$

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wherein R_6 is hydrogen, C_1 to C_6 alkyl, substituted C_1 to C_6 alkyl as defined above; perfluoro C_2 to C_4 alkyl, trihalomethyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} phenylalkyl substituted on the C_1 to C_6 alkyl portion or the phenyl portion as defined above;

phenyl or substituted phenyl as defined above; a group of the formula

—$COOR_7$

wherein R_7 is hydrogen, an organic or inorganic cation chosen from the group consisting of lithium, sodium, potassium, barium and calcium cations, ammonium, dibenzylammonium, benzylammonium, 2-hydroxyethylammonium, bis(2-hydroxyethyl)ammonium, phenylethylbenzylammonium, dibenzylethylenediammonium, the protonated forms of procaine, quinine, N-methylglucosamine, glycine, ornithine, histidine, phenylglycine, lysine and arginine; C_1 to C_6 alkyl, substituted on the C_1 to C_6 alkyl as defined above; C_7 to C_{12} phenylalkyl, C_7 to C_{12} phenylalkyl substituted on the C_1 to C_6 alkyl portion or phenyl portion as defined above phenyl, substituted phenyl as defined above; a carboxy protecting group, or a non-toxic, metabolically-labile ester-forming group chosen from the group consisting of methoxymethyl, ethoxymethyl, isopropoxymethyl, methoxyethyl, ethoxyethyl, propoxyethyl, iso-propoxyethyl, 5-methyl-2-oxo-1,3-dioxolen-4-ylmethyl, 5-phenyl-2-oxo-1,3-dioxolen-4-ylmethyl, methylthiomethyl, ethylthiomethyl, iso-propylthiomethyl, pivloyloxymethyl, α-acetoxymethyl, ethoxycarbonyl-1-methyl, α-acetoxyethyl, 3-phthalidyl, 5,6-dimethylphthalidyl, 1-(ethoxycarbonyloxy)-eth-1-yl, and 1-(methylaminocarbonyloxy)eth-1-yl; and the other of R_1 or R_2 is a group of the formula

—$COOR_9$

wherein R_9 is hydrogen, an organic or inorganic cation chosen from the group consisting of lithium, sodium, potassium, barium and calcium cations, ammonium, dibenzylammonium, benzylammonium, 2-hydroxyethylammonium, bis(2-hydroxyethyl)ammonium, phenylethylbenzyl ammonium, dibenzylethylenediammonium, the protonated forms of procaine, quinine, N-methylglucosamine, glycine, ornithine, histidine, phenylglycine, lysine and arginine a carboxy protecting group, or a non-toxic, metabolically-labile ester-forming group as defined above for R_7; and R_3 and R_4 are the same or different and are hydrogen, C_1 to C_6 alkyl, substituted C_1 to C_6 alkyl as defined above for R_1 or R_2 C_7 to C_{12} phenylalkyl, C_7 to C_{12} phenylalkyl substituted on the C_1 to C_6 alkyl portion or the phenyl portion as defined above for R_1 or R_1; phenyl, substituted phenyl as defined above for R_1 or R_2; or a group of the formula

—$COOR_{10}$

wherein R_{10} has the same definition as R_7;

with the exception that, when R_1 and R_2 are a group of the formula

—$COOCH_3$,

R_3 and R_4 are not methyl; or a pharmaceutically-acceptable salt thereof.

18. A pharmaceutical composition useful for the control of gram-positive and gram-negative bacterial infections, comprising a suitable vehicle and a therapeutically effective amount of the compound of claim 1, wherein R_9 is other then a carboxy protecting group and, wherein any amino, hydroxy and carboxy groups present in R_1, R_2, R_3 R_4 are unprotected.

4,902,708

CCK ANTAGONISTS

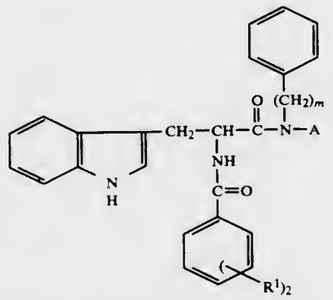
Sun H. Kim, Chestnut Hill, Mass., assignor to Biomeasure, Inc., Hopkinton, Mass.

Continuation-in-part of Ser. No. 815,217, Dec. 31, 1985, Pat. No. 4,814,463. This application Apr. 12, 1988, Ser. No. 180,310

Int. Cl.[4] C07D *209/20;* **A61K** *31/405*

U.S. Cl. 514—419 **24 Claims**

1. A compound having the formula



or pharmaceutically acceptable salt thereof,

wherein each R^1 is, independently, an alkyl group having 1-5, inclusive, carbon atoms, an alkoxy group having 1-5, inclusive, carbon atoms, a halogen, amino, hydroxy, nitro, cyano, carboxyl, trifluoromethyl, ethyl carboxylate, or a hydrogen;

m is an integer between 0 and 2, inclusive;

A is either

wherein n is an integer between 1 and 5, inclusive, and R^2 is hydroxy, an alkoxy group having 1-5, inclusive, carbon atoms, aralkoxy, aralkyl, amino, an alkyl group having 1-5, inclusive, carbon atoms, an alkylamino group having 1-5, inclusive, carbon atoms, a dialkylamino group with each alkyl group having 1-5, inclusive, carbon atoms, or A is an alkyl group having 1-5, inclusive, carbon atoms, a hydroxalkyl group having 1-5, inclusive, carbon atoms, an alkoxyalkyl group having 2-8, inclusive, carbon atoms, an aralkoxyalkyl having 8-14, inclusive, carbon atoms, an aryl group having 6-14, inclusive, carbon atoms, an aralkyl group having 6-14, inclusive, carbon atoms, and a cycloalkyl group having 3-12, inclusive, carbon atoms.

22. A method for treating a patient having a disorder associated with excessive cholecystokinin comprising administering to said patient an effective amount of the compound of any of claims 1-21.

4,902,709

NOVEL ANTIHYPERCHOLESTEROLEMIC COMPOUNDS

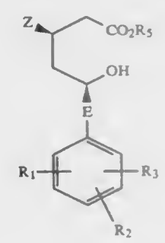
Gerald E. Stokker, Gwynedd Valley, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 26,512, Mar. 17, 1987, Pat. No. 4,789,682. This application Aug. 12, 1988, Ser. No. 231,322

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—428 **8 Claims**

1. A compound of structural formula (II):



(II)

wherein

Z is phenyl, naphthyl, thiophenyl, pyrryl; or phenyl, naphthyl, thiophenyl, pyrryl substituted with a group A;

A is selected from a group consisting of: Cl, F, OH, C_{1-5}alkyl, C_{1-5}alkyloxy, C_{2-8}alkanoyloxy, C_{2-6}alkanoylamino, C_{1-5}alkyloxycarbonyl, phenyl, hydroxy-C_{1-5}alkyl, trifluoromethyl-C_{2-8}alkanoylamino;

E is a direct bond, —CH_2—, —CH_2CH_2— R_1, R_2, R_3 are each selected from: H, Cl, or F, C_{1-4}alkyl, C_{1-4}chloroalkyl or C_{1-4}fluroalkyl, phenyl, phenyl substituted by Cl or F, C_{1-4}alkyloxy. C_{2-8}alkanoyloxy C_{2-8}-Balkanoyloxy-C_{1-5} alkyl, and

OR_4 in which R_4 is H, C_{2-8}alkanoyl, benzoyl phenyl, chlorophenyl or flurophenyl, phenyl-C_{1-3}alkyl, C_{1-8}alkyl, C_{1-4}-chloroalkyl or C_{1-4}fluroalkyl, cycloalkyl-C_{1-3}alkyl, adamantyl-C_{1-3}alkyl, or substituted Phenyl-C_{1-3}alkyl in which the substituents are selected from: chlorine or fluorine, C_{1-4}alkyloxy, C_{1-4}alkyl, C_{1-4}chloroalkyl or C_{1-4}-fluroalkyl;

R_5 is hydrogen, C_{1-5} alkyl or C_{1-5} alkyl substituted with a member of the group consisting of phenyl, dimethylamino, or acetylamino; and

a pharmaceutically acceptable salt of the compound (II) in which R_5 is hydrogen.

4,902,710

SEROTONIN AND NOREPINEPHRINE UPTAKE INHIBITORS

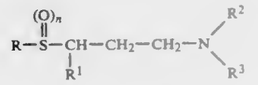
Bennie J. Foster, Greenwood; David C. Hunden, Carmel, and Edward R. Lavagnino, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 14, 1988, Ser. No. 284,501

Int. Cl.[4] A61K *31/38, 31/34;* **C07D** *409/00, 333/32*

U.S. Cl. 514—438 **27 Claims**

1. A compound of the formula



wherein:

R is phenyl, substituted phenyl, naphthyl, substituted naphthyl, thienyl, halothienyl, (C_1–C_4 alkyl)-substituted-thienyl, furanyl, halofuranyl, (C_1–C_4 alkyl)-substituted-furanyl, pyrrolyl, halopyrrolyl or (C_1–C_4 alkyl)-substituted-pyrrolyl;

R^1 is phenyl, substituted phenyl, C_5–C_7 cycloalkyl, thienyl, halothienyl, (C_1–C_4 alkyl)-substituted-thienyl, furanyl, pyridyl or thiazolyl;

R^2 and R^3 are each independently hydrogen or methyl;

n is 0, 1 or 2; and

the pharmaceutically acceptable acid addition salts thereof.

4,902,711

6′ CARBAMATE ESTERS OF ZEARALANOL AND ITS DERIVATIVES

Edward B. Hodge, Terre Haute, Ind., assignor to Pitman-Moore, Inc., Terre Haute, Ind.

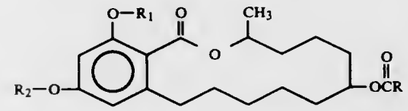
Filed Jan. 19, 1988, Ser. No. 145,057

Int. Cl.[4] A61K *31/335*

U.S. Cl. 514—450 **8 Claims**

1. A method for promoting growth in a ruminant comprising the step of:

administering to said ruminant a growth promoting amount of a compound having the formula:



wherein R_1 and R_2, which may be the same or different, are H, X, or COX, where X is an alkyl group having from 1–6 carbon atoms; and R is NH—Y, where Y is an alkyl group having from 1–6 carbon atoms.

4,902,712

FLUOROALKANE DERIVATIVES

Michael J. Smithers, Macclesfield, United Kingdom, assignor to Imperial Chemical Industries plc, London, England

Filed May 9, 1986, Ser. No. 861,331

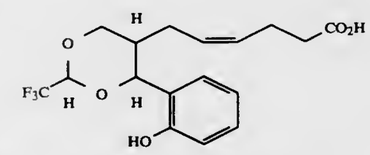
Claims priority, application United Kingdom, May 10, 1985, 8511892

The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.

Int. Cl.[4] A61K *31/335;* **C07D** *319/06*

U.S. Cl. 514—452 **6 Claims**

1. The compound 4(Z)-6-((2,4,5-cis)-4-o-hydroxyphenyl-2-trifluoromethyl-1,3-dioxan-5-yl)hexenoic acid of the formula I:



I

or a pharmaceutically acceptable salt thereof.

4,902,713

AZADIRACHTIN-LIKE COMPOUNDS AND INSECT-DESTROYING AGENTS CONTAINING THEM

Heinz Rembold, and Hans Forster, both of Munich, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foederung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

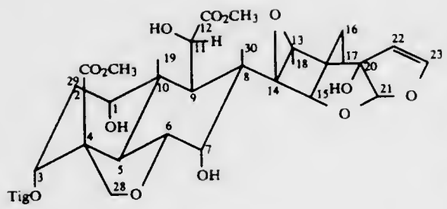
Filed Jan. 22, 1988, Ser. No. 146,820

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 3702175

Int. Cl.[4] A01N *43/16;* **C07D** *317/70*

U.S. Cl. 514—453 **3 Claims**

1. Azadirachtin F of the formula



in which Tig represents tigloyl.

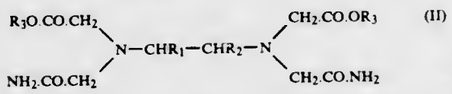
4,902,714

PHARMACEUTICAL COMPOSITIONS

Andrew M. Creighton, London, and William A. Jeffery, Tollesbury, both of England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 842,857, Mar. 24, 1986, Pat. No. 4,755,619.
This application Apr. 19, 1988, Ser. No. 183,067
Claims priority, application United Kingdom, Apr. 1, 1985, 8508508
Int. Cl.[4] A61K *31/35*
U.S. Cl. 514—459 **22 Claims**

1. A method for the treatment of a patient receiving an anthracycline drug in order to provide protection against any cardiotoxic effect of that drug, which method comprises administering to said patient a therapeutically effective amount of a compound of formula (II)



(II)

wherein R_1 and R_2 are each separately selected from hydrogen, alkyl, alkenyl and alkynyl groups having up to a maximum of four carbon atoms and being unsubstituted, and alkyl, alkenyl and alkynyl groups having up to a maximum of three carbon atoms and being substituted by one phenyl, carboxy, alkoxycarbonyl, halogeno (other than fluoro), hydroxy or alkoxy group, or by one or more fluoro groups, but with the proviso that when R_1 is hydrogen then R_2 is hydrogen or methyl or R_1 and R_2 together constitute an ethylene bridging group, and R_3 excludes any group in which the bonding carbon atom does not carry at least one hydrogen atom, R_3 being selected from (a) alkyl, alkenyl and alkynyl groups having up to a maximum of ten carbon atoms and being either unsubstituted or substituted by one or more alkoxy, carboxy, halogeno, hydroxy, alkoxycarbonyl, benzyloxycarbonyl, cyano, amino, alkylamino, dialkylamino or oxo groups and (b) aralkyl, aralkenyl, and aralkynyl groups in which the aromatic part of the group may optionally be substituted by one or two substituents selected from halogen, lower alkyl, lower alkoxy, amino and nitro groups or by one methylenedioxy group, and in which the aliphatic part of the group has up to a maximum of ten carbon atoms and may optionally be substituted by one substituent selected from alkoxycarbonyl and cyano groups, with the further proviso that the compound is in the meso or erythro configuration when each R_1 and R_2 is the same or different unsubstituted or substituted alkyl, alkenyl or alkynyl group, and salts thereof with a physiologically acceptable inorganic or organic acid.

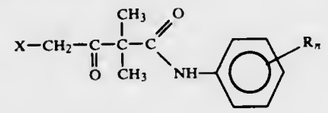
4,902,715

FUNGICIDAL 4-MONOHALOACETOACETOACETANILIDES

Bernd Schilling, Burghausen; Anneliese Reutter, Eglharting, and Norman Häberle, Munich, all of Fed. Rep. of Germany, assignors to The Dow Chemical Company, Midland, Mich.

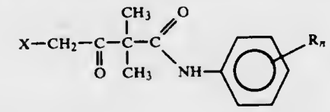
PCT No. PCT/EP87/00564, § 371 Date Jun. 27, 1988, § 102(e) Date Jun. 27, 1988, PCT Pub. No. WO88/03132, PCT Pub. Date May 5, 1988
PCT Filed Oct. 1, 1987, Ser. No. 233,199
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636551
Int. Cl.[4] C07C *103/34, 122/00;* A01N *37/34, 37/18*
U.S. Cl. 514—522 **2 Claims**

1. Compounds of the formula



wherein X is a chlorine, bromine or iodine atom, each R is the same or different substituents in any desired ring position of the benzene ring, and is namely, halogen atoms, C_1–C_3-alkyl groups, trifluoromethyl groups or cyano groups and ? is a whole number with a value of 1, 2 or 3.

2. A method for killing and controlling fungi which attack plants or plant products which comprises applying to the fungi or its living area an amount of a composition effective to kill and/or control said fungi, said composition comprising, as the fungicidal-active material, a compound of the formula



wherein X is a chlorine, bromine or iodine atom, each R is the same or different substituents in any desired ring position of the benzene ring, and is namely, halogen atoms, C_1–C_3-alkyl groups, trifluoromethyl groups or cyano groups and n is a whole number with a value of 1, 2 or 3 in admixture with inert adjuvants.

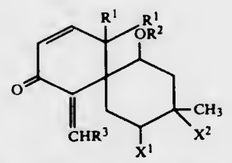
4,902,716

ANTI-VIRAL CHAMIGRENE DERIVATIVES

Tatsuo Higa, Naha, Japan, and Kenneth M. Snader, Vero Beach, Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Fla.

Filed Dec. 18, 1984, Ser. No. 682,896
Int. Cl.[4] A61K *31/12, 35/80;* C07C *49/597*
U.S. Cl. 514—546 **15 Claims**

1. A composition of the general formula:



wherein both R^1 groups are the same and are hydrogen or a lower alkyl group R^2 is hydrogen, lower alkyl or a lower acyl group, R^3 is hydrogen or a lower alkyl group, and X^1 and X^2 are the same or different and are a fluoro, chloro, bromo, iodo or lower alkoxy group.

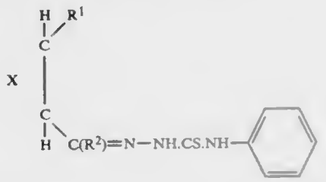
4,902,717

PROSTAGLANDINS

Judith Senior, Otley, and Kay M. Troughton, Skipton, both of England, assignors to National Research Development Corporation, London, England

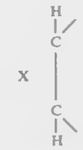
PCT No. PCT/GB86/00028, § 371 Date Sep. 3, 1986, § 102(e) Date Sep. 3, 1986, PCT Pub. No. WO86/04234, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 16, 1986, Ser. No. 913,672
Claims priority, application United Kingdom, Jan. 16, 1985, 8501035
Int. Cl.[4] A61K *31/34, 31/557, 31/175*
U.S. Cl. 514—562 **21 Claims**

1. A method for aiding the regression and palliation of oestrogen-dependent neoplastic disease which comprises administering to a patient in need thereof a therapeutically effective amount of a compound of the formula (I)

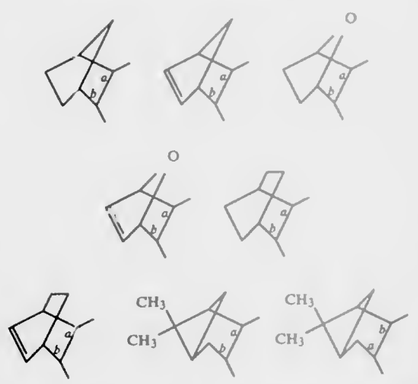


(I)

wherein



represents one of the divalent cyclic groups



the letters a and b indicating in each case the points of attachment of the substituents R^1 and $C(R^2)$ =N—NH.CS.NH—C_6H_5, respectively; R^1 is a 6-carboxyhex-2-enyl group or a modification thereof in which the group is altered by one, or an appropriate combination of two or more, of the following: (a) alteration of the position of the double bond to the 3,4-position, (b) reduction of the double bond, (c) alteration of the chain length through a decrease or an increase of one methylene group, and (d) formation of a physiologically acceptable amide, ester or salt derivative of the carboxy group; and R^2 is hydrogen, methyl or ethyl.

4,902,718

CALCIUM HOMEOSTASIS COMPOSITIONS AND METHODS FOR CONTROLLING CALCIUM METABOLISM

Robert K. Bayless, 6509 Pevensey Dr., Austin, Tex. 78745; Gerald P. Hirsch, 8414 Hanbridge La., Austin, Tex. 78736, and Sandra S. Kern, 2630 Deerfoot Trail, Austin, Tex. 78704

Filed Apr. 8, 1988, Ser. No. 179,258
Int. Cl.[4] A61K *31/195*
U.S. Cl. 514—562 **9 Claims**

1. A method for normalizing calcium metabolism in a subject in need thereof, comprising administering to the subject active components in dosage form consisting essentially of a daily allowance of a pharmaceutically acceptable calcium agent which provides 0.5 to 1.5 grams of calcium, an a therapeutically effective calcium metabolism normalizing amount of a methionine compound selected from the group consisting of the methionine hydroxy analog, the S-methyl methionine analog, and methionine compounds having the structural formula I



I

dl- or d- form

and pharmaceutically acceptable N- (mono- and di-carboxylic acid) acyl derivatives and alkyl esters thereof, where n is an integer from 1 to 3.

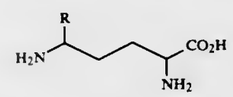
4,902,719

5-SUBSTITUTED ORNITHINE DERIVATIVES

Fritz E. Gerhart, Kehl Lentesheim, Fed. Rep. of Germany, and Nikolaus J. Seiler, Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Feb. 1, 1989, Ser. No. 305,247
Claims priority, application United Kingdom, Feb. 5, 1988, 88400275
Int. Cl.[4] A61K *31/195*
U.S. Cl. 514—564 **9 Claims**

1. A δ-substituted ornithine derivative of the formula:



wherein R is a —CH_2F, —CHF_2, —CHClF, —C≡CH, —CH=CH_2, or —CH=C=CH_2 group or a pharmaceutically acceptable acid addition salt thereof.

4,902,720

TREATMENT OF VIRUS INFECTIONS WITH QUATERNARY AMMONIUM COMPOUNDS

Joseph A. Baldone, 1211 Royal St., New Orleans, La. 70116

Continuation of Ser. No. 19,117, Feb. 26, 1987, abandoned, which is a continuation of Ser. No. 756,666, Jul. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 743,889, Jun. 12, 1985, abandoned, which is a continuation of Ser. No. 631,645, Jul. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 456,732, Jan. 10, 1983, abandoned. This application Jul. 5, 1988, Ser. No. 214,880
Int. Cl.[4] A61K *31/14*
U.S. Cl. 514—642 **13 Claims**

1. A method for treating infection or disease in a mammal caused by herpes simplex virus type-1 or herpes simplex virus type-2 comprising the step of administering to the mammal a

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quaternary ammonium compound selected from the group consisting of tetraethylammonium ion, hexamethonium ion, pentolinium ion, chlorisondamine ion, trimethidinium ion, trimethaphan ion, and homologs thereof in an effective dosage.

4,902,721

FOAMABLE THERMOPLASTIC POLYMERS AND A METHOD FOR FOAMING

Tu-Anh Pham, Lake Jackson, and Gerald M. Lancaster, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 241,523, Sep. 7, 1988, which is a division of Ser. No. 47,071, May 4, 1987, Pat. No. 4,853,420. This application Jul. 19, 1989, Ser. No. 382,451

Int. Cl.[4] C08J *9/00*

U.S. Cl. 521—50.5 **32 Claims**

1. A polymer composition which when subjected to high frequency electromagnetic radiation produces a foamed polymer, which polymer composition comprises

(1) from about 10 to about 100 percent by weight based upon the combined weight of components (1) and (2) of at least one thermoplastic polymer which is heatable when subjected to high frequency electromagnetic radiation, which polymer contains in its backbone, some carbon atoms which have attached thereto a member selected from the group consisting of =O, —Cl, —OH, —OCH_3, —OC_2H_5, —O—CO—CH_3, and —O—CO—C_2H_5; which groups are present in an amount to render the polymer heatable by high frequency electromagnetic radiation;

(2) from about zero to about 90 percent by weight based upon the combined weight of components (1) and (2) of at least one polymer which is not heatable when subjected to high frequency electromagnetic radiation: and wherein each of the polymer compositions (1) and (2) has been imbibed or impregnated with a suitable mechanical or physical foaming or blowing agent in an amount which causes expansion of the imbibed or impregnated polymer when subjected to a sufficient amount of electro-magnetic radiation to cause foaming of the imbibed or impregnated polymer composition.

4,902,722

EXPANDABLE GRAPHIC ART PRINTING MEDIA USING A SYNTACTIC FOAM BASED ON MIXTURE OF UNEXPANDED AND EXPANDED HOLLOW POLYMERIC MICROSPHERES

George E. Melber, Depew, N.Y., assignor to Pierce & Stevens Corp., Buffalo, N.Y.

Continuation of Ser. No. 122,693, Nov. 19, 1987, Pat. No. 4,771,079, which is a division of Ser. No. 756,270, Jul. 18, 1985, abandoned. This application Jun. 9, 1988, Ser. No. 204,304

Int. Cl.[4] C08J *9/22, 9/32*

U.S. Cl. 521—54 **6 Claims**

1. In a thermally expandable syntactic foam graphics art medium containing a polymer binder, a vehicle, and hollow, thermaly expandable thermoplastic microspheres, the improvement comprising:

including in said ink composition about 0.1 to about 10 weight percent, based on the weight of the non-volatile contents of said medium, of expanded hollow, thermoplastic microspheres, said expanded microspheres having a diameter of from about 2 to about 5 times the diameter of the said expandable microspheres, said diameter being in the range of from about 10 to 200 micrometers having a density of from about 1 to about 5 lbs per cubic foot, and said expanded microspheres are substantially free from further expansion at the temperature of thermal expansion of said medium.

4,902,723

PROCESS FOR PRODUCING FLEXIBLE POLYURETHANE FOAM USING HEXAHYDRO-S-TRIAZINE CATALYSTS

Otis M. Baker, St. Albans; Frank E. Critchfield, South Charleston, and Paul M. Westfall, St. Albans, all of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Division of Ser. No. 139,758, Dec. 30, 1987, Pat. No. 4,814,359. This application Nov. 7, 1988, Ser. No. 272,428

Int. Cl.[4] C08J *9/12*

U.S. Cl. 521—129 **3 Claims**

1. A flexible polyurethane foam produced by the process which comprises reacting:

(a) a polyether polyol and

(b) an organic polyisocyanate, in the presence of a hexahydro-s-triazine catalyst, a foam stabilizer and a blowing agent wherein the hexahydro-s-triazine catalyst is hexamethylenetetramine or mixtures of hexamethylenetetramine with 1,3,5-tris(N,N dialkylaminoalkyl)-s-hexhydrotriazines.

4,902,724

PHOTOCURABLE ACRYLIC COATING COMPOSITION

James E. Moore, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

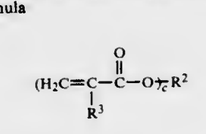
Continuation of Ser. No. 136,625, Dec. 22, 1987, abandoned, which is a division of Ser. No. 944,030, Dec. 22, 1986, abandoned. This application Apr. 21, 1989, Ser. No. 342,607

Int. Cl.[4] C08F *2/50*

U.S. Cl. 522—40 **16 Claims**

1. An ultraviolet radiation curable coating composition for plastic substrates consisting of:

(i) at least one polyfunctional acrylate monomer represented by the formula

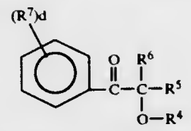


wherein:

R^3 is either a methyl radical or hydrogen; R^2 is a c functional hydrocarbon residue, a c functional substituted hydrocarbon residue, a c functional hydrocarbon residue containing at least one ether linkage, or a c functional substituted hydrocarbon residue containing at least one ether linkage, said substituted hydrocarbon residue having from 1 to 4 substituent groups; and

c is an integer having a value of from 2 up to the number of replacable hydrogen atoms present on R^2;

(ii) at least one acetophenone photoinitiator present at a level selected from between about 0.05 to about 10 weight percent based on the total amounts of polyfunctional acrylate monomer and said photoinitiator present in said coating composition, said acetophenone photoinitiator being represented by the formula



R^4 being selected from lower alkyl radicals, R^5 being selected from hydrogen and alkyl radicals, R^6 being a —OR" radical wherein R" is selected from hydrogen and lower alkyl radicals, R^7 being independently selected from halogen radicals, monovalent hydrocarbon radicals and substituted monovalent hydrocarbon radicals, d having a value of from 0 to 5 inclusive, said substituted monovalent hydrocarbon radicals having from 1 to 4 substituent groups, said substituent groups being selected from hydroxyl, halogens, amino, nitro, —COOH, and —COOR' wherein R' is selected from alkyl groups of 1 to 6 carbon atoms and aryl group of from 6 to 12 ring carbon atoms; and

(iii) at least one active ultraviolate radiation absorber selected from benzotriazoles, cyanoacrylates, and hydroxybenophenones and mixtures thereof, said absorber being present at a level selected from between 5 and 15 weight percent based on the total weight of said polyfunctional acrylate monomer, photoinitiator and absorber in said composition.

4,902,725

PHOTOCURABLE ACRYLIC COATING COMPOSITION

James E. Moore, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 944,031, Dec. 22, 1986, abandoned. This application Nov. 7, 1988, Ser. No. 268,314

Int. Cl.[4] C08F *2/50*

U.S. Cl. 522—42 **6 Claims**

1. An ultraviolet radiation curable coating composition consisting essentially of:

(i) at least one polyfunctional acrylate monomer;

(ii) at least one active ultraviolet radiation absorber selected from the group consisting of benzotriazoles, cyanoacrylates, and hydroxybenzophenones and mixtures thereof, said ultraviolet radiation absorber being present at a level of from about 5 to about 10 weight percent based on the total weight of polyfunctional acrylate monomers, photoinitiators and UV radiation absorber present in the composition; and

(iii) a photoinitiator selected from the group consisting of 2-hydroxy-2,2-dimethylacetophenone, 1-hydroxy cyclohexane phenyl ketone, and 2,2-dimethoxy-2-phenylacetophenone, said photoinitiator being present at a level of from about 0.05 to about 10 weight percent based on the total weight of the polyfunctional acrylate monomer and photoinitiator present in the coating composition.

4,902,726

PHOTOSENSITIVE RESIN COMPOSITION SOLUTION

Nobuyuki Hayashi; Katsushige Tsukada; Tadashi Fujii, and Katsunori Tsuchiya, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo and Ibiden Co., Ltd., Ogaki, both of, Japan

Filed May 11, 1988, Ser. No. 192,785

Claims priority, application Japan, May 19, 1987, 62-121549

Int. Cl.[4] G03C *1/00;* **H05K** *3/28;* **C08F** *2/50;* **C08K** *3/22*

U.S. Cl. 522—18 **22 Claims**

2. A photosensitive resin composition solution for formation of a printed wiring board permanent mask to be coated on a substrate to be coated according to the curtain flow coating method or the roll coating method, comprising

(A) an oligomer having at least one epoxy group and at least one polymerizable vinyl group in the side chain,

(B) a photopolymerization initiator,

(C) an epoxy resin curing agent,

(D) a filler and

(E) a solvent capable of dissolving the oligomer, characterized in that

(1) said solvent (E) contains 10 to 20% by weight of at least one low boiling point solvent selected from the group consisting of methanol, ethanol, methyl ethyl ketone, acetone and ethyl acetate based on the total amount of the solvent, and

(2) said composition solution has a viscosity of 100 mPas to 200 mPas at 25° C.; and

(3) said oligomer having an epoxy group and a polymerizable vinyl group in the side chain is an oligomer obtained by reacting isocyanatoethyl methacrylate with an unsaturated compound, which is obtained by addition reaction of a compound having at least two epoxy groups and an unsaturated carboxylic acid at an acid equivalent/-epoxy equivalent ratio in the range of 0.1 to 0.98, at a ratio relative to the hydroxyl group of the unsaturated compound of an isocyanate equivalent/hydroxyl group equivalent ratio in the range of 0.1 to 1.2.

4,902,727

COMPOUNDS HAVING A POLYMERIZABLE ACYLURETHANE STRUCTURE, AND THEIR PRODUCTION AND PROCESS OF USING

Kei Aoki, Ikoma; Kazunori Kanda, Yao; Satoshi Urano, and Ryuzo Mizuguchi, both of Yawata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

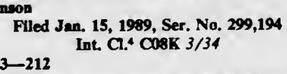
Filed May 27, 1986, Ser. No. 867,014

Claims priority, application Japan, May 28, 1985, 60-117310; May 28, 1985, 60-117315; May 29, 1985, 60-116192

Int. Cl.[4] C08F *2/48;* **B05D** *3/06*

U.S. Cl. 522—90 **34 Claims**

1. A polymeric compound having a substituent of the formula:



wherein R is C_{1-5} alkyl, which can be derived from the corresponding compound having an OH group instead of said substituent and a molecular weight of at least 300.

4,902,728

SURGICAL MATERIAL

Hanns Pietsch, Hamburg; Karl G. Doppler, Lübeck; Barbara Krug, Hamburg; Wolfgang Meyer-Ingold, Hamburg; Ingrid Wesselkamp, Hamburg; Volker Hohmann, Norderstedt; Ernst-Joachim Henssge, and Andre Ljutow, both of Lübeck, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Nov. 8, 1988, Ser. No. 268,420

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738422

Int. Cl.[4] A01F *2/28*

U.S. Cl. 523—115 **7 Claims**

1. In a surgical composition comprising a liquid monomeric and powdered polymeric acrylate and/or methacrylate, a catalyst and an accelerator, the composition upon mixing of the liquid and powdered constituents passing through a plastic state to a solid state, the improvement which comprises including in the composition about 1 to 15% by weight of dimethyl sulfoxide.

4,902,729

SYNTHETIC ALKALI METAL ALUMINO-SILICATES, METHODS AND USES, COMPOSITIONS AND THEIR METHODS OF PREPARATION

Satish K. Wason, Macon, Ga., assignor to J. M. Huber Corporation, Rumson

Filed Jan. 15, 1989, Ser. No. 299,194

Int. Cl.[4] C08K *3/34*

U.S. Cl. 523—212 **14 Claims**

1. A plastic composition containing an alkali metal aluminosilicate having a composition in terms of mole ratio of oxides as follows:

$$xM_2O:Al_2O_3:ySiO_2:zH_2O$$

wherein x is the number of moles of alkali metal oxide and is an integer of 0.01 to 2.0, M is an alkali metal, y is the number of moles of SiO_2 associated with the compositions and is an integer of 2.0 to 20.0, and z is the number of moles of bound water

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and is an integer of 1.0 to 5.0, wherein primary particles of said alkali metal alumino-silicate comprise a core of clay platelets having an integral adjacent area of essentially amorphous alkali metal silicate base-kaolin clay reaction product.

4,902,730

FIBRE REINFORCED POLYPHENYLENE SULPHIDE

Karl-Heinz Reichert, and Ingo Koschinski, both of Berlin, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1988, Ser. No. 232,013

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728602

Int. Cl.[4] C08K *9/04*; C08L *81/04*

U.S. Cl. 523—215 **8 Claims**

1. Fiber reinforced polyarylene sulphide which has been prepared in the presence of fibers chemically activated by pretreatment with arylsulphonic acid chlorides or halogenated arylsulphonic acid chlorides at elevated temperatures.

4,902,731

ORGANOSILICON PREPOLYMERS

Raymond T. Leibfried, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 79,740, Jul. 30, 1987, which is a continuation-in-part of Ser. No. 901,092, Aug. 27, 1986, abandoned. This application Aug. 16, 1988, Ser. No. 232,826

Claims priority, application Canada, Aug. 25, 1987, 545252

Int. Cl.[4] C08K *7/02*; C08G *77/04*

U.S. Cl. 523—222 **48 Claims**

1. An organosilicon prepolymer which is the partial reaction product of (a) a cyclic polysiloxane or a tetrahedral siloxysilane containing at least two ≡SiH groups and (b) a polycyclic hydrocarbon polyene having in its rings at least two chemically distinguishable carbon-carbon double bonds, wherein the ratio of carbon-carbon double bonds in the rings of (b) to ≡SiH groups in (a) is greater than 0.5:1 and up to 1.8:1, at least one of the compounds (a) and (b) has more than two reactive sites and wherein 30% to 65% of the ≡SiH groups are reacted.

4,902,732

EPOXY RESIN-BASED CURABLE COMPOSITIONS

Kunio Itoh, Gunma; Sumiko Komiya, Kumamoto; Toshio Shiobara, Gunma; Kazutoshi Tomiyoshi, Gunma, and Yoshio Fujimura, Gunma, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 781,533, Sep. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 606,703, May 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 404,890, Aug. 3, 1982, abandoned. This application Nov. 5, 1986, Ser. No. 928,654

Int. Cl.[4] C08L *63/04*, *83/10*

U.S. Cl. 525—433 **13 Claims**

1. An epoxy resin-based curable composition which comprises:

(a) 100 parts by weight of a curable epoxy resin blend composed of an epoxy resin and a crosslinking or curing agent therefor in such a proportion as to effect curing of the epoxy resin;

(b) from 5 to 100 parts by weight of a block copolymer having at least one hydroxyl group or epoxy group reactive with the component (a) and composed of:

(b-1) at least one segment of a moiety of a substituted or unsubstituted epoxy novolac resin or a phenol novolac resin containing aromatic groups bonded through divalent linking units expressed by the formula —(—CR_2—)$_5$—, in which R is a hydrogen atom or a monovalent hydrocarbon group having 1 to 5 carbon atoms and wherein t is a positive integer from 1 to 6; and

(b-2) at least one segment of an organopolysiloxane moiety having 37 to 200 silicon atoms in the polysiloxane linkage and expressed by the average formula $R^1_aSiO_{(4-a)/2}$, in which R^1 is a monovalent organic group, at least 70% in number of the groups R^1 being alkyl groups and a part of the groups R^1 optionally being hydrogen atoms, and a is a positive number in the range from 1.8 to 2.7, said segments (b-1) and (b-2) being bonded together through a silicon-to-carbon linkage; and

(c) an inorganic filler in an amount of 100 to 500 % by weight based on the total amount of the components (a) and (b).

4,902,733

AQUEOUS PROTECTIVE COATING COMPOSITION COMPRISING 3-ALKOXY-2-HYDROXYPROPYLHYDROXYETHYLCELLULOSE AND FILM FORMING LATEX

John D. Angerer, Chester, Va., assignor to Aqualon Company, Wilmington, Del.

Filed Jul. 25, 1988, Ser. No. 223,577

Int. Cl.[4] C08J *1/26*; C08B *11/08*, *11/20*

U.S. Cl. 524—44 **14 Claims**

1. An aqueous protective coating composition comprising (a) a nonionic, water-soluble 3-alkoxy-2-hydroxypropylhydroxyethylcellulose wherein the alkyl moiety is a straight or branched chain alkyl group having 6 to 24 carbon atoms and (b) a film forming latex.

4,902,734

ACID-CURABLE THERMOSET ENAMELS CONTAINING A TRIAZOLE

Martin Dexter, Briarcliff Manor, N.Y., and Rudolf A. Behrens, New Fairfield, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 803,683, Dec. 2, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 82,894

Int. Cl.[4] C08K *5/34*, *5/42*

U.S. Cl. 524—91 **4 Claims**

1. A thermosetting, acid-curable enamel coating composition, stabilized against discoloration, degradation and light sensitivity resulting from contact with a copper or copper alloy substrate, which comprises

(a) an acid-curable thermosetting resin which is selected from the group of thermosetting resins consisting of melamine-acrylic resins, melamine-polyester resins, and melamine-alkyd resins;

(b) an acidic catalyst, suitable for curing said thermosetting resin, which is an aryl sulfonic acid;

(c) an ultraviolet light-absorber which is a 2-(2-hydroxyphenyl)-2H-benzotriazole; and

(d) a triazole which is benzotriazole or tolutriazole.

4,902,735

HIGH IMPACT RESISTANT POLYCARBONATE AND PROCESS FOR PRODUCING SAID POLYCARBONATE

Masaya Okamoto, and Eiichi Terada, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,888

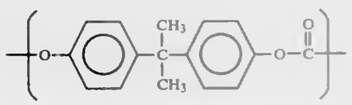
Claims priority, application Japan, Jun. 3, 1987, 62-138185; Sep. 11, 1987, 62-226548

Int. Cl.[4] C08K *5/52*; C08G *63/62*

U.S. Cl. 524—151 **11 Claims**

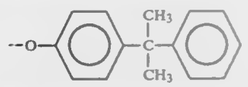
1. High impact resistant polycarbonate:

consisting of a main chain and terminal groups bonded thereto, said main chain comprising a repeating unit represented by the formula (I):



(I)

and at least one of the terminal groups being a cumylphenoxy group represented by the formula (II):



(II)

and having a viscosity average molecular weight of at least 10,000 and an acetone soluble content of not more than 3.5% by weight.

10. The composition as claimed in claim 9 wherein the phosphorus-based antioxidant is at least one compound selected from trialkyl phosphites, triaryl phosphites, trialkyl phosphates, triaryl phosphates, and 2-ethylhexyldiphenyl phosphite.

4,902,736

ONE-PART CURING COMPOSITION

Toshiaki Nonaka; Masashi Nakajima, both of Ichihara; Tatsuro Matsui, Funabashi, and Noriaki Dokoshi, Ichihara, all of Japan, assignors to Toray Thiokol Company Limited, Tokyo, Japan

PCT No. PCT/JP87/00961, § 371 Date Aug. 10, 1988, § 102(e) Date Aug. 10, 1988, PCT Pub. No. WO88/04307, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 10, 1987, Ser. No. 243,308

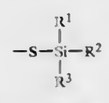
Claims priority, application Japan, Dec. 10, 1986, 61-292542

Int. Cl.[4] C08K *5/09*

U.S. Cl. 524—296 **22 Claims**

1. A one-part curing composition comprising:

(a) a compound having two or more structural groups, per molecule, expressed by the general formula:



(I)

wherein R^1, R^2, and R^3 are selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, a phenyl group, and a chloromethyl group, and

(b) a polymer which is a polyester urethane polymer or a polyether urethane polymer having two or more isocyanate groups per molecule.

4,902,737

RESIN BLENDS EXHIBITING IMPROVED IMPACT PROPERTIES

Angelika H. McHale, Mt. Vernon, Ind., and Warren J. Peascoe, West Stockbridge, Mass., assignors to General Electric Company, Parkersburg, W. Va.

Continuation of Ser. No. 945,459, Dec. 23, 1986, abandoned. This application Jun. 22, 1988, Ser. No. 209,884

Int. Cl.[4] C08L *67/02*, *69/00*

U.S. Cl. 524—409 **33 Claims**

1. A resin composition comprising:

(i) at least one aromatic carbonate resin;

(ii) at least one polyester resin; and

(iii) an impact improving effective amount of at least one two-phase interpolymer comprised of a cross-linked acrylate and a cross-linked styrene-acrylonitrile, said interpolymer being free of linear or non-cross-linked styrene-acrylonitrile and free of any grafting or graft-linking.

4,902,738

THERMOPLASTIC ELASTOMER COMPOSITION AND PROCESS FOR PRODUCING SAME

Tatsuyuki Mitsuno; Hideo Shinonaga; Akio Daimon, and Satoru Hosoda, all of Chiba, Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Continuation of Ser. No. 111,878, Oct. 23, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 277,864

Claims priority, application Japan, Oct. 28, 1986, 61-257635

Int. Cl.[4] C08F *255/00*; C08K *5/01*; C08L *23/10*

U.S. Cl. 524—525 **14 Claims**

1. A thermoplastic elastomer composition which comprises a mixture comprising (A) 20–50 parts by weight of an olefinic copolymer rubber, (B) 50–80 parts by weight of a thermally pre-decomposed olefinic plastic having a ratio of melt index M_1/M_0 of 2–50 wherein M_1/M_0 is a thermal decomposition degree of olefinic plastic thermally pre-decomposed, M_0 is a melt index of the plastic before being subjected to thermal decomposition with organic peroxide and M_1 is a melt index of the plastic after being subjected to the thermal decomposition with the organic peroxide, sum of (A) and (B) being 100 parts by weight, (C) 5–25 parts by weight of a mineral oil, (D) 0.1–3 parts by weight of a bismaleimide compound, and (E) an organic peroxide.

4,902,739

FIBER-TREATMENT COMPOSITION

Isao Ona, and Masaru Ozaki, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

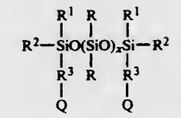
Filed May 19, 1988, Ser. No. 195,983

Claims priority, application Japan, May 26, 1987, 62-129399

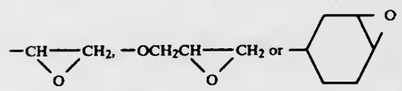
Int. Cl.[4] C08L *23/06*

U.S. Cl. 524—588 **3 Claims**

1. A fiber-treatment composition consisting essentially of an epoxy group-containing organopolysiloxane with the general structural formula



wherein R is a monovalent hydrocarbon radical, R^1 is an alkoxy radical, R^2 is an R or R^1 radical, R^3 is a divalent hydrocarbon radical, Q is a radical having the formula



and x is an integer with a value of at least 5 and a component selected from the group consisting of a silanol-condensing catalyst and an epoxy-curing agent.

4,902,740

POLYAMIDEIMIDES CONTAINING 3,4'-DIAMINO-DIPHENYLETHER AS DIAMINE COMPONENT, WITH PLASTICIZER

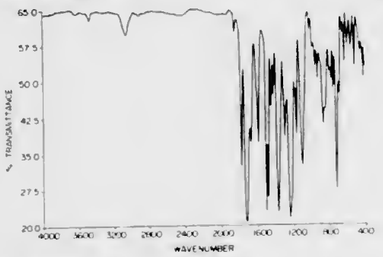
Shigeyoshi Hara; Hiroo Inata, and Shunichi Matsumura, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 888,524, Jul. 23, 1986, abandoned. This application Nov. 8, 1988, Ser. No. 268,479

Claims priority, application Japan, Jul. 26, 1985, 60-163864; Sep. 18, 1985, 60-204321; Jul. 6, 1988, 63-166859

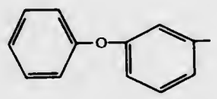
Int. Cl.[4] C08L *67/00, 73/00, 77/00, 79/00*

U.S. Cl. 524—600 **10 Claims**



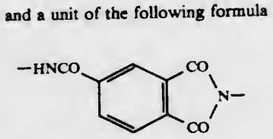
1. An intimate mixture comprising

(A) a polyamideimide comprising a unit of the following formula (II)



(II)

and a unit of the following formula (IV)



(IV)

as main units forming the molecular chains of the polyamideimide, said polyamideimide having an inherent viscosity (η_{inh}) measured at 30° C. in N-methylpyrrolidone, of above 0.48, and

(B) a plasticizing material for the polyamideimide (A), said plasticizing material for the poly amideimide(A) being a diphenyl compound represented by the following formula

$$Ar—A^3—Ar$$

wherein A^3 is —O—, —SO_2, —CO—or an alkylene group, and

Ar is an aromatic radical.

4,902,741

SYNDIOTACTIC 1,2-POLYBUTADIENE LATEX

Gary L. Burroway, Doylestown; George F. Magoun, and Ramesh N. Gujarathi, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 24, 1988, Ser. No. 235,397

Int. Cl.[4] C08J *11/02*

U.S. Cl. 524—836 **20 Claims**

1. A process for producing a syndiotactic 1,2-polybutadiene latex which comprises polymerizing 1,3-butadiene monomer in an aqueous medium in the presence of (1) at least one emulsifier; (2) a catalyst emulsion composition which is comprised of (a) at least one cobalt compound selected from the group consisting of (i) β-ketone complexes of cobalt, (ii) β-keto acid ester complexes of cobalt, (iii) cobalt salts of organic carboxylic acids having 6 to 15 carbon atoms, and (iv) complexes of halogenated cobalt compounds of the formula CoX_n, wherein X represents a halogen atom and n represents 2 or 3, with an organic compound selected from the group consisting of tertiary amine alcohols, tertiary phosphines, ketones and N,N-dialkylamides, and (b) at least one organoaluminum compound of the formula AlR_3 wherein- R represents a hydrocarbon radical of 1 to 6 carbon atoms, wherein said catalyst emulsion composition is microencapsulated in a polyene product and wherein said catalyst emulsion composition is microfluidized in an oil to a particle size which is within the range of about 10 nanometers to about 1000 nanometers: and (3) at least one member selected from the group consisting of carbon disulfide and phenyl isothiocyanate.

4,902,742

THERMOPLASTIC POLYMETHACRYLIMIDE RESIN COMPOSITION

Naoki Yamamoto, Hiroshima; Kozi Nishida, and Akira Yanagase, both of Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1988, Ser. No. 243,929

Claims priority, application Japan, Sep. 18, 1987, 62-234050

Int. Cl.[4] C08L *51/08*

U.S. Cl. 525—63 **14 Claims**

1. A polymethacrylimide resin composition comprising (A) a polymethacrylimide resin and (B) a polyorganosiloxane type graft copolymer formed by graft-polymerizing at least one ethylenically unsaturated monomer onto a polyorganosiloxane rubber copolymerized with a graft-crosslinking agent.

4,902,743

LOW GLOSS THERMOPLASTIC BLENDS

Omar M. Boutni, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 27, 1988, Ser. No. 289,933

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **9 Claims**

1. A low-gloss thermoplastic blend comprising:

(a) an aromatic carbonate polymer;

(b) an acrylonitrile-butadiene-styrene copolymer; and

(c) an effective gloss-reducing amount of from 0.1 to 5% of at least one polymer of glycidyl methacrylate, the weight ratio of (a) to (b) being in the range of about 99:1 to about 20.80.

4,902,744

POLYMER MIXTURE AND ITS USE AS A MODIFIER FOR POLYVINYL CHLORIDE

Christian Lindner; Hans-Eberhard Braese, both of Cologne, and Karl-Erwin Piejko, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 275,925

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742103

Int. Cl.[4] C08L *51/04*

U.S. Cl. 525—71 **5 Claims**

1. A polymer mixture of

(a) 45 to 50 parts by weight of a graft product of a mixture of 25 to 40 parts by weight acrylonitrile and 75 to 60 parts by weight styrene, α-methylstyrene, alkylmethacrylate or mixtures thereof on a particulate, highly crosslinked diene rubber with a gel content greater than 70% by weight and average particle diameters of 0.1 to 0.5 μm, said graft having a rubber content of 20 to 40% by weight,

(b) 45 to 10 parts weight of a graft product of a mixture of 20 to 35 parts by weight acrylonitrile and 80 to 65 parts by weight styrene or α-methylstyrene on a particulate, highly crosslinked diene rubber with a gel content greater than 70% by weight and average particle diameters of 0.2 to 0.6 μm, said graft having a rubber content of 50 to 75% by weight, the graft yield being greater than 60% by weight,

(c) 10 to 50 parts by weight of a particulate, partially crosslinked rubber-like copolymer of a C_2–C_8 alkylacrylate and/or butadiene containing up to 40% by weight (based on copolymer) acrylonitrile which has an average particle diameter (d_{50}) of 0.1 to 0.3 μm and a gel content of 40 to 88% by weight.

5. A method of improving polyvinyl chloride molding compositions by adding effective amounts of the polymer mixture according to claim 1.

4,902,745

RUBBER-LIKE THERMOPLASTIC POLYMER MIXTURES

Karl-Erwin Piejko, Gladbach; Otto Billinger, Linz; Lothar Meier, Sprockhoevel; Christian Lindner, Cologne, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,464

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743488

Int. Cl.[4] C08L *51/04, 51/06*

U.S. Cl. 525—80 **1 Claim**

1. Soft polymer mixtures of

(a) from 10 to 50 parts by weight of a graft polymer containing 40 to 15% by weight of graft polymerized alkyl methacrylate, acrylonitrile, styrene, alkyl acrylate or mixtures thereof grafted onto 60 to 85% by weight of the graft of a particulate highly cross-linked diene or alkylacrylate rubber with a gel content above 80% by weight and a particle size of 0.08 to 0.7 μm, and

(b) from 90 to 50 parts by weight of a partially crosslinked particulate, rubber-like copolymer of 10 to 35% by weight of acrylonitrile and/or methyl methacrylate and 90 to 65% by weight of C_1 to C_8 alkyl acrylate, having a gel content of from 60 to 90% by weight and an average particle diameter (d_{50}) of from 0.1 to 0.6 μm.

4,902,746

USE OF MIXTURES OF POLYCARBONATES AND STYRENE POLYMERS AS SUBSTRATES FOR OPTICAL STORAGE MEDIA

Volker Serini; Klaus Berg, both of Krefeld; Ulrich Grigo, Kempen; Leo Morbitzer, Cologne; Karl-Erwin Piejko, Bergisch Gladbach, and Klaus Sümmermann, Froendenberg-Froemern, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 13, 1988, Ser. No. 283,672

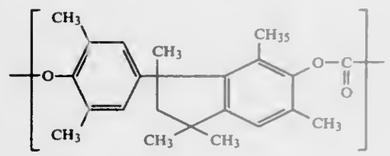
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743491

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—148 **6 Claims**

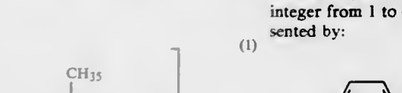
1. A substrate for optical storage media consisting essentially of

(a) 5 to 95% by weight of an aromatic polycarbonate resin the linear chains of which contain 0.1–50 mol. % of units corresponding to



(1)

the balance conforming to



(2)

wherein —O—D—O denotes the residue of a diphenolate other than that in formula (1) and

(b) 5 to 95% by weight of a thermoplastic styrene polymer.

4,902,747

POLYARYLATE MOLDING COMPOSITIONS

Robert J. Kassal, Wilmington, and Pallatheri M. Subramanian, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 14, 1987, Ser. No. 132,489

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—151 **4 Claims**

1. A melt blend of a mixture consisting essentially of

(a) 50–100 parts of a polyarylate derived from at least one dihydric phenol and at least one aromatic dicarboxylic acid;

(b) 0–50 parts of a polyester derived from at least one aliphatic and/or cycloaliphatic diol and at least one dicarboxylic acid;

(c) 1–15 parts of an epoxy group containing copolymer consisting of recurring units of the monomer (1) CH_2=C(R)COOCH$_2$CHCH$_2$O wherein R=H or alkyl of 1–6 carbon atoms, and recurring units of at least one monomer selected from the group consisting of (2) CH_2=CHR where R=H, lower alkyl or phenyl, (3) CH_2=C(R1)COOR$_2$ where R_1=H, lower alkyl and R_2=alkyl of 1–8 carbons, (4) RCOOCH=CH_2 where R= lower alkyl, and (5) CO; and

(d) 0.1–3.0% of a fibrillatable fluoropolymer resin.

4,902,748

POLYMERIC BLENDS BASED ON VINYL-AROMATIC POLYMERS

Gianfranco Biglione, and Gian C. Fasulo, both of Mantova, Italy, assignors to Montedison, S.p.A., Milan, Italy

Division of Ser. No. 837,196, Mar. 10, 1986, Pat. No.

Int. Cl.[4] C08L *67/02, 35/06*

U.S. Cl. 525—166 **6 Claims**

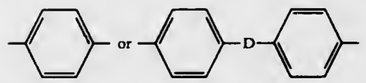
1. A polymeric blend containing from 20 to 80% by weight, with respect to the blend, of a vinyl-aromatic polymer containing from 5 to less than 15% of an ethylenically unsaturated nitrile and from 80 to 20% by weight with respect to the blend of a crystalline aromatic polyester obtained by polymerization of a glycol of the formula:

$$HO—(CH_2)_n—OH$$

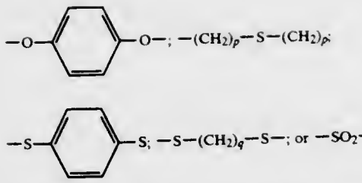
in which n is an integer from 2 to 10, with a bicarboxylic acid of the formula:

$$HOOC—R_5—B—R_6—COOH$$

in which R_5 and R_6 represents —(CH_2)m where m is zero or an integer from 1 to 4 and B is a bivalent aromatic radical represented by:



in which D is: —(CH_2)p—; —(CH_2)p—CO—(CH_2)p; —(CH_2)p—O—(CH_2)p;
—O—(CH_2)q—O—;



where p is zero or an integer from 1 to 5 and q is an integer from 1 to 5, said vinyl-aromatic polymer containing about 8% by weight of polybutadiene rubber for rendering the polymer impact-resistant, said rubber having a glass transition temperature (Tg) lower than −20° C.

4,902,749

HIGH IMPACT, STYRENIC POLYMER/THERMOPLASTIC POLYMER GRAFTED BLENDS

Murali K. Akkapeddi, Morris Plains; Bruce VanBuskirk, Randolph, and Timothy J. Kraft, Pompton Plains, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 88,736, Aug. 24, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 262,196

Int. Cl.[4] C08L *77/00*

U.S. Cl. 525—66 **7 Claims**

1. A blended composition comprising:

(a) a preblend of a modified styrenic polymer wherein said modified styrenic polymer comprises the reaction product of polybutadiene modified styrene-acrylonitrile resin with an ethylenically unsaturated grafting agent, said grafting agent being maleic anhydride and said modified styrenic polymer containing the acid anhydride groups of said maleic anhydride as pendant reactive functionalities, and a functionalized ethylene-propylene rubber and

(b) a polyamide having reactive moieties selected from the group consisting of amine, hydroxyl, and carboxyl; said reactive moieties being present as end groups or groups pendant to the polyamide backbone.

4,902,750

LATENT CATALYSTS FOR HEAT CURABLE THERMOSETTING RESINS

Hong-Son Ryang, Camarillo, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 100,651, Sep. 24, 1987, abandoned. This application Mar. 9, 1989, Ser. No. 320,991

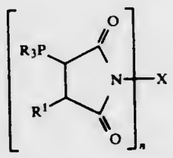
Int. Cl.[4] C08F *30/02, 22/40*

U.S. Cl. 525—326.8 **20 Claims**

1. A heat-curable resin system, comprising:

(a) a bismaleimide resin; and

(b) an effective amount of a catalyst which promotes thermal curing of said bismaleimide resin, wherein said catalyst contains at least one N-[3-phosphoranylidenly-1-azacyclopenta-2,4-dione] radical, and having the formula:



wherein R^1 and each R are individually selected from the group consisting of substituted and unsubstituted alkyl, cycloalkyl, and aryl radicals; and wherein X is an organic radical of valence n wherein n is a whole number from 1 to about 4.

4,902,751

PREPARATION OF MODIFIED ACRYLAMIDE POLYMERS

Morris E. Lewellyn, and Donald P. Spitzer, both of Fairfield, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 197,884, May 24, 1988, abandoned. This application Jun. 5, 1989, Ser. No. 361,089

Int. Cl.[4] C08F *8/32*

U.S. Cl. 525—340 **3 Claims**

1. In a process for the preparation of an acrylamide polymer containing hydroxamic groups by reacting an aqueous solution of an acrylamide polymer with a hydroxylamine salt at a mole ratio of hydroxylamine to amide groups in the acrylamide polymer of from about 0.1 to about 2.0, the improvement which comprises conducting the reaction at a pH of at least about 11.0, a temperature ranging from about 40°–80° C., for from about 1–4 hours and at a polymer solution concentration of at least 2%, by weight, the polymer having a molecular weight of from about 10^6 to about 3×10^7, said pH being that naturally occurring after substantially complete neutralization of said hydroxylamine salt.

4,902,752

POLYCYANATE ESTERS OF POLYHYDRIC PHENOLS BLENDED WITH THERMOPLASTIC POLYMERS

David A. Shimp, Prospect, Ky., assignor to Hi-Tek Polymers, Inc., Jeffersontown, Ky.

Filed Oct. 5, 1987, Ser. No. 104,686

Int. Cl.[4] C08L *71/04*

U.S. Cl. 525—390 **8 Claims**



1. A cured composition comprised of a blend of:

(A) a polycyanate ester of a polyhydric phenol;

(B) an amorphous, aromatic thermoplastic resin which is initially soluble in the blend but which phase separates during cyclotrimerization of the polycyanate ester; and

(C) a polycyanate curing catalyst,

wherein B is present in the amount of about 5 to about 25 weight percent based on the weight of A and B,

said cured composition having strain energy release rate values in the crack opening mode, G_{IC}, in excess of 1.5 inch-pounds/inch^2.

4,902,753

POLYPHENYLENE ETHER-POLYESTER MOLDING COMPOSITIONS USEFUL UNDER SEVERE MOLDING CONDITIONS

Sterling B. Brown, Schenectady; John R. Campbell, Clifton Park, and Timothy J. Shea, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

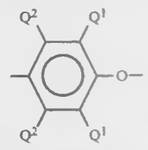
Filed Jan. 4, 1988, Ser. No. 140,522

Int. Cl.[4] C08L *67/02, 69/00, 71/04*

U.S. Cl. 525—394 **6 Claims**

1. A resinous composition comprising the following, all percentage proportions being by weight of total resinous components:

(A) about 15–70% of at least one polyphenylene ether comprising structural units having the formula



(I)

wherein in each of said units independently, each Q^1 is independently halogen, primary or secondary lower alkyl, phenyl, haloalkyl, aminoalkyl, hydrocarbonoxy, or halohydrocarbonoxy wherein at least two carbon atoms separate the halogen and oxygen atoms; and each Q^2 is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl, hydrocarbonoxy or halohydrocarbonoxy as defined for Q^1;

(B) about 20–80% of at least one poly(alkylene dicarboxylate); and

(C) from 3% to about 50% of a mixture of:

(C-1) a bisphenol A homopolycarbonate having a weight average molecular weight of at least about 30,000, as determined by gel permeation chromatography relative to polystyrene; and

(C-2) a triblock copolymer having a weight average molecular weight in the range of about 10,000–100,000, in which the end blocks are polyphenylene ether blocks having a number average molecular weight in the range of about 2,000–20,000 and the midblock is a bisphenol A polycarbonate block;

the weight ratio of component C-1 to component C-2 being in the range of about 0.3–3.0:1.

4,902,754

HYDROXY FUNCTIONAL URETHANE POLYESTER WITH POLYMERIZED LACTONES

Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Grosse Pointe Farms, and Tab Semanision, Mt. Clemens, all of Mich., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

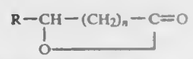
Division of Ser. No. 105,329, Oct. 7, 1987, Pat. No. 4,833,216, which is a division of Ser. No. 813,104, Dec. 24, 1985, Pat. No. 4,734,463. This application Oct. 5, 1988, Ser. No. 253,692

Int. Cl.[4] C08G *63/08, 63/18, 63/20;* **C08L** *67/02*

U.S. Cl. 525—440 **9 Claims**

1. An organic solvent based, thermosetting coating composition comprising:

(I) a hydroxy functional urethane modified polyester resin of a hydroxy functional urethane modified polyester resin suitable for use in a thermosetting composition, which resin has a number average molecular weight (M_n) of between about 2,000 and about 20,000, said resin being the product of polymerization at about 50°–300° C. of a reaction mixture of lactone monomers in the presence of hydroxy-containing urethane modified polyester precursor (i) having a number average molecular weight (M_n) between about 1,000 and about 10,000, (ii) having a hydroxyl number between about 30 and about 300, and (iii) containing between about 1 and about 10 urethane groups per molecule; wherein pendant hydroxyl terminated polycaprolactone moieties are formed and attached to the polyester precursor and wherein said lactone monomers are selected from those represented by the general formula:



in which n is at least 4, at least n+2 R's are hydrogen, and the remaining R's are substituents selected from the group consisting of alkyl, cycloalkyl, alkoxy and single ring aromatic hydrocarbon radicals, and wherein said hydroxy-containing urethane modified polyester precursor is the reaction product of:

(A) hydroxy functional polyester resin being the reaction product of:

(a) polyhydroxy material comprising diols and triols, and (b) acid component selected from dicarboxylic acid and anhydrides thereof, wherein said (a) and (b) are reacted in amounts so as to provide hydroxyl groups and carboxyl groups in a ratio of from about 6:2 to about 6:5, respectively; and

(B) diisocyanate, wherein said (A) and (B) are reacted in amounts so as to provide hydroxyl groups and isocyanate groups in a ratio of from about 4:1 to about 10:1, respectively and wherein the reaction mixture comprises between about 10 and 80 percent by weight of said precursor and between about 90 and 20 percent by weight of said lactone monomers; and

(II) blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups which have been blocked by reaction with an active hydrogen bearing blocking agent, said blocked polyisocyanate crosslinking agent being included in an amount such that upon de-blocking of the blocked isocyanate groups thereof at the cure temperature of the composition, said crosslinking agent provides between about 0.5 and about 1.6 reactive isocyanate groups per hydroxyl group on said hydroxy functional urethane modified polyester resin.

4,902,755

HYDROXY FUNCTIONAL URETHANE POLYESTER WITH POLYMERIZED LACTONES

Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Grosse Pointe Farms, and Tab Semanision, Mt. Clemens, all of Mich., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

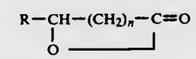
Division of Ser. No. 105,329, Oct. 7, 1987, Pat. No. 4,833,216, which is a division of Ser. No. 813,104, Dec. 24, 1985, Pat. No. 4,734,463. This application Oct. 5, 1988, Ser. No. 253,694

Int. Cl.[4] C08G *63/08, 63/18, 63/20;* **C08L** *67/02*

U.S. Cl. 525—440 **7 Claims**

1. An organic solvent based, thermosetting coating composition comprising:

(I) hydroxy functional urethane modified polyester resin suitable for use in a thermosetting composition, which resin has a number average molecular weight (M_n) of between about 2,000 and about 20,000, said resin being the product of polymerization at about 50° to 300° C. of a reaction mixture of lactone monomers in the presence of hydroxy-containing urethane modified polyester precursor (i) having a number average molecular weight (M_n) between about 1,000 and about 10,000, (ii) having a hydroxyl number between about 30 and 300, and (iii) containing between about 1 and about 10 urethane groups per molecule; wherein pendant hydroxyl terminated polycaprolactone moieties are formed and attached to the polyester precursor and wherein said lactone monomers are selected from those represented by the general formula:



in which n is at least 4, at least n+2 R's are hydrogen, and the remaining R's are substituents selected from the group consisting of alkyl, cycloalkyl, alkoxy and single ring aromatic hydrocarbon radicals, and wherein said hydroxy-containing urethane modified polyester precursor is the reaction product of:

(A) hydroxy functional polyester resin being the reaction product of:

(a) polyhydroxy material comprising diols and triols,

and (b) acid component selected from dicarboxylic acid and anhydrides thereof, wherein said (a) and (b) are reacted in amounts so as to provide hydroxyl groups and carboxyl groups in a ratio of from about 6:2 to about 6:5, respectively; and

(B) diisocyanate, wherein said (A) and (B) are reacted in amounts so as to provide hydroxyl groups and isocyanate groups in a ratio of from about 4:1 to about 10:1, respectively and wherein the reaction mixture comprises between about 10 and 80 percent by weight of said precursor and between about 90 and 20 percent by weight of said lactone monomers, and

(II) a blocked polyisocyanate crosslinking agent comprising the reaction product of:

(A) the reaction product of (i) organic diisocyanate represented by the formula:

OCN—R—NCO

wherein R is selected from the group consisting of aliphatic, cycloaliphatic and aromatic radicals and combinations thereof and wherein one of the isocyanate groups thereof is a more reactive isocyanate group than the other isocyanate group and (ii) sufficient active hydrogen containing blocking agent to react with substantially all of said more reactive isocyanate groups; and

(B) sufficient polyol to react with substantially all of said other isocyanate groups.

4,902,756

HYDROXY FUNCTIONAL URETHANE POLYESTER WITH POLYMERIZED LACTONES

Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Grosse Pointe Farms, and Tab Semanision, Mt. Clemens, all of Mich., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

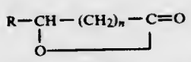
Division of Ser. No. 105,329, Oct. 7, 1987, Pat. No. 4,833,216, which is a division of Ser. No. 813,104, Dec. 24, 1985, Pat. No. 4,734,463. This application Oct. 5, 1988, Ser. No. 253,693

Int. Cl.[4] C08G *63/08, 63/18, 63/20;* **C08L** *67/02*

U.S. Cl. 525—440 **5 Claims**

1. The solvent based, thermosetting coating composition comprising

(I) hydroxy functional urethane modified polyester resin which resin has a number average molecular weight (M_n) of between about 2,000 and about 20,000, said resin being the product of polymerization at about 50°–300° C. of a reaction mixture of lactone monomers in the presence of hydroxy-containing urethane modified polyester precursor (i) having a number average molecular weight (M_n) between about 1,000 and about 10,000 (ii) having a hydroxyl number between about 30 and about 300, and (iii) containing between about 1 and about 10 urethane groups per molecule; wherein pendant hydroxyl terminated polycaprolactone moieties are formed and attached to the polyester precursor and wherein said lactone monomers are selected from those represented by the general formula:



in which n is at least 4, at least n+2 R's are hydrogen, and the remaining R's are substituents selected from the group consisting of alkyl, cycloalkyl, alkoxy and single ring aromatic hydrocarbon radicals, and wherein said hydroxy-containing urethane modified polyester precursor consists of the reaction product of:

(A) urethane modified diol being the reaction product of: (a) diol and (b) diisocyanate, wherein said diol and said diisocyanate are reacted in a molar ratio from about 4:1 to about 4:3, respectively:

(B) polyol comprising at least about 5 weight percent triol; and

(C) acid component selected from dicarboxylic acids and anhydrides thereof; and wherein the reaction mixture comprises between about 10 and 80 weight percent of said precursor and between about 90 and about 20 weight percent of said lactone monomers; and

(II) a blocked polyisocyanate crosslinking agent comprising the reaction product of:

(A) the reaction product of (i) organic diisocyanate represented by the formula:

OCN—R—NCO

wherein R is selected from the group consisting of aliphatic, cycloaliphatic and aromatic radicals and combinations thereof and wherein one of the isocyanate groups thereof is a more reactive isocyanate group than the other isocyanate group and (ii) sufficient active hydrogen containing blocking agent to react with substantially all of said more reactive isocyanate groups; and

(B) sufficient polyol to react with substantially all of said other isocyanate groups.

4,902,757

HYDROXY FUNCTIONAL URETHANE POLYESTER WITH POLYMERIZED LACTONES

Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Grosse Pointe Farms, and Tab Semanision, Mt. Clemens, all of Mich., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

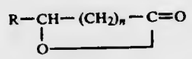
Division of Ser. No. 105,329, Oct. 7, 1987, Pat. No. 4,833,216, which is a division of Ser. No. 813,104, Dec. 24, 1985, Pat. No. 4,734,463. This application Oct. 5, 1988, Ser. No. 253,691

Int. Cl.[4] C08G *63/08, 63/18, 63/20;* **C08L** *67/02*

U.S. Cl. 525—440 **7 Claims**

1. An organic solvent based, thermosetting coating composition comprising:

(I) A hydroxy functional urethane modified polyester resin which resin has a number average molecular weight (M_n) of between about 2,000 and about 20,000, said resin being the product of polymerization at about 50°–300° C. of a reaction mixture of lactone monomers in the presence of hydroxy-containing urethane modified polyester precursor (i) having a number average molecular weight (M_n) between about 1,000 and about 10,000 (ii) having a hydroxyl number between about 30 and about 300, and (iii) containing between about 1 and about 10 urethane groups per molecule; wherein pendant hydroxyl terminated polycaprolactone moieties are formed and attached to the polyester precursor and wherein said lactone monomers are selected from those represented by the general formula:



in which n is at least 4, at least n+2 R's are hydrogen, and the remaining R's are substituents selected from the group consisting of alkyl, cycloalkyl, alkoxy and single ring aromatic hydrocarbon radicals, and wherein said hydroxy-containing urethane modified polyester precursor consists of the reaction product of:

(A) urethane modified diol being the reaction product of: (a) diol and (b) diisocyanate, wherein said diol and said diisocyanate are reacted in a molar ratio from about 4:1 to about 4:3, respectively;

(B) polyol comprising at least about 5 weight percent triol; and

(C) acid component selected from dicarboxylic acids and anhydrides thereof; and

wherein the reaction mixture comprises between about 10 and 80 weight percent of said precursor and between about 90 and about 20 weight percent of said lactone monomers; and

(II) blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups which have been blocked by reaction with an active hydrogen bearing blocking agent, said blocked polyisocyanate crosslinking agent being included in an amount such that upon de-blocking of the blocked isocyanate groups thereof at the cure temperature of the composition, said crosslinking agent provides between about 0.5 and about 1.6 reactive isocyanate groups per hydroxyl group on said hydroxy functional urethane modified polyester resin.

4,902,758

PREPARATION OF SEGMENTED BLOCK COPOLYCARBONATES

Maurice J. Marks, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1988, Ser. No. 261,069

Int. Cl.[4] C08F *283/02*

U.S. Cl. 525—462 **44 Claims**

1. A purpose for the preparation of a high molecular weight segmented block copolymer from a diphenol and a tetrahalogenated diphenol, comprising the steps of sequentially:

(A) contacting together a diphenol, a tetrahalogenated diphenol, an organic solvent, and an aqueous metal hydroxide to form a mixture, wherein the diphenol and tetrahalogenated diphenol are in the bisalkali metal phenolate form, and the pH of the aqueous phase of the mixture is within about 10% of the pH of an equilibrium composition consisting solely of an aqueous solution of a molar amount of the diphenol in two normal alkali metal hydroxide;

(B) next, continuously agitating the mixture, and adding to the agitated mixture phosgene, and an amount of additional alkali metal hydroxide sufficient to maintain the pH of the mixture within the about 10% range recited in step A, whereby diphenol polycarbonate oligomers having chloroformate end groups are prepared;

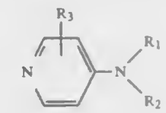
(C) thereafter, adding to the agitated mixture additional phosgene sufficient to attain a decreased pH of the aqueous phase to within about 10% of the pH of an equilibrium composition consisting solely of an aqueous solution of a molar amount of the tetrahalogenated diphenol in two normal alkali metal hydroxide;

(D) then, adding to the agitated mixture additional phosgene, while maintaining the pH of the aqueous phase of the mixture within the about 10% range recited in step C, whereby tetrahalogenated diphenol chloroformates are prepared; and

(E) finally, adding to the mixture an amount of additional alkali metal hydroxide sufficient to attain and maintain an increased pH of the aqueous phase of the mixture within the about 10% range recited in step A,

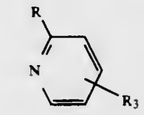
and an amount of an activated pyridine selected from the group consisting of

4-aminopyridines of the general formula:



wherein R_1 and R_2, together with N, form a cyclic alkyl structure, or are each independently a monovalent alkyl radical, or are each independently a polymer chain such that the formula weight of the catalyst is less than 50,000, and R_3 is independently hydrogen or a monovalent alkyl radical, or

2-substituted pyridines of the general formula:



wherein R is a monovalent alkyl radical, a cycloalkyl radical, or a polymer chain such that the formula weight of the catalyst is less than 50,000, and R_3 is as previously defined,

sufficient to catalyze the coupling of the diphenol polycarbonate oligomers having chloroformate end groups and the tetrahalogenated diphenol chloroformates,

whereby a high molecular weight segmented block copolycarbonate is prepared.

4,902,759

COATING COMPOSITION FOR USE IN PREPARING METALLIZED ARTICLES

Maurice Vo-Than, Montmagny, and George Chavasset, Courbevoie, both of France, assignors to Holden Europe SA, Caudebec les Elbeuf, France

Continuation of Ser. No. 48,354, May 11, 1987, abandoned. This application Mar. 3, 1989, Ser. No. 318,478

Claims priority, application France, May 9, 1986, 86 06698

Int. Cl.[4] C08L *63/00*

U.S. Cl. 525—481 **6 Claims**

1. A coating composition suitable for use in preparing a metallized article comprising from 30–70% by weight of a novolac-type phenolic resin of melting point in the range of 70°–130° C. and from 70–30% weight of a multi-epoxy group containing compound having an epoxide equivalent weight of 100 to 1200.

4,902,760

CROSS-LINKED RESINS

Kazuhiro Arita, Takatsuki, and Yasuo Sano, Minoo, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 26, 1988, Ser. Nn. 262,872

Claims priority, application Japan, Oct. 26, 1987, 62-271316

Int. Cl.[4] C08G *59/56*

U.S. Cl. 525—504 **20 Claims**

1. A cross-linked resin produced by heating a mixture of (a) a bis(2-oxazoline) compound, (b) an aromatic polyamine compound which has at least two amino groups in the molecule and (c) a polyepoxy compound which has at least two epoxy groups in the molecule at an elevated temperature of not lower than 80° C.

4,902,761

METHOD FOR PRODUCING AN OLEFIN POLYMER

Yoshinori Suga, Machida; Eiji Tanaka, Kawasaki, and Yasuo Maruyama, Tokyo, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 122,040

Claims priority, application Japan, Nov. 20, 1986, 61-277361; May 8, 1987, 62-111994

Int. Cl.[4] C08F *4/64, 10/00*

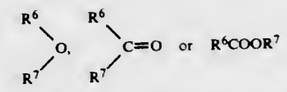
U.S. Cl. 526—119 **28 Claims**

1. A method for producing an olefin polymer, which comprises polymerizing or copolymerizing olefins in the presence of a catalyst consisting essentially of:

(A) a solid catalyst component obtained by thermally reacting (a_1) a magnesium compound of the formula $Mg(OR^1)_n(OR^2)_{2-n}$ wherein each of R^1 and R^2 which may be the

same or different is an alkyl group, an aryl group or an aralkyl group, and n is $2 \geqq n \geqq 0$, (a_2) a titanium compound of the formula $Ti(OR^3)_4$ wherein R^3 is an alkyl group, an aryl group or an aralkyl group and (a_3) a silicon compound of the formula $Si(OR^4)_4$ wherein R^4 is an alkyl group, an aryl group or an aralkyl group, and contacting and treating (a) the resulting thermal reaction product with (b) a halogen-containing titanium compound and (c) an electron donative compound

of the formulas:



wherein each of R^6 and R^7 is a hydrocarbon group which may be substituted by an alkyoxy group, or R^6 and R^7 may be bonded to each other to form a cyclic group,

wherein the thermal reaction product (a) contains a solid product comprising magnesium, titanium, silicon and OR group wherein R is an alkyl group, an aryl group or an aralkyl group,

wherein the molar ratios relative to one mol of the magnesium compound (a_1) are:

$Mg(OR^1)_n(OR^2)_{2-n}$	1
$Ti(OR^3)_4$	0.05–4
$Si(OR^4)_4$	0.1–5,

wherein the molar ratios relative to one mol of the magnesium compound in component (a) are:

Halogen-containing titanium compound (b)	0.1–100
Electron donative compound (c)	0.01–10,

and (B) an organometallic compound of a metal of Groups I–III of the Periodic Table,

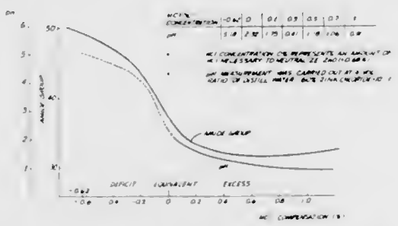
wherein the molar ratio of titanium in the catalyst component (A): organometallic compound (B) is 1:3–500.

4,902,762

PROCESS FOR PREPARING CARBON FIBERS OF HIGH STRENGTH

Koichi Imai; Misao Sumoto; Hiroyuki Nakamura, and Namasa Miyahara, all of Tokyo, Japan, assignors to Nikkiso Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 693,723, Jan. 23, 1985, abandoned. This application Feb. 9, 1987, Ser. No. 12,014
Claims priority, application Japan, Feb. 10, 1984, 59-21995
Int. Cl.[4] C08F *4/00, 20/44, 120/44*
U.S. Cl. 526—237 **8 Claims**



1. A process for preparing carbon fibers of high strength while preventing agglutination thereof during preparation, which comprises forming a polymeric solution by homopolymerizing acrylonitrile or copolymerizing at least 85 percent by weight of acrylonitrile with other vinyl monomers in a concentrated zinc chloride aqueous solution which contains impurity levels of basic salts, and for reducing amide groups in said fibers and increasing the strength of carbon fibers formed there being included in said zinc chloride aqueous solution hydrogen chloride in an amount by weight of from 0.01 to 5% in excess of an equivalent amount of the basic salts to form a zinc chloride solution of a pH of at most 2 prior to forming said polymeric solution, spinning said polymeric solution to form precursor filaments, and carbonizing said precursor filaments to provide carbon fibers.

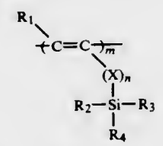
4,902,763

PROCESS FOR THE POLYMERIZATION TRI-SUBSTITUTED SILYLALKYNES

Ann C. Savoca, Reading, and Michael Langsam, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 27, 1988, Ser. No. 199,566
Int. Cl.[4] C08L *238/00*
U.S. Cl. 526—240 **8 Claims**

1. In a process for the polymerization of trisubstituted silylalkyne in an organic solvent in the presence of a Group VB or VIB metal halide catalyst, to produce a polymer having the general structural formula:



wherein R_1 is a linear or branched C_1–C_4 alkyl group; R_2 and R_3 are independently linear or branched C_1–C_6 alkyl groups; R_4 is a linear or branched C_1–C_{12} alkyl group or aryl group; X is a C_1–C_3 alkyl group or phenyl; m is at least 100 and n is 0 or 1, the improvement for increasing the conversion and the rate of polymerization of the trisubstituted silylalkynes comprising: carrying out said polymerization in the presence of about 0.1 to 5.0 mole %, based upon total alkyne concentration, of a trialkylgermylalkyne compound.

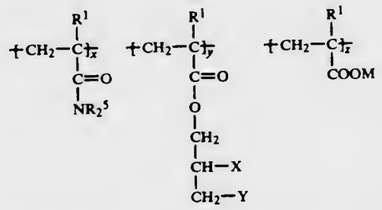
4,902,764

POLYMERIC SULFIDE MINERAL DEPRESSANTS

Alan S. Rothenberg, Norwalk; David W. Lipp, Stamford; Samuel S. Wang, Cheshire, and Donald P. Spitzer, Riverside, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 770,125, Aug. 28, 1985, Pat. No. 4,744,893. This application Feb. 19, 1988, Ser. No. 157,559
Int. Cl.[4] C08F *20/06*
U.S. Cl. 526—240 **3 Claims**

1. A polymer composition comprising recurring units of the formula:



wherein each R^1 is, individually, hydrogen or C_1–C_4 lower alkyl; each R^5, individually, is hydrogen or C_1–C_4 lower alkyl group; X is OH or SH; Y is OR^2, each R^2, individually, is hydrogen or, a lower C_1–C_4 alkyl group, no more than one of Y or X being hydroxyl; M is hydrogen, an alkali metal or an ammonium ion; x is a mole fraction ranging from about 50% to about 99%; y is a mole percent fraction ranging from about 0.5% to about 25.0%, z is a mole percent fraction ranging from about 0.5% to about 25.0%; and the molecular weight of the polymer is between about 1,000 and 500,000.

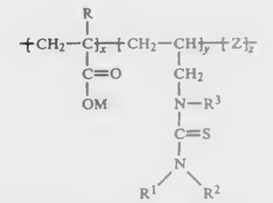
4,902,765

ALLYL THIOUREA POLYMERS

Samuel S. Wang, New Haven, and D. R. Nagaraj, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 19, 1988, Ser. No. 221,389
Int. Cl.[4] C08F *28/00*
U.S. Cl. 526—288 **3 Claims**

1. A polymer composition comprising recurring units of the formula:



wherein R is hydrogen or a C_1–C_4 alkyl group, R^1 and R^2 are, individually hydrogen, a C_1–C_4 alkyl group or an aryl group, R^3 is hydrogen, a C_1—C_4 alkyl group or an aryl group, M is hydrogen, an alkali metal, ammonium or C_1–C_4 alkyl ammonium, Z represents the polymerization residue of any copolymerizable monomer except an acrylamide, x represents a residual mole percent fraction, y represents a mole percent fraction ranging from about 1.0 to about 49.0%, by weight, based on the total weight of x, y and z, z represents a mole percent fraction ranging from about 0% to about 49.0%, same basis, and the molecular weight of the polymer is between about 1000 and about 1,000,000.

4,902,766

LIQUID ALIPHATIC RESINS

Steven G. Heatges, Baton Rouge, La., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 1, 1986, Ser. No. 936,409
Int. Cl.[4] C08F *36/04*
U.S. Cl. 526—290 **14 Claims**

1. A petroleum hydrocarbon resin suitable for use as a tackifier in an adhesive composition, said resin having a softening point of about 0°–40° C., a number average molecular weight Mn of about 100 to 900, a Gardner color of 6 or less, and a piperylene-derived content of about 5–50 weight percent, said resin being prepared by the aluminum chloride catalyzed Friedel-Crafts polymerization of a hydrocarbon feed comprising:

(a) less than about 5 weight percent vinyl aromatic hydrocarbons;

(b) less than 1 weight percent butadiene;

(c) about 10–90 weight percent piperylene stream; and

(d) about 90–10 weight percent monoolefin chain transfer agent stream.

4,902,767

HIGH SLIP URETHANE-SILOXANE COATINGS

Lipa Roitman, and Robert A. Auerbach, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Continuation of Ser. No. 54,900, May 28, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,830
Int. Cl.[4] C08G *77/04*
U.S. Cl. 528—28 **6 Claims**

1. A high surface slip, water repellant, abrasion resistant coating composition comprising a reaction product of

(A) a polydialkyl-substituted polysiloxane having at least two reactive functionalities that are reactive with an isocyanate and selected from the group consisting of carbinol, amino, thiol and epoxy functionalities,

(B) a polyisocyanate; and

(C) an isocyanate reactive polyol having a molecular weight from about 200 to 10,000 and selected from the group consisting of polyether and polyester,

wherein said coating composition imparts a slip angle of from 5° to 16° to an elastomer substrate as measured by an inclined plane arrangement, and wherein component (A) is from about 1 to about 10% weight based on total weight of said reaction product; and (B) and (C) are from 90 to about 99% weight based on total weight of said reaction product.

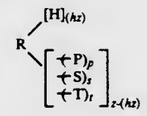
4,902,768

ELASTOMERS PREPARED FROM N-(POLYOXYALKYL)-N-(ALKYL)AMINES

Richard M. Gerkin, Cross Lanes, and Nigel Barksby, Dunbar, both of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 67,819, Jun. 30, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 176,221
Int. Cl.[4] C08G *18/32, 18/10, 18/30*
U.S. Cl. 528—68 **26 Claims**

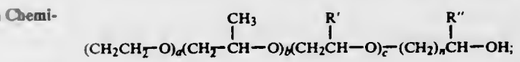
1. A process for the preparation of elastomers which process comprises: reacting a amine mixture with an isocyanate in the presence of a chain extender wherein the amine mixture is of the general formula:



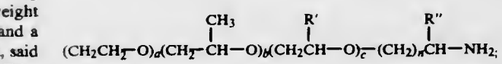
wherein:

R represents an initiator radical based on a compound containing Zerewitinoff active hydrogen atoms;

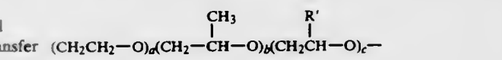
H represents a hydroxy-containing group of the formula:



P represents a primary amine-containing group of the formula:



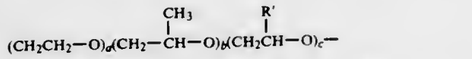
S represents a secondary amine-containing group of the formula:



-continued



T represents a tertiary amine-containing group of the formula:





a is 0 to 175;
b is 0 to 175;
c is 0 to 30;
n is 1 to 3; the sum a+b+c must be greater than or equal to 2 when, n equals 1;
R' is an alkyl group containing from two carbon atom to eighteen carbon atoms;
R'' is hydrogen or an alkyl group containing up to eighteen carbon atoms;
R''' and R'''' are independently alkyl groups containing from two to twelve carbon atoms;
h is from 0 to 0.7;
p is from 0 to 0.5;
s is from 0.5 to 1.0;
t is from 0 to 0.15;
(hz) is the product of h and z;
p+s+t=1; and
z is 2 to 6, with the proviso that when z is 2 and a is zero, then b must be greater than 22.

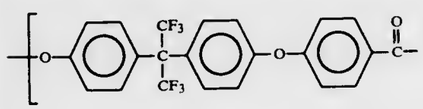
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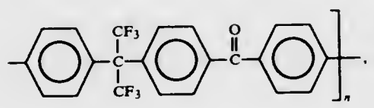
LOW DIELECTRIC FLUORINATED POLY(PHENYLENE ETHER KETONE) FILM AND COATING

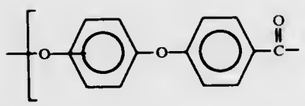
Patrick E. Cassidy, Austin; Gordon L. Tullos, Lake Jackson, both of Tex., and Anne K. St. Clair, Poquoson, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 23, 1988, Ser. No. 248,009
Int. Cl.[4] C08G 8/02, 14/00
U.S. Cl. 528—125 **9 Claims**

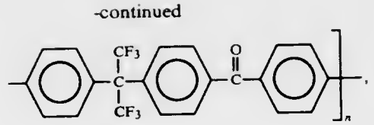
1. A fluorinated poly(phenylene ether ketone) having a structural formula selected from the group consisting of:



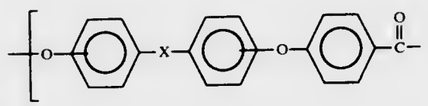


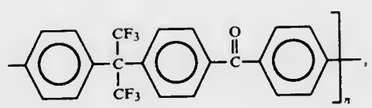


-continued



and





wherein X is selected from the group consisting of aryl, SO_2, O, CO, $-C(CH_3)_2-$, and S.

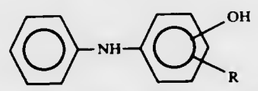
4,902,770

UNDERCOATING MATERIAL FOR PHOTOSENSITIVE RESINS

Wataru Ishii, Hadano; Shozo Miyazawa, Chigasaki; Shinji Tsuchiya, Kanagawa; Hisashi Nakane, Kawasaki, and Akira Yokota, Yamato, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Division of Ser. No. 708,940, Mar. 6, 1985, Pat. No. 4,702,992. This application May 20, 1987, Ser. No. 52,466
Claims priority, application Japan, Mar. 6, 1984, 59-41231
The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.
Int. Cl.[4] C08G 8/16; C14G 14/10; G03C 1/76
U.S. Cl. 528—149 **7 Claims**

1. An undercoating composition for the preparation of a bilayered photoresist film composed of an undercoating layer and a top coat layer of a photosensitive resist on the surface of a substrate which comprises, as a principal ingredient thereof, a condensation product formed by the condensation reaction between (a) a hydroxydiphenylamine compound represented by the general formula



in which R is a hydrogen atom or a hydroxy group, and (b) a melamine compound modified with formaldehyde or a combination of an alcohol and formaldehyde in the presence of an acid catalyst.

4,902,771

IMIDO-MODIFIED UNSATURATED POLYESTER RESIN COMPOSITION

Yasuo Sugawara; Yuuji Aimono, and Hatuo Sugitani, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Aug. 23, 1988, Ser. No. 235,985
Claims priority, application Japan, Sep. 10, 1987, 62-226866; Mar. 18, 1988, 63-66411
Int. Cl.[4] C08G 63/02
U.S. Cl. 528—272 **22 Claims**

1. An imido-modified unsaturated polyester resin composition comprising an imido-modified unsaturated polyester obtainable by reacting an animal or vegetable fat and oil or a fatty acid thereof, an imido alcohol obtainable from a primary amino-alcohol and a polybasic acid anhydride, a polyhydroxy alcohol, and a polybasic acid in such a manner that said imido alcohol is used in an amount of 10 to 60 equivalent amount % based on the alcoholic components; and a polymeric monomer.

4,902,772

DISPERSION POLYMERISATION PROCESS

Neil Carter, Northwich; Brian P. Griffin, St. Albans; William A. MacDonald, Guisborough, and Timothy G. Ryan, Upton, all of England, assignors to Imperial Chemical Industries plc, London, England

Filed Jan. 14, 1988, Ser. No. 143,705
Claims priority, application United Kingdom, Jan. 16, 1987, 8700922
Int. Cl.[4] C08G 63/02
U.S. Cl. 528—272 **8 Claims**

1. A process for the production of a condensation polymer dispersed in an inert organic liquid medium, comprising mixing reactants for forming the condensation polymer in the organic liquid in the presence of a finely divided particulate material having at least 95% by weight of particles with at least one dimension less than 1 micron and comprising an inorganic portion insoluble in the organic liquid medium, and in combination therewith hydrcarbon chains containing at least 8 carbon atoms, the hydrocarbon chains being at least partially soluble in the organic liquid medium, and heating the mixture to produce a condensation polymer of a required degree of polymerisation in the form of stably deflocculated, polymer particles.

4,902,773

METHOD OF PREPARATION OF UNSATURATED POLYESTER RESINS FROM MALEIC ACID/ANHYDRIDE

Akos Bodnar, Balatonfured; Maria Solymosa, Veszprem; Ibolya Vancson Szmercsanyi, Budapest; Istvan Szigeti, Veszprem, and Laszlo Szommer, Fuzfogyartelep, all of Hungary, assignors to Nitrokemia Ipartelepek, Fuzfogyártelep, Hungary

Filed Dec. 4, 1987, Ser. No. 128,903
Claims priority, application Hungary, Dec. 3, 1986, 5001/86
Int. Cl.[4] C08G 63/52, 63/64
U.S. Cl. 528—303 **13 Claims**

1. A polycondensation method for preparing an unsaturated polyester comprising:
polycondensing in a reaction system maleic acid/anhydride and a saturated dicarboxylic acid with an equivalent amount of 1 to 5 mole percent of a stoichiometric excess of a diol,
said polycondensation method characterized in that additional maleic acid/anhydride in an amount of 1 to 30 percent, based on the amount of maleic acid/anhydride prescribed prior to the polycondensing step, is added to said reaction system at the stage of polycondensation when the acid number is 50 to 250 or the molecular weight of the polycondensed product formed is 300 to 1500, said additional amount of the maleic acid/anhydride is added in total or in two or more increments.

4,902,774

POLY(P-PHENYLENETEREPHTHALAMIDE) YARN OF IMPROVED FATIGUE RESISTANCE

Hung H. Yang, and Minshon J. Chiou, both of Richmond, Va., assignors to E. I. DuPont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 162,967, Mar. 2, 1988, Pat. No. 4,859,393. This application Aug. 10, 1988, Ser. No. 230,447
Int. Cl.[4] C08G 69/46, 69/32
U.S. Cl. 528—348 **2 Claims**

1. Poly(p-phenyleneterephthalamide) yarn having an apparent crystallite size in the range of 40 to 50 A, an orientation angle in the range of 20° to 30°, an elongation in the range of 4.5 to 5.6%, a tenacity of at least 18 grams per denier and a modulus of at least 200 grams per denier, but less than 450 grams per denier.

4,902,775

RUBBER VULCANIZATION AGENTS OF SULFUR OLEFIN ADDUCT

Howard A. Colvin, Tallmadge; Charles L. Bull, Jr., Akron, and Fredrick L. Magnus, Mogadore, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 78,320, Jul. 27, 1987, abandoned, which is a division of Ser. No. 896,688, Aug. 15, 1986, Pat. No. 4,739,036. This application Aug. 5, 1988, Ser. No. 228,425
Int. Cl.[4] C08G 75/14
U.S. Cl. 528—389 **11 Claims**

1. A composition of matter comprising a sulfur/olefin adduct containing from about 39% to about 46% by weight of free elemental sulfur and prepared according to a process which includes the steps of
(a) heating to a temperature of from 120° C. to about 200° C., with agitation, an aqueous suspension containing (1) a mixture of elemental sulfur and at least one olefin, or (2) a reaction product of sulfur melt and at least one olefin, wherein the aqueous suspension is heated for a time sufficient to form a granular sulfur/olefin adduct; and
(b) isolating the granular sulfur/olefin adduct.

4,902,776

PREPARATION OF POLY-P-PHENYLENE WITH (1) ALUMINUM CHLORIDE AND (2) CU(I) CL OR VCl_3

Hidefumi Hirai, 14-10, Yutenji 1-chome, Meguro-ku, Tokyo; Naoki Toshima; Keiichi Kanaka, both of Tokyo, and Atsunori Koshirai, Matsudo, all of Japan, assignors to Hidefumi Hirai, Tokyo, Japan

Filed Jan. 12, 1988, Ser. No. 143,036
Claims priority, application Japan, Feb. 19, 1987, 62-36352
Int. Cl.[4] C08G 61/10
U.S. Cl. 528—396 **6 Claims**

1. A process for the preparation of poly-p-phenylene which comprises
polymerizing benzene in an oxygen-containing atmosphere in the presence of aluminum chloride and a lower-valence metal chloride selected from the group consising of copper (I) chloride and vanadium (III) chloride, at a temperature of room temperature to 80° C.

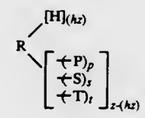
4,902,777

N-(POLYOXYALKYL)-N-(ALKYL)AMINES

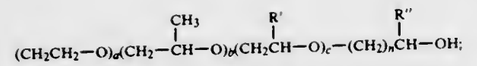
Richard M. Gerkin; David J. Schreck, and Danny E. Smith, all of Cross Lanes, W. Va., assignors to Union Carbide Chemicals and Plastics Company, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 67,822, Jun. 30, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 176,217
Int. Cl.[4] C08G 59/00; C07G 93/04
U.S. Cl. 528—407 **20 Claims**

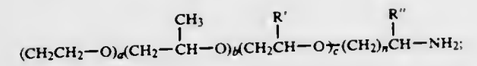
1. A amine mixture of the general formula:



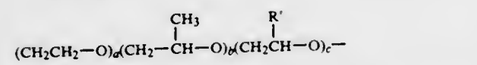
wherein:
R represents an initiator radical based on a compound containing Zerewitinoff active hydrogen atoms;
H represents a hydroxy-containing group of the formula:



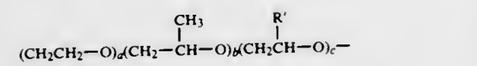
P represents a primary amine-containing group of the formula:



S represents a secondary amine-containing group of the formula:



T represents a tertiary amine-containing group of the formula:



a is 0 to 175;
b is 0 to 175;
c is 0 to 30;
n is 1 to 3;
the sum a+b+c must be greater than or equal to 2 when n equals 1;
R' is an alkyl group containing from two carbon atoms to eighteen carbon atoms;
R'' is hydrogen or an alkyl group containing up to eighteen carbon atoms;
R''' and R'''' are independently alkyl groups containing from two to twelve carbon atoms;
h is from 0 to 0.7;
p is from 0 to less than 0.5;
s is from 0.5 to 1.0;
t is from 0 to 0.15;
(hz) is the product of h and z;
p+s+t=1; and
z is an integer derived from the number of Zerewitinoff active hydrogens on the initiator, with the proviso that when z is 2 and a and c are both zero, then b must be greater than 22.

4,902,778

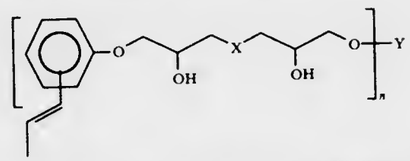
PROPENYLPHENOXY-TERMINATED OLIGOMERIC TOUGHENERS AND THEIR USE IN TOUGHENING THERMOSETTING BISMALEIMIDE RESIN COMPOSITIONS

Jack D. Boyd, San Clemente, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 156,983, Feb. 18, 1988. This application Jun. 6, 1988, Ser. No. 202,412
Int. Cl.[4] C08L *79/08*
U.S. Cl. 525—421 **4 Claims**

1. A heat curable resin composition comprising:
(a) a maleimide-group-containing, heat curable resin; and
(b) a toughening amount of a chain-extended toughener which is the reaction product of a 2-propenylphenol, a diphenol or polyphenol, and an epoxy resin,

wherein said toughener has the formula:



wherein X is the residuum of an epoxy resin and wherein Y is the residuum of a diphenol or polyphenol having n phenolic hydroxyls, where n is an integer of from 2 to about 4.

4,902,779

COMPOSITIONS OF INORGANIC -ORGANIC ALLOY WITH HIGHLY CHARGED NITROGEN CONTENT POLYMERS AND THEIR MANUFACTURE

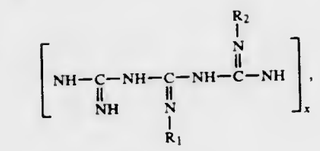
John J. Waldmann, 2129 Knickerbocker Dr., Charlotte, N.C. 28212

Continuation-in-part of Ser. No. 749,343, Jun. 27, 1985. This application Mar. 21, 1986, Ser. No. 842,515
Int. Cl.[4] C08G *73/00*
U.S. Cl. 528—422 **8 Claims**

1. Water-soluble inorganic-organic alloy polymer adduct composition for purification of potable water, acid rain water, paper mill effluent, industrial waster water, industrial waste liquids, solids and semiliquids, water-borne waste and paint, said composition having the formula:

$$A.B^{+}.C.D^{+}$$

wherein
A=$[Me_m^{II}Me_n^{III}(OH)_p(SO_4)_y(Aci)(2m+3n)-p-2y]_r$, where r=0 to 98%;
B=



where x=2 to 98%;
C=$(PAM)_z(PAM-PAD)_{t+z}$;
D=$(PQAM)_w$;
Me_m^{II} is selected from the divalent cation group comprising Mg, Zn, Ca, and Fe^{2+};
m=0 to 5;
Me_n^{III} is a tri-or more valent metal selected from the group comprising Fe, Al, and Al-Zr complexes;
n=1 to 20;
Aci is selected from the monovalent anionic group comprising Cl^-, Br^-, I^-, and NO_3;
PAM=polyamine;
PAD=polyamide;
PQAM=polyquaternized polymer;
p=0 to 75;
y=0 to 15
z=0 to 95% percent by weight of polyamine;
t=0 to 95% percent by weight of polyamide;
w=0 to 98% percent by weight of polyquaternized polymer; and
R_1=bridge cationic or multiple organic cationic charge or mixture thereof.

4,902,780

PROCESS FOR PURIFYING STYRENE/VINYLPYRIDINE COPOLYMER USING SUPERCRITICAL CARBON DIOXIDE

Paul Bourrain, Dardilly; Gérard Collas, Caluire; Jean-Francois Roetaing, Vienne, and Francois Sagi, Lyons, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Continuation of Ser. No. 156,608, Feb. 17, 1988, abandoned. This application Jul. 28, 1989, Ser. No. 385,956
Claims priority, application France, Feb. 19, 1987, 87 02114
Int. Cl.[4] C08F *6/00*
U.S. Cl. 528—483 **2 Claims**

1. A process for producing a copolymer of styrene and a vinylpyridine containing 10 to 50% by weight of styrene units having a content of residual monomers less than or equal to 2 ppm from a said styrene/vinylpyridine copolymer contaminated with residual monomers which comprises contacting the said copolymer with supercritical carbon dioxide at a temperature between 35° and 60° C. and at a pressure between 80 and 250 bars for 1 to 6 hours, recovering the entrained extracts at a temperature of between 25° and 30° C. and at a pressure of between 40 and 70 bars, and recovering the purified copolymer.

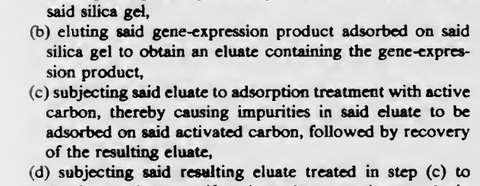
4,902,781

NOVEL TRIPETIDE DERIVATIVES

Kazutoshi Mizone; Tadayasu Okazaki, both of Urawa; Kazunori Hanada; Sadafumi Omura, both of Ageo, and Toshiro Amamoto, Omiya, all of Japan, assignors to Taisho Pharmacentical Co., Ltd., Japan

Filed Nov. 21, 1988, Ser. No. 273,944
Claims priority, application Japan, Nov. 24, 1987, 62-295579; Dec. 4, 1987, 62-306934
Int. Cl.[4] C07K *5/08*
U.S. Cl. 530—331 **1 Claim**

1. A tripeptide derivative of the formula



(I)

wherein R is a formyl group or a dimethoxymethyl group.

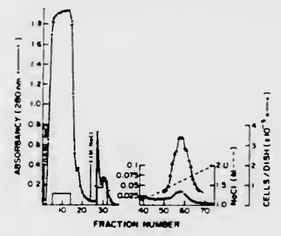
4,902,782

ISOLATION OF FIBROBLAST GROWTH FACTOR

Denis Gospodarowicz, San Francisco; Andrew Baird, San Diego, both of Calif., and Peter Bohlen, Uster, Switzerland, assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation of Ser. No. 940,524, Dec. 10, 1986, Pat. No. 4,785,079, and a continuation-in-part of Ser. No. 670,160, Nov. 9, 1984,. This application Nov. 7, 1988, Ser. No. 268,000
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] C07K *3/28*
U.S. Cl. 530—399 **10 Claims**

1. A method for separating basic fibroblast growth factor (bFGF) from a biological sample, said method comprising the steps of: binding bFGF in the biological sample to heparin linked to an insoluble support; eluting bFGF from said linked heparin by gradient fractionation; and selecting for fractions



capable of inducing proliferation of vascular endothelial cells in vitro.

4,902,783

METHOD FOR PURIFYING A GENE-EXPRESSION PRODUCT PRODUCED BY RECOMBINANT DNA TECHNIQUE

Hideo Goda; Toshiyuki Akiyama; Akihisa Takamizawa; Iwao Yoshida; Takeo Konobe, all of Kanonzi, and Keisuke Takaku, Suita, all of Japan, assignors to The Research Foundation for Microbial Diseases of Osaka University, Osaka, Japan

Filed Jun. 15, 1987, Ser. No. 61,503
Claims priority, application Japan, Jun. 18, 1986, 61-143413
Int. Cl.[4] C07K *3/18, 3/12, 3/28*
U.S. Cl. 530—415 **5 Claims**

1. A method for purifying a gene-expression product produced by recombinant DNA technique which consists essentially of the steps of:
(a) subjecting a crude aqueous solution containing a gene-expression product which solution is obtained from a culture of a transformant prepared by recombinant DNA technique to adsorption treatment with silica gel, thereby causing the gene-expression product to be adsorbed on said silica gel,
(b) eluting said gene-expression product adsorbed on said silica gel to obtain an eluate containing the gene-expression product,
(c) subjecting said eluate to adsorption treatment with active carbon, thereby causing impurities in said eluate to be adsorbed on said activated carbon, followed by recovery of the resulting eluate,
(d) subjecting said resulting eluate treated in step (c) to density gradient centrifugation at least two times to obtain a preliminary fraction containing the gene-expression product, and
(e) subjecting said preliminary fraction obtained in step (d) to equilibrium density gradient centrifugation at least two times to obtain a final fraction containing the gene-expression product;
said gene-expression product being free of allergens detectable by a passive cutaneous anaphylaxis reaction test.

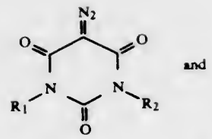
4,902,784

1,3 DISUBSTITUTED-5-DIAZOBARBITURIC ACIDS

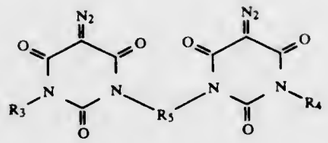
Frederick R. Hopf, Parsippany, and Michael J. McFarland, Middlesex, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 805,641, Dec. 6, 1985, Pat. No. 4,730,885. This application Dec. 28, 1987, Ser. No. 140,447
Int. Cl.[4] C07C *113/00, 113/04*
U.S. Cl. 534—566 **8 Claims**

1. A substituted derivative of 5-diazobarbituric acid selected from those having the structural formulas:



and



I

II

wherein R_1 and R_2 are substituents selected from the group consisting of C_3 to C_{12} alkyl, cyclohexyl, benzyl and aralkyl groups, wherein the alkyl portion contains 2 to 6 carbon atoms and when R_1 or R_2 is C_3 to C_{12} alkyl, the other is cyclohexyl, benzyl or aralkyl groups wherein the alkyl portion contains 2 to 6 carbon atoms; R_3 and R_4 are substituents selected from the group consisting of C_1 to C_{12} alkyl, cyclohexl, benzyl and aralkyl groups wherein the alky portion contains 2 to 6 carbon atoms and R_5 is selected from the group consisting of α,ω-disubstituted C_2 to C_{12} alkyl, methylene dicyclohexyl or C_1 to C_6 dialkylphenylene.

4,902,785

PHENOLIC PHOTOSENSITIZERS CONTAINING QUINONE DIAZIDE AND ACIDIC HALIDE SUBSTITUENTS

Robert E. Potvin, West Warwick; Jonas O. St. Alban, Westerly, and Chester J. Sobodacha, Coventry, all of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 859,284, May 2, 1986, Pat. No. 4,732,836. This application Mar. 21, 1988, Ser. No. 170,538

Int. Cl.[4] **C07C** *113/00, 113/04*

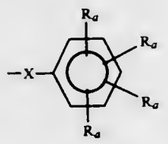
U.S. Cl. 534—557 **18 Claims**

1. A photosensitive compound represented by the formulae (1), (2) or (3):

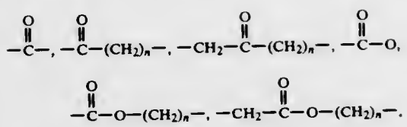
(1)



wherein R is H, —X—R_b or



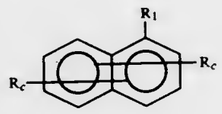
X is a single C—C bond, —O—, —S—, —SO_2—,



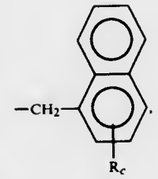
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n is 1 or 2, R_a is H, —OH, —OY, —OZ, halogen or lower alkyl, with at least one R_a radical being —0Y and at least one thereof being —OZ, R_b is H, alkyl, aryl, substituted alkyl, or substituted aryl;

(2)

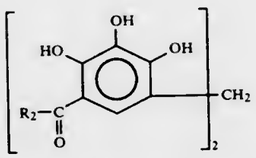


wherein R_1 is H, or



R_c is H, —OH, —OY or —OZ, with at least one R_c radical being —OY and at least one thereof being —OZ; and

(3)



wherein R_2 is H, alkyl, aryl, substituted alkyl, or substituted aryl, Rd is —OH, —OY or —OZ with at least one R_d radical being —OY and at least one thereof being —OZ; wherein y is 1,2-naphthoquinonediazide-4-sulfonyl and Z is —W—R_3, where W is



or —SO_2—, and R_3 is alkyl, aryl, substituted alkyl or substituted aryl.

4,902,786

PHENYLAZONAPHTHOL OR NAPHTHYLAZONAPHTHOL COMPOUNDS CONTAINING A FIBRE-REACTIVE AMINOPHENYLAMINO-SUBSTITUTED HALOGEN-S-TRIAZINYLAMINO GROUP AND A FIBRE-REACTIVE GROUP OF THE VINYLSULFONE SERIES, SUITABLE AS DYESTUFFS

Hartmut Springer, Königstein/Taunus; Michael Kunze, and Marcos Segal, both of Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

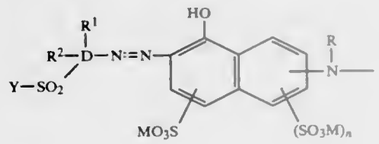
Continuation of Ser. No. 913,534, Sep. 30, 1986, Pat. No. 4,757,136. This application May 20, 1988, Ser. No. 196,323

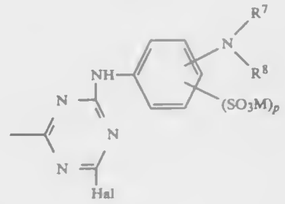
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624136; Sep. 30, 1986, 3624781

Int. Cl.[4] **C09B** *62/085, 62/45, 62/51;* **D06P** *1/384*

U.S. Cl. 534—638 **6 Claims**

1. A compound of the formula





in which:

D is a benzene or naphthalene ring;

R^1 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, sulfo or carboxy;

R^2 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, sulfo, carboxy, phenyl or phenyl substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, hydroxy, nitro, carboxy, sulfo and chlorine, or is 1- or 2-naphthyl, or is 1- or 2-naphthyl substituted by 1, 2 or 3 sulfo, or is hydroxy, nitro or halogen;

R is hydrogen, alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by 1 or 2 substituents selected from the group consisting of: alkoxy of 1 to 4 carbon atoms; sulfocarboxy; hydroxy; sulfato; phenyl; phenyl substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, hydroxy, nitro, carboxy, sulfo and chlorine; 1- or 2-naphthyl; and 1- or 2-naphthyl substituted by 1, 2 or 3 sulfo;

R^7 is hydrogen, or is alkyl of 1 to 4 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of: alkoxy of 1 to 4 carbon atoms; sulfo; carboxy; hydroxy; sulfato; phosphato; phenyl; naphthyl; phenyl substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, hydroxy, nitro, carboxy, sulfo and chlorine; and naphthyl substituted by 1, 2 or 3 sulfo; or R^7 is alkenyl of 2 to 4 carbon atoms or cyclopentyl or cyclohexyl, or cyclopentyl or cyclohexyl substituted by 1, 2 or 3 methyl, and

R^8 is hydrogen, or is alkyl of 1 to 4 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of: alkoxy of 1 to 4 carbon atoms; sulfo; carboxy; hydroxy; sulfato; phosphato; phenyl; naphthyl; phenyl substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, hydroxy, nitro, carboxy, sulfo and chlorine; and naphthyl substituted by 1, 2 or 3 sulfo; or R^8 is alkenyl of 2 to 4 carbon atoms or is phenyl or naphthyl, or is phenyl substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, hydroxy, nitro, carboxy, sulfo and chlorine, or is naphthyl substituted by 1, 2 or 3 sulfo, or R^8 is cyano or a group of the formula



in which Z is oxygen, sulfur, or =N—H, or R^8 is amino or amino monosubstituted or disubstituted by substituents selected from: alkyl of 1 to 4 carbon atoms; phenyl; naphthyl; phenyl substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, hydroxy, nitro, carboxy, sulfo and chlorine; and naphthyl substituted by 1, 2 or 3 sulfo; or R^8 is a group of the formula



in which

W is alkyl of 1 to 4 carbon atoms unsubstituted or substituted by 1 or 2 substitutents selected from group consisting of: alkoxy of 1 to 4 carbon atoms; sulfo; carboxy; hydroxy; sulfato; phosphato; phenyl; naphthyl; phenyl substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, hydroxy, nitro, carboxy, sulfo and chlorine; and naphthyl substituted by 1, 2 or 3 sulfo; or

R^8 is alkoxy of 1 to 4 carbon atoms unsubstitued or substituted by hydroxy, alkoxy of 1 to 4 carbon atoms or alkoxyalkoxy of 1 to 4 carbon atoms in each of the alkyl moieties; or R^7 and R^8 together with the nitrogen are morpholino, piperidino or piperazino;

M is hydrogen or an alkali metal or alkaline earth metal;

n is zero or 1;

p is zero, 1 or 2;

Y is β-thiosulfatoethyl, β-phosphatoethyl, β-chloroethyl, vinyl or β-sulfatoethyl;

Hal is chlorine or fluorine.

4,902,787

METHOD FOR PRODUCING LIGHTFAST DISPERSE DYESTUFFS CONTAINING A BUILD-IN PHOTOSTABILIZER [MOLECULE] COMPOUND

Harold S. Freeman, Raleigh, N.C., assignor to North Carolina State University, Raleigh, N.C.

Filed Apr. 21, 1988, Ser. No. 184,382

Int. Cl.[4] **D06P** *1/16, 1/18, 1/17, 1/20*

U.S. Cl. 534—800 **17 Claims**

1. A method of producing a UV lightfast disperse dyestuff comprising selecting a disperse dyestuff having predetermined chromophoric groups, selecting a photostabilizer compound, designing a hybrid disperse dye compound the molecular structure of which contains the chromophoric groups of the selected disperse dyestuff and contains the molecular structural features of the selected photostabilizer compound in close proximity to the chromophoric groups, and synthesizing the thus designed hybrid disperse dyestuff compound.

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4,902,788

CROSSLINKED CYCLODEXTRINS SUPPORTED ON POROUS REFRACTORY INORGANIC OXIDES

Haya Zemel; Mark B. Koch, and Ronald P. Rohrbach, all of Des Plaines, Ill., assignors to UOP, Des Plaines, Ill.

Filed Sep. 29, 1988, Ser. No. 250,653

Int. Cl.[4] C07H *1/00;* **C08B** *33/04, 37/00;* **C13K** *37/00*

U.S. Cl. 536—1.1 **15 Claims**

1. A composite of a supported insolubilized cyclodextrin comprising a particulate porous refractory inorganic oxide having dispersed thereon a crosslinked cyclodextrin which is the reaction product of a cyclodextrin with from 1 to about 20 molar proportions of a dicarboxylic acid dihalide, where the crosslinked cyclodextrin is from about 1 to about 25 weight percent of the finished product.

4,902,789

PROCESS AND COMPOSITION FOR THE PURIFICATION OF AMPHOTERICIN B

Gerd W. Michel, Princeton; Wilbur L. Bryan, Somerset, both of N.J., and Elizabeth Bryan, Arlington, Va., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 27, 1987, Ser. No. 113,790

Int. Cl.[4] C07H *17/08;* **A01N** *43/04;* **A61K** *35/00;* **C07G** *3/00*

U.S. Cl. 536—6.5 **10 Claims**

1. An amphotericin B salt forming composition comprising amphotericin B, and an acid capable of forming a salt with said amphotericin B, in a solution comprising methanol, dimethylformamide, methylene chloride in an amount sufficient to enhance the crystallinity and purity of amphotericin B produced therefrom, and water.

4,902,790

NOVEL PROCESS FOR THE SYNTHESIS OF AMIKACIN

Alberto Maggia, Milan; Vicenzo Giobbio, Turin, and Giorgio Ornato, Ivrea, all of Italy, assignors to Pierrel Spa, Naples, Italy

Filed Oct. 2, 1986, Ser. No. 914,451

Claims priority, application Italy, Oct. 10, 1985, 22425 A/85

Int. Cl.[4] C07H *15/20, 15/22*

U.S. Cl. 536—13.7 **18 Claims**

I. A process for the selective synthesis of amikacin from kanamycin A protected in the 3- and 6' positions, said process comprising the steps of:

reacting kanamycin A protected in the 3- and 6'-positions with a salt of a bivalent metal cation selected from the group consisting of zinc, nickel, iron, cobalt, manganese, copper, cadmium and mixtures thereof in the presence of an effective amount of water as a solvent or co-solvent to form a complex;

reacting said complex with a derivative of L-(−)-4-amino-2-hydroxybutyric acid wherein the amino group is protected and the carboxyl group is activated; and

destroying the complex by removing the metal cation and removing the protective groups.

4,902,791

NITROSOUREA DERIVATIVES, PROCESS FOR THEIR PREPARATION AND MEDICAMENTS CONTAINING THEM

Pierre Roger, Montigny-les-Bretonneux; Patrick Choay; Claude Monneret, both of Paris; Jean-Paul Fournier, Paris, and Alain Martin, Sedan, all of France, assignors to Sanofi S.A., Paris, France

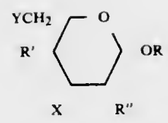
Continuation-in-part of Ser. No. 732,007, Apr. 24, 1985, abandoned. This application Apr. 14, 1988, Ser. No. 181,760

Claims priority, application France, Aug. 30, 1983, 83 13878; Apr. 22, 1987, 87 05708; Apr. 22, 1987, 87 05709

Int. Cl.[4] C07C *125/065, 111/00;* **C07H** *5/06;* **A61K** *31/04*

U.S. Cl. 536—17.7 **36 Claims**

1. A nitrosourea derivative of the formula:



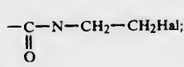
in which:

R is hydrogen, alkyl of 1 to 30 carbon atoms, aralkyl of 7 to 12 carbon atoms, or aralkyl of 7 to 12 carbon atoms substituted with Hal, $-NO_2$, NH_2, $-CF_3$ or alkoxy of 1 to 4 carbon atoms;

X is hydroxy or $-NR_1R_2$;

Y is hydrogen, hydroxy or $-NR'_1R'_2$;

R_1 and R'_1 are each hydrogen or



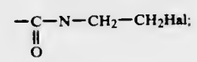
Hal is a halogen;

R_2 and R'_2 are each hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, aryl of 4 to 10 carbon atoms, aralkyl of 7 to 12 carbon atoms, aryl of 4 to 10 carbon atoms substituted with Hal, $-NO_2$, $-NH_2$, $-CF_3$ or alkoxy of 1 to 4 carbon atoms, or aralkyl of 7 to 12 carbon atoms substituted with Hal, $-NO_2$, $-NH_2$, $-CF_3$ or alkoxy of 1 to 4 carbon atoms;

R' and R'' are each hydrogen, hydroxy or —OM; and

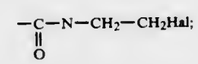
M is alkyl of 1 to 30 carbon atoms, aryl of 4 to 10 carbon atoms, aralkyl of 7 to 12 carbon atoms, aryl of 4 to 10 carbon atoms substituted with Hal, $-NO_2$, $-NH_2$, $-CF_3$ or alkoxy of 1 to 4 carbon, aralkyl of 7 to 12 carbon atoms substituted with Hal, $-NO_2$, $-NH_3$, $-CF_3$ or alkoxy of 1 to 4 carbon atoms, acyl of 2 to 8 carbon atoms, aroyl of 5 to 12 carbon atoms, or aroyl of 5 to 12 carbon atoms substituted with Hal, $-NO_2$, $-NH_2$, CF_3 or alkoxy of 1 to 4 carbon atoms; provided that at least:

X is $-NR_1R_2$ and R_1 is



or

Y is $-NR'_1R'_2$ and R'_1 is



and

either R' is hydrogen or R'' is hydrogen, and R' and R'' are not both hydrogen.

33. A method for treating a patient with a tumor, comprising the step of administering to the patient an effective anti-tumor amount of a nitrosourea derivative of any one of claims 1 to 32.

4,902,792

FINE CELLULOSE PARTICLES AND PROCESS FOR PRODUCTION THEREOF

Shigeru Okuma; Kanji Yamagishi; Masami Hara, all of Hofu; Keizo Suzuki, Osaka, and Toshihiro Yamamoto, Hofu, all of Japan, assignors to Kanebo Ltd., Tokyo and Kanebo Rayon, Ltd., Osaka, both of, Japan

Division of Ser. No. 853,514, Apr. 18, 1986, abandoned. This application Dec. 30, 1987, Ser. No. 139,860

Claims priority, application Japan, Apr. 19, 1985, 60-82632; Oct. 2, 1985, 60-218135; Nov. 21, 1985, 60-259832; Feb. 25, 1986, 61-38382

Int. Cl.[4] C08B *3/32, 5/16, 16/00*

U.S. Cl. 536—57 **42 Claims**

1. A process for producing fine cellulose particles, which comprises

(1) mixing viscose with a water-soluble anionic polymeric compound and forming a dispersion of fine droplets of the viscose dispersed in an aqueous mother liquor,

(2) (i) heating the dispersion without drying it or mixing it with a coagulating agent to thereby coagulate the viscose in the dispersion, and thereafter neutralizing the dispersion with an acid to form fine particles of cellulose dispersed in said aqueous mother liquor, or (ii) coagulating and neutralizing the dispersion with an acid to form fine particles of cellulose dispersed in said aqueous mother liquor, and

(3) thereafter, separating the fine particles of cellulose from said aqueous mother liquor.

4,902,793

PROCESS FOR PREPARING 3-ALKOXYMETHYLCEPHALOSPORINS

Joji Nishikido, Fuji, and Kentaro Fukuzaki, Nobeoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

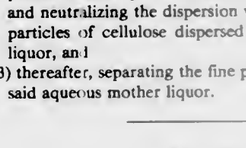
Filed Oct. 1, 1987, Ser. No. 103,217

Claims priority, application Japan, Oct. 2, 1986, 61-233331; Dec. 4, 1986, 61-287773; Jul. 27, 1987, 62-185356; Aug. 24, 1987, 62-208297

Int. Cl.[4] C07D *501/04;* **A61K** *31/545*

U.S. Cl. 540—230 **17 Claims**

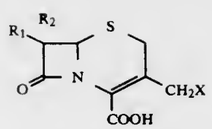
1. A process for preparing a 3-alkoxymethyl-3-cephem-4-carboxylic acid represented by the formula (II) or its derivative at the carboxyl group, or a pharmaceutically acceptable salt of said carboxylic acid or said derivative



(II)

wherein R_1 represents an amino group, R_2 represents a hydrogen atom or a lower alkoxy group and R_3 represents a lower alkyl group unsubstituted or substituted with a halogen atom, an aryl group, an alkoxy group, an alkythio group, a nitro group, a cyano group, an alkylamino group, a dialkylamino group, an acylamino group and an acyl group, said derivative at the carboxyl group being selected from the group consisting of esters, amides and condensation products with N-hydroxysuccinimide, N-hydroxyphthalimide, dimethylhydroxylamine, diethylhydroxylamine, 1-hydroxypiperidine and an oxime, and protecting group-protected derivatives thereof, the process comprising the steps of:

reacting a cephalosporanic acid represented by the formula (I) or its derivative at the carboxyl group, or a pharmaceutically acceptable salt of said cephalosporanic acid or said derivative



(I)

wherein R_1 and R_2 have the same meanings as defined above, and X represents an acetoxy group, said derivative at the carboxyl group being selected from the group consisting of esters, amides and condensation products with N-hydroxysuccinimide, N-hydroxyphthalimide, dimethylhydroxylamine, diethylhydroxylamine, 1-hydroxypiperidine and an oxime, and protecting group-protected derivatives thereof, with an alcohol represented by the formula (III):

$$R_3—OH \qquad \text{(III)}$$

wherein R_3 has the same meaning as defined above,

in the presence of one member selected from the group consisting of halides of antimony, iron, zinc and bismuth and complexes of said halides with dialkyl ethers, amines, fatty acids, nitriles, carboxylic acid esters and phenols.

4,902,794

TRIAZOLO-BENZODIAZEPINES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

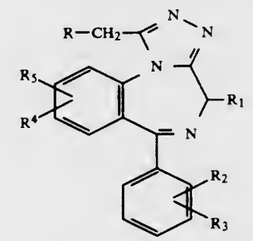
Continuation of Ser. No. 317,618, Dec. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 201,207, Nov. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 138,278, Apr. 28, 1971, abandoned. This application Jul. 20, 1983, Ser. No. 515,884

Int. Cl.[4] C07D *487/04;* **A61K** *31/55*

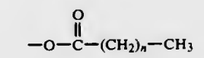
U.S. Cl. 540—563 **13 Claims**

1. A 1-substituted 6-phenyl-4H-s-triazolo[4,3-a][1,4]benzodiazepine of the formula (III):

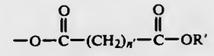
III



wherein R is selected from the group consisting of hydroxy and alkoxy, in which the alkyl moiety is of 1 to 3 carbon atoms, inclusive,



in which n is 0 to 16;



in which n' is 2 to 3 and R' is hydrogen, or alkyl defined as above, benzoyloxy, and phenylacetoxy; wherein R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; and wherein R_2, R_3, R_4, and R_5 are

selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, halogen, nitro, cyano, trifluoromethyl, and alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoylamino and dialkylamino in which the carbon chain moieties are of 1 to 3 carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts thereof.

4,902,795

INTERMEDIATES FOR 1,8-BRIDGED 4-QUINOLONE-3-CARBOXYLIC ACID ANTIBACTERIALS

Michael Schriewer; Klaus Crobe, both of Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

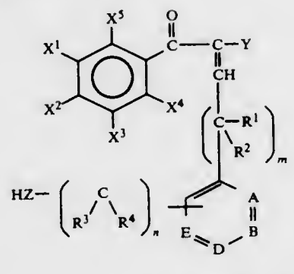
Division of Ser. No. 108,839, Oct. 15, 1987, Pat. No. 4,841,059. This application Nov. 17, 1988, Ser. No. 272,619

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 3600891

Int. Cl.[4] C07D *253/00, 239/02, 237/00, 241/02*

U.S. Cl. 544—182 **1 Claim**

1. An enamine of the formula



in which

X^1 represents hydrogen, nitro, alkyl with 1-3 carbon atoms or halogen,

X^2 denotes halogen, alkyl with 1-3 carbon atoms, an alkylsulphonyl group with up to 3 C atoms in the alkyl radical or a phenylsulphonyl group, X^5 can be hydrogen, halogen or methyl, R^1, R^2, R^3 and R^4 each independently represents hydrogen, an alkyl group with 1-3 carbon atoms, phenyl, or a phenyl radical which is substituted by halogen, nitro, or alkyl with up to 3 carbon atoms,

wherein 2 or 3 of A, B, D and E represent nitrogen and the balance represent C—H,

Y represents a carboxyl group, a nitrile group an ester group —$COOR^5$ or an acid amide group —$CONR^6R^7$,

Z represents oxygen or an amine radical NR^8,

m and n each denote 0 or 1,

X^3 represents halogen or the nitro group and

X^4 denotes halogen, a nitro group, an alkoxy, alkylmercapto or alkylsulphonyl group with in each case 1-3 carbon atoms or an arylsulphonyl group.

4,902,796

6-ALKENYL AND ETHYNYL DERIVATIVES OF 2-AMINO-4-HYDROXYPYRIDO[2,3-D]PYRIMIDINES

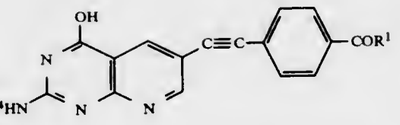
Edward C. Taylor, Princeton, and George S. K. Wong, Fort Lee, both of N.J., assignors to The Trustees of Princeton University, Princeton, N.J.

Division of Ser. No. 922,511, Oct. 20, 1986, Pat. No. 4,818,819. This application Aug. 8, 1988, Ser. No. 229,696

Int. Cl.[4] C07D *471/04*

U.S. Cl. 544—279 **18 Claims**

1. A compound of the formula:

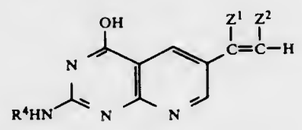


wherein

R^1 is —$NHCH(COOR^2)CH_2CH_2COOR^2$, or OR^2 in which R^2 is hydrogen or a carboxylic acid protecting group; and

R^4 is hydrogen or an amino protecting group.

15. A compound of the formula:



wherein

R^4 is hydrogen or an amino protecting group;

Z^1 when taken independently of Z^2 is hydrogen; and

Z^2 when taken independently of Z^1 is hydrogen, methyl or ethyl; or

Z^1 and Z^2 when taken together are a carbon-carbon bond.

4,902,797

AMMINE-ALICYCLIC AMINE-PLATINUM COMPLEXES AND ANTITUMOR AGENTS

Tetsushi Totani, Hyogo; Katsutoshi Aono, Nara, and Yasuko Adachi, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Fukushima, Japan

Filed Dec. 18, 1987, Ser. No. 135,061

Claims priority, application Japan, Dec. 18, 1986, 61-303529

Int. Cl.[4] A61K *31/555;* **C07D** *295/22*

U.S. Cl. 546—11 **2 Claims**

1. A compound which is (ammine)(glyccolato-O,O')(pyrrolidine)platinum (II).

2. A compound which is (ammine)(glycolato-O,O')-(piperidine)platinum (II).

4,902,798

ANTHRAPYRIDONE COMPOUNDS

Toshio Nakamatsu, Osaka; Yoshitugu Egashira, Hyogo, and Yasuyuki Suzuki, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka and Daiei Chemical Co., Ltd., Hyogo, both of, Japan

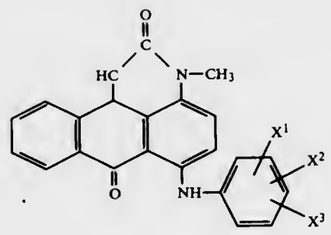
Filed Nov. 30, 1987, Ser. No. 126,596

Claims priority, application Japan, Dec. 1, 1986, 61-287093; May 29, 1987, 62-135695; Sep. 3, 1987, 62-221755

Int. Cl.[4] C09B *5/14, 1/32*

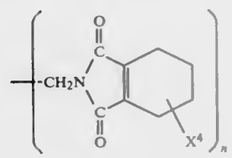
U.S. Cl. 546—76 **4 Claims**

1. An anthrapyridone compound represented by the formula (I):



(I)

wherein X^1 is hydrogen, —$NHCOR^1$, —$CONR^2R^3$, —COR^4 or —SO_2R^5, in which R^1 and R^4 are each C_{1-4} alkyl, R^5 is C_{1-4} alkyl or hydroxyethyl, X^2 is hydrogen or imidomethyl of the formula (II):



(II)

wherein n is a number of 1 to 2, X^4 is hydrogen or carboxylic acid C_{1-4} alkyl-ester, X^3 is hydrogen, halogen, hydroxyl, C_{1-4} alkyl or C_{1-4} alkoxyl, with the proviso that X^1 is —$NHCOR^1$, —$CONR^2R^3$, —COR^4 or —SO_2R^5 when X^2 is hydrogen, X^2 is the imidomethyl of the formula (II) when X^1 is hydrogen.

4,902,799

BICYCLIC ALKOXY- AND ALKYLTHIO-SUBSTITUTED AMINOALCOHOLS

Giampaolo Picciola, Milan; Mario Riva, Monza; Franco Ravenna, Milan, and Piergiorgio Gentili, Bergamo, all of Italy, assignors to Maggioni-Winthrop S.p.A., Milan, Italy

PCT No. PCT/EP86/00595, § 371 Date Jun. 4, 1987, § 102(e) Date Jun. 4, 1987, PCT Pub. No. WO87/02666, PCT Pub. Date May 7, 1987

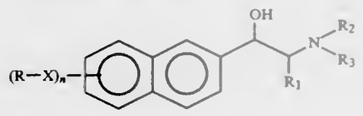
PCT Filed Oct. 18, 1986, Ser. No. 60,393

Claims priority, application United Kingdom, Oct. 14, 1985, 8525256; Jun. 25, 1986, 8615562

Int. Cl.[4] C07D *401/06*

U.S. Cl. 546—199 **6 Claims**

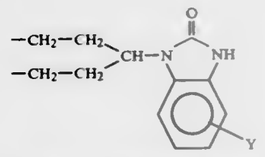
1. A compound of the formula:



I

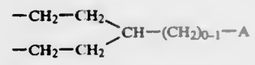
wherein R represents a lower straight or branched alkyl group, X represents —O— or —S—, n is an integer from 1 to 3, R_1 represents hydrogen or a lower alkyl group; R_2 represents hydrogen or benzyl; R_3 represents an alkyl group; or alternatively R_2 and R_3 taken together represent a divalent group selected from:

(a)

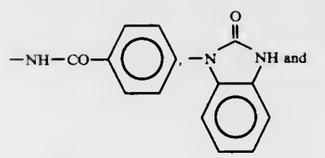


wherein Y represents hydrogen or halogen; and

(b)



wherein A is a group selected from



wherein R_4 represents a lower alkyl group and its salts with inorganic acids, organic acids, cationic exchange resins and complexes with cyclodextrins.

4,902,800

1-SUBSTITUTED-4-PYRROLIDINOPIPERIDINES AS INHIBITORS OF INTERLEUKIN 1

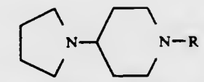
Jeranid S. Skotnicki, Chadds Ford, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 17, 1988, Ser. No. 233,187

Int. Cl.[4] C07D *401/02;* **A61K** *31/395*

U.S. Cl. 546—208 **3 Claims**

1. A compound having the formula:



wherein R is phenyl or naphthyl or any of the foregoing substituted with halo, lower alkyl, lower alkenyl, lower alkoxy, carboxy, lower alkoxycarbonyl, hydroxy, amino, mono- or diloweralkylamino, mercapto, lower alkylthio, lower alkylsulfonyl, cyano, nitro or trifluoromethyl.

4,902,801

PROCESS FOR PREPARING ARYL-PIPERIDINE CARBINOLS AND NOVEL INTERMEDIATES USED IN THE PROCESS

Erol A. Faruk, and Roger T. Martin, both of Harlow, England, assignors to Beecham Group plc., Brentford, England

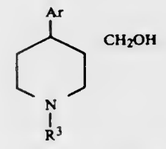
Filed Aug. 8, 1986, Ser. No. 894,695

Claims priority, application United Kingdom, Aug. 10, 1985, 8520153; May 23, 1986, 8612579

Int. Cl.[4] C07D *211/22, 211/32, 211/40*

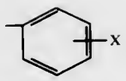
U.S. Cl. 546—220 **8 Claims**

1. A process for the preparation of a compound of formula (I):



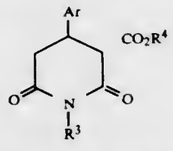
(I)

wherein Ar is a group:



in which X is hydrogen, alkyl having 1–4 carbon atoms, C_{1-6} alkoxy, trifluoro C_{1-6} alkyl, hydroxy, halogen, methylthio, or phenyl C_{1-6} alkoxy and R^3 is hydrogen, C_{1-6} alkyl or phenyl C_{1-6} alkyl, which process comprises reducing a compound of formula (II):

(II)



wherein Ar and R^3 are as defined with respect to formula (I) and R^4 is C_{1-6} alkyl.

4,902,802

PROCESS FOR PREPARING PYRIDINE HOMOLOGUES BY MEANS OF SUBSTITUTED CYCLOPENTADIENYL COBALT COMPLEXES

Hiroshi Yamazaki, Kamifukuoka, and Yasuo Wakatsuki, Shiki, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Chiyoda and Rikagaku Kenkyusyo, Wakoh, both of, Japan

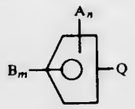
Division of Ser. No. 818,065, Jan. 13, 1986, Pat. No. 4,656,299, which is a continuation of Ser. No. 547,712, Nov. 1, 1983, abandoned. This application Dec. 22, 1986, Ser. No. 942,815

Claims priority, application Japan, Nov. 6, 1982, 57-193951; Jun. 9, 1983, 58-101721; Jan. 9, 1983, 58-101722

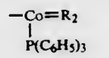
Int. Cl.[4] C07D *213/09, 213/10, 213/12*

U.S. Cl. 546—251 **41 Claims**

1. In a process for preparing a pyridine homologue, which comprises reacting an alkyne with a nitrile in the presence of a cobalt-containing complex, the improvement which comprises conducting said reaction in the presence of a complex of an electron attracting group-substituted η^5-cyclopentadienyl-cobalt comprising a polyene or an acetylene, which is represented by the general formula



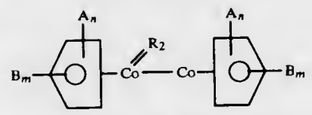
wherein A is a C_1–C_4 alkyl group or a phenyl group; n is an integer of from 0 to 2, B is an alkoxycarbonyl group in which the alkoxy moiety contains from 1 to 3 carbon atoms or a C_1–C_4 acyl group, m is an integer of 1 or 2, and Q is —Co=R_1 where R_1 is a η^4 C_4–C_{12} polyene having from 2 to 4 double bonds, which is unsubstituted or substituted by from 1 to 4 substituents selected from the group consisting of a C_1–C_4 alkyl group and a C_1–C_4 alkoxycarbonyl group, and which forms a coordinate bond with the cobalt atom at its diene portion, provided R_1 excludes a polyene composed solely of an aromatic ring,



where R_2 is an organic residue of a metallo-cyclic cyclopentadiene composed of two molecules of an acetylene which may be unsubstituted or substituted by from 1 to 4 substituents selected from the group consisting of a C_1–C_4 alkyl group, a C_1–C_4 alkoxycarbonyl group, a phenyl group and a cyano group,



where R_3 is an acetylene which is substituted by one or two substituents selected from the group consisting of a C_1–C_4 alkyl group, a C_1–C_4 alkoxycarbonyl group, a phenyl group and a cyano group and which forms a coordinate bond with the cobalt atom at its triple bond portion, and



where A, B, n, m and R_2 are as defined as above.

4,902,803

AROMATIC HETEROCYCLIC PEROXYCARBOXYLIC ACIDS

Carlo Venturello, Novara, and Claudio Cavallotti, Milan, both of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Jul. 15, 1988, Ser. No. 219,141

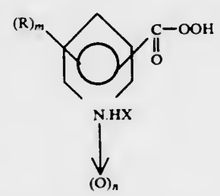
Claims priority, application Italy, Jul. 20, 1987, 21344 A/87

Int. Cl.[4] C07D *213/46*

U.S. Cl. 546—318 **9 Claims**

1. A heterocyclic peroxycarboxylic compound having the formula:

(I)



wherein

R is a hydrogen atom or a straight or branched alkyl containing up to 10 carbon atoms, cycloalkyl containing up to 10 carbon atoms, or aryalkyl containing up to 10 carbon atoms; a carboxylic group or a peroxycarboxylic group; and F, Cl, NO_2 or an alkoxy-group containing from 1 to 5 carbon atoms;

and wherein:

n is a number selected from O to 1;

m is a number selected from 1, 2 and 3; and

X represents an anion selected from HSO_4—and CH_3SO_3—.

4,902,804

MULTIFUNCTIONAL THIADIAZOLE LUBRICANT ADDITIVES

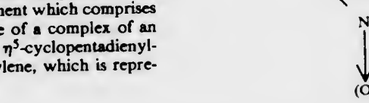
James P. King, Upper Gwynedd, and Sameeh S. Toukan, Phoenixville, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 783,728, Oct. 3, 1985, abandoned. This application Sep. 6, 1988, Ser. No. 244,608

Int. Cl.[4] C07D *285/08, 285/12;* **C10M** *133/00*

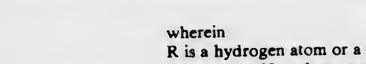
U.S. Cl. 548—130 **26 Claims**

1. A compound of the structure

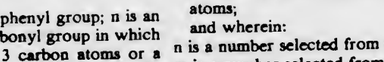


wherein:

Q is a bivalent thiadiazole ring moiety which is 1,3,4-thiadiazole or 1,2,4-thiadiazole;



and



wherein

R and R‴ are each, independently, C_{1-22} alkoxy, C_{2-22} branched or straight chain alkylenoxy, aryl-C_{1-22}-alkoxy, OH', or NR'R'; R' and R'' are each, independently, hydrogen, C_{1-22} branched or straight chain alkyl, or aryl-C_{1-22}-alkyl; with the proviso that at least one of R, R', R'', or R‴ forms a carboxyl with the adjacent carbon atom to which it is linked;

or an alkali metal or amine salt of said compound.

4,902,805

DERIVATIVES OF DIHYDROTRIAZOLE, AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME AS AN ACTIVE INGREDIENT

Takafumi Shida; Takeo Watanabe; Shiro Yamazaki; Hiroyasu Shinkawa, and Keigo Satake, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 820,948

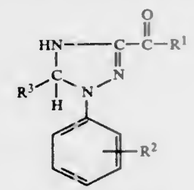
Claims priority, application Japan, Jan. 23, 1985, 60-10623; Mar. 15, 1985, 60-51700

Int. Cl.[4] A01N *43/653;* **C07D** *249/10*

U.S. Cl. 548—262 **7 Claims**

1. A derivative of 4,5-dihydro-1,5-disubstituted; 1H-1,2,4-triazole-3-carboxylic acid represented by the formula (I):

(I)



wherein R^1 represents an amino group, or lower alkyl amino group, R^2 represents a hydrogen atom, halogen atom, or lower alkyl group, and R^3 represents a hydrogen atom, lower alkyl group, benzyl group, furyl group, phenyl group or phenyl group substituted with a halogen atom, hydroxyl group, carboxyl group, methoxycarbonyl group, lower alkyl group, or lower alkoxy group.

4,902,806

BIS(INDOLYL)ETHYLENE ALDEHYDES

Hubertus Psaar, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

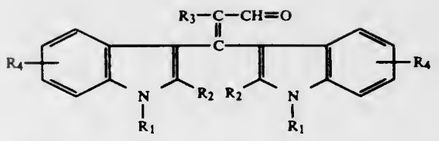
Filed Oct. 24, 1988, Ser. No. 261,946

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738238

Int. Cl.[4] C07D *403/06*

U.S. Cl. 548—455 **7 Claims**

1. A bis(indolyl) ethylene aldehyde of the formula



in which

R_1 denotes hydrogen, C_1–C_{12}-alkyl, aralkyl, wherein said aralkyl is benzyl or phenylethyl or phenyl,

R_2 denotes hydrogen, C_1–C_{12}-alkyl or phenyl,

R_3 denotes hydrogen, C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl, COOH or phenyl and

R_4 denotes hydrogen, C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy, cycloalkoxy or halogen, said alkyl being unsubstituted or substituted by a halogen, C_1–C_4-alkoxy cyano or a carboxyl group, said aralkyl being unsubstituted or substituted by halogen, cyano, C_1–C_4-alkoxy or a carboxyl group, said phenyl being unsubstituted or substituted by a halogen, C_1–C_4-alkoxy, cyano, C_1–C_4-alkyl or a carboxyl group, said alkoxy being unsubstituted or substituted by a halogen, cyano or a carboxyl group, said cycloalkoxy being unsubstituted or substituted by a halogen, cyano or a carboxyl group.

4,902,807

PROCESS FOR BATCHWISE ACETAL PRODUCTION

Toshiaki Kobayashi, Nara, and Kango Kujitani, Uji, both of Japan, assignors to New Japan Chemical Co., Ltd., Japan

Filed Dec. 5, 1988, Ser. No. 279,507

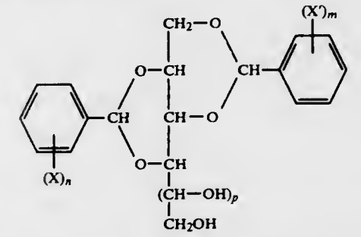
Claims priority, application Japan, Dec. 7, 1987, 62-310342

Int. Cl.[4] C07D *319/04*

U.S. Cl. 549—364 **15 Claims**

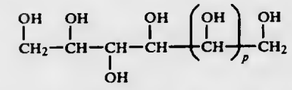
1. A process for batchwise production of an acetal of the general formula

(I)

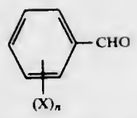


wherein X and X' are the same or different and each represent a hydrogen or halogen atom, an alkyl or alkoxy group containing 1 to 4 carbon atoms or a carboxyl group, m and n each represent an integer of 1 to 5 and p is 0 (zero) or 1, which comprises subjecting (a) a polyhydric alcohol of the general formula

(II)

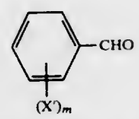


wherein p is as defined above, and (b) a benzaldehyde compound of the general formula



(III)

wherein X and n are as defined above, or a benzaldehyde compound of the general formula



(IV)

wherein X' and m are as defined above, or a mixture of said compound of general formula (III) and said compound of general formula (IV), to condensation reaction in a reactor by feeding a homogeneous solution or suspension containing

(a) said polyhydric alcohol of general formula (II),

(b) said compound of general formula (III) or (IV) or said mixture,

(c) a lower alcohol and, optionally,

(d) an acid catalyst,

to the reactor, together with a hydrophobic organic solvent, continuously or intermittently while adjusting the rate of feeding of said homogeneous solution or suspension such that said polyhydric alcohol of general formula (II) and said compound of general formula (III) or (IV) or said mixture are fed to the reaction system in a total amount per hour of about 0.1 to about 2 parts by weight per part by weight of the acetal of general formula (I) as found in the reaction system.

4,902,809

METHOD FOR MAKING N-SUBSTITUTED NITROPHTHALIMIDES

Peter G. Groeneweg, Ancaster, Canada, and Roy R. Odle, Schuylerville, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 559,616, Dec. 8, 1983, abandoned. This application Oct. 10, 1986, Ser. No. 917,926

Int. Cl.[4] C07D *209/48*

U.S. Cl. 548—481 **10 Claims**

1. A process for producing a mixture which consists essentially of N-alkyl-3-nitrophthalimide and N-alkyl-4-nitrophthalimide, which consists essentially of (1) mixing an N-alkylphthalimide with a nitrating reagent which consists essentially of nitric acid having a concentration of at least about 95%, (2) reacting the mixture within a temperature range of from about −20° C. to the boiling point of nitric acid and (3) thereafter recovering the N-alkyl-3-nitrophthalimide and the N-alkyl-4-nitrophthalimide.

4,902,808

PROCESS FOR PREPARING 4-CARBOXY-1-(3,5-DIMETHYLPHENYL)-5-PYRAZOLECARBOXAMIDE

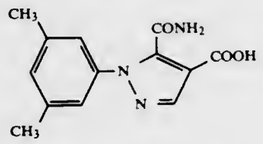
Stephen A. Ackmann; James R. Beck, both of Indianapolis, and Fred L. Wright, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 145,735, Jan. 15, 1988, Pat. No. 4,801,326, which is a continuation of Ser. No. 13,520, Feb. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 947,139, Dec. 29, 1986, abandoned, which is a continuation of Ser. No. 841,405, Mar. 19, 1986, abandoned. This application Nov. 14, 1988, Ser. No. 271,127

Int. Cl.[4] C07D *231/14*

U.S. Cl. 548—378 **1 Claim**

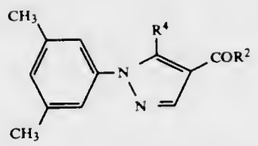
1. A process for preparing a compound of the formula



(2)

which comprises the steps of

(a) reacting a compound of formula (3)



(3)

where R^2 alkoxy and R^4 is NH_2, with dimethylsulfide in the presence of t-butyl nitrite to provide the corresponding compound of formula (3) wherein R^4 is SCH_3,

(b) oxidizing the resulting intermediate to provide the corresponding compound of formula (3) wherein R^4 is $-SO_2CH_3$,

(c) reacting the product of step (b) with an alkali metal cyanide to provide the corresponding compound of formula (3) wherein R^4 is CN, and

(d) hydrolyzing the product of step (c).

4,902,810

PROCESS FOR THE PRODUCTION OF HEXAFLUOROPROPYLENE OXIDE

Masanori Ikeda; Morikazu Miura, both of Shizuoka, and Atsushi Aoshima, Kanagawa, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 375,632, May 6, 1982, abandoned. This application Jul. 6, 1987, Ser. No. 72,189

Claims priority, application Japan, May 6, 1981, 56-67834; Dec. 19, 1981, 56-205581; Dec. 26, 1981, 56-210487; Feb. 4, 1982, 57-15539

Int. Cl.[4] C07D *301/24*

U.S. Cl. 549—521 **14 Claims**

1. A process for producing hexafluoropropylene oxide from hexafluoropropylene using hypochlorite as an oxidizing agent, which comprises epoxidizing hexafluoropropylene in a two-phase system of an aqueous phase and an organic phase which is immiscible in the aqueous phase, said hypochlorite being dissolved or dispersed in the aqueous phase in the presence of an inorganic base at a temperature of between −25° C. and 60° C., in the presence of a lipophilic quaternary ammonium salt, catalyst the total number of carbon atoms in quaternary ammonium ion being not less than 10 per quaternary ammonium ion, to produce HFPO.

4,902,811

BENZODIOXANE PROSTACYCLIN ANALOGS

Sachio Mori, and Shozo Takechi, both of Hyogo, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

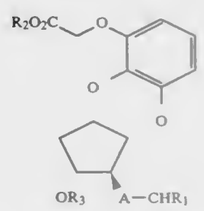
Filed Jun. 20, 1988, Ser. No. 208,728

Claims priority, application Japan, Jul. 1, 1987, 62-164288

Int. Cl.[4] C07D *319/14*

U.S. Cl. 549—359 **9 Claims**

1. A compound of the formula:



wherein R_1 is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, or phenoxyalkyl; R_2 is hydrogen, lower alkyl, or lower alkyl substituted by (1) or more phenyl which may have one or more substituents selected from the group consisting of methyl, methoxy, bromo and nitro or (2) anthryl; R_3 is hydrogen or a hydroxy-protecting group; A is ethylene or vinylene; and the wavy line indicates α or β configuration or their mixture; or a pharmaceutically acceptable salt thereof.

4,902,812

OPTICALLY ACTIVE ALCOHOLS, PROCESS FOR PRODUCING THE SAME, AND PROCESS FOR RESOLVING THE SAME

Fumie Sato, Fujisawa, Japan, assignor to Nissan Chemical Industries, Ltd., Tokyo, Japan

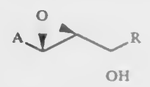
Filed Jul. 30, 1987, Ser. No. 79,464

Claims priority, application Japan, Jul. 31, 1986, 61-180969; Oct. 31, 1986, 61-260419; Feb. 17, 1987, 62-33615

Int. Cl.[4] C07D *303/08*

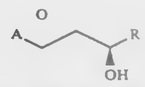
U.S. Cl. 549—550 **4 Claims**

1. An optically active alcohol having a halogen atom at the gamma-position, selected from compounds represented by the general formula [I],



[I]

and the general formula [II],



[II]

wherein A denotes said halogen atom; R denotes methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, t-butyl, amyl, isoamyl, hexyl, heptyl, octyl, nonyl, decyl, 2-methylhexyl, 2-methyl-2-hexyl, 2-hexyl, cyclopentyl, cyclohexyl, cyclohexamethyl, hex-4-yn-2-yl, hept-4-yn-2-yl, 2,6-dimethyl-hept-5-en-1-yl, pent-1-en-1-yl, pent-2-en-1-yl, hex-1-en-2-yl, 3-ethoxy-2-methyl-propan-2-yl, methoxyethyl, 5-methoxy-hexyl, 6-methoxy-2-hexyl, halogenated methyl, halogenated n-butyl, halogenated n-pentyl, halogenated nonyl, phenyl, halogenated phenyl, n-pentyloxymethyl, 1-ethoxy-2-methyl-propan-2-yl, phenoxymethyl, benzyloxymethyl, p-chlorophenoxymethyl, 2-phenylethyl, benzyloxyethyl, p-fluorophenoxymethyl, phenylacetylenyl, m-chlorophenoxymethyl, m-trifluoromethyl-phenoxymethyl, 1-butyl-cyclopropyl, 3-ethyl-cyclopentyl, benzothiopen-5-yl, 2-octenyl, 3-methoxycarbonylpropyl, and vinyl.

4,902,813

PROCESS FOR PREPARING DIORGANOPOLYSILOXANES HAVING TERMINAL SI-BONDED HYDROXYL GROUPS

Karl-Heinrich Wegehaupt; Karl Braunsperger; Günter von Au, and Fridolin Stary, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,852

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742068

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—459 **7 Claims**

1. A process for preparing diorganopolysiloxaneshaving terminal Si-bonded hydroxyl groups which comprises reacting an organosilicon compound selected from the group consisting of a cyclic diorganopolysiloxane, a diorganodichlorosilane hydrolysis product and mixtures thereof with from 0.1 to 3 percent by weight of diorganodichlorosilane, based on the weight of the organosilicon compound employed, in the presence of from 1 to 50 ppm by weight of phosphonitrile chloride, based on the total weight of the organosilicon compound and diorganodichlorosilane employed, to form diorganopolysiloxanes containing an Si-bonded chlorine atom in each of the terminal units, treating the reaction mixture with water or an aqueous solution, removing the aqueous phase and thereafter distilling off the low boiling constituents from the diorganopolysiloxanes containing terminal Si-bonded hydroxyl groups.

4,902,814

FLUOROBENZYL ESTERS

Alan J. Whittle, Hampshire, England, assignor to Imperial Chemical Industries PLC, London, England

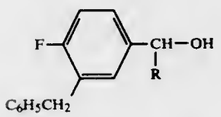
Filed Jul. 2, 1987, Ser. No. 69,443

Claims priority, application United Kingdom, Jul. 18, 1986, 8617649

Int. Cl.[4] C07C *122/00, 33/03, 19/08, 21/24*

U.S. Cl. 558—388 **7 Claims**

1. A compound of formula



wherein R is selected from cyano and ethynyl.

4,902,815

PLANT GROWTH REGULANT

Takeo Motegi; Yasuya Sakuraba; Hiroyuki Iguchi, and Kaoru Kasahara, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

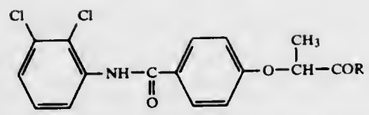
Filed Mar. 3, 1988, Ser. No. 163,729

Claims priority, application Japan, Mar. 5, 1987, 62-48716

Int. Cl.[4] C07C *101/72*

U.S. Cl. 560—45 **2 Claims**

1. A plant growth regulant containing a benzamide derivative of the formula:



wherein R is hydroxyl, alkoxy, alkoxyalkoxy, alkoxyalkoxyalkoxy, alkenylalkoxy, alkenylalkoxyalkoxy, alkynylalkoxy, alkynylalkoxyalkoxy, monoalkylamino, dialkylamino or O-cat wherein cat is an inorganic or organic cation.

4,902,816

POLYOLS FROM PHTHALIC COMPOUNDS

Kenneth G. McDaniel, West Chester, Pa., assignor to ARCO Chemical Technology, Inc., Wilmington, Del.

Filed Mar. 28, 1988, Ser. No. 173,788
Int. Cl.[4] C07C *67/03, 67/08, 69/80*
U.S. Cl. 560—88 **22 Claims**

1. A method for preparing a polyol useful in the preparation of both polyurethane and polyisocyanurate foams, comprising reacting a phthalic acid derivative with a polyether polyol, where the phthalic acid derivative is selected from the group consisting of phthalic acid, phthalic anhydride and an ester of phthalic acid and where the polyether polyol is made from an initiator selected from the group consisting of an alkanolamine, an alkyleneamine, an arylamine, sucrose, glycerin, sorbitol, a methylglucoside, a resin of phenol, aniline and phenol aniline, a Mannich condensate and mixtures thereof.

18. A polyol useful in the preparation of both polyurethane and polyisocyanurate foams, prepared by a process comprising reacting a phthalic acid derivative with a polyether polyol, where the phthalic acid derivative is selected from the group consisting of phthalic acid, phthalic anhydride and an ester of phthalic acid and where the polyether polyol is made from an initiator selected from the group consisting of an alkanolamine, an alkyleneamine, an arylamine, sucrose, glycerin, sorbitol, a methylglucoside, a resin of phenol, aniline and phenol aniline, a Mannich condensate, and mixtures thereof.

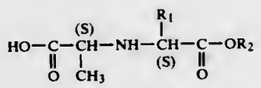
4,902,817

PROCESS FOR THE SYNTHESIS OF ALPHA N ALKYLATED AMINO ACIDS AND ESTERS THEREOF, APPLICATION TO THE SYNTHESIS OF CARBOXYALKYL DIPEPTIDES

Michel Vincent, Bagneux; Jean Ballarda, Anthony; Bernard Marchand, Checy, and Georges Remond, Versailles, all of France, assignors to ADIR Et Cie, Neuilly-sur-Seine, France

Filed Sep. 16, 1988, Ser. No. 245,353
Claims priority, application France, Sep. 17, 1987, 8712901
Int. Cl.[4] C07C *103/66*
U.S. Cl. 560—171 **10 Claims**

1. A process for the synthesis of compounds of formula (I):



(I)

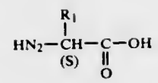
in which:

R_1 is linear or branched lower alkyl having 1 to 6 carbon atoms, inclusive,

R_2 is hydrogen or a linear or branched lower alkyl group having 1 to 4 carbon atoms, inclusive

the two asymmetric carbn atoms both having the S configuration,

wherein the starting material employed is a compound of formula (IV):

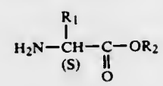


(IV)

in which:

R_1 has the same meaning as in formula (I), the asymmetric carbon having the S configuration, and in which process, when R_2 in the product of formula (I) is other than the hydrogen atom, is first esterified, optionally in the presence of an acidic esterification catalyst, with a lower aliphatic alcohol of general formula R'_2OH in which R'_2 denotes a linear or branched lower alkyl group having 1 to 4 carbon atoms, inclusive,

to obtain a compound of formula (V):



(V)

in which:

R_1 and R_2 have the same meaning as in formula (I),

the asymmetric carbon having the S configuration, and in which process the compound of formula V is then condensed with pyruvic acid by catalytic hydrogenation under pressure and with slight heating,

the pressure being between 10 and 100 bars,

the temperature being between 10° and 60° C.,

in an aqueous or lower aliphatic alcohol medium, by itself or mixed with water,

the catalyst being selected from nickel, platinum, palladium or rhodium, mixed with a support to produce a high proportion of the diastereoisomer of the compound of formula (I) in which the two asymmetric carbons have the S configuration.

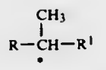
4,902,818

PROCESS FOR THE MANUFACTURE OF OPTICALLY ACTIVE COMPOUNDS

Hans-Jürgen Hansen, Riehen; Rudolf Schmid, Basel, and Max Schmid, Brugg, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

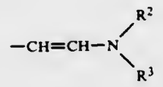
Division of Ser. No. 795,813, Nov. 7, 1985, abandoned, which is a division of Ser. No. 525,529, Aug. 22, 1983, Pat. No. 4,578,642.
This application Oct. 5, 1988, Ser. No. 253,882
Claims priority, application Switzerland, Aug. 27, 1982, 5110/82; Jul. 1, 1983, 3642/83
Int. Cl.[4] C07C *101/28*
U.S. Cl. 560—172 **3 Claims**

1. An optically active bifunctional compound of the formula:



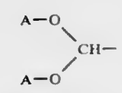
I

wherein R is protected formyl or alkoxycarbonyl; and R^1 is



(Ia)

in which R^2 and R^3 individually are lower alkyl or cycloalkyl or R^2 and R^3 taken together with the nitrogen atom of Ia form a mononuclear hydrocarbon ring of 3 to 8 carbon atoms containing at least one hetero atom selected from O, N or S; said protected formyl having the formula:



wherein A is C_1-C_4-alkyl or both A groups taken together are C_2-C_4-alkylene.

4,902,819

PREPARATION OF SODIUM DIETHYL OXALACETATE

B. Franklin Gupton, Virginia Beach, and James H. Rae, Portsmouth, both of Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 94,413, Sep. 9, 1987, abandoned. This application Sep. 22, 1988, Ser. No. 247,496
Int. Cl.[4] C07C *69/732*
U.S. Cl. 560—181 **6 Claims**

1. In a method of preparing sodium diethyl oxalacetate by reaction of sodium ethoxide, diethyl oxalate and ethyl acetate, the improvement which comprises adding sodium ethoxide to a mixture of diethyl oxalate and ethyl acetate while maintaining a temperature of about 0° C. to 40° C., reacting said ethoxide, oxalate and acetate mixture for a period of time sufficient to obtain a product mixture containing sodium diethyl oxalacetate, heating the product mixture to a temperature of 70° C. to 80° C. for a period of time ranging from ½ to 2 hours, cooling the product mixture to room temperature, and thereafter recovering sodium diethyloxalacetate.

4,902,820

PREPARATION OF α-ACYLOXYCARBONYL COMPOUNDS

Joseph R. Zoeller, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 21, 1989, Ser. No. 312,982
Int. Cl.[4] C07C *69/66, 69/32*
U.S. Cl. 560—185 **6 Claims**

1. Process for the preparation of an α-acyloxycarbonyl compound which comprises contacting an α-dicarbonyl compound with at least 2 moles of an acyl iodide per mol of α-dicarbonyl compound, wherein acyl is carboxylic acid acyl.

4,902,821

PROCESS FOR PREPARING LINEAR, LOW MOLECULAR WEIGHT POLYESTER-BASED POLYOL

Leonard J. Calbo, Jr., Bethel, and Lawrence V. Gallacher, East Norwalk, both of Conn., assignors to King Industries, Inc., Norwalk, Conn.

Filed Dec. 27, 1982, Ser. No. 453,222
Int. Cl.[4] C07C *67/03, 67/08*
U.S. Cl. 560—193 **3 Claims**

1. A process for preparing a polyol comprising heat reacting cyclohexane dimethanol with at least one aliphatic, saturated dibasic acid or a lower alkyl ester thereof in a mole ratio of from about 2.2 to 1.0 to about 6.0 to 1.0 respectively until the esterification or transesterification is substantially completed, stripping the thus produced product in order to remove any excess of cyclohexane dimethanol by using a product stripping temperature of from about 150° C. to 225° C. at an absolute pressure of 0.1 to 100 Torr for a period of time from about 10 seconds to 10 minutes whereby the resultant product is substantially free of cyclohexane dimethanol, and immediately cooling the resultant product to prevent further chemical reaction.

4,902,822

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACIDS OR ESTERS THEREOF

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 11, 1988, Ser. No. 192,551
Claims priority, application United Kingdom, May 15, 1987, 8711524
Int. Cl.[4] C07C *67/38*
U.S. Cl. 560—233 **25 Claims**

1. A process for the preparation of carboxylic acids and carboxylic acid esters which process comprises contacting, at a temperature in the range of from 100° C. to 250° C. and a pressure in the range of from 5 to 200 bar, one or more olefinically unsaturated compounds having in the range of from 2 to 30 carbon atoms per molecule with carbon monoxide in the presence of a material selected from the group consisting of water and alcohols, and in the presence of a catalytic system which consists essentially of a combination of one or more of each of the following components:

component (a)-a ruthenium compound, and

component (b)-a salt having a non-coordinating anion of an acid with a pK_a below 0.5, as measured at 25° C. in aqueous solution, in a quantity in the range of from 0.1 to 100 equivalents per gram-atom of ruthenium.

4,902,823

PROCESS FOR THE PREPARATION OF VINYL ACETATE

Friedrich Wunder, Flörsheim am Main; Günter Roscher, Kelkheim, and Klaus Eichler, Eschborn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt-/Main, Fed. Rep. of Germany

Filed Feb. 7, 1989, Ser. No. 307,733
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803900
Int. Cl.[4] C07C *67/055*
U.S. Cl. 560—245 **3 Claims**

1. A process for the preparation of vinyl acetate in the gas phase from ethylene, acetic acid and oxygen or oxygen-containing gases on a catalyst which contains palladium and/or compounds thereof and optionally gold and/or gold compounds and, as activators, alkali metal compounds and if optionally cadmium compounds, on a support which consists of aerogenic SiO_2 or an aerogenic SiO_2-Al_2O_3 mixture having a surface area of 50–250 m^2/g and a pore volume of 0.4–1.2 ml/g, the pore volume being formed to the extent of at least 50% by pores having a diameter of 50–200 Angstroms, wherein the support consists of cylindrical particles having curved front faces.

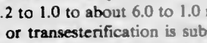
4,902,824

DISPERSANT FOR VINYL ACETATE UNIT FOULING

Allen R. Syrinek, Richmond, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed May 9, 1988, Ser. No. 191,641
Int. Cl.[4] C07C *67/48*
U.S. Cl. 560—248 **10 Claims**

1. A method of inhibiting the formation of tars, gums, and foulants in vinyl acetate monomer manufacturing and recovery equipment which comprises adding to the liquid or gaseous phases contained therein an effective antifouling amount of an antifoulant, said antifoulant having the structure:



wherein;

R is a hydrocarbonaceous group having from 1–34 carbon atoms chosen from linear or branched alkyl groups, aromatic, cyclic, alkaryl, aralkyl, or alkenyl groups, alkyl diphenyl ether groups, dialkyl naphthalene groups, or mixtures thereof;

M is chosen from the group consisting of H, alkali metals,

alkaline earth metals, ammonium cations, alkyl ammonium cations, or mixtures thereof; and n ranges from 1 to about 6.

4,902,825

N,N'-BIS(TRANS-4-ISOCYANATOCYCLOHEXYL)UREA, A PROCESS FOR ITS PREPARATION AND ITS USE

Andreas Ruckes, Leverkusen; Werner Rasshofer; Richard Kopp, both of Cologne, and Gerhard Grögler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

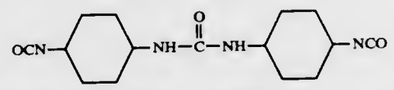
Filed Oct. 11, 1988, Ser. No. 255,915

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1987, 3735469

Int. Cl.[4] C07C *69/00, 127/15*

U.S. Cl. 560—330 **5 Claims**

1. A compound of the formula



wherein the trans isomer N,N'-bis(trans-4-isocyanatocyclohexyl)urea comprises at least 80% by weight of said compound.

4,902,826

PROCESS FOR THE PREPARATION OF 2-ARYLTHIOBENZOIC ACIDS

Wolfgang Bauer, Maintal; Manfred Langer, and Kuno Reh, both of Frankfurt, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

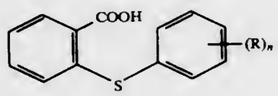
Filed Jun. 3, 1988, Ser. No. 201,851

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1987, 3723079

Int. Cl.[4] C07C *149/40*

U.S. Cl. 562—432 **14 Claims**

1. Process for the preparation of 2-arylthiobenzoic acid of the formula

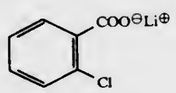


wherein

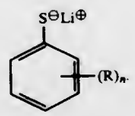
R is alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, trifluoromethyl, hydrogen, fluorine, chlorine or nitro and

n is 1, 2, 3 or 4, and when n is 2, 3, or 4, each R can be identical or different,

which comprises reacting lithium 2-chlorobenzoate of the formula



with lithium thiophenoxide of the formula



4,902,827

PROCESS FOR THE PREPARATION OF ADIPIC ACID

Gay R. Steinmetz; Norma L. Lafferty, and Charles E. Sumner, Jr., all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1988, Ser. No. 189,933

Int. Cl.[4] C07C *51/31, 55/14*

U.S. Cl. 562—543 **4 Claims**

1. Process for the preparation of adipic acid which comprises contacting cyclohexane with air in the presence of acetic acid and a catalytic amount of a combination of a soluble cobalt compound and a soluble zirconium and/or hafnium compound at a temperature of about 80° to 160° C. and a pressure of about 2 to 100 bar, wherein the atomic ratio of Zr:Co, Hf:Co or Zr + Hf:Co is about 0.001 to 1,000.

4,902,828

RECOVERY OF AQUEOUS GLYOXYLIC ACID SOLUTIONS

Gerhard Wickenhaeuser, Bergisch-Gladbach; Bernd Heida, Boehl-Iggelheim; Fritz Graf, Speyer, and Leopold Hupfer, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,182

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1983, 3334863

Int. Cl.[4] C07C *51/48, 59/153*

U.S. Cl. 562—577 **9 Claims**

1. A process for the recovery of an aqueous glyoxylic acid solution, essentially free of other acids, from an aqueous solution which contains other acids in addition to glyoxylic acid by treating the aqueous solution with a solution of organic nitrogen compound dissolved in a non-polar organic solvent, said organic nitrogen compound being selected from the group consisting of a straight-chain or branched tertiary amine having a molecular weight higher than 200 and a dialkylated acid amide, wherein the treatment is carried out by mixing the solutions at a temperature up to 50° C., and the glyoxylic acid is extracted from the resulting organic phase with water, at a higher temperature.

4,902,829

PROCESS FOR THE ADSORPTIVE SEPARATION OF HYDROXY PARAFFINIC DICARBOXYLIC ACIDS FROM OLEFINIC DICARBOXYLIC ACIDS

Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP, Des Plaines, Ill.

Filed Nov. 16, 1988, Ser. No. 272,042

Int. Cl.[4] C07C *51/42*

U.S. Cl. 562—580 **19 Claims**

1. A process for separating hydroxy paraffinic dicarboxylic acids from a feed mixture comprising, one or more hydroxy paraffinic dicarboxylic acids and one or more olefinic dicarboxylic acids, which process comprises contacting, at adsorption conditions, said feed mixture with an adsorbent material comprising a hydrophobic, non-zeolitic, crystalline silica, to effect the adsorption of the olefinic dicarboxylic acids and thereby rejecting to a raffinate stream a purified quantity of the hydroxy paraffinic dicarboxylic acids.

4,902,830

POLYARALKYLATED HYDROXYBENZAMIDES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Thomas Scholl, Meerbusch; Christian Wegner, Cologne; Christian Frölich, Krefeld; Artur Botta, Krefeld, and Heinz-Joachim Rother, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

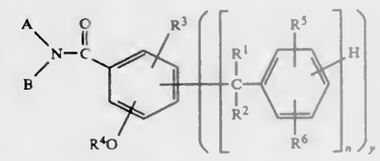
Filed Jun. 1, 1988, Ser. No. 200,981

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719101

Int. Cl.[4] C07C *91/16, 103/26*

U.S. Cl. 564—155 **3 Claims**

1. A polyaralkylated hydroxybenzamide of the formula



in which

n is an integer from 1 to 10 and

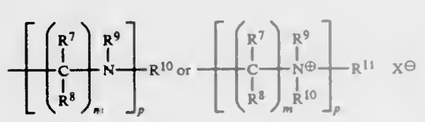
y is an integer from 1 to 4, with the proviso that the product n·y has a maximum value of 20,

R^1 and R^2 independently of each other are hydrogen or C_1–C_4-alkyl,

R^3 is hydrogen, hydroxyl, O–C_1–C_{18}-alkyl, C_1–C_{18}-alkyl, C_1–C_{18}-alkoxycarbonyl, haloen, carboxyl, carboxamide, sulpho, sulphonate or amino,

R^4 is hydrogen, C_1–C_{18}-alkyl, C_8–C_{18}aralkyl or C_1–C_{18}-alkylcarbonyl,

R^5 and R^6 independently of each other are hydrogen, hydroxyl, halogen or C_1–C_{18}-alkyl, A and B are identical or different and denote hydrogen, C_1–C_{18}-alkyl, C_7–C_{18}-aralkyl, C_6–C_{15}aryl, C_1–C_{18}-alkylcarbonyl or are a group of the formula



in which

R^7 to R^{11} independently of each other denote hydrogen, C_1–C_{18}-alkyl, C_7–C_{18}-aralkyl or C_6–C_{15}-aryl,

X^- is anion,

m is a number from 2 to 8 and

p is a number from 1 to 50.

4,902,831

PREPARATION OF ETHYLENEDIAMINE DERIVATIVES

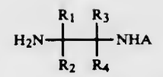
Khuong H. X. Mai, Waukegan, and Ghanshyam Patil, Vernon Hills, both of Ill., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 9, 1987, Ser. No. 118,126

Int. Cl.[4] C07C *85/12, 85/11, 87/28*

U.S. Cl. 564—357 **3 Claims**

1. A process of preparingn a derivative of a 1,2-diamioethane of the formula



wherein R_1, R_2, R_3 and R_4 are each independently hydrogen, C_1–C_{20}alkyl, C_3–C_{12}cycloalkyl, C_7–C_{15}aralkyl, unsubstituted or substituted aryl or heteroaryl, or alternatively, R1 and R_2, R_3 and R_4 together with the carbon atom to which they are attached form a 3 to 12 member cycloalkyl group, or with a heteroatom form a 3 to 12 member heterocyclic group, optionally including oxygen, sulfur, or phosphorus as the heteroatom, and A together with N forms an amido, a carbamate, an ureido, a sulfonamido, or a sulfamido group, which process comprises: reacting and acid radical halide (AX) with a N-benzyl 2-nitropropylamine to produce the intermediate N-benzyl N-substituted 2-nitropropylamine; hydrogenating the compound so formed at medium pressure using Pd/C as a catalyst to produce the N-substituted derivatives of 1,2-diaminoethanes.

4,902,832

2-SUBSTITUTED PHENYL-4,5,6,7-TETRAHYDRO-2H-ISOINDOLE-1,3-DIONES, AND THEIR PRODUCTION AND USE

Toru Haga; Eiki Nagano; Ryo Yoshida, all of Hyogo, and Shunichi Hashimoto, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

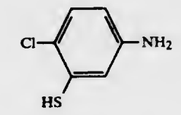
Continuation-in-part of Ser. No. 638,680, Aug. 8, 1984, Pat. No. 4,595,409. This application Jan. 10, 1986, Ser. No. 817,667

Claims priority, application Japan, Aug. 31, 1983, 58-160855; Jan. 11, 1985, 60-003654; Jan. 11, 1985, 60-003655; Jan. 11, 1985, 60-003656

Int. Cl.[4] C07C *149/42*

U.S. Cl. 564—446 **1 Claim**

1. A compound of the formula:



4,902,833

BISPHOSPHINE DIOXIDES

Kenneth G. Moloy, Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Feb. 19, 1988, Ser. No. 157,716

Int. Cl.[4] C07F *9/53*

U.S. Cl. 568—14 **15 Claims**

1. A process for the production of an organic bisphosphine oxide of the general formula:

(I)

which consists of reacting an organize bisphosphonate of the general formula:

(II)

under essentially anhydrous conditions with from at least one to about six molar equivalents of a reagent of the general formula:

R'MX (III)

VOL
1111
ISS
3
FE
20
19 90
UMI

and recovering said organic bisphosphine oxide; wherein R is an alkyl group having from 1 to about 10 carbon atoms; R' is an aryl or aralkyl or alkaryl group having 6 to 10 ring carbon atoms in the aryl-moiety and from 1 to about 10 carbon atoms in the alk-moiety; Z is a divalent alkylene or alkenylene group having from 1 to about 10 carbon atoms, or a divalent cyclic bridging group having from 4 to about 10 ring carbon atoms; M is a metal atom from the group consisting of Mg or Zn or Al; and X is a halogen atom.

4,902,834

PROCESS FOR PREPARING CAPPED POLYOXYALKYLENE BLOCK POLYETHERS

Jay G. Otten, Flat Rock, and Roger A. Ott, Grosse Ile, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Continuation of Ser. No. 933,143, Nov. 21, 1986, abandoned. This application Aug. 30, 1988, Ser. No. 238,644

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.[4] C07L 41/03

U.S. Cl. 568—608 **20 Claims**

1. A process for the preparation of capped polyoxyalkylene block polyethers, comprising:

(a) sequentially oxyalkylating an initiator molecule having one or more active hydrogens

(i) with ethylene oxide in the presence of a basic cesium-containing catalyst; and

(ii) one or more higher alkylene oxides in the presence of a basic oxyalkylation catalyst; and

(b) capping the product of step (a) to form an alkyl, cycloalkyl, or aralkyl ether terminated polyoxyalkylene block polyether.

4,902,835

FLUORINATED BUTENE DERIVATIVES AND METHODS FOR THEIR PREPARATION

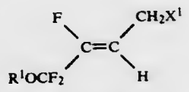
Andrew S. Kende, Rochester, N.Y., and Noritada Matsuo, Minamino, Japan, assignors to The University of Rochester, Rochester, N.Y.

Filed Jan. 11, 1988, Ser. No. 142,630

Int. Cl.[4] C07C 41/05, 43/15, 43/166

U.S. Cl. 568—684 **4 Claims**

1. Z-isomers of fluorinated alkene compounds of the formula



I

wherein R^1 is C_1–C_4 alkyl; X^1 is C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, aryl, aralkyl chlorine, or bromine.

4,902,836

PROCESS FOR INHIBITING DIHYDRIC PHENOL DEGRADATION AND COLOR FORMATION AND COMPOSITION THEREOF

Gaylord M. Kissinger, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 11, 1988, Ser. No. 217,025

Int. Cl.[4] C07C 37/00, 37/68, 37/16

U.S. Cl. 568—702 **12 Claims**

1. A process which comprises the addition of a bisphenol-A degradation inhibiting and color inhibiting effective amount of a phosphite or a phosphonite to a composition comprising biophenol-H, phenol, and isomers of bisphenol-A, said addition occurring prior to a distillaton procedure, said amount of phosphite being from 0.01 to 0.3 wt% of the composition.

4,902,837

PROCESS FOR PREPARING BIPHENOLS

Michio Tanaka; Yoshito Kurano, and Katsuo Taniguchi, all of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

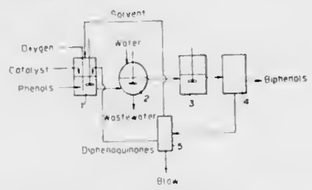
PCT No. PCT/JP87/00770, § 371 Date Jun. 13, 1988, § 102(e) Date Jun. 13, 1988, PCT Pub. No. WO88/02745, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 14, 1987, Ser. No. 219,151

Claims priority, application Japan, Oct. 14, 1986, 61-243381

Int. Cl.[4] C07C 37/11, 39/14

U.S. Cl. 568—730 **12 Claims**



1. A process for preparing biphenols by oxidation coupling of phenols, characterized by carrying out said oxidation coupling reaction at a temperature of 70–300° C. in the presence of molecular oxygen under such conditions that the same diphenoquinones as the diphenoquinones produced as by-products at the time when said oxidation coupling is carried out are added to the reaction system.

4,902,838

ISOMERIZATION OF SATURATED FLUOROHYDROCARBONS

Leo E. Manzer, and V. N. Mallikarjuna Rao, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1988, Ser. No. 291,100

Int. Cl.[1] C07C 17/24, 17/34

U.S. Cl. 570—151 **12 Claims**

1. A process for isomerizing saturated C_2 to C_6 fluorohydrocarbons having lesser thermodynamic stability to fluorohydrocarbons having greater thermodynamic stability comprising;

contacting in the gaseous phase at a temperature from about 200° C. to about 475° C. at least one C_2 to C_6 saturated fluorohydrocarbon with a catalyst composition comprising an aluminum fluoride.

4,902,839

PROCESS FOR PREPARING FLUORINATED C_4 TO C_6 HYDROCARBONS AND NOVEL CYCLIC FLUORINATED HYDROCARBONS AND THEIR USE AS PROPELLANT GAS AND WORKING FLUID FOR HEAT PUMP SYSTEMS

Dietmar Bielefeldt, Ratingen; Albrecht Marhold, Leverkusen, and Michael Negele, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

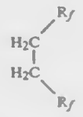
Filed Oct. 13, 1988, Ser. No. 257,351

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1987, 3735467

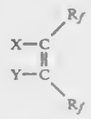
Int. Cl.[4] C07C 19/08

U.S. Cl. 570—175 **10 Claims**

1. A process for preparing a fluorinated C_4 to C_6 hydrocarbon of the formula



wherein R_f is CF_3 or the two R_f groups taken together are $—CF_2—CF_2—$, $—CF_2—CF_2—CF_2—$, or $CH(CF_3)—CH(CF_3)—$, comprising catalytically hydrogenating, in the presence of a base, an olefinic compound of the formula



wherein

X is hydrogen, fluorine, chlorine, or bromine;

Y is fluorine, chlorine, or bromine; and

R_f is defined as above.

4,902,840

SUBSTITUTED TETRAHYDROINDANE DERIVATIVES AND ORGANOLEPTIC USES OF SUBSTITUTED TETRAHYDROINDANES

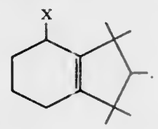
Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge, and Charles E. J. Beck, Summit, all of N.J., assignors to International Flavors and Fragrances Inc., New York, N.Y.

Filed Apr. 28, 1989, Ser. No. 345,014

Int. Cl.[4] C07C 23/34

U.S. Cl. 570—187 **1 Claim**

1. The compound having the structure:



wherein x is chloro or bromo.

4,902,841

METHOD FOR PRODUCING ELECTRICAL INSULATING OIL COMPOSITION

Shigenobu Kuwakami, Ichikawa; Keiji Endo, Yokosuka; Hideyuki Doshi, Yokohama, and Atsushi Sato, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Ltd., Tokyo, Japan

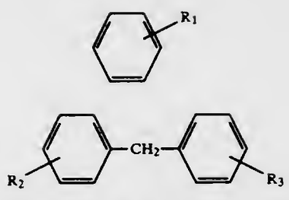
Filed Mar. 8, 1988, Ser. No. 165,307

Claims priority, application Japan, Mar. 11, 1987, 62-55863; Mar. 11, 1987, 62-55864

Int. Cl.[4] H01B 3/22; C07C 15/12

U.S. Cl. 585—6.3 **8 Claims**

1. A method for producing an electrical insulating oil composition consisting essentially of 20 to 80% of benzyltoluene and 80 to 20% of ditolylmethane, said method comprising the steps of reacting a monocyclic aromatic hydrocarbon represented by the following general formula (I) with a diarylmethane represented by the following general formula (II) which has been prepared without using a chlorinated hydrocarbon as a starting material, at a temperature of −10° to 550° C. in the presence of a disproportionation catalyst to prepare a reaction product containing benzyltoluene and ditolylmethane, and recovering benzyltoluene and ditolylmethane from said reaction product by distillation:



(I)

(II)

wherein each of R_1 to R_3 is a hydrogen atom or a methyl group, but when R_1 is the hydrogen atom, the total number of carbon atoms of R_2 and R_3 is 2, and when R_1 is the methyl group, the total number of carbon atoms of R_2 and R_3 is 0 or 1.

4,902,842

PROCESS FOR THE SIMULTANEOUS HYDROCONVERSION OF A FIRST FEEDSTOCK COMPRISING UNSATURATED, HALOGENATED ORGANIC COMPOUNDS AND A SECOND FEEDSTOCK COMPRISING SATURATED, HALOGENATED ORGANIC COMPOUNDS

Tom N. Kaines, La Grange, and Robert B. James, Jr., Northbrook, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Feb. 13, 1989, Ser. No. 309,508

Int. Cl.[4] C07C 15/02

U.S. Cl. 585—310 **19 Claims**

1. A process for the simultaneous hydrodehalogenation of a first feedstock comprising unsaturated, halogenated organic compounds and a second feedstock comprising saturated, halogenated organic compounds which process comprises:

(a) contacting said first feedstock comprising unsaturated, halogenated organic compounds with a first dried hydrogen-rich gas stream in a first hydrogenation reaction zone operated at hydrogenation conditions selected to minimize the polymerization of unsaturated organic compounds and to produce a first hydrogenated stream comprising hydrocarbonaceous compounds;

(b) reacting at least a portion of said first hydrogenated stream comprising hydrocarbonaceous compounds and said second feedstock comprising saturated, halogenated organic compounds with hydrogen in a second hydrogenation reaction zone operated at hydrogenation conditions selected to produce a second hydrogenated stream comprising hydrocarbonaceous compounds and to generate at least one water-soluble hydrogen halide compound;

(c) containing said second hydrogenated stream with a halide-lean absorber solution in an absorption zone;

(d) withdrawing a halide-rich absorber solution containing at least a portion of said water-soluble hydrogen halide compound from said absorption zone;

(e) withdrawing a first stream comprising hydrogenated hydrocarbonaceous compounds and a hydrogen-rich gas from said absorption zone;

(f) introducing said first stream recovered in step (e) into a separation zone to produce a hydrogen-rich gas stream comprising water vapor and a second stream comprising hydrogenated hydrocarbonaceous compounds;

(g) removing at least a portion of said water vapor from said hydrogen-rich gas stream comprising water vapor in a drying zone to produce a second dried hydrogen-rich gas stream; and

(h) recycling at least a portion of said second dried hydrogen-rich gas stream to step (a) as said first dried hydrogen-rich gas stream.

4,902,843
PROCESS FOR PRODUCING M-XYLENE FROM O-XYLENE
Tamio Onodera, and Akio Namatame, both of Matsuyama, Japan, assignors to Teijin Petrochemical Industries, Ltd., Tokyo, Japan
Filed Oct. 4, 1988, Ser. No. 253,215
Claims priority, application Japan, Oct. 5, 1987, 62-249916
Int. Cl.[4] C07C 5/22
U.S. Cl. 585—481 10 Claims

1. A process for producing m-xylene, which comprises isomerizing a hydrocarbon material containing o-xylene as a main ingredient in the presence of a catalyst composition selected from the group consisting of zeolite ZSM-4, zeolite omega and mixtures thereof at a temperature of about 100° to 200° C. to selectively form m-xylene, and recovering m-xylene by distillation from the resulting isomerization mixture containing o-xylene and m-xylene as main ingredients.

4,902,844
NEW ZEOLITE SSZ-23 AND XYLENE ISOMERIZATION THEREWITH
Stacey I. Zones, San Francisco, and R. A. Innes, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Filed Apr. 5, 1989, Ser. No. 333,654
Int. Cl.[4] C07C 5/22
U.S. Cl. 585—481 11 Claims

6. A process for converting hydrocarbons, comprising contacting a hydrocarbonaceous feed at hydrocarbon converting conditions with a zeolite having a mole ratio of an oxide selected from silicon oxide, germanium oxide and mixtures thereof to an oxide selected from aluminum oxide, gallium oxide, iron oxide, boron oxide and mixtures thereof greater than about 50:1, and having the X-ray diffraction lines of Table 1.

4,902,845
METHOD TO EXTEND LIFE OF IRON OXIDE-CONTAINING CATALYSTS USING LOW LEVELS OF OXYGEN
Dae K. Kim, and George A. McConaghy, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.
Continuation of Ser. No. 345,663, Feb. 4, 1982, abandoned. This application Nov. 21, 1988, Ser. No. 274,444
Int. Cl.[4] C07C 4/18, 5/333, 15/46; B01J 23/94
U.S. Cl. 585—486 2 Claims

1. A conversion process wherein an alkylaromatic compound is dealkylated using an iron oxide-containing catalyst contacting such catalyst with a feed containing about 0.0001 to about 0.01 mole of oxygen per mole of feed in the substantial absence of an oxidation catalyst whereby the life of said iron oxide-containing catalyst is extended.

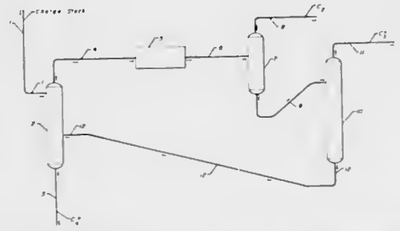
4,902,846
SYNLUBE PROCESS
Thomas J. DiLeo; Matthew J. Lynch; Marshall B. Nelson, and Ronny W. Lin, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.
Continuation-in-part of Ser. No. 225,872, Jul. 29, 1988, abandoned. This application Feb. 2, 1989, Ser. No. 305,716
Int. Cl.[4] C07C 2/04, 2/02
U.S. Cl. 585—525 13 Claims

1. A one-step batch process for making an α-olefin oligomer, said process comprising:
(A) placing an initial amount of 0–1.0 mole parts of a C_{8-14} α-olefin which is substantially free of promoted BF_3 catalyst in a reaction vessel and
(B) co-feeding at least 0.5 additional mole parts of said C_{8-14} α-olefin and a BF_3 promoter to said reaction vessel over a period of at least one-half hour and under BF_3 pressure while maintaining the reaction temperature at about 20°–50° C., said co-feeding being commenced at a time when said initial amount of C_{8-14} α-olefin, if any, is still at least 75 weight percent monomer.

4,902,847
METHOD FOR PRODUCING OLEFIN OLIGOMERS USING A MODIFIED MORDENITE BASED CATALYST
Bernard Juguin; Francis Raatz; Christine Travers, all of Rueil-Malmaison, and Germain Martino, Poissy, all of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France
Filed Sep. 16, 1988, Ser. No. 245,241
Claims priority, application France, Sep. 17, 1987, 87 12932
Int. Cl.[4] C07C 2/02
U.S. Cl. 585—533 17 Claims

1. A method for producing oligomers, in which at least one mono-olefin having 2 to 8 carbon atoms is placed in contact with a mordenite which has been obtained by the following series of operations:
(a) subjecting non-dealuminized mordenite substantially in the H or NH_4^+ form to at least one treatment with steam at a temperature of 450° C. to 600° C. at a partial steam pressure above 60%, and
(b) treating the resulting product, at least once, with an acid, said acid being used at a concentration of 0.5 and 20N.

4,902,848
PROCESS FOR THE DEHYDROGENATION OF HYDROCARBONS
Norman H. Scott, Arlington Heights, and Bipin V. Vora, Darien, both of Ill., assignors to UOP, Des Plaines, Ill.
Filed Jul. 1, 1988, Ser. No. 214,355
Int. Cl.[4] C07C 5/36
U.S. Cl. 585—655 7 Claims



1. A process for the dehydrogenation of a dehydrogenatable hydrocarbon feedstock having small quantities of higher boiling range hydrocarbons which comprises:
(a) introducing said dehydrogenatable hydrocarbon feedstock into a fractionation zone having at least a portion of reflux to a fractionation column supplied by said dehydrogenatable hydrocarbon feedstock to provide a dehydrogenatable hydrocarbon stream having a reduced concentration of higher boiling range hydrocarbons and a stream comprising said higher boiling range hydrocarbons;
(b) introducing said dehydrogenatable hydrocarbon stream having a reduced concentration of higher boiling range hydrocarbon recovered in step (a) into a dehydrogenation zone containing dehydrogenation catalyst and operated at dehydrogenation conditions to provide a hydrocarbon stream comprising dehydrogenated hydrocarbons and unconverted dehydrogenatable hydrocarbons;
(c) separating said hydrocarbon stream comprising dehydrogenated hydrocarbons and unconverted dehydrogenatable hydrocarbons from step (b) to provide a product stream comprising dehydrogenated hydrocarbons and a recycle stream comprising unconverted dehydrogenatable hydrocarbons; and
(d) introducing said recycle stream comprising unconverted dehydrogenatable hydrocarbons recovered in step (c) into said fractionation column to provide at least a portion of feed to said fractionation column.

4,902,849
DEHYDROGENATION PROCESS
Dwight L. McKay, Bartlesville, Okla., and Michael E. Olbrich, Lake Jackson, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Feb. 6, 1989, Ser. No. 307,122
Int. Cl.[4] C07C 5/333
U.S. Cl. 585—660 16 Claims

1. A process for dehydrogenating light alkanes comprising the steps of:
(a) contacting a feed stream comprising at least one alkane having from 2 to 5 carbon atoms per molecule in a reactor with steam and a catalyst composition comprising (i) at least one aluminate spinel selected from the group consisting of Group IIA metal aluminates and Group IIB metal aluminates, (ii) at least one metal selected from the group consisting of nickel, ruthenium, rhodium, palladium, osmium, iridium and platinum, and (iii) at least one compound of a metal selected from the group consisting of germanium, tin and lead, under such dehydrogenation conditions as to at least partially convert said at least one alkane to at least one alkene;
(b) discontinuing the flow of said feed stream through said reactor containing said catalyst composition, and passing a purge gas stream selected from the group consisting of steam, at least one inert gas and mixtures of steam and at least one inert gas through said reactor, so as to substantially remove hydrocarbons from said reactor;
(c) thereafter contacting said catalyst composition in said reactor, with steam and a free oxygen containing gas stream, under such regeneration conditions as to substantially burn off carbonaceous deposits on said catalyst composition and to obtain a regenerated catalyst composition;
(d) discontinuing the flow of the free oxygen containing gas stream through said reactor containing said regenerated catalyst composition, and passing a purge gas stream, as described in step (b), through said reactor so as to substantially remove free oxygen from said reactor;
(e) contacting said regenerated catalyst composition in said reactor with a reducing gas stream comprising free hydrogen and steam, under such conditions as to obtain a reactivated catalyst composition, wherein the molar ratio of steam to free hydrogen in said reducing gas stream is in the range of from about 2:1 to about 20:1; and
(f) discontinuing the flow of free hydrogen through said reactor and contacting said feed stream in said reactor with steam and the reactivated catalyst composition obtained in step (e), under such dehydrogenation conditions as to at least partially convert said at least one alkane to at least one alkene.

4,902,850
PURIFICATION OF ANETHOLE BY CRYSTALLIZATION
Curry B. Davis, Panama City, Fla., assignor to Arizona Chemical Company, Panama City, Fla.
Filed Aug. 5, 1988, Ser. No. 229,004
Int. Cl.[4] C07C 7/14
U.S. Cl. 585—817 5 Claims

1. The method of improving the purity of crude anethole from the residue or high boiling fractions from the distillation of crude wood, gum or sulfate turpentine comprising:
preparing an aqueous emulsion of crude anethole by combining crude anethole, emulsifier, and water at a temperature above the melting point of the crude anethole and agitating the mixture;
cooling the emulsion to form crystals of purified anethole;
separating the anethole crystals from the aqueous emulsion liquid phase;
washing the crystals of the purified anethole with cool water; and
removing the residual water from the purified anethole.

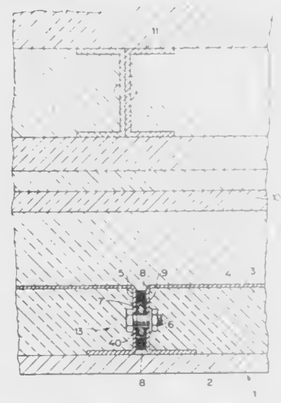
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4,902,851

COMBINATION PROTECTION ROOM

Klaus Richter, Berlin, Fed. Rep. of Germany, assignor to ABS Allgemeiner Brandschutz, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,719
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3728455
Int. Cl.[4] H05K 9/00
U.S. Cl. 174—35 MS 13 Claims



1. A combination protection room for protecting contents thereof against the action of heat in the case of fire, water, steam, and gas, as well as magnetic and electric fields, comprising:

(a) walls made from several layers of fire protection materials, which are not interconnected and are self-supporting;

(b) an internal metal envelope made from individual sheet metal elements disposed within each of the walls;

(c) a fire door with a through metal plate formed in one of the walls; and

(d) a plurality of steam-gas seals disposed at transition points between the individual sheet metal elements and between the sheet metal elements and the metal plate of the fire door, the steam-gas seals being electrically and magnetically conductive and elastic, each of the steam-gas seals comprising a central element formed from a resilient mterial with an insert embedded therein to act as a pressure stop.

4,902,852

POWER POLE WIRING CHAMBER

Emil S. Wuertz, Madison, Conn., assignor to Hubbell Incorporated, Orange, Conn.

Filed Feb. 15, 1989, Ser. No. 311,346
Int. Cl.[4] H02G 3/04
U.S. Cl. 174—48 6 Claims

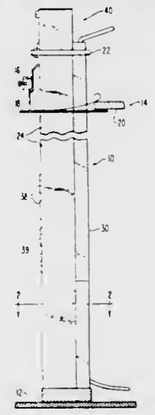
1. An improved power pole structure comprising

a first elongated U-shaped metal body having an open side and open upper and lower ends;

a second elongated U-shaped metal body having an open side and upper and lower ends, said open side of said second body being coupled to said open side of said first body to form a housing, said upper end of said second body terminating a predetermined distance from said upper end of said first body, thereby leaving a portion of the open side of said first body uncovered;

an elongated dividing wall attached to one of said first and second bodies along one of said open sides to separate said housing into a power wire chamber and a communication wire chamber, said elongated dividing wall terminating said predetermined distance from the upper end of said first body leaving said portion of said open side uncovered;

the edges of at least said uncovered portion of said first body being bent to form a reverse curve; a cover plate dimensioned and shaped to close said uncovered portion of said first body, said cover plate having hook-shaped edges shaped to engage said reverse curves, said edges of said



cover plate and said first body being crimped together to maintain said cover plate in position, said cover plate having a latch opening adjacent an upper edge thereof; and

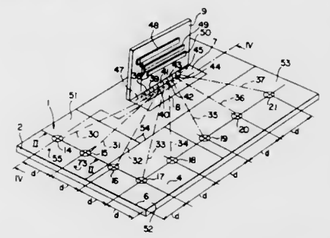
a top plate dimensioned to close the upper end of said first body, said top plate having means to engage said latch opening, thereby forming a wiring chamber at said upper end of said pole.

4,902,853

ELECTRICAL OR LIKE ENERGY TRANSPORT INSTALLATION AND METHOD OF IMPLEMENTING SAME

Patrice Elluin, Paris, France, assignor to Societe d'Administration et de Realisationsd'Investissements (SARI), Paris, France

Filed Aug. 2, 1988, Ser. No. 227,236
Claims priority, application France, Aug. 3, 1987, 87 11015
Int. Cl.[4] H02G 3/28
U.S. Cl. 174—48 10 Claims



6. Installation for transporting energy between a technical facility and locations dispersed on a platform, comprising centralized transmit and receive means for said energy in said technical facility and, incorporated into said platform, a predetermined number of independent closed boxes distributed according to a specific plan chosen at will and ducts each of which emerges into said technical facility and connects a respective one of said boxes to said technical facility independently of the other ducts, whereby, according to the require-

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ments for connection between a specific location on said platform and specific energy transmit and receive means, it is possible to determine which box is nearest said location, to open said box through said platform, to insert into the associated duct at least one cable and to connect said at least one cable to said specific energy transmit and receive means.

4,902,854

HERMETIC DIRECT BOND CIRCUIT ASSEMBLY

Lance R. Kaufman, 131 North White Oak Way, Mequon, Wis. 53092

Filed Apr. 12, 1988, Ser. No. 180,476
Int. Cl.[4] H01L *23/02*
U.S. Cl. 174—52.4 **14 Claims**



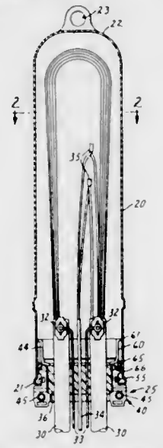
1. An electric circuit assembly comprising:
an electrically insulating refractory tub having a floor and an integral side wall around the perimeter thereof and extending upwardly therefrom;
electrically conductive metallic lead frames directly and hermetically bonded to said tub by placing said lead frames in contact with said tub, heating said lead frames and said tub to a temperature below the melting point of said lead frames to form a eutectic with said lead frames which wets said lead frames and said tub, and cooling said lead frames and said tub, with said lead frames bonded to said tub;
an electrical component in said tub connected to said lead frames;
a top cover hermetically sealed to the top of said side wall to close said tub and hermetically seal said electrical component therein, wherein said cover is an electrically insulating refractory member;
a first metallic ring directly and hermetically bonded to the top of said side wall of said tub by placing said first ring in contact with said top of said side wall, heating said ring and said tub to a temperature below the melting point of said ring to form a eutectic with said ring which wets said ring and said top of said side wall of said tub, and cooling said ring and said tub, with said ring bonded to said top of said side wall of said tub;
a second metallic ring directly and hermetically bonded to said top cover by placing said second ring in contact with said top cover, heating said second ring and said top cover to a temperature below the melting point of said second ring to form a eutectic with said second ring which wets said second ring and said top cover, and cooling said second ring and said top cover, with said second ring bonded to said top cover;
and wherein said rings are welded to each other.

4,902,855

END SEAL FOR SPLICE CLOSURE

Russell P. Smith, Georgetown, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 25, 1988, Ser. No. 262,278
Int. Cl.[4] H02G *15/04*
U.S. Cl. 174—77 R **11 Claims**



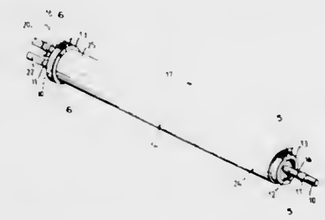
1. An end seal for an end of a splice closure formed as a hollow tubular member which is elliptical in cross section and has at least one open end for receiving cables to be spliced together, said seal comprising:
collar means adapted to be placed about the cables in a location corresponding to a said end of the closure, said collar means having an elliptical shape in transverse cross section and having means defining a peripheral groove about the outside perimeter of said collar means, and
an O-ring placed in said groove, said O-ring having an inside diameter to fit snugly against the bottom of said groove and
said groove having a width sufficient to accommodate one rotation of said O-ring.

4,902,856

REUSABLE CABLE JOINT COVER

John M. Miller, Harrow, England, assignor to British Telecommunications, London, United Kingdom

Filed Dec. 9, 1987, Ser. No. 130,574
Int. Cl.[4] H02G *15/08*
U.S. Cl. 174—91 **9 Claims**



1. A reusable cable joint cover comprising:
(a) a hollow sleeve for housing joints between cables;
(b) a first end cap of smaller external diameter than an internal diameter of said sleeve and sealed to said sleeve by way of a first releasable seal; and

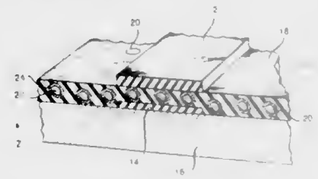
(c) a second end cap which is sealed by a clamp member to said sleeve by way of a second releasable seal, said sleeve and said second end cap having respective flange members for interacting with said clamp member;
each of said end caps having a substantially planar inner surface, each said end cap comprising at least one respective cable entry port formed integrally with the cap and terminating coplanar with said substantially planar inner surface, each said cable entry port having an outwardly extending portion for surrounding a respective one of said cables and being permanently sealable to said respective one of said cables at a point longitudinally separated from each respective releasable seal and external of said sleeve.

4,902,857

POLYMER INTERCONNECT STRUCTURE

Benjamin H. Cranston, Princeton, and Lloyd Shepherd, Madison, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 27, 1988, Ser. No. 290,611
Int. Cl.[4] H01R *9/00, 11/01, 43/00*
U.S. Cl. 174—94 R **18 Claims**



1. In combination with each of a pair of opposed, spaced-apart conductive members, a generally planar polymer interconnect (PI) structure, which exhibits anisotropic conductivity in the z direction between its opposed major surfaces, the PI structure being sandwiched between the conductive members such that each of the opposed major surfaces of the structure is in contact with one of the members, the PI structure comprising:
an insulative polymer matrix which is cured to form a generally planar structure; and
a plurality of electrically conductive particles arranged in the polymer matrix to create a plurality of lateraly spaced, conductive paths extending between the opposed major surfaces of the polymer structure such that at least one of the particle in at least one of the paths is in contact with a separate one of the conductive members, wherein improvement comprises:
at least a portion of those particles proximate a separate one of the opposed major surfaces of the cured polymer structure has at least a portion thereof coate with a solder whose composition is such that the solder melts at a temperature no greater than the cure temperature of the polymer matrix so that during curing, each solder-coated particle in contact with one of the conductive members forms a metallurgical bond therewith.

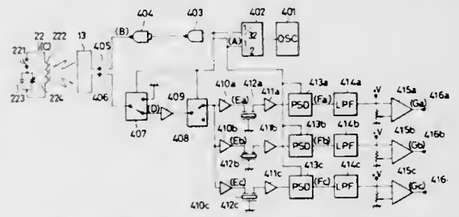
15. A method for manufacturing a polymer interconnect structure which affords anisotropic conductivity in the z direction comprising the steps of:
mixing a plurality of conductive particles in an uncured insulative polymer;
at least partially curing the polymer to form a generally planar matrix; while
arranging the particles in the polymer to obtain a plurality of laterally spaced conductive paths extending through the matrix in the z direction to achieve anisotropic conductivity, wherein improvement comprises:
at least partially coating those particles which are each proximate a separate one of the opposed surfaces of the matrix with a solder whose composition is tailored so the solder melts at a cure temperature not greater than the cure temperature of the polymer.

4,902,858

COORDINATES INPUT APPARATUS

Tsuguya Yamanami, and Toshiaki Senda, both of Okegawa, Japan, assignors to Wacom Co., Ltd., Saitama, Japan

Continuation-in-part of Ser. No. 95,691, Sep. 14, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 273,642
Claims priority, application Japan, Sep. 8, 1986, 61-209711
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—19 **12 Claims**



1. In a coordinates input apparatus having a tablet constituting a coordinates input section, a plurality of different types of position designating devices, and a position detecting circuit adapted to drive said tablet and detect positions at which coordinates are input by said position designating devices, a system for detecting the statuses of said position designating devices comprising:
at least one antenna coil positioned relative to a coordinates input range of said tablet;
wherein each of said position designating devices has a tuning circuit disposed therein, each of said tuning circuits including a coil and capacitors working cooperatively to transmit radio waves in response to an external signal at a frequency predetermined in accordance with a corresponding type of position designating device;
wherein an AC signal having a plurality of frequencies each being identical to an individual frequency of one of said tuning circuits is intermittently and sequentially applied to said antenna coil so that radio waves are transmitted by said antenna coil, and, when the transmission of said radio waves is suspended, signals generated by said tuning circuits in response to said radio waves are received by said antenna coil to enable detection of the respective positions and operating statuses of said position designating devices; and
wherein a determination of the correspondence of the frequencies of the received signals with the types of position designating devices is used to effect a differentiation between the different types of said position designating devices.

4,902,859

CIRCUIT BREAKER MECHANICAL INTERLOCK

Gustav Witzmann, Atlanta, and John R. Patrick, Stone Mountain, both of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Mar. 2, 1989, Ser. No. 317,892
Int. Cl.[4] H01H *9/26*
U.S. Cl. 200—50 C **4 Claims**

1. An assembly for interlocking a first circuit breaker and a second circuit breaker, wherein the circuit breakers are of the type including a first electrical contact and a tie-bar coupled to a second electrical contact being engageable with the first electrical contact, the assembly comprising:
means for supporting the first circuit breaker and the second circuit breaker;

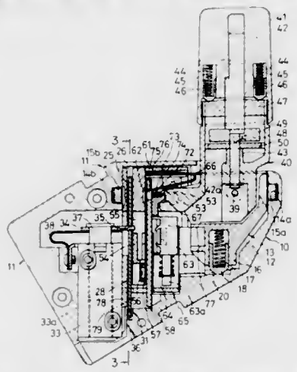
a pivot support supported by the means for supporting;
a pivot pin;
a rocker arm, the rocker arm being supported substantially at the center of the rocker arm by the pivot support, wherein the pivot pin pivotally couples the rocker arm and the pivot support;
an engagement member for engaging the tie-bar of the first circuit breaker;
a guide member including a slot, the guide member being mountable to the first circuit breaker with a first mounting means;
a link defining a first end and second end;
a rod defining a first end and a second end, wherein the second end includes a slotted opening and the rocker arm includes a first end and a means for engaging the slotted opening of the rod;



a guide pin being slidable within the slot of the guide member, the guide pin pivotally attaching the engagement member to the first end of the link;
a first pin for pivotally attaching the second end of the link to the first end of the rod; and
a second means for transferring movement between the tie-bar of the second circuit breaker and the means for restricting movement, wherein the second means is coupled to the tie-bar of the second circuit breaker;
wherein the rod moves the rocker arm when the first electrical contact is engaged with the second electrical contact of the first circuit breaker such that the rocker arm moves the second means which prevents the first electrical contact from engaging the second electrical contact of the second circuit breaker.

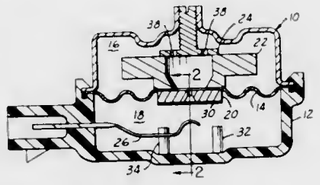
4,902,860
AUTOMATIC CANCELING DEVICE FOR WINKER DEVICE
Takuya Maeda, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed Feb. 16, 1989, Ser. No. 311,923
Claims priority, application Japan, Apr. 28, 1988, 63-56741[U]
Int. Cl.[4] H01H *3/16, 9/00;* **B60Q** *1/42*
U.S. Cl. 200—61.27 **4 Claims**

1. An automatic canceling device for a winker device comprising:
a container,
a winker operation lever rockably held by the container,
an engaging unit extensibly or contractably provided through a compression spring mounted in the lever,
a locking cam provided in the container for holding the lever engaged with the engaging unit at neutral, right or left positions,
a solenoid energized by an unlock signal,
a second cam unit provided on the lever,
an unlocking member for rotating the lever in the unlocking direction in contact with the second cam unit provided on the lever,
and an energizing member activated by the solenoid and engaged with the unlocking member for energizing the



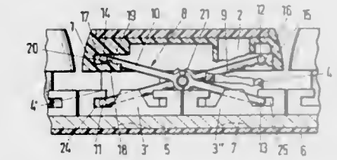
locking cam towards its neutral position whereby the lever returns to its neutral position.

4,902,861
INERTIA SWITCH
John E. Cook, Chatham, Canada, assignor to Siemens-Bendix Automotive Electronics Limited, Chatham, Canada
Filed Mar. 20, 1989, Ser. No. 326,825
Int. Cl.[4] H01H *35/14, 35/40*
U.S. Cl. 200—61.48 **13 Claims**



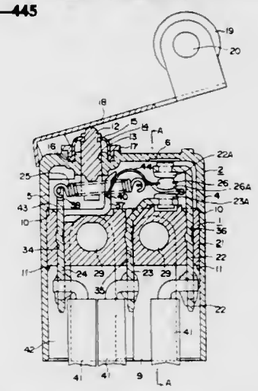
1. An inertia switch comprising:
a casing that is divided into two chambers by an axially movable diaphragm;
an electrical contact carried by said diaphragm on a face thereof that bounds one of said chambers, said electrical contact being disposed centrally on said face;
a pair of spaced apart terminals disposed in said one chamber in the path of said electrical contact as said diaphragm moves toward said one chamber, a circuit being completed between said pair of terminals when said pair of terminals is contacted by said electrical contact;
orifice means passing through said electrical contact and said diaphragm to communicate said two chambers with each other, said orifice means comprising a control orifice, said control orifice being in said electrical contact;
said inertia switch occupying an off state, when subjected to axial force below a predetermined magnitude and duration characteristic in a sense urging said electrical contact and said diaphragm toward said pair of terminals, said off state being defined by said electrical contact being spaced from said pair of terminals; and
said inertia switch assuming an on state, when subjected to axial force in said sense equaling or exceeding said predetermined magnitude and duration characteristic, said on state being defined by said electrical contact being placed in contact with said pair of terminals;
said orifice means functioning to conduct a gas from said one chamber to the other of said chambers in response to displacement of said electrical contact and said diaphragm toward said pair of terminals, said control orifice restricting the flow of gas through said orifice means to impart dampening to the motion of said diaphragm and said electrical contact toward said pair of terminals.

4,902,862
KEYBOARD SWITCH DEVICE FOR FACILITATING REMOVAL AND REPLACEMENT OF PUSH BUTTONS
Jurgen Oelsch, Hohenroth; Bertold Sturmer, Bad Kissingen; Nicola Dijlovinazzo, Hohenroth, and Gerhard Hochgesang, Bad Neustadt/Saale-Lebenhan, all of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf GmbH & Co., Bad Neustadt/Saale, Fed. Rep. of Germany
Filed May 12, 1988, Ser. No. 193,107
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719839
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—344 **3 Claims**



1. A push button device comprising: a button head having slots; an electrical switch contact means for connecting and disconnecting an electrical signal, said switch contact means having an operating position and a switching position; a guide having engagement slots, the guide bearing the switch contact means, the button head capable of being pressed to bring the switch contact means out of the operating position and into the switching position; and a parallel guide member having a first and second stop member, the parallel guide member arranged between the button head and the guide, wherein in the operating position and the switching position, the first stop member of the parallel guide member engages the engagement slots of the guide and the second stop member of the parallel guide member engages the slots in the button head, characterized in that the push button device further comprises:
a catch device for holding the parallel guide member in a lock-in position, wherein in the lock-in position with the button head located on the guide, the first stop member of the parallel guide member is located in front of openings of the engagement slots and that by pressing the button head onto the guide, the parallel guide member is moved out of the lock-in position into the operating position, whereby the first stop member moves into the engagement slots, the catch device further comprising a further stop face for preventing the parallel guide member from being moved from the operating position into the lock-in position when the button is operated; and a stop cam having a first stop face and a second stop face is formed at one of the slots of the button head.

4,902,863
PUSH BUTTON MICROSWITCH WITH WIPING CONTACT EFFECT
Yasumichi Fukuma, Hirata, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan
Continuation of Ser. No. 97,034, Sep. 14, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,153
Claims priority, application Japan, Sep. 16, 1986, 61-140607; Sep. 16, 1986, 61-140608; Sep. 16, 1986, 61-140609
Int. Cl.[4] H01H *5/06*
U.S. Cl. 200—445 **10 Claims**



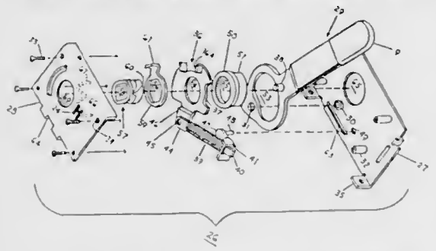
1. A switch, comprising:
a movable piece having a movable contact;
an arcuate movable plate spring projecting from a side surface of the movable piece;
at least one fixed terminal provided with a fixed contact facing the movable contact;
a common terminal having a standing piece and a holding piece;
a movable coil spring having an end fixed to the standing piece of the common terminal, wherein the other end of the coil spring is coupled to an end of the movable piece, wherein the movable plate spring is biased by the movable coil spring, one end of the movable plate spring being swingably held by the holding piece of the common terminal, and wherein the coil spring and the movable plate spring provide wiping and contact pressure of the movable contact on the fixed terminal; and
a push-button for directly pressing the upper portion of the movable coil spring.

4,902,864
VERSATILE ELECTRIC DISCONNECT SWITCH
Robert G. Markowski, East Haven; Dean A. Robarge, New Britain; Robert L. Owens, Southington, all of Conn., and Jerome B. Tankersley, III, Fredericksburg, Va., assignors to General Electric Company, New York, N.Y.
Filed Dec. 9, 1988, Ser. No. 281,614
Int. Cl.[4] H01H *5/08*
U.S. Cl. 200—459 **10 Claims**

1. An operating handle assembly for an electric disconnect switch comprising:
a pair of first and second parallel opposing side plates each having an opening therethrough;
an operating handle pivotally supported on one of said side plates defining an opening at one end and including a handle extension on an opposite end;
an actuator lever defining a circular opening and including a perimetric slot formed on an outer surface and a tab extending from said outer surface, said tab being pivotally attached to an operating spring guide having an operating spring arranged thereon, said perimetric slot being captured within a post extending from said operating handle

for driving said actuator lever in a clockwise and counterclockwise direction in response to manual operation of said operating handle;

a drive ring defining a non-circular opening concentric with said circular opening formed within said actuator lever and including a tab extending from one end, said drive ring tab being captured within a second perimetric slot formed within said actuator lever outer surface and extending within an arcuate slot formed within the other of said side plates; and



a non-circular sleeve extending through said openings in said first and second side plates, said drive ring opening, said actuator lever opening and said operating handle opening, said sleeve including a non-circular opening adapted to receive a non-circular drive shaft whereby said counterclockwise and said clockwise motion is transmitted to said drive shaft.

4,902,865

PUSH-PULL ACTUATOR FOR KEY SWITCHES

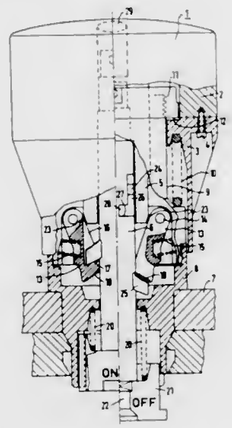
Herbert Müller, Schwarzenfeld, and Gerhardt Sehnke, Sulzbach-Rosenberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 72,115, Jul. 10, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 273,755

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624946

Int. Cl.⁴ H01H *15/24*

U.S. Cl. 200—538 **5 Claims**



1. A push-pull actuator for switches, the actuator comprising:

a mushroom knob, the mushroom knob being movable longitudinally between a rest position and an operating position;

a first spring, the first spring biasing the mushroom knob toward the rest position;

an actuating plunger, the actuating plunger movable between an ON position and an OFF position;

a second spring, the second spring biasing the actuating plunger in a predetermined direction toward one of the ON positions and the OFF position;

at least one detent, the detent selectively maintaining the actuating plunger in one of the ON position and the OFF position against the bias of the second spring, the mushroom knob being movable with respect to the actuating plunger for disengaging the detent means at least when the plunger is in one of the ON position and the OFF posiiton, the mushroom knob being movable into direct contact with the actuating plunger so as to allow movement of the actuating plunger in the direction of biasing of the second spring when the second spring fails to bias the actuating plunger;

wherein the mushroom knob includes an inclined surface and the at least one detent comprises a spring loaded latch, the spring loaded latch having a recess; and

the actuating plunger having a projection, the projection extending into the recess such that the actuating plunger is engaged by the latch when the actuating plunger is in the ON position.

4,902,866

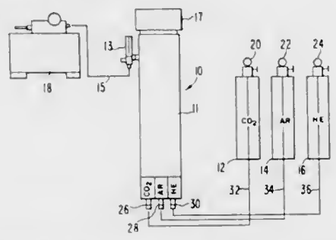
APPARATUS FOR MIXING GASES FOR USE IN ARC WELDING PROCESSES

Carlo Galantino, 3097 Old Sonoma Rd., Napa, Calif. 94558

Filed Aug. 8, 1988, Ser. No. 229,580

Int. Cl.⁴ B23K *9/16*

U.S. Cl. 219—74 **12 Claims**



1. Apparatus for mixing gases for use in sustaining the arc of a gas metal arc welding process comprising:

an elongated housing having a pair of opposed ends;

means adjacent to one end of the housing for defining a number of gas inlet ports adapted to be coupled to respective sources of gases;

means in said housing and coupled with the ports for mixing the gases supplied thereto from said sources, said mixing means including a pair of Y members, each Y member including a pair of inlets and an outlet, the outlet of one of the Y members being coupled to an inlet of the other Y member, there being a number of fittings between each inlet port and the inlet of the corresponding Y member, said mixing means having an outlet adapted to be coupled to a welding machine, whereby the mixture of gases from said mixing means can be directed to the welding machine to sustain the arc of a gas metal arc welding process performed by the machine.

4,902,867

METHOD OF JOINING AN INSULATED WIRE TO A CONDUCTIVE TERMINAL

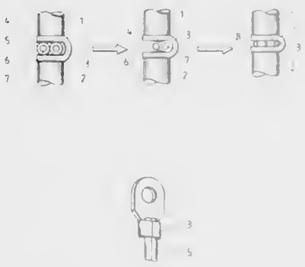
Takashi Haramaki, Toukai; Mitsuo Nakamura, Takahagi; Satoshi Kokuni, Ohta; Takao Funamoto, Hitachi, and Katsuyoshi Terakado, Urizura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 254,306

Claims priority, application Japan, Oct. 9, 1987, 62-253705

Int. Cl.⁴ B23K *1/02, 11/00*

U.S. Cl. 219—85.18 **12 Claims**



1. A method of joining an insulated wire to a conductive terminal which comprises placing an insulated wire (5) comprising an insulating coating (6) and a core wire (7) between both sides of a conductive terminal and causing a current to flow between said both sides of said conductive terminal (3) while pressing said conductive terminal (3) after a joining assistant (4) comprising a metal is applied to a joining area of said core wire (7) of said insulated wire (5) or said conductive terminal (3), said insulating coating (6) of said insulated wire (5) is removed and said joining assistant (4) is melted through electric heating thereby bringing about a metallic joining conductive layer (8) between said core wire (7) of said insulated wire (5) and said conductive terminal (3), characterized in that said conductive terminal (3) comprises Cu alloy, thereby bringing about said metallic joining conductive layer (8) between said core wire (7) of said insulated wire (5) and said Cu alloy conductive terminal (3).

4,902,868

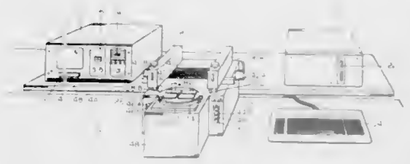
ADVANCED PARALLEL SEAM-SEALING SYSTEM

Robert K. Slee, Wren Ct. London Rd., Bromley, Kent BR1 1WF, England, and James L. Kern, 3134 Deerfield La., Murrysville, Pa. 15668

Filed Dec. 7, 1987, Ser. No. 129,145

Int. Cl.⁴ B23K *11/32*

U.S. Cl. 219—86.7 **9 Claims**



1. An advanced parallel seam-sealing system for sealing a matrix of packages in a single operation comprising:

A control console having a CRT display for viewing of a menu-driven program, menu select keys for selecting said menu-driven program and controlling electro-mechanical systems of said advanced parallel seam-sealing system, AC and DC power parallel seam-sealing system;

A computer deck for inserting therein and running of a disk storing a computer program with package data which controls said electro-mechanical system of said advanced parallel seam-sealing system, said package data consisting of package dimensions, welding parameters and array configurations which may be viewed on said CRT display;

An electronic keyboard connected to said computer deck for keying in said computer programs, said package data, and input data which controls said electro-mechanical systems;

A welding robot having seven (7) degrees of motion consisting of a right arm latitudinal motion independent of a left arm latitudinal motion, right arm rotary motion independent of left arm rotary motion, circumferential rotary table motion, vertical rotary table motion and longitudinal rotary table motion, all of which are controlled by said computer programs, except for said vertical rotary table motion;

A structural means of supporting and protecting said welding robot;

A control means for operation of said electromechanical systems of said welding robot.

4,902,869

APPARATUS FOR RESISTANCE WELDING

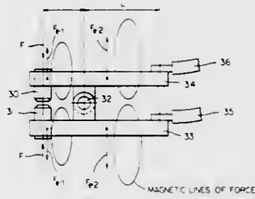
Robert Wald, Bad Sackingen, Fed. Rep. of Germany, assignor to Heinz Finzer KG, Bad Sackingen, Fed. Rep. of Germany

Filed Dec. 30, 1987, Ser. No. 139,722

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1986, 3644756

Int. Cl.⁴ B23K *11/00*

U.S. Cl. 219—86.32 **6 Claims**



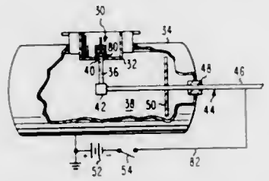
1. In an electric welding apparatus having opposing electrodes spaced from each other, a pair of relatively movable supports, resilient means for biasing said electrodes toward each other and current supply means connected to the supports for conducting welding current therethrough to the electrodes, the improvement residing in said electrodes (**10, 11**) being mounted in fixed relation to the supports (**13, 14, 24**), said welding current conducted through the supports electromagnetically inducing movement thereof away from each other and means (**14a, 24a**) for mechanically transforming said movement of the supports away from each other into movement of the electrodes toward each other to augment said biasing of the electrodes toward each other and thereby maintain the electrodes in continuous workpiece contact.

4,902,870

APPARATUS AND METHOD FOR TRANSFER ARC CLEANING OF A SUBSTRATE IN AN RF PLASMA SYSTEM

Gerhard Frind, Altamont; Paul A. Siemers, Clifton Park, and Stephen F. Ratkowski, Duanesburg, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1989, Ser. No. 330,854
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.52 **12 Claims**



1. An RF plasma system for arc cleaning oxides from the surface of a substrate during RF plasma processing of the substrate comprising:

an RF plasma device including a dielectric enclosure defining a chamber for containing a plasma and having a plasma exit port through which said plasma flows, an electrical conductor coil adjacent to the enclosure for applying RF energy to a region within the chamber to create a plasma from a gas flowing in the chamber and an electrically conductive member at said port and secured to said enclosure, said member being sufficiently close to said flowing plasma to permit current to flow to the plasma from the member;

a substrate support for bolding a substrate adjacent to said port for processing by the plasma flowing through the port; and

means for providing a direct current (DC) voltage between said member and said substrate support, said voltage having a polarity and magnitude such that an electric arc flows from said member to said substrate via said plasma, said arc being of sufficient intensity to substantially remove said oxides from said substrate during said processing.

4,902,871

APPARATUS AND PROCESS FOR COOLING A PLASMA ARC ELECTRODE

Nicholas A. Sanders, Norwich, Vt., and Richard W. Conch, Jr., Hanover, N.H., assignors to Hypertherm, Inc., Hanover, N.H.

Continuation-in-part of Ser. No. 9,508, Jan. 30, 1987, Pat. No. 4,791,268. This application Sep. 26, 1988, Ser. No. 249,407
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.49 **17 Claims**

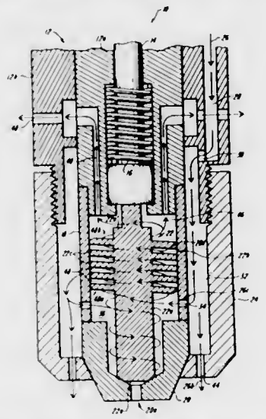
17. In a plasma arc torch having (i) a torch body, (ii) an anode supported on the body, and (iii) a cathode mounted for an axial sliding movement within the body, said cathode, anode and torch body defining a plasma chamber, the improvement comprising

resilient means mounted within the body that urges said anode and said cathode into electrical contact,

means for directing a pressurized flow of a plasma gas to said plasma chamber to produce a fluid force within said plasma chamber that separates said anode from said cathode,

a volume opposite the chamber that is vented to atmosphere which is at a substantially reduced pressure as compared to the gas pressure in said plasma chamber, and

a cooling gas flow passage formed in said cathode that is in fluid communication between said plasma chamber and said volume, said passage being dimensioned and configured to restrict a gas flow therethrough to a sufficient degree to maintain a pressure differential between the



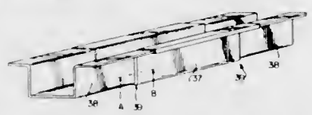
plasma gas in said plasma chamber and the plasma gas in said volume, while at the same time passing a sufficient gas flow to said volume to cool the cathode.

4,902,872

PROCESS FOR THE PRODUCTION OF A SHAPED PART FROM PIECES OF SHEET METAL OF DIFFERENT THICKNESSES

Adam Frings, Essen, and Wilfried Prange, Dinslaken, both of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Division of Ser. No. 135,194, Dec. 18, 1987, Pat. No. 4,827,100. This application Dec. 21, 1988, Ser. No. 287,777
Claims priority, application European Pat. Off., Dec. 22, 1986, 86117911
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.63 **5 Claims**



1. A shaped member of welded pieces of sheet metal of different thickness, more particularly having a metallic anti-corrosion protection, for example of zinc, on at least one side, characterized in that the pieces of sheet metal are joined to one another by a laser-beam-butt-welding process and shaped as a unit.

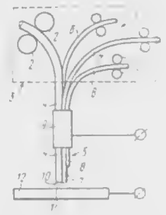
4,902,873

METHOD OF ELECTRIC ARC WELDING

Alfred V. Ivannikov, Ostrov, 4 linia, 45, kv. 10, Leningrad, Vasilievsky, U.S.S.R.

PCT No. PCT/SU86/00015, § 371 Date Oct. 19, 1987, § 102(e) Date Oct. 19, 1987, PCT Pub. No. WO87/04956, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 20, 1986, Ser. No. 153,271
Claims priority, application U.S.S.R., Dec. 25, 1978, 2731253
Int. Cl.[4] B23K *9/28, 9/00, 9/12*
U.S. Cl. 249—137 R **2 Claims**

1. A method of electric arc welding, comprising the steps of feeding a main consumable electrode (4) consisting of at least one wire through a current supply device (9) into a welding zone (1), feeding an additional consumable electrode (5) of at least one filler wire (6,7,8) in sliding contact with the main consumable electrode (4) and the current supply device (9) into the welding zone (1) through the current supply device (9); filling a crater along a welding line with a weld seam; controlling the welding amperage, and the size and shape of the weld seam by varying the total cross-sectional area of the consumable electrodes (4,5) by feeding a variable number of wires comprising said main and said additional consumable electrodes (4,5).

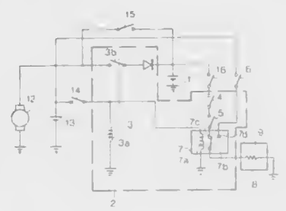


4,902,874

ANTI-FROST SYSTEM FOR A WINDSHIELD OF A MOTOR VEHICLE

Takeshi Tachimori, Oota, and Hirohisa Takada, Fukaya, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,803
Claims priority, application Japan, Oct. 28, 1987, 62-273995
Int. Cl.[4] B60L *1/02*
U.S. Cl. 219—203 **3 Claims**



1. A system for preventing frost from accumulating on a window of a motor vehicle comprising;

a heating element provided on the window;

a manual switch;

a temperature switch closing when the temperature of the window is lower than 0° C.;

a humidity switch closing when the humidity of air outside of the window becomes slightly lower than 100% relative humidity; and

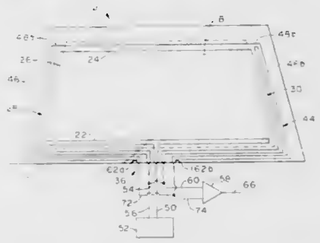
an electric circuit connecting the heating element, manual switch, temperature switch and humidity switch to a battery in series.

4,902,875

POWER DISCONTINUITY SENSOR FOR A DUAL FEED HEATABLE WINDSHIELD

Harold S. Koontz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 4, 1988, Ser. No. 267,402
Int. Cl.[4] B60L *1/02*
U.S. Cl. 219—203 **20 Claims**



1. An electrically heatable transparency comprising:

a non-electrically conductive substrate;

a first bus bar on a surface of said substrate;

a second bus bar on said surface of said substrate spaced from said first bus bar;

an electroconductive heating member on said substrate interconnecting said first and second bus bars;

first and second electroconductive leads electrically insulated from said electroconductive member and said second bus bar and each having a first end connected to said first bus bar and an opposing second end;

a sensor filament electrically insulated from said bus bars, leads, and electroconductive member to detect a power discontinuity in selected portions of said first bus bar and leads; and

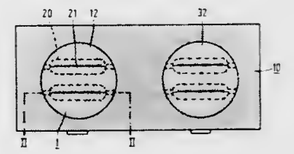
means to electrically interconnect an end of said filament with said first bus bar or one of said leads at a location such that said selected portions are positioned between said interconnecting means and said second end of said lead.

4,902,876

ELECTRICAL COOKING APPARATUS

Jan A. C. Mewissen, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Oct. 5, 1988, Ser. No. 253,293
Claims priority, application Netherlands, Oct. 21, 1987, 8702506
Int. Cl.[4] H05B *3/74*
U.S. Cl. 219—464 **3 Claims**



1. An electrical cooking apparatus comprising

an electrical cooking unit provided with a housing with a base wall and side walls placed thereon, which are provided with openings for receiving a respective end of a glass envelope of an electric filament, and

a hot plate of material pervious to IR radiation, which is arranged opposite the electrical cooking unit so that its base wall is remote from the hot plate, which hot plate has at least laterally of the cooking unit means for influencing

its light transmission, wherein at least one surface of the hot plate is light-scattering and wherein the hot plate is illuminated during operation laterally of the cooking unit with a diffuse radiation having a brightness which is proportioned to the power consumption of the cooking unit.

4,902,877

POWER CONTROL FOR MULTIPLE HEATING ELEMENTS

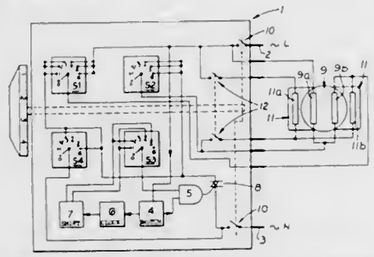
Alfie L. Grasso, Catania, Italy, and Richard C. Scott, Shatterford, United Kingdom, assignors to Micropore International Limited, Droitwich, United Kingdom

Continuation of Ser. No. 897,532, Aug. 7, 1986, abandoned. This application Dec. 3, 1987, Ser. No. 129,315

Claims priority, application United Kingdom, Dec. 21, 1984, 8432542

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—483 **4 Claims**



1. Heating apparatus for an electric cooking appliance comprising:

only two resistive heating elements having a fast thermal response, such as infra-red lamps;

power source means for providing a source of alternating current; and

manually operable switch means for controlling the power output of said two elements in response to energization with alternating current, said switch means comprising connecting means for selectively connecting the elements in series or in parallel, selecting means for selecting a proportion of complete half-cycles of alternating current to be blocked from energizing said elements, and blocking means for blocking the selected proportion of complete half-cycles from energizing said elements irrespective of whether said elements are connected in series or in parallel.

4,902,878

DATA ENTRY AND CONTROL ARRANGEMENT FOR AN APPLIANCE

John M. Smith, Louisville, Ky., and Martin H. Pitstick, Cleves, Ohio, assignors to General Electric Company, Louisville, Ky.

Filed Nov. 4, 1988, Ser. No. 267,501

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—486 **20 Claims**

1. A data entry and display control arrangement comprising:

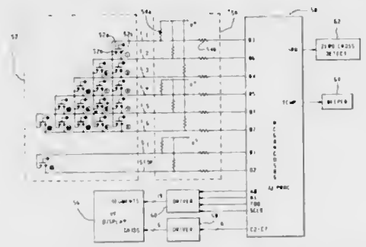
electronic display means having a plurality of digits including a least significant digit and at least one higher order digit for displaying numerical operating data;

data entry means comprising a plurality of user actuable keys including an up key and a down key;

display control means responsive to said data entry means;

said display control means including update means for periodically updating said display at regular update intervals of predetermined duration, in response to actuation of said up or down key;

said update means being operative to increase or decrease said display by a first amount in response to each initial actuation of said up or down key respectively, and to switch said least significant digit to zero and thereafter increase or decrease said display by a second amount, evenly divisible by ten at the end of each succeeding update interval as long as said up or down key remains continuously actuated, whereby the display is changed in



relatively small increments when an up or down key is momentarily actuated and in larger increments with the displayed values evenly divisible by ten when an up or down key is continuously actuated.

4,902,879

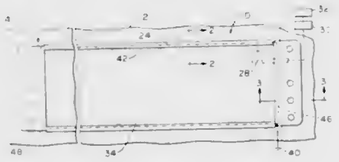
AIRCRAFT BILAYER APPENDAGE

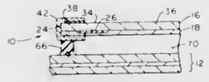
Patricia B. Walters, Capshaw; Connie J. Parvin, New Market; Gary M. Cribbs, Athens, and Radford French, Arab, all of Ala., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 28, 1987, Ser. No. 138,614

Int. Cl.[4] H05B *3/28*

U.S. Cl. 219—522 **20 Claims**





1. A transparent appendage for an aircraft window mounted in a airframe comprising:

an outer glass ply;

an inner flexible ply secured to said glass ply;

means to heat said plies;

strap members secured to edge portions of said piles;

means to secure said strap members to an airframe such that said plies are positioned outboard of an aircraft window mounted in said airframe; and

means to maintain said plies in spaced relation from said aircraft window.

4,902,880

CARD READER SYSTEM AND METHOD WITH PRINTING AND VERIFICATION CAPABILITY

John S. Garczynski, Norristown; Jeffrey C. Hahn, Oreland, and Edward C. Meehan, Villanova, all of Pa., assignors to Peripheral Dynamics, Inc., Plymouth Meeting, Pa.

Filed Sep. 30, 1988, Ser. No. 252,180

Int. Cl.[4] G06F *15/20*

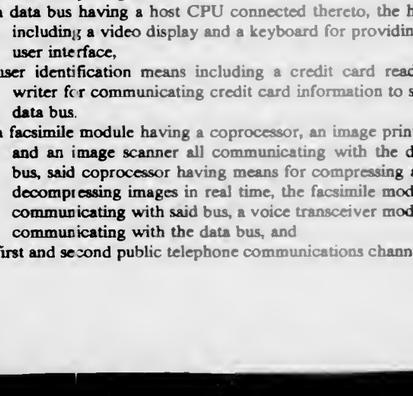
U.S. Cl. 235—375 **25 Claims**

1. A method of reading, printing and verifying data in a card reader-printer/CPU information processing system comprising the steps of:

(a) entering data and storing said data in a card reader-printer,

(b) transmitting said data from said card reader-printer to a CPU, assigning a unique transaction code to said data, and storing said data in said CPU along with said transaction code,

(c) transmitting said data and associated transaction code from said CPU to said card reader-printer, and receiving said data and transaction code and storing said transaction code in said card reader-printer,



(d) comparing said data received by said card reader-printer from said CPU with said data stored in said card reader-printer in step (a), and activating an alarm and terminating further operations if said received data differs from said stored data,

(e) producing a receipt on which said data and said transaction code received by said card reader-printer is displayed, and

(f) reading said transaction code displayed on said receipt, comparing said read transaction code with said transaction code stored in step (c) and activating an alarm if said read transaction code differs from said stored transaction code.

4,902,881

PARALLEL PROCESS COMMUNICATIONS TERMINAL AND NETWORK

Jan A. Janku, Atherton, Calif., assignor to Faxplus Corporation, Santa Clara, Calif.

Filed Jun. 10, 1988, Ser. No. 205,237

Int. Cl.[4] G06F *7/08*

U.S. Cl. 235--381 **22 Claims**

MICROFICHE APPENDIX INCLUDED

(2 Microfiche, 129 Pages)

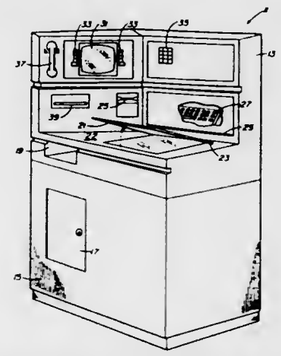
1. A public document image and voice communications terminal comprising,

a data bus having a host CPU connected thereto, the host including a video display and a keyboard for providing a user interface,

user identification means including a credit card reader-writer for communicating credit card information to said data bus.

a facsimile module having a coprocessor, an image printer, and an image scanner all communicating with the data bus, said coprocessor having means for compressing and decompressing images in real time, the facsimile module communicating with said bus, a voice transceiver module communicating with the data bus, and

first and second public telephone communications channels, said first channel communicating with said voice transceiver module and said second channel communicating



with said facsimile module, said first and second channels arranged for simultaneous communication.

4,902,882

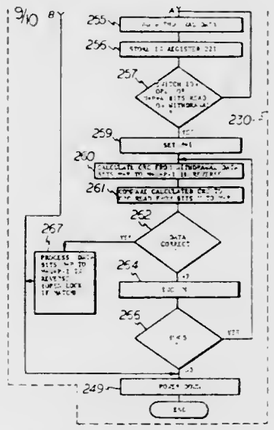
CODE READER

Gary E. Lavelle, Avon, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sep. 23, 1987, Ser. No. 99,924

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—382 **20 Claims**



1. In an electronic locking apparatus having means for reading a set of actual data from a key card, the improvement comprising:

memory means coupled to the reading means for storing said set of actual data and also storing false data erroneously read by said reading means,

means for shifting through said memory means to the locations of a plurality of sets of said actual and false data, a first one of said sets including both said actual data and false data and a second one of said sets including said actual data and none of said false data,

processing means coupled to the shifting means for determining that said first set contains some of said false data and said second set contains said actual data and none of said false data, and

means coupled to said processing means for comparing said actual data within said second set to a lock combination

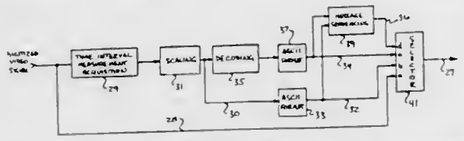
stored within said locking apparatus and operating said locking apparatus if the comparison is favorable.

4,902,883

DIGITIZED VIDEO SIGNAL AND TIME INTERVAL MEASUREMENT TRANSMISSION FROM A BAR CODE READER

Mckee D. Poland, Portola Valley, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 28, 1988, Ser. No. 149,453
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—462 **12 Claims**



1. A bar code reader for scanning data from bar codes for input to a host computer system, comprising:

means for producing a digitized video signal representing the reflectivity of the bars and spaces of the bar code;

decoding means for receiving the digitized video signal, for measuring the pulse widths of the video signal that correspond to the widths of the bar and space elements of the bar code to produce element time interval data, and for translating the time interval data into decoded ASCII characters; and

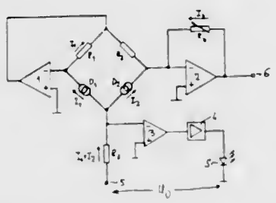
means for transmitting data to a host computer system, the transmitting means having an adjustable configuration that determines whether the digitized video signal, the element time interval data, the decoded ASCII characters, or a combination thereof, is transmitted to the host system.

4,902,884

CIRCUIT ARRANGEMENT FOR CARRYING OUT LIGHT INTENSITY MEASUREMENTS

Gábor Szabó, and Márta S. Burgert, both of Györ, Hungary, assignors to Dunacoop Kereskedelmi és Idegenforgalmi Vállalkozásokat Szervező Szolgáltató Lebonyolít, *acu/o/ GT, Budapest, Hungary*

Filed Apr. 5, 1988, Ser. No. 178,014
Claims priority, application Hungary, Apr. 10, 1987, 1596
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—210 **14 Claims**



1. A circuit arrangement for carrying out light intensity measurements, comprising

an input terminal,

an output terminal,

an optical light source,

a first and a second photodiode,

a first and a second operational amplifier for receiving current signals generated by said first and second photodiodes under influence of said emitted light,

a third operational amplifier for supplying power to said optical light source,

a four branch bridge circuit including in two adjacent branches said first and second photodiodes coupled to a common point by their respective poles of the same sign and further including oppositely to the latter in the remaining two adjacent branches a first and a second bridge resistor,

current generator means arranged between said input terminal and said bridge circuit, provided with an output connected to a common terminal of said bridge circuit and said third operational amplifier for driving said bridge circuit and the optical light source, wherein

said first operational amplifier is coupled with its input to said first photodiode and with its output to the junction point of said first and second bridge resistors, and said second operational amplifier is connected via its input to said second photodiode and via its output to said output terminal, further

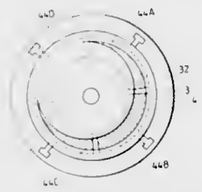
said output of said second operational amplifier is connected to its input through a feed-back member.

4,902,885

PHOTOELECTRIC CONVERSION TYPE ROTATIONAL POSITION DETECTOR

Yoshikazu Kojima; Takao Yanase; Mitsuharu Nonami, and Takao Chida, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Dec. 19, 1988, Ser. No. 286,008
Claims priority, application Japan, Feb. 1, 1988, 019593
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 K **6 Claims**



1. A photoelectric conversion-type rotational position indicator for indicating the rotational position of a rotating body measuring light received from a fixed disposed light emitting member, comprising:

a light receiving member fixedly disposed opposite the light emitting member, said light receiving member including m×n identically shaped light receiving portions made from a photoelectric converting material at predetermined spacings on the light receiving member, to generate n sinusoidal signals (360/(m×n)) degrees out of phase from each other, where m is a positive, non-zero integer equal to the number of sinusoidal signal cycles generated per revolution of a light shielding member, and n is a positive, non-zero integer equal to the number of phase separated sinusoidal signals to be generated by the light receiving portions, the identically shaped light receiving portions being disposed between a first set of two concentric circles having radii r_1 and r_2 on the light receiving member and divided circumferentially therein, the first set of circles being coaxial with the light receiving member;

a light shielding member coaxially interposed between the light emitting member and said light receiving member and being operably connected to the rotating body such that the light shielding member rotates with the rotating body,

the light shielding member having m windows disposed in a region between a second set of two concentric circles having radii r_3 and r_4, such that $r_1 \geqq r_3 > r_2 \geqq r_4$, the second

set of circles being coaxial with the light shielding member, the windows not being superimposed upon one another when viewed in a radial direction from the center of the light shielding member,

each of the windows being shaped with an inner curve and an outer curve such that the visible area of each light receiving portion through each of the windows varies in a sinusoidal form of one cycle as the light shielding member rotates through (2360/M) degrees; and,

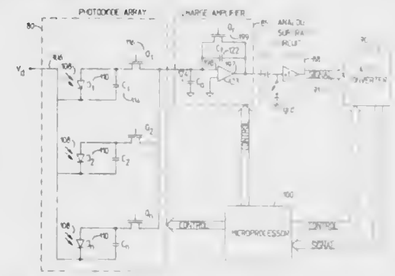
means for obtaining the phase separated sinusoidal signals by connecting n groups of m light receiving portions in parallel or series.

4,902,886

NOISE REDUCTION FOR PHOTODIODE ARRAYS

J. Daniel Swiako, Newark, Del., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 23, 1989, Ser. No. 299,382
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 R **7 Claims**



1. A method for reducing noise in the output of a light sensing circuit, said circuit comprising at least one photodiode having a photodiode capacitance related thereto, coupled to a low bandwidth charge amplifier through a transfer switch, wherein a series of noisy image signals, each comprising an image signal representing the intensity of light incident on said photodiode and an unwanted noise signal, are transferred to said charge amplifier by opening and closing said transfer switch, said method comprising the steps of:

measuring the charge amplifier output, a first time after closing said transfer switch and a second time after opening said transfer switch, said unwanted noise signal being displaced evenly, but of opposite polarity, on both sides of said open transfer switch,

subtracting said first and second measurements, wherein the difference corresponds to said unwanted noise signal;

storing said difference;

resetting said charge amplifier to accept a new signal;

transferring the noisy image signal next in the series of noisy image signals, and which contains the displaced unwanted noise signal of opposite polarity, to said charge amplifier;

measuring the charge amplifier output;

adding said stored difference to said transferred noisy image signal to eliminate the unwanted noise signal.

4,902,887

OPTICAL MOTION DETECTOR DETECTING VISIBLE AND NEAR INFRARED LIGHT

Hobart R. Everett, Jr., San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 13, 1989, Ser. No. 359,249
Int. Cl.[4] G01V *9/04;* **G01J** *1/00*
U.S. Cl. 250—221 **27 Claims**

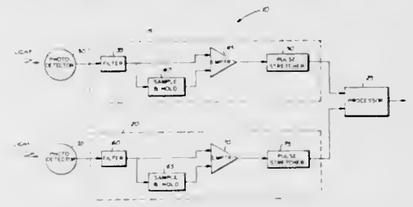
1. An optical motion detector, comprising:

means for detecting visible light and for providing an output functionally related to the intensity of said visible light;

first signal processing network means operably coupled to receive said output of said visible light detecting means for providing an output corresponding to a change in intensity of said detected visible light from a visible light reference scene having a greatest detected intensity of said detected visible light;

means for detecting near-infrared light and for providing an output functionally related to the intensity of said near-infrared light;

second signal processing network means operably coupled to receive said output of said near-infrared light detecting means for providing an output corresponding to a change in intensity of said detected near-infrared light from a near-infrared light reference scene having a greatest detected intensity of said detected near-infrared light; and



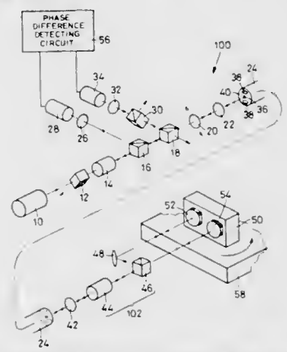
logical processor means operably coupled to said first and second signal processing network means for providing a motion detector warning output indicating a perturbation of visible light intensity in response to said detected change in visible light intensity, providing a motion detector warning output indicating a perturbation of near-infrared light intensity in response to said detected change in near-infrared light intensity, and providing a motion detector warning output indicating a perturbation of incandescent light intensity in response to said detection of said change in visible light intensity being detected simultaneously to said detection of said change in near-infrared light intensity.

4,902,888

OPTICAL FIBER SENSOR

Michio Kondo, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 12, 1988, Ser. No. 282,502
Claims priority, application Japan, Dec. 15, 1987, 62-316497; Dec. 18, 1987, 62-322242; Dec. 28, 1987, 62-335242
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **22 Claims**



1. An optical fiber sensor for detecting a change in a trans-

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mission parameter of a measuring beam, based on the measuring beam and a reference beam, comprising:

an optical fiber for transmitting said measuring and reference beams respectively in a first and a second transmission mode which have mutually perpendicular polarization planes, such that said polarization planes are maintained;

a light transmitter/receiver portion for producing said measuring and reference beams and directing the measuring and reference beams to said optical fiber so that the beams are transmitted in said respective two transmission modes in a first direction from a proximal end of the optical fiber to a distal end thereof, said light transmitter/receiver portion being operable to detect said change in said transmission parameter of said measuring beam, based on said measuring and reference beams which have been returned through said optical fiber in a second direction from said distal end toward said proximal end thereof;

a sensor head portion operable to receive said measuring and reference beams transmitted through said optical fiber in said first direction, and causing said transmission parameter of at least said measuring beam to be influenced by a change of an external subject, said sensor head portion returning the measuring and reference beams to said light transmitter/receiver portion through said optical fiber in said second direction; and

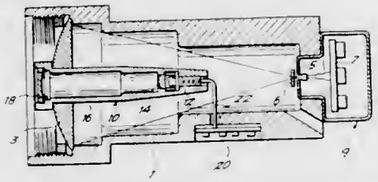
said sensor head portion including a Faraday effect element for rotating the polarization planes of said measuring and reference beams before said beams are incident upon said distal end of said optical fiber in said second direction so that said measuring and reference beams are transmitted through said optical fiber in said second direction in said second and first transmission modes, respectively.

4,902,889

OPTICAL SIGHT SYSTEM FOR THE DETECTION AND RECORDING OF INFRINGEMENTS OF THE ROAD TRAFFIC REGULATIONS, USING A LASER

Fiorello Sodi, Via Ugo Foscolo No. 5, 50018 Scandicci, Firenze, Italy

Filed Aug. 11, 1988, Ser. No. 231,182
Claims priority, application Italy, Aug. 25, 1987, 9466 A/87
Int. Cl.⁴ G01V *9/04*; G06M *7/00*; G08G *1/01*
U.S. Cl. 250—222.1 **16 Claims**



1. The traffic violation detection and recordation arrangement, comprising:

a plurality of optical sights, each optical sight including a laser emitter having a central axis and a photodiode receiver having a central axis, said laser emitter and photodiode receiver being arranged co-axially, said photodiode receiver including a photodiode sensing changes in light reflected from objects passing in front of a path of each associated laser emitter, and emitting a photodiode signal representative of the change in light sensed;

power supply means including a power supply circuit associated with each laser emitter for generating a high frequency pulse laser emission, each emission having an emission duration which is much smaller than the duration between emissions;

a tubular optical screen, connected to said laser, an optical concentrating and focusing assembly being connected to said tubular optical screen;

photodiode optical concentrating means, arranged coaxial with said tubular optical screen, for concentrating and uniformly distributing incoming light on the photodiode;

metallic screening means encompassing said photodiode, said screening means including an opening for receiving concentrated, distributed incoming light which has passed through said photodiode optical concentrating means, said screening means for shielding said photodiode receiver from external disturbances and disturbances generated by said power supply means and said laser emitter;

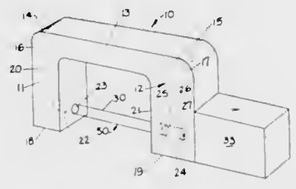
photodiode signal amplification and processing means for amplifying said photodiode signal from an associated photodiode and processing said photodiode signal, including a preamplifier connected to said photodiode, a signal detector connected to said preamplifier, a differential amplifier for comparing the signal and a signal representative of background noise, gain control circuit means for controlling the gain on an average signal and trigger means for generating a signal by comparison with a reference and a timing value.

4,902,890

RODENT MONITORING APPARATUS

William C. Blehle, 7075 Petri Dr., Cincinnati, Ohio 45230

Filed Sep. 7, 1988, Ser. No. 241,503
Int. Cl.⁴ G01V *9/04*
U.S. Cl. 250—222.1 **13 Claims**



1. An electronic device for locating the active pathways of rodents, comprising:

(a) an archway having:

(i) a first vertical leg, said first leg having a top end, a bottom end, and an intermediate portion;

(ii) a second vertical leg, said second leg having a top end, a bottom end, and an intermediate portion; and

(iii) a horizontal member, said member having two ends, said ends being connected to said top end of said first leg and said top end of said second leg respectively;

(b) a three sided passageway defined by said first leg, said second leg, and said horizontal member, said passageway being sufficiently open so as not to inhibit the movement of a rodent through said passageway;

(c) an infrared light source associated with said intermediate portion of said first leg, said light source configured to produce an infrared light beam;

(d) an infrared photoelectric cell associated with said intermediate portion of said second leg;

(e) means for shielding said cell from ambient light;

(f) means for directing said infrared light beam across said passageway from said light source to said cell; and

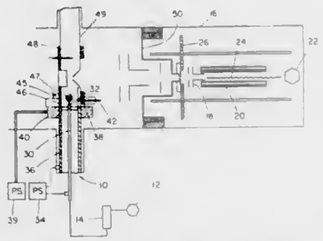
(g) a counter circuit connected to said cell for monitoring the number of times said light beam is interrupted.

4,902,891

THERMOSPRAY METHODS AND APPARATUS FOR INTERFACING CHROMATOGRAPHY AND MASS SPECTROMETRY

Marvin L. Vestal, Houston, Tex., assignor to Vestec Corporation, Houston, Tex.

Filed Jun. 3, 1988, Ser. No. 202,093
Int. Cl.⁴ H01J *49/04*
U.S. Cl. 250—281 **19 Claims**



1. A thermospray vaporizer for obtaining an ion vapor for detection or analysis by a mass analyzer from a liquid sample having molecules of interest separated by chromatography, the vaporizer comprising:

a metal capillary tube having an internal cylindrical passageway for transmitting the liquid sample to a discharge end thereof;

a heater for partially vaporizing the liquid smaple passing through the passageway in the metal capillary tube;

a controller for controlling the temperature of the liquid sample passing through the passageway in the capillary tube to maintain a constant degree of partial vaporization of the sample molecules discharged from the capillary tube and for producing an intense thermospray jet of vaporized ions and minute particles entrained in the vaporized jet;

a jet nozzle being removably affixed to the capillary tube at the discharge end thereof and having an aperture cross-sectional area substantially less than the cross-sectional area of the passageway in the capillary tube; and

the aperture of the jet nozzle being selectively sized as a function of sample flow rates to satisfy the relationship $50F^{\frac{1}{2}} \leq d \leq 100F^{\frac{1}{2}}$, wherein d is the aperture diameter in microns, and F is the sample flow rate in milliliters per minute.

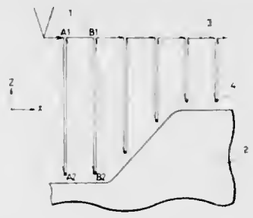
4,902,892

METHOD OF MEASUREMENT BY SCANNING TUNNELING MICROSCOPE

Shigeo Okayama; Hiroshi Tokumoto; Hiroshi Bando; Wataru Mizutani, all of Ibaragi; Masayuki Shimura; Haruki Nakagawa, both of Saitama; Masatsugu Shigeno, and Kazutoshi Watanabe, both of Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology, Kosaka Laboratory Ltd. and Seiko Instruments Inc., both of Tokyo, Japan

Filed Oct. 13, 1988, Ser. No. 257,468
Claims priority, application Japan, Oct. 15, 1987, 62-260612
Int. Cl.⁴ H01J *37/26*
U.S. Cl. 250—307 **10 Claims**

1. In a scanning tunneling microscope capable of controlling tunnel currents flowing between a probe and a material to be observed by changing the distance between the probe and the material, a method of measurement by scanning tunneling microscope wherein a plurality of measured values are obtained at plural measuring points by repeatedly carrying out the steps of: carrying out a measurement at a measuring point in a state in which a tunnel current flows between the probe and the material, separating the probe from the material sufficiently far relative to the roughness of the surface of the material to avoid collision therewith when the probe is scanned across the material surface, moving the probe to another measuring point, bringing the probe close to the material again at



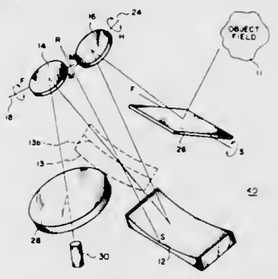
another measuring point, and carrying out another measurement in a state of which a tunnel current flows therebetween.

4,902,893

PASSIVE INFRARED RADIATION SCANNING SYSTEM

Gordon J. Burrer, 5 Wayland Hills Rd., Wayland, Mass. 01778

Continuation of Ser. No. 183,834, Apr. 20, 1988, abandoned.
This application Aug. 2, 1989, Ser. No. 388,763
Int. Cl.⁴ G02B *26/10*; H04N *5/33*
U.S. Cl. 250—334 **20 Claims**



1. A passive infrared scanning system having high optical throughput for detecting infrared radiation emanating from an object field and providing an output compatible with video display systems, comprising:

spherical reflecting means for optically relaying pupils along an optical path of said passive infrared scanning system with minimal pupil shift, said spherical reflecting means including a spherical reflecting surface, an optical axis, a predetermined radius of curvature, and a predetermined intermediate focal line;

second scanning means for coupling radiation emanating from the object field onto said spherical reflecting surface of said spherical reflecting means, said second scanning means including a second rotational axis and an essentially flat reflecting surface adjacent said second rotational axis for oscillatory movement thereabout, and wherein said second scanning means is positioned a distance from said spherical reflecting surface equal to said predetermined radius of curvature;

wherein the radiation reflected from said spherical reflecting surface converges at said predetermined intermediate focal line and diverges therefrom;

radiometric reference source means disposed at ends of said predetermined intermediate focal line for calibrating the radiation converging at said predetermined intermediate focal line;

first scanning means operative for line scanning by intercepting and reflecting the radiation diverging from said predetermined intermediate focal line, said first scanning means including a first rotational axis and an essentially flat

reflecting surface adjacent said first rotational axis for oscillatory movement thereabout, and wherein said first scanning means is positioned a distance from said spherical reflecting surface equal to said predetermined radius of curvature; and

detection means for coupling the divergent radiation reflected from said first scanning means to focalize for detection.

4,902,894

GATE COUPLED INPUT CIRCUIT

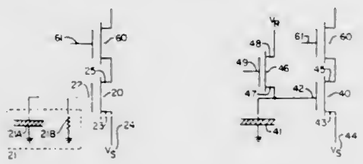
Neal R. Butler, Acton; Jeff L. McClelland, Somerville, and Shigesato Iwasa, Harvard, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 26, 1986, Ser. No. 912,885

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[4] G01J *1/44*

U.S. Cl. 250—338.1 **18 Claims**



1. A circuit for use in a thermal imaging system comprising:

an infrared detector for detecting an infrared signal impining thereon,

an amplifier having an input to which said detector is connected, and an output, said amplifier responding to said detector detecting an infrared signal to provide an amplified electrical signal representing said infrared signal at its output, and

a resistor made as part of said detector and effectively being in parallel therewith, said resistor being used to bias both said detector and said amplifier, said resistor being fabricated by doping the material from which the detector is made to produce a resistance in the range of 10^{12} to 10^{15} ohms.

4,902,895

CAPACITIVE BOLOMETER AND METHOD FOR DETECTING INFRARED RADIATION

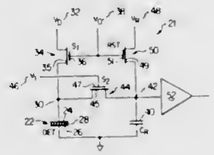
Charles M. Hanson, Richardson, Tex., assignor to Varo, Inc., Garland, Tex.

Continuation of Ser. No. 922,415, Oct. 23, 1986, Pat. No. 4,792,681. This application Sep. 12, 1988, Ser. No. 243,281

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[4] H01L *37/02*

U.S. Cl. 250—338.2 **3 Claims**



1. A capacitive bolometer comprising:

a detection capacitor having two electrodes, a ferroelectric material between said electrodes exhibiting a first order phase transition between ferroelectric and paraelectric phases when the electric displacement between said electrodes is substantially zero; and

said capacitor responding during a detection step to a change in temperature, means for applying preselected electric field applied between said electrodes during said detection step to enhance the sensitivity of said ferroelectric material to a change in temperature during said detection step to close to a theoretical maximum for said ferroelectric material.

4,902,896

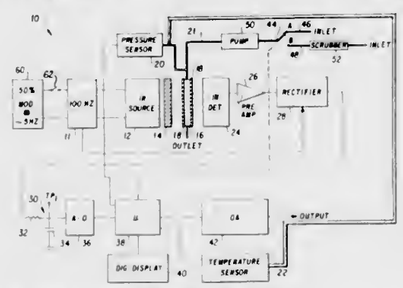
INFRARED FLUID ANALYZER

Glenn H. Fertig, Sr., Natrona Heights, and Adrian C. Billetdeaux, Allison Park, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed May 8, 1987, Ser. No. 47,650

Int. Cl.[4] G01N *21/61*

U.S. Cl. 250—343 **8 Claims**



1. An infrared fluid analyzer comprising:

means for producing infrared radiation at a constant predetermined wavelength;

a chamber transparent to infrared radiation housing the fluid to be analyzed, said chamber disposed to receive the radiation produced by the radiation producing means;

means for detecting the radiation produced by the radiation producing means which passes through the chamber, said detecting means producing a signal corresponding to the amount of radiation detected;

means for providing a first fluid to the chamber to be analyzed, and at least a second zero fluid in order to determine instabilities therein;

means for correcting the signal produced by the detecting means when the first fluid is in the chamber to compensate for instabilities therein measured when the second zero fluid is in the chamber, said correcting means controlling the fluid providing means to determine which fluid is to be provided to the chamber; and

means for displaying the corrected signal to show the concentration of fluid reactive to the IR radiation passing through the chamber.

4,902,897

ION BEAM GUN AND ION BEAM EXPOSURE DEVICE

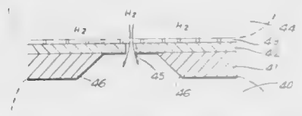
Seiichi Iwamatsu, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 107,424

Claims priority, application Japan, Oct. 13, 1986, 61-242389; Oct. 13, 1986, 61-242390; Nov. 2, 1986, 61-278192; Nov. 6, 1986, 61-264241; Nov. 12, 1986, 61-268950; Nov. 13, 1986, 61-270759; Nov. 14, 1986, 61-271409; Nov. 14, 1986, 61-271411; Nov. 20, 1986, 61-277483; Nov. 21, 1986, 61-278199; Jan. 16, 1987, 62-007536; Jan. 16, 1987, 62-007532; Jan. 19, 1987, 62-009767; Jan. 19, 1987, 62-009768

Int. Cl.[4] H01J *27/00*

U.S. Cl. 250—423 R **42 Claims**



1. An ion beam gun for ionizing a gas comprising:

gas supply means having an outlet port for supplying gas to be ionized;

ion emission means including a thin film and means for applying a voltage to the thin film for emitting ions of the gas in the gas supply means, the ion emission means disposed on the outlet port of the gas supply means for emitting ions;

the thin film being a thin plate with a pin hole and a second thin film for emitting the ions disposed on the gas supply side of the thin plate; and

vacuum means for providing a vacuum on the ion emitting side of the emission means and for receiving the ions emitted by the ion emission means.

4,902,898

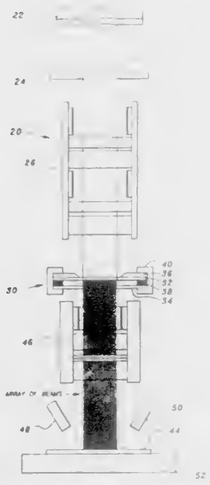
WAND OPTICS COLUMN AND ASSOCIATED ARRAY WAND AND CHARGED PARTICLE SOURCE

Gary W. Jones, and Susan K. Schwartz Jones, both of Durham, N.C., assignors to Microelectronics Center of North Carolina, Research Triangle Park, N.C.

Filed Apr. 26, 1988, Ser. No. 186,510

Int. Cl.[4] H01J *37/317*

U.S. Cl. 250—492.2 **13 Claims**



1. A wand optics column for the exposure of patterns on a target through the use of charged particle beams, said column comprising:

a charged particle source for supplying a charge of electrons or ions;

a monolithic multilayer array wand positioned downstream of said charged particle source, said monolithic multilayer array wand including an integrated blocking layer formed of a material that will block the incoming charged particles, an integrated conductive deflector layer, at least one integrated lens layer and at least one aperture formed through the integrated blocking, deflector and lens layers in substantially parallel alignment to the path of the incoming charged particles, said aperture providing a collimated beam of charged particles passing therethrough;

said integrated deflector layer providing a primary conductive path for switching voltages for shaping, controlling and deflecting the individual beams passing through the associated apertures; and

said at least one integrated lens layer focusing said collimated beam of charged particles.

4,902,899

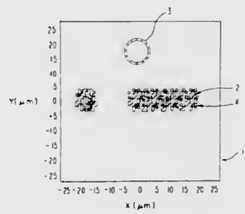
LITHOGRAPHIC PROCESS HAVING IMPROVED IMAGE QUALITY

Burn J. Lin, Scarsdale; Anne M. Moruzzi, Wappingers Falls, and Alan E. Rosenbluth, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1987, Ser. No. 56,161

Int. Cl.[4] G03F *7/20*

U.S. Cl. 250—492.1 **6 Claims**



1. A lithographic process having improved image quality that comprises:

positioning a member including a photosensitive layer at the imaging plane of a projection lens with respect to a lithographic mask that defines areas that are to receive actinic light wherein said lithographic mask includes a plurality of opaque elements or transparent elements, each of which is smaller than the resolution of the projection lens, to be employed for controlling the transmittance of the actinic light defining area, and wherein the concentrations of said elements are varied within an individual mask opening to provide higher transmission in the corners and along the edges of said individual mask opening.

4,902,900

DEVICE FOR DETECTING THE LEVELLING OF THE SURFACE OF AN OBJECT

Saburo Kamiya, and Hideo Mizutani, both of Yokohama, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,659

Claims priority, application Japan, Dec. 21, 1987, 62-321585; Mar. 22, 1988, 63-67518

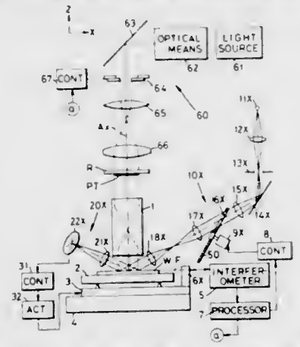
Int. Cl.[4] G01N *21/86, 9/04*

U.S. Cl. 250—548 **7 Claims**

1. A device for detecting the levelling of an object disposed on a plane substantially perpendicular to the optic axis of main

objective optical means and worked by a radiation beam from said main objective optical means, comprising:

levelling detecting optical means including an irradiating optical system for supplying a collimated light beam to a particular area of the surface of said object from an oblique direction, and a condensing optical system having light receiving means and for condensing the light beam



reflected by said particular area on said light receiving means; and

field stop means providing a plurality of stop openings differing in shape from one another, said field stop means being disposed in said levelling detecting optical means, one stop opening corresponding to the shape of said particular area being selected from among said plurality of stop openings.

4,902,901

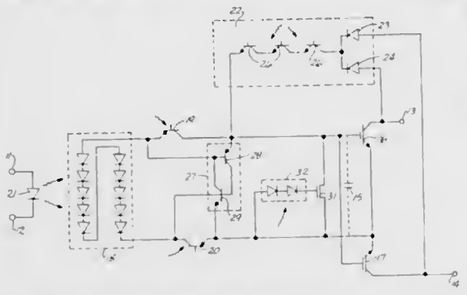
HIGH-POWER SOLID STATE RELAY EMPLOYING PHOTOSENSITIVE CURRENT AUGMENTING MEANS FOR FASTER TURN-ON TIME

Joseph Peruyeszi, Scotts Valley, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 14, 1989, Ser. No. 338,872

Int. Cl.[4] G02B *27/00*

U.S. Cl. 250—551 **17 Claims**



11. A solid state relay comprising:

a semiconductor switch for switching a voltage and having a control terminal and an inherent input capacitance;

a photovoltaic array coupled to the switch for closing the switch upon illumination of the photovoltaic array;

shorting means coupled to the switch for accelerating discharge of the inherent capacitance when illumination of the photovoltaic array is discontinued;

charging means for accelerating the charging of the inherent capacitance upon illumination of the photovoltaic array comprising phototransistor means for coupling the switched voltage to the control terminal of the switch; and

illumination means for simultaneously illuminating the photovoltaic array and the phototransistor means.

4,902,902

APPARATUS FOR DETERMINING THE THICKNESS OF MATERIAL

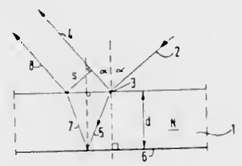
Walter R. Tole, Chinnor, England, assignor to Beta Instrument Co., Bucks, England

Filed May 13, 1987, Ser. No. 49,235

Claims priority, application United Kingdom, May 14, 1986, 8611728

Int. Cl.[4] G01B *11/06*

U.S. Cl. 250—560 **7 Claims**



1. Apparatus for determining the thickness of a transparent workpiece comprising a source of radiation, means for directing a beam of radiation from said source to impinge on said workpiece to produce a first reflected beam from a front surface of the workpiece and a second reflected beam from the back surface of the workpiece at a spacing therebetween, radiation responsive means in the path of said two beams and providing respective pulse wave outputs representative of the distribution of radiation falling on said radiation responsive means, and means for determining the center of gravity of an area under each said pulse, the relationship between said centers of gravity providing a measure of the thickness of the workpiece.

4,902,903

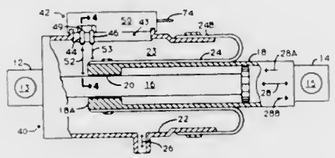
APPARATUS EMPLOYING REFLECTIVE OPTICAL MEANS

Eugene E. Segerson, 108 W. Erie, Tempe, Ariz. 85282; David L. Vowles, 3249 E. Altadena, Phoenix, Ariz. 85028, and David D. Hanson, 8234 E. Gail Rd., Scottsdale, Ariz. 85260

Filed Oct. 27, 1988, Ser. No. 263,652

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—561 **31 Claims**



1. An apparatus having a position sensor, comprising:

a first portion fixed to a first end of the apparatus;

a second portion moveably engaging the first portion and fixed to a second end of the apparatus, wherein the position of the second portion relative to the first portion varies in response to varying loads on the apparatus;

means for enclosing at least part of the first and second portions; and

reflective optical means for providing at least partly within the enclosing means a light path at least partially interruptible by relative motion of the first and second portions.

4,902,904

COAXIAL ENGINE STARTER

Shuzoo Isozumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

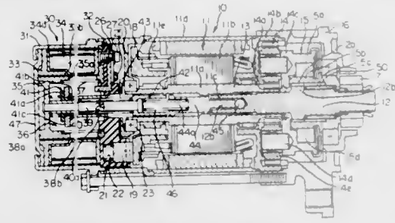
PCT No. PCT/JP88/00098, § 371 Date Oct. 4, 1988, § 102(e) Date Oct. 4, 1988, PCT Pub. No. WO88/05865, PCT Pub. Date Aug. 11, 1988

PCT Filed Feb. 3, 1988, Ser. No. 279,220

Claims priority, application Japan, Feb. 5, 1987, 62-16936; Feb. 27, 1987, 62-29108

Int. Cl.[4] F02N *15/06*

U.S. Cl. 290—48 **3 Claims**



1. A coaxial engine starter comprising;

an electric motor for generating a rotating force for starting an engine;

an output rotary shaft disposed on one end of said motor in an axially aligned relationship with its armature rotary shaft and operatively connected to the armature rotary shaft through an over-running clutch mechanism; and

a solenoid switch assembly disposed on the other end of said electric motor in an axially aligned relationship for supplying electric power to said motor and for axially sliding said output rotary shaft;

said solenoid switch assembly comprising a cylindrical excitation coil;

a plunger axially slidable within said excitation coil;

a front magnetic path section disposed on one end of said excitation coil in opposition to said plunger;

a rear magnetic path section disposed around the circumference of said plunger when it is in the return position;

a bushing made of an iron-system material and disposed between said rear magnetic path section and said plunger; and

a non-magnetic sleeve disposed side by side relative to said iron-system bushing for guiding said plunger in a moving space from its return position to the position in which said plunger abuts against said front magnetic path section.

4,902,905

PINION STOPPER ARRANGEMENT FOR STARTER MOTOR

Akira Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 289,151

Claims priority, application Japan, Dec. 26, 1987, 62-331166

Int. Cl.[4] F02N *11/00*

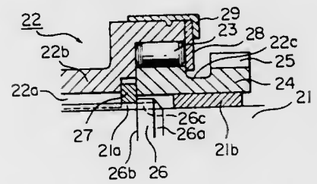
U.S. Cl. 290—48 **12 Claims**

1. A pinion stopper arrangement for a starter motor comprising:

a motor output shaft driven by an electric motor and having a circumferentially extending projection, said circumferential projection having a front end surface facing away from said electric motor and a rear end surface facing toward said electric motor and being substantially perpendicular to the axis of said output shaft;

a pinion drive shaft having a pinion gear thereon;

an over-running clutch having a clutch outer member having a front end surface facing away from said electric motor and engaged with said helical splines on said output shaft and a clutch inner member mounted on said pinion drive shaft for rotation therewith, said clutch outer member and said clutch inner member being relatively rotatable but substantially immovable in the axial direction relative to each other; and



an elastic stopper ring disposed between said front end surface of said clutch outer member and said rear end surface of said circumferential projection on said output shaft, said elastic stopper ring having an inner diameter smaller than the outer diameter of said circumferential projection, and said elastic stopper ring, in cooperation with said circumferential projection on said output shaft, restricting the axial movement of said over-running clutch and said pinion gear relative to said outer shaft.

4,902,906

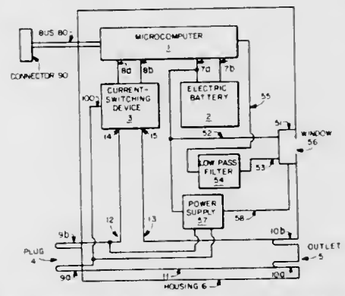
SECURITY LIGHTING SYSTEM

Gordon J. Murphy, 638 Garden Ct., Glenview, Ill. 60025

Filed Jun. 9, 1988, Ser. No. 204,422

Int. Cl.[4] H02J *7/00*

U.S. Cl. 307—117 **9 Claims**



1. An electrical outlet adapter, designed to be installed with ease by merely plugging it into a standard electrical outlet without the need to program said adapter, for automatically switching a second electrical outlet on and off in response to the level of ambient light between a first time of day and a second time of day, said first time of day and said second time of day being independent of the level of ambient light and being built into said adapter with no provision for altering them during the lifetime of said adapter, said electrical outlet adapter comprising:

an electrical plug compatible with a standard electrical outlet;

an electrical outlet;

a clock that is set and started during the manufacturing process, for generating the time of day, with no provision for altering the time of day generated by said clock during the lifetime of said adapter;

a source of energy connected to said clock to ensure that the time of day is maintained by said clock;

photodetector circuit means for sensing the level of ambient

light and for generating a light signal which has a first logic value when the level of ambient light is below a reference level and which has a second logic value when the level of ambient light is above the reference level;

storage means in which said first time of day and said second time of day are stored during the manufacturing process;

means for comparing the time of day generated by said clock with said first time of day and said second time of day, and for providing an output signal that is equal to said light signal when the time of day generated by said clock is between said first time of day and said second time of day and that is equal to a selected one of said first logic value and said second logic value when the time of day generated by said clock is outside the range extending from said first time of day to said second time of day;

switching means responsive to said output signal for connecting said electrical plug to said electrical outlet and disconnecting said electrical outlet from said electrical plug; and

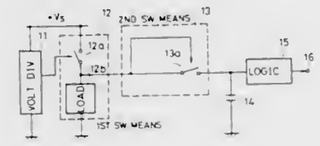
a compact integral housing, with no provision for programming said clock and no provision for displaying time.

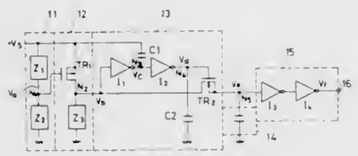
4,902,907

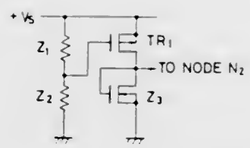
RESET SIGNAL GENERATING CIRCUIT

Akira Haga, Kawasaki, and Kazuhiro Kobayashi, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 16, 1988, Ser. No. 271,818
Claims priority, application Japan, Nov. 18, 1987, 62-291217
Int. Cl.[4] H03K *17/20, 17/22, 5/153, 17/687*
U.S. Cl. 307—272.3 **10 Claims**







1. A reset signal generating circuit comprising:

voltage dividing means for dividing a power source voltage into a divided voltage;

first switching means coupled to said voltage dividing means, said first switching means being turned ON when the power source voltage rises to a value in a vicinity of a predetermined value with an arbitrary rising speed;

second switching means coupled to an output of said first switching means, said second switching means having a transistor which has an input electrode for receiving an output signal of said first switching means, an output electrode and a control electrode, and control means coupled between said input electrode and said control electrode for turning said transistor ON in response to an output signal of said first switching means, said transistor being turned ON during a time in which said first switching means is ON; and

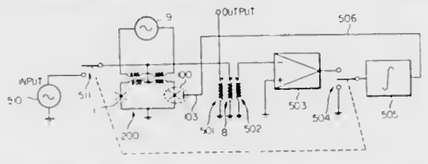
charging and discharging means coupled to said output electrode of said second switching means having a capacitor which is supplied with an output signal of said second switching means for starting a charging operation from a first time when said second switching means turns ON, said capacitor being charged by a current which flows through said transistor of said second switching means during a charging operation, said charging and discharging means for outputting a reset signal for a constant time from said first time to a second time and for stopping to output a reset signal after said second time.

4,902,908

SUPERCONDUCTING CIRCUIT

Yutaka Harada, Tokyo, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan, a part interest

Filed Jan. 20, 1988, Ser. No. 146,160
Claims priority, application Japan, Jan. 20, 1987, 62-11085; Feb. 4, 1987, 62-24356; Mar. 9, 1987, 62-53416
Int. Cl.[4] H03K *5/24, 17/92, 19/195*
U.S. Cl. 307—245 **7 Claims**



1. A superconducting circuit comprising a quantum flux parametron which comprises a superconducting loop and a load inductor connected thereto, said superconducting loop including two Josephson devices through which critical currents are respectively conducted and two exciting inductors, at least one of said Josephson devices being a voltage controlled superconducting device, the critical current of which is controllable by an applied voltage, and voltage supply means supplying the applied voltage to the voltage controlled super conducting device for equalizing the critical currents of the two Josephson devices wherein the voltage supply means comprises integrator means for integrating a signal from the load inductor to produce an output signal, and means for supplying said output signal from the integrator means to the voltage controlled superconducting device.

4,902,909

FLIP-FLOP ARRANGEMENT FOR A DIVIDE-BY-2 FREQUENCY DIVIDER COMPRISING MASTER-SLAVE TYPE MEMORY ELEMENTS

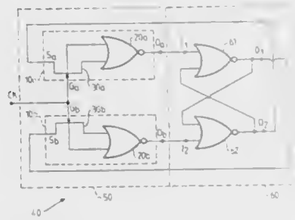
Bernard Chantepie, Chevry, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed Feb. 21, 1989, Ser. No. 313,670
Claims priority, application France, Feb. 26, 1988, 88 02374
Int. Cl.[4] H03K *3/037, 23/52, 3/284*
U.S. Cl. 307—247.1 **2 Claims**

1. Flip-flop arrangement for halving a frequency of a signal received on an input terminal, comprising:

a RS-flip-flop with a first and a second logic gate that have their first gate inputs mutually intercoupled to their gate outputs;

a third logic gate and a fourth logic gate having respective gate outputs coupled to a second gate input of the first and the second logic gate, respectively, and having first gate inputs coupled to a gate output of the second and first logic gate, respectively, via a conduction path of a first



and a second switch, respectively the second gate inputs of the third and fourth logic gates and control inputs of switches being coupled to said input terminal.

4,902,910

POWER SUPPLY VOLTAGE LEVEL SENSING CIRCUIT

Hung-Cheng Hsieh, Sunnyvale, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Nov. 17, 1987, Ser. No. 121,962
Int. Cl.[4] H03K *3/01, 5/153, 5/159*
U.S. Cl. 307—296.4 **49 Claims**



1. A semiconductor device having a power supply voltage level sensing circuit comprising:

first means having a power supply terminal and an output terminal, for providing a first output signal in response to the power supply voltage rising above a first selected value;

second means for receiving said first output signal and for providing a second output signal in response to the power supply voltage rising above a second selected value wherein;

said second output signal has a level greater than the level of said first output signal if said power supply voltage is greater than a third selected value and said second output signal has a level less than said level of said first output signal if said power supply voltage is less than said third selected value;

filter means, having an input terminal and an output terminal, for receiving said second output signal and generating a third output signal having a first value ifs aid second output signal has a first selected value and if said second output signal has a second selected value for less than a selected period of time, and having a second value if said second output signal has a second selected value for greater than said selected period of time.

4,902,911

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING A BUILT-IN POWER VOLTAGE GENERATOR

Katsuji Hoshi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 19, 1988, Ser. No. 245,859
Claims priority, application Japan, Sep. 18, 1987, 62-234194
Int. Cl.[4] H03K *5/01, 3/00*
U.S. Cl. 307—296.3 **10 Claims**



1. A semiconductor integrated circuit comprising:

a first means for receiving an externally supplied power voltage;

a voltage generator circuit coupled to said first means for generating an internal power voltage lower than said externally supplied power voltage;

a second means for receiving a control signal;

a first circuit coupled to said first means and said second means, said first circuit operating with said externally supplied power voltage to generate a first signal after a predetermined time from an activation of said control signal

a second circuit coupled to said voltage generator circuit and said first circuit, said second circuit operating with said internal power voltage to generate a second signal in response to said first signal, said second signal having an amplitude approximately of said internal power voltage; and

a functional circuit coupled to said voltage generator and said second circuit, said functional circuit operating with said internal power voltage and being controlled by said second signal thereby to perform a predetermined function.

4,902,912

APPARATUS INCLUDING RESONANT-TUNNELING DEVICE HAVING MULTIPLE-PEAK CURRENT-VOLTAGE CHARACTERISTICS

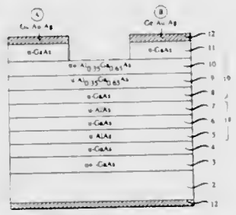
Federico Capasso, Westfield; Alfred Y. Cho, Summit; Susanta Sen, Scotch Plains; Masakazu Shoji, and Deborah Sivco, both of Warren, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 68,974, Jul. 1, 1987, abandoned. This application Jun. 13, 1989, Ser. No. 366,340
Int. Cl.[4] H01L *29/205, 29/88*
U.S. Cl. 307—322 **20 Claims**

1. Apparatus comprising a semiconductor device which comprises first (A), second (S), and third (B) terminals, said device being capable of operating such that the current-voltage characteristic between said first terminal and said second terminal comprises a plurality of voltage ranges in which differential resistance is negative,

characterized in that said device comprises a substratesup-

ported resonant-tunneling structure consisting of a quantum-well layer between first and second barrier layers, said first and third terminals being on the side of said first barrier layer, and said second terminal being on the side of



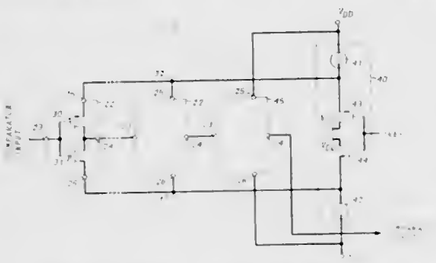
said second barrier layer, and said resonant-tunneling structure being the only resonant-tunneling structure between said first and third terminals on the one side and said second terminal on the other side.

4,902,913

ANALOG COMPARATOR

Jerrell P. Hein, Spring Township, Berks County, and Thayamkulangara R. Viswanathan, Wyomissing Hills, both of Pa., assignors to American Telephone and Telegraph Company, Murray Hill, N.J.

Filed Jul. 1, 1988, Ser. No. 214,086
Int. Cl.[4] H03K *5/24*
U.S. Cl. 307—362 **17 Claims**



1. An analog comparator formed on an integrated circuit for comparing first voltage input to a second voltage input characterized by:

at least one cascadable gain stage, the stage having an input, an output and first and second power terminals, the corresponding power terminals coupling to first and second buses, the input of the cascadable gain stage coupling to the first voltage input of the comparator;

a first transistor of a first polarity type having two output terminals and an input terminal, corresponding output terminals coupling to the first bus and directly to a first voltage source, and the input terminal coupling to the second voltage input;

a second transistor of a second polarity type having two output terminals and an input terminal, corresponding output terminals coupling to the second bus and directly to a second voltage source, the input terminal coupling to the second voltage input;

a first current source for supplying current to the first bus; and,

a second current source for supplying current to the second bus, the amount of current being substantially equal to the current supplied by the first current source;

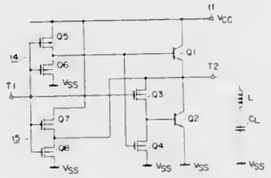
wherein the voltage of the first voltage source is different from the voltage of the second voltage source.

4,902,914

LOGIC CIRCUIT USED IN STANDARD IC OR CMOS LOGIC LEVEL

Hideaki Masuoka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 9, 1988, Ser. No. 154,066
Claims priority, application Japan, Feb. 17, 1987, 62-34133
Int. Cl.[4] H03K *19/02, 19/092, 19/096*
U.S. Cl. 307—446 **6 Claims**



1. A logic circuit used in a standard IC of CMOS logic level, comprising:

signal input means for receiving input data;

a signal output terminal;

a first potential supply source;

a second potential supply source;

first and second bipolar transistors each having a base, collector, and emitter, the collector-emitter paths being serially connected to each other at a connection node between said first and second potential supply sources, the connection node of said first and second bipolar transistors being connected to said signal output terminal for setting the signal output terminal to a first potential level;

first CMOS logic means having an input terminal connected to said signal input means and an output terminal connected to the base of said first bipolar transistor;

second CMOS logic means having an input terminal connected to said signal input means and an output terminal connected to said signal output terminal, said second CMOS logic means being operative to change said first potential level of the signal output terminal to the potential level of one of said first and second potential supply sources;

first switching means connected between said signal output terminal and the base of said second bipolar transistor, operative to be switched OFF at times when the input data is set at a potential level corresponding to the level for rendering said first bipolar transistor conductive, and operative to be switched ON at times when the input data is set at a potential level corresponding to the level for rendering said first bipolar transistor nonconductive; and

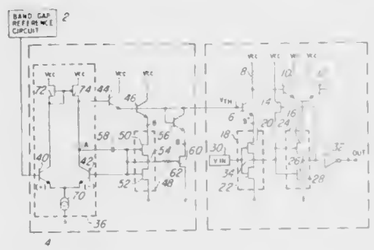
second switching means connected between said second potential supply source and the base of said second bipolar transistor, operative to be switched OFF at times when the input data is set at a potential level corresponding to the level for rendering said first bipolar transistor conductive, and operative to be switched ON at times when the input data is set at a potential level corresponding to the level for rendering said first bipolar transistor nonconductive, wherein said signal input means is a signal input terminal, each of said first and second CMOS logic means is a CMOS inverter and said first switching means comprises an N channel MOSFET whose drain-source path is connected between said signal output terminal and the base of said second bipolar transistor, and whose gate is connected to said signal input terminal.

4,902,915

BICMOS TTL INPUT BUFFER

Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 25, 1988, Ser. No. 198,276
Int. Cl.[4] H03K *17/16*
U.S. Cl. 307—446 **32 Claims**



1. An input buffer comprising:

a buffer input;

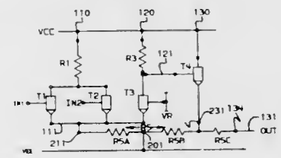
an operational amplifier including an inverting input and a non-inverting input;

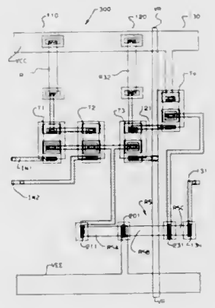
a threshold inverter including a threshold inverter input, a threshold inverter output, and a plurality of field effect transistors, said threshold inverter's input being connected to its output and to said inverting input;

a voltage source connected to said non-inverting input;

a first stage inverter connected to said buffer input and including substantially identically sized field effect transistors as those of the threshold inverter, said first stage inverter being connected to said threshold inverter so as to mirror selected voltages of said threshold inverter to said first stage inverter.

second connection means for coupling said second contact to one of said supply buses; and





third connection means for coupling said third contact to the emitter of said output transistor.

4,902,916

IDENTIFICATION OF DEFECTS IN EMITTER-COUPLED LOGIC CIRCUITS

Delbert R. Cecchi, and Nghia van Phan, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,880
Int. Cl.[4] H03K *19/086, 19/003, 17/62;* **G11C** *11/40*
U.S. Cl. 307—455 **6 Claims**

1. A structure for an emitter-coupled logic circuit having a plurality of input transistors, first and second supply buses, and an output transistor, each of said transistors having a collector, and emitter, and a base, said structure comprising:

a single unitary resistor having at least first, second and third contacts at different points along its length;

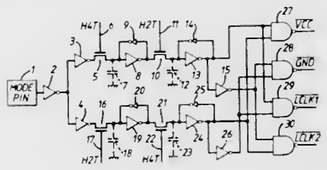
first connection means for coupling said first contact to the emitters of said input transistors;

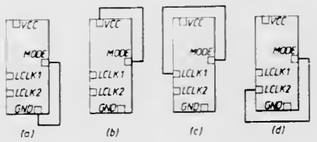
4,902,917

INTEGRATED CIRCUIT HAVING MODE SELECTION

Richard Simpson, Bedford, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 5, 1989, Ser. No. 294,039
Int. Cl.[4] H03K *19/173, 19/017;* **G11C** *7/02*
U.S. Cl. 307—465 **8 Claims**





1. An integrated circuit having at least two different modes of operation selected by a mode selection circuit in response to one or more inputs applied to one or more mode selection terminal pins, respectively, and one or more other terminal pins for one or more clock signals from a clock means, respec-

VOL 1111 ISS 3 FE 20 19 90 UMI
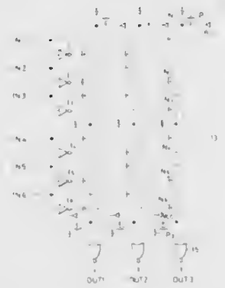
tively, wherein at least one mode selection terminal pin is connected to a synchronous decoding circuit responsive to a clock signal related to that applied to the other terminal pin or one of the other terminal pins by the clock means and capable of producing a particular output only when another signal related to the clock signal applied to the said other terminal pin by the clock means is applied to the mode selection terminal pins, the mode selection circuit being responsive to the particular output of the synchronous decoding circuit.

4,902,918

PROGRAMMABLE LOGIC ARRAYS WITH EACH ARRAY COLUMN DIVIDED INTO A PLURALITY OF SERIES CONNECTIONS OF FETS

Yukio Sugeno, Yokohama; Kimiyoshi Usami; Tohru Sasaki, both of Kawasaki, and Yasuyuki Nozuyama, Meguro, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 13, 1988, Ser. No. 205,940
Claims priority, application Japan, Sep. 25, 1987, 62-239154
Int. Cl.⁴ H03K *17/04*
U.S. Cl. 307—468 **3 Claims**



1. A programmable logic array comprising:
a set of input terminals;
a plurality of first FETs arranged in columns in matrix form, said first FETs in each column of said columns being programmably coupled with said input terminals at their gate terminals, each of said columns being divided into a plurality of series connections of said first FETs, each of said series connections being connected to a higher logic level through a second FET at one end and to a lower logic level at the other end; and
a plurality of OR gates having their input terminals connected, respectively, to said one end of each of said series connections in order to produce, as an output of said logic array, the logical sum of the logical levels at said one end of each of said series connections belonging to each of said columns.

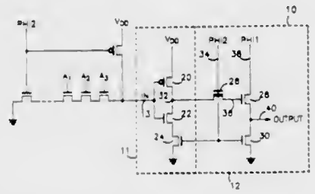
4,902,919

INVERTING LATCHING BOOTSTRAP DRIVER WITH V_{dd}*2 BOOTING

Thomas S. Spohrer, and Bernard C. Dewitt, both of Austin, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 26, 1988, Ser. No. 248,883
Int. Cl.⁴ H03K *17/10*
U.S. Cl. 307—482 **5 Claims**

1. In a bootstrap driver circuit with V_{DD}*2 booting for driving an output node in response to an input signal on an input node, comprising:
bootstrapped driver means, coupled between said input node and said output node and having a bootstrap node for receiving complementary clock signals having a precharge phase and a drive phase, for precharging said bootstrap node in response to said input signal during the precharge phase, and driving said output node in proportion to the charge on said bootstrap node during the drive phase;
the improvement comprising:



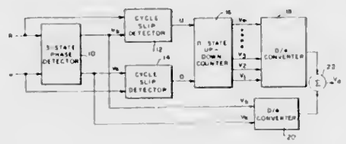
inverting latching buffer means, coupled between said driver means and said input node, for coupling said driver means to said input node only during said precharge phase.

4,902,920

EXTENDED RANGE PHASE DETECTOR

Dan H. Wolaver, Brookfield, Mass., assignor to General Signal Corporation, N.Y.

Filed Sep. 26, 1988, Ser. No. 249,283
Int. Cl.⁴ H03K *5/26, 5/00*
U.S. Cl. 307—514 **21 Claims**



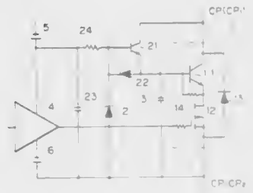
1. A phase detector of n+1 cycle linear range whose output has a fundamental frequency at least as high as a fundamental frequency of its input signals comprising:
first and second input means for receiving first and second input signals whose phase relationship is to be detected;
three-state phase detector means connected to said first and second input means for producing state output signals representing lead, lag and center states as a function of the phase relationship of said first to said second input signals linearly over two cycles;
cycle slip detector means connected to said first and second input means and said three-state phase detector means and responsive to said input signals and said state output signals for providing an up signal when said first input signal leads said second input signal by more than one cycle and a down signal when said first input signal lags said second input signal by more than one cycle;
n-state up-down counter means connected to said cycle slip detector means for providing a count output as a function of said up and down signals; and
output means connected to said up-down counter means and said three-state phase detector means for providing a phase output signal linear over n+1 cycles as a function of said count output and state output signals.

4,902,921

DRIVE CIRCUIT FOR DRIVING CASCODE BIPOLAR-MOS CIRCUIT

Takahiro Hiramoto, Itami, and Gourab Majumdar, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1988, Ser. No. 195,286
Int. Cl.⁴ H03K *17/04, 17/56*
U.S. Cl. 307—570 **4 Claims**



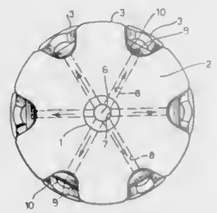
1. A drive circuit for driving a cascode bipolar-MOS circuit having a first bipolar transistor and a MOS transistor coupled to each other through a cascode connection or series, said bipolar-MOS circuit being inserted in a current path to open and close said current path in response to a control signal supplied from the exterior of said cascode bipolar-MOS circuit to a gate of said MOS transistor, said drive circuit comprising:
a second bipolar transistor coupled to said first bipolar transistor through a Darlington connection;
current supply circuit including a D.C. power source and a first capacitor connected in series through a connection node which is coupled to a base of said second bipolar transistor for supplying a base current to said base of said second bipolar transistor wherein said first capacitor supplies a discharge current as an over shoot current of said second bipolar transistor to turn on said second bipolar transistor;
a diode inserted between said base of said second bipolar transistor and a base of said first bipolar transistor for allowing a current to pass through said diode only in a direction from said base of said first bipolar transistor to said base of said second bipolar transistor; and
a Zener diode having a cathode coupled to said base of said second bipolar transistor and an anode coupled to a source electrode of said MOS transistor.

4,902,922

ALTERNATOR ROTOR, PARTICULARLY FOR MOTOR VEHICLES

Lorella Annorazzi, Segrate, Italy, assignor to Industrie Magneti Marelli S.r.l., Milan, Italy

Filed Sep. 9, 1988, Ser. No. 242,407
Claims priority, application Italy, Sep. 9, 1987, 53637/87[U]
Int. Cl.⁴ H02K *1/32*
U.S. Cl. 310—61 **2 Claims**



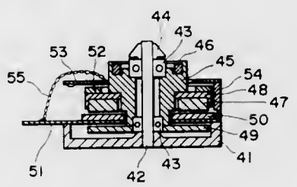
1. An alternator rotor, particularly for motor vehicles, comprising a shaft from which two facing pole plates extend radially, each having a plurality of radial pole fingers whose ends are bent towards the facing pole plate and each of which extends between two adjacent fingers of the facing pole plate; at least one excitation winding being situation between the plates coaxial with the shaft; at least one axial ventilation duct being forming in the shaft from which branch radial ducts in alignment with the pole plates, a plurality of radial ventilation passages provided in each pole plate which are in communication with said radial ducts and which open into recesses defined between pairs of adjacent pole fingers.

4,902,923

MOTOR HAVING FREQUENCY GENERATOR

Shigeki Okauchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 924,434, Oct. 29, 1986, abandoned.
This application Jun. 24, 1988, Ser. No. 211,177
Claims priority, application Japan, Oct. 31, 1985, 60-242934
Int. Cl.⁴ H02K *11/00*
U.S. Cl. 310—268 **2 Claims**



1. A motor comprising:
a stator unit including an exciting coil and a base plate to support said exciting coil, and a shaft fixed to said base plate;
a rotor unit including a magnet; and
frequency generating means having
a frequency generating magnet fixed to said rotor unit at the outer periphery thereof,
a frequency generating coil, disposed at a position which faces said frequency generating magnet, for outputting a wave form each time said frequency generating coil passes over the frequency generating magnet,
a frequency generating base plate to support the frequency generating coil, and
lead wires connected to output ends of the frequency generating coil at said frequency generating base plate,
said output ends of the frequency generating coil being disposed near an axial center of said rotor unit inside said frequency generating coil,
said lead wires being disposed within leakage magnetic flux regions of a magnet of at least one of said rotor unit and said frequency generating magnet, and
said lead wires being twisted into a single unit such that the direction of each lead wire does not cross the magnetic fluxes of the magnets whereby increase and decrease in signal to the lead wires is prevented, said lead wires being arranged to establish a connection between said output ends and said frequency generating base plate.

4,902,924

BRUSHLESS MOTOR

Tatsuzo Ushiro, Kawaguchi, and Yukuo Karube, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 16, 1987, Ser. No. 133,782
Claims priority, application Japan, Dec. 19, 1986, 61-301512; Dec. 19, 1986, 61-301513; Jan. 13, 1987, 62-5811
Int. Cl.[4] H02K 1/22
U.S. Cl. 310—268 1 Claim



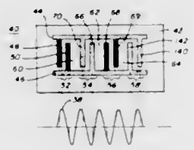
1. A brushless motor comprising:
a motor shaft;
a rotor including a plate-like stator yoke member and a permanent magnet mounted thereon, the permanent magnet having plural north poles and plural south poles magnetized in an axial direction of said rotor and arranged along a circle around the axis of the rotor;
a stator including a plate-like yoke member and plural coils fixed on the stator yoke member and arranged along a circle around said axis and forming a small gap with the permanent magnet;
the stator yoke member being provided with three holes so that flux from the permanent magnet changes as the permanent magnet rotates from a position where a permanent magnet pole thereof passes over each of said holes to a position where the permanent magnet pole passes over a ridge portion of the stator yoke member located adjacent to such holes.

4,902,925

REFLECTIONLESS TRANSDUCER

Peter V. Wright, Dallas, Tex., assignor to R.F. Monolithics, Inc., Dallas, Tex.

Continuation of Ser. No. 891,237, Jul. 29, 1982, abandoned. This application Mar. 15, 1988, Ser. No. 178,271
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—313 B 22 Claims



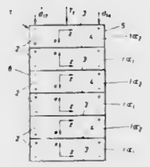
1. A reflectionless surface acoustic wave transducer comprising:
a. a substrate means having at least a surface layer of piezoelectric material on which surface acoustic waves may be propagated,
b. first and second opposed conductive transducer pads defined on said substrate,
c. a plurality of groups of n interdigitated λ/4 electrodes extending from opposed conductive pads to form an elongated transducer, and
d. each group of said interdigitated electrodes having a spacing from each electrode to adjacent electrodes within the group of substantially λ/4 and the spaces between adjacent groups of said interdigitated electrodes being substantially λ/2, such that adjacent groups cancel reflections from each other.

4,902,926

PIEZOELECTRIC MEASURING ELEMENT

Günter Engel, Leitring; Peter W. Krempl, Graz/Ragnitz, and Helmut List, Graz, all of Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr. Dr. h.c. Hans List, Graz, Austria

Filed Nov. 10, 1988, Ser. No. 269,594
Claims priority, application Austria, Nov. 19, 1987, 3057/87
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—361 10 Claims



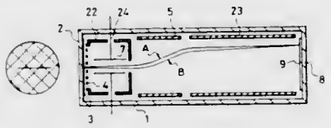
1. A piezoelectric measuring element for use in transducers, comprising two or more crystal elements from crystals of point group 32, said crystal elements existing in opposite enantiomorphic types l and r, and being jointly subject to a mechanical variable to be measured, belonging to the group of force, pressure and acceleration, said crystal elements carrying electrically conductive electrodes on surfaces that are located opposite of each other and are essentially normal to electric (x) axes of said crystal elements, wherein said measuring element consists of a first and a second group of crystal elements, each of said first and second group comprises at least one crystal element, and wherein said crystal elements of said first and second group belong to opposite enantiomorphic types l and r and have opposite absolute orientalions α_1 and α_2 of said x-axis.

4,902,927

STREAK TUBE

Katsuyuki Kinoshita, Shizuoka, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed May 2, 1988, Ser. No. 189,256
Claims priority, application Japan, May 1, 1987, 62-108575
Int. Cl.[4] H01J 31/50, 40/08
U.S. Cl. 313—376 10 Claims



1. A streak tube comprising:
an air-tight container having an incident window at one end for receiving an optical image and an exit window at the other end for observing a processed optical image;
a photocathode provided at the inner surface of said incident window for converting said optical image into a photoelectron beam;
accelerating means for accelerating said photoelectron beam;
deflecting means for generating a deflection field short in

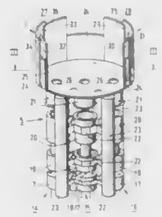
length and for deflecting said accelerated photoelectron beam, said deflecting means being disposed immediately behind said accelerating means;
focusing means for focusing said deflected photoelectron beam; and
a phosphor screen provided at the inner surface of said exit window for receiving said focused photoelectron beam and forming a streak image corresponding to said optical image, said photoelectron beam emitted from said photocathode being deflected immediately after being accelerated by said accelerating means, and subsequently being focused on said phosphor screen with substantially no spread.

4,902,928

COLOR DISPLAY TUBE

Jan Gerritsen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 607,544, May 7, 1984, abandoned. This application Aug. 27, 1986, Ser. No. 902,095
Claims priority, application Netherlands, May 13, 1983, 8301712
Int. Cl.[4] H01J 29/54, 29/70
U.S. Cl. 313—412 6 Claims



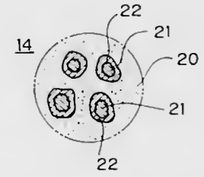
1. A color display tube comprising:
(a) an evacuated envelope having a display window with an inner surface supporting a luminescent display screen;
(b) an electron gun system for producing central and first and second outer electron beams having their axes lying in a longitudinal plane intersecting the display screen, and for converging the electron beams toward a point of coincidence on said display screen;
(c) first and second deflection means disposed around the electron beam axes for producing first and second deflection fields for deflecting the electron beams in a first direction perpendicular to the longitudinal plane and in a second direction parallel to said plane, respectively; and
(d) field shaping means, arranged at an end of the electron gun system from which the electron beams exit, for locally distorting at least one of the deflection fields to augment dynamic convergence of the electron beams such that there is coincidence on the display screen of respective rasters produced by said electron beams;
characterized in that the field shaping means comprises first and second ferromagnetic plate means arranged symmetrically with respect to both the longitudinal plane and the central beam axis, said plate means being arranged transversely to said longitudinal plane and shaped such that they partially surround the beam axes and distort the first deflection field, where the electron beams enter said field, such that said field is pin-cushioned-shaped, each of said plate means comprising at least first and second circumferentially-spaced plates defining a slot therebetween, and a third slot-covering plate radially spaced from said first and second plates and partially overlapping said plates, said slot-covering plates forming magnetic shunts across the slots covered thereby for shunting the second deflection field and minimizing distortion by said slots of said second deflection field.

4,902,929

ELECTROLUMINESCENT DEVICE CONTAINING ELECTROLUMINESCENT PARTICLES EACH COVERED WITH MOISTURE PROOF FILM

Masahiro Toyoda, and Katsuhiko Tanaka, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 6, 1988, Ser. No. 190,716
Claims priority, application Japan, May 6, 1987, 62-110272; May 6, 1987, 62-110273; Jul. 13, 1987, 62-174354; Jul. 13, 1987, 62-174355
Int. Cl.[4] H01J 1/70
U.S. Cl. 313—503 5 Claims



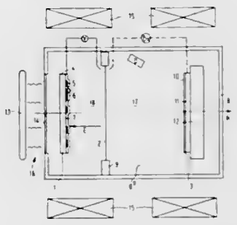
1. An electroluminescent device comprising:
emitter means containing electroluminescent particles; and
means for applying an electric field to said emitter means,
each of said electroluminescent particles being covered with a moisture-proof film of an inorganic polymer containing silica having network structure obtained y hydrolyzing metal alkoxide and causing polycondensation reaction polymer.

4,902,930

ELECTRON IMAGE PROJECTOR

Karel D. Van Der Mast, Pijnacker, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 21, 1988, Ser. No. 261,207
Claims priority, application European Pat. Off., Oct. 22, 1987, 87202030
Int. Cl.[4] H01J 29/41, 31/50
U.S. Cl. 315—12.1 7 Claims



1. An electron image projector comprising a vacuum tight housing containing a target and a cathode for emitting electrons in a predetermined spatial pattern, said projector further comprising electric field producing means for accelerating the emitted electrons toward the target and magnetic field producing means for focusing the electrons such that they impinge on the target in a manner reproducing said spatial pattern, characterized in that said electric field producing means includes an intermediate electrode disposed in a region between the cathode and the target for, in operation, effecting the production of a substantially homogeneous electric field in said region, said

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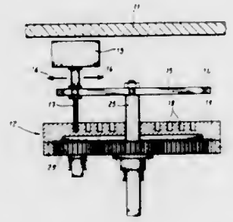
intermediate electrode comprising a foil providing a vacuum tight seal between portions of the housing containing the cathode and the target, said foil being permeable to the emitted electrons but impermeable to gaseous molecules from the target, thereby preventing poisoning of the cathode by said molecules.

4,902,931

METHOD AND ARRANGEMENT FOR MECHANICALLY MOVING OF A MAGNETIC FIELD GENERATING DEVICE IN A CATHODE ARC DISCHARGE EVAPORATING DEVICE

Hans Veltrop, Grubbenvorst; Harald Wesemeyer, Wiehl; Boudewijn J. A. M. Bull, Belfeld, and Simon Boelens, Venlo, all of Netherlands, assignors to Hauzer Holding B.V., Pa Venlo, Netherlands

Filed Mar. 15, 1988, Ser. No. 168,439
Claims priority, application Netherlands, Mar. 16, 1987, 8700619; Mar. 16, 1987, 8700621
Int. Cl.[4] H01J *1/50*
U.S. Cl. 315—326 **18 Claims**



1. Method for mechanically moving a magnetic field generating device along a path near a cathode plate comprising:
rotating said magnetic field generating device relative to said cathode plate according to a first rotational movement;
simultaneously moving said magnetic field generating device according to a second movement; and
wherein said path created by said first and second movements creates an erosion pattern over a substantial portion of said cathode plate.

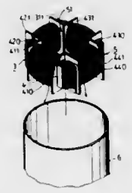
4,902,932

SOCKET-ADAPTER STABILIZING DEVICE FOR MINIATURE FLUORESCENT LAMPS

Jiun-Fu Yang, 2nd Fl., No. 149, Ching Hsing Rd., Taipei, Taiwan

Continuation of Ser. No. 922,453, Oct. 23, 1986, abandoned.
This application Feb. 27, 1989, Ser. No. 317,087
Int. Cl.[4] H01J *17/34*
U.S. Cl. 315—71 **1 Claim**

1. A stablizing device, for being incorporated into a socket-adapter for miniature fluorescent lamps comprising:
core means formed with plurality of L-shaped laminated cores for being assembled in a square configuration: and coil means formed with a plurality of core frames respectively wound with coils and sleevingly disposed around said L-shaped laminated cores so as to form a square-shaped structure with an open section defined in a middle portion thereof for accommodating a socket seat of the socket adapter in the open section:
wherein each of said L-shaped laminated cores includes a straight end and an inclined end so that when said laminated cores are combined together, a stabilizing device is formed having a square open section in a middle portion and an annular circumference on an outer periphery thereof:
wherein each of said coil frames is formed in a l-shape with a through opening provided in a central portion thereof to receive said straight end and said and inclined end of said L-shaped laminated cores so as to effect said core means;



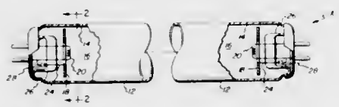
wherein at least one of said coil means is mounted on each side of said square configuration of said core means.

4,902,933

HIGH EFFICACY DISCHARGE LAMP HAVING LARGE ANODES

Victor D. Roberts, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 20, 1988, Ser. No. 246,605
Int. Cl.[4] H01J *17/34;* **H05B** *41/14*
U.S. Cl. 315—94 **14 Claims**



1. An electric discharge lamp, comprising:
a light-transmissive envelope containing a gaseous discharge medium;
two spaced pairs of electrodes sealed within said envelope, each electrode pair comprising an enlarged anode in proximity with a cathode, the surface area of each said enlarged anode being sufficiently large to avoid any voltage drop between the positive discharge column and each said enlarged anode during lamp operation; and
electronic means to prevent electron emission from the surface of each said enlarged anode.

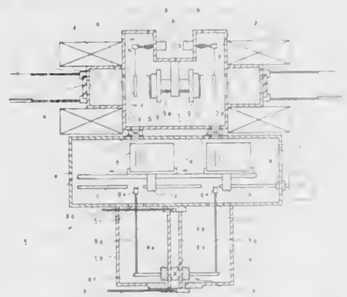
4,902,934

PLASMA APPARATUS

Tadashi Miyamura, and Shigeo Sugawara, both of Osaka, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed May 10, 1988, Ser. No. 192,130
Int. Cl.[4] H01J *7/24;* **H05B** *31/26;* **C23C** *16/00*
U.S. Cl. 315—111.21 **5 Claims**

1. A plasma apparatus comprising;
a pair of plasma generation chambers for generating plasma by electron cyclotron resonance excitation utilizing microwaves;
a specimen chamber being provided at both sides thereof with said plasma generation chambers opposite to each other and at the facing positions at both side walls thereof with plasma extraction windows facing said plasma generation chambers; and



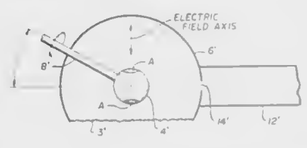
a pair of specimen mounts disposed in said specimen chamber, oriented reversely to each other, and opposite to said plasma extraction windows respectively.

4,902,935

METHOD AND APPARATUS FOR EVENING OUT THE TEMPERATURE DISTRIBUTION OF ELECTRODELESS LAMP BULBS

Charles H. Wood, Rockville, Md., assignor to Fusion Systems Corporation, Rockville, Md.

Filed Jun. 29, 1988, Ser. No. 213,041
Int. Cl.[4] H01J *17/28*
U.S. Cl. 315--112 **19 Claims**



1. In an electrodeless lamp, a method of evening out the temperature distribution of the bulb wall, comprising the steps of,
providing an electrodeless lamp including a bulb containing a gaseous fill which is disposed in only one electromagnetic field, which field has an electric field component which is predominantly in a first direction, and
rotating the bulb about an axis which is at an angle of between about 30° and about 70° or between about 110° and about 150°, with said first direction.

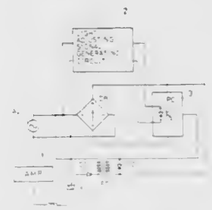
4,902,936

LIGHT ADJUSTING APPARATUS

Yoshikado Yamada, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 123,288, Nov. 20, 1987, abandoned.
This application May 30, 1989, Ser. No. 358,532
Claims priority, application Japan, Nov. 20, 1986, 61-278972
Int. Cl.[4] H05B *41/36*
U.S. Cl. 315—158 **5 Claims**

1. A light adjusting apparatus comprising:
a lamp connected to the output voltage of a commercial a.c. power supply through a switching element,
a rectifier for directly rectifying the current of the a.c. power supply to generate a d.c. output,
a switching control circuit operable by the d.c. output of the rectifier for controlling the conduction time of the switching element based on the time of the zero-crossing of the a.c. power supply output voltage, and
a light adjusting signal generating circuit for producing a pulsewidth modulated light adjusting signal by a light-emitting element,
the switching control circuit comprising,
a photodetector for receiving the light adjusting signal from the light-emitting element,
a demodulation circuit for subjecting the output signal from the photodetector to pulsewidth demodulation, and
a conduction timing control circuit for controlling the conduction time of the switching element by the output signal of the demodulation circuit,
the conduction timing control circuit further comprising,
a voltage adjusting circuit for adjusting the voltage of an output signal from the demodulation circuit in response to



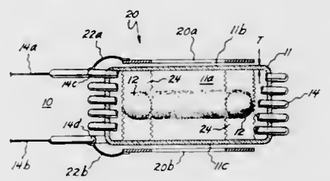
the amplitude of the output voltage of the a.c. power supply,
a zero-cross timing detecting circuit for detecting the time of the zero-crossing of the output voltage of the a.c. power supply,
a sawtooth wave generating circuit for generating a sawtooth wave having a ramp corresponding to a voltage adjusted by the voltage adjusting circuit in response to the zero crossing detected by the zero-cross timing detecting circuit, and
a switching timing control circuit for controlling the conduction time of said switching element in response to the ramp of the sawtooth wave generated by the sawtooth wave generating circuit.

4,902,937

CAPACITIVE STARTING ELECTRODES FOR HID LAMPS

Harald L. Witting, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,315
Int. Cl.[4] H05B *41/16*
U.S. Cl. 315—248 **13 Claims**



1. Starting electrodes for an electrodeless high-intensity-discharge (HID) lamp of the type having an arc tube situated within the bore of an RF excitation coil and within which arc tube a plasma arc discharge is to be formed and driven by the excitation coil, comprising:
a pair of starting electrodes, each positioned, at least during commencement of the plasma arc discharge, adjacent to the exterior surface of an associated one of a pair of op-

posed surfaces of the arc tube, said starting electrodes not substantially driving said plasma arc discharge, and at least one of the starting electrodes having a cross-sectional shape selected to be a conical section substantially similar to the shape of the exterior arc tube surface adjacent to which that electrode will be located at least during plasma arc discharge commencement; and

means for coupling a high-voltage starting signal between the pair of starting electrodes to cause creation, at least at said plasma arc discharge commencement, of a glow discharge within the arc tube due to capacitive current flow therethrough from said starting electrodes.

4,902,938

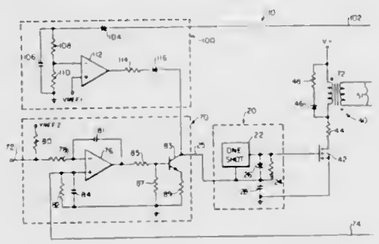
ELECTRONIC BALLAST WITH HIGH VOLTAGE PROTECTION

John Lindquist, Larkspur, Calif., assignor to MagneTek Inc., Del.

Continuation-in-part of Ser. No. 798,285, Nov. 15, 1986, Pat. No. 4,700,113. This application Sep. 18, 1987, Ser. No. 98,580

Int. Cl.⁴ H05B *41/36*

U.S. Cl. 315—307 **21 Claims**



1. In a solid-state ballast for discharge lamps, the ballast being of the type including an oscillator providing an operating signal to the discharge lamp load through a driver, the improvement comprising:

said oscillator being a signal controlled oscillator having a frequency control input and providing an output signal with a frequency determined by the value of a signal applied at said frequency control input;

control means sensing the instantaneous current flowing within the load for producing a first control signal representing this load current;

comparator means differentially responsive to the voltage across the load and a predetermined reference voltage for producing a second control signal representing the polarity of the difference between said voltages, said reference voltage corresponding to a load voltage substantially in excess of the voltage across a normally discharging lamp;

coupling means jointly responsive to said first and second control signals for producing a composite control signal to said frequency control input, said composite control signal being substantially identical to said first control signal when said second control signal has a polarity indicating that the load voltage is not excessive, said composite control signal being equal to a predefined signal when said second control signal has polarity indicating that the load voltage is excessive, said predefined signal being effective to operate said oscillator so as to reduce the voltage across said load to a predetermined minimum value.

4,902,939

DISPLAY CIRCUIT

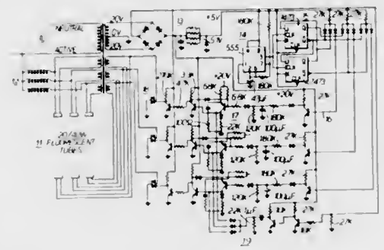
Leslie C. Harvey, Shailer Park, Australia, assignor to Mosaic Rentals Pty., Ltd., Enoggera, Queensland, Australia

Continuation of Ser. No. 816,247, Jan. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 696,032, Jan. 29, 1985, abandoned. This application Mar. 25, 1988, Ser. No. 177,855

Claims priority, application Australia, Feb. 21, 1985, 39.052/85

Int. Cl.⁴ H05B *41/00*

U.S. Cl. 315--316 **14 Claims**



1. A discharge tube control circuit for progressive and either continuous or intermittent variation of the luminance of one or more discharge tubes in accordance with a programmed sequence whereby the luminance of the tubes is progressively changed between high and low luminance output levels so as to progressively and automatically change the illumination of a visible object illuminated by the tubes, said control circuit comprising:

(a) control signal generating means having

(i) an input for a switching signal,

(ii) switching means actuated by the switching signal to control an RC network having a predetermined charge/discharge rate proportional to the pattern of switching signals,

(iii) circuit means generating a control signal, and

(iv) modulating means driven by the RC network and modulating the control signal in response to the pattern of switching signals and the RC network whereby the control signal is progressively varied;

(b) programming means for the switching signal, said programming means including timer means generating timing pulses of a predetermined frequency giving rise to a predetermined pattern of switching signals; and

(c) a power supply circuit for the discharge tubes and including supply means to fire the tubes and to maintain the tubes in a fired state, power supply varying means responsive to the control signal to vary the power supplied to the tubes in accordance with the changes in the control signal as determined by the programming means.

4,902,940

CURRENT CONTROL CIRCUIT

Brian K. Herbert, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1988, Ser. No. 279,387

Claims priority, application United Kingdom, Dec. 4, 1987, 8728441

Int. Cl.⁴ H01J *29/58, 29/70*

U.S. Cl. 315—382 **5 Claims**

1. A current control circuit for a magnetic quadrupole lens comprising two pairs of coils, characterised in that each coil is connected in series with a respective current monitoring resistor, in that the current monitoring resistors of the first pair of coils are connected together and to one end of a total current monitoring resistor and the current monitoring resistors of the

second pair of coils are connected together and to the other end of the total current monitoring resistor to form a current distribution network, in that a first d.c. generator is connected to drive current through one coil and current monitoring resistor of the first pair of coils and thence into the current distribution network, one coil and current monitoring resistor of the second pair of coils forming a current return path, in that first means are provided for controlling the first d.c. generator so that the voltage across the total current monitoring resistor is equal to a predetermined proportion of an adjustable input astigmatism control voltage, in that a second d.c. generator is connected to drive current through the other coil and current



monitoring resistor of the first pair of coils and thence into the current distribution network, in that second means are provided for controlling the second d.c. generator so that the difference in voltage across the current monitoring resistors of the first pair of coils is equal to a first adjustable proportion of the adjustable input astigmatism control voltage, in that a third d.c. generator is connected to drive current through the other coil and current monitoring resistor of the second pair of coils and thence into the current distribution network, and in that third means are provided for controlling the third d.c. generator so that the difference in voltage across the current monitoring resistors of the second pair of coils is a second adjustable proportion of the adjustable input control voltage.

4,902,941

DRIVE MOTOR FOR INFORMATION-STORAGE-DISK DEVICES

Alfred Merkle, St. Georgen; Georg Moosmann, Pennenbronn, and Rolf Müller, St. Georgen, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 812,273, Dec. 2, 1985, Pat. No. 4,701,653, which is a continuation of Ser. No. 517,793, Jul. 27, 1983, abandoned. This application Oct. 20, 1987, Ser. No. 111,366

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1982, 3227946; Jul. 27, 1982, 3227947; Jul. 27, 1982, 3227948

Int. Cl.⁴ H02K *1/24;* G11B *19/22*

U.S. Cl. 310—216 **37 Claims**



1. A drive arrangement for signal processing devices, especially storage-disk devices, of the type including a motor whose rotor is used for direct-drive,

the arrangement comprising:

a brushless dc motor comprising an internal stator and an external permanent-magnet rotor,

the stator comprising a carrier structure accommodating at least one roller bearing unit, the carrier structure being provided with a mounting portion for mounting the motor as a whole,

the rotor including a rotor shaft journalled within the roller bearing unit accommodated in the carrier structure, the rotor comprising a rotor magnet arrangement which is of predetermined axial length and has a general inner periphery,

the stator furthermore comprising a packet of stator plates radially outward of the carrier structure, the stator plate packet having two opposite axial end faces,

the stator plate packet having cut-outs forming salient poles and being provided with a stator winding to produce a periodic stator field,

the axial length of the stator plate packet being substantially smaller than the axial length of the rotor magnet arrangement,

the stator plate packet being provided at at least one of its axial end faces with at least one flux-conducting element having an overall peripheral outline which as viewed axially of the rotor is substantially the same as the peripheral outline of the stator plate packet,

the flux-conducting element having a peripheral skirt portion which extends generally parallel to the general inner periphery of the rotor magnet arrangement and is of substantially constant axial length along at least a substantial part of its circumferential extent,

the skirt portion forming with the rotor magnet arrangement a useful air gap which is a continuation of the air gap formed between the outer periphery of the stator plate packet and the inner periphery of the rotor magnet arrangement,

the skirted-rim flux-conducting element being provided with cut-outs in the skirt portion thereof, these cut-outs being located at least partly outside the angular intervals occupied, at the air gap, by the salient-pole-forming cut-outs of the stator plate packet, to thereby produce a reluctance torque component which during rotor rotation is shifted in time relative to the electromagnetic torque component resulting from said periodic stator field.

4,902,942

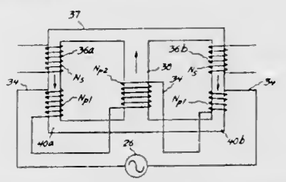
CONTROLLED LEAKAGE TRANSFORMER FOR FLUORESCENT LAMP BALLAST INCLUDING INTEGRAL BALLASTING INDUCTOR

Saved-Amr El-Hamamsy, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 2, 1988, Ser. No. 200,881

Int. Cl.⁴ H05B *41/16;* H01F *27/28*

U.S. Cl. 315—276 **8 Claims**



1. An isolation transformer for use in a multi-lamp ballast comprising:

a multi-legged transformer core having at least three legs, an electrical primary winding and multiple electrical secondary windings;

at least one of said legs constituting a leakage leg of said transformer and the remaining ones of said legs, being N_c in number, constituting secondary legs;

said electrical primary winding distributed on each leg of said core in a continuous manner and containing a number of turns N_p necessary to avoid saturation of the transformer for any specific input voltage and core material, the number of primary turns N_{p1} disposed on each of said secondary legs and the number of primary turns N_{p2}

disposed on said leakage leg being determined according to the equation $N_c N_{p1} = N_p - N_{p2}$; and

said electrical secondary windings disposed on said secondary legs.

4,902,943

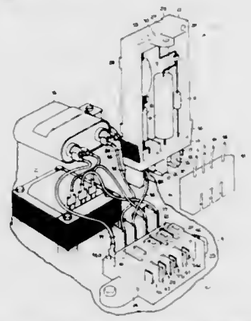
PLUG-IN STARTING AID

Judith A. Nicholson; Omer E. Murray, Jr., and Carl D. Taylor, all of Hendersonville, N.C., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 117,427, Nov. 2, 1987, abandoned, which is a continuation of Ser. No. 446,804, Dec. 3, 1982, abandoned. This application May 23, 1989, Ser. No. 357,620

Int. Cl.[4] H05B *39/00;* **H05K** *7/20*

U.S. Cl. 315—289 **14 Claims**



1. A plug-in starting aid capable of generating high voltage pulses when interconnected to a ballast of an operating circuit for a high intensity discharge lamp, said starting aid comprising;

(a) interconnected electrical components requiring at least three connections into said operating circuit, said electrical components include at least a charging capacitor, a resistor and a voltage-sensitive switch, said charging capacitor being connected in series with said voltage-sensitive switch for forming a series discharge loop when said plug-in starting aid is interconnected to said ballast, operating circuit with turns at the output end of the ballast said capacitor also being connected in series with at least said resistor across said lamp to form a charging loop when said plug-in starting aid is interconnected with said ballast;

(b) a frame of insulating material in which said components are mounted, said frame having a rigidity sufficient to withstand gripping and tugging without deforming so as to serve as said plug-in starting aid;

(c) at least three terminals projecting out of one side of said frame for said interconnection with said ballast and wherein a first of said terminals is connected to said voltage-sensitive switch, a second of said terminals is connected to said capacitor and a third of said terminals is connected to the end of said charging loop which is opposite from said connection of capacitor to said resistor, said terminals being adapted to be engageable by and mated with cooperating terminals.

4,902,944

DIGITAL ROBOT CONTROL HAVING AN IMPROVED CURRENT SENSING SYSTEM FOR POWER AMPLIFIERS IN A DIGITAL ROBOT CONTROL

Kenneth E. Daggett, Murrysville, Pa.; Elmer M. Onaga, Brookfield Center; Richard J. Casler, Jr., Newtown, both of Conn.; Richard A. Johnson, Murrysville, and Leonard C. Vercellotti, Oakmont, both of Pa., assignors to Staubli International AG., Switzerland

Continuation of Ser. No. 932,975, Nov. 20, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 180,719

Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568.11 **13 Claims**

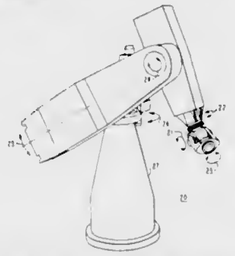
1. A system for energizing a robot arm joint motor and for sensing motor current for feedback control, said system comprising:

a power amplifier including a bridge circuit with a plurality of legs each having one end thereof connected to supply drive current to the motor from a power supply connected across said bridge circuit to the other ends of said legs;

a semiconductor switch having a control terminal, one said switch connected in each bridge leg with a control signal being applied to the control terminal to make that bridge leg switchably conductive;

digital control means for cyclically generating switch control signals that are pulse width modulated to operate said power switches and produce motor drive current having direction and magnitude required by cyclically generated robot drive control commands;

said digital control means generating said switch control signals to make each motor supply current path through said bridge circuit conductive over at least a short portion of each control cycle, according to forced switching patterns, the direction and amplitude of the current through the motor being adapted to be sampled with a single sense resistor, independent of the number of legs in the power bridge;



means for cyclically sampling the current from the power supply to said bridge circuit via the single sense resistor, at a predetermined time interval during the forced patterns of semiconductor switch conduction in each controlled cycle of the motor supply path and in synchronism with the digital control means cycle and within said short cycle portion, so that the sampled current is forced to flow through the single sense resistor at a time when it accurately indicates the magnitude and polarity of average current flowing in the motor; and

said sampling means further coupling signals representing the current samples to said digital control means to provide feedback control over the generation of said robot drive control commands.

4,902,945

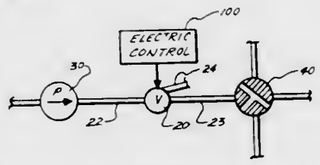
ELECTRICAL CONTROL FOR HYDRAULIC VALVES

Flavious J. Meades, Jr., 309 Fairview Dr., and Flavious J. Meades, III, 2112 Cartier Dr., both of LaPlace, La. 70068

Filed Feb. 16, 1988, Ser. No. 156,472

Int. Cl.[4] F16K *31/04*

U.S. Cl. 318—467 **11 Claims**



1. An electrical control apparatus for hydraulic speed control valves, the apparatus comprising:

(a) electrical motor means;

(b) coupling means for coupling the motor means to a hydraulic speed control valve which is openable in varying degrees;

(c) detecting means, for detecting the degree to which the hydraulic speed control valve is opened, comprising a plurality of electrical switches;

(d) visual indicating means comprising electrically activated indicators for indicating, at a position remote from the valve, the degree to which the hydraulic speed control valve is opened; and

(e) actuating means for actuating, from a position remote from the valve, the motor means, wherein the visual indicating means is located adjacent the actuating means.

4,902,946

SOFTWARE SERVO FOR A ROTARY HEAD DRUM OF VTR

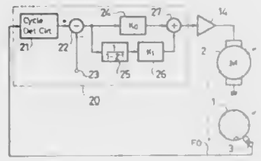
Tadafusa Tomitaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 281,647

Claims priority, application Japan, Jan. 26, 1988, 63-15559

Int. Cl.[4] G05B *13/00*

U.S. Cl. 318—560 **8 Claims**



1. Apparatus for controlling a rotation of a drum motor to rotate a rotary head drum, said apparatus comprising:

a driver circuit and

a servo circuit; said servo circuit comprising:

means for generating a frequency signal corresponding to a revolution speed of said drum motor;

means responsive to said frequency signal generating means for detecting a cycle of said frequency signal from said frequency signal generating means to produce a detected signal;

means for generating a reference speed signal;

means responsive to said detecting means and said reference speed signal generating means for detecting a speed deviation between said detected signal from said detecting means and said reference speed signal to produce a speed deviation signal;

means responsive to said speed deviation signal means for generating a speed control signal based on said speed deviation signal;

means responsive to said speed deviation signal means for effecting an integration of said speed deviation signal;

means responsive to said integration means for producing a phase control signal based on said integration of said speed deviation signal; and

means responsive to said speed control signal means and said phase control signal means for adding said speed control signal and said phase control signal to produce a rotation control signal;

said rotation control signal being supplied to said driver circuit and said driver circuit driving said drum motor in response to said rotation control signal.

4,902,947

SERVO CIRCUIT WITH FAILURE DETECTION MECHANISM

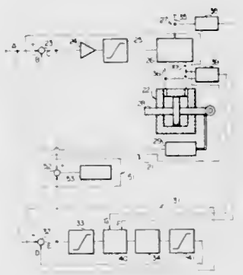
Hidenobu Ako, Ogaki, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Jan. 12, 1989, Ser. No. 296,142

Claims priority, application Japan, Jan. 20, 1988, 63-10512

Int. Cl.[4] G05B *9/02*

U.S. Cl. 318—563 **4 Claims**



1. A servo circuit with a failure detection mechanism comprising:

a servo circuit for servo controlling, on the basis of a control signal, an actuator which is connected through a hydraulic circuit to a source of oil pressure, and is operated by said hydraulic circuit which is changed over by a servo valve;

a monitor circuit arranged in parallel relationship with said servo circuit and generating a monitor control signal; and

a failure detection circuit in which said control signal of said servo circuit and said monitor control signal of said monitor circuit are inputted and which detects a failure of said servo circuit on the basis of said control signal and said monitor control signal; wherein

said hydraulic circuit is provided with pressure detecting means for detecting a pressure thereof; and

said monitor circuit includes a correction circuit in which a pressure signal from said pressure detecting means is inputted and which corrects a loop gain of said monitor circuit in correspondence with a value of said pressure signal.

4,902,948

GUIDE WIRE COMMUNICATION SYSTEM AND METHOD

Leigh E. Sherman, North Wales, Pa.; Gary L. Whatcott, Holladay, Utah; Richard M. Dicks, Salt Lake City, Utah, and David C. Madsen, Sandy, Utah, assignors to Eaton-Kenway, Inc., Salt Lake City, Utah

Division of Ser. No. 873,032, Jun. 11, 1986, Pat. No. 4,791,570, which is a continuation-in-part of Ser. No. 729,514, May 2, 1985, abandoned. This application Jul. 1, 1988, Ser. No. 214,242

Int. Cl.[4] G05D *1/03*

U.S. Cl. 318—580 **28 Claims**

1. A system for controlling at least one unmanned, task-performing vehicle including vehicle portion and non-vehicle portion, comprising:

at least one stationary guide wire essentially defining a path to be traversed by the vehicle;

the vehicle portion and the non-vehicle portion of the system each comprising substantially the same electrical means, each of the electrical means transmits and receives substantially the same communicating data signals, comprising signal generating means and antenna means for

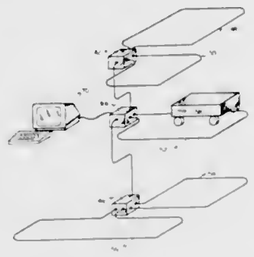
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transmitting generated signal from the vehicle to the guide wire, and vice versa;

the antenna means in the vehicle portion comprising at least two opposed conductive loops, each conductive loop comprising a plurality of turns.

21. A method for controlling at least one unmanned, task-performing vehicle by at least one non-vehicle means, comprising the steps of:

outputting data signals from a source to and along a guide wire;



communicating substantially the same data signals bidirectionally between the vehicle and the non-vehicle means;

reducing the impedance of the guide wire whereby amplitude deterioration in the data signals on the guide wire, which would otherwise occur, is alleviated;

detecting the data signals by vehicle signal detecting and tracking means, causing the vehicle to substantially follow the path defined by the guide wire.

4,902,949

MOTOR SERVO CIRCUIT

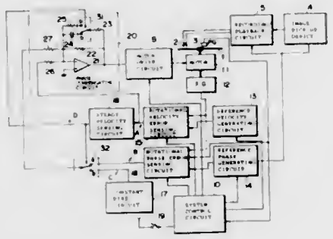
Masafumi Hirata, Kawaguchi, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 22, 1988, Ser. No. 209,949

Claims priority, application Japan, Jun. 23, 1987, 62-154365

Int. Cl.[4] G05B *1/02*

U.S. Cl. 318—608 **5 Claims**



1. A motor servo circuit comprising:

a rotational velocity sensor for sensing the rotational velocity of a motor;

a velocity error sensing circuit for sensing a rotational velocity error by comparing the sensed rotational velocity with a prescribed reference velocity;

a phase compensating circuit, which includes a capacitor, for controlling a motor driver circuit based on the velocity error signal inputted thereto;

steady velocity sensing means for sensing a steady velocity state in which the sensed rotational velocity is in the vicinity of the reference velocity;

a resistance circuit connected in parallel with said capacitor; and

changeover means for selectively connecting one of said capacitor and said resistance circuit into said phase compensation circuit in such a manner that said capacitor is connected to said phase compensating circuit only when a steady velocity state is sensed by said steady velocity sensing means, and said resistance circuit is connected to said phase compensating circuit at all other times.

4,902,950

NUMERICAL CONTROL METHOD WITH RESPONSE DELAY COMPENSATING FUNCTION

Hideaki Kawamura, Hachiouji; Kentaro Fujibayashi, Mitaka, and Haruhiko Kozai, Hachioji, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

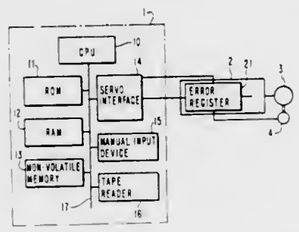
PCT No. PCT/JP88/00105, § 371 Date Aug. 11, 1988, § 102(e) Date Aug. 11, 1988, PCT Pub. No. WO88/05935, PCT Pub. Date Aug. 11, 1988

PCT Filed Feb. 4, 1988, Ser. No. 247,442

Claims priority, application Japan, Feb. 4, 1987, 62-22498

Int. Cl.[4] G05B *5/00*

U.S. Cl. 318—627 **10 Claims**



1. In a numerical control method for repetitively and alternately effect forward movement and backward movement of a controlled object, a numerical control method with response delay compensating function, comprising the steps of:

(a) reading a program in which a commanded amount of forward movement, a commanded amount of backward movement, a commanded feed rate for forward movement, and a commanded feed rate for backward movement are stated, respectively;

(b) calculating a command time period required for delivery of all of first command pulses relating to the forward movement of the controlled object on the basis of contents of statement of the thus read program;

(c) detecting an amount of second command pulses delivered over a time period from an instant at which delivery of the second command pulses is started to an instant at which an amount of an error register associated with the forward movement commanded amount becomes less than a predetermined value, said second command pulses relating to the backward movement of the controlled object;

(d) calculating a corrected commanded feed rate for subsequent forward movement and the backward movement as a function of the detected delivery amount of said second command pulses; and

(e) delivering subsequent first and second command pulses at said corrected commanded feed rate over said calculated command time period.

4,902,951

NUMERICALLY CONTROLLED MACHINE TOOL

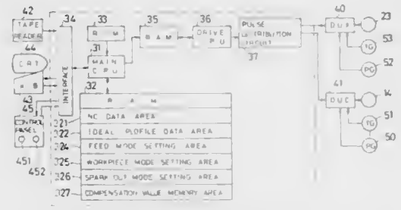
Norio Ohta, Okazaki; Yoshinobu Yotsui; Kouichi Isomura, both of Kariya, and Masatomo Yoshimura, Toyoake, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Kariya, Japan

Filed Aug. 25, 1988, Ser. No. 236,549

Claims priority, application Japan, Aug. 25, 1987, 62-211664

Int. Cl.[4] G06F *11/00*

U.S. Cl. 318—632 **5 Claims**



1. A numerically controlled machine tool for machining a non-circular workpiece by controlling numerically the main spindle rotation and the position of the tool according to profile data which defines the profile generating movement of a tool along a final shape of said workpiece, said numerically controlled machine tool comprising:

profile data memory means for storing profile data which is calculated form an ideal sectional shape of said workpiece and indicates positional change of said tool with respect to the rotational position of said workpiece;

numerical control data memory means for storing numerical control data which commands to perform at least two successive machining steps in which the position of said tool is controlled in accordance with said profile data, and commands the rotational speed of said main spindle to be changed at each machining step;

compensation data memory means for storing at least two groups of compensation data which are used for compensating for follow delay of the tool feed, in connection with the rotational speeds of said main spindle at said at least two machining steps; and

control means operable in response to said numerical control data for searching one group of said compensation data corresponding to the commanded rotational speed of said main spindle during said each machining step from said compensation data memory means, and for compensating said profile data with said searched group of compensation data so as to control the position of said tool while eliminating said follow delay.

4,902,952

COOLING APPARATUS

Brendan Lavery, Hatfield, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 168,546, Mar. 9, 1989, abandoned, which is a continuation of Ser. No. 932,556, Nov. 20, 1986, abandoned. This application May 17, 1989, Ser. No. 355,136

Claims priority, application United Kingdom, Nov. 20, 1985, 8528559

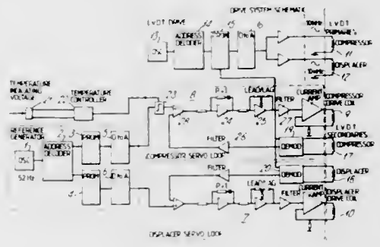
Int. Cl.[4] F25B *9/00*

U.S. Cl. 318—645 **6 Claims**

1. A Stirling Cycle cooling engine comprising:

electromagnetic drive means for electromagnetically driving a compressor for generating pressure variations in a working fluid of a cold finger assembly and for electromagnetically driving a cold finger displacer; and

means for energizing the electromagnetic drive means for the compressor and cold finger displacer, comprising a common oscillator, two digital memories arranged to be addressed in dependence upon an output of the oscillator and each storing respective output waveform sample look-up tables, two digital-to-analog converters for converting respective outputs of said digital memories to analog waveforms, and two servo loop circuits for receiving respective ones of said analog waveforms and forming respective energization signals for the electromagnetic drive means based thereon.



4,902,953

MOTORIZED WINDOW BLIND ELECTRICAL ACTUATOR

David W. Kraft, 716 N. Third, Bozeman, Mont. 59715; Lyle N. Eberhadrdt, 8420 Starling Dr., Bozeman, Mont. 59715, and Lee E. Cannon, 3550 Stucky Rd., Bozeman, Mont. 59715

Filed Aug. 19, 1988, Ser. No. 234,183

Int. Cl.[4] E05F *15/14*

U.S. Cl. 318—665 **10 Claims**

1. A motorized window blind actuator for a window blind having a motor operatively attached to the window blind to control opening and closing of the window blind by an output shaft means of the motor, comprising:

input means for receiving regulated electrical power and a first variable reference voltage signal, the first variable reference voltage signal being proportional to a desired position of the window blind between and including open and closed positions defined by end stop means;

feedback voltage means for producing a second variable reference voltage signal from the regulated electrical power;

connection means for connecting the output shaft means of the motor to the feedback voltage means, rotation of the output shaft means causing proportional change in the second variable reference voltage signal which is in turn proportional to the actual position of the window blind between and including the open and closed positions;

comparator means for comparing the first and second variable reference voltage signals and for producing a drive signal based on the comparison of the first and second variable reference voltage signals;

drive means connected to the motor, the drive means in-

structing the motor to rotate the output shaft means according to the drive signal to bring the first and second variable reference voltage signals within a predetermined range to cause the window blind to move to the desired position; and

over-current sensing means for sensing circuit current above a pre-set level for over a predetermined time, including current monitoring means and timing means, the over-current sensing means disabling the driver means upon the window blind reaching an end stop open or closed position, or jamming or sticking between an open and a closed position.

4,902,954

ALTERNATING CURRENT MOTOR CONTROL APPARATUS

Kenji Oshima, 5-4-3-203 Karabe, Narita-shi, Chiba-ken 286, and Yasutami Kito, 715 Aza Ochiai, Oaza Ochiai, Haruhimura, Nishikasugai-gun, Aichi-ken 452, both of Japan

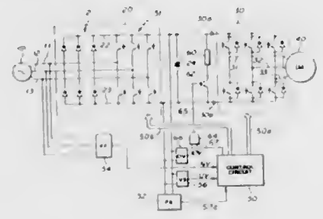
PCT No. PCT/JP87/00623, § 371 Date Jun. 6, 1988, § 102(e) Date Jun. 6, 1988, PCT Pub. No. WO88/01450, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 21, 1987, Ser. No. 196,199

Claims priority, application Japan, Aug. 22, 1986, 61-197569

Int. Cl.[4] H02P *3/18, 5/40*

U.S. Cl. 318—762 **4 Claims**



1. An apparatus connected to a source of fixed frequency alternating current (AC) for providing a motor control signal for controlling the speed of an AC motor coupled to drive an elevator cage, comprising:

a converter connected to the source of AC having rectifier means for converting the AC into direct current (DC);

an inverter connected through relatively positive and negative conductors to the converter, responsive to the motor control signal, for inverting said DC into AC having adjustable frequency to drive the motor and for providing regenerative power from the motor during regenerative conditions;

AC power failure detector means, responsive to the fixed frequency AC power source for detecting a power failure and for providing a power failure signal;

overvoltage detector means, responsive to the voltage between said positive and negative conductors, for providing an overvoltage signal upon detecting said voltage exceeding a selected magnitude;

said converter further comprising regenerative power switching means responsive to a regenerative power control signal for controlling the flow of said regenerative power from said inverter to the fixed frequency AC source during said regenerative conditions;

an electric resistor responsive to said regenerative power for dissipation thereof; and

a control circuit for providing the motor control signal for controlling said inverter for driving the motor at a selected speed, said control circuit responsive to said power failure signal for providing said regenerative power control signal for controlling said regeneration means to prevent flow of regenerative power to the power source, said control circuit for providing said motor control signal for reducing the current magnitude of said inverter output power to a predetermined minimum limit enough to maintain a synchronous relationship between said inverter and the motor, said control circuit further comprising means responsive to said power failure signal and said overvoltage signal for connecting said electric resistor between said relatively positive and negative conductors to provide a dynamic braking of the motor in the simultaneous presence of said overvoltage signal and said power failure signal after said power failure signal has persisted for a predetermined time.

4,902,955

PORTABLE BATTERY CHARGER

Donald R. Manis, 7968 Camberly Dr., and Lon C. Hammock, 4915 W. Emory Rd., both of Powell, Tenn. 37849

Filed Oct. 31, 1988, Ser. No. 264,859

Int. Cl.[4] H02J *7/00;* **B65B** *31/00*

U.S. Cl. 320—2 **12 Claims**



1. A portable battery charger for boosting and charging automotive-type batteries comprising;

a charger housing;

an automotive-type battery received within said charger housing, said battery having a positive terminal and a negative terminal;

a first cable housing secured to said charger housing proximate a first vertical wall of said charger housing, said first cable housing having an upper portion defining a first bore and a first saddle notch disposed above said bore;

a second cable housing secured to said charger housing proximate a second vertical wall of said charger housing, said second vertical wall being oppositely disposed from said first vertical wall whereby said first and second cable housings are physically isolated one from the other by said charger housing, said second cable housing having an upper portion defining a second bore and a second saddle notch disposed above said second bore;

a positive charging cable having proximal and distal end portions, said proximal end portion being electrically connected to a positive terminal of said automotive-type battery, an intermediate portion of said positive charging cable being received through said first bore and retractably received within said first cable housing, said positive charging cable terminating at its said distal end portion external to said first cable housing;

a negative charging cable having proximal and distal end portions, said proximal end portion being electrically connected to a negative terminal of said automotive-type battery, an intermediate portion of said negative charging cable being received through said second bore and retractably received within said second cable housing, said negative charging cable terminating at its said distal end portion external to said second cable housing; and

positive and negative charging clamps electrically connected to said distal end portions of said positive and negative charging cables, respectively, said positive and negative clamps each having a pair of rearwardly disposed, diverging handles for being releasably received in said first and second saddle notches, respectively, whereby said clamps are held in a preselected position when said intermediate portions of said positive and negative charging cables are fully received within said first and second cable housings.

10. A portable battery charger for boosting and charging automotive type batteries comprising:

a charger housing;

an automotive-type battery received within said charger housing, said battery having a positive terminal and a negative terminal;

a positive charging cable having proximal and distal end portions, said proximal end portion being electrically connected to said positive terminal of said automotive-type battery;

a negative charging cable having proximal and distal end portions, said proximal end portion being electrically connected to said negative terminal of said automotive-type battery;

positive and negative charging clamps electrically connected to said distal end portions of said positive and negative charging cables, respectively; and

an air compressor mounted within said charger housing and powered by said automotive-type battery, said compressor being provided with an air hose having a proximal end portion connected to said compressor and a distal end portion terminating in a fitting for facilitating the inflation of vehicle tires.

4,902,956

SAFETY DEVICE TO PREVENT EXCESSIVE BATTERY DRAIN

Jeffrey M. Sloan, 1082 Woodkrest Dr., Flint, Mich. 48532

Continuation-in-part of Ser. No. 940,863, Dec. 12, 1986, abandoned. This application Nov. 17, 1988, Ser. No. 272,427

Int. Cl.[4] H02G *3/00;* **H02H** *7/18;* **H02J** *7/00*

U.S. Cl. 320—13 **26 Claims**



1. For use in conjunction with a vehicle having a battery, an ignition system, and at least one electrically powered accessory connected to the battery, a device for electrically disconnecting the battery from the accessory whenever the battery energy falls below a predetermined value comprising:

a normally closed switch connected in series between the battery and the accessory, and

means for opening said switch comprising:

means for sensing a battery characteristic indicative of battery drain and for generating an output signal whenever an energy capacity of said battery falls below said predetermined value,

timing means responsive to said sensing means output signal for generating a timing output signal a predetermined time period after said sensing means output signal, and

means responsive to said timing means output signal for opening said switch,

wherein said sensing means comprises means for determining the rate of discharge of the battery and for adjusting a threshold level at which said timing means is activated as a function of the rate of discharge of the battery.

15. For use in conjunction with a vehicle having a battery, an ignition system, and at least one electrically powered accessory connected to the battery, a device for electrically disconnecting the battery from the accessory whenever the battery energy falls below a predetermined value comprising:

a normally closed switch connected in series between the battery and the accessory, and

means for opening said switch comprising:

means for sensing a battery characteristic indicative of battery drain and for generating an output signal whenever an energy capacity of said battery falls below said predetermined value,

timing means responsive to said sensing means output signal for generating a timing output signal a predetermined time period after said sensing means output signal, and

means responsive to said timing means output signal for opening said switch,

wherein said sensing means comprises a first and second comparator, said first comparator generating a first output signal to said timer means which resets and energizes said timing means when the battery voltage falls below a first voltage level, said second comparator generating an output signal which activates and initiates the beginning of said predetermined time period when the battery voltage falls below a second voltage level, said first voltage level being greater than said second voltage level.

4,902,957

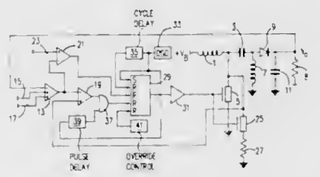
DC/DC CONVERTER

John C. Cassani; Mark K. DeMoor; Paul W. Graf; Jonathan J. Hurd, all of Lexington; Christopher D. Jones, Georgetown; Stephen F. Newton, Winchester, and David R. Thomas, Cynthiana, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 27, 1989, Ser. No. 344,182

Int. Cl.[4] G05F *1/613;* **H02M** *3/335*

U.S. Cl. 323—222 **4 Claims**



1. A first converter circuit comprising an input from a direct current voltage source, an inductor connected from said input to a first node, a second converter circuit connected to said first node and having a direct current voltage output for a load, a switch connected from said first node in parallel with said output, means to produce a first control signal corresponding to the current carried by said switch, means to produce a second control signal corresponding to the difference of the voltage at said output and a first reference signal corresponding to a voltage from said output lower than a first predetermined level, means to produce a third control signal when said second control signal is less than a second predetermined level with respect to a second reference signal corresponding to a voltage from said output higher than a third predetermined level, means to produce a fourth control signal when said first control signal is at least at a fourth predetermined level with respect to said second control signal, a clock source for producing a clock signal, means to produce a displaced clock signal displaced less than one cycle from said clock signal, a latch having a set input and at least one reset input, means controlling said switch in response to the status of said latch so that said switch is closed when said latch is set and said switch is open when said latch is reset, means to produce a fifth control signal at each initial closing of said switch, means responsive to said fifth control signal to temporarily inhibit said fourth control signal from resetting said latch, and means

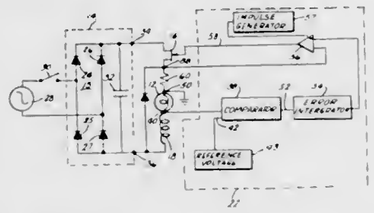
connecting said clock to said set input to set said latch, means connecting said fourth control signal to said reset input to reset said latch when not temporarily inhibited in response to said fifth control signal, means connecting said third control signal to said reset input to reset said latch, and means connecting said displaced clock signal to said reset input to reset said latch.

4,902,958

INCANDESCENT LIGHT REGULATION AND INTENSITY CONTROLLER

James C. Cook, II, Marshall, Mich., assignor to Progressive Dynamics, Inc., Marshall, Mich.

Filed Nov. 14, 1988, Ser. No. 271,016
Int. Cl.[4] H05B *37/02;* **G05F** *1/56*
U.S. Cl. 323—282 **18 Claims**



9. A regulating circuit for supplying electrical power from an alternating current power source to an incandescent lamp comprising:
- a pair of outlet terminals configured for connection to opposite terminals of a lamp;
- power source means for producing direct current power at a voltage between two output lines that is higher than the rated voltage of the lamp;
- a switch between one of said output lines and one of said terminals;
- an inductor between the other one of said output lines and the other one of said terminals;
- a diode connected between said one of said terminals and said other one of said output lines and antiparallel said power source means;
- voltage monitoring means for monitoring the voltage across said terminals and producing a lamp voltage control signal proportional to said voltage across said terminals;
- control means for opening and closing said switch in response to said lamp voltage control signal at a duty cycle which causes the voltage across said terminals to have a predetermined average value, said control means including a reference voltage source and comparison means for comparing said lamp voltage control signal with said reference voltage and for producing an error signal proportional to the difference between said reference voltage and said lamp voltage control signal, said control means further including integrating means for integrating said error signal according to a predetermined closed loop time response.

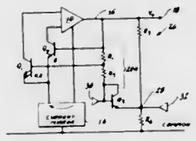
4,902,959

BAND-GAP VOLTAGE REFERENCE WITH INDEPENDENTLY TRIMMABLE TC AND OUTPUT

Adrian P. Brokaw, Burlington, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Jun. 8, 1989, Ser. No. 363,209
Int. Cl.[4] G05F *3/30*
U.S. Cl. 323—314 **20 Claims**

1. An IC band-gap voltage reference comprising:
- a pair of transistors each having base, collector and emitter electrodes;
- said emitter electrodes being connected together;
- amplifier means coupled to said pair of transistors to produce an output signal responsive to the difference between the currents through said pair of transistors;
- a feedback circuit coupled to said amplifier means and developing a feedback signal corresponding to said output signal;
- a current mirror forming part of said feedback circuit and coupled to said pair of transistors to force the combined current through said transistor pair to track said feedback signal;
- means to establish different current densities in the separate transistors of said pair of transistors;
- an output circuit for said amplifier means and having an output terminal for developing a DC output voltage;



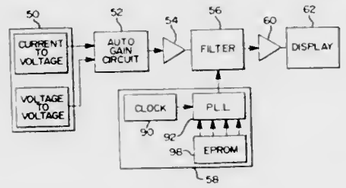
- a network comprising resistor means and connected to said output circuit to carry a current corresponding to said output voltage;
- means connecting the voltage across at least a part of said resistor means as a differential signal to said bases of said pair of transistors respectively to drive the current through said transistors to an equilibrium condition with the voltage between said transistor bases corresponding to the ΔV_{BE} voltage of said two transistors; and
- a transistor diode forming part of said network to provide that said output voltage is responsive to the combination of said ΔV_{BE} voltage and the V_{BE} voltage of said diode, said output voltage thereby serving as a temperature-compensated reference voltage.

4,902,960

VOLTAGE INPUT FOR HARMONIMETER, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Michael Z. Lowenstein, Southfield, and Ronald G. Jawernycky, Farmington Hills, both of Mich., assignors to Myron Zucker, Inc., Royal Oak, Mich.

Continuation-in-part of Ser. No. 169,407, Mar. 17, 1988. This application Feb. 13, 1989, Ser. No. 310,226
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[4] G01R *29/26*
U.S. Cl. 324—621 **14 Claims**



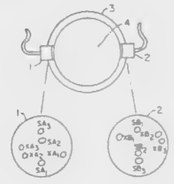
1. Apparatus for locating and measuring harmonic distortion in a conductor, comprising:
- first means detachably connectable to a conductor for providing an input signal indicative of electrical energy in said conductor;
- second means connected to said first means and receiving said input signal therefrom, said second means providing a modified signal indicative of the strength of a single, predetermined harmonic of said input signal;
- third means connected to said second means for selectively varying the single, predetermined harmonic which is indicated by said modified signal; and
- said modified signal indicates voltage harmonics.

4,902,961

MICROWAVE SYSTEM FOR MONITORING WATER CONTENT IN A PETROLEUM PIPELINE

Bibhas R. De, Laguna Beach; Paul L. Donoho, Fullerton; David E. Revus, Yorba Linda, and Russell E. Boyer, Fullerton, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 8, 1987, Ser. No. 35,838
Int. Cl.[4] G01N *22/00*
U.S. Cl. 324—640 **12 Claims**



1. Apparatus for analyzing a multi-phase liquid comprising:
- pipeline means for containing the liquid;
- a low frequency transmitting antenna substantially in the S-band near a wall of said means for containing a liquid;
- a low frequency receiving antenna substantially in the S-band located within one-half wavelength of said low frequency transmitting antenna;
- means for determining a phase shift of a low frequency wave; and
- means for determining an amplitude change of the low frequency wave.

4,902,962

DETECTION OF THE SURFACE OF A LIQUID OR FOAM INCLUDING MOISTURE INHIBITING

Yoichi Ishikawa, Tokyo, Japan, assignor to Able Corporation, Tokyo, Japan

Filed Nov. 9, 1988, Ser. No. 269,134
Int. Cl.[4] G01R *27/26;* **G01N** *27/02*
U.S. Cl. 324—690 **8 Claims**



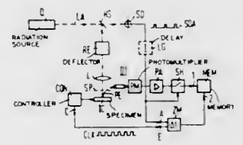
1. An apparatus for detecting the surface of a liquid or of a foam comprising a detector electrode (**10**) arranged to be touched by the liquid or foam, an insulator (**20, 64**) for the detector electrode (**10**), a counter-electrode (**48**) for electrical contact with the liquid or foam being provided, a change in electrical conductivity (or capacitance) between the electrodes being indicative as to whether the detector electrode (**10**) is touching the surface of the liquid or foam, characterized in that the detector electrode (**10**) is surrounded by a shroud (**12**) having an open lower end and means are provided for maintaining vapour surrounding the detector electrode (**10**) and confined by the shroud (**12**) in an unsaturated state, said means for maintaining the vapour surrounding the detector electrode unsaturated comprising a drying device, said drying device comprising a heater for heating the detector electrode (**10**).

4,902,963

METHOD AND ARRANGEMENT FOR RECORDING PERIODIC SIGNALS WITH A LASER PROBE

Hans D. Brust, Martin Luther Str. 2, 6602 Dudweiler, Fed. Rep. of Germany

Filed Jan. 11, 1989, Ser. No. 295,500
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802566
Int. Cl.[4] G01R *31/28*
U.S. Cl. 324—158 R **11 Claims**



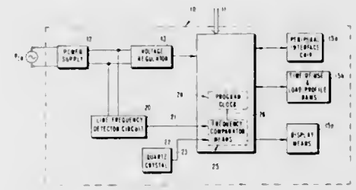
1. A method for recording periodic signals with a laser probe, whereby the laser probe is pulsed and is directed onto at least one point of a specimen carrying a first signal, and whereby a secondary signal triggered on the specimen by the laser probe is detected and is converted into a measured signal (g(t)), comprising asynchronously gating the laser probe; identifying chronological spacing (Δt) of the pulses of the laser probe relative to a second signal (CLK) synchronous with said first signal; and recording the value of the measured signal (g(t)) associated with the respective pulse of the laser probe and the measured chronological spacing (Δt) of the pulse relative to the second signal (CLK).

4,902,964

PROGRAM CLOCK FOR AN ELECTRONIC DEMAND REGISTER WITH AUTOMATIC CALIBRATION BASED ON SENSED LINE FREQUENCY

William A. Szabela, Brookston, and Gordon R. Burns, Lafayette, both of Ind., assignors to Landis & GYR Metering, Inc., Lafayette, Ind.

Filed Sep. 21, 1987, Ser. No. 99,078
Int. Cl.[4] G01R *11/32, 11/04*
U.S. Cl. 324—103 P **9 Claims**

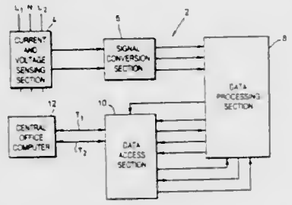


1. An electronic demand register for registering AC power consumption from an AC source, comprising:
- a microprocessor including timing means for generating

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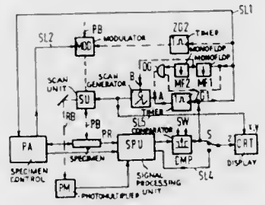
periodic timing signals in relation to the cycles of the AC source;
means for automatically calibrating the generation of said periodic timing signals based on the line frequency of the AC source; and
means for registering power consumption over a time period determined by said periodic timing signals.

4,902,965
CONSUMPTION METER FOR ACCUMULATING DIGITAL POWER CONSUMPTION SIGNALS VIA TELEPHONE LINES WITHOUT DISTURBING THE CONSUMER
John D. Bodrug, 360 Bloor Street E., Apt. 601, Toronto, Ontario, Canada (M4W 3M3); Melvin J. Bradford, 43 Hettersley Drive, Ajax, Ontario, Canada (L1T 1S1), and Robert R. Freeman, 485 Waverly St. N., Oshawa, Ontario, Canada (L1J 5W5)
Filed Jun. 15, 1987, Ser. No. 62,456
Int. Cl.[4] G01R *11/00, 21/06;* **H04M** *11/08*
U.S. Cl. 324—116 **14 Claims**



1. A consumption meter to be associated with sensors for sensing the consumption of a utility at a location comprising:
a real time clock operable to generate timing signals at pre-determined times to divide a pre-determined time period into a plurality of intervals, said intervals defining critical and non-critical utility consumption times;
processing means communicating with said sensors and being responsive to said timing signals for detecting and storing the utility consumption separately for each of said intervals;
accumulation means for accumulating separately, the utility consumption stored for each of said intervals over a plurality of said time periods;
access means for allowing a transmission link between a remote location and said consumption meter to be established over telephone lines; and
interface means communicating with said accumulation means and said processing means, said interface means allowing said utility consumption stored in said accumulation means to be conveyed to said remote location upon receipt of appropriate commands therefrom, said interface means including a telephone status detector for detecting the condition of the handset of a telephone connected to said telephone lines at said location and disconnect means for disconnecting said telephone from said telephone lines and establishing said transmission link to enable transmission of said utility consumption when said telephone is not in use.

4,902,966
METHOD AND APPARATUS FOR OPERATING A SCANNING MICROSCOPE
Hans-Detlef Brust, Dudweiler, and Johann Otto, Bad Toelz, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Division of Ser. No. 900,801, Aug. 27, 1986, Pat. No. 4,812,748.
This application Nov. 2, 1988, Ser. No. 265,949
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1985, 3531129
Int. Cl.[4] G01R *31/09, 31/02*
U.S. Cl. 324—158 R **9 Claims**



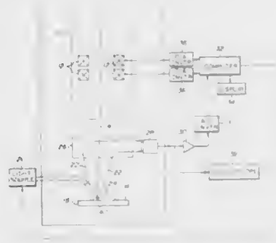
1. An apparatus for scanning a specimen surface, comprising:
a scanning microscope having a scanning primary beam;
a scan generator for generating a scan signal to scan said primary beam;
a specimen control connectable to a specimen to be tested;
a signal processing arrangement connected to receive signals from the specimen to be tested;
a threshold circuit connected to an output of said signal processing arrangement;
a first signal line connecting an output of said threshold circuit to an input of said specimen control; and
an adjustable timer element connecting an output of said threshold circuit to an input of said scan generator for switching from a first to a second lower scan rate.

9. An apparatus for scanning a specimen surface, comprising:
a scanning microscope having a scanning primary beam;
a scan generator for generating a scan signal to scan said primary beam;
a specimen control connectable to a specimen to be tested;
a signal processing arrangement connected to receive signals from the specimen to be tested;
a threshold circuit connected to an output of said signal processing arrangement;
a first signal line connecting an output of said threshold circuit to an input of said specimen control;
display means having deflection means for a write beam connected to said scan generator; and
a switchover means connectible to an input of said display means for controlling the intensity of said write beam to an output of said threshold circuit with a signal.

4,902,967
SCANNING ELECTRON MICROSCOPY BY PHOTOVOLTAGE CONTRAST IMAGING
Larry D. Flesner, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 18, 1989, Ser. No. 353,722
Int. Cl.[4] G01R *31/28, 31/26*
U.S. Cl. 324—158 R **25 Claims**

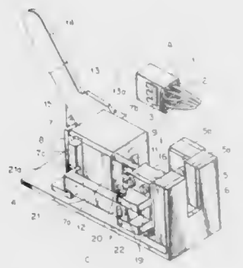
1. An apparatus for determining electrical properties of a semiconductor, comprising:
first means for irradiating said semiconductor with an electron beam so that secondary electrons having energy spectra are emitted from said semiconductor;

second means for illuminating said semiconductor with a modulated light beam and for inducing a photovoltaic effect in said semiconductor so that said energy spectra of said secondary electrons may be modified in accordance with said electrical properties of said semiconductor;
third means positioned to receive said secondary electrons emitted from said semiconductor for selectively filtering said secondary electrons based on said energy spectra of said secondary electrons;
14 fourth means positioned to receive said filtered secondary



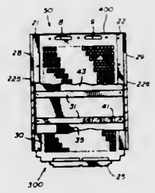
electrons for detecting said filtered secondary electrons and for providing an output functionally related to a quantity of said detected secondary electrons; and
fifth means operably coupled to receive said output of said fourth means for synchronizing detection of said filtered secondary electrons to a first period when said semiconductor is being illuminated by said light beam and to a second period, alternate to said first period, when said semiconductor is not being illuminated by said light beam, and for determining a change of said output between said first and second periods.

4,902,968
CONNECTOR TERMINAL CHECKING TOOL
Yasuyoshi Sugimoto, Kosai, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Filed Jun. 19, 1989, Ser. No. 367,594
Claims priority, application Japan, Jun. 24, 1988, 63-154996
Int. Cl.[4] G01R *31/04*
U.S. Cl. 324—158 F **5 Claims**



1. A connector terminal checking tool comprising:
a base,
a connector receiving member fixedly provided on one end portion of said base for receiving a connector to be checked, and
a connector checking member movably provided on the other end portion of said base in opposed relationship to said connector receiving member, said connector checking member including a plurality of check terminals adapted to be electrically connected to a plurality of terminals disposed in a connector housing of said connector to form a closed circuit when said connector is received into said connector receiving member, whereby electrical disconnection of said terminals of said connector is checked;
characterized in that said connector receiving member further comprises detecting means for detecting projection of a terminal locking spacer mounted in said connector housing of said connector projecting from a side surface or a back surface of said connector housing.

4,902,969
AUTOMATED BURN-IN SYSTEM
Robert L. Gussman, Houston, Tex., assignor to Reliability Incorporated, Houston, Tex.
Filed Jun. 1, 1987, Ser. No. 57,255
Int. Cl.[4] G01R *1/02*
U.S. Cl. 324—158 F **30 Claims**

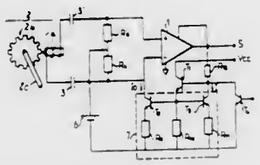


1. Burn-in cartridge, comprising:
a first printed circuit means forming a first face of said cartridge;
a second printed circuit means forming a second fact of said cartridge;
frame means for adjoining said first and second printed circuit means and for maintaining said first printed circuit means spaced from said second printed circuit means; and
means on said first and second faces for receiving IC packages for burn-in; and
means inside said cartridges for supporting said first and second printed circuit means wherein said means for supporting includes a plurality of cross-beams placed perpendicularly to said frame means, each of said cross-beams lying in spaced relation to define interior chambers therebetween and being connected at a first end thereof to frame means and at a second end to said frame means.

4,902,970
APPARATUS FOR MEASURING THE SPEED OF AN OBJECT WITH CIRCUIT FOR CONVERTING ANALOG SIGNALS INTO LOGIC SIGNALS AND CIRCUIT FOR VARYING SENSITIVITY
Michel Suquet, Cugnaux, France, assignor to Bendix Electronics S.A., Toulouse, France
Filed Feb. 17, 1988, Ser. No. 157,203
Claims priority, application France, Mar. 20, 1987, 87 03876
Int. Cl.[4] G01P *3/48, 3/54;* **H03K** *5/00;* **H03B** *19/00*
U.S. Cl. 324—173 **12 Claims**

1. A circuit for converting an analog electrical signal into a pulsed logic signal, comprising:
a source for generating the analog signal,
a comparator having first and second inputs between which the analog signal is applied,
a DC bias voltage source connected by one terminal to said

first and second inputs through first and second resistors respectively and
means for selectively varying the input voltage sensitivity of the circuit,
said means comprising:
a current source (7),



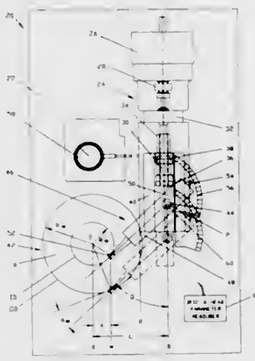
a switching device (8) for selectively connecting said current source between said first input of said comparator and the other terminal of said voltage source,
said current source providing a predetermined offset voltage at the terminals of said first resistor (R_4), for selecting the voltage amplitude of the analog signal for generating pulsed logic signals at the output of said comparator.

4,902,971

MAGNETIC HEAD AND DISC TESTER EMPLOYING PIVOT ARM ON LINEARLY MOVABLE SLIDE

Nahum Guzik, Mountain View, and Vinod K. Rao, Fremont, both of Calif., assignors to Guzik Technical Enterprises, Inc., San Jose, Calif.

Filed Sep. 14, 1988, Ser. No. 244,718
Int. Cl.[4] G01R *33/12, 31/00;* **G11B** *5/55, 21/08*
U.S. Cl. 324—212 **20 Claims**



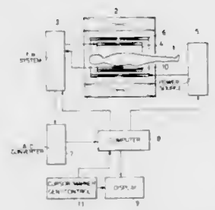
1. A method of moving a magnetic read-write head across a magnetic disc so that said head and said disc can be tested electrically, said head having a longitudinal axis and said magnetic disc having a plurality of concentric circular magnetic tracks thereon, said method comprising:
rotatingly supporting said disc on a stationary base;
installing said head on a pivotable arm,
mounting said arm on a slide which is linearly movable in a given direction;
positioning said arm at an angle to said direction of movement of said slide so that said longitudinal axis of said head defines a predetermined angle with a tangent of a predetermined one of said circular tracks on said disc, and
moving said slide in said given direction so that said head traverses said tracks of said disc.

4,902,972

METHOD AND APPARATUS FOR CAUSING NUCLEAR MAGNETIC RESONANCE OF AN OBJECT

Ryuzaburo Takeda, Mito; Hideaki Koizumi, Katsuta, and Toshiaki Aritomi, Tohkai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP87/01021, § 371 Date Oct. 24, 1988, § 102(e) Date Oct. 24, 1988
PCT Filed Dec. 23, 1987, Ser. No. 254,652
Claims priority, application Japan, Dec. 24, 1986, 61-306450
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **8 Claims**



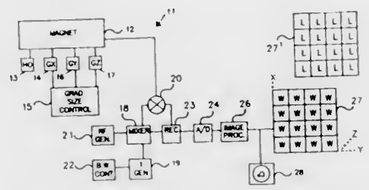
1. A method of causing nuclear magnetic resonance of an object, comprising the steps of:
causing nuclear magnetic resonance excitation of a predetermined region of the object defined by a predetermined frequency band so as to generate a nuclear magnetic resonance signal from the predetermined region of the object; and
sampling the nuclear magnetic resonance signal so as to produce an aliased signal thereon in a frequency band in accordance with the Nyquist theorem and which differs from the predetermined frequency band to enable imaging of the predetermined region of the object in accordance with the aliased signal.

4,902,973

SEPARATION OF SPECTRAL COMPONENTS

Hanan Keren, Kfar Saba, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Mar. 23, 1988, Ser. No. 172,213
Claims priority, application Israel, Mar. 27, 1987, 82030
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—312 **23 Claims**



1. A method for separating spectral components in magnetic resonance imaging (MRI) systems, said method comprising the steps of:
using a spin echo sequence including;
applying a first radio frequency (RF) pulse to tip spins into a transverse plane where the spins dephase,
applying a second RF pulse to rephase the spins to form an echo, said first and second RF pulses each having a bandwidth,
applying a first slice selecting gradient pulse while applying said first RF pulse,

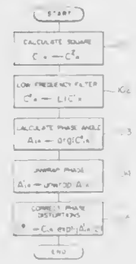
applying a second slice selecting gradient pulse while applying said second RF pulse,
limiting the bandwidth of at least one of the applied RF pulses in the spin-echo scan sequence,
reducing the slice selecting gradient pulse applied while applying the at least one of the applied RF pulses to acquire separated RF signals from each of the spectral components; and
using a 2-D fast Fourier transform operation for transforming the acquired separated RF signals into image values of a selected one of the spectral components.

4,902,974

PHASE CORRECTING METHOD IN A MAGNETIC RESONANCE IMAGING SYSTEM AND DEVICE FOR REALIZING THE SAME

Akira Maeda, Machida; Koichi Sano, Sagamihara, and Tetsuo Yokoyama, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,777
Claims priority, application Japan, Jul. 31, 1987, 62-190019
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—312 **7 Claims**



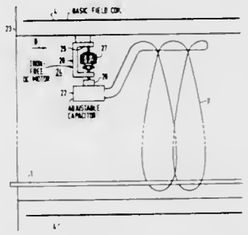
1. A magnetic resonance imaging method for obtaining a magnetic resonance image having corrected phases comprising:
a step of generating a static magnetic field, gradient magnetic fields and a radio-frequency magnetic field, irradiating an object to be tested therewith and detecting nuclear magnetic resonance signals having both positive and negative values coming from said object to be tested;
a step of sequence-controlling the irradiation of said object to be tested with said gradient magnetic fields and said radio-frequency magnetic field and the detection of said nuclear magnetic resonance signals;
a step of reconstructing complex image data on the basis of said nuclear magnetic resonance signals;
an operating step of multiplying the phase angle of said complex image data thus reconstructed by an even number and obtaining operation results thereof;
an assuming step of assuming phase distortions of said complex image data on the basis of the operation results of said operating step;
a correcting step of correcting said complex image data on the basis of the assumptions of said assuming step; and
a step of synthesizing and displaying the magnetic resonance image on the basis of said complex image data corrected in said correcting step.

4,902,975

NMR TOMOGRAPHY APPARATUS HAVING IRON-FREE DC MOTORS FOR CAPACITOR ADJUSTMENT

Helmut Kess, Deggendorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 17, 1984, Ser. No. 641,726
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336254
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **2 Claims**



1. In a nuclear magnetic resonance tomography apparatus having a means for generating a basic magnetic field, a means for superimposing a gradient on said basic magnetic field, a stimulation and measuring means for inducing nuclear resonance in a selected layer of an examination subject and for measuring the frequency thereof, and a means for initially tuning said stimulation and measuring means by physically displacing at least a portion of a circuit element connected to said stimulation and measuring means, the improvement comprising:
said means for initially tuning including an iron-free dc motor having a rotor connected to said displaceable portion of said circuit element, said rotor being disposed in said basic magnetic field such that said basic magnetic field functions as a stator field for rotating said rotor.

4,902,976

PROBE FOR DETECTING THE PRESENCE OF MAGNETIC MATERIAL IN A GROUND HOLE

Douglas J. Belshaw, Georgetown; Donald A. Toon, Burlington, and Peter F. Kuryllowicz, Georgetown, all of Canada, assignors to Solinst Canada Limited, Georgetown, Canada

Filed Jun. 24, 1988, Ser. No. 211,441
Claims priority, application United Kingdom, Jun. 27, 1987, 8715118
Int. Cl.[4] G01V *3/00, 3/08, 3/18;* **G01N** *27/72*
U.S. Cl. 324—346 **4 Claims**

1. Apparatus, which is suitable for detecting the presence of magnetic material in a ground-hole, characterised:
in that the apparatus includes a probe comprising a housing, a magnet, a movable mounting for the magnet, and a pair of electrical contacts;
in that the housing surrounds and encloses the magnet;
in that the movable mounting includes a means for holding the magnet in a first at-rest position, in which the magnet is, in substance, clear of any operative contact with the housing;
in that the movable mounting includes a means for permitting the magnet to move towards the housing to a second position, in response to magnetic attraction between the magnet and steel located outside the housing;
in that the arrangement is such that as the magnet moves between the first and second positions, the electrical contacts change between OFF and ON;
in that the movable mounting includes a spring means for

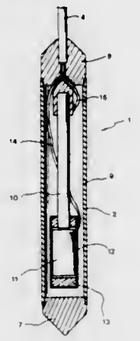
restoring the magnet to the said at-rest position upon removal of the probe from the said steel;

in that the spring means comprises a springy stalk, one end of which is built-into the housing;

in that the magnet is attached to a point on the springy stalk remote from the built-in end;

in that the length of the springy stalk is disposed along the length of the probe;

in that the apparatus includes a suspension means, by means of which the apparatus may be lowered down into the ground-hole, and raised therefrom;



in that the apparatus includes a means for measuring the depth below the ground surface to which the probe has been lowered;

in that the apparatus includes a means for indicating whether the electrical contacts are in the ON or OFF condition, and said indicating mean situated at the ground surface for indicating said condition;

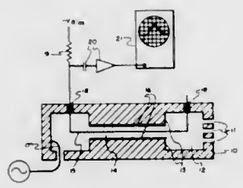
and in that the probe is sealed tight against entry of liquid into the probe, whereby the electrical contacts in the probe are isolated from water present within the ground-hole.

4,902,977

MULTIPACTOR PRESSURE GAUGE FOR USE AS A NONINVASIVE VACUUM TUBE SENSOR

Michael B. Kenny, Sunnyvale, Calif.; Larry R. Barnett, Bailey, Colo.; Richard W. Grow, Salt Lake City, and J. Mark Baird, Sandy, both of Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Jan. 10, 1989, Ser. No. 295,720
Int. Cl.[4] G01L *21/32*; G01N *21/62*
U.S. Cl. 324—462 **6 Claims**



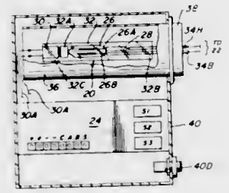
1. An apparatus for testing vacuum levels comprised of a re-entrant cavity resonator within which is located, at both ends of said resonator, a highly capacitive post with capacitive surfaces constructed from material compatible with the type of environment being tested, between said posts there existing a gap; between said posts there being disposed a RF field to obtain a multipactor discharge between said highly capacitive re-entrant cavity post surfaces; and a negatively biased wire, or wires or a grid, disposed between, but not in contact with said post surfaces, for collection of residual gas ions formed by collision with primary electrons produced by said multipactor discharge, thereby producing a measurable electric current which is a function of vacuum pressure.

4,902,978

OPTO-ISOLATION SYSTEM AND METHOD OF USE

Walter L. Horigan, Huntingdon Valley, Pa., assignor to Wolf Technologies Corporation, Philadelphia, Pa.

Filed Jan. 9, 1989, Ser. No. 295,089
Int. Cl.[4] G01R *31/00*
U.S. Cl. 324—556 **19 Claims**



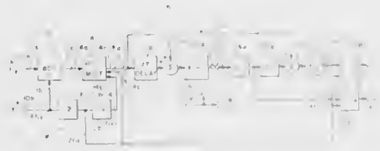
1. A coupling device for connection between first means providing a first high voltage digital electrical signal to be monitored and second means for monitoring said first signal, said second means operating at low voltage and/or low current levels, said device comprising light output means powered by said first electrical signal and for producing light upon the passage electrical current in the microamp range therethrough, said light output means comprising a neon tube, electrical resistance means having very high resistivity connected to said light output means and coupled to said first means for providing electrical current in said microamp range from said first electrical signal to said light output means to apply a voltage of at least a predetermined threshold across said neon tube to cause said neon tube to fire to provide output light, light responsive means coupled to said second means and being arranged to provide a second electrical signal in response to the receipt of said output light from said light output means, and holding means, said holding means comprising a pair of hollow portions and light transmissive means separating said hollow portions, said light transmissive means having a high dielectric strength, said light output means being disposed within one of said hollow portions adjacent said light transmissive means to direct its light therethrough to the other of said hollow portions, said light responsive means being disposed within said other of said hollow portions to receive said light from said light output means, and light isolation means for preventing ambient light from reaching said light responsive means said microamp current from said first means ensuring that said coupling device has virtually no effect on said first means, said high dielectric strength light transmissive means ensuring that the operation of said second means is not adversely affected by said high voltage of said first electrical signal.

4,902,979

HOMODYNE DOWN-CONVERTER WITH DIGITAL HILBERT TRANSFORM FILTERING

Charles M. Puckette, IV, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 10, 1989, Ser. No. 321,697
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—343 **10 Claims**



1. A homodyne down-converter, for providing substantially simultaneous output streams of in-phase I data and quadrature-phase Q data words to a digital detector means of a digital demodulator receiving an analog IF signal, comprising:

ADC means for converting the analog IF signal, having a center frequency f_{IF}, to a stream of digital data samples taken at a sampling frequency f_s substantially equal to $4f_{IF}$;

digital mixer means for converting the digital data sample stream to a stream of baseband digital data words;

means for removing from the data words the effect of any DC offset in the analog IF signal; and

a discrete Hilbert transform filter (DHTF) means for generating streams of sequential in-phase and quadrature-phase data words, with each stream being used to form one of the down-converter output streams.

4,902,980

MASTER-OSCILLATOR POWER-AMPLIFIER LASER SYSTEM

Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 30,320, Mar. 26, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 274,740
Int. Cl.[4] H01S *3/98*
U.S. Cl. 330—4.3 **33 Claims**



1. A master-oscillator power-amplifier optical system which comprises:

a master oscillator comprising ring oscillator means for providing an input laser beam having a predetermined frequency along an input path, said ring oscillator means comprising:

(a) an amplifying medium having an input for receiving a forwardly propagating laser beam and amplifying the received beam; and

(b) a plurality of reflector means disposed to receive the amplified beam from the medium along a ring path around the medium and back into the input for further amplification, one of the plurality of reflector means providing the input beam by transmitting a portion of the amplified beam along the input path;

a beam splitter disposed to receive the input beam from said ring oscillator means;

a power amplifier disposed to receive the input beam from said beam splitter and amplify the beam;

a reflector disposed to reflect the beam back through the power amplifier and through the beam splitter to provide an amplified output beam along an output path; and

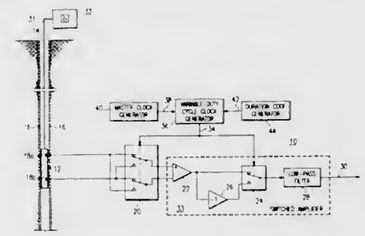
attenuation means including a frequency filter disposed along the input path for rejecting substantially all of the output beam that propagates back along the input path toward said ring oscillator means.

4,902,981

WELL CASING POTENTIAL MEASUREMENT TOOL WITH COMPENSATED DC ERRORS

Michael F. Gard, and William P. Goodwill, both of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 9, 1988, Ser. No. 283,149
Int. Cl.[4] H03F *3/38*
U.S. Cl. 330—9 **24 Claims**



1. An amplifier for a differential voltage signal comprising:

means for alternating polarity of said differential voltage signal to produce a switched low level signal;

an amplifier having an input coupled to said alternating polarity means and an output which supplies an amplified signal;

an inverter having an input coupled to said amplifier output and having an output which supplies an inverted signal;

means, coupled to said amplifier and said inverter, for alternatiely filtering said amplified signal and said inverted signal to produce a filtered output signal; and

means, coupled to said alternating polarity means and to said alternately filtering means, for synchronizing polarity of said differential voltage with filtering of said amplified and inverted signal to compensate for offset errors in said amplifier, inverter, and alternately filtering means.

4,902,982

NONLINEAR NONINVERTING TRANSIMPEDANCE AMPLIFIER

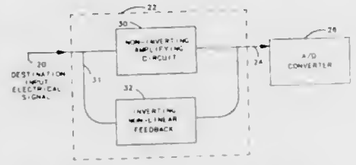
Charles E. Moore, and Robert A. Zimmer, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 9, 1989, Ser. No. 279,400
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—85 **35 Claims**

1. A nonlinear noninverting amplifier for receiving and amplifying an input signal and for producing an output signal having a gain which is a function of the amplitude of said input signal comprising:

amplification means having a predetermined forward noninverting gain for amplifying said input signal by said predetermined forward noninverting gain;

input terminal means for coupling to a positive input of said amplification means;
output terminal means for coupling to said amplification means at which a noninverted amplified output voltage appears,
nonlinear inverting feedback means, connected between said input terminal means and said output terminal means, for producing an inverting feedback signal that varies as an



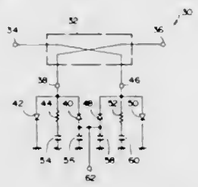
inverted function of said input signal to modify said gain of said nonlinear noninverting amplifier to prevent saturation of said amplification means and provide a wide dynamic range of amplitudes of said input signals and,
biasing means for producing a predetermined amplitude feedback signal whenever said input signal has a substantially zero state amplitude so as to significantly reduce the amplitude of said input signal required to cause said nonlinear inverting feedback means to turn-on.

4,902,983

NONLINEAR SIGNAL GENERATING CIRCUIT AND NONLINEAR COMPENSATING DEVICE USING THE SAME

Yoshinori Fujiki; Masatoshi Ishida, both of Tokyo; Nobuaki Imai, and Toshio Nojima, both of Kanagawa, all of Japan, assignors to NEC Corporation and Nippon Telegraph and Telephone Corp., both of Tokyo, Japan

Filed Feb. 2, 1988, Ser. No. 151,333
Claims priority, application Japan, Feb. 2, 1987, 62-20497; Feb. 2, 1987, 62-20498
Int. Cl.[4] H03F *1/32*
U.S. Cl. 330—149 **11 Claims**



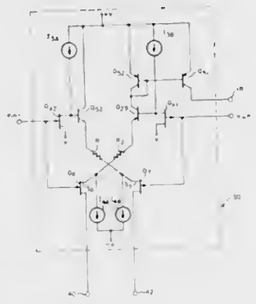
1. A nonlinear signal generating circuit comprising:
a quadrature hybrid having an input port, a coupling port, a passing port and an output port;
a first parallel connection constituted by a first and a second diode which are connected in parallel and opposite in polarity to each other and a first terminating resistor which is connected in parallel with said first and second diodes, said first parallel connection being connected at one end to said coupling port of said quadrature hybrid and at the other end to ground; and
a second parallel connection constituted by a third and a fourth diode which are connected in parallel and opposite in polarity to each other and a second terminating resistor which is connected in parallel with said third and fourth diodes, said second parallel connection being connected at one end to said passing port of said quadrature hybrid and at the other end to ground, wherein said first diode of said first parallel connection and said third diode of said second parallel connection are connected to be identical in polarity, said second diode and said fourth diode are connected to be identical in polarity, and wherein first, second, third and fourth capacitors are connected between said first terminating resistor and ground, between said second diode and ground, between said second terminating resistor and ground, and between said fourth diode and ground, respectively.

4,902,984

DIFFERENTIAL AMPLIFIER

Charles L. Vinn, Milpitas, and John A. Flink, Santa Clara, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 23, 1988, Ser. No. 289,296
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—252 **6 Claims**



1. A circuit comprising:
(a) a first differential amplifier means for providing output current related to a differential input voltage fed to the circuit;
(b) a second differential amplifier means, including a pair of transistors having control electrodes fed by the differential input voltage, for directing current from a voltage source through a first one or a second one of the pair of transistors to either a first output or a second output selectively in accordance with the polarity of the differential input voltage when the magnitude of the differential input voltage exceeds a predetermined magnitude and for reducing the level of the current passing to the first or second output when the differential input voltage is less than the predetermined magnitude while providing current through the pair of transistors when the magnitude of the input differential voltage is at a level less than the predetermined magnitude; and
(c) an output stage means for combining the output current provided by the first differential amplifier means and the current passed to the first output or second output of the second differential amplifier means into a composite output current.

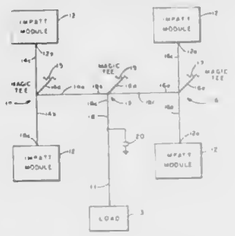
4,902,985

MICROWAVE REFLECTIION AMPLIFIERS HAVING INCREASED BANDWIDTH

Thomas K. Arthur, Milford; Michael H. Cobb, Maynard, and James W. McClymonds, Waltham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 25, 1988, Ser. No. 160,546
Int. Cl.[4] H03F *3/10, 3/60*
U.S. Cl. 330—287 **12 Claims**

1. A microwave circuit comprising:
a pair of negative resistance diode amplifiers each having an input/output port;
means, having an input/output port and having a pair of ports, for passively combining said input/output ports of said pair of negative resistance diode amplifiers; and



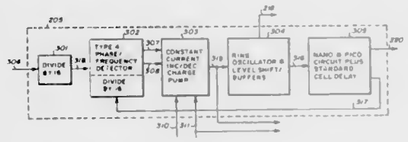
means disposed in said input/output port of said combining means for providing selected, equal perturbations in load impedance at the input/output poet of each one of said pair of diode amplifiers.

4,902,986

PHASED LOCKED LOOP TO PROVIDE PRECISE FREQUENCY AND PHASE TRACKING OF TWO SIGNALS

Gary J. Lesmeister, Sunnyvale, Calif., assignor to Asix Systems Corporation, Fremont, Calif.

Filed Jan. 30, 1989, Ser. No. 303,927
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—25 **14 Claims**



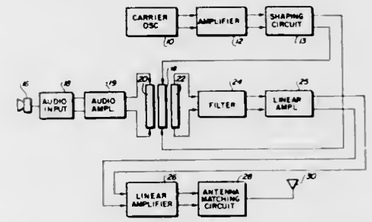
1. A device for use within an integrated circuit and which utilizes an external reference oscillating signal to calibrate signals within the integrated circuit, the device comprising:
a ring oscillator for generating a calibration signal oscillating at a first frequency which is to be matched to the frequency of oscillation of the external reference oscillating signal;
a power source for supplying a compensated power signal to the ring oscillator, the frequency of oscillation of said calibration signal increasing when the voltage of said compensated power signal is increased, and the frequency of oscillation of said calibration signal decreasing when the voltage of said compensated power signal is decreased, the voltage of said compensated power signal being responsive to a control signal; and
phase detector means, coupled to the power source, for receiving as input said calibration signal and said reference oscillating signal and for generating said control signal, the phase detector means varying said control signal so that said first frequency matches the frequency of oscillation of the external reference oscillating signal;
wherein said compensated power signal is used in other portions of the integrated circuit which are critical data paths.

4,902,987

INDUCTIVE MODULATOR SYSTEM

Eugene A. Albright, 1404 E. Myrna La., Tempe, Ariz. 85284

Filed Apr. 21, 1989, Ser. No. 341,769
Int. Cl.[4] H03C *1/00*
U.S. Cl. 332—120 **38 Claims**



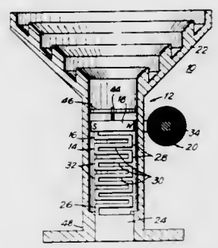
1. An inductive modulator system including in combination:
a source of carrier signals including a shaping circuit for supplying unidirectional pulses on the output of said source of carrier signals;
a source of information input signals;
a first coil connected to the output of said source of carrier signals;
a second coil connected to said source of information input signals and inductively coupled with said first coil; and
a third coil inductively coupled with said first and second coils for supplying an output signal therefrom.

4,902,988

CONTROL FOR FLEXIBLE PROBE

Robert W. Bruns, Campbell; Lorenzo J. Morris, Sunnyvale; John G. Weber, Boulder Creek, and H. Taylor Howard, San Andreas, all of Calif., assignors to Chapparal Communications, Inc., Portola Valley, Calif.

Filed Jan. 27, 1989, Ser. No. 302,367
Int. Cl.[4] H01P *1/165*
U.S. Cl. 333—21 A **18 Claims**



1. Apparatus comprising:
wave-guide means for receiving radio-frequency electromagnetic radiation;
electrically-conductive probe means mounted in said wave-guide means, at least a given portion of said probe means having an orientation that is adjustable between two positions angularly displaced with respect to each other by a given angle;
first magnetic means connected to said given portion of said probe means; and
second magnetic means mounted adjacent to said first magnetic means so as to be capable of being magnetically coupled to said first magnetic means;
at least one of said first and second magnetic means being

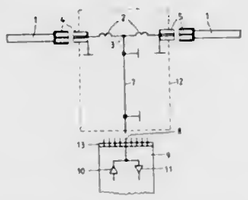
electrically controllable so as to control the magnetic coupling therebetween, move said first magnetic means selectively to one of said two angular positions, and thereby correspondingly move said given portion of said probe means and cause said wave-guide means to
preferentially transmit radio-frequency electromagnetic radiation having a selected one of two polarizations in planes that are angularly displaced with respect to each other substantially by said given angle and
preferentially reflect radio-frequency electromagnetic radiation having the other of said polarizations.

4,902,989

LOCAL AREA NETWORK COAXIAL CABLE CONNECTION DEVICE

Friedrich Glaab, Hochst, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 186,168, Apr. 26, 1988, abandoned. This application Apr. 3, 1989, Ser. No. 333,757
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715594
Int. Cl.[4] H03H *7/48*
U.S. Cl. 333—100 13 Claims



1. Device for connection of a transmitter/receiver (9) to a coaxial cable (1) serving as a serial bus in a local area network, comprising:
an inductance (2), in the form of a printed-circuit pass-through filter inductance having two single-loop windings (17, 18), interposed in the center conductor of said coaxial cable (1), said inductance having a central tap (3); and
a further coaxial cable (7) interconnecting said central tap (3) and said transmitter/receiver (9), and wherein said further coaxial cable (7) has, at most, a length which gives rise to a capacitance 8 pF greater than the capacitance which, together with said inductance (2), defines the characteristic impedance of said coaxial cable forming said serial bus.

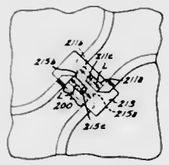
4,902,990

THICK FILM MICROWAVE COUPLER

Terry C. Cisco, Glendale, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 26, 1988, Ser. No. 249,136
Int. Cl.[4] H01P *5/18*
U.S. Cl. 333—116 10 Claims

1. A microwave coupler comprising:
a first conductive transmission line having one or more strip sections;
a second conductive transmission line having one or more strip sections respectively associated with the sections of said first transmission line, wherein associated strip sections are substantially uniformly separated from each other and non-coplanar and thereby coupled;
dielectric means for dielectrically separating associated strip sections of said first and second conductive transmission lines, wherein said dielectric means comprises a dielectric layer having first and second sides:
said first conductive transmission line comprises a first strip on the first side of said dielectric layer and a second strip on the second side of said dielectric layer; and
said second conductive transmission line comprises (a) a first strip on the second side of said dielectric layer uniformly



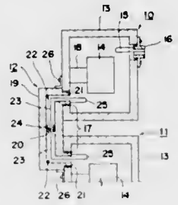
separated from said first strip of said first transmission line and (b) a second strip on the first side of dielectric layer uniformly separated from said second strip of said first transmission line.

4,902,991

RADIO FREQUENCY SIGNAL COMBINING/SORTING DEVICE

Youhei Ishikawa, Kyoto; Hidekazu Wada, Kobe; Koichi Takehara, Osaka; Shigeji Arakawa, Ibaraki, and Toru Tanizaki, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 10, 1988, Ser. No. 166,111
Claims priority, application Japan, Mar. 12, 1987, 62-57455
Int. Cl.[4] H01P *1/212*
U.S. Cl. 333—126 4 Claims



1. A radio frequency signal combining/sorting device which comprises a plurality of filters, each filter having a different resonant frequency and having at least one respective input-/output connector means; and duplexer means connected to said at least one connector means of each said filter for combining/sorting signals carried by said connector means;
said duplexer means comprising a unitary metallic block substantially in the shape of a rectangular prism, said block having a unitary outer metallic casing means which is securable to and removable from said filters, and said block defining a lengthwise direction and a transverse direction substantially perpendicular thereto;
said duplexer means further comprising composite transmission line means therein and comprising a coaxial cable which is connectable with an antenna, said coaxial cable extending transversely out of said block from a junction point located substantially at the lengthwise middle of said block;
each of said filters comprising a casing defining a resonant cavity therein; and said input/output connector means of each said filter to which said duplexer means is securable comprising an opening formed in said casing communicating with said resonant cavity; said block having at least a pair of fitting projections both extending in a common direction therefrom, each defining a central aperture and being sized and shaped to releasably fit in said openings in

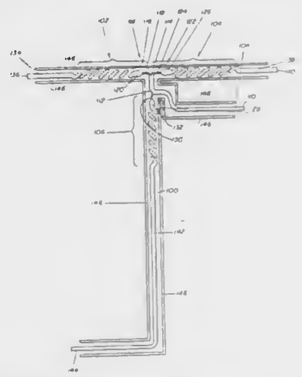
said filters; means for securing said outer metallic casing means of said block to said filters with said fitting projections fitted into said openings in said filters; said apertures in said fitting projections thereby communicating with said resonant cavities via said openings;
said duplexer means further comprising a respective individual transmission line which extends from each said fitting projection to said junction point via the interior of the block and is physically and electrically isolated from said block;
each said individual transmission line further comprising a continuous central conductor which is connected to a central conductor of said coaxial cable at said junction point;
said continuous central conductors of said individual transmission lines also extending continuously out of the interior of said block at said respective fitting projections, and being formed into respective coupling loops extending into said resonant cavity, thereby coupling said filters to said composite transmission line means when said block is secured to said filters.

4,902,992

MILLIMETER-WAVE MULTIPLEXERS

David Rubin, San Diego, and Kurt Reinke, Santa Barbara, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1988, Ser. No. 182,290
Int. Cl.[4] H01P *1/213*
U.S. Cl. 333—126 10 Claims



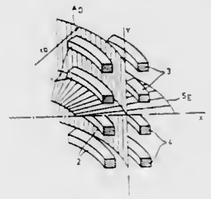
1. A millimeter wave triplexer comprising:
a dielectric substrate having first and second surfaces;
a first bandpass filter disposed on said first surface and having a passband P_1 centered around the frequency f_1;
a second bandpass filter disposed on said first surface and having a passband P_2 centered around the frequency f_2;
first conductor means disposed on said first surface for interconnecting said first and second bandpass filters;
a third bandpass filter disposed on said first surface and having a passband P_3 centered around the frequency f_3;
an input conductor disposed on said first surface;
second conductor means disposed on said first surface for interconnecting said input conductor with said first conductor means at an intersection, the impedance at said intersection towards said first conductor being approximately an open circuit to signals within said frequency band P_3; and
third conductor means connected at said intersection to said input conductor and to said second conductor means and also being connected to said third bandpass filter.

4,902,993

MAGNETIC DEFLECTION SYSTEM FOR CHARGED PARTICLES

Berthold Krevet, Dettenheim, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

PCT No. PCT/DE88/00079, § 371 Date Dec. 14, 1988, § 102(e) Date Dec. 14, 1988, PCT Pub. No. WO88/06394, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 18, 1988, Ser. No. 290,259
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705294
Int. Cl.[4] H01F *7/00*
U.S. Cl. 335—210 2 Claims



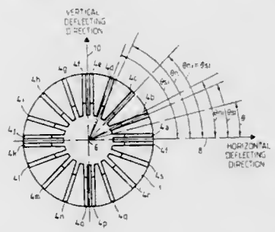
1. Magnetic deflection system for charged particles, the system including a coil arrangement for generating a magnetic guide field perpendicular to the plane of the desired orbit so as to guide the particles in the plane S_E of the desired orbit on a deflection path on a deflection radius r_0, characterized in that at least two coils are arranged on top of one another on either side of an area A_0 defined by the direction of the magnetic guide field and the deflection radius r_0 so that the winding faces of the coils extend parallel to area A_0, with at least two of the coils being disposed above the plane S_E of the desired orbit and two below the plane S_E of the desired orbit.

4,902,994

DEFLECTING DEVICE FOR A CATHODE RAY TUBE

Masaharu Kawamura, Kanagawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 9, 1988, Ser. No. 242,393
Claims priority, application Japan, Sep. 9, 1987, 62-224231
Int. Cl.[4] H01F *7/00*
U.S. Cl. 335—210 10 Claims



1. In a deflecting device for a cathode ray tube in which a plurality of winding slots are formed in the inner surface of a tubular core, in which slots deflecting coils are positioned, when θni is an angle in a plane normal to the tube axis at the neck between a line connecting said tube axis to the center of said winding slot in the transverse direction and a reference line in the horizontal direction, and θsi is an angle in a plane normal to the tube axis at the screen between a line connecting said tube axis to the center of said winding slot in the transverse

direction and a reference line in the horizontal direction, said winding slots being formed to be

$\theta ni > \theta si$

in a first region of said tubular core,

$ni = \theta si$

in a second region of said tubular core, and

$\theta ni < \theta si$

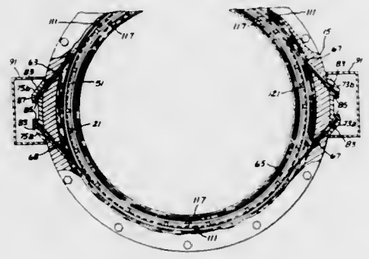
in a third region of said tubular core.

4,902,995

CABLE SUSPENSION SYSTEM FOR CYLINDRICAL CRYOGENIC VESSELS

Mark E. Vermilyea, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 5, 1988, Ser. No. 215,477
Int. Cl.[4] H01F 7/22
U.S. Cl. 335—216 **12 Claims**



1. A superconducting magnetic resonance magnet comprising:

a cylindrical vacuum vessel;

a cylindrical cartridge having superconductor windings, situated inside said vacuum vessel, said cartridge defining a pair of circumferential grooves in the outer surface of the cartridge near each end of the cartridge;

four cables; and

means affixed to the vacuum housing for securing the ends of said cables to said housing, said means situated in pairs circumferentially spaced on either side of where a first imaginary diametral line passing through said grooves on one end of said cartridge emerges radially on either side of the housing, said means also situated in pairs circumferentially spaced on either side of where a second imaginary diametral line passing through said grooves on the other end of said cartridge emerges radially on either side of the housing, each of said cables having one end secured to one securing means of an associated pair of securing means and extending more than halfway around said cartridge in one of said grooves with the other end of each of the cable secured to the other securing means in the pair.

4,902,996

MOVABLE COIL DRIVING UNIT

Kenichi Takahara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 28, 1987, Ser. No. 138,451
Claims priority, application Japan, Dec. 27, 1986, 61-311885
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—222 **10 Claims**

1. A movable coil driving unit comprising:

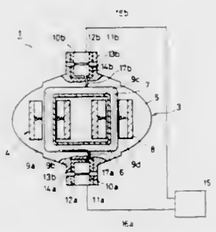
a movable coil;

a supporting structure, including a pivot joint, for supporting said coil thereon;

a magnetic field inducing means for subjecting said coil to an magnetic field; and

an electric energy supply for supplying electric current to said coil in order to move said coil by virtue of a magnetic force generated by said magnetic field,

wherein the current supply is provided directly through said pivot joint which comprises a rotatable member and a fixed member, the fixed member being engaged with said rotatable member in a manner that electric current can pass from one member to the other.

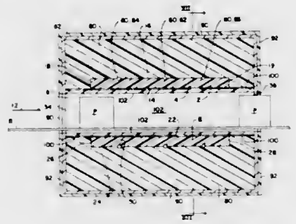


4,902,997

SEARCH COIL ASSEMBLY FOR METAL DETECTORS

James M. Moran, Leominster, Mass., assignor to Barkley & Dexter Laboratories, Inc., Fitchburg, Mass.

Continuation-in-part of Ser. No. 206,299, Jun. 14, 1988, which is a division of Ser. No. 56,241, Jun. 1, 1987, Pat. No. 4,833,733.
This application May 30, 1989, Ser. No. 357,782
Int. Cl.[4] H01F 15/04
U.S. Cl. 336—84 C **9 Claims**



1. A metal detector search coil assembly comprising a frame of non-metallic material, said frame having an aperture therethrough, coils of electrically conductive strands wound upon exterior surfaces of said frame, a first plastic coating adhered to said surfaces with said coils being embedded in said first plastic coating, a layer of metal adhered to the exterior surface of said first plastic coating to encase said first plastic coating in said metal, and a second plastic coating adhered to said metal layer to encase said metal layer in said second plastic coating.

4,902,998

INDUCTOR ASSEMBLY WITH COOLED WINDING TURNS

David D. Pollard, Cridersville, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 21, 1988, Ser. No. 274,103
Int. Cl.[4] H01F 27/08, 27/28
U.S. Cl. 336—60 **7 Claims**

1. An inductor assembly comprising:

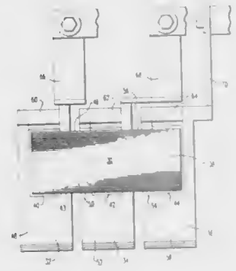
a magnetic core having a first leg and shaped to form a first aperture for receiving a first coil;

said first coil including a plurality of turns of a first conductor encircling said first leg;

means for insulating said first conductor from said core;

each of said turns including a first portion positioned within said first aperture and a second portion positioned outside of said first aperture;

said second portions of said turns being spaced apart thereby permitting flow of cooling medium between said second portions;



the surface area per unit length of said first portions of selected ones of said turns being less than the surface area per unit length of said second portions of said selected turns; and

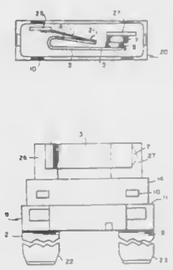
means for exposing only said second portions of said selected ones of said turns to said cooling medium.

4,902,999

ENCLOSED BIMETAL CIRCUIT BREAKER

George A. Ball, Jr., Cape Elizabeth, and John L. Schneider, Raymond, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 27, 1989, Ser. No. 315,663
Int. Cl.[4] H01H 37/04, 37/12
U.S. Cl. 337—372 **5 Claims**



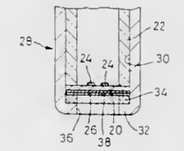
1. An electrical circuit breaker comprising a base, two terminals, a PMB bimetal and a cover; the PMB bimetal comprising a compensator fastened to a U shaped armature, the U shaped armature having a shorter leg and a longer leg; the terminals having inner portions within the cover and also having external plug-in portions; the terminals being embedded in, and extending through, the base; the base having a longitudinal center line; the external plug-in portions of the terminals being located on said longitudinal center line an extending perpendicularly therefrom; the embedded portions of the terminals being bent at a slight angle so that the inner portions of the terminals are offset from said longitudinal center line; the PMB bimetal being fastened to the inner portion of one of the terminals and making contact, when closed, to a contact on the inner portion of the other terminal, the PMB bimetal being in a substantially parallel relationship with the external plug-in portions of the terminals.

4,903,000

PRESSURE SENSOR HAVING MEANS FOR ELECTROMAGNETICALLY SHIELDING RESISTORS

Yasuhito Yajima, Nagoya, and Syunzo Mase, Tobishima, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Nov. 29, 1988, Ser. No. 277,188
Claims priority, application Japan, Dec. 3, 1987, 62-306100
Int. Cl.[4] G01L 1/22
U.S. Cl. 338—4 **12 Claims**



1. A pressure sensor comprising:

a metallic housing having an end with an opening formed therethrough;

a ceramic diaphragm positioned within said metallic housing such that said ceramic diaphragm is exposed at one of opposite major surfaces thereof to a pressure of a measurement fluid in an external space through said opening at the end of said metallic housing;

at least one resistor formed integrally on the other of said opposite major surfaces of said ceramic diaphragm, an electrical resistance value of said at least one resistor varying with said pressure acting on said one major surface of said ceramic diaphragm, whereby said pressure is determined by said electrical resistance value; and

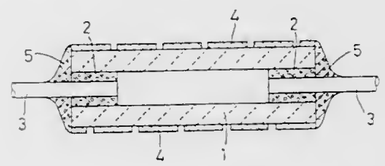
a shielding member formed as a film on said one major surface of said ceramic diaphragm, thereby covering said one major surface and protecting said at least one resistor from an electromagnetic wave in said external space.

4,903,001

DETECTING ELEMENT USING AN ELECTRICALLY RESISTIVE BODY, FOR DETERMINING A PARAMETER

Toru Kikuchi, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Jul. 7, 1988, Ser. No. 216,100
Claims priority, application Japan, Jul. 13, 1987, 62-174251
Int. Cl.[4] B05D 5/12; G01F 1/68
U.S. Cl. 338—22 R **21 Claims**



1. A detecting element for determining a parameter, comprising:

a support having a bearing surface;

an electrically resistive body formed on said bearing surface of said support;

conductor means electrically connected to said electrically resistive body;

bonding means for securing said conductor means to said support, said bonding means consisting of a porous glass structure which has pores formed therein as at least a part of a low-conductivity portion having a lower thermal

conductivity than a remainder of said bonding means which consists of a glass.

4,903,002

DISPLACEMENT OR POSITION TRANSDUCER

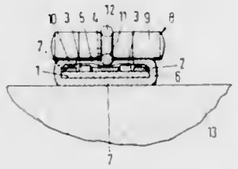
Lothar Sachse, Weisendorf, Fed. Rep. of Germany, assignor to Preh, Elektrofeinmechanische Werke, Jakob Preh. Nachf. GmbH & Co., Bad Neustadt/Saale, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,351

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710286

Int. Cl.[4] H01C *10/06*

U.S. Cl. 338—96 **11 Claims**



1. A displacement or position transducer, comprising a resistor track provided with voltage terminals and a slide, which can move along the latter and serves as displacement or position sensing element, wherein a conductor foil is arranged over the resistor track, held at a distance from the resistor track by at least one spacer track of flexible plastic and able to be pressed with flexible resilience against the resistor track, and wherein the slide is displaceably arranged above the conductor foil, pressing the latter against the resistor track.

4,903,003

VARIABLE RESISTOR WITH A SWITCH

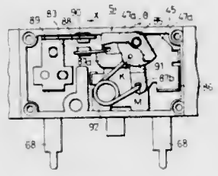
Junichi Kuratani, and Keizi Takezawa, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 139,901

Claims priority, application Japan, Apr. 28, 1987, 62-63435[U]

Int. Cl.[4] H01C *10/50*

U.S. Cl. 338—198 **4 Claims**



1. A variable resistor with a switch wherein a resistance strip and a collector strip are formed on a resistance base plate while a slider receiver having a slider thereon is mounted for sliding movement on and covers said resistance base plate, the resistance of said variable resistor being determined in accordance with a sliding position of said slider receiver while said switch is actuated to make a switching operation at a predetermined sliding position of said slider receiver, comprising an actuating element located on a side wall of said slider receiver, a switch base plate disposed in an opposing relationship to said side wall of said slider receiver, a fixed contact and a support shaft both provided on said switch base plate, a movable contact element supported for pivotal motion around said support shaft and having a movable contact located thereon for contacting with said fixed contact, a cam member also supported for pivotal motion around said support shaft and located for engagement and actuation by said actuating element, and a torsion coil spring having opposite ends connected to said movable contact element and said cam member such that when said cam member is pivoted, a connecting point at which said torsion coil spring is connected to said cam member may move across a straight line interconnecting said support shaft and another connecting point at which said torsion coil spring is connected to said movable contact element.

4,903,004

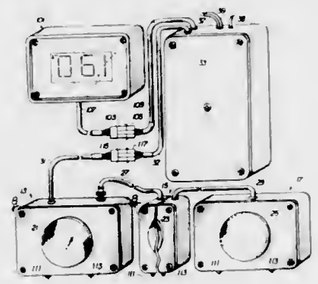
ALL-WEATHER DIGITAL DISTANCE MEASURING AND SIGNALLING SYSTEM

Jeffrey W. Starke, 10920 SW. 70th Ter., Miami, Fla. 33156, and Gregory Dalkranian, 640 SW. 73rd Ave., Miami, Fla. 33144

Filed Nov. 5, 1986, Ser. No. 927,110

Int. Cl.[4] B60Q *1/00;* **G08G** *1/16*

U.S. Cl. 340—425.5 **20 Claims**



1. A digital distance measuring & signalling system for a motor vehicle, such as a truck or automobile, comprising:

a transducer means both for receiving a pulsed electrical signal and generating a pulsed ultrasonic wave from said pulsed electrical signal and transmitting said ultrasonic wave, and, for receiving an ultrasonic wave and generating a pulsed electrical signal from said ultrasonic wave;

an output signal means for generating an output signal corresponding to the distance of an obstruction from the transducer means as determined from the time lapse interval between the transmission & reception of the ultrasonic wave;

a digital display means responsive to a varying output signal for producing a visual digital display &/or audible sounds;

a pulse generator means for producing a pulsed signal and transmitting said pulsed signal to the transducer means;

means for sending selected signals to the respective transducer means, output signal means, digital display means, & pulse generator means;

means for sending a signal from said pulse generator means to said transducer means;

means for sending a signal from said transducer means to said output signal means; and,

means for sending a signal from said output signal means to said digital display means.

4,903,005

COMPARATOR CIRCUIT

Narumi Sakashita, and Yukihiko Shimazu, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 28, 1988, Ser. No. 250,461

Claims priority, application Japan, Nov. 4, 1987, 62-278531

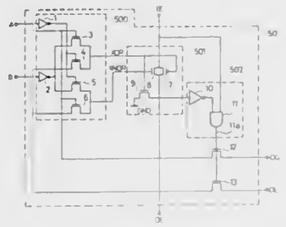
Int. Cl.[4] G06F *7/04*

U.S. Cl. 340—146.2 **5 Claims**

1. A binary one-digit comparator circuit useful for a multiple digit comparator circuit, which comprises:

a match detection circuit for determining whether or not first input data and second input data match;

a transmission circuit for outputting carry input data from a previous digit to a next digit if said match detection circuit determines that said first input data and said second input data match or a no match signal to said next digit if no match between said first input data and said second input data is detected;



a change point detection circuit for outputting a change point signal if said carry input data and carry output data on said transmission circuit do not match;

a first signal output unit for outputting said first input data when said change point detection circuit outputs said change point signal; and

a second signal output unit for outputting said second input data when said change point detection circuit outputs said change point signal.

4,903,006

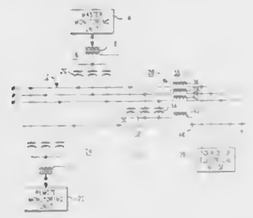
POWER LINE COMMUNICATION SYSTEM

Dirk J. Boomgaard, Monroeville, Pa., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Feb. 16, 1989, Ser. No. 311,502

Int. Cl.[4] H04M *11/04*

U.S. Cl. 340—310 A **7 Claims**



1. A power line communication system comprising:

an electrical power line having a predetermined number of electrical phase conductors, and electrical ground,

a source of communication signals applied to said power line at a first point,

a load connected to said power line at a second point,

said load applying electrical noise to said power line,

and a broad band directional trap connected to said power line between said first and second points which provides a lower impedance to ground for the electrical noise than for the communication signals,

said trap including a capacitor connected to each electrical phase conductor; and a 1:1 transformer having a winding connected in series with each electrical phase conductor between said first and second points, and an additional winding,

said additional winding functioning as a capacitor common, connecting each phase related capacitor to electrical ground,

each phase related capacitor being connected to the associated phase conductor between the associated phase related transformer winding and said first point, to cause communication signals to pass through all of the transformer windings in the same direction, providing a high inductance and high impedance to ground for the communication signals, while causing the electrical noise to pass through the capacitor common transformer winding in an opposite sense to the direction of the electrical noise through the phase related transformer windings, providing a low inductance and low impedance path to ground for the electrical noise.

4,903,007

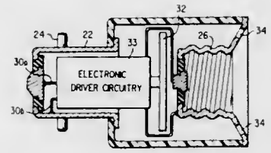
COMBINATION BACK-UP LIGHT AND SOUND EMITTING DEVICE FOR AUTOMOTIVE VEHICLE

Mark Gottlieb, Washington, D.C., assignor to Design Tech International, Inc., Washington, D.C.

Continuation of Ser. No. 222,730, Jul. 22, 1988, Pat. No. 4,851,813. This application Jun. 6, 1989, Ser. No. 362,304

Int. Cl.[4] B60Q *5/00*

U.S. Cl. 340—474 **5 Claims**



1. A combination back-up light and sound emitting device for use with automotive vehicle, comprising:

a housing;

means on said housing for mounting a light bulb thereto;

an electrical actuated sound emitting device mechanically and electrically connected to said housing;

means for mechanically connecting said housing to a back-up light socket of a vehicle tail light assembly; and

means on said housing for electrically connecting said sound emitting device and a light bulb mounted in said housing to said means for mechanically connecting said housing to a back-up light socket of a vehicle tail light assembly, whereby the mechanical connection of said combination back-up light and sound emitting device to a back-up socket of a vehicle also provides electrical connection for both said sound emitting device and a light bulb mounted in said housing.

4,903,008

INTERNATIONAL HAND SIGN STOP SIGNAL

Bill Lewis, 4146 Martin Luther King, Jr. Way, Oakland, Calif. 94609-2320

Continuation-in-part of Ser. No. 34,029, Apr. 2, 1987, abandoned. This application Jun. 30, 1988, Ser. No. 214,005

Int. Cl.[4] B60Q *1/44*

U.S. Cl. 340—479 **3 Claims**

1. A brake signal for a vehicle comprising:

a. a housing; said housing including a chamber and a first opening to said chamber, said housing further including a base;

b. a source of light, activated by the vehicle brake;

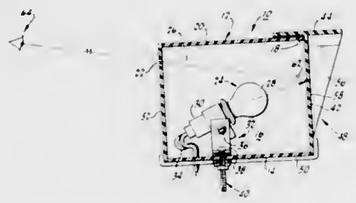
c. a translucent patterned panel;

d. means for mounting said light source within said housing chamber at a certain level above said housing base, including a hood detachably connected to said housing, said hood including a shoulder for pressing engagement with

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said patterned panel, and a clip extending along the base of said housing, said clip engaging said patterned panel;

e. means for removably mounting said patterned panel in said first opening to said chamber; and



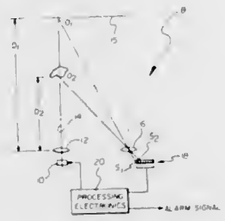
f. a second opening to said chamber, said second opening being at a level in said housing above said source of light, said source of light lying between said first and second openings to said housing chamber.

4,903,009

INTRUSION DETECTION DEVICE

George C. D'Ambrosia, Penfield, and Christopher A. Ludden, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1988, Ser. No. 195,746
Int. Cl.[4] G08B *13/18*
U.S. Cl. 340—556 23 Claims



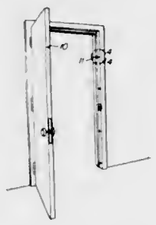
1. An intrusion detection device comprising a radiation emitter arranged to project a beam of infrared radiation toward a field of view, means for receiving the reflected radiation of said beam reflected from said field of view, said beam receiving means including a deflecting means and a plurality of detector means, said deflecting means being arranged to divert said reflected beam onto a specific detector means determined by the distance from said device at which said beam has been reflected by said field of view, said receiving means arranged to generate a signal indicative of the distance from said device at which said beam has been reflected by said field of view during a selected time period, means for storing a reference signal which is indicative of the distance of reflection of said beam from said field of view during a reference time period, means for comparing said signal from said selected time period with said reference signal, and means for generating an output signal if said signal is different from said reference signal.

4,903,010

INTRUSION DETECTION SWITCH HOUSING

Teddy R. Greene, 2171 Research Dr., Livermore, Calif. 94550

Filed Nov. 29, 1988, Ser. No. 277,162
Int. Cl.[4] G08B *23/00, 13/08*
U.S. Cl. 340—693 7 Claims



1. A magnetic switch unit for use in an intrusion detection device for mounting in a door or window assembly, comprising:

a generally cylindrical hollow housing member formed with a threaded exterior surface and having an end portion formed to receive a screw driver for screwing said housing member directly into said door or window assembly; and

an operative detection element fixed within said hollow housing member for detecting the movement of said door or window assembly;

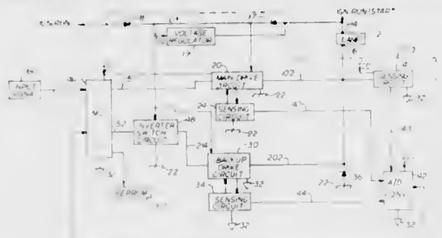
whereby said magnetic switch unit is adapted to be threadably installed directly into said door or window assembly.

4,903,011

LAMP DRIVE CIRCUIT

James H. Reinholm, Farmington Hills; Dana A. Stonerook, Plymouth, and Roger A. McCurdy, Troy, all of Mich., assignors to TRW Inc., Lyndhurst, Ohio

Filed Jan. 4, 1988, Ser. No. 140,390
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—641 33 Claims



1. An apparatus for energizing an indicator lamp comprising:

means for connecting one terminal of the lamp to a first electrical terminal, said first electrical terminal having an electrical potential present threat;

a main circuit for, when enabled by a first control signal, connecting a second terminal of the lamp to a second electrical terminal, said second electrical terminal having a first electrical ground reference present thereat, a difference in electrical potential between the first and second electrical terminals being sufficient to energize the lamp;

a backup circuit for, when enabled by a second control signal, connecting the second terminal of the lamp to a third electrical terminal, said third electrical terminal having a second electrical ground reference present thereat, a difference in electrical potential between the first and third electrical terminals being sufficient to energize the lamp;

sensing means for providing a signal indicative of the lamp being energized; and

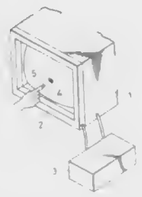
control means for providing said first control signal, said second control signal, and for monitoring said signal provided by said sensing means, said control means providing said second control signal when said first control signal is provided and said signal from said sensing means indicates the lamp is not energized.

4,903,012

COORDINATE SYSTEM INPUT DEVICE PROVIDING REGISTRATION CALIBRATION AND A MOUSE FUNCTION

Junichi Ohuchi, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1987, Ser. No. 101,136
Claims priority, application Japan, Jan. 20, 1987, 62-7058[U]; Jan. 20, 1987, 62-7059[U]; Jan 20, 1987, 62-7060[U]
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—709 5 Claims



1. A coordinate system input device comprising:

a display apparatus having a display screen;

a coordinate system detector disposed on a front surface of said display screen to detect a coordinate position of an object adjacent to said front surface of said display screen and to output detected coordinate system data corresponding to said position of said object;

an initial detected coordinate system memory means for storing an initial value of said detected coordinate system data obtained from said coordinate system detector;

a coordinate movement amount calculating means for calculating a movement amount of said object, as said object is being moved across said front surface, referenced to said initial value of said detected coordinate system data stored in said initial detected coordinate system memory means, said coordinate movement amount calculating means calculating said movement amount by comparing said initial value with new detected coordinate system data;

a cursor movement amount setting means for setting a movement amount of a cursor displayed on said display screen in response to an output of said coordinate movement amount calculating means;

a cursor coordinate system setting means for outputting data to said display apparatus indicating a cursor position in response to an output of said cursor movement amount setting means and said initial value stored in said initial detected coordinate system memory means; and

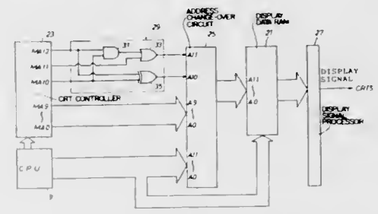
a cursor coordinate system memory means for storing an output of said cursor coordinate system setting means corresponding to a cursor position of said cursor displayed by said display apparatus when said object adjacent to said front surface of said display screen is removed.

4,903,013

DISPLAY SYSTEM FOR PLURAL DISPLAY AREAS ON ONE SCREEN

Susumu Takeda, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 30, 1987, Ser. No. 139,809
Claims priority, application Japan, Jan. 7, 1987, 62-1454
Int. Cl.[4] G09G *1/06*
U.S. Cl. 340—726 3 Claims



1. A display system for displaying characters on a screen which is divided into a plurality of display areas and for allowing a scroll within each of the display areas, comprising:

display data memory means for storing character data to be displayed on the screen, the display data memory means being divided into a plurality of memory areas each corresponding to a respective display area;

display control means for sequentially outputting addresses in order to output the character data of the display data memory means designated by the addresses to each of the display areas of the screen corresponding to respective memory areas of the display data memory means,

wherein a first number of address designation lines of the display control means is greater than a second number of address designation lines of the display data memory means; and

address conversion means including a logic circuit provided between the display control means and the display data memory means for converting said first number of addresses outputted from the display control means into said second number of addresses of the display data memory means, said logic circuit receiving a select number of said first number of address designation lines and outputting less than said select number of said second number of address designation lines, whereby any virtual address outputted from said display control means is converted into an actual address of the memory areas of the display data memory means, the virtual address being greater than any of the actual addresses of the display data memory means.

4,903,014

CHARACTER FONT CONVERTING SYSTEM

Kunio Yoshida, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 6, 1987, Ser. No. 118,027
Claims priority, application Japan, Nov. 6, 1986, 61-265142
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—727 3 Claims

1. A system for converting a dot character font having a first orientation into a character font having a second orientation, comprising:

font memory means for storing an original dot character font having said first orientation;

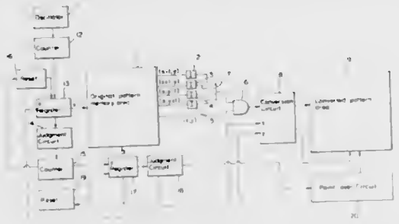
peripheral dot detection means for detecting peripheral black dots of said dot character font stored in said font memory means including,

address means for sequentially addressing locations in said font memory means,

means for detecting whether an addressed location contains a black dot, and

means for determining whether a black dot detected by said means for detecting is a peripheral black dot by detecting whether at least one location adjacent to said addressed location contains a white dot;

font conversion means for converting the location of peripheral black dots detected by said peripheral dot detection



means to said second orientation according to predetermined conversion parameters;

converted font pattern memory means for storing the converted peripheral black dot pattern produced by said font conversion means; and

paint-over means for converting white dots within said stored peripheral black dot pattern into black dots to complete the conversion of said original dot character font.

4,903,015

COMMUNICATION DEVICE AND STAR CIRCUIT FOR USE IN SUCH A COMMUNICATION DEVICE, AND DEVICE COMPRISING SUCH A STAR CIRCUIT

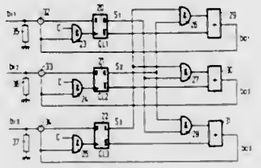
Bernard Van Steenbrugge, and Egbertus J. Berkhoff, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1988, Ser. No. 191,296

Claims priority, application Netherlands, May 22, 1987, 8701221

Int. Cl.[4] H04L *11/16*

U.S. Cl. 340—825.500 **10 Claims**



4,903,016

COMMUNICATION CONTROL UNIT

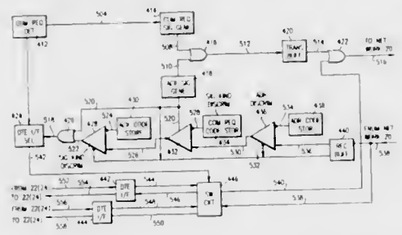
Toshiharu Murai, Kawasaki, and Akio Matsubara, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 5, 1988, Ser. No. 215,414

Claims priority, application Japan, Jul. 7, 1987, 62-167791; Jul. 9, 1987, 62-169708; Apr. 13, 1988, 63-89284

Int. Cl.[4] G08C *17/00;* **H04J** *3/16*

U.S. Cl. 340—825.070 **16 Claims**



1. A communication control unit for controlling data transmission and reception between a terminal and a communication network employing a multi-conjunction architecture, said communication control unit comprising:

transmitter/receiver means for transmitting a signal to and for receiving a signal from the communication network, said signal transmitted to and received from the communication network prior to a data communication between the terminal and the communication network comprising at least a destination address portion indicating an address of a destination communication control unit, an originating address portion indicating an address of an originating communication control unit and a signal kind indicating portion indicating whether the signal is a transmission request or an acknowledge signal;

switch means for enabling signal transmission and reception between the terminal and the communication network through said transmitter/receiver means in a first state and for disabling the signal transmission and reception between the terminal and the communication network through said transmitter/receiver means in a second state; and

control means comprising address discriminating means for discriminating whether or not an address indicated by the destination address portion of the signal received from the communication network through said transmitter/-receiver means coincides with an address of said communication control unit, signal kind discriminating means for discriminating the kind of the signal received from the communication network through said transmitter/-receiver means, and signal detecting means for detecting whether or not a signal received from the communication network through said transmitter/receiver means is intended for the terminal coupled to said communication control unit based on a discrimination made in said address discriminating means,

said control means controlling said switch means to the first state only when said address discriminating means discriminates that the two addresses coincide and said signal kind discriminating means discriminates that the signal received is a transmission request signal when receiving the signal from the communication network through said transmitter/receiver means, and controlling said switch means to the first state only when said address discriminating means discriminates that the two addresses coincide and said signal kind discriminating means discriminates that the signal received is an acknowledge signal when transmitting the signal to the communication network through said transmitter/receiver means.

4,903,018

PROCESS FOR COMPRESSING AND EXPANDING STRUCTURALLY ASSOCIATED MULTIPLE-DATA SEQUENCES, AND ARRANGEMENTS FOR IMPLEMENTING THE PROCESS

Heinz-Ulrich Wiebach, Friedrichsdorf, and Reinhard Lidzba, Frankfurt, both of Fed. Rep. of Germany, assignors to Heinz-Ulrich Wiebach, Friedrichsdorf, Fed. Rep. of Germany

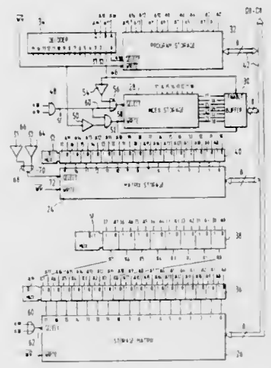
PCT No. PCT/DE86/00289, § 371 Date May 18, 1987, § 102(e) Date May 18, 1987, PCT Pub. No. WO87/00714, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 16, 1986, Ser. No. 40,772

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525898

Int. Cl.[4] H03M *7/38*

U.S. Cl. 341—51 **37 Claims**



1. Process of compression and expansion of several structurally associated data sequences, including data sequences comprising data sets to be compressed, wherein the data sets to be compressed are stored in parallel in a storage matrix with regard to their structural association for obtaining a number of data elements of the data sequences of linking characteristic for several data sequences, the process comprising the steps of:

compression of the data sequences by applying codes in substitution and representative of the data elements of coincident ordinal numbers;

expansion of the data sequences by encoding the codes and obtaining the data elements, and arranging the data elements in data sequences with regard to the respective actual data element ordinal number;

characterized in that the process further comprises the steps of:

evaluation of the lengths of the data sequences, prior to performance of the structural analysis;

formation of data sequence groups comprising data sequences of equal length, prior to performance of the structural analysis; and

arrangement of the groups of data sequences in accordance with increasing or decreasing length of the sequences, prior to performance of the structural analysis.

4,903,017

AIRCRAFT DISPLAY DEVICES

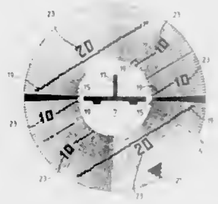
Frank R. Wooller, Kent, England, assignor to GEC-Marconi Limited, England

Continuation of Ser. No. 40,227, Apr. 20, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 325,662

Claims priority, application United Kingdom, Apr. 23, 1986, 8609931

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—975 **9 Claims**



1. A display device for an aircraft, comprising:

(A) a circular array including a multitude of selectively activatable display elements, the array having an outer periphery bounding a circular display area having a center,

(i) the elements being disposed in equally angularly spaced lines extending radially from the center of the display area, each radial line having at least four, and the same number of, elements with corresponding elements in the different radial lines at the same radial distance from the center of the display area,

(ii) the elements along each radial line occupying a major proportion of the radial line,

(iii) each said element subtending an angle of substantially the same magnitude at the center of the display area and having a radial dimension of substantially the same magnitude, and

(iv) each said element being arranged to be substantially contiguous with each adjacent element; and

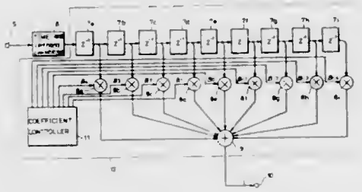
(B) means for selectively activating said display elements in accordance with aircraft attitude whereby the selected elements form a visible area and line pattern indicative of the aircraft attitude, said means for selectively activating said display elements activating elements in a segmental area defined by a chord joining extremities of an arcuate portion of the outer periphery of the array, said chord moving with respect to the array in a direction normal to its length to depict changes in pitch of the aircraft and changing its angle with respect to the array to depict changes in roll of the aircraft.

4,903,019

SAMPLING FREQUENCY CONVERTER FOR CONVERTING A LOWER SAMPLING FREQUENCY TO A HIGHER SAMPLING FREQUENCY AND A METHOD THEREFOR

Nobuo Ito, Inazawa, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Aug. 23, 1988, Ser. No. 235,231
Claims priority, application Japan, Aug. 31, 1987, 62-218523
Int. Cl.[4] H03M *7/30*
U.S. Cl. 341—61 **9 Claims**



1. A sampling frequency converter for converting first time-sequential data Q_i obtained by sampling an analog signal at the rate of a first sampling frequency f_m to second time-sequential data P_j having a second sampling frequency f_n ($f_m:f_n=m:n$, $m<n$, m, n: integer), comprising:

time axis converter means (6) receiving said first time-sequential data Q_i for converting the same to a data stream having said second sampling frequency f_n by adding $(n-m)$ dummy data to said first time-sequential data Q_i every time m said first time sequential data Q_i are applied, to output the converted data stream, and

means (12) having n kinds of tap coefficient data obtained based on impulse response data obtained by sampling a sampling function for said first sampling frequency f_m at the rate of the least common multiple of said frequencies f_n and f_m for interpolating an output of said time axis converter means by using said tap coefficient data,

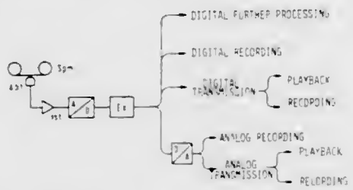
said tap coefficient data being determined to eliminate the effect of said dummy data and being switched at the rate of said second sampling frequency f_n.

4,903,020

METHOD AND APPARATUS FOR DIGITALLY PROCESSING STORED COMPRESSED ANALOG SIGNALS

Jürgen Wermuth, Peine, and Heinz Göckler, Backnang, both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Oct. 5, 1988, Ser. No. 254,117
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1987, 3733738; May 4, 1988, 3815079
Int. Cl.[4] H04C *3/00*
U.S. Cl. 341—106 **30 Claims**



2. In a signal processing apparatus including a scanning means for scanning signals from a storage medium on which analog signals are recorded in a compressed manner and wherein the signals are to be expanded for subsequent utilization, the improvement comprising:

an A/D converter responsive to the scanned compressed analog signals for initially converting the compressed analog signals into an output of compressed digital signals, and

a digital expander having an input connected to the output of the A/D converter for digitally expanding the compressed digital signals and for providing an output.

4,903,021

SIGNAL ENCODING/DECODING EMPLOYING QUASI-RANDOM SAMPLING

Stephen W. Leibholz, 1204 Pheasant Rd., Rydal, Pa. 19046

Continuation of Ser. No. 129,886, Nov. 24, 1987, abandoned, which is a continuation of Ser. No. 864,154, May 16, 1986, abandoned, which is a continuation of Ser. No. 444,179, Nov. 24, 1982, abandoned. This application Nov. 3, 1988, Ser. No. 267,662
Int. Cl.[4] H03M *1/00*
U.S. Cl. 341—110 **2 Claims**



1. A signal transmission system having a maximum transmission frequency for transmitting said signal, the signal having a minimum sampling frequency which exceeds said maximum transmission frequency, said system including an encoding subsystem and decoding subsystem comprising:

a first quasi-random interval generator including means for generating a substantially random number;

means responsive to said first quasi-random interval generator for producing coded samples of said signal, the time between said samples varying quasi-randomly;

a first buffer for storing said coded samples;

a clock means for retrieving said coded samples from said first buffer, the time between each of said retrieved coded samples being substantially equal, and the frequency of said retrieved coded samples being substantially equal to said maximum transmission frequency;

a second buffer remote from said first buffer for storing said retrieved coded samples;

a second quasi-random interval generator including means for generating a substantially random number, said second quasi-random interval generator being synchronized with said first quasi-random interval generator; and

means responsive to said second quasi-random interval generator for decoding the retrieved coded samples from said second buffer.

4,903,022

INCREMENT/DECREMENT SAMPLING PHASE SHIFTER

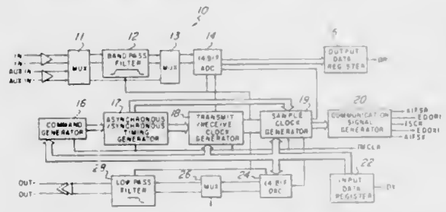
Richard K. Hester, Whitewright, and Nuboru Shiwaku, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 9, 1987, Ser. No. 130,819
Int. Cl.[4] H03M *1/10*
U.S. Cl. 341—110 **5 Claims**

1. An analog interface system for interfacing with a digital signal processor having an analog-to-digital converter of digitally selectable sample rate and a digital-to-analog converter of digitally selectable sample rate for converting input analog data signals and output digital data signals, respectively, a communication bus and means for detecting a sampling rate mismatch between said converters and the amplitude of said mismatch, for transmitting the mismatch amplitude on the communication bus to the analog interface system, comprising:

(a) an analog input channel including the analog-to-digital converter, input means for receiving the input analog data signals and transmitting the input analog data signals to the analog-to-digital converter for conversion to input digital data signals, and output means connected to the communication bus for transmitting of the input digital signals to the digital signal processor;

(b) an analog output channel including the digital-to-analog converter, input means connected to the communication



bus for receiving the output digital data signals from the digital signal processor and transmitting the output digital data signals to the digital-to-analog converter for conversion into analog output signals; and

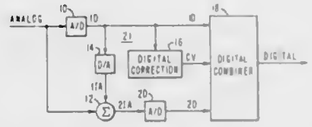
(c) increment/decrement means connected to receive the input analog signals from the input means to indicate the amplitude of mismatch and the required direction of change of sampling rate for advancing or retarding the sampling rate of said converters in accordance with the amplitude of the mismatch.

4,903,023

SUBRANGING ANALOG-TO-DIGITAL CONVERTER WITH DIGITAL ERROR CORRECTION

William P. Evans, Glen Burnie, and Eric H. Naviasky, Catonsville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 795,397, Nov. 6, 1985, abandoned. This application Mar. 28, 1988, Ser. No. 174,253
Int. Cl.[4] H03M *1/10*
U.S. Cl. 341—120 **17 Claims**



1. An analog-to-digital conversion system for converting an analog input signal into corresponding digital output values, said conversion system comprising:

first means for converting an instantaneous value of the analog input signal into a first digital value;

second means for converting said first digital value into a first intermediate analog value;

difference means for providing a second intermediate analog value which is responsive to the difference between said instantaneous value of the analog input signal and the first intermediate analog value;

third means for converting said second intermediate analog value into a second digital value;

correction means for providing a predetermined correction value responsive to said first digital value, said correction means including a digital memory addressed by said first digital value, with the provided correction value being stored at the memory position being addressed; and

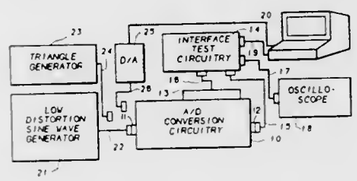
combining means for digitally combining said first and second digital values and said correction value to provide a digital output value.

4,903,024

A/D CONVERTER SYSTEM WITH ERROR CORRECTION AND CALIBRATION APPARATUS AND METHOD

William P. Evans, Glen Burnie, and Thomas K. Lisle, Jr., Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 23, 1987, Ser. No. 111,765
Int. Cl.[4] H03M *1/10*
U.S. Cl. 341—120 **27 Claims**



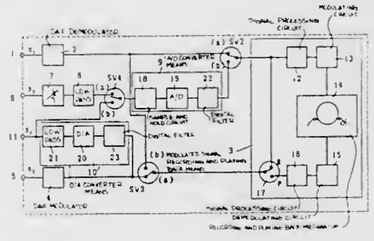
1. An analog to digital converter system comprising: conversion circuitry operative for developing a digital output corresponding to the magnitude of an input analog signal, a calibration port arranged for receiving digital calibration data from an external source, adjustable calibration means comprising adjustable reference voltage means comprised of solid state potentiometer means associated with said circuitry, and adjustment means for adjusting said calibration means in response to data applied to said calibration port, said adjustment means being operable for adjusting said adjustable reference voltage means.

4,903,025

SIGNAL PATH SETTING CIRCUIT

Takeshi Nakamichi, Kodaira, Japan, assignor to Nakamichi Corporation, Kodaira, Japan

Filed Apr. 5, 1988, Ser. No. 177,616
Claims priority, application Japan, Apr. 7, 1987, 62-52470[U]; Feb. 17, 1988, 63-19867[U]
Int. Cl.[4] G11B *27/02*
U.S. Cl. 341—123 **6 Claims**



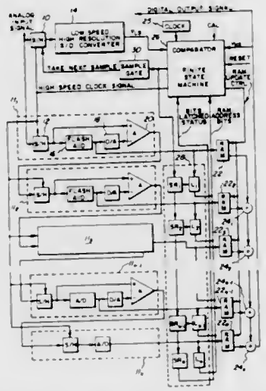
1. A signal path setting circuit comprising:

first switching means to select a signal from a plurality of digital signals including a first digital signal from recording and playing back means for making a digital recording and playback through a recording medium;

D/A converter means to receive said selected signal from said first switching means and to convert this digital signal into a first analog signal;

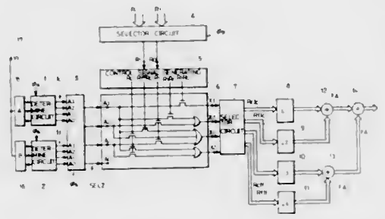
second switching means to supply a selected signal from a plurality of analog signals including said first analog signal from said D/A converter means;
and A/D converter means to convert said analog signal from said second switching means into a second digital signal.

4,903,026
ARCHITECTURE FOR HIGH SAMPLING RATE, HIGH RESOLUTION ANALOG-TO-DIGITAL CONVERTER SYSTEM
Jerome J. Tiemann, Schenectady; William E. Engeler, Scotia, and Kenneth B. Welles, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Nov. 22, 1988, Ser. No. 274,082
Int. Cl.[4] H03M *1/20, 1/38*
U.S. Cl. 341—131 **16 Claims**



1. A high sampling rate, high resolution analog-to-digital converter system comprising:
a low speed, high resolution analog-to-digital converter for providing a first digital output signal in response to a system analog input signal;
first sample and hold circuit means coupled to the input of said low speed analog-to-digital converter and operable at said low speed for sampling said system analog input signal;
a high speed, low resolution pipelined analog-to-digital converter including second sample and hold circuit means operable at said high speed for sampling said system analog input signal, said high speed, low resolution analog-to-digital converter being adapted to generate address bits;
memory means coupled to receive address bits from said high speed, low resolution analog-to-digital converter for generating a second digital output signal corresponding to said analog input signal and
comparator means responsive to said first and second digital output signals for iteratively comparing said digital signals and being adapted to correct said second digital output signal by updating said memory means at said low speed rate said corrected second digital output signal thereby representing the high sampling rate, high resolution analog to digital converter system output signal.

4,903,027
A/D CONVERTER COMPRISING ENCODER PORTION HAVING FUNCTION OF MULTIPLYING ANALOGUE INPUT BY DIGITAL INPUT
Sumitaka Takeuchi, and Keisuke Okada, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 11, 1988, Ser. No. 159,405
Claims priority, application Japan, Feb. 12, 1987, 62-30013
Int. Cl.[4] H03M *1/14*
U.S. Cl. 341—156 **5 Claims**

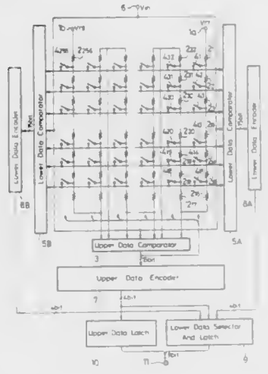


1. An A/D converter having a multiplying function, comprising:
means for supplying analog input data,
means responsive to said analog input data for calculating a first digital code I_c which provides a basis of A/D conversion of n/2 more significant digits, where n is a positive integer,
means responsive to said analog input data for calculating a second digital code I_f which provides a basis of A/D conversion of n/2 less significant digits,
first selecting means for selecting alternately said first digital code I_c and said second digital code I_f at predetermined timing and outputting the same,
means for supplying m-bit digital input data, where m is a positive integer,
second selecting means for selecting alternately a first digital signal R_c which is m/2 more significant bits of said digital input data and a second digital signal R_f which is m/2 less significant bits of said digital input data at predetermined timing and outputting the same,
multiplying means responsive to the digital code which is outputted from said first selecting means and the digital signal which is outputted from said second selecting means for sequentially performing a first multiplication $R_c \times I_c$, a second multiplication $R_f \times I_c$, a third multiplication $R_c \times I_f$, I_f and a fourth multiplication $R_f \times I_f$ within the time period determined for one A/D conversion,
first adding means for adding the result of shiftin m bits a result R_cI_c of said first multiplication and the result of shifting m/2 bits a result R_fI_c of said second multiplication,
second adding means for adding the result of shifting m/2 bits a result R_cI_f of said third multiplication and a result R_fI_f of said fourth multiplication, and
third adding means for adding an output of said first adding means and an output of said second adding means.

4,903,028
ANALOG-TO-DIGITAL CONVERTER
Noriyuki Fukushima, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 19, 1989, Ser. No. 299,016
Claims priority, application Japan, Jan. 27, 1988, 63-16269
Int. Cl.[4] H03M *1/00*
U.S. Cl. 341—156 **8 Claims**

1. An analog-to-digital converter for converting an analog input voltage signal to a digital output voltage signal of m upper bits and n lower bits, comprising:

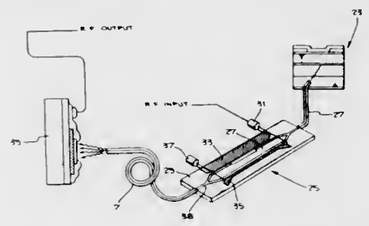
a plurality of resistor means connected in a series circuit to a voltage source for establishing respective reference voltages;
upper bit encoder means having a first input receiving said analog input voltage and second inputs connected to said series circuit at respective intervals defining groups of said resistor means therebetween for generating said m upper bits and a switch control signal, each of said groups including a plurality of said resistor means;
first lower bit encoder means having a first input receiving said analog input voltage signal and second inputs for generating said n lower bits;



second lower bit encoder means having a first input receiving said analog input voltage signal and second inputs for generating said n lower bits;
switch means associated with each of said groups of said resistor means and responsive to said switch control signal for selectively connecting each of said second inputs of said first and second lower bit encoder means to respective resistor means in said associated group of said resistor means, and
means for alternately combining said m upper bits with said n lower bits generated by said first and second lower bit encoder means, and for generating said digital output voltage signal.

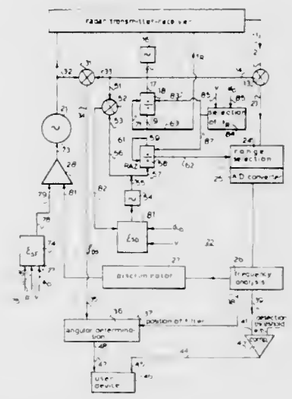
4,903,029
DELAYED REPLICA RADAR TEST SET TARGET
Irwin L. Newberg, Northridge, and Adrian E. Popa, Newbury Park, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Mar. 18, 1988, Ser. No. 169,930
Int. Cl.[4] G01S *7/40;* **G02F** *2/00;* **G08C** *19/36*
U.S. Cl. 342—172 **37 Claims**

1. A radar test set for producing a delayed replica of an R. F. radar signal comprising:
a. light means for generating a light;
b. modulation means connected to the radar signal and to said light means for modulating the light generated by said light means in accordance with the radar signal;
c. delay means connected to said modulation means for delaying the modulated light, said delay means including a fiber optic cable have two ends, one end of which is connected to the modulated light; and



d. demodulator means connected to the other end of said fiber optic cable for extracting from the modulated light the delayed radar signal.

4,903,030
ANGULAR DISCRIMINATION PROCESS AND DEVICE FOR RADAR
Bernard J. Maitre, Elancourt, France, assignor to Electronique Serge Dassault, Paris, France
Filed Jul. 2, 1987, Ser. No. 75,679
Int. Cl.[4] G01S *13/72, 13/50*
U.S. Cl. 342—113 **25 Claims**



1. A process for the angular discrimination, by a coherent pulse radar carried by a flying missile, of close terrestrial points, which comprises the steps of:
(a) determining Doppler frequency of close terrestrial points to be discriminated between by narrow passband filtering of the frequencies;
(b) making an angular determination of the points by analysis based on the determined Doppler frequencies during a period of analysis; and
(c) during the period of said analysis, maintaining the Doppler frequency to be determined at its initial value.

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4,903,031

SATELLITE RECEIVER

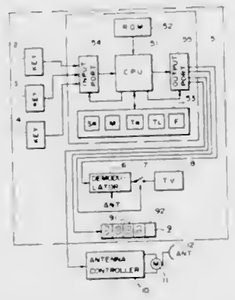
Tsuneo Yamada, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 841,617, Mar. 20, 1986, abandoned. This application Oct. 20, 1987, Ser. No. 110,537

Claims priority, application Japan, Mar. 26, 1985, 60-59553; Mar. 26, 1985, 60-59554; Mar. 26, 1985, 60-42366[U]

Int. Cl.⁴ H01Q *3/02*

U.S. Cl. 342—359 **6 Claims**



1. A satellite receiver for receiving and reproducing a signal from a transponder of a satellite, comprising:

a receiver unit means;

said receiver unit means having an output means for supplying a demodulated signal from designated satellite and transponder;

a reproduction unit means for exhibiting a reproduction of the demodulated signal from the output means of said receiver unit means;

a control unit means including

(a) a first memory means for storing designated satellite and transponder numbers, and

(b) a second memory means for storing satellite and transponder numbers to be locked by a parental lock signal,

(c) a coincidence determining means for comparing the memory contents of said first memory means with said second memory means to determine whether said designated satellite and transponder numbers corresponds with said satellite and transponder numbers to be locked, and

(d) a means for generating a parental lock signal when said coincidence determining means determines that the memory contents of said first and second memory means coincide;

a means for disabling the reproduction at said reproduction unit means for the demodulated signal which has been received from said designated satellite and transponder in response to said parental lock signal;

a third memory means for storing a recitation number and means for inputting a recitation number, wherein the inhibition of reproduction by said means for disabling is released in response to the occurrence of a coincidence between the stored recitation number and the input recitation number; and

a flag means responsive to a recitation number update instruction for raising a flag, wherein said control unit responsive to the coincidence of the input recitation number with the recitation number stored in said third memory means releases the receiver from the parental lock when said flag means does not raise the flag and rewrites said third memory with the input updated recitation number when said flag means raises the flag.

4,903,032

METHOD AND DEVICE FOR PROTECTION AGAINST A JAMMER IN A RADIO STATION COMPRISING SEVERAL CHANGE-OVER ANTENNAS AND THEIR USE FOR THE MAKING OF RADIOGONIOMETERS

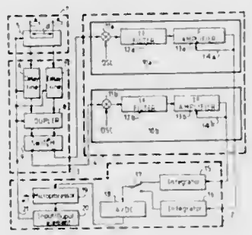
Gilbert Multedo, Bouffemont, and Jean-Claude Balin, Paris, both of France, assignors to Thomson-CSF, Paris, France

Filed Jul. 6, 1988, Ser. No. 215,709

Claims priority, application France, Jul. 7, 1987, 87 09624

Int. Cl.⁴ G01S *5/04;* **H04K** *3/00*

U.S. Cl. 342—441 **10 Claims**



1. A method for protection against a jammer in a radio station comprising several antennas which can be changed over to one or more reception channels, comprising the steps of:

determining a temporal window centered on a time when the antennas are changed over from one to another; and

masking an energy influence of the aliased spectrum of the jammer, received in the useful band of each of the reception channels during a specified time interval surrounding the instant at which an antenna is changed over to a reception channel by attenuating, in each of the channels, the signal received from an antenna in said temporal window centered on the change-over instant, the attenuation ratio varying substantially linearly with time near each of the ends of the window, passing through a maximum value in the middle of the window.

4,903,033

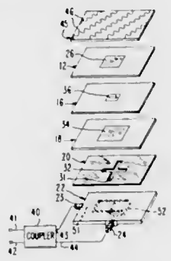
PLANAR DUAL POLARIZATION ANTENNA

Chich-Hsing Tsao, Saratoga; Yeongming Hwang, Los Altos Hills; Francis J. Kilburg, Mountain View, and Fred J. Dietrich, Palo Alto, all of Calif., assignors to Ford Aerospace Corporation, Newport Beach, Calif.

Filed Apr. 1, 1988, Ser. No. 176,581

Int. Cl.⁴ H01Q *1/38*

U.S. Cl. 343—700 MS **8 Claims**



1. A microwave-frequency microstrip antenna simultaneously usable with dual orthogonally polarized signals, comprising:

a substantially planar 90° rotation-symmetric conductive radiating patch mounted on a substantially planar first dielectric having first and second sides;

a substantially planar conductive ground plane having a first side facing the second side of the first dielectric, said ground plane having two elongated coupling apertures having substantially the same size and shape, being disposed at right angles to each other, being less than one-half wavelength long at the nominal center frequency of operation, and crossing each other at their respective midpoints;

a substantially planar second dielectric having a first side facing a second side of the ground plane and a second side on which lie two substantially identical conductive planar feed networks that correspond to the dual orthogonal polarizations and are disposed at right angles with respect to each other, wherein each feed network is symmetric about one of two center planes, respectively, each of which is orthogonal to the first and second dielectrics and ground plane and which bisects a corresponding one of the coupling apertures; and

at least one additional substantially planar tuning layer interposed between the first dielectric and the ground plane, wherein each tuning layer comprises a dielectric material on which lies a conductive non-apertured tuning element that is centered with respect to each feed network, whereby the bandwidth of the antenna is dependent upon the number, composition, and thickness of the tuning layers; wherein

the projection of each aperture onto the plane of the radiating patch is centered with respect to the radiating patch;

each feed network comprises two elongated substantially identical parallel conductive microstrip elements positioned equidistant from their associated center plane, each microstrip element being disposed orthogonally with respect to its associated coupling aperture; and

the antenna radiates in one direction only, said direction being defined by a vector originating at the midpoints of the coupling apertures and terminating at the midpoint of the radiating patch.

4,903,034

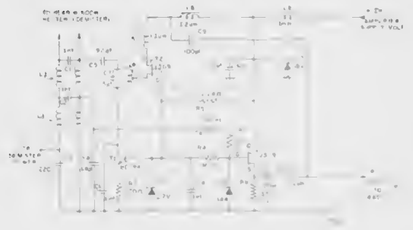
ELECTRICAL SIGNAL SEPARATING DEVICE HAVING ISOLATING AND MATCHING CIRCUITRY

Jerzy J. Kropielnicki, Knutsford; Brian Easter, Llangeeni, and James D. Last, Gwyneed, all of United Kingdom, assignors to BSH Electronics, Ltd., Manchester, England

Continuation of Ser. No. 27,519, Mar. 18, 1987, abandoned, which is a division of Ser. No. 563,513, Dec. 20, 1983, Pat. No. 4,654,669. This application Mar. 7, 1989, Ser. No. 319,992

Int. Cl.⁴ H01Q *1/02, 1/32*

U.S. Cl. 343—704 **7 Claims**



1. An isolating and matching device to enable the heating element of a motor vehicle electrically heatable window, not designed specifically to be an antenna or aerial and essentially aperiodic and non-resonant at VHF frequencies, to be used as a receiving aerial, said device being interconnected between terminal leads of said heating element and an aerial feeder circuit of a receiver and having input leads for connection to a motor vehicle D.C. power supply and an aerial terminal for connection to said aerial feeder circuit, comprising in combination: isolating circuitry effectively coupled in parallel with said terminal leads and said heating element and connected with said motor vehicle D.C. power supply to permit passage of heating current from said power supply to the said heating element while isolating or blocking passage of RF signals from said heating element to the said power supply, and means including matching circuitry means for effectively matching the impedance of said heating element to an aerial input impedance of the said aerial feeder circuit to thereby effect efficient VHF signal reception, said matching circuitry means including input circuit capacitance means operatively connected in series with an inductance of said isolating circuitry and in parallel with said heating element to bring the said heating element to parallel resonance near the center of the VHF band; whereby, via said isolating and matching device, said motor vehicle electrically heatable window forms together with said input circuit capacitance means and said inductance of the said isolating circuit means a parallel resonance in the VHF band and becomes usable as an efficient VHF receiving aerial.

4,903,035

ELECTRICAL SIGNAL SEPARATING DEVICE HAVING ISOLATING AND MATCHING CIRCUITRY

Jerzy J. Kropielnicki, Knutsford, England; Brian Easter, Llangefni, and James D. Last, Llanfairfechan, both of United Kingdom, assignors to BSH Electronics, Ltd., Manchester, England

Continuation of Ser. No. 563,513, Dec. 20, 1983, Pat. No. 4,654,669. This application Mar. 18, 1987, Ser. No. 27,420

The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.

Int. Cl.⁴ H01Q *1/02, 1/32*

U.S. Cl. 343—704 **10 Claims**



1. An isolating and matching device to enable the heating element means of a motor vehicle electrically heatable window, not designed specifically to be an antenna or aerial and essentially aperiodic and non-resonant at VHF frequencies, to be used as a broad-band VHF receiving aerial, said device being interconnected between terminal leads of said heating element and an aerial feeder circuit of a receiver and having input leads for connection to a motor vehicle D.C. power supply and an aerial terminal for connection to said aerial feeder circuit, comprising in combination: isolating circuitry coupled with said terminal leads of said heating element and with said motor vehicle D.C. power supply to permit passage of heating current from said power supply to the said heating element while isolating or blocking passage of RF signals from said heating element to the said power supply, and means including matching circuitry means for effectively matching the impedance of said heating element to an aerial input impedance of the said aerial feeder circuit to thereby effect efficient VHF signal reception, said matching circuitry means including input circuit means operatively connected with said terminal leads of said heating element for bringing the said heating element to series resonance near the center of the VHF band to thereby provide efficient broad-band VHF reception; whereby, via said isolating and matching device, said motor vehicle electrically heatable window forms together with said input circuit means a series resonance in the VHF band and

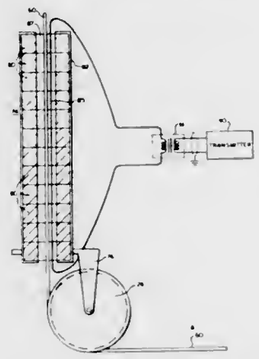
becomes usable as an efficient broad-band VHF receiving aerial.

4,903,036

VLF COMMUNICATION SYSTEM

Myron S. Wheeler, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1988, Ser. No. 288,386
Int. Cl.[4] H01Q *1/28*
U.S. Cl. 343—706 **7 Claims**



1. A VLF communication system, comprising:
(A) a VLF transmitter;
(B) an aerostat;
(C) a ground based aerostat deployment/retrieval mooring system;
(D) an electromechanical tether having an electrical portion and a mechanical portion connecting said aerostat with said mooring system and being of a length H when said aerostat is deployed, where H is approximately a quarter wavelength of the operating frequency of said transmitter;
(E) an elongated sleeve transformer having a longitudinal central aperture;
(F) said transformer including at least a one turn primary winding passing through said central aperture;
(G) said tether passing through said central aperture and constituting a secondary winding of said transformer;
(H) means coupling said primary winding to said transmitter to couple a VLF signal to be transmitted to the electrical portion of said tether which operates as an antenna to radiate said signal.

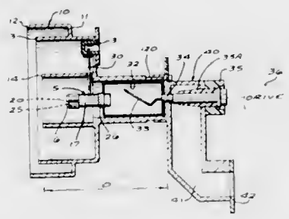
4,903,037

DUAL FREQUENCY MICROWAVE FEED ASSEMBLY

Rodney A. Mitchell, Tujunga, and Gerry B. Blachley, Simi Valley, both of Calif., assignors to Antenna Downlink, Inc., Simi Valley, Calif.

Filed Oct. 2, 1987, Ser. No. 105,135
Int. Cl.[4] H01Q *13/02*
U.S. Cl. 343—756 **21 Claims**

14. A coaxial dual frequency antenna feed assembly comprising a generally circular horn defining a first circular aperture and waveguide cavity having boundary walls;
a first probe for detecting electromagnetic energy in a first frequency band exposed to incident electromagnetic energy in said first circular aperture and positioned within said first waveguide cavity including a portion thereof coaxial with said first circular aperture and waveguide cavity;
means outside of said first circular aperture and waveguide cavity for rotating said first probe to change the polarization thereof;
means defining a second circular aperture and waveguide cavity of smaller size than said first circular aperture and waveguide cavity;
a second probe exposed to incident electromagnetic energy in said second circular aperture and positioned within said second waveguide cavity for detecting electromagnetic energy entering said second circular aperture in a higher frequency band than electromagnetic energy detected by said first probe;
means for positioning said means defining said second circular aperture and waveguide cavity coaxially within said



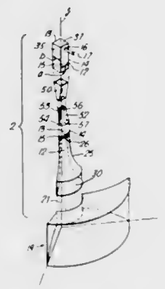
first circular aperture and waveguide cavity and wherein said means defining said second aperture and waveguide cavity is spaced from all of the boundary walls of said first circular aperture and waveguide cavity;
signal conducting means for transmitting electromagnetic energy detected by said second probe to the exterior of said first circular waveguide cavity; and
means for rotating said second probe to change the polarization thereof
said means for rotating said second probe extending longitudinally through a portion of said first waveguide cavity and into probe rotational coupling engagement with said second cavity.

4,903,038

HORN ANTENNA ARRANGEMENT

Peter J. Massey, Crawley, England, assignor to U.S. Philips Corp., New York, N.Y.

Filed Dec. 16, 1988, Ser. No. 286,573
Claims priority, application United Kingdom, Dec. 22, 1987, 8729914
Int. Cl.[4] H01Q *13/02*
U.S. Cl. 343—786 **18 Claims**



1. A horn antenna arrangement comprising an H-plane sectoral horn wherein, with reference to a cylindrical co-ordinate system having a rectilinear z-axis which is normal to a reference plane parallel to the H-plane, the sectoral horn has a wide angle of flare about the z-axis in the reference plane, said angle of flare being not greater than 360 degrees, the sectoral horn being bounded over the whole of said angle of flare by conductive surfaces spaced apart in the z-axis direction and conductively connected to conductive planar side surfaces arranged radially to the z-axis at each end of the angle of flare, and wherein the aperture of the horn substantially conforms to an imaginary reference surface which is cylindrical about the z-axis, in combination with a feeder waveguide formed between substantially orthogonally disposed first and second pairs of parallel spaced conductive surfaces, said feeder waveguide extending from the throat of the sectional horn and being provided with launching means for launching radio-frequency energy along said feeder waveguide towards said horn substantially only in a fundamental mode over an operating frequency range, characterized in that electromagnetic energy is launched by said launching means so as to propagate along said feeder waveguide substantially only in the fundamental TE(1,0) waveguide mode characterised by a planar wavefront, and in that said feeder waveguide includes a mode-converting section having an input at which the waveguide has an input of planar elongate cross-section transverse to the direction of flow of said radio frequency energy along the waveguide, which is comprised of said orthogonally disposed pairs of parallel spaced conductive surfaces, and the longer width dimension, taken along a longitudinal median axis of the input cross-section, is at least four times the height in a direction orthogonal to said median axis, the H-plane of said fundamental TE(1,0) waveguide mode in said cross-section being parallel to said longitudinal median axis, said mode-converting section having an output cross-section of circumferential form transverse to the direction of radio frequency energy flow which conforms substantially to an imaginary cylindrical reference surface whose axis is the z-axis, and said output cross-section having longer and shorter boundaries substantially parallel to the H-plane of the sectoral horn and to the z-axis, respectively, said output cross-section corresponding to the throat of the sectoral horn, and the waveguide forming said mode-converting section is so shaped that the path length for the flow of said radio frequency energy therethrough is substantially the same for all respective propagation paths parallel to the local energy propagation direction in the mode converting section and each connecting a respective pair of corresponding points in said cross-sections at the respective ends of the mode-converting section, the arrangement being such that substantially only the lowest order horn mode TM(0,1) is excited in the sectoral horn by said radio frequency energy.

4,903,040

TRANSPARENT IMAGE-RECORDING ELEMENTS COMPRISING VINYL PYRROLIDONE POLYMERS

William A. Light, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 14, 1989, Ser. No. 393,441
Int. Cl.[4] B41M *5/00*
U.S. Cl. 346—1.1 **8 Claims**

1. In a transparent image-recording element comprising a support and an ink-receptive layer, said element adapted for use in a printing process where liquid ink dots are applied to the ink-receptive layer that contains a vinyl pyrrolidone polymer, the improvement wherein the layer comprises particles of a polyester, poly(cyclohexylenedimethylene isophthalate-co-sodiosulfobenzenedicarboxylate), dispersed in the vinyl pyrrolidone polymer to thereby control ink dot size.

4,903,041

TRANSPARENT IMAGE-RECORDING ELEMENTS COMPRISING VINYL PYRROLIDONE POLYMERS AND POLYESTERS

William A. Light, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 14, 1989, Ser. No. 393,445
Int. Cl.[4] B41M *5/00*
U.S. Cl. 346—1.1 **8 Claims**

1. In a transparent image-recording element comprising a support and an ink-receptive layer, said element adapted for use in a printing process where liquid ink dots are applied to the ink-receptive layer that contains a vinyl pyrrolidone polymer, the improvement wherein the layer comprises particles of a polyester, poly(cyclohexylenedimethylene-co-xylylene terephthalate-co-malonate-co-sodioiminobis(sulfonyl-benzoate)) dispersed in the vinyl pyrrolidone polymer to thereby control ink dot size.

4,903,039

TRANSPARENT IMAGE-RECORDING ELEMENTS

William A. Light, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 14, 1989, Ser. No. 393,443
Int. Cl.[4] B41M *5/00*
U.S. Cl. 346—1.1 **9 Claims**

1. In a transparent image-recording element comprising a support and an ink-receptive layer, said element adapted for use in a printing process where liquid ink dots are applied to the ink-receptive layer that contains a vinyl pyrrolidone polymer, the improvement wherein the layer comprises particles of a polyester, poly(cyclohexylenedimethylene-co-oxydiethylene isophthalate-co-sodiosulfobenzenedicarboxylate), dispersed in the vinyl pyrrolidone polymer to thereby control ink dot size.

4,903,042

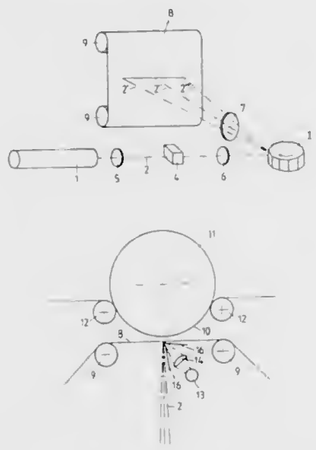
METHOD OF AND APPARATUS FOR MAKING THERMOCOPIES

Hans U. Käufl, Oberschleissheim, and Hans J. Vedder, Puchheim, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 10, 1989, Ser. No. 349,630
Claims priority, application Fed. Rep. of Germany, May 25, 1988, 3817625
Int. Cl.[4] G01D *15/10, 9/42*
U.S. Cl. 346—76 L **14 Claims**

11. An apparatus for making thermocopies by thermosublimation transfer of ink from an ink carrier member to a receiving material, said apparatus comprising means for synchronously displacing the receiving material and the ink carrrier member in a predetermined relationship therebetween; means for linewise and pixelwise heating of the ink carrier member,

said heating means comprising means for providing a laser beam movable along a respective line of the ink carrier member; and means for modulating said laser beam in accordance with a predetermined density of an ink layer.

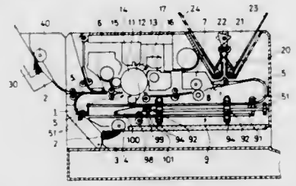


4,903,043

RECORDING APPARATUS FOR PRINTING ON OPPOSITE SURFACES OF RECORDING MEDIUM

Akio Tajima, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Nov. 24, 1987, Ser. No. 124,878
Claims priority, application Japan, Nov. 26, 1986, 61-281590
Int. Cl.[4] G01D *15/24*
U.S. Cl. 346—134 **13 Claims**



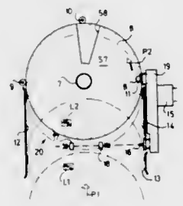
3. A recording apparatus for printing on opposite surfaces of a recording medium comprising: conveying means having an upstream conveying section for conveying a recording medium in an advancing direction to a printing station to enable printing on one surface of the recording medium and having a downstream conveying section for conveying the once-printed recording medium in the advancing direction to a turning station to enable turning upside-down of the once-printed recording medium; printing means operable when the recording medium is at the printing station for printing on one surface of the recording medium; turning means operable when the once-printed recording medium is at the turning station for turning the recording medium in a direction transverse to the advancing direction to turn the recording medium upside down without inverting the leading and trailing ends thereof, the turning means including first feeding means actuatable to a first position to enable the recording medium to be delivered to and discharged from the turning station and actuatable to a second position for feeding the recording medium through the turning station, and first camming means for actuating the first feeding means to the first and second positions; and transporting means for transporting the upside-down recording medium from the turning station to the upstream conveying section for conveyance to the printing station to enable printing on the other surface of the recording medium, the transporting means including second feeding means actuatable to a first position to enable the upside-down recording medium discharged from the turning station to be delivered to the transporting means and actuatable to a second position for feeding the upside-down recording medium to the upstream conveying section, and second camming means for actuating the second feeding means to the first and second positions in synchronism with the first camming means such that the first feeding means is in its first position when the second feeding means is in its second position and the first feeding means is in its second position when the second feeding means is in its first position.

4,903,044

ARRANGEMENT FOR THE AUTOMATIC AND CORRECT POSITIONING WITH RESPECT TO TIME OF A RECORD CHART BUNDLE SERVING TO RECORD IN SEGMENTS IN A CONTINUOUS MANNER

Norbert Knauer, Trossingen; Benjamin Saeger; Josef Wangler, both of Villingen-Schwenningen, and Norbert Helmschrott, Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 312,912
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806026
Int. Cl.[4] G01D *15/24*
U.S. Cl. 346—121 **10 Claims**



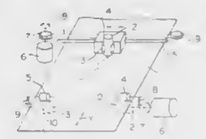
1. An arrangement for automatic and correct positioning with respect to time of a record chart bundle which is recorded on in segments but in a continuous manner relative to recording members of a recording device comprising: recording gear means for driving the record chart bundle synchronously with respect to time, said gear means having a drive connection with individual record charts of the record chart bundle which is gradually interrupted, the individual record charts each having a sector-shaped cut-out portion and being arranged so as to be staggered relative to one another; a centering pin provided so as to receive and rotatably support the record chart bundle in a centering position, said pin being raisable and lowerable vertically relative to a recording base of the record chart bundle; positioning drive means independent of the recording gear means for driving the record chart bundle at a rate of rotation greater than a recording speed, said positioning drive means including a sensor provided so as to synchronously rotate with the record chart bundle with respect to time, said sensor being controllable so that after passing through a recording angle of a record chart it executes a movement around a residual angle at 360° in the direction of recording movement of the record chart bundle; and driving means for coupling the record chart bundle with a recording drive of the recording device when the bundle is located in a certain position determined by the sensor.

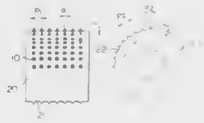
4,903,045

X-Y PLOTTER FOR NON-PERFORATED PAPER

Masami Sakamoto; Ryoichi Magumo; Tamio Ishihara, all of Katsuta, and Takao Kobari, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,350
Claims priority, application Japan, Sep. 16, 1987, 62-229586
Int. Cl.[4] G01D *15/24*; B65H *20/00*
U.S. Cl. 346—136 **8 Claims**





1. An X-Y plotter comprising:
a recording paper;
a recording means for recording on said recording paper;
first drive means for moving said recording means in an X direction;
at least one set of a drive roller means and a pinch roller means disposed for pinching said recording paper therebetween; and
second drive means for rotating said drive roller means to move said recording paper in a Y direction which is orthogonal to said X direction;
wherein said drive roller has a cylindrical reference surface and a plurality of minute projections projecting from the cylindrical reference surface and being arranged in discreet regular pitches such that adjacent projections are spaced from each other with a part of the cylindrical reference surface therebetween, each projection having a quadrangular pyramidal shape.

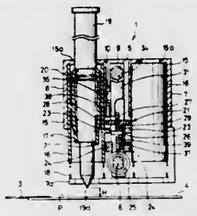
4,903,046

PEN POSITION REGULATOR

Takashi Onozato, Morioka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 98,542, Sep. 18, 1987, Pat. No. 4,845,516.
This application Mar. 17, 1989, Ser. No. 325,314
Claims priority, application Japan, Dec. 1, 1986, 61-183730; Dec. 1, 1986, 61-183731; Dec. 11, 1986, 61-293496; Dec. 12, 1986, 61-296348
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—139 R **2 Claims**

1. In a pen position regulating mechanism, in which a pen is held by a pen chuck mechanism holding said pen inserted towards a surface to be printed and freely movable in the direction perpendicular to said surface to be printed so that the extremity thereof is in accordance with a mounting reference position predetermined therefor, the improvement wherein it comprises further a simultaneous movement distance regulating member, which regulates the distance over which said pen chuck mechanism can move towards said surface to be printed at the same time as said pen, when said pen is inserted in said pen chuck mechanism, and a separate movement distance regulating member, which regulates the distance over which



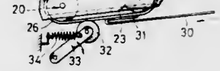
said pen can move alone in the same direction after said pen chuck mechanism has been stopped.

4,903,047

ELECTROPHOTOGRAPHIC PRINTER

Sunao Hatanaka, Takizawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 307,860
Claims priority, application Japan, Mar. 24, 1988, 63-37641[U]
Int. Cl.[4] G03G *15/00*
U.S. Cl. 346—153.1 **5 Claims**



1. An electrophotographic printer having a photosensitive member disposed in a body for transferring an electrostatically adhered toner to the lower surface of a sheet, a fixing unit disposed at the downstream side of said photosensitive member for fixing the toner transferred to the sheet, and a suction conveying mechanism disposed between said photosensitive member and said fixing unit for conveying the sheet transferred with the toner by said photosensitive member by sucking the sheet transferred with the toner from above comprising a retaining roller rotatably pressed in contact with the lower surface of the conveyor belt of said suction conveying mechanism.

4,903,048

SIMULATED COLOR IMAGING USING ONLY TWO DIFFERENT COLORANTS/TONERS

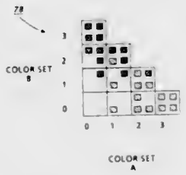
Steven J. Harrington, Holley, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1988, Ser. No. 276,593
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—157 **9 Claims**

1. The method of gray scale imaging, said method including the steps of:
combining complementary ink patterns on an imaging sur-

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face thereby forming a representation of an elemental area of an original image; and



repeating said step of combining complementary ink patterns for each elemental area of said original image.

4,903,049

WRONG SIGN TONER EXTRACTION FOR A DIRECT ELECTROSTATIC PRINTER

John D. Sotack, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 28, 1989, Ser. No. 398,874
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—159 8 Claims



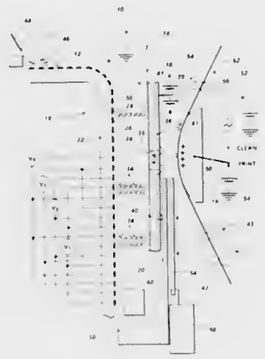
1. Direct electrostatic printing apparatus, said apparatus comprising:
- a supply of charged toner particles including means for creating a toner cloud;
- an apertured printhead structure through which toner particles of one polarity from said toner cloud pass in image configuration;
- an image receiving member disposed adjacent one side of said apertured printhead;
- means for supporting said image receiving member for movement past said apertured printhead;
- means for effecting the attraction of toner particles from said apertured printhead structure to said image receiving member; and
- means forming an integral part of said apertured printhead for removing toner particles from said toner cloud, said removed toner particles being charged oppositely to the charge of toner particles attracted to said imaging surface.

4,903,050

TONER RECOVERY FOR DEP CLEANING PROCESS

Fred W. Schmidlin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1989, Ser. No. 375,163
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160.1 12 Claims



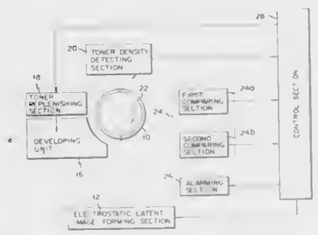
1. Direct electrostatic printing apparatus, said apparatus comprising:
- a supply of charged toner particles;
- an apertured printhead structure through which toner particles pass in image configuration;
- an image receiving member disposed adjacent one side of said apertured printhead;
- means for supporting said image receiving member past said apertured printhead;
- means for effecting the attraction of toner particles from said apertured printhead structure to said image receiving member;
- means for periodically causing toner particles from said supply to bombard the side of said printhead structure disposed between said image receiving member and said printhead structure whereby momentum transfer between said toner particles caused to bombard said side and toner particles which have accumulated on said side causes said accumulated toner to become dislodged; and
- means for preventing dislodged toner from being deposited on said image receiving member.

4,903,051

IMAGE FORMING APPARATUS FOR CONTROLLING DEVELOPER TO BE REPLENISHED IN ACCORDANCE WITH DENSITY OF DEVELOPER

Jiro Egawa, Yokosuka, and Osamu Kenmochi, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jul. 21, 1988, Ser. No. 222,704
Claims priority, application Japan, Jul. 22, 1987, 62-182739
Int. Cl.[4] G01J *15/00*
U.S. Cl. 346—160.1 27 Claims



4,903,052

METHOD OF MAKING AN IMPROVED DYED COLOR CHANGE CONTACT LENS

Charles W. Neefe, Big Spring, Tex., assignor to Sunsoft Corp., Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 147,148, Jan. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 869,583, Jun. 2, 1986, Pat. No.
The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.
Int. Cl.[4] G02B *7/04*
U.S. Cl. 351—162 17 Claims



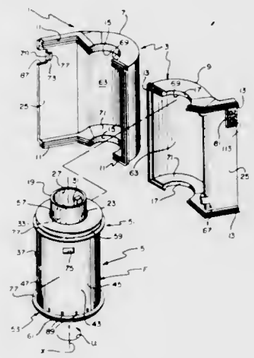
1. A method of making a cosmetic contact lens that changes the apparent color of the eye by the steps of dying the iris area of the convex lens surface the desired transparent color, allowing the dye solution to penetrate 0.0001 to 0.005 of a millimeter into the convex lens surface, removing the lens from the dye solution, preparing a solution of a soluble salt which may be precipitated to form an insoluble light reflecting precipitant, adding a swelling agent to the soluble salt precipitating solution, allowing the swelling agent and precipitating salt solution to swell the lens convex surface and penetrate the iris area of the lens convex surface from 0.002 to 0.05 of a millimeter, removing the lens from the precipitating salt and swelling agent solution, allowing the precipitating salt in the convex lens surface to be precipiated forming an insoluble light reflecting layer which is further from the convex lens surface than the colored transparent dye layer.

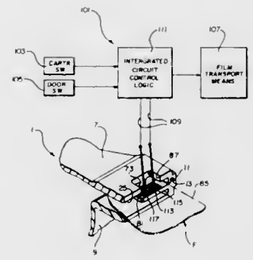
4,903,053

CAMERA APPARATUS

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1989, Ser. No. 296,476
Int. Cl.[4] G03B *7/00, 17/26*
U.S. Cl. 354—21 5 Claims





1. Camera apparatus intended for use with a film cassette including (a) an internal film engageable member for engaging a leader portion of a filmstrip prior to its initial advance from the cassette shell and for re-engaging the leader portion following its return to the shell, (b) an internal film support for normally supporting the filmstrip within engaging range of the film engageable member to enable the engageable member to engage the leader portion, (c) a trailing end portion of the filmstrip configured to fall away from the film support to move the filmstrip out of engaging range of the film engageable member, when the filmstrip has been advanced sufficiently from the cassette shell to position the trailing end portion at the film support, to prevent the engageable member from re-engaging the leader portion following its return to the shell, and (d) an access opening in the cassette shell proximate the film support, said camera apparatus comprising:
- sensor means adapted during a film loading mode to enter the access opening for determining whether or not the filmstrip has fallen away from the film support to thus determine whether or not the filmstrip is positioned out of engaging range of the film engageable member; and
- control means adapted during said film loading mode for preventing the occurrence of a perceptible camera function relating to the filmstrip, when said sensor means determines the filmstrip has fallen away from the film support to be positioned out of engaging range of the film

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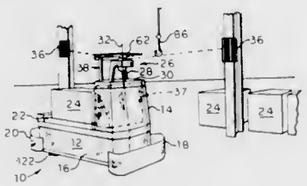
engageable member, whereby one will be altered not to use the filmstrip.

4,903,054

OBSTACLE DETECTION SYSTEM

John E. Wible, Plainesville, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Sep. 23, 1988, Ser. No. 248,878
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—561 20 Claims



1. An obstacle detection system for a self guided vehicle having a frame upper end portion comprising:
- means for delivering a light signal in a direction along a preselected elevationally oriented axis;
- means for receiving a reflection of the light signal and delivering a condition control signal in response to receiving said reflected light signal;
- a supporting assembly connected to and extending from the frame upper end portion;
- a guide frame connected to the supporting assembly and defining a plane passing through said elevationally oriented light signal axis;
- a reflecting member movably supported on said guide frame and movable in said plane;
- means for connecting the reflecting member to the supporting assembly and maintaining said reflecting member for movement substantially along the plane defined by the guide frame, between a first position, at which said reflecting member reflects said light signal toward said receiving means, and a second position, spaced from said first position, at which said reflecting member is free from reflecting a sufficient amount of said light signal toward said receiving means, said reflecting member being movable between said first and second positions in response to an external force of a preselected minimum magnitude being applied to said reflecting member and said second position of the reflecting member being located substantially in the direction of the applied force lying along said plane.

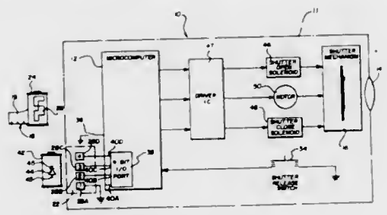
4,903,055

METHOD AND APPARATUS FOR CALIBRATING AND/OR TESTING A PHOTOGRAPHIC CAMERA

Richard W. Lourette, and J. David Cocca, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 30, 1989, Ser. No. 303,614
Int. Cl.[4] G03B *7/24*
U.S. Cl. 354—21 7 Claims

1. Photographic apparatus comprising:
- a camera adapted to receive a film cartridge having a surface provided with a code pattern;
- control means for controlling the operation of the camera, said control means having a first mode of operation for recording an image on light sensitive film and a second mode of operation for facilitating calibration and/or testing of the camera;
- circuit means having predetermined electrical characteristics adapted to be inserted into the camera in place of said cartridge;
- sensing means for sening said code pattern and for sensing said electrical characteristics; and
- means responsive to sensing of said code pattern by said sensing means for rendering said control means operative in said first mode, and to sensing of said electrical characteristics by said sensing means for rendering said control means operative in said second mode.

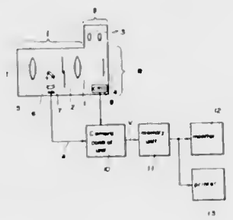


4,903,056

CAMERA HAVING CHECKING FUNCTION

Masafumi Kamikubota, and Masamichi Sato, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 23, 1988, Ser. No. 276,165
Claims priority, application Japan, Nov. 24, 1987, 62-294187; Oct. 17, 1988, 63-259512
Int. Cl.[4] G03B *29/00*
U.S. Cl. 354—76 7 Claims



1. A camera having a checking function which is composed of a silver-halide-film camera with an imaging device, comprising:
- a mirror disposed at a conjugate system of a camera lens assembly for reflecting a first part of an incident light beam,
- a focusing optical system for receiving said light part of said incident light beam reflected by said mirror and for focusing an optical image, and
- an imaging device disposed at a position where said optical image is focused by said focusing optical system for outputting a picture signal corresponding to said focused optical image, while simultaneously a second part of said incident light beam records an image on said silver-halide-film.

4,903,057

APPARATUS FOR PRODUCING PHOTOGRAPH

Shohei Yamamoto; Hiroyuki Aki; Hiroshi Katsu; Yuichi Teshigawara, and Kenichi Atsumi, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 27, 1989, Ser. No. 302,652
Claims priority, application Japan, Jan. 29, 1988, 63/19303
Int. Cl.[4] G03B *17/50*
U.S. Cl. 354—88 20 Claims



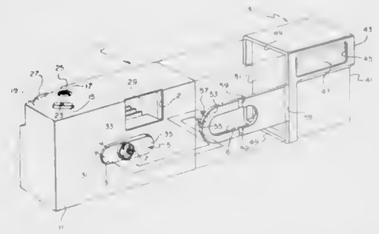
1. A photograph-producing apparatus for rapidly obtaining an image of a person photographed comprising:
- (a) a portion for receiving a heat development photosensitive material;
- (b) a photographic exposure portion for performing photographic exposure of the image of said person on said photosensitive material sent from said receiving portion;
- (c) a frame exposure portion for exposing the margin around said photographic image on said photosensitive material;
- (d) an application portion for applying a solvent used for forming said image to said photosensitive material after frame exposure;
- (e) a portion for receiving an image-receiving material;
- (f) a heat development and transfer portion for causing said image-receiving material sent from said image-receiving material receiving portion to adhere to said photosensitive material to which said solvent for forming said image is applied and subjecting said photosensitive material to heat development, as well as transferring the developed image to said image-receiving material; and
- (g) a separation means for separating said photosensitive material from said image-receiving material which serves as a final product.

4,903,058

RE-USABLE ELECTRONIC FLASH UNIT FOR DISPOSABLE SINGLE-USE CAMERA

Joseph J. Schappler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 8, 1989, Ser. No. 363,558
Int. Cl.[4] G03B *17/05*
U.S. Cl. 354—145.1 6 Claims



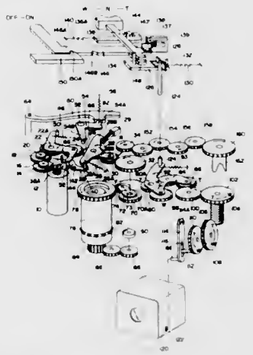
1. An improved accessry re-usable electronic flash unit intended for use with a disposable single-use camera comprising an (a) inner camera part pre-loaded with film and including a taking lens, a shutter, and flash synchronization access ports, and (b) an outer sealed perforable pack containing said camera part and having an opening for said taking lens, wherein said flash unit has electrically conductive flash synchronization pins shaped to perforate said outer sealed pack to enter said access ports in order to connect the flash unit to said inner camera part, and wherein the improvement comprises:
- a movable arm supporting said flash synchronization pins and adapted to be moved to a storage position on the flash unit to make said flash unit compact and to be moved to an operative position extended from the flash unit to dispose the pins to perforate said outer sealed pack to enter said access ports.

4,903,059

CAMERA

Kazuhiko Onda; Masayoshi Hirai; Tetsuo Nishizawa; Muneyoshi Sato, all of Saitama; Nobuyuki Kameyama, Tokyo; Haruo Onozuka, Saitama; Masashi Takamura, Tokyo; Takashi Kamoda, Saitama, and Kiyotaka Kobayashi, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 7, 1988, Ser. No. 241,206
Claims priority, application Japan, Sep. 7, 1987, 62-223655; Sep. 7, 1987, 62-223656; Sep. 7, 1987, 62-223657; Sep. 7, 1987, 62-223658; Sep. 7, 1987, 62-136681; Mar. 1, 1988, 63-48228
Int. Cl.[4] G03B *1/18*
U.S. Cl. 354—173.1 10 Claims



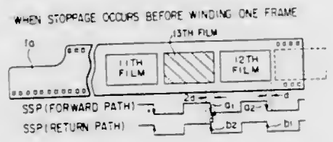
1. A camera comprising:
- a film winding mechanism for drawing out a film from a patrone to wind the same around a spool;
- a film rewinding mechanism for rewinding said film from said spool into said patrone;
- a first planetary clutch mechanism for transmitting rotational power from a motor to said film winding mechanism or to said film rewinding mechanism by rotation of said motor in the same direction during film winding as during film rewinding;
- an engagement member for holding said first planetary clutch mechanism in such a manner that said first planetary clutch mechanism can be connected with said film winding mechanism; and,
- a torque detect mechanism which is operative, upon detecting a given torque at the end of winding of the whole film, to drive said engagement member to release the holding of said first planetary clutch mechanism by said engagement member so as to connect said first planetary clutch mechanism with said film rewinding mechanism.

4,903,060

FILM FEEDING DEVICE OF THE CAMERA

Yasushi Hoshino, Tokyo; Hiroyuki Horiuchi, and Yasutsugu Nakagawa, both of Hamura, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 3, 1989, Ser. No. 305,812
Claims priority, application Japan, Feb. 9, 1988, 63-26697
Int. Cl.[4] G03B *1/18*
U.S. Cl. 354—173.1 **3 Claims**



1. A photographic film-feeding apparatus for positioning picture frames of a film to an exposure position of a camera comprising,

a film-feeding means for winding and rewinding a film in said camera by using an electric motor;

a frame signal-generating means for generating a frame signal representing a picture frame passing through the exposure position while the film is wound or rewound by said film-feeding means;

a wind control means for controlling said film-feeding means to wind the film by two frames based on the frame signal from said frame signal-generating means in response to every picture-taking operation;

a return control means for letting said film-feeding means to start rewinding the film when judging the latest exposed frame to be the last picture frame in the winding process; and

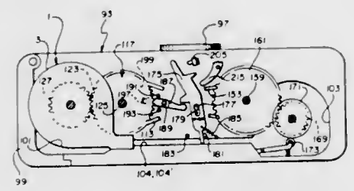
a rewind control means for controlling said film-feeding means to rewind the film so that, when starting the rewinding process, the film is rewound so as to position a picture frame being adjacent to the latest exposed frame in the winding process to the exposure position on the basis of the frame signal from said frame signal-generating means, and thereafter the film is rewound by two frames in response to every picture-taking operation.

4,903,061

METERING CONTROL MECHANISM

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 9, 1989, Ser. No. 349,478
Int. Cl.[4] G03B *1/00*
U.S. Cl. 354—213 **5 Claims**



1. A metering control mechanism for a photographic camera to be used with a film cassette in which a film spool is rotatable to unwind a filmstrip off the spool to thrust a non-protruding leader portion of the filmstrip from the cassette, to enable the leader portion to be moved along a film path to film take-up means in the camera, and alternatively to rewind the filmstrip onto the spool to draw the leader portion along the same path back into the cassette, wherein the camera includes a motorized film drive apparatus operable in a prewind mode for rotating the film spool to unwind the filmstrip off the spool and in a rewind mode for rotating the film spool to rewind the filmstrip onto the spool, characterized in that said metering control mechanism comprises:

a metering pawl adapted to engage the filmstrip at respective metering perforations preparatory to each exposure;

actuation means for moving said metering pawl into the film path to permit the pawl to engage the filmstrip at one of its metering perforations; and

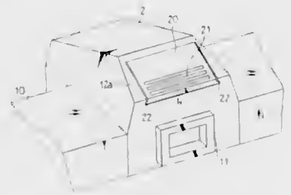
control means responsive to operation of said film drive apparatus in the prewind mode for removing said metering pawl from the film path to prevent the pawl from engaging the filmstrip at one of its metering perforations, and responsive to operation of said film drive apparatus in the rewind mode for allowing said metering pawl to be moved into the film path to permit the pawl to engage the filmstrip at one of its metering perforations.

4,903,062

PROTECTIVE APPARATUS FOR DISPLAYING PORTION OF PHOTOGRAPHING DATA IN A CAMERA

Tadayuki Kirigaya, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Mar. 23, 1988, Ser. No. 172,212
Claims priority, applicatioo Japan, Mar. 26, 1987, 62-44832[U]
Int. Cl.[4] G03B *17/02, 17/18, 17/56*
U.S. Cl. 354—225 **16 Claims**



1. An apparatus for protecting a photographic data display portion of a camera body, said apparatus comprising a protective cover which includes means for attaching said protective cover to said camera body, said photographic data display portion comprising means for providing a visual display of photographic data to a user, said photographic data display portion being positioned in a recessed area of said camera body, said cover being positioned over said display portion and being slidably positioned within an upper portion of said recessed area, said protective cover further being attached to a removable finder eyepiece frame cap.

4,903,063

INSTANT FILM PACK

Yoshio Hara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

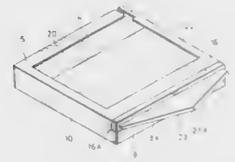
Filed Oct. 17, 1988, Ser. No. 258,352
Claims priority, application Japan, Oct. 16, 1987, 62-158316[U]
Int. Cl.[4] G03B *17/26, 17/52*
U.S. Cl. 354—277 **14 Claims**

1. An instant film pack for containing and removably holding a plurality of integral type instant film units in a stack comprising:

a parallelpipedal housing having a flat top wall with a film exposure aperture therein and a front wall having a film unit exit slot therein through which each of said elongated film units is withdrawn after exposure:

a light blocking member attached to said film pack to close off said film unit exit slot from light: and

a protective cover sheet removably disposed over the foremost one of said stack of film units in said film pack proximate to said film unit exit slot to isolate said foremost film unit to light and having a leading edge inclined at an angle



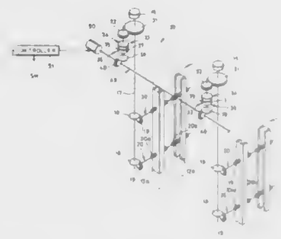
laterally outwardly and rearwardly towards at least one side from a part on the leading edge relative to a direction in which each said film unit is withdrawn, whereby said inclined leading edge splits said light blocking member when said protective cover sheet is withdrawn by passing through said film unit exit slot.

4,903,064

PHOTOGRAPHIC PROCESSING APPARATUS

Mikio Kogane; Shigemi Saito, both of Tokyo, and Tadatosi Koyama, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 10, 1989, Ser. No. 308,588
Claims priority, application Japan, Feb. 12, 1988, 63-30537; Feb. 12, 1988, 63-30538; Feb. 12, 1988, 63-30539; Feb. 12, 1988, 63-30540; Feb. 12, 1988, 63-30541
Int. Cl.[4] G03D *3/13*
U.S. Cl. 354—321 **20 Claims**



1. A photographic processing apparatus having a plurality of processing tanks and a guide rack structure detachably mounted on said processing tanks for guiding a long strip of photographic material passing through said processing tanks, said guide rack structure comprising:

a plurality of pairs of guide members, each of which is removably installed into each of said plurality of processing tanks, said guide members being movable toward and apart from each other to define a width of guide passage therebetween for guiding lengthwise edges of said long strip of photographic material passing through said processing tanks;

a plurality of width adjusting means, each cooperating with one of said plurality of pairs of guide members for adjusting said width of guide passage to be equal to a width of said long strip of photographic material;

drive means mounted on said processing apparatus, connected to said plurality of width adjusting means for driving said plurality of width adjusting means to effect said adjustment of said width of guide passage; and

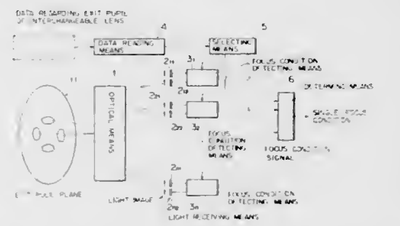
coupling means provided between said drive means and said plurality of width adjusting means for connecting and disconnecting transmission of drive power from said drive means to said width adjusting means.

4,903,065

FOCUS CONDITION DETECTING DEVICE

Nobuyuki Taniguchi; Toshihiko Karasaki; Hiromu Mukai; Hisashi Tokumaru, and Tokuji Ishida, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 13, 1988, Ser. No. 193,794
Claims priority, application Japan, May 15, 1987, 62-119200; May 19, 1987, 62-121481
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—402 **13 Claims**



1. A focus condition detecting device, comprising an optical means for forming a plurality of pairs of images of light from beams of light from a plurality of pairs of areas of an objective lens, a plurality of pairs of light receiving means for receiving thereon the pairs of light images from said optical means, a plurality of focus condition detecting means for detecting a relative displacement between the images of light in pairs received by said pairs of light receiving means to deliver focus condition signals of said objective lens for the mutually different areas, means for providing data regarding optical characteristics of said objective lens, a selecting means for selecting those of said focus condition detecting means on which detection of a focus condition is possible depending upon the data of the optical characteristics, and a determining means for determining a focus condition of said objective lens in response to a plurality of focus condition signals from the selected ones of said focus condition detecting means.

4,903,066

OPTICAL SYSTEM FOR FOCUS STATE DETECTION

Keiji Moriyama, Yokohama, and Hiroshi Ohki, Setagaya, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,468
Claims priority, application Japan, Mar. 4, 1988, 63-51311
Int. Cl.[4] G03B *3/00*; G01J *1/20*
U.S. Cl. 354—406 **16 Claims**

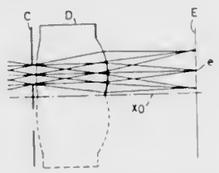
1. A focus state detecting optical system for a camera, comprising:

(a) a condenser lens positioned in the vicinity of or behind an image plane of a primary image of an object, formed by a photographing lens of said camera;

(b) pupil dividing means positioned behind said condenser lens and adapted for dividing the pupil of the photographing lens of said camera into plural areas symmetrically with respect to the optical axis; and

(c) a re-imaging optical system for forming secondary images of the object, composed integrally of plural positive biconvex lenses positioned in parallel manner respectively corresponding to said divided areas of the pupil and symmetrically with respect to the optical axis, wherein each of

said plural positive biconvex lenses is provided, at the side



of said secondary image, with an aspherical surface satisfying following conditions:

$$\Delta_D = Ch^2/(1 + \sqrt{1 - kh^2C^2}),\ C = 1/r,\ -3.0 < k < 1.0$$

wherein h is the vertical height of the optical axis of each of said plural positive biconvex lenses, k is the conical constant, r is the reference radius of curvature of each of said plural positive biconvex lenses, and Δ_D is the distance, in each of said plural positive biconvex lenses, from the tangential plane of said aspherical surface at the crossing point thereof with the optical axis to a point of said aspherical surface at said height h.

4,903,067

MULTIIMAGE FORMING APPARATUS

Yasushi Murayama; Osamu Hoshino, both of Tokyo; Kazuyoshi Chiku, Yokohama; Yukio Sato, Chigasaki; Yoichi Kubota, Kawasaki; Ken Miyagi; Yoshihiko Hirose, both of Yokohama; Kunihiko Matsuzawa; Hiroyuki Miyake, both of Kawasaki; Tomohiro Aoki, Yokohama; Takashi Uchida, Yokohama, and Kazunori Kanekura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 187,078

Claims priority, application Japan, Apr. 28, 1987, 62-107011; Jun. 30, 1987, 62-161273; Nov. 30, 1987, 62-300006; Nov. 30, 1987, 62-300008

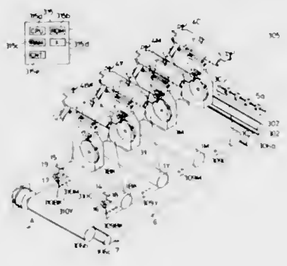
Int. Cl.[4] G03G *15/00*

U.S. Cl. 346—160 **59 Claims**

1. An image forming apparatus comprising:

(a) conveying means for conveying a transfer material, marks for position matching being formed on said conveying means;

(b) image forming means for forming an image onto said transfer material which is conveyed by said conveying means, wherein said image forming means includes an optical system for image formation; and





(c) means for controlling said image forming means in accordance with detection of said marks, wherein said controlling means controls said optical system.

4,903,068

PHOTOGRAPHIC PRINTER

Kazuo Shiota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 5, 1988, Ser. No. 215,146

Claims priority, application Japan, Jul. 3, 1987, 62-167533

Int. Cl.[4] G03B *27/80*

U.S. Cl. 355—20 **11 Claims**

1. A photographic printer comprising:

a CRT for illuminating an original with a flying light spot for printing an image of a frame of said original on a photographic paper;

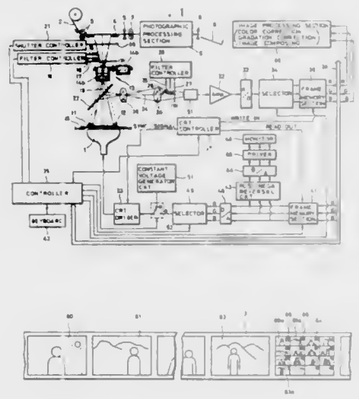
a mirror for reflecting said flying light spot passed through said original;

light detecting means for detecting said reflected light to provide output signals for each frame of said original;

means for electrically composing said output signals of several frames as composite video image signals;

means for displaying said composite video image signals as an inlaid composite video image on said CRT, and

means for projecting said composite video image from said CRT to a photographic paper so as to print said inlaid composite video image onto said photographic paper after removing said original.



2. A photographic printer as defined in claim 1 wherein said mirror comprises a half mirror disposed in a printing path between said CRT and said photographic paper.

4,903,069

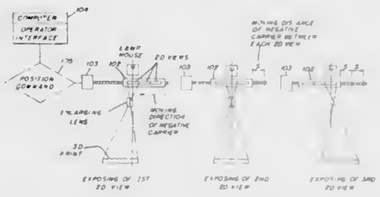
AUTOMATIC THREE-DIMENSIONAL PHOTO PRINTER TO ALIGN THE KEY SUBJECT IMAGE

Nicholas L. Lam, Quarry Bay, Hong Kong, assignor to Image Technology, Inc., Doraville, Ga.

Filed Feb. 24, 1989, Ser. No. 315,126

Int. Cl.[4] G03B *27/32, 35/14*

U.S. Cl. 355—22 **9 Claims**



1. A method of printing an image array on the photosensitive surface of lenticular print film from a set of 2D views on a negative taken by a multi-lens camera, said image array consisting of a multiplicity of stereoscopic image pairs of lineform image bands within each lenticule, said printing utilizing a printer having a movable negative carrier which comprises

(a) determining the distance (K) from the camera to the key subject for each set of views on the negative in order to properly align and register the key subject on the lenticular print film so the 3D photograph is in proper focus by utilizing the following equation:

$$S = \frac{(K + F)T}{K}$$

where

S is the distance between key subject images of adjacent 2-D views,

T is the separation between adjacent camera lenses,

F is the back focal length of the camera lens,

K is the distance between the lens of the camera and the key subject K';

(b) aligning in proper registration the first view of each set of views on the negative on the print film, and

(c) moving the negative carrier of the printer by the appropriate S value between the printing of adjacent 2D views of a set of views on the negative.

4,903,070

IMAGE RECORDING APPARATUS

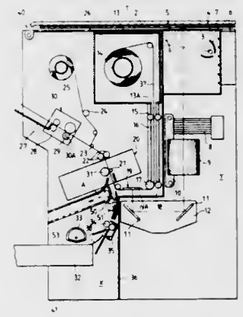
Takashi Nakata, Nagoya; Takashi Tomizawa, Aichi; Shigeyuki Hayashi, Nagoya; Motoshi Ohno, Nagoya, and Yoichi Horaguchi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 24, 1989, Ser. No. 300,841

Claims priority, application Japan, Jan. 29, 1988, 63-11875

Int. Cl.[4] G03B *15/00*

U.S. Cl. 355—27 **7 Claims**



1. An image recording apparatus for recording an image on an image recording medium, said image corresponding to an original image, said apparatus comprising;

a main frame,

an exposure unit disposed in said main frame for exposing said image recording medium to light;,

a pressure developing unit disposed in said main frame and positioned downstream of said exposure unit for pressure developing said image recording medium;

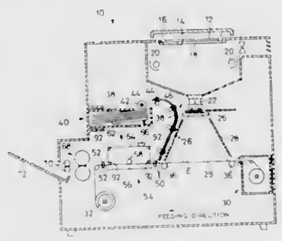
a sheet delivery means for feeding said image recording medium to said pressure developing unit, said sheet delivery means defining a sheet path extending to said pressure developing unit;

a branch path branching from said sheet path and directing toward the outside of said main frame for selectively discharging said image recording medium outside of said main frame without undergoing pressure developing operation, said branch path having an inlet portion;

a detecting means positioned at said sheet delivery means for detecting at least one of posture and size of said image recording medium; said detecting means generating a signal indicative of at least one of said posture and said size, and,

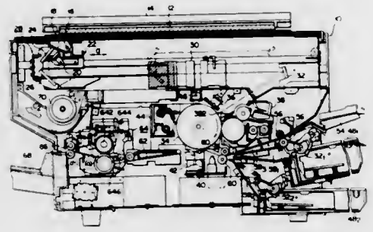
sheet change over means movable between first and second positions in response to said signal, said first position being directed to said branch path and said second position being directed to said pressure developing unit, said sheet change over means being positioned at said inlet portion of said branch path and movable to said first position for selectively discharging said image recording medium to said branch path when at least one of said posture and said size of said image recording medium is unduly provided.

4,903,071
IMAGE FORMING SYSTEM USING A PHOTOSENSITIVE MEDIUM
Motoshi Ohno, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Mar. 11, 1988, Ser. No. 167,199
Claims priority, application Japan, Mar. 17, 1987, 62-38959
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 9 Claims



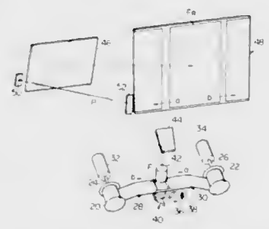
1. An image forming system comprising:
a pressure-sensitive photosensitive medium having a surface coated with a photosensitive material;
exposing means for exposing said surface of said photosensitive medium to a radiation and thereby forming a latent image thereon according to an amount of exposure of the medium to said radiation;
a developing device including a first and a second member which cooperate with each other to press the exposed medium therebetween and thereby develop said latent image into a visible image;
an endless belt which passes between said second member of the developing device and said photosensitive medium, and thereby inhibit a direct contact of said second member with said surface of the photosensitive medium; and
belt driving means for rotating said endless belt.

4,903,072
IMAGE FORMING APPARATUS HAVING COOLING EFFICIENCY SWITCHING CONTROL FUNCTION
Yasuhiro Iwata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 23, 1988, Ser. No. 197,822
Claims priority, application Japan, May 30, 1987, 62-136290
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—30 19 Claims



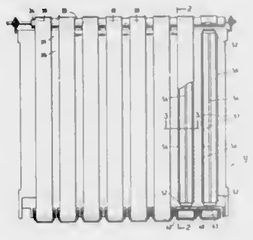
1. An image forming apparatus comprising:
means for forming an image based on image data, said image forming means having at least a thermal source for generating heat;
means for forcibly expelling from said apparatus the heat which is generated by the thermal source and which accumulates as a result of said image forming means forming an image;
means for detecting the temperature within said apparatus;
means for switching the heat releasing rate of said heat expelling means between at least two level modes, in accordance with the temperature detected by said temperature detecting means, including at times after copying operation is completed; and
means for driving said heat releasing means at the heat releasing rate selected by said switching means and controlling the temperature within said apparatus.

4,903,073
IMAGE PROJECTING APPARATUS WITH MARGIN DETECT MEANS
Takao Saijo; Masafumi Fujita, and Takanori Saitoh, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 176,291, Mar. 31, 1988, abandoned.
This application May 1, 1989, Ser. No. 346,285
Claims priority, application Japan, Mar. 31, 1987, 62-79999; Mar. 31, 1987, 62-80000; Mar. 31, 1987, 62-80001; Aug. 21, 1987, 62-207861
Int. Cl.[4] G03B *27/52, 13/28, 23/12*
U.S. Cl. 355—41 14 Claims



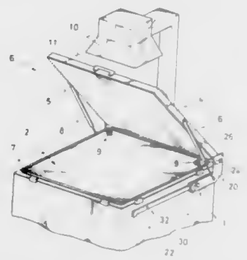
1. An image projecting apparatus using a microfilm strip as an image-carrying medium carrying a series of image frames which have a margin area between adjacent two thereof, comprising
(a) a viewing screen for displaying an image reproduced from said microfilm strip,
(b) drive means for driving said microfilm strip to travel along a predetermined path,
(c) means for irradiating said microfilm strip with a beam of light, the beam of light being transmitted as an information-carrying beam of light carrying image information detected from said microfilm strip,
(d) a projection lens for magnifying said information-carrying light beam and projecting the magnified beam of light onto said viewing screen,
(e) photoelectric transducer means responsive to at least a portion of said information-carrying light beam for producing an electric signal variable with the quantity of light incident on the photoelectric transducer means, said photoelectric transducer means being located off the location at which said information-carrying light beam is to be focussed by said projection lens, and
(f) control means responsive to the electrical signal from said photoelectric transducer means for detecting the margin area intervening between any adjacent two of the image frames of said microfilm strip and thereby controlling said drive means.

4,903,074
PLURAL BELT DOCUMENT FEEDER WITH OPTIMUM OPTICAL PROPERTIES
William L. Lama, Webster; Robert P. Loce, Rochester; Martin Pepe, Jr., West Henrietta; Eleanor Whitte, Rochester; Robert P. Siegel, Penfield; Antje B. Parker, Sodus Center, all of N.Y., and Peter Watson, Stevenage Herts, England, assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 12, 1989, Ser. No. 336,992
Int. Cl.[4] G03B *27/64*
U.S. Cl. 355—76 3 Claims



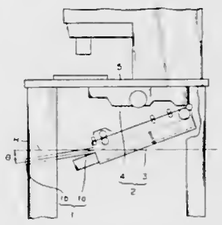
1. A document feeder for conveying document sheets into and away from an imaging position on a platen of a copier, including a vacuum belt transport system which comprises:
a plurality of spaced-apart belts moving between a plenum having a white backing surface and the platen, and
a vacuum source for applying a partial vacuum to the inter-belt gaps to hold a document sheet against said belts so that the document is conveyed with the movement of the belts, characterized in that the plenum backing surface has a reflectance of approximately 92% and a surface roughness of approximately 3.6 microns and said belts, when backed by the plenum, have a reflectance of approximately 91%.

4,903,075
APPARATUS FOR MAKING CONTACT PRINTS
Tsutomu Kinoshita, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan
Filed Jul. 27, 1988, Ser. No. 224,804
Claims priority, application Japan, Jul. 29, 1987, 62-116313[U]
Int. Cl.[4] G03B *27/20*
U.S. Cl. 355—94 2 Claims



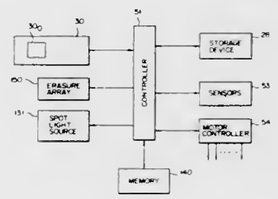
1. An apparatus for making contact prints, the apparatus comprising a printing box, a printing plate mounted to the printing box, a frame including a transparent plate, a pair of frame carriers for supporting the frame, the frame carriers disposed at opposite sides of the printing box such that the frame is placeable over the printing plate in an optically sealed manner, each of the frame carriers comprising a connecting rod, a slider, a rail and a stop means for anchoring the slider at a predetermined position along the rail, the connecting rod connecting the frame to the slider, and the slider being slidable on and along the rail.

4,903,076
IMAGE FORMING APPARATUS HAVING STATIONARY UPPER UNIT AND PIVOTABLE LOWER UNIT
Katsunori Sakakibara, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed May 26, 1989, Ser. No. 357,718
Claims priority, application Japan, May 27, 1988, 63-129990
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—200 3 Claims



1. In an image forming apparatus possessing a stationary upper unit and a pivotable lower unit adapted to swing downwardly about a pivotal axis attached to said upper unit, the improvement which comprises a paper receiving tray for receiving a paper having the image formed thereon, a basal end part of said paper receiving tray being rotatably attached to the lower unit at the side opposite to a pivotal axis of said lower unit, and a support mechanism for moving the paper receiving tray relative to the movement of said lower unit so that a leading end part of the paper receiving tray is positioned at a level higher than said basal end part thereof.

4,903,077
ELECTRONIC COPYING APPARATUS WITH TRIMMING FUNCTION
Hideshi Oushiden, Kawasaki, and Norio Imada, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 27, 1988, Ser. No. 213,708
Claims priority, application Japan, Jun. 30, 1987, 62-162893
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—204 11 Claims



1. A copying apparatus comprising:
means for generating position data representing an image formation region in units of originals;
means for storing data generated by said generating means; said storing means including primary means for temporar-

VOL 1111 ISS 3 FE 20 19 90 UMI

ily storing the position data, and secondary memory means for storing the position data transferred from different areas in said primary memory means in units of originals;

means for reading out the data stored by said storing means in accordance with the image formation region corresponding to each of the originals; and

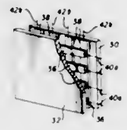
means for forming an image corresponding to each original within the image formation region in accordance with the data read out by said read out means.

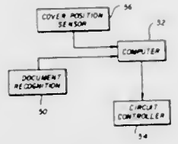
4,903,078

IMAGING APPARATUS WITH VARIABLE APERTURE PLATEN

Eugene D. Yeo, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1988, Ser. No. 178,699
Int. Cl.[4] G03G *21/00*; G03B *27/54*
U.S. Cl. 355—218 **8 Claims**





1. Imaging apparatus comprising:

a light transparent platen for holding an original document which may be smaller than the platen;

a light source for illuminating the platen to expose a document on the platen;

actuatable means for selectively inhibiting the transmittance of light through that portion of the platen not covered by a document;

a light-blocking cover for the platen, said cover being movable between an operative, light blocking position and a non-use position; and

means, responsive to movement of said cover to its non-use position for actuating said light inhibiting means.

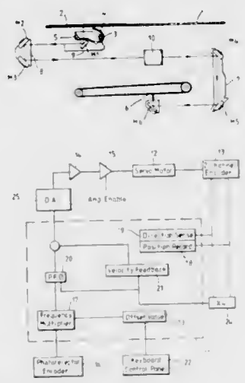
4,903,079

VARIABLE MAGNIFICATION COPIER

John A. MacAndrew, Eaton Ford, United Kingdom, assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 24, 1988, Ser. No. 236,079
Claims priority, application United Kingdom, Aug. 24, 1987, 8719950
Int. Cl.[4] G03G *15/28*
U.S. Cl. 355—235 **9 Claims**

1. A variable magnification optical system for a copying machine comprising a lens for projecting an image of an original document with a pre-selected magnification onto an imaging member, wherein at least one parameter may be altered to achieve the pre-selected magnification, means for generating a reference signal indicative of the nominal pre-selected magnification, means for generating a second signal indicative of the prevailing value of said parameter, means for comparing the second signal with said reference signal and for automatically altering said parameter until the second signal matches said reference signal and means for adjusting the value of the reference signal substantially to compensate for tolerances between the nominal magnification and the actual magnification, said



adjusting means, comprising means for adjusting the value of the reference, comprises signal memory means for storing an offset value which is applied to modify the reference signal at all magnifications.

4,903,080

COPY PAPER SEPARATOR FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

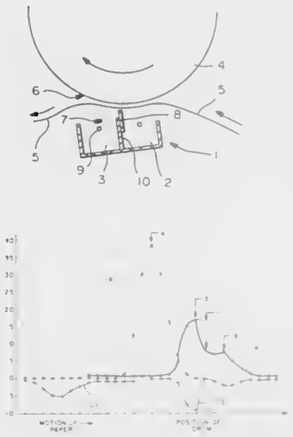
Hideo Taniguchi, Yamayatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 249,399, Aug. 29, 1988, abandoned, which is a continuation of Ser. No. 131,283, Dec. 10, 1987, abandoned, which is a continuation of Ser. No. 892,316, Aug. 4, 1986, abandoned. This application Feb. 21, 1989, Ser. No. 314,254
Claims priority, application Japan, Aug. 29, 1985, 60-191438
Int. Cl.[4] G03G *15/14, 15/16*
U.S. Cl. 355—274 **3 Claims**

1. In a copy paper separator disposed opposite to a photosensitive body surface and having a separation charger with a charger wire therein and a transfer charger adjacent to said separation charger and having a boundary wall with said separation charger, the improvement comprising

an elongated charge controlling sheet made of a narrow belt-like insulator designed and disposed between said charger wire and said photosensitive body surface such that, when said separation charger is discharged, the total charge received by said photosensitive body surface from said charger wire is significantly less but the maximum current on said photosensitive body surface received from said charger wire is not less than if said charge controlling sheet were absent, and

an insulative separator plate attached to said boundary wall protrudingly towards said photosensitive body surface so as to form an adjustably determined gap between said insulative separator plate and said photosensitive body



surface, whereby whitening of copy paper processed on said photosensitive body surface is reduced.

4,903,081

TRANSFER DEVICE

Michio Takahashi, Machida, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 6, 1988, Ser. No. 280,713
Claims priority, application Japan, Dec. 7, 1987, 62-307743
Int. Cl.[4] G03G *15/16, 15/14*
U.S. Cl. 355—274 **8 Claims**



1. A transfer device provided with a cleaning unit having a magnetic brush roller, for functioning to electrostatically transfer a toner image on an image carrier to a transfer material held on a dielectric body, said device comprising:

a transfer charger for applying DC electric field to the portion of said dielectric body opposite to said image carrier during transfer so that said toner image on said image carrier is transferred to said transfer material;

means for applying AC voltage to said transfer charger within a given time during non-transfer; and

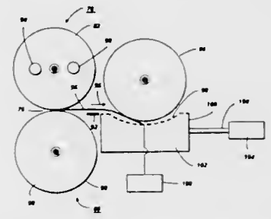
a DC charger for applying DC electric field with the same polarity as that of the toner particles frictionally electrified to the surface of said dielectric body at least within said given time.

4,903,082

LIQUID INK FUSING AND DRYING SYSTEM

Dexter A. Dyer, Williamson; Michael J. Langdon, Pittsford; Henry B. Peters, Jr., Webster, and Thomas F. Szlucha, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 10, 1988, Ser. No. 192,076
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—290 **2 Claims**



1. An apparatus for fusing a liquid image of liquid carrier and toner particles to a sheet, including:

a substantially porous first roller arranged to contact the liquid image on the sheet;

a housing defining a chamber and having an arcuate, air pervious, heated plate positioned adjacent said first roller defining a nip through which the sheet having the liquid image thereon passes;

a heated fuse roller;

a pressure roller cooperating with said fuser roller to define a nip through which the sheet passes with the liquid image thereon contacting said fuser roller to fuse the toner particles to the sheet and vaporize at least a portion of the liquid carrier therefrom with the sheet passing through the nip defined by said fuser roller and said pressure roller before passing through the nip defined by said plate and said first roller; and

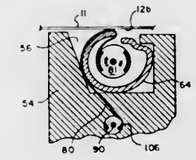
means, coupled to said plate, for maintaining the side of the sheet adjacent said plate at a lower pressure than atmospheric pressure to reduce the heat required to vaporize the liquid carrier and remove the vaporized liquid carrier therefrom.

4,903,083

SIMPLIFIED CLEANING WEB APPARATUS

Carl R. Bothner, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,447
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—300 **12 Claims**



1. A device for holding cleaning web material in a web apparatus for cleaning a surface of an image-bearing or other member in a copier or printer, the device including:

a. an elongate housing having an outside wall and an inside wall;

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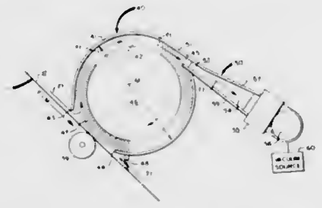
b. a chamber defined by said inside wall of said housing for receiving and holding a roll of the cleaning web material;
c. means associated with said housing for permitting insertion of the roll of cleaning web material into said chamber;
d. a longitudinal slot formed through said housing communicating with said chamber for receiving web material pulled out in sheet form from the roll within said chamber; and
e. retaining means associated with said housing for keeping the web material in sheet form in frictional contact against the surface to be cleaned.

4,903,084

CLEANING APPARATUS HAVING AN INTERFERENCE-FIT HOUSING

Leon A. Baltrus, Pittsford; Clyde M. Creveling, Rochester; Donald G. McKeown, Warsaw; Thomas E. Redding, South Byron; David L. Thompson, Henrietta, and Francisco L. Ziegelmuller, Greece, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 132,841, Dec. 14, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 327,850
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—301 **5 Claims**



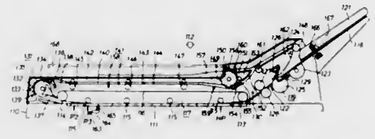
1. A cleaning apparatus for removing residual toner particles from an image bearing surface, said apparatus being of the type including a rotatable cleaning brush for sweepingly removing residual toner particles from the image bearing surface, an external dusthood or housing substantially surrounding the brush, a vacuum source for moving air into, through and out of the dusthood or housing, and some means within the external dusthood or housing for contacting the bursh, the improvements comprising:
(a) radially protruding fibers on the brush, said fibers having free ends forming an average outer diameter of the brush; and
(b) a single external dusthood or housing including (i) a frontside opening through which said fibers can extend to sweepingly remove toner particles from the image bearing surface, (ii) a backside opening connected to th vacuum source, and spaced about 180° from said frontside opening; and (iii) a generally cylindrical inside wall, said inside wall having an inner diameter substantially less than said average outer diameter of the brush, so as to create a substantial interference fit of said fibers of the brush with said inside wall of said external dusthood, whereby said fibers, after sweeping and removing toner particles from the image bearing surface, are immediately deflected, substantially compressed, and then held in such a compressed state by said inside wall of said external dusthood, and whereby such toner particles are immediately entrained by said fibers against said inside wall, thereby preventing such toner particles from ever becoming airborne within said external dusthood.

4,903,085

AUTOMATIC ORIGINAL CIRCULATING AND FEEDING APPARATUS

Sunao Ikeda, and Shiro Saeki, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 1, 1988, Ser. No. 177,460
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—320 **1 Claim**



1. An automatic original circulating and feeding apparatus having an original passage loop through which an original is conveyed, comprising:
an original feeding base disposed on said original passage loop for receiving a plurality of originals thereon, which are piled-up with image faces thereof downward;
an original separating and feeding means disposed on said original passage loop for successively separating said piled-up originals on said original feeding base one by one from a lowermost original and feeding said separated originals one by one in a separated order;
first conveying means disposed in an exposure portion of said original passage loop for conveying at a first conveying speed each of said originals to thereby expose each of said originals fed from said original separating and feeding means at an exposed position of said exposure portion;
first turning over means disposed on said original passage loop at a downstream side of said first conveying means for turning over at a second conveying speed, each of said exposed originals being conveyed by said first conveying means, and conveying at said second conveying speed each of said turned over originals, said second conveying speed is equal to or slightly slower than said first conveying speed;
second conveying means disposed on said original passage loop at a downstream side of said first turning over means for conveying at said second conveying speed each of said originals conveyed from said first turning over means;
second turning over means disposed on said original passage loop at a downstream side of said second conveying means along an original passage loop and at a position distant more than a maximum length of each of said originals conveyed thereto from said exposed position for turning over at said second conveying speed each of said originals conveyed to said distant position by said second conveying means, and conveying at a third conveying speed each of said originals turned over by said second turning over means to said original feeding base, said third conveying speed being faster than said first conveying speed and said second conveying speed; and
said second conveying means, said first turning over means and said second turning over means being adapted to convey at said second conveying speed each of originals from said exposed position to said distant position.

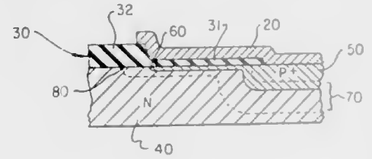
4,903,086

VARACTOR TUNING DIODE WITH INVERSION LAYER

Lloyd W. Hackley, Seminole, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 145,211, Jan. 19, 1988, abandoned. This application Jan. 13, 1989, Ser. No. 296,962
Int. Cl.[4] H01L *29/92*
U.S. Cl. 357—14 **15 Claims**

1. A varactor tuning diode with fast-hopping capability and a decreased settling time for resonant frequency changes comprising:
(a) a conductive metallic layer overlaying an oxide layer and a permanently inverted P+ silicon area for receiving a bias voltage;
(b) said oxide layer contiguous with and immediately below the conductive metallic layer such that the thickness of the oxide layer is predetermined by the lowest voltage imposed upon the varactor tuning diode by the voltage controlled oscillator for the purpose of transmitting said bias voltage across the conductive metallic layer to the N-type silicon layer below the conductive metallic layer and the oxide layer;
(c) an N-type silicon layer contiguous with the oxide layer;



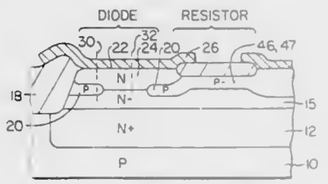
(d) a permanently inverted P+ silicon area being doped into the N-type silicon layer immediately below the conductive metallic layer and the leading edge of the the oxide layer;
(e) a planer PN junction disposed in the N-type layer at the P+ silicon area and N-type silicon layer interface; and
(f) a space charge region disposed partially in the P+ silicon area and partially in the N-type silicon layer, encompassing the planer PN junction, said space charge region being expanded along the upper surface of the N-type silicon layer by the application of said bias voltage so as to terminate at the oxide layer at a distance from the planer PN junction sufficient to avoid the capacitance drift effect.

4,903,087

SCHOTTKY BARRIER DIODE FOR ALPHA PARTICLE RESISTANT STATIC RANDOM ACCESS MEMORIES

Rick C. Jerome, and Duncan A. McFarland, both of Puyallup, Wash., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 2,828, Jan. 13, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 286,818
Int. Cl.[4] H01L *29/48*
U.S. Cl. 357--15 **12 Claims**



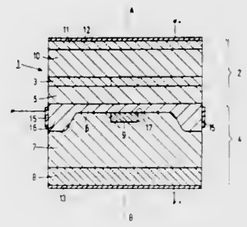
1. A schottky diode structure comprising:
a first region of N-conductivity type semiconductor material having an upper boundary;
an annular region of P-conductivity type semiconductor material disposed in contact with a periphery of the upper boundary;
a second region of N-conductivity type semiconductor material having a lower boundary disposed in contact with both the first region and the annular region and having an upper surface wherein the annular region is at a depth below the upper surface and not at the upper surface; and
a metal contact disposed on the upper surface in contact with the second region.

4,903,088

SEMICONDUCTOR LASER WITH LARGE BANDGAP CONNECTION LAYER

Christianus J. M. Van Opdorp, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,446
Claims priority, application Netherlands, Jun. 26, 1987, 8701497
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 **7 Claims**



1. A semiconductor device for production electro-magnetic radiation having a semiconductor body comprising a radiation-emitting element having an active layer, in which active layer electromagnetic radiation can be produced by injection of hot charge carriers, and an injection element, in which the said hot charge carriers are generated by avalanche multiplication, the radiation-emitting element and the injection element each comprising a monocrystalline epitaxial layer structure, characterized in that the layer structures of the radiation-emitting element and of the injection element adjoin each other epitaxially and the active layer is connected to the injection element by means of a semiconductor connection layer having a band gap larger than that of the active layer and that of the adjoining layer of the injection element, the materials of the active layer and of the connection layer being chosen so that at their interface the lower level of the conduction band in the active layer lies below the lower level in the conduction band in the connection layer and the upper level of the valency band in the active layer lies above the upper level of the valency band in the connection layer.

4,903,089

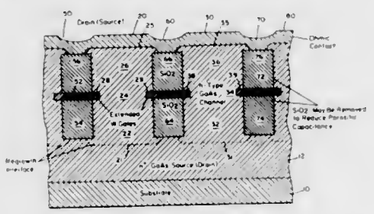
VERTICAL TRANSISTOR DEVICE FABRICATED WITH SEMICONDUCTOR REGROWTH

Mark A. Hollis, Concord; Carl O. Bozler, Sudbury; Kirby B. Nichols, Chelmsford, and Normand J. Bergeron, Jr., New Bedford, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 2, 1988, Ser. No. 151,395
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 **10 Claims**

1. A vertical transistor device comprising one or more active cells which comprise:
a. first and second semiconductor regions vertically displaced in semiconductor material and separated by a control region;
b. isolation regions adjacent to the sides of the first and second semiconductor regions, the isolation regions being formed of a material which is different from the semiconductor material and which has a lower dielectric constant; and
c. a conducting layer extending from at least one isolation

region, thereby defining the control region, said control region being narrower than at least one of either the first or second semiconductor regions wherein the conducting



layer extends beyond the isolation region material to a distance on the order of the zero bias depletion width of the semiconductor due to the isolation region material to semiconductor interface.

4,903,090

SEMICONDUCTOR DEVICE

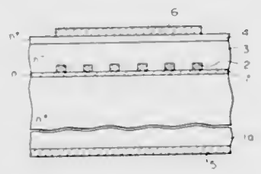
Naoki Yokoyama, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 796,406, Nov. 8, 1985, abandoned. This application Feb. 22, 1988, Ser. No. 161,272

Claims priority, application Japan, Nov. 19, 1984, 59-242413

Int. Cl.[4] H01L *29/80*

U.S. Cl. 357—22 **10 Claims**



1. A semiconductor device comprising:
an emitter layer having a first conductivity type and a first energy band gap and a second energy band gap greater than the first energy band gap;
a base layer having a predetermined conductivity type, provided on the emitter layer, and having a third energy band gap less than said first band gap of the emitter layer defining a heterojunction surface between the emitter layer and the base layer so that there is a discontinuity between conduction band edges of the emitter layer and the base layer so as to form an energy barrier therebetween so that hot electrons can be injected into said base layer from said emitter layer;
one of comb-shaped and lattice-shaped base electrodes, formed adjacent to the heterojunction surface; and
a collector layer having the first conductivity type, provided on the base layer.

4,903,091

HETERJUNCTION TRANSISTOR HAVING BIPOLAR CHARACTERISTICS

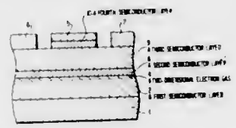
Toshio Baba; Masaki Ogawa, and Keiichi Ohata, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

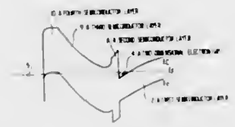
Continuation of Ser. No. 848,188, Apr. 4, 1986, abandoned. This application May 23, 1988, Ser. No. 197,485

Claims priority, application Japan, Apr. 5, 1985, 60-72154; Apr. 5, 1985, 60-72163

Int. Cl.[4] H01L *29/80*

U.S. Cl. 357—22 **3 Claims**





1. A semiconductor device comprising a first semiconductor layer having a low impurity concentration and having a first electron affinity and a first energy sum of electron affinity and energy band gap at an upper surface thereof, an N-type second semiconductor layer provided above said first semiconductor layer and having a second electron affinity and a second energy sum of electron affinity and energy band gap, an intermediate layer interposed between said first and second semiconductor layers and having at a lower surface thereof a third electron affinity smaller than said first electron affinity to form a two-dimensional electron gas layer at a surface of said first semiconductor layer in response to charge in said second semiconductor layer and having at an upper surface thereof a third energy sum of electron affinity and energy band gap larger than said second energy sum, said intermediate layer being of sufficient thickness such that holes cannot penetrate therethrough due to tunnelling effect, a P-type third semiconductor layer forming a PN-junction with said second semiconductor layer, a control electrode connected to said third semiconductor layer so as to form an ohmic contact so that there will be no Schottky barrier with respect to said second semiconductor layer, and a common electrode and an output electrode formed on the opposite sides of said control electrode for electrical coupling to said two-dimensional electron gas layer.

4,903,092

REAL SPACE ELECTRON TRANSFER DEVICE USING HOT ELECTRON INJECTION

Sergey Luryi, Millington, and Alexander Kastalsky, North Plainfield, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

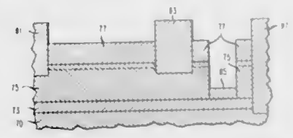
Continuation of Ser. No. 894,396, Aug. 12, 1986, abandoned, which is a continuation of Ser. No. 532,604, Sep. 15, 1983, abandoned. This application Apr. 17, 1989, Ser. No. 339,892

Int. Cl.[4] H21L *29/80*

U.S. Cl. 357—22 **9 Claims**

1. A semiconductor device comprising
three semiconductor regions which are spatially sequential in a first direction, and which here are designated, in sequence, as first channel region, potential-barrier region, and second channel region, said first and second channel

regions having respective first and second bandgaps, and said potential-barrier region having a composition adapted to forming a potential barrier between said first and second channel regions;
means for supplying carriers to said first and second channel regions;



first and second contacts to said first channel region, said first and second contacts being spaced apart in a second direction which is perpendicular to said first direction, and said first and second contacts being such as not to make contact to said second channel region;
and a third contact to said second channel region.

4,903,093

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE DOUBLE ISOLATED CMOS INPUT PROTECTION RESISTOR

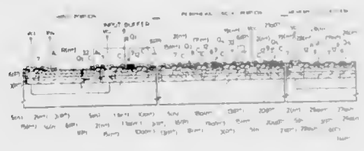
Akira Ide; Koichi Motohashi, both of Takasaki; Masanori Odaka, Kodaira, and Nobuo Tamba, Ohme, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,671

Claims priority, application Japan, Jun. 5, 1987, 62-142027

Int. Cl.[4] H01L *27/04*

U.S. Cl. 357--23.13 **11 Claims**



1. A semiconductor integrated circuit device incorporating a bipolar transistor and MISFET comprising:
a semiconductor substrate of a first conductivity type having at least an input protective portion and an input buffer circuit portion, said portions being respectively formed near a main surface of said semiconductor substrate;
a first semiconductor region of the first conductivity type formed in said input protective portion of said substrate, said first semiconductor region having a lowermost face and end sides;
a second semiconductor region of a second, conductivity type, opposite said first conductivity type, formed in said input protective portion of said substrate so that said first semiconductor region is surrounded at its lowermost face and end sides by said second semiconductor region and is electrically isolated from said semiconductor substrate;
a third semiconductor region of the second conductivity type formed in said first semiconductor region;
a MISFET formed in said input buffer portion of said substrate; and
a first voltage supplying line for supplying a first operating voltage and a second voltage supplying line for supplying a second operating voltage, wherein said second semiconductor region is connected to said first operating voltage supplying line and said semiconductor substrate is connected to said second operating voltage supplying line, the polarity of said first operating voltage with respect to said second operating voltage being such as to effect a reverse bias condition between said second semiconductor region and said semiconductor substrate, said third semiconductor region has one end connected to an input terminal and another end connected to a gate electrode of said MISFET formed in said semiconductor substrate of said input buffer circuit portion, and wherein said first region is to be in an electrically floating state during operation of said device.

4,903,094

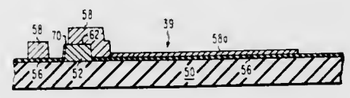
MEMORY CELL STRUCTURE HAVING RADIATION HARDNESS

Dora Plus, South Bound Brook, and Roger G. Stewart, Hillsborough Township, Somerset County, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 900,617, Aug. 26, 1986, abandoned. This application Jul. 12, 1988, Ser. No. 218,425

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.5 **13 Claims**



1. A radiation hardened structure comprising:
an electrically insulating body;
a conducting layer overlying said body for a given region, said given region comprising the entire overlay area between said body and said layer; and
an oxide barrier layer means disposed between and contiguous with both of said conducting layer and said body for preventing photoconduction between said layer and said body, said barrier layer extending over at least said given region and having a maximum thickness at about 300 nm.

4,903,095

INTEGRATED CIRCUIT COMPRISING A DEVICE FOR PROTECTION AGAINST ELECTROSTATIC DISCHARGE

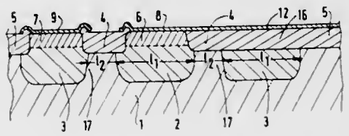
Claude E. P. Chapron, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 809,632, Dec. 16, 1985, abandoned. This application Aug. 10, 1988, Ser. No. 231,636

Claims priority, application France, Dec. 21, 1984, 84 19656

Int. Cl.[4] H01L *29/78, 29/72, 27/04*

U.S. Cl. 357—23.13 **10 Claims**



1. An integrated circuit having a protection device for protecting against electrostatic discharges comprising
a semiconductor body having a substrate region of a first conductivity type, and an epitaxial layer of a second conductivity type,
a protection device comprising at least one first active region and at least one second active region of said second conductivity type disposed in said substrate region, said first and second active regions being laterally spaced,
a first conductive layer to be protected from electrostatic discharges and connected to said first active region,
a second conductive layer connecting said second active region to a reference voltage source,
said protection device further comprising at least one third

active region formed by a portion of said substrate region and separating said first and said second active regions, said substrate region being more weakly dopend than said first and said second active regions, said first, third and second active regions forming at least three successive active regions of alternate conductivity types of said protection device,

a first thick insulating layer having a thickness inset in said semiconductor body, said thickness extending to a first depth below a surface of said semiconductor body, said first thick insulating layer covering said third active region,

wherein said first and said second active regions are disposed in said semiconductor body at a second depth below said surface greater than said first depth, and wherein each of said first and said second active regions have a first portion and a second portion, and

a first contact region covering said first portion of said first active region and a second contact region covering said first portion of said second active region, said first and second contact regions forming part of said epitaxial layer and extending through the depth of said epitaxial layer,

wherein said first conductive layer covers said first contact region and said second conductive layer covers said second contact region, and wherein said second portions of said first active region and said second active region are at least partly covered by said first thick insulating layer.

4,903,096

SEMICONDUCTOR MEMORY DEVICE WITH BARRIER LAYER

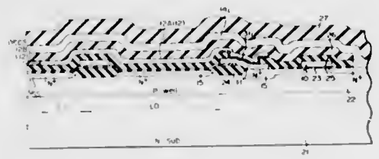
Fujio Masuoka, and Kiyofumi Ochii, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 71,569, Jul. 10, 1987, abandoned, which is a continuation of Ser. No. 765,497, Aug. 14, 1985, abandoned. This application Oct. 25, 1988, Ser. No. 265,276

Claims priority, application Japan, Aug. 23, 1984, 59-175412; Aug. 23, 1984, 59-175413

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.5 **3 Claims**



1. A static memory cell of a semiconductor device comprising:

a first layer of polycrystal silicon containing semiconductor impurities of a selected conductivity type and having a resistance;

a second layer of a predetermined length of polycrystal silicon overlapping said first layer and having a resistance higher than that of said first layer, said second layer having a first portion and a second portion, said second portion of said second layer forming a load resistor of the static memory cell;

an insulation film provided between said first layer and said second layer and having a contact hole formed therein and an upper surface; and

a barrier layer for preventing the semiconductor impurities contained in the silicon of said first layer from entering said second layer, the barrier layer comprising a silicide layer of a refractory metal contacting said first portion of said second layer of polycrystal silicon, the barrier layer extending in a current path of said first portion of said second layer of polycrystal silicon, through which an electric current flows, to reduce the resistance in said current path of said first portion of said second layer of polycrystal silicon, said barrier layer having a first portion formed in said contact hole and a second portion extending on the upper surface of a portion of said insulation film and between said insulation film and said second polycrystal silicon layer, the area of said second portion of said barrier layer establishing the resistance of said load resistor by determining the size of the area of said second portion of said second layer of polycrystal silicon wherein said semiconductor impurities contained in said silicon of said first layer may enter said second layer, the first portion of said barrier layer formed in said contact hole being sandwiched by said first and second silicon layers and connecting the first and second silicon layers.

4,903,097

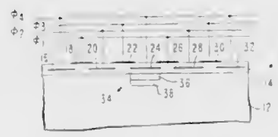
CCD READ ONLY MEMORY

Greg Nash, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 671,802, Nov. 15, 1984, Pat. No. 4,592,130, which is a continuation of Ser. No. 246,344, Mar. 23, 1981, abandoned, which is a division of Ser. No. 23,860, Mar. 26, 1979, abandoned. This application Feb. 24, 1986, Ser. No. 831,881

Int. Cl.⁴ H01L *29/78;* **G11C** *19/28*

U.S. Cl. 357—24 **8 Claims**



1. A read-only memory (ROM) structure for providing nonvolatile storage of binary information, said structure comprising:

(a) a semiconductive substrate of a first conductivity-type, having first and second major surfaces,

(b) a plurality of adjacent charge-coupled-device (CCD) memory cells including input, output, and intermediate CCD cells therebetween, each cell including an information storage segment and being further defined by separate pluralities of clocked electrodes selectively spaced above and insulated from said substrate to define, when energized, a series of charge storage sites in said substrate, and

(c) selected cells having in their information storage segments

(i) a first region of a second conductivity-type adjacent to said first major surface of said substrate,

(ii) a second region of the same conductivity-type as said substrate, and of higher impurity concentration than said substrate, directly adjacent to said first region; and

(d) at least one unselected cell, having the same impurity concentration as said substrate;

wherein clocking signals are applied to said pluralities of electrodes to step charge packets between successive cells including said storage sites, and said first region is adapted to accumulate charge in said selected cells to represent a first type of binary digit, said at least one unselected cell represents a second type of binary digit, and said greater impurity concentration of each said second region serves to provide a neutralizing effect on the surface potential of the substrate adjacent to the first and second regions.

4,903,098

CHARGE-COUPLED DEVICE

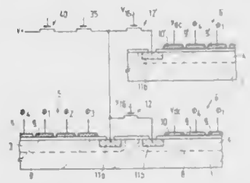
Theodorus F. Smit, and Jan w. Pathuis, both of Nijmegen, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 7,296, Jan. 27, 1987, abandoned. This application Nov. 17, 1988, Ser. No. 273,123

Claims priority, application Netherlands, Jan. 28, 1986, 8600185

Int. Cl.⁴ H01L *29/78, 27/02, 27/04*

U.S. Cl. 357—24 **10 Claims**



1. A charge-coupled device having a semiconductor body comprising a surface-adjoining semiconductor layer substantially of a first conductivity type, said semiconductor layer having a charge transport channel for storage and transport of information representing charge packets, said charge packets corresponding to a second conductivity type opposite to that of the first conductivity type, a switchable connection, said charge transport channel having at least two segments which can be connected in series with each other by said switchable connection, by means of which a charge packet that has been transported through the first segment of the charge transport channel may be transferred to the second segment for further charge transport through the second segment, the switchable connection comprising a first zone of said second conductivity type and constituting an output diode for the first segment, a second zone of the second conductivity type constituting an input diode for the second segment, and a switch having at least one main electrode connected to one of these zones.

4,903,099

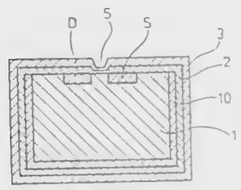
FIELD EFFECT TRANSISTOR FOR USE AS ION SENSOR

Tetsushi Sekiguchi, Tokorozawa; Tetsuo Hamatani, Iruma; Hideo Ozawa, Kawagoe, and Masao Takahashi, Tokyo, all of Japan, assignors to Nihon Kohden Corp, Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,711

Int. Cl.⁴ H01L *29/66*

U.S. Cl. 357—25 **2 Claims**



1. A field effect transistor for use as an ion sensor, comprising:

a P-type silicon substrate having a top, a bottom and sides;

a source region and a drain region of N-type material formed on said top of said P-type silicon substrate;

an N-type isolation diffusion layer formed on the outer periphery of said bottom and sides of said P-type silicon substrate, and

an insulating layer formed on the outer peripheral surface of said N-type isolation layer.

4,903,100

LONG STRIP MATERIAL HANDLING APPARATUS

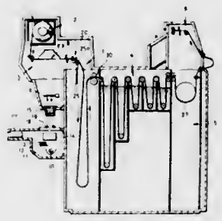
Mikio Kogane, and Tsutomu Kimura, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 10, 1989, Ser. No. 308,579

Claims priority, application Japan, Feb. 10, 1988, 63-29493; Feb. 10, 1988, 63-29494; Feb. 10, 1988, 63-29495

Int. Cl.⁴ G03B *27/32;* **G03D** *3/13*

U.S. Cl. 357—27 **13 Claims**



1. An apparatus for transporting a long strip material between a first processing section, which includes first transporting means which transports said long strip material lengthwise at a first speed in said first processing section, and a second processing section wherein said long strip material is transported lengthwise at a second speed different from said first speed, said apparatus comprising:

second transporting means, disposed before said second processing section, for grabbing said long strip material, and for transporting said long strip material lengthwise at a speed substantially equal to second disposed speed;

a reservoir section, disposed between said second transporting means and said second processing section, for temporarily reserving said long strip material therein;

a guide member, disposed in said reservoir section, for guiding the leading end of said long strip material toward said second transporting means, said guide member being movable away from said leading end of said long strip material after said long, strip material is grabbed by said second transporting means; and

speed changing means for changing the speed of lengthwise transportation of said long strip material to said second speed before said leading end of said long strip material passes through said second transporting means, and to said first speed after said leading end of said long strip material has passed through second said transporting means.

4,903,101

TUNABLE QUANTUM WELL INFRARED DETECTOR

Joseph Maserjian, Goleta, Calif., assignor to California Institute of Technology, Pasadena, Calif.

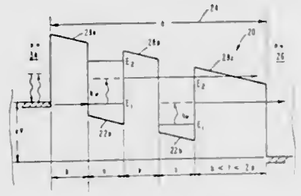
Filed Mar. 28, 1988, Ser. No. 174,111

Int. Cl.⁴ H01L *27/14*

U.S. Cl. 357—30 **18 Claims**

1. A tunable quantum well detector for detecting infrared radiation comprising (a) a quantum well structure formed in an intrinsic layer comprising a III-V semiconducting material formed over an n^+ bottom contact layer comprising a III-V semiconductor material, (b) an n^+ top contact layer formed on said intrinsic layer, said quantum well structure comprising at least one and less than three quantum wells confined by barrier layers connecting said at least one quantum well to said contact layers, said barrier layers thin enough to permit photon-assisted tunneling of charge carriers from a first electronic state

in one well to a second, excited electronic state in an adjacent well, and (c) means for applying an electric field to both said



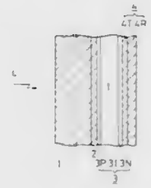
contact layers for adjusting the respective energy levels of said first and second electronic states to achieve said tunability.

4,903,102

SEMICONDUCTOR PHOTOELECTRIC CONVERSION DEVICE AND METHOD OF MAKING THE SAME

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Hase Atsugi, Japan

Continuation of Ser. No. 723,358, Apr. 15, 1985, abandoned. This application Jul. 14, 1989, Ser. No. 380,683
Claims priority, application Japan, Apr. 13, 1984, 59-74257
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **7 Claims**



1. A semiconductor device comprising:
a substrate; and
a non-single-crystalline semiconductor layer formed on said substrate and including an intrinsic region;
wherein the intrinsic region of said semiconductor layer is doped with lithium for neutralizing trapping centers generated by incident radiant rays and doped with boron for compensating the conductivity type which is biased by virtue of said doping of lithium and the concentration of lithium in the intrinsic region is below 2×10^{19} atom/cm^3 and the concentration of the boron is in the range of 5×10^{15} to 5×10^{18} atom/cm^3 to form the intrinsic region.

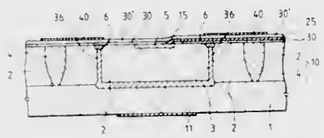
4,903,103

SEMICONDUCTOR PHOTODIODE DEVICE

Tomitaka Yamashita, and Mikio Kyomasu, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 27, 1988, Ser. No. 263,203
Claims priority, application Japan, Oct. 30, 1987, 62-274864
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **3 Claims**

1. A semiconductor photodiode device comprising:
a substrate with top and bottom opposite surfaces, having an upper portion of a first conductivity type adjacent the top surface and a lower portion of a second conductivity type adjacent the bottom surface;
an anode region of the second conductivity type and a cathode region of the first conductivity type radially spaced from the anode region and disposed in the top surface of the substrate;
an isolation region of the second conductivity type disposed in the upper portion of the substrate radially spaced from and surrounding the cathode and anode regions, said isolation region extending to the lower portion of the substrate;
a buried region of the first conductivity type underlying a portion of the top surface of the substrate enclosed by the cathode region and spaced from the anode, cathode and



isolation regions, said buried region being in contact with the upper and lower portions of the substrate;
a sidewall region of the first conductivity type in the upper portion of the substrate disposed between and spaced from the isolation region and the anode region and connecting the buried region to the cathode region for eliminating parasitic effects; and
a light-shield film covering a portion of the top surface of the substrate overlaying and extending between the cathode region and the isolation region for preventing light from striking the covered portion of the substrate.

4,903,104

HETEROJUNCTIONAL COLLECTOR-TOP TYPE BI-POLAR TRANSISTOR

Hiroji Kawai, Kanagawa, and Kenichi Taira, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 110,836, Oct. 21, 1987, abandoned. This application Jul. 5, 1989, Ser. No. 376,904
Claims priority, application Japan, Oct. 29, 1986, 61-257293
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—35 **1 Claim**



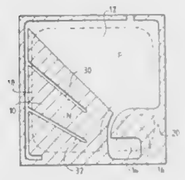
1. A transistor, said transistor formed as a heterojunction collector-top type bi-polar transistor, said transistor having an emitter region, intrinsic and external base regions, and a collector region formed on a compound semiconductor substrate, and a heterojunctin structure forming a boundary between said intrinsic base region formed adjacent said external base region, wherein said transistor has a substrate, an emitter region formed on said substrate, and a collector region formed on top of said emitter region, said intrinsic base region formed between said emitter and collector regions.

4,903,105

THYRISTOR OR TRIAC WITH EMITTER SHORTING STRIPES

Jean-Paul Nadi, Tours, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jul. 1, 1988, Ser. No. 214,254
Claims priority, application France, Jul. 3, 1987, 87 09456
Int. Cl.[4] H01L *29/74, 29/747*
U.S. Cl. 357—38 **5 Claims**



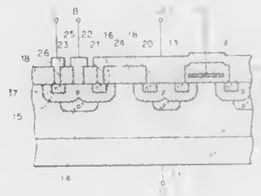
1. A thyristor comprising an emitter region, a gate region, a central region and an anode region, the emitter region having one surface overlaid by an emitter metallization, with emitter shorts through which the gate region crosses the emitter region and contact the emitter metallization, wherein substantially all of said emitter shorts are groups into a maximum of two narrow elongated stripes extending through the surface of the emitter region whereby said emitter region, a ratio between the cumulated surface of the emitter shorts of each of said stripes and a surface of the respective stripe is greater than 0.30.

4,903,106

SEMICONDUCTOR POWER DEVICE INTEGRATED WITH TEMPERATURE PROTECTION MEANS

Masanori Fukunaga, and Gourab Majumdar, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 202,469
Claims priority, application Japan, Sep. 28, 1987, 62-243063
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—43 **6 Claims**



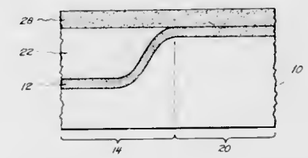
1. A semiconductor device having a power device formed by a field effect transistor and a temperature detecting device formed by a bipolar transistor on a single chip, said semiconductor device comprising:
a first conductivity type semiconductor substrate of high impurity concentration;
a first conductivity type epitaxial layer of low impurity concentration formed on said semiconductor substrate;
a second conductivity type first region formed by introducing a second conductivity type impurity into a part of a power device element region within an upper layer part of said epitaxial layer;
a second conductivity type second region formed by introducing a second conductivity type impurity into a part of a temperature detecting device element region within the upper layer of said epitaxial layer;
a first conductivity type first region formed by introducing a first conductivity type impurity into a part of a surface of said second conductivity type first region;
a first conductivity type second region and a first conductivity type third region formed by introducing a first conductivity type impurity into a part and another part of a surface of said second conductivity type second region, respectively, said part and another part being apart from each other;
an insulation film formed on said epitaxial layer, said second conductivity type first region, said second conductivity type second region, said first conductivity type first region, said first conductivity type second region and said first conductivity type third region, and having contact holes which expose a region extending over said second conductivity type first region and said first conductivity type first region of said power device element region and said first conductivity type second region, said second conductivity type second region and said first conductivity type third region of said temperature detecting device element region, respectively;
a control electrode layer formed in said insulation film corresponding to the surface of said second conductivity type first region between the surface of said first conductivity type first region and the surface of said epitaxial layer;
a first interconnection layer connected to said region extending over said second conductivity type first region and said first conductivity type first region and said first conductivity type second region through a plurality of said contact holes;
a second interconnection layer connected to said second conductivity type second region through one of said contact holes; and
a third interconnection layer connected to said first conductivity type third region through another one of said contact holes.

4,903,107

BURIED OXIDE FIELD ISOLATION STRUCTURE WITH COMPOSITE DIELECTRIC

Ching-Yeu Wei, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 947,340, Dec. 29, 1986, abandoned. This application Sep. 16, 1988, Ser. No. 246,068
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—49 **6 Claims**



1. A buried oxide field isolation structure for a silicon semiconductor device exhibiting a low radiation-induced threshold voltage shift, comprising:
a silicon substrate layer having an active region and a trench adjacent to said active region, said trench having a side wall curved along a dimension perpendicular to said substrate layer in substantially the entire extent of said side wall so as to form no sharp corners with said active region;
a thermal SiO_2 layer in said trench along the curved side wall; and
a filler of deposited SiO_2 over said thermal SiO_2 layer along said side wall and filling up said trench.

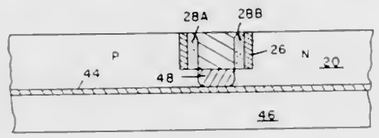
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4,903,108

RADIATION HARDENED COMPLEMENTARY TRANSISTOR INTEGRATED CIRCUITS

William R. Young; Anthony L. Rivoli, both of Palm Bay, and William W. Wiles, Jr., West Melbourne, all of Fla., assignors to Harris Corporation

Filed Jun. 21, 1988, Ser. No. 209,365
Int. Cl.[4] H01L *21/76*
U.S. Cl. 357—49 **11 Claims**



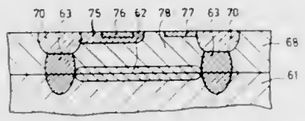
1. An integrated circuit comprising:
a first means having a first and second surface region of a first conductivity type spaced in a third region of a second conductivity type;
a second means having a fourth and fifth surface region of said second conductivity type in a sixth region of said first conductivity type;
a trench laterally separating said first, second and fourth, fifth regions and portions of said third and sixth regions;
a first gate in said trench connected to said third region at the bottom of said trench and separated from said first, second and third regions laterally by a first insulative layer; and
a second gate in said trench connected to said sixth region at the bottom of said trench, and separated from said fourth, fifth and sixth regions laterally by a second insulative layer and separated from said first gate by a third insulative layer.

4,903,109

SEMICONDUCTOR DEVICES HAVING LOCAL OXIDE ISOLATION

Else Kooi, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 160,650, Jul. 8, 1971, abandoned. This application Mar. 2, 1987, Ser. No. 21,563
Claims priority, application Netherlands, Jul. 10, 1970, 7010204
Int. Cl.[4] H01L *27/04*
U.S. Cl. 357—50 **2 Claims**



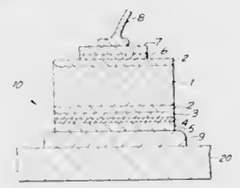
1. A semiconductor monolithic integrated circuit comprising a monocrystalline semiconductor substrate of a first conductivity type, a second-conductivity-type epitaxial semiconductor layer of a given thickness on a surface of said substrate, at least one isolation zone laterally dividing the epitaxial layer into a plurality of islands, at least one PN junction isolating each of said islands from the substrate, and at least one circuit element within one of the islands, said isolation zone including a region of silicon oxide extending from the epitaxial layer surface down into said epitaxial layer but spaced from said substrate such that said silicon oxide extends through only a part of the thickness of said epitaxial layer, and a region of said first conductivity type more heavily doped than said epitaxial layer and extending from said silicon oxide layer into contact with said substrate to complete the isolation of the islands.

4,903,110

SINGLE PLATE CAPACITOR HAVING AN ELECTRODE STRUCTURE OF HIGH ADHESION

Yohichi Aono, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 14, 1988, Ser. No. 206,427
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—51 **6 Claims**



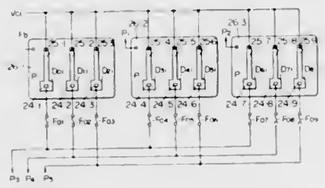
1. A single plate capacitor comprising:
a dielectric substrate essentially consisting of TiO_2, and having a first and second main surfaces each provided with a multi-layer film structure positioned thereon,
the multi-layer film structure on said first main surface of said dielectric substrate including:
a first SiO_2 film formed on said first main surface,
a first TiW film formed on said first SiO_2 film,
a Pt film formed on said first TiW film, and
a first Au film formed on said Pt film;
the multi-layer film structure on said second main surface of said dielectric substrate including:
a second SiO_2 film formed on said second main surface,
a second TiW film formed on said second SiO_2 film, and
a second Au film formed on said second TiW film.

4,903,111

INTEGRATED CIRCUIT DEVICE

Yoshihiro Takemae, Tokyo; Tomio Nakano; Masao Nakano, both of Kawasaki, and Kimiaki Sato, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 82,948, Aug. 5, 1987, abandoned, which is a continuation of Ser. No. 931,982, Nov. 24, 1986, abandoned, and Ser. No. 687,685, Dec. 5, 1984, abandoned. This application Oct. 25, 1988, Ser. No. 265,275
Claims priority, application Japan, Dec. 6, 1983, 58-229052
Int. Cl.[4] H01L *27/02*; G11C *17/00*; H02H *07/20*
U.S. Cl. 357—51 **2 Claims**



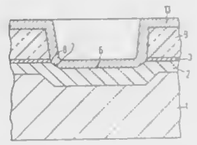
1. An integrated circuit device comprising:
a semiconductor substrate;
a first plurality of well regions in said substrate of a first conductivity type, with each said well region having a respective probing pad;
a second plurality of elongated regions of a second conductivity type in each said well region, with each said elongated region having at a first end thereof a contact in common with the first end of each of the others of said elongated regions,
a third plurality of fuses, the number of said third plurality being the product of the numbers of said first and second pluralities, each said fuse being connected at a first end to the second end of a respective one of said elongated regions, and the other end of each said fuse being connected in common with the second end of the same corresponding one of said elongated regions in each said well region;
a plurality of further probing pads, each connected to a respective one of the common connections of said second ends of the fuses, the number of said further probing pads being that of said second plurality.

4,903,112

SEMICONDUCTOR COMPONENT WITH CONTACT HOLE

Helmut Strack, Munich, and Gottfried Schuh, Augsburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 924,105, Oct. 31, 1986, abandoned, which is a continuation of Ser. No. 556,499, Nov. 30, 1983, abandoned. This application Jun. 22, 1988, Ser. No. 212,365
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245457
Int. Cl.[4] H01L *29/06, 29/78*
U.S. Cl. 357--55 **6 Claims**



1. A semiconductor component comprising:
a semiconductor substrate having an upper side;
a first layer of a first conductivity type having upper and lower sides with a predetermined separation therebetween, said lower side being supported on said upper side of said semiconductor substrate, said first layer having a doping concentration exhibiting a maximum concentration at a depth below said upper side of said first layer, said upper side of said first layer having therein a depression having a bottom located substantially at said depth of said maximum concentration;
a second layer of a second conductivity type having a doping concentration greater than 10^{19} cm^{-3} and being supported on said upper side of said first layer, said second layer having therein an opening to expose said depression; and
a conducting layer interconnecting said first and second layers, said conducting layer contacting said first layer at said depression and contacting said second layer at a wall of said opening.

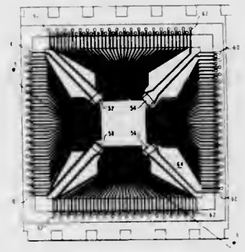
4,903,113

ENHANCED TAB PACKAGE

Richard F. Frankeny, Elgin, and James M. Rakes, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1988, Ser. No. 145,808
Int. Cl.[4] H01L *23/14*
U.S. Cl. 357—70 **5 Claims**

1. An improved semiconductor device TAB package for electrical connection to printed circuit substrate, having plural conductive planes comprising:
a planar flexible insulating member;
a pattern of conductive leads, including power and ground leads, formed on said flexible insulating member;
at least a decoupling capacitor across adjacent ones of said power and ground leads;
means for connecting said semiconductor device to first ends of at leaast some conductive leads in said pattern, said



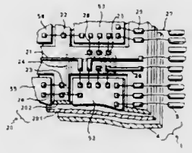
means comprising apertures in said flexible insulating member adapted for permitting direct attachment of said power and ground leads to interior sites on a surface of said semiconductor device or on peripheral edges of said device; and
means for selectively connecting opposite ends of some of said conductive leads to surface circuitry and internal conductive planes of said circuit substrate.

4,903,114

RESIN-MOLDED SEMICONDUCTOR

Tsuyoshi Aoki; Michio Ono; Kazuhiro Maeda, all of Kawasaki, and Hiroyuki Kitasako, Sendai, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 912,095, Sep. 29, 1986. This application Jun. 15, 1988, Ser. No. 207,929
Claims priority, application Japan, Oct. 1, 1985, 60-219624
Int. Cl.[4] H01L *23/48, 29/44, 29/52, 29/60*
U.S. Cl. 357—70 **12 Claims**



1. A resin-molded semiconductor device comprising:
a metal lead-frame, comprising:
a metal sheet die-stage located in a central portion of the semiconductor device and having an upper surface and a lower surface; and
a plurality of inner-leads, each of said inner leads being a thin metal strip arranged on a plane parallel to and higher than an upper surface of said metal sheet die-stage, extending toward the central portion of the semiconductor device, and placed around said metal sheet die-stage forming a space therebetween;
an insulating plate, mounted on said metal sheet die-stage having a bottom surface attached to the upper surface of said metal sheet die-stage and having an upper surface parallel to the bottom surface, comprising:
a first surface formed at a central portion of said insulating plate;

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a second surface formed surrounding said first surface and being at a level, measured from the upper surface of said metal die-stage, higher than that of said first surface, said inner-leads being the same height as said second surface; and

a plurality of relay-wirings provided along the periphery of said second surface, each of said relay wirings corresponding to each of said inner-leads;

an integrated circuit semiconductor (IC) chip having an upper surface and a lower surface parallel to the upper surface, mounted on said first surface of said insulating plate and being the same height as said second surface, including a plurality of chip-pads formed on the upper surface of said integrated circuit semiconductor chip;

a plurality of first bonding wires bonded between said chip-pads and said relay-wirings, respectively, said first bonding wires being short in length since said chip-pads and relay wirings are located a small distance from each other; and

a plurality of second bonding wires bonded between said relay-wirings of said insulating plate and said inner-leads, each of said relay wirings being connected to said respective inner-leads, said metal sheet die-stage, a predetermined portion of said inner-leads, said insulating plate, and said second bonding wires being molded by a resin.

4,903,115

METHOD OF MANUFACTURING CONDUCTIVE ELECTRODES FOR A CIRCUIT ELEMENT, AND SEMICONDUCTOR DEVICE THUS OBTAINED

Stefan Barbu, and Claude E. Chapron, both of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 841,128, Mar. 18, 1986, Pat. No. 4,749,442. This application Nov. 12, 1987, Ser. No. 119,609

Claims priority, application France, Mar. 26, 1985, 85 04472

Int. Cl.[4] H01L *21/223*

U.S. Cl. 357—71 **3 Claims**



1. A semiconductor device for a very high frequency transistor comprising a semiconductor body having a surface; an insulating layer disposed on said surface; at least two adjacent contact windows disposed in said insulating layer and extending to said surface; a narrow region of said insulating layer separating said adjacent contact windows, said narrow region having a dimensions E between said contact windows; a layer of a metal chemically combined with said semiconductor body within said contact windows, said layer entirely covering said surface within said contact windows; a base electrode disposed over said layer in one of said contact windows; an emitter electrode disposed over said layer in another of said contact windows, said emitter electrode entirely covering said another contact window, and said emitter electrode having a dimension exceeding the size of said another contact window by a quantity 2A, where A is a tolerance distance of positioning conductive electrodes with respect to said contact windows at either side of a normal position of said conductive electrodes; said emitter electrode and said base electrode separated by a distance B, said distance B being a minimum distance between said two electrodes; wherein said dimension E is at least equal to one of the value 2A or the value A + B, and wherein E is less than 2A + B.

4,903,116

INTEGRATED SEMICONDUCTOR CIRCUIT HAVING A MULTILAYER WIRING

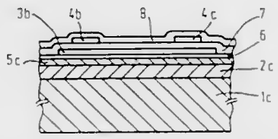
Cord H. Kohsiek, Ellerau, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 126,383, Nov. 30, 1987, abandoned. This application Jul. 20, 1989, Ser. No. 384,850

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641299

Int. Cl.[4] H01L *23/54, 23/48*

U.S. Cl. 357—71 **2 Claims**



1. An integrated semiconductor circuit having a multilayer wiring system and comprising circuit elements formed in a semiconductor body, said circuit elements being interconnected by connection conductors extending at at least two levels, the connection conductors at a lower, first level being separated from the connection conductors at a second, higher level by an insulating layer, characterized in that, in addition to the connection conductors being present at said first level for interconnecting said circuit elements, at least one further connection conductor is situated at said first level between said circuit elements and said second level of connection conductors, said one further connection conductor having a position, shape and fixed applied potential during operation such that it constitutes at least in part a screening element to prevent capacitive coupling between at least one underlying circuit element and at least one connection conductor of said second level.

4,903,117

SEMICONDUCTOR DEVICE

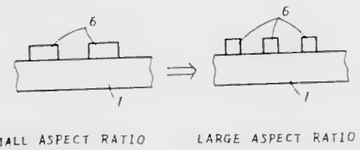
Tatsuo Okamoto, and Ikuo Ogoh, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 904,705, Sep. 8, 1986, abandoned. This application Jun. 7, 1988, Ser. No. 203,445

Claims priority, application Japan, Sep. 11, 1985, 60-201009

Int. Cl.[4] H01L *23/54*

U.S. Cl. 357—71 **13 Claims**



1. A semiconductor device comprising:

a silicon substrate;

a first silicon oxide film formed on the surface of said silicon substrate;

a second silicon oxide film formed on said first silicon oxide film and containing boron and phosphorus;

a contact hole selectively formed in said first and second silicon oxide films;

an impurity diffusion layer formed on the surface layer of said silicon substrate at the bottom portion of said contact hole;

a first metal film formed on said second silicon oxide film and said impurity diffusion layer to serve as a barrier layer; and

a second metal film of aluminum alloy containing silicon formed on said first metal film to serve as a metal electrode;

said first metal film comprising a material capable of preventing boron contained in said second silicon oxide film from being diffused into said second metal film.

4,903,118

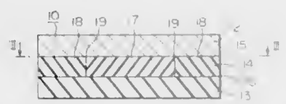
SEMICONDUCTOR DEVICE INCLUDING A RESILIENT BONDING RESIN

Shuhei Iwade, Itami City, Japan, assignor to Director General, Agency of Industrial Science and Technology, Japan

Filed Mar. 30, 1988, Ser. No. 175,181

Int. Cl.[4] H01L *21/58, 21/78*

U.S. Cl. 357--72 **5 Claims**



1. A semiconductor device comprising a semiconductor chip, a substrate for supporting said semiconductor chip, and bonding means disposed between said semiconductor chip and said substrate for bonding said semiconductor chip onto said substrate for bonding said semiconductor chip onto said substrate, said bonding means comprising a relatively rigid bonding resin disposed between and contacting said semiconductor chip and substrate and a relatively resilient bonding resin disposed between and contacting said semiconductor chip and substrate and enclosing said relatively rigid resin whereby differences in thermal expansion between said semiconductor chip and said substrate are accommodated.

4,903,119

SEMI-CONDUCTOR DEVICE

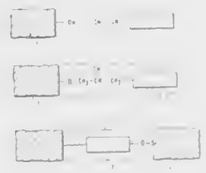
Satoshi Ito; Akiko Kitayama; Takatoshi Hamada, and Miho Yamaguchi, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 44,546, May 1, 1987, abandoned. This application Mar. 27, 1989, Ser. No. 328,712

Claims priority, application Japan, May 1, 1986, 61-101752

Int. Cl.[4] H01L *23/28*

U.S. Cl. 357—72 **3 Claims**



1. A semi-conductor device comprising a semi-conductor element sealed with a molding resin, wherein

said molding resin is a cured epoxy resin composition comprising an epoxy resin, a curing agent which is a phenolic resin modified by preliminary reaction with a silane compound, and an inorganic filler, and

adhesion between a semi-conductor chip in the semi-conductor device and said molding resin is achieved mainly by oxygen-crosslinking between silicon in said semi-conductor chip and silicon in said molding resin.

4,903,120

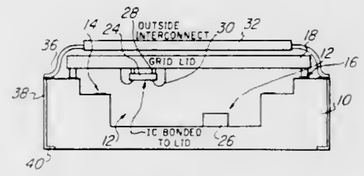
CHIP CARRIER WITH INTERCONNECTS ON LID

Gary L. Beene, Allen; Thomas D. Petrovich, Richardson, and Charles E. Williams, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 22, 1985, Ser. No. 801,177

Int. Cl.[4] H01L *23/14, 23/02, 27/12*

U.S. Cl. 357—74 **22 Claims**



1. A chip carrier comprising:

a chip carrier body defining a cavity therein, said cavity having a substantially planar mounting surface at the bottom thereof and one or more bonding ledges in proximity to said mounting surface within said cavity;

external contacts on the exterior of said chip carrier body;

a lid hermetically sealed to enclose said cavity in said chip carrier body, said lid comprising conductive vias therethrough; and

one or more integrated circuit chips enclosed between said lid and said body within said cavity; wherein a first set of chips (comprising one or more integrated circuit chips) is mounted on said mounting surface, at the bottom of said cavity, and a second set of chips (comprising one or more integrated circuit chips) is mounted on the surface of said lid facing said cavity.

4,903,121

IMAGE PICK UP APPARATUS HAVING PIXEL COMPENSATION CIRCUIT

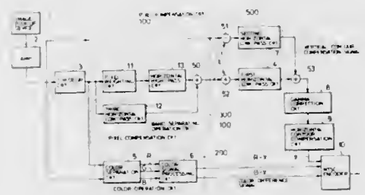
Kenya Uomori, Osaka; Atsushi Morimura, Nara, and Yoshinori Kitamura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 13, 1988, Ser. No. 193,469

Claims priority, application Japan, May 14, 1987, 62-117946; May 22, 1987, 62-12612; Sep. 17, 1987, 62-231156

Int. Cl.[4] H04N *9/083*

U.S. Cl. 358—41 **25 Claims**



1. An image pick-up apparatus comprising:

(a) an image pick up device means for picking up an image and for producing a pixel signal indicative of said image;

(b) a 1-H delay circuit means responsive to said pixel signal from said image pick up device means for delaying said pixel signal by 1H;

(c) a first pixel compensation circuit means responsive to an

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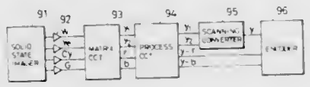
output signal from said 1-H delay circuit means for generating a first weighted signal;
(d) a second pixel compensation circuit means responsive to said pixel signal from said image pick up device means for generating a second weighted signal;
(e) a vertical contour compensation circuit means for emphasizing contours defined by said first and second weighted signals, thereby producing a vertical contour compensation signal;
(f) a first adder means for adding said first weighted signal to said second weighted signal;
(g) a horizontal low-pass circuit means responsive to an output signal from said first adder means;
(h) a second adder means for adding an output signal from said horizontal low-pass circuit means to said vertical contour compensation signal;
(i) a circuit means responsive to an output signal from said second adder means to generate a luminance signal;
(j) a color operation circuit means responsive to said pixel signal from said image pick up device means and to said output signal from said 1-H delay circuit means for generating color difference signals; and
(k) an encoder means responsive to said luminance signal and said color difference signals for obtaining a video signal.

4,903,122

SOLID-STATE COLOR IMAGING APPARATUS FOR EXTENDED DEFINITION TELEVISION (EDTV)

Toshifumi Ozaki, Koganei; Naoki Ozawa, Akishima; Shinya Ohba, Kanagawa, and Itaru Mimura, Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 12, 1988, Ser. No. 142,919
Claims priority, application Japan, Jan. 28, 1987, 62-16060
Int. Cl.[4] H04N *9/077, 9/07*
U.S. Cl. 358—48 **7 Claims**



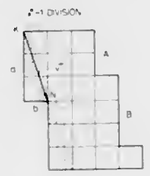
1. A solid-state color imaging apparatus having a plurality of photoelectric conversion means disposed two-dimensionally in rows and columns, each of said photoelectric conversion means having a spectral responsivity characteristic, the apparatus comprising:
scanning means for reading out a signal of each of said photoelectric conversion means corresponding to a charge accumulated therein as an independent signal in a field, scanning with respect to said field the same number of rows as that of a frame;
means for obtaining first intensity signals with respect to each one of said number of rows of a frame, wherein each of said first intensity signals corresponds to an intensity signal of each row, and is obtained only from the independent signals read out from each row;
means for obtaining second intensity signals corresponding to half the number of said first intensity signals by processing said first intensity signals; and
means for encoding said second intensity signals,
wherein said means for obtaining first intensity signals does so preforming a specified weighted summation of the independent signals read out from each row based on the spectral responsivity characteristics of the corresponding photoelectric conversion means.

4,903,123

IMAGE PROCESSING APPARATUS USING INCLINED LINE SCREENS TO REDUCE MOIRé

Naoto Kawamura, and Hidejiro Kadowaki, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 204,031
Claims priority, application Japan, Jun. 10, 1987, 62-143044; Jun. 10, 1987, 62-143045
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—75 **9 Claims**



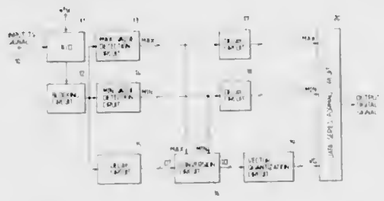
1. An image processing apparatus comprising:
pixel data input means;
process means for intermediate tone processing of the pixel data entered by said input means to generate reproduction signals for dot formation; and
scanning means for effecting line scanning in accordance with the reproduction signals generated by said process means,
wherein said process means is adapted to generate the reproduction signals in such a manner that plural microdots are formed for each pixel data and that a line screen is formed by a group of said plural microdots, and further in such a manner that, in response to pixel data of a predetermined uniform density, a line screen is formed by continuously connecting the smallest microdots among plural microdots in each pixel and the line screen formed by connecting the smallest microdots is oblique to the direction of said line scanning.

4,903,124

IMAGE INFORMATION SIGNAL TRANSMISSION APPARATUS

Nobuhiro Hoshi, Atsugi; Hisashi Ishikawa, Sagamihara; Yoshiki Ishii, Hadano; Toshihiro Yagisawa, and Akio Fujli, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1989, Ser. No. 673,244
Claims priority, application Japan, Mar. 17, 1988, 63-064131; Jul. 29, 1988, 63-189808; Aug. 5, 1988, 63-194352; Aug. 5, 1988, 63-194353; Aug. 5, 1988, 63-194354; Aug. 5, 1988, 63-194355; Aug. 5, 1988, 63-194356; Sep. 29, 1988, 63-242216
Int. Cl.[4] H04N *7/13*
U.S. Cl. 358—133 **16 Claims**



1. An image information signal transmission apparatus comprising:

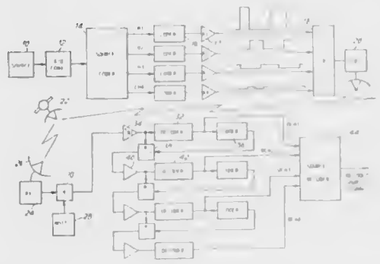
(A) blocking means for receiving an image information signal in which one frame is constituted by a plurality of sample data and for dividing the input image information signal into a plurality of blocks each consisting of a predetermined number of sample data;
(B) reference value data forming means for forming at least two types of reference value data associated with a dynamic range of sample data of each block in units of blocks formed by said blocking means;
(C) first coding means for coding the sample data of each block by using the reference value data formed by said reference value data forming means and forming a plurality of first coded data in units of blocks;
(D) second coding means for vector-quantizing the plurality of first coded data formed by said first coding means in units of blocks and forming second coded data in units of blocks; and
(E) transmission data forming means for forming transmission data by using as a transmission unit the reference data formed by said reference value data forming means in units of blocks and the second coded data formed by said second coding means in units of blocks.

4,903,125

METHOD AND APPARATUS FOR CONVEYING INFORMATION SIGNALS

Michael A. Parker, London, United Kingdom, assignor to British Broadcasting Corporation, London, England

PCT No. PCT/GB86/00783, § 371 Date Jan. 25, 1988, § 102(e) Date Jan. 25, 1988, PCT Pub. No. WO87/06418, PCT Pub. Date Oct. 22, 1987
PCT Filed Dec. 19, 1986, Ser. No. 134,774
Claims priority, application United Kingdom, Apr. 17, 1986, 8609426
Int. Cl.[4] H04N *7/04, 7/01, 11/12*
U.S. Cl. 358—141 **19 Claims**



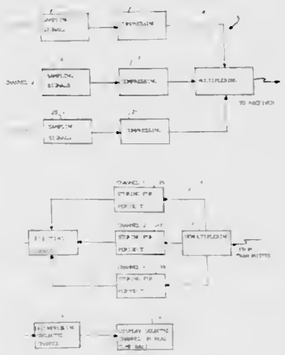
1. A method of conveying television signals from a source to a receiver by way of a medium, comprising the steps of segregating signals from the source into component signals in a corresponding plurality of channels corresponding to progressively less visually significant information, forming a composite signal, for conveyance by the said medium, by subjecting the component signals from the said channels to a combining operation to form a composite signal with the powers of the component signals in the composite signal varying directly in dependence on the visual significance of the information in the channels, the combining operation being such as to be reversible to recover the component signals from the composite signal, and, at the receiver, recovering a number of the component signals from the composite signal conveyed to the receiver by the said medium and forming a television signal from the recovered signals.

4,903,126

METHOD AND APPARATUS FOR TV BROADCASTING

Salim A. Kassatly, 18600 NE. August Ave., Battle Ground, Wash. 98604

Filed Feb. 10, 1989, Ser. No. 308,826
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—146 **5 Claims**



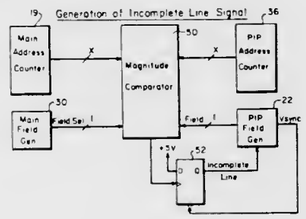
5. A television broadcasting apparatus comprising:
(a) means for compressing and multiplexing signals from a plurality of channels over a single carrier frequency;
(b) means for transmitting the multiplexed signals;
(c) means for receiving the multiplexed signals;
(d) means for demultiplexing and separating the received signals into separate channels;
(e) means for storing the separated signals for a predetermined period of time;
(f) means for selecting a desired channel;
(g) means for decompressing and reconstructing the signals of the selected channel on a real-time basis; and
(h) means for displaying the reconstructed signals of the selected channel on a real-time basis.

4,903,127

FIELD GENERATOR WITH INCOMPLETE LINE CORRECTION

Larry G. Phillips, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 261,202, Oct. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 209,452, Jun. 15, 1988. This application Jun. 23, 1989, Ser. No. 373,679
Int. Cl.[4] H04N *5/04, 5/262*
U.S. Cl. 358—148 **1 Claim**



1. Apparatus for receiving an interlaced signal having a first field and a second field timed by a first vertical synchronization signal and a second vertical synchronization signal respec-

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tively, and having, respectively, first lines timed by first horizontal synchronization signals and second lines timed by second horizontal synchronization signals, comprising:

means for receiving said interlaced signal and generating a first field selector signal indicative of top field for an arbitrarily selected one of said first and second fields, and a second field selector signal signifying bottom field for the other of said first and second fields;

memory means having a first group of memory locations and a second group of memory locations;

means for recording top field information in said first memory locations and bottom field information in said second memory locations under control of said first and second field selector signals, respectively;

means for reading said top field information and said bottom field information from said first and second memory locations; and

means for maintaining said first field selector signal during receipt of the other of said first and second fields when said recording means and said readout means are simultaneously operative in the same one of said groups of memory locations.

4,903,128

METHOD AND DEVICE FOR THE REDUCTION OF NOISE GENERATED BY A DIGITAL IMAGE ENCODER/DECODER OPERATING BY BLOCKS

Dominique Thoreau, Rennes, France, assignor to Thomson Grand Public, Paris, France

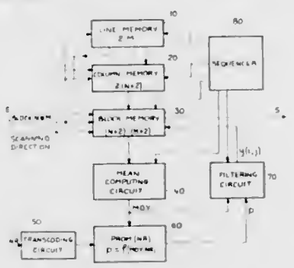
PCT No. PCT/FR87/00425, § 371 Date Aug. 25, 1988, § 102(e) Date Aug. 25, 1988, PCT Pub. No. WO88/03346, PCT Pub. Date May 5, 1988

PCT Filed Oct. 28, 1987, Ser. No. 221,453

Claims priority, application France, Oct. 31, 1986, 8615242

Int. Cl.⁴ H04N *5/208, 5/21*

U.S. Cl. 358—167 **7 Claims**



1. A method for the reduction of noise generated by an encoding/decoding of digital images, operating by blocks of pixels, said method comprising the processing of the characteristic value of the current point of the decoded blocks;

by determining, from a window centered on the current point of an image, a mean characteristic value Moy,

and then determining a filtering parameter p from a parameter NR, related to the operating status of an encoder and said mean characteristic value Moy;

and by determining a filtered value, y(i,j), for the current point from its decoded characteristic value x(i,j), of the filtering parameter p, and of said mean characteristic value Moy: $y(i,j)=pxc((i,j)+(1-p).Moy$.

4,903,129

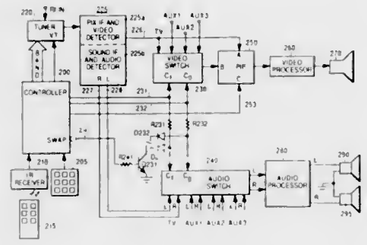
AUDIO SIGNAL SECTION APPARATUS

Issac M. Bell, and Gene K. Sendelweck, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 6, 1989, Ser. No. 334,058

Int. Cl.⁴ H04N *5/268, 5/60, 5/74, 5/272*

U.S. Cl. 358—181 **9 Claims**



1. A baseband television signal switching system, comprising:

video switch means, having a plurality of video signal inputs for receiving respective baseband video signals, having first and second control inputs for receiving respective first and second switching control signals and having an output terminal for developing a video signal selected from said baseband video signals at said plurality of video inputs in response to said switching control signals;

audio switch means, having a plurality of signal inputs for receiving respective baseband audio signals, having first and second control inputs for receiving said respective first and second control switching signals and having an output terminal for developing an audio signal selected from said baseband video signals at said plurality of audio inputs in response to said switching control signals;

control means for generating said first and second switching control signals at first and second outputs respectively, and generating a third control signal at a third output in response to data signals input by a user; and

additional control means coupled to said control means for substituting an alternate control signal for said first and second control signals at said control inputs of said audio switch means in response to said third control signal.

4,903,130

BROADCAST SATELLITE RECEIVER

Keiko Kitagawa, Tokyo, and Osamu Yamakami, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 289,670

Claims priority, application Japan, Jan. 12, 1988, 63-004389

Int. Cl.⁴ H04N *5/262, 5/63*

U.S. Cl. 358—190 **11 Claims**

1. A receiver comprising:

a power source circuit;

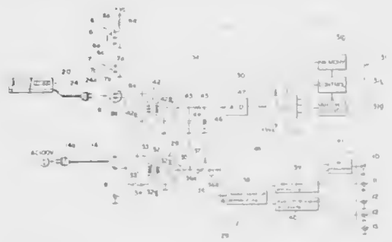
a tuner circuit;

power switching means for controlling the supplying of a power source voltage from said power source circuit to said tuner circuit for operating the latter;

coupling means for connecting an external appliance to said power source circuit of the receiver;

detecting means for detecting values of power consumption by the external appliance connected through said coupling means to said power source circuit; and

controlling means responsive to said values of power consumption detected by said detecting means for closing said power switching means, and thereby operating said tuner circuit, when the detected value of power consumption exceeds, by a predetermined amount, a previously detected value of power consumption of the external appliance in a standby condition.



4,903,131

METHOD FOR THE AUTOMATIC CORRECTION OF ERRORS IN IMAGE REGISTRATION DURING FILM SCANNING

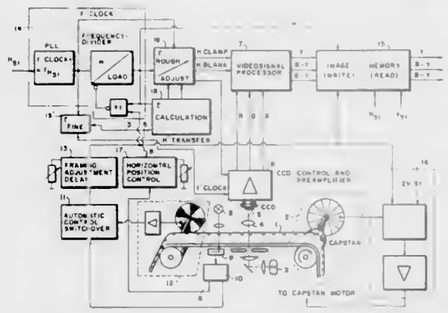
Karl-Heinz Lingemann, Pfungstadt; Dieter Poetsch, and Volker Massmann, both of Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 31, 1988, Ser. No. 264,636

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736790

Int. Cl.⁴ H04N *5/253*

U.S. Cl. 358—214 **43 Claims**



1. A method for determining and automatically correcting errors in image steadiness during television image scanning of continuously moving motion picture film having a succession of image frames, said image scanning producing video signals which are temporarily stored in an image buffer memory, said method comprising the steps of:

(a) producing vertical image steadiness error signals and determining from said vertical error signals the start of scanning of the first television scan line for said film frame as well as the start of writing said video signals for said film frame into said memory in dependence upon the vertical position of a film frame relative to the television image scanner;

(b) producing studio timing pulses;

(c) producing standard television horizontal and vertical timing pulses in synchronism with said studio timing pulses; and

(d) reading said video signals out from said memory in dependence upon said standard horizontal and vertical timing pulses,

whereby vertical errors in image steadiness are corrected.

4,903,132

ELECTRONIC STILL CAMERA WITH SLOW-IN, FAST OUT MEMORY ADDRESSING

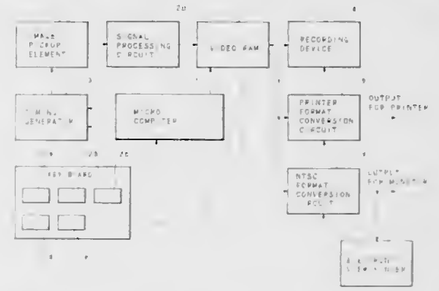
Masao Yamawaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 248,713

Claims priority, application Japan, Sep. 26, 1987, 62-241055

Int. Cl.⁴ H04N *5/76*

U.S. Cl. 358—209 **11 Claims**



1. An electronic still camera comprising:

an image pickup means for photoelectrically converting an image of an object to output video signals comprising picture elements;

an image storage means for storing said video signals for at least one picture plane;

a recording means for recording said video signals read out from said image storage means;

a processing means for processing said video signals read out from said image storage means;

a first control means for synchronously writing, at a first clock frequency, the output video signals of said image pickup means to said image storage means; and

a second control means for synchronously reading out, at a second clock frequency, the video signals stored in said storage means to said processing means, said second clock frequency being greater than said first clock frequency.

4,903,133

OCULAR ATTACHMENT FOR AN ENDOSCOPE

Siegfried Hiltebrandt, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 257,518

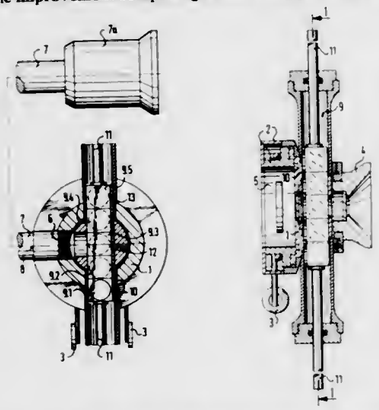
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 3734917

Int. Cl.⁴ H04N *7/18*

U.S. Cl. 358—225 **12 Claims**

1. In an ocular attachment for an endoscope, in which an endoscopic image may be split into two images by means of one in each case of several adjacently positioned beam splitter elements which are displaceable transversely to an image axis, one image being transmissible along said image axis acting as a first optical axis to a first camera connector and the other image being transmissible to a second camera connector via an image conductor along a second optical axis, to which end the degrees of brightness of both images being adjustable by means of the beam splitter elements having different transmission/reflection ratios and being secured in a mounting, one of the beam splitter elements being positionable in each case in the

beam path of the endoscopic image by displacing the mounting, the improvement comprising means being provided in said



mounting for supplying an undivided endoscopic image optionally to a selected one of the first and second optical axes.

4,903,134

AUTOMATIC FOCUSING CIRCUIT FOR AUTOMATICALLY MATCHING FOCUS IN RESPONSE TO VIDEO SIGNAL AND ZOOM POSITION

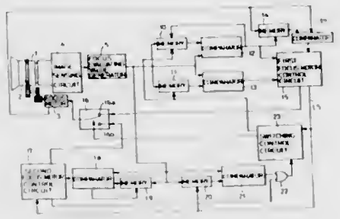
Hirotsugu Murashima, Yamatotakada; Satoru Maeda, Hirakata, and Shunji Hirano, Takatsuki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Division of Ser. No. 120,583, Nov. 13, 1987, Pat. No. 4,841,370. This application Dec. 9, 1988, Ser. No. 282,394

Claims priority, application Japan, Nov. 17, 1986, 61-273212; Dec. 19, 1986, 61-304411; Feb. 18, 1987, 62-34763; Feb. 26, 1987, 62-43405; Feb. 26, 1987, 62-43406; Mar. 4, 1987, 62-49513

Int. Cl.[4] H04N *5/232*

U.S. Cl. 358—227 **15 Claims**



1. An automatic focusing circuit for automatically matching the focus in response to a video signal obtained from image sensing means having a focusing lens, a zoom lens, zoom lens moving means for moving said zoom lens in the direction of an optical axis and an image sensor, comprising:

zoom position detecting means for detecting the zoom position of said zoom lens,

focus evaluating value detecting means for detecting a level of a high frequency component of a video signal obtained from said image sensing means every constant period, converting the level into a focus evaluating value which takes the maximum value in the in-focus position or a focus evaluating value which takes the minimum value in the in-focus position and sequentially supplying the same, and

focus control means connected to said zoom position detecting means and responsive to the change of the focus evaluating value supplied from said focus evaluating value detecting means for performing control in a predetermined characteristic so that said focusing lens is held in the in-focus position, said predetermined characteristic being switched in response to the zoom position detected by said zoom position detecting means;

said focus control means including focusing lens position changing means for changing the relative position in the direction of the optical axis of said focusing lens relative to said image sensor;

said focusing lens position changing means including a focusing ring for moving the focusing lens or the image sensor in the direction of the optical axis and a focusing motor.

4,903,135

AUTOMATIC FOCUSING SYSTEM

Yoshichi Ohtake, Kamakura; Kaichiro Nomoto, Tokyo, and Takashi Shinozaki, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 103,637, Oct. 2, 1987, abandoned. This application May 15, 1989, Ser. No. 352,629

Claims priority, application Japan, Oct. 2, 1986, 61-235238; Feb. 24, 1987, 62-40538

Int. Cl.[4] H04N *5/232*

U.S. Cl. 358—227 **3 Claims**



1. An automatic focusing system including a focusing lens system and an image pickup device for converting a light beam incident thereon from an object through said focusing lens system into a corresponding electrical signal, comprising:

filter means coupled to said image pickup device for deriving a predetermined high-frequency component from said electrical signal;

detector means coupled to said filter means for detecting a focus voltage of the derived predetermined high-frequency component, the level of said focus voltage varying in accordance with the position of said focusing lens system so as to be at a maximum when said focusing lens system takes a focus position where the light beam from said object is focused on said image pickup device, the detector means including means for successively sampling and digitizing the focus voltage to output a series of sampled focus data: p1 drive means for driving said focusing lens system in directions along its optical axis;

means for successively generating a series of lens position data which represent positions of the focusing lens system at times when the focus voltage is sampled; and

control means for successively comparing the series of focus data with a plurality of reference voltages which are different from each other and are stepped in value to select the focus data which are substantially equal to corresponding reference voltages, sequentially storing the reference values corresponding to the selected focus data together with the lens position data corresponding to the selected focus data, comparing each of the stored reference values with the subsequently stored reference value to find out the consecutively stored two reference values which are equal to each other or the consecutively stored three reference values among which the secondarily

stored reference value is maximum, and causing the drive means to adjust the position of the focus lens system to a middle between two positions represented by the two lens position data respectively stored together with the consecutively stored two reference values when the consecutively stored two reference values are equal to each other, and to a middle position among three positions represented by the three lens position data respectively stored together with the consecutively stored three reference values when the secondarily stored reference value is maximum among the consecutively stored three reference values.

4,903,136

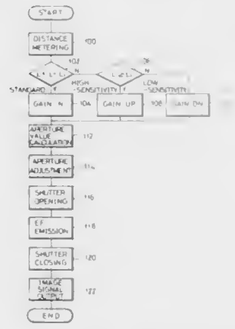
AUTOMATIC SENSITIVITY CONTROLLER FOR ELECTRONIC STILL CAMERA

Kohei Iketani, Kawagoe, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Aug. 31, 1988, Ser. No. 238,531

Int. Cl.[4] H04N *5/235*

U.S. Cl. 358—228 **5 Claims**



1. An automatic sensitivity controller for an electronic still camera which performs flash photography, said automatic sensitivity controller comprising:

an image pickup device;

distance metering means for measuring the camera-to-subject distance;

a variable-gain amplifier circuit having a control terminal and amplifying a video signal supplied from said image pickup device at a gain determined in response to a control signal applied to said control terminal;

a gain control means for applying a control signal relating to a measured value of the camera-to-subject distance to said control terminal, wherein said control signal output from said gain control means is a dc-voltage signal, said gain control means having:

a control voltage producing circuit having a plurality of output terminals through which a plurality of different dc voltages are taken out in parallel with each other;

a change-over switch for selectively connecting one of said plurality of output terminals to said control terminal of said variable-gain amplifier circuit in response to a change-over control signal; and

switch control means for supplying the change-over control signal relating to the measured value of the camera-to-subject distance to said change-over switch;

said automatic sensitivity controller further comprising:

an aperture device for adjusting the quantity of light introduced to said image pickup device;

aperture value calculating means for obtaining an aperture value by dividing an equivalent guide number determined from the gain of said variable-gain amplifier circuit by the measured value of the camera-to-subject distance; and

aperture control means for controlling said aperture device so that the aperture value of said aperture device becomes equal to the aperture value calculated by said aperture value calculating means.

4,903,137

PROJECTION TELEVISION RECEIVER COMPRISED OF MODULAR ARRAY OF INDIVIDUAL RGB PROJECTORS

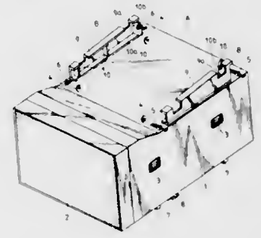
Toshiya Wakasa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 6, 1988, Ser. No. 280,919

Claims priority, application Japan, Mar. 8, 1988, 63-52574

Int. Cl.[4] H04H *9/31*

U.S. Cl. 358—254 **9 Claims**



1. A multiple projection television receiver comprising a plurality of projection television receiver modules, each including:

a Fresnel lens;

a screen located at the front of said receiver modules;

three cathode-ray tubes corresponding to the colors red, green and blue, respectively, for projecting a picture from said tubes onto said screen through said Fresnel lens;

means for vertically and horizontally coupling each module to other modules wherein the front surfaces of said modules adjoining each other are adjacent and located in substantially the same plane.

4,903,138

METHOD OF AND APPARATUS FOR ELIMINATING INTERBLOCK DISTORTION DUE TO COMPRESSED IMAGE DATA

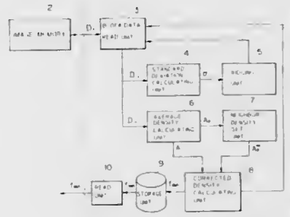
Masami Aragaki, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co. Ltd., Japan

Filed Apr. 5, 1989, Ser. No. 333,444

Claims priority, application Japan, May 4, 1988, 63-84481

Int. Cl.[4] H04N *1/41, 1/415, 7/133*

U.S. Cl. 358—261.3 **12 Claims**



1. A method of eliminating interblock distortion, which is seen in a reproduced image produced on the basis of com-

pressed image data obtained for each pixel block consisting of a prescribed number of pixels in said reproduced image and is defined as stepwise density difference on boundaries between said pixel blocks, by correcting a density distribution expressing densities for respective pixels in said pixel blocks, said method comprising the steps of:

(a) sequentially selecting said pixel blocks one by one as an object pixel block,

(b) obtaining a density distribution in said object pixel block on the basis of said compressed image data,

(c) finding a statistical value expressing a standard deviation of said density distribution,

(d) comparing said statistical value with a prescribed threshold value expressing a threshold standard deviation, thereby designating said object pixel block as either of a first type to be subjected to a processing for correcting said density distribution and a second type not to be subjected to said processing, and

(e) performing said processing when said object pixel block is said first type, said processing comprising

(e-1) obtaining respective average densities of said object pixel block and neighbor pixel blocks neighboring said object pixel block in a prescribed direction, and

(e-2) correcting said density distribution through interpolation of quantities corresponding to said respective average densities so as to reduce said stepwise density differences on boundaries between said object pixel block and said neighbor pixel blocks, thereby obtaining a corrected density distribution in said object pixel block.

4,903,139

IMAGE GENERATING SYSTEM FOR DUPLEX PRINTING

Charles Minter, Boulder, Colo., assignor to Kentek Information Systems Inc., Allendale, N.J.

Filed Nov. 2, 1987, Ser. No. 116,363

Int. Cl.[4] H04N *1/21*

U.S. Cl. 358—296 **1 Claim**



1. An image generation system for controlling a printer engine capable of simplex and duplex printing on a sheet of recording medium, comprising

a bit-map for storing data to be printed on said sheet,

means for receiving format selection signals indicating whether simplex or duplex printing is selected,

means responsive to said format selection signals for causing said data to be read from said bit map in an order determined by whether simplex or duplex printing is selected, so that a first side of said sheet is printed from top to bottom and a second side of said sheet is printed from bottom to top when duplex printing is selected, and

means for transmitting said data from said bit-map to said printer engine,

wherein said printer engine includes means for printing a first side of said sheet from top to bottom and a second side of said sheet from bottom to top when duplex printing is selected,

wherein said means responsive to said format selection signals includes an address gate array in electrical communication with said bit map for addressing said data stored in said bit map in accordance with whether simplex or duplex printing is selected, and

wherein said transmitting means includes a data gate array in electrical communication with said print engine and said bit map, said data gate array operating in conjunction with said address gate array for transmitting data from said bit map to said print engine.

4,903,140

APPARATUS FOR REPRODUCING SIGNALS FROM BOTH SIDES OF DISCS

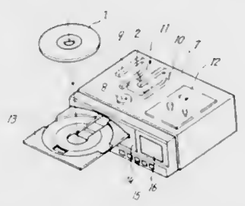
Kazuyuki Okamoto, Kyoto, and Nasashi Yagi, Neyagawa, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 24, 1988, Ser. No. 197,879

Claims priority, application Japan, May 28, 1987, 62-132313; May 29, 1987, 62-136136; May 29, 1987, 62-136137; Jun. 1, 1987, 62-137953; Jun. 8, 1987, 62-142647; Oct. 20, 1987, 62-264364; Nov. 6, 1987, 62-281424

Int. Cl.[4] G11B *7/00, 21/00, 17/00*

U.S. Cl. 358—342 **14 Claims**



1. An apparatus for reproducing signals from both sides of a disc in succession having at least one pickup movable radially of the disc while the disc is being rotated at a high speed, drive control means for controlling the rotation of the disc and the movement of the pickup, and signal reproduction means having connected thereto the output terminal of the pickup, the apparatus being characterized in that the apparatus comprises means for detecting that the signal reproduction side of the disc opposed to the pickup is being changed over from one side to the other side, and means for notifying the user that the reproduction side is being changed over according to an output signal from the detecting means.

4,903,141

APPARATUS FOR ELECTRONICALLY DUPLICATING FILM IMAGES WHILE MAINTAINING A HIGH DEGREE OF IMAGE QUALITY

Roger R. A. Morton, Penfield, and Joseph T. Olesik, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1989, Ser. No. 316,204

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—448 **15 Claims**

1. Apparatus for making a copy of an original onto photosensitive material comprising:

means for photoelectrically scanning the original, line-by-line to obtain a first video signal representing the original image;

means for processing the first video signal to produce a series of first video parameters;

means for storing said video parameters;

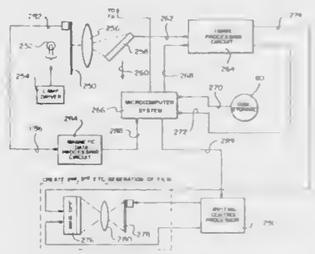
means for writing upon a photosensitive material in response to said first video signals to create a second generation image;

means for scanning said second generation image to generate a second video signal;

means for processing said second video signal to produce a second series of video parameters;

means for retrieving said first series of video parameters;

means for comparing said first video parameters with said second video parameters to produce an adjustment signal; and



means for modifying said second video signal in accordance with said adjustment signal.

4,903,142

APPARATUS FOR PROCESSING HALFTONE IMAGE

Takashi Hasebe; Seiichiro Hiratsuka, both of Hachioji; Yoshinori Abe, Hino, and Masahiko Matsunawa, Fussa, all of Japan, assignors to Konica Corporation, Tokyo, Japan

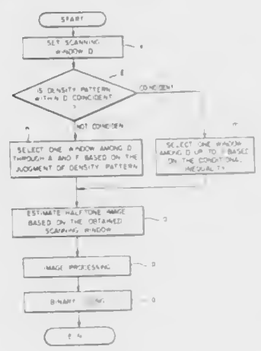
Continuation of Ser. No. 118,945, Nov. 10, 1987, abandoned.

This application Jun. 27, 1989, Ser. No. 372,159

Claims priority, application Japan, Nov. 14, 1986, 61-272562

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—457 **23 Claims**



1. An image processing apparatus, for estimating a halftone image from original binary coded image data consisting of white pixels and black pixels, comprising:

a plurality of memory means for storing the original binary coded image data and shift register means for storing a plurality of scanning windows, said scanning windows being capable of shifting relative to the original binary coded image data for estimating a halftone level of a target pixel;

a counting circuit for counting the number of white pixels or black pixels within each of the plurality of scanning windows and generating a count signal in proportion thereto,

a first judgment circuit for comparing the density pattern between selected coded image data and the original binary coded image data and generating a first judgment result signal in response to the comparison, said selected coded image data being obtained by selecting from a plurality of coded image data stored in density pattern storage means in response to the value of the count signal,

a second judgment circuit having a conditional formula circuit for performing a predetermined conditional algorithm based on the value counted in said counting circuit and generating a second judgment result signal in response to the performance of the predetermined conditional algorithm,

a third judgment circuit having a predetermined truth table for selecting one scanning window from among the plurality of scanning windows in response to said first and second judgment result signals.

4,903,143

IMAGE PROCESSING APPARATUS

Masahiro Sakamoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

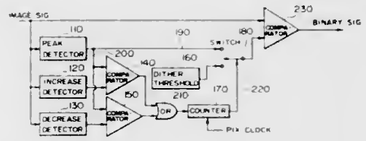
Continuation of Ser. No. 783,148, Oct. 2, 1985, Pat. No. 4,686,579. This application Jun. 15, 1987, Ser. No. 61,349

Claims priority, application Japan, Oct. 11, 1984, 59-211477

The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—457 **23 Claims**



1. An image processing apparatus comprising:

input means for inputting pixel data;

means for processing at least some of the pixel data inputted from said input means;

peak value detection means for detecting a peak value of the pixel data inputted from said input means;

discriminating means for detecting an amount of change in density level of the pixel data and discriminating an image content relating to the pixel data for each pixel by using a detected amount of change in density level and an output from said peak value detecting means; and

means for selecting a process mode of said processing means in accordance with the results of said discrimination.

4,903,144

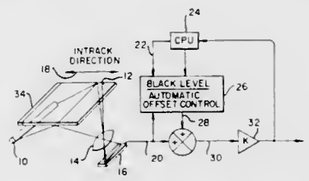
AUTOMATIC D.C. OFFSET CONTROL FOR IMAGE SCANNERS

Mark E. Stefanik, and Martin Potucek, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 27, 1988, Ser. No. 263,462

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—461 **24 Claims**



1. In a scanner having a photosensitive scanning array for producing a series of analog image signals containing a video component which is characteristic of a scanned image and a D.C. offset component which is characteristic of the scanning array; improved means for restoring the image signal to a

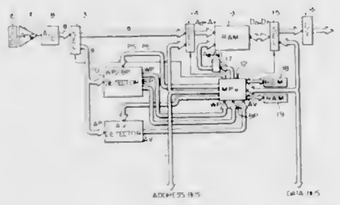
known D.C. level from which the video component is referenced, said improved means comprising:
- means for periodically scanning a reference region of known reflectivity to produce a scanned value signal;
- means for comparing said scanned value signal to a predetermined value to produce an offset value signal;
- means for periodically producing a signal characteristic of the D.C. offset component of the scanning array;
- means for producing an offset voltage signal from the D.C. offset component signal and said offset value signal; and
- means responsive to said offset voltage signal for modifing the image signals.

4,903,145

IMAGE QUALITY CONTROL APPARATUS CAPABLE OF DENSITY-CORRECTING PLURAL AREAS OF DIFFERENT TYPES

Masahiro Funada, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1987, Ser. No. 81,721
Claims priority, application Japan, Aug. 6, 1986, 61-184557; Aug. 6, 1986, 61-184558; Aug. 6, 1986, 61-184565
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—462 **24 Claims**



1. An image processing apparatus comprising:
reading means for reading image data of an original image;
correcting means for correcting a density of the image data output from said reading means, said correcting means having a plurality of density correction modes;
designating means for designating an arbitrary area of the original image; and
selecting means for selecting different density correction modes for an area designated by said designating means and a remaining area.

24. An image processing apparatus comprising:
reading means for reading image data of an original image;
correcting means for correcting a density of image data output from said reading means; and
designating means for designating an arbitrary area of the original image,
wherein said correcting means detects the density of the arbitrary area designated by said designated means and corrects the density of an area other than the arbitrary area of the original image based on the detected density.

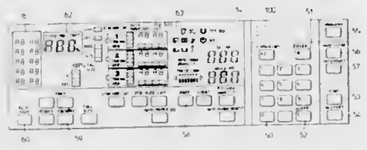
4,903,146

DIGITAL IMAGE FORMING APPARATUS

Kazuyuki Nakahara, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Dec. 9, 1988, Ser. No. 281,790
Claims priority, application Japan, Dec. 9, 1987, 62-309690; Dec. 9, 1987, 62-309692; Dec. 9, 1987, 62-309691
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—468 **10 Claims**

1. A digital image forming apparatus comprising:
reading means for optically reading a document which is set thereon and for outputting an image information of the document;
memory means for storing the image information from said reading means, said memory means having a memory capacity for storing image information amounting to more than one document;
writing means for writing the stored image information from said memory means onto a sheet of paper so as to form a copy print of the document read on said reading means;
operation means for successively entering copying conditions with respect to at least first and second documents which are successively set on said reading means, said operation means including display means for displaying the copying conditions entered with respect to one document at one time, the copying conditions for the second document being entered after the first document is read by



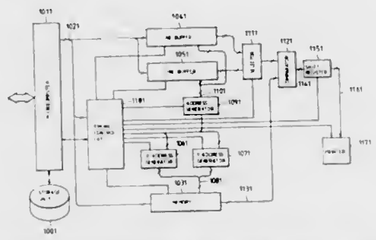
said reading means and after said writing means starts to write the first document simultaneously as when said reading means starts to read the second document; and
control means for controlling operation timings of said reading means, said memory means, said writing means and said operation means so that said writing means starts to write the second document only after the writing of the first document is completed,
said control means including means for controlling said operation means to automatically change the copying conditions displayed on said display means between the copying conditions for the first document and the copying conditions for the second document at an arbitrary time.

4,903,147

METHOD AND APPARATUS FOR PROCESSING AN IMAGE

Yoshimitsu Kanno, Sagamihara; Teruo Fumoto, and Hiroaki Kotera, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 7, 1988, Ser. No. 216,165
Claims priority, application Japan, Jul. 8, 1987, 62-170255; Jul. 14, 1987, 62-175164; Sep. 22, 1987, 62-237836; Oct. 19, 1987, 62-263426
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—448 **9 Claims**



1. In a method for changing a size of an image wherein new data are added between original picture element data through an interpolation process to change the size of the original image by a factor of B/α where the characters B and α denote integers, the improvement comprising a method of processing the image, including the steps of:
(a) equally dividing an interval between adjacent picture elements of an original image into G image portions, wherein G is an integer;
(b) setting points corresponding to the respective divided image interval portions;
(c) determining interpolation data at points which vary as a function of adjacent picture elements of the original image;
(d) selecting part of the interpolation data at a rate equal to $B/(\alpha \cdot G)$, and
(e) deriving output data h through said interpolation process in accordance with the following equation:

$$h = gn + (gn+1 - gn)/G \cdot i$$

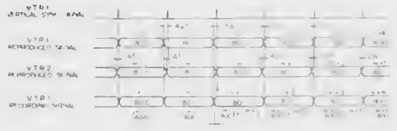
where i denotes a number for selection of the points, which number i is determined in accordance with a rate equal to $B/(\alpha \cdot G)$.

4,903,148

DIGITAL SIGNAL EDITING APPARATUS

Yoshinori Ariano, Ibaraki; Shiro Tsuji, Minoo, and Hiroshi Matsushima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 847,213, Apr. 2, 1986, Pat. No. 4,772,959. This application Jul. 8, 1988, Ser. No. 216,374
Int. Cl.[4] G11B *27/02*
U.S. Cl. 360--13 **1 Claim**



1. A digital signal apparatus for editing video tapes on which, when a sampling frequency of an audio signal is different from an integral multiple of a field frequency of a video signal, an audio digital signal is divided into fields each containing a number of sampling units of the audio digital signal, and information for identifying the number of sampling units of the audio digital signal as well as the audio digital signal contained in the sampling units are recorded in each field, said apparatus comprising:
- means for reproducing the sampling number information as well as the audio digital signal from a first video tape;
- means for reproducing the sampling number information as well as the audio digital signal from a second video tape;
- means for re-dividing the audio digital signal reproduced from the second video tape into each field in accordance with the sampling number information of each field reproduced from the first video tape; and
- means for recording the re-divided audio digital signal together with the sampling number information reproduced from the first video tape beginning from a predetermined edit point of the first video tape.

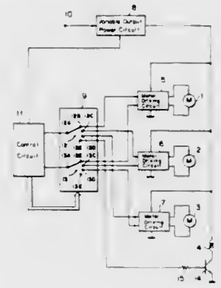
4,903,149

TAPE CASSETTE LOADING SYSTEM FOR A MAGNETIC RECORDING AND REPRODUCING APPARATUS

Akira Hasegawa, and Fumiyoshi Abe, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,480
Claims priority, application Japan, Mar. 3, 1987, 62-48574
Int. Cl.[4] G11B *5/004, 15/665*
U.S. Cl. 360--69 **5 Claims**

1. A tape cassette loading system for a magnetic recording and reproducing apparatus capable of operating with a plurality of kinds of tape cassettes differing from each other in the center distance between a pair of reels contained therein for carrying a tape, comprising:
reel mount shifting means which discriminates between a plurality of kinds of tape cassette and varies the center distance between a pair of reel mounts according to the center distance between a pair of reels of a tape cassette to be used;
a cassette holder for holding a tape cassette, capable of being moved between a cassette inserting position where a tape cassette is inserted therein and a cassette mounting position where a tape cassette is mounted on the reel mounts;
tape loading means for pulling out a tape from a tape cassette mounted on the reel mounts and winding the tape around a rotary drum;
reel mount shifting means driving means for driving the reel mount shifting means;



cassette holder driving means for driving the cassette holder;
tape loading means driving means for driving the tape loading means;
a single power circuit for supplying power to the reel mount shifting means driving means, to the cassette holder driving means and to the tape loading means driving means; and
control means for connecting the power circuit sequentially to the reel mount shifting means driving means, to the cassette holder driving means and to the tape loading means driving means in a time sharing mode.

4,903,150

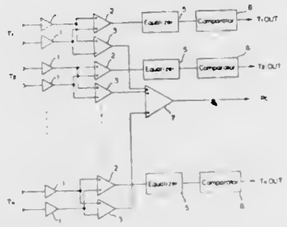
MULTITRACK MAGNETIC RECORDING AND REPRODUCING APPARATUS AND METHOD OF CONTROLLING TRACKING OF MULTITRACK MAGNETIC HEADS

Hiromi Juso, Gose; Keago Sudoh, and Yukihiko Haikawa, both of Higashihiroshima, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 745,137, Jun. 17, 1985, Pat. No. 4,727,438. This application Dec. 21, 1987, Ser. No. 136,123
The portion of the term of this patent subsequent to Feb. 23, 2008, has been disclaimed.
Int. Cl.[4] G11B *5/584, 5/56*
U.S. Cl. 360—77.12 **2 Claims**

2. A method for controlling the tracking operations of multitrack magnetic heads, more particularly, a method of controlling the tracking operations of a plurality of multi-track recording magnetic heads and a plurality of multi-track reproducing magnetic heads all heads situated against a magnetic tape having a plurality of data tracks, comprising the steps of:
providing a pair of the reproducing magnetic heads for each individual recording head to form a plurality of groups having two reproducing heads and one recording head, each group corresponding to one of the plurality of data tracks;
detecting differences in output of each pair of said reproducing magnetic heads that corresponds to each recording

magnetic head and producing a first signal that corresponds to all of the detected differences; and



tracking respective reproducing magnetic heads in response to said first signal.

4,903,151

HEAD POSITIONING SYSTEM FOR POSITIONING A MULTIPLE HEAD WITH RESPECT TO DATA AND SERVO TRASKS OF A RECORDING MEDIUM

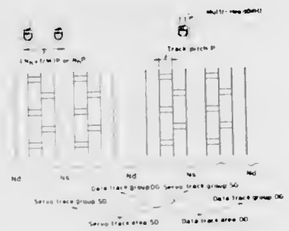
Makoto Mizukami; Akio Mitamura, both of Tokyo; Ryoichi Arai, Saitama; Yasunaga Mitsuya, and Tetsuo Mikazuki, both of Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jan. 22, 1987, Ser. No. 5,984

Claims priority, application Japan, Jan. 23, 1986, 61-12350

Int. Cl.[4] G11B *5/55, 5/29, 5/58*

U.S. Cl. 360—78.01 **5 Claims**



1. A head positioning system on a recording medium comprising:

(a) a recording medium having a periodic arrangement of data tracks and servo tracks wherein the periodic arrangement having a predetermined period includes N_d (N_d is an integer equal to or larger than (1) number of data tracks and N_s (N_s is an integer equal to or larger than (2) number of servo tracks, said servo tracks having single phase servo patterns, alternately recorded thereon;

(b) a multi-head carrying a plurality of head elements disposed in a direction perpendicular to the tracks, so that the distance between head elements is $(N_h+1/M)P$ where N_h is an integer equal to or larger than 0, M is an integer equal to or larger than 2, and P is a track pitch, said multi-head being movable in a direction generally perpendicular to the tracks;

(c) means for selecting a servo head for reading servo tracks and a data head for reading data tracks from said head elements during a seek operation, wherein a selected servo head is selected to reproduce a servo pattern from a servo track and a selected data head is determined according to the selected servo head; and

(d) wherein the multi-head is positioned on a servo track in every 1/M track pitch of movement.

4,903,152

MAGNETIC RECORDING AND REPRODUCING APPARATUS CAPABLE OF CONTAINING A PLURALITY OF RECORDING CASSETTES

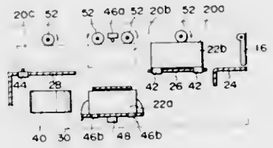
Akira Matsui, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1988, Ser. No. 173,118

Claims priority, application Japan, Mar. 30, 1987, 62-76635

Int. Cl.[4] G11B *15/68*

U.S. Cl. 360—92 **13 Claims**



1. A magnetic recording and reproducing apparatus comprising:

a cassette housing section including a first stand-by region, a tape loading region, and a second stand-by region linearly arranged in a horizontal direction, whereby two tape cassettes can be housed in the housing section, in a horizontal plane, said housing section having an inlet opening through which tape cassettes are inserted into the housing section and which communicates with one of the first and second stand-by regions;

a first transportation mechanism for linearly transporting one of the tape cassettes in the cassette housing section between the first stand-by region and the tape loading region, and linearly transporting the other tape cassette between the tape loading region and the second stand-by region;

a tape drive region defined below the tape loading region;

a second transportation mechanism for transporting one of the tape cassettes in the cassette housing section between the tape loading region and the tape drive region; and

drive means for driving any tape cassette transported in the tape drive region.

4,903,153

TAPE CARTRIDGE LOADING MECHANISM WITH CARTRIDGE HELD BY THE REEL DRIVE

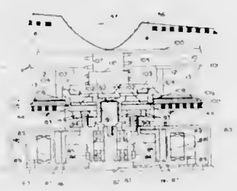
Yoshihisa Inoue, Hannou, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,486

Claims priority, application Japan, May 27, 1987, 62-80123

Int. Cl.[4] G11B *15/66, 15/675*

U.S. Cl. 360—93 **4 Claims**



1. An apparatus for loading a tape cartridge for a magnetic instrument comprising:

a chassis;

means to move said tape cartridge between an operative position and a loading/unloading position by displacing relative to said chassis a holder in which said tape cartridge is held;

reel drive means to rotatively drive a reel contained in said tape cartridge;

and said reel drive means including an engagement portion protrusively disposed in said holder to engage an engaged portion of said reel in said loading/unloading position whereby said tape cartridge is positioned in said holder by inserting said tape cartridge into said holder while said engaged portion of said reel engages said engagement portion of said reel drive means.

4,903,154

AUTOMATIC DISKETTE STACK LOADER

Dan N. Costas, 48387 Hackberry St., Fremont, Calif. 94535, and Larry W. Robertson, 2737 Burlingame Way, San Jose, Calif. 95121

Continuation of Ser. No. 57,937, Jun. 2, 1987, abandoned. This application Apr. 17, 1989, Ser. No. 339,902

Int. Cl.[4] G11B *17/12, 15/68*

U.S. Cl. 360—98.04 **11 Claims**



1. Apparatus for serially transporting diskettes from a horizontally oriented stack to at least one disk drive for recording of a selected program on said diskettes and then transporting said diskettes to at least one output stack, said apparatus comprises:

input hopper means for receiving at least one diskette in a horizontally oriented stack onto which the selected program is to be recorded;

mounting means beneath and in substantial vertical alignment with said input hopper means for receiving at least one disk drive in a horizontal orientation, one below the other, for recording the selected program onto the transported diskettes;

extraction means for extracting one diskette at a time from said input hopper means; and

transport means for receiving the diskette from the extraction means, transporting it away from the input hopper means substantially horizontally, redirecting the diskette downward toward the first of said at least one disk drive, inserting and removing the diskette into and from the disk drive substantially horizontally, and transporting the diskette downward to an output stack.

4,903,155

DISC DRIVE

Nobuyoshi Maekawa; Hideya Yokouchi; Tomoe Aruga, and Tadashi Sugiyama, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 161,362, Feb. 22, 1988, Pat. No. 4,825,314, which is a continuation of Ser. No. 746,095, Jun. 18, 1985, abandoned. This application Feb. 28, 1989, Ser. No. 316,718

Claims priority, application Japan, Jun. 22, 1984, 59-128955

Int. Cl.[4] G11B *17/028*

U.S. Cl. 360—99.08 **26 Claims**

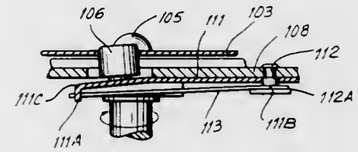
1. A disc drive for a disc having a first aperture and a second aperture comprising:

a rotating shaft for being received within the first aperture of the disc;

spindle hub means affixed to the rotating shaft having a surface, the surface supporting the disc;

a pin member supported on the spindle hub means for coupling with the second aperture;

rotating means for rotating the rotating shaft and the spindle hub means; and



movable lever means mounted on the spindle hub means, the pin mounted on the movable lever means, whereby the pin member is permitted to move radially with respect to the central shaft while maintaining a predetermined angle relative to the axis of rotation of the rotating shaft.

4,903,156

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS HAVING A HEAD SUPPORT MECHANISM FOR SUPPRESSING VIBRATION OF MAGNETIC HEADS

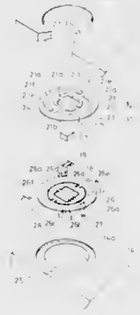
Tohru Hayashi, Mitaka; Yoshiaki Sakai, Higashikurume; Shinichi Aikawa, Mitaka; Hiroshi Matsunaga, Kunitachi, and Jun Makabe, Higashimurayama, all of Japan, assignors to TEAC Corporation, Japan

Filed May 12, 1988, Ser. No. 193,516

Claims priority, application Japan, May 21, 1987, 62-122630

Int. Cl.[4] G11B *5/58, 21/20*

U.S. Cl. 360—104 **3 Claims**



1. A magnetic recording and/or reproducing apparatus for recording and/or reproducing an information signal on both sides of a flexible rotary magnetic recording medium defined by a substantially circular periphery comprising:

carriage means disposed at one side of said flexible rotary recording medium and extending along the flexible rotary recording medium toward a radially outer direction thereof;

first biaxial gimbal support means provided on said carriage means;

first magnetic head means for engagement with the one side of the flexible rotary magnetic recording medium and carried on said first biaxial gimbal support means in a manner to swing freely around mutually perpendicular axes which extend parallel to the flexible rotary magnetic recording medium;

an arm supported on the carriage at a radially outer position of the periphery of the flexible rotary magnetic recording

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medium in a manner to swing close to and away from the carriage means;

resilient means for urging the arm in a direction of the carriage;

second biaxial gimbal support means provided on said arm; and

second magnetic head means for engagement with another side of the flexible rotary magnetic recording medium and carried on the second biaxial gimbal support means in a manner so as to swing around mutually perpendicular axes which extend parallel to the flexible rotary magnetic recording medium, said second biaxial gimbal support means maintaining the engagement with the flexible rotary magnetic recording medium by freely swinging around a fulcrum provided by a pivot which is formed unitary with the arm, said first biaxial gimbal support means supporting the first magnetic head means with a first elastic modulus for swinging of the magnetic head means and at the same time with a second elastic modulus for a displacement vertical to the major plane of the flexible rotary magnetic recording medium, said first elastic modulus and said second elastic modulus being chosen so as to suppress the resonance of the first and second magnetic head means due to vibration applied thereto from outside;

said first biaxial gimbal support means comprising a substantially circular metal plate which carries the first magnetic head means on a mounting portion defined on an inner portion by a pair of generally U-shaped cutouts which extend around the mounting portion except at a pair of first bridging portions, said inner portion, in turn, being defined by a pair of arcuate cutouts extending around the inner portion except at a pair of second bridging portions, said first bridging portions and said second bridging portions are disposed such that a line connecting the pair of first bridging portions and another line connecting the pair of second bridging portions cross each other perpendicularly at generally the center of the first biaxial gimbal supporting means, said first and second elastic moduli are obtained by suitably choosing length and width of said first and second bridging portions and by suitably choosing thickness of the metal plate;

said second magnetic head means being urged against the flexible rotary magnetic recording medium with a force of about 20 grams, said second gimbal support means supporting the second magnetic head means such that it swings freely responsive to the deflection of the flexible rotary magnetic recording medium, the first elastic modulus of said first gimbal supporting means ranging from 200 g.cm/rad to 500 g.cm/rad and the second elastic modulus of said first gimbal supporting means ranging from 2000 g/cm to 5000 g/cm.

4,903,157

ELECTROMAGNET-ACTUATED HEAD LATCHING APPARATUS

Stefan J. Malek, Boulder, Colo., assignor to MiniScribe Corporation, Longmont, Colo.

Filed Mar. 30, 1988, Ser. No. 175,489

Int. Cl.[4] G11B *5/54, 21/12*

U.S. Cl. 360—105 **15 Claims**

1. In a disk drive device including a moveable head assembly having at least one head moveable over a predetermined range to position said head along a disc and further moveable in response to an off-power condition to retract said head, apparatus for latching said head at a retracted position for said off-power conditions, comprising:

a magnetically attractable latch element movable between a first, unlatched position out of contact with said head assembly during motion of the latter over said range and a second, latched position in latching contact with said head assembly for latching said head at said retracted position;

electromagnet means including a solenoid which is substantially continuously actuated during power-on conditions and a elongated flux carrying core, said core including both bias means for urging said latch element away from said unlatched position and anchoring means for anchoring both said solenoid and said latch element; said electromagnet means being energized during power-on conditions for attracting said latch element from said latched position and for holding the same at said unlatched position against the urging of said bias means; and



means responsive to an off-power condition for deactuating said electromagnet means to release said latch element;

whereby when said head assembly moves to retract said head, said latch element moves to said latched position and thereafter prevents movement of said head assembly to maintain said head at said retracted position during off-power conditions.

4,903,158

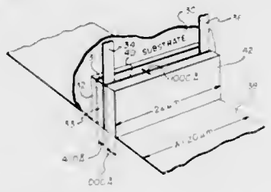
MR HEAD WITH COMPLEMENTARY EASY AXIS PERMANENT MAGNET

Neil Smith, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,418

Int. Cl.[4] G11B *5/127, 5/33*

U.S. Cl. 360—113 **8 Claims**



1. A magnetoresistive head for use in the playback of magnetically recorded signals comprising

a. a magnetoresistive sense film having a given geometric configuration,

b. means for supporting said magnetoresistive sense film,

c. said magnetoresistive sense film having a longitudinal magnetization component which results in a demagnetization field in said magnetoresistive sense film.

d. means for conveying a sense current from one portion of said magnetoresistive sense film to another thereof,

e. permanent magnet means having essentially the same geometric configuration as said magnetoresistive sense film, and

f. means for so electrically insulating said permanent magnet means from said sense film that said permanent magnet means substantially overlays said magnetoresistive sense film wherein the magnetic field of said permanent magnet means is so coupled to said magnetoresistive sense film to substantially cancel said demagnetization field in said magnetoresistive sense film, thereby to reduce Barkhausen effects in said magnetoresistive head.

4,903,159

TAPE CASSETTE

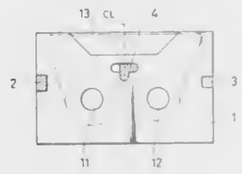
Masatoshi Kawano, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,409

Claims priority, application Japan, Oct. 16, 1987, 62-261098

Int. Cl.[4] G11B *23/02*

U.S. Cl. 360—132 **7 Claims**



1. A novel tape cassette for accommodating a tape that has a characteristic different from that of a conventional tape and that can be loaded into recording and/or reproducing apparatus designed to accept either said novel tape cassette or a conventional tape cassette formed with a housing and an aperture in said housing for preventing improper recording, said apparatus being designed with upward compatibility so that it can record and/or reproduce according to a conventional format or a format different from a conventional format depending on whether said conventional tape cassette or said novel tape cassette is loaded into said apparatus, said novel tape cassette comprising:

a cassette housing having a size and shape that are respectively substantially the same as the size and shape of the housing of said conventional tape cassette;

first detecting means provided adjacent to one edge of said cassette housing of said novel tape cassette at a position corresponding to the aperture of said conventional tape cassette housing;

second detecting means provided adjacent to an opposite edge of said cassette housing of said novel tape cassette; and

a detecting portion provided on said cassette housing of said novel tape cassette for indicating that tape having a different characteristic is wound within said cassette housing of said novel tape cassette.

4,903,160

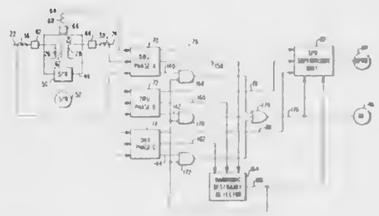
SUDDEN, PRESSURE RELAY SUPERVISORY APPARATUS

Walter A. Elmore, and Hung J. Li, both of Coral Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 25, 1985, Ser. No. 704,993

Int. Cl.[4] H02H *7/04*

U.S. Cl. 361—37 **11 Claims**



1. Apparatus for the supervision of a sudden pressure relay (SPR) system which protects a power transformer of a power system network of at least one phase, said power transformer including a plurality of windings associated with said power system phase, said power transformer being disposed in a sealed enclosure and susceptible to internal and external faults, said SPR system operative to detect a fault condition of said power transformer and to generate a fault signal indicative thereof, said SPR system including a breaker for each of said transformer windings, said breakers operative conditionally in response to said SPR generated fault signal to isolate said transformer windings from said power system network, said SPR supervisory apparatus comprising:

means for generating a signal for each transformer winding representative of the current thereof;

means for generating restraint signals correspondingly from said generated current representative signals;

means for selecting the generated restraint signal having the greatest amplitude;

means responsive to an event including the occurrence of said selected restraint signal exceeding a predetermined fixed level to block said SPR generated fault signal from operating said breakers, said blocking means being operative to relieve said blocking condition when said selected restraint signal is below said predetermined level; and

means for delaying relief from said blocking condition for a predetermined time period from the occurrence of an event including said selected restraint signal rendered below said predetermined level.

4,903,161

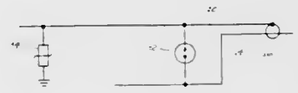
SURGE SUPPRESSION FOR LOW VOLTAGE SIGNAL CIRCUITS

Paul G. Huber, West Warwick; John J. Gizienski, Coventry, both of R.I.; Edward B. Miller, Avon, Conn.; Joseph P. Stefani, Warwick, and Dewey L. Harris, Coventry, both of R.I., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 942,483, Dec. 15, 1986, Pat. No. 4,739,436. This application Jan. 19, 1988, Ser. No. 145,081

Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—56 **19 Claims**



1. A voltage surge suppression circuit for protecting a low voltage signal circuit which receives data or signals from a coaxial cable which comprises a signal conductor and a ground shield conductor, said circuit comprising a gas tube connected across the signal and shield conductors of the cable and an MOV connecting the shield conductor of the cable to a ground.

4,903,162

FIRE-PREVENTION ELECTRICAL WIRING DEVICE

Robert L. Kopelman, 121 Fountain Ave., Rockville Centre, N.Y. 11570

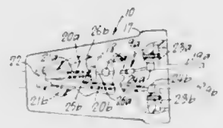
Filed Jul. 25, 1988, Ser. No. 223,411

Int. Cl.[4] H02H *5/04*

U.S. Cl. 361—103 **9 Claims**

1. An electrical device comprising in combination: a main electrical power-source means for receiving main and full power from a main electrical power source; an electricity-carrying means for conducting electrical power to a main electrical utensil circuitry and having a composition, shape and structure characterized by and upper limit of a first predetermined maximum amperage-capacity at and above which potential fire hazard exists from overheating of circuitry and combustible matter associated therewith thereby heated to combustion temperature, and for safely operatively functioning and connected in series with said main electrical power-source means,

for conducting main electric current in series to a main electrical utensil circuitry, with the electricity-carrying means positioned and located before any utensil main-power electrical circuit of a utensil in electrical series therewith, at electrical amperages at and below a second predetermined amperage at and below which said electrical utensil circuitry and associated combustible matter safely function devoid of fire hazard, said second predetermined amperage being below said first predetermined amperage; and said electricity-carrying means including a normally-closed heat-sensitive circuit-breaking means and a circuit-breaker circuitry therefor, for opening and thereby breaking electrical-circuit at a predetermined third electrical amperage within a range between said first and second predetermined amperages as a result of an responsive to detected heat for a period of time sufficient for increasingly-hot detected-temperature to have risen to a predetermined circuit-breaking temperature, said predetermined circuit-breaking temperature being below said combustion temperature of said combustible matter and the circuit-breaker circuitry, said heat-sensitive circuit-breaking means being for connecting in electrical series and for intermittently breaking electrical series and for intermittently breaking electrical circuitry of said circuit-breaker circuitry of electricity from said main electrical power-source means to said electric utensil



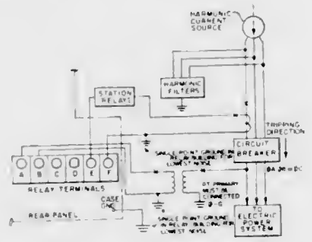
circuit, said heat-sensitive circuit-breaking means being adapted and positioned to become heated by heat from said main electrical utensil circuitry to sufficiently elevated temperature from a sufficient period of time after amperage from the main power-source element is at-least as high as said third predetermind amperage, for said detected heat temperature to reach said predetermined circuit-breaking temperature said heat-sensitive circuit-breaking means including circuit-making means for automatically intermittently closing and thereby making electrical completed circuit whenever after said heat-detected temperature has dropped below said circuit-breaking temperature from a temperature at-least as high as the circuit-breaking temperature, and including an electronic power-delay means for delaying passage of electric current through said heat-sensitive circuit-breaking means and for a predetermined period of time after electrical-contact subsequent to a breaking-of electrical contact by the heat-sensitive circuit-breaking means, said period of time being sufficiently prolonged for the electricity-carrying means to cool-down sufficient as to avert an electrical fire, said electronic power-delay means being mounted in electrical series with said circuit-breaking means, positioned such that electrical flow through said heat-sensitive circuit breaker means becomes possible only after said predetermined period following breaking of electrical circuit by the heat-sensitive circuit breaking means.

4,903,163

DIRECTIONAL HARMONIC OVERCURRENT RELAY DEVICE

Philip L. Atwater, Golden, and Malin L. Jacobs, Littleton, both of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 9, 1989, Ser. No. 349,736
Int. Cl.[4] H02H *3/46*
U.S. Cl. 361—113 **24 Claims**



1. A single or multiple phase directional harmonic overcurrent relay device for monitoring currents at one or more harmonic frequencies in an electric power system comprising:

a current input means for allowing current from the power system being monitored to enter said relay device and for channeling a signal proportional to said current to a harmonic current filter;

a current input overrange detector capable of receiving a signal from said current input means and capable of transmitting an inhibit signal to a harmonic time-overcurrent generation means when the signal received from the current input means corresponds to a condition of current overrange;

a polarizing voltage input means for allowing polarizing voltage from the power system being monitored to enter said relay device and for channeling a signal proportional to said polarizing voltage to a harmonic voltage filter;

at least one harmonic current filter capable of receiving a signal from said current input means and capable of channelling a signal proportional only to the particular harmonic frequency being monitored to a phase detection means and a minimum current pickup means;

at least one harmonic voltage filter capable of receiving a signal from said polarizing voltage input means and capable of channeling a signal proportional only to the particular harmonic frequency monitored to a polarizing voltage level detection means and a phase detection means:

a harmonic polarizing voltage level detector capable of receiving signals from at least one harmonic voltage filter and capable of transmitting a control signal to a harmonic time-overcurrent generation means;

harmonic current minimum pickup means capable of receiving signals from said harmonic current filters and capable of transmitting a signal proportional to the magnitude of the harmonic current to a harmonic time-overcurrent generation means;

harmonic phase detection means capable of receiving signals from said harmonic current and voltage filters and capable of transmitting a signal to a harmonic time-overcurrent generation means when the phase angle between the harmonic current and polarizing voltage falls within a given set of values;

harmonic time-overcurrent generation means capable of receiving signals from said harmonic polarizing voltage level detector, said harmonic phase detection means, said current input overrange detector, and said harmonic current minimum pickup means, and capable of signaling a trip means when a condition of overcurrent is sensed for a given duration of time; and

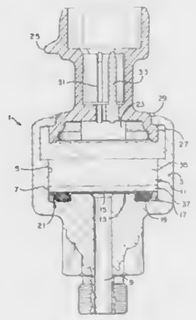
a trip means capable of receiving signals from the harmonic time-overcurrent generation means, and capable of signaling an appropriate external protective or diagnostic device when a condition of overcurrent is present.

4,903,164

O-RING/BACK-UP RING SEAL FOR HIGH PRESSURE TRANSDUCERS

Robert P. Bishop, Carver, and Herman Purut, Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 282,185, Dec. 8, 1988. This application Jun. 13, 1989, Ser. No. 366,054
Int. Cl.[4] H01G *7/00*; G01L *9/12*
U.S. Cl. 361—283 **21 Claims**



1. A pressure transducer which comprises, in combination:

(a) a housing having a high pressure fluid inlet;

(b) a pressure sensing element having a pressure responsive surface communicating with said fluid inlet and disposed within said housing to form a pressure cavity with said housing within said housing;

(c) a relatively rigid member disposed within said pressure cavity and contacting said housing and said pressure responsive surface; and

(d) a relatively less rigid O-ring contacting said relatively rigid member, said housing and said pressure responsive surface, disposed within said housing and communicating with said fluid inlet to define a surface of said pressure cavity and provide a seal among said rigid member, said housing and said pressure responsive surface;

(e) said relatively rigid member minimizing extrusion of said seal into gaps caused by the tolerances on the transducer parts.

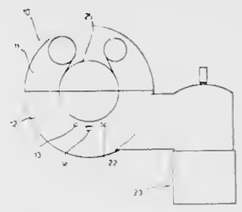
4,903,165

PROCESS AND APPARATUS FOR MANUFACTURING METALLIZED FILMS FOR ELECTRIC CAPACITORS AND PRODUCTS THUS OBTAINED

Pietro Ronchi, Vimercate, Italy, assignor to Metalvuoto Films S.p.A., Bellusco, Italy

PCT No. PCT/IT87/00076, § 371 Date Mar. 24, 1989, § 102(e) Date Mar. 24, 1989, PCT Pub. No. WO88/00984, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 31, 1987, Ser. No. 334,954
Claims priority, application Italy, Aug. 1, 1986, 21386 A/86
Int. Cl.[4] H01G *1/01, 7/00*; B32B *15/08*
U.S. Cl. 361—305 **14 Claims**

12. A metallized film comprising three layers of different material laid on a dielectric film, the first layer (31) being silver, copper or their alloys, which is thinner than the second (32) one which is a layer of zinc and the third (33) a layer of aluminium or aluminium alloy, comprising a percentage of



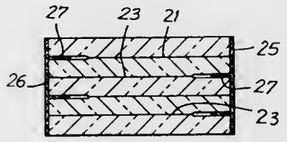
titanium, silicon or cadmium lower than 1%, and in that it has uncovered peripheral edges (36).

4,903,166

ELECTROSTRICTIVE ACTUATORS

John Galvagni, Myrtle Beach, S.C., assignor to AVX Corporation, New York, N.Y.

Filed Jun. 9, 1989, Ser. No. 363,770
Int. Cl.[4] H01G *4/10, 7/00*
U.S. Cl. 361—321 **6 Claims**



5. As a new article of manufacture a preform for the manufacture of a ceramic actuator or capacitor comprising a stack of a plurality of equal size green ceramic sheets, a first surface area of said sheets being coated with electrode forming material extending to a first margin of said sheets, remaining areas of said surface being coated with pseudo electrode ink, said pseudo ink areas extending to at least a second margin of said sheets, said sheets being arranged in said stack such that said first margins of alternate sheets are exposed at a first surface of said stack and said first margins of the layers intervening between said alternate layers are exposed at a second surface of said stack, said second margins being interposed between said first margins of said surfaces.

4,903,167

CASING FOR ACCOMMODATING ELECTRIC AND/OR ELECTRONIC COMPONENTS

Ernst Lichtensperger, Eching, Fed. Rep. of Germany, assignor to Schleicher for Accommodating Electric GmbH & Co. KG, Oberschleissheim, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 208,576
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 8708332[U]
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—395 **6 Claims**

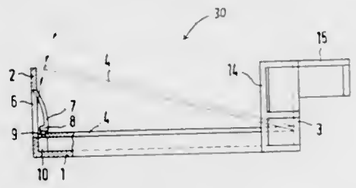
1. A casing for accommodating a printed circuit board (pc board), comprising:

a lower box having a substantially U-shaped cross section, comprising a floor and at least two upstanding side walls, each side wall having a horizontal slot formed proximate an upper edge thereof, at least one of the side walls having a resilient snap nose formed therein which is normally biased inwardly in the casing, and

a lid for closing said lower box; characterized in that the snap nose has a bead attached thereto which is engagable

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with a recess in a pc board to orient and lock said pc board within said casing, and that said lid has a closing edge on



one side thereof which fits into at least one of the horizontal slots of said casing.

4,903,168

SUBSTRATE CARRIER DEVICE

Thomas D. Belanger, Jr., Clarendon Hills, Ill., assignor to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Apr. 22, 1988, Ser. No. 185,005
Int. Cl.[4] H05K *1/04*
U.S. Cl. 361—413 **7 Claims**



1. A substrate carrier device mounting and electrically connecting an electrical substrate to a carrier substrate, said carrier substrate further including a plurality of electrical connectors connected to a source of electrical signals, said substrate carrier device comprising:

means supporting an electrical substrate including a generally planar first surface having said electrical substrate mounted thereon, a generally planar second surface, and a plurality of rectangular openings extending longitudinally along a central axis of said means supporting, each of said openings equidistantly spaced from the other forming transversely oriented surfaces therebetween;

means mounting a pair of guides to said carrier substrate said substrate guides located along the major perimeter edges of said means supporing second surface, said means mounting slidably inserted and accepted within said substrate guides; and,

means making an electrical connection having a first leg extending through each of said transversely oriented surfaces to said electrical substrate, and a second leg extending horizontally from said first leg parallel to said second surface, said second leg located within a respective one of said plurality of electrical connectors, said connection means connecting said electrical substrate to said source of electrical signals.

4,903,169

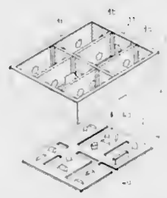
SHIELDED HIGH FREQUENCY APPARATUS HAVING PARTITIONED SHIELD CASE, AND METHOD OF MANUFACTURE THEREOF

Motoyoshi Kitagawa, Aichi; Kohei Tanaka, Gifu; Toso Ishida, Aichi, and Kenzo Ito, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 19, 1988, Ser. No. 246,058
Claims priority, application Japan, Apr. 3, 1986, 61-48952
Int. Cl.[4] H05K *9/00*
U.S. Cl. 361—424 **15 Claims**

1. In a shielded high-frequency apparatus comprising a frame formed of metal plate, a plurality of partition plates, respectively formed of metal plate, for partitioning the interior of said frame, and a printed circuit board mounted within said frame, the improvement comprising:

a solder resist film provided over at least an interior surface of said frame, and over respective surfaces of said partition plates, with said solder resist film being omitted from specific end regions of said partition plates, said specific end regions being positioned closely adjacent to said



frame interior surface, said solder resist film being further omitted from specific regions of said frame interior surface which are respectively positioned closely adjacent to specific end regions of said partition plates and

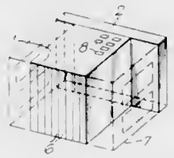
solder portions respectively provided on said partition plate end regions and said specific regions of said frame interior surface, for thereby attaching said partition plates to said frame.

4,903,170

HOUSING ARRANGEMENTS FOR ELECTRICAL OR ELECTRONIC EQUIPMENT

Alwyn Finney, Warwick, and Michael Whitlam, Coventry, both of England, assignors to The General Electric Company, p.l.c., England

Continuation of Ser. No. 113,537, Oct. 26, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 281,100
Claims priority, application United Kingdom, Oct. 27, 1986, 8625648
Int. Cl.[4] H05K *9/00*
U.S. Cl. 361—424 **3 Claims**



1. A housing arrangement for electrical equipment providing electromagnetic screening for said electrical equipment at frequencies up to a predetermined upper frequency, comprising: first and second electromagnetic screening enclosures; fixing means utilized in assembling said enclosures which are spaced at intervals less than the wavelength of said upper frequency; a plurality of carrier means for units of said electrical equipment, each said carrier means including a front cover and respective first connector means; means detachably to mount said carrier means within said first enclosure such that said front covers of said plurality of carrier means together make up a substantially electrically continuous front panel of said first enclosure; an electromagnetic screening member forming a rear face of said first screening enclosure and at least part of a front facing surface of said second screening enclosure; a plurality of second connector means co-operable with respective first connector means to extend connections from respective units of electrical equipment on respective carrier

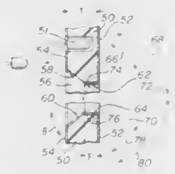
means in said first enclosure into said second enclosure; means to mount external connection means on said forward facing surface of said second enclosure; and means within said second enclosure to make connections between respective second connector means and said external connection means.

4,903,171

PANEL LIGHTING

Jerry L. Livezey, Celina, and Everett J. Horst, Little Elm, both of Tex., assignors to SFENA Corporation, Grand Prairie, Tex.

Continuation of Ser. No. 245,347, Sep. 16, 1988, abandoned. This application Jun. 12, 1989, Ser. No. 364,527
Int. Cl.[4] G01D *11/28*
U.S. Cl. 362—26 **24 Claims**



1. In a panel for illuminating an object in at least one aperture therein, said panel being integrally formed of light transmitting material, having a light source coupled to the panel and including means on the inner and outer surface of the panel for causing transmission of light from said source only in the plane of said panel, the improvement comprising:

said at least one aperture having a cylindrical portion extending partially into the front of said panel toward the object to be viewed;

means on the walls of the cylindrical portion for preventing light from escaping therefrom; and

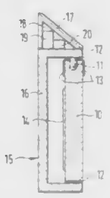
outwardly beveled edges on at least a portion of the remainder of said aperture toward said object for emitting light and illuminating said object, the angle of the beveled edges and the thickness of the cylindrical portion being selected such that transmission of the emitted light in the direction of the front of the panel is minimized.

4,903,172

DISPLAY CONSTRUCTION

Karl-Heinz Schöniger, Barbarossastr., 40/6, 7300 Esslingen, and Winfried Scheid, Ringweg 14, 7333 Ebersbach, both of Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 243,465
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730591
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—31 **4 Claims**



1. An illuminated display unit, in particular of the type including one of a house number, traffic sign, advertisement device, which display unit comprises:

a photoconductive fluorescent plate which has a front viewing face, and an opposite fear face and a peripheral edge extending between the faces;

a display symbol in engagement with said rear face;

at least one light-emitting element inserted into a portion of the edge of the plate for directing light into the plate thereby illuminating the plate and the display symbol;

a reflecting layer extending along the peripheral edge for reflecting light from within the plate incident on such edge, internally,

a contrast wall mounted behind the rear face of the plate forming a rear housing wall;

reflecting layers arranged along said front and rear faces adjacent said edge portion between which reflecting layers the light-emitting element is disposed;

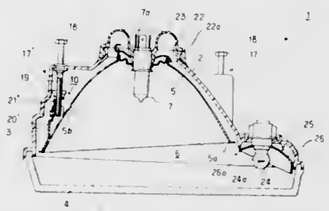
said light-emitting element including a light-emitting diode arrangement, a chargeable battery connected to said diode arrangement, a charging device connected to said battery and a solar cell connected to said charging device, operating said charging device.

4,903,173

HEADLIGHT DEVICE

Kazuo Mochizuki, and Manabu Takada, both of Shimizu, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 209,328
Claims priority, application Japan, Apr. 5, 1988, 63-83697
Int. Cl.[4] F21V *7/16*
U.S. Cl. 362—66 **3 Claims**



1. A headlight device for an automobile comprising:

a main reflective mirror portion for locating a main reflective mirror associated with a main light source;

a mounting portion integral with and located outside the main reflective mirror portion and being provided with a sub-light source; and

a lens covering the front side of the main and sub-light sources; and wherein

an edge of an opening of the main reflective mirror at a side adjacent to the sub-light source is located such that light emitted from the sub-light source is not prevented from reaching a part of the main reflective mirror at a side remote from the sub-light source and adjacent to the front edge; and

a portion of the light of the sub-light source is reflected by said part of the main reflective mirror and is projected forward;

whereby sub-light of sufficient intensity can be provided without restricting the intensity of the main light.

4,903,174

VEHICLE EMERGENCY LIGHT KIT

Edward Busby, 2115 Villeneuve St., Apt. No. 5, Longueuil, Quebec J4J 3A9, Canada

Filed May 9, 1989, Ser. No. 349,036
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 362—61 **7 Claims**

1. An emergency light kit for a vehicle comprising:

at least two rear light units with attachment means to tempo-

rarily attach the units to the back of a vehicle or trailer, each rear light unit having a tail light element, and a direction indicator and brake light element;

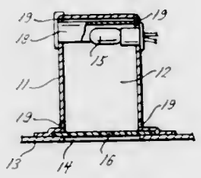
control box for positioning beside a vehicle driver, the control box having a power lead with a plug for insertion in a standard cigarette lighter socket, first electrical circuit for direction indicator lights with a flasher therein and



positive switches for left and right indication, second electrical circuit for tail lights with a positive switch therein, and third electrical circuit for brake lights with a momentary switch therein, and

electrical multi lead cable for all circuits between the control box and the rear light units having at least one combined cable plug and socket connection therein.

4,903,175
ILLUMINATION MODULE
Greg D. Cotton, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Nov. 30, 1988, Ser. No. 278,195
Int. Cl.[4] F21V *11/00*
U.S. Cl. 362—62 **18 Claims**



1. An illumination module, comprising,

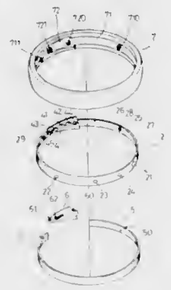
(a) a housing having an opening at one end,

(b) the housing having a housing mounting plate across the opening and spaced therefrom creating a slot in the housing adjacent to the housing mounting plate, the housing mounting plate having a window coextensive with the open end of said housing, the housing having means for inserting a mask in the as formed slot,

(c) an illumination source at the closed end of said housing,

(d) an insertable mask located within said slot, the mask having aperture means for configuring and positioning illumination from said source passing through the aperture means to a target area in the external environment.

4,903,176
FLASH BRACELET
Jiann-Shyong Chen, No. 25, Sublane 99, Lane 274, Chong-Cheng S. Rd., Yung-Kang Shiang, Tainan Hsien, Taiwan
Filed Jun. 21, 1989, Ser. No. 369,614
Int. Cl.[4] F21L *1/00*
U.S. Cl. 362—103 **1 Claim**



1. A flash bracelet comprising:

an annular body made of translucent material, having a channel formed in an inner sidewall along an inner circumference thereof with one end terminating with a recess spaced from the other end of the channel and a plurality of hollow projections with holes therein extending axially, attached to the inner sidewall within the channel and recess;

a bulb belt having openings formed therein and adapted to be engaged in the channel of the annular body by slipping the openings onto the projections within the channel;

an integrated circuit having an inlet end and a series of output legs and concealed in the bulb belt;

a plurality of flash bulbs respectively connected to outlet legs of the integrated circuit and fitted evenly in the belt;

a resistance connected between two outlet legs of the integrated circuit for oscillation and fitted in the belt;

a power panel having openings formed therein and adapted to be engaged in the recess of the annular body by slipping the openings onto the projections within the recess;

a contactor fitted in the power panel and connected to the inlet end of the integrated circuit;

at least a battery fitted in the power panel;

a snap ring adapted to be engaged in the channel and positioned over the belt and having pins extending radially and provided for plugging into holes of the projections within the channel; and

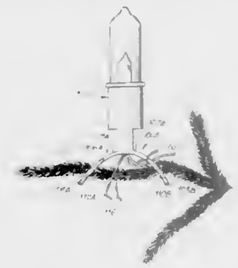
a switch plate adapted to be engaged in the recess and positioned over the power panel to contact the battery by plugging two pins protruding outwardly therefrom into holes of the projections within the recess and having a switch pin provided to be operated between on ON position to contact the contactor or an OFF position to disconnect the contactor.

4,903,177
ORNAMENTAL LIGHT BULB MOUNTING
Donald Warning, 53 Irving Pl., New York, N.Y. 10010
Filed Apr. 25, 1989, Ser. No. 343,890
Int. Cl.[4] F21P *1/02*
U.S. Cl. 362—123 **6 Claims**

1. A means for mounting an ornamental light bulb on a linear support, said means comprising:

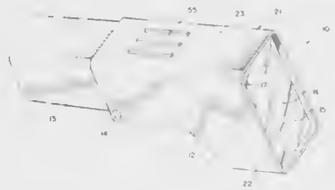
a light bulb holder, the bottom of said holder having first and second resilient arms, each extending perpendicularly to the axis of said light bulb holder, and in opposite directions from each other,

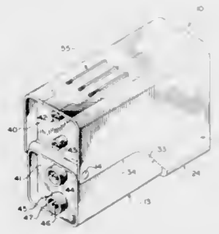
said first and second resilient arms each having a distal end and an annular portion defining an aperture at said distal end, said said arms being moveable, in response to downward pressure, from a first position wherein the respective axes of the apertures are non-collinear to a second position



wherein the respective axes of said apertures are collinearly aligned for inserting a linear support through them, and said resilient arms frictionally holding said linear support by being resiliently urged to their non-collinear first position when the downward pressure is removed.

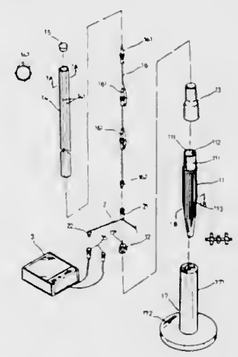
4,903,178
RECHARGEABLE FLASHLIGHT
Barry Englot, Box 32, Abernethy, Saskatchewan S0A 0A0, and Orville Olm, Saskatoon, both of Canada, assignors to Barry Englot, Abernethy, Canada
Filed Feb. 2, 1989, Ser. No. 305,061
Int. Cl.[4] F21L *9/00*
U.S. Cl. 362—183 **16 Claims**





1. A rechargeable removable flashlight comprising a flashlight body having a first body portion including a casing, a bulb and a reflector assembly mounted in the casing and arranged to generate a directional beam of light projecting outwardly from the casing, a pair of electrical terminals projecting from the casing at a position spaced from the bulb and reflector assembly and means connecting the terminals to the bulb so that a voltage connected across the terminals provides a current through the bulb for generating the beam of light; a second body portion including a casing, a rechargeable battery mounted in the casing a pair of electrical terminals projecting from the casing and means connecting the terminals to the battery, and means mounting the second body portion on the first body for movement from a first position in which electrical terminals of the second body portion are exposed for engaging terminals of a charging device and a second position in which the terminals of the second body portion contact the terminals of the first body portion for communicating current from the battery to the bulb.

4,903,179
INDOOR/OUTDOOR LIGHT DECORATION
Ling-Yung Lin, Taipei, Taiwan, assignor to New Feilien Ent. Co., Ltd., Taipei, Taiwan
Filed Aug. 23, 1989, Ser. No. 397,251
Int. Cl.[4] F21V *15/00*
U.S. Cl. 362—184 **7 Claims**



1. An indoor/outdoor light decoration assembly comprising:

a number of light strings each consisting of a number of light bulbs electrically connected to each other in parallel with a male plug disposed at the end thereof;

a corresponding number of transparent tubular holders in which said light strings are respectively located with a top cap means engaged with the top end and a seal cover having a pair of symmetric vertical grooves disposed thereon attached at the bottom end thereof for the passage of electric wires therethrough;

a battery box having an on/off switch being provided with a pair of strings of female sockets electrically connected to each other in parallel;

a tubular fixing mount engaged with the end of each said tubular holder being defined to have two sections with different diameters; and

a pointed ground-fixing member provided with reinforced ribs on the wall thereof so to prevent the same from being easily broken in operation, and a projected tubular element with a pair of grooves disposed thereon for the passage of electric wires therethrough and said fixing mount being engaged with said ground-fixing member; whereby said tubular holders, with said light strings located therein and the male plugs engaged with said strings of female sockets and said female sockets being stuffed into the bottom end of said tubular holders with said seal cover in registry with the same end, are engaged with said tubular fixing mounts which are coupled to said ground fixing members respectively so as to permit the light strings to be planted on the ground.

255-672 - 90 - 20

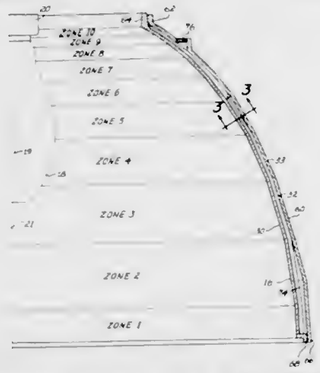
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4,903,180

LUMINAIRE WITH PROTECTED PRISMATIC REFLECTOR

C. David Taylor, Hendersonville; J. Bradley Pearce, Horse Shoe, and Mitchell M. Osteen, Zirconia, all of N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 7, 1988, Ser. No. 281,117
Int. Cl.[4] F21V *5/02, 15/00, 29/00*
U.S. Cl. 362—337 **11 Claims**



1. In a luminaire comprising a dome-shaped reflector of transparent material having a central longitudinal axis and means for mounting a light source substantially on said central axis, the reflector having a prismatic outer surface that has many prisms extending generally in planes that include said longitudinal axis and located at juxtaposed angularly spaced locations about the periphery of the reflector, the prisms having two reflecting surfaces that intersect at an apex with the apex being substantially a non-active reflective surface, the prisms being disposed so that a large percentage of the rays from said source strike said reflecting surfaces at angles of incidence greater than the critical angle of incidence, thereby totally reflecting a large percentage of the light from said source, the combination with said reflector of: (a) a cover of substantially transparent material of a shape generally conforming to the reflector shape and surrounding the reflector externally of said prismatic outer surface, and (b) means for mounting said transparent cover about said reflector in such a manner that said cover is spaced from said prismatic outer surface of the reflector at substantially all points on the prism active reflecting surfaces where said prism reflecting surfaces are disposed to effect total internal reflection of the light source rays, and wherein said transparent cover touches said prisms only at the apices thereof.

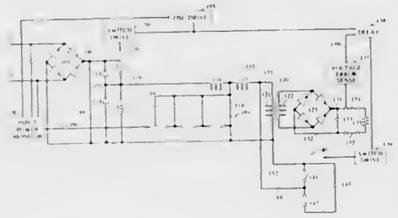
4,903,181

POWER CONVERTER HAVING PARALLEL POWER SWITCHING SYSTEMS COUPLED BY AN IMPEDANCE INVERSION NETWORK

Harold Seidel, Warren, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 16, 1989, Ser. No. 352,796
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—16 **28 Claims**

1. A power supply, comprising:
an input circuit for accepting an AC line;
an input rectifier connected to the input circuit;
a first switching circuit connected for switching the rectifier output;
a quarter wave impedance transformation circuit coupled to receive an output of the switching circuit;
a voltage level support circuit connected to an output of the quarter wave impedance transformation circuit, and including: voltage storage means and a second switching circuit for controlling a charge on the voltage storage means;
an output rectifier connected to an output of the quarter wave impedance transformation circuit and in parallel with the voltage level support circuit;



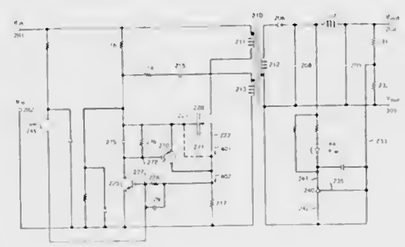
a load circuit connected to the output rectifier;
a voltage regulation circuit for regulating a voltage of the load circuit, including:
a control circuit for delaying switching of the second switching circuit relative to the first switching circuit;

4,903,182

SELF-OSCILLATING CONVERTER WITH LIGHT LOAD STABILIZER

Raymond W. Pilukaitis, Stanhope; Khanh C. Tran, Parsippany, and Thomas G. Wilson, Jr., Morristown, all of N.J., assignors to American Telephone and Telegraph Company AT& T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 20, 1989, Ser. No. 325,751
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—19 **7 Claims**



1. A self oscillating converter comprising:
an input for accepting a DC voltage source;
an output for accepting a load to be energized;
a MOSFET power switching device having significant interelectrode capacitance between gate and source electrodes, and with a main power conduction path connected for enabling energy flow from the input to the output;
drive circuitry connected to the gate electrode for controlling the conduction state of the MOSFET power switching device including a bipolar turn-off transistor having its base-collector junction connected across the significant interelectrode capacitance of the MOSFET power switching device wherein the capacitance between gate and source electrodes may behave as a miller capacitance to a collector-base junction of the bipolar turnoff transistor switch;
a regenerative feedback circuit for sustaining self oscillation of the converter; and operative for regeneratively driving the power switch through the drive circuitry; and

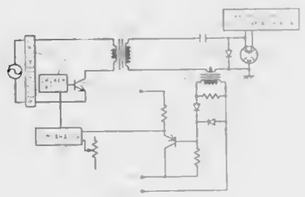
means for enhancing the gain of the drive circuitry including;
means for discharging stored charge from the source-gate capacitance of the gate electrode including a second bipolar transistor having its main conduction path in parallel only with the capacitance between gate and source electrodes in order to prevent charge on the capacitance between gate and source electrodes from inhibiting rapid turn off of the bipolar turn-off transistor at low output loads.

4,903,183

POWER SUPPLY FOR A MAGNETRON

Syouichi Noguchi, Shirako; Kunio Ishiyama, and Terunaki Odaka, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,478
Claims priority, application Japan, Oct. 21, 1987, 62-263821; Mar. 11, 1988, 63-56086
Int. Cl.[4] H02M *3/335;* **H05B** *6/80*
U.S. Cl. 363—21 **2 Claims**



1. In a power supply for a magnetron in which a direct current obtained by rectifying a voltage of a commercial AC frequency is inverted into an alternating voltage of a higher frequency than said commercial frequency by a switching element and is inputted to a primary-side of a transformer, and an output of a secondary-side high voltage winding of said transformer is applied to an anode of said magnetron after rectifying said output, the improvement comprising detecting means for detecting an AC output current of said high voltage secondary winding of said transformer, whereby a signal obtained by clipping a positive or negative side of an output of said detecting means is imparted to a control circuit of said switching element, and an electric current to said magnetron is controlled to a desired preset value, said detecting means for detecting said high voltage AC output current of said transformer including a current transformer, and said positive or negative side of said output being clipped by diodes connected to both ends of an output winding of said current transformer.

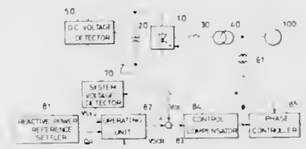
4,903,184

REACTIVE POWER CONTROLLER

Syunichi Hirose, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 7, 1988, Ser. No. 203,140
Claims priority, application Japan, Jun. 23, 1987, 62-154343
Int. Cl.[4] H02M *5/45*
U.S. Cl. 363--37 **7 Claims**

1. A reactive power controller for a reactive power output from a self-commutated inverter having controllable rectifier elements, connected to an AC system power source via an AC reactor, the inverter alternatively acting as a capacitor or a reactor, comprising:
first means for producing a DC reference voltage for the inverter from a reference signal of the reactive power to be controlled and a system voltage of the system power source to make equal the reactive power output from the inverter to the value of the reference signal of the reactive power;
second means for producing a control signal for the inverter by conducting a differential operation between a DC voltage of the inverter and the DC reference voltage; and
third means for comparing a phase of the voltage of the system power source with the control signal to output



firing pulses for the controllable rectifier elements of the inverter, in which an output AC voltage of the inverter is controlled by varying a supply of an active power from the inverter or the system power source to the latter or the former via the AC reactor so that the DC voltage of the inverter may be equal to the DC reference voltage, and in which the variation of the active power supply is controlled by the control signal.

4,903,185

FILTERING DEVICE OF THE COMMON MODE DISTURBANCES AFFECTING THE PRINTED CIRCUIT BOARDS OF A STATIC POWER CONVERTER

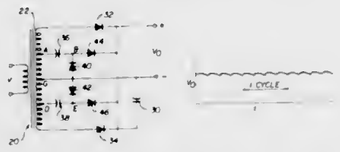
Jean-Noël Fiorina, Seyssinet-Pariset, and Hervé Denis, Echirolles, both of France, assignors to Merlin Gerin, Grenoble Cedex, France

Filed Jul. 13, 1988, Ser. No. 218,262
Claims priority, application France, Jul. 23, 1987, 87 10521
Int. Cl.[4] H02M *1/14*
U.S. Cl. 363—40 **3 Claims**



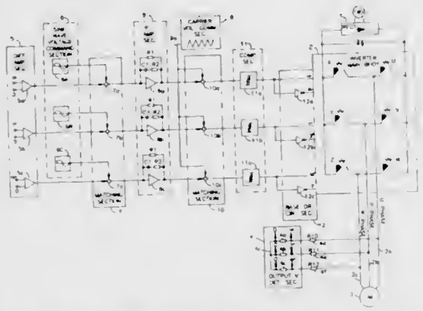
1. A static power converter, notably for an uninterruptible power supply system, comprising:
a conversion circuit having a plurality of power semi-conductors,
a control board for controlling the semi-conductors of said conversion circuit,
means for supplying electrical power to the control board,
all control and monitoring data transmission conductors between the control board and the conversion circuit being formed into a flexible flat cable or strand, whose intermediate part is wound onto a single magnetic circuit to constitute a common mode inductance, designed to compensate the disturbances affecting said control board, due to the variation of potential upon switching of the semi-conductors between the conducting state and the blocking state.

4,903,186
TRANSFORMER-RECTIFIER WITH RIPPLE FILTER
Keats A. Pullen, Jr., 2807 Jerusalem Rd., Kingsville, Md. 21087
Filed May 22, 1989, Ser. No. 355,580
Int. Cl.[4] H02M *1/14*
U.S. Cl. 363—45 **7 Claims**



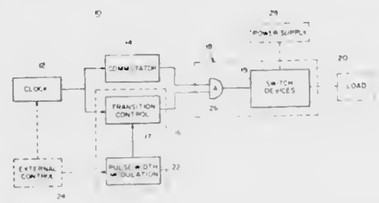
1. A power supply which results in a low output voltage ripple, comprising,
a transformer which is center-tapped and has one intermediate tap within each transformer half,
rectifier means connected to the output of the transformer, said rectifier means including at least one diode and an output capacitor, and
circuit means connected between the intermediate taps and the output capacitor for increasing the frequency at which the output capacitor is charged.

4,903,187
IMPROVED CONTROL FOR VARIABLE FREQUENCY DRIVE
Kazuhiko Doi, Narita, and Yasutami Kito, Tokyo, both of Japan, assignors to Otis Elevator Company, Conn.
Filed Apr. 18, 1989, Ser. No. 339,736
Claims priority, application Japan, Apr. 18, 1988, 63-94899
Int. Cl.[4] H02M *5/44*
U.S. Cl. 363—95 **1 Claim**



1. A control for an inverter, comprising:
an output voltage detection means having a star connected resistor for detecting a voltage of an A.C output line of the inverter and providing a sensed signal indicative thereof;
a differential amplification section, responsive to the sensed inverter output voltage signal, for providing an amplified signal;
a sine wave voltage command section for providing a voltage command signal in the form of a sine wave;
summing means, responsive to said differentially amplified signal and to said sine wave voltage command signal for summing the output of the said differential amplification section with said sine wave voltage command signal and providing an error signal;
a proportional-integral (P-I) amplification section, responsive to said error signal for amplifying said error signal with a selected gain of a low frequency component of said error signal and providing a P-I amplified output signal; and
a carrier voltage command section for providing a carrier signal; and
a comparator section for comparing said P-I amplified output signal to said carrier signal for providing a pulse width modulated (PWM) output signal.

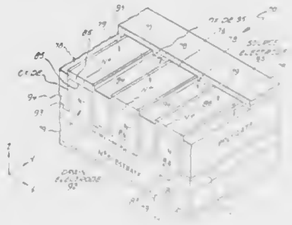
4,903,188
PULSE WIDTH MODULATED INDUCTIVE LOAD CONTROLLER
Suresh Madhavan, Framingham; Adam Cohen, Worcester, and Roger Holman, Maynard, all of Mass., assignors to Cambridge Aerofio, Inc., Shirley, Mass.
Filed Dec. 20, 1988, Ser. No. 287,124
Int. Cl.[4] H02M *7/48*
U.S. Cl. 363—96 **9 Claims**



1. A pulse with modulated inductive load controller comprising:
a load switching circuit including a plurality of switch means, said switch means operative in pairs, each pair including first and second switch devices for controlling power from a power source to a load during a predetermined period;
commutation means for enabling various sequential combinations of first and second switch devices in different pairs;
pulse width modulation means for selectively shortening the period during which both of said first and second switch devices are enabled for controlling the amount of power applied to the load; and
transition control means, responsive to the shortening of the period by said pulse width modulation means, for maintaining closed until after current in the load has generally discharged, one of said first and second switch devices in a sequential combination of switch device pairs, for maintaining a path within the load, and external to the power supply, through which the regenerated current may recirculate and dissipate.

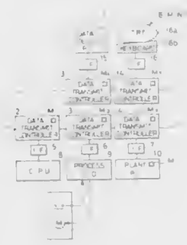
4,903,189
LOW NOISE, HIGH FREQUENCY SYNCHRONOUS RECTIFIER
Khai D. T. Ngu, Schenectady; Robert L. Steigerwald, Burnt Hills; John P. Walden, Schenectady; Bantval J. Baliga, Schenectady; Charles S. Korman, Schenectady, and Hsueh-Rong Chang, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Apr. 27, 1988, Ser. No. 186,983
Int. Cl.[4] H02M *7/217*
U.S. Cl. 363—127 **20 Claims**

1. In a high efficiency synchronous rectifier circuit of the type including switching devices whose conductive state is controlled by an external control signal, a transformer for supplying an AC voltage to said switching devices for rectification and an output terminal, the improvement comprising:
each of said switching devices comprising:
an insulated gate field effect transistor in which all of the semiconductor material is of a single conductivity type, and
a diode connected in parallel with said field effect transistor in an orientation to conduct transient currents in its forward direction when said field effect transistor is non-conductive; and



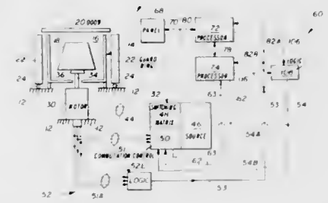
said switching devices, said transformer and said output terminal being interconnected so that a current path from said transformer to said output terminal is free of series connections of said switching devices.

4,903,190
DATA COLLECTING METHOD AND APPARATUS FOR LOOP-LINKED CONTROL SYSTEM
Takumi Akai, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 29, 1988, Ser. No. 150,049
Claims priority, application Japan, Jan. 30, 1987, 62-18695
Int. Cl.[4] G06F *15/46, 13/00*
U.S. Cl. 364—131 **8 Claims**



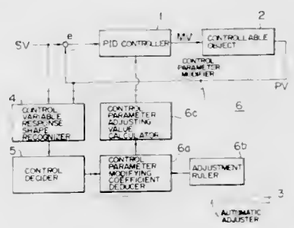
1. A method of data transmission for a loop-linked processor system in which a plurality of processor means are linked together by a data transmission loop through a plurality of transmission controller means, each processor means having an internal memory not directly accessible from the data transmission loop, each transmission controller means having a common memory directly accessible from the data transmission loop, the method comprising the steps of:
reserving a first portion of each common memory for a command signal from one processor means commanding to bring data in the internal memory of another processor means to the common memory of the corresponding transmission controller means;
bringing data in the internal memory of one of the processor means to the common memory of the corresponding transmission controller means, only when the command signal from another processor means is received; and
reserving a second portion of each common memory for those data originally in the internal memory of one processor means which has been brought to the common memory of the corresponding transmission controller means.

4,903,191
CENTRIFUGE CONTROL SYSTEM HAVING DUAL PROCESSORS
Gerald E. Fries, Bear, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 23, 1987, Ser. No. 137,097
Int. Cl.[4] G06F *11/16*
U.S. Cl. 364—132 **1 Claim**



1. In a control system for a centrifuge instrument having a motor with a shaft and a source of energy for the motor, the motor being operative to rotate the shaft to a rotational speed, a tachometer operative to generate a signal representative of the actual rotational speed of the shaft, the system including programmable controller means for providing a predetermined set of instrument control functions including the function of conditionally coupling the source to the motor,
wherein the improvement comprises:
the programmable controller means having a first and a second processor therein,
the processors being configured in a master-slave relationship for some predetermined subset of the instrument control functions during the execution of which the slave operates under the direction of the master to effect that subset of control functions,
each of the processors being independently responsive to the speed signal from the tachometer and each comprising means for independently controlling the function of conditionally coupling the source to the motor.

4,903,192
PID CONTROLLER SYSTEM
Tadayoshi Saito, Hitachiota; Junzo Kawakami, Mito; Susumu Takahashi; Testuo Suehiro, both of Katsuta; Hiroshi Matsumoto, Ibaraki, and Kouji Tachibana, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 1, 1988, Ser. No. 177,428
Claims priority, application Japan, Apr. 3, 1987, 62-80976; Aug. 14, 1987, 62-201733; Sep. 24, 1987, 62-237201
Int. Cl.[4] G05B *13/00, 13/02*
U.S. Cl. 364—157 **9 Claims**



1. A PID controller system comprising:
a PID controller for receiving a difference between a set point and a controlled variable of a process to be con-

trolled and delivering a manipulated variable to the process, the process being operated by the manipulated variable to produce the controlled variable; and

automatic adjuster means including

a control variable response shape recognizer means for receiving the set point and controlled variable of the process and determining a plurality of performance indexes on the basis of a response shape of the controlled variable obtained when the set point is changes or a disturbance is applied;

a control parameter modifier means having a plurality of evaluation means for utilizing a plurality of performance indexes, and interpreting magnitudes of the plurality of performance indexes and defining magnitudes of control parameter modifying coefficients by using a plurality of qualitative values, and inferring the control parameter modifying coefficients through fuzzy inference by using a plurality of adjusting rules which express an interrelation between the performance indexes and the control parameter modifying coefficients by the plurality of qualitative values;

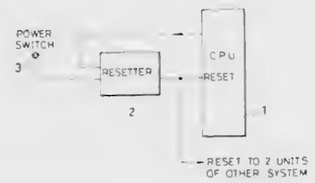
said automatic adjuster means being responsive to a variable relating to the manipulation of said PID controller and the controlled variable from the process to obtain performance indexes and preparing, on the basis of the performance indexes, optimum control parameters for tuning the controlled variable to the set point, the optimum control parameters being fed back from said automatic adjuster means to said PID controller.

4,903,193

RUNAWAY DETECTING SYSTEM FOR CPU

Isao Nakamura, Iwate, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1987, Ser. No. 123,187
Claims priority, application Japan, Mar. 11, 1987, 62-56125
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—200 **8 Claims**



1. A runaway detecting system for detecting the runaway of a CPU in a CPU system comprising:

resetter circuit means, activated by the turning ON of a power source of the CPU system or by a reset output signal of the CPU, for outputting a system reset signal to the CPU system to thereby reset the CPU, and

first and second runaway detecting programs, operatively coupled to the CPU for controlling the CPU when they are activated by respective signals from corresponding first and second timers,

the first runaway detecting program including error counting means for incrementally or decrementally changing an error count upon receipt of a periodic timer interrupt generated by the first timer and overflow-causing means for causing the second timer to overflow when the error count coincides with a predetermined value,

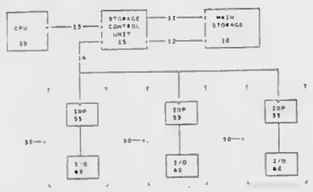
the second runaway detecting program including reset signal generating means for generating said reset output signal to thereby reset the CPU either when said second runaway program timer overflows or when said second timer of the second runaway detecting program is restarted more than once before a predetermined period has elapsed.

4,903,194

STORAGE ADDRESSING ERROR DETECTION CIRCUITRY

Merle E. Houdek, and David O. Lewis, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 12, 1987, Ser. No. 119,756
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 **14 Claims**



1. Storage addressing error detection circuitry for detecting addressing errors in a computer system during data transfers between an I/O unit and main storage, where a central processing unit (CPU) provides the I/O unit with starting storage addresses for the data transfers and said I/O unit provides storage addresses for the remainder of the data transfer, said storage having logical boundaries, said starting storage addresses containing hash values related to said main storage boundaries, the improvement comprising:

means in said CPU for generating hash values for said starting storage addresses,

means for transferring starting storage addresses and hash values contained therein to said I/O unit,

register means connected to receive and store storage addresses from said I/O unit including the hash values contained therein,

hash generate means connected to receive the non hash portions of storage addresses from said register means and generate hash values from said non hash portions of storage addresses, and

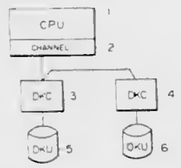
compare means connected to compare hash values from said register means with hash values from said hash generate means and for transmitting an error signal to said I/O unit if a hash value from said hash generate means compares unequal with a hash value from said register means.

4,903,195

METHOD FOR CONTROLLING DATA TRANSFER

Shigeo Honma, Odawara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 920,609, Oct. 20, 1986, abandoned.
This application Nov. 14, 1988, Ser. No. 271,381
Claims priority, application Japan, Oct. 18, 1985, 60-231138
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **6 Claims**



1. In a data transfer control method for controlling data transfer between a rotary memory device and a central processing unit, wherein after issuing to said rotary memory device a positioning command to position said memory device to a location in which a desired data is recorded, coupling between said central processing unit and said rotary memory device becomes temporarily interrupted and upon reception of a positioning completion interruption signal from said rotary memory device, said central processing unit coupling with said rotary memory device is restored wherein it then issues a next read command, said method comprising the steps of:

positioning said rotary memory device to a read start location designated by a command from said central processing unit for determining a read start location;

starting a read operation of data stored in said rotary memory device and a write operation of the data read out of said rotary memory device into a buffer even when said coupling between said central processing unit and said rotary memory device has been temporarily interrupted and without waiting for a read command subsequent to said command for determining a read start location;

generating an interruption signal to request said central processing unit to output said read command, wherein said interruption signal is generated at a point in time which is based upon the relative speed of data transfer at the rotary memory device and data transfer at the central processing unit including generating said interruption signal simultaneously with the start of said read and write operations when the data transfer speed at the central processing unit is not greater than that at the rotary memory device; and

transferring the data in said buffer to the central processing unit after the reception of said read command.

sequential instructions, including supplementary storage means associated with each GPR for storing the unique IDs of execution units which are assigned usage of the specific GPR,

means operative during the decoding cycle for assigning specific GPR Registers to be used as sources and sinks for each instruction,

means for assigning an execution unit to each instruction by means of an identifying tag (ID) unique to such execution unit, stored in the storage means associated with respective GPRs,

means operative during the execution cycle of said system for allowing an instruction to be processed by an execution unit when it is determined that the instruction is independent of the execution of one or more preceding instructions,

said means for determining if an instruction is independent comprising means for determining if an identified GPR register to be used as a Source or Sink for a particular instruction being executed has an execution unit ID value stored in said supplementary storage means as the result of the execution of a preceeding instruction, that matches an execution unit ID value stored in the current execution unit and wherein,

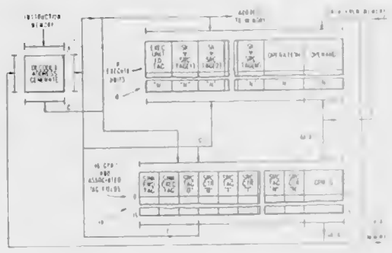
said means for decoding operates substantially independently of the execution of dependent instructions by the execution units.

4,903,196

METHOD AND APPARATUS FOR GUARANTEEING THE LOGICAL INTEGRITY OF DATA IN THE GENERAL PURPOSE REGISTERS OF A COMPLEX MULTI-EXECUTION UNIT UNIPROCESSOR

James H. Pomerene, Chappaqua, N.Y.; Thomas R. Puzak, Cary, N.C.; Rudolph N. Rechtschaffen, Scarsdale, N.Y., and Frank J. Sparacio, North Bergen, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1986, Ser. No. 859,156
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—200 **20 Claims**



1. In a complex high speed-multi-execution unit uniprocessor system having N-execution units and a plurality of General Purpose Registers (GPRs) each of which is accessible to each of the execution units, said system including an instruction decoder for decoding a sequence of program instructions to be executed by said system during an instruction decoding cycle, said N-execution units concurrently executing up to N decoded instructions during subsequent execution cycles, said execution units using the same GPR sequentially or different GPR's concurrently, the improvement comprising;

means for preserving the logical integrity of the data within the individual GPRs during simultaneous execution of

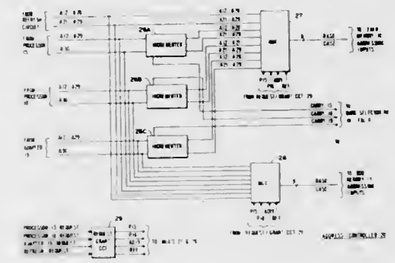
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4,903,197

MEMORY BANK SELECTION ARRANGEMENT GENERATING FIRST BITS IDENTIFYING A BANK OF MEMORY AND SECOND BITS ADDRESSING IDENTIFIED BANK

David A. Wallace, Chelmsford, and Richard A. Lemay, Carlisle, both of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Feb. 27, 1987, Ser. No. 19,897
Int. Cl.[4] G06F *12/02, 12/06*
U.S. Cl. 364—200 **10 Claims**



1. A memory bank selection arrangement for use in a data processing system including a memory wherein an address used for addressing said memory to read or write locations therein includes first bits for identifying a bank of said memory to be selected and addressed by second bits of said address, said arrangement comprising:

an address controller for processing said second bits of said address before they are used to address a location in said memory, said address controller being responsive to a predetermined bit of the second address bits to increment said second bits, said address controller generating a carry output when the incrementing of said second bits results in there being a carry from the highest order bit of said second bits, and

a bank selector to which said first bits are input, said bank selector being responsive to said carry output generated

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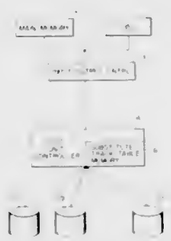
by said address controller to increment the binary number represented by said first bits and said first bits, being used to select a bank in said memory to be addressed using said second bits.

4,903,198

METHOD FOR SUBSTITUTING REPLACEMENT TRACKS FOR DEFECTIVE TRACKS IN DISC MEMORY SYSTEMS

Hiroshi Iwasaki, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,201
Claims priority, application Japan, Oct. 6, 1981, 56-159169
Int. Cl.⁴ G06F *11/20*
U.S. Cl. 364—200 **4 Claims**



1. A method for controlling magnetic disc units in a computer system including a main computer (5), a plurality of magnetic disc units (D_1-D_n), a disc unit controller (3) for transferring information between a selected one of said disc units (D_1-D_n) and said computer (5), and a substitute track table memory (6) for storing addresses of defective tracks in each of said magnetic disc units (D_1-D_n), said method comprising the steps of:

comparing in said disc unit controller (3) positioning information received from said computer (5) with entries in said substitute track table memory (6) before a positioning instruction based on said positioning information is communicated to the designated disc unit (D_1-D_n);

if an entry in said substitute track table memory corresponds to said positioning information, applying a positioning instruction to said selected disc unit corresponding to a substitute track position stored in said substitute track table memory (6);

and if no entry exists in said substitute track table memory (6) corresponding to said positioning information, determining whether or not a track position indicated by said positioning information is defective;

if said track position indicated by said positioning information is defective, storing substitute track information in said substitute track table memory (6) and transferring to said selected disc unit a positioning instruction corresponding to said substitute track information, said storing of said substitute track information in said substitute track memory being performed by transferring said substitute track information as a whole;

and if said track position indicated by said positioning information is not defective, transferring said positioning information to said selected disc unit (D_1-D_n) as a positioning instruction.

4,903,199

METHOD OF INCREASING THE SPEED OF TEST PROGRAM EXECUTION FOR TESTING ELECTRICAL CHARACTERISTICS OF INTEGRATED CIRCUITS

W. Russ Keenan; Stephen F. Comen, both of Dallas, and Robert J. Brainard, Carrollton, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 19, 1988, Ser. No. 183,195
Int. Cl.⁴ G06F *11/00*
U.S. Cl. 364—300 **11 Claims**



1. A method of increasing the speed of test program execution performed by a computer, the computer being part of a test system having a processor controlled test head and in which the test program executes a single test loop continuously to test a large number of semiconductor devices the test program having one or more program statements, and, the computer performing a first execution of at least some of the program statements of the test program, including the steps of:

changing each program statement into a pseudo code;

using the first execution of each program statement of the test program in an interpreted environment to build a table of values and addresses for the values computed or used by the statement; and

changing the pseudo code of each statement to execute a new routine which uses the computed values.

4,903,200

POINT OF SALE APPARATUS

William H. Mook, Jr., Columbus, Ohio, assignor to Mueller and Smith, LPA, Columbus, Ohio

Continuation of Ser. No. 941,190, Dec. 12, 1988, abandoned.
This application Mar. 10, 1989, Ser. No. 323,072
Int. Cl.⁴ G06F *9/00*
U.S. Cl. 364—405 **24 Claims**

1. Apparatus for monitoring and recording commercial transactions, comprising:

point of sale housing means for positioning at the situs of said transaction;

first keyboard means mounted upon said housing means and manually actuable to provide a select first key output representing a point of sale transaction;

second keyboard means manually actuable to provide a select second key output representing a general computer function input;

keyboard output port means for receiving and transmitting keyboard data signals including said first key output and said second key output;

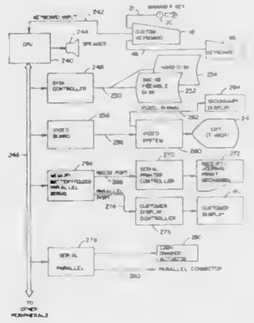
switch means coupled between said keyboard output port means and said second keyboard means and controllable to assume non-conducting and conducting conditions for effecting a select transmission of said second key output from said second keyboard means to said keyboard output port means;

microprocessor means mounted with said point of sale housing means including read/write memory, processor memory retaining a unique key code corresponding with said first key output of said first keyboard means and representing an aspect of said transaction, clock means for providing a processor clock signal of predetermined frequency,

said microprocessor means responsive to said first key output of said first keyboard means for accessing said processor memory for said unique key code and retaining said unique key code in said read/write memory,

said microprocessor means responsive in the absence of said second key output of said second keyboard means for controlling said switch means to provide said non-conducting condition and for effecting transmission of said unique key code and processor clock signal as said keyboard data signals from said keyboard output port means,

said microprocessor means responsive in the presence of said second key output of said second keyboard means to provide said switch means conducting condition to permit transmission of said second key output as said keyboard signals from said keyboard port means;



a general purpose computer mounted with said point of sale housing means, having an operating system and including an input designated port coupled with said keyboard output port means and having output designated ports, said operating system including memory means and

said general purpose computer being responsive to said transmitted keyboard data signals for corresponding with a said unique key code to access a preloaded code program within said memory means and implementing said aspect to said transaction on a priority, vector interrupt basis to derive a corresponding operation output at predetermined said designated output ports, and

said general purpose computer responsive to said transmitted keyboard data signals corresponding with said select second key outputs to derive a corresponding said operation output at predetermined said designated output ports;

first display means with said housing including a video generator circuit and a first visual display, said video generator circuit being coupled with a said output port and responsive to a said operation output for generating a perceptible output at said visual display; and

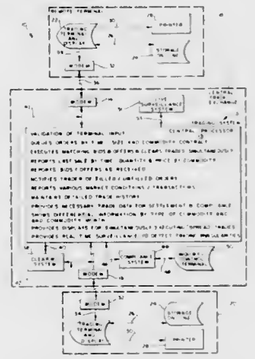
printer means coupled with a said designated output port and responsive to said operation output for providing printed text corresponding therewith.

4,903,201

AUTOMATED FUTURES TRADING EXCHANGE

Susan W. Wagner, Dallas, Tex., assignor to World Energy Exchange Corporation, Dallas, Tex.

Filed Nov. 3, 1983, Ser. No. 548,319
Int. Cl.⁴ G06F *15/30*
U.S. Cl. 364—408 **42 Claims**



1. A computerized open outcry exchange system for transacting sales of a particular futures commodity contract in varying volumes or lot sizes by members of a futures trading exchange as principals or agents for others wherein bids to purchase or offers to sell said particular commodity contract are made by said principals or agents through remote terminals, said system comprising:

a. means for receiving and storing bids and offers from said remote terminals and automatically completing a transaction of matching bids and offers on a first-come, first-served basis thereby establishing a trading system,

b. means for storing CFTC requirements and regulations to be observed on said buy and sell transactions thereby establishing a clearing system,

c. means coupling said stored CFTC requirements and regulations in said clearing system to said trading system for comparing said transaction with said stored requirements and regulations thereby determining the validity of each transaction,

d. means for storing predetermined compliance criteria necessary to detect illegal trade practices or trade patterns which would adversely affect said commodity market thereby establishing a compliance system, and

e. mean coupling said stored compliance criteria in said compliance system to said trading system and said clearing system for automatically comparing said transaction determined to be valid to said predetermined compliance criteria thereby enabling detection of illegal trade practices and trade patterns which would adversely affect said commodity market.

4,903,202

THREE-DIMENSIONAL OBJECT REMOVAL VIA CONNECTIVITY

Carl R. Crawford, Milwaukee, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Aug. 4, 1988, Ser. No. 228,891
Int. Cl.⁴ G06F *15/62*
U.S. Cl. 364—413.13 **6 Claims**

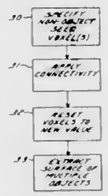
1. A method for generating a three-dimensional surface definition of multiple objects within a three-dimensional tomographic data set. including a plurality of voxel data points, each voxel having a respective density value and said multiple ob-

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jects including voxels having density values satisfying a predetermined property, said method comprising the steps of:

identifying at least one non-object seed voxel not in said multiple objects but having a density value satisfying said property;

applying connectivity to each non-object seed voxel;



modifying said density value for each voxel satisfying connectivity to a value not satisfying said predetermined property; and

extracting a surface definition of said multiple objects from a data subset comprising all voxels having density values which continue to satisfy said predetermined property after said modifying step has been completed.

4,903,203

BONE EVALUATION METHOD

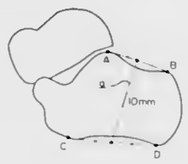
Gentaro Yamashita, Tachikawa; Yasuhiro Uotani, Koshigaya, and Yoshio Hirano, Setagaya, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 12, 1986, Ser. No. 929,308

Claims priority, application Japan, Nov. 11, 1985, 60-250638; Feb. 7, 1986, 61-24151

Int. Cl.⁴ G06F *15/42*

U.S. Cl. 364—413.15 **17 Claims**



1. A method for evaluating cancellous bone comprising the steps of:

(a) irradiating cancellous bone with radiation;

(b) measuring the transmitted radiation to form a bone density pattern;

(c) directly transforming the density pattern by a Fourier transformation as a periodic function of f(x) to a Fourier series:

$$f(x) = \tfrac{1}{2}a_0 + \sum_{n=1}^{\infty} (An \cos nx + Bn \sin nx)$$

to determine the Fourier factors An and Bn followed by determining a power spectrum Cn as follows:

$$Cn = \sqrt{An^2 + Bn^2}$$

and plotting the power spectrum C_n.

4,903,204

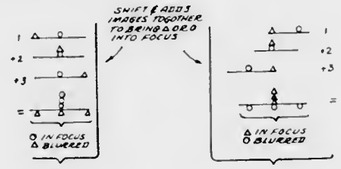
MATRIX INVERSION TOMOSYNTHESIS IMPROVEMENTS IN LONGITUDINAL X-RAY SLICE IMAGING

James T. Dobbins, III, Durham, N.C., assignor to Duke University, Durham, N.C.

Filed Dec. 1, 1987, Ser. No. 126,793

Int. Cl.⁴ G06F *15/42*

U.S. Cl. 364—413.24 **94 Claims**



1. A tomosynthesis apparatus, comprising:

an x-ray tomography machine for producing a plurality of x-ray projection images of a subject including an x-ray source, and detection means; and

processing means, connected to receive said plurality of projection images, for:

(a) shifting and reconstructing said projection x-ray images to obtain a tomosynthesis matrix of images T;

(b) acquiring a blurring matrix F having components which represent out-of-focus and in-focus components of said matrix T;

(c) obtaining a matrix P representing only in-focus components of said imaged subject by solving a matrix equation including said matrix T and said matrix F;

(d) correcting said matrix P for low spatial frequency components; and

(e) displaying images indicative of contents of said matrix P.

4,903,205

METHOD AND APPARATUS FOR DISPLAYING RADIATION IMAGE, AND METHOD AND APPARATUS FOR CALCULATING UNSHARP MASK SIGNAL USED FOR THE SAME

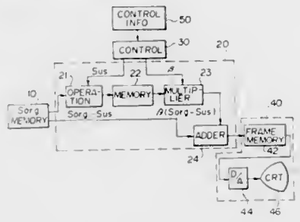
Kazuhiro Hishinuma, Kanagawa, Japan, assignor to Fuji Photo Film Co. Ltd., Japan

Filed Oct. 15, 1986, Ser. No. 918,961

Claims priority, application Japan, Oct. 15, 1985, 60-229412; Oct. 15, 1985, 60-229413

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 364—413.13 **19 Claims**



1. A radiation image displaying method which comprises the steps of:

scanning a recording medium, reading out a radiation image recorded thereon, converting the read out image into an electrical image signal for each scanning point, processing said image signals, and displaying the radiation image as a visible image on a display device using said processed image signals, said processing step comprising;

(i) obtaining an unsharp mask signal Sus corresponding to a super-low frequency at each scanning point, conducting an operation represented by the formula

$$S' = Sorg + \beta(Sorg\text{-}Sus)$$

where Sorg denotes the original image signal read out from said recording medium and β denotes an emphasis coefficient, to perform an unsharp masking process for emphasizing frequency components above said super-low frequency and generate processed image signals, and

(ii) continuously changing at least one of said unsharp mask signal Sus and said emphasis coefficient β to continuously update said processed image signals,

said displaying step comprising displaying a series of said processed image signals as a moving image.

4,903,206

SPELLING ERROR CORRECTING SYSTEM

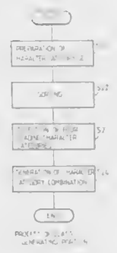
Nobuyasu Itoh, Kawasaki, and Hiroyasu Takahashi, Yokohama, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1988, Ser. No. 150,960

Claims priority, application Japan, Feb. 5, 1987, 62-23706

Int. Cl.⁴ G06F *15/21, 7/04*

U.S. Cl. 364—419 **7 Claims**



7. A spelling error correcting system characterized by comprising:

means for storing a number of correctly spelled words, each of which can be read with one or more combinations of character categories, each combination consisting of m (m is a constant satisfying m less than n) character categories out of n (n is a constant) leading character categories of the character category included in the word and sorted based on a predetermined rule associated with character categories;

said rule for sorting is the ascending order of frequencies of appearance of character categories;

means for sorting character categories included in an input word based on said rule for sorting;

means for obtaining all combinations of m character categories out of n leading character categories of said sorted character categories, said n character categories may include one or more blank characters;

means for reading from said storing means correctly spelled words based on each of said obtained combinations of character categories; and

means for matching said input word with each of said read words.

4,903,207

METHOD FOR DETERMINING RESERVOIR BULK VOLUME OF HYDROCARBONS FROM RESERVOIR POROSITY AND DISTANCE TO OIL-WATER CONTACT LEVEL

Robert P. Alger, Buchanan Dam, and Donald L. Luffel, Houston, both of Tex., assignors to Restech, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 863,451, May 15, 1986, Pat. No. 4,751,646. This application Apr. 14, 1988, Ser. No. 181,587

The portion of the term of this patent subsequent to Jan. 14, 2005, has been disclaimed.

Int. Cl.⁴ G01N *15/08*; E21B *49/02*

U.S. Cl. 364—422 **12 Claims**



1. A method for determining bulk volume of gas (BVG or ϕ_g) as a function of depth and effective porosity in a zone of a produced well in which a log of effective porosity ϕ_E exists comprising the steps of,

obtaining core samples from said zone corresponding to said zone of said produced well,

testing said core samples to determine a first relationship of bulk volume of gas (BVG or ϕ_g) as a function of capillary pressure P_c and effective porosity ϕ_E, that is, $\phi_g = f(\phi_E, P_c)$,

determining the correspondence between capillary pressure P_c, and height h above the gas-free water contact of the zone of the form,

$$P_c = \frac{(d_w - d_g)\, h}{K_1}$$

where

d_w is the density of the connate water of the zone, d_g is the density of gas in the zone, and K_1 is a constant of proportionality,

determining a second relationship of bulk volume of gas (BVG) as a function of total porosity ϕ_E of the formation and height h above the gas water contact depth of the zone of the form,

$$\phi_g = C\phi_E - K + g \log h,$$

where C, K, and g are numerical constants, and

recording a log of $\phi_g(h)$ from said second relationship by combining $\phi_E(h)$ data from a log of effective porosity for said zone.

5. A method for determining bulk volume of oil (BVO or ϕ_o) as a function of depth above initial oil-water contact and effective porosity in a zone of a well in which a log of effective porosity ϕ_E exists and at least one other log exists from which a log of water saturation S_{wi} may be derived, said logs having been made before any significant water table movement occurred, comprising the steps of

identifying the initial oil-water contact depth z_c from one of said logs,

determining a log of water saturation S_{wi} as a function of depth in the well z from said existing logs,

determining a log of bulk volume of oil ϕ_o from said log of

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water saturation S_{wi} as a function of distance $h=z-z_c$ above the oil-water contact depth,

determining the constants C, K, and g from multiple equations of the form,

$$\phi_o(h)=C\phi_E(h)-K+g\log h$$

where numerical values of ϕ_o and ϕ_E are determined as respective logs at distinct values of h, and

recording a log of ϕ_o(h) by combining ϕ_E(h) data from a log of effective porosity for said zone.

4,903,208

POWER SOURCE FAILURE DETECTING SYSTEM FOR AUTOMOTIVE CONTROL SYSTEM

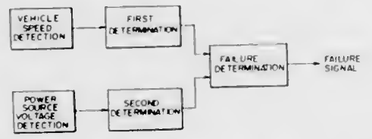
Takeshi Murai, and Makoto Uko, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 29, 1988, Ser. No. 188,411

Claims priority, application Japan, May 1, 1987, 62-106260

Int. Cl.[4] G06F *15/20;* **G08B** *19/00*

U.S. Cl. 364—424.05 **11 Claims**



1. A power source failure detecting system for detecting failure in a power source system for an automotive control system, comprising a vehicle speed sensor, a first determining means which receives a signal from the vehicle speed sensor and generates a signal when the vehicle speed continues to be higher than a predetermined speed for a predetermined time interval, a power source voltage detecting means, a second determining means which receives a signal from the power source voltage detecting means and generates a signal when the power source voltage is lower than a predetermined value, and a failure determining means which determines that a failure occurs in the power source system when it receives signals from both the first and second determining means.

4,903,209

HEIGHT CONTROL SYSTEM IN AUTOMOTIVE SUSPENSION SYSTEM PERFORMING ATTITUDE CHANGE SUPPRESSIVE CONTROL AND HEIGHT REGULATING CONTROL WITH HIGH RESPONSE CHARACTERISTICS IN HEIGHT ADJUSTMENT

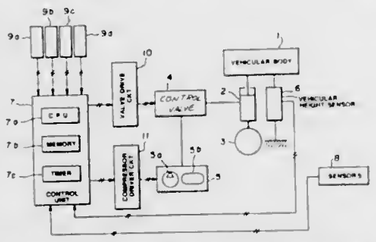
Akira Kaneko, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 17, 1988, Ser. No. 258,731

Claims priority, application Japan, Oct. 19, 1987, 62-265153

Int. Cl.[4] B60G *17/00*

U.S. Cl. 364—424.05 **9 Claims**



1. An automotive height control system comprising:

a suspension mechanism interposed between a vehicle body and a suspension member which rotatably supports a vehicular wheel and including a pressure chamber variable of a pressure of pressure medium therewithin for adjusting relative distance between said vehicle body and said suspension member;

a pressure source circuit connected to said pressure chamber of said suspension mechanism for increasing pressure of said pressure medium within said pressure chamber in a first mode for increasing relative distance between said vehicle body and said suspension member, for decreasing the pressure of said pressure medium within said pressure chamber in a second mode for decreasing relative distance between said vehicle body and said suspension member and for maintaining the pressure of said pressure medium within said pressure chamber constant in a third mode, said pressure source circuit normally operating in a third mode;

a first sensor means for monitoring vehicle body height level to produce a first sensor signal indicative of said vehicle body height level;

a second sensor means for monitoring vehicle body attitude change to produce a second sensor signal indicative of magnitude of vehicle body attitude change;

a third detector means for detecting load change state to produce a third detector signal when load change state is detected;

a controlling means, active in a normal state mode in absence of said third detector signal, for controlling operation of said pressure source circuit on the basis of said first and second sensor signal values for adjusting the pressure in said pressure chamber for maintaining the vehicle body height level within a predetermined first height range and disabling the height adjustment when substantial attitude change is detected based on said second sensor signal, said controlling means being responsive to said third detector signal to operate in a load change transition mode, for controlling said pressure source means based on said first sensor signal value for adjusting pressure in said pressure chamber so as to adjust vehicle body height level within a predetermined second height range irrespective of vehicular attitude change represented by said second sensor signal.

4,903,210

METHOD FOR REDUCING KNOCKING IN INTERNAL COMBUSTION ENGINE

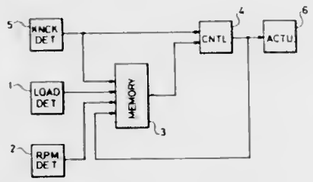
Masahira Akasu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1985, Ser. No. 788,678

Claims priority, application Japan, Apr. 22, 1983, 58-71718; Apr. 22, 1983, 58-71719; Apr. 22, 1983, 58-71720; May 16, 1983, 58-86820; Jun. 3, 1983, 58-99679

Int. Cl.[4] F02P *5/14, 5/04*

U.S. Cl. 364—431.08 **13 Claims**



1. An anti-knocking control method for an internal combustion engine, comprising the steps of:

detecting knocking of the engine;

detecting a load condition of the engine;

detecting an engine rotational speed;

storing, at addresses of memory means corresponding to predetermined engine operating modes each defined by a load condition and speed of the engine, reference values calculated in accordance with detected knocking levels for operating modes of the engine corresponding to said addresses;

reading out one of said reference values, stored at on of said addresses corresponding to a combination of a detected load condition and engine speed;

calculating a correcting control value of at least one control parameter of the engine on the basis of said one read-out reference value and said detected knocking level to control knocking of the engine;

determining whether a plurality of preconditions have been satisfied for a predetermined period of a number of ignitions of the engine;

changing, after said predetermined period of the preconditions are satisfied, said control value to a new value in a knocking restricting direction when knocking is present and in an opposite direction when no knocking is present; and

storing, at addresses of said memory means corresponding to said predetermined operating modes, said new control value.

4,903,211

ON-BOARD NAVIGATION SYSTEM FOR MOTOR VEHICLES

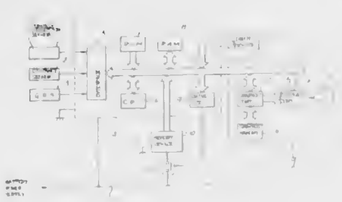
Hitoshi Ando, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,091

Claims priority, application Japan, Sep. 29, 1987, 62-245618; Sep. 29, 1987, 62-245619

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—443 **2 Claims**



1. An on-board navigation system for a motor vehicle, having a memory device in which map data in digital form is stored, adapted to read-out from the memory device map data of a region of a given area including a present location of the vehicle while recognizing the present location of the vehicle and to display a map by a display unit on the basis of the map data, said system comprising:

switching means for selectively supplying electric power to the memory device; and

control means for operating said switching means to supply the electric power to the memory device, said control means performing the operations of detecting whether or not map data around the present position of the vehicle has been stored into the memory device, and operating said switching means to supply the electric power to the memory device if it is detected that the map data around the present position of the vehicle has not been stored into the memory device.

4,903,212

GPS/SELF-CONTAINED COMBINATION TYPE NAVIGATION SYSTEM

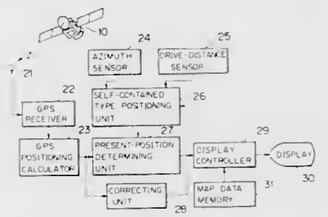
Kazuhiro Yokouchi; Tatsumi Kageyama, both of Hyogo; Chogo Sekine, Tokyo; Harumasa Hojo, Tokyo; Koji Yamada, Tokyo; Makoto Mikuriya, and Seiichiro Hirata, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Japan Radio Co., Ltd., both of Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 167,093

Claims priority, application Japan, Mar. 13, 1987, 62-56683; May 22, 1987, 62-125139

Int. Cl.[4] G06F *15/50;* **G01C** *21/00*

U.S. Cl. 364—449 **16 Claims**



1. A global positioning system (GPS)/self-contained combination type navigation system for a moving object comprising:

self-contained type positioning means for acquiring self-contained type positioning information of the moving object;

GPS type positioning means for acquiring GPS type positioning information from GPS navigation data transmitted from a plurality of satellites arranged for constituting the global positioning navigation system;

correcting means for producing a correction signal to be supplied to the self-contained type positioning means based upon the GPS type positioning information, whereby corrected self-contained type positioning information is derived from the self-contained type positioning means;

present-position determining means for determining a present position of the moving object by processing one of said corrected self-contained type positioning information and GPS type positioning information, depending upon a reception condition of said GPS positioning information;

map data memory means for previously storing map data required for navigating the moving object; and

display means for displaying the present position of the moving object superimposed on the map data by receiving the output of the present-position determining means and the map data from the map data memory means.

4,903,213

NUMERICAL CONTROL SYSTEM FOR HIGHLY DYNAMIC PROCESSES

Ernst Bühler, Losone, and Marco Boccadoro, Verscio, both of Switzerland, assignors to AG fur Industrielle Elektronik Agie, Losone, Switzerland

Filed Nov. 30, 1987, Ser. No. 126,267

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 3640987

Int. Cl.[4] G06F *15/46;* **G05B** *19/403;* **B23H** *7/06*

U.S. Cl. 364—474.31 **24 Claims**

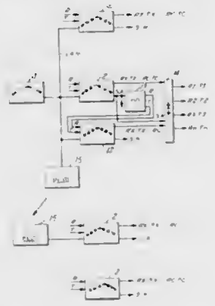
1. A numerical control system for performing path interpolation calculations for the control of highly dynamic processes having different path contour geometries wherein a vector having a length L connects in linear form a first point P1 to a second point P2, said first and second points being located in three dimensional Cartesian space having axes x, y, and z, length L having Cartesian components X, Y and Z and being subject to an angular rotation C about the z axis, the system

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also having process parameters S and K wherein S is an address identifying the parameter to be modified and K identifies the modified parameter, said system comprising:

a coarse interpolator means for performing coarse interpolations of and outputting path elements L, X, Y, Z and C and the parameters S and K between path increments wherein said course interpolations are a function of the path contour geometry but are independent of a time grid;

a master fine interpolator means for performing fine interpolations of said path elements and parameters and including an intermediate memory and being connected down-



stream from the course interpolator means and receiving, intermediately storing, subsequently processing the coarse interpolations from said coarse interpolator means, and outputting said path elements and parameters as fine interpolations, wherein there is no joint fixed grid frame for data exchange between the coarse interpolator means and the fine interpolator means; and

control means operating in time independence from the coarse interpolator means for controlling the fine interpolator means so that said memory thereof performs fine interpolation steps and the outputting of parameters S and K in real time.

4,903,214

METHOD FOR WIRING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

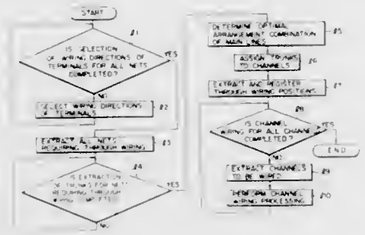
Tamotsu Hiwatashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 18, 1987, Ser. No. 135,085

Claims priority, application Japan, Dec. 26, 1986, 61-315340; Mar. 31, 1987, 62-78572

Int. Cl.[4] G06F *15/60, 15/20*

U.S. Cl. 364—491 **13 Claims**



1. A method for wiring a semiconductor integrated circuit device having a plurality of cell rows each containing a plurality of cells respectively having cell terminals, and channel regions arranged between adjacent cell rows, comprising:

a first step of assigning wiring routes for globally wiring cells of said plurality of cell rows to said cell rows and said channel regions, in accordance with a wiring request for realizing a predetermined circuit operation to obtain a plurality of nets with each net of said plurality of nets having at least a single X line and a single Y line;

a second step of extracting trunks, extending along said channel regions from said nets;

a third step of combining said trunks into a plurality of trunk groups, in accordance with X-coordinates of said trunks, and assigning the trunk groups to tracks of said channel regions; and

a fourth step of determining a position of at least one cell row through which the Y line of each net of said plurality if nets passes, in order to perform through wiring for the cells corresponding to each of said plurality of nets.

4,903,215

INFERENCE METHOD

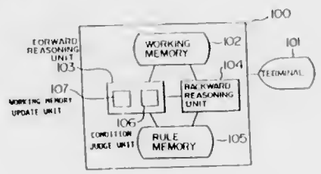
Tetsuya Masuishi, Machida; Hiroshi Tsuji, Kawasaki; Chizuko Yasunobu, Yokobama, and Hideo Ohata, Machida, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 122,273

Claims priority, application Japan, Nov. 19, 1986, 61-274027

Int. Cl.[4] G06F *15/18*

U.S. Cl. 364—513 **1 Claim**



1. An inference method in a system having a rule memory for storing a group of rules each consisting of a condition part and a conclusion part, a working memory for storing facts, and inference means for deriving facts based on the contents of said rule memory and said working memory, each of said facts representing whether a term is true or false, comprising the steps of:

determining by matching the contents of said working memory and a term described in the condition part of a rule stored in said rule memory whether said term described in said condition part is true, false, or undeterminable, wherein said determining by matching further includes

a sub-step of determining whether the condition part of the rule in said rule memory corresponds to the fact in said working memory, and

a sub-step of writing the conclusion part of the rule into said working memory;

determining by backward reasoning based on the content of said working memory and said rule memory, if the determining by matchiog step determines that the term is undeterminable, whether the condition part of the rule in said rule memory having truth or falsehood of said term as the conclusion part is true or false; and,

inquiring to a user whether the term is true or false, if the rule having as the conclusion part whether the term is true or false, is not in said rule memory.

4,903,216

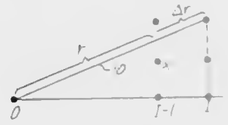
METHOD FOR DISPLAYING INTERVISIBILITY DATA

Ronald E. Huss, Los Angeles, Calif., and Robert M. Denlinger, Henderson, Nebr., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 11, 1988, Ser. No. 179,711

Int. Cl.[4] G09B *9/08*

U.S. Cl. 364—518 **12 Claims**



1. A method for presenting intervisibility data relative to an observation point comprising the steps of:

storing in a computer memory a data base of terrain altitudes at a grid of points in a selected terrestrial area encompassing the observation point;

deriving from said data base visible heights from the observation point at the grid points by performing, grid point by grid point in succession in an order moving away from the observation point, using a computer, the steps of:

(a) determining, from the visible heights between the observation point and the grid point, a projected height at the grid point;

(b) comparing the projected height with the terrain altitude at the grid point; and

(c) selecting, as a visible height at the grid point, the larger of the compared terrain altitude and projected height;

storing representations of the visible heights in computer memory; and

coupling said computer memory to a visual display device to present the stored representations in spatial relationship coordinated with the spatial relationship of the grid points of the terrestrial area.

4,903,217

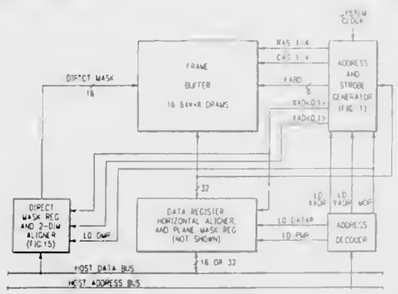
FRAME BUFFER ARCHITECTURE CAPABLE OF ACCESSING A PIXEL ALIGNED M BY N ARRAY OF PIXELS ON THE SCREEN OF AN ATTACHED MONITOR

Satish Gupta, Peekskill, N.Y.; Leon Lumelsky, Stamford, Conn., and Marc Segre, Rhinebeck, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 12, 1987, Ser. No. 13,843

Int. Cl.[4] G06F *12/00*

U.S. Cl. 364—521 **2 Claims**



1. A frame buffer memory organization for use with a raster scan video monitor which organization is capable of accessing a pixel aligned M by N array of contiguous pixels on the screen of the monitor from a frame buffer memory constructed of an M by N array of memory chips, memory addressing and control means for driving a common address bus to all the memory chips, and for energizing selectively N row address strobe (RAS) wires across the memory chip array and M column address strobe (CAS) wires down the memory chip array,

means to effect the writing of individual pixels in the array being enabled by energizing the write enable pins to each memory chip directly,

means connecting the data wires in the memory organization together such that M pixels in a single row can be read or written simultaneously,

means for supplying the same row and column address to all of the memory sections when address decoding means determine that the accessed M by N array lies along a physical word address boundary on said screen and in said memory whereby the pixel accessed from each section of the memory is at the same address in each section, or alternatively,

means for sequentially supplying within a memory access cycle, two consecutive sets of row and column addresses to said memory and means including clock means for selectively energizing a first set of RAS and CAS wires during a first phase and a second set of RAS and CAS wires during a second phase of the memory access cycle wherein a total of N rows and M columns of address strobe wires are energized during a given memory access cycle, when said address decoding means determine that the accessed M by N array does not lie along a physical word address boundary, and

means for generating an M by N direct mask for controlling the access to specified pixels of an accessed M by N array during a particular frame buffer cycle said mask comprising a configuration of "1's" and "0's" depending on which pixel(s) is to be accessed, said generating means including,

a register for storing said direct mask,

first rotation means operable in response to an X-offset signal cooperable with the direct mask register for rotating the mask in the X direction an amount equal to the offset of the array origin address (P0) from a physical word boundary along the X axis and second rotation means operable in response to a Y-offset signal cooperable with said direct mask register for rotating the mask in the Y direction an amount equal to the offset of the array origin address from a physical word boundary along the Y axis, and

wherein means for determining the X and Y offset values comprises an address decoder which decodes the low order bits of the X and Y addresses defining the array origin (P0) to determine the pixel offset of the array origin, if any, from a physical word boundary.

4,903,218

CONSOLE EMULATION FOR A GRAPHICS WORKSTATION

Mark Longo, Nashua, N.H., and Steven D. DiPirro, Holliston, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 13, 1987, Ser. No. 84,930

Int. Cl.[4] G06F *3/037*

U.S. Cl. 364—521 **5 Claims**

1. A method for performing console emulation at a workstation terminal having a display device, the method comprising the steps of:

(a) operating a console subsystem in a first central processing unit (cpu);

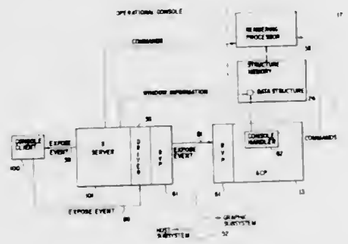
(b) coupling a second cpu located at the workstation terminal, to said first cpu, for controlling a graphics processor;

(c) operating a windowing system on said first cpu and creating with said windowing system a plurality of windows in the graphics processor for display on the display device, one of said windows being a console window;

(d) said windowing system notifying a console client application when an exposure event of said console window occurs;

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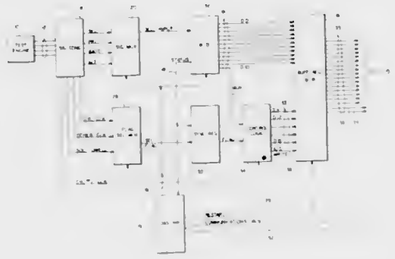
(e) emulating said console subsystem in the console window with said second cpu to provide a workstation console;
(f) operating said workstation console simultaneously with said plurality of windows;
(g) providing input data to said second cpu from a plurality of input devices coupled to said second cpu;
(h) operating a keyboard handler and a mouse handler by the second cpu to route the input data through said second cpu to said console subsystem when said exposure event occurs;
(i) receiving console input data into said console subsystem in the first cpu from the second cpu and generating con-



sole display data from said console subsystem, said console display data being received by the second cpu;
(j) directing, with a console handler in said second cpu the console display data received by the second cpu to the graphics processor;
(k) said step of directing the console display data by said second cpu further includes the step of operating a driver by the first cpu to inform the console handler of said exposure event; and
(l) directing the console display data with the console handler directly to said graphics processor for display in said console window.

4,903,219
METHOD OF IDENTIFYING FLAG BITS
Neal S. Reynolds, Schaumburg; Robert Woodbury, Carpentersville, and Robert J. Rzadzki, Crystal Lake, all of Ill., assignors to Sun Electric Corp., Crystal Lake, Ill.
Filed Jan. 27, 1988, Ser. No. 148,972
Int. Cl.[4] G06F *11/00, 11/30, 15/74*
U.S. Cl. 364—550 **10 Claims**

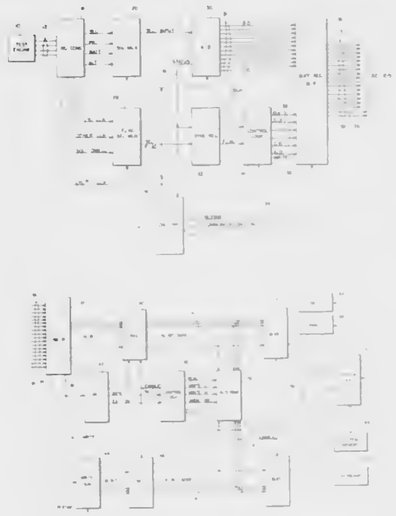
3. A method of identifying flagged data in a memory in which data consists of digital words having a fixed number of bits representing magnitude and other bits in known bit positions including a sign bit representing the sign of the data and first and second flag bits corresponding to a cylinder #X firing event and a cylinder #1 firing event, respectively, a flag being set by having its bit value made opposite to that of the sign bit, comprising the steps of:
processing a digital word from the memory to isolate the sign bit and the first flag bit to produce a first digital result;
conducting a parity test on the first digital result to determine whether the first flag bit is set;
storing the memory address of the digital word if the first flag bit is set; and if set
processing the digital word to isolate the sign bit and the second flag bit to produce a second digital result;
conducting a parity test on the second digital result to determine whether the second flag bit is set; and



storing the memory address of the digital word if the second flag bit is set.

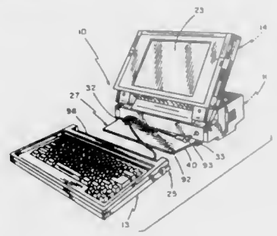
4,903,220
DUAL PORTED SPEED UP MEMORY IN ROM LOCATION FOR ENGINE ANALYZER
James H. Johnson, Lake In The Hills, Ill., assignor to Sun Electric Corporation, Crystal Lake, Ill.
Filed Jan. 27, 1988, Ser. No. 148,874
Int. Cl.[4] G01M *15/00;* **G06F** *15/74*
U.S. Cl. 364—551.01 **6 Claims**

1. A diagnostic engine tester comprising:
RAM memory means;
data acquisition means, including a microprocessor and register means coupled to said RAM memory means, for acquiring test signals from an engine for storing them in digital form as data in said RAM memory means;
system microprocessor means, including a memory, for processing data, including said stored engine test signals from said RAM memory means and for accessing said RAM memory means, said data acquisition means and said system microprocessor means operating substantially independently of each other; and



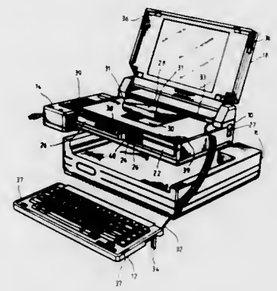
control logic means for regulating access to said RAM memory means by said data acquisition means and said system microprocessor means.

4,903,221
KEYBOARD LATCHING ARRANGEMENT FOR PORTABLE COMPUTERS
Horst M. Krenz, Bridgman, Mich., assignor to Zenith Electronics Corporation, Glenview, Ill.
Filed Oct. 31, 1988, Ser. No. 265,078
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—708 **20 Claims**



1. A portable computer, comprising: a base including at least one drive, a visual display, a keyboard assembly having a longitudinal axis, releasably connected to the base, means to releasably connect the keyboard assembly to the base in an attached position and a stand alone position including interengaging means on the keyboard assembly and base for aligning and holding the keyboard assembly in a predetermined fixed plane with respect to the base, and latch means for releasably locking the keyboard assembly to the base, said interengaging means being separate from the latch means and constructed to align the keyboard assembly prior to the attached position as the keyboard assembly is moved toward the base in a direction perpendicular to the longitudinal axis of the keyboard assembly.

4,903,222
ARRANGEMENT OF COMPONENTS IN A LAPTOP COMPUTER SYSTEM
R. Richard Carter, Cypress; Thomas Mitchell, and Douglas C. Bushman, both of Houston, all of Tex., assignors to Compaq Computer Corporation, Del.
Filed Oct. 14, 1988, Ser. No. 257,952
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—708 **1 Claim**



1. A portable computer system comprising:
first housing means for containing a first set of computer components and a plurality of signal wires, said first housing means having a rectangular prism shape with substantially planar front, back, top, bottom and side faces;
said first housing means having an access slot ins aid front planar face;
said first set of computer components including a floppy disk drive, said floppy disk drive being positioned to allow for the insertion of floppy disks in said floppy disk drive through said access slot;
said first set of computer components further including a hard disk drive, said hard disk drive also being mountd in the front of said first housing means;
said first housing means having first and second indicator means mounted on said front planar face for indicating read or write access to said floppy disk drive and said hard disk drive;
an AC power supply for supplying power to said first set of computer components, and a battery power supply for supplying power to said first set of computer components, said battery power supply having a substantially rectangular prism shape;
said first housing means having a rectangular opening in said top planar face for receiving said battery power supply, said rectangular opening being formed to allow said battery power supply to be flush with said top planar face, said battery power supply having clasping means for holding said power supply in said rectangular opening;
a display screeen having substantially planar first and second faces;
hinging means coupling said display screen to said top planar face of said first housing means, said hinging means allowing said display screen to be moved either to upright positions or to a folded position;
keyboard means coupled to said first housing means via a cable, said keyboard means having adjustable rear support means capable of being folded flush with the surface of said keyboard;
said hinging means defining a channel running along said top planar surface of said first housing means generally between said side faces of said first housing means, said

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channel being sized to receive said cable when said keyboard is placed on the said top planar face of said first housing means, and being disposed directly above said battery power supply and immediately adjacent to said hinging means and said channel;

second housing means containing a plurality of signal wires, having a substantially rectangular prism shape and having a substantially rectangular recess for receiving said first housing means.

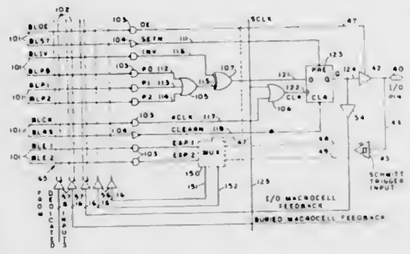
said first housing means and said second housing means having complementary coupling means which electrically couple said plurality of signal wires inside said first housing means with said plurality of signal wires inside said second housing means when said first housing means is inserted into said recess in said second housing means.

4,903,223

PROGRAMMABLE LOGIC DEVICE WITH PROGRAMMABLE WORD LINE CONNECTIONS

Kevin A. Norman, Belmont, and Robert J. Frankovich, Cupertino, both of Calif., assignors to Altera Corporation, Santa Clara, Calif.

Filed May 5, 1988, Ser. No. 190,571
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—716 **10 Claims**



1. A programmable logic device for producing a plurality of first signals, each of which is a programmable logical function of a plurality of second signals, each of which is applied to a respective one of a plurality of word line conductors, said programmable logic device comprising:

a plurality of first P-term line conductors, each of which is programmably interconnectable to each of said work line conductors for producing on each of said first P-term line conductors a third signal which is a logical function of the second signals applied to the work line conductors to which the first P-term line conductor is interconnected;

means for logically combining said third signals to produce a first of said first signals;

at least one second P-term line conductor which is programmably interconnectable to each of said word line conductors for producing on said second P-term line conductor a second of said first signals which is a logical function of the second signals applied to the work line conductors to which said second P-term line conductor is interconnected;

means for receiving an input signal applied to the programmable logic device;

switch means for applying either the second of said first signals or said input signal to one of said work line conductors as the second signal applied to that work line conductor;

at least one third P-term line conductor which is programmably interconnectable to each of said work line conductors for producing on said third P-term line conductor a third of said first signals which is a logical function of the second signals applied to the word line conductor to which said third P-term line conductor is interconnected; and

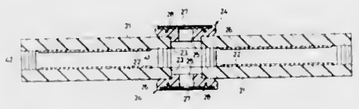
means for applying the third of said first signals to said switch means for controlling said switch means to apply either the second of said first signals or said input signal to said one of said word line conductors.

4,903,224

OPTICAL INFORMATION RECORDING DISK

Tohru Namiki; Fumio Matsui; Kouji Shimoda, all of Saitama, and Yoshiaki Fuse, Tokyo, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 16, 1988, Ser. No. 168,777
Claims priority, application Japan, Mar. 16, 1987, 62-60656; Jun. 19, 1987, 62-153063
Int. Cl.[4] G11B *17/028, 19/20, 23/00*
U.S. Cl. 369—290 **10 Claims**



1. An optical information recording disk comprising:

a disk substrate having a recording layer formed on at least one surface thereof and having a center hole formed in a central position thereof; and

a metal plate lamination member inserted into and fixed in said center hole of said substrate, said metal plate lamination member comprising a metal plate and a resin hub member, said metal plate and said resin hub member having respective center holes communicated with one another in an axial direction in such a manner that center positioning of said disk is effected by engaging the spindle with said center hole in said metal plate; wherein said metal plate has as plurality of protrusions equidistantly spaced therearound and extending in said axial direction, said protrusions being ultrasonically pressed into said resin hub member and welded thereto so as to adhere said metal plate to said resin hub member, wherein said protrusions are bent downward from a plane of said metal disk and have small holes formed in end portions thereof, wherein when said metal plate is ultrasonically welded to said hub, resin flows into said small holes to further secure said metal plate to said hub member.

4,903,225

HIGH SPEED DIGITAL DATA CORRELATOR HAVING A SYNCHRONOUS PIPELINED FULL ADDER CELL ARRAY

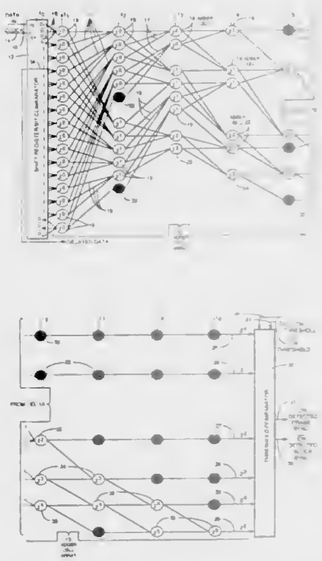
Andrew C. Brost, San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Dec. 23, 1988, Ser. No. 290,717
Int. Cl.[4] G06F *15/336*
U.S. Cl. 364—728.03 **11 Claims**

1. A high speed digital data correlator for detecting a known correlation word in a serial data stream having a known data rate, comprising:

first means for storing respective bits of said known correlation word, for receiving said serial data stream and a clock signal synchronous therewith, said first means comparing said data stream bit-by-bit with said known correlation word at said data rate, said first means having parallel outputs, each providing an output signal of a first logic level when a bit match is obtained, and a second logic level when a bit match is not obtained;

synchronous pipelined single bit full adder cell array means for providing a binary sum indicating a number of bit matches obtained by said first means, said array means having consecutive stages, each adder cell having up to three inputs, each input of the same adder cell being coupled to receive a single bit of equal order of magnitude, and each adder cell having a summation output for outputting a single bit of the same order as that of its input bits,



and a carry output for outputting a carry bit, the respective inputs of said adder cells of a first synchronous stage being coupled to respective outputs of said first means, respective inputs of adder cells from a second and said consecutive stages being coupled to respective outputs of adder cells of a previous stage, respectively; and

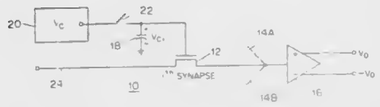
second means for receiving said sum provided by said array means, comparing said sum with a predetermined threshold, and providing a synchronizing output signal when said comparison is obtained.

4,903,226

SWITCHED NETWORKS

Yannis Tsividis, 601 W. 113th St. #11-F, New York, N.Y. 10025

Continuation-in-part of Ser. No. 90,126, Aug. 27, 1987, Pat. No. 4,873,661. This application Nov. 18, 1987, Ser. No. 122,059
Int. Cl.[4] G06R *15/46*
U.S. Cl. 364—807 **9 Claims**



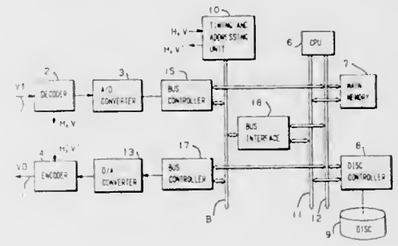
1. A neural network comprising a plurality of neurons each having one or more synapse circuit means each comprising a voltage-variable resistive means, each voltage-variable resistive means including a control element, each of said synapse circuit means further comprising a capacitor one of whose plates is connected both to said control element and by way of a switch to a terminal of a variable control voltage source.

4,903,227

PROCESSOR FOR DIGITIZED VIDEO HAVING COMMON BUS FOR REAL TIME TRANSFER OF INPUT AND OUTPUT VIDEO DATA

Nobuo Fukushima, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 661,949, Oct. 17, 1984, abandoned. This application Jul. 30, 1987, Ser. No. 79,434
Int. Cl.[4] G06F *15/66, 3/14, 13/16, 13/40*
U.S. Cl. 364—900 **4 Claims**



1. A video signal processor comprising:

first bus means including a plurality of data lines and a plurality of control lines,

a memory connected to the first bus means and including a predetermined picture processing program,

a computer connected to the first bus means for reading program instructions from the memory, reading data from the memory, processing the data, and writing the processed data to the memory,

second bus means including a plurality of data lines and a plurality of timing and addressing lines,

input video processing means connected to the second bus means for converting an input video signal into consecutive digitized video signal data applied to the second bus means,

output video processing means connected to the second bus means for converting consecutive digitized video signal data from the second bus into an output video signal,

timing and addressing means connected to the second bus and operated in synchronism with sync signals of the input video signal for generating timing and addressing signals on the second bus means to operate the input and output video processing means;

means controlled by the computer for selectively connecting the second bus means to the memory, and

said computer including means for operating in one of the following three modes: (1) disabling the selective connecting means, and enabling both the input and output video processing means for passing the consecutive digitized video signal data from the input video processing means to the second bus means and output video processing means, (2) enabling the input video processing means and the selective connecting means to write consecutive digitized video signal data into the memory in accordance with the timing and addressing signals from the timing and addressing means, and (3) disabling the input video processing means, and enabling the output video processing means and the selective connecting means for reading out data from the memory onto the second bus means and the output video processing means in accordance with the

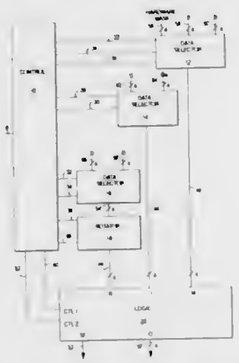
timing and addressing signals from the timing and addressing means.

4,903,228

SINGLE CYCLE MERGE/LOGIC UNIT

Dennis G. Gregoire; Randall D. Groves, and Martin S. Schmookler, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1988, Ser. No. 269,202
Int. Cl.[4] G06F *7/00, 7/52, 9/32*
U.S. Cl. 364—900 **8 Claims**



1. A data processing circuit for performing either a merge or Boolean logic operation on data within a single clock cycle in response to an instruction, said circuit comprising:

control means for receiving an instruction during a clock cycle and providing a selection signal, a rotator signal and a control signal to specify either a merge or a Boolean logic operation in response to said instruction;

data selector means for providing a plurality of data words, each containing a plurality of bits, in response to the selection signal;

rotator means connected to said data selector means for rotating the bits of at least one of said provided data words in response to the rotator signal; and

logic means for logically combining the bits from said data words from said data selector means and said rotator means in response to the control signal and including means for performing a mask operation within said clock cycle upon a first word from said data selector means with a mask word provided by said data selector means

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4,903,229

FORMS GENERATING AND INFORMATION RETRIEVAL SYSTEM

Alfred C. Schmidt, Wilton, and Robert T. Durst, Jr., Monroe, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 13, 1987, Ser. No. 25,315
Int. Cl.[4] G06F *7/32*
U.S. Cl. 364—900 **6 Claims**

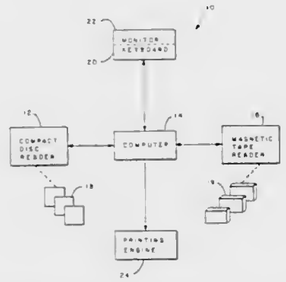
1. A forms generating and information retrieval apparatus, comprising:

first means for storing a large number of independent, machine-readable form files, said first means including a compact disc reader and a compact disc detachably mounted in said compact disc reader and having written thereon in machine-readable form all of said large number of form files, each of said form files having associated therewith a unique identification code and having a plurality of information field identifiers;

second means for storing a plurality of machine-readable information files, said second means including a magnetic media reader and a magnetic media mounted in said magnetic media reader and having written thereon in machine-readable form a plurality of information files each divided up into a plurality of fields each with its own identifier, each of said information files having associated therewith a unique identification code;

processing means;

access means for allowing an operator to communicate with said processing means, said access mean being utilized to allow said operator to selectively identify one of said form files and one of said information files by communicating to said processing means said respective identification codes and to selectively identify field identifiers of said selected form files;



said processing means being in communication with said first means and said second means, said processing means being responsive to said operator selection of identification codes and field identifiers such that said processing means can direct said first means to locate a selected one of said form files corresponding to the respective identification code and transmit said selected forms file to said processing means for storing therein, and can direct said second means to locate a selected one of said information files corresponding to the respective identification code and transmit said selected information file to said processing means for storing therein, said processing means being active to merge said selected stored forms file with said selected stored information file fields as specified by said selected field identifiers; and

means in communication with said processing means for printing said merged files.

4,903,230

REMOTE TERMINAL ADDRESS AND BAUD RATE SELECTION

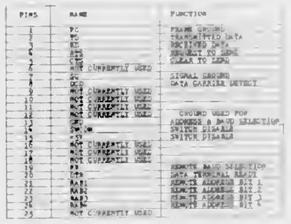
Jay Kaplan, Wayland; Richard G. Harris, Franklin, and Barry Sidebottom, Marlboro, all of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Continuation of Ser. No. 726,294, Apr. 24, 1985, abandoned, which is a continuation of Ser. No. 665,511, Oct. 31, 1984, abandoned, which is a continuation of Ser. No. 277,783, Jun. 26, 1981, abandoned. This application Jun. 29, 1988, Ser. No. 214,893
Int. Cl.[4] G06F *9/02*
U.S. Cl. 364—900 **7 Claims**

1. An apparatus comprising a remote terminal of a data processing system, the terminal having electronic means positioned in and generally inaccessible within a terminal housing, the electronic means comprising a plurality of individual lines selectively closed by preset means inaccessible within the terminal housing to select the terminal address and baud rate, the terminal further comprising apparatus for selecting for said terminal an alternative address and an alternative baud rate

without access into the terminal housing by interconnection of external leads of the apparatus to the individual lines of the electronic means with jumpers, said apparatus comprising:

(a) first means for disabling said electronic means for selecting the terminal address and baud rate by means of voltage applied to said individual lines with said interconnection with jumpers of external leads to the individual lines of the electronic means;



(b) second means for selecting said terminal address by means of voltage applied to said individual lines with said interconnection with jumpers of external leads to the individual lines; and

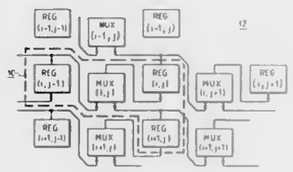
(c) third means for selecting said baud rate by means of voltage applied to said individual lines with said interconnection with jumpers of external leads to the individual lines.

4,903,231

TRANSPOSITION MEMORY FOR A DATA PROCESSING CIRCUIT

Alain Artieri, Meylan, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly Cedex, France

Filed Jul. 1, 1988, Ser. No. 214,252
Claims priority, application France, Jul. 3, 1987, 87/09458
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364--900 **4 Claims**



1. A transposition memory comprising n inputs (E0 to En−1) for receiving n×n data groups line after line, and n outputs (S0 to Sn−1) for outputting the data grouped according to successive columns, the data being the n×n data of a data square matrix, the data being further transmitted and processed in the form of electrical signals, further comprising a network of n×n registers (REG(i,j)) and of n×n multiplexers (MUX(i,j)), arranged in lines and columns, each register being associated with one multiplexer and being marked by its location in line i and its location in column j, the multiplexer (MUX(i,j)) having a first input connected with the output of register REG(i,j−1), a second input connected with the output of register REG(i+1,j) and an output connected with the input of register (REG(i,j)), the multiplexer output transmitting the status of the first input during a first operating phase (a) of the memory and further transmitting the status of the second input during a second phase (b), and the connections of the registers and multiplexers of the first and last lines and columns of the network being as follows:

(a) the first inputs of the multiplexers of the first column (rank 0) are each connected with a respective input of the memory;

(b) the outputs of the registers of the last column (rank n−1) are each connected through a respective switch with a respective output of the memory, this switch being closed during the first phase and open during the second phase;

(c) the output of each register of the first line (rank 0) is connected, through a switch open during the first phase and closed during the second phase, with a respective output of the memory;

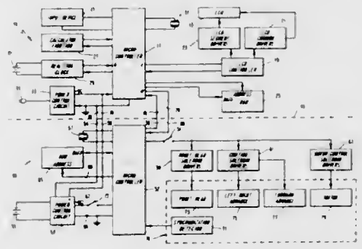
(d) the second input of each multiplexer of the last line (rank n−1) is connected with a respective input of the memory.

4,903,232

ELECTRONIC PROGRAMMABLE STAMPING MARKING DEVICE

James A. O'Connell, 108 Woodfield Dr., Short Hills, N.J. 07078, and S. Randy Sarantos, 240 Cedar Knolls Rd., Cedar Knolls, N.J. 07927

Filed Jun. 26, 1987, Ser. No. 66,466
Int. Cl.[4] G06F *3/12;* **B65H** *25/00*
U.S. Cl. 364—900 **22 Claims**



1. An improved programmable marking device comprising:

a microcontroller having memory means for storing data;

input means connected to said microcontroller for inputting said data to said memory means;

display means connected to said microcontroller for displaying said data substantially simultaneously with the inputting thereof;

printer means controlled by said microcontroller for printing said data;

said printer means including a print head means for placement against and for printing said messages on a substantially planar surface;

print activation means for activating said printer means; and

means for disabling said print activation means until said print head means is placed on a substantially planar surface;

such that data may be inputted, substantially simultaneously displayed on said display means stored in said memory means and thereafter selectively printed on said substantially planar surface located externally of said housing.

4,903,233

WORD PROCESSOR HAVING CAPABILITY OF CONTINUOUSLY ENTERING DOCUMENTS INTO A COLUMN OR A BLOCK OF AN EDITING SYSTEM

Akira Hirami, and Yasuhiro Taguchi, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 19, 1987, Ser. No. 64,053
Claims priority, application Japan, Jun. 20, 1986, 61-145950; Jun. 20, 1986, 61-145951; Jun. 20, 1986, 61-145952
Int. Cl.[4] G06F *3/12, 3/14, 3/153, 13/00*
U.S. Cl. 364—900 **3 Claims**

1. An editing system for use in a word processor comprising:

letter code producing means for sequentially producing letter codes;

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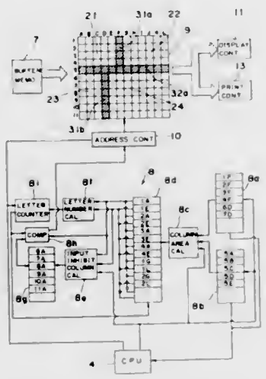
document memory means having a plurality of memory elements aligned in vertical and horizontal directions, each memory element having a capacity of storing one letter code;

vertical and horizontal boundary setting means for setting vertical and horizontal boundaries within said document memory means to divide said document memory means into a plurality of blocks, each block having a plurality of rows of text, and different, ordered priorities being assigned to said blocks;

row address storing means for storing row addresses from top to bottom in each of said blocks and in the order of blocks having a higher priority;

address data producing means for sequentially producing address data of said memory elements in each row and in the order of rows as stored in said storing means;

control means for controlling depositing of said letter codes from said letter code producing means to said document memory means, said control means being operatively connected to at least said address data producing means and depositing the letter codes in said document memory means in response to said address data produced from said address data producing means, said control means further



determining when a last row address for a block is filled by deposited letter code and when at least one subsequent letter code remains undeposited and thereafter beginning depositing of the at least one subsequent letter code in a first row address of a block having next priority to the filled block; and

inhibit setting means for setting a block to be skipped in depositing the letter codes, said inhibit setting means comprising;

means for specifying a block to be skipped,

means for holding row addresses of the specified block, and

comparing means for comparing said row address obtained from said row address storing means with said row addresses held in said row address holding means, said comparing means thereafter causing said address data producing means to produce said row address when said row address obtained from said row address storing means is absent from said row addresses held in said row address holding means, and for causing said address data producing means to fail to produce said row address when said row address obtained from said row address storing means is found in said row addresses held in said row address holding means.

4,903,234

MEMORY SYSTEM

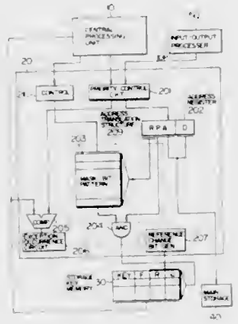
Taketoshi Sakuraba, Yokohama; Hisashi Katada, Sagamihara; Yoshitaka Ohfusa, Yokohama; Yasufumi Yoshizawa, Tachikawa; Toshiaki Arai, Kawasaki, and Hiroo Miyadera, Atsugi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,538

Claims priority, application Japan, May 22, 1987, 62-123794

Int. Cl.[4] G11C *13/00, 15/00*

U.S. Cl. 365—49 **18 Claims**



6. A memory system comprising:

a means storage having a plurality of subdivided areas including equally sized bank areas made up of pages of a size corresponding to said bank areas or of a plurality of sizes;

a key storage including storage keys respectively assigned to said plurality of subdivided areas;

main storage access control means for controlling access to said main storage and to said key storage;

key address translation means including an address translation table to which a portion of said address information is to be inputted and control means for changing and reading the content of said address translation table through an execution of a program instruction for translating address information of said main storage associated with an access request into address information of an entry of said key storage,

said address information including a bank number identifying said bank and a page number denoting an order of page in a bank,

said address translation table receiving said bank number as an input and having a point part disposed to convert said bank number into a first address of the key storage associated with a page in the bank related to said address information and shift information concerning a page size in said bank;

key address translation means including a circuit for attaining an address of said key storage by use of a signal obtained by shifting said first address and said page number depending on said shift information, for translating address information of said main storage associated with an access request into address information of an entry of said key storage; and

setting means operative in association with said key address translation means for setting said area to which said storage key is set.

4,903,235

SEMICONDUCTOR MEMORY

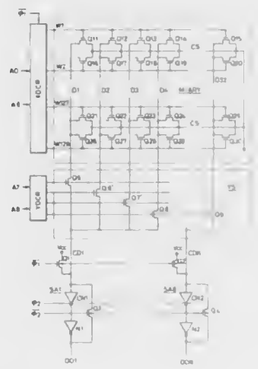
Taei Kubota, and Tetsuo Nakano, both of Ohme, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 74,852, Jul. 17, 1987, Pat. No. 4,831,593. This application May 9, 1989, Ser. No. 349,419

Claims priority, application Japan, Jul. 18, 1986, 61-167941

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—104 **5 Claims**



1. A semiconductor memory comprising:

a word line;

a plurality of data lines;

a plurality of memory cells each of which is disposed at an intersection between said word line and one of said data lines;

a common data line;

a plurality of first MOSFETs each of which has a first conductivity type and is coupled between one of said data lines and said common data line;

selecting means coupled to said first MOSFETs and including means for controlling the operation of each of said first MOSFETs;

amplifier means coupled to said common data line and including means for providing an output signal having an inverted level with respect to an signal on said common data line; and

a second MOSFET having a second conductivity type, coupled to said common data line and responsive to said output signal for providing a predetermined voltage level to said common data line.

4,903,236

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE AND A WRITING METHOD THEREFOR

Takeshi Nakayama; Kazuo Kobayashi, and Yasushi Terada, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,431

Claims priority, application Japan, Jul. 15, 1987, 62-177715; Aug. 5, 1987, 62-196825

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—185 **18 Claims**

1. A nonvolatile semiconductor memory device formed on one chip of a semiconductor substrate in an integrated manner, said device having a plurality of word lines, a plurality of bit lines intersecting with said word lines, and a plurality of memory cells, each said memory cell being a single transistor-type cell provided at an intersection of said plurality of word lines and said plurality of bit lines for storing information in a nonvolatile manner, comprising:

an internal DC power supply provided on said semiconductor substrate,

means for generating a high DC voltage for writing data into said memory cells and erasing the data written into said memory cells,

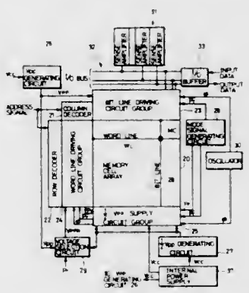
said means for generating the high DC voltage comprising first voltage increasing means for increasing an output voltage of said internal DC power supply,

means for generating an intermediate voltage higher than a ground voltage and lower than said high DC voltage,

said means for generating the intermediate voltage comprising second voltage increasing means for increasing an output voltage of said internal DC power supply,

addressing means for selecting a word line and a bit line intersecting at a selected memory cell,

word line voltage applying means for applying said high DC voltage and one of said intermediate voltage and said



ground voltage to said word lines dependent on an operation cycle of said nonvolatile semiconductor memory device, and

bit line voltage applying means for applying said high DC voltage and one of said intermediate voltage and said ground voltage to said bit lines dependent on the operation cycle of said nonvolatile semiconductor memory device,

said word line voltage applying means including word line write voltage applying means for applying said ground voltage to the word line selected by said addressing means and applying said intermediate voltage to the non-selected word lines in a write cycle of data into said memory cells,

said bit line voltage applying means including bit line write voltage applying means for applying said high DC voltage to the bit line selected by said addressing means and applying said intermediate voltage to the non-selected bit lines in said write cycle.

4,903,237

DIFFERENTIAL SENSE AMPLIFIER CIRCUIT FOR HIGH SPEED ROMS, AND FLASH MEMORY DEVICES

Kameswara K. Rao, San Jose, Calif., assignor to Catalyst Semiconductor, Inc., Santa Clara, Calif.

Filed Aug. 2, 1988, Ser. No. 227,584

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—185 **6 Claims**

1. A memory circuit comprising:

at least one memory cell for storing data;

means for providing a data signal corresponding to the data stored in said memory cell;

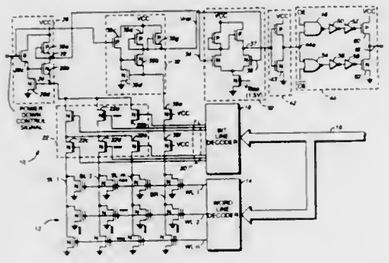
means for providing a reference voltage;

first sense amplifier means having an output lead, an inverting input lead receiving said reference voltage and a noninverting input lead receiving said data signal;

second sense amplifier means having an output lead, nonin-

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verting input lead receiving said reference voltage, and an inverting input lead receiving said data signal;
a memory circuit output lead;
first means for coupling said memory circuit output lead to



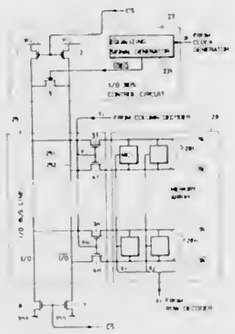
a first voltage in response to the signal on said output lead of said first sense amplifier means; and
second means for coupling said memory circuit output lead to a second voltage in response to the signal on said output lead of said second sense amplifier means.

4,903,238

SEMICONDUCTOR MEMORY DEVICE WITH IMPROVED IMMUNITY TO SUPPLY VOLTAGE FLUCTUATIONS

Hideshi Miyatake; Masaki Kumanoya, and Katsumi Dosaka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,787
Claims priority, application Japan, Jun. 4, 1987, 62-140197
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—189.06 **17 Claims**



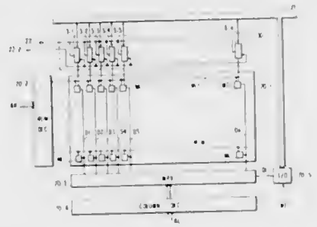
1. A semiconductor memory device comprising:
first and second I/O bus lines;
precharge means connected to a source of a first voltage potential and said first and second I/O bus lines for precharging said first and second I/O bus lines in response to a variable state signal;
equalizing signal generation means for generating an equalizing signal in response to a clock signal;
equalizing means connected between said first and second I/O bus lines for establishing an equipotential of said first and second I/O bus lines in response to said equalizing signal; and
ground connection means connected to said first and second I/O bus lines for supplying a source of ground potential thereby bringing said first and second I/O bus lines to said ground level potential in response to said variable state control signal.

4,903,239

SEMICONDUCTOR MEMORY HAVING A PARALLEL INPUT/OUTPUT CIRCUIT

Yoichi Akashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,427
Claims priority, application Japan, Mar. 30, 1987, 62-77310
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189.01 **4 Claims**



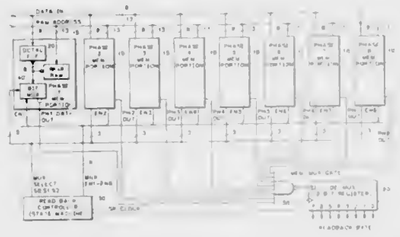
1. A memory circuit comprising a memory array having a plurality of word lines arranged in rows including first and second outermost rows, a plurality of digit lines arranged in columns normal to said rows, and a plurality of memory cells arranged in an array and coupled to said word plurality lines and said digit lines, each of said memory cells being coupled to only one of said word lines and including data storage means having a data node and a transfer gate having a controllable current path connected between said data node and one of said digit line and a control electrode connected to the one of said word lines to which the memory cell is connected, a row decoder coupled to said word lines for operatively selecting one of said word lines in response to row address information thereby to enable the transfer gates of the memory cells coupled to the selected word line, a column selection circuit coupled to said digit lines for operatively selecting a number of said digit lines in response to column address information for data access thereto, a number of signal lines, a parallel read-write unit coupled to said number of signal lines and to a number of memory cells in the first outermost row of said memory array corresponding to the number of signal lines, said parallel read-write unit including read-write circuits of a corresponding to the number of signal lines, each of said read-write circuits having a first node coupled to one of said signal lines and a second node directly connected to the data node of one of said cells in said first outermost row coupled to said parallel read-write unit, each of said read-write circuits transferring a signal at the first node thereof to the second node thereof in a first mode and transferring a signal at said second node to said first node in a second mode, first control means coupled to said read-write circuits for simultaneously setting said read-write circuits in said first mode thereby to simultaneously write signals on said signal lines into the storage means of said memory cells in said first outermost row coupled to said parallel read-write unit, and second control means coupled to said read-write circuits for simultaneously setting said read-write circuits in said second mode thereby to simultaneously read out to said signal lines the states of the storage means of said memory cells in said first outermost row coupled to said parallel read-write unit.

4,903,240

READOUT CIRCUIT AND METHOD FOR MULTIPHASE MEMORY ARRAY

Timothy A. Von Flue, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 16, 1988, Ser. No. 156,492
Int. Cl.[4] G06F *12/00*
U.S. Cl. 365—189.02 **6 Claims**



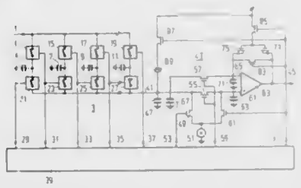
1. A circuit for reading out the contents of a multiphase memory array having a plurality of memory portions, the circuit comprising:
a plurality of means for multiplexing the bits, each associated with one of the memory portions, to multiplex a plurality of bits within each memory portion onto a single output line;
means for multiplexing memory portions to enable one of the single output lines from the plurality of bit multiplexing means so as to multiplex the signals of each of the single output lines onto a single readout line;
means for demultiplexing and holding, to present for readback on parallel output lines the bits from each memory portion; and
means for controlling the bit multiplexing means, the memory portions multiplexing means, and the demultiplexing and holding means, so that for each memory portion in sequence the plurality of bits are held for readback on the parallel output lines.

4,903,241

READ CIRCUIT HAVING A LIMITED-BANDWIDTH AMPLIFIER FOR HOLDING THE OUTPUT OF A DELAY CIRCUIT

Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1988, Ser. No. 253,539
Claims priority, application Netherlands, Oct. 12, 1987, 8702425
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—194 **2 Claims**



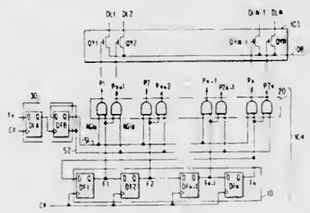
1. A read circuit for a delay circuit for successively reading a plurality of capacitive memory elements of the delay circuit, said reading being delayed with respect to a successive writing of said memory elements and being performed by means of an amplifier an input of which is coupled to an output of the delay circuit, characterized in that the amplifier (63) has a second input constituting a difference signal input with respect to the first-mentioned input, while the first-mentioned input and the second input are coupled via a sampling circuit to the output of the delay circuit and to an impedance, respectively, which is identical to the output impedance of the delay circuit, and the output of the amplifier is coupled via a negative feedback impedance to the second input so that in the operative state of the sampling circuit the negative feedback impedance ensures a voltage division from the output of the amplifier to the input impedance of its second input during reading of a memory element, said voltage division being identical to the voltage division produced by the series circuit of the impedance of a memory element to be read and the parallel circuit of the output impedance of the delay circuit and the input impedance of the first-mentioned input, so that during reading the voltage at the output of the amplifier becomes substantially equal to the unloaded voltage at the relevant memory element and the amplifier serves as a hold circuit when the sampling circuit is inoperative.

4,903,242

SERIAL ACCESS MEMORY CIRCUIT WITH IMPROVED SERIAL ADDRESSING CIRCUIT COMPOSED OF A SHIFT REGISTER

Kunihiko Hamaguchi, and Yasuhide Ohara, both of Toyko, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 6, 1988, Ser. No. 190,969
Claims priority, application Japan, May 6, 1987, 62-111251; May 6, 1987, 62-111252
Int. Cl.[4] G11C *13/00, 7/00*
U.S. Cl. 365—230.08 **5 Claims**



1. A memory circuit comprising a memory array of memory cells having N addresses, wherein N is a positive integer larger than 3, to be serially selected, and a serial selection circuit for serially selecting said N addresses one by one in synchronism with control pulses, said serial selection circuit including a shift register having N/K, wherein K is a positive integer equal or larger than 2 and less than N, shift outputs, said shift register activating sequentially the N/K shift outputs sequentially one by one in synchronism with said control pulses, a control circuit having K control outputs and activating only one of the K control outputs, said control circuit changing the output from one of said K control outputs to another after said shift register activates all the N/K shift outputs, and a gate circuit coupled to said N/K shift outputs of said shift register and to said K control outputs of said control circuit and generating N selection output signals one by one.

4,903,243

MARINE TRANSPONDER SYSTEM

John H. Turner, Jr., Cambridge, Mass., assignor to Whistler Corporation, Westford, Mass.

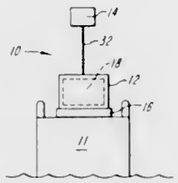
Filed Aug. 4, 1988, Ser. No. 228,723
Int. Cl.[4] H04B *1/59*
U.S. Cl. 367—3 **22 Claims**

1. A marine transponder system activated in response to a transponder activating signal broadcast by a remote transmitter, comprising:

receiver means tuned for receiving and processing the transponder activating signal transmitted by operator activation of the remote transmitter;

means for recognizing that the transponder activating signal has been received and for providing a control signal in response thereto;

a housing for said receiver means and said recognizing means, said housing configured for use in a marine environment;



signaling means for providing a predetermined recognizable signal to alert the remote transmitter to the presence and relative location of said marine transponder system; and

timing/control means disposed in said housing and coupled to said signaling means and operative in response to said control signal for causing said signaling means to be energized for a predetermined period of time to provide said predetermined recognizable signal.

4,903,244

MULTISOURCE MULTIRECEIVER METHOD AND SYSTEM FOR GEOPHYSICAL EXPLORATION

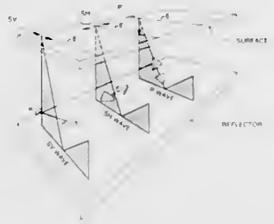
Richard M. Alford, Broken Arrow, Okla., assignor to Standard Oil Company (now Amoco Corporation), Chicago, Ill.

Continuation of Ser. No. 633,160, Jul. 20, 1984, Pat. No. 4,803,666. This application Jun. 10, 1988, Ser. No. 206,053

The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.

Int. Cl.[4] G01V *1/30*

U.S. Cl. 367—36 **36 Claims**



1. A method for geophysical exploration of the earth's subterranean formations comprising the steps of:

(a) imparting seismic energy into the earth's subterranean formations; and

(b) recording a concord of seismic signals representative of the earth's response to the imparted seismic energy.

4,903,245

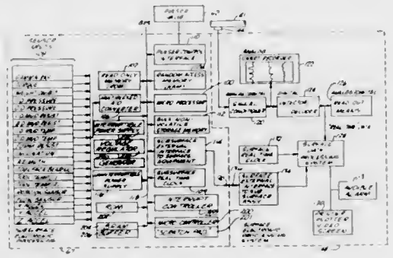
DOWNHOLE VIBRATION MONITORING OF A DRILLSTRING

David A. Close, Houston; Steven C. Owens, Katy, and Trevor K. C. Pugh, Houston, all of Tex., assignors to Exploration Logging, Inc., Sacramento, Calif.

Filed Mar. 11, 1988, Ser. No. 166,897

Int. Cl.[4] G01V *1/40*

U.S. Cl. 367—81 **12 Claims**



11. Apparatus for monitoring vibration of a bottom hole assembly secured to the lower end of a drillstring used to drill a well, the apparatus comprising:

at least one accelerometer mounted in the bottom hole assembly to generate data in the form of electrical signals corresponding to the acceleration experienced by the bottom hole assembly;

a computer mounted in the assembly and programmed to collect data from the accelerometer and compute magnitude of the assembly acceleration;

means downhole for processing selected data in accordance with any or all of the following algorithms:

$$\Sigma \frac{|A_i - A|}{n} \quad (1)$$

$$\Sigma \left[\frac{|A_i - A|^2}{n} \right]^{\frac{1}{2}} \quad (2)$$

$$\Sigma \left[\frac{|A_i - A|^3}{n} \right]^{\frac{1}{3}} \quad (3)$$

where A is the instantaneous value of acceleration for n, data points having a mean value of $\bar{A}$, and means for selecting from the collected data a value which exceeds a present level.

4,903,246

MINEHUNTING SYSTEMS

Leonard B. Jarman, Dorset, England, assignor to Plessey Overseas Limited, Ilford, England

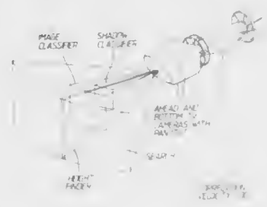
Filed Sep. 15, 1988, Ser. No. 244,420

Claims priority, application United Kingdom, Mar. 15, 1988, 8806077

Int. Cl.[4] G01S *15/00*

U.S. Cl. 367—99 **4 Claims**

1. A minehunting system for a vessel, comprising a remotely operated vehicle controllably driven forwardly of said vessel, the remotely operated vehicle being equipped with sonar transmission and reception means for detecting, classifying and disposing of a mine, said sonar means including a dual field of



view reflector, a height finding element and a dual frequency classifier.

4,903,247

DIGITAL ECHO CANCELLER

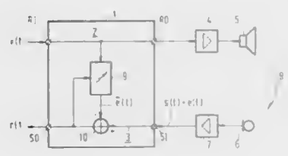
Petrus J. Van Gerwen; Franciscus A. M. van de Laar, and Hendrik J. Kotmans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 57,561, Jun. 3, 1987, Pat. No. 4,807,173. This application Jun. 23, 1988, Ser. No. 210,268

Claims priority, application Netherlands, Jul. 10, 1987, 8701633

Int. Cl.[4] H04B *1/06, 3/23*

U.S. Cl. 367—135 **7 Claims**



1. A digital echo canceller with a receive path between a receive input and receive output, and a send path between a send input and a send output, said echo canceller being used for cancelling an additive echo signal at the send input which has occurred in response to a receive input signal applied to the receive input, said echo canceller comprising:

a filter combination comprising

a first digital filter with a programmable filter coefficient memory for generating in response to the receive input signal a first replica signal which is an estimate of the echo signal, and

a second, adaptive digital filter with a filter coefficient memory for generating in response to the receive input signal a second replica signal which is an estimate of the echo signal, the second digital filter further including means for forming an error signal that is representative of the difference between a signal applied to the send input and the second replica signal, and an adaptation processor for adaptively modifying filter coefficients in response to the receive input signal and the error signal and applying the modified filter coefficients to the filter coefficient memory of this second digital filter;

means for forming a send output signal as the difference between the signal applied to the send input and the first replica signal;

controllable gate means for selectively applying the modified filter coefficients to the programmable filter coefficient memory of the first digital filter; and

control means for blockwise respectively determining the levels of the error signal and the send output signal, and for generating in response to the levels thus found a control signal for the gate means which depends in a predetermined manner on differences between said levels;

characterized in that:

in the said filter combination the second digital filter is a frequency-domain block-adaptive filter having a block length of N′ components and having, for each signal block m, a number of N′ frequency-domain filter coefficients W(p;m) with p=0,1,2, . . . ,N′−1, and the first digital filter is a time-domain programmable digital filter having a number of N time-domain filter coefficients w(i;m) with i=0,1,2, . . . ,N−1, with N′ exceeding N; and

the echo canceller further includes transforming means, cascaded with the gate means, for forming the N time-domain filter coefficients w(i;m) required in the first digital filter as components of an N′-point Discrete Orthogonal Transform of a block of N′ frequency-domain filter coefficients W(p;m).

4,903,248

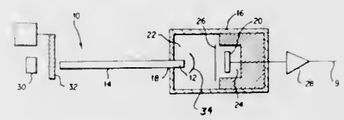
PHOTO-ACOUSTIC DETECTOR

Glenn H. Fertig, Natrona Heights, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Division of Ser. No. 165,750, Mar. 9, 1988, Pat. No. 4,866,681. This application Oct. 13, 1988, Ser. No. 256,974

Int. Cl.[4] H04R *23/00*

U.S. Cl. 367—140 **3 Claims**



1. A photo-acoustic apparatus for detecting energy that exits from an end of an optical waveguide device comprising:

a housing having an opening through which the end of the optical waveguide device is inserted into the housing;

a solid absorber disposed in a first chamber of the housing such that it receives the energy which exits the end of the optical waveguide device and is heated corresponding to the energy which exits the end of the optical waveguide;

a gas which fills the housing and which is not capable of absorbing the energy which exits the end of the optical waveguide but which is capable of being heated by the solid absorber such that the pressure of the gas increases;

a capacitor microphone disposed in a second chamber of said housing which is capable of sensing the pressure in the gas and producing an electrical signal proportional to the energy which exits the optical waveguide device; and

a highly reflective shield disposed between the first chamber and the second chamber such that it permits gas communication therebetween but reflects light onto the solid absorber and reduces black body absorption by the capacitor microphone.

4,903,249

RIGID FORAMINOUS MICROPHONE PROBE FOR ACOUSTIC MEASUREMENT IN TURBULENT FLOW

Richard H. Hoops, Stoughton; Larry J. Eriksson, Madison, and Mark C. Allie, Oregon, all of Wis., assignors to Nelson Industries, Stoughton, Wis.

Filed Mar. 24, 1988, Ser. No. 173,111

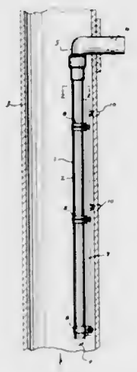
Int. Cl.[4] H04R *23/00*

U.S. Cl. 367—140 **14 Claims**

1. A microphone probe for acoustical measurement in turbulent flow, comprising a tube to be disposed in a sound field and having a closed end facing a source of sound energy, a micro-

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phone disposed in said tube downstream in the direction of sound propagation of said closed end, at least a portion of the length of said tube being composed of a rigid foraminous material containing a multiplicity of interconnected cells.



4,903,250

WRIST WATCH WITH MEMO CASE

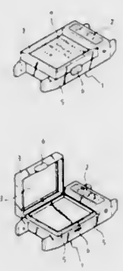
Kang-Rai Cho, 207-305 Garak-Samik Mansion, 395 Pangi-dong, Songpa-ku, Seoul, Rep. of Korea

Filed Jul. 29, 1988, Ser. No. 204,305

Claims priority, application Rep. of Korea, Jun. 16, 1987, 9552/1987

Int. Cl.[4] G04B *45/00*

U.S. Cl. 368—41 **3 Claims**



1. In combination a wrist watch including a time means for measuring and displaying time, and a memo case, said memo case comprising:

a plate member integrally provided adjacent to said time means;

a boundary protrusion formed along the peripheral edge of said plate member and adapted to receive a pad of paper sheets retained within said boundary protrusion;

a lid attached to said plate member by a hinged joint adapted to be hingedly moved between an open position to permit insertion and removal of said paper sheets and a close position to retain said paper sheets within said boundary protrusion, said lid having an opening thereon sufficient to permit said paper to be seen when said lid is in the closed position; and

fastening means on said lid and adapted to releasably fasten said lid in a closed position in engagement with said boundary protrusion.

4,903,251

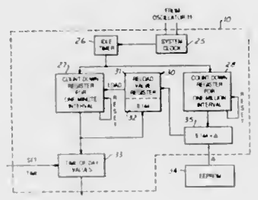
ACCURACY ADJUSTMENT FOR TIME-OF-DAY CLOCK USING A MICROCONTROLLER

Max C. Chapman, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 5, 1989, Ser. No. 402,726

Int. Cl.[4] G04C *13/08;* **G04B** *17/12*

U.S. Cl. 368—156 **11 Claims**



1. Apparatus comprising:

idle timer means for generating interrupts separated by a fixed time period which differs from an ideal time period by an error;

first counting means having a first register and coupled to said idle timer means for counting said interrupts and for generating an increment signal when a number of interrupts have occurred equal to a load value loaded into said first register;

reload means for storing a reload value and for (1) transferring said reload value to said first register as said load value upon the occurrence of said increment signal and 2) then resetting said reload value to a predetermined value;

second counting means coupled to said idle timer means and to said reload means for counting said interrupts and for transferring an accumulated error value to said reload means as said reload value when a number of interrupts have occurred equal to a large count number relatively greater than said predetermined value; and

time means coupled to said first counting means and receiving said increment signal for keeping track of time-of-day.

4,903,252

DISC FILE APPARATUS

Katsufusa Tanaka; Takeo Motoyoshi; Tohru Yamashita; Naoyuki Nakatsukasa, and Takaharu Takematsu, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,272

Claims priority, application Japan, Feb. 27, 1987, 62-27329[U]; Apr. 7, 1987, 62-86111; Apr. 28, 1987, 62-105864; May 7, 1987, 62-112825; Jun. 26, 1987, 62-157821; Jun. 26, 1987, 62-157821; Aug. 6, 1987, 62-198473; Aug. 6, 1987, 62-198472; Sep. 24, 1987, 62-147138[U]

Int. Cl.[4] G11B *5/78, 17/00*

U.S. Cl. 369—36 **12 Claims**

1. A disc file apparatus comprising:

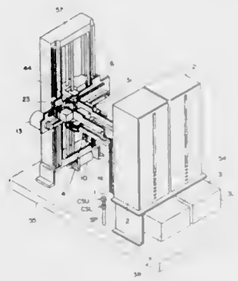
at least one stocker for housing, in juxtaposition with one another, a plurality of cartridges each housing therein an information storage medium and each having two lateral sides having recessed engaging portions, respectively;

at least one recording and reproducing system disposed in such a manner that a first direction of taking and housing said cartridge out of and into said stocker is parallel to the direction of inserting and discharging said cartridge into and from said recording and reproducing system;

a carriage guided along rails extending in a second direction in which said cartridges are juxtaposed in said stocker; and

pick-up and discharge means, supported by said carriage and including a cartridge holder to hold said cartridge, for moving said cartridge holder in the first direction so as to pick-up said cartridge from said stocker, for inserting said cartridge into an insertion/discharge port of said recording and reproducing system, for removing said cartridge when discharged from said recording and reproducing system, for housing said cartridge into said stocker at a predetermined position therein, and for turning over said cartridge;

said cartridge holder being substantially C-shaped with one end being open and another end being closed, said open end being opposable to a front surface of a cartridge housed in said stocker to receive a middle portion of said cartridge excluding the lateral side portions thereof, said closed end being supported by said carriage so as to be rotatable around an axis parallel to the first direction to turn over said cartridge;



a moving member provided on said pick-up and discharge means and movable in parallel to the first direction between said open end and said closed end of said cartridge holder; and

a clamping mechanism mounted on said moving member and engageable with said recessed engaging portions of said cartridge, thereby clamping said cartridge.

4,903,253

MEANS FOR ATTACHING A BAND TO A WATCH CASE

Francois Niklès, Cressier; Gaston Gagnebin, and Marco Bettelini, both of Bienne, all of Switzerland, assignors to ETA SA Fabriques d'Ebauches, Granges, Switzerland

Continuation of Ser. No. 100,858, Sep. 25, 1987, abandoned. This application Feb. 3, 1989, Ser. No. 306,219

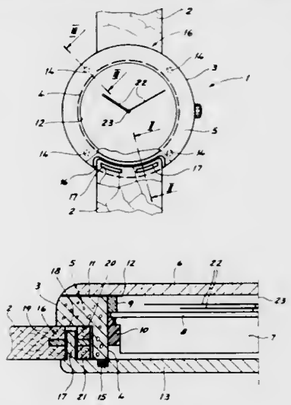
Claims priority, application Switzerland, Oct. 22, 1986, **04200/86**

Int. Cl.[4] G04B *37/00;* **A44C** *5/14*

U.S. Cl. 368—282 **18 Claims**

1. A watch case comprising a crystal (6), a single piece watch frame (5) having an inner periphery surrounding and laterally confining a watch movement (7) equipped with hands (22), said frame having an outer periphery spaced from and extending parallel to said inner periphery and defined by a side (3) having no projections extending outwardly of said outer periphery in the plane of said frame and a base (13) fastened removably to the frame, with the bottom edge of said frame having two diametrically opposed undercuts (16) extending from said outer periphery toward said inner periphery by a distance less than the space between said inner and outer peripheries and shaped to accommodate one end (2) of a band, the shape of each said undercut being essentially the same as the shape of the band inserted therein, and said base being shaped to cover said undercuts when the case is closed, said watch case further comprising:

at least one projection (17, 30) integral with the base and



extending into each undercut and passing through a matching opening (18, 32) fashioned in the band end so as to fasten said end to the watch case when the base is applied to the underside of the frame.

4,903,254

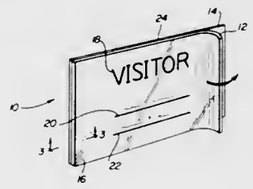
TIME INDICATOR ENHANCEMENT METHOD

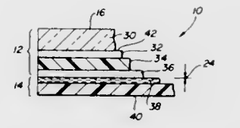
David J. Haas, P.O. Box 659, Spring Valley, N.Y. 10977-0659

Filed Aug. 31, 1989, Ser. No. 401,080

Int. Cl.[4] G04B *17/00;* **G01N** *31/32*

U.S. Cl. 368—327 **15 Claims**





15. A time indicator subassembly comprising:

a transparent front support layer with a front print display surface;

an ink display layer with a front ink display surface overlaying said support layer;

an optical barrier layer overlaying said display layer; and

an adhesive and ink dissolver overlaying said barrier layer.

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4,903,255

OPTICAL RECORDING DISC

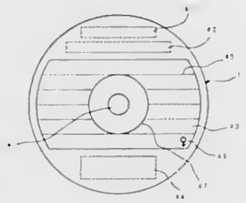
Syoji Sugaya, Nishinomiya; Toshihiro Rokujo, Hashima, and Hisayoshi Asahino, Ampachi, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Aug. 10, 1987, Ser. No. 84,032

Claims priority, application Japan, Mar. 31, 1987, 62-48241[U]

Int. Cl.⁴ G11B *7/26*

U.S. Cl. 369—284 **20 Claims**



1. An optical recording disc including a light transmissible substrate having on one side thereof a recording surface for recording audio, visual and/or literal information, and a protective layer on said recording surface, the recorded information being read out by irradiating a light on a side of said substrate opposite said recording surface, said optical recording disc comprising means defining a write-in-region provided on said protective layer, said write-in-region including a roughened surface for having entered thereon a note or the like by conventional writing means, said write-in region being in overlying relationship to said recording surface.

4,903,256

CARD INCLUDING ROTATORY SYSTEM OPTICAL RECORDING MEDIUM

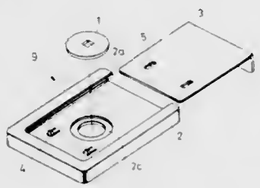
Takashi Nakahara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1987, Ser. No. 110,282

Claims priority, application Japan, Oct. 23, 1986, 61-250702; Mar. 18, 1987, 62-061329

Int. Cl.⁴ G11B *25/04*

U.S. Cl. 369—291 **9 Claims**



1. A card including a rotatory system optical recording medium, comprising a rotatory optical recording medium, a case body having a holding space which releasably holds said optical recording medium, and a protective cover which protects the surface of said optical recording medium when said optical recording medium is held on said case body, said case body including opening means for the opening protective cover from a first position in which it protects the surface of the optical recording medium to a retracted position in which an opening portion is formed, said optical recording medium being releasable from and returnable to the case body through the opening portion, wherein said opening means comprises a guide groove in which said protective cover can freely slide.

4,903,257

DIGITAL TWO-WAY RADIO-COMMUNICATION SYSTEM USING SINGLE FREQUENCY

Yukio Takeda, Zama; Takeshi Takano, Ushiku; Yoshiaki Kaneko, Yokohama; Akihiko Kimura, and Takaharu Nakamura, both of Urawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 27, 1988, Ser. No. 199,703

Claims priority, application Japan, May 27, 1987, 62-130860; Aug. 31, 1987, 62-217394

Int. Cl.⁴ H04B *1/56*; H04L *5/14*

U.S. Cl. 370—29 **9 Claims**



1. A digital two-way radio communication system comprising:

a first radio station including:

a first antenna;

first data transmission means;

first data reception means including a first clock reproduction circuit for supplying a first clock for recovering a first reception signal, said first clock being generated by a first local clock generator when said first radio station initiates a data transmission;

first switching means provided between said first antenna, said first data reception means and said first data transmission means to form one of a first transmission path between said first data transmission means and said first antenna and a first reception path between said first antenna and said first data reception means;

first voice signal generation means, operatively connected to said first data transmission means, for supplying a first voice signal to said first data transmission means;

first voice signal reproduction means, operatively connected to said first data reception means, for reproducing a second voice signal;

first speed converter means, operatively connected between said first voice signal generation means and said first data transmission means, for receiving said first voice signal, converting said first voice signal into a digital signal, and raising the bit rate of said first voice digital signal from said first data transmission means by at least two times; and

second speed converter means, operatively connected between said first data reception means and said first voice signal reproduction means, for lowering the bit rate of said first voice digital signal from said first data reception means by at least half speed;

a second radio station including:

a second antenna;

second data transmission means;

second data reception means, including a second clock reproduction circuit for supplying a second clock for recovering the reception signal, said second clock being reproduced from said second data reception means output when said first radio station initiates a data transmission and generated by a second local clock generator when said second radio station initiates a data transmission;

third speed converter means, operatively connected between said second voice signal generation means and said second data transmission means, for receiving said second voice signal, converting said second voice signal into a digital signal and for raising the bit rate of said second voice digital signal from said second data transmission means by at least two times;

fourth speed converter means, operatively connected between said second data reception means and said second voice signal reproduction means, for lowering the bit rate of said second voice digital signal from said second data reception means by at least half speed;

second switching means provided between said second antenna, said second data reception means and said second data transmission means to form one of a second transmission path between said second data transmission means and said second antenna, and a second reception path between said second antenna and said second data reception means,

said first and second radio stations being radio-connected by passing a single frequency through said first and second antennas,

when said first data transmission means transmits data to said second radio station through said first antenna, said first switching means forming said first transmission path, and said second switching means forming said second reception path, and

when said second data transmission means transmits data to said first radio station through said second antenna, said second switching means forming said second transmission path, and said first switching means forming said first reception path;

second voice signal generation means, operatively connected to said second data transmission means, for supplying said second voice signal to said second data transmission means; and

second voice signal reproduction means, operatively connected to said second data reception means, for reproducing said first voice signal from said first radio station;

said first and second voice signal generation means each comprising:

a microphone; and

a voice coder connected to said microphone; and

said first and second voice signal reproduction means each comprising:

a voice decoder; and

a speaker connected to said voice decoder.

4,903,258

MODULARLY STRUCTURED DIGITAL COMMUNICATIONS SYSTEM

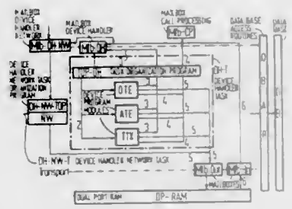
Klaus Kuhlmann, Auenstr. 102, 8000 Muenchen 5, Fed. Rep. of Germany; John Muyssen, Draaitopstr. 61, B09050 Euergem, Belgium, and Manfred Sonnemann, Greppenstr. 83, 8031 Alling, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 233,801

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727952; Jun. 13, 1988, 3820072

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—58.2 **25 Claims**



1. A modularly structured digital communications system for connecting terminal equipment having versatile performance features to one another and to public networks, comprising:

a central communication computer having a system data base and at least one multi-tasking operating system,

for the administration of a line technology task having device program modules hierarchically subordinated to a line technology task organization program exercising distributor functions as a logical network node, said device program modules, controlling a signalling procedure and a user interface of the terminal equipment associated with types of terminal equipment, the system data base being individually accessible to said device program modules via defined data base access rountines, and said device program modules having a pre-processing program level that evaluates signals output by the terminal equipment according to individual line criteria and converts logical messages of the communication computer into setting data for the terminal equipment and having an interpretation program level that converts signals output by the terminal equipment into logical messages by means of system-associated parameters, and

for the administration of a switching technology task having switching procedure program modules hierarchically subordinated to a switching technology task organization program exercising distributor functions as a logical network node, the system data base being individually accessible to said switching procedure program modules via said defined data base access rountines, and said switching procedure program modules being structured such independently of the class of terminal equipment and independently of the communications services by forming logical sub-processes of the overall switching process such that, in addition to forming at least one connection handler program module for the control of the set up and clear down of connections, further performance feature program modules for the activation and de-activation of corresponding control procedures are formed, whereby

the line technology task has an input and output memory administered by the line technology task organization program and operated mailbox-like allocated to it and the switching technology task has an input and output memory administered by the switching technology task organization program and operated mailbox-like allocated to it;

the multi-tasking operating system forming and administering a program bus structure having a transmission protocol defined with universal validity independently of the communications services and independently of the types of terminal equipment for the messages communicated thereover as a logical network node for the intercommunication of the connection handler program modules and at least a part of the performance feature program modules via the input and output memories of the switching technology task and of the line technology task.

4,903,259

TIME-DIVISION MULTIPLEX SWITCHING NETWORK

Shin-Ichiro Hayano, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 21, 1988, Ser. No. 222,259

Claims priority, application Japan, Jul. 24, 1987, 62-183508; Jul. 24, 1987, 62-183509; Jul. 24, 1987, 62-183510

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—58.3 **7 Claims**

1. A time-division switching network, comprising:

a plurality of switch groups connected to each other through a plurality of intergroup buses;

each of said switch groups comprising a respective plurality of interconnected basic switches;

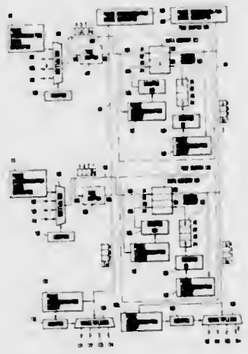
each of said plurality of basic switches including a plurality of time switches, a plurality of input buses and a plurality of output buses; each of said plurality of input buses being connected to each of said plurality of output buses by a

respective one of said plurality of time switches; and a plurality of circuit means respectively connected to each of said input and output buses for providing frame synchronization data to a time-division multiplexed signal on each of said input and output buses; selected ones of said input and output buses constituting said intergroup buses;

each of said time switches including:

a data memory having a data input which is connected to the input bus and a data output which is connected to the output bus;

data-writing means connected to the input bus for detecting a frame phase in accordance with the frame synchroniza-



tion data provided to the time-division multiplexed signal on the input bus, for aligning the detected frame phase with a frame phase of first control data, and for writing a data signal from the input bus at an address of said data memory indicated by the first control data; and

data-read-out means connected to the output bus for detecting a frame phase in accordance with the frame synchronization data provided to the time-division multiplexed signal on the output bus, for aligning the detected frame phase with a frame phase of second control data, for reading out the data signal from an address of said data memory indicated by the second control data and for outputting the readout data onto the output bus.

4,903,260

DIGITAL CIRCUIT-SWITCHING AND PACKET-SWITCHING NETWORK AND SWITCHING FACILITY THEREFOR

Helmuth Preissch, Murr, and Karl Schrodi, Heimsheim, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Jan. 28, 1988, Ser. No. 149,664

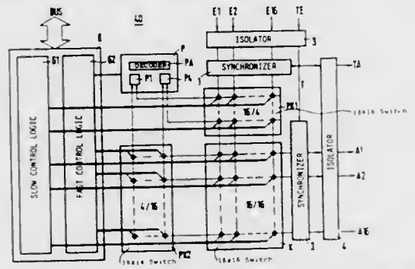
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702614

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—60 **8 Claims**

1. In a digital switching network having a plurality of inlets and outlets and a plurality of switching facilities each having a plurality of inputs and outputs through which possible paths for circuit-switched connections can be set up, each such possible path extending from a respective network inlet through at least one respective switching facility via an associated input and an associated output to a respective network outlet, with two of said possible paths for circuit-switched connections converging or diverging at a common said switching facility in which said two possible paths converge from a first pair of inputs of said common switching facility into a first single output of said common switching facility or in which said two possible paths diverge from a single input of said common switching facility into a pair of outputs of said common switching facility, the improvement comprising:

packet switching setup means for designating on demand both of said two possible paths for circuit-switched connections as two respective preset packet switched paths that are temporarily simultaneously available on demand for packet-switched messages each comprising one or



more data packets identified with one or the other of said respective preset paths, and

packet switching means associated with at least said common switching facility for switching data packets identified with each of said two preset paths from the respective switching facility input associated with said each path to the respective switching facility output associated with said each path.

4,903,261

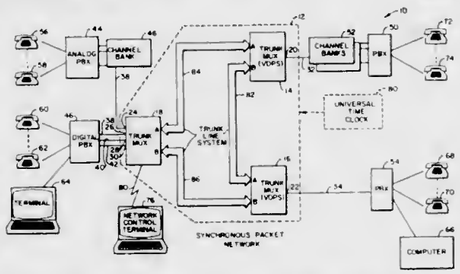
SYNCHRONOUS PACKET VOICE/DATA COMMUNICATION SYSTEM

Paul Baran, Menlo Park; Charles M. Corbalis, San Jose; Brian D. Holden, Half Moon Bay; Jon K. Masatsugu; Lewis J. Marggraff, both of Mountain View; David P. Owen, Palo Alto, and Peter W. J. Stonebridge, San Jose, all of Calif., assignors to Stratacom, Inc., Campbell, Calif.

Continuation of Ser. No. 665,819, Oct. 29, 1984, Pat. No. 4,771,825. This application Mar. 9, 1988, Ser. No. 165,867

Int. Cl.⁴ H04J *3/24*

U.S. Cl. 370—94.2 **21 Claims**



1. A communications network for communicating digitized voice and data in separate and distinct packets, said network comprising:

a digital communications medium having at least a first node and a second node, said digital communications medium being operative to communicate standardized bit synchronous digital time frames of information according to a standardized bit synchronous communications format having a predetermined bit synchronous framing structure; and

means for coupling digital signals bit synchronously to said digital communications medium at said first node, said coupling means including means for packetizing signals into digitized information packets, each said digitized

information packet having a packet format which is self contained as to destination and content and which conforms bit synchronously to said bit synchronous communications format and to boundaries of said standardized bit synchronous digital time frames such that packets are communicated from said first node to said second node bit synchronously with reference to said communications medium within said standardized bit synchronous communications format such that an additional framing structure is not needed.

4,903,262

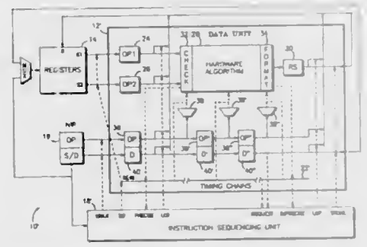
HARDWARE INTERFACE AND PROTOCOL FOR A MOBILE RADIO TRANSCEIVER

Marc A. Dissosway, Forest, and Jeffrey S. Childress, Lynchburg, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Aug. 14, 1987, Ser. No. 85,490

Int. Cl.⁴ H04J *3/16*; G05B *23/02*

U.S. Cl. 370—95.2 **21 Claims**



1. In a digital mobile radio transceiver including radio frequency circuit means for transmitting and receiving radio frequency signals, and a digital signal processor connected to control said radio frequency circuit means, a method of communicating signals between a peripheral device and said digital signal processor over a serial data bus having first and second data lines and a service request line, said method comprising the steps of:

(1) seizing control of said service request line with said peripheral device;

(2) receiving, with said peripheral device, a poll message passed over said first data line in response to seizure of said service request line;

(3) applying, with said peripheral device, a preset identification code to said second data line in response to receipt of said poll message;

(4) receiving, with said peripheral device a further poll message passed over said first data line in response to application of said identification code to said second line, said further poll message including said preset identification code;

(5) applying, with said peripheral device, a data and/or command message to said second data line in response to receipt of said further poll message; and

(6) releasing said service request line.

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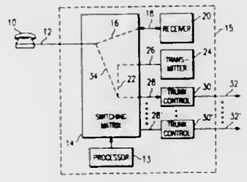
APPARATUS AND METHOD FOR PROVIDING EXISTING TELEPHONE SWITCHING EQUIPMENT WITH INTEGRATED SERVICES DIGITAL NETWORK CAPABILITY

Rajendra Patel, Richardson, and Girish Patel, both of Plano, Tex., assignors to Network Access Corporation, Richardson, Tex.

Filed Oct. 3, 1988, Ser. No. 252,539

Int. Cl.⁴ H04J *3/02*; H04Q *11/04*

U.S. Cl. 370—110.1 **7 Claims**



1. Apparatus for upgrading existing telephone switching equipment for connecting a calling subscriber to a remote receiving subscriber through a switching system having a switching matrix, SS7 trunk circuits and non-SS7 trunk circuits, with the capability of controlling the connection, management and disconnection of incoming and outgoing calls to or from ISDN terminals using an ISDN protocol comprising:

a line-side interface coupled between a plurality of subscriber ISDN terminals and the switching system for detecting a status condition of any ISDN terminal, generating a signal identifying the subscriber port for a specific terminal, and coupling said port-identifying signal to the switching system;

a receiver module coupled to the switching system for receiving the port-identifying signal, and the corresponding dialed called number from the line-side interface, generating a first signal identifying the specific call and the type of trunk circuit required as SS7 or non-SS7, and generating a second signal representing the called number associated with the specific call, said first signal being coupled to said switching matrix for routing the calling subscriber terminal to the identified trunk circuit;

a trunk circuit interface coupled to predetermined ones of said SS7 trunk circuits and to said switching system for receiving said first signal generated by the receiver module and generating a trunk circuit identification signal related to the specific call, said trunk circuit interface coupling the calling ISDN terminal to the selected SS7 trunk circuit in accordance with the first signal of said receiver module for transmission of a terminal message to the receiving terminal; and

processor means coupled to said line-side interface for receiving the signal representing the subscriber port associated with said specific call, and generating the calling number for said specific call and for receiving from the line-side interface the signal representing the called number associated with the specific call, said processor means also coupled to said receiver module and to said trunk circuit interface for receiving said trunk identification signal for said specific call and transmitting said calling number, said called number, and said trunk circuit identification signal on the SS7 link to the receiving terminal.

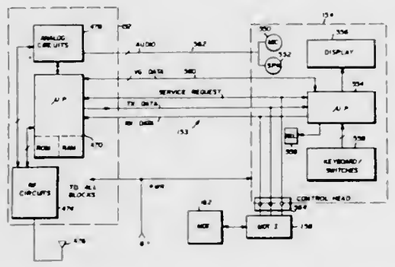
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4,903,264

METHOD AND APPARATUS FOR HANDLING OUT OF ORDER EXCEPTIONS IN A PIPELINED DATA UNIT

Yoav Talgam, Tel-Aviv, Israel; Mitch K. Alsup, Dripping Springs, and Marvin A. Denman, Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 18, 1988, Ser. No. 182,551
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—16.1 **13 Claims**



1. In a pipelined data unit for use in a data processor, the data unit comprising:
- an input stage for selectively receiving input operands from said data processor;
- an operation stage for performing a selected operation on said input operands to produce an output result; and
- an output stage for selectively providing said output result to said data processor;

the improvement comprising:
- precise exception detection means, in the input stage of the data unit, for performing a predetermined input operand test on said input operands, and selectively providing a precise exception signal to said data processor if any of said input operands fails said input operand test; and
- imprecise exception detection means, in the output stage of the data unit, for performing a predetermined output result test on said output result, and selectively providing an imprecise exception signal to said data processor if said output result fails said output result test.

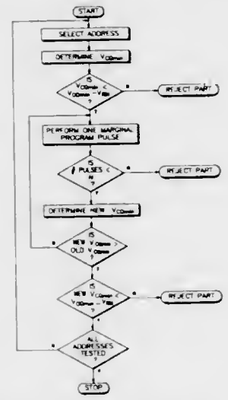
4,903,265

METHOD AND APPARATUS FOR POST-PACKAGING TESTING OF ONE-TIME PROGRAMMABLE MEMORIES

Paul D. Shannon, Austin, Tex.; Hiroyuki Oka, Tokyo, Japan; Paul E. Grimme, Dripping Springs, and Robert W. Sparks, Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 119,528, Nov. 27, 1987, Pat. No. 4,809,231. This application Nov. 28, 1988, Ser. No. 276,990
Int. Cl.[4] G01R *31/28*; G11C *29/00*
U.S. Cl. 371—21.4 **9 Claims**

1. A method of post-packaging testing of one-time programmable memories comprising the steps of:
- determining a post-packaging threshold voltage of a cell of said memory;
- rejecting said memory if said post-packaging threshold voltage is above a minimum rated supply voltage;
- applying a programming voltage to said cell for a predetermined time;
- determining a new threshold voltage of said cell;
- determining whether said new threshold voltage is above said post-packaging threshold voltage;
- rejecting said memory if said new threshold voltage is above said minimum rated supply voltage; and



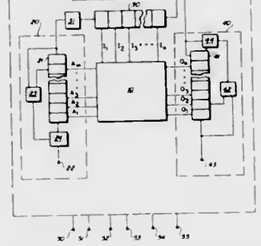
- accepting said memory if said new threshold voltage is above said post-packaging threshold voltage.

4,903,266

MEMORY SELF-TEST

George E. Hack, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1988, Ser. No. 187,708
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—21.2 **10 Claims**



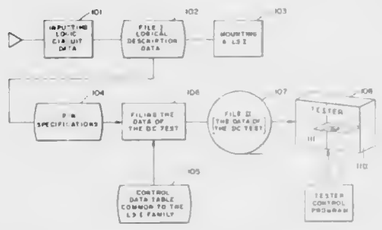
5. A system for memory self-test comprising:
- a memory array having address lines, input lines, and output lines;
- a multiple input signature register connected to the output lines of the memory array;
- a random pattern generator based upon a primitive polynomial and connected to the address lines and input lines of the memory array, the random pattern generator having at least one stage in addition to the number of address lines; and
- a switchable inverter connected between the random pattern generator and the input lines of the memory array.

4,903,267

METHOD OF GENERATING TEST DATA

Kiyokazu Arai, and Syun Ishiyama, both of Kanagawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1987, Ser. No. 126,834
Claims priority, application Japan, Dec. 1, 1986, 61-286290
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—27 **16 Claims**



1. A method of generating operating test data for an integrated circuit having a plurality of signal pins having functions of input, output or input/output, a plurality of control pins for inputting an external test control signal, and means responsive to the external control signal for selectively setting each signal pin in a desired state, the method being applied to a test device having a first memory, a second memory, and a file, the method comprising the steps of:
- storing first data in the first memory, the first data being representative of the specific function of each individual signal pin;
- storing second data in the second memory, the second data being representative of a plurality of pin states corresponding to a plurality of signal states of the external test control signal, each pin state being predetermined in accordance with its pin function;
- reading the first and second data from the first and second memory;
- selectively communicating said external test control signal to the integrated circuit to be tested;
- generating third data representative of each pin state of signal pins of the integrated circuit to be tested corresponding to each signal state of the external test control signal; and
- storing the third data into a file as test data.

4,903,268

SEMICONDUCTOR MEMORY DEVICE HAVING ON-CHIP ERROR CHECK AND CORRECTION FUNCTIONS

Hideto Hidaka; Kazuyasu Fujishima; Masaki Kumanoya; Hideshi Miyatake; Katsumi Dosaka, and Tsutomu Yoshihara, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

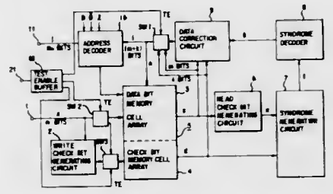
Continuation-in-part of Ser. No. 911,433, Sep. 25, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 161,890
Claims priority, application Japan, Sep. 26, 1985, 60-215472
Int. Cl.[4] G06F *11/10*; G01R *31/28*
U.S. Cl. 371—40.1 **7 Claims**

1. A semiconductor memory device having on-chip error checking and correcting functions comprising:
- a plurality of memory cell arrays, said arrays including a data bit memory cell array for storing data words of m bits each and a check bit memory cell array for storing data including error correction codes having k check bits each;

error checking and correcting means including
- (a) error code generation means for receiving input data words and, in response, generating said error correction codes,
- (b) error code writing means for storing said error codes in said check bit memory cell array, and
- (c) data correction means for reading said data words stored in said data bit memory cell array and said error codes stored in said check bit array and, in response thereto, supplying a corrected data word output;

clock input means for receiving a switching control signal;

means for disabling said on-chip error checking and correcting means in response to an external test mode enable control signal (TE);



data writing means for writing data into said memory cell arrays; and

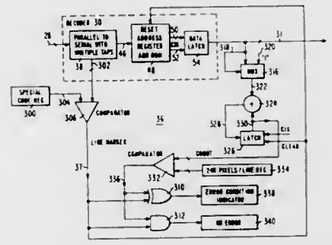
data reading means for supplying data words from said data correction means and from said check bit memory cell array, said data reading means including a single data output terminal and switching mans responsive to said switching control signal for alternatingly accessing said check bit memory cell array and said data bit memory cell array through said error checking and correction means for successively outputting check bits and data bits from said single data output terminal in an interleaved manner.

4,903,269

ERROR DETECTOR FOR ENCODED DIGITAL SIGNALS

Nicola J. Fedele, Kingston, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed May 16, 1988, Ser. No. 194,657
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—57.2 **13 Claims**



10. An error detector for determining loss of transmission of one or more encoded pixels in a digital video signal in a communication system, said signal comprising n pixels per scan line, said detector comprising:
- means for inserting a marker codeword in said signal to mark the beginning of each scan line;
- means for transmitting said signal including said marker codeword to a receiver;
- receiver means for detecting each said received marker codeword and for generating a marker signal in response to said detecting;
- means for counting the number of received pixels subsequent to each received marker and for generating a count signal manifesting the pixel count;

means for comparing said marker signal with said count signal to generate a first signal when the count is n and a second signal when the count is less than n; and

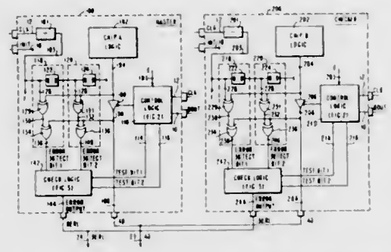
means responsive to said marker, first and second signals for generating an error indicating condition when only one of said marker and first signals are present.

4,903,270

APPARATUS FOR SELF CHECKING OF FUNCTIONAL REDUNDANCY CHECK (FRC) LOGIC

David B. Johnson; Mark S. Myers, both of Portland, and Eileen Riggs, Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 14, 1988, Ser. No. 206,418
Int. Cl.[4] G06F *11/16*
U.S. Cl. 371—68.1 4 Claims



1. In an integrated circuit module (200) in which an error detection circuit (236) compares data (204) generated internally on said module (200) with data (108) generated externally from another substantially identical module (100) to thereby assert an error detect output (240) upon the condition that said data (204) generated internally on said module (200) and said data (108) generated externally from said other module (100) do not match, the improvement comprising:

means (220) for altering said internally generated data (204) by injecting erroneous data into said internally generated data (204) to thereby generate altered data (232);

said means (220) for altering said internally generated data (204) including first means (224) for digitally storing data, said data being shifted upon application of a clock pulse, said first means being driven by a clock pulse source (201), said second means (231) for combining the output (228) of said first means (224) and said data (204);

error anticipation means (210) for generating a test condition (216), which test condition corresponds to an expected error condition caused by said altered data (232) at the error detect output (240) of said error detection circuit (236);

said error anticipation means (210) being a circuit (56) with two stable states that can be changed from one state to the other, said circuit being driven alternately between said one state and said other state by said clock pulse source (201); and,

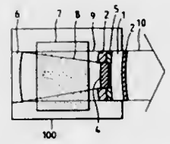
comparison means (242) for comparing said actual error detect output (240) with said expected error detect output (216).

4,903,271

LASER APPARATUS

Koji Yasui; Masaaki Tanaka; Shigenori Yagi; Masaki Kuzumoto; Yasuhito Myoi, and Kazuki Kuba, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,999
Claims priority, application Japan, Jun. 3, 1987, 62-139438; Jul. 22, 1987, 62-181186; Jul. 24, 1987, 62-183678; Nov. 27, 1987, 62-299369; Dec. 10, 1987, 62-312523; Dec. 10, 1987, 62-312524; Dec. 11, 1987, 62-313314; Feb. 16, 1988, 63-31896; Feb. 16, 1988, 63-31895
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—9 17 Claims



1. A laser apparatus, comprising: a laser medium; a resonator including a fully reflective mirror and a partially reflective mirror, said laser medium being arranged between said fully reflective mirror and said partially reflective mirror; an exciting means for exciting said laser medium; and a phase regulator for regulating the phase of an output laser beam derived through said partially reflective mirror, wherein said phase regulator comprises a partially reflective portion formed on a center portion of a matrix of said partially reflective mirror and a lower reflective portion formed around said partially reflective portion and having a lower reflectivity than that of said partially reflective portion, a thickness of said lower reflective portion being different from a thickness of said partially reflective portion is as to control phase difference between laser beams passing through said partially reflective portion and said lower reflective portion

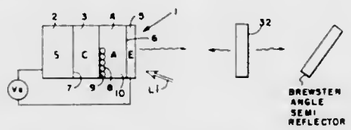
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4,903,272

LASER

Branimir Simic-Glavaski, Cleveland Heights, Ohio, assignor to Partnership of M. G.Simic, P. D. Junger, D. M. Doyle, S. T. Jaros and B. Simic-Glavaski, Cleveland, Ohio

Continuation of Ser. No. 773,411, Sep. 6, 1985, abandoned. This application Oct. 28, 1988, Ser. No. 266,216
Int. Cl.[4] H01S *3/30*
U.S. Cl. 372—3 21 Claims



1. A device capable of lasing in an optically resonant cavity, comprising an electrically conductive substrate, complex means for supporting plural energy states of electrons thereof, and lasing material means for lasing in response to at least one of optical pumping and electrical pumping to produce an electromagnetic radiation output, said complex means comprising a material having ground states able to provide transfer of electrons to an excited state which is higher than the excited state of said lasing material means and being operable to transfer such excited electrons to the excited state of said lasing material means therefor contributing to inverse population

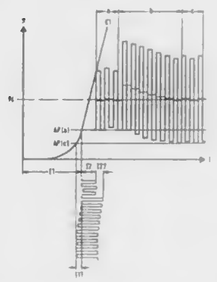
conditions in said lasing material means to effect lasing by said lasing material means.

4,903,273

LASER DIODE CONTROL METHOD AND CIRCUIT

Paul Bathe, Eckental, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Feb. 17, 1988, Ser. No. 157,447
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 3706572
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—38 16 Claims



1. A control method for a laser diode which comprises the steps of:

providing a bias current for the laser diode; and

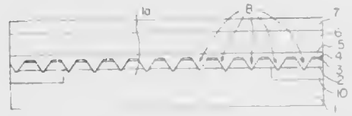
directly determining a presettable operating point for the laser diode having a characteristic curve with a linear portion by evaluating the slope of the characteristic curve and setting; the operating point at that point of the characteristic curve at which the slope is smaller than the slope in the linear portion of the characteristic curve.

4,903,274

SEMICONDUCTOR LASER ARRAY DEVICE

Mototaka Taneya, Tsukuba; Mitsuhiro Matsumoto, Nara; Sadayoshi Matsui, and Hiroyuki Hosoba, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 18, 1988, Ser. No. 195,742
Claims priority, application Japan, May 19, 1987, 62-121669; Jun. 9, 1987, 62-144522; Jun. 30, 1987, 62-164467
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—48 17 Claims



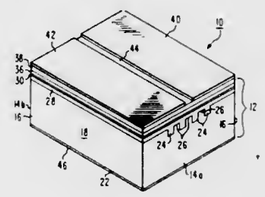
1. In a semiconductor laser array device comprising a substrate with a plurality of grooves some of which extend from facet to facet within a central area and an active layer disposed over said substrate, resulting in optical waveguides within said active layer corresponding to said grooves, the device wherein said grooves are disposed within the central area and outside the central area of said substrate, causing the surface of said active layer to be flat and uniform over the entire area thereof, and a means for preventing the injection of current into some of said grooves that are positioned outside of the central area of said substrate is disposed, said current injection prevention means extending from facet to facet, whereby no grooves positioned outside of the central area of said substrate contribute to laser oscillation and the other grooves positioned in the central area of said substrate constitute a laser array portion of said semiconductor laser array device.

4,903,275

PHASE MODULATION SEMICONDUCTOR LASER ARRAY

Michael Ettenberg, Freehold, and Donald B. Carlin, Robbinsville, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 20, 1989, Ser. No. 325,805
Int. Cl.[4] H01S *3/19, 3/13*
U.S. Cl. 372—50 11 Claims



1. A semiconductor laser array comprising;

a body of semiconductor material having first and second reflecting surfaces with at least said first reflecting surface being partially transparent at the laser wavelength so that light may be emitted therefrom; said body including:

a substrate with first and second opposed planar major surfaces;

a plurality of index guide means connected to the first major surface and extending between the reflecting surfaces;

a first cladding layer overlying the first major surface of the substrate and said index guide means;

a laser cavity region overlying the first cladding layer;

a second cladding layer overlying the laser cavity region; and

first and second electrical contacts coupled to the second cladding layer and the second major surface of the substrate respectively;

wherein each index guide means is spaced from adjacent guide means by a distance such that laser oscillations adjacent to said guide means are phase-locked to one another upon application of a given current to said contacts;

said first contacts including a plurality of spaced electrically isolated contacts extending parallel to said index guide means and adapted to selectively receive corresponding currents for selectively causing dephase modulation of said light emitted by said array.

4,903,276

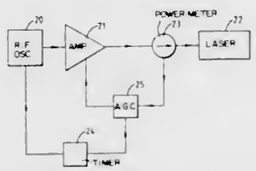
POWER SUPPLY FOR RADIO-FREQUENCY EXCITED GAS LASER

Iain E. Ross, Fife, Scotland, assignor to Ferranti, plc, Cheshire, England

Filed Apr. 29, 1988, Ser. No. 187,981
Claims priority, application United Kingdom, May 6, 1987, 8710644
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—82 7 Claims

1. A power supply for a radio-frequency excited laser of the type in which an electric discharge is produced in a gaseous lasing medium, which power supply includes a signal generator operable to generate a radio-frequency signal, amplifier means connected to receive and to amplify said signal and to

apply to the laser sufficient electrical power to initiate a gas discharge in the gaseous lasing medium, means for measuring the power applied to said laser and power control means operable initially to apply to the laser power at a first, higher value



and subsequently to reduce the power to a second, lower level and responsive to the output of the measuring means for adjusting the power supplied to the gas discharge after the initiation of the gas discharge in said medium to that value of power required to cause the laser to operate at maximum efficiency.

4,903,277

ELECTRIC MELTING FURNACE WITH PARTITIONED MELTING CAVITY FOR SOLIDIFYING HIGHLY RADIOACTIVE WASTE IN GLASS

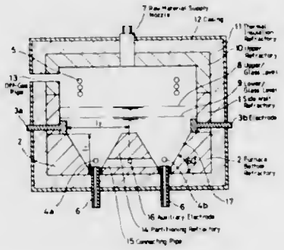
Hiroshi Igarashi, Ibaraki, Japan, assignor to Doryokuro Kakeunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Aug. 18, 1988, Ser. No. 233,624

Claims priority, application Japan, Aug. 21, 1987, 62-207570

Int. Cl.[4] C03B *5/027*

U.S. Cl. 373—30 **8 Claims**



1. An electric melting furnace for solidifying highly radioactive waste into glass, comprising:

a melting cavity having a bottom portion;

a plurality of outflow ports disposed in the bottom portion of the melting cavity for extracting molten glass;

at least one pair of opposing electrodes positioned on opposite side walls of the melting cavity; and

at least one non-electrically conductive partitioning refractory disposed between the outflow ports to partition said melting cavity.

4,903,278

ELECTRODE HOLDING AND POSITIONING

Heribert Koenig, Duisburg, and Heinz Stark, Essen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 1, 1988, Ser. No. 265,571

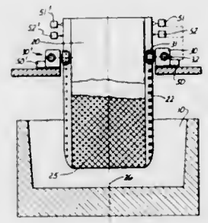
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1987, 3737488

Int. Cl.[4] H05B *7/09, 7/10*

U.S. Cl. 373—97 **14 Claims**

1. Apparatus for positioning a consumable electrode in a furnace, the electrode having a jacket with at least two radially outwardly projecting longitudinal ribs, a positioning device comprising:

at least one wheel with projections engaging one of the longitudinal ribs and providing a deformation thereof in



terms of indentation which thereby is and remains briefly in engagement with said wheel such that the wheel with and through its projection holds and advances that electrode.

4,903,279

RECEIVER FOR SPREAD SPECTRUM COMMUNICATION AND RECEIVING METHOD FOR THE SAME

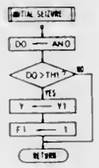
Yuichi Murakami, and Tomohiro Yamamoto, both of Kawasaki, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 30, 1987, Ser. No. 102,731

Claims priority, application Japan, Sep. 30, 1986, 61-232992; Sep. 30, 1986, 61-232993; Sep. 30, 1986, 61-232994

Int. Cl.[4] H04K *1/00;* **H04L** *9/00*

U.S. Cl. 375—1 **20 Claims**



1. A receiver for use in an spread spectrum communication system comprising:

receiving means for receiving spread spectrum signals,

spread signal distributing means for distributing a spread spectrum signal received by said receiving means into a first spread signal, a second spread signal and a third spread signal,

pseudo noise signal generating means for generating a first pseudo noise signal having a code series substantially the same as a code series of a pseudo noise signal included in said received spread spectrum signal and having a reference phase, a second pseudo noise signal having a phase that leads the reference phase by an amount corresponding to a specified number of bits and a third pseudo noise signal having a phase that lags the reference phase by an amount corresponding to a specified number of bits,

activating means for setting a bit rate of said pseudo noise signal generating means,

first correlation detecting means for reversely spreading said first spread signal and for detecting the correlation with said first pseudo noise signal,

second correlation detecting means for reversely spreading said second spread signal and for detecting the correlation with said second pseudo noise signal,

third correlation detecting means for reversely spreading said third spread signal and for detecting the correlation with said third pseudo noise signal,

hybrid means for generating a signal depending on a difference between an output of said second correlation detecting means and an output of said third correlation detecting means,

initial seizing control means for setting a first bit rate to said activating means and synchronizing the pseudo noise signal included in said received spread spectrum signal and said first pseudo noise signal by monitoring an output of said first correlation detecting means,

phase lock sustaining control means for setting a second bit rate to said activating means and sustaining synchronization between the pseudo noise signal included in said received spread spectrum signal and said first noise signal by monitoring an output of said first correlation detecting means and an output of said hybrid means,

synchronization control means for first operating the initial seizing control means and upon completion of the operation of said initial seizing control means, starting a measurement of time by suspending execution of a synchronization sustaining control operation which is performed by a synchronization sustaining control means when an output of said first correlation detecting means becomes lower than a specified level and executing the synchronization sustaining control operation if an output of said first correlation detecting means becomes higher than said specified level within a specified time period, and

demodulating means connected to said first correlation detecting means for extracting data included in said received spread spectrum signal.

4,903,280

CIRCUIT ARRANGEMENT FOR SERIAL DATA TRANSMISSION BETWEEN A PLURALITY OF SUBSCRIBER STATIONS

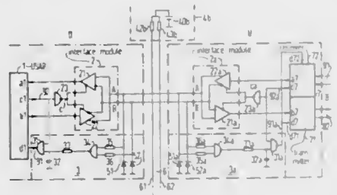
Otto Lang, and Manfred Dombrowski, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 15,710, Feb. 17, 1987, abandoned. This application Aug. 30, 1988, Ser. No. 240,387

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1986, 3604982

Int. Cl.[4] H04B *1/44*

U.S. Cl. 375—7 **10 Claims**



1. In a circuit arrangement for serial data transmission between first and second subscriber stations connected to respective first and second transmission/receiving devices and each of the subscriber station including a data transmitter and a data receiver, each data transmitter and each data receiver connected to two leads of a data bus, each of said transmitters including a control input responsive to control signals from the other transmitter such that only one of the transmitters is active at a time to output a voltage of a first polarity or of a second polarity dependent on the state of a data signal applied thereto by the respective transmission/receiving device, each of the transmitters having a higher internal impedance in the passive condition than in the active condition, and each of the receivers operable in response to the polarity of the voltage received from the other station to output data to the respective transmission/receiving device, the improvement therein comprising:

a resistor arrangement connected to the data bus and connecting both leads thereof via resistors to the same potential; and

a recognition circuit in at least one of the subscriber stations connected to the two leads of the data bus and responsive to at least approximately identical voltages on the leads of the data bus to output a free control signal having a first logic state and responsive to different voltages of the leads of the data bus to output a busy control signal having a second logic state.

4,903,281

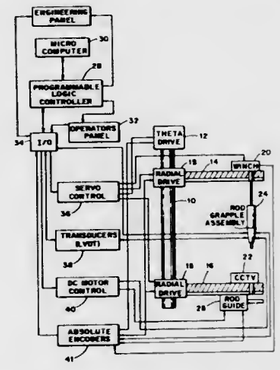
SYSTEM FOR FUEL ROD REMOVAL FROM A REACTOR MODULE

Richard L. Matchett, Bethel Park; David R. Roof, North Huntingdon; Thomas J. Kikta, Pittsburgh; Rosemarie Wilczynski, McKees Rocks; Roy J. Nilsen, Pittsburgh; William S. Bacvinskas, Bethel Park, and George Fodor, Pittsburgh, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 28, 1988, Ser. No. 225,435

Int. Cl.[4] G21C *19/00*

U.S. Cl. 376—264 **8 Claims**



1. A system for removing and transferring a plurality of fuel rods from a reactor module, comprising:

an elongated support tube vertically mounted above said module;

angular drive means, rigidly supported above said support tube, for rotating said support tube about its vertical axis;

fuel rod grapple assembly means for engaging said fuel rods in said module;

winch means for vertically positioning said fuel rod grapple assembly means so as to engage a fuel rod in said module and for removing an engaged fuel rod from said module by vertically retracting said grapple assembly means from said module;

first radial support means, horizontally extending from said support tube, for supporting said winch means above a selected fuel rod;

radial drive means, mounted adjacent said support tube, for horizontally positioning said winch means over a selected fuel rod; and

control means for controlling the operation of said angular drive means, grapple assembly means, winch means, and radial drive means, to sequentially and systematically remove preselected fuel rods from said module for transfer and storage thereof.

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4,903,282

ELECTRONIC COIN-COUNTING CONTROL

Kurt Botker, Thurmond, Md., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 38,106, Apr. 14, 1987, abandoned. This application Jan. 6, 1989, Ser. No. 294,965

Int. Cl.[4] G07F *17/20*; G06M *3/10*

U.S. Cl. 377—7 **16 Claims**

1. A device for determining occurrence of a selected number of events spaced in time by a minimum interval, comprising

means for providing an input electric signal in response to occurrence of an event,

a resettable counter having a plurality of output terminals providing a parallel binary coded register output for counting said electric signals,

means for comparing said output with a pre-set number to provide a control signal when said output at least equals said number, comprising a conductor, a plurality of manually settable switches corresponding to the respective digits of the binary coded output, and a plurality of diodes corresponding to said plurality of switches, each respective switch and a respective diode being connected in series between said conductor and a respective terminal of the register parallel output,

means for resetting said register output to zero after provision of said control signal, comprising latching relay means which is latched by a set coil in response to said one control signal, and which is unlatched only upon occurrence of a predetermined condition; and while latched disables the counter from counting, said means for resetting further comprising a delay circuit arranged such that said counter is enabled only after a predetermined period of time after said latching relay means is unlatched, and

means, responsive to said input electric signal, for preventing counting for said minimum interval, whereby false signals do not generate a false count.

4,903,283

PHASE DETERMINING CIRCUIT TO GENERATE A PHASE CONTROL SIGNAL, AND METHOD FOR GENERATING SAID SIGNAL

Gerd Eisenberg, Rosdorf, Fed. Rep. of Germany, assignor to BTS Broadcast Televison Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 194,809

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1987, 3719582

Int. Cl.[4] H03L *7/18*

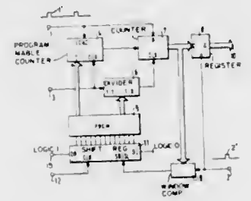
U.S. Cl. 377—43 **7 Claims**

1. Digital phase determining circuit for a digital phase controller to generate digital phase control signals, comprising:

counter means (7) providing digital count signals representative of the generated digital phase control signal;

variable clock rate pulse generating means (3, 6, 5) coupled to the counter means and connected to a source of phase reference pulses (1') for controlling said counter means to operate or count at a controlled and variable rate in dependence on the relative phase or temporal relation between a phase reference pulse signal (1') and an actual pulse signal (2') representative of the actual phase position of a cyclical element under phase control;

start control means (4) coupled to said counter means (7) for starting said counter means at a time which is variable with respect to said phase reference pulse signal (1');



said variable clock rate means and said start control means (4) being jointly controlled to change the clock frequency of the variable clock rate means and the starting time of the counter means (7) under control of the start control means such that a desired phase relation of the actual pulse signal (2') with respect to the reference pulse signal (1') is maintained, and

a window comparator (9) connected for receiving output signals from the counter means (7) and the actual pulse signals (2'), said window comparator being coupled to and controlling the variable clock rate means to control the temporal occurrence of the start signal from the start control means (4) in relation to said reference pulse signal (1') and the frequency of the clock rate supplied by the variable clock rate means to the counter means (7).

4,903,284

ACCORDION-TYPE CHARGE-COUPLED DEVICES

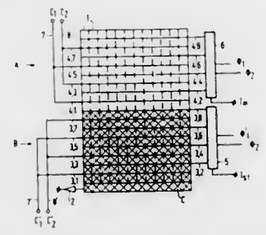
Leonard J. M. Esser, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Nov. 23, 1987, Ser. No. 123,697

Claims priority, application Netherlands, Nov. 27, 1986, 8603007

Int. Cl.[4] H04N *3/14*; H01L *29/78, 27/10*; G11C *27/04*

U.S. Cl. 377—62 **6 Claims**



1. A charge-coupled device comprising a semiconductor body, a charge transport channel defined in said semiconductor body and an electrode system for controlling the transport of charges through the charge transport channel, a shift register by means of which voltages can be applied to the electrode

system such that during the storage of charge packets the device is operated as an m-phase device and is operated during transport as an n-phase device (n being larger than m), while a charge packet does not participate in the transport until the preceding charge packet has already been displaced over a given distance, said electrode system comprising a first group of electrodes coupled to said shift register and a second group of electrodes coupled to a common clock signal source, electrodes of said first group and electrodes of said second group being alternately arranged.

4,903,285

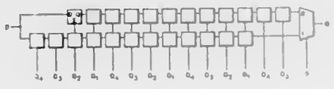
EFFICIENCY SHIFT REGISTER

Daniel G. Knierim, Beaverton, and Martin S. Denham, Newberg, both of Oreg., assignors to Tektronic, Inc., Beaverton, Oreg.

Filed Feb. 24, 1989, Ser. No. 314,750

Int. Cl.[4] H03K *23/42*; G11C *19/00*

U.S. Cl. 377--78 **8 Claims**



1. A shift register of effective length N, comprising:

a multiphase clock source for producing m phases of clock signal, 1 through m, where m is an even number greater than 2;

m/2 strings of latches, with each string having a first latch and a last latch and a total number of latches equal to 2N/(m--1), with a source of input data coupled to the input of the first latch in each string and with the input of each succeeding latch coupled to the output of the preceding latch in the string, and with each successive latch in each string being enabled by the clock signal whose phase immediately precedes the phase of the clock signal used to enable the preceding latch in that string, and with the first latch in each string being enabled by a phase of the clock signal that is two phases earlier than the clock phase of the preceding string; and

a multiplexer connected to the outputs of the last latches in each string and controlled so as to combine the outputs of the different strings of latches into one overall output of the shift register such that the bits exiting the shift register are in the same order that the bits entering the shift register were in.

4,903,286

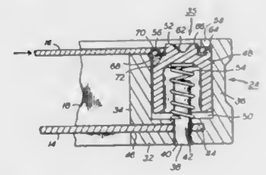
COVER LATCH MECHANISM FOR A PHOTOGRAPHIC CASSETTE

John J. Niecospial; Bruce R. Muller; Roger G. Covington, and Evan P. Carmichael, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1987, Ser. No. 125,314

Int. Cl.[4] G03B *42/04*

U.S. Cl. 378—182 **4 Claims**



1. In an x-ray cassette having one end wall with a slot therein through which a sheet is movable therethrough along an inlet path, an opposite end wall, opposite side walls joining the one end wall and opposite end wall, and opposing front and rear cover walls joined to the end walls and side walls in which one of the cover walls is slidably moved along grooves in the side walls and into a recess in the opposite end wall into a closed position, the x-ray cassette further having a cover latch mechanism for releasably latching the one cover wall in its closed position comprising:

an opening in the one cover wall adjacent the opposite end wall;

a button interposed between the front and rear cover walls in alignment with the opening; and

a spring coupled to the button for biasing the button into engagement with the opening for releasably latching the one cover wall in its closed position, the button further having a blind cavity at one end for receiving the spring, and a head at the opposite end that is biased into the opening, the cassette further comprising a post mounted on the other cover wall adjacent the opposite end wall, the post extending toward the one cover wall and being encircled by the spring which is captive within one blind cavity, and light-lock means interposed between the opposite end of the button and the one cover wall in its closed position to prevent light from entering the opening, the light-lock means further comprising a ring and groove encircling the opening, and a recess and rim on the button encircling the head and nesting within the ring and groove respectively under the bias of the spring.

4,903,287

RADIATION SOURCE FOR GENERATING ESSENTIALLY MONOCHROMATIC X-RAYS

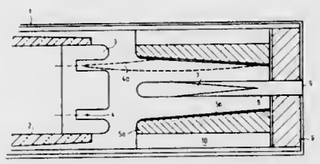
Geoffrey Harding, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 16, 1988, Ser. No. 194,631

Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716618

Int. Cl.[4] H01J *35/00*

U.S. Cl. 378—119 **21 Claims**



1. A radiation source for generating essentially monochromatic x-ray radiation comprising

(a) cathode means for generating accelerated electrons,

(b) anode means receiving said accelerated electrons for forming a primary beam of x-rays, said anode means having an elongated, inner surface facing said cathode means to receive said accelerated electrons and to form said primary beam of x-ray all along said elongated inner surface,

(c) a conical member spaced from said inner surface of said anode means for forming fluorescence radiation from said primary beam of x-rays,

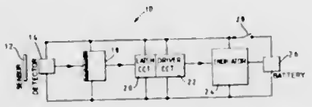
(d) a radiation exit means for passing said fluorescence radiation,

wherein said conical member has a conical apex directed toward said radiation exit, and

(e) cylindrical shield means for enclosing said conical member in a sealing manner, said cylindrical shield means being connected to said radiation exit means.

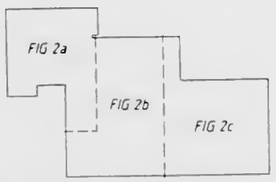
VOL 1111 ISS 3 FEB 20 1990 UMI

4,903,288
RADIATION MONITOR
Raymond G. McAllister, Ludlow, England, assignor to Plantech Radiology Ltd., England
Filed Mar. 2, 1988, Ser. No. 163,080
Claims priority, application United Kingdom, Mar. 4, 1987, 8705014
Int. Cl.[4] H05G 1/28
U.S. Cl. 378—162 5 Claims



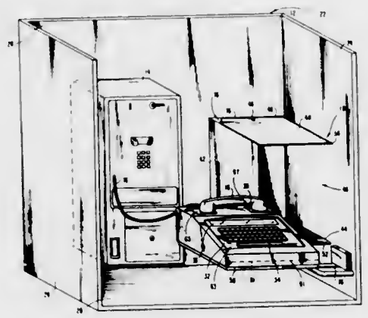
1. A device for indicating the state of exposure to x-radiation of an X-ray cassette of the type having an outer holder and an inner, removable photographic film, the device comprising:
visual indicator means having a first visual state for indicating the presence of unexposed film, a second visual state for indicating the presence of exposed film and a third visual state for indicating the absence of film;
a power supply circuit for supplying power to said indicator means;
first means operable in response to the incidence of x-radiation to provide a control signal for altering the status of said indicator means; and
switch means in said power supply circuit, said switch means being positioned such that in the presence of photographic film in said cassette, said film bears on said switch means to close said switch means.

4,903,289
TELEPHONE EQUIPMENT WITH MULTIPLE FUNCTION
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan
Filed Mar. 24, 1988, Ser. No. 172,393
Claims priority, application Japan, Mar. 24, 1987, 62-70009
Int. Cl.[4] H04M 1/64, 11/00
U.S. Cl. 379—61 6 Claims



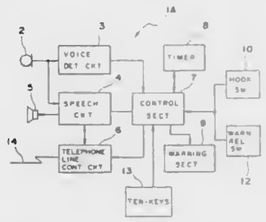
1. Telephone equipment with multiple functions capable of operating off-hook dialing following picking up of a handset of a phone and on-hook dialing by turning on a special off-hook switch of the phone, using a DTMF (dual-tone multifrequency) tone, and incorporating an additional device that can be controlled (1) by remote control by signals from an external source over an outside telephone line by pushing DTMF tone buttons of the external source, and (2) manually and independently of the outside telephone line by pushing DTMF tone buttons of said equipment of the same numeral or sign as those for remote control operation of the additional device over the outside telephone line, said equipment including circuitry for automatically making the additional device independent of the outside telephone line during an off-hook dialing operation of said telephone equipment for placing an outgoing call, and thereafter during the time a talking circuit on the telephone line is established by the outgoing call, enabling said additional device to be controlled either by a calling party by a remote control operation or by a called party.

4,903,290
DEVICE FOR MOUNTING A TELECOMMUNICATIONS DEVICE FOR THE DEAF IN A PUBLIC PHONE BOOTH
Bruce A. King, 3956 Downes Dr., Indianapolis, Ind. 46236
Filed Jul. 22, 1988, Ser. No. 222,910
Int. Cl.[4] H04M 1/2, 11/00, 17/02
U.S. Cl. 379—52 3 Claims



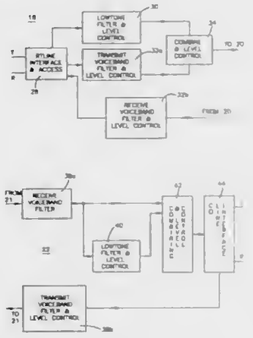
1. A device for providing public telephone services to the hearing impaired comprising:
a coin operated telephone mounted to a housing, said coin operated telephone having a handset;
a telecommunications device for the deaf having a handset cradle designed and arranged to receive a telephone handset when said telecommunications device for the deaf is in use;
an enclosure attached to said housing and sized to receive said telecommunications device for the deaf;
positioning means attached to said telecommunications device for the deaf and said housing for positioning said telecommunications device for the deaf between a first position wherein said telecommunications device for the deaf is received within said enclosure and a second position wherein said telecommunications device for the deaf is adjacent said coin operated telephone so that said handset can be received in said handset cradle;
said positioning means comprising sliding attachment means for sliding attahing said telecommunications device for the deaf to said housing so that said telecommunications device for the deaf can be slid between said first position and said second position;
said positioning means further comprising a shelf and pivoting attachment means secured to said shelf for pivotally attaching said telecommunications device for the deaf to said sliding attachment means so that said shelf may be pivoted about said sliding attachment means between a horizontal position and a vertical position;
said sliding attachment means comprising a bar attached to said housing, wherein a first portion of said bar is positioned within said enclosure and a second portion of said bar is positioned outside said enclosure; and
said pivoting attachment means further comprising a bracket, said bracket attaching said shelf to said bar, said bracket having an aperture therein which surrounds said bar and is slidingly received thereon.

4,903,291
AUTOMATIC ON-HOOK ARRANGEMENT
Shinichi Tsurufuji, Nara, and Masayuki Iida, Yawata, both of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Oct. 6, 1987, Ser. No. 106,228
Claims priority, application Japan, Oct. 9, 1986, 61-155027
Int. Cl.[4] H04M 1/27
U.S. Cl. 379—88 13 Claims



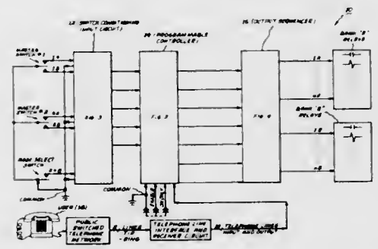
6. A method of obtaining an on-hook arrangement for telephone equipment, comprising the steps of:
detecting an absence of an input voice of a user at voice input means;
measuring time during which the input voice of the user is not detected;
emitting a warning for the user if a predetermined period of time is measured during which the input voice of the user is not detected; and
cutting off a telephone line connection when the warning is not released and the input voice of the user is not detected for another predetermined period of time.

4,903,292
SYSTEM FOR TRANSMITTING LOW FREQUENCY TONES THROUGH A DIGITAL LOOP CARRIER SYSTEM
Philip L. Dillon, Arlington, Tex., assignor to Reliance Comm/-Tec Corporation, Chicago, Ill.
Filed Nov. 1, 1988, Ser. No. 265,718
Int. Cl.[4] H04M 11/06
U.S. Cl. 379—93 20 Claims



1. A digital loop carrier system comprising:
(a) a first end;
(b) a second end; and
(c) transmission means connecting said first and second ends;
(d) said first end comprising:
(i) first means having an input and an output, said first means for passing only that part of an analog signal at said input which is in a predetermined frequency band to said output;
(ii) second means having a narrow bandwidth for passing only a tone having a frequency below said predetermined frequency band included in said analog signal at said first means input, said second means also for controlling the amplitude of said tone to fall within a predetermined amplitude range; and
(iii) means responsive to said analog signal at said first means output and to said amplitude controlled tone for encoding said analog signals and said tone into a digital signal for transmission by said transmission means to said second end.

4,903,293
PROGRAMMABLE SYSTEM CONTROLLER FOR REMOTE DEVICES
Esther F. Ovadia, Barrington; Paul G. Huber, West Warwick, and Dewey L. Harris, Coventry, all of R.I., assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 132,233, Dec. 14, 1987, abandoned.
This application Jul. 10, 1989, Ser. No. 378,435
Int. Cl.[4] H04M 11/00
U.S. Cl. 379—102 6 Claims



1. A programmable system controller for controlling a plurality of distributed electrical loads including a plurality of control circuits comprising;
one or more input selectable means of various types comprising three-wire maintained switches, two-wire maintained switches, and momentary activated switches, each of said selectable means having its arm appropriately connected to a source of excitation so that said excitation is representative of one or more positions of said arm of said selectable means for respectively generating one or more switch control signals from said selectable means;
conditioning means for receiving the one or more switch command signals representative of the one or more positions of said selectable means and respectively generating in response thereto one or more representative digital signals;
programmable means for receiving one or more representative digital signals and having means for determining the various type of said input selectable means and if said generated switch command signals are present and constant for predetermined durations, said programmable means responding to said present and constant switch commands and generating output digital quantities in response thereto;
sequencer means for receiving said output digital quantities and generating in response thereto on or more sequence control signals;
said control circuits for receiving said sequence control signals and generating in response thereto drive signals so as to control the on-off state of remote devices
wherein said predetermined durations of said means of said programmable means comprises;
(a) means for sensing the state of the one or more representa-

tive digital signals about once every twenty-five microseconds; and

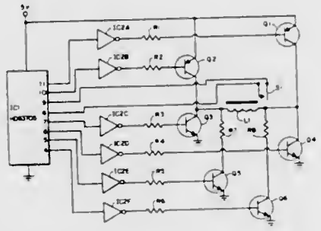
(b) means for sensing that the states of the one or more representative digital signals do not change for about 500 microseconds.

4,903,294

LOW VOLTAGE OPERATED COIN RELAY

Gary Grantland, Hartselle, and Attie D. Johnson, Somerville, both of Ala., assignors to Palco Telecom Inc., Nashville, Tenn.

Filed Jan. 9, 1989, Ser. No. 301,965
Int. Cl.[4] H04M *1/02, 17/00*
U.S. Cl. 379—150 **9 Claims**



1. A relay for use in a coin operated telephone paystation operable to control an associated coin hopper mechanism to collect, or in the alternative, to refund coins deposited in said telephone paystation, said relay including a coil, a core and an armature, the improvement comprising:

a control circuit including circuit connections to said coil, operated to conduct operating current over said connections to said coil, to operate said armature to move in a direction toward said core;

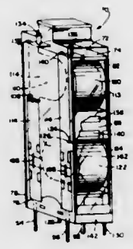
and a shield of non-magnetic metallic material located between said core and said armature effective to reduce the force required to restore said relay to a non-operated mode by reducing said current required to operate said relay, said shield further operated to reduce the release time of said relay.

4,903,295

COMPACT SOLID STATE STATION PROTECTOR DEVICE

William Shannon, Saco, and John Napiorkowski, Cape Elizabeth, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 7, 1987, Ser. No. 82,625
Int. Cl.[4] H04M *7/00*
U.S. Cl. 379—437 **7 Claims**



1. A compact solid state protector unit for Central Office Equipment and Building Entrance Terminal Equipment, said device comprising:

an outer cover means having an open lower end;

an inner insert member adapted to be inserted into said cover means;

a pair of cavity means disposed in said insert member;

a PTC variable resistance means disposed in each cavity means of said insert member;

a chamber means disposed between said cavity means;

a pair of VSS means disposed in said chamber means;

channel means disposed upon the surface of said insert means;

conductor means disposed in said channel means connecting said PTC variable resistance means and said VSS means to form a circuit having a pair of office-side conductors and a pair of line-side conductors;

a pair of input terminal means conncected to said line-side conductors and a pair of output terminal means connected to said office-side conductors;

a ground terminal connected between said VSS means; and

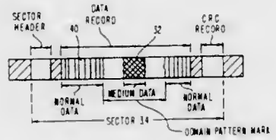
a base disposed in the lower end of said cover means.

4,903,296

IMPLEMENTING A SHARED HIGHER LEVEL OF PRIVILEGE ON PERSONAL COMPUTERS FOR COPY PROTECTION OF SOFTWARE

Akhileshwari N. Chandra, Mahopac; Liam D. Comerford, Carmel, and Steve R. White, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 651,184, Sep. 14, 1984, Pat. No. 4,644,493. This application Nov. 12, 1986, Ser. No. 930,219
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—4 **4 Claims**



1. A software copy-protection apparatus, which is operable with a host computer system, comprising:

a magnetic medium having tracks formed thereon which are divided into sectors, with each sector being comprised of a plurality of bit storage location, with indicia being formed in at least a portion of at least one sector, with at least some of said indicia not being modifiable by the medium write process;

a product program stored on said medium, at least a portion of which is in an encrypted form which identifies the program for use only on said host computer system;

a support computing system operable with said host computer system, including a decryption key for identifying product programs which may be executed on said host computer system;

means for ascertaining said indicia are present on said medium;

means included in said support computing system for utilizing said decryption key to decrypt said encrypted portion of said program; and

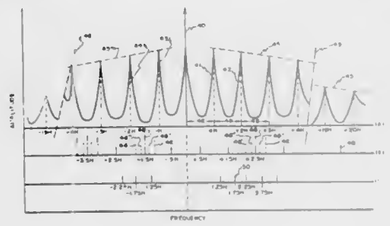
means responsive to the ascertaining that said indicia are on said medium, and said encrypted portion of said program has been decrypted, to permit said host computer system to execute said program product.

4,903,297

RESTRICTED ACCESS TELEVISION TRANSMISSION SYSTEM

Bruno A. Rist, Woodland Hills, Calif., and Adrian J. DeVries, Aurora, Ill., assignors to International Telesystems, Inc., Beverly Hills, Calif.

Continuation-in-part of Ser. No. 934,810, Nov. 25, 1986, Pat. No. 4,825,467. This application Nov. 7, 1988, Ser. No. 267,964
Int. Cl.[4] H04N *7/467;* **H07H** *7/00*
U.S. Cl. 380—7 **77 Claims**



48. A television signal transmission security system comprising;

television signal generating means generating a television signal having a video carrier and an audio carrier;

encoder means for injecting multiple interfering signals into said television signal, each of said multiple interfering signals being injected into said television signal about midway between harmonics of the horizontal sweep frequency of said video carrier where spectral intensity of said harmonics is not substantial and in a frequency band including said video carrier and on either side or both sides of said video carrier;

modulating means in said encoder means for modulating said multiple interfering signals, each of said multiple interfering signals with said modulation having a bandwidth at 3 db down of less than about the frequency bandwidth between adjacent harmonics of said horizontal sweep frequency;

transmission means for transmitting said television signal with said interfering signal to a plurality of television receivers; and

decoder means having notch filter means with multiple notches at each television receiver receiving and removing said multiple interfering signals, each of said multiple notches of said notch filter means having a bandwidth at 3 db down of less than about the frequency bandwidth between adjacent harmonics of said horizontal sweep frequency wherein said notch filter means does not remove a significant amount of video sideband information, allowing said television signal to be viewed at said plurality of television receivers without substantial degradation.

4,903,298

SYSTEM FOR PROVIDING ENCRYPTION AND DECRYPTION OF VOICE AND DATA TRANSMISSIONS TO AND FROM AN AIRCRAFT

James D. Cline, Mission Viejo, Calif., assignor to Sunstrand Data Control, Inc., Redmond, Wash.

Filed Jul. 27, 1988, Ser. No. 225,065
Int. Cl.[4] H04K *1/00*
U.S. Cl. 380—9 **13 Claims**

1. A communication system for an aircraft that selectably provides an encrypted communication path between a user and a selected radio transceiver, said system comprising:

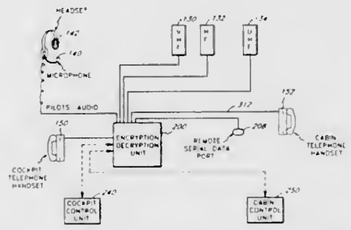
at least one first voice communication device in the cockpit of the aircraft that responds to the voice of a person in the cockpit to transmit a first communication device audio output signal, and that responds to a first communication device audio input signal to generate a first audible output signal;

a second voice communication device in the passenger cabin of the aircraft that responds to the voice of a person in the passenger cabin to transmit a second communication device audio output signal, and that responds to a second communication device audio input signal to generate a second audible output signal;

a first radio transceiver that receives a first transceiver audio input signal and generates a modulated radio frequency output signal responsive thereto, and that receives a modulated radio frequency input signal and generates a first transceiver audio output signal responsive thereto;

a second radio transceiver that receives a second transceiver audio input signal and generates a modulated radio frequency output signal responsive thereto, and that receives a modulated radio frequency input signal and generates a second transceiver audio output signal responsive thereto;

an encryption/decryption system that includes an encryption/decryption module, a first control unit located in said cockpit and a second control unit located in said passenger cabin, each control unit having a plurality of switches, said encryption/ decryption module responsive to an intelligible audio input signal to generate an encrypted audio output signal in accordance with a selected encryption key, said encryption/decryption module further responsive to an encrypted audio input signal to generate an intelligible output signal, said encryption/ decryption



system interposed between said first and second voice communication devices and said first and second transceivers and responsive to said switches on said control units so that:

said encryption/decryption system receives said first and second communication device audio output signals and selectably provides one of said first and second communication device audio output signals as said intelligible audio input signal to said encryption/decryption module to be encrypted therein;

said encryption/decryption system selectably provides said encrypted audio output signal as one of said first and second transceiver audio input signals while providing the other of said first and second communication device audio output signals as the other of said first and second transceiver electrical input signals;

said encryption/decryption system receives said first and second transceiver audio output signals and selectably provides one of said first and second transceiver audio output signals as said encrypted input signal to said encryption/ decryption module to be unencrypted therein; and

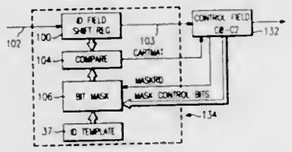
said encryption/decryption system selectably provides said intelligible audio output signal from said encryption/decryption module as one of said first and second communication device audio input signals while providing the other of said first and second transceiver electrical output signals as the other of said first and second communication device audio input signals

4,903,299

ID PROTECTED MEMORY WITH A MASKABLE ID TEMPLATE

Robert D. Lee, Denton, and Hal Kurkowski, Dallas, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Jun. 28, 1988, Ser. No. 212,500
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—25 **17 Claims**



1. Access circuitry associated with a peripheral device for selectively gaining access thereto from the common data link, comprising:

interface means for interfacing with the common data link for receiving ID information and control information from a common data link and transferring data between the common data link and the peripheral unit;

protocol means for receiving and storing control information and ID information received from the common data link;

ID storage means for storing a digital ID template corresponding to the ID information;

data transfer means for transferring data between said interface means and the peripheral device;

masking means for masking off a portion of said ID template in response to receiving a predetermined mask command in the control information, said predetermined mask command determining the portion of said ID template that is masked off;

compare means for comparing the unmasked portion of said ID template with the corresponding portion of the received ID information stored in said protocol means and outputting a match signal if a match is present between the unmasked portion of said ID template and the corresponding portion of the received ID information stored in said protocol means;

control means for controlling said data transfer means to transfer data to the peripheral device from said interface means in response to device Write control information stored in said protocol means, or from the peripheral device to said interface means in response to device Read control information stored in said protocol means;

inhibit means for inhibiting access to the peripheral unit by said data transfer means if a match signal is not generated by said compare means.

4,903,300

COMPACT AND EFFICIENT SUB-WOOFER SYSTEM AND METHOD FOR INSTALLATION IN STUCTURAL PARTITIONS

Matthew S. Polk, Baltimore, Md., assignor to Polk Investment Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 294,150, Jan. 5, 1989. This application Apr. 21, 1989, Ser. No. 342,042
Int. Cl.[4] H04R *5/02*
U.S. Cl. 381—24 **22 Claims**

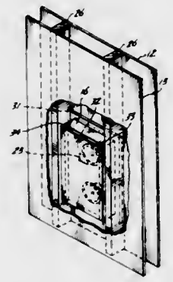
1. A loudspeaker system for installation in a space defined by a front panel and an enclosed area behind the front panel of a structural partition fronting a listening area comprising:

electroacoustical transducing means having a two sided vibratory diaphragm;

means for coupling an electrical signal to said electroacoustical transducing means for driving same;

enclosure means for mounting said electroacoustical transducing means such that one side of said vibratory diaphragm is in contact with air outside said enclosure means and said enclosure means substantially enclosing and defining a specific volume of air having a predefined acoustic compliance and which is in contact with the other side of said vibratory diaphragm of said electroacoustical transducing means;

means for mounting said enclosure means to the structural partition such that said enclosure means extends into the space between a front panel of the partition and a rear panel of the partition so that the one side of said vibratory diaphragm contacts a volume of air outside said enclosure means within the space between the front panel and the rear panel of the partition;



passive radiating means characterized by having a specific acoustic mass for coupling the specific volume of air enclosed by said enclosure means to the air outside said enclosure means in the listening area;

a compression plate mounted to said enclosure means in spaced relationship to and facing said one side of said vibratory diaphragm in contact with air outside said enclosure means to form a partial enclosure so as to isolate said vibratory diaphragm from the rear partition member adjacent said one side of said vibratory diaphragm while at the same time maintaining coupling of said vibratory diaphragm to the air volume outside said enclosure means between the front and rear panels of the partition;

whereby the volume of air outside said enclosure means within the space behind the front panel of the partition is substantially acoustically isolated over the approximate frequency range of operation of said electroacoustical transducing means from the volume of air outside said enclosure means within the listening area.

4,903,301

METHOD AND SYSTEM FOR TRANSMITTING VARIABLE RATE SPEECH SIGNAL

Kazuhiro Kondo, Kokubunji, and Toshiro Suzuki, Tama, both of Japan, assignors to Hitachi, Ltd., Chiyoda, Japan

Filed Feb. 12, 1988, Ser. No. 155,392
Claims priority, application Japan, Feb. 27, 1987, 62-42554
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—30 **11 Claims**

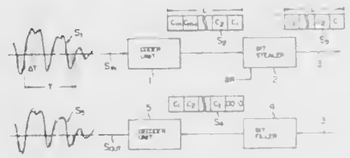
1. A method for transmitting coded signals with variable bit rate comprising:

the step of transforming original signals each inputted during a predetermined period of time into a first group of coded data representing characteristics of said original inputted signals;

the step of obtaining error signals corresponding to the difference between signals reproduced on the basis of said first group of coded data and said inputted original signals;

the step of transforming said error signals into a second group of coded data, said first group of coded data being assigned a high priority and said second group of coded data being assigned a low priority; and

the further step of transmitting said coded data by an amount corresponding to a determined transmission rate.

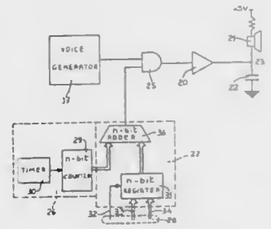


4,903,302

ARRANGEMENT FOR CONTROLLING THE AMPLITUDE OF AN ELECTRIC SIGNAL FOR A DIGITAL ELECTRONIC APPARATUS AND CORRESPONDING METHOD OF CONTROL

Alessandro Graciotti, Ivrea, and Massimo Bertagna, Samone, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Aug. 12, 1988, Ser. No. 231,453
Claims priority, application Italy, Feb. 5, 1988, 67078 A/88
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—31 **10 Claims**



1. An arrangement for controlling the amplitude of an electric signal for a digital electronic apparatus, comprising a generator of a first logical signal of constant amplitude and of a frequency comprised within a predetermined frequency band, and a utilizing device sensitive to the amplitude of said signal, wherein said first logical signal defines a mark-space ratio and a main value, and wherein said arrangement further comprises a generator of a second logical signal with a frequency much greater than the frequencies of said band, a digital circuit for varying the mark-space ratio (duty-cycle) of said second signal, and a circuit for modulating said first logical signal according to said second signal so as to reduce the mean value of said first signal correspondingly.

4,903,303

MULTI-PULSE TYPE ENCODER HAVING A LOW TRANSMISSION RATE

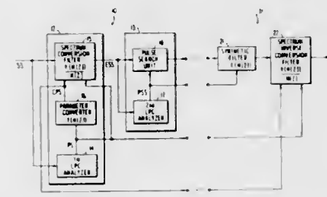
Tetsu Taguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 4, 1988, Ser. No. 153,290
Claims priority, application Japan, Feb. 4, 1987, 62-25028
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—31 **5 Claims**

1. An encoder for use in encoding a speech signal into a plurality of pulse signals, each having an amplitude and a location determined by said speech signal, said speech signal having spectrum envelope which has a plurality of peak components, wherein the improvement comprises:

parameter calculating means responsive to said speech signal for calculating parameters specific to said spectrum envelope to produce a parameter signal representative of said parameters;

a spectrum emphasis filter responsive to said speech signal and said parameter signal for emphasizing said peak components of said spectrum envelope to produce an emphasized speech signal in accordance with said parameter signal, said emphasized speech signal having spectrum envelope which substantially comprises a plurality of line spectra; and



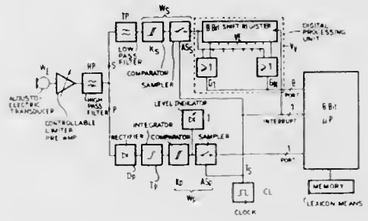
pulse producing means coupled to said spectrum emphasis filter for reproducing said plurality of pulse signals in response to said emphasized speech signal.

4,903,304

METHOD AND APPARATUS FOR THE RECOGNITION OF INDIVIDUALLY SPOKEN WORDS

Martin Schlang; Wolfgang Knepper, and Bernhard Kaemmerer, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 853,945, Apr. 21, 1986, abandoned. This application Oct. 20, 1988, Ser. No. 262,183
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3514286
Int. Cl.[4] G10L *1/00, 5/00, 3/00*
U.S. Cl. 381—41 **20 Claims**



1. A system for the recognition of separately spoken words, comprising:

an acousto-electric transducer for receiving the spoken words to be recognized and producing an electrical signal therefrom;

a controllable amplifier connected to an output of said acousto-electric transducer to amplify the electrical signal from said transducer;

a high-pass filter connected to an output of said controllable amplifier to filter the electrical signal;

a signal analysis path connected at an output of said high-pass filter to receive the electrical signal, said signal analysis path including:

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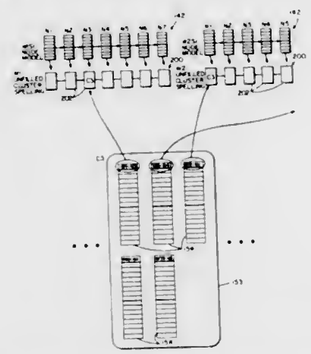
a low pass filter for filtering the electrical signal;
a first one-bit analog - to - digital converter connected at an output of said low pass filter for converting the electrical signal into a digital signal;
a digital processing means for sign correlation of the signal in sections from said first analog-to-digital converter to produce digital data words;
a microprocessor having a digital input connected to receive said digital data words from said digital processing means;
a level calculation path connected to the output of said high pass filter, said level calculation path including:
an envelope detection circuit operable to calculate the level of the output signal of said transducer and produce an envelope signal;
a second one-bit analog-to-digital converter having an input connected to an output of said envelope detection circuit and having and output connected to a digital input of said microprocessor for producing a digital envelope signal from said envelope signal; and
means for supplying a master clock signal to synchronize said microprocessor and said first and second analog-to-digital converters;
said microprocessor processing signals from said first and second analog to-digital converters to recognize the spoken words, said microprocessor:
receiving the beginning and end of the digital envelope signal corresponding to a separately spoken word t determine the word length,
dividing the signals corresponding to a separately spoken word into regions having feature vectors,
averaging the feature vectors to produce resulting vectors, and
comparing the resulting vectors to lexicon entries for election of an appropriate lexicon word.

4,903,305

METHOD FOR REPRESENTING WORD MODELS FOR USE IN SPEECH RECOGNITION

Laurence Gillick, Brookline; Dean Sturtevant, Watertown; Robert S. Roth, Brighton; James K. Baker, and Janet M. Baker, both of West Newton, all of Mass., assignors to Dragon Systems, Inc., Newton, Mass.

Continuation of Ser. No. 862,275, May 12, 1986, abandoned. This application Mar. 23, 1989, Ser. No. 328,738
Int. Cl.[4] G10L *9/06*
U.S. Cl. 381—41 **34 Claims**



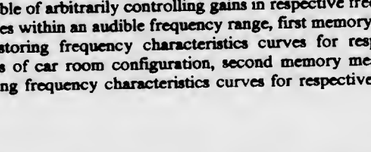
1. A method of deriving an acoustic word representation for use in speech recognition systems, said method comprising:
creating a word model for each of a plurality of words, each word model having a temporal sequence of acoustic models derived from one or more utterances of its associated word;
clustering the individual acoustic models from each of the plurality of word models, so as to place individual models into clusters of relatively similar models;
providing a cluster ID for each such cluster; and
creating a cluster spelling for a given word, said cluster spelling including a collection of cluster IDs indicating the clusters into which the sequence of acoustic models of said given word's word model have been placed by said clustering.

4,903,306

VOICE RECOGNITION USING AN EIGENVECTOR

Shogo Nakamura, Matsudo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Sep. 29, 1987, Ser. No. 102,559
Claims priority, application Japan, Oct. 3, 1986, 61-236900
Int. Cl.[4] G10L *7/08*
U.S. Cl. 381—42 **4 Claims**



1. A voice recognition method including the steps of:
(a) forming an input voice pattern from an input voice signal of an unknown input voice, said input voice pattern including a plurality of frames, each frame having frequency and time data;
(b) comparing less than all of said frequency and time data of said input voice pattern with a library of known voice patterns, each of said known voice patterns having its own frequency and time data, to select a plurality of candidate voice patterns, each of said candidate voice patterns having:
(1) an eigenvector having a non-zero minimum eigenvalue; and
(2) an inner product frequency distribution of inner products between (i) the frames of each of said candidate voice patterns and (ii) said eigenvector;
(c) calculating an inner product frequency distribution of inner products between the frames of said input voice pattern and the eigenvector of each of said plurality of candidate voice patterns; and
(d) selecting one of said plurality of candidate voice patterns, whose inner product frequency distribution is most similar to one of said calculated inner product frequency distributions calculated at said calculating step to thereby identify said input voice by the thus selected candidate voice pattern.

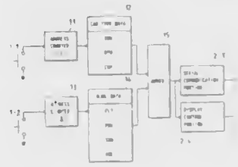
4,903,307

AUDIO APPARATUS HAVING ELECTRONIC GRAPHIC EQUALIZER

Hiroshi Ozawa; Shiro Horii, and Ichiro Hondo, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Company, Ibaraki, both of, Japan

Filed Jun. 14, 1989, Ser. No. 365,828
Claims priority, application Japan, Jun. 21, 1988, 63-151138
Int. Cl.[4] H03G *5/00*
U.S. Cl. 381—103 **6 Claims**

1. An audio apparatus having an electronic graphic equalizer capable of arbitrarily controlling gains in respective frequency ranges within an audible frequency range, first memory means for storing frequency characteristics curves for respective types of car room configuration, second memory means for storing frequency characteristics curves for respective sound sources, first selection means for selecting one of frequency characteristics curves stored in said first memory means, a second selection means for selecting one of frequency characteristics curves stored in said second memory means, and



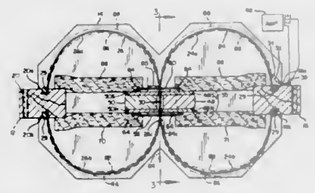
means for adding the two frequency characteristics read out from said first and said second memory means to obtain a composite frequency characteristic, whereby a frequency characteristic suitable for a specific sound source to be reproduced in a specific car room is obtained.

4,903,308

AUDIO TRANSDUCER WITH CONTROLLED FLEXIBILITY DIAPHRAGM

Paul W. Paddock, McMinnville, and Steven R. Geist, Portland, both of Oreg., assignors to Linaeum Corporation, Portland, Oreg.

Filed Feb. 10, 1988, Ser. No. 154,945
Int. Cl.[4] H04R *7/02, 1/02, 7/12, 9/04*
U.S. Cl. 381—202 **11 Claims**



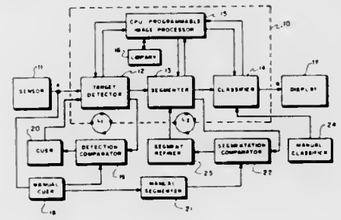
1. An audio transducer, comprising:
a frame;
a diaphragm comprising a pair of elongate resilient webs having portions joined to each other to form a movable expanse extending substantially in a plane, the expanse being movable in the direction of the plane, the webs each having a flexible end portion extending from the expanse in an arc to a remote frame location, each frame location substantially aligned through the expanse with the other remote frame location;
coil means attached to the expanse of the diaphragm;
magnetic means for producing opposing magnetic fields extending normal to the expanse; and
connecting means for conducting electrical impulses to the coil means.

4,903,309

FIELD PROGRAMMABLE AIDED TARGET RECOGNIZER TRAINER

Edwin W. Wentworth; William C. Gerckes, both of Woodbridge; Stuart B. Horn, and John H. Buchbach, both of Fairfax, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 25, 1988, Ser. No. 198,799
Int. Cl.[4] G06K *9/00;* **H04N** *5/33*
U.S. Cl. 382—1 **5 Claims**



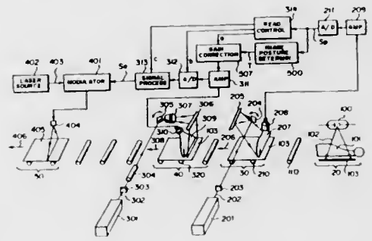
1. In an ATR having a target detector, a segmenter, and a Classifier; the improvement comprising:
a display means connected to said ATR to permit a human operator to view and understand the sequential operations performed by the ATR; and
a loop circuit cueing means coupling the output of said detector to the input thereof to permit said operator to cue targets and to circulate detected targets until the detector has stored and thereby recognizes only these targets cued by said operator.

4,903,310

METHOD OF AUTOMATICALLY DETERMINING IMAGED BODY POSTURE IN MEDICAL IMAGE DISPLAY

Hideya Takeo; Nobuyuki Tanaka, and Nobuyoshi Nakajima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Apr. 20, 1988, Ser. No. 183,954
Claims priority, application Japan, Apr. 20, 1987, 62-96701; Apr. 20, 1987, 62-96702; Apr. 20, 1987, 62-96703; Apr. 20, 1987, 62-96704; Apr. 20, 1987, 62-96705; Apr. 20, 1987, 62-96706
Int. Cl.[4] G03B *41/00*
U.S. Cl. 382—6 **6 Claims**



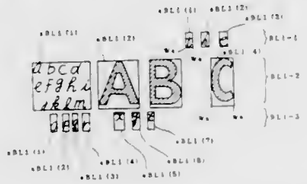
6. A method of determining the imaged posture of a medical image, comprising the steps of:
(i) generating a histogram of an image signal bearing a transmitted image of a human body;
(ii) determining the dispersion of said histogram; and
(iii) determining the imaged posture of said image based on said dispersion.

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4,903,311
CHARACTER REGION EXTRACTING METHOD AND APPARATUS CAPABLE OF IMPLEMENTING THE METHOD

Masahiro Nakamura, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed May 2, 1988, Ser. No. 189,403
Claims priority, application Japan, May 1, 1987, 62-108553; May 30, 1987, 62-135397
Int. Cl.[4] G06K *9/34*
U.S. Cl. 382—9 **17 Claims**



1. A character region extracting method for character recognition comprising the steps of;
segmentating a first region (BL1) from a document image by extracting projection of the document image in a first direction parallel to a character string and detecting a range in which the projection is continuous in a second direction perpendicular to the first direction, the range defining the first region;
segmentating a second region (sBL1) from the first region by extracting projection of the first region in the second direction and detecting a range in which the projection is continuous in the first direction, the range defining the second region; and
segmentating a third region (BL2) from the second region by extracting projection of the second region in the first direction and detecting a range in which the projection is continuous in the second direction, the range defining the third region.

4,903,312
CHARACTER RECOGNITION WITH VARIABLE SUBDIVISIONS OF A CHARACTER REGION

Gen Sato, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Continuation of Ser. No. 51,611, May 15, 1987, abandoned. This application Sep. 6, 1988, Ser. No. 241,825
Claims priority, application Japan, May 19, 1986, 61-114042; Oct. 20, 1986, 61-249159; Oct. 22, 1986, 61-251537
Int. Cl.[4] G06K *9/48*
U.S. Cl. 382—21 **51 Claims**

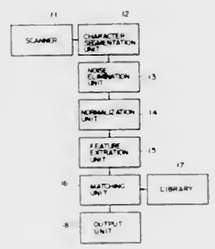


1. A character recognizing method, comprising the steps of:
optically reading an input character to be recognized to form a binary character image including at least one character line comprised of black pixels;
broadening said character line in accordance with a predetermined manner;
assigning a plurality of first features, different from one another, to each of pixels defining a contour of said binary character image depending on a local pattern of arrangement of black and white pixels along said contour;
counting said first features assigned to said character image;
subdiving said character image into a plurality of mesh sub-regions based on the count of said assigned first features;
extracting a second feature from each of said sub-regions to define a collection of extracted second features; and
identifying said input character by comparing said collection of extracted second features with each of a plurality of stored collections of second features for known characters and selecting one of said known characters, having a highest degree of similarity.

4,903,313
CHARACTER RECOGNITION METHOD

Michiyoshi Tachikawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jul. 2, 1987, Ser. No. 69,303
Claims priority, application Japan, Jul. 3, 1986, 61-156838; Jul. 8, 1986, 61-160647
Int. Cl.[4] G06K *9/56*
U.S. Cl. 382—27 **6 Claims**

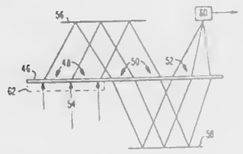


1. A character pattern recognition method comprising the steps of:
optocallly reading an original image to produce an image signal;
producing an individual input character pattern from said image signal;
extracting a predetermined feature vector from said input character pattern, said extracting step including subdividing said input character pattern into a first plurality of sub-regions in accordance with a first subdivision scheme such that predetermined feature quantities are distributed among the sub-regions substantially equally, and converting said first plurality of sub-regions into a second plurality of mesh regions in accordance with a second subdivision scheme by combining at least some of said first plurality of sub-regions into one or more of said mesh regions; and
comparing said feature vector of said input character pattern with each of the feature vectors of a plurality of known character patterns stored in a library, thereby selecting one of said plurality of known character patterns, which is closer to said input character pattern, thereby determining identification of said input character pattern.

4,903,314
SINGLE PLATE COMPACT OPTICAL CORRELATOR

John V. Fine, Goose Creek, S.C., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 31, 1988, Ser. No. 200,600
Int. Cl.[4] G06K *9/64;* **G03H** *1/02*
U.S. Cl. 382—31 **9 Claims**



1. A compact system for an optical correlator which optically compares an input image with optical information stored in a matched filter memory to provide identification and aspect information about the input image, comprising:
a. means for spatially modulating a reference beam of radiation with an input image to be analyzed to produce a spatially modulated radiation beam;
b. a unitary optical plate having recorded thereon at least one holographic lens, having the spatially modulated radiation beam incident thereon, for performing a Fourier transformation thereon to obtain at least one Fourier transform of the spatially modulated radiation beam, said unitary optical plate also having recorded thereon at least one matched filter, having the Fourier transform incident thereon, with each matched filter comprising a Fourier transform hologram of an aspect view of an object of interest and passing an optical correlation signal in dependence upon the degree of correlation of the Fourier transform of the spatially modulated radiation beam with the Fourier transform recorded by the matched filter;
c. at least one inverse Fourier transform lens receiving the optical correlation output of each matched filter, for performing an inverse Fourier transformation on each optical correlation output; and
d. a detector means for detecting the output of the at least one Fourier transform lens and for producing a detector output signal representative thereof.

4,903,315
APPARATUS FOR ENLARGING OR REDUCING AN IMAGE PATTERN

Norman A. Peppers, Belmont; James R. Young, Palo Alto, and Gerald A. Pierce, Redwood City, all of Calif., assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

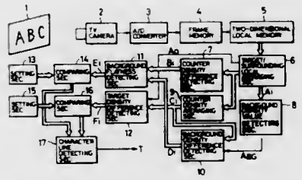
Continuation of Ser. No. 48,046, May 11, 1987, abandoned. This application May 19, 1989, Ser. No. 355,889
Int. Cl.[4] G06K *9/42*
U.S. Cl. 382—47 **8 Claims**

1. An apparatus for enlarging or reducing an image pattern, comprising:
substantially identical first and second image sensors for reading said image pattern with respective scanning frequencies along a predetermined scanning direction, said first and second image sensors each having sensors arranged in a row along said scanning direction;
means for relatively moving said image pattern in relation to said first and second image sensors in a direction different from said scanning direction;
means for calculating the size of said image pattern along the moving direction of said image pattern on the basis of the scanning frequency and an output of and from said first image sensor and the speed of moving said image pattern in relation to said first and second image sensors; and
means for controlling the scanning frequency of said second image sensor on the basis of the calculated size of said image pattern,
said second image sensor generating an output signal having a content representing that said image pattern is enlarged or reduced along said moving direction of said image pattern.

4,903,316
BINARIZING APPARATUS

Yasuo Hongo, and Kouichi Toyama, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed May 15, 1987, Ser. No. 50,220
Claims priority, application Japan, May 16, 1986, 61-110684; Nov. 21, 1986, 61-276709
Int. Cl.[4] G06K *9/38*
U.S. Cl. 382—52 **8 Claims**



1. A binarizing apparatus comprising:
image pickup means for converting an image of a line graphic or of characters, said image having a background, into electric signals;
A/D converter means for converting the electric signals into digital image signals;
frame memory means for storing the digital image signals from said A/D converter means;
square grating window generating means for receiving the stored digital image signals from said frame memory means, and for generating a square grating window, said square grating window having a target subwindow and a plurality of pairs of surrounding subwindows provided around said target subwindow, wherein each subwindow represents separated portions of the line graphic and wherein each subwindow pair has subwindows opposite each other;
first arithmetical operating means connected to said window generating means for arithmetically calculating an average density value for each of said target subwindow and said surrounding subwindows;
first extracting means connected to said first arithmetical operating means for extracting a background density value from the average density values of said surrounding subwindows;
second arithmetical operating means connected to said first arithmetical operating means for arithmetically calculating a counter density difference value between each pair of said surrounding subwindows opposite each other, and

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for arithmetically calculating an average density value for said each pair, said calculations being performed according to said average density values for each window of said pair from said first arithmetical operating means;

third arithmetical operating means for arithmetically calculating a background density difference value for each subwindow pair representing the difference between the average density value from said second arithmetical operating means and the background density value from said first extracting means;

second extracting means for extracting a background flatness value from the background density difference value for each subwindow pair from said third arithmetical operating means and the counter density difference value from said second arithmetical operating means;

fourth arithmetical operating means for arithmetically calculating a target density difference value for each subwindow pair represented by the difference value between the average density value for the target subwindow from said first arithmetical operating means and the average density value from said second arithmetical operating means;

first discriminating means for comparing the target density difference value for each subwindow pair from said fourth arithmetical operating means with a predetermined density difference lower limit value;

second discriminating means for comparing the background flatness value for each subwindow pair from said second extracting means with a predetermined flatness upper limit value; and

character line detecting means for receiving outputs from said first and second discriminating means and for determining whether the target subwindow belongs to a character line and for binarizing said received outputs according to said determination.

4,903,317

IMAGE PROCESSING APPARATUS

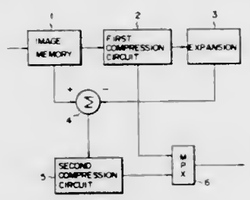
Eitaro Nishihara, Ootawara; Zhixiong Wu, and Yoshihiko Ogawa, both of Sapporo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 23, 1987, Ser. No. 66,073

Claims priority, application Japan, Jun. 24, 1986, 61-146059; Jun. 24, 1986, 61-146060; Jun. 24, 1986, 61-146061; Aug. 12, 1986, 61-189174; Nov. 14, 1986, 61-272366; Nov. 14, 1986, 61-272367; Nov. 21, 1986, 61-276644

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—56 **15 Claims**



1. An image data processing apparatus comprising:

image output means for outputting image data;

first compression means, for loss-compressing the image data from said image output means;

image data expansion means for expanding the image data compressed by said first compression means, to output expanded image data;

difference means, connected to said image data output means and said image data expansion means, for calculating a difference between the image data of said image output means and the expanded image data, and outputting difference image data;

second compression means, for compressing the difference image data output from said difference means; and

multiplexing means, connected to said first and second compression means, for multiplexing the loss-compressed image data and compressed difference image data; and

wherein

said first compression means comprises transformation means for orthogonal-transforming the image output from said image data output means, quantization means for quantizing the output of said transformation means and outputting the quantized data to said expansion means, and encoding means for encoding the quantized data of said quantization means and outputting encoded data to said multiplexing means.

4,903,318

ELECTRIC SWITCH SYSTEM FOR A POWER TOOL

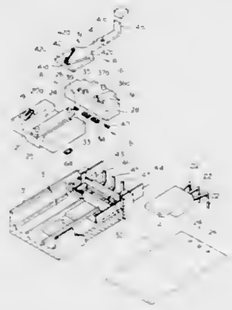
Kunio Nagata, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 14, 1988, Ser. No. 257,685

Claims priority, application Japan, Nov. 13, 1987, 62-288208; Nov. 14, 1987, 62-288228; Nov. 14, 1987, 62-288229

Int. Cl.[4] H02P *5/04*

U.S. Cl. 388—840 **6 Claims**



1. An electric switch system for a power tool which is powered by a DC motor, comprising:

a movable block adapted to be displaced within a range of movement, said range having a first position and a second position;

a fixed block arranged adjacent to said movable block;

a selection lever pivotally attached to said fixed block, said selection lever having a guide means engaging said movable block for guiding said selection lever so that said selection lever is manually rotatable from a neutral middle position to either side only when said movable block is in said first position, said guide means for angularly guiding said selection lever when said movable block is not in said first position;

a reversion control contact means which modulates the polarity of electric current supplied to the motor to one polarity if said selection lever is angularly displaced to one side and another polarity if said selection lever is displaced to an other side; and

a speed control slide contact means mounted on said movable block for modulating the magnitude of the electric current supplied to said motor with respect to the position of said movable block.

4,903,319

PORTABLE RADIO TELEPHONE HAVING POWER SAVER

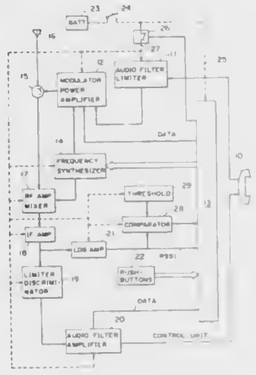
Yoshihiko Kasai, and Sotoaki Babano, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 23, 1987, Ser. No. 77,137

Claims priority, application Japan, Jul. 26, 1986, 61-174743

Int. Cl.[4] H04B *1/16*

U.S. Cl. 455—33 **10 Claims**



1. A battery-powered radio communication unit for use in a mobile telecommunication network covering a service area which is divided into a plurality of cells each having a cell site, comprising:

means for receiving signals from the cell sites and generating signals indicating respective strengths of the received signals;

processing means for detecting the strongest signal from said received signals in accordance with said strength indicating signals, comparing the detected strongest signal with a threshold corresponding to a signal strength at the boundary of said service area and generating a first output indicating that said portable radio communication unit is outside of said service area when said strongest signal is lower than said threshold or a second output indicating that said portable radio communication unit is inside of said service area when said strongest signal is higher than said threshold; and

battery saving means responsive to said first output for periodically interrupting the power supplies to power consuming portions of said communication unit.

4,903,320

APPARATUS FOR SELECTING CONTROL CHANNEL IN MOBILE COMMUNICATION SYSTEM

Tetsuya Hasawa, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 18, 1988, Ser. No. 169,880

Claims priority, application Japan, Mar. 20, 1987, 62-64150

Int. Cl.[4] H04Q *7/00*

U.S. Cl. 455—34 **8 Claims**

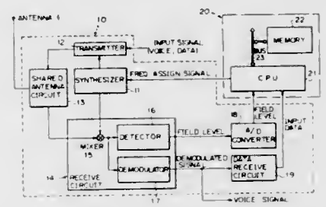
1. An apparatus provided in a mobile station for selecting dedicated control channels having a field level in a mobile communication system, said apparatus having a transmitting and receiving circuit, the mobile station being a subscriber to one of two mobile communication systems and can use the service of a nonsubscribed-to system when the service of a subscribed-to system is not available, said apparatus comprising:

first driving means for driving said transmitting and receiving circuit to scan the dedicated control channels of the subscribed-to system;

detecting means for detecting the field level of the scanned dedicated control channels;

determining means for determining whether at least one of the scanned dedicated control channels has a predetermined field level and is available;

setting means for setting said transmitting and receiving circuit to a state of waiting for an outgoing call and for an incoming call when said determining means determines



that one of the dedicated control channels has the predetermined field level and is available;

scan repeat means for driving said transmitting and receiving circuit to continue the scan of the dedicated control channels of the subscribed-to system for a predetermined time when none of the scanned dedicated control channels have the predetermined field level and are available;

second driving means for driving said transmitting and receiving circuit to scan the dedicated control channels of the non-subscribed-to system after said predetermined time has passed.

4,903,321

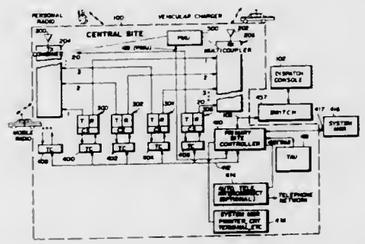
RADIO TRUNKING FAULT DETECTION SYSTEM

Nancy L. Hall, and David L. Hattey, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Aug. 14, 1987, Ser. No. 85,663

Int. Cl.[4] H04Q *9/02*; H04B *17/02*

U.S. Cl. 455—34 **7 Claims**



1. A digitally trunked radio communications system of the type having a control channel and plural working channels, said working channels being temporarily assigned for communication by radio units in response to digital control signals passed over said control channel, a method of testing the operation of said system comprising:

(a) continually monitoring digital control messages passed over said control channel with a testing radio transceiver;

(b) controlling, from a site controller, initiation of a test call sequence provided by said testing radio transceiver, including the steps of (b1) generating a test call message at said site controller, (b2) providing said generated test call message to said testing radio transceiver by passing said test call message from said site controller to said testing

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transceiver over a digital signal link connecting said testing transceiver to said site controller, and (b3) transmitting a digital call message over said control channel with said testing transceiver in response to said test call message provided to said testing transceiver, said call message requesting a working channel;

(c) receiving a working channel assignment message passed over said control channel;

(d) in response to receipt of said working channel assignment message, performing the following steps:

(1) tuning said testing transceiver to a working channel specified by said working channel assignment message,

(2) monitoring high speed signaling passed over said working channel,

(3) transmitting low-speed signaling over said working channel,

(4) monitoring low-speed signaling passed over said working channel, and

(5) receiving a drop channel message passed over said working channel; and

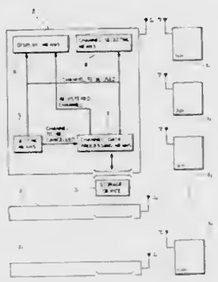
(e) applying a called results message indicating results of said step (d) monitoring to said site controller via said digital signal link.

4,903,322

APPARATUS FOR MANAGING CHANNELS OF RADIO COMMUNICATION SYSTEM

Kazuo Inahara, Saitama, and Junichi Igarashi, Tokyo, both of Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,348
Claims priority, application Japan, Feb. 23, 1987, 62-39944
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 455—34 **4 Claims**



1. A channel management apparatus for use in connection with a plurality of master radio communication units which perform communication with a plurality of slave radio communication units by selecting as desired one or more of a plurality of channels that are respectively pre-assigned to said plurality of slave radio communication units, said apparatus comprising;

a shared storage device capable of being set on each master unit and adapted to contain data on registered channels which correspond to all of channels used by said master units; and

a plurality of groups of means incorporated in each said master unit,

each of said groups of means including,

setting means for manually setting channels which are to be used by the corresponding master unit and the channels which are not to be used by said corresponding master unit;

display means for displaying usable or unusable channels and said channels registered by said corresponding master unit;

channel data processing means adapted to cause said display means to display as either usable or unusable channels, data on said registered channels by reading from said shared storage said data on said registered channels, said channel data processing means being capable of updating said data on said registered channels contained in said shared storage device using said data regarding said channels used and not used by said corresponding master unit; and

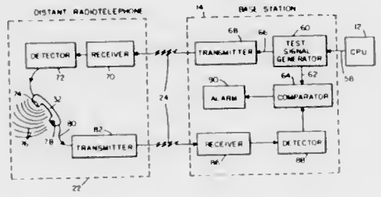
channel selecting means adapted to select, in accordance with said data on channels to be used, channels through which communication is to be performed.

4,903,323

CALL BOX

James R. Hendershot, Arroyo Grande, Calif., assignor to Signal Communications Corporation, Mandeville, La.

Division of Ser. No. 161,157, Feb. 26, 1988, Pat. No. 4,817,126.
This application Nov. 7, 1988, Ser. No. 267,982
Int. Cl.[4] H04B *17/00*; H04M *1/24*
U.S. Cl. 455—67 **8 Claims**



1. A method of testing a two-way radio communication channel between a base station and a distant radio telephone and noteworthy for not needing anyone to be present at the distant radio telephone, comprising the steps of:

(a) generating a test signal in the audio frequency range;

(b) transmitting the test signal from the base station to the distant radio telephone via the communication channel being tested;

(c) receiving at the distant radio telephone the test signal transmitted from the base station;

(d) detecting the test signal received by the radio telephone;

(e) applying the detected test signal to the earpiece of the radio telephone, whereby the earpiece produces a sound that is sensed by the mouthpiece and converted to an electrical signal;

(f) transmitting the electrical signal produced by the mouthpiece from the radio telephone to the base station via the communication channel being tested;

(g) receiving at the base station the electrical signal transmitted from the radio telephone;

(h) detecting the electrical signal received at the base station; and,

(i) deciding whether the detected electrical signal is similar to the test signal that was transmitted by the base station.

4,903,324

RING AROUND TRANSCEIVER

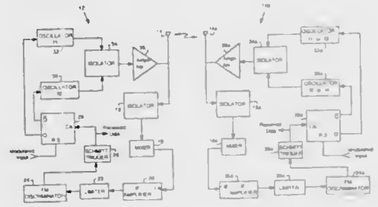
Thomas J. Warnagiris, San Antonio, Tex., assignor to Colin Electronics Co., Ltd., Komaki, Japan

Filed Feb. 1, 1988, Ser. No. 150,542
Int. Cl.[4] H04B *1/00*
U.S. Cl. 455—69 **18 Claims**

1. A communications system comprising:

a first transceiver comprising (a) a first signal source for producing a first output signal having either a first frequency or a second frequency; (b) means for controlling said signal source to cause said first output signal to have either said first or said second frequency; (c) means for receiving an input signal from a second signal source and for mixing said input signal with said first output signal of said first signal source to produce a first difference frequency determined by the relative difference between the frequency of said received input signal and the frequency of said first output signal; (d) first detector means responsive to said first difference frequency to cause said means for controlling said first signal source to cause said first output signal to shift from said first frequency to said second frequency;

a second transceiver comprising (e) a second signal source for producing a second output signal having either said first frequency or said second frequency; (f) means for controlling said second signal source to cause said second output signal to have either said first or said second frequency; (g) means for receiving the first output signal produced by said first signal source in said first transceiver and for mixing said received signal with said second output signal of said second signal source to produce a second difference frequency determined by the relative difference between said received signal and said second output signal; (h) second detector means responsive to said second difference frequency to cause said second output signal produced by said second signal source to change from said first frequency to said second frequency, said change from said first to said second frequency causing a detectable change in said first difference signal in said first transceiver thus defining a feedback data path between said first and said second transceiver.



4,903,325

PORTABLE WIRELESS COMMUNICATION APPARATUS

Kunitoshi Yoshitake; Yoshihiro Tsujita, and Hideyo Ono, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,494
Claims priority, application Japan, Jun. 30, 1987, 62-164763
Int. Cl.[4] H04B *1/38*
U.S. Cl. 455—89 **14 Claims**

1. A portable wireless communication apparatus comprising

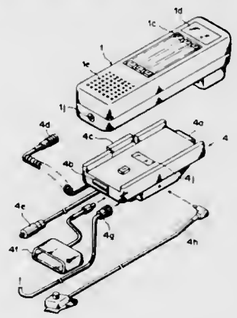
a substantially rectangular parallelopiped body having a top surface and a bottom surface wherein said top surface is provided with a key operating section, a display section and a speaker, whereas said bottom surface is provided with a transmitter section and a receiver section;

a collapsible antenna and a connector mounted to perspective longitudinal end surfaces of said body;

said bottom surface of the body having a battery pack seat between said transmitter section and said receiver section;

a battery pack removably attached to said battery pack seat; and

said battery pack seat being structured to engage an automobile passenger compartment support table when not attached to said battery pack and being powered from said support table.

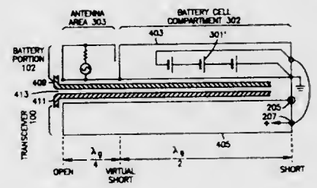


4,903,326

DETACHABLE BATTERY PACK WITH A BUILT-IN BROADBAND ANTENNA

Zdravko M. Zakman, Schaumburg, Ill., and Carl V. Novak, Pell Lake, Wis., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 27, 1988, Ser. No. 186,845
Int. Cl.[4] H04B *1/38*
U.S. Cl. 455—89 **10 Claims**



1. A portable radiotelephone having improved decoupling of conductive surfaces of the radiotelephone and antenna such than little antenna efficiency is lost when the portable radiotelephone is held in a user's hand, comprising:

a transceiver portion further comprising a first conductive surface;

a battery portion, detachable from said transceiver portion and having a housing and a second conductive surface within said housing, said second conductive surface disposed opposite said first conductive surface when said battery portion is attached to said transceiver portion;

an antenna, coupled to said transceiver portion and disposed within said detachable battery portion housing; and

a transmission line formed by said first conductive surface, said second conductive surface, and said housing disposed between said first conductive surface and said second conductive surface, said transmission line further having a short circuit between said first conductive surface and said second conductive surface thereby improving decoupling of radiotelephone conductive surfaces and antenna.

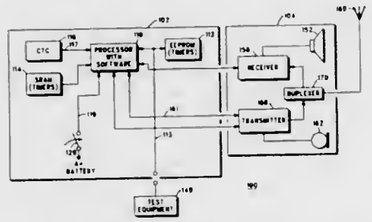
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4,903,327

CELLULAR TELEPHONE WITH TRANSMISSION-ON AND RADIO-ON TIMERS

Sharada Raghuram, Darien; Gary J. Pregout, Elgin; Les Updegrove, Schaumburg, and Thomas R. Klaus, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1989, Ser. No. 306,592
Int. Cl.[4] H04B *17/00*
U.S. Cl. 455—127 **4 Claims**



1. Timing apparatus for a radio switchably coupled to a battery and including a radio frequency (RF) signal transmitter, comprising:

means for repetitively generating an interrupt signal at a predetermined rate;

volatile memory means;

non-volatile memory means;

processing means coupled to the RF signal transmitter for generating a transmitter key signal to turn the RF signal transmitter on, and coupled to the battery for sensing when the battery is switched to and from the radio; when said battery is switched to the radio, said processing means responsive to the interrupt signal for incrementing and storing an interrupt timer in said volatile memory means, incrementing and storing a radio-on timer in said volatile memory means, and incrementing and storing a transmission-on timer in said volatile memory means when the transmitter key signal is generated; and when the battery is switched from the radio, said processing means reading out from the volatile memory means the radio-on timer and transmission-on timer, reading out from the non-volatile memory means a previously stored radio-on timer and transmission-on timer, adding the radio-on timer and transmission-on timer read out from the volatile memory means to the previously stored radio-on timer and transmission-on timer, respectively, read out from the non-volatile memory means, and storing the summed radio-on timer and transmission-on timer in said non-volatile memory means.

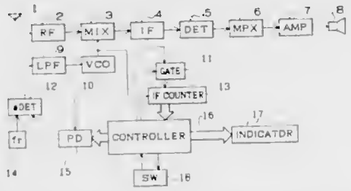
4,903,328

AUTOMATIC FREQUENCY SWEEPING METHOD FOR CONTROLLING A FREQUENCY SYNTHESIZING TYPE AUTOTUNER

Masaomi Ichikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 5, 1988, Ser. No. 215,476
Claims priority, application Japan, Jul. 3, 1987, 62-167254
Int. Cl.[4] H04B *1/16*
U.S. Cl. 455—165 **20 Claims**

1. An automatic frequency sweeping method for controlling a frequency synthesizing type autotuner for broadcasting receivers, in which said autotuner includes a phase locked loop for controllably generating a local oscillation signal, a mixer receiving a RF received signal and said local oscillation signal for generating an intermediate frequency signal, an intermediate frequency counter receiving said intermediate frequency signal through a gate, and a controller coupled to said phase locked loop, said intermediate frequency counter and said gate and also coupled with a key input used for providing an automatic frequency sweeping instruction, said controller responding to said automatic frequency sweeping instruction given through said key input so as to cause said phase locked loop to increment or decrement the frequency of said local oscillation signal, said controller operating to open said gate so as to allow said intermediate frequency signal to be inputted to said intermediate frequency counter so that said intermediate frequency signal is counted for a period in which said gate is opened, said controller also operating to examine whether or not a count value of said intermediate frequency counter is within a predetermined count range and to cause said phase locked loop to further increment or decrement said frequency of said local oscillation signal if said count value of the intermediate frequency counter is not within said predetermined count range, and said controller operating to cause said phase locked loop to stop the further increment or decrement of said frequency of said local oscillation signal if said count value of said intermediate frequency counter is within said predetermined count range, the method comprising a first intermediate frequency



counting method in which said intermediate frequency signal is counted by opening said gate for a relatively short first period of time and the presence of the received signal is judged when said count value of said intermediate frequency counter is within a first range corresponding to a relatively wide intermediate frequency width and a second intermediate frequency counting method in which said intermediate frequency signal is counted by opening said gate for a second period of time longer than said first period of time and the presence of the received signal is judged when said count value of said intermediate frequency counter is within a second range corresponding to an intermediate frequency width narrower than said relatively wide intermediate frequency width, wherein when said automatic frequency sweeping instruction is given through said key input, a high speed frequency sweeping is ordinarily executed by using said first intermediate frequency counting method, and when the presence of said received signal is judged by said first intermediate frequency counting method, a more precise judgment is made in accordance with said second intermediate frequency counting method.

4,903,329

CLAMPING CIRCUIT FOR A PLL TUNING SYSTEM

Charles J. Marik, Richmond, and Lawrence Eckland, Wheaton, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

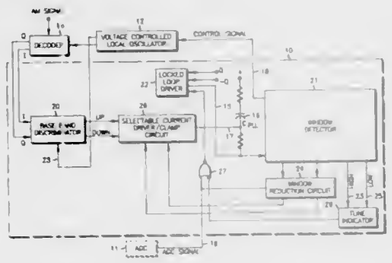
Filed Jun. 15, 1987, Ser. No. 61,757
Int. Cl.[4] H04B *1/16*
U.S. Cl. 455—182 **5 Claims**

3. In a receiver which includes sensor means for detecting a decrease in the level of a received signal, a clamping circuit for controlling the voltage coupled to the input of a VCO, comprising:

window detection means for sensing a change responsive to the frequency of said received signal in the voltage at the input of the VCO according to a predetermined threshold;

window reduction means, responsive to the sensor means, for altering the predetermined threshold; and

clamping means, responsive to said window detection means, for selectively controlling the voltage coupled to the input of the VCO,



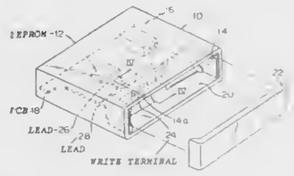
further including phase driver means, responsive to the sensor means, for controlling the voltage at the input of the VCO when the phase locked loop is locked to the received signal.

4,903,330

HOUSING STRUCTURE FOR PAGING RECEIVER

Tetsumi Ishiguro, Tokyo, and Kazumori Yamada, Shizuoka, both of Japan, assignors to NEC Corporation, Japan

Filed Jul. 7, 1988, Ser. No. 216,026
Claims priority, application Japan, Jul. 7, 1987, 62-167756
Int. Cl.[4] H04B *11/16*
U.S. Cl. 455—186 **7 Claims**



1. A housing structure for a paging receiver comprising:

a printed-circuit board on which are mounted at least a storage device for storing code and a write terminal for writing the code in the storage device;

a chamber for accommodating said printed-circuit board;

a battery chamber that is spaced from the printedcircuit board chamber by an internal separating wall and that has an opening to permit battery insertion and removal from the outside;

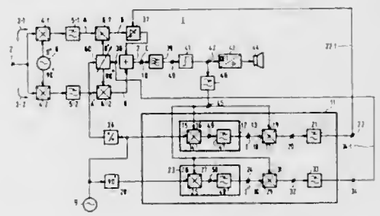
said internal separating wall having a window with an opening in said printed-circuit board chamber in proximity to the portion of said printed-circuit board on which said write terminal is mounted, and with a further opening in said battery chamber for allowing a connector of a writing apparatus to be inserted through the window and into contact with said write terminal.

4,903,331

QUADRATURE DETECTION RECEIVER WITH SEPARATE AMPLITUDE AND PHASE CONTROL

Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 6, 1988, Ser. No. 241,172
Claims priority, application European Pat. Off., Sep. 3, 1987, 87201668.8
Int. Cl.[4] H04B *1/16*
U.S. Cl. 455—207 **8 Claims**



1. A receiver for high frequency signals, comprising:

a first oscillator providing high frequency oscillator signals in a phase quadrature relationship, and oscillator means providing signals of a frequency f_2 in a phase quadrature relationship,

a pair of signal paths connected in parallel to an input, each signal path including a series arrangement including:

a first mixing stage receiving a respective one of said high frequency oscillator signals for down-conversion of received high frequency signals,

filtering means for selecting a down-converted signal from the respective mixing stage, and

a second mixing stage receiving the respective selected high frequency signal and a respective one of said signals of a frequency f_2 for up-conversion of the respective selected down-converted signal,

a superposition circuit connected to said second mixing stages for producing, at a signal output, an output signal containing two frequency components having a central frequency value equal to f_2 situated substantially centrally between them, and

a control signal arrangement comprising a pair of third mixing stages each having first and second mixing inputs and a mixing output, the two second mixing inputs being connected to said signal output for generating at the respective mixing output respective control signals for separately correcting undesired amplitude and phase differences in signal processing in said signal paths,

characterized in that said oscillator means comprises a second oscillator which produces phase quadrature oscillator signals having a frequency $2\times f_2$, and a divide-by-two divider between the second oscillator and the second mixing stages,

said control signal arrangement includes a pair of further mixing stages having respective third and fourth mixing inputs and further mixing outputs, said third mixing inputs each receiving a respective one of said signals having a frequency $2\times f_2$, and said fourth mixing inputs being connected to said signal output, for generating at each of the further mixing outputs a frequency-mirror signal containing two frequency components which are mirror-image components with respect to the two frequency components in said output signal, symmetrical about the frequency f_2, and

said further mixing outputs are coupled respectively to the third mixing inputs of said third mixing stages.

4,903,332

FILTER AND DEMODULATION CIRCUIT FOR FILTERING AN INTERMEDIATE FREQUENCY MODULATED SIGNAL CARRYING A MODULATION SIGNAL

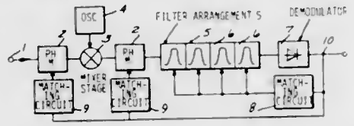
Jens Hansen, Berlin, Fed. Rep. of Germany, assignor to H.n.C. Electronik GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 881,470, Jun. 13, 1986, abandoned. This application Mar. 2, 1988, Ser. No. 163,272

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 3438286

Int. Cl.[4] H04B 1/16

U.S. Cl. 455—209 **4 Claims**



1. A filter and demodulator circuit for filtering a frequency-modulated signal carrying a modulation signal comprising:

an oscillator;

mixer means, controlled by the oscillator, for converting a first frequency signal into a second frequency signal having a lower intermediate frequency;

controllable filter means, having a resonant frequency and coupled to the mixer means, for narrow band pass filtering of the second frequency signal;

demodulator means, coupled to the filter means, for demodulating the filtered second frequency signal to recover a modulation signal therefrom;

matching circuit means, coupled to the output of the demodulator means, for deriving a control voltage from the modulation signal and for providing the control voltage as an output control signal to another input of the filter means to control the resonant frequency of the filter means; and

a first phase modulator means coupled to the filter means and a second phase modulator means connected ahead of the mixer means for modulating the second and first frequency signals, respectively, oppositely in-phase from the interfering phase modulation generated by a control loop delay in passing the signals from the filter means through the demodulator means and the matching circuit means to control the resonant frequency of the filter means.

4,903,333

APPARATUS FOR AUTOMATICALLY ADJUSTING LENGTH OF ANTENNA OF RADIO RECEIVER

Hideo Aizawa, Iwaki, Japan, assignor to Alpine Electronics Inc., Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 274,736

Claims priority, application Japan, Jan. 28, 1987, 62-17910

Int. Cl.[4] H04B 1/06

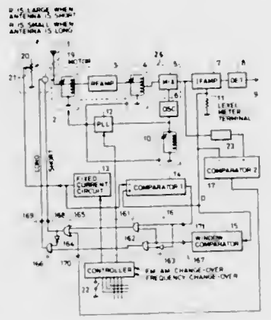
U.S. Cl. 455—269 **4 Claims**

1. An apparatus for automatically adjusting a length of an antenna for a radio receiver comprising:

first means coupled to an antenna through an amplifying means and coupled to a means for outputting a signal level corresponding to a length of said antenna, said first means for generating a first signal and a third signal, said first signal being generated when said first means detects a condition where a signal outputted by said amplifying means, corresponding to an intensity of an antenna input electric field, is below said signal level corresponding to a length of said antenna, said third signal being generated when said first means detects a condition where said signal outputted by said amplifying means is above said signal level corresponding to a length of said antenna;

second means coupled to said antenna through said amplifying means, said second means for detecting a condition that the signal outputted by said amplifying means is outside of an optimum range and, upon such detection, generating a second signal;

third means coupled to said antenna through said amplifying means so as to receive a signal containing interference at a first terminal and receive a signal containing substantially no interference at a second terminal, said third means for detecting a condition that radio wave interference is above a predetermined level and, upon such detection, generating a fourth signal and for detecting a condition



that said radio wave interference is below said predetermined level and, upon such detection, generating a fifth signal;

fifth means having input terminals coupled to outputs of said first, second, and third means, said fifth means including means mechanically coupled to said antenna for elongating and shortening said antenna, said fifth means for elongating said antenna in response to a simultaneous generation of the first, second, and fifth signals and for shortening said antenna in response to said fourth signal or a simultaneous generation of said second signal and said third signal.

4,903,334

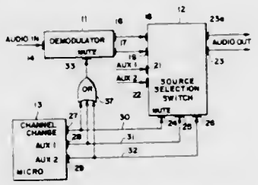
SYSTEM FOR PREVENTING CROSSTALK IN A MULTI-INPUT ELECTRONIC DEVICE

Mark R. Anderson, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed May 5, 1988, Ser. No. 190,136

Int. Cl.[4] H04B 1/10

U.S. Cl. 455—295 **7 Claims**



1. A system for preventing crosstalk between inputs of a device having a plurality of inputs, said system comprising:

a source of a first signal;

means for receiving a second signal;

control means for generating a selection control signal;

signal selection means coupled to said control means and having a first input coupled to said source of said first signal and a second input coupled to said means for receiving said second signal respectively, and being responsive to said selection control signal for selectively producing one of said first and second signals at an output; and

muting means coupled to said control means and to said source of said first signal and responsive to said selection control signal for generating a muting signal and applying said muting signal to said source of said first signal for muting said source of said first signal when said second signal is selected.

4,903,335

POWER-SAVING TYPE RECEIVER

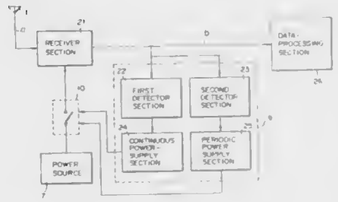
Giichiro Shimizu, Tokyo, Japan, assignor to Man Design Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1989, Ser. No. 298,044

Claims priority, application Japan, Jan. 25, 1988, 63-14053

Int. Cl.[4] H04B 1/16

U.S. Cl. 455—343 **18 Claims**



1. A receiver for receiving input signals and outputting detection signals, each of said input signals including a preamble, a data portion, and a postamble, said receiver comprising:

signal-receiving means for receiving the input signals and outputting the detection signals;

power source means connected to the signal-receiving means, for supplying power thereto;

first detector means connected to the signal-receiving means, for detecting the preamble of each input signal;

second detector means connected to the signal-receiving means, for detecting the end of the postamble of each input signal;

switch means connected between the signal-receiving means and the power source means;

power-supply means connected to the switch means and the first detector means, for turning on said switch means for a predetermined time, thereby to supply the power to the signal-receiving means through the switch means, when said first detector means detects the preamble of the input signal, said predetermined time being proportional to the length of the data portion of each input signal; and

periodic power-supply means connected to the switch means and the second detector means, for periodically turning on the switch means to supply the power periodically to the signal-receiving means when said second detector means detects the end of the postamble of each input signal.

4,903,336

TUNER WITH A TIMEPIECE

Masami Masuhara, Katano, and Akihito Shimahara, Osaka, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Apr. 26, 1988, Ser. No. 186,377

Claims priority, application Japan, Apr. 30, 1987, 62-107513

Int. Cl.[4] H04B 1/06

U.S. Cl. 455—344 **10 Claims**

1. A tuner with a timepiece, comprising:

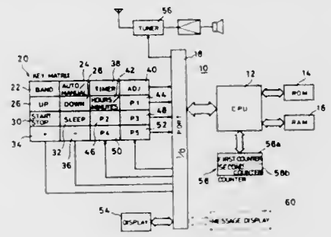
display means capable of being changed between a time displaying state and a frequency displaying state;

a first key group including a plurality of keys;

timepiece means responsive to said plurality of keys of said first key group for generating a time signal;

a second key group including a plurality of keys;

tuner means responsive to said plurality of keys of said second key group for demodulating a received broadcast signal;



means for inhibiting said tuner means from responding to a key-entry of said second key group when said display means is changed into said time displaying state; and

means responsive to an operation of a specific key included in said second group for changing said display means from said time displaying state to said frequency displaying state and for allowing said tuner means to respond to a key-entry of said second key group.

4,903,337

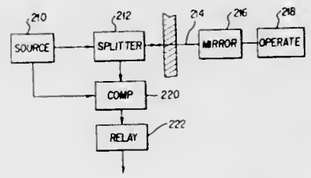
FIBER OPTIC TRANSCEIVER

Edwin R. Newell, Wake Forest; Terry E. Franks, Leicester, and Jinde Liu, Lenoir, all of N.C., assignors to Square D Company, Palatine, Ill.

Filed Sep. 9, 1988, Ser. No. 243,049

Int. Cl.[4] H04B 9/00

U.S. Cl. 455—605 **1 Claim**



1. A transceiver for a fiber optic switch that uses a single optical fiber to communicate with an operator-controlled mirror at a remote location, the mirror operable to reflect light from an end of the optical fiber, the transceiver comprising:

a. a pulse generator;

b. a light-emitting diode (LED) coupled to the pulse generator to produce pulsed light at a predetermined waveform, frequency and repetition rate;

c. a splitter coupled optically to the LED and to an end of the single optical fiber to launch the pulsed light in the optical fiber;

d. a photodiode connected to the splitter to respond to light entering the splitter from the optical fiber;

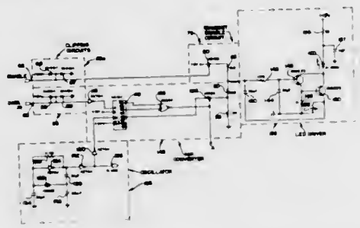
e. an amplifier connected to the photodiode to produce an electrical signal corresponding to an output of the photodiode;

f. a comparator connected to the amplifier and the pulse generator to produce an output pulse in response to a detected input pulse from each of the pulse generator and the amplifier;

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g. a counter connected to the comparator to count consecutive output pulses from the comparator and produce a counter output upon reaching a predetermined count; and
h. a relay connected to the counter to energize in response to the counter output.

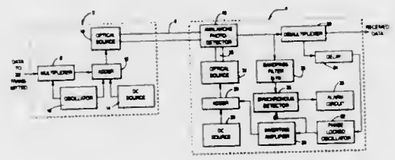
4,903,338
OPTICAL INTERFACE
Klaus E. Funke, San Rafael, Calif., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 931,578, Nov. 17, 1986, abandoned. This application Jan. 16, 1989, Ser. No. 368,134
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—607 **28 Claims**



1. An optical receiver, comprising:
light sensitive receiver means for receiving optical signals encoded with digital data comprising a plurality of optical pulses corresponding in time to selected state changes in said digital data and for producing electrical signals having pulses corresponding to said optical pulses;
peak pulse detector means responsive to the slope of said electrical signals for detecting peaks in said electrical signals and for generating peak detection output signals indicative of the occurrence of individual ones of the peaks of said pulses; and
means responsive to individual ones of said peak detection output signals for supplying output digital data pulses corresponding in time with each respective one of said peak detection output signals, said output digital data pulses forming a data output of said optical receiver, which data output is indicative of said encoded digital data.

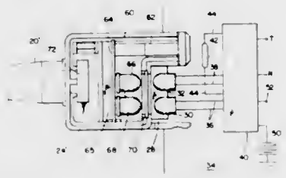
4,903,339
LOCALLY NULLED SINE-WAVE TOTAL POWER ALARM FOR INTRUSION DETECTING OPTICAL COMMUNICATIONS SYSTEMS
Harvey E. Solomon, Highland, Md., assignor to The United States of America as represented by the Director, National Security Agency, Fort George G. Meade, Md.
Filed Jun. 16, 1988, Ser. No. 209,144
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—612 **15 Claims**

1. An intrusion detection optical system, comprising
(a) first means for generating a combined multiplexed data and periodic subcarrier alarm waveform optical signal;
(b) optical fiber means connected with said first generating means for transmitting said combined signal; and
(c) means connected with said optical fiber means for receiving said combined signal, said receiving means including
(1) second means for generating a local optical signal including a periodic wave component matched with the periodic subcarrier alarm waveform of said transmitted combined signal;
(2) means for combining said transmitted and local optical signals to produce a composite output signal;
(3) filter means connected with said combining means for passing only non-zero periodic wave components from said composite output signal; and



(4) means connected with said filter means for detecting and indicating the presence of non-zero periodic wave components above a threshold value as a result of an intrusion into said optical fiber means.

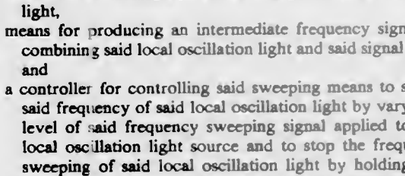
4,903,340
OPTICAL DATA CONNECTOR HAVING MAGNETIC INTERCONNECT SENSOR
Jay R. Sorensen, Aloha, Oreg., assignor to SpaceLabs, Inc., Bothell, Wash.
Filed Mar. 23, 1988, Ser. No. 172,326
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—617 **21 Claims**



18. A method of transferring digital data between first and second connectors and indicating when said first and second connectors are interconnected, said method comprising:
transmitting light from one of said connectors in accordance with said digital data;
detecting said light at the other of said connectors;
generating a magnetic field from said first connector; and
detecting said magnetic field at said second connector, thereby providing an indication that said first and second connectors are interconnected.

4,903,341
SEMICONDUCTOR OPTICAL HETERODYNE DETECTOR
Robert R. Rice, Florissant, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Dec. 28, 1987, Ser. No. 138,211
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—619 **4 Claims**

1. A semiconductor laser heterodyne detector, comprising:
(a) a semiconductor heterostructure means for generating optical radiation having connected thereto an optical signal input;
(b) forward biasing means for applying a variable voltage to a first electrode section covering approximately the length of a laser cavity of the semiconductor heterostructure to generate optical radiation that mixes with the optical input signal frequency creating an intermediate frequency;
(c) reverse biasing means for applying a reverse biased voltage to a second electrode covering a short section of the cavity of the semiconductor heterostructure means to



detect an output current consisting of ac and dc components at the intermediate frequency.

4,903,342
OPTICAL HETERODYNE HOMODYNE DETECTION APPARATUS
Shuntaro Yamazaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Oct. 27, 1988, Ser. No. 263,216
Claims priority, application Japan, Oct. 27, 1987, 62-271224
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—619 **2 Claims**
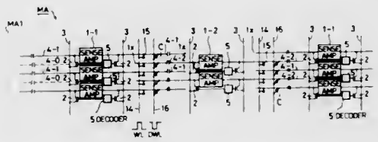


1. An optical heterodyne homodyne detection apparatus comprising:
means for sweeping a frequency of a local oscillation light emmitted from a local oscillation light source in accordance with a frequency sweeping signal,
means for scrambling polarization of at least one light selected from said local oscillation light and a signal light supplied from an optical transmitter in accordance with a scrambling signal,
means for controlling a polarization angle of said at least one light,
means for producing an intermediate frequency signal by combining said local oscillation light and said signal light, and
a controller for controlling said sweeping means to sweep said frequency of said local oscillation light by varying a level of said frequency sweeping signal applied to said local oscillation light source and to stop the frequency sweeping of said local oscillation light by holding said level of said frequency sweeping signal constant, when a predetermined channel is detected, and controlling said scrambling means to scramble said polarization of said at least one light by applying said scrambling signal to said scrambling means and to stop said polarization scrambling by cutting said scrambling signal simultaneously with said stopping of said frequency sweeping, and further controlling said polarization angle controlling means to control said polarization angle of said at least one light, thereby resulting in the coincidence of polarization between said local oscillation light and said signal light.

4,903,343
MAGNETIC DIGITAL DATA STORAGE SYSTEM
David B. Cope, Medfield, and Gary J. Spletter, Winthrop, both of Mass., assignors to MRAM, Inc., Medfield, Mass.
Filed Jan. 23, 1989, Ser. No. 299,304
Int. Cl.[4] G11C 11/08
U.S. Cl. 365—91 **18 Claims**

1. A digital data storage element comprising:
A. a magnetic core;
B. an input addressing portion comprising:
i. a laddic-shaped input addressing element having a pair of sidebars and plurality of rungs including an input rung, at least one addressing rung, and a distal rung;
ii. an input wire magnetically coupled to said input rung for generating an input flux signal in said addressing element having a direction related to a digital data value;
iii. an enabling wire magnetically coupled to said distal rung and said magnetic core for coupling magnetic flux from said distal rung to said magnetic core to generate flux in the magnetic core having a direction reflecting said digital data value;
iv. an input addressing wire magnetically coupled to said addressing rung for selectively receiving current to generate magnetic flux in said addressing rung to control coupling of said input flux signal at said input rung to said distal rung for coupling by said enabling wire, the level of said current and the respective dimensions and materials of the addressing rung, said input rung, said distal rung and said sidebars being selected so that the flux generated in the addressing rung substantially saturates the addressing rung, but not the input rung, the distal rung and the sidebars; and
C. an output element magnetically coupled to said magnetic core that detects transitions in magnetic flux in said magnetic core.

4,903,344
SEMICONDUCTOR MEMORY DEVICE WITH STAGGERED SENSE AMPLIFIERS
Hiroshi Inoue, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 6, 1988, Ser. No. 215,624
Claims priority, application Japan, Jul. 7, 1987, 62-168952
Int. Cl.[4] G11C 7/00, 11/40, 5/06
U.S. Cl. 365—51 **8 Claims**



1. A semiconductor memory device of an open bit line configuration, comprising:
a plurality of memory cells arranged in rows and columns;
a plurality of periodically spaced, vertically-extending word

lines for performing row selection of said plurality of memory cells;

a plurality of sense amplifiers arranged in rows and columns, each of said sense amplifiers respectively having an open bit line composed of a left bit line portion and a right bit line portion, said left and right bit line portions extending horizontally in opposite directions from the respective said sense amplifier for performing column selection of said plurality of memory cells; the sense amplifiers within each column being separated from each other by a predetermined vertical distance and the sense amplifiers within each row being separated from each other at a periodic spacing;

each of said open bit lines in corresponding rows in alternate columns being at substantially the same height, and each of said open bit lines in adjacent columns in corresponding adjacent rows being staggered in a vertical direction relative to each other by about half said predetermined vertical distance

the left bit line portions of the sense amplifiers which are disposed in a single column overlapping in a vertical direction with the right bit line portions of the sense amplifiers which are disposed in an adjacent column; each of said left and right bit line portions of the sense amplifiers which are disposed in a single column terminating such that they do not overlap in the vertical direction with the sense amplifiers which are disposed in an adjacent column.

DESIGN PATENTS

GRANTED FEB. 20, 1990

ERRATA

For CLASS	See PATENT NO.
D20-005	306,092
D12-157	306,191

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DESIGNS

FEBRUARY 20, 1990

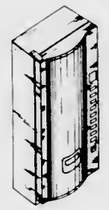
306,090
BRIEF
Robert C. Burneka, 4944 Lansdowne Rd., Fredericksburg, Va. 22401
Filed Jun. 22, 1987, Ser. No. 64,796
Term of patent 14 years
U.S. Cl. D2—10



306,091
MOSQUITO NET JACKET
Kenneth J. Nykolaychuk, Sherwood Park, Canada, assignor to Lazar Sports Manufacturing Inc., Edmonton, Canada
Filed Mar. 5, 1987, Ser. No. 23,044
Term of patent 14 years
U.S. Cl. D2—185



306,092
VENDING MACHINE
Donald C. Rockola, Chicago, Ill., assignor to Rock-Ola Manufacturing Corporation, Addison, Ill.
Filed Feb. 1, 1989, Ser. No. 305,486
Term of patent 14 years
U.S. Cl. D20—5



306,093
UMBRELLA
Karl D. Lerch, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jul. 8, 1987, Ser. No. 70,885
Term of patent 14 years
U.S. Cl. D3—5

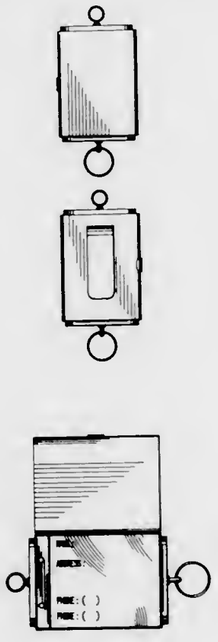


306,094
TRAVELER'S TOILETRIES CONTAINER
Charles D. Carmichael, P.O. 150, Escondido, Calif. 92025
Filed Nov. 19, 1986, Ser. No. 932,391
Term of patent 14 years
U.S. Cl. D3—39

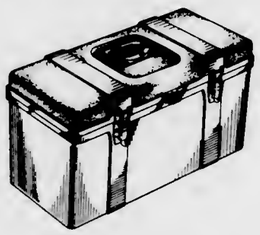


255-672 - 90 - 22

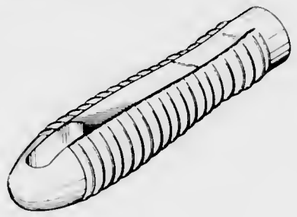
306,095
COMBINED PHONE NUMBER AND ADDRESS CASE WITH CAR KEY RING
Byok N. Kim, 234 Fairview Ave., #207, Glendale, Calif. 91202
Filed Sep. 18, 1987, Ser. No. 98,140
Term of patent 14 years
U.S. Cl. D3—62



306,096
TOOL BOX
Thomas Dickinson, St. Louis, Mo., and Joe E. Le Grand, Granite City, Ill., assignors to Contico International Company, St. Louis, Mo.
Filed Oct. 3, 1986, Ser. No. 916,043
Term of patent 14 years
U.S. Cl. D3—72



306,097
BRUSH HANDLE
Eric Gingras, Cross Junction, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Dec. 3, 1987, Ser. No. 127,968
Term of patent 14 years
U.S. Cl. D4—138

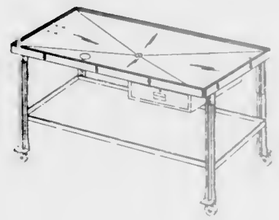


306,098
SPACE-DIVIDER PANEL FOR USE PRIMARILY IN AN OFFICE
Jane L. Jones, Park Township, Ottawa County, and Douglas J. Maat, Holland, both of Mich., assignors to Haworth, Inc., Holland, Mich.
Filed Oct. 7, 1986, Ser. No. 916,445
Term of patent 14 years
U.S. Cl. D6—332

306,099
CHILD'S SAFETY SEAT FOR AN AUTOMOBILE
Kenzou Kasai, Osaka, Japan, assignor to Aprica Kasai Kabushikikaisha, Osaka, Japan
Filed Nov. 18, 1986, Ser. No. 932,896
Claims priority, application Japan, May 20, 1986, 61-19282
Term of patent 14 years
U.S. Cl. D6—333



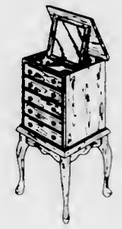
306,100
TRANSMISSION TABLE TOP
Adolph H. Wende, St. Louis, Mo., assignor to Shure Manufacturing Corporation, St. Louis, Mo.
Filed Mar. 2, 1987, Ser. No. 20,644
Term of patent 14 years
U.S. Cl. D6—398



306,101
COMBINED TABLE WITH LAMP
Paolo Borsani, Milan, Italy, assignor to Tecno S.p.A. Mobili e Forniture per Arredamento, Milan, Italy
Filed Mar. 13, 1987, Ser. No. 25,792
Claims priority, application Italy, Sep. 15, 1986, 23023/86[U]
Term of patent 14 years
U.S. Cl. D6—399



306,102
JEWELRY ARMOIRE
Peter M. Yau Kee, Flat 1002, Block A, 10th Floor, Lotto Villa, 18 Broadwood Road, Happy Valley, Hong Kong
Filed Apr. 25, 1989, Ser. No. 343,514
Term of patent 14 years
U.S. Cl. D6—440



306,103
RACK FOR APPAREAL OR THE LIKE
William D. Arnold, St. Louis County, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.
Filed Apr. 30, 1987, Ser. No. 44,135
Term of patent 14 years
U.S. Cl. D6—462

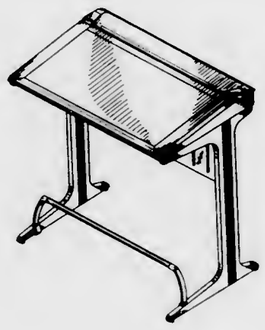


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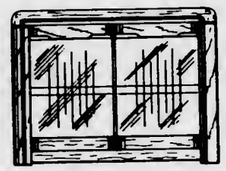
306,104
BATHROOM TOILET TISSUE DISPENSER
Louis A. Merdic, 1110 Wilshire Dr., Youngstown, Ohio 44511
Filed Mar. 2, 1988, Ser. No. 163,072
Term of patent 14 years
U.S. Cl. D6—523



306,105
DESK
Thomas J. Newhouse, Grand Rapids, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Jun. 2, 1987, Ser. No. 57,824
Term of patent 14 years
U.S. Cl. D6—420



306,106
CABINET OR SIMILAR ARTICLE
Paul S. Bush, Lakewood, N.Y.; Richard Bova, Corry, Pa., and Bruce Anderson, Jamestown, N.Y., assignors to Bush Industries, Inc., Jamestown, N.Y.
Division of Ser. No. 835,453, Mar. 3, 1986, Pat. No. Des. 301,814. This application Oct. 31, 1988, Ser. No. 264,781
Term of patent 14 years
U.S. Cl. D6—432







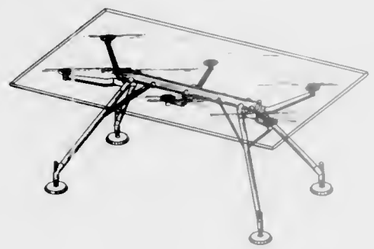
306,107
TABLE
Raymond Grosfillex, Arbent, 01107 Oyonnax, France
Filed Jan. 23, 1987, Ser. No. 6,643
Claims priority, application Int'l Pat. Institute, Jul. 23, 1986, DM/007259
Term of patent 14 years
U.S. Cl. D6—480



306,108
TABLE
Raymond Grosfillex, Arbent, 01107 Oyonnax, France
Filed Jan. 23, 1987, Ser. No. 6,635
Claims priority, application Hague, Jul. 23, 1986, DM/007259
Term of patent 14 years
U.S. Cl. D6—485



306,109
TABLE
Paolo Borsani, Milan, Italy, assignor to Tecno S.p.A. Mobilie Forniture per Arredamento, Milan, Italy
Filed Mar. 13, 1987, Ser. No. 25,791
Claims priority, application Italy, Sep. 15, 1986, 23024 B/86
Term of patent 14 years
U.S. Cl. D6—487



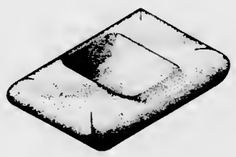
306,110
OBJECT SUPPORT RACK
Alex Thompson, 1713 Rubland Ave., and Russell L. Thompson, 113 - 35th St., Apt. B, both of Manhattan Beach, Calif. 90266
Filed Jun. 29, 1987, Ser. No. 67,093
Term of patent 14 years
U.S. Cl. D6—513



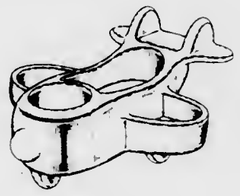
306,111
COFFEE MUG
Sharon A. Fleming, and Colleen A. Wheeler, both of St. Paul, Minn., assignors to Plastics, Inc., St. Paul, Minn.
Filed Jul. 15, 1987, Ser. No. 73,628
Term of patent 14 years
U.S. Cl. D7—9



306,112
ORTHOPEDIC CERVICAL PILLOW
Audre C. Forsland, 300 Liberty St. N.E., Minneapolis, Minn. 55432
Filed Jan. 12, 1987, Ser. No. 2,500
Term of patent 14 years
U.S. Cl. D6—601

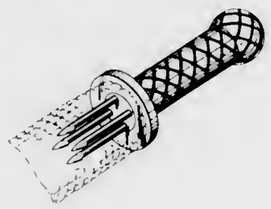


306,113
FOOD TRAY OR SIMILAR ARTICLE
Leonard C. McCarron, Asharoken, N.Y., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.
Filed Jun. 22, 1987, Ser. No. 64,601
Term of patent 14 years
U.S. Cl. D7—5



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306,114
CORN COB HOLDER
Stanley Moll, 14-6 Granada Crescent, White Plains, N.Y. 10603
Filed Feb. 9, 1987, Ser. No. 12,200
Term of patent 14 years
U.S. Cl. D7—42



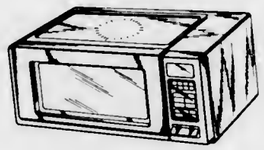
306,115
SPATULA
Larry G. Zimmerman, North Smithfield, R.I., assignor to Dart Industries, Inc., Deerfield, Ill.
Division of Ser. No. 847,608, Apr. 1, 1986, Pat. No. Des. 301,533. This application Apr. 21, 1989, Ser. No. 341,330
Term of patent 14 years
U.S. Cl. D7—102



306,116
FORK
Larry G. Zimmerman, North Smithfield, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Division of Ser. No. 847,608, Apr. 1, 1986, Pat. No. Des. 301,533. This application Apr. 21, 1989, Ser. No. 341,329
Term of patent 14 years
U.S. Cl. D7—106



306,117
COMBINED MICROWAVE OVEN AND ELECTRIC HEATER COOK TOP
Kensuke Mizuma; Masuo Ichihara, both of Nara, and Katsutoshi Kido, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 13, 1987, Ser. No. 121,769
Claims priority, application Japan, May 15, 1987, 62-19219
Term of patent 14 years
U.S. Cl. D7—351

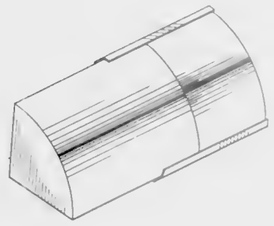




306,118
COFFEE MAKER WARMER PLATE COVER OR SIMILAR ARTICLE
Raul Guerrero, 829 Leslie, Coppell, Tex. 75019
Filed Mar. 9, 1987, Ser. No. 23,310
Term of patent 14 years
U.S. Cl. D7—397



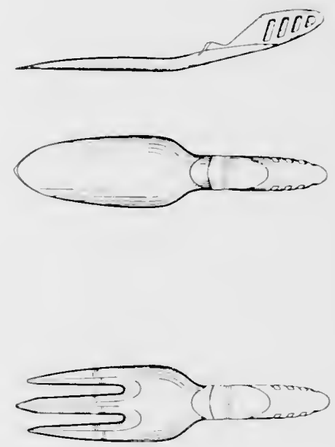
306,119
PROTECTIVE SHIELD FOR STOVE KNOBS
Albert Stockman, and James E. Stockman, both of 9442 N. Custer Rd., Free Soil, Mich. 49411
Filed Aug. 6, 1987, Ser. No. 82,369
Term of patent 14 years
U.S. Cl. D7—406



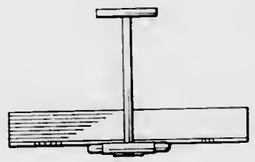
306,120
GRASS SHEARS
Kimikazu Ishida, and Tsuneo Ishida, both of Miki, Japan, assignors to Suboten Company Ltd., Hyogo, Japan
Filed Feb. 26, 1988, Ser. No. 162,347
Claims priority, application Japan, Dec. 24, 1987, 62-53047
Term of patent 14 years
U.S. Cl. D8—5



306,121
GARDEN HAND TOOL
Gianfranco Roman, Pasiano, Italy, assignor to Claber S.p.A., Italy
Filed Dec. 2, 1987, Ser. No. 127,697
Claims priority, application Italy, Jun. 12, 1987, 21795B/87
Term of patent 14 years
U.S. Cl. D8—10

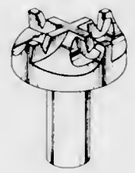


306,122
SHOVEL
Bonnie J. Snyder, 2063 S. Franklin St., Denver, Colo. 80210
Filed Dec. 14, 1988, Ser. No. 284,459
Term of patent 14 years
U.S. Cl. D8—10

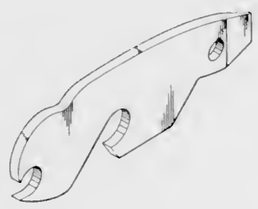


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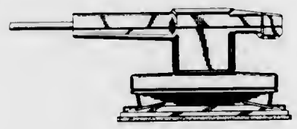
306,123
TRIMMING AND DEBURRING TOOL FOR GUN CARTRIDGE CASES
Delvin W. Ramsey, R.R. 6, Box 383, Harrison, Ark. 72601
Filed Dec. 2, 1985, Ser. No. 803,580
Term of patent 14 years
U.S. Cl. D8—14



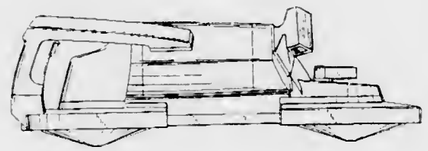
306,124
CARBONATED BEVERAGE CAN OPENER
Michael D. Hollien, Forest Grove, Oreg., assignor to Springhill Company, Gaston, Oreg.
Filed Nov. 18, 1986, Ser. No. 931,720
Term of patent 14 years
U.S. Cl. D8—18



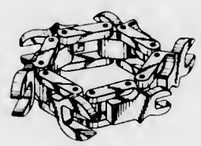
306,125
ELECTRIC SANDER
Robert I. Somers, Raleigh, N.C., assignor to Black & Decker, Inc., Newark, Del.
Filed Apr. 2, 1984, Ser. No. 595,612
Term of patent 14 years
U.S. Cl. D8—62



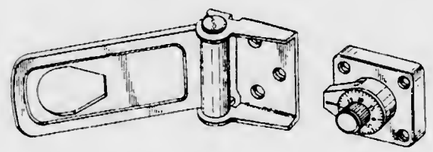
306,126
PORTABLE BANDSAW
Robert W. Arehart, Downers Grove, and Raymond W. Peeler, Chicago, both of Ill., assignors to Greenlee Textron Inc., Rockford, Ill.
Filed Jan. 20, 1987, Ser. No. 5,529
Term of patent 14 years
U.S. Cl. D8—64



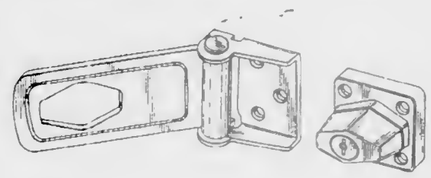
306,127
COLLAPSIBLE WRENCH SET
Charles H. Graham, deceased, late of Lava Hot Springs, Id., and by Scott H. Hogan, special administrator, Bountiful, Utah, assignors to Chain-Tool Company, Inc., North Salt Lake, Utah
Filed Dec. 31, 1986, Ser. No. 910
Term of patent 14 years
U.S. Cl. D8—105



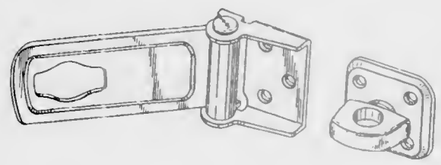
306,128
HASP-TYPE LATCH
Louis G. Bobrowski, Berlin; Walter J. MacFarlane, Kensington, and Richard L. Valenti, New Britian, all of Conn., assignors to The Stanley Works, New Britian, Conn.
Division of Ser. No. 16,234, Feb. 19, 1987, Pat. No. Des. 301,971. This application Jan. 9, 1989, Ser. No. 294,586
Term of patent 14 years
U.S. Cl. D8—338



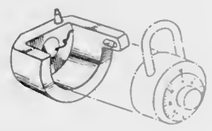
306,129
HASP-TYPE LATCH
Louis G. Bobrowski, Berlin; Walter J. MacFarlane, Kensington, and Richard L. Valenti, New Britian, all of Conn., assignors to The Stanley Works, New Britian, Conn.
Division of Ser. No. 16,234, Feb. 19, 1987, Pat. No. Des. 301,971. This application Jan. 9, 1989, Ser. No. 294,582
Term of patent 14 years
U.S. Cl. D8—338



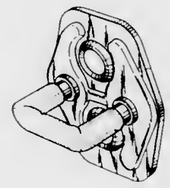
306,130
HASP-TYPE LATCH
Louis G. Bobrowski, Berlin; Walter J. MacFarlane, Kensington, and Richard L. Valenti, New Britian, all of Conn., assignors to The Stanley Works, New Britian, Conn.
Division of Ser. No. 16,234, Feb. 19, 1987, Pat. No. Des. 301,97. This application Jan. 9, 1989, Ser. No. 294,585
Term of patent 14 years
U.S. Cl. D8—338



306,131
ILLUMINATED HOLDER FOR COMBINATION PADLOCKS
David M. Coffman, 1235 E. Plymouth St., Glendora, Calif. 91740
Filed Jun. 26, 1987, Ser. No. 66,640
Term of patent 14 years
U.S. Cl. D8—343



306,132
STRIKER PLATE FOR AN AUTOMOBILE DOOR LOCK
Hitoshi Nakamura; Haruo Mochida, and Yoshio Watanuki, all of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd. and Nissan Motor Co., Ltd., both of Kanagawa, Japan
Filed Aug. 3, 1988, Ser. No. 227,711
Term of patent 14 years
U.S. Cl. D8—345

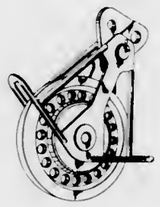


306,133
DISK-DRIVE/CONTROLLER CARD MOUNTING BRACKET
Derek J. Zupancic, 21935 Ventura Blvd., Woodland Hills, Calif. 91364
Filed May 5, 1986, Ser. No. 859,776
Term of patent 14 years
U.S. Cl. D8—354



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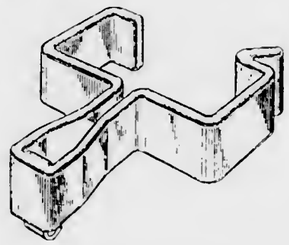
306,134
PULLEY-TYPE BEARING BLOCK OR SIMILAR ARTICLE
Peter O. Harken, Pewaukee; Gregory W. Hartlmeier, Milwaukee, and David J. Swandt, Hartford, all of Wis., assignors to Vanguard, Inc., Pewaukee, Wis.
Filed Jul. 7, 1986, Ser. No. 882,710
Term of patent 14 years
U.S. Cl. D8—360



306,135
CASTOR FOR SUITCASE OR SIMILAR ARTICLE
Yee-Juang Lia, No. 39, Lane 395, Shui Yuan Rd., Feng Yuan City, Taichung Hsien, Taiwan
Filed Dec. 24, 1986, Ser. No. 947,764
Term of patent 14 years
U.S. Cl. D8—375



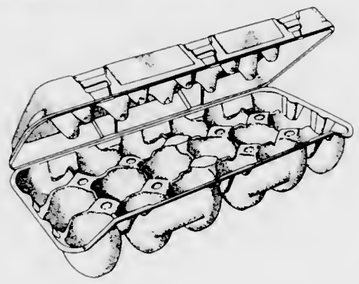
306,136
LADDER RAIL CLAMP
Ordell R. Lund, 1915 E. 9th St., Duluth, Minn. 55812
Filed Sep. 3, 1987, Ser. No. 92,706
Term of patent 14 years
U.S. Cl. D8—395



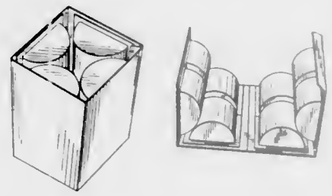
306,137
AEROSOL CONTAINER
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan
Filed Dec. 11, 1986, Ser. No. 941,961
Term of patent 14 years
U.S. Cl. D9—300



306,138
EGG CARTON
Wayne L. Congleton, Walnut, and Joe R. Payne, La Habra, both of Calif., assignors to Dolco Packaging Corporation, DE
Filed Jul. 24, 1987, Ser. No. 77,541
Term of patent 14 years
U.S. Cl. D9—341



306,139
MULTI-UNIT CONTAINER
Christophe Bridel, Reanes, France, assignor to Laiteries E. Bridel, Retiers, France
Filed Nov. 18, 1987, Ser. No. 122,423
Claims priority, application France, May 19, 1987, 87 2948
Term of patent 14 years
U.S. Cl. D9—341



306,140
JUG
Keith A. Chambers, and John W. Bradbard, both of Los Angeles, Calif., assignors to McKesson Corporation, San Francisco, Calif.
Filed Feb. 6, 1987, Ser. No. 11,674
Term of patent 14 years
U.S. Cl. D9—376



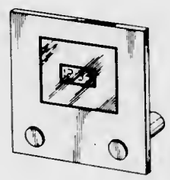
306,141
PACKAGE FOR MEDICAL INSTRUMENT
Richard H. McFarlane, Geneva, Ill., assignor to Taut, Inc., Geneva, Ill.
Filed Jun. 17, 1987, Ser. No. 62,985
Term of patent 14 years
U.S. Cl. D9—424



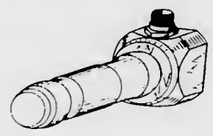
306,142
TWO LITER BOTTLE HANDLE
Charles H. Dye, Rte. 4, Box 237, Lenoir City, Tenn. 37771
Filed Oct. 19, 1987, Ser. No. 110,652
Term of patent 14 years
U.S. Cl. D9—434



306,143
CLOCK
David C. H. Leung, Quarry Bay, Hong Kong, assignor to Langfield Electronics Co., Ltd., Quarry Bay, Hong Kong
Filed May 23, 1986, Ser. No. 867,265
Claims priority, application United Kingdom, Nov. 25, 1985, 1030686
Term of patent 14 years
U.S. Cl. D10—15



306,144
LOAD HAULING VEHICLE HITCH PIN TRANSDUCER FOR ELECTRONIC LOAD WEIGHING
Rolf P. Häggström, 41 Washington Green, East Walpole, Mass. 02023
Filed Oct. 16, 1986, Ser. No. 919,820
Term of patent 14 years
U.S. Cl. D10—83

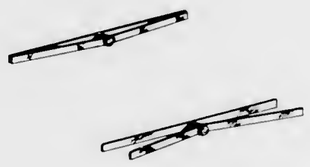


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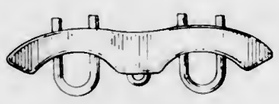
306,145
JEWELRY CHAIN
Disegna Giuseppe, Via Leonardo Da Vinci, 13, Romano D'Ezzelino, Italy, assignor to D. Chabbott, Inc., New York, N.Y.
Filed Jan. 26, 1988, Ser. No. 149,073
Claims priority, application Italy, Nov. 20, 1987, 64353/87[U]
Term of patent 14 years
U.S. Cl. D11—14



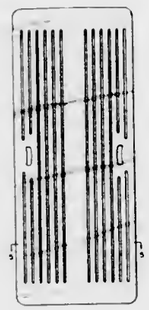
306,146
COLLAR BAR
George W. Graham, 14 Meadows La., Apt. 9, Bridgewater, Mass. 02324
Filed Nov. 25, 1985, Ser. No. 806,356
Term of patent 14 years
U.S. Cl. D11—214



306,147
TIE TAC OR SIMILAR ARTICLE
William H. Ross, 700 Mississippi Dr., Waynesboro, Miss. 39367
Filed Jun. 10, 1987, Ser. No. 60,369
Term of patent 14 years
U.S. Cl. D11—223



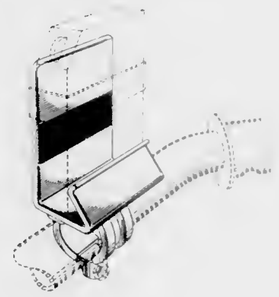
306,148
PATENT TRANSFER DEVICE
Edward J. Dunnals, Keysborough, and George E. Wood, Safety Beach, both of Australia, assignors to Drewson International Pty. Ltd., Victoria, Australia
Filed Dec. 3, 1987, Ser. No. 128,514
Term of patent 14 years
U.S. Cl. D12—128



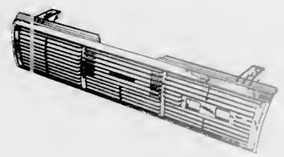
306,149
BABY CARRIAGE
Keuzou Kasai, Osaka, Japan, assignor to Aprica Kasai Kabushikikaisha, Osaka, Japan
Filed Dec. 31, 1987, Ser. No. 139,937
Claims priority, application Japan, Jul. 23, 1987, 62-29917
Term of patent 14 years
U.S. Cl. D12—129



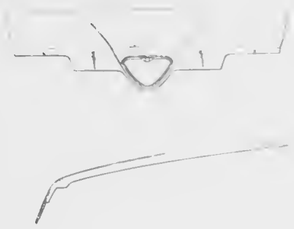
306,150
BICYCLE RADIO HOLDER
James E. Macke, P.O. Box 3455, Cincinnati, Ohio 45201
Filed Sep. 8, 1987, Ser. No. 93,686
Term of patent 14 years
U.S. Cl. D12—158



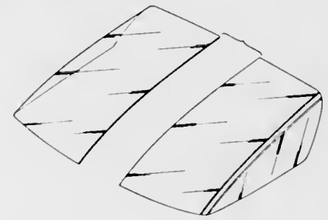
306,151
AUTOMOBILE GRILL
Tadahisa Koga, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Feb. 28, 1986, Ser. No. 838,003
Claims priority, application Japan, Sep. 21, 1985, Des.60-39822
Term of patent 14 years
U.S. Cl. D12—163



306,152
FRONT HOOD PANEL FOR AUTOMOTIVE VEHICLE
Giorgio Guelfi; Franco Mendicino, and Renato Pasquali, all of Milan, Italy, assignors to Alfa Lancia Industriale S.r.l., Milan, Italy
Filed Feb. 25, 1987, Ser. No. 18,987
Term of patent 14 years
U.S. Cl. D12—173



306,153
PAIR OF WINDOWS FOR THE ROOF OF A VAN OR SIMILAR VEHICLE
Oyvind Haugestad, 67746 Klinger Lake Rd., Sturgis, Mich. 49091, assignor to Oyvind Haugestad, Sturgis, Mich.
Filed Mar. 10, 1987, Ser. No. 24,222
Term of patent 14 years
U.S. Cl. D12—183



306,154
BICYCLE WHEEL COVER
Roger M. Berg, 8025 SW. 185th Ave., Beaverton, Oreg. 97007
Continuation-in-part of Ser. No. 898,434, Aug. 20, 1986, Pat. No. Des. 293,233. This application Oct. 6, 1987, Ser. No. 118,338
The portion of the term of this patent subsequent to Dec. 15, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—204

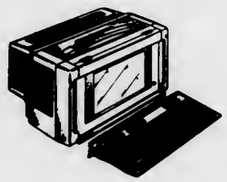


306,155
FACE PANEL FOR ELECTRICAL APPARATUS
John P. Stahler, La Jolla; David B. Hartley, San Diego, and Stephen O. Ross, Del Mar, all of Calif., assignors to Robot Research, Inc., San Diego, Calif.
Filed Aug. 29, 1988, Ser. No. 238,573
Term of patent 14 years
U.S. Cl. D13—35

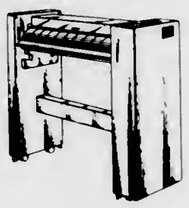


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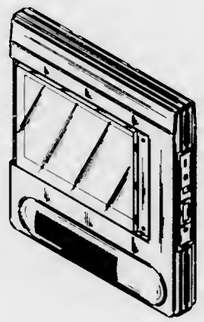
306,156
PORTABLE COMPUTER
Stephen M. Myers, Hockley, and Richard V. Haner, Houston, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Continuation-in-part of Ser. No. 944,600, Dec. 19, 1986. This application Nov. 25, 1987, Ser. No. 125,444
Term of patent 14 years
U.S. Cl. D14—106



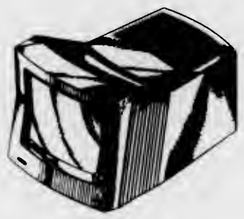
306,157
DRAFTING PLOTTER
Barton D. Davis, Fort Bragg; David W. Leong, San Diego, and Richard N. Tverdoch, Leucadia, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 26, 1987, Ser. No. 19,404
Term of patent 14 years
U.S. Cl. D14—107



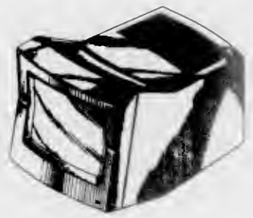
306,158
LIQUID CRYSTAL DISPLAY FOR COMPUTER
Kazuhiko Ashihara, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 30, 1987, Ser. No. 44,456
Claims priority, application Japan, Nov. 4, 1986, 61-43560
Term of patent 14 years
U.S. Cl. D14—113



306,159
VISUAL DISPLAY
Kenneth H. Grange, and Johan C. Santer, both of London, England, assignors to Reuters Limited, London, England
Filed Apr. 4, 1986, Ser. No. 850,354
Claims priority, application United Kingdom, Oct. 11, 1985, 1029791
Term of patent 14 years
U.S. Cl. D14—113



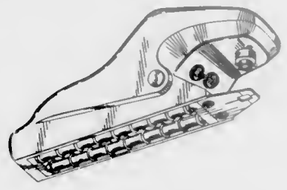
306,160
VISUAL DISPLAY
Kenneth H. Grange, and Johan C. Santer, both of London, England, assignors to Reuters Limited, London, England
Filed Apr. 4, 1986, Ser. No. 850,351
Claims priority, application United Kingdom, Oct. 11, 1985, 1029794
Term of patent 14 years
U.S. Cl. D14—113



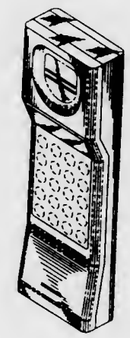
306,161
VISUAL DISPLAY
Kenneth H. Grange, and Johan C. Santer, both of London, England, assignors to Reuters Limited, London, England
Filed Apr. 4, 1986, Ser. No. 850,349
Claims priority, application United Kingdom, Oct. 11, 1985, 1029792
Term of patent 14 years
U.S. Cl. D14—113



306,162
HAND-HELD OCR SCANNER
James L. Faulkerson, Woodside, and Alan Kittrell, Fremont, both of Calif., assignors to Everex Ti Corporation, Fremont, Calif.
Filed Oct. 20, 1987, Ser. No. 110,953
Term of patent 14 years
U.S. Cl. D14—116



306,163
HOUSING FOR A PORTABLE CELLULAR HANDSET TELEPHONE OR A SIMILAR ARTICLE
Leonid Soren, Lincolnwood, and Albert L. Nagale, Wilmette, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 6, 1989, Ser. No. 334,011
Term of patent 14 years
U.S. Cl. D14—138



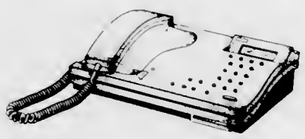


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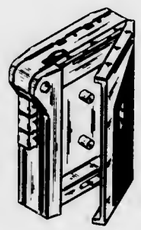
306,164
MICRO-CASSETTE PLAYER/TRANSCRIBER
Robert L. Johnson, Jr., 4223 E. San Francisco Ave., and Jimmie L. Miller, Jr., 4835 Margaritta Ave., both of St. Louis, Mo. 63115
Filed Mar. 31, 1986, Ser. No. 847,560
Term of patent 14 years
U.S. Cl. D14—154

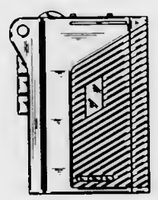


306,165
TELEPHONE SET
Koji Hikawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Nov. 17, 1988, Ser. No. 272,306
Claims priority, application Japan, May 17, 1988, 63-019430
Term of patent 14 years
U.S. Cl. D14—151

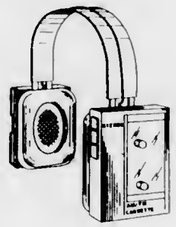


306,166
COMBINED TAPE PLAYER AND RADIO
Takashi Matsushima, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 28, 1987, Ser. No. 138,679
Claims priority, application Japan, Jul. 2, 1987, 62-27318
Term of patent 14 years
U.S. Cl. D14—163





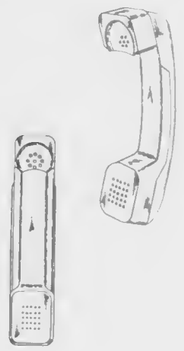
306,167
COMBINED CASSETTE PLAYER AND HEADSET
Robert L. Johnson, Jr., 4223 E. San Francisco Ave., and Jimmie L. Miller, Jr., 4835 Margaritta Ave., both of St. Louis, Mo. 63115
Filed Mar. 28, 1986, Ser. No. 847,045
Term of patent 14 years
U.S. Cl. D14—163



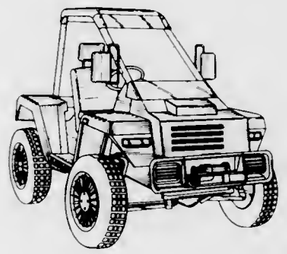
306,168
CORNER-MOUNTED LOUDSPEAKER
Kip W. Caputo, 8420 Chloe Ave., La Mesa, Calif. 92042
Filed Jul. 13, 1987, Ser. No. 72,618
Term of patent 14 years
U.S. Cl. D14—210



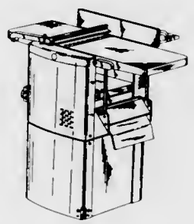
306,169
TELEPHONE HANDSET FOR ACCOMMODATING EAR JEWELRY
Virginia I. Burton, E. 640 Benson Lake Dr., Grapeview, Wash. 98546
Filed Jun. 22, 1988, Ser. No. 210,009
Term of patent 14 years
U.S. Cl. D14—249



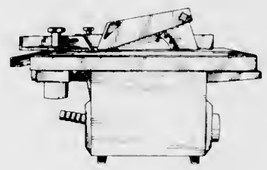
306,170
AGRICULTURAL TRACTOR
Sotoshi Takagi, Izumisano, and Akio Fukata, Izumi, both of Japan, assignors to Kubota Ltd., Osaka, Japan
Filed Sep. 23, 1987, Ser. No. 100,139
Claims priority, application Japan, Jul. 20, 1987, 62-29434
Term of patent 14 years
U.S. Cl. D15—23



306,171
PLANING MACHINE
Peter Kronthaler, Gries, Austria, assignor to Maier & Co., Fabrik fuer Spezialmaschinen, Hallein, Austria
Filed Apr. 26, 1988, Ser. No. 186,201
Term of patent 14 years
U.S. Cl. D15—127

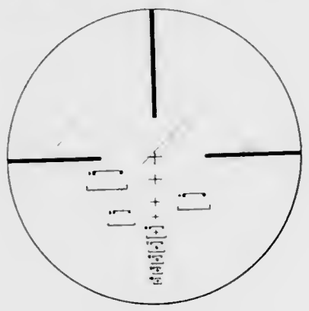


306,172
PLANING SAW
Marc Wodli, Bischheim, France, assignor to Electroli, S.A., Bischwiller, France
Filed Mar. 16, 1988, Ser. No. 168,739
Claims priority, application France, Oct. 15, 1987, 876,028
Term of patent 14 years
U.S. Cl. D15—133

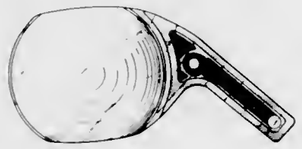


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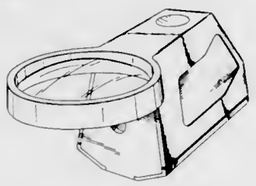
306,173
TRANSPARENT RETICLE DISC
Robert R. Reese, Coloma, Ill., assignor to Springfield Armory, Inc., Geneseo, Ill.
Filed May 29, 1987, Ser. No. 55,777
Term of patent 14 years
U.S. Cl. D16—130



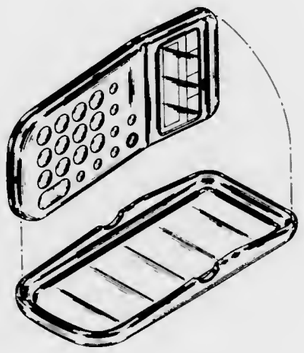
306,174
MAGNIFIER
Gérard Rethore, Sete, France, assignor to L.H.P. Loupes Hautes Performances, Lyons, France
Filed Apr. 14, 1988, Ser. No. 181,687
Claims priority, application Int'l Pat. Institute, Oct. 13, 1987, DM/009455
Term of patent 14 years
U.S. Cl. D16—135



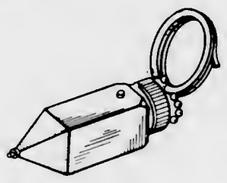
306,175
MAGNIFIER
Veronica G. Steel, London, England, and David F. Francis, Sydney, Australia, assignors to Combined Optical Industries Limited, United Kingdom
Filed Apr. 9, 1987, Ser. No. 36,283
Claims priority, application United Kingdom, Oct. 14, 1986, 1037362
Term of patent 14 years
U.S. Cl. D16—135



306,176
COMBINED CALCULATOR AND CRADLE THEREFOR
Takahisa Yubisui; Hiroshi Sakaguchi, both of Osaka, and Masaki Kawamura, Osaka, all of Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Aug. 22, 1986, Ser. No. 899,502
Claims priority, application Japan, Feb. 25, 1986, 61-6905
Term of patent 14 years
U.S. Cl. D18—7



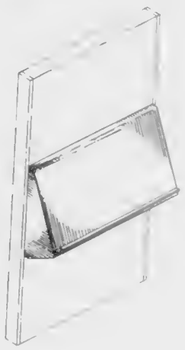
306,177
COMBINED BALL-POINT PEN AND RING
Paek Y. Park, 1629 Ivy Bridge Rd., Glendale, Calif. 91207
Filed Feb. 9, 1987, Ser. No. 12,640
Term of patent 14 years
U.S. Cl. D19—36



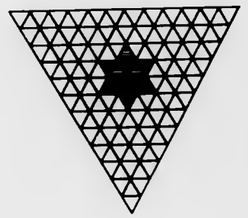
306,178
CASING FOR A WRITING INSTRUMENT
Daniel Lauper, Givisiez, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Nov. 24, 1986, Ser. No. 933,889
Claims priority, application France, May 27, 1986, 86 2783
Term of patent 14 years
U.S. Cl. D19—49



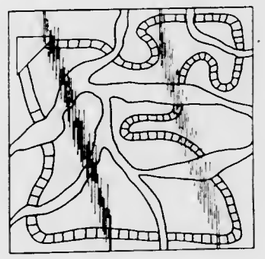
306,179
DISPLAY WALL TILE FOR MAGAZINES OR OTHER REFERENCE MATERIALS
Frank A. Friedman, San Francisco, Calif., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed May 6, 1987, Ser. No. 47,252
Term of patent 14 years
U.S. Cl. D20—43



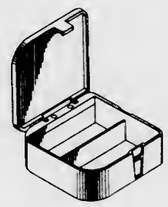
306,180
GAME PLAYING SURFACE
Timothy J. Murray, 612 Piedmont, Duluth, Minn. 55806
Filed Feb. 26, 1987, Ser. No. 19,552
Term of patent 14 years
U.S. Cl. D21—14



306,181
GAME BOARD
Roger Burten, 5614 McKinley St., Bethesda, Md. 20817
Filed Nov. 19, 1986, Ser. No. 932,392
Term of patent 14 years
U.S. Cl. D21—31

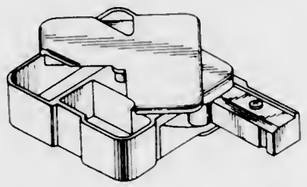


306,182
SIMULATIVE TOY BOX
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd, Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,534
Term of patent 14 years
U.S. Cl. D21—59



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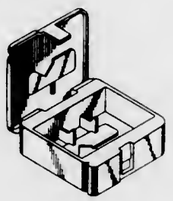
306,183
SIMULATIVE TOY SEWING BOX OR SIMILAR ARTICLE
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,546
Term of patent 14 years
U.S. Cl. D21—59



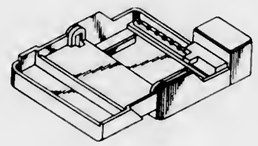
306,184
SIMULATIVE TOY NAIL CLIPPER
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,552
Term of patent 14 years
U.S. Cl. D21—59



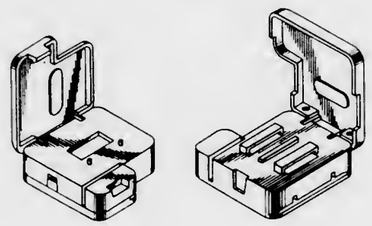
306,185
SIMULATIVE TOY BOX
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,526
Term of patent 14 years
U.S. Cl. D21—59



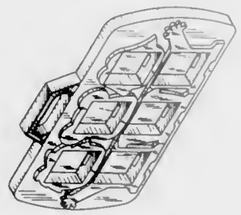
306,186
SIMULATIVE TOY REGISTER HOLDER
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,530
Term of patent 14 years
U.S. Cl. D21—59



306,187
SIMULATIVE TOY BOX
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,528
Term of patent 14 years
U.S. Cl. D21—59



306,188
BASE PLATE FOR A TOY ACTIVITY CENTER
Erik P. Tapdrup, Virum, and Flemming H. Olsen, Espergaerde, both of Denmark, assignors to Interlego A.G., Switzerland
Filed Nov. 26, 1986, Ser. No. 935,702
Claims priority, application Denmark, May 29, 1986, 547/86
Term of patent 14 years
U.S. Cl. D21—59

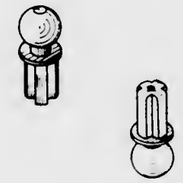




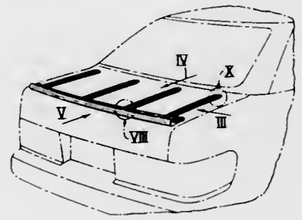
306,189
FLAPPER DRIVEN TOY BALLOON
Robin Reilly, Los Angeles; Robert Sheppard, North Hollywood; John Dykstra, Sherman Oaks; Grant McCune, Van Nuys, and Thomas Valentine, Sherman Oaks, all of Calif., assignors to Apogee, Inc., Van Nuys, Calif.
Filed Jan. 23, 1987, Ser. No. 6,582
Term of patent 14 years
U.S. Cl. D21—84



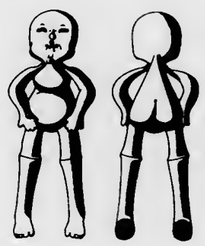
306,190
TOY CONSTRUCTION ELEMENT
Ole V. Poulsen, Vejle, Denmark, assignor to Interlego A.G., Switzerland
Filed Dec. 2, 1987, Ser. No. 127,885
Term of patent 14 years
U.S. Cl. D21—108



306,191
VEHICLE DECK RACK WITH POP-UP TIE DOWNS
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Apr. 1, 1987, Ser. No. 33,061
Term of patent 14 years
U.S. Cl. D12—157

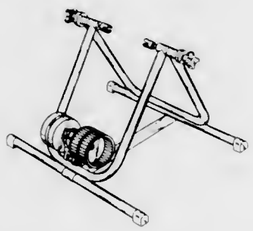


306,192
DOLL
Karen R. Berry, Cincinnati, Ohio, assignor to Berkoh Company, Inc., Cincinnati, Ohio
Filed Aug. 1, 1986, Ser. No. 892,500
Term of patent 14 years
U.S. Cl. D21—184



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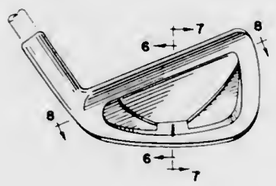
306,193
BICYCLE EXERCISE SUPPORT
James R. Blackburn, Los Gatos, Calif., assignor to Jim Blackburn Designs, Inc., Campbell, Calif.
Filed Mar. 9, 1987, Ser. No. 23,470
Term of patent 14 years
U.S. Cl. D21—194



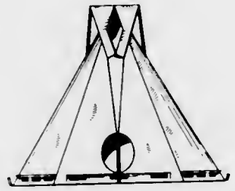
306,194
GOLF TEE
John E. Sadowski, 26826 Rouge River Dr., Dearborn Heights, Mich. 48127
Filed Mar. 12, 1987, Ser. No. 26,561
Term of patent 14 years
U.S. Cl. D21—208



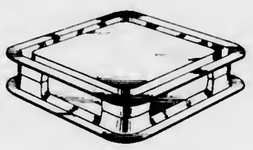
306,195
GOLF CLUB HEAD
Robert F. MacNally, Hinsdale, and John B. Hoeflich, Arlington Heights, both of Ill., assignors to Kidde Recreation Products, Inc., Northbrook, Ill.
Filed Sep. 15, 1987, Ser. No. 97,078
Term of patent 14 years
U.S. Cl. D21—220



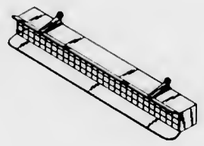
306,196
TENT
Robert A. Muirhead, 4872 Montgomery Rd., Ellicott City, Md. 21043
Filed Sep. 18, 1987, Ser. No. 98,135
Term of patent 14 years
U.S. Cl. D21—253



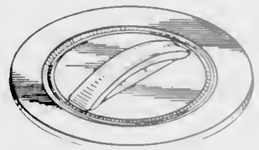
306,197
INSECT BAIT STATION
Scott W. Demarest, and John Martin, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Jul. 2, 1987, Ser. No. 69,561
Term of patent 14 years
U.S. Cl. D22—122



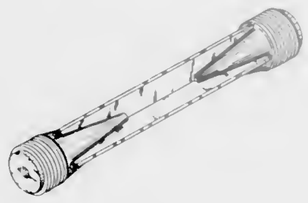
306,198
CEILING FAN FILTER
Elmer L. Matherne, 129 Matherne St., Bourg, La. 70343
Filed Jun. 14, 1988, Ser. No. 206,690
Term of patent 14 years
U.S. Cl. D23—365



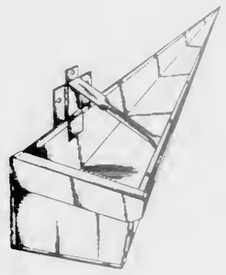
306,199
COVER PLATE FOR A FILTER CARTRIDGE FOR A SPA OR SWIMMING POOL WATER FILTER
Paul J. Meissner, Camarillo, Calif., assignor to Meissner Mfg. Co., Inc., Sun Valley, Calif.
Filed Feb. 25, 1987, Ser. No. 18,976
Term of patent 14 years
U.S. Cl. D23—209



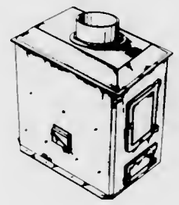
306,200
WATER METER REPLACEMENT PLUG
John Bednar, Girard, Ill., assignor to John J. Bednar, Girard, Ill.
Filed May 9, 1986, Ser. No. 862,411
Term of patent 14 years
U.S. Cl. D23—260



306,201
COMBINED GUTTER, BRACKET AND SUPPORT
Arne Paulsson, Järnforsen, Sweden, assignor to AB Siba-Verken, Sweden
Filed Nov. 13, 1986, Ser. No. 930,851
Claims priority, application Denmark, May 15, 1986, MA04761986
Term of patent 14 years
U.S. Cl. D23—267



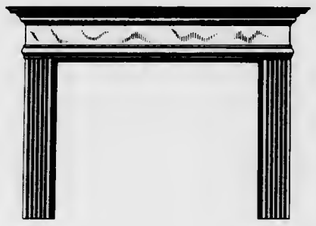
306,202
WOOD BURNING STOVE
Melvin Wade, Bridgeport, Ala., and Carl E. Higgins, Chattanooga, Tenn., assignors to United States Stove Company, Chattanooga, Tenn.
Filed Jan. 19, 1988, Ser. No. 145,185
Term of patent 14 years
U.S. Cl. D23—343



306,203
FAN
Yung-Kuan Wei, Tainan, Taiwan, assignor to Hung Hsing Electric Co., Ltd., Tainan, Taiwan
Filed Sep. 4, 1987, Ser. No. 93,900
Term of patent 14 years
U.S. Cl. D23—381

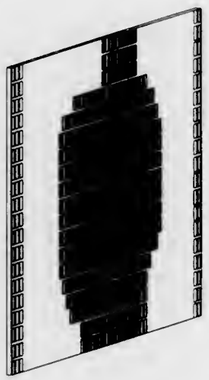


306,204
FIREPLACE MANTLE
George K. MacAleese, Huntington, Ind., assignor to Majco Building Specialties, L.P., New York, N.Y.
Filed Mar. 3, 1988, Ser. No. 163,457
Term of patent 14 years
U.S. Cl. D23—404

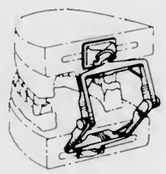


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306,205
PROTECTIVE COVER FOR A FAN OF A CONVECTION OVEN
Per E. Pettersson, Västra Frölunda, and Inge Dahlgren, Vårgårda, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Oct. 23, 1986, Ser. No. 922,552
Claims priority, application Sweden, Apr. 25, 1986, 86-1030
Term of patent 14 years
U.S. Cl. D23—412



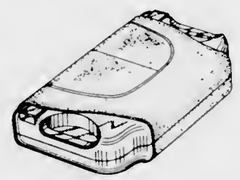
306,206
HINGED DENTAL ARTICULATOR WITH A TAB MOUNTING
Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.
Filed Jan. 28, 1987, Ser. No. 7,819
The portion of the term of this patent subsequent to Oct. 28, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—10



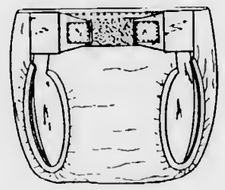
306,207
ORTHODONTIC DEBONDING TOOL
Clarence W. Hannan, and Wilford A. Snead, both of San Dimas, Calif., assignors to Unitek Corporation, Monrovia, Calif.
Filed May 8, 1987, Ser. No. 47,923
Term of patent 14 years
U.S. Cl. D24—11



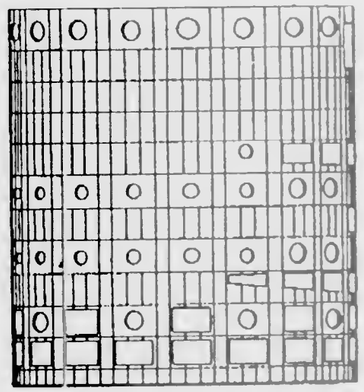
306,208
MASSAGER FOR A SEAT
Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Fuji Iryoki, Osaka, Japan
Filed Mar. 3, 1987, Ser. No. 21,063
Term of patent 14 years
U.S. Cl. D24—36



306,209
ADJUSTABLE PANTS
Fredrica V. Coates, Earlysville, Va., and Richard Jannoni, Edison, N.J., assignors to Blessings Corporation, Liberty Corner, N.J.
Filed May 13, 1987, Ser. No. 48,923
Term of patent 14 years
U.S. Cl. D24—50

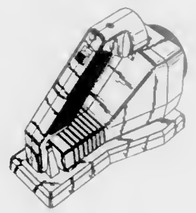


306,210
STRUCTURE FOR OBSERVING A MARINE ENVIRONMENT
Henry J. Thiemann, III, P.O. Box 14292, South Lake Tahoe, Calif. 95702; Henry A. Olson, Oakland, and Leonard T. Stanton, Alameda, both of Calif., assignors to Henry J. Thiemann, III, South Lake Tahoe, Calif.
Filed Oct. 10, 1986, Ser. No. 917,827
Term of patent 14 years
U.S. Cl. D25—5



306,211
COMBINATION TORCH AND AUDIBLE SIGNAL WITH STAND
Hideki Maruyama, Hong Kong, Hong Kong, assignor to Fee Tat Plastic Factory Limited, Aberdeen, Hong Kong
Filed Dec. 15, 1986, Ser. No. 941,945
Claims priority, application United Kingdom, Jun. 23, 1986, 1034931
Term of patent 14 years
U.S. Cl. D26—38





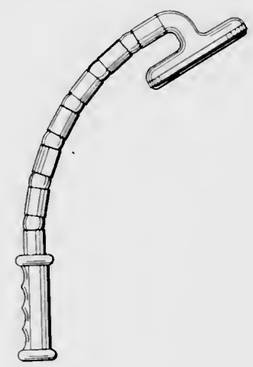
306,212
POCKET TORCH
Siegfried Hölterschmidt, Hückelhoven, Fed. Rep. of Germany, assignor to Walter Henkels GmbH, Fed. Rep. of Germany
Filed Mar. 20, 1987, Ser. No. 28,623
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1987, MR179
Term of patent 14 years
U.S. Cl. D26—44



306,213
MANICURE BRUSH
Keith Elton, Honolulu, Hi., assignor to Henry J. Cassai, Howard Beach, N.Y.
Filed Mar. 27, 1989, Ser. No. 328,694
Term of patent 14 years
U.S. Cl. D28—7



306,214
SUN TAN OIL APPLICATOR
J. Brian Delphus, 912 Latonka Dr., Mercer, Pa. 16137
Filed Sep. 14, 1987, Ser. No. 96,323
Term of patent 14 years
U.S. Cl. D28—7

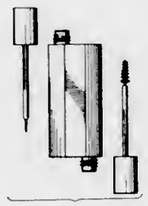


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306,215
HAIR ORNAMENT
Pamela J. Bell, Essex Fells, N.J., and Kelly P. Burke, Corona Del Mar, Calif., assignors to Bobo & Co., Boulder, Colo.
Filed Mar. 2, 1987, Ser. No. 20,686
Term of patent 14 years
U.S. Cl. D28—39

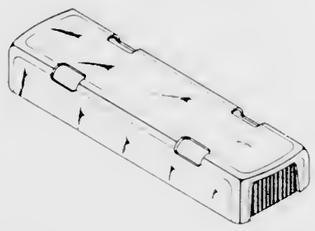


306,217
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 736,448, May 21, 1985. This application Mar. 28, 1989, Ser. No. 329,499
Term of patent 14 years
U.S. Cl. D28—77



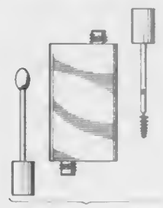


306,216
OVERCAP FOR A SHAVING UNIT
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed May 12, 1987, Ser. No. 48,912
Term of patent 14 years
U.S. Cl. D28—45





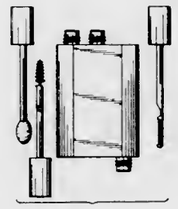
306,218
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85 St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 736,448, May 21, 1985. This application Mar. 28, 1989, Ser. No. 329,498
Term of patent 14 years
U.S. Cl. D28—77





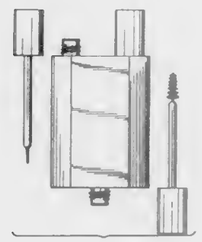




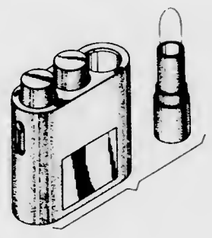




306,219
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 765,394, Aug. 14, 1985. This application Apr. 14, 1989, Ser. No. 337,533
Term of patent 14 years
U.S. Cl. D28—77



306,220
LIPSTICK CONTAINER
Chun-Te Wang, 230-2 Hsi-Men St., Hsinchu, Taiwan
Filed Dec. 10, 1987, Ser. No. 130,972
Term of patent 14 years
U.S. Cl. D28—86



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306,221
LIPSTICK CASE OR SIMILAR ARTICLE
Fo-Chun Chen, Chang-Hua, Taiwan, assignor to Chuan Hsiang Tang Chemical Co., Ltd., Yeong-Hua, Taiwan
Filed Feb. 10, 1988, Ser. No. 156,198
Term of patent 14 years
U.S. Cl. D28—87



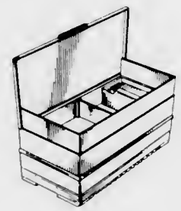


306,222
SPORT VISOR
Troy M. Lee, 4002 Garretson Ave., Corona, Calif. 91720
Filed Oct. 21, 1986, Ser. No. 922,144
Term of patent 14 years
U.S. Cl. D29—18

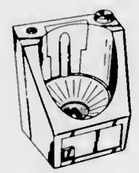




306,223
PORTABLE PARTS WASHER
Charles R. Muirhead, Pasadena, and Chris Sutherland, Carpinteria, both of Calif., assignors to Seacliff International, Inc., South El Monte, Calif.
Filed May 11, 1987, Ser. No. 48,653
Term of patent 14 years
U.S. Cl. D32—1



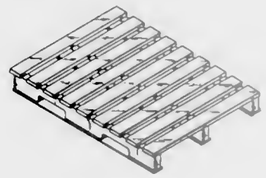
306,224
DETERGENT DISPENSER
David L. Nystuen, Bloomington, Minn., assignor to Ecolab Inc., St. Paul, Minn.
Filed Jan. 5, 1987, Ser. No. 971
Term of patent 14 years
U.S. Cl. D32—3



306,225
VACUUM CLEANER
Alvaro Correa, Cheshire, Conn., assignor to Black & Decker, Inc., Newark, Del.
Filed Apr. 6, 1987, Ser. No. 35,143
Term of patent 14 years
U.S. Cl. D32—22



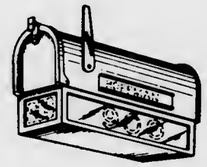
306,226
PALLET
Robert E. Jhwcha, Weston, Conn., assignor to Champion International Corporation, Stamford, Conn.
Filed Oct. 24, 1984, Ser. No. 664,147
Term of patent 14 years
U.S. Cl. D34—38



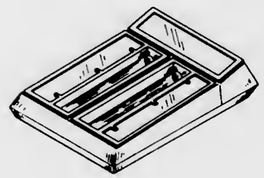
306,227
STORAGE BIN
Anthony A. W. Ross, P.O. Box 513, Hawthorn, Victoria, 3123, Australia
Filed Aug. 18, 1987, Ser. No. 86,665
Term of patent 14 years
U.S. Cl. D34—43



306,228
ILLUMINATED MAILBOX OR SIMILAR ARTICLE
Paul J. Hoffman, and Milton J. Fischer, both of P.O. Box 2501, Appleton, Wis. 54913
Filed Mar. 25, 1987, Ser. No. 30,211
Term of patent 14 years
U.S. Cl. D99—31



306,229
ALLOWANCE BANK
Terry A. Turbeville, 440 S. 5th St., Louisville, Ky. 40202
Filed Aug. 1, 1986, Ser. No. 892,093
Term of patent 14 years
U.S. Cl. D99—34



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF FEBRUARY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Fitzpatrick, Ian, 4,901,574, Cl. 73-579.000.

A/S Ferrosan: *See—*
Watjen, Frunk; and Hansen, Holger C., 4,902,686, Cl. 514-250.000.

Abbott, Kenneth E.; Lyons, Patrick J.; and Satariano, Richard M., to Stripping Technologies Inc. Pressure hose handle and system. 4,901,928, Cl. 239-530.000.

Abbott Laboratories: *See—*
Bennett, Larry G.; and Chiapetta, Enrico G., 4,902,630, Cl. 436-546.000.
Durley, Benton A., III; Schultz, Steven G.; and Galitz, Charles M., 4,902,399, Cl. 204-409.000.

Abe, Fumiyoshi: *See—*
Hasegawa, Akira; and Abe, Fumiyoshi, 4,903,149, Cl. 360-69.000.

Abe, Yoshinori *See—*
Hasebe, Takashi; Hiratsuka, Seiichiro; Abe, Yoshinori; and Matsunawa, Masahiko, 4,903,142, Cl. 358-457.000.

Abel, Heinz; and Berenut, Hans-Ulrich, to Ciba-Geigy Corporation. Detergent composition for washing off dyeings obtained with fibre-reactive dyes, process for the preparation thereof and use thereof. 4,902,439, Cl. 252-174.250.

Abiomed Cardiovascular, Inc.: *See—*
Milder, Fredric L.; Kung, Robert T. V.; Lederman, David M.; and Singh, Puram I., 4,902,272, Cl. 600-18.000.

Able Corporation: *See—*
Ishikawa, Yoichi, 4,902,962, Cl. 324-690.000.

Abramov, Vsevolod V.: *See—*
Yarmashev, Jury N.; Nikolaenko, Alexandr I.; Kotenko, Alexandr F.; Chernenko, Evgeny A.; Abramov, Vsevolod V.; Veselov, Alexandr V.; Rysin, Nikolai I.; and Salnikova, Vera N., 4,901,511, Cl. 56-220.000.

ABS Allgemeiner Brandschutz: *See—*
Richter, Klaus, 4,902,851, Cl. 174-35.0MS.

Ackeret, Peter, to Licinvest AG. Device for the rearrangement of a pile of pictures. 4,902,193, Cl. 414-788.800.

Ackmann, Stephen A.; Beck, James R.; and Wright, Fred L., to Eli Lilly and Company. Process for preparing 4-carboxy-1-(3,5-dimethylphenyl)-5-pyrazolecarboxamide. 4,902,808, Cl. 548-378.000.

Across Co., Ltd.: *See—*
Okura, Akimitsu; Cho, Toshoku; Nakagawa, Takao; Gomi, Shimpei; and Ueda, Takuya, 4,902,453, Cl. 264-29.200.

Actor, James M. Apparatus for adapting a single sheet feed offset duplicator to print on continuous form paper. 4,901,639, Cl. 101-142.000.

Acurex Corporation: *See—*
Beveridge, John H.; and Knuth, William H., 4,901,525, Cl. 60-211.000.

Adachi, Kenro *See—*
Ito, Kenichiro; Nojiri, Hiromi; and Adachi, Kenro, 4,901,831, Cl. 192-38.000.

Adachi, Seiji: *See—*
Wada, Takahiro; Adachi, Seiji; and Mihara, Toshihiro, 4,902,457, Cl. 264-43.000.

Adachi, Yasuko: *See—*
Totani, Tetsushi; Aono, Katsutoshi; and Adachi, Yasuko, 4,902,797, Cl. 546-11.000.

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ADIR Et Cie: *See—*
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Adiutori, Eugene F., to General Electric Company. Apparatus and method for measuring the thermal performance of a heated or cooled component. 4,902,139, Cl. 374-137.000.

Adler, Robert; Fendley, James R.; Lange, Howard G.; Prazak, Charles J., III; Steiner, Johan; and Strauss, Paul, to Zenith Electronics Corporation. Methods and apparatus for making flat tension mask color cathode ray tubes. 4,902,257, Cl. 445-4.000.

Adolf Coors Company: *See—*
Tatham, Richard L.; and Hunter, Alan D., 4,901,880, Cl. 220-269.000.

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Aero Industries, Inc.: *See—*
Tuerk, James R.; and Tuerk, Robert P., 4,902,064, Cl. 296-105.000.

AG Communication Systems Corporation: *See—*
Belanger, Thomas D., Jr., 4,903,168, Cl. 361-413.000.

AG fur Industrielle Elektronik Agie: *See—*
Buhler, Ernst; and Boccadoro, Marco, 4,903,213, Cl. 364-474.310.

Agency of Industrial Science and Technology, The: *See—*
Imamura, Toshinori; Miyazaki, Masaru; Terano, Akihisa; Matsunaga, Nobutoshi; and Yanazawa, Hiroshi, 4,902,635, Cl. 437-44.000.
Ohta, Toshitaka; and Kajikawa, Takenobu, 4,902,648, Cl. 437-247.000.

Agency of Industrial Science and Technology, Kosaka Laboratory Ltd.: *See—*
Okayama, Shigeo; Tokumoto, Hiroshi; Bando, Hiroshi; Mizutani, Wataru; Shimura, Masayuki; Nakagawa, Haruki; Shigeno, Masatsugu; and Watanabe, Kazutoshi, 4,902,892, Cl. 250-307.000.

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Kume, Shoichi; Yoshida, Haruo; Suzuki, Kazutaka; Tasaki, Yoshio; Ikuta, Shiro; Ishikawa, Masamitu; and Machida, Michihide, 4,902,652, Cl. 501-90.000.

AGFA-Gevaert AG: *See—*
Kaufl, Hans U.; and Vedder, Hans J., 4,903,042, Cl. 346-76.00L.

Agfa-Gevaert Aktiengesellshcaft: *See—*
Thiele, Hartmut, 4,901,856, Cl. 206-397.000.

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Buelens, Edward; De Smedt, Roger F.; and Muylle, Wilfried E., 4,901,936, Cl. 242-74.100.
Vermeulen, Leon L.; Vervloet, Ludovicus H.; De Smedt, Willy P.; and Kok, Piet, 4,902,593, Cl. 430-10.000.

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Aida Engineering, Ltd.: *See—*
Nakagawa, Tatsuzi, 4,902,220, Cl. 425-574.000.

Aikawa, Shinichi: *See—*
Hayashi, Tohru; Sakai, Yoshiaki; Aikawa, Shinichi; Matsunaga, Hiroshi; and Makabe, Jun, 4,903,156, Cl. 360-104.000.

Aimono, Yuuji: *See—*
Sugawara, Yasuo; Aimono, Yuuji; and Sugitani, Hatuo, 4,902,771, Cl. 528-272.000.

Air Products and Chemicals, Inc.: *See—*
Garg, Diwakar; Mueller, Carl F.; Schaffer, Leslie E.; and Dyer, Paul N., 4,902,535, Cl. 427-292.000.
Savoca, Ann C.; and Langsam, Michael, 4,902,763, Cl. 526-240.000.
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,901,910, Cl. 228-242.000.

Air Purification Products International, Inc.: *See—*
Burnett, Gilbert W.; and Jackson, Paul D., 4,902,306, Cl. 55-6.000.

Airi Laine: *See—*
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Ishikawa, Masanobu, 4,901,593, Cl. 74-493.000.
Murakami, Yuichi; and Yamamoto, Tomohiro, 4,903,279, Cl. 375-1.000.
Ohhashi, Masao; and Ishiguro, Yoshimasa, 4,902,058, Cl. 292-337.000.

Aitkens, Terry K.: *See—*
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Tahara, Yoshimasa, 4,901,435, Cl. 30-2.000.

Akada, Masanori: *See—*
Kanto, Jumpei; Akada, Masanori; Kamakari, Katsuhiro; Asahina, Kenichi; Sakashita, Katsuaki; and Watanabe, Yoshihisa, 4,902,670, Cl. 503-227.000.

Akagawa, Minoru, to Intelmatec Corporation. Disk guide for a disk handling system. 4,902,186, Cl. 414-417.000.

Akai, Takumi, to Kabushiki Kaisha Toshiba. Data collecting method and apparatus for loop-linked control system. 4,903,190, Cl. 364-131.000.

Akashi, Tomohiko: *See—*
Kimura, Katsumi; Anzawa, Masamitsu; Uchida, Masamichi; and Akashi, Tomohiko, 4,901,813, Cl. 180-230.000.

Akashi, Yoichi, to NEC Corporation. Semiconductor memory having a parallel input/output circuit. 4,903,239, Cl. 365-189.010.

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Aki, Hiroyuki: *See—*
Yamamoto, Shohei; Aki, Hiroyuki; Katsu, Hiroshi; Teshigawara, Yuichi; and Atsumi, Kenichi, 4,903,057, Cl. 354-88.000.

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Akiyama, Sigeo; Suzumura, Masahiko; and Nobe, Takeshi, to Matsushita Electric Works, Ltd. Method for manufacturing a depletion type double-diffused metal-oxide semiconductor field effect transistor device. 4,902,636, Cl. 437-45.000.

Akiyama, Toshiyuki: *See—*
Goda, Hideo; Akiyama, Toshiyuki; Takamizawa, Akihisa; Yoshida, Iwao; Konobe, Takeo; and Takaku, Keisuke, 4,902,783, Cl. 530-415.000.

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Akutsu, Takahashi: *See—*
Matsubara, Akinori; and Akutsu, Takahashi, 4,901,616, Cl. 84-1.030.

Akzo N.V.: *See—*
Jansen, Theodorus; Janssen, Engelbertus J. M.; and Cornelius, Lammert, 4,902,500, Cl. 424-78.000.
Witt, Peter, 4,902,621, Cl. 435-188.000.

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Mueller, Rudolf; and Albertshofer, Wolfgang, 4,902,136, Cl. 356-419.000.

Albertson, Orris E.; and Baturay, Allen. Deodorization and cleaning of medium temperature wet off-gases derived from burning of wet waste sludge. 4,901,654, Cl. 110-346.000.

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Alcatel N.V.: *See—*
Preisach, Helmuth; and Schrodi, Karl, 4,903,260, Cl. 370-60.000.

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Nitecki, Danute E.; Katre, Nandini; Goodson, Robert J.; and Aldwin, Lois, 4,902,502, Cl. 424-83.000.

Aleksa, David M.: *See—*
Benedikt, George M.; and Aleksa, David M., 4,902,556, Cl. 428-209.000.

Alexander, Camie: *See—*
Cantley, Donald G.; and Alexander, Camie, 4,901,938, Cl. 242-107.100.

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Weiler, Rolf, 4,901,825, Cl. 188-73.350.
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Alkermes: *See—*
Pardridge, William M.; and Schimmel, Paul R., 4,902,505, Cl. 424-85.700.

Allen, Leslie J.: *See—*
Baker, James C.; Lang, Geraldine M.; Clift, Stephen A.; and Allen, Leslie J., 4,902,095, Cl. 350-96.210.

Allergan Humphrey: *See—*
Shinn, Alan L., 4,902,121, Cl. 351-208.000.

Allie, Mark C.: *See—*
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Butts, Gary, to Ling Electronics, Inc. Stray magnetic field control system for vibration testing apparatus. 4,901,579, Cl. 73-668.000.
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Brodsky, William L.; Buyck, Wesley J.; and Knight, Alan D., 4,902,234, Cl. 439-67.000.
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Bynum, Mac W. Faucet or yard sprinkler support. 4,901,955, Cl. 248-49.000.
Byrd, Geoffrey C. M., to Imperial Chemical Industries PLC. Gas-moving device. 4,902,196, Cl. 415-90.000.
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Theopold, Klaus H.; and Byrne, Erin K., 4,902,486, Cl. 423-122.000.
Byro, Thomas: *See—*
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Bertrand, Carol, 4,901,720, Cl. 606-40.000.
Trenconsky, Robert P., Bertrand, Carol; and Weiss, Robert A., 4,901,719, Cl. 606-49.000.
Cady, Byron C.: *See—*
Story, Carl E.; Nichols, Jerry A.; and Cady, Byron C., 4,901,751, Cl. 137-312.000.
Calbo, Leonard J., Jr.; and Gallacher, Lawrence V., to King Industries, Inc. Process for preparing linear, low molecular weight polyester-based polyol. 4,902,821, Cl. 560-193.000.
Caldwell, J. Brian; and Moore, Duncan T., to University of Rochester, The. Gradient-index glass. 4,902,650, Cl. 501-12.000
California Institute of Technology: *See—*
Gavalas, George R.; and Megiris, Constantin E., 4,902,307, Cl. 55-16.000.
Maserjian, Joseph, 4,903,101, Cl. 357-30.000.
Calpis Food Industry Co., Ltd., The: *See—*
Hayakawa, Kunihiko; Masai, Teruhisa; Yoshida, Yasuyuki; Shibuta, Takanobu; and Miyazaki, Hiroshi, 4,902,673, Cl. 514-21.000.
Nakagawa, Yoshikatsu; and Kitamura, Syuzi, 4,902,517, Cl. 426-11.000.
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Cambou, Bertrand F., to Motorola, Inc. Process for making a bipolar integrated circuit. 4,902,633, Cl. 437-31.000.
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Madhavan, Suresh; Cohen, Adam; and Holman, Roger, 4,903,188, Cl. 363-96.000.
Campbell, Jay A.: *See—*
Amin, Mahendra I.; and Campbell, Jay A., 4,902,683, Cl. 514-206.000.
Campbell, John R.: *See—*
Brown, Sterling B.; Campbell, John R.; and Shea, Timothy J., 4,902,753, Cl. 525-394.000.
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Dallaire, Serge; Spino, Denis; and Champagne, Blaise, 4,901,921, Cl. 239-11.000.
Lucas, Bernard H.; and Shimano, David Y., 4,902,344, Cl. 75-101.00R.
Morris, Oswald N.; and Trottier, Marc R., 4,902,507, Cl. 424-93.000.
Candino, Domenico. Apparatus for dispensing thread from a spool. 4,901,943, Cl. 242-150.00R.
Cannon, Lee E.: *See—*
Kraft, David W.; Eberhadrdt, Lyle N.; and Cannon, Lee E., 4,902,953, Cl. 318-665.000.
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Funada, Masahiro, 4,903,145, Cl. 358-462.000.
Hoshi, Nobuhiro; Ishikawa, Hisashi; Ishii, Yoshiki; Yagisawa, Toshihiro; and Fujii, Akio, 4,903,124, Cl. 358-133.000.
Kawamura, Naoto; and Kadowaki, Hidejiro, 4,903,123, Cl. 358-75.000.
Kawate, Shinichi; Fujiwara, Ryoji; and Kishi, Etsuro, 4,902,109, Cl. 350-357.000.
Matsuzaki, Hideo, 4,902,149, Cl. 400-279.000.
Morohoshi, Naoya, 4,902,568, Cl. 428-331.000.
Murayama, Yasushi; Hoshino, Osamu; Chiku, Kazuyoshi; Sato, Yukio; Kubota, Yoichi; Miyagi, Ken; Hirose, Yoshihiko; Matsuzawa, Kunihiko; Miyake, Hiroyuki; Aoki, Tomohiro; Uchida, Takashi; and Kanekura, Kazunori, 4,903,067, Cl. 346-160.000.
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Okauchi, Shigeki, 4,902,923, Cl. 310-268.000.
Sakamoto, Masahiro, 4,903,143, Cl. 358-457.000.
Tsuboyama, Akira; Okada, Shinjiro; Taniguchi, Osamu; and Enari, Masahiko, 4,902,107, Cl. 350-350.00S.
Ushiro, Tatsuzo; and Karube, Yukuo, 4,902,924, Cl. 310-268.000.
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Cantley, Donald G.; and Alexander, Camie. Electrical cord retractor. 4,901,938, Cl. 242-107.100.
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Carl Freudenberg, Firma: *See—*
Barth, Thomas; and Keller, Heinz, 4,901,526, Cl. 60-258.000.
Beicht, Bernd; Tinz, Reinhard; and Heinemann, Joachim, 4,901,702, Cl. 123-520.000.
Eschwey, Helmut; Hackler, Lothar; Hartmann, Ludwig; Kauschke, Michael; Klein, Bernhard; Kumpel, Thomas; Kunkel, Hans-Achim; Nahe, Torsten; and Ruzek, Ivo, 4,902,559, Cl. 428-224.000.
Carl Schneck AG: *See—*
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Carlin, Donald B.: *See—*
Ettenberg, Michael; and Carlin, Donald B., 4,903,275, Cl. 372-50.000.
Carlin, Paul J. Line mark book mark. 4,901,665, Cl. 116-235.000.
Carlton, Raymond R. Drive link for saw chain. 4,901,613, Cl. 83-830.000.
Carmein, David E. E.: *See—*
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Carmen, Raleigh A.; and Chong, Chi-Yong, to Miles Inc. Sterilizable system for blood storage. 4,902,287, Cl. 604-416.000.
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Caroll, James E.: *See*—
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Carpenter, Robert K.; and Lyman, Harrison F., Jr., to Redux Corporation. Gas assisted flotation process. 4,902,429, Cl. 210-704.000.
Carrasco, Fernando M. Explosive release window grille. 4,901,817, Cl. 182-21.000.
Carrera, John P.: *See*—
Watson, Craig D., Eastman, Mary C.; Woods, David D.; Carrera, John P.; Easter, James R.; Lipner, Melvin H.; Elm, William C., and Mundy, A. Dean. 4,902,469, Cl. 376-259.000
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McKinney, Craig J., 4,901,416, Cl. 29-726.000.
Carter, Joseph: *See*—
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Carter, R. Richard; Mitchell, Thomas; and Bushman, Douglas C., to Compaq Computer Corporation. Arrangement of components in a laptop computer system. 4,903,222, Cl. 364-708.000.
Cartier, George E.; and Farmer, Peter H., to Monsanto Company Cross-linked polyvinyl butyral. 4,902,464, Cl. 264-211.240.
Carvais, Jean. Oral sustained release medicament. 4,902,513, Cl 424-455.000
Casale, Rudy J., and Messina, Neil, to Child Riding Incorporated. Foldable automobile convertible seat. 4,902,070, Cl. 297-238.000.
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House, Marshall K., 4,902,190, Cl. 414-667.000.
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Choy, Daniel S. J.; and Case, Robert B., 4,902,273, Cl. 600-18.000.
Casimir, Donald J.: *See*—
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Casler, Richard J., Jr.: *See*—
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Cassidy, Patrick E.; Tullos, Gordon L.; and St. Clair, Anne K., to United States of America, National Aeronautics and Space Administration. Low dielectric fluorinated poly(phenylene ether ketone) film and coating. 4,902,769, Cl. 528-125.000.
Castoldi, Luigi, to BCS S.p.A. Dynamically compensated anti-clog mowing device. 4,901,512, Cl. 56-293.000
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Rao, Kameswara K., 4,903,237, Cl. 365-185.000
Caterpillar Industrial Inc.: *See*—
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Causton, Peter: *See*—
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Cawse, John L.; and Rowland, David. Photographic coating solutions. 4,902,612, Cl. 430-628.000.
CDP Diamond Products, Inc.: *See*—
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Cearley, James E.: *See*—
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Ceelen, Dietrich: *See*—
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Centre National de la Recherche Scientifique (CNRS): *See*—
Aubert, Jean-Jacques; Lejus, Anne-Marie; Viana, Bruno; and Vivien, Daniel, 4,902,654, Cl. 501-117.000.
Centre National d'Etudes Spatiales (C.N.E.S.). *See*—
Regipa, Robert, 4,902,373, Cl. 156-467.000.
Cetus Corporation: *See*—
Nitecki, Danute E.; Katre, Nandini; Goodson, Robert J.; and Aldwin, Lois, 4,902,502, Cl. 424-83.000.
Chabanas, Denis: *See*—
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Chalberg, Philip E.; and McKnight, James P., to Hydrabaths, Inc. Air excitation hydromassage system. 4,901,379, Cl. 4-543.000.
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Russell, Gordon K.; Taylor, Donald; Ching, Clement; and Chan, Kam-Chuen, 4,901,631, Cl. 99-339.000.
Chan, Peter W. K., to Iolab Corporation. Method and composition for ophthalmic anesthesia using rodocaine. 4,902,692, Cl. 514-299.000.
Chan, Ting Y.; and Strickland, John C., to Texaco Inc. Catalyst inventory control in an ebullated bed process. 4,902,407, Cl. 208-152.000.
Chancellor, Charles W., Jr., to Tela Flynt Chancellor. Chair with pivotal arm extension. 4,902,072, Cl. 297-417.000.
Chandler, Donald O. Container label. 4,901,457, Cl. 40-306.000.
Chandra, Akhileshwari N.; Comerford, Liam D.; and White, Steve R., to International Business Machines Corporation. Implementing a shared higher level of privilege on personal computers for copy protection of software. 4,903,296, Cl. 380-4.000.
Chang, Chin-hai; and Saunders, Alex M., to Becton, Dickinson and Company. Lysing agent for analysis of peripheral blood cells. 4,902,613, Cl. 435-2.000.
Chang, Chin-Hsiung, to Allied-Signal Inc. Carbon molecular sieves for purification of chlorofluorocarbons. 4,902,312, Cl. 55-71.000.
Chang, Clarence D.; and Chu, Cynthia T-W., to Mobil Oil Corp Active amorphous mixed oxides. 4,902,663, Cl. 502-242.000.
Chang, Hsueh-Rong: *See*—
Ngo, Khai D. T.; Steigerwald, Robert L.; Walden, John P.; Baliga, Bantval J.; Korman, Charles S.; and Chang, Hsueh-Rong, 4,903,189, Cl. 363-127.000.
Chang, Morgan. Brake mechanism. 4,901,823, Cl. 188-73.100.
Chang, On-Kok; Hall, John C.; Phillips, Jeffrey; and Silvester, Lenard F., to Altus Corporation. Electrolyte additives to improve voltage regulation in the lithium-copper chloride rechargeable cell. 4,902,588, Cl. 429-50.000.
Chang, Shih-Chia; Hicks, David B.; and Putty, Michael W., to General Motors Corporation. Resonant-bridge two axis microaccelerometer 4,901,570, Cl. 73-517.0AV.
Chang, Tsun-Tsai: *See*—
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Chantepie, Bernard, to U.S. Philips Corp. Flip-flop arrangement for a divide-by-2 frequency divider comprising master-slave type memory elements. 4,902,909, Cl. 307-247.100.
Chapman, Max C., to Ford Motor Company. Accuracy adjustment for time-of-day clock using a microcontroller. 4,903,251, Cl. 368-156.000.
Chapparal Communications, Inc.: *See*—
Bruns, Robert W.; Morris, Lorenzo J.; Weber, John G.; and Howard, H. Taylor, 4,902,988, Cl. 333-21.00A.
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Chapron, Claude E. P., to U.S. Philips Corporation. Integrated circuit comprising a device for protection against electrostatic discharge. 4,903,095, Cl. 357-23.130.
Chapsky, Karl A.: *See*—
East, George H., Jr.; Roemer, Robert E.; and Chapsky, Karl A., 4,901,829, Cl. 188-381.000.
Chas, Jean-Bernard. Propulsion device with conditioned inertia. 4,902,254, Cl. 440-38.000.
Chasteen, Ronald E., to Injection Research Specialists, Inc. Two-cycle engine with electronic fuel injection. 4,901,701, Cl. 123-478.000.
Chatelin, Roger: *See*—
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Chaudhari, Raghunath V.: *See*—
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Chavasset, George: *See*—
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Chemello, Jean-Pierre; and Perchet, Thierry, to Salomon S.A. Ski boot liner. 4,901,450, Cl. 36-10.000.
Chemie Holding Aktiengesellschaft: *See*—
Korsatko, Werner; and Korsatko-Wabnegg, Brigitta, 4,902,516, Cl. 424-497.000.
Chen, Jiann-Shyong. Flash bracelet. 4,903,176, Cl. 362-103.000.
Chen, Samuel J., to Kendall Company. Novel adhesives and tapes including same. 4,902,569, Cl. 428-344.000.
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Cheng, Jung-Jen A.: *See*—
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Chernenko, Evgeny A.: *See*—
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Chesnut, M. Gaines. Cartridge magazine having a single piece magazine head. 4,901,463, Cl. 42-50.000.
Chestnut, M. Gaines; and Brandenburg, Ernest, to Ram-Line, Inc. Apparatus for partial disassembly of firearm. 4,901,411, Cl. 29-1.100.
Cheung, Harry, to Union Carbide Corporation. Cryogenic rectification process for producing ultra high purity nitrogen 4,902,321, Cl. 62-24.000.
Chevron Research Company: *See*—
De, Bibhas R.; Donoho, Paul L.; Revus, David E., and Boyer, Russell E., 4,902,961, Cl. 324-640.000.
McRoskey, Peter K.; and Havlovitz, Paul M., 4,901,923, Cl. 239-123.000.
Rainis, Andrew, 4,902,666, Cl 502-439.000.
Zones, Stacey I.; and Innes, R. A., 4,902,844, Cl. 585-481.000.
Chi-Shuang, Huang. Picking apparatus for a loom. 4,901,768, Cl. 139-134.000.
Chiapetta, Enrico G.: *See*—
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Chiarino, Dario; Grancini, Gian Carlo; Frigeni, Viviana, and Carenzi, Angelo, to Zambon Group S.p.A. 4-(3-Coumarinyl)-thiazole-derivatives with anti-allergic, anti-anaphylactic and anti-arthritic activity and compositions containing them. 4,902,688, Cl. 514-253.000.
Chida, Takao: *See*—
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Chikamori, Yoshihiro: *See*—
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Ching, Clement: *See*—
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Ching, Hui P., to Hing Wai Metal Factory Ltd. Adjustable deadlatch. 4,902,057, Cl. 292-337.000.
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Chisso Corporation: *See*—
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Cho, Alfred Y.: *See*—
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Cho, Kang-Rai. Wrist watch with memo case. 4,903,250, Cl 368-41.000.
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Cholat-Serpoud, Gerard; and Scherubl, Franz, to Atomic Skifabrik A. Rohrmoser. Reinforcing member. 4,902,548, Cl. 428-102.000.
Chong, Chi-Yong: *See*—
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Choy, Daniel S. J.; and Case, Robert B. Heart assist device. 4,902,273, Cl. 600-18.000
Christ, Hubertus, Nieman, Klaus; and Mehren, Herbert, to Daimler-Benz Aktiengesellschaft. Safety device for selectivity track-guided or road travelling vehicles. 4,901,810, Cl. 180-131.000.
Christensen, Joel R.; and Rorer, Morris P., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,902,339, Cl. 71-93.000.
Christensen, Marc F. Apparatus for inserting and extracting light bulbs. 4,901,606, Cl. 81-57.110.
Christenson, Craig L.: *See*—
Feldmann, Fritz K.; Griffith, Paul J.; and Christenson, Craig L., 4,901,646, Cl. 102-521.000.
Christian, Robert L., to General Motors Corporation. Paint color change system. 4,902,352, Cl. 134-22.120.
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Frost, Barry L., 4,901,835, Cl. 192-53.00F.
Glowczewski, Thomas, 4,901,561, Cl. 73-118.100.
Scott, Ian J. C., 4,901,686, Cl. 123-142.50E.
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Chupka, David E.; and Landegger, Carl C., to Black Clawson Company, The. Method of finishing screen plates. 4,901,417, Cl. 29-163.800.
Church, Henry: *See*—
Sable, Chester A.; Maldarelli, Lawrence V.; Church, Henry; and Graboff, Roy, 4,901,754, Cl. 137-433.000.
Chutjian, Ara; Hecht, Michael H.; and Orient, Otto J., to United States of America, National Aeronautics and Space Administration. Surface modification using low energy ground state ion beams. 4,902,647, Cl. 437-239.000.
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Hubele, Adolf, 4,902,340, Cl. 71-94.000.
Topfl, Werner, 4,902,336, Cl. 71-90.000.
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Hansen, N. Larry, to Johnson Industries, Inc. Portable car hoist and trailer with removable wheels. 4,901,980, Cl. 254-9.00C.

Hanson, Charles M., to Varo, Inc. Capacitive bolometer and method for detecting infrared radiation. 4,902,895, Cl. 250-338.200.

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Higa, Tatsuo; and Snader, Kenneth M., to Harbor Branch Oceanographic Institution, Inc. Anti-viral chamigrene derivatives. 4,902,716, Cl. 514-546.000.

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Loomis, Gary L.; and Murdoch, Joseph R., to Du Pont de Nemours, E. I., and Company. Polylactide compositions 4,902,515, Cl. 424-486.000.
Lopata, Donald J.; and Mathew, Robert L., to Corning Incorporated. Method of using external system for locating the geometric center of an internal lens element. 4,902,329, Cl. 65-29.000.
Lopatin, George: *See*—
Yen, Larry Y.; and Lopatin, George, 4,902,456, Cl. 264-41.000.
Lord Corporation: *See*—
Roitman, Lipa; and Auerbach, Robert A., 4,902,767, Cl. 528-28.000.
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Goncalves, Antonin, 4,901,882, Cl. 220-324.000.
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Novy, Vladimir A., 4,901,698, Cl. 123-418.000.
Losch, Gunter: *See*—
Kunze, Siegmar; and Losch, Gunter, 4,902,351, Cl. 134-3.000.
Lourette, Richard W.; and Cocca, J. David, to Eastman Kodak Company. Method and apparatus for calibrating and/or testing a photographic camera. 4,903,055, Cl. 354-21.000.
Lowe, Gregory E. Variable density light transmitting device. 4,902,112, Cl. 350-396.000.
Lowenstein, Michael Z.; and Jawernycky, Ronald G., to Myron Zucker, Inc. Voltage input for harmonimeter, and methods of constructing and utilizing same. 4,902,960, Cl. 324-621.000.
Loy, Fernand: *See*—
Rollin, Joel; Perrin, Jean-Claude; and Loy, Fernand, 4,902,098, Cl. 350-286.000.
LRC Electronics: *See*—
Samchisen, Edward J., 4,902,246, Cl. 439-578.000.
Lubbers, Hans: *See*—
Bertke, Heinrich; Bruggemann, Reinhard; Hampel, Peter; Schmidt, Joachim; Pohl, Werner, Bronstrup, Martin, Kasselmann, Hans; Lubbers, Hans; Prasse, Hans; and Schamel, Gerhard, 4,901,567, Cl. 73-272.00R.
Lucas, Bernard H.; and Shimano, David Y., to Canadian Patents & Development Ltd. Ferric chloride leach of a metal-sulphide bearing material. 4,902,344, Cl. 75-101.00R.
Lucas, Raymond, to Bobst SA. Device for automatically piling up flat elements. 4,902,195, Cl. 414-799.000.
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Park, Ho J.; Choi, Jin Y.; Park, Seong C.; and Yang, Gi H., 4,902,367, Cl. 156-297.000.
Ludden, Christopher A.: *See*—
D'Ambrosia, George C.; and Ludden, Christopher A., 4,903,009, Cl. 340-556.000.
Lueders, Arthur: *See*—
Bellotti, Marc; Davis, Ralph; and Lueders, Arthur, 4,902,282, Cl. 604-258.000.
Luffel, Donald L.: *See*—
Alger, Robert P.; and Luffel, Donald L., 4,903,207, Cl. 364-422.000.
Luhrs, Hermann: *See*—
Tegtmeyer, Kurt; Luhrs, Hermann, and Werner, Wolfgang, 4,901,636, Cl. 100-117.000.
Lui, Ming-Wah, to Keystone Electronics Company Limited. Motion sensors. 4,901,569, Cl. 73-517.00R.
Luk Lamellen Und Kupplungsbau GmbH: *See*—
Reik, Wolfgang; and Friedmann, Oswald, 4,901,596, Cl. 74-574.000.
Luke, John K. Mattress overlay with individual foam springs. 4,901,387, Cl. 5-464.090.
Luke, Milton. Control for foam brush for coin operated car wash. 4,902,153, Cl. 401-131.000.
Lumelsky, Leon: *See*—
Gupta, Satish; Lumelsky, Leon; and Segre, Marc, 4,903,217, Cl. 364-521.000.
Lundwall, Neal M.: *See*—
Nevins, William R.; Lundwall, Neal M.; and Walker, Dale L., 4,901,644, Cl. 102-293.000.
Lunsford, David W. Power unit and battery pack for toys. 4,902,262, Cl. 446-268.000.
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Lutz, Eugene G.: *See*—
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,901,910, Cl. 228-242.000.
Lyman, Harrison F., Jr.: *See*—
Carpenter, Robert K.; and Lyman, Harrison F., Jr., 4,902,429, Cl. 210-764.000.
Lynch, Matthew J.: *See*—
DiLeo, Thomas J.; Lynch, Matthew J.; Nelson, Marshall B.; and Lin, Ronny W., 4,902,846, Cl. 585-525.000.
Lynx Golf, Inc.: *See*—
Boone, David D., 4,902,016, Cl. 273-175.000.
Lyons, Patrick J.: *See*—
Abbott, Kenneth E.; Lyons, Patrick J.; and Satariano, Richard M., 4,901,928, Cl. 239-530.000.
Ma, Bao-Min; and Narasimhan, Kalathur S. V. L., to Crucible Materials Corporation. Permanent magnet alloy for elevated temperature applications. 4,902,360, Cl. 148-302.000.
MacAndrew, John A., to Xerox Corporation. Variable magnification copier. 4,903,079, Cl. 355-235.000.
MacArthur, J. Ward: *See*—
Grald, Eric W.; and MacArthur, J. Ward, 4,901,918, Cl. 236-178.00D.
MacDonald, Alistair: *See*—
Marietta, Dale B.; and MacDonald, Alistair, 4,902,047, Cl. 285-39.000.
MacDonald, Robert D.: *See*—
Nicklas, James R.; and MacDonald, Robert D., 4,901,750, Cl. 137-270.000.
MacDonald, William A.: *See*—
Carter, Neil; Griffin, Brian P.; MacDonald, William A.; and Ryan, Timothy G., 4,902,772, Cl. 528-272.000.
Macedo, Pedro B.; Litovitz, Theodore A.; and Hojaj, Hamid, to Macedo, Pedro B.; and Litovitz, Theodore Aaron. Ion exchange compositions. 4,902,426, Cl. 210-656.000.
Macemon, Herbert J.: *See*—
Marshall, James W.; Smith, Somers H., III; Piatt, Clair E.; Bryant, Rickey W.; Lee, Donald S.; Macemon, Herbert J.; Wood, Robert B., Jr.; and Wallace, Ricky L., 4,901,773, Cl. 140-92.100.
Machado, Marc I.: *See*—
Machado, Rodney I.; and Machado, Marc I., 4,901,418, Cl. 29-263.000.
Machado, Rodney I.; and Machado, Marc I. Golf head removal tool. 4,901,418, Cl. 29-263.000.
Machida, Michihide: *See*—
Kume, Shoichi; Yoshida, Haruo; Suzuki, Kazutaka; Tasaki, Yoshio; Ikuta, Shiro; Ishikawa, Masamitu; and Machida, Michihide, 4,902,652, Cl. 501-90.000.
Mackie, Michael J.: *See*—
McGugan, John D.; Mackie, Michael J.; and Buckley, Norman, 4,902,045, Cl. 285-24.000.
MacLean, Alison J.; Holloway, Richard L.; Lawson, Valerie A.; and Cronen, John W., to Atlantic Richfield Company. Fixed bed hydrocracking process. 4,902,405, Cl. 208-59.000.
Madden, Dermot G., to Saturn Corporation. Engine and low vibration crankshaft therefor. 4,901,692, Cl. 123-192.00B.
Madhavan, Suresh; Cohen, Adam; and Holman, Roger, to Cambridge Aeroflo, Inc. Pulse width modulated inductive load controller. 4,903,188, Cl. 363-96.000.
Madsen, David C.: *See*—
Sherman, Leigh E.; Whatcott, Gary L.; Dicks, Richard M.; and Madsen, David C., 4,902,948, Cl. 318-580.000.
Maeda, Akira; Sano, Koichi; and Yokoyama, Tetsuo, to Hitachi, Ltd. Phase correcting method in a magnetic resonance imaging system and device for realizing the same. 4,902,974, Cl. 324-312.000
Maeda Industries, Ltd.: *See*—
Ozaki, Nobuo; Miura, Kazuyuki; and Yamazaki, Toshimasa, 4,901,595, Cl. 74-502.200.
Maeda, Kazuhiro: *See*—
Aoki, Tsuyoshi; Ono, Michio; Maeda, Kazuhiro; and Kitasako, Hiroyuki, 4,903,114, Cl. 357-70.000.
Maeda, Satoru: *See*—
Murashima, Hirotsugu; Maeda, Satoru; and Hirano, Shunji, 4,903,134, Cl. 358-227.000.
Maeda, Shozo: *See*—
Kobori, Takuju; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 4,901,486, Cl. 52-167.0DF.
Maeda, Takuya, to Alps Electric Co., Ltd. Automatic canceling device for winker device. 4,902,860, Cl. 200-61.270.
Maehara, Yasunori: *See*—
Utsumi, Isao; Kawai, Yasuhiro; Tamura, Kaoru; Maehara, Yasunori; Fujiwara, Sigeme; and Koyama, Katsuhide, 4,901,868, Cl. 211-51.000.
Maekawa, Nobuyoshi; Yokouchi, Hideya; Aruga, Tomoe; and Sugiyama, Tadashi, to Seiko Epson Corporation. Disc drive. 4,903,155, Cl. 360-99.080.
Magda, Robert J., to Lawn Doctor, Inc. Cultivator. 4,901,655, Cl. 111-8.000.
Magenta Corporation: *See*—
Song, John S., 4,901,892, Cl. 222-498.000.
Maget, Henri J. R.; and Krejci, Paul K., to IVAC Corporation. Fluid delivery micropump. 4,902,278, Cl. 604-132.000.
Maggioni-Winthrop S.p.A.: *See*—
Picciola, Giampaolo; Riva, Mario; Ravenna, Franco; and Gentili, Piergiorgio, 4,902,799, Cl. 546-199.000.
Magneco/Metrel, Inc.: *See*—
Soofi, Madjid, 4,901,985, Cl. 266-281.000.
MagneTek Inc.: *See*—
Lindquist, John, 4,902,938, Cl. 315-307.000.
Magnus, Fredrick L.: *See*—
Colvin, Howard A.; Bull, Charles L., Jr.; and Magnus, Fredrick L., 4,902,775, Cl. 528-389.000.

Magoun, George F. *See—*
Burroway, Gary L.; Magoun, George F.; and Gujarathi, Ramesh N., 4,902,741, Cl. 524-836.000.

Magro, Carmelo: *See—*
Oliveri, Carmelo; and Magro, Carmelo, 4,902,632, Cl. 437-8.000.

Magumo, Ryoichi: *See—*
Sakamoto, Masami; Magumo, Ryoichi; Ishihara, Tamio; and Kobari, Takao, 4,903,045, Cl. 346-136.000.

Maguran, Gene A.; and Meloche, Kenneth R., to General Motors Corporation. Electrically controlled shock absorber. 4,902,034, Cl. 280-707.000.

Maho Aktiengesellschaft. *See—*
Babel, Werner, 4,901,840, Cl. 198-346.100.

Mai, Khuong H. X.; and Patil, Ghanshyam, to Du Pont de Nemours, E. I., and Company. Preparation of ethylenediamine derivatives. 4,902,831, Cl. 564-367.000.

Maillot, Jean C., to Schlumberger Industries. Connector assembly for electronic memory cards, and read/write apparatus making use thereof. 4,902,233, Cl. 439-62.000.

Maina, Bruno, to ROJ Electrotex S.p.A. Casing for weft storage and feeding device. 4,901,771, Cl. 139-452.000.

Mairlot, Henri, to Glaceries de Saint-Roch S.A. Curved glazed roofs 4,901,499, Cl. 52-742.000.

Maitre, Bernard J., to Electronique Serge Dassault. Angular discrimination process and device for radar. 4,903,030, Cl. 342-113.000.

Maja, Mario: *See—*
Clerici, Guido; and Maja, Mario, 4,902,591, Cl. 429-204.000.

Majumdar, Gourab: *See—*
Fukunaga, Masanori; and Majumdar, Gourab, 4,903,106, Cl. 357-43.000.
Hiramoto, Takahiro; and Majumdar, Gourab, 4,902,921, Cl. 307-570.000.

Makabe, Jun: *See—*
Hayashi, Tohru; Sakai, Yoshiaki; Aikawa, Shinichi; Matsunaga, Hiroshi; and Makabe, Jun, 4,903,156, Cl. 360-104.000.

Maki, Kazuya: *See—*
Iino, Takashi; Yamaguchi, Koji; Kawahara, Enchiro, and Maki, Kazuya, 4,901,529, Cl. 60-489.000.

Maldarelli, Lawrence V.: *See—*
Sable, Chester A.; Maldarelli, Lawrence V., Church, Henry; and Graboff, Roy, 4,901,754, Cl. 137-433.000.

Maldonado, Robert L. Convertible car seat apparatus. 4,902,026, Cl. 280-30.000.

Malek, Stefan J., to MiniScribe Corporation. Electromagnet-actuated head latching apparatus. 4,903,157, Cl. 360-105.000.

Mallouk, Robert S., and Branca, Phillip A. Composite membrane 4,902,308, Cl. 55-16.000.

Maloberti, Rene, to Coflexip. Connector with quick release under load. 4,902,046, Cl. 285-34.000.

Malone, Kenneth M.; and Bacco, Samuel D. Hand-held percussion instrument. 4,901,617, Cl. 84-402.000.

Mamulashvili, Gennady L.: *See—*
Loladze, Teimuraz N.; Battashvili, Boris I., and Mamulashvili, Gennady L., 4,901,477, Cl. 51-109.00R.

Man Design Co., Ltd.: *See—*
Shimizu, Giichiro, 4,903,335, Cl. 455-343.000.

Mandet, Gerard M. F.: *See—*
Commaret, Patrice; Desaulty, Michel A. A.; Hernandez, Didier H.; Laugeois, Jean-Claude; Mandet, Gerard M. F.; and Martinez, Rodolphe, 4,901,522, Cl. 60-39.320.

Manganelli Del Fa' Carlo. *See—*
Piacenti, Franco; Manganelli Del Fa' Carlo; Moggi, Giovanni; Pasetti, Adolfo; and Scala, Andrea, 4,902,538, Cl. 427-393.600.

Mangia, Alberto; Giobbio, Vicenzo; and Ornato, Giorgio, to Pierrel Spa. Novel process for the synthesis of amikacin. 4,902,790, Cl. 536-13.700.

Manis, Donald R.; and Hammock, Lon C. Portable battery charger. 4,902,955, Cl. 320-2.000.

Mannesmann AG: *See—*
Koenig, Heribert; and Stark, Heinz, 4,903,278, Cl. 373-97.000.

Mannesmann Kienzle GmbH: *See—*
Knauer, Norbert; Saeger, Benjamin; Wangler, Josef; and Helmschrott, Norbert, 4,903,044, Cl. 346-121.000.

Mannesmann Rexroth GmbH: *See—*
Feuser, Alfred, 4,901,624, Cl. 91-35.000.

Mantoku, Hitoshi: *See—*
Yagi, Kazuo; and Mantoku, Hitoshi, 4,902,460, Cl. 264-83.000.

Manville Corporation: *See—*
Wilson, Jerry F., 4,901,849, Cl. 206-148.000.

Manzer, Leo E.; and Rao, V. N. Mallikarjuna, to Du Pont de Nemours, E. I., and Company. Isomerization of saturated fluorohydrocarbons. 4,902,838, Cl. 570-151.000.

Mao, Bor-Yen; and Yeakley, Richard L., to Texas Instruments, Incorporated. Epitaxial process for silicon on insulator structure. 4,902,642, Cl. 437-83.000.

Marchand, Bernard. *See—*
Vincent, Michel; Baliarda, Jean; Marchand, Bernard, and Remond, Georges, 4,902,817, Cl. 560-171.000.

Marcinko, Richard M.: *See—*
Woo, James T. K.; and Marcinko, Richard M., 4,902,566, Cl. 428-319.900.

Marggraff, Lewis J.: *See—*
Baran, Paul; Corbalis, Charles M.; Holden, Brian D.; Masatsugu, Jon K.; Marggraff, Lewis J.; Owen, David P.; and Stonebridge, Peter W. J., 4,903,261, Cl. 370-94.200.

Marhold, Albrecht. *See—*
Bielefeldt, Dietmar; Marhold, Albrecht, and Negele, Michael, 4,902,839, Cl. 570-175.000.

Marietta, Dale B.; and MacDonald, Alistair, to Vetco Gray Inc. Thread connector anti-rotation device. 4,902,047, Cl. 285-39.000.

Marik, Charles J.; and Ecklund, Lawrence, to Motorola, Inc. Clamping circuit for a PLL tuning system. 4,903,329, Cl. 455-182.000.

Markowski, Robert G.; Robarge, Dean A.; Owens, Robert L.; and Tankersley, Jerome B., III, to General Electric Company. Versatile electric disconnect switch. 4,902,864, Cl. 200-459.000.

Marks, Maurice J., to Dow Chemical Company, The. Preparation of segmented block copolycarbonates. 4,902,758, Cl. 525-462.000.

Marks and Spencer p.l.c.: *See—*
Conran, Sebastian; and Anderson, Antony, 4,901,893, Cl. 223-66.000.

Markson, Ralph J. *See—*
Williams, Earle R., and Markson, Ralph J., 4,901,564, Cl. 73-170.00R.

Marshall, James W.; Smith, Somers H., III; Piatt, Clair E.; Bryant, Rickey W.; Lee, Donald S.; Macemon, Herbert J.; Wood, Robert B., Jr.; and Wallace, Ricky L., to Kuhlman Corporation. High voltage coil winding machine. 4,901,773, Cl. 140-92.100.

Martin, Alain: *See—*
Roger, Pierre; Choay, Patrick; Monneret, Claude; Fournier, Jean-Paul; and Martin, Alain, 4,902,791, Cl. 536-17.700.

Martin, James M.: *See—*
Pepi, Jerome S.; and Martin, James M., 4,901,799, Cl. 169-39.000.

Martin, M. Warren; and Weber, Lawrence H., to R & B Machine Tool Company. Rotary blow molding machine with rotary take-out mechanism having expandible take-out pin. 4,902,217, Cl. 425-537.000.

Martin Paul, Inc.: *See—*
Belokin, Martin P., and Belokin, Norman P., 4,901,458, Cl. 40-414.000.

Martin, Richard R.; and Schnell, Earl W., to John Zink Company. Oxygen injector means for secondary reformer. 4,902,484, Cl. 422-189.000.

Martin, Roger T.: *See—*
Faruk, Erol A.; and Martin, Roger T., 4,902,801, Cl. 546-220.000.

Martinez, Rodolphe: *See—*
Commaret, Patrice; Desaulty, Michel A. A.; Hernandez, Didier H.; Laugeois, Jean-Claude; Mandet, Gerard M. F.; and Martinez, Rodolphe, 4,901,522, Cl. 60-39.320.

Martino, Germain: *See—*
Juguin, Bernard; Raatz, Francis; Travers, Christine; and Martino, Germain, 4,902,847, Cl. 585-533.000.

Martino, Louis D. Modular athletic turf. 4,902,540, Cl. 428-17.000.

Martino, Louis D. Golf range mat. 4,902,541, Cl. 428-17.000.

Maruyama, Yasuo: *See—*
Suga, Yoshinori; Tanaka, Eiji; and Maruyama, Yasuo, 4,902,761, Cl. 526-119.000.

Marx, Wolf-Ruediger: *See—*
Goeldner, Heinz-Dieter; Horn, Bertold; Liedtke, Thomas; Marx, Wolf-Ruediger; and Schaefer, Werner, 4,902,138, Cl. 374-44.000.

Maryatt, Christopher J., to Avantek, Inc. Substrate transport box. 4,901,853, Cl. 206-334.000.

Masai, Teruhisa: *See—*
Hayakawa, Kunihiko; Masai, Teruhisa; Yoshida, Yasuyuki; Shibuta, Takanobu; and Miyazaki, Hiroshi, 4,902,673, Cl. 514-21.000.

Masaki, Kenji; Osawa, Izumi; Takedomi, Yumiko; and Fujiwara, Masanori, to Minolta Camera Kabushiki Kaisha. Photosensitive member having an overcoat lyer and process for manufacturing the same. 4,902,595, Cl. 430-66.000.

Masatsugu, Jon K.: *See—*
Baran, Paul; Corbalis, Charles M.; Holden, Brian D.; Masatsugu, Jon K.; Marggraff, Lewis J.; Owen, David P.; and Stonebridge, Peter W. J., 4,903,261, Cl. 370-94.200.

Maschinenfabrik Hellmut Geiger GmbH. & Co. KG: *See—*
Botsch, Bertram, 4,902,410, Cl. 210-104.000.

Maschinenfabrik Rieter AG: *See—*
Stalder, Herbert; Keller, Urs; Briner, Emil; Oeggerli, Werner; and Wurmli, Arthur, 4,901,518, Cl. 57-401.000.

Maschmeier, Frederick W. Method and apparatus for guiding a saw relative to an angular cut of a board. 4,901,444, Cl. 33-423.000.

Masco Corporation of Indiana: *See—*
Hutto, Joe D., 4,901,749, Cl. 137-270.000.
Nicklas, James R.; and MacDonald, Robert D., 4,901,750, Cl. 137-270.000.

Mase, Syunzo: *See—*
Yajima, Yasuhito; and Mase, Syunzo, 4,903,000, Cl. 338-4.000.

Maserjian, Joseph, to California Institute of Technology. Tunable quantum well infrared detector. 4,903,101, Cl. 357-30.000.

Massachusetts Institute of Technology: *See—*
Hollis, Mark A.; Bozler, Carl O.; Nichols, Kirby B.; and Bergeron, Normand J., Jr., 4,903,089, Cl. 357-22.000.
Yannas, Ioannis V., 4,902,289, Cl. 623-1.000.

Massardo, Pietro: *See—*
Capuzzi, Luigi; Bettarini, Franco; Castoro, Paolo; Massardo, Pietro; and Caprioli, Vincenzo, 4,902,697, Cl. 514-351.000.

Massey, Peter J., to U.S. Philips Corp. Horn antenna arrangement. 4,903,038, Cl. 343-786.000.

Massmann, Volker: *See—*
Lingemann, Karl-Heinz; Poetsch, Dieter; and Massmann, Volker, 4,903,131, Cl. 358-214.000.

Masuda, Tomohiko: *See—*
Matsubara, Ken; Saito, Itaru; Kitano, Hirohisa; Shingaki, Kouichi; and Masuda, Tomohiko, 4,902,111, Cl. 350-393.000.

Masuhara, Masumi; and Shimahara, Akihito, to Sanyo Electric Co., Ltd. Tuner with a timepiece. 4,903,336, Cl. 455-344.000.

Masuishi, Tetsuya; Tsuji, Hiroshi; Yasunobu, Chizuko; and Ohata, Hideo, to Hitachi Ltd. Inference method. 4,903,215, Cl. 364-513.000.

Masuoka, Fujio; and Ochii, Kiyofumi, to Kabushiki Kaisha Toshiba. Semiconductor memory device with barrier layer. 4,903,096, Cl. 357-23.500.

Masuoka, Hideaki, to Kabushiki Kaisha Toshiba. Logic circuit used in standard IC or CMOS logic level. 4,902,914, Cl. 307-446.000.

Matchett, Richard L.; Roof, David R.; Kikta, Thomas J.; Wilczynski, Rosemarie; Nilsen, Roy J.; Bacvinskas, William S.; and Fodor, George, to United States of America, Energy System for fuel rod removal from a reactor module. 4,903,281, Cl. 376-264.000.

Matex Co., Ltd.: *See—*
Matoba, Hideyasu, 4,901,602, Cl. 415-335.000.

Mathew, Robert L.: *See—*
Lopata, Donald J.; and Mathew, Robert L., 4,902,329, Cl. 65-29.000.

Mathies, Burkhard; Misse, Didier; Guignard, Claude; and Pidoux, Paul, to Orthoconcept. Circulating a liquid through a joint. 4,902,277, Cl. 604-67.000.

Matkovich, Vlado I.: *See—*
Pascale, Frank R.; and Matkovich, Vlado I., 4,902,421, Cl. 210-416.100.

Matoba, Hideyasu, to Matex Co., Ltd. Planetary gear assembly for a planetary transmission. 4,901,602, Cl. 415-335.000.

Matsubara, Akinori; and Akutsu, Takahashi, to Casio Computer Co., Ltd. Electronic musical instrument with delay trigger function. 4,901,616, Cl. 84-1.030.

Matsubara, Akio: *See—*
Murai, Toshiharu; and Matsubara, Akio, 4,903,016, Cl. 340-825.070.

Matsubara, Ken; Saito, Itaru; Kitano, Hirohisa; Shingaki, Kouichi; and Masuda, Tomohiko, to Minolta Camera Kabushiki Kaisha. Method and device for driving electro-optical light shutter array. 4,902,111, Cl. 350-393.000.

Matsubara, Saburo; and Yagi, Shinichi, to Nippon Oil Co. Ltd. Method of making ceramic articles. 4,902,459, Cl. 264-63.000.

Matsuda, Hiromu; Taguchi, Nobuyoshi; Imai, Akihiro; and Yubakami, Keiichi, to Matsushita Electric Industrial Co., Ltd. Thermal dye transfer printing systems, thermal printing sheets, and dye receiving sheets. 4,902,669, Cl. 503-227.000.

Matsui, Akira, to Kabushiki Kaisha Toshiba. Magnetic recording and reproducing apparatus capable of containing a plurality of recording cassettes. 4,903,152, Cl. 360-92.000.

Matsui, Fumio. *See—*
Namiki, Tohru; Matsui, Fumio; Shimoda, Kouji; and Fuse, Yosiaki, 4,903,224, Cl. 369-290.000.

Matsui, Sadayoshi: *See—*
Taneya, Mototaka; Matsumoto, Mitsuhiro; Matsui, Sadayoshi; and Hosoba, Hiroyuki, 4,903,274, Cl. 372-48.000.

Matsui, Tatsuro: *See—*
Nonaka, Toshiaki; Nakajima, Masashi; Matsui, Tatsuro; and Dokoshi, Noriaki, 4,902,736, Cl. 524-296.000.

Matsumoto, Hiromitsu, to Yamaha Hatsudoki Kabushiki Kaisha. Intake system for engines. 4,901,680, Cl. 123-52.0MB.

Matsumoto, Hiroshi: *See—*
Saito, Tadayoshi; Kawakami, Junzo; Takahashi, Susumu; Suehiro, Testuo; Matsumoto, Hiroshi; and Tachibana, Kouji, 4,903,192, Cl. 364-157.000.

Matsumoto, Masaharu: *See—*
Sakai, Kunio; Nishikawa, Hiromitsu; and Matsumoto, Masaharu, 4,902,067, Cl. 296-180.100.

Matsumoto, Mitsuhiro: *See—*
Taneya, Mototaka; Matsumoto, Mitsuhiro; Matsui, Sadayoshi; and Hosoba, Hiroyuki, 4,903,274, Cl. 372-48.000.

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Hiramoto, Takahiro; and Majumdar, Gourab, 4,902,921, Cl. 307-570.000.
Isoda, Satoru; Tomisawa, Osamu; and Kawakubo, Hiroaki, 4,902,555, Cl. 428-195.000.
Isozumi, Shuzoo, 4,902,904, Cl. 290-48.000.
Iwasaki, Hiroshi, 4,903,198, Cl. 364-200.000.
Kondou, Harufusa; and Nakaya, Masao, 4,902,637, Cl. 437-51.000.
Miyatake, Hideshi; Kumanoya, Masaki; and Dosaka, Katsumi, 4,903,238, Cl. 365-189.060.
Morishita, Akira, 4,902,905, Cl. 290-48.000.
Nakano, Hirofumi, 4,902,646, Cl. 437-203.000.
Nakayama, Takeshi; Kobayashi, Kazuo; and Terada, Yasushi, 4,903,236, Cl. 365-185.000.
Okamoto, Tatsuo; and Ogoh, Ikuo, 4,903,117, Cl. 357-71.000.
Sakashita, Narumi; and Shimazu, Yukihiko, 4,903,005, Cl. 340-146.200.
Takeuchi, Sumitaka; and Okada, Kensuke, 4,903,027, Cl. 341-156.000.
Tanaka, Katsufusa; Motoyoshi, Takeo; Yamashita, Tohru; Nakatsukasa, Naoyuki; and Takematsu, Takaharu, 4,903,252, Cl. 369-36.000.
Tsuji, Shintaro, 4,901,822, Cl. 187-127.000.
Yamawaki, Masao, 4,903,132, Cl. 358-209.000.
Yasui, Koji; Tanaka, Masaaki; Yagi, Shigenori; Kuzumoto, Masaki; Myoi, Yasuhito; and Kuba, Kazuki, 4,903,271, Cl. 372-9.000.
Yokouchi, Kazuhiro; Kageyama, Tatsumi; Sekine, Chogo; Hojo, Harumasa; Yamada, Koji; Mikuriya, Makoto; and Hirata, Seiichiro, 4,903,212, Cl. 364-449.000.
Yoshitake, Kunitoshi; Tsujita, Yoshihiro; and Ono, Hideyo, 4,903,325, Cl. 455-89.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Tsuji, Mikio; Yoshitomi, Kazuo; Noro, Shingo; Hayashi, Masayuki; Murase, Hiroyasu; Kato, Naoyoshi; Araki, Kazunori; and Tanaka, Kenjiro, 4,901,504, Cl. 53-247.000.
Yamamoto, Takashi; Kaneko, Shozo; Gengo, Tadashi, Ichinari, Joji; Fujiyama, Hiroshi; Kayumi, Yoshio; and Murata, Masayoshi, 4,901,669, Cl. 118-723.000.

Mitsubishi Kasei Corporation: *See—*
Hayasi, Yosio; Oguri, Tomei; Shimoda, Masaki; Tsutsui, Mikio; Takahashi, Kazuo; and Miida, Hitoshi, 4,902,700, Cl. 514-365.000.
Noguchi, Masahiro; Gotoh, Hideki; and Shimoyama, Kenji, 4,902,356, Cl. 148-33.400.
Suga, Yoshinori; Tanaka, Eiji; and Maruyama, Yasuo, 4,902,761, Cl. 526-119.000.

Mitsubishi Kinzoku Kabushiki: *See—*
Yoshimura, Hironori, 4,902,395, Cl. 204-192.300.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Koide, Masato; Iwamura, Takuro; and Koya, Tsugio, 4,901,550, Cl. 72-38.000.

Mitsubishi Monsanto Chemical Company: *See—*
Noguchi, Masahiro; Gotoh, Hideki; and Shimoyama, Kenji, 4,902,356, Cl. 148-33.400.

Mitsubishi Rayon Co., Ltd.: *See—*
Nishihara, Yoshihiro; Furutani, Yoshifumi, Toramaru, Masaaki; and Yasunaga, Toshiyuki, 4,902,452, Cl. 264-28.000.
Yamamoto, Naoki; Nishida, Kozi; and Yanagase, Akira, 4,902,742, Cl. 525-63.000.

Mitsuboshi Belting Ltd.: *See—*
Takano, Hiroshi, 4,902,265, Cl. 474-13.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Tanaka, Michio; Kurano, Yoshito; and Taniguchi, Katsuo, 4,902,837, Cl. 568-730.000.
Yagi, Kazuo; and Mantoku, Hitoshi, 4,902,460, Cl. 264-83.000.

Mitsuno, Tatsuyuki; Shinonaga, Hideo; Daimon, Akio; and Hosoda, Satoru, to Sumitomo Chemical Company Limited. Thermoplastic elastomer composition and process for producing same 4,902,738, Cl. 524-525.000.

Mitsuya, Yasunaga: *See*—
Mizukami, Makoto; Mitamura, Akio; Arai, Ryoichi; Mitsuya, Yasunaga; and Mikazuki, Tetsuo, 4,903,151, Cl. 360-78.010.

Miura, Kazuyuki: *See*—
Ozaki, Nobuo; Miura, Kazuyuki; and Yamazaki, Toshimasa, 4,901,595, Cl. 74-502.200.

Miura, Morikazu: *See*—
Ikeda, Masanori; Miura, Morikazu; and Aoshima, Atsushi, 4,902,810, Cl. 549-521.000.

Mivelaz, Michael B. Watering system automatic additive dispenser kit. 4,901,890, Cl. 222-395.000.

Miwa, Hiromichi; Uchida, Masaaki; and Kawamura, Yoshihisa, to Nissan Motor Company, Limited. System for controlling a fuel injection quantity and method therefor. 4,901,699, Cl. 123-478.000.

Miyadera, Hiroo: *See*—
Sakuraba, Taketoshi; Katada, Hisashi; Ohfusa, Yoshitaka; Yoshizawa, Yasufumi; Arai, Toshiaki; and Miyadera, Hiroo, 4,903,234, Cl. 365-49.000.

Miyagi, Ken: *See*—
Murayama, Yasushi; Hoshino, Osamu; Chiku, Kazuyoshi, Sato, Yukio; Kubota, Yoichi; Miyagi, Ken; Hirose, Yoshihiko; Matsuzawa, Kunihiko; Miyake, Hiroyuki; Aoki, Tomohiro; Uchida, Takashi; and Kanekura, Kazunori, 4,903,067, Cl. 346-160.000.

Miyahara, Michito: *See*—
Wada, Toshiaki; Furukawa, Mitsuhiko; Shiroyama, Masaharu; Nagano, Mitsuyoshi; Miyahara, Michito; Kitahira, Takashi; and Mohri, Shigeki, 4,902,651, Cl. 501-87.000.

Miyahara, Namasa: *See*—
Imai, Koichi; Sumoto, Misao; Nakamura, Hiroyuki; and Miyahara, Namasa, 4,902,762, Cl. 526-237.000.

Miyake, Hiroyuki: *See*—
Murayama, Yasushi; Hoshino, Osamu; Chiku, Kazuyoshi; Sato, Yukio; Kubota, Yoichi; Miyagi, Ken; Hirose, Yoshihiko, Matsuzawa, Kunihiko; Miyake, Hiroyuki; Aoki, Tomohiro; Uchida, Takashi; and Kanekura, Kazunori, 4,903,067, Cl. 346-160.000.

Miyake, Kazuyuki; Murata, Atsuhiko; and Yoshimoto, Yuji, to Koito Manufacturing Co., Ltd. Color liquid-crystal display unit with electrodes interleaved in vertical and horizontal directions. 4,902,103, Cl. 350-336.000.

Miyame, Yutaka: *See*—
Takarabe, Isamu; and Miyame, Yutaka, 4,901,421, Cl. 29-437.000.

Miyamura, Tadashi; and Sugawara, Shigeo, to Sumitomo Metal Industries, Ltd. Plasma apparatus. 4,902,934, Cl. 315-111.210.

Miyamura, Takao: *See*—
Sakabe, Takao; Honma, Akira; Miyamura, Takao; Suzuki, Hiroshi; and Meguro, Yoshihito, 4,902,382, Cl. 162-175.000.

Miyatake, Hideshi; Kumanoya, Masaki; and Dosaka, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device with improved immunity to supply voltage fluctuations. 4,903,238, Cl. 365-189.060.

Miyatake, Hideshi: *See*—
Hidaka, Hideto; Fujishima, Kazuyasu; Kumanoya, Masaki; Miyatake, Hideshi; Dosaka, Katsumi; and Yoshihara, Tsutomu, 4,903,268, Cl. 371-40.100

Miyauchi, Hiroshi: *See*—
Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi; Yanagi, Akihiko; Yagi, Shigeki, Miyauchi, Hiroshi; and Shibuya, Katsuhiko, 4,902,335, Cl. 71-90.000.

Miyazaki, Hiroshi: *See*—
Hayakawa, Kunihiko; Masai, Teruhisa; Yoshida, Yasuyuki; Shibuta, Takanobu; and Miyazaki, Hiroshi, 4,902,673, Cl 514-21.000.

Miyazaki, Kunihiro: *See*—
Kimura, Yoshitaka; Furuta, Yuji; Miyazaki, Kunihiro; and Hiratwa, Tadashi, 4,902,649, Cl. 501-1.000.

Miyazaki, Masaru: *See*—
Imamura, Toshinori; Miyazaki, Masaru; Terano, Akihisa; Matsunaga, Nobutoshi; and Yanazawa, Hiroshi, 4,902,635, Cl. 437-44.000.

Miyazawa, Shozo: *See*—
Ishii, Wataru; Miyazawa, Shozo; Tsuchiya, Shinji; Nakane, Hisashi; and Yokota, Akira, 4,902,770, Cl. 528-149.000.

Miyoshi, Motosuke: *See*—
Yamazaki, Yuichiro; Miyoshi, Motosuke; Ogawa, Shigeru; and Okumura, Katsuya, 4,902,131, Cl. 356-336.000.

Miyoshi, Shuji; Sugihara, Takashi; and Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Moisture sensitive resistive element. 4,902,571, Cl. 128-411.100.

Mizoue, Kazutoshi; Okazaki, Tadayasu; Hanada, Kazunori; Omura, Sadafumi; and Amamoto, Toshiro, to Taisho Pharmaceutical Co., Ltd. Novel tripetide derivatives. 4,902,781, Cl. 530-331.000.

Mizuguchi, Ryuzo: *See*—
Aoki, Kei; Kanda, Kazunori; Urano, Satoshi; and Mizuguchi, Ryuzo, 4,902,727, Cl. 522-90.000.

Mizukami, Hiroshi; and Tukazaki, Hideo, to Nakajima, Hidetoshi; Mizukami, Hiroshi; and Watanabe, Kuniaki. Gas filter. 4,902,314, Cl. 55-97.000.

Mizukami, Makoto; Mitamura, Akio; Arai, Ryoichi; Mitsuya, Yasunaga; and Mikazuki, Tetsuo, to Nippon Telegraph and Telephone Corporation. Head positioning system for positioning a multiple head with respect to data and servo trasks of a recording medium. 4,903,151, Cl. 360-78.010.

Mizukoshi, Yasumasa; and Ishijima, Minoru, to Nippon Seiko Kabushiki Kaisha. Fastening band and fastening tool therefor. 4,901,404, Cl. 24-20.0TT.

Mizumura, Shunzi: *See*—
Kawai, Osamu; and Mizumura, Shunzi, 4,902,039, Cl. 280-802.000.

Mizutani, Haruyasu: *See*—
Ohta, Satoshi; Takimoto, Mashiro; Yamazaki, Yoshio; and Mizutani, Haruyasu, 4,902,545, Cl. 428-36.600.

Mizutani, Hideo: *See*—
Kamiya, Saburo; and Mizutani, Hideo, 4,902,900, Cl. 250-548.000.

Mizutani, Wataru: *See*—
Okayama, Shigeo; Tokumoto, Hiroshi; Bando, Hiroshi; Mizutani, Wataru; Shimura, Masayuki; Nakagawa, Haruki; Shigeno, Masatsugu; and Watanabe, Kazutoshi, 4,902,892, Cl. 250-307.000.

Mizutani, Yoshiyuki: *See*—
Shimura, Yoshio; Mizutani, Yoshiyuki; and Isogai, Akio, 4,902,576, Cl. 428-472.000.

Mobil Oil Corporation: *See*—
Aufdembrink, Brent A.; Degnan, Thomas F.; Socha, Richard F.; and Stapleton, Michael R., 4,902,392, Cl. 208-110.000.
Chang, Clarence D.; and Chu, Cynthia T-W., 4,902,663, Cl. 502-242.000.
Phelps, Craig H.; Strom, E. Thomas; Hoskin, Dennis H.; Mitchell, Thomas O.; and Shu, Paul, 4,901,795, Cl. 166-270.000.
Valyocsik, Ernest W., 4,902,406, Cl. 208-118.000.

Mobius, Gunter: *See*—
Beitz, Jurgen; Erren, Karl-Heinz; and Mobius, Gunter, 4,901,942, Cl. 242-150.00R.

Mochizuki, Kazuo; and Takada, Manabu, to Koito Seisakusho Co., Ltd. Headlight device. 4,903,173, Cl. 362-66.000.

Mochizuki, Masao: *See*—
Takeda, Masayuki; Mochizuki, Masao; Kuniashiro, Koichi; Nagatsuka, Ikutaroh; Shinoki, Masayoshi; and Aoki, Takayoshi, 4,902,597, Cl. 430-106.600.

Moggi, Giovanni: *See*—
Piacenti, Franco; Manganelli Del Fa' Carlo; Moggi, Giovanni; Pasetti, Adolfo; and Scala, Andrea, 4,902,538, Cl. 427-393.600.

Mohn, Frank, to Framo Developments (UK) Limited. Sealing arrangement. 4,901,629, Cl. 92-261.000

Mohri, Shigeki: *See*—
Wada, Toshiaki; Furukawa, Mitsuhiko; Shiroyama, Masaharu; Nagano, Mitsuyoshi; Miyahara, Michito; Kitahira, Takashi; and Mohri, Shigeki, 4,902,651, Cl. 501-87.000.

Molaire, Michel F.: *See*—
Klein, Gerald W.; McConkey, Robert C.; Molaire, Michel F.; and Noonan, John M., 4,902,605, Cl. 430-285.000.

Moli Energy Limited: *See*—
Dahn, Jeffery R.; and Wainwright, David, 4,902,589, Cl. 429-94.000.

Moloy, Kenneth G., to Union Carbide Chemicals and Plastics Company Inc. Bisphosphine dioxides. 4,902,833, Cl. 568-14.000.

Monneret, Claude: *See*—
Roger, Pierre; Choay, Patrick; Monneret, Claude; Fournier, Jean-Paul; and Martin, Alain, 4,902,791, Cl. 536-17.700.

Monroe Auto Equipment Company: *See*—
Schmidt, Robert J.; and Zawada, Jerome J., Jr., 4,901,828, Cl. 188-288.000.

Monsanto Company: *See*—
Cartier, George E.; and Farmer, Peter H., 4,902,464, Cl. 264-211.240.
Fisher, Don E., 4,901,517, Cl. 57-315.000.

Montedison, S.p.A.: *See*—
Biglione, Gianfranco, and Fasulo, Gian C., 4,902,748, Cl 525-166.000.
Capuzzi, Luigi; Bettarini, Franco; Castoro, Paolo; Massardo, Pietro; and Caprioli, Vincenzo, 4,902,697, Cl. 514-351.000.
Montino, Franco; and Spoto, Giuseppe, 4,902,494, Cl. 423-625.000.

Montino, Franco; and Spoto, Giuseppe, to Montedison S.p.A. Process for preparing hydrated alumina consisting essentially of spherical particles by homogeneous precipitation. 4,902,494, Cl. 423-625.000.

Mook, William H., Jr., to Mueller and Smith, LPA. Point of sale apparatus. 4,903,200, Cl. 364-405.000.

Mookherjee, Braja D.: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,902,504, Cl. 424-84.000.

Moore, Archie S.; and Bode, Stephen R., to Mid-West Conveyor Company, Inc. Trolley braking method and apparatus for use with conveyors. 4,901,648, Cl. 104-250.000.

Moore, Charles E.; and Zimmer, Robert A., to Hewlett-Packard Company. Nonlinear noninverting transimpedance amplifier. 4,902,982, Cl. 330-85.000.

Moore, Clayton A.: *See*—
Knox, L. Carter; and Moore, Clayton A., 4,902,170, Cl. 405-225.000.

Moore, David M.: *See*—
Ream, Ronald L.; and Moore, David M., 4,902,519, Cl. 426-91.000.

Moore, Duncan T.: *See*—
Caldwell, J. Brian; and Moore, Duncan T., 4,902,650, Cl. 501-12.000.

Moore, Frank S., Jr.: *See*—
Schoenig, Fred C.; Kaiser, Bruce J.; Ruiz, Carl P.; and Moore, Frank S., Jr., 4,902,467, Cl. 376-159.000.

Moore, James E., to General Electric Company. Photocurable acrylic coating composition. 4,902,724, Cl. 522-40.000.

Moore, James E., to General Electric Company. Photocurable acrylic coating composition. 4,902,725, Cl. 522-42.000.

Moore, Kenneth P.: *See*—
McDonald, Russell; Wargo, John A.; Herbert, Glenn M.; Moore, Kenneth P.; and Gramlich, John D., 4,902,199, Cl. 415-143.000

Moore, Robert R.; Lamb, Steve; and Wolf, Eugene M. Tendon leader. 4,901,717, Cl. 606-1.000.

Moore, Ronald G.: *See*—
Knight, Michael; and Moore, Ronald G., 4,901,700, Cl 123-470.000.

Moosmann, Georg: *See*—
Merkle, Alfred; Moosmann, Georg; and Muller, Rolf, 4,902,941, Cl. 310-216.000.

Moran, James M., to Barkley & Dexter Laboratories, Inc. Search coil assembly for metal detectors. 4,902,997, Cl. 336-84.00C

Morbitzer, Leo: *See*—
Serini, Volker; Berg, Klaus; Grigo, Ulrich; Morbitzer, Leo; Piejko, Karl-Erwin; and Summermann, Klaus, 4,902,746, Cl. 525-148.000.

Morell, Joseph, De Marchi, Jean-Louis, and Kopp, Norbert, to Salomon, S.A. Alpine ski boot. 4,901,455, Cl. 36-117.000.

Mori, Kei. Light ray radiation device for use in medical treatment. 4,901,724, Cl. 128-372.000.

Mori, Ken. Solar ray-collecting device. 4,902,089, Cl. 350-96.180.

Mori, Sachio; and Takechi, Shozo, to Shionogi & Co., Ltd. Benzodioxane prostacyclin analogs. 4,902,811, Cl. 549-359.000.

Mori, Shigeharu: *See*—
Nakai, Kuniharu; Shiozaki, Masayoshi; Tsuji, Hiroji; Mori, Shigeharu; Hirose, Susumu; Yokoi, Nobumasa, and Ohya, Takaichi, 4,902,622, Cl. 435-210.000.

Morikawa, Michio; and Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Method for continuously producing at a substantially constant flow rate a strip of dough of substantially uniform dimensions. 4,902,524, Cl. 426-503.000

Morimura, Atsushi: *See*—
Uomori, Kenya; Morimura, Atsushi, and Kitamura, Yoshinori, 4,903,121, Cl. 358-41.000.

Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Pinion stopper arrangement for starter motor. 4,902,905, Cl. 290-48.000.

Morishita, Yoshimasa; and Shobara, Yoshitaka, to Nippon Acchakutanshi Seizo Kabushiki Kaisha. Assembly of electrical connector and a shield cable. 4,902,249, Cl. 439-610.000.

Morita, Kunihiko, to Nippon Thompson Co., Ltd. Rectilinear motion rolling guide unit. 4,902,143, Cl. 384-43.000.

Moriyama, Keiji; and Ohki, Hiroshi, to Nikon Corporation. Optical system for focus state detection. 4,903,066, Cl. 354-406.000.

Morneweck, Scott W.: *See*—
Bacon, Michael E.; Morneweck, Scott W.; Keith, Roger C.; and Simon, Arvin B., 4,901,545, Cl. 70-278.000.

Morohoshi, Naoya, to Canon Kabushiki Kaisha. Recording medium and recording method by use thereof. 4,902,568, Cl. 428-331.000.

Morris, Lorenzo J.: *See*—
Bruns, Robert W.; Morris, Lorenzo J.; Weber, John G., and Howard, H. Taylor, 4,902,988, Cl. 333-21.00A.

Morris, Oswald N., and Trottier, Marc R., to Canadian Patents & Development Ltd. Toxic strains of the bacterium *Bacillus thuringiensis* for control of the bertha armyworm *Mamestra configurata*. 4,902,507, Cl. 424-93.000.

Morrison, Andrew D., to United States of America, National Aeronautics and Space Administration. Multi-element spherical shell generation. 4,902,450, Cl. 264-4.000.

Morse, Vicki M. Method of playing a modified cribbage game utilizing cards and dice. 4,902,018, Cl 273-249.000.

Mortier, Michael S.: *See*—
Corbett, Thomas J.; McGowen, Chris C.; Mortier, Michael S.; and Smith, Michele A., 4,902,041, Cl. 280-807.000.

Morton, Roger R. A.; and Olesik, Joseph T., to Eastman Kodak Company. Apparatus for electronically duplicating film images while maintaining a high degree of image quality. 4,903,141, Cl. 358-448.000.

Morton Thiokol, Inc.: *See*—
White, C. Max; and Rozanski, James D., 4,901,642, Cl 102-202.000.

Moruzzi, Anne M.: *See*—
Lin, Burn J.; Moruzzi, Anne M., and Rosenbluth, Alan E., 4,902,893, Cl. 250-492.100.

Mosaic Rentals Pty., Ltd.: *See*—
Harvey, Leslie C., 4,902,939, Cl. 315-316.000.

Moss, Douglas M.; and Levashef, Stanley W. Fishing pole holder with universally adjustable mount. 4,901,970, Cl. 248-514.000.

Motegi, Takeo; Sakuraba, Yasuya, Iguchi, Hiroyuki; and Kasahara, Kaoru, to Hodogaya Chemical Co., Ltd. Plant growth regulant. 4,902,815, Cl. 560-45.000.

Motohashi, Koichi: *See*—
Ide, Akira; Motohashi, Koichi; Odaka, Masanori; and Tamba, Nobuo, 4,903,093, Cl. 357-23.130.

Motorola, Inc.: *See*—
Berglund, Robert K.; and Mautz, Karl E., 4,902,377, Cl 156-643.000.
Cambou, Bertrand F., 4,902,633, Cl. 437-31.000
Ford, Jenny M., 4,902,639, Cl. 437-56.000.
King, Jeffrey S., 4,901,852, Cl. 206-320.000.
Koury, Daniel N., Jr., 4,902,641, Cl. 437-62.000.
Marik, Charles J.; and Ecklund, Lawrence, 4,903,329, Cl. 455-182.000.
Pine, Jerrold S., 4,901,432, Cl. 29-759.000.
Raghuram, Sharada; Pregont, Gary J.; Updegrove, Les; and Klaus, Thomas R., 4,903,327, Cl. 455-127.000.
Shannon, Paul D.; Oka, Hiroyuki; Grimme, Paul E.; and Sparks, Robert W., 4,903,265, Cl. 371-21.400.
Spohrer, Thomas S.; and Dewitt, Bernard C., 4,902,919, Cl. 307-482.000.
Talgam, Yoav; Alsup, Mitch K.; and Denman, Marvin A., 4,903,264, Cl. 371-16.100.
White, Ted R.; and Klein, Jeff L., 4,902,533, Cl. 427-99.000.
Zakman, Zdravko M.; and Novak, Carl V., 4,903,326, Cl. 455-89.000.

Motoyoshi, Takeo: *See*—
Tanaka, Katsufusa; Motoyoshi, Takeo; Yamashita, Tohru; Nakatsukasa, Naoyuki; and Takematsu, Takaharu, 4,903,252, Cl. 369-36.000.

Moulin, Gerard: *See*—
Azema, Alain; Botineau, Jean; and Moulin, Gerard, 4,902,122, Cl. 351-212.000.

Moulton, Anthony D. Spring action fastener. 4,902,181, Cl. 411-347.000.

MRAM, Inc.: *See*—
Cope, David B.; and Spletter, Gary J., 4,903,343, Cl. 365-91.000.

MTU Motoren-und Turbinen Union Muenchen GmbH: *See*—
Neubert, Horst, 4,902,201, Cl. 415-197.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See*—
Huether, Werner, 4,902,536, Cl. 427-350.000.

Mueller, Carl F.: *See*—
Garg, Diwakar; Mueller, Carl F.; Schaffer, Leslie E.; and Dyer, Paul N., 4,902,535, Cl. 427-292.000.

Mueller, Rudolf; and Albertshofer, Wolfgang, to Siemens Aktiengesellschaft. Arrangement for high-resolution spectroscopy. 4,902,136, Cl. 356-419.000.

Mueller and Smith, LPA: *See*—
Mook, William H., Jr., 4,903,200, Cl. 364-405.000.

Mukai, Hiromu: *See*—
Taniguchi, Nobuyuki; Karasaki, Toshihiko; Mukai, Hiromu; Tokumaru, Hisashi; and Ishida, Tokuji, 4,903,065, Cl. 354-402.000.

Mulcahy, Timothy E. Apparatus and method for breathing through the soil-stack during a high-rise fire. 4,901,715, Cl. 128-200.240.

Muller, Bruce R.: *See*—
Niedospial, John J.; Muller, Bruce R.; Covington, Roger G.; and Carmichael, Evan P., 4,903,286, Cl. 378-182.000.

Muller, Dieter J., to Huels Aktiengesellschaft. Process for the production of 1,1,2-trichloro-2-methylpropane. 4,902,393, Cl. 204-158.120.

Muller, Fritz: *See*—
Rudenauer, Werner; Muller, Fritz; Liebl, Norbert; Kufner, Dieter; and Furtmeyr, Joachim, 4,901,643, Cl. 102-256.000.

Muller, Herbert; and Sehnke, Gerhardt, to Siemens Aktiengesellschaft. Push-pull actuator for key switches. 4,902,865, Cl. 200-538.000.

Muller, Rolf: *See*—
Merkle, Alfred; Moosmann, Georg; and Muller, Rolf, 4,902,941, Cl. 310-216.000.

Muller, Wolfgang: *See*—
Faulstich, Ingo; and Muller, Wolfgang, 4,902,175, Cl. 409-12.000.

Multedo, Gilbert; and Balin, Jean-Claude, to Thomson-CSF. Method and device for protection against a jammer in a radio station comprising several change-over antennas and their use for the making of radiogoniometers. 4,903,032, Cl. 342-441.000.

Multilift Limited: *See*—
Raisio, Reijo J., 4,902,189, Cl. 414-498.000.

Mundy, A. Dean: *See*—
Watson, Craig D.; Eastman, Mary C.; Woods, David D.; Carrera, John P.; Easter, James R.; Lipner, Melvin H.; Elm, William C.; and Mundy, A. Dean, 4,902,469, Cl. 376-259.000.

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Newton, Stephen F.: *See*—
Cassani, John C.; DeMoor, Mark K.; Graf, Paul W.; Hurd, Jonathan J.; Jones, Christopher D.; Newton, Stephen F.; and Thomas, David R., 4,902,957, Cl. 323-222.000.
Neyret, Guy. Rapid fixation device. 4,902,178, Cl. 409-234.000.
NGK Insulators, Ltd.: *See*—
Kikuchi, Toru, 4,903,001, Cl. 338-22.00R.
Tsuno, Nobuo, 4,901,904, Cl. 228-56.300.
Usami, Jun; Hattori, Akinobu; and Kajita, Takeshi, 4,902,400, Cl. 204-426.000.
Yajima, Yasuhito; and Mase, Syunzo, 4,903,000, Cl. 338-4.000.
Ngo, Khai D. T.; Steigerwald, Robert L.; Walden, John P.; Baliga, Bantval J.; Korman, Charles S.; and Chang, Hsueh-Rong, to General Electric Company. Low noise, high frequency synchronous rectifier. 4,903,189, Cl. 363-127.000.
NHK Spring Co. Ltd.: *See*—
Minegishi, Takeshi; Yoneshige, Yasuo; Takehana, Toshihiro; and Sakai, Toru, 4,902,542, Cl. 428-198.000.
Ojima, Juji; Ishii, Kazuo; and Numakura, Fumio, 4,902,266, Cl. 474-111.000.
Nichols, Jerry A.: *See*—
Story, Carl E.; Nichols, Jerry A.; and Cady, Byron C., 4,901,751, Cl. 137-312.000.
Nichols, Kirby B.: *See*—
Hollis, Mark A.; Bozler, Carl O.; Nichols, Kirby B.; and Bergeron, Normand J., Jr., 4,903,089, Cl. 357-22.000.
Nicholson, John P.; and Burnham, Jeffrey C., to N-Viro Energy Systems Ltd. Method for treating wastewater sludge. 4,902,431, Cl. 210-751.000.
Nicholson, Judith A.; Murray, Omer E., Jr.; and Taylor, Carl D., to General Electric Company. Plug-in starting aid. 4,902,943, Cl. 315-289.000.
Nicklas, James R.; and MacDonald, Robert D., to Masco Corporation of Indiana. Temperature and volume control valve assembly. 4,901,750, Cl. 137-270.000.
Niedospial, John J.; Muller, Bruce R.; Covington, Roger G.; and Carmichael, Evan P., to Eastman Kodak Company. Cover latch mechanism for a photographic cassette. 4,903,286, Cl. 378-182.000.
Nieman, Klaus: *See*—
Christ, Hubertus; Nieman, Klaus; and Mehren, Herbert, 4,901,810, Cl. 180-131.000.
Niemiro, Thaddeus A.; and Zimich, Daniel R., to Rockwell International Corporation. Oscillating form roller dampener. 4,901,640, Cl. 101-148.000.
Nihon Kohden Corp: *See*—
Sekiguchi, Tetsushi; Hamatani, Tetsuo; Ozawa, Hideo; and Takahashi, Masao, 4,903,099, Cl. 357-25.000.
Nihon Kohden Corporation: *See*—
Inahara, Kazuo; and Igarashi, Junichi, 4,903,322, Cl. 455-34.000.
Nihon Radiator Co. Ltd.: *See*—
Enokido, Hiroaki; Hatanaka, Takayuki; and Kozono, Takashi, 4,901,907, Cl. 228-183.000.
Nihon Shinku Gijutsu Kabushiki Kaisha: *See*—
Nakayama, Izumi; Suzuki, Akitoshi; Nawa, Hiroyuki; and Kaneko, Motohiro, 4,902,531, Cl. 427-39.000.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi; Yanagi, Akihiko; Yagi, Shigeki; Miyauchi, Hiroshi; and Shibuya, Katsuhiko, 4,902,335, Cl. 71-90.000.
Nikken Chemicals Company, Limited: *See*—
Kondou, Tsutomu, 4,902,525, Cl. 426-548.000.
Nikkiso Co., Ltd.: *See*—
Imai, Koichi; Sumoto, Misao; Nakamura, Hiroyuki; and Miyahara, Namasa, 4,902,762, Cl. 526-237.000.
Nikles, Francois; Gagnebin, Gaston; and Bettelini, Marco, to ETA SA Fabriques d'Ebauches. Means for attaching a band to a watch case. 4,903,253, Cl. 368-282.000.
Nikolaenko, Alexandr I.: *See*—
Yarmashev, Jury N.; Nikolaenko, Alexandr I.; Kotenko, Alexandr F.; Chernenko, Evgeny A.; Abramov, Vsevolod V.; Veselov, Alexandr V.; Rysin, Nikolai I.; and Salnikova, Vera N., 4,901,511, Cl. 56-220.000.
Nikon Corporation: *See*—
Kamiya, Saburo; and Mizutani, Hideo, 4,902,900, Cl. 250-548.000.
Moriyama, Keiji; and Ohki, Hiroshi, 4,903,066, Cl. 354-406.000.
Nilsen, Roy J.: *See*—
Matchett, Richard L.; Roof, David R.; Kikta, Thomas J.; Wilczynski, Rosemarie; Nilsen, Roy J.; Bacvinskas, William S.; and Fodor, George, 4,903,281, Cl. 376-264.000.
Nilsson, Sven: *See*—
Dingfors, Kent; Heinegård, Christer; and Nilsson, Sven, 4,902,311, Cl. 55-60.000.
Ninomiya, Ken: *See*—
Suzuki, Keizo; Ninomiya, Ken; Nishimatsu, Shigeru; and Okada, Osami, 4,901,667, Cl. 118-719.000.
Nippon Acchakutanshi Seizo Kabushiki Kaisha: *See*—
Morishita, Yoshimasa; and Shobara, Yoshitaka, 4,902,249, Cl. 439-610.000.
Nippon air Brake Co., Ltd.: *See*—
Munetika, Kazuyoshi, 4,901,953, Cl. 246-182.00R.
Nippon Oil Co. Ltd.: *See*—
Matsubara, Saburo; and Yagi, Shinichi, 4,902,459, Cl. 264-63.000.
Nippon Paint Co., Ltd.: *See*—
Aoki, Kei; Kanda, Kazunori; Urano, Satoshi; and Mizuguchi, Ryuzo, 4,902,727, Cl. 522-90.000.
Matsumura, Akira; Ohata, Masashi; and Ishikawa, Katsukiyo, 4,902,592, Cl. 430-7.000.
Nippon Petrochemicals Company, Ltd.: *See*—
Kawakami, Shigenobu; Endo, Keiji; Dohi, Hideyuki; and Sato, Atsushi, 4,902,841, Cl. 585-6.300.
Nippon Seiko Kabushiki Kaisha: *See*—
Ito, Nobuyoshi; Nagashima, Toshiyuki; Ichikawa, Mitsuo; and Yamaguchi, Mikio, 4,901,592, Cl. 74-492.000.
Kawai, Osamu; and Mizumura, Shunzi, 4,902,039, Cl. 280-802.000.
Mizukoshi, Yasumasa; and Ishijima, Minoru, 4,901,404, Cl. 24-20.0TT.
Nippon Sheet Glass Co., Ltd.: *See*—
Peppers, Norman A.; Young, James R.; and Pierce, Gerald A., 4,903,315, Cl. 382-47.000.
Nippon Steel Chemical Co. Ltd.: *See*—
Yamada, Takashi; Hayashi, Ryusuke; and Nakazawa, Yoshio, 4,902,537, Cl. 427-386.000.
Nippon Steel Corporation: *See*—
Arata, Hiroto; Shiga, Kenji; Sakurai, Daihachiro; Fujisawa, Kazuo; Souma, Isao; Watanabe, Yusiyo; and Tanaka, Akira, 4,902,473, Cl. 420-105.000.
Nose, Tetsuro; and Fujii, Toshimitsu, 4,901,582, Cl. 73-799.000.
Yamada, Takashi; Hayashi, Ryusuke; and Nakazawa, Yoshio, 4,902,537, Cl. 427-386.000.
Nippon Telegraph and Telephone Corp.: *See*—
Fujiki, Yoshinori; Ishida, Masatoshi; Imai, Nobuaki; and Nojima, Toshio, 4,902,983, Cl. 330-149.000.
Kyoto, Michihisa; Watanabe, Minoru; Tanaka, Shigeru; and Nakahara, Motohiro, 4,902,325, Cl. 65-3.120.
Mizukami, Makoto; Mitamura, Akio; Arai, Ryoichi; Mitsuya, Yasunaga; and Mikazuki, Tetsuo, 4,903,151, Cl. 360-78.010.
Nippon Tenshashi Kabushiki Kaisha: *See*—
Ihata, Sachiko, 4,902,305, Cl. 51-293.000.
Nippon Thompson Co., Ltd.: *See*—
Morita, Kunihiko, 4,902,143, Cl. 384-43.000.
Nippon Tungsten Co., Ltd.: *See*—
Wada, Toshiaki; Furukawa, Mitsuhiko; Shiroyama, Masaharu; Nagano, Mitsuyoshi; Miyahara, Michito; Kitahira, Takashi; and Mohri, Shigeki, 4,902,651, Cl. 501-87.000.
Nippondenso Co., Ltd.: *See*—
Negura, Kengi; Yamamoto, Ken; Ito, Shigeo; and Shimoya, Masahiro, 4,901,908, Cl. 228-183.000.
Uno, Haruhiko; Imoto, Yuzo; Izumi, Tetuya; and Takei, Toshihiro, 4,902,075, Cl. 303-14.000.
Nishida, Kozi: *See*—
Yamamoto, Naoki; Nishida, Kozi; and Yanagase, Akira, 4,902,742, Cl. 525-63.000.
Nishihara, Eitaro; Wu, Zhixiong; and Ogawa, Yoshihiko, to Kabushiki Kaisha Toshiba. Image processing apparatus. 4,903,317, Cl. 382-56.000.
Nishihara, Yoshihiro; Furutani, Yoshifumi; Toramaru, Masaaki; and Yasunaga, Toshiyuki, to Mitsubishi Rayon Co., Ltd. Process for producing an acrylic fiber having high fiber characteristics. 4,902,452, Cl. 264-28.000.
Nishikawa, Hiromitsu: *See*—
Sakai, Kunio; Nishikawa, Hiromitsu; and Matsumoto, Masaharu, 4,902,067, Cl. 296-180.100.
Nishikawa, Masao: *See*—
Hattori, Torao; and Nishikawa, Masao, 4,901,597, Cl. 74-665.0GE.
Nishikido, Joji; and Fukuzaki, Kentaro, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing 3-alkoxymethylcephalosporins. 4,902,793, Cl. 540-230.000.
Nishimatsu, Shigeru: *See*—
Suzuki, Keizo; Ninomiya, Ken; Nishimatsu, Shigeru; and Okada, Osami, 4,901,667, Cl. 118-719.000.
Nishimoto, Masayuki: *See*—
Takeyama, Hidekazu; Ohashi, Yoshinobu; Okagawa, Shuji; Nishimoto, Masayuki; and Nishimura, Masao, 4,902,440, Cl. 252-182.180.
Nishimura, Isao: *See*—
Kobori, Takuju; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 4,901,486, Cl. 52-167.0DF.

Nishimura, Masao: *See*—
Takeyama, Hidekazu; Ohashi, Yoshinobu; Okagawa, Shuji; Nishimoto, Masayuki; and Nishimura, Masao, 4,902,440, Cl. 252-182.180.
Nishino, Atsuo; and Kakei, Tsutomu, to Fuji Photo Film Co., Ltd. Process for producing aluminum support for printing plate. 4,902,389, Cl. 204-129.100.
Nishizawa, Tetsuo: *See*—
Onda, Kazuhiko; Hirai, Masayoshi; Nishizawa, Tetsuo; Sato, Muneyoshi; Kameyama, Nobuyuki; Onozuka, Haruo; Takamura, Masashi; Kamoda, Takashi; and Kobayashi, Kiyotaka, 4,903,059, Cl. 354-173.100.
Nishizawa, Yukimasa: *See*—
Hirano, Akira; Watanabe, Shinichi; Fukuda, Yutaka; Higuchi, Yukio; Shibano, Fumio; Sekino, Hiroshi, Nabeshima, Hiroichi; and Nishizawa, Yukimasa, 4,901,560, Cl. 73-117.000.
Nissan Chemical Industries, Ltd.: *See*—
Sato, Fumie, 4,902,812, Cl. 549-550.000.
Nissan Motor Company, Limited: *See*—
Doi, Koichi, 4,901,788, Cl. 165-24.000.
Hira, Kazumi; Otsuka, Kenro; and Kiyono, Shunichi, 4,902,040, Cl. 280-804.000.
Kaneko, Akira, 4,903,209, Cl. 364-424.050.
Miwa, Hiromichi; Uchida, Masaaki; and Kawamura, Yoshihisa, 4,901,699, Cl. 123-478.000.
Nagashima, Setsuko; and Ugawa, Satoru, 4,901,476, Cl. 49-488.000.
Okabayashi, Shigeru; and Fukano, Junichi, 4,902,082, Cl. 350-3.700.
Saigo, Fumitaka; Azuma, Akira; and Nakagawa, Ryoichi, 4,901,528, Cl. 60-312.000.
Sasaki, Masayoshi; Saeki, Fumio; and Hino, Harumichi, 4,901,780, Cl. 164-4.100.
Taguchi, Hiromi, 4,901,605, Cl. 74-606.00R.
Tonomura, Hiroshi, 4,902,033, Cl. 280-690.000.
Uno, Takaaki; Kan, Hiroyasu; and Tonomura, Hiroshi, 4,901,811, Cl. 180-140.000.
Nisso Engineering Kabushiki Kaisha: *See*—
Nakazawa, Takao; Naito, Jisaburo; Horiki, Hiroyuki; and Kawashima, Tutomu, 4,902,206, Cl. 417-394.000.
Nitecki, Danute E.; Katre, Nandini; Goodson, Robert J.; and Aldwin, Lois, to Cetus Corporation. Preparation of a polymer/interleukin-2 conjugate. 4,902,502, Cl. 424-83.000.
Nitrokemia Ipartelepek: *See*—
Bodnar, Akos; Solymosi, Maria; Vancson Szmercsanyi, Ibolya; Szigeti, Istvan; and Szommer, Laszlo, 4,902,773, Cl. 528-303.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Ito, Satoshi; Kitayama, Akiko; Hamada, Takatoshi, and Yamaguchi, Miho, 4,903,119, Cl. 357-72.000.
Niwa, Minoru: *See*—
Kaida, Noriyuki; Yokoe, Hifumi, Harada, Chikao; Niwa, Minoru; and Yasui, Masanobu, 4,901,733, Cl. 128-687.000.
Nobakht, Jamshid. Detachable bag-carrying handgrip device. 4,902,060, Cl. 294-171.000.
Nobe, Takeshi: *See*—
Akiyama, Sigeo; Suzumura, Masahiko; and Nobe, Takeshi, 4,902,636, Cl. 437-45.000
Nobel Chematur AB: *See*—
Dingfors, Kent; Heinegård, Christer; and Nilsson, Sven, 4,902,311, Cl. 55-60.000.
Noguchi, Hidehiko: *See*—
Kashiwara, Eyohei; Kashiwara, Hideaki, Noguchi, Hidehiko; and Kashiwara, Takeaki, 4,901,688, Cl. 123-169.0EL.
Noguchi, Ichiro; Kobayashi, Kazuo; Sawada, Toru; Okita, Masao; Takayama, Yasunari; and Kozumi, Kazuo, to Alps Electric Co., Ltd. Method of mounting a magnetic head. 4,901,430, Cl. 29-603.000.
Noguchi, Masahiro; Gotoh, Hideki; and Shimoyama, Kenji, to Mitsubishi Monsanto Chemical Company; and Mitsubishi Kasei Corporation. Epitaxial substrate for high-intensity LED, and method of manufacturing same. 4,902,356, Cl. 148-33.400.
Noguchi, Syouichi; Ishiyama, Kunio; and Odaka, Teruaki, to Hitachi, Ltd. Power supply for a magnetron. 4,903,183, Cl. 363-21.000.
Noguchi, Takeshi, to Kabushiki Kaisha Mutec. Suturing needle with suture. 4,901,722, Cl. 606-223.000.
Nojima, Toshio: *See*—
Fujiki, Yoshinori; Ishida, Masatoshi; Imai, Nobuaki, and Nojima, Toshio, 4,902,983, Cl. 330-149.000.
Nojiri, Hiromi: *See*—
Ito, Kenichiro; Nojiri, Hiromi; and Adachi, Kenro, 4,901,831, Cl. 192-38.000.
Nomix Manufacturing Company Limited: *See*—
Gill, David C.; and Pressey, Gary K., 4,901,975, Cl. 251-148.000.
Nomoto, Kaichiro: *See*—
Ohtake, Yoshichi; Nomoto, Kaichiro; and Shinozaki, Takashi, 4,903,135, Cl. 358-227.000.
Nomura, Etsuzo; Takeuchi, Hirokazu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, to Brother Kogyo Kabushiki Kaisha. Pattern-matching sewing machine. 4,901,659, Cl. 112-314.000.
Nomura, Etsuzo: *See*—
Takeuchi, Hirokazu; Itoh, Hirosumi; Suzuki, Shigeru; and Nomura, Etsuzo, 4,901,660, Cl. 112-314.000.
Nonaka, Toshiaki; Nakajima, Masashi; Matsui, Tatsuro; and Dokoshi, Noriaki, to Toray Thiokol Company Limited. One-part curing composition. 4,902,736, Cl. 524-296.000.
Nonami, Mitsuharu: *See*—
Kojima, Yoshikazu; Yanase, Takao; Nonami, Mitsuharu; and Chida, Takao, 4,902,885, Cl. 250-211.00K.
Noonan, John M.: *See*—
Klein, Gerald W.; McConkey, Robert C.; Molaire, Michel F.; and Noonan, John M., 4,902,605, Cl. 430-285.000.
Norddeutsche Faserwerke GmbH: *See*—
Beitz, Jurgen; Erren, Karl-Heinz; and Mobius, Gunter, 4,901,942, Cl. 242-150.00R.
Nordischer Maschinenbau Rud. Baader GmbH & Co. Kg: *See*—
Hegelmann, Heinz-Dieter, 4,901,399, Cl. 17-1.00G.
Norling, Brian L.: *See*—
Blake, Graeme A.; and Norling, Brian L., 4,901,586, Cl. 73-862.590.
Norman, Jerry D. Directional flow tailgate. 4,902,066, Cl. 296-180.100.
Norman, Kevin A.; and Frankovich, Robert J., to Altera Corporation. Programmable logic device with programmable word line connections. 4,903,223, Cl. 364-716.000.
Noro, Shingo: *See*—
Tsuji, Mikio; Yoshitomi, Kazuo; Noro, Shingo; Hayashi, Masayuki; Murase, Hiroyasu; Kato, Haoyoshi; Araki, Kazunori; and Tanaka, Kenjiro, 4,901,504, Cl. 53-247.000.
North American Philips Corporation: *See*—
Botker, Kurt, 4,903,282, Cl. 377-7.000.
Phillips, Larry G., 4,903,127, Cl. 358-148.000.
North Carolina State University: *See*—
Freeman, Harold S., 4,902,787, Cl. 534-800.000.
North, William E., to Westinghouse Electric Corp. Apparatus for film cooling of turbine van shrouds. 4,902,198, Cl. 415-115.000.
Norton, Michael K.: *See*—
Boissevain, Mathew G.; Norton, Michael K.; Foskett, Anthony D.; and Boissevain, Tobias J., 4,901,445, Cl. 33-501.020.
Norwich Eaton Pharmaceuticals, Inc.: *See*—
Benedict, James J.; and Perkins, Christopher M., 4,902,679, Cl. 514-86.000.
Nose, Tetsuro; and Fujii, Toshimitsu, to Nippon Steel Corporation. Fixture for brittle pre-crack introduction in ceramic specimen. 4,901,582, Cl. 73-799.000.
Nouwens, F. H. C., to Econosto N.V. Heating boiler and method for operating same. 4,901,678, Cl. 122-504.200.
Nova Medical Specialties: *See*—
Griffin, Joseph C.; and Skaggs, James L., 4,901,734, Cl. 128-692.000.
Nova Scand Utveckling AB: *See*—
Bjorhaag, Georg; Embring, Goran; and Stahl, Karl-Gunnar, 4,902,445, Cl. 252-607.000.
Novak, Carl V.: *See*—
Zakman, Zdravko M.; and Novak, Carl V., 4,903,326, Cl. 455-89.000.
Novation Design Ltd.: *See*—
Ziegler, James T., 4,902,259, Cl. 446-117.000.
Novoselsky, Boris. Hermaphrodite connector for land and seas and air and space applications. 4,902,161, Cl. 403-322.000.
Novy, Vladimir A., to Los Angeles County Sanitation District. Emission control system. 4,901,698, Cl. 123-418.000.
Nozuyama, Yasuyuki: *See*—
Sugeno, Yukio; Usami, Kimiyoshi; Sasaki, Tohru; and Nozuyama, Yasuyuki, 4,902,918, Cl. 307-468.000.
NSK-Warnar Kabushiki Kaisha: *See*—
Hira, Kazumi; Otsuka, Kenro; and Kiyono, Shunichi, 4,902,040, Cl. 280-804.000.
NTN Toyo Bearing Co., Ltd.: *See*—
Ito, Kenichiro; Nojiri, Hiromi; and Adachi, Kenro, 4,901,831, Cl. 192-38.000.
Numakura, Fumio: *See*—
Ojima, Juji; Ishii, Kazuo; and Numakura, Fumio, 4,902,266, Cl. 474-111.000.
NWM de Kruithoorn B.V.: *See*—
Leemans, Johan S.; and Dorweiler, Heinz J., 4,902,346, Cl. 75-251.000.
O.F. Mossberg & Sons, Inc.: *See*—
Lee, Joseph L., 4,901,623, Cl. 89-193.000.
Obst, Donald L.; and Shrum, R. E., to Siecor Corporation. Reel. 4,901,939, Cl. 242-118.400.
Oce-Nederland B.V.: *See*—
Knippels, Antonius A.; and van Gerwen, Thomas T. C., 4,901,981, Cl. 254-28.000.
Ochii, Kiyofumi: *See*—
Masuoka, Fujio; and Ochii, Kiyofumi, 4,903,096, Cl. 357-23.500.
O'Connell, James A.; and Sarantos, S. Randy. Electronic programmable stamping marking device. 4,903,232, Cl. 364-900.000.
O'Connor, Sean P., to Bp Chemicals Limited. Lubricating oil compositions containing anti-wear/extreme pressure additives. 4,902,438, Cl. 252-48.200.
Odaka, Masanori: *See*—
Ide, Akira; Motohashi, Koichi; Odaka, Masanori; and Tamba, Nobuo, 4,903,093, Cl. 357-23.130.
Odaka, Teruaki: *See*—
Noguchi, Syouichi; Ishiyama, Kunio; and Odaka, Teruaki, 4,903,183, Cl. 363-21.000.
Odle, Roy R.: *See*—
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Beakas, Mark L.; Kerney, Delmar L.; Schlosser, Kraig J.; Paton, Geoffrey T.; Oechsle, Vernon E.; and Franklin, Marvin A., III, 4,901,562, Cl. 73-118.100.
Oeggerli, Werner: *See*—
Stalder, Herbert; Keller, Urs; Briner, Emil; Oeggerli, Werner; and Wurmli, Arthur, 4,901,518, Cl. 57-401.000.

Oelsch, Jurgen; Sturmer, Bertold; Digiovinazzo, Nicola; and Hochgesang, Gerhard, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf GmbH & Co. Keyboard switch device for facilitating removal and replacement of push buttons. 4,902,862, Cl. 200-344.000.
Oelschlegel, Hannes: *See*—
Fan, Chung T.; and Oelschlegel, Hannes, 4,901,533, Cl. 62-11.000.
Officine Meccanishe Pavesi & C. S.p.A.: *See*—
Barrera, Giorgio, 4,901,433, Cl. 29-734.000.
Ogawa, Hideki: *See*—
Suzuki, Izumi; and Ogawa, Hideki, 4,902,247, Cl. 439-595.000.
Ogawa, Kazufumi; and Tamura, Hideharu, to Matsushita Electric Industrial Co., Ltd. Recording medium and method of producing the same. 4,902,585, Cl. 428-694.000.
Ogawa, Masaki: *See*—
Baba, Toshio; Ogawa, Masaki; and Ohata, Keiichi, 4,903,091, Cl. 357-22.000.
Ogawa, Shigeru: *See*—
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Ogawa, Takashi: *See*—
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Ogawa, Yoshihiko: *See*—
Nishihara, Eitaro; Wu, Zhixiong; and Ogawa, Yoshihiko, 4,903,317, Cl. 382-56.000.
Ogino, Haruo: *See*—
Nakaso, Akishi; Okamura, Toshiro; Ogino, Haruo; Watanabe, Tomoko; and Kimura, Yuko, 4,902,551, Cl. 428-137.000.
Ogoh, Ikuo: *See*—
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Oguri, Tomei: *See*—
Hayasi, Yosio; Oguri, Tomei; Shimoda, Masaki; Tsutsui, Mikio; Takahashi, Kazuo; and Miida, Hitoshi, 4,902,700, Cl. 514-365.000.
Ohara, Yasuhide: *See*—
Hamaguchi, Kunihiko; and Ohara, Yasuhide, 4,903,242, Cl. 365-230.080.
Ohashi, Yoshinobu: *See*—
Takeyama, Hidekazu; Ohashi, Yoshinobu; Okagawa, Shuji; Nishimoto, Masayuki; and Nishimura, Masao, 4,902,440, Cl. 252-182.180.
Ohata, Hideo: *See*—
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Ohata, Keiichi: *See*—
Baba, Toshio; Ogawa, Masaki; and Ohata, Keiichi, 4,903,091, Cl. 357-22.000.
Ohata, Masashi: *See*—
Matsumura, Akira, Ohata, Masashi; and Ishikawa, Katsukiyo, 4,902,592, Cl. 430-7.000.
Ohba, Shinya: *See*—
Ozaki, Toshifumi; Ozawa, Naoki; Ohba, Shinya; and Mimura, Itaru, 4,903,122, Cl. 358-48.000.
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Safranek, Edward J., to F & B Mfg. Co. Hall effect device ignition and charging system. 4,901,704, Cl. 123-599.000.

Sagami Chemical Research: *See*—
Hirai, Kenji; Fuchikami, Takamasa; Fujita, Atsuko; Hirose, Hiroaki; Yokota, Masahiro; and Nagato, Shoin, 4,902,337, Cl. 71-92.000.

Sager, Harold W. Housing for dual outlet, dual rotor blower. 4,902,203, Cl. 417-350.000.

Sagi, Francois: *See*—
Bourrain, Paul; Collas, Gerard; Rostaing, Jean-Francois; and Sagi, Francois, 4,902,780, Cl. 528-483.000.

Saigo, Fumitaka; Azuma, Akira; and Nakagawa, Ryoichi, to Nissan Motor Co., Ltd. System for suppressing noise due to exhaust gas from motor vehicle. 4,901,528, Cl. 60-312.000.

Saijo, Takao; Fujita, Masafumi; and Saitoh, Takanori, to Minolta Camera Kabushiki Kaisha. Image projecting apparatus with margin detect means. 4,903,073, Cl. 355-41.000.

St. Alban, Jonas O.: *See*—
Potvin, Robert E.; St. Alban, Jonas O., and Sobodacha, Chester J., 4,902,785, Cl. 534-557.000.

St. Clair, Anne K.: *See*—
Cassidy, Patrick E.; Tullos, Gordon L.; and St. Clair, Anne K., 4,902,759, Cl. 528-125.000.

Saint-Gobain Vitrage: *See*—
Vanaschen, Luc; Kuster, Hans-Werner; and Radermacher, Herbert, 4,902,331, Cl. 65-106.000.

Saishoji, Toshihide: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishoji, Toshihide, 4,902,702, Cl 514-383.000.

Saito, Itaru: *See*—
Matsubara, Ken; Saito, Itaru; Kitano, Hirohisa, Shingaki, Kouichi; and Masuda, Tomohiko, 4,902,111, Cl. 350-393.000

Saito, Shigemi: *See*—
Kogane, Mikio; Saito, Shigemi; and Koyama, Tadatosi, 4,903,064, Cl. 354-321.000.

Saito, Tadayoshi; Kawakami, Junzo; Takahashi, Susumu; Suehiro, Testuo; Matsumoto, Hiroshi; and Tachibana, Kouji, to Hitachi, Ltd. Pid controller system. 4,903,192, Cl. 364-157.000.

Saitoh, Koetsu; and Kawabuchi, Masami, to Matsushita Electric Industrial Co., Ltd. Ultrasonic probe having ultrasonic propagation medium. 4,901,729, Cl. 128-662.030.

Saitoh, Takanori: *See*—
Saijo, Takao; Fujita, Masafumi; and Saitoh, Takanori, 4,903,073, Cl. 355-41.000.

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Sakabe, Shigetomo: *See*—
Sato, Kensaku; and Sakabe, Shigetomo, 4,901,434, Cl. 29-753.000.

Sakabe, Takao; Honma, Akira; Miyamura, Takao; Suzuki, Hiroshi; and Meguro, Yoshihito, to Hokuetsu Paper Mills, Ltd. Process for producing a neutral paper. 4,902,382, Cl. 162-175.000.

Sakai, Hiroyuki; Asahara, Yoshiyuki; Omi, Shigeaki; Nakayama, Shin, and Yoneda, Yoshitaka, to Hoya Corporation. Method of producing gradient-index lens. 4,902,330, Cl. 65-30.130.

Sakai, Kunio; Nishikawa, Hiromitsu; and Matsumoto, Masaharu, to Ohi Seisakusho Co., Ltd. Air spoiler retracting device. 4,902,067, Cl. 296-180.100.

Sakai, Toru: *See*—
Minegishi, Takeshi; Yoneshige, Yasuo; Takehana, Toshihiro; and Sakai, Toru, 4,902,542, Cl. 428-198.000.

Sakai, Yoshiaki: *See*—
Hayashi, Tohru; Sakai, Yoshiaki; Aikawa, Shinichi; Matsunaga, Hiroshi; and Makabe, Jun, 4,903,156, Cl. 360-104.000.

Sakakibara, Katsunori, to Minolta Camera Kabushiki Kaisha. Image forming apparatus having stationary upper unit and pivotable lower unit. 4,903,076, Cl. 355-200.000.

Sakakibara, Shigeru, to Inax Corporation. Control apparatus for water temperature and water flow rate. 4,901,915, Cl. 236-12.120.

Sakamoto, Katsuyoshi; and Takahashi, Takeshi, to Amada Company, Limited. Punch press. 4,901,427, Cl. 29-568.000.

Sakamoto, Masahiro, to Canon Kabushiki Kaisha. Image processing apparatus. 4,903,143, Cl. 358-457.000.

Sakamoto, Masami; Magumo, Ryoichi; Ishihara, Tamio; and Kobari, Takao, to Hitachi, Ltd. X-Y plotter for non-perforated paper. 4,903,045, Cl. 346-136.000.

Sakamoto, Osamu; and Nakamura, Kazuhiro, to Sanshin Kogyo Kabushiki Kaisha. Ignition timing control system for internal combustion. 4,901,696, Cl. 123-413.000.

Sakashita, Katsuaki: *See*—
Kanto, Jumpei; Akada, Masanori; Kamakari, Katsuhiro; Asahina, Kenichi; Sakashita, Katsuaki; and Watanabe, Yoshihisa, 4,902,670, Cl. 503-227.000.

Sakashita, Narumi; and Shimazu, Yukihiko, to Mitsubishi Denki Kabushiki Kaisha. Comparator circuit. 4,903,005, Cl. 340-146.200.

Sakata, Yoichi: *See*—
Wakabayashi, Kenji; Sumi, Yoshihiko; Ichikawa, Yataro; Sakata, Yoichi; Mimuro, Jun; and Aoki, Nobuo, 4,902,614, Cl. 435-7.000.

Sakita, Masami. Rotary engine. 4,901,694, Cl. 123-234.000.

Sakuraba, Taketoshi; Katada, Hisashi; Ohfusa, Yoshitaka; Yoshizawa, Yasufumi; Arai, Toshiaki; and Miyadera, Hiroo, to Hitachi, Ltd. Memory system. 4,903,234, Cl. 365-49.000.

Sakuraba, Yasuya: *See*—
Motegi, Takeo; Sakuraba, Yasuya; Iguchi, Hiroyuki; and Kasahara, Kaoru, 4,902,815, Cl. 560-45.000.

Sakurai, Daihachiro: *See*—
Arata, Hiroto; Shiga, Kenji; Sakurai, Daihachiro; Fujisawa, Kazuo; Souma, Isao; Watanabe, Yusiyo; and Tanaka, Akira, 4,902,473, Cl. 420-105.000.

Sakurai, Kazuaki: *See*—
Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Sakurai, Kazuaki, 4,902,240, Cl. 439-157.000.

Salerno, Ronald E. Lottery number selection device. 4,902,013, Cl. 273-138.00R.

Salesse, Christian: *See*—
Oppermann, Rene; and Salesse, Christian, 4,901,591, Cl. 74-469.000.

Salk Institute for Biological Studies, The: *See*—
Gospodarowicz, Denis; Baird, Andrew; and Bohlen, Peter, 4,902,782, Cl. 530-399.000.

Salmon, James E., to Fanstick Products International, Inc. Game apparatus including free floating game elements. 4,902,022, Cl. 273-317.000.

Salnikova, Vera N.: *See*—
Yarmashev, Jury N.; Nikolaenko, Alexandr I.; Kotenko, Alexandr F.; Chernenko, Evgeny A.; Abramov, Vsevolod V.; Veselov, Alexandr V.; Rysin, Nikolai I.; and Salnikova, Vera N., 4,901,511, Cl. 56-220.000.

Salomon, Kurt D.: *See*—
Sturm, Lillian P.; and Salomon, Kurt D., 4,901,661, Cl. 112-436.000.

Salomon S. A.: *See*—
Cumin, Christophe, 4,901,451, Cl. 36-50.000.

Salomon S.A.: *See*—
Chemello, Jean-Pierre; and Perchet, Thierry, 4,901,450, Cl. 36-10.000.
Morell, Joseph; De Marchi, Jean-Louis; and Kopp, Norbert, 4,901,455, Cl. 36-117.000.

Salzgitter Maschinenbau GmbH: *See—*
Tegtmeyer, Kurt; Luhrs, Hermann; and Werner, Wolfgang, 4,901,636, Cl. 100-117.000.

Samchisen, Edward J., to LRC Electronics. Snap-n-seal coaxial connector. 4,902,246, Cl. 439-578.000.

Sandeen, Stephen; and Rich, Todd. Antenna-mountable windsock comprising rigid cylinder with leveling holes. 4,901,662, Cl. 116-28.00R.

Sanders, Nicholas A.; and Couch, Richard W., Jr., to Hypertherm, Inc. Apparatus and process for cooling a plasma arc electrode. 4,902,871, Cl. 219-121.490.

Sankyo Engineering Co., Ltd.: *See—*
Nakamura, Susumu; and Yokoi, Koichi, 4,902,212, Cl. 425-107.000.

Sankyo Kogyo Co., Ltd.: *See—*
Watanabe, Toshihiro, 4,902,489, Cl. 423-245.100.

Sano, Koichi: *See—*
Maeda, Akira; Sano, Koichi; and Yokoyama, Tetsuo, 4,902,974, Cl. 324-312.000.

Sano, Yasuo: *See—*
Arita, Kazuhiro; and Sano, Yasuo, 4,902,760, Cl. 525-504.000.

Sanofi S.A.: *See—*
Roger, Pierre; Choay, Patrick; Monneret, Claude; Fournier, Jean-Paul; and Martin, Alain, 4,902,791, Cl. 536-17.700.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Sakamoto, Osamu; and Nakamura, Kazuhiro, 4,901,696, Cl. 123-413.000.

Santa Barbara Research Center: *See—*
Ahlgren, William L., 4,901,670, Cl. 118-728.000.

Santosuosso, Christopher J., to Christopher Enclosure, Inc. Enclosure for inground swimming pool. 4,901,484, Cl. 52-90.000.

Sanvito, Roberto; and Ronchi, Adelio, to Rockwell-Rimoldi S.p.A. Angled support surface for a multi sewing machine working site. 4,901,658, Cl. 112-217.200.

Sanyo Electric Co., Ltd.: *See—*
Ito, Nobuo, 4,903,019, Cl. 341-61.000.
Masuhara, Masami; and Shimahara, Akihito, 4,903,336, Cl. 455-344.000.
Murashima, Hirotsugu; Maeda, Satoru; and Hirano, Shunji, 4,903,134, Cl. 358-227.000.
Okamoto, Kazuyuki; and Yagi, Nasashi, 4,903,140, Cl. 358-342.000.
Sugaya, Syoji; Rokujo, Toshihiro; and Asahino, Hisayoshi, 4,903,255, Cl. 369-284.000.
Tsurufuji, Shinichi; and Iida, Masayuki, 4,903,291, Cl. 379-88.000.

Sarantos, S. Randy: *See—*
O'Connell, James A., and Sarantos, S. Randy, 4,903,232, Cl. 364-900.000.

Sarto, Julius A.: *See—*
Hawkinson, Rodney B.; and Sarto, Julius A., 4,901,869, Cl. 211-59.300.

Sasaki, Masayoshi; Saeki, Fumio; and Hino, Harumichi, to Nissan Motor Company, Limited; and Atsugi Motor Parts Company. Method for producing fiber reinforced metal composition. 4,901,780, Cl. 164-4.100.

Sasaki, Tohru: *See—*
Sugeno, Yukio; Usami, Kimiyoshi; Sasaki, Tohru; and Nozuyama, Yasuyuki, 4,902,918, Cl. 307-468.000.

Sassmannshausen, Ulrich; and Pietsch, Manfred, to Dynamit Nobel Aktiengesellschaft. Shaped charge with barrier produced in situ. 4,901,619, Cl. 86-20.120.

Satake, Keigo: *See—*
Shida, Takafumi; Watanabe, Takeo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Satake, Keigo, 4,902,805, Cl. 548-262.000.

Satariano, Richard M.: *See—*
Abbott, Kenneth E.; Lyons, Patrick J.; and Satariano, Richard M., 4,901,928, Cl. 239-530.000.

Sato, Atsushi: *See—*
Kawakami, Shigenobu; Endo, Keiji; Dohi, Hideyuki; and Sato, Atsushi, 4,902,841, Cl. 585-6.300.

Sato, Fumie, to Nissan Chemical Industries, Ltd. Optically active alcohols, process for producing the same, and process for resolving the same. 4,902,812, Cl. 549-550.000.

Sato, Gen, to Ricoh Company, Ltd. Character recognition with variable subdivisions of a character region. 4,903,312, Cl. 382-21.000.

Sato, Kensaku; and Sakabe, Shigetomo, to Hirose Electric Co., Ltd. Apparatus for terminating multiconductor cable by pressure connection. 4,901,434, Cl. 29-753.000.

Sato, Kimiaki: *See—*
Takemae, Yoshihiro; Nakano, Tomio; Nakano, Masao; and Sato, Kimiaki, 4,903,111, Cl. 357-51.000.

Sato, Kozo: *See—*
Yamamoto, Soichiro; Aono, Toshiaki; Nakamura, Koichi; and Sato, Kozo, 4,902,599, Cl. 430-138.000.

Sato, Kumiko: *See—*
Katsuyama, Harumi; Kageyama, Shigeki; and Sato, Kumiko, 4,902,477, Cl. 422-56.000.

Sato, Kuniaki: *See—*
Kobori, Takuju; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 4,901,486, Cl. 52-167.0DF.

Sato, Masamichi: *See—*
Kamikubota, Masafumi; and Sato, Masamichi, 4,903,056, Cl. 354-76.000.

Sato, Mitsuyoshi: *See—*
Yasaka, Anto; Nakagawa, Yoshitomo; and Sato, Mitsuyoshi, 4,902,530, Cl. 427-38.000.

Sato, Muneyoshi: *See—*
Onda, Kazuhiko; Hirai, Masayoshi; Nishizawa, Tetsuo; Sato, Muneyoshi; Kameyama, Nobuyuki; Onozuka, Haruo; Takamura, Masashi; Kamoda, Takashi; and Kobayashi, Kiyotaka, 4,903,059, Cl. 354-173.100.

Sato, Nobuo: *See—*
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo, and Saishoji, Toshihide, 4,902,702, Cl. 514-383.000.

Sato, Yukio: *See—*
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Satomura, Masafumi: *See—*
Yoshikawa, Masaharu; Arai, Nobushige; Satomura, Masafumi; Tanaka, Syozo; Shinobu, Yoshiharu; Takushima, Akira; and Yanagisawa, Nobuhiro, 4,901,537, Cl. 62-235.100.

Sattler, Heinz: *See—*
Kossatz, Gert; Sattler, Heinz; Kammerer, Rudiger; Sachs, Hanns I.; and Schapel, Dietmar, 4,902,348, Cl. 106-111.000.

Sattler, Henning; and Asmussen, Bodo, to Beiersdorf AG. W/O cream containing hydrocortisone diester. 4,902,682, Cl. 514-179.000.

Saturn Corporation: *See—*
Corbett, Thomas J.; McGowen, Chris C.; Mortier, Michael S.; and Smith, Michele A., 4,902,041, Cl. 280-807.000.
Madden, Dermot G., 4,901,692, Cl. 123-192.00B.

Sauder, Myrl D., to Sauder Woodworking Co. Mitered joint assembly. 4,902,164, Cl. 403-402.000.

Sauder Woodworking Co.: *See—*
Sauder, Myrl D., 4,902,164, Cl. 403-402.000.

Saunders, Alex M.: *See—*
Chang, Chin-hai; and Saunders, Alex M., 4,902,613, Cl. 435-2.000.

Savoca, Ann C.; and Langsam, Michael, to Air Products and Chemicals, Inc. Process for the polymerization tri-substituted silylalkynes. 4,902,763, Cl. 526-240.000.

Sawada, Toru: *See—*
Noguchi, Ichiro; Kobayashi, Kazuo; Sawada, Toru; Okita, Masao; Takayama, Yasunari; and Kozumi, Kazuo, 4,901,430, Cl. 29-603.000.

Sayre, Edwin D.: *See—*
Dixon, Robert C.; Cearley, James E.; Van Diemen, Paul; Sayre, Edwin D.; and Gordon, Gerald M., 4,902,470, Cl. 376-333.000.

Scala, Andrea: *See—*
Piacenti, Franco; Manganelli Del Fa' Carlo; Moggi, Giovanni; Pasetti, Adolfo; and Scala, Andrea, 4,902,538, Cl. 427-393.600.

Schacht, Ezra L. Re-terminating inaccessible aluminum conductors. 4,902,253, Cl. 439-877.000.

Schaefer, Werner: *See—*
Goeldner, Heinz-Dieter; Horn, Bertold; Liedtke, Thomas; Marx, Wolf-Ruediger; and Schaefer, Werner, 4,902,138, Cl. 374-44.000.

Schaffer, Leslie E.: *See—*
Garg, Diwakar; Mueller, Carl F.; Schaffer, Leslie E.; and Dyer, Paul N., 4,902,535, Cl. 427-292.000.

Schamel, Gerhard: *See—*
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Schapel, Dietmar: *See—*
Kossatz, Gert; Sattler, Heinz; Kammerer, Rudiger; Sachs, Hanns I.; and Schapel, Dietmar, 4,902,348, Cl. 106-111.000.

Schappler, Joseph J., to Eastman Kodak Company. Re-usable electronic flash unit for disposable single-use camera. 4,903,058, Cl. 354-145.100.

Scheid, Winfried: *See—*
Schoniger, Karl-Heinz; and Scheid, Winfried, 4,903,172, Cl. 362-31.000.

Scheinpflug, Hans: *See—*
Brandes, Wilhelm; Kaspers, Helmut; Scheinpflug, Hans; and Holmwood, Graham, 4,902,703, Cl. 514-383.000.
Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinpflug, Hans; and Kramer, Wolfgang, 4,902,704, Cl. 514-383.000.

Schemenau, Wolfgang; Bennert, Jurgen; and Ceelen, Dietrich, to Brown Boveri & Cie. Combined gas turbine and steam power plant having a fluidized bed furnace for generating electrical energy. 4,901,521, Cl. 60-39.120.

Schering Corporation: *See—*
Blythin, David J.; and Shue, Ho-Jane, 4,902,693, Cl. 514-300.000.

Scherm, Hans P.: *See—*
Heinemann, Mario; Bindl, Johann; Doppelberger, Johann; and Scherm, Hans P., 4,902,570, Cl. 428-405.000.

Scherubl, Franz: *See—*
Cholat-Serpoud, Gerard; and Scherubl, Franz, 4,902,548, Cl. 428-102.000.

Schiff, Peter, to IABP Corporation. Prepackaged intra-aortic balloon assembly with holder, and method of using same. 4,901,707, Cl. 128-1.00D.

Schilling, Bernd; Reutter, Anneliese; and Haberle, Norman, to Dow Chemical Company, The. Fungicidal 4-monohaloacetoacetoacetanilides. 4,902,715, Cl. 514-522.000.

Schimmel, Paul R.: *See—*
Pardridge, William M.; and Schimmel, Paul R., 4,902,505, Cl. 424-85.700.

Schindler, Walter A., to Elma Electronic AG. Rotatable manipulator for a plug board. 4,902,239, Cl. 439-153.000.

Schippers, Heinz, to Barmag, AG. Method for heating an advancing yarn. 4,902,461, Cl. 264-103.000.

Schlang, Martin; Kuepper, Wolfgang; and Kaemmerer, Bernhard, to Siemens Aktiengesellschaft. Method and apparatus for the recognition of individually spoken words. 4,903,304, Cl. 381-41.000

Schleicher for Accommodating Electric GmbH & Co. KG: *See—*
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Schleupen, Richard, to Robert Bosch GmbH. Device for controlling an internal combustion engine. 4,901,697, Cl. 123-414.000

Schlosser, Kraig L.: *See—*
Beakas, Mark L.; Kerney, Delmar L.; Schlosser, Kraig J.; Paton, Geoffrey T.; Oechsle, Vernon E.; and Franklin, Marvin A., III, 4,901,562, Cl. 73-118.100.

Schlough, James R., to AM International Incorporated. Apparatus and method for feeding sheet material from a stack for a collating conveyor. 4,901,996, Cl. 271-10.000.

Schlumberger Industries: *See—*
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Schmeykal, Rudolf; and Haftmann, Johannes, to Ta Triumph-Adler Aktiengesellschaft. Typewriter with a print wheel and hammer driven by one motor. 4,902,148, Cl. 400-144.200.

Schmid, Max: *See—*
Hansen, Hans-Jurgen; Schmid, Rudolf; and Schmid, Max, 4,902,818, Cl. 560-172.000.

Schmid, Rudolf: *See—*
Hansen, Hans-Jurgen; Schmid, Rudolf, and Schmid, Max, 4,902,818, Cl. 560-172.000.

Schmidl, Benno: *See—*
Knauff, Karl-Georg; and Schmidl, Benno, 4,902,328, Cl. 65-17.000.

Schmidlin, Fred W., to Xerox Corporation. Toner recovery for DEP cleaning process. 4,903,050, Cl. 346-160.100.

Schmidt, Alfred C.; and Durst, Robert T., Jr., to Pitney Bowes Inc. Forms generating and information retrieval system. 4,903,229, Cl. 364-900.000.

Schmidt, Deborah D.: *See—*
Poorman, Richard M.; and Schmidt, Deborah D., 4,902,354, Cl. 148-4.000.

Schmidt, Herwig, to Elpatronic AG. Method and apparatus for the production of frusto-pyramidal can bodies. 4,901,557, Cl. 72-370.000.

Schmidt, Joachim: *See—*
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Schmidt, Robert J.; and Zawada, Jerome J., Jr., to Monroe Auto Equipment Company. Method and apparatus for controlling displacement of a piston in a shock absorber. 4,901,828, Cl. 188-288.000.

Schmidtz, William B.; and Schmitz, William L., to Autoject Systems Inc. Liquid medicament safety injector. 4,902,279, Cl. 604-134.000.

Schmits, Heinz-Herbert: *See—*
Rother, Wolfgang; Schmits, Heinz-Herbert; and Thiemeyer, Heinz-Werner, 4,901,448, Cl. 34-85.000.

Schmitt, Kevin P. Fire fighting roof ladder accessory. 4,901,818, Cl. 182-117.000.

Schmitt, Peter J.: *See—*
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Schmitz, William L.: *See—*
Schmidtz, William B.; and Schmitz, William L., 4,902,279, Cl. 604-134.000.

Schmookler, Martin S.: *See—*
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Schneider, John L.: *See—*
Ball, George A., Jr.; and Schneider, John L., 4,902,999, Cl. 337-372.000.

Schnell, Earl W.: *See—*
Martin, Richard R.; and Schnell, Earl W., 4,902,484, Cl. 422-189.000.

Schnell, Heinrich. Device for winding a continuous length of material. 4,901,934, Cl. 242-56.00R.

Schoenig, Fred C.; Kaiser, Bruce J.; Ruiz, Carl P.; and Moore, Frank S., Jr., to General Electric Company. Non-destructive testing of nuclear fuel rods. 4,902,467, Cl. 376-159.000.

Scholl, Thomas; Wegner, Christian; Frolich, Christian; Botta, Artur; and Rother, Heinz-Joachim, to Bayer Aktiengesellschaft. Polyaralkylated hydroxybenzamides, process for their preparation and their use. 4,902,830, Cl. 564-155.000.

Schoniger, Karl-Heinz; and Scheid, Winfried. Display construction. 4,903,172, Cl. 362-31.000.

Schott Fiber Optics: *See—*
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Schott, Lawrence A. Hand, wrist, and forearm friction resistance exercise device. 4,901,999, Cl. 272-67.000

Schrankel, Kenneth R.: *See—*
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Schreck, David J.: *See—*
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Schreiber, Alan D., to University of Pennsylvania. Inhibition of immune clearance using progesterone analogues. 4,902,681, Cl. 514-177.000.

Schriewer, Michael; Crohe, Klaus; Zeiler, Hans-Joachim, and Metzger, Karl G., to Bayer Aktiengesellschaft. Intermediates for 1,8-bridged 4-quinolone-3-carboxylic acid antibacterials. 4,902,795, Cl. 544-182.000.

Schrodi, Karl: *See—*
Preisach, Helmuth; and Schrodi, Karl, 4,903,260, Cl. 370-60.000.

Schroeder, Charles, deceased: *See—*
Holmes, Terry L.; Thiemann, Daniel A.; and Schroeder, Charles, deceased, 4,902,375, Cl. 156-516.000.

Schroeder, Lawrence R.; and Caskey, Terrence L., to Dow Chemical Company, The. Membrane separation device. 4,902,416, Cl. 210-321.670.

Schroeder, Ruth, administrator: *See—*
Holmes, Terry L.; Thiemann, Daniel A.; and Schroeder, Charles, deceased, 4,902,375, Cl. 156-516.000.

Schroer, William L.; and Kniss, Kraig S., to Elkay Manufacturing Company. Bottled water cooler air filter. 4,902,320, Cl. 55-385.100.

Schrors, Gunter: *See—*
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Schuett, Bernd: *See—*
Belart, Juan; Volkmar, Werner; Schuett, Bernd; and Stahlheber, Peter, 4,902,077, Cl. 303-113.000.

Schuh, Gottfried: *See—*
Strack, Helmut; and Schuh, Gottfried, 4,903,112, Cl. 357-55.000.

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Durley, Benton A., III; Schultz, Steven G.; and Galitz, Charles M., 4,902,399, Cl. 204-409.000.

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Jones, Gary W.; and Schwartz Jones, Susan K., 4,902,898, Cl. 250-492.200.

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Immel, Otto; and Schwarz, Hans-Helmut, 4,902,661, Cl. 502-184.000.

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Grasso, Alfie L.; and Scott, Richard C., 4,902,877, Cl. 219-483.000.

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Rhodes, Richard O.; Sears, Stephan; and Pomeroy, Dan M., 4,902,197, Cl. 415-111.000.

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Securicome Development Inc.: *See—*
Platek, Avner, 4,901,723, Cl. 606-133.000.

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Gomez, Enidio A.; and Downey, Robert J., 4,901,503, Cl. 53-244.000.

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Tucker, Leslie R., 4,901,393, Cl. 15-308.000.

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Gupta, Satish; Lumelsky, Leon; and Segre, Marc, 4,903,217, Cl. 364-521.000.

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Muller, Herbert; and Sehnke, Gerhardt, 4,902,865, Cl. 200-538.000.

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Iwamatsu, Seiichi, 4,902,897, Cl. 250-423.00R.

Maekawa, Nobuyoshi; Yokouchi, Hideya; Aruga, Tomoe; and Sugiyama, Tadashi, 4,903,155, Cl. 360-99.080.

Seiko Instruments Inc.: *See—*
Okayama, Shigeo; Tokumoto, Hiroshi; Bando, Hiroshi; Mizutani, Wataru; Shimura, Masayuki; Nakagawa, Haruki; Shigeno, Masatsugu; and Watanabe, Kazutoshi, 4,902,892, Cl. 250-307.000.
Yasaka, Anto; Nakagawa, Yoshitomo; and Sato, Mitsuyoshi, 4,902,530, Cl. 427-38.000.

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Tajima, Akio, 4,903,043, Cl. 346-134.000.

Seiler, Nikolaus J.: *See—*
Gerhart, Fritz E.; and Seiler, Nikolaus J., 4,902,719, Cl. 514-564.000.

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Yokouchi, Kazuhiro; Kageyama, Tatsumi; Sekine, Chogo; Hojo, Harumasa; Yamada, Koji; Mikuriya, Makoto; and Hirata, Senchiro, 4,903,212, Cl. 364-449.000.

Sekino, Hiroshi: *See—*
Hirano, Akira; Watanabe, Shinichi; Fukuda, Yutaka; Higuchi, Yukio; Shibano, Fumio; Sekino, Hiroshi; Nabeshima, Hiroichi; and Nishizawa, Yukimasa, 4,901,560, Cl. 73-117.000.

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Kanto, Jumpei; Akada, Masanori; Kamakari, Katsuhiro; Asahina, Kenichi; Sakashita, Katsuaki; and Watanabe, Yoshihisa, 4,902,670, Cl. 503-227.000.

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Kordomenos, Panagiotis I.; Dervan, Andrew H., and Semanision, Tab, 4,902,754, Cl. 525-440.000.
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Yamazaki, Shunpei, 4,903,102, Cl. 357-30.000.

Semrau, Waldemar R., to General Motors Corporation. Self-sealing heat activated grommet. 4,901,395, Cl. 16-2.000.

Sen, Susanta: *See—*
Capasso, Federico; Cho, Alfred Y.; Sen, Susanta; Shoji, Masakazu; and Sivco, Deborah, 4,902,912, Cl. 307-322.000.

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Yamanami, Tsuguya; and Senda, Toshiaki, 4,902,858, Cl. 178-19.000.

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Bell, Issac M.; and Sendelweck, Gene K., 4,903,129, Cl. 358-181.000.

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Servaes, Donald A.: *See—*
Reynolds, George O.; and Servaes, Donald A., 4,902,100, Cl. 350-320.000.

Sevastakis, Gus. Continuous casting apparatus. 4,901,783, Cl 164-421.000.

SFENA Corporation: *See—*
Livezey, Jerry L.; and Horst, Everett J., 4,903,171, Cl. 362-26.000.

SGS-Thomson Microelectronics S.r.l.: *See—*
Oliveri, Carmelo; and Magro, Carmelo, 4,902,632, Cl. 437-8.000.

SGS-Thomson Microelectronics S.p.A.: *See—*
Picco, Paolo, 4,902,634, Cl. 437-34.000.

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Artieri, Alain, 4,903,231, Cl. 364-900.000.
Najji, Jean-Paul, 4,903,105, Cl. 357-38.000.

Shank, Jeffrey B., to GTE Products Corporation. Hybrid plug assembly. 4,902,094, Cl. 350-96.210.

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Shannon, William; and Napiorkowski, John, to GTE Products Corporation. Compact solid state station protector device. 4,903,295, Cl. 379-437.000.

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Hirami, Akira; and Taguchi, Yasuhiro, 4,903,233, Cl. 364-900.000.
Juso, Hiromi; Sudoh, Kengo; and Haikawa, Yukihiko, 4,903,150, Cl. 360-77.120.
Miyoshi, Shuji, Sugihara, Takashi; and Hijikigawa, Masaya, 4,902,571, Cl. 128-411.100.
Taneya, Mototaka; Matsumoto, Mitsuhiro; Matsui, Sadayoshi, and Hosoba, Hiroyuki, 4,903,274, Cl. 372-48.000.
Taniguchi, Hideo, 4,903,080, Cl. 355-274.000.
Yamada, Yoshikado, 4,902,936, Cl. 315-158.000.
Yoshida, Kunio, 4,903,014, Cl. 340-727.000

Shea, Timothy J.: *See—*
Brown, Sterling B.; Campbell, John R.; and Shea, Timothy J., 4,902,753, Cl. 525-394.000.

Sheen Kleen, Inc.: *See—*
Kim, Dai W.; and Cowling, Albert R., 4,902,544, Cl. 428-36.100.

Shekleton, Jack R.; Smith, Robert W.; and Vershure, Roy W., to Sundstrand Corporation. Staged, coaxial, multiple point fuel injection in a hot gas generator. 4,901,524, Cl. 60-39.465.

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Garden, Alan R., 4,902,510, Cl. 424-405.000.

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Drent, Eit, 4,902,822, Cl. 560-233.000.

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Cotherman, Robert D.; and Way, Keith F., 4,901,413, Cl. 29-890.140.

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Shepard, Michael L.; and Snyder, Charles A., II, to Westvaco Corporation. Method and apparatus for roll nip load measurement. 4,901,585, Cl. 73-862.380.

Shepherd, Lloyd: *See—*
Cranston, Benjamin H.; and Shepherd, Lloyd, 4,902,857, Cl. 174-94.00R.

Sherman, Leigh E.; Whatcott, Gary L.; Dicks, Richard M.; and Madsen, David C., to Eaton-Kenway, Inc. Guide wire communication system and method. 4,902,948, Cl. 318-580.000.

Shibano, Fumio: *See—*
Hirano, Akira; Watanabe, Shinichi; Fukuda, Yutaka; Higuchi, Yukio; Shibano, Fumio; Sekino, Hiroshi; Nabeshima, Hiroichi; and Nishizawa, Yukimasa, 4,901,560, Cl. 73-117.000.

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Shibata, Yoshihiko; Chikamori, Yoshihiro; and Shimizu, Yoichi. Product and method for fastening soft porous tubes. 4,902,419, Cl. 210-321.890.

Shibuta, Takanobu: *See—*
Hayakawa, Kunihiko; Masai, Teruhisa; Yoshida, Yasuyuki; Shibuta, Takanobu; and Miyazaki, Hiroshi, 4,902,673, Cl. 514-21.000.

Shibuya, Katsuhiko: *See—*
Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi, Yanagi, Akihiko; Yagi, Shigeki; Miyauchi, Hiroshi; and Shibuya, Katsuhiko, 4,902,335, Cl. 71-90.000.

Shickel, Robert J., to EIGI Corporation. Laminated insulating material. 4,902,550, Cl. 428-137.000.

Shida, Takafumi; Watanabe, Takeo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Satake, Keigo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivatives of dihydrotriazole, and herbicidal compositions containing the same as an active ingredient. 4,902,805, Cl. 548-262.000.

Shieh, James. Adjustable angle ratchet wrench. 4,901,608, Cl. 81-177.800.

Shiga, Kenji: *See—*
Arata, Hiroto; Shiga, Kenji; Sakurai, Daihachiro; Fujisawa, Kazuo; Souma, Isao; Watanabe, Yusiyo; and Tanaka, Akira, 4,902,473, Cl. 420-105.000.

Shigeno, Masatsugu: *See—*
Okayama, Shigeo; Tokumoto, Hiroshi; Bando, Hiroshi; Mizutani, Wataru; Shimura, Masayuki; Nakagawa, Haruki; Shigeno, Masatsugu; and Watanabe, Kazutoshi, 4,902,892, Cl. 250-307.000.

Shimada, Yoshiharu: *See—*
Takata, Manabu; Tanaka, Junzo; Shimada, Yoshiharu; and Kagomoto, Yoshiteru, 4,901,705, Cl. 126-41.00R.

Shimada, Yoshihiro: *See—*
Fujihara, Tadafumi; and Shimada, Yoshihiro, 4,902,101, Cl. 350-320.000.

Shimahara, Akihito: *See—*
Masuhara, Masami; and Shimahara, Akihito, 4,903,336, Cl. 455-344.000.

Shimano, David Y.: *See—*
Lucas, Bernard H.; and Shimano, David Y., 4,902,344, Cl. 75-101.00R.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,901,824, Cl. 188-73.100.

Shimawaki, Hidenori, to NEC Corporation. Method of selective epitaxial growth for compound semiconductors. 4,902,643, Cl. 437-89.000.

Shimazu, Yukihiko: *See—*
Sakashita, Narumi; and Shimazu, Yukihiko, 4,903,005, Cl. 340-146.200.

Shimizu, Giichiro, to Man Design Co., Ltd. Power-saving type receiver. 4,903,335, Cl. 455-343.000.

Shimizu, Susumu: *See—*
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo, and Saishoji, Toshihide, 4,902,702, Cl. 514-383.000.

Shimizu, Yoichi: *See—*
Shibata, Yoshihiko; Chikamori, Yoshihiro; and Shimizu, Yoichi, 4,902,419, Cl. 210-321.890.

Shimoda, Kouji: *See—*
Namiki, Tohru; Matsui, Fumio; Shimoda, Kouji, and Fuse, Yosiaki, 4,903,224, Cl. 369-290.000.

Shimoda, Masaki *See—*
Hayasi, Yosio; Oguri, Tomei; Shimoda, Masaki, Tsutsui, Mikio; Takahashi, Kazuo; and Muda, Hitoshi, 4,902,700, Cl. 514-365.000.

Shimoichi, Koji, to Hiroshima Press Kogyo Co., Ltd. Hemming apparatus. 4,901,555, Cl. 72-322.000.

Shimoya, Masahiro: *See—*
Negura, Kengi; Yamamoto, Ken; Ito, Shigeo; and Shimoya, Masahiro, 4,901,908, Cl. 228-183.000.

Shimoyama, Kenji: *See—*
Noguchi, Masahiro; Gotoh, Hideki; and Shimoyama, Kenji, 4,902,356, Cl. 148-33.400.

Shimp, David A., to Hi-Tek Polymers, Inc. Polycyanate esters of polyhydric phenols blended with thermoplastic polymers. 4,902,752, Cl. 525-390.000.

Shimura, Masayuki: *See—*
Okayama, Shigeo; Tokumoto, Hiroshi; Bando, Hiroshi; Mizutani, Wataru; Shimura, Masayuki; Nakagawa, Haruki; Shigeno, Masatsugu; and Watanabe, Kazutoshi, 4,902,892, Cl. 250-307.000.

Shimura, Toshio *See—*
Murakoshi, Kazuhiko; and Shimura, Toshio, 4,902,085, Cl. 350-6.800.

Shimura, Yoshio, Mizutani, Yoshiyuki; and Isogai, Akio, to Kabushiki Kaisha Toyoto Chuo Kenkyusho. High temperature sliding element and method for preventing high temperature sliding wear 4,902,576, Cl. 428-472.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Itoh, Kunio; Komiya, Sumiko; Shiobara, Toshio, Tomiyoshi, Kazutoshi, and Fujimura, Yoshio, 4,902,732, Cl. 525-433.000.

Shingaki, Kouichi: *See—*
Matsubara, Ken; Saito, Itaru; Kitano, Hirohisa; Shingaki, Kouichi; and Masuda, Tomohiko, 4,902,111, Cl. 350-393.000.

Shinkawa, Hiroyasu: *See—*
Shida, Takafumi; Watanabe, Takeo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Satake, Keigo, 4,902,805, Cl. 548-262.000.

Shinn, Alan L., to Allergan Humphrey. Range detector for eye instrument having interrogating beam. 4,902,121, Cl. 351-208.000.

Shinobu, Yoshiharu: *See—*
Yoshikawa, Masaharu; Arai, Nobushige, Satomura, Masafumi; Tanaka, Syozo; Shinobu, Yoshiharu; Takushima, Akira; and Yanagisawa, Nobuhiro, 4,901,537, Cl. 62-235.100.

Shinoki, Masayoshi: *See—*
Takeda, Masayuki; Mochizuki, Masao; Kumashiro, Koichi, Nagatsuka, Ikutaroh; Shinoki, Masayoshi; and Aoki, Takayoshi, 4,902,597, Cl. 430-106.600.

Shinonaga, Hideo: *See—*
Mitsuno, Tatsuyuki; Shinonaga, Hideo; Daimon, Akio; and Hosoda, Satoru, 4,902,738, Cl. 524-525.000

Shinozaki, Takashi: *See—*
Ohtake, Yeshichi; Nomoto, Kaichiro; and Shinozaki, Takashi, 4,903,135 Cl. 358-227.000.

Shinwa Sangyo Co., Ltd.: *See—*
Komiya, Jujiro, 4,901,792, Cl. 165-150.000.

Shiobara, Toshio: *See—*
Itoh, Kunio; Komiya, Sumiko; Shiobara, Toshio; Tomiyoshi, Kazutoshi; and Fujimura, Yoshio, 4,902,732, Cl 525-433.000

Shiojiri, Kentaro: *See—*
Wakizaka, Saburo; Hayasaka, Hiraku; Hashimoto, Kazuki; Shiojiri, Kentaro; and Suzuki, Toshiaki, 4,902,349, Cl 106-277.000.

Shionogi & Co., Ltd.: *See—*
Mori, Sachio; and Takechi, Shozo, 4,902,811, Cl. 549-359.000.
Totani, Tetsushi; Aono, Katsutoshi; and Adachi, Yasuko, 4,902,797, Cl. 546-11.000.

Shiota, Kazuo, to Fuji Photo Film Co., Ltd Photographic printer. 4,903,068, Cl. 355-20.000.

Shiozaki, Masayoshi: *See—*
Nakai, Kuniharu; Shiozaki, Masayoshi; Tsuji, Hiroji; Mori, Shigeharu; Hirose, Susumu; Yokoi, Nobumasa; and Ohya, Takaichi, 4,902,622, Cl. 435-210.000.

Shipley, Charles R., to Shipley Company Inc. Method for manufacture of multilayer circuit board. 4,902,610, Cl. 430-312.000.

Shipley Company Inc.: *See—*
Shipley, Charles R., 4,902,610, Cl. 430-312.000.

Shirai, Hiroshi: *See—*
Fukuo, Koichi; Shirai, Hiroshi; and Tatsumi, Takashi, 4,901,685, Cl. 123-90.160.

Shirasawa, Masaharu: *See—*
Ito, Tsuyoshi; and Shirasawa, Masaharu, 4,902,263, Cl. 453-49.000.

Shirouma Plastics Kogyo Inc.: *See—*
Tahara, Yoshimasa, 4,901,435, Cl. 30-2.000.

Shiroyama, Masaharu: *See—*
Wada, Toshiaki; Furukawa, Mitsuhiko; Shiroyama, Masaharu; Nagano, Mitsuyoshi; Miyahara, Michito; Kitahira, Takashi; and Mohri, Shigeki, 4,902,651, Cl 501-87.000.

Shiwaku, Nuboru: *See—*
Hester, Richard K.; and Shiwaku, Nuboru, 4,903,022, Cl. 341-110.000.

Shobara, Yoshitaka: *See—*
Morishita, Yoshimasa; and Shobara, Yoshitaka, 4,902,249, Cl. 439-610.000.

Shockling, Larry A.: *See—*
Veronesi, Luciano; and Shockling, Larry A., 4,902,468, Cl. 376-327.000.

Shoji, Masakazu: *See—*
Capasso, Federico; Cho, Alfred Y.; Sen, Susanta; Shoji, Masakazu; and Sivco, Deborah, 4,902,912, Cl. 307-322.000.

Shotmeyer, Albert. Filling station structure. 4,901,748, Cl. 137-234.600.

Showa Denko Kabushiki Kaisha: *See—*
Kimura, Yoshitaka; Furuta, Yuji; Miyazaki, Kunihiro; and Hiraiwa, Tadashi, 4,902,649, Cl. 501-1.000.
Tanaka, Toyoaki; Ohira, Katuzi; Nakamura, Akira; Kamei, Ryosuke; and Hashimoto, Akihiro, 4,902,463, Cl. 264-122.000.

Shrum, R. E.: *See—*
Obst, Donald L.; and Shrum, R. E., 4,901,939, Cl. 242-118.400.

Shu, Paul: *See—*
Phelps, Craig H.; Strom, E. Thomas; Hoskin, Dennis H.; Mitchell, Thomas O.; and Shu, Paul, 4,901,795, Cl. 166-270.000.

Shue, Ho-Jane: *See—*
Blythin, David J.; and Shue, Ho-Jane, 4,902,693, Cl. 514-300.000.

Sidebottom, Barry: *See—*
Kaplan, Jay; Harris, Richard G.; and Sidebottom, Barry, 4,903,230, Cl. 364-900.000.

Siebecker, Hans; and Weigel, Wolfgang, to Hughes Aircraft Company. Apparatus for harmonizing a plurality of optical/optronic axis of sighting apparatus to a common axis. 4,902,128, Cl. 356-152.000.

Siecor Corporation: *See—*
Obst, Donald L.; and Shrum, R. E., 4,901,939, Cl. 242-118.400.

Siegel, Robert P.: *See—*
Lama, William L.; Loce, Robert P.; Pepe, Martin, Jr.; Whitte, Eleanor; Siegel, Robert P.; Parker, Antje B.; and Watson, Peter, 4,903,074, Cl. 355-76.000.

Siegmund, Walter P.; and Szwarc, Anthony F., to Schott Fiber Optics. Orientation indicator for a flexible fiberscope or endoscope including method of manufacture. 4,902,129, Cl. 356-241.000.

Siemens AG: *See—*
Althaus, Hans-Ludwig; Bialas, Joachim; Haltenorth, Helmut; Hoermann, Ewald; Keil, Evelyn; and Sobota, Edmund, 4,902,091, Cl. 350-96.200.

Siemens Aktiengesellschaft: *See—*
Brust, Hans-Detlef; and Otto, Johann, 4,902,966, Cl. 324-158.00R.
Erbse, Dietmar; Fuchs, Lydia; Bege, Dietmar; Queiser, Horst; and Meininger, Siegfried, 4,902,446, Cl. 252-632.000.
Kess, Helmut, 4,902,975, Cl. 324-318.000.
Lang, Otto; and Dombrowski, Manfred, 4,903,280, Cl. 375-7.000.
Mueller, Rudolf; and Albertshofer, Wolfgang, 4,902,136, Cl. 356-419.000.
Muller, Herbert; and Sehnke, Gerhardt, 4,902,865, Cl. 200-538.000.
Rattner, Manfred, 4,901,709, Cl. 128-24.00A.
Schlaig, Martin; Kuepper, Wolfgang; and Kaemmerer, Bernhard, 4,903,304, Cl. 381-41.000.
Strack, Helmut; and Schuh, Gottfried, 4,903,112, Cl. 357-55.000.

Siemens-Bendix Automotive Electronics Limited: *See—*
Cook, John E.; and Gillier, William C., 4,901,974, Cl. 251-129.150.
Cook, John E., 4,902,861, Cl. 200-61.480.

Siemens Energy & Automation, Inc.: *See—*
Robbins, W. Dale, 4,901,821, Cl. 185-40.00R.
Witzmann, Gustav; and Patrick, John R., 4,902,859, Cl. 200-50.00C.

Siemers, Paul A.: *See—*
Frind, Gerhard; Siemers, Paul A.; and Rutkowski, Stephen F., 4,902,870, Cl. 219-121.520.

Sigmund, Sandra K.: *See—*
Jungheim, Louis N.; and Sigmund, Sandra K., 4,902,707, Cl. 514-405.000.

Signal Communications Corporation: *See—*
Hendershot, James R., 4,903,323, Cl. 455-67.000.

Signeon Corporation: *See—*
Whorton, Jere D.; and Gellenthin, Carl O., Jr., 4,902,252, Cl. 439-796.000.

Silver, Paul A., to Hercules Incorporated. Improving the physical properties of glass composite polydicyclopentadiene by heat treatment. 4,902,560, Cl. 428-273.000.

Silvester, Lenard F.: *See—*
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Miller, William J.; and Truesdale, Carlton M., 4,902,324, Cl. 65-3.110.

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Broszat, Lothar; Merklinger, Andreas; and Busse, Fritz, 4,902,158, Cl. 403-77.000.

TRW Inc.: *See—*
Lewis, Jeffrey C., 4,902,182, Cl. 411-510.000.
Reinholm, James H.; Stonerook, Dana A.; and McCurdy, Roger A., 4,903,011, Cl. 340-641.000.

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Papp, Endre K., 4,902,117, Cl. 350-601.000.

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Tsuchiya, Shinji: *See—*
Ishii, Wataru; Miyazawa, Shozo; Tsuchiya, Shinji; Nakane, Hisashi; and Yokota, Akira, 4,902,770, Cl. 528-149.000.

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Tsuji, Hiroji: *See—*
Nakai, Kuniharu; Shiozaki, Masayoshi; Tsuji, Hiroji; Mori, Shigeharu; Hirose, Susumu; Yokoi, Nobumasa; and Ohya, Takaichi, 4,902,622, Cl. 435-210.000.

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Amano, Yoshinori; Tsuji, Shiro; and Matsushima, Hiroshi, 4,903,148, Cl. 360-13.000.

Tsujimoto, Kazukuki: *See—*
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Tsujita, Yoshihiro: *See—*
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Tucker, Leslie R., to Sedgemoor Developments PLC. Hay and straw cleaning apparatus. 4,901,393, Cl. 15-308.000.

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Tullos, Gordon L.: *See—*
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Tran, Anthony T.; Tung, Chi R.; and Yost, Peter W., 4,901,951, Cl. 244-122.00A.

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Turner, David W.: *See—*
Miller, Brian J.; and Turner, David W., 4,901,494, Cl. 52-309.120.

Turner, Joe D., to Ashland Oil, Inc. Heat treatment of exchangers to remove coke. 4,902,403, Cl. 208-48.00R.

Turner, John H., Jr., to Whistler Corporation. Marine transponder system. 4,903,243, Cl. 367-3.000.

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Hirota, Yohjiro; Sugiura, Hisao; Kuroda, Nobuyuki; Wada, Takuo; and Tsujimoto, Kazukuki, 4,902,705, Cl. 514-397.000.

Uchida, Hiroshi: *See—*
Okudaira, Shigenori; Irie, Takefumi; Uchida, Hiroshi; Fukasawa, Eiichi; Kobayashi, Kazuhiko; and Yamaguchi, Masanori, 4,902,341, Cl. 75-10.180.

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Uchida, Masamichi: *See—*
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Hori, Takashi; Ueda, Sanae; Kojima, Yoshihiro; and Kumagai, Hitoshi, 4,902,436, Cl. 252-33.200.

Ueda, Takuya: *See—*
Okura, Akimitsu; Cho, Toshoku; Nakagawa, Takao; Gomi, Shimpei; and Ueda, Takuya, 4,902,453, Cl. 264-29.200.

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Ugawa, Satoru: *See—*
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Ukai, Norio: *See—*
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Uko, Makoto: *See—*
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Desvallees, Jean; Michaux, Jacques; and Mennel, Gabriel, 4,901,554, Cl. 72-225.000.

Union Carbide Chemicals and Plastics Company Inc.: *See—*
Baker, Otis M.; Critchfield, Frank E.; and Westfall, Paul M., 4,902,723, Cl. 521-129.000.
Collins, Paul R.; and Rothrock, Larry R., 4,902,224, Cl. 433-8.000.
Gerkin, Richard M.; and Barksby, Nigel, 4,902,768, Cl. 528-68.000.
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Moloy, Kenneth G., 4,902,833, Cl. 568-14.000.

Union Carbide Corporation: *See—*
Cheung, Harry, 4,902,321, Cl. 62-24.000.
Drnevich, Raymond F., 4,901,796, Cl. 166-278.000.
Jackson, John E., 4,902,539, Cl. 427-423.000.
King, Stephen W.; and Knopf, Robert J., 4,902,658, Cl. 502-159.000.

Unisys Corporation: *See—*
Lins, Stanley J.; and Fleming, David L., 4,902,087, Cl. 350-96.130.

United States of America
Administrator, National Aeronautics and Space Administration: *See—*
Poorman, Richard M.; and Schmidt, Deborah D., 4,902,354, Cl. 148-4.000.
Agriculture: *See—*
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Army: *See—*
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Commerce: *See—*
Peterson, Melvin N. A., 4,902,430, Cl. 210-747.000.
Director, National Security Agency: *See—*
Solomon, Harvey E., 4,903,339, Cl. 455-612.000.
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Kaliner, Michael A.; and Boltansky, Howard, 4,902,495, Cl. 424-1.100.
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Chutjian, Ara; Hecht, Michael H.; and Orient, Otto J., 4,902,647, Cl. 437-239.000.
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Morrison, Andrew D., 4,902,450, Cl. 264-4.000.
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Everett, Hobart R., Jr., 4,902,887, Cl. 250-221.000.
Flesner, Larry D., 4,902,967, Cl. 324-158.00R.
Kidwell, David, 4,902,627, Cl. 436-112.000.
Nevins, William R.; Lundwall, Neal M.; and Walker, Dale L., 4,901,644, Cl. 102-293.000.
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Tran, Anthony T.; Tung, Chi R.; and Yost, Peter W., 4,901,951, Cl. 244-122.00A.

U.S. Philips Corporation: *See—*
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Bathe, Paul, 4,903,273, Cl. 372-38.000.
Boudewijns, Arnoldus J. J., 4,903,241, Cl. 365-194.000.
Chantepie, Bernard, 4,902,909, Cl. 307-247.100.
Chapron, Claude E. P., 4,903,095, Cl. 357-23.130.
Esser, Leonard J. M., 4,903,284, Cl. 377-62.000.
Gerritsen, Jan, 4,902,928, Cl. 313-412.000.
Gosch, Peter; Klemen, Albert; and Wolfger, Arno, 4,901,436, Cl. 30-43.920.
Harding, Geoffrey, 4,903,287, Cl. 378-119.000.
Herbert, Brian K., 4,902,940, Cl. 315-382.000.
James, Phillip A., 4,902,414, Cl. 210-198.200.
Kasperkovitz, Wolfdietrich G., 4,903,331, Cl. 455-207.000.
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Mewissen, Jan A. C., 4,902,876, Cl. 219-464.000.
Ponjee, Johannes J.; and Voermans, Antonius B., 4,902,104, Cl. 350-340.000.
Rollin, Joel; Perrin, Jean-Claude; and Loy, Fernand, 4,902,098, Cl. 350-286.000.
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Van Gerwen, Petrus J.; van de Laar, Franciscus A. M.; and Kotmans, Hendrik J., 4,903,247, Cl. 367-135.000.
Van Opdorp, Christianus J. M., 4,903,088, Cl. 357-17.000.
Van Steenbrugge, Bernard; and Berkhoff, Egbertus J., 4,903,015, Cl. 340-825.500.
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United States Shoe Corporation, The: *See—*
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United States Surgical Corporation: *See—*
Lander, Jack R., 4,902,280, Cl. 604-165.000.

United Technologies Automotive, Inc.: *See—*
Dowd, James D.; and Hampton, Darrel, 4,902,068, Cl. 296-214.000.

United Technologies Corporation: *See—*
Fornwalt, Donald E.; Lomasney, Gary M.; and Routsis, Kostas, 4,902,388, Cl. 204-32.100.
Jarmon, David C., 4,902,326, Cl. 65-4.100.
Srinivasan, Amrutur V.; Cutts, David G.; and Fulton, Graham B., 4,901,573, Cl. 73-579.000.

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Umemura, Yoshihiro; Ozaki, Yasuhiko; and Kawaide, Akihito, 4,902,503, Cl. 424-83.000.

Universal Consolidated Methods, Inc.: *See—*
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University of California, Regents of: *See—*
Pardridge, William M., and Schimmel, Paul R., 4,902,505, Cl. 424-85.700.
Zakko, Salam F., 4,902,276, Cl. 604-28.000.

University of Delaware: *See—*
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University of Florida, The: *See—*
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,902,504, Cl. 424-84.000.

University of Michigan, The: *See—*
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University of Pennsylvania: *See—*
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University of Rochester, The: *See—*
Anderson, Porter W., and Eby, Ronald J., 4,902,506, Cl. 424-92.000.
Caldwell, J. Brian; and Moore, Duncan T., 4,902,650, Cl. 501-12.000.
Kende, Andrew S., and Matsuo, Noritada, 4,902,835, Cl. 568-684.000.

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Kenny, Michael B.; Barnett, Larry R.; Grow, Richard W.; and Baird, J. Mark, 4,902,977, Cl. 324-462.000.

University of Utah Research Foundation: *See—*
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University of Virginia Alumni Patents Foundation, The: *See—*
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Uno, Haruhiko; Imoto, Yuzo; Izumi, Tetuya; and Takei, Toshihiro, to Nippondenso Co., Ltd. Braking apparatus for vehicle. 4,902,075, Cl. 303-14.000.

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UOP: *See—*
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Scott, Norman H.; and Vora, Bipin V., 4,902,848, Cl. 585-655.000.
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Uotani, Yasuhiro: *See—*
Yamashita, Gentaro; Uotani, Yasuhiro; and Hirano, Yoshio, 4,903,203, Cl. 364-413.150.

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Uptown Products, Inc.: *See—*
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Urano, Satoshi: *See—*
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Usami, Jun; Hattori, Akinobu; and Kajita, Takeshi, to NGK Insulators, Ltd. Gas sensing element. 4,902,400, Cl. 204-426.000.

Usami, Kimiyoshi: *See—*
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Ushijima, Takayuki; Igarashi, Katsumasa; Ishizeki, Seiichi; and Ishido, Hideki, to Fuji Jukogyo Kabushiki Kaisha. Antilock brake control method for motor vehicle. 4,902,076, Cl. 303-100.000.

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USX Corporation: *See—*
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Utsumi, Isao; Kawai, Yasuhiro; Tamura, Kaoru; Maehara, Yasunori; Fujiwara, Sigeme; and Koyama, Katsuhide, to Fuji Photo Film Co. Ltd. Stimulable phosphor sheet stacking tray. 4,901,868, Cl. 211-51.000.

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Vaas, Eberhard: *See—*
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Vac-Tec Systems, Inc.: *See—*
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Vaintola, Raimo K.: *See—*
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Valdivia, Jesse. Dual shower head assembly. 4,901,927, Cl. 239-446.000.

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Bandi, Gianluigi S.; and Valenti, Mauro, 4,902,501, Cl. 424-79.000.

Valenza, Michael A. Dispensing brush with barb means to rupture material packet. 4,902,154, Cl. 401-132.000.

Valmet Paper Machinery Inc.: *See—*
Hagel, Rauno; and Landin, Wilhelm, 4,901,637, Cl. 100-170.000.

Valyocsik, Ernest W., to Mobil Oil Corporation. Synthesis of zeolite ZSM-22. 4,902,406, Cl. 208-118.000.

Vanaschen, Luc; Kuster, Hans-Werner; and Radermacher, Herbert, to Saint-Gobain Vitrage. Process for bending a glass sheet and support device adapted to this process. 4,902,331, Cl. 65-106.000.

van Belle, Arie, to Flameco-Eclipse B.V. Gas burner. 4,902,222, Cl. 431-186.000.

Van Bogaert, Philippe; and Frank, Ampe, to Picanol N.V. Method for adjusting the length of the weft thread to be inserted into the shed of weaving looms and devices used for this object. 4,901,772, Cl. 139-452.000.

VanBuskirk, Bruce: *See—*
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Vancson Szmercsanyi, Ibolya: *See—*
Bodnar, Akos; Solymoss, Maria; Vancson Szmercsanyi, Ibolya; Szigeti, Istvan; and Szommer, Laszlo, 4,902,773, Cl. 528-303.000.

Van De Griend, Jan M., to U.S. Philips Corporation. Two parts secured by hall ST40 connection. 4,902,163, Cl. 403-375.000.

van de Laar, Franciscus A. M.: *See—*
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Vandenberg, Eric S.: *See—*
Leining, Lyndon R.; Vandenberg, Eric S.; and Erlandson, Ralph O., 4,901,558, Cl. 73-49.300.

van den Top, Hendrik. Apparatus for cultivating market garden products, particularly mushrooms. 4,901,471, Cl. 47-1.100.

Van Der Mast, Karel D., to U.S. Philips Corporation. Electron image projector. 4,902,930, Cl. 315-12.100.

Van der Woude, Gerbrig W., to Prolens. Face shield. 4,901,374, Cl. 2-453.000.

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Dixon, Robert C.; Cearley, James E.; Van Diemen, Paul; Sayre, Edwin D.; and Gordon, Gerald M., 4,902,470, Cl. 376-333.000.

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van Gerwen, Thomas T. C.: *See—*
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Van Opdorp, Christianus J. M., to U.S. Philips Corp. Semiconductor laser with large bandgap connection layer. 4,903,088, Cl. 357-17.000.

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Kojima, Yoshikazu; Yanase, Takao; Nonami, Mitsuharu; and Chida, Takao, 4,902,885, Cl. 250-211.00K.
Yanazawa, Hiroshi: *See*—
Imamura, Toshinori; Miyazaki, Masaru; Terano, Akihisa; Matsunaga, Nobutoshi; and Yanazawa, Hiroshi, 4,902,635, Cl. 437-44.000.
Yang, Alex; and Liao, Ben-Shin, to Yang, Alex. Modular frame for a water bed. 4,901,383, Cl. 5-201.000.
Yang, Gi H.: *See*—
Park, Ho J.; Choi, Jin Y.; Park, Seong C.; and Yang, Gi H., 4,902,367, Cl. 156-297.000.
Yang, Hung H.; and Chiou, Minshon J., to Du Pont de Nemours, E. I., and Company. Poly(p-phenyleneterephthalamide) yarn of improved fatigue resistance. 4,902,774, Cl. 528-348.000.
Yang, Jiun-Fu. Socket-adapter stabilizing device for miniature fluorescent lamps. 4,902,932, Cl. 315-71.000.
Yannas, Ioannis V., to Massachusetts Institute of Technology. Multilayer bioreplaceable blood vessel prosthesis. 4,902,289, Cl. 623-1.000.
Yarmashev, Jury N.; Nikolaenko, Alexandr I.; Kotenko, Alexandr F.; Chernenko, Evgeny A.; Abramov, Vsevolod V.; Veselov, Alexandr V.; Rysin, Nikolai I.; and Salnikova, Vera N. Harvester reel rake bar. 4,901,511, Cl. 56-220.000.
Yasaka, Anto; Nakagawa, Yoshitomo; and Sato, Mitsuyoshi, to Seiko Instruments Inc. Method of correcting a pattern film. 4,902,530, Cl. 427-38.000.
Yasuda, Makoto: *See*—
Okamoto, Yukio; Yasuda, Makoto; Murayama, Seiichi; and Koga, Masataka, 4,902,099, Cl. 356-316.000.
Yasui, Koji; Tanaka, Masaaki; Yagi, Shigenori; Kuzumoto, Masaki; Myoi, Yasuhito; and Kuba, Kazuki, to Mitsubishi Denki Kabushiki Kaisha. Laser apparatus. 4,903,271, Cl. 372-9.000.
Yasui, Masanobu: *See*—
Kaida, Noriyuki; Yokoe, Hifumi; Harada, Chikao; Niwa, Minoru; and Yasui, Masanobu, 4,901,733, Cl. 128-687.000.
Yasunaga, Toshiyuki: *See*—
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Yasunobu, Chizuko: *See*—
Masuishi, Tetsuya; Tsuji, Hiroshi; Yasunobu, Chizuko; and Ohata, Hideo, 4,903,215, Cl. 364-513.000.
Yates, Emmett A.: *See*—
Burnett, Lauren W., 4,902,177, Cl. 409-234.000.
Yazaki Corporation: *See*—
Endo, Takayoshi; Inaba, Shigemitsu; and Hashizawa, Shigemi, 4,902,244, Cl. 439-489.000.
Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Sakurai, Kazuaki, 4,902,240, Cl. 439-157.000.
Sugimoto, Yasuyoshi, 4,902,968, Cl. 324-158.00F.
Yeakley, Richard L.: *See*—
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Yen, Larry Y.; and Lopatin, George, to Millipore Corporation. Fluorocarbon membranes and process for making fluorocarbon membranes. 4,902,456, Cl. 264-41.000.
Yeo, Eugene D., to Eastman Kodak Company. Imaging apparatus with variable aperture platen. 4,903,078, Cl. 355-218.000.
Yoder, Paul R., Jr., to Taunton Technologies, Inc. Topography measuring apparatus. 4,902,123, Cl. 351-212.000.
Yoder, Ronald L., to Universal Consolidated Methods, Inc. Adjustable clamp. 4,901,963, Cl. 248-231.500.
Yokoe, Hifumi: *See*—
Kaida, Noriyuki; Yokoe, Hifumi; Harada, Chikao; Niwa, Minoru; and Yasui, Masanobu, 4,901,733, Cl. 128-687.000.
Yokohama Rubber Co., Ltd., The: *See*—
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Yokoi, Koichi: *See*—
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Yokoi, Nobumasa: *See*—
Nakai, Kuniharu; Shiozaki, Masayoshi; Tsuji, Hiroji; Mori, Shigeharu; Hirose, Susumu; Yokoi, Nobumasa; and Ohya, Takaichi, 4,902,622, Cl. 435-210.000.

Yokota, Akira: *See*—
Ishii, Wataru; Miyazawa, Shozo; Tsuchiya, Shinji; Nakane, Hisashi; and Yokota, Akira, 4,902,770, Cl. 528-149.000.

Yokota, Masahiro: *See*—
Hirai, Kenji; Fuchikami, Takamasa; Fujita, Atsuko; Hirose, Hiroaki; Yokota, Masahiro; and Nagato, Shoin, 4,902,337, Cl 71-92.000.

Yokouchi, Hideya: *See*—
Maekawa, Nobuyoshi; Yokouchi, Hideya; Aruga, Tomoe; and Sugiyama, Tadashi, 4,903,155, Cl. 360-99.080.

Yokouchi, Kazuhiro; Kageyama, Tatsumi; Sekine, Chogo; Hojo, Harumasa; Yamada, Koji; Mikuriya, Makoto; and Hirata, Seiichiro, to Mitsubishi Denki Kabushiki Kaisha; and Japan Radio Co., Ltd. GPS/self-contained combination type navigation system. 4,903,212, Cl. 364-449.000.

Yokoyama, Naoki, to Fujitsu Limited. Semiconductor device. 4,903,090, Cl. 357-22.000.

Yokoyama, Tetsuo: *See*—
Maeda, Akira; Sano, Koichi; and Yokoyama, Tetsuo, 4,902,974, Cl. 324-312.000.

Yoneda, Yoshitaka: *See*—
Sakai, Hiroyuki; Asahara, Yoshiyuki; Omi, Shigeaki; Nakayama, Shin; and Yoneda, Yoshitaka, 4,902,330, Cl. 65-30.130.

Yoneda, Yousuke, to Tomy Kogyo Co., Inc. Radio controlled steering device for a two-wheeled vehicle toy. 4,902,271, Cl. 446-440.000.

Yoneshige, Yasuo: *See*—
Minegishi, Takeshi; Yoneshige, Yasuo; Takehana, Toshihiro; and Sakai, Toru, 4,902,542, Cl. 428-198.000.

Yoritomi, Yoshifumi: *See*—
Kenmotsu, Akihiro; Kobayashi, Shigeru; Watanabe, Kunihiko; Matsuzaki, Eiji; Yoritomi, Yoshifumi; Koshita, Toshiyuki; and Nakatani, Mitsuo, 4,902,394, Cl. 204-192.120.

Yoshida, Haruo: *See*—
Kume, Shoichi; Yoshida, Haruo; Suzuki, Kazutaka; Tasaki, Yoshio; Ikuta, Shiro; Ishikawa, Masamitu; and Machida, Michihide, 4,902,652, Cl. 501-90.000.

Yoshida, Iwao: *See*—
Goda, Hideo; Akiyama, Toshiyuki; Takamizawa, Akihisa; Yoshida, Iwao; Konobe, Takeo; and Takaku, Keisuke, 4,902,783, Cl. 530-415.000.

Yoshida, Kunio, to Sharp Kabushiki Kaisha. Character font converting system. 4,903,014, Cl. 340-727.000.

Yoshida, Noriyuki, to Brother Kogyo Kabushiki Kaisha. Information display apparatus for a sewing machine. 4,901,656, Cl. 112-121.110.

Yoshida, Ryo: *See*—
Haga, Toru; Nagano, Eiki; Yoshida, Ryo; and Hashimoto, hunichi, 4,902,832, Cl. 564-446.000.

Yoshida, Yasuyuki: *See*—
Hayakawa, Kunihiko; Masai, Teruhisa; Yoshida, Yasuyuki; Shibuta, Takanobu; and Miyazaki, Hiroshi, 4,902,673, Cl. 514-21.000.

Yoshihara, Tsutomu: *See*—
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Yoshikawa, Masaharu; Arai, Nobushige; Satomura, Masafumi; Tanaka, Syozo; Shinobu, Yoshiharu; Takushima, Akira; and Yanagisawa, Nobuhiro. Solar heat collector system. 4,901,537, Cl. 62-235.100.

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Miyake, Kazuyuki; Murata, Atsuhiko; and Yoshimoto, Yuji, 4,902,103, Cl. 350-336.000.

Yoshimura, Hironori, to Mitsubishi Kinzoku Kabushiki. Method of manufacturing surface coated carbo-nitride titanium-base cermet materials for inserts of high-speed cutting tools. 4,902,395, Cl. 204-192.300.

Yoshimura, Masatomo: *See*—
Ohta, Norio; Yotsui, Yoshinobu; Isomura, Kouichi; and Yoshimura, Masatomo, 4,902,951, Cl. 318-632.000.

Yoshino, Hisakazu: *See*—
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Yoshitake, Kunitoshi; Tsujita, Yoshihiro; and Ono, Hideyo, to Mitsubishi Denki Kabushiki Kaisha. Portable wireless communication apparatus. 4,903,325, Cl. 455-89.000.

Yoshitomi, Kazuo: *See*—
Tsuji, Mikio; Yoshitomi, Kazuo; Noro, Shingo; Hayashi, Masayuki; Murase, Hiroyasu; Kato, Naoyoshi; Araki, Kazunori; and Tanaka, Kenjiro, 4,901,504, Cl. 53-247.000.

Yoshizawa, Yasufumi: *See*—
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Yost, Peter W.: *See*—
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Yotsui, Yoshinobu: *See*—
Ohta, Norio; Yotsui, Yoshinobu; Isomura, Kouichi; and Yoshimura, Masatomo, 4,902,951, Cl. 318-632.000.

Young, James R.: *See*—
Peppers, Norman A.; Young, James R.; and Pierce, Gerald A., 4,903,315, Cl. 382-47.000.

Young, Philip J. Oxy-fuel burner for burning pulverized fuel. 4,902,223, Cl. 431-284.000.

Young, William R.; Rivoli, Anthony L.; and Wiles, William W., Jr., to Harris Corporation. Radiation hardened complementary transistor integrated circuits. 4,903,108, Cl. 357-49.000.

Yubakami, Keiichi: *See*—
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Yukimoto, Sadao; Hirose, Toshifumi; and Isayama, Katsuhiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of applying alkyd paints to oxyalkylene polymers having a reactive silicon group. 4,902,575, Cl. 428-447.000.

Zakko, Salam F., to University of California, The Regents of the. Apparatus and method for removing obstructions in bodily organs or cavities. 4,902,276, Cl. 604-28.000.

Zakman, Zdravko M.; and Novak, Carl V., to Motorola, Inc. Detachable battery pack with a built-in broadband antenna. 4,903,326, Cl. 455-89.000.

Zambon Group S.p.A.: *See*—
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Zander, Ronald; Wells, Dennis J.; Merkley, Leon; and Esterberg, Dean, to Talley Automotive Products, Inc. Deflector ring for use with inflators with passive restraint devices. 4,902,036, Cl. 280-736.000.

Zarate, Nola: *See*—
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Zawada, Jerome J., Jr.: *See*—
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Zech, Ludwig V.: *See*—
Brunner, Wolfgang; and Zech, Ludwig V., 4,901,584, Cl. 73-862.040.

Zeiler, Hans-Joachim: *See*—
Schriewer, Michael; Crohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,902,795, Cl. 544-182.000.

Zemel, Haya; Koch, Mark B.; and Rohrbach, Ronald P., to UOP. Crosslinked cyclodextrins supported on porous refractory inorganic oxides. 4,902,788, Cl. 536-1.100.

Zemler, Willibald: *See*—
Frantl, Erich; Hofstatter, Peter; Zemler, Willibald; Raunicher, Albert P.; and Frantl, Werner, 4,902,159, Cl. 403-171.000.

Zenith Electronics Corporation: *See*—
Adler, Robert; Fendley, James R.; Lange, Howard G.; Prazak, Charles J., III; Steiner, Johan; and Strauss, Paul, 4,902,257, Cl. 445-4.000.
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Zermani, Thomas: *See*—
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Ziegelmuller, Francisco L.: *See*—
Baltrus, Leon A.; Creveling, Clyde M.; McKeown, Donald G.; Reding, Thomas E.; Thompson, David L.; and Ziegelmuller, Francisco L., 4,903,084, Cl. 355-301.000.

Ziegler, Heinrich, to Sulzer Brothers Limited. Element having a porous wall. 4,902,418, Cl. 210-321.770.

Ziegler, James T., to Novation Design Ltd. Connectable polygonal construction modules. 4,902,259, Cl. 446-117.000.

Ziegler, Kelly W., to Minnesota Automation, Inc. Article control assembly for article transfer device. 4,902,192, Cl. 414-732.000.

Zillig, Steven R.; and Caroll, James E., to Hoskins, John T.; and Zillig, Steven R. Fluid coupling and seal assembly. 4,902,043, Cl. 285-4.000.

Zimdars, Arno W., to Joseph Albrecht, Bohrfutterfabrik GmbH & Co. Self-clamping or self-tightening chuck. 4,902,025, Cl. 279-64.000.

Zimich, Daniel R.: *See*—
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Zimmer, Inc.: *See*—
Devanathan, Thirumalai N. C., 4,902,297, Cl. 623-16.000.

Zimmer, Robert A.: *See*—
Moore, Charles E.; and Zimmer, Robert A., 4,902,982, Cl. 330-85.000.

Zingel, Heinz; and Bartsch, Thomas, to Alfred Teves GmbH. Hydraulic power booster. 4,901,626, Cl. 91-369.100.

Zinniel, Francis R.; Barbero, John G.; and Saccullo, Louis J., deceased (by Saccullo, Josephine F., heir), to Gabalan Corporation. Raised flooring panel and raised flooring assemblies. 4,901,490, Cl. 52-263.000.

Zoeller, Joseph R., to Eastman Kodak Company. Preparation of α-acyloxycarbonyl compounds. 4,902,820, Cl. 560-185.000.

Zollinger, Hans; and Tamaro, Mario, to Sulzer Brothers Limited. Tuck-in needle for a selvage forming device. 4,901,769, Cl. 139-434.000.

Zones, Stacey I.; and Innes, R. A., to Chevron Research Company. New zeolite SSZ-23 and xylene isomerization therewith. 4,902,844, Cl. 585-481.000.

Zorgiebel, Karl H., to Carl Schneck AG. Friction roller conveyor. 4,901,845, Cl. 198-780.000.

Zornes, Bruce L., to Balanced Engines, Inc. Regenerative heat exchanger and system. 4,901,787, Cl. 165-4.000.

Zudal, Andrew. Attachment for power tool. 4,901,588, Cl. 74-57.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF FEBRUARY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Advanced Cardiovascular Systems, Inc.: *See*—
Samson, Wilfred J., Re. 33,166, Cl. 606-194.000.

Gross, Jerome A.: *See*—
McDaniel, Larry A., Re. 33,168, Cl. 564-411.000.

Leek, John G. Side stroking golf putter. Re. 33,169, Cl. 273-168.000.

McDaniel, Larry A., to Gross, Jerome A., a part interest. Nitration processes. Re. 33,168, Cl. 564-411.000.

Moosmann, Helmut; and Muller, Rolf, to Papst-Motoren GmbH & Co. KG. Circuit arrangement for monitoring speed of a drive motor. Re. 33,167, Cl. 307-519.000.

Muller, Rolf: *See*—
Moosmann, Helmut; and Muller, Rolf, Re. 33,167, Cl. 307-519.000.

Papst-Motoren GmbH & Co. KG: *See*—
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Samson, Wilfred J., to Advanced Cardiovascular Systems, Inc. Steerable dilatation catheter. Re. 33,166, Cl. 606-194.000.

LIST OF DESIGN PATENTEES

AB Siba-Verken: *See*—
Paulsson, Arne, 306,201, Cl. D23-267.000

Aktiebolaget Electrolux: *See*—
Pettersson, Per E.; and Dahlgren, Inge, 306,205, Cl. D23-412.000.

Alfa Lancia Industriale S.r.l.: *See*—
Guelfi, Giorgio; Mendicino, Franco; and Pasquali, Renato, 306,152, Cl. D12-173.000.

Anderson, Bruce: *See*—
Bush, Paul S.; Bova, Richard, and Anderson, Bruce, 306,106, Cl. D6-432.000.

Apogee, Inc.: *See*—
Reilly, Robin; Sheppard, Robert; Dykstra, John; McCune, Grant; and Valentine, Thomas, 306,189, Cl. D21-84.000.

Aprica Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 306,099, Cl. D6-333.000.
Kassai, Kenzou, 306,149, Cl. D12-129.000.

Arehart, Robert W.; and Peeler, Raymond W., to Greenlee Textron Inc. Portable bandsaw. 306,126, 2-20-90, Cl. D8-64.000.

Arnold, William D., to Lee-Rowan Company. Rack for appareal or the like. 306,103, 2-20-90, Cl. D6-462.000.

Ashihara, Kazuhiko, to Sharp Corporation. Liquid crystal display for computer. 306,158, 2-20-90, Cl. D14-113.000.

Bednar, John, to Bednar, John J. Water meter replacement plug. 306,200, 2-20-90, Cl. D23-260.000.

Bednar, John J.: *See*—
Bednar, John, 306,200, Cl. D23-260.000.

Bell, Pamela J.; and Burke, Kelly P., to Bobo & Co. Hair ornament. 306,215, 2-20-90, Cl. D28-39.000.

Berg, Roger M. Bicycle wheel cover. 306,154, 2-20-90, Cl. D12-204.000.

Berkoh Company, Inc.: *See*—
Berry, Karen R., 306,192, Cl. D21-184.000.

Berry, Karen R., to Berkoh Company, Inc. Doll. 306,192, 2-20-90, Cl. D21-184.000.

Black & Decker, Inc.: *See*—
Correa, Alvaro, 306,225, Cl. D32-22.000.
Somers, Robert I., 306,125, Cl. D8-62.000.

Blackburn, James R., to Jim Blackburn Designs, Inc. Bicycle exercise support. 306,193, 2-20-90, Cl. D21-194.000.

Blessings Corporation: *See*—
Coates, Fredrica V.; and Jannoni, Richard, 306,209, Cl. D24-50.000.

Bobo & Co.: *See*—
Bell, Pamela J.; and Burke, Kelly P., 306,215, Cl. D28-39.000.

Bobrowski, Louis G.; MacFarlane, Walter J.; and Valenti, Richard L., to Stanley Works, The. Hasp-type latch. 306,128, 2-20-90, Cl. D8-338.000.

Bobrowski, Louis G.; MacFarlane, Walter J.; and Valenti, Richard L., to Stanley Works, The. Hasp-type latch. 306,129, 2-20-90, Cl. D8-338.000.

Bobrowski, Louis G.; MacFarlane, Walter J.; and Valenti, Richard L., to Stanley Works, The. Hasp-type latch. 306,130, 2-20-90, Cl. D8-338.000.

Borsani, Paolo, to Tecno S.p.A. Mobili e Forniture per Arredamento. Combined table with lamp. 306,101, 2-20-90, Cl. D6-399.000.

Borsani, Paolo, to Tecno S.p.A. Mobilie Forniture per Arredamento. Table. 306,109, 2-20-90, Cl. D6-487.000.

Bott, John A. Vehicle deck rack with pop-up tie downs. 306,191, 2-20-90, Cl. D12-157.000.

Bova, Richard: *See*—
Bush, Paul S.; Bova, Richard; and Anderson, Bruce, 306,106, Cl. D6-432.000.

Bradbard, John W.: *See*—
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Bridel, Christophe, to Bridel, Laiteries E. Multi-unit container. 306,139, 2-20-90, Cl. D9-341.000.

Bridel, Laiteries E.: *See*—
Bridel, Christophe, 306,139, Cl. D9-341.000.

Burke, Kelly P.: *See*—
Bell, Pamela J.; and Burke, Kelly P., 306,215, Cl. D28-39.000.

Burneka, Robert C. Brief. 306,090, 2-20-90, Cl. D2-10.000.

Burten, Roger. Game board. 306,181, 2-20-90, Cl. D21-31.000.

Burton, Virginia I. Telephone handset for accommodating ear jewelry. 306,169, 2-20-90, Cl. D14-249.000.

Bush Industries, Inc.: *See*—
Bush, Paul S.; Bova, Richard; and Anderson, Bruce, 306,106, Cl. D6-432.000.

Bush, Paul S.; Bova, Richard; and Anderson, Bruce, to Bush Industries, Inc. Cabinet or similar article. 306,106, 2-20-90, Cl. D6-432.000.

Caputo, Kip W. Corner-mounted loudspeaker. 306,168, 2-20-90, Cl. D14-210.000.

Carmichael, Charles D. Traveler's toiletries container. 306,094, 2-20-90, Cl. D3-39.000.

Cassai, Gino H.: *See*—
Cassai, Henry J.; and Cassai, Gino H., 306,217, Cl. D28-77.000.
Cassai, Henry J.; and Cassai, Gino H., 306,218, Cl. D28-77.000.
Cassai, Henry J.; and Cassai, Gino H., 306,219, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 306,217, 2-20-90, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 306,218, 2-20-90, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 306,219, 2-20-90, Cl. D28-77.000.

Cassai, Henry J.: *See*—
Elton, Keith, 306,213, Cl. D28-7.000.

Chain-Tool Company, Inc.: *See*—
Graham, Charles H., deceased; and Hogan, Scott H., special administrator, 306,127, Cl. D8-105.000.

Chambers, Keith A.; and Bradbard, John W., to McKesson Corporation. Jug. 306,140, 2-20-90, Cl. D9-376.000.

Champion International Corporation: *See*—
Jirucha, Robert E., 306,226, Cl. D34-38.000.

Chen, Fo-Chun, to Chuan Hsiang Tang Chemical Co., Ltd. Lipstick case or similar article. 306,221, 2-20-90, Cl. D28-87.000.

Chuan Hsiang Tang Chemical Co., Ltd.: *See*—
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Roman, Gianfranco, 306,121, Cl. D8-10.000.

Coates, Fredrica V.; and Jannoni, Richard, to Blessings Corporation. Adjustable pants. 306,209, 2-20-90, Cl. D24-50.000.

Coffman, David M. Illuminated holder for combination padlocks. 306,131, 2-20-90, Cl. D8-343.000.

Combined Optical Industries Limited: *See*—
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Compaq Computer Corporation: *See*—
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Congleton, Wayne L.; and Payne, Joe R., to Dolco Packaging Corporation. Egg carton. 306,138, 2-20-90, Cl. D9-341.000.

Contico International Company: *See*—
Dickinson, Thomas; and Le Grand, Joe E., 306,096, Cl. D3-72.000.

Correa, Alvaro, to Black & Decker, Inc. Vacuum cleaner. 306,225, 2-20-90, Cl. D32-22.000.

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Dannals, Edward J.; and Wood, George E., to Drewson International Pty. Ltd. Patient transfer device. 306,148, 2-20-90, Cl. D12-128.000.
Dart Industries, Inc.: *See—*
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Zimmerman, Larry G., 306,116, Cl. D7-106.000.
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Thiemann, Henry J., III; Olson, Henry A.; and Stanton, Leonard T., to Thiemann, Henry J., III. Structure for observing a marine environment. 306,210, 2-20-90, Cl. D25-5.000.

Thompson, Alex; and Thompson, Russell L. Object support rack. 306,110, 2-20-90, Cl. D6-553.000.

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Thompson, Alex; and Thompson, Russell L., 306,110, Cl. D6-553.000

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Nitta, Tomio, 306,137, Cl. D9-300.000.

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Unitek Corporation: *See—*
Hannan, Clarence W.; and Snead, Wilford A., 306,207, Cl. D24-11.000.

Valenti, Richard L.: *See—*
Bobrowski, Louis G.; MacFarlane, Walter J.; and Valenti, Richard L., 306,128, Cl. D8-338.000.
Bobrowski, Louis G.; MacFarlane, Walter J.; and Valenti, Richard L., 306,129, Cl. D8-338.000.
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Valentine, Thomas: *See—*
Reilly, Robin; Sheppard, Robert; Dykstra, John; McCune, Grant; and Valentine, Thomas, 306,189, Cl. D21-84.000.

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Di Giorgio, Renato: *See—*
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CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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59 4 4,901,870
86 4,901,871
133 4,901,872

CLASS 215

32 4,901,873
226 4,901,874
271 4,901,875

CLASS 219

74 4,902,866
85 18 4,902,867
86 32 4,902,869
86 7 4,902,868
121 49 4,902,871
121 52 4,902,870
121 63 4,902,872
203 4,902,874
4,902,875
464 4,902,876
483 4,902,877
486 4,902,878
522 4,902,879

CLASS 220

22 3 4,901,876
90 4 4,901,877
94 A 4,901,878
256 4,901,879
269 4,901,880
287 4,901,881
324 4,901,882
337 4,901,883
339 4,901,884
402 4,901,885

CLASS 222

1 4,901,886
131 4,901,887
145 4,901,888
153 4,901,889
395 4,901,890
402 13 4,901,891
498 4,901,892

CLASS 223

66 4,901,893
96 4,901,894

CLASS 224

42 03 A 4,901,895
42 07 4,901,896
153 4,901,897
159 4,901,898
223 4,901,899
257 4,901,900
277 4,901,901
326 4,901,902

CLASS 226

196 4,901,903

CLASS 228

56 3 4,901,904
107 4,901,905
176 4,901,906
183 4,901,907
4,901,908
223 4,901,909
242 4,901,910

CLASS 229

114 4,901,911

CLASS 232

1 C 4,901,912
17 4,901,913
35 4,901,914

CLASS 235

375 4,902,880
381 4,902,881
382 4,902,882
462 4,902,883

CLASS 236

12 12 4,901,915
12 16 4,901,916
46 R 4,901,917
178 D 4,901,918

CLASS 237

81 4,901,919

CLASS 239

2 2 4,901,920
11 4,901,921
12 4,901,922
123 4,901,923
242 4,901,924
343 4,901,925
411 4,901,926
446 4,901,927
530 4,901,928

CLASS 241

236 4,901,929

CLASS 242

4 BE 4,901,930
18 R 4,901,931
43 A 4,901,932
55 19 R 4,901,933
56 R 4,901,934
68 7 4,901,935
74 1 4,901,936
86 5 R 4,901,937
107 1 4,901,938
118 31 4,901,940
118 4 4,901,939
125 1 4,901,941
150 R 4,901,942
4,901,943
260 4,901,944

CLASS 244

2 4,901,945
3 13 4,901,946
12 5 4,901,947
23 C 4,901,948
49 4,901,949
119 4,901,950
122 A 4,901,951
234 4,901,952

CLASS 246

182 R 4,901,953

CLASS 248

48 2 4,901,954
49 4,901,955
56 4,901,956
59 4,901,958
62 4,901,957
97 4,901,959
205 3 4,901,960
217 2 4,901,961
218 3 4,901,962
231 5 4,901,963
4,901,964
246 4,901,965
299 4,901,966
327 4,901,967
407 4,901,968
455 4,901,969
514 4,901,970
523 4,901,971
918 4,901,972
922 4,901,973

CLASS 249

137 R 4,902,873

CLASS 250

210 4,902,884
211 K 4,902,885
214 R 4,902,886
221 4,902,887
222 1 4,902,889
4,902,890
4,902,888
227 4,902,891
281 4,902,892
307 4,902,893
334 4,902,894
338 1 4,902,895
338 2 4,902,896
343 4,902,897
423 R 4,902,899
492 1 4,902,898
492 2 4,902,900
548 4,902,901
551 4,902,902
560 4,902,903
561 4,903,054

CLASS 251

129 15 4,901,974
148 4,901,975
206 4,901,976
249 5 4,901,977
282 4,901,978
306 4,901,979

CLASS 252

8 6 4,902,434
18 4,902,435
33 2 4,902,436
34 4,902,437
48 2 4,902,438
174 25 4,902,439
182 18 4,902,440
187 26 4,902,441
313 2 4,902,442
388 4,902,443
511 4,902,444
607 4,902,445
632 4,902,446

CLASS 254

9 C 4,901,980
28 4,901,981
95 4,901,982

CLASS 261

65 4,902,448
94 4,902,449

CLASS 264

4 4,902,450
24 4,902,451
28 4,902,452
29 2 4,902,453
40 6 4,902,454
40 7 4,902,455
41 4,902,456
43 4,902,457
46 6 4,902,458
63 4,902,459
83 4,902,460
103 4,902,461
4,902,462
122 4,902,463
211 24 4,902,464
257 4,902,465
299 4,902,466

CLASS 266

270 4,901,983
280 4,901,984
281 4,901,985

CLASS 267

140 1 4,901,986
166 4,901,987

CLASS 269

16 4,901,988
17 4,901,989
25 4,901,990
234 4,901,991
315 4,901,992

CLASS 270

21 1 4,901,993
53 4,901,994
54 4,901,995

CLASS 271

10 4,901,996

CLASS 272

1 A 4,901,997
4,901,998
67 4,901,999
70 4,902,000
73 4,902,001
4,902,002
93 4,902,003
114 4,902,004
116 4,902,005
118 4,902,006
126 4,902,007
134 4,902,008
4,902,009

CLASS 273

1 GD 4,902,011
1 GF 4,902,010
29 A 4,902,012
138 R 4,902,013
162 B 4,902,014
168 Re.33,169
4,902,015
175 4,902,016
240 4,902,017
249 4,902,018
256 4,902,019
4,902,020
260 4,902,021
317 4,902,022

CLASS 277

12 4,902,023
204 4,902,024

CLASS 279

64 4,902,025

CLASS 280

30 4,902,026
33 998 4,902,027
91 4,902,028
304 1 4,902,029
455 1 4,902,030
625 4,902,031
661 4,902,032
690 4,902,033
707 4,902,034
713 4,902,035
736 4,902,036
751 4,902,037
759 4,902,038
802 4,902,039
804 4,902,040
807 4,902,041

CLASS 283

2 4,902,042

CLASS 285

4 4,902,043
18 4,902,044
24 4,902,045
34 4,902,046
39 4,902,047
319 4,902,048
347 4,902,049

CLASS 289

1.5 4,902,050

CLASS 290

48 4,902,904
4,902,905

CLASS 292

127 4,902,051
144 4,902,052
4,902,053
254 4,902,054
319 4,902,055
335 4,902,056
337 4,902,057
4,902,058

CLASS 293

117 4,902,059

CLASS 294

171 4,902,060

CLASS 296

37 12 4,902,061
97 11 4,902,063
97 4 4,902,062
104 4,902,065
105 4,902,064
180 1 4,902,066

214 4,902,067
4,902,068

CLASS 297

14 4,902,069
238 4,902,070
270 4,902,071
417 4,902,072

CLASS 299

81 4,902,073

CLASS 301

13 SM 4,902,074

CLASS 303

14 4,902,075
100 4,902,076
113 4,902,077

CLASS 307

117 4,902,906
245 4,902,908
247 1 4,902,909
272 3 4,902,907
296 3 4,902,911
296 4 4,902,910
322 4,902,912
362 4,902,913
446 4,902,914
4,902,915
455 4,902,916
465 4,902,917
468 4,902,918
482 4,902,919
514 4,902,920
519 Re.33,167
570 4,902,921

CLASS 310

61 4,902,922
216 4,902,941
268 4,902,923
4,902,924
313 B 4,902,925
361 4,902,926

CLASS 312

7 2 4,902,078
245 4,902,079
348 4 4,902,080

CLASS 313

376 4,902,927
412 4,902,928
503 4,902,929

CLASS 315

12 1 4,902,930
71 4,902,932
94 4,902,933
111 21 4,902,934
112 4,902,935
158 4,902,936
248 4,902,937
276 4,902,942
289 4,902,943
307 4,902,938
316 4,902,939
326 4,902,931
382 4,902,940

CLASS 318

467 4,902,945
560 4,902,946
563 4,902,947
568 11 4,902,944
580 4,902,948
608 4,902,949
627 4,902,950
632 4,902,951
645 4,902,952
665 4,902,953
762 4,902,954

CLASS 320

2 4,902,955
13 4,902,956

CLASS 323

222 4,902,957
282 4,902,958
314 4,902,959

CLASS 324

103 P 4,902,964
116 4,902,965
158 F 4,902,968
4,902,969
158 R 4,902,963
4,902,966
4,902,967
173 4,902,970
212 4,902,971
309 4,902,972
312 4,902,973
4,902,974
318 4,902,975
346 4,902,976
462 4,902,977
556 4,902,978
621 4,902,960
640 4,902,961
690 4,902,962

CLASS 329

343 4,902,979

CLASS 330

4 3 4,902,980
9 4,902,981
85 4,902,982
149 4,902,983
252 4,902,984
287 4,902,985

CLASS 331

25 4,902,986

CLASS 332

120 4,902,987

CLASS 333

21 A 4,902,988
100 4,902,989
116 4,902,990
126 4,902,991
4,902,992

CLASS 335

210 4,902,993
4,902,994
216 4,902,995
222 4,902,996

CLASS 336

60 4,902,998
84 C 4,902,997

CLASS 337

372 4,902,999

CLASS 338

4 4,903,000
22 R 4,903,001
96 4,903,002
198 4,903,003

CLASS 340

146 2 4,903,005
310 A 4,903,006
425 5 4,903,004
474 4,903,007
479 4,903,008
556 4,903,009
641 4,903,011
693 4,903,010
709 4,903,012
726 4,903,013
727 4,903,014
825 070 4,903,016
825 500 4,903,015
975 4,903,017

CLASS 341

51 4,903,018
61 4,903,019
106 4,903,020
110 4,903,021
4,903,022
120 4,903,023
4,903,024
123 4,903,025
131 4,903,026
156 4,903,027
4,903,028

CLASS 342

113 4,903,030
172 4,903,029
359 4,903,031
441 4,903,032

CLASS 343

700 MS 4,903,033
704 4,903,034
4,903,035
706 4,903,036
756 4,903,037
786 4,903,038

CLASS 346

1 1 4,903,039
4,903,040
4,903,041
76 L 4,903,042
121 4,903,044
134 4,903,043
136 4,903,045
139 R 4,903,046
153 1 4,903,047
157 4,903,048
159 4,903,049
160 4,903,067
160 1 4,903,050
4,903,051

CLASS 350

1 7 4,902,081
3 7 4,902,082
6 6 4,902,083
6 8 4,902,084
4,902,085
96 12 4,902,086
96 13 4,902,087
96 14 4,902,088
96 18 4,902,089
96 20 4,902,090
4,902,091
4,902,092
4,902,093
96 21 4,902,094
4,902,095
96 23 4,902,096
4,902,097
4,902,098
320 4,902,100
4,902,101
4,902,102
336 4,902,103
340 4,902,104
346 4,902,105
350 S 4,902,106
4,902,107
357 4,902,108
4,902,109
4,902,110
393 4,902,111
396 4,902,112
432 4,902,113
4,902,114
449 4,902,115
501 4,902,116
601 4,902,117
631 4,902,118

CLASS 351

137 4,902,119
158 4,902,120
162 4,903,052
208 4,902,121
212 4,902,122
4,902,123
223 4,902,124

CLASS 354

21 4,903,053
4,903,055
76 4,903,056
88 4,903,057
145 1 4,903,058
173 1 4,903,059
4,903,060
213 4,903,061
225 4,903,062
277 4,903,063
321 4,903,064
402 4,903,065
406 4,903,066

CLASS 355

20 4,903,068
22 4,903,069
27 4,903,070
4,903,071
30 4,903,072
41 4,903,073
76 4,903,074
94 4,903,075
200 4,903,076
204 4,903,077
218 4,903,078
235 4,903,079
274 4,903,080
4,903,081
290 4,903,082
300 4,903,083
301 4,903,084
320 4,903,085

CLASS 356

4 4,902,125
5 4,902,126
4,902,127
152 4,902,128
241 4,902,129
248 4,902,130
316 4,902,099
336 4,902,131
339 4,902,132
356 4,902,133
364 4,902,134
373 4,902,135
419 4,902,136
427 4,902,137

CLASS 357

14 4,903,086
15 4,903,087
17 4,903,088
22 4,903,089
4,903,090
4,903,091
23.13 4,903,092
4,903,093
4,903,095
23.5 4,903,094
4,903,096
24 4,903,097
4,903,098
25 4,903,099
27 4,903,100
30 4,903,101
4,903,102
4,903,103
35 4,903,104
38 4,903,105
43 4,903,106
49 4,903,107
4,903,108
50 4,903,109
51 4,903,110
4,903,111
55 4,903,112
70 4,903,113
4,903,114
71 4,903,115
4,903,116
4,903,117
72 4,903,118
4,903,119
74 4,903,120

CLASS 358

41 4,903,121
48 4,903,122
75 4,903,123
133 4,903,124
141 4,903,125
146 4,903,126
148 4,903,127
167 4,903,128
181 4,903,129
190 4,903,130
209 4,903,132
214 4,903,131
225 4,903,133
227 4,903,134
4,903,135
228 4,903,136
254 4,903,137
261 3 4,903,138
296 4,903,139
342 4,903,140
448 4,903,141
4,903,147
457 4,903,142
4,903,143
461 4,903,144
462 4,903,145
468 4,903,146

CLASS 360

13 4,903,148
69 4,903,149
77 12 4,903,150
78 01 4,903,151
92 4,903,152
93 4,903,153
98 04 4,903,154
99 08 4,903,155
104 4,903,156
105 4,903,157
113 4,903,158
132 4,903,159

CLASS 361

37 4,903,160
56 4,903,161
103 4,903,162
113 4,903,163
283 4,903,164
305 4,903,165
321 4,903,166
395 4,903,167
413 4,903,168
424 4,903,169
4,903,170

CLASS 362

26 4,903,171
31 4,903,172
61 4,903,174
62 4,903,175
66 4,903,173
103 4,903,176
123 4,903,177
183 4,903,178
184 4,903,179
337 4,903,180

CLASS 363

16 4,903,181
19 4,903,182
21 4,903,183
37 4,903,184
40 4,903,185
45 4,903,186
95 4,903,187
96 4,903,188
127 4,903,189

CLASS 364

131 4,903,190
132 4,903,191
157 4,903,192
200 4,903,193
4,903,194
4,903,195
4,903,196
4,903,197
4,903,198
300 4,903,199
405 4,903,200
408 4,903,201
413 13 4,903,202
4,903,205
413 15 4,903,203
413 24 4,903,204
419 4,903,206
422 4,903,207
424 05 4,903,208
4,903,209
431 08 4,903,210
443 4,903,211
449 4,903,212
474 31 4,903,213
491 4,903,214
513 4,903,215
518 4,903,216
521 4,903,217
4,903,218
550 4,903,219
551 01 4,903,220
708 4,903,221
4,903,222
716 4,903,223
728 03 4,903,225
807 4,903,226
900 4,903,227
4,903,228
4,903,229
4,903,230
4,903,231
4,903,232
4,903,233

CLASS 365

49 4,903,234
51 4,903,344
91 4,903,343
104 4,903,235
185 4,903,236
4,903,237
189 01 4,903,239
189 02 4,903,240
189 06 4,903,238
194 4,903,241
230 08 4,903,242

CLASS 367

3 4,903,243
36 4,903,244
81 4,903,245
99 4,903,246
135 4,903,247
140 4,903,248
4,903,249

CLASS 368

41 4,903,250
156 4,903,251
282 4,903,253
327 4,903,254

CLASS 369

36 4,903,252
284 4,903,255
290 4,903,224
291 4,903,256

CLASS 370

29 4,903,257
58 2 4,903,258
58 3 4,903,259
60 4,903,260
94 2 4,903,261
95 2 4,903,262
110 1 4,903,263

CLASS 371

16 1 4,903,264
21 2 4,903,266
21 4 4,903,265
27 4,903,267
40 1 4,903,268
57 2 4,903,269
68 1 4,903,270

CLASS 372

3 4,903,272
9 4,903,271
38 4,903,273
48 4,903,274
50 4,903,275
82 4,903,276

CLASS 373

30 4,903,277
97 4,903,278

CLASS 374

44 4,902,138
137 4,902,139

CLASS 375

1 4,903,279
7 4,903,280

CLASS 376

159 4,902,467
259 4,902,469
264 4,903,281
327 4,902,468
333 4,902,470

CLASS 377

7 4,903,282
43 4,903,283
62 4,903,284
78 4,903,285

CLASS 378

119 4,903,287
162 4,903,288
182 4,903,286

CLASS 379

52 4,903,290
61 4,903,289
88 4,903,291
93 4,903,292
102 4,903,293
150 4,903,294
437 4,903,295

CLASS 380

4 4,903,296
7 4,903,297
9 4,903,298
25 4,903,299

CLASS 381

24 4,903,300
30 4,903,301
31 4,903,302
4,903,303
41 4,903,304
4,903,305
42 4,903,306
103 4,903,307
202 4,903,308

CLASS 382

1 4,903,309
6 4,903,310
9 4,903,311
21 4,903,312
31 4,903,314
47 4,903,315
52 4,903,316
56 4,903,317

CLASS 383

25 4,902,140
61 4,902,141
78 4,902,142

CLASS 384

43 4,902,143
398 4,902,144
530 4,902,145

CLASS 388

840 4,903,318

CLASS 400

61 4,902,146
144 2 4,902,147
4,902,148
279 4,902,149
320 4,902,150

CLASS 401

34 4,902,151
117 4,902,152
131 4,902,153
132 4,902,154
206 4,902,155

CLASS 403

24 4,902,156
50 4,902,157
77 4,902,158
171 4,902,159
205 4,902,160
322 4,902,161
355 4,902,162
375 4,902,163
402 4,902,164

CLASS 404

25 4,902,165

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CLASS 405

30 4,902,166
128 4,902,167
195 4,902,168
204 4,902,169
225 4,902,170
232 4,902,171
269 4,902,172

CLASS 406

145 4,902,173

CLASS 408

101 4,902,174

CLASS 409

12 4,902,175
231 4,902,176
234 4,902,177
4,902,178

CLASS 411

21 4,902,179
82 4,902,180
347 4,902,181
510 4,902,182

CLASS 412

7 4,902,183

CLASS 414

301 4,902,185
417 4,902,186
456 4,902,187
495 4,902,188
498 4,902,189
667 4,902,190
729 4,902,191
732 4,902,192
788.8 4,902,193
790.3 4,902,184
798.5 4,902,194
799 4,902,195

CLASS 415

90 4,902,196
111 4,902,197
115 4,902,198
143 4,902,199
148 4,902,200
197 4,902,201
335 4,901,602

CLASS 417

310 4,902,202
350 4,902,203
360 4,902,204
372 4,902,205
394 4,902,206
403 4,902,207
462 4,902,208

CLASS 418

6 4,902,209
122 4,902,549

CLASS 419

33 4,902,471

CLASS 420

49 4,902,472
105 4,902,473
418 4,902,474
548 4,902,475

CLASS 422

46 4,902,476
56 4,902,477
4,902,478
72 4,902,479
101 4,902,481
121 4,902,482
134 4,902,483
189 4,902,484

CLASS 423

82 4,902,485
122 4,902,486
215.5 4,902,487
235 4,902,488
245.1 4,902,489
300 4,902,490
322 4,902,491
447.4 4,902,492
522 4,902,493
625 4,902,494

CLASS 424

1.1 4,902,495
52 4,902,497
4,902,498
70 4,902,499
78 4,902,500
79 4,902,501
83 4,902,502
4,902,503
84 4,902,504
85.7 4,902,505
92 4,902,506
93 4,902,507
95 4,902,508
105 4,902,509
405 4,902,510
423 4,902,511
450 4,902,512
455 4,902,513
473 4,902,514
486 4,902,515
497 4,902,516

CLASS 425

6 4,902,210
88 4,902,211
107 4,902,212
113 4,902,213
195 4,902,214
406 4,902,215
463 4,902,216
537 4,902,217
549 4,902,218
4,902,219
574 4,902,220

CLASS 426

11 4,902,517
14 4,902,518
91 4,902,519
107 4,902,520
112 4,902,521
231 4,902,522
4,902,523
503 4,902,524
548 4,902,525
598 4,902,526
607 4,902,527
625 4,902,528

CLASS 427

37 4,902,529
38 4,902,530
39 4,902,531
58 4,902,532
99 4,902,533
257 4,902,534
292 4,902,535
350 4,902,536
386 4,902,537
393.6 4,902,538
423 4,902,539

CLASS 428

17 4,902,540
4,902,541
35.2 4,902,543
36.1 4,902,544
36.6 4,902,545
40 4,902,546
4,902,547
102 4,902,548
137 4,902,550
4,902,551
152 4,902,552
156 4,902,553
195 4,902,554
4,902,555
198 4,902,542
209 4,902,556
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February 27, 1990 Volume 1111 Number 4

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Printing [illegible] 11(a)3 of Title 35, U.S. P.T.O.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Jan. 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 24, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,644,588 through 4,646,361
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 22, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,374,439 through 4,375,106
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 10, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,304,059	06/216,391	12/08/81
4,304,392	06/242,773	12/08/81
4,304,689	06/233,861	12/08/81
4,304,708	06/228,928	12/08/81
4,304,772	06/218,329	12/08/81
4,304,788	06/220,718	12/08/81
4,557,001	06/557,028	12/10/85
4,557,005	06/636,870	12/10/85
4,557,006	06/651,117	12/10/85
4,557,008	06/531,170	12/10/85
4,557,014	06/556,146	12/10/85
4,557,024	06/577,293	12/10/85
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4,557,223	06/604,646	12/10/85
4,557,228	06/533,935	12/10/85
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4,557,244	06/612,106	12/10/85
4,557,250	06/557,479	12/10/85
4,557,260	06/516,380	12/10/85
4,557,262	06/580,335	12/10/85
4,557,265	06/574,215	12/10/85
4,557,278	06/469,098	12/10/85
4,557,279	06/521,977	12/10/85
4,557,288	06/408,448	12/10/85
4,557,289	06/593,402	12/10/85
4,557,297	06/596,059	12/10/85
4,557,301	06/550,019	12/10/85
4,557,304	06/594,566	12/10/85
4,557,305	06/517,352	12/10/85
4,557,308	06/621,713	12/10/85
4,557,314	06/597,299	12/10/85
4,557,315	06/620,552	12/10/85
4,557,319	06/394,943	12/10/85
4,557,325	06/583,036	12/10/85
4,557,331	06/551,764	12/10/85
4,557,335	06/479,807	12/10/85
4,557,347	06/282,990	12/10/85
4,557,353	06/493,743	12/10/85
4,557,358	06/472,028	12/10/85
4,557,359	06/499,156	12/10/85
4,557,367	06/350,802	12/10/85
4,557,385	06/582,948	12/10/85
4,557,388	06/628,858	12/10/85
4,557,393	06/601,210	12/10/85
4,557,399	06/394,793	12/10/85
4,557,400	06/454,881	12/10/85
4,557,402	06/561,835	12/10/85
4,557,404	06/439,782	12/10/85
4,557,415	06/696,391	12/10/85
4,557,416	06/660,633	12/10/85
4,557,418	06/562,526	12/10/85
4,557,425	06/623,296	12/10/85
4,557,427	06/660,696	12/10/85

Patent Number	Serial Number	Issue Date
4,557,428	06/637,225	12/10/85
4,557,439	06/315,475	12/10/85
4,557,447	06/508,071	12/10/85
4,557,452	06/522,788	12/10/85
4,557,484	06/653,597	12/10/85
4,557,485	06/657,382	12/10/85
4,557,487	06/528,905	12/10/85
4,557,488	06/701,939	12/10/85
4,557,494	06/560,431	12/10/85
4,557,495	06/622,699	12/10/85
4,557,496	06/560,898	12/10/85
4,557,521	06/444,070	12/10/85
4,557,526	06/628,439	12/10/85
4,557,530	06/613,900	12/10/85
4,557,539	06/632,259	12/10/85
4,557,572	06/465,255	12/10/85
4,557,599	06/586,704	12/10/85
4,557,607	06/632,278	12/10/85
4,557,623	06/457,522	12/10/85
4,557,632	06/562,192	12/10/85
4,557,635	06/556,186	12/10/85
4,557,637	06/552,425	12/10/85
4,557,638	06/597,494	12/10/85
4,557,644	06/522,615	12/10/85
4,557,645	06/584,201	12/10/85
4,557,651	06/308,209	12/10/85
4,557,655	06/491,554	12/10/85
4,557,663	06/569,076	12/10/85
4,557,668	06/690,033	12/10/85
4,557,674	06/509,419	12/10/85
4,557,686	06/631,367	12/10/85
4,557,687	06/480,668	12/10/85
4,557,709	06/374,020	12/10/85
4,557,717	06/420,301	12/10/85
4,557,740	06/648,517	12/10/85
4,557,779	06/628,953	12/10/85
4,557,781	06/710,739	12/10/85
4,557,793	06/573,729	12/10/85
4,557,817	06/670,078	12/10/85
4,557,832	06/573,820	12/10/85
4,557,857	06/615,491	12/10/85
4,557,865	06/607,378	12/10/85
4,557,877	06/563,764	12/10/85
4,557,878	06/612,921	12/10/85
4,557,881	06/597,644	12/10/85
4,557,884	06/626,255	12/10/85
4,557,887	06/504,646	12/10/85
4,557,890	06/445,762	12/10/85
4,557,894	06/706,525	12/10/85
4,557,918	06/525,312	12/10/85
4,557,941	06/715,344	12/10/85
4,557,978	06/560,601	12/10/85
4,557,982	06/597,692	12/10/85
4,558,011	06/386,182	12/10/85
4,558,017	06/609,629	12/10/85
4,558,019	06/572,727	12/10/85
4,558,026	06/643,922	12/10/85
4,558,035	06/584,420	12/10/85
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4,558,044	06/537,035	12/10/85
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4,558,062	06/626,298	12/10/85
4,558,063	06/584,015	12/10/85
4,558,074	06/699,062	12/10/85
4,558,077	06/587,508	12/10/85
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4,558,097	06/609,375	12/10/85
4,558,112	06/270,867	12/10/85
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4,558,139	06/589,380	12/10/85
4,558,145	06/544,296	12/10/85
4,558,158	06/501,898	12/10/85
4,558,176	06/420,562	12/10/85
4,558,177	06/708,381	12/10/85
4,558,179	06/527,978	12/10/85
4,558,183	06/538,422	12/10/85
4,558,187	06/319,086	12/10/85
4,558,191	06/581,055	12/10/85
4,558,195	06/565,202	12/10/85
4,558,203	06/570,986	12/10/85
4,558,209	06/689,919	12/10/85
4,558,217	06/468,189	12/10/85
4,558,224	06/498,635	12/10/85
4,558,243	06/608,401	12/10/85
4,558,261	06/579,934	12/10/85
4,558,270	06/529,859	12/10/85
4,558,278	06/556,010	12/10/85
4,558,288	06/599,024	12/10/85
4,558,295	06/439,371	12/10/85
4,558,296	06/698,478	12/10/85
4,558,307	06/513,021	12/10/85
4,558,309	06/507,977	12/10/85
4,558,311	06/448,853	12/10/85
4,558,316	06/593,183	12/10/85
4,558,319	06/447,568	12/10/85
4,558,321	06/492,827	12/10/85
4,558,330	06/670,807	12/10/85
4,558,361	06/504,828	12/10/85
4,558,362	06/463,933	12/10/85
4,558,373	06/609,299	12/10/85
4,558,386	06/384,908	12/10/85
4,558,392	06/647,166	12/10/85
4,558,400	06/537,395	12/10/85
4,588,404	06/486,632	12/10/85
4,558,408	06/524,365	12/10/85
4,588,410	06/342,897	12/10/85
4,558,424	06/422,493	12/10/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,705,783, Re. S. N. 07/434,849, Filed Nov. 9, 1989, Cl. 514/180, 9 ALPHA, 11 BETA-SUBSTITUTED AND 11 BETA-SUBSTITUTED ESTRANES, David F. Crowe, et al., Owner of Record: *SRI International, Menlo, Calif.*, Attorney or Agent: William H. Benz, Ex. Gp.: 125

4,718,123, Re. S. N. 07/463,594, Filed Jan. 11, 1990, Cl. 2/91, COLD CLIMATE PROTECTIVE GARMENT, Chrissellene Petropoulos, Owner of Record: *Inventor*, Attorney or Agent: Thomas L. Peterson, Ex. Gp.: 247

4,718,940, Re. S. N. 07/463,475, Filed Jan. 11, 1990, Cl. 75/10.18, METHOD OF MANUFACTURING ALLOY FOR USE IN FABRICATING METAL PARTS, Kerry A. McPhillips, Owner of Record: *Inventor*, Attorney or Agent: Charles H. Thomas, Ex. Gp.: 111

4,744,366, Re. S. N. 07/422,057, Filed Oct. 13, 1989, Cl. 128/344, CONCENTRIC INDEPENDENTLY INFLATABLE DEFLATABLE MULTIPLE DIAMETER BALLON ANGIOPLASTY CATHETER SYSTEMS AND METHOD OF USE, G. David Jang, Owner of Record: *Inventor*, Attorney or Agent: Edward J. Lynch, Ex. Gp.: 336

4,794,376, Re. S. N. 07/461,264, Filed Jan. 5, 1990, Cl. 340/508, AUTOMATIC SIGNAL EVALUATION AND TRANSFER, Alva B. Lloyd, et al., Owner of Record: *Babcock and Wilcox Co., New Orleans, La.*, Attorney or Agent: Robert B. Sundheim, Ex. Gp.: 268

4,810,924, Re. S. N. 07/458,160, Filed Dec. 28, 1989, Cl. 313/609, DOUBLE-BORE CAPILLARY-TUBE GAS DISCHARGE LAMP WITH AN ENVELOPE WINDOW TRANSPARENT TO SHORT WAVELENGTH LIGHT, Marinko Jelic, Owner of Record: *Inventor*, Attorney or Agentz; Kit M. Stetina, Ex. Gp.: 264

4,873,029, Re. S. N. 07/442,524, Filed Nov. 28, 1989, Cl. 264/1.3, METHOD AND APPARATUS FOR MANUFACTURING LENSES, Ronald D. Blum, Owner of Record: *Inventor*, Attorney or Agent: William K. Wells, Jr. et al., Ex. Gp.: 137

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,261,880, Reexam No. 90/001,927, Requested Jan. 30, 1990, Cl. 260/45.853, POLYOLEFIN RESIN COMPOSITIONS, Masaki Fujii, et al., Owner of Record: *Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan*, Attorney or Agent: Unknown, Ex. Gp.: 150, Requester: Owner

4,697,884, Reexam No. 90/001,925, Requested Jan. 17, 1990, Cl. 350/334, LIQUID CRYSTAL DISPLAY HAVING DEGREE OF TWIST AND THICKNESS FOR IMPROVED MULTIPLEXING, Herman Amstutz, Owner of Record: *BBC Brown, Boveri & Co. Ltd., Baden, Switzerland*, Attorney or Agent: G. J. Maier, Ex. Gp.: 250, Requester: Owner

4,785,035, Reexam No. 90/001,926, Requested Dec. 29, 1989, Cl. 524/101, CURING COMPOSITION, August L. L. Palluel, et al., Owner of Record: *Imperial Chemical Industries Plc., London, England*, Attorney or Agent: Cushman, Darby & Cushman, Ex. Gp.: 150, Requester: Owner

Extension of Time For Filing Notices of Opposition to Marks Published in the Official Gazette Dated January 16, 1990

Copies of the Trademark Official Gazette dated January 16, 1990 were not mailed until January 22, 1990. Therefore, for marks published in the Trademark Official Gazette dated January 16, 1990, Notices of Opposition filed by February 21, 1990 will be considered timely.

January 30, 1990

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

The limit of 500 Demands for International Preliminary Examination filed by U.S. Applicants with the European Patent Office (EPO) as an International Preliminary Examining Authority (IPEA/EP) was reached at the beginning of February 1990.

A Memorandum of Understanding between the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO) permits Demands under the Patent Cooperation Treaty (PCT) to be submitted to the IPEA/EP by U.S. applicants (see the *Official Gazette* of July 7, 1987 at 1080 O.G.2). The ability to file Demands with the IPEA/EP under this agreement is limited to U.S. applicants who had filed their international applications with the USPTO in its capacity as a Receiving Office and had their International Search Reports prepared by the EPO. The agreement limits the number of Demands filed by U.S. applicants to 500 for the period of July 1, 1989 to June 30, 1990.

The number of Demands filed by U.S. applicants with the IPEA/EP reached 500 at the beginning of February 1990. U.S. applicants should henceforth file all their Demands directly with the USPTO for processing in the U.S. International Preliminary Examining Authority. Any Demands filed with the IPEA/EP after the beginning of February 1990 will be forwarded to the USPTO for processing.

The current agreement ends on June 30, 1990. A new agreement will be sought and when obtained the results will be published promptly in the Official Gazette.

February 5, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

Errata

"All reference to Patent No. 4,864,053 to William S. Grove of Doylestown, Ohio for `SUBSTITUTED DIPHENYL ETHERS HAVING HERBICIDAL ACTIVITY' appearing in the Official Gazette of September 5, 1989 should be deleted since no patent was granted."

"All reference to Patent No. PP7,092 to Blair L. Winner for `VARIETY OF GERANIUM NAMED CARNIVAL' appearing in the Official Gazette of January 2, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,891,224 to Eric A. Forssen of La Canada, Calif. for `MULTIPLE STEP ENTRAPMENT/LOADING PROCEDURE FOR PREPARING LILIPOPHILIC DRUG-CONTAINING LIPSOMES' appearing in the Official Gazette of Janaury 2, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,893,004 to A. Nakamura of Kyoto, Japan for `REFLECTION TYPE PHOTOELECTRIC SWITCH FOR DETECTING THE PRESENCE OF AN OBJECT' appearing in the Official Gazette of January 9, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,895,563 to James H. Gilbaugh of Portland, Ore. for `FINGER MOUNTED SURGICAL NEEDLE GUIDE/NEEDLE PROTECTOR' appearing in the Official Gazette of January 23, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,895,797, to Len J. Gawel of Ponca City, Okla. for `SULFATE REDUCING BACTERIA DETERMINATION AND CONTROL' appearing in the Official Gazette of January 23, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,896,743 to Thomas J. Danley of Ill. for `METHOD AND APPARATUS FOR ACOUSTIC LEVITATION' appearing in the Official Gazette of January 30, 1990 should be deleted since no patent was granted."

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Status of PTO Services

The following is an update of the status of PTO services for January 1990:

Service Item	FY 1990 Goal (Calendar Days) *	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	20
Trademarks	30	43
Patent/Trademark Copies:	24 Hours	16 Hours
Special Window Coupons	5	2
Window Coupons	12	5
Mail Coupons	16	16
Letter Orders	11	2
Electronic Ordering Sevice (EOS)		
Certified Copies:	21	44
Trademark Registrations	17	10
Applications-As-Filed	N/A	15
File-Wrapper/Contents	1	1
Walk-up Certification	5	5
Patent Application Expedited		
Trademark Search Library:	25**	50
Filing Pending Marks	Issue Date+2 Days	+9 Days
Filing Reg. Certificates	8**	23
Filing Temp. Drawings		
Assignments:	43	48
Recording Patent-New Applications	20	58
Recording Patents-Mail Room Recpts.		
Receipt Date of Bulk Pat. Docs. Returned by End of Month	20	Sept. 25-Oct. 6, 1989 40
Recording Trademarks		
Receipt Date of Bulk Trademark Documents Returned by End of Month		Nov. 10-Nov. 24, 1989
Avg. Days from Issue Fee Payment to Issue Date	90-100	95
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	+12 Days
Patent Copies Available	95% on Issue Date	+67 Days
Trademark Copies Available	95% on Issue Date	99% on Issue Date

* Unless otherwise noted.
** Goal was adjusted slightly to show calendar days rather than work days

HELPFUL HINTS

•*Computer Generated Drawings*•If a computer generated drawing is submitted, the drawing must meet the same drawing requirements currently enforced for a hand drawn drawing. Requirements, such as for solid and continuous straight or curved lines, will be enforced regardless of how the drawing is produced.

Feb. 2, 1990

THERESA A. BRELSFORD
Assistant Commissioner for Administration

PATENT NOTICES

Certificates of Correction For Week of February 27, 1990

B1. 4,526,565	4,806,970	4,823,014	4,835,341
4,516,641	4,808,264	4,823,281	4,835,782
4,625,407	4,809,071	4,823,838	4,835,876
4,659,953	4,809,193	4,824,821	4,835,996
4,660,018	4,809,268	4,824,876	4,836,516
4,661,265	4,809,488	4,825,512	4,836,758
4,661,804	4,810,092	4,825,655	4,836,764
4,704,116	4,810,941	4,825,798	4,837,451
4,710,465	4,811,055	4,826,499	4,837,466
4,724,511	4,812,178	4,826,920	4,837,580
4,726,340	4,812,379	4,827,674	4,837,815
4,733,948	4,812,662	4,828,029	4,838,026
4,744,931	4,812,869	4,828,051	4,838,252
4,748,004	4,812,941	4,828,190	4,838,253
4,748,720	4,813,125	4,828,317	4,838,568
4,752,470	4,815,117	4,829,547	4,839,969
4,754,767	4,815,428	4,830,266	4,840,679
4,759,808	4,815,507	4,830,331	4,840,940
4,760,887	4,816,341	4,830,474	4,841,715
4,766,592	4,816,819	4,830,547	4,841,872
4,769,753	4,817,755	4,830,737	4,842,058
4,772,391	4,818,162	4,830,872	4,842,217
4,773,416	4,818,277	4,831,331	4,843,202
4,774,538	4,818,431	4,831,386	4,843,544
4,778,808	4,819,923	4,831,582	4,843,974
4,779,548	4,820,200	4,832,123	4,844,760
4,782,917	4,820,348	4,832,580	4,844,917
4,784,200	4,820,593	4,833,175	4,845,033
4,786,303	4,820,814	4,833,320	4,845,064
4,786,789	4,820,940	4,833,508	4,849,012
4,791,731	4,820,951	4,834,018	4,851,928
4,792,741	4,821,217	4,834,264	4,851,988
4,794,939	4,821,224	4,834,337	4,852,492
4,799,229	4,822,397	4,834,575	4,879,227
4,801,802	4,822,455	4,834,694	
4,803,403	4,822,659	4,834,947	
4,806,626	4,822,844	4,835,256	

Disclaimers

4,625,905.—*Raj K. Mangla*, East Rochester, N. Y. HINGED COVER CARTON. Patent dated Dec. 2, 1986. Disclaimer filed May 21, 1987, by the assignee, Mobile Oil Corp.

The term of this patent subsequent to September 16, 2003, has been disclaimed.

4,853,065.—*Dennis C. Terry*, Costa Mesa; *Waldemiro M. Filho*, Laguna Hills; *John J. Turechek*, Glendale, all of Calif. METHOD OF MANUFACTURING CLEAN-ROOM COMPATIBLE HONEYCOMB TABLES. Patent dated Aug. 1, 1989. Disclaimer filed Nov. 13, 1989, by the assignee, Newport Corporation.

The term of this patent subsequent to November 4, 2003, has been disclaimed.

4,858,377.—*James R. Oglevee*; *Kirk A. Oglevee*, both of Connellsville, Pa. PLANT ORIENTED CONTROL SYSTEM BASED UPON VAPOR PRESSURE DEFICIT DATA. Patent dated Aug. 22, 1989. Disclaimer filed Dec. 8, 1989 by the assignee, OCS, Inc.

The term of this patent subsequent to August 15, 2006, has been disclaimed.

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Box FWC	Requests for File Wrapper Continuation Applications.
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Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
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	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
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Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institite of Technology	(404) 894-4508
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	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
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	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF January 27, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	1-13-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	9-1-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	12-24-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during January 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,707,729 to 3,714,667 inclusive
Plant Patents ..... 3281 to 3296 inclusive

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REEXAMINATIONS

FEBRUARY 27, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,098,407 (1208th)

LUMBER SORTING SYSTEM

Jack Moore, Portland, Oreg., assignor to Oregon Bank, The Oregon Banking Corporation

Reexamination Request No. 90/001,596, Aug. 31, 1988.
Reexamination Certificate for Patent No. 4,098,407, issued Jul. 4, 1978, Ser. No. 722,638, Sep. 13, 1976.
Filed Aug. 31, 1988, Ser. No. 722,638
Int. Cl.[4] B65G *47/34*
U.S. Cl. 209—517

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2**, **3**, **5**, **7**, **12** and **13** are determined to be patentable as amended.

Claims **4**, **6** and **8–11**, dependent on an amended claim, are determined to be patentable.

New claims **14–19** are added and determined to be patentable.

1. In a lumber sorter including a frame,
an elongated flexible sling for forming at least a portion of an open-topped bin for the receipt of sorted lumber,
first mounting means nonreleasably mounting one end of said sling at one fixed position on said frame, [and]
a swing arm pivotally mounted to the frame and movably supporting the sling,
second mounting means releasably mounting the other end of said sling at another fixed position on said frame [for selective release and recapture of said other end], *and including second locking means on said frame,*
first locking means on said other end of said sling swingable by said swing arm into a position adjacent said second locking means, and
means selectively operable for actuating said second locking means to positively interlock said first and second locking means to capture said first locking means, and further selectively operable for actuating said second locking means to disengage said first and second locking means and release said first locking means.

B1 4,444,553 (1209th)

HEAT TREATING A PARTICULATE COMMODITY

Spyros D. Christodoulou, New Barnet, England, assignor to Din Engineering Limited, London, England

Reexamination Request No. 90/001,740, Mar. 31, 1989.
Reexamination Certificate for Patent No. 4,444,553, issued Apr. 24, 1984, Ser. No. 368,066, Apr. 13, 1982.
Filed Mar. 31, 1989, Ser. No. 368,066
Claims priority, application United Kingdom, Apr. 16, 1981, 8112190
Int. Cl.[4] F27B *15/00, 9/14, 9/16;* A23L *3/00*
U.S. Cl. 432—15

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **5** is cancelled.

Claims **1**, **3**, **4** and **8** are determined to be patentable as amended.

Claims **2**, **6**, **7** and **9–12**, dependent on an amended claim, are determined to be patentable.

New claims **13** and **14** are added and determined to be patentable.

1. An apparatus for heat treating a particulate commodity, said apparatus comprising:
(i) an enclosure defined in part by a lower wall comprising a concave perforate deck;
(ii) supply means for supplying fluid under pressure through the perforate deck to said enclosure;
(iii) temperature control means for controlling a temperature of said fluid supply under pressure through the perforate deck, whereby a bed of particles in said enclosure can be fluidised and heat treated;
(iv) transfer means *comprising a rotary screw conveyor including a shaft coaxial with said deck and having at least one vane comprising a helical flight, the helical flight being disposed adjacent the concave deck and being* disposed during fluidisation at least partially within the bed and operable tocontrolledly move said particles [continuously or stepwise] along said deck,
said transfer means being adapted to control a dwell time of the particles in said enclosure while simultaneously improving conditions of fluidisation within the bed by substantially eliminating stagnant areas and reducing bubble formation; and
(v) vibratory means operable to vibrate the deck with a component of vertical motion, whereby fluidisation of the particle bed is further enhanced.

B1 4,512,556 (1250th)

SLAT RETAINING MEANS FOR CHAIN LINK FENCES

Don A. Meglino, 85 Edwards St., Roslyn Heights, N.Y. 11577

Reexamination Request No. 90/001,735, Mar. 28, 1989.
Reexamination Certificate for Patent No. 4,512,556, issued Apr. 23, 1985, Ser. No. 577,216, Feb. 6, 1984.
Filed Mar. 28, 1989, Ser. No. 577,216
Int. Cl.[4] B21F *27/00*
U.S. Cl. 256—34

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

New claim **5** is added and determined to be patentable.

1. Slat retaining means for chain link fences of the type made of linking wires comprising:
a plurality of parallel slats woven through the wires the parallel slats extending in a first direction,
a rectangular aperture in each parallel slat and
a connecting member of complimentary rectangular cross-section along its length inserted through said rectangular apertures to lock the parallel slats in position,

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wherein the rectangular apertures are a predetermined distance from one end of the parallel slats and the connecting member is adapted to be secured to a vertical fence support.

B1 4,595,627 (1211th)
FLUORESCENT TEXTILE MATERIAL
Barry Steinman, Stamford, Conn., assignor to Safety Trim Industries, Inc.
Reexamination Request No. 90/001,304, Aug. 17, 1987.
Reexamination Certificate for Patent No. 4,595,627, issued Jun. 17, 1986, Ser. No. 698,679, Feb. 6, 1985.
Filed Aug. 17, 1987, Ser. No. 698,679
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—241

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–4** are cancelled.

[1. As new article of manufacture a woven piece good consisting of warp and weft threads, at least some of said warp and weft threads being monofilaments of substantially square cross-section, and having at least two oppositely disposed glass-beaded reflective surfaces, further characterized in said filaments being formed by slitting a pair of bonded oppositely facing synthetic resinous sheets having a glass-beaded reflective coating on the then exposed surfaces thereof.**]**

B1 4,666,344 (1212th)
TRUSS SYSTEMS AND COMPONENTS THEREOF
Ben L. Seegmiller, 3500 Loren Von Dr., Salt Lake City, Utah 84124
Reexamination Request No. 90/001,759, Apr. 21, 1989.
Reexamination Certificate for Patent No. 4,666,344, issued May 19, 1987, Ser. No. 809,139, Dec. 16, 1985.
Filed Apr. 21, 1989, Ser. No. 809,139
Int. Cl.[4] E21D *20/00, 21/00*
U.S. Cl. 405—259

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** and **7–17** is confirmed.

Claim **2** is determined to be patentable as amended.

Claims **3–5** and **6**, dependent on an amended claim, are determined to be patentable.

2. A rock-formation-supporting, plural-way truss support bracket including, in combination: a bearing plate having an upper bearing surface and an intermediate anchor-bolt receiving aperture passing through said surface; plural flange portions integral with and depending from said bearing plate about and mutually spaced from said aperture, said flange portions each having plural tie rod receiving apertures; *and an elongate anchor bolt passing through said anchor bolt receiving aperture and provided with means, for tensioning said anchor bolt, reactively thrusting against said bearing plate and disposed between said plurol flange portions.*

B1 4,666,575 (1213th)
METHOD OF RECOVERING GALLIUM FROM SCRAP CONTAINING GALLIUM
Shigeki Kubo, Niihama, Japan, assignor to Sumitomo Metal Mining Company, Tokyo, Japan
Reexamination Request No. 90/001,502, Apr. 26, 1988.
Reexamination Certificate for Patent No. 4,666,575, issued May 19, 1987, Ser. No. 886,153, Jul. 16, 1986.
Filed Apr. 26, 1988, Ser. No. 886,153
Claims priority, application Japan, Sep. 13, 1985, 60-203120
Int. Cl.[4] C25C *1/00*
U.S. Cl. 204—105 R

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–18** have been cancelled.

[1. A method of recovering gallium comprising:
treating scrap containing glalium and arsenic with chlorine gas to form a crude gallium and arsenic chloride mixture;
removing arsenic chloride and impurities having a lower boiling point than that of arsenic chloride by vaporizaiton from said mixture to obtain crude gallium chloride;
distilling said crude gallium chloride to purify it; and electrolyzing said purified gallium chloride to recover metallic gallium therefrom.

12144,753,672 (B1st)
HERBICIDAL ACETALS AND KETALS
George Levitt, Wilmington, Del., assignor to E.I. Du Pont de Nemours and Co., Wilmington, Del.
Reexamination Request No. 90/001,627, Oct. 27, 1988.
Reexamination Certificate for Patent No. 4,753,672, issued Jun. 28, 1988, Ser. No. 6,,434, Jan. 23, 1987.
Division of Ser. No. 754,709, Jul. 19, 1985, Pat. No. 4,659,369, which is a continuation-in-part of Ser. No. 644,259, Aug. 27, 1984, abandoned. This application Oct. 27, 1988, Ser. No. 6,434
Int. Cl.[4] A01N *43/54, 43/90;* **C07D** *239/69, 239/70*
U.S. Cl. 71—92

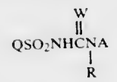
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2, 3, 17, 28, 30, 31, 34, 37, 38** and **41** are cancelled.

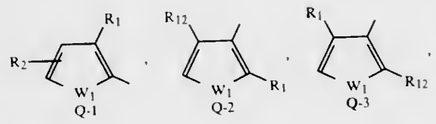
Claims **1, 4, 18** and **19–27** are determined to be patentable as amended.

Claims **5–16, 29, 32, 33, 35, 36, 39, 40** and **42**, dependent on an amended claim, are determined to be patentable.

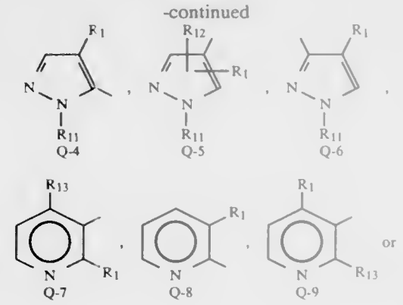
1. A compound of the formula



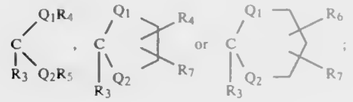
wherein
Q is



-continued

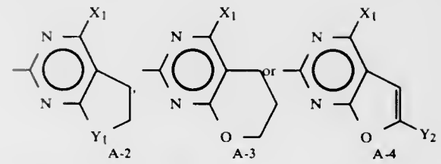


R is H or CH_3
R_1 is



[E is CH_2 *or a single bond.***]**
R_2 is H, C_1–C_2 alkyl of Cl;
R_3 is H, C_1–C_3 alkyl **[**or C_1–C_3 alkoxy;**]**
R_4 and R_5 are independently C_1–C_2 alkyl;
R_6 and $R_7$are independently H or C_1–C_2 alkyl,
W is O;
W_1 is O or S;
Q_1 and Q_2 are independently O, S or NCH_3;

A is



[P_{11}**]** R_{11} is C_1–C_3 alkyl;
R_{12} is H, F, Cl, NO_2, C_1–C_2 alkoxy, C_1–C_2 alkylthio, C_1–C_2 alkylsulfinyl, C_1–C_2 alkylsulfonyl, di(C_1–C_2)alkylsulfamoyl or CO_2(C_1–C_2 alkyl);
R_{13} is H, C_1–C_2 alkyl, C_1–C_2 alkoxy, Cl, F or NO_2
R_{14} is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 haloalkyl, C_1–C_3 haloalkoxy, Cl, Br, F, NO_2 di(C_1–C_3)alkylsulfamoyl, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, amino, C_1–C_3 alkylamino, di(C_1–C_3)alkylamino, CH_2OCH_3, CH_2SCH_3 or CH_2CN;**]**
Y_1 is O or CH_2;
X_1 is CH_3, OCH_3, OC_2H_5 or OCF_2H; and
Y_2 is H or CH_3;
and their agriculturally suitable salts; **[**provided that
(a) when R_3 is C_1–C_3 alkoxy, then Q_1 and Q_2 are oxygen;
(b) when R_3 is H or C_1–C_3 alkyl, then Q is Q-1 through Q-9;
(c) when E is CH_2, then R_{14} *is H,* $CH3$ CH_3 OCH_3, Cl or NO_2 and is not in the 4-position**]**.

29. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim **1** and at least one of the following: surfactant, solid or liquid inert diluent.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,170

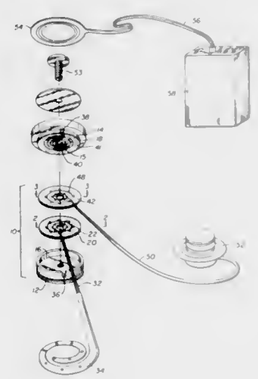
SURGICALLY IMPLANTABLE DISCONNECT DEVICE

Charles L. Byers, Vacaville, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Original No. 4,495,917, dated Jan. 29, 1985, Ser. No. 362,344, Mar. 26, 1982. Application for reissue Dec. 18, 1985, Ser. No. 811,019

Int. Cl.[4] A61N *1/04*

U.S. Cl. 128—419 R — 23 Claims



1. A connector comprising a case, including a base member and a lid, the base member and lid being shaped to provide a cavity between them, a first contact pad of elastomeric material, a first set of electrical contacts embedded in the first contact pad, the contact pad being dimensioned to fit within the cavity, the contact pad being interposed between the lid and the base member, a second set of electrical contacts [carried by the lid] within the cavity, means for providing separate electrical connections through the case to the first and second sets of electrical contacts, and means for pressing the lid against the base member and the contact pad to exert a predetermined pressure on the pad, causing it to form a fluid tight seal around the first and second sets of electrical contacts, some of which are thereby placed in electrical contact with each other, *one of the first and second sets of electrical contacts being comprised of partially flattened metallic spheres.*

Re. 33,171

HYDRAULIC ELEVATOR

Tsuyoshi Ogasawara; Keo Ichiryu, both of Shimoinayoshi; Ichiro Nakamura, and Yasuo Kido, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,534,452, dated Aug. 13, 1985, Ser. No. 607,651, May 7, 1984. Application for reissue Aug. 12, 1987, Ser. No. 84,205

Claims priority, application Japan, May 6, 1983, 58-78261

Int. Cl.[4] B66B *1/04*

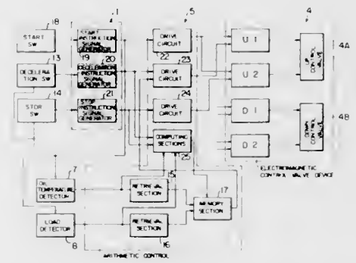
U.S. Cl. 187—111 — 9 Claims

9. In a hydraulic elevator system in which a cage is moved by hydraulic means including a cylinder and a plunger, a control apparatus comprising:

instruction means for producing a cage deceleration instruction in response to the cage reaching a predetermined deceleration position in advance of a stop position where the cage is to be stopped;

memory means for storing a plurality of values of deceleration delay time;

data retrieval means connected to said memory means for retrieving one of said plurality of values corresponding to detected values of the oil temperature and elevator load; and



drive means responsive to said deceleration instruction for causing said cage to begin to decelerate after expiration of a delay time corresponding to the value retrieved by said data retrieval means following the producing of said deceleration instruction by said instruction means.

Re. 33,172

PROCESS FOR MAGNETIC IMAGE CHARACTER RECOGNITION

Robert J. Gruber, Pittsford; John F. Knapp, Fairport, and Steven B. Bolte, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original No. 4,517,268, dated May 14, 1985, Ser. No. 531,520, Sep. 12, 1983. Application for reissue May 4, 1987, Ser. No. 45,346

Int. Cl.[4] G03G *9/02*

U.S. Cl. 430—39 — 31 Claims

19. An improved aerographic process which comprises forming a latent image on an imaging member; thereafter developing this image with a magnetic developer composition comprised of from about 20 percent to about 70 percent by weight of magnetite, and from about 30 percent by weight to about 80 percent by weight of toner resin particles selected from the group consisting of styrene methacrylate copolymers, styrene butadiene copolymers and styrene acrylate copolymers, and polyesters; and carrier particles; subsequently transferring the developed image to a supporting substrate; and affixing the image thereto.

Re. 33,173

ENVELOPE WITH POUCH AND METHOD OF MANUFACTURE THEREOF

Russel A. Cassey, Hamilton, New Zealand, assignor to Trigon Packaging Systems (NZ) Ltd., New Zealand

Original No. 4,648,860, dated Mar. 10, 1987, Ser. No. 703,822, Feb. 21, 1985. Application for reissue May 31, 1988, Ser. No. 200,530

Claims priority, application New Zealand, Feb. 23, 1984, 207248

Int. Cl.[4] B31B *41/10*

U.S. Cl. 493—195 — 3 Claims

1. A method of producing a courier pack envelope incorporating an external pouch, characterized by the steps of:

progressively folding a continuous sheet of plastics material

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to provide juxtaposed sheet portions interconnected at one of their longitudinal edges by the bight of said fold;

transporting said folded sheet in a longitudinal direction;

progressively feeding a continuous strip of plastics material of a determined width-longitudinally into face engagement with an outwardly presented face of one of said sheet portions;

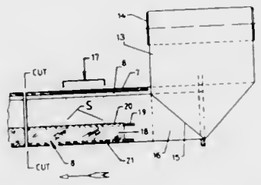
providing a supply of a continuous peelable adhesive-carrying tape having a peel strip, and applying said tape to said strip of plastics material adjacent one edge of said strip of plastics material with the peel strip facing said plastics material;

progressively attaching one edge of said strip *of plastics material* continuously to said face during the feeding of said strip *of plastics material*; and,

sealing each of said folded sheet portions and said attached strip *of plastics material* to each other at positions spaced longitudinally of said folded sheet, and along lines extending transversely of said folded sheet and said strip *of plastics material*;

whereby said strip *of plastics material* is attached to said outwardly presented face of one of said sheet portions along three of its edges and defines an open-sided pouch in conjunction with said outwardly presented face of said one sheet portion;

said tape being applied to the edge of said strip of plastics material adjacent the open end of said open-sided pouch whereby the open side of said pouch is sealable by peeling said peel strip away securing the upper edge of said strip of plastics material to said one sheet portion.



PLANT PATENTS

GRANTED FEBRUARY 27, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,166

MINIATURE ROSE PLANT NAMED BENJIM

Frank A. Bensrdella, Old Tappan, N.J., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 15, 1988, Ser. No. 245,000

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, and parts thereof, substantially as shown and described, characterized particularly by attractive red and yellow bicolored flowers.

7,167

APPLE TREE-STARLING CULTIVAR

David Starling, and Teresa Starling, both of R.R. #1, Oyama, British Columbia, Canada (V0H 1W0)

Filed Mar. 31, 1987, Ser. No. 32,435

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct apple tree as shown and described herein.

7,168

FRENCH PRUNE (PUNIAN)

Gurbachan Purian, 1351 Debbie La., Yuba City, Calif. 95991

Filed Oct. 17, 1988, Ser. No. 259,340

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct French prune substantially as illustrated and described, particularly characterized by its upright, vase shaped tree form of medium to large size; its vigorous growth; by reaching full maturity earlier than other varieties of French prune; and by bearing excellent fruit with a high sugar content which are particularly suitable for commercial production.

7,169

PEACH TREE, "EARLY ELEGANT LADY"

Michael D. Lewis, P.O. Box 968, Reedley, Calif. 93654

Filed Oct. 20, 1988, Ser. No. 260,070

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree to be denominated varietally as Early Elegant Lady substantially as illustrated and described and which is characterized principally as to novelty by its production of fruit which are somewhat similar in their overall appearance to the fruit produced by the Elegant Lady Peach Tree (U.S. Plant Pat. No. 4,399) from which it was believed derived as a mutation, but which is distinguished therefrom and characterized principally as to novelty by producing fruit which are ripe for commercial harvesting and shipment approximately seven days earlier than the fruit produced by the Elegant Lady Peach Tree.

7,170

PEACH TREE, "RUBY MAY"

Joe S. Takeda, 26729 E. Huntsman Ave., Orosi, Calif. 93647

Filed Oct. 20, 1988, Ser. No. 260,033

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of Peach Tree substantially as illustrated and described and which is somewhat similar to the Springcrest Peach Tree (unpatented) from which it was derived as a scaffold mutation, but from which it is distinguished therefrom and characterized principally as to novelty by bearing fruit which are ripe for commercial harvesting and shipment approximately May 3 through May 10 at Orosi, Calif., and which further produces a semi-freestone fruit which has a good flavor and noteworthy handling characteristics.

7,171

STRAWBERRY—ANACAPA

Harold A. Johnson, Jr.; Thomas M. Sjulin, both of Watsonville; David W. Small, Ventura; Amado Q. Amorao, and Joseph I. Espejo, Jr., both of Watsonville, all of Calif., assignors to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Dec. 29, 1988, Ser. No. 291,911

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—48 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated and having the characteristics herein enumerated together with the parts thereof.

7,172

STRAWBERRY PLANT CALLED IRVINE

Victor Voth, Santa Ana, and Royce S. Bringhurst, Davis, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 9, 1988, Ser. No. 269,928

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated and identified by the characteristics enumerated above.

7,173

PLANT OF THE CACTACEAE PLANT FAMILY

Barnell L. Cobia, Winter Garden, and Mark E. Cobia, Orlando, both of Fla., assignors to B. L. Cobia, Inc., Winter Garden, Fla.

Filed Dec. 9, 1988, Ser. No. 282,315

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct plant variety of the Cactaceae family as shown and described and which is mainly distinguished from its antecedents and known related varieties by a growth habit which is substantially like that of the "Gold Charm" variety but as modified by the combination of the following characteristics:

(1) An erect growth habit,

(2) Buds with (a) an ovary having a basic field during immaturity in which the color is usually dominated by a red hue, and in which, with further maturity of the bud, there is a development of random areas in which the color is dominated by a yellow green hue, and (b) petals having a basic field during bud immaturity in which the color is usually dominated by a red and/or pink hue and in which, with further maturity of the bud, there is a development of streaks in which the color is dominated by a yellow green and/or olive green hue, and

(3) Sterile flowers having tepals with (a) a narrow marginal blade area that in color is dominated by a reddish orange, orange, orange yellow and/or pink hue, and (b) a center blade area that in color is dominated by a yellow hue and merges distally with the color in the basal area of the tepal blade.

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7,174

PLANT OF THE CACTACEAE PLANT FAMILY 'SANTA CRUZ'

Barnell L. Cobia, Winter Garden, and Mark E. Cobia, Orlando, both of Fla., assignors to B. L. Cobia, Inc., Winter Garden, Fla.

Filed Dec. 12, 1988, Ser. No. 283,988
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct plant variety of the Cactaceae family as shown and described and which is mainly distinguished from its antecedents and known related varieties by a growth habit which is similar to that of the "Twilight Tangerine" variety but as modified by the combination of the characteristics which follow:

(1) A more erect posture at maturity than the "Twilight Tangerine" variety.

(2) Phylloclades which, in comparison to the "Twilight Tangerine" variety, have (a) longer and thicker midribs, (b) thicker wings, and (c) thicker teeth,

(3) Flowers which, in comparison to the "Twilight Tangerine" variety, are sterile and have (a) a bloom with a greater dominance of a reddish orange hue in the coloration, (b) a sepaloid tepal series with a smaller number of tepals and which have a shorter length and smaller width, (c) a tube laminating tepal series with a larger number of tepals and which have a greater width, (d) a tube forming tepal series with tepals that have a greater width, (e) a longer perianth tube, (f) an androecium with a smaller number of tube attached stamens, and both the tube attached and basally united stamens having filaments that are longer and with greater diameters, and (g) a gynoecium with a style that is longer and and has a larger diameter and ovaries that are shorter in length and have a smaller number of carpules, the ovaries having longer major and minor axes at the distal ends of the concavities.

7,175

PLANT OF THE CACTACEAE PLANT FAMILY

Barnell L. Cobia, Winter Garden, and Mark E. Cobia, Orlando, both of Fla., assignors to B. L. Cobia, Inc., Winter Garden, Fla.

Filed Dec. 9, 1988, Ser. No. 281,808
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct plant variety of the Cactaceae family as shown and described and which is mainly distinguished from its antecedents and known related varieties by a growth habit which is similar to that of the "Kris Kringle" variety but as modified by the combination of the following characteristics:

(1) An erect growth habit,

(2) Phylloclades which, in comparison to the Kris Kringle variety, have (a) wings with greater thickness and width dimensions and (b) teeth with greater thickness dimensions and longer areole to apex dimensions,

(3) Flowers which, in comparison to the Kris Kringle variety, are sterile and have (a) a sepaloid series of tepals with a smaller number of tepals that generally have shorter length dimensions and smaller maximum blade width dimensions, (b) a tube laminating series of tepals that generally have greater maximum blade width dimensions, (c) a tube forming series of tepals that generally have greater maximum blade width dimensions and perianth tubes that generally have shorter length dimensions, (d) an androecium with a smaller number of tube attached stamens, and (e) a gynoecium with a shorter style length dimension and longer ovary length dimension.

PATENTS

GRANTED FEB. 27, 1990

ERRATA

For CLASS	See PATENT NO.
004-420	4,903,347
475-084	4,903,547
475-059	4,903,548
606-070	4,903,691
606-099	4,903,692
606-004	4,903,695
606-037	4,903,696
227-178	4,903,697
606-235	4,903,698
280-160	4,903,856
280-267	4,903,857
206-631	4,903,893
180-253	4,903,974
411-396	4,904,145
252-548	4,904,359
204-059	4,904,370
562-849	4,904,417
528-129	4,904,516
523-435	4,904,716
430-110	4,904,762
330-004	4,904,963
357-034	4,905,078
219-121	4,905,310
250-225	4,905,311
250-213	4,905,312
261-112	4,905,313
307-264	4,905,314
318-640	4,905,315
324-319	4,905,316
341-051	4,905,317
357-027	4,905,318
357-065	4,905,319

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PATENTS

GRANTED FEBRUARY 27, 1990

GENERAL AND MECHANICAL

4,903,345

STOCKINGS WITH CONNECTING CROTCHPIECE

Thurman B. Oakley, 321 Coach-Light Trail, Burlington, N.C. 27215

Filed Nov. 16, 1988, Ser. No. 271,932
Int. Cl.[4] A41B 9/04
U.S. Cl. 2—240 11 Claims



1. A hosiery garment including a pair of full-length stockings, each stocking having upper thigh and lower leg portions and having a length extending to the upper thigh area; each thigh portion having a support means comprised of a circumferential band knitted around the upper periphery of said thigh portion and terminating on a line substantially horizontal to the crotch of the wearer for supporting said stockings on the leg of the wearer; a crotch member for connecting said pair of stocking at the upper edges of said support means; the upper extent of said crotch member also terminating substantially on said horizontal line; whereby said hosiery garment terminates substantially above a horizontal line extending through the crotch of the wearer and may be worn as a conventional pair of pantyhose extending to the upper thigh area, and with said crotch member worn underneath a conventional separate panty.

4,903,346

MULTI-PART PROTECTIVE HELMET

Hans Reddemann, and Tronje von dem Hagen, both of Luebeck, Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed May 11, 1989, Ser. No. 350,847
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1988, 3821513
Int. Cl.[4] A42B 3/02
U.S. Cl. 2—411 8 Claims



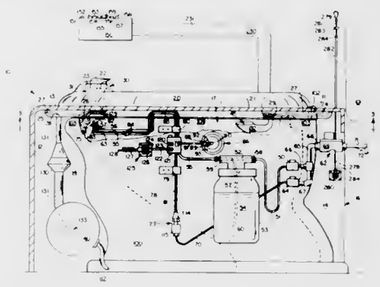
1. A protective helmet comprising an inner shell which is custom fittable and is formed of at least two connected inner shell split portions and an outer hard protective shell which is engageable over said split inner shell so that together the inner shell and the outer shell provide a face opening and a neck opening, said inner shell having a fixed interior contour fitted to the wearer's head, said outer shell being of one piece with an interior contour to engage over said inner shell.

4,903,347

AUTOMATED CLEANSING APPARATUS ADAPTABLE TO A COMMODE

Gilbert C. Gareia, 163 Tabard Dr., San Antonio, Tex. 78213, and Rodolfo G. Valdes, 11011 Reverie La., San Antonio, Tex. 78216

Filed May 20, 1987, Ser. No. 52,720
Int. Cl.[4] A47K 3/20; E03D 7/08
U.S. Cl. 4—420.4 15 Claims



1. An apparatus for use in conjunction with means for receiving bodily excretions, such as a toilet, for removing waste products from the surface of a body after the excretion of said waste products, comprising:

a support structure;

means for directing a solution onto the surface of a body, said directing means being connected to said support structure and comprising a tube which encloses a fluid passage in fluid communication with a pressurized supply of the solution for directing the solution through an exit end of the tube onto the body surface; and

means for pivoting said tube with respect to said support structure in an oscillatory manner such that the solution is directed onto the body surface along an arc traversed by the exit end of said tube, said pivoting means being operatively connected between said tube and said support structure;

said pivoting means comprising:

a shaft which is linked with said tube in a manner such that the position of the exit end of said tube correlates with the orientation of said shaft;

an electric motor for rotating said shaft;

a rotating electrical contact attached to said shaft wherein said rotating contact is electrically connected to the power terminal of said motor so as to cause the operation of said motor when said rotating contact is connected to an electric power source; and

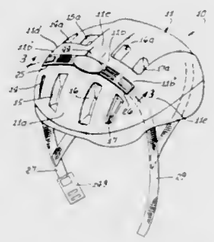
an annularly-shaped contact positioned to engage said rotating contact during rotation thereof, said annularly-shaped contact being electrically connected to said electric power source but having a discontinuity at a certain point thereof, wherein said rotating electrical contact makes an electrical connection with said annularly-shaped contact as said rotating contact rotates along with said shaft of said electric motor except when said rotating contact rotates to said discontinuity, said electrical connection completing a first electrical pathway for causing operation of said motor;

said annularly-shaped contact being positioned relative to said shaft such that said first pathway is completed except when

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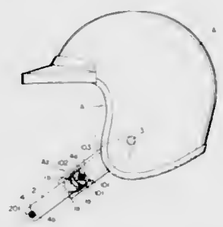
the rotation of said shaft corresponds with a retracted position of the exit end of said tube.

4,903,348
HELMET WITH STRAP HOLDER
Lester V. Broersma, Bellflower, Calif., assignor to Bell Bicycles, Inc., Norwalk, Calif.
Filed Sep. 26, 1988, Ser. No. 248,616
Int. Cl.[4] A42B *7/00*
U.S. Cl. 2—421 **21 Claims**



1. In a helmet, the combination comprising
(a) a generally domed shaped helmet body having inner and outer sides,
(b) openings through the body to pass retention straps,
(c) a first strap holder configured to be supported at and by the outer side of the helmet, the holder attached to at least one strap that extends through one of said openings, and the holder operable to transmit strap tension to the helmet,
(d) attachment means positively attaching the holder to the helmet at said outer side thereof,
(e) and wherein said attachment means comprises hook and pile elements, one of which is carried by the holder and the other of which is carried by the helmet body.

4,903,349
HELMET CHIN STRAP HAVING PRIMARY FASTENING DEVICE AND SECONDARY FASTENING DEVICE FOR FREE END OF STRAP
Michio Arai, 1-164 Horinouchi, Ohmiya-shi, Saitama-ken, Japan
Filed Sep. 29, 1987, Ser. No. 102,421
Claims priority, application Japan, Feb. 17, 1987, 62-35264
Int. Cl.[4] A42B *3/02, 7/00*
U.S. Cl. 2—421 **4 Claims**



1. A helmet comprising:
(a) a helmet body having first and second side portions;
(b) a chin strap including:
(i) a retainer strap having a first end mounted to the first side portion of the helmet body and a second, opposite free end having an outward surface;
(ii) a fastening member provided at the second end of the retainer strap, said fastening member including first and second rings pivotally connected at said second end;
(iii) an operational strap having a first end mounted to the second side portion of the helmet body and a second, opposite free end for insertion through and engaged with said first and second rings to secure said helmet body on a head of a user, said second free end of said operational strap extending in a direction away from said retainer strap when said operational strip is engaged with said rings and said second free end of said operational strap having a floppy nature and having an inner surface which may contact the user when said helmet body is positioned on the head of the user;
(iv) male connector means provided on the outward surface of the second free end of the retainer strap; and
(v) female connector means for matingly connecting with the male connector means when said second free end of said operational strap is turned about said first ring in a direction extending toward said retainer strap to prevent free movement of the second free end of the operational strap, said female connector means provided on the inner surface of the second free end of the operation strap

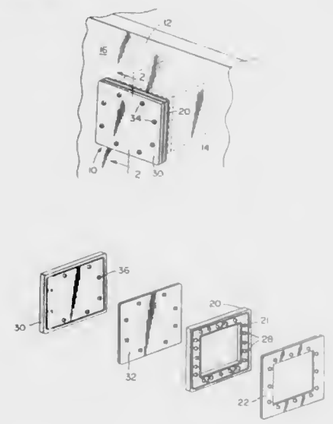
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4,903,350
AERODYNAMICALLY STREAMLINED BICYCLE RACING HELMET
James J. Gentes, Soquel, and Steven K. Sasaki, Santa Cruz, both of Calif., assignors to Giro Sport Design, Inc., Santa Cruz, Calif.
Filed Jun. 28, 1988, Ser. No. 212,749
Int. Cl.[4] A42B *7/00;* **A63B** *71/10*
U.S. Cl. 2—421 **18 Claims**



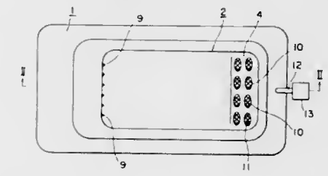
1. A streamlined bicycle helmet comprising:
a molded body having a cavity formed in the lower portion thereof for receiving a user's head, at least two ribs protruding from the interior surface of said body into said cavity to form at least one passage for air to flow between the user's head and said body, and at least one aperture formed in a front portion of said body for admitting air therethrough to said passage;
chin strap means including a front strap affixed to said front portion of said body and adapted to engage a forward portion of the user's head as it passes from the points of attachment to said body to a fastening means proximate the user's chin, and a rear strap affixed to an aft portion of said body and adapted to pass from the points of attachment to said body to points of attachment with said front strap; and
a cap for placement over the exterior surface of said body, said cap including at least one opening corresponding to the position of said aperture for admitting air therethrough to said passage.

4,903,351
SWIMMING POOL WINTERIZING FACEPLATE KIT
Robert W. Dengel, 474 Rhode Island Ave., and Robert D. Goelz, 153 Princeton Ave., both of Brick, N.J. 08724
Filed Nov. 14, 1988, Ser. No. 270,196
Int. Cl.[4] E03H *3/18*
U.S. Cl. 4—496 **2 Claims**



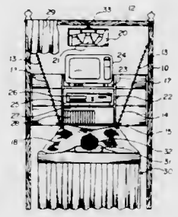
1. A winterizing kit for a swimming pool which includes a skimmer throat connected to a side wall of the swimming pool and communicated with the interior of the swimming pool through an opening in the side wall of the swimming pool to provide flow water into the skimmer throat during use of the pool, an annular faceplate extending peripherally of the opening in the wall of the pool, said faceplate being positioned interiorly of the wall, an annular gasket between the faceplate and pool wall and fasteners extending through the faceplate, gasket, pool wall and connected to the skimmer throat to permanently secure the faceplate to the interior of the pool wall and skimmer throat, said kit comprising said faceplate being provided with internally threaded bores therein spaced from the fasteners extending through the faceplate, a cover plate overlying the faceplate and forming a closure for the annular faceplate and opening, a gasket interposed between the cover plate and faceplate, and fastening means extending through the cover plate and gasket and into the threaded bores in the faceplate without extending inwardly of the faceplate for removably securing the cover plate and gasket to the faceplate in sealed relation to form a closure for the opening through the annular faceplate, annular gasket, opening in the wall and skimmer throat to prevent entry of chemically treated water, debris and the like into the skimmer throat during periods of non-use of the swimming pool with the skimmer throat being closed by installation of the cover plate and gasket onto the faceplate without removing or altering the faceplate, said cover plate being an imperforate plate having a periphery generally coinciding with the periphery of the annular faceplate, the gasket between the cover plate and faceplate being an imperforate resilient member forming a seal between the cover plate and faceplate, said fastening means removably securing the cover plate to the faceplate including screw threaded fasteners extending through apertures in the cover plate and imperforate gasket, said internally threaded bores in the faceplate receiving the inner ends of the screw threaded fasteners without extending inwardly of the faceplate to secure the cover plate and gasket in place in sealed relation to the faceplate.

4,903,352
FLUID FLOW MASSAGING APPARATUS
Eiichi Murakami, Chiba, Japan, assignor to Rally Master Co., Ltd. and All Max Co. Ltd., both of Tokyo, Japan
Filed Jan. 23, 1989, Ser. No. 299,375
Claims priority, application Japan, Feb. 5, 1988, 63-26303
Int. Cl.[4] E03C *1/02;* **A61H** *33/02*
U.S. Cl. 4—541 **13 Claims**



1. A fluid flow massaging apparatus, comprising:
a first bathtub means having four side walls and a bottom wall;
a second bathtub means disposed within said first bathtub means, having four side walls and a bottom wall, and having an inner volume sufficient to accommodate a person to be massaged by a flow of fluid;
first and second hole means defined within two oppositely facing side walls of said four side walls of said second bathtub means such that said first hole means defines a fluid inlet into said inner volume of said second bathtub means, and said second hole means defines a fluid outlet from said inner volume of said second bathtub means;
means defining a space between said first and second bathtub means for fluidically interconnecting said fluid outlet with said fluid inlet such that a fluid circuit is defined within said apparatus as including said fluid inlet, said inner volume of said second bathtub means, said fluid outlet, and said space fluidically interconnecting said fluid outlet with said fluid inlet; and
means operatively mounted in association with at least one of said first and second hole means for causing said fluid to flow and circulate throughout said apparatus along said fluid circuit.

4,903,353
APPARATUS FOR SUSPENDING BEDCLOTHES
Ki Dong Park, 920 H. Street, N.E., Washington, D.C. 20002
Filed Dec. 14, 1988, Ser. No. 284,330
Int. Cl.[4] A47C *21/02, 21/04*
U.S. Cl. 5—2 R **8 Claims**



1. An apparatus for suspending a bedclothing which comprises:
bed frame support means,
a pair of flexible members connected to said bed frame support means, said flexible members dividing into a pair of divided flexible members, respectively,

grasping means mounted to the ends of said divided flexible members, respectively,

a housing containing a plurality of light emitting members, said housing being adjustably suspended by flexible members to said bed frame support means for upwardly moving from and downwardly moving to the occupant of the bed to operate as a sauna, and

a TV set and a VCR set supported by said bed frame support means for being used by the occupant of bed, whereby the bedclothing hangs by the flexible members to suspend the bedclothing for relieving an occupant of a bed from the weight of the bedclothing and treating various regions of the human body of the occupant.

4,903,354

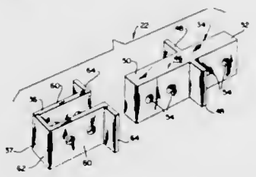
HEADBOARD CONNECTION DEVICE

John Yeh, 660 S. Aberdeen, Anaheim Hills, Calif. 92807

Filed Apr. 17, 1989, Ser. No. 338,629

Int. Cl.[4] A47C *17/02, 19/02*

U.S. Cl. 5—53 R **3 Claims**



1. In combination, a sofa bed or a daybed having a frame structure including:

a pair of oppositely disposed sideboards and a headboard, wherein said headboard comprises a first half section and a second half section, said half sections being secured together to define a single elongated headboard, said half sections having upper and lower rail members provided with elongated end slots formed in the free ends of said rail member; and connecting means interposed between said half sections to secure said half sections together wherein said connection means comprise a brace member defined by an elongated body member with a pair of connector lug members defined by its end portions and a pair of oppositely disposed arm members which extend laterally from a central portion of said body member, said connecting means further including a joint plate for mounting in at least one of said end slots, said joint plate being formed to receive a connector lug member of said brace member, said joint plate having a pair of side plate members, a bottom plate member and outwardly formed flange members formed in said side plate members whereby said arm members of said brace member abut said respective flange members, said connecting means further including means for fixedly securing said connector lug members to said half sections to form a single headboard frame member by positioning a pair of connector lug members in respective end slots of said upper and lower rail members.

4,903,355

TORSO SLING FOR A HOIST FOR LIFTING AND SUPPORTING A PHYSICALLY DISABLED PERSON

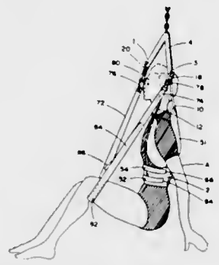
Karen M. V. Hickerson, 296 North St., Rural Hall, N.C. 27045

Filed Jul. 28, 1989, Ser. No. 387,176

Int. Cl.[4] A61G *1/00, 7/10*

U.S. Cl. 5—89 **7 Claims**

1. A torso sling for lifting and supporting a physically disabled or handicapped person by a hoist having hanger means comprising torso support means adapted to extend around and be fitted to the torso of a wearer in the region between the waist and armpits, said torso support means including an elongate support strap having an upper edge and a lower edge, said upper edge being greater in length than said lower edge so that the perimeter formed by said support strap upper edge, when said support strap is fitted to a wearer, is greater than the perimeter formed by said support strap lower edge; suspension



means extending upwardly from said support strap in the region below the armpits of the wearer and engaging the hanger means of the hoist; the underarm support means carried by said suspension means and adapted to extend beneath and support the armpits of the wearer.

4,903,356

BEDCLOTHES

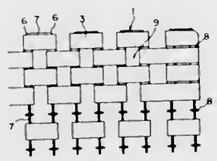
Tsutomu Morisaki, 791-2, Nakakoga, Oaza, Okawa-shi, Fukuoka-ken, Japan

Continuation-in-part of Ser. No. 35,393, Apr. 7, 1987, abandoned. This application Oct. 21, 1988, Ser. No. 261,034

Claims priority, application Japan, Dec. 6, 1986, 61-290973

Int. Cl.[4] A47G *9/06;* **A47C** *27/00*

U.S. Cl. 5—420 **7 Claims**



1. A mat for use as an over-mattress having an elongated configuration which comprises a cover (4), a substrate sheet (10), substantially small block-like pieces (3) and a cushion means (2), said cushion means positioned at one end of said elongated configuration, said substantially small block-like pieces having holes or conduits extending therethrough, and arranged in a zig-zagged juxtaposed position to each other but overlapped only at their end portions to form spaces therebetween, said end portions connected by connecting means such as cord or wire, said connecting means extending through said holes in said block-like pieces to thereby connect said end portions together, said block-like pieces extending throughout said elongated configuration except for said cushion means (2) said block-like pieces having at least portions of their corners chamferred, said block-like pieces made of paulownia and having a substantially hexahedral shape, said cover enclosing the entire said over-mattress.

4,903,357

PILLOW OR TICKING PROVIDED WITH AN UNREMOVABLE INFORMATION MEDIUM

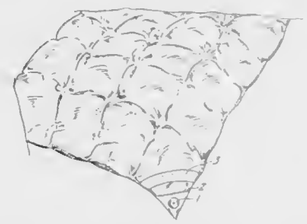
Hans Kruchen, and Ernst Kruchen, both of Telgte, Fed. Rep. of Germany, assignors to Kruchen Gmbh, Telgte, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,689

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 8808316[U]

Int. Cl.[4] A47G *9/00*

U.S. Cl. 5—434 **5 Claims**



1. A pillow or the like comprising a tick filled with filling and having a corner with a button fixed thereto, said button having a shank which is riveted to a backing plate, said button bearing information about the pillow.

4,903,358

FIRE-RESISTANT SEATING, IN PARTICULAR AIRCRAFT SEATS

Hubert S. G. Creyf, Brugge, and Eddie R. Du Prez, Brakel, both of Belgium, assignors to Recticel, Brussels, Belgium

Filed Sep. 22, 1988, Ser. No. 247,937

Claims priority, application Netherlands, Sep. 22, 1987, 8702253

Int. Cl.[4] B64D *25/04;* **A47C** *5/12*

U.S. Cl. 5—459 **3 Claims**



1. Fire-resistant seating, such as aircraft seats, which comprises at least a soft, supporting material and a cover, between which there is a fire-resistant intermediate layer, which is a combination of a layer of polyurethane foam which has been rendered fire-resistant having a thickness between 1 mm to 15 mm, and a fiberglass fabric, characterized in that the fire-resistant intermediate layer is a combination of a layer of fiberglass fabric, which is firmly attached to the soft supporting material, and a layer of polyurethane foam, which has been rendered fire-resistant and is firmly attached both to the layer of fiberglass fabric and to the cover.

4,903,359

BODY SUPPORT FOAM PAD WITH ADAPTIVE SHEAR STRESS CONTROL

John E. Rogers, P.O. Box 1437, Blue Jay, Calif. 92317

Filed Mar. 15, 1989, Ser. No. 323,676

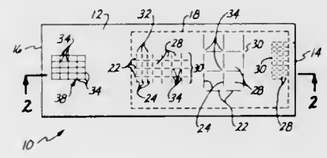
Int. Cl.[4] A47C *27/14;* **A61G** *7/00*

U.S. Cl. 5—464 **15 Claims**

1. In a body support pad of compressible foam having a supporting surface and substantially uniform thickness, the improvement wherein:

at least a portion of said supporting surface is sliced without removal of foam material to a select depth lesser than said thickness in a pattern defining an array of contiguous polygonal blocks each having a load bearing surface and a plurality of corners extending normally to said surface into said pad;

each said block being connected to each other block immediately adjacent thereto by foam links integral with said pad said foam links defined by discontinuous cuts also defining sides of each said polygonal block;



said foam links being adapted and configured to rupture in response to predetermined shear force applied to said load bearing surface relative to any other of said adjacent blocks;

whereby said portion of said supporting surface is characterized by initially uniform load bearing characteristics for each said block but is permanently adaptive to the support requirements of particular users for relieving shear stress on a body resting on said supporting surface by selective rupturing of said foam links.

4,903,360

ARTICLE OF BEDDING

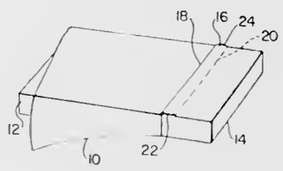
Aviyam Z. Friedman, Montreal, Canada, assignor to Med-I-Pant Inc., Montreal, Canada

Filed Oct. 24, 1988, Ser. No. 261,328

Claims priority, application Canada, Aug. 17, 1988, 575002

Int. Cl.[4] A47G *9/02*

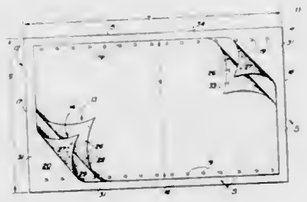
U.S. Cl. 5—485 **10 Claims**



1. An article of bedding, comprising a bedsheet or similar member, having opposed ends and opposed side edges, and having a pleat formed by a pair of oppositely-folded substantially parallel folds extending across the member intermediate said opposed ends, said folds forming said pleat being secured together by lateral seams, one adjacent each end of said pleat, and wherein that one of said parallel folds which would be uppermost in use is closer to a head-end of the member than the other of said parallel folds, and a pair of transverse seams extending one from each of the lateral seams to adjacent side edges of said member, each of said transverse seams joining said opposed lateral seams to edges of said member following removal from between said lateral seams and said adjacent side edges of said member equivalent to two webs of the pleat.

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4,903,361
COMPOSITE BED COVER
Thomas L. Tang, 7 Ridge La., Lincoln, Mass. 01773
Filed Dec. 16, 1988, Ser. No. 285,687
Int. Cl.[4] A47G *9/00*
U.S. Cl. 5—502 7 Claims

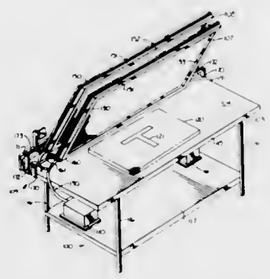


1. A composite bed cover comprising:
a substantially rectangular bed sheet having a pair of substantially parallel sheet side edges and spaced apart top and bottom sheet edges each joining different ends of said sheet side edges and extending transversely thereto;
sheet fastener means comprising openings in said bed sheet and disposed adjacent to each of said sheet side edges;
a substantially rectangular bed coverlet positioned above said bed sheet substantially greater weight than said bed sheet, said coverlet having a pair of substantially parallel coverlet side edges and spaced apart top and bottom coverlet edges each joining different ends of said coverlet side edges and extending transversely thereto; and
coverlet fastener means retained by said coverlet and disposed adjacent to each of said coverlet side edges and adapted for fastenable engagement with said sheet fastener means, said coverlet fastener means comprising elements spaced apart along said coverlet side edges and adapted to be received and retained by said openings in said bed sheet, and wherein a marginal portion of said coverlet extends beyond said top, bottom and side edges of said sheet with said sheet fastener means engaged with said coverlet fastener means.

4,903,362
SULFITED FATS AS OILING AGENTS FOR LEATHER AND SKINS
Hans-Herbert Friese, Monheim; Friedrich Pieper, Langenfeld-Richrath, and Reinhard Bosse, Duessledorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany
Division of Ser. No. 53,998, May 26, 1987, Pat. No.
Claims priority, application Fed. Rep. of Germany, May 26, 1986, 3617691
Int. Cl.[4] C14C *5/00*; C07C *143/90*
U.S. Cl. 8—94.23 11 Claims

1. An oiling agent for the treatment of leather and skins comprising
I. from about 10 to about 95% by weight of an oxidized sulfited fat mixture comprising
A. at least one sulfited fat having an iodine number before sulfitation below about 100; and
B. at least one sulfited fatty acid ester having an iodine number before sulfitation of from about 60 to about 100, and containing from 12 to 24 carbon atoms in a linear or branched, natural or synthetic fatty acid residue, and wherein the ester residue is from a monofunctional C_1–C_5 alcohol;
wherein the ratio by weight of A to B is from about 9:1 to about 1:4; and
II. one or more of a sulfated fat, a sulfonated fat, a sulfochlorinated fat, a phosphated fat, a neutral oil, an anionic emulsifier, and a nonionic emulsifier.

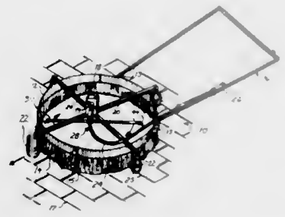
4,903,363
MULTIPLE DYE SETTING STEAM CHAMBER APPARATUS AND METHOD
Ronald B. Robbins, 619 Meadowbrooke Ct., Duncanville, Tex. 75137
Continuation-in-part of Ser. No. 104,681, Oct. 5, 1987, Pat. No. 4,828,567. This application May 2, 1989, Ser. No. 346,468
Int. Cl.[4] D06B *11/00, 23/18*
U.S. Cl. 8—149.3 10 Claims



1. An apparatus for simultaneously setting dye on multiple pieces of a dye receiving fabric by use of steam heat comprising:
(a) an upper and a lower cover; each of said covers being adapted to be placed in covering and surrounding relationship to the dye on a respective piece of the fabric so as to form a chamber with the dye of a respective piece of fabric therein; said upper and lower covers being in a stacked configuration relative to one another when setting dye such that a top surface of the lower cover provides a supporting surface for a piece of fabric wherein dye is being set within the chamber associated with said upper cover;
(b) steam generation means;
(c) means for conveying steam produced by said steam generation means to the chambers associated with said upper and lower cover when said both of said covers are in a dye setting orientation thereof.

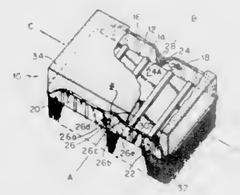
10. A method for simultaneously setting dye on multiple pieces of a dye receiving fabric comprising the steps of:
(a) placing a first piece of said fabric on a planar surface;
(b) placing a first cover in closely spaced relationship over said first piece of fabric so as to form a first chamber with dye on said first piece of fabric therein; said first cover having a substantially planar and insulative upper interior surface;
(c) placing a second piece of fabric on an upper surface of said first cover;
(d) placing a second cover over said second piece of fabric so as to form a second chamber with dye on said second piece of fabric therein;
(e) generating steam means; and
(f) simultaneously directing said generated steam to said first and second chambers while said first and second pieces of fabric are within said first and second chambers respectively and said first and second covers are in covering relationship to said first and second pieces of fabric thereby setting dye on said first and second pieces of fabric generally simultaneously.

4,903,364
CLEANING UNDERLYING SURFACES
Jerry T. Long, 11208 Cowlitz Dr. S.E., Olympia, Wash. 98503
Filed Jul. 8, 1988, Ser. No. 216,285
Int. Cl.[4] A47L *11/26*
U.S. Cl. 15—50 R 8 Claims



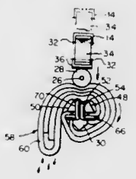
1. Mobile apparatus for cleaning an underlying surface and optionally other adjacent surfaces, comprising
spraying means adapted to rotate in a given plane for dispensing cleaning liquid,
having a plurality of spray tips at spaced intervals;
circumferential shielding means for the rotating spray means,
including completely circumferential brushing means; and
carriage means movably supporting the foregoing means on the underlying surface,
having supporting wheels normally in contact with the underlying surface;
wherein the spray tips are adjustable in position about horizontal pivots tangential to the plane of rotation and arranged at even circumferential intervals on supporting wands rotatable in such plane.

4,903,365
RESILIENT SCRUB BRUSH
Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566
Filed Sep. 28, 1988, Ser. No. 250,080
Int. Cl.[4] A47L *13/12, 13/26*; A46B *11/00*
U.S. Cl. 15—110 9 Claims



1. An article, comprising flexible scrub brush having a flat shape when not in use and having a major axis, end walls, side walls, and a minor axis intersecting the side walls of the article,
a concave, integrally formed recess in each said ride wall intersection of said minor axis and the corresponding side wall, so that the brush, when used, bends around the minor axis to form two longitudinal halves to be resiliently returned to its flat shape when not being used, said side walls each comprising main side wall portions and a web portion connecting the main side wall portions,
wherein each said recess is defined by one said web portion and each web portion comprises a first inclined surface and a second inclined surface inclined with respect to the main side wall portions and to each other, with each said inclined surface being polygonal and planar in shape.

4,903,366
SELF WRINGING MOP
Peter Traglia, 3306 Crescent St., Long Island City, N.Y. 11106
Filed Aug. 26, 1988, Ser. No. 237,276
Int. Cl.[4] A47L *13/144*
U.S. Cl. 15—119 R 6 Claims



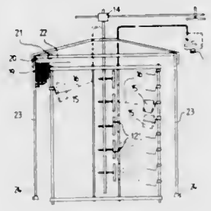
1. A self-wringing mop comprising, a main frame, a wringer roller received in said main frame, providing a first engagement means against a plurality of mop strips removably received on a mop strip support frame, and a wringer block received in said main frame, for retaining said mop strip support frame and providing a second engagement means against said mop strips for wringing water from said mop strips, by squeezing said mop strip between said roller and said wringer block, wherein said main frame includes a channel having a pair of rods secured within by suitable fasteners, and said pair of rods extend downward on each side of said channel and each are doubled to form a space that freely receives an end shaft fixedly secured in said wringer roller having an outer peripheral surface normally in engagement with a pair of channel brackets fixedly secured to a compression plate, wherein an opening is provided in each end of said compression plate and receives said pair of rods and said rods serve as guide means for said compression plate when said compression plate and said wringer roller are moved upward during wringing of said mop wherein a loop is formed in an end of said rods and removably receives ends of said mop strip support frame, and spring pressure means for normally engaging said channel brackets with said wringer roller, wherein said spring pressure means comprises a pair of spaced apart and removable rubber compression strips having pins projecting from each end, and said pins of said compression strips are removably received in cut-out openings provided in edges of said channel and said channel brackets, and said compression strips are normally arcuate in configuration when mounted in said main frame, and a wringer handle is formed in one end of said mop strip support frame and is received in one said loop of said rods where by said handle may be rotated by an operator to wring said mop.

4,903,367
APPARATUS FOR PNEUMATIC DEDUSTING FOR TEXTILE MACHINES
Heinz Brunner, Albstadt-Ebingen, Fed. Rep. of Germany, assignor to Sipra Patententwicklungs-und Beteiligungsgesellschaft mbH, Albstadt, Fed. Rep. of Germany
Filed Aug. 17, 1988, Ser. No. 233,277
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728985
Int. Cl.[4] B08B *5/02*
U.S. Cl. 15—301 14 Claims

1. An apparatus for pneumatic dedusting of yarn supply supports and thread guiding elements of textile machines, comprising filter lattice wall which substantially completely surrounds a dust forming region occupied by said yarn supply supports and said thread guiding elements on its periphery, and at least one blowing element which forms an air stream in said

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dust forming region, said blowing element being oriented and positioned with respect to said filter lattice wall so that said air



stream from said blowing element exits from said dust forming region and is directed toward said filter lattice wall.

4,903,368

ROAD SWEEPING VEHICLES

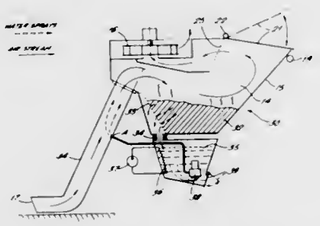
Anthony J. Duthie, Horsham, and Clive F. Offley, Croydon, both of United Kingdom, assignors to Johnston Engineering Limited, Dorking, United Kingdom

Filed Jun. 15, 1989, Ser. No. 368,981

Claims priority, application United Kingdom, Jun. 16, 1988, 8814308; Jul. 15, 1988, 8816901

Int. Cl.[4] E01H *1/08*

U.S. Cl. 15—339 **6 Claims**



1. A suction type road sweeping vehicle comprising a self repelled chassis, an air-tight container mounted on the chassis and communicating with a fan for generating a vacuum within said container, at least one suction conduit extending at one end into the container and being provided at the other end with a suction pick-up nozzle, at least one hydraulically driven component and a hydraulic oil cooling system comprising means for introducing water into the at least one suction conduit such that it mixes with a cooling stream of air flowing through the at least one conduit into the air tight container, means for separating cooled water from the air and debris carried thereby and means for cooling hydraulic oil from the at least one hydraulically driven component utilising the cooled water.

4,903,369

SUCTION NOZZLE DEVICE FOR USE IN VACUUM CLEANER

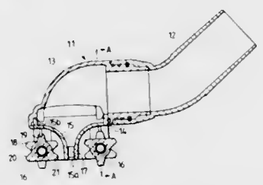
Hidenori Kitamura, and Yoshitaka Murata, both of Shiga, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 4, 1988, Ser. No. 228,090

Claims priority, application Japan, Aug. 6, 1987, 62-196710; Aug. 11, 1987, 62-122615[U]; Nov. 18, 1987, 62-175895[U]

Int. Cl.[4] A47L *9/04*

U.S. Cl. 15—384 **11 Claims**



1. A suction device for use in a vacuum cleaner comprising:

a housing;

a nozzle disposed in said housing and coupled through a suction passage to an electric blower of said vacuum cleaner, said nozzle means having a suction opening at its end portion which is arranged so as to face an object to be cleaned; and

at least one pair of rotatable rollers which are disposed in said housing and each of which is cylindrically shaped and has on its outer circumferential surface a plurality of tooth-portions which radially protrude from said outer circumferential surface and each of which is elongated by a predetermined length in the direction of the rotational axis of said rotatable rollers, each of said pair of rotatable rollers being rotatable forwardly or backwardly in accordance with movement of said suction nozzle device and said tooth-portions being arranged to be successively brought into contact with said object so as to tap a surface of said object in response to the rotations of said pair of rotatable rollers.

4,903,370

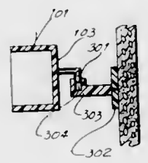
CURTAIN TIEBACK WITH A HOLDER FOR INTERCHANGEABLE DECORATIVE FRONTS

Suzanne L. Erdmann, 10832 S. 112th St., Franklin, Wis. 53132

Filed Sep. 19, 1988, Ser. No. 245,913

Int. Cl.[4] E05D *15/00;* **A47H** *1/00*

U.S. Cl. 16—87.2 **2 Claims**



1. A curtain tieback comprising:

a. a hollow cup-shaped member;

b. a clip, formed from a rod which has been bent to form a right angle and attached to the exterior of the bottom of the cup-shaped member on one end;

c. an elbow member, having a hole formed therein, which is in turn attached to a base member by suitable means, the clip being rotatably attachable to the elbow member through the hole;

d. a plate, made of magnetic material, which is attached to the bottom of the cup-shaped member; and

e. a second member comprising a magnet and a front piece which is attached to one end of the magnet, said magnet being slightly smaller in size and similar in shape to the interior of the cup-shaped member so that the magnet may be slidably inserted in said cup-shaped member, the front piece being of decorative shape and providing the means for grasping the second member for removal from attachment to the cup-shaped member.

4,903,371

PROCESS AND APPARATUS FOR THE TYING OF ARTICLES, ESPECIALLY MEAT-BASED PRODUCTS

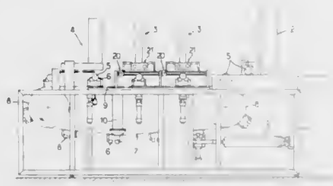
Daniel Villemin, Ormesson, France, assignor to Boca-Quest and Unifrains-Union Financiere Pour Le Developpement De L'Economies Cerealiere, both of Cedex, France

Filed Feb. 26, 1988, Ser. No. 161,166

Claims priority, application France, Feb. 26, 1987, 87 02589

Int. Cl.[4] B65B *63/04*

U.S. Cl. 17—1 R **14 Claims**



1. Apparatus for the tying of articles, especially articles of a type and/or consistency making them difficult to handle, this tying involving carrying out, round each article to be tied, at least two looping operations in parallel or intersecting planes by means of a tie and joining the ends of the tie together after at least one looping, comprising at least one fixed tying station, at least one movable support for the article to be tied, this support being divided into several parts separated in planes corresponding to the planes in which the article is to be tied, and means for shifting the support relative to the tying station or tying stations successively into several positions allowing the tying operations to be carried out in the said planes on the article resting on the support.

4,903,372

PORTABLE DEER POLE

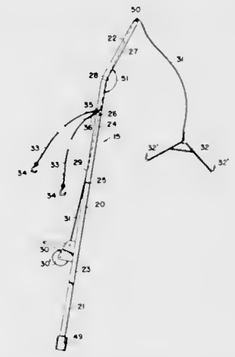
Carl E. Jones, Rt. 2, Box 2635, Fitzgerald, Ga. 31750

Filed Jul. 7, 1988, Ser. No. 215,999

Int. Cl.[4] A22B *1/00*

U.S. Cl. 17—44.2 **14 Claims**

1. A portable disassemblable deer pole for releasable attachment to a rear portion of a pickup truck comprising an elongated tubular boom having separate proximal and distal end portions connected to each other to form said boom, connecting means secured to said proximal end portion for attaching said boom to a rear bumper of a pickup truck, a pulley attached to said distal end, a winch outwardly affixed to said proximal end portion of said boom spaced above said connecting means, a first passageway through said distal end portion generally above and adjacent said winch, a cable windable on said winch and extending through said first passageway and through the hollow of said distal end portion and out a second passageway to a free end extending over and engaging said pulley whereby said cable extends outwardly of said boom below said first passageway and inwardly of said boom above said first passageway to enable ready disassembly of said distal end portion from said proximal end portion, a spreader being attached to said free end of said cable upon which an animal carcass may be hung for skinning, said support means attachable at one end



to said distal end portion and attachable at the other end to said truck.

4,903,373

SCALLOP EVISCERATING MACHINE

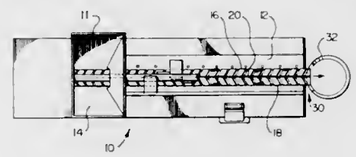
Joseph R. C. Chouinard, Liverpool, and Richard R. Cowmeadow, Halifax, both of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne Des Brevets Et D-Exploitation Limitee, Ottowa, Canada

Filed Jun. 17, 1988, Ser. No. 208,245

Claims priority, application Canada, Jun. 18, 1987, 540001

Int. Cl.[4] A22C *25/16*

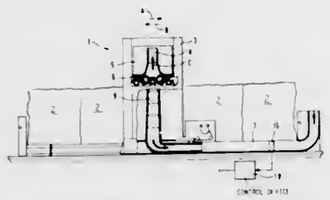
U.S. Cl. 17—53 **9 Claims**



1. Apparatus for eviscerating scallops after they have been shucked comprising an elongated generally horizontally extending trough portion for receiving said scallops, said trough portion having a bottom slot, and comprising first and second elongated rolls disposed in side-by-side relationship in said bottom slot, said rolls defining a nip in a vertical plane between said rolls, said first roll having a knurled surface and being provided with a left-hand-thread helical groove, said second roll having a knurled surface and being provided with a right-hand-thread helical groove, said apparatus having means for rotating said rolls in opposite directions so that their surfaces enter said nip in a vertically downward direction whereby viscera tend to be pulled from muscle portions of the scallopw and through said nip while said grooves move the scallops longitudinally along the rolls toward a discharge region, said apparatus having rotary cleaning brushes engaging said rolls below said slot and said brushes engaging flicker bars to clean the brushes.

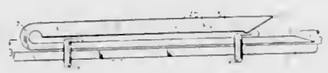
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4,903,374
APPARATUS FOR DETERMINING QUANTITIES OF FIBER CONVEYED THROUGH A DUCT
Fritz Hösel, Mönchengladbach, Fed. Rep. of Germany, assignor to Trutzschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany
Filed Mar. 31, 1989, Ser. No. 331,371
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1988, 3811332
Int. Cl.[4] D01B *7/00*
U.S. Cl. 19—80 R 16 Claims



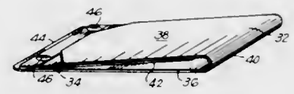
1. In an apparatus for determining quantities of textile fiber material during conveyance thereof by an air stream through a duct, including a sensor unit situated at the duct and arranged for monitoring the stream flowing through the duct and composed of a fiber/air mixture; the improvement wherein said sensor unit comprises a plurality of side-by-side situated light emitters forming an emitter bank and a plurality of side-by-side arranged light detectors forming a detector bank; said detector bank being situated spaced from and opposite to said emitter bank for providing a passage for the stream therebetween.

4,903,375
POCKET CLIP FOR EYEGLASSES
Jack E. DiFranco, 1077 River Rd., Edgewater, N.J. 07020
Filed Jul. 7, 1989, Ser. No. 376,647
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—3 C 10 Claims



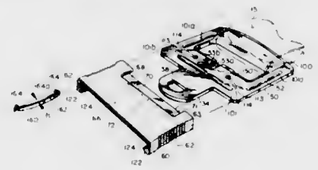
1. A clip for yieldably attaching eyeglasses, having temple bars, to a support such as the fabric edge of a pocket comprising:
(a) an elongate inner leg having short first and second ends;
(b) an elongate outer leg having short first and second ends;
(c) a joining member springably joining said first and of said inner leg to said frist and of said outer leg and maintaining a space between said inner and outer legs with spring bias for gripping said fabric edge therebetween; and
(d) at least two elastic O-rings, having an inner diameter sufficient to tightly encircle said inner leg and one of said temple bars;
(e) at least two groove means for engaging said O-rings, said groove means in the surface of said inner leg adjacent said outer leg and arranged transversely to the long axis of said inner leg, wherein said O-rings tightly encircle said temple bar and said inner leg to securely attach said clip to said temple bar and said groove means securely engage said O-rings to prevent movement therebetween.

4,903,376
CARD HOLDER
Jean-Pierre Rousseau, 96 Rue de Miromesnil, 75008, Paris, France
Filed Apr. 18, 1988, Ser. No. 182,693
Int. Cl.[4] B42F *1/00*
U.S. Cl. 24—67.9 6 Claims



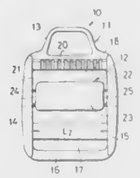
1. A holder for card-like items, comprising a generally planar base having first and second opposed ends; a solid, planar arm; means supporting said first arm above said base and pivotally connecting said first arm to said first end of said base; a second solid, planar arm overlying said first arm, said arms each dimensioned in plan to be substantially equal in size to the card-like item; and means supporting said second arm in said overlying relationship and pivotally connecting said second arm to said second end of said base; said first and second arm pivot means being biased to urge said first and second arms together in an abutting, parallel orientation such that a card-like item inserted between said first and second arms pivots both of said arms apart whereby the item is retained by the opposed, parallel faces of said arms therebetween.

4,903,377
FREE-FALLING, SELF-LOCKING ADJUSTABLE TIP ASSEMBLY
Gerald A. Doty, Crown Point, Ind., assignor to Gateway Industries, Inc., Olympia Fields, Ill.
Filed May 31, 1988, Ser. No. 200,684
Int. Cl.[4] A44B *11/06*
U.S. Cl. 24—194 5 Claims



1. A tip assembly for free sliding mounting on a safety belt, the tip assembly comprising:
a tongue plate for connection to a buckle, the tongue plate having lateral edges,
snubber slide means movable in a forward and rearward direction and slidably engaged with the tongue plate for gripping the belt,
channel-shaped region walls at the lateral edges of the snubber slide means receiving the lateral edges of the tongue plate,
the snubber slide means being slidable on the tongue plate to a belt gripping position when the tip assembly is mounted on a belt that is under tension and the tongue plate is connected to a buckle,
the snubber slide means being slidable to a position that will allow sliding of the tip assembly downwardly along the belt when the belt is in a vertical position and the tongue plate is disconnected from the buckle, and
said tongue plate being a substantially flat plate having top and bottom sidewalls,
said snubber slide means having portions covering the top and bottom sidewalls and the lateral edges of the flat plate,
the snubber slide means having an opening through which the belt passes, and
dampening means including a spring located between at least part of the portions of the tongue plate and the snubber slide means that engage one another to urge the lateral edges of the flat plate in a lateral direction against the channel-shaped region walls to reduce noise between the tongue plate and the snubber slide means.

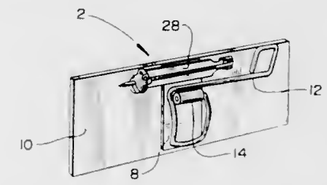
4,903,378
STRAP ADJUSTMENT ASSEMBLY
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 515,036, Jul. 18, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 726,165
Claims priority, application Japan, Aug. 12, 1982, 57-122729[U]
Int. Cl.[4] A44B *11/10*
U.S. Cl. 24—196 3 Claims



1. A strap adjustment assembly comprising:
(a) a molded connector frame of synthetic resin including
(1) a grip base having a flat strap bearing surface;
(2) a pair of spaced legs extending integrally from opposite ends of said grip base and having a pair of transversely aligned slots, respectively, spaced from said flat strap bearing surface of said grip base by a distance, said slots having an oblong shape, and
(3) a connecting bar extending integrally between said legs remotely from said grip base; and
(b) a strap retainer of molded synthetic resin including
(1) a central strap engagement portion, and
(2) a pair of arms extending integrally from opposite ends of said central strap engagement portion and loosely fitted in said slots, respectively, said arms being disposed out of coaxial alignment with said central strap engagement portion and toward said connecting bar, said central strap engagement portion having a flat strap pressing surface extending parallel to said flat strap-bearing surface for frictionally pressing a strap end portion against said flat strap-bearing surface, said flat strap pressing surface being transversely spaced from said arms, at least by said distance, each of said arms having an elliptical cross section and being prevented from rotating in the respective oblong slots, said grip base, said legs, said connecting bar and said strap retainer being disposed in a plane lying substantially in the middle of the thickness of said strap adjusting assembly, said connector frame and said strap retainer having been molded in an assembled condition with said arms in said slots.

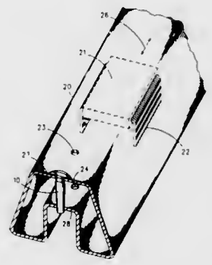
4,903,379
PIN AND CLIP ARRANGEMENT FOR NAME TAGS AND BADGES
Charles C. Uchiman, 2604 Sheridan Rd., Evanston, Ill. 60201
Filed Jun. 16, 1988, Ser. No. 207,548
Int. Cl.[4] A44B *21/00*; A44C *3/00*
U.S. Cl. 24—351 28 Claims

1. As part of a fastening system on a first article for fastening at least a second article, a releasable grip fastener comprising:
a substantially planar support surface; and
a gripping member mounted to said support surface, said gripping member comprising:
a torsionable gripping shaft arranged substantially parallel to said support surface, for gripping said second article between said support surface and said gripping member;
a first torsioning arm means, for biasing said gripping shaft, a first end of said first torsioning arm means attached to a first end of said gripping shaft and extending substantially radially away from said gripping shaft, and a second end of said first torsioning arm means braced against said support surface;
a second torsioning arm means for torsioning said gripping shaft, having a length shorter than said first arm, a first end of said second torsioning arm means attached to a



second end of said gripping shaft and extending substantially radially from said gripping shaft, with a second end of said second torsioning arm means rotatably engaged with said support surface to allow rotation of said gripping shaft away from said support surface transversely to its length, and said second torsioning arm means attached at a radial position on said gripping shaft for causing torsion in said gripping shaft which forces said gripping shaft toward said support surface to engage said second article; and
a release lever for releasing said second article, mounted to said second end of said first torsioning arm means, extending away from said support surface and said first arm, such that rotation of said release lever toward said support surface forces said gripping shaft away from said support surface to release said second article.

4,903,380
RETAINING PIN
Kenneth D. Kirby, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 1, 1989, Ser. No. 317,417
Int. Cl.[4] A47B *21/00*
U.S. Cl. 24—453 7 Claims



1. A retaining pin for insertion into a first round hole in alignment with a second round hole which is spaced apart from the first round hole, comprising: a cylindrical shank having a

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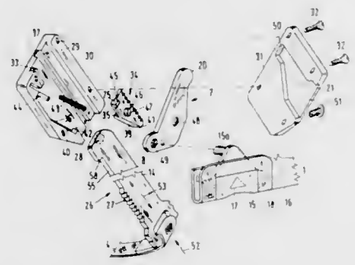
first end and a second end, the first end being truncated and the shank being tapered toward the second end up to a predetermined distance from the second end to form a gentle shoulder before reaching the second end wherein the predetermined distance is such that the shoulder can pass through only the first round hole; a semi-spherical head formed on the second end of the shank having a flat bottom joining the shank and rising gradually to peak of top head to provide the spherical head.

4,903,381

FASTENER MECHANISM FOR THE CHIN STRAP OF A HELMET

Artur Föbl, Auf der Halde 28, 7060 Schorndorf, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 303,541
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802526; Dec. 13, 1988, 3841832
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—585 **20 Claims**



1. A fastener mechanism for the fastener part of a chin strap of a helmet that includes a helmet shell for head protection, with said fastener mechanism comprising:

an insertion lock that is secured to said helmet shell and has a receiving channel for receiving said fastener part of said chin strap, with said fastener part being longitudinally displaceably guided in said receiving channel and having two narrow sides, on at least one of which are provided arresting teeth that are disposed one after the other in the longitudinal direction of said fastener part;

an arresting member that is disposed in said insertion lock on one side of said receiving channel, with said arresting member being adapted to cooperate with said teeth of said fastener part and being disposed essentially alongside said fastener part at least nearly in a plane therewith;

a guide surface provided by said arresting member in a location at an acute angle to said receiving channel, said guide surface being braced against a counter surface in said insertion lock and located with the same angle relative to said receiving channel, said arresting member having force applied thereto in a direction as to said receiving channel longitudinally of said guide surface, said arresting member having toothing consisting of multiple teeth arranged one after another in sequence in the longitudinal direction of said receiving channel;

means for exerting force on said arresting member in a direction toward said fastener part, with said arresting member being adapted to assume an engagement position with said fastener part that prevents said fastener part from being pulled out of said insertion lock, i.e. prevents said chin strap from being lengthened or released; and

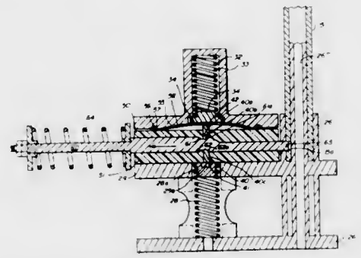
handle means for shifting said arresting member into a disengaged position wherein said fastener part is released.

4,903,382

PRESSURE ARMED RELEASE DEVICE

Jimmy L. Held, and Charles E. Tallerino, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 30, 1989, Ser. No. 400,849
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—602 **11 Claims**



1. An apparatus for releasing a member after a predetermined pressure cycle comprising:

means for housing the member in a slidable relationship;

means mounted in the housing means for latching the member in a releasable engagement thereof in a first position and a second position and release thereof at a third position attainable only after said second position has been effected;

means mounted in said housing and abutting the latching means for biasing it to said second position when said apparatus encounters a first ambient pressure; and

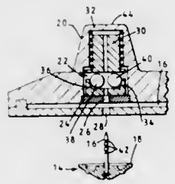
means disposed in said housing and abutting said latching means when said latching means is in said second position for displacing it to said third position to assure said release of said member when a said apparatus is subjected to a second ambient pressure which is at a predetermined magnitude that is less than said first ambient pressure, the displacing means includes a flexible diaphragm seared on an O-ring in a nonslidable relationship and an appropriately shaped solid stop to prevent damage of said flexible diaphragm at said first ambient pressure and at pressures greatly in excess of said first ambient pressure.

4,903,383

ANTI-THEFT FASTENING

Brian I. Gartshore, Leicester, United Kingdom, assignor to ID Systems International BV, Zwolle, Netherlands

Filed Mar. 18, 1988, Ser. No. 169,812
Int. Cl.[4] G08B *13/14*
U.S. Cl. 24—706.8 **7 Claims**



1. An anti-theft fastening comprising:

a housing;

a retainer loosely received within said housing for axial movement therein along a first distance and having an axial bore therein;

an insert loosely received within said housing for axial movement with said retainer along a second distance and having a cup-shaped recess facing said retainer, said recess having a generally conical side wall tapering outwardly towards said retainer and said insert having a central bore coaxial with said retainer bore, the first distance being not greater than the second distance;

a plurality of retaining balls located in said cup-shaped recess between said insert and said retainer;

pin means for extending through said central bore and into said axial bore of said retainer;

resilient means for resiliently biasing said retainer towards said insert thereby causing said retaining balls to engage tightly and frictionally against said pin means when inserted into said bores and retain said pin means in said bores;

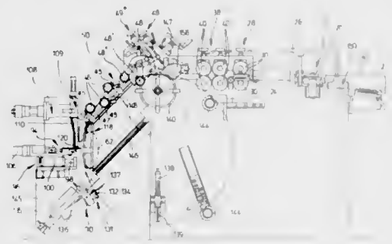
whereby tight engagement between said retaining balls and said pin means is maintained during axial movement of said insert with said retainer to thereby prevent withdrawal of said pin means by sharp impact upon said housing.

4,903,384

APPARATUS FOR THE MANUFACTURE OF A ROLL OF COILED, CLAMPED BARBED WIRE

Gerhard Lange, Reutlingen, Fed. Rep. of Germany, assignor to Wafios Maschinenfabrik GmbH & Co. Kommanditgeseilschaft, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,763
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721466
Int. Cl.[4] B21F *25/00*
U.S. Cl. 29—7.1 **15 Claims**



1. Apparatus for the manufacture of a circular roll of coiled barbed strap which is formed into loops, the loops of which are provided in pairs with clamps in an uneven number of at least three per loop and can be separated from each other in the axial direction of the roll in such a manner that each strap loop pivots about a screw-type line, in which the barbed strap is coiled, in which clamps are placed on every two adjacent loops according to the number of clamps per loop, and after the last clamp is placed, the barbed strap is cut, comprising:

a strap draw-in device, a coiling device, a clamping device and a cutting device;

wherein said coiling device and said clamping device are provided as a winderless coiling device and a single clamping device, respectively;

wherein as viewed in the direction of movement of and along the barbed strap a guide device is arranged in front of said single clamping device by means of which two separate sections of the barbed strap to be clamped are separated from each other by one loop, and are supplied with a desired permanent curve to said single clamping device via the strap draw-in device; and

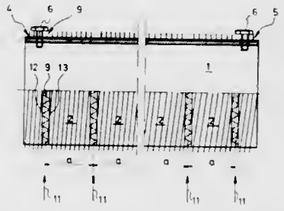
wherein a synchronization device is located near said single clamping device, which synchronization device engages positively, by means of movable members, without slip in two strap sections connectable by clamps, and has a counter coupled with said movable member that counts the movable member movements between two successive clamping steps.

4,903,385

METHOD FOR MAKING CARD ROLLER RINGS

Karl-Heinz Schmolke, Amselweg 15, Neuweiler 5, Fed. Rep. of Germany 7266

Filed Jan. 23, 1989, Ser. No. 300,517
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805281
Int. Cl.[4] B21D *53/12;* **B21H** *1/14;* **B21K** *1/02, 1/04*
U.S. Cl. 29—895.211 **8 Claims**



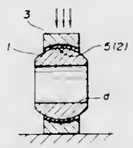
1. A method for making card roller rings, particularly for open-end spinning machines, wherein a sawtooth wire comprising a sawtooth portion extending normal to a foot portion is wound onto the ring over the length thereof and the leading and trailing ends of the sawtooth wire are secured to said ring, comprising winding said sawtooth wire (3) onto a tube (1) of multiple ring length (a) with said foot portion engaging the outer surface of said tube and said sawtooth portion extending outwardly therefrom, removing said teeth (7) of said sawtooth wire (3) in a circumferential plunge-cut groove (9) extending down to said foot portion (8) of said sawtooth wire (3) at spacings substantially corresponding to the ring length (a), securing said foot portion of said sawtooth wire windings (12, 13) within said plunge-cut grooves to said tube (1), and subsequently separating said tube (1) with said sawtooth wire wound thereon into individual card roller rings (2) substantially at the center of said plunge-cut grooves (9).

4,903,386

METHOD OF MANUFACTURING A SPHERICAL BEARING

Hirosbi Teramachi, 2-34-8, Higashi-Tanagawa, Setagaya-Ku, Tokyo, Japan

Division of Ser. No. 214,744, Jul. 1, 1988, Pat. No. 4,846,590. This application Mar. 14, 1989, Ser. No. 323,346
Claims priority, application Japan, Jul. 7, 1987, 62-167853
Int. Cl.[4] B21D *53/10*
U.S. Cl. 29—898.06 **1 Claim**



1. A method of manufacturing a spherical bearing in which an inner ring is slidably fitted in an outer ring through a liner, comprising the steps of:

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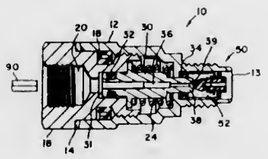
coating an outer surface of the inner ring with a resin made sheet;
embedding a metallic mesh member in the coated resin made sheet;
disposing the inner ring in a mold;
preparing a molten metal and casting the molten metal around said resin-made sheet coated on said inner ring to mold the outer ring;
filling the molten metal in meshes of said mesh member so as to bond the resin-made sheet to the outer ring; and
pressing said outer ring against an outer surface of said inner ring and spreading the same by applying a radially inwardly-oriented external force to said outer ring of a molding removed from said mold after cooling and hardening, thereby forming a very small gap between said resin-made sheet bonded to an inner periphery of said outer ring and said outer surface of said inner ring.

4,903,387

METHOD FOR MAKING A PROPORTIONING VALVE HAVING A UNITARY POPPET VALVE ASSEMBLY

John E. Steer, South Bend; Donald A. Crumb, Granger, both of Ind., and Richard A. Zander, Niles, Mich., assignors to Allied-Signal Inc., Morristown, N.J.

Division of Ser. No. 44,378, Mar. 27, 1987, Pat. No. 4,785,847.
This application Aug. 3, 1988, Ser. No. 227,946
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—888.46 **4 Claims**



1. A method for assembling a valve device, comprising the steps of (a) locating a piston within a body of the valve device, the piston having an opening for fluid flow therethrough and biased by resilient means, (b) securing the body and inserting into the device a member which engages the piston and displaces the piston a predetermined amount against the biasing force of said resilient means, (c) inserting into an open portion of the device a poppet valve assembly comprising an annular retainer with a poppet extending longitudinally and slidably through an opening in one end of the retainer, the poppet having a poppet head disposed opposite an abutment, the poppet head located within an interior cavity of the retainer and a spring extending between the retainer and poppet, the retainer having at least one lateral retainer extension extending away from an outer surface of the retainer, (d) advancing the poppet valve assembly into the open portion of the device until the poppet head engages the opening in the piston, the lateral retainer extension engaging the body to prevent retraction of the assembly from the open portion, and (e) removing the member so that the piston is returned by the resilient means to an at-rest position.

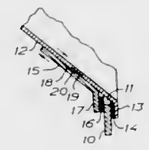
4,903,388

METHOD OF BRANCHING OFF A TUBE

Tage Skönvall, Ekudden, Hökerum S-520 15, Sweden

Continuation of Ser. No. 282,220, Dec. 19, 1988, abandoned.
This application Jun. 7, 1989, Ser. No. 363,301
Claims priority, application Sweden, May 30, 1986, 8602456
Int. Cl.[4] B21P *53/00*
U.S. Cl. 29—890.11 **1 Claim**

1. Method in branching off a tube wherein an oval aperture is made in the tube wall and a tube element is inserted into the aperture from the outside and is secured to the tube, characterized in that the tube element is inserted at a flange at one end thereof through the oval aperture and is pressed against the inside surface of the main tube by means of a ring passed over the tube element, which is engaged with the outside surface of



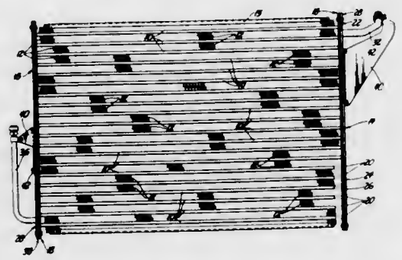
the main tube and is secured by snap action in the engaged position by being pressed over retaining shoulder portions on the tube element, a sealing ring being provided between the flange and the inside surface of the main tube.

4,903,389

HEAT EXCHANGER WITH LAMINATED HEADER AND METHOD OF MANUFACTURE

Peter G. Wolf, Tonawanda, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed May 31, 1988, Ser. No. 200,321
Int. Cl.[4] F28B *1/00*
U.S. Cl. 29—890.43 **8 Claims**



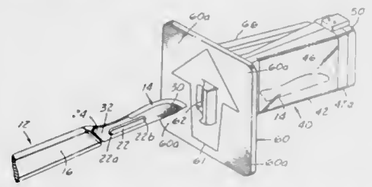
1. A heat exchanger having a plurality of parallel tubes for carrying a working fluid and a header at each end of the tubes for directing the working fluid through the tubes in a desired flow path, each header comprising;
a flat inner plate apertured for receiving an end of each of the plurality of tubes and serving as one side of a passage means,
an outer plate aligned with and spaced from the inner plate and serving as a second side of the passage means, and
a flat spacer conforming to and bonded between the margins of the inner plate and the outer plate to form the remaining boundaries of the passage means, the thickness of the spacer defining the spacing of the inner and outer plates to provide at least one flow passage connecting the tube ends.

4,903,390

SCALPEL BLADE REMOVER AND BLADE STORAGE APPARATUS

Claude Vidal, Santa Barbara; Al Pixley, Goleta, and Vernon Vincent, Santa Barbara, all of Calif., assignors to VIR Engineering, Inc., Goleta, Calif.

Filed Oct. 3, 1988, Ser. No. 251,759
Int. Cl.[4] A61B *19/02*; B23P *19/04*
U.S. Cl. 29—239 **8 Claims**



1. A combination scalpel blade removal and used blade storage apparatus for use in connection with a changeable blade scalpel of the character having a blade with a cutting portion and heel portion removably mounted on a handle by fitting a mounting aperture formed in the heel portion of the blade over a grooved blade mounting tang provided on the handle, said apparatus comprising:
(a) a hollow housing having first and second ends and spaced apart, inwardly converging side walls defining a receiving channel for receiving the scalpel blade and a portion of the scalpel handle, one of said side walls having an opening therein located proximate said second end of said housing, said side walls converging to define a restricted opening;
(b) shield means connected to said housing proximate said second end thereof for shielding the fingers of a user of the apparatus while gripping said housing, said shield means comprising a shielding member having a receiving slot in communication with said receiving channel and, finger shielding portions extending outwardly from said spaced apart side walls a sufficient distance to shield those fingers of the user of the apparatus in gripping engagement with said side walls;
(c) blade deflecting means mounting on said hollow housing for engaging the blade to deflect the heel of the blade away from the scalpel handle, when the blade is within said receiving channel, said blade deflecting means comprising a blade deflecting arm extending through said opening formed in said one of said side walls, said blade deflecting arm having a blade engaging portion movable sequentially from a first position located outside said blade receiving channel to a second position in pressural engagement with the heel of the blade to a third position wherein the heel portion of the blade is deflected away from the scalpel handle; and
(d) stop means mounted on said hollow housing proximate said receiving slot for engaging the heel of the blade when said blade engaging portion of said blade deflecting arm is in said third position for blocking removal of the blade from said receiving channel.

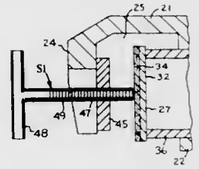
4,903,391

DISC BRAKE TOOL

Joe R. Franks, 8200 Blue Spruce Dr., Hixon, Tenn. 37343

Filed Jan. 3, 1989, Ser. No. 293,190
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—239 **1 Claim**

1. A combination with a disc brake caliper that includes a housing structure comprising a bridge wall, a first end wall extending normal to said bridge wall, a second end wall extending normal to said bridge wall in spaced relation to said first end wall, a fluid-containment bore in said first end wall, and a piston slidably positioned in said bore for movement into or out of the space circumscribed by the housing structure;
a first brake pad positionable within the housing structure in engagement with the exposed end of the piston, and a second brake pad positionable within the housing structure in engagement with the inner face of the second end wall;
the improvement comprising means for manually moving the piston into the fluid-containment bore and away from said second end wall;
said manual means comprising a single thrust plate positionable against the inner face of the second end wall after the second brake pad has been worn down and removed;
said single thrust plate having a threaded hole at a central point along the plate surface, such that the hole is in substantial axial alignment with the piston when the plate is engaged with the inner face of the second end wall;
a screw threaded through said hole so that one end of the screw is engageable with the first brake pad;



and means on the other end of the screw for manually turning said screw, whereby the screw exerts an axial pressure on the first brake pad sufficient to cause said first pad to force the piston into the fluid-containment bore without manually removing fluid from the bore;
said screw having a length greater than the piston length;
said single thrust plate being a flat plate devoid of flanges, said plate having a substantial thickness that is less than the thickness of the second brake pad in the unworn state;
said thrust plate having a rectangular plan configuration, with the length dimension thereof extending parallel to the bridge wall and the width dimension thereof extending normal to the bridge wall;
the width dimension of the thrust plate being approximately one half the length dimension, and the length dimension of the thrust plate being approximately the same as the length dimension of the second brake pad, whereby the thrust plate is enabled to fit into the space vacated by a worn brake pad.

4,903,392

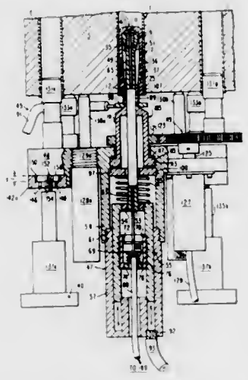
METHOD FOR REMOVING A METALLIC PLUG FROM A TUBE BY SIMULTANEOUSLY HEATING AND STRETCHING THE PLUG

Mark M. Stickel, Murrysville Borough; James W. Everett; Ray A. Shirey, both of New Stanton; Roy D. Hosley, Murrysville; Eugene P. Ciferno, South Huntington Twp., Westmoreland County, and George D. Fulmer, Hempfield Twp., Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 22, 1988, Ser. No. 209,817
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—426.5 **8 Claims**

1. A method for removing a plug from a conduit wherein said plug is formed from a metallic shell whose interior includes a tapered wall section as well as an expander element that wedgingly coacts with the tapered wall section when moved into engagement therewith to expand the outer wall of the shell into engagement with the conduit, comprising the steps of:

a. moving the expander element out of engagement with the tapered wall section;
b. heating the tapered wall section to a temperature sufficient to substantially lower the tensile yield strength of said wall section by applying an electric current to said wall section with a pushing means;



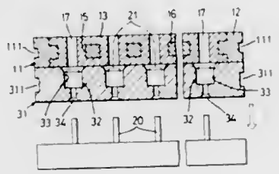
c. applying a tensile force across the tapered wall section with said pushing means while said wall section is at said yield strength lowering temperature that is sufficient to elongate the same along the longitudinal axis of the conduit, thereby lessening the engagement between said wall section and said conduit, and
d. pulling said plug from said conduit.

4,903,393

METHOD FOR INSERTING CHIP PARTS INTO A HOLDING PLATE

Hirokazu Higuchi, Komatsu, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Division of Ser. No. 152,798, Feb. 5, 1988, Pat. No. 4,847,991.
This application Mar. 1, 1989, Ser. No. 317,662
Int. Cl.[4] B23P *11/02*; **H05K** *3/30*
U.S. Cl. 29—450 **3 Claims**



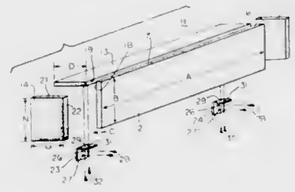
1. An insertion method for inserting chip parts into through holes in a holding plate having a plurality of such through holes therein surrounded by elastic material for resiliently holding the chip parts in the respective through holes, said insertion method comprising:
providing a generally plate-shaped member having a plurality of individual through bores therein each separate from the other through bores and at positions corresponding to the positions of the through holes in the holding plate, each of said through bores having a larger portion with an outer end communicating with one surface of said member and having a cross-sectional size sufficiently large to hold one of the chip parts, and a smaller bore portion extending from the inner end of said larger bore portion to the other surface of said member and having a cross-sectional size of the chip parts;
positioning said insertion apparatus with said one surface disposed upwardly and placing chip parts in said larger bore portions of said through bores, respectively;
superposing said holding plate on said one surface of said insertion apparatus with the through holes aligned with said through bores in said insertion apparatus; and
then moving pins and the superposed holding plate and insertion apparatus relative to each other to cause said pins to move relatively into said through bores in said insertion apparatus from said smaller bore portion end to insert said chip parts into the respective through bores in said holding plate.

4,903,394

METHOD OF MAKING A WINDOW TREATMENT CROWN

Beverly R. Roberts, 395 Castleridge Dr. NE., Atlanta, Ga. 30342

Filed Dec. 30, 1988, Ser. No. 291,970
Int. Cl.[4] B23P *25/00*
U.S. Cl. 29—458 **8 Claims**



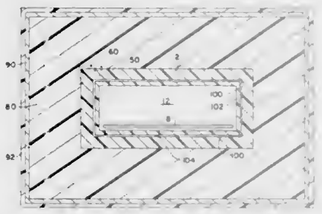
1. A method of making a window top treatment crown assembly comprising the steps of:
positioning a face board of appropriate length and height, the face board having front and rear surfaces and a top surface extending the length thereof, said face board comprising an expanded plastic foam material,
positioning a dust board having top and bottom surfaces and a leading edge of said appropriate length, the dust board being made of the same material as the face board,
applying a line of adhesive along the leading edge of the dust board,
pressing the leading edge of the dust board to the top of the rear surface of the face board adjacent said top surface and holding the two boards in contact with the top surface of the dust board in alignment with the top edge of the face board until the adhesive is partially set,
positioning first and second side boards having top and front edges and being made of the same material as the dust board and face board,
applying a line of adhesive to the top and front edges of each of the side boards,
pressing the top edge of each of the side boards to the bottom surface of the dust board at the ends thereof and pressing the front edge of each of the side boards to the rear surface of the face board at each end thereof,
holding the side boards in contact with the dust board and the face board with the outer surface of the side boards flush with the ends of the dust board and the face board until the adhesive is at least partially set, and
connecting angled mounting brackets to the bottom surface of the dust board by means of tacks.

4,903,395

METHOD FOR MAKING SEARCH COIL ASSEMBLY FOR METAL DETECTORS

James M. Moran, Leominster, Mass., assignor to Barkley & Dexter Laboratories, Inc., Fitchburg, Mass.

Continuation-in-part of Ser. No. 56,241, Jun. 1, 1987, Pat. No. 4,833,773. This application May 30, 1989, Ser. No. 357,781
Int. Cl.[4] H01F *7/06*
U.S. Cl. 29—602.1 **19 Claims**



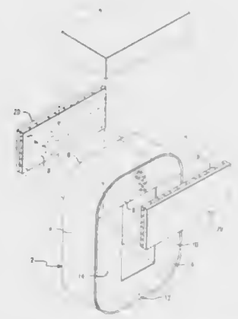
16. A method for making search coil assemblies for metal detectors, comprising providing a frame of non-metallic material, said frame defining an aperture therethrough of a selected size for inspection of a selected product of a given size, winding coils of electrically conductive strands about said frame, applying a plastic coating in liquid form to said frame and said coils, less said aperture portion of said frame, to imbed said strands in said plastic coating, providing a metal layer around said plastic coating, coating said aperture with a conductive material, but leaving uncoated by said conductive material a portion of a wall of said aperture, said uncoated portion of said wall extending in the direction of movement of said product through said aperture, such that said coating of conductive material is interrupted throughout the length of said aperture portion by a gap, and overcoating said conductive material and said gap with a layer of plastic.

4,903,396

METHOD OF CONTAINING AN AMORPHOUS CORE JOINT

Frank H. Grimes, Athens, and Terrence E. Chenoweth, Watkinsville, both of Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 14, 1989, Ser. No. 323,460
Int. Cl.[4] H01F *41/12*
U.S. Cl. 29—606 **10 Claims**



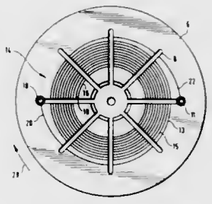
1. A method of making a transformer having an annealed wound amorphous core having a joint and a top portion and a bottom portion and two core faces comprising:
(A) placing oil compatible porous pads on each core face of the amorphous metal core joint;
(B) placing pressure plates in generally intimate contact with said oil compatible porous pads; and
(C) placing a framing means generally about said pressure plates to secure said pads and plates to said core to form a core assembly.

4,903,397

PROCESS FOR PRODUCING A HEATING ELEMENT

Norbert Freidel, Waghäusel, Fed. Rep. of Germany, assignor to Friedrichsfeld GmbH Keramik- und Kunststoffwerke, Mannheim, Fed. Rep. of Germany

Filed Mar. 29, 1989, Ser. No. 330,201
Claims priority, applicatioo Fed. Rep. of Germany, Mar. 30, 1988, 3810845
Int. Cl.[4] H05B *3/00*
U.S. Cl. 29—611 **9 Claims**



1. A process for producing a heating element which is to be arranged in a plastic part and used to weld the plastic part to a plastic pipe, said heating element comprising a heating wire wound as bifilar spiral with radially outwardly extending wire ends through which current can be supplied to the heating element, said process comprising arranging said heating wire in a bifilar spiral groove in a surface of an injection mold with the windings of the heating wire spaced a distance corresponding to the radial spacing of the windings of the spiral groove, closing said injection mold, and introducing plastic into connecting grooves between the windings of said spiral groove so that the plastic at least partially surrounds the heating wire in the vicinity of said connecting grooves.

4,903,398

BALANCE WEIGHT FITTING APPARATUS

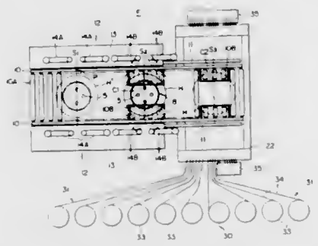
Shunji Sakamoto, Higashihiroshima, and Hisao Miyahara, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 23, 1988, Ser. No. 158,970
Claims priority, application Japan, Feb. 24, 1987, 62-26207/87[u]; Feb. 24, 1987, 62-26208/87[U]; Feb. 24, 1987, 62-40675/87
Int. Cl.[4] B23P *21/00*
U.S. Cl. 29—703 **5 Claims**

1. A balance weight fitting apparatus comprising a balance measuring station and a balance weight fitting station for fitting balancer weights to a rim edge of a wheel placed in said balance weight fitting station according to unbalance of said wheel,
means disposed in said balance measuring station for detecting unbalance of said wheel placed in said balance measuring station to provide a weight size signal indicating weight size of balance weight to be fitted to said rim edge of said wheel and an angular fitting position at which said rim edge of said wheel is fitted with said indicated weight size of balance weight;
upper and lower balance weight supplying means, each

being disposed out of said balance weight fitting station for supplying and distributing various sizes of balance weights in a line on a pick-up table;

upper and lower pick-up means disposed in said balance weight fitting station, each being caused by said weight size signal to move to a balance weight of a weight size indicated by said weight size signal on said pick-up table for picking up and bringing said balance weight of a weight size indicated said weight size signal near a position where said wheel is placed ion said balance weight fitting station; and



upper and lower balance weight fitting means disposed in said balance weight fitting station, each being caused by said weight size signal for holding and fitting said indicated balance weight to said trim edge of said wheel at a position indicated by said fitting position signal, wherein said balance weight supplying means includes a plurality of vibrating bucket type balance weight feeders each of which contains therein a same size of balance weights used with a high frequency and a plurality of cartridge type balance weight feeders each of which contains therein a stack of a same size of balance weights used with a low frequency.

4,903,399

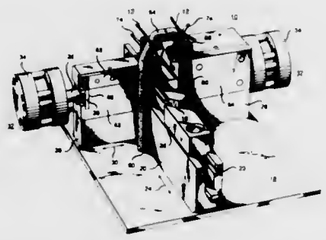
APPARATUS FOR ATTACHING A CONNECTOR

Kenneth H. Billingham, Feasterville, Pa.; James E. Franks, Lindenwold, N.J.; Ivan Pawlenko, Holland; Frank J. Schiller, Yardley, both of Pa., and Alexander Sbemarovsky, Robbinsville, N.J., assignors to American Telepbone and Telegraph Company, New York, N.Y.

Filed Feb. 28, 1989, Ser. No. 317,262

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—753 **5 Claims**



1. Apparatus for successively attaching each of a pair of wires in a cable to a respective one of a pair of contacts, each contact seated in a separate one of a pair of opposed recesses in a connector comprising:

a base;

a connector-carrying carriage slidably mounted to the base for movement along an axis;

a pair of ram assemblies, each located on opposite sides of the carriage and being movable to and from the carriage, for ramming a separate one of a pair of wires into a separate one of the pair of opposed recesses in the connector;

a pair of wire guides, each located adjacent to a separate one of the ram assemblies and including a block having a flat end aligned with a corresponding ram assembly, and a member extending outwardly from the block at an upwardly inclined angle so as to diverge from the member extending from the other block, the member having an inclined surface which engages a wire, pulled thereacross by an operator, and guides the wire downwardly therealong to the end of the block which guides the wire into alignment with the corresponding ram assembly; and

means for displacing the carriage along the axis to align each contact in a successive pair of recesses in the connector with a respective one of the ram assemblies.

4,903,400

METHOD AND APPARATUS FOR TEXTURIZING WORKPIECES

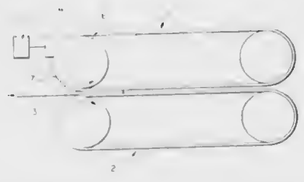
Christa Pankoke, Bielefeld, Fed. Rep. of Germany, assignor to Firma Theodor Hymmen, Bielefeld, Fed. Rep. of Germany

Continuation of Ser. No. 943,668, Dec. 18, 1986, abandoned. This application Aug. 29, 1988, Ser. No. 238,999

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545744

Int. Cl.[4] B23P *21/00*

U.S. Cl. 29—782 **13 Claims**



1. A method of producing an embossed structure on a planar workpiece, comprising the steps of

(a) driving a spaced pair of opposed endless belts of a double-belt pressing mechanism, the opposed portions of said belts being driven in the same direction;

(b) applying raised textured components onto the outer surface of at least one of said driven belts;

(c) passing a workpiece between the opposed portions of said belts, said textured components on said one belt surface contacting a surface of the workpiece; and

(d) pressing said endless belts together to press said textured components against said workpiece surface and transfer said components from said belt surface to said workpiece surface while said workpiece is driven between said belts.

4,903,401

LEADFRAME SILVER BLEED ELIMINATION

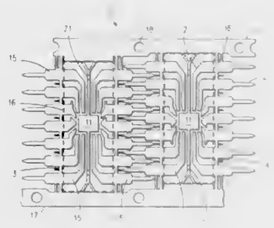
Brian A. Webb, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1989, Ser. No. 331,972

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—827 **4 Claims**

1. A method to eliminate silver bleed on a leadframe having a flag area, a plurality of leads extending from adjacent the flag area, and a dam bar tieing the leads together a predetermined distance from the flat area, comprising the following steps: providing material to form the leadframe; forming the leadframe including leaving leadframe material along edges of the leads adjacent the dam bar on the flag area side of the dam bar to receive any silver bleed; plating the leads between the dam



bar and the flag area with silver; and removing the leadframe material left along edges of the leads.

4,903,402

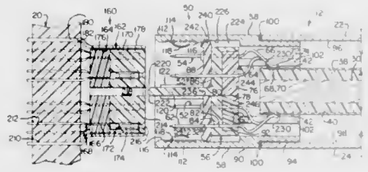
METHOD OF ASSEMBLING A CONNECTOR TO A CIRCUIT CARD

Jeffrey M. Norton, Lebanon; Edward J. Paukovits Jr., Hershey; William J. Rudy Jr., Annville, and Howard R. Shaffer, Millersburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 213,577, Jun. 30, 1988, abandoned, which is a division of Ser. No. 78,944, Jul. 28, 1987, abandoned. This application May 4, 1989, Ser. No. 351,280

Int. Cl.[4] H01R *23/70*

U.S. Cl. 29—843 **11 Claims**



1. A method of assembling an electrical connector to an end of an LRM having cover means fastened together as a unit and shielded, the LRM including a pair of daughter cards mounted to heat sink means of the LRM, each daughter card having circuit paths on one side thereof to which respective arrays of terminals of the connector are to be joined, comprising the steps of:

stamping and forming two arrays of terminals, each array comprising a plurality of contact terminals joined to a carrier strip at severable locations, each said contact terminal including a first contact section proximate said severable section for being joined to a respective circuit path of a daughter card associated with the array, said first contact section being defined on an end of an elongate cantilever beam portion of said contact terminal, and further including a second contact section remote and forwardly from said elongate cantilever beam portion for electrical engagement with a corresponding contact means of an electrical article, each said contact terminal further including a body section between said elongate cantilever beam portion and said second contact section, said second contact sections of said plurality of contact terminals of each said array having been formed to define a respective preselected arrangement whereby said second contact sections are matable with a like arrangement of said corresponding contact means of said electrical article, said elongate cantilever beam portions being adapted to flex during connector mating;

securing said body sections of said contact terminals of said arrays within respective dielectric housing means forming respective terminal subassemblies, said housing means holding said second contact sections of said contact terminals in said preselected arrangements and said carrier strips firmly holding said first contact sections thereof spaced apart preselected distances in respective planar arrays, with said elongate cantilever beam portions permitting the thus-housing body sections incremental movement with respect to said first contact portions;

joining said first contact sections held spaced apart along said planar arrays by said carrier strips to said respective circuit paths of said respective daughter cards;

severing said carrier strips from said contact terminals at said severable sections after said joining;

joining together said respective housing means, defining a connector having a mating face along said second contact sections; and

securing cover means thereover, defining a module,

whereby a method is defined of securing to a pair of daughter cards of a module, a connector movable incrementally with respect thereto.

4,903,403

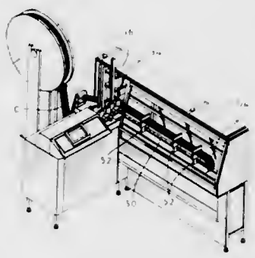
CABLE HARNESS MANUFACTURING AND ELECTRICAL TESTING SYSTEM

Christopher K. Brown, Camp Hill; Carl L. Moyer, Mt. Penn; Joanne E. Shipe, Harrisburg, and Herman D. Walter, Marysville, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 15, 1987, Ser. No. 132,210

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—861 **5 Claims**



1. A method for the simultaneous manufacturing and electrical testing of a cable harness assembly having a harness length and at least a first connector, of the insulation displacement type, terminated to a planar multi-conductor cable, comprising the steps of

a. feeding said cable past a cable shearing station and through said first connector,

b. terminating said first connector to said cable,

c. testing said first connector and cable to verify an appropriately terminated connector,

d. if an additional connector is needed proceed to step e, otherwise:

(1) advance said first connector and cable a distance downstream from said shearing station equivalent to said harness length,

(2) shear said cable at said shearing station while simultaneously testing the sheared cable to verify continuity between said first connector and the cable end resulting from the shearing thereof,

(3) eject said cable harness assembly;

e. if more than one additional connector is needed proceed to step f, otherwise:

(1) advance said first connector and cable a distance

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downstream from said shearing station equivalent to said harness length,

(2) shear said cable,

(3) terminate a last connector to said cable,

(4) test said last connector and cable to verify an appropriately terminated connector

(5) eject said cable harness assembly;

f. advance said first connector and cable a predetermined distance downstream from said shearing station,

g. terminated an additional connector to said cable,

h. test said additional connector and cable to verify an appropriately terminated connector,

i. proceed to step e;

wherein after each said testing step, if the test fails to verify an appropriately terminated connector or continuity throughout the cable, said cable shearing station is immediately activated to cut said cable in the event the cable has not previously been cut, whereafter the cut failed cable harness portion is discarded.

4,903,404

SHAVING APPARATUS

Hans Labrijn, Drachten, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Oct. 27, 1988, Ser. No. 263,653

Claims priority, application Netherlands, Nov. 24, 1987, 8702811

Int. Cl.[4] B26B *19/26*

U.S. Cl. 30—34.1 **3 Claims**

1. A shaving apparatus comprising a housing, at least one shaving unit, and a trimmer, which is movable relative to the housing between an operational position and a rest position by means of a push-button, a spring being arranged between a trimmer frame and the housing, wherein the housing is provided with a pivotable catch having a hook-shaped end which is pivotable into and out of engagement with a latching projection of the trimmer frame, movement of said hook-shaped end being stopped by engagement with said latching projection in the rest position, said hook-shaped end being free of engagement by said latching projection in the operational position, and wherein around the latching projection the trimmer frame is formed with guide walls defining a forward and return path for the hook-shaped end.

4,903,405

SAFETY RAZORS

Ben-Zion Halevy, 5 Alonim St., Nazaret Ilit, Israel

Filed Jul. 9, 1987, Ser. No. 71,376

Claims priority, application Israel, Aug. 7, 1986, 79651

Int. Cl.[4] B26B *71/52*

U.S. Cl. 30—47 **4 Claims**

1. A disposable safety razor comprising:

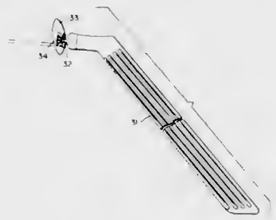
a handle part,

a bonded blade unit,

a channel profiled connecting member having two resilient side walls and being integral with said handle part at a lower end of said handle part, the free ends of said side walls being bent outwardly from the channel formed by said connecting member and forming an outwardly extending tooth along each end,

edge faces of said side walls located adjacent each of said teeth being curved to form an arch,

said bonded blade unit having an aperture for introduction of said connecting member to pivotably connect said handle part and said bonded blade unit, said aperture



including an inwardly narrowing portion terminating at an interiorly extending portion within which said teeth are locked after passing through said inwardly narrowing portion to move pivotably by engagement of said arch with said bonded blade unit.

4,903,406

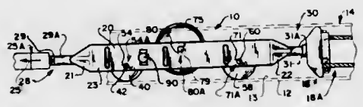
PIPE SPLITTER

William O. Schosek, 1748 Coral Way NW., North Ft. Myers, Fla. 33917; Neil Schosek, 14041 Hall Rd., #805, North Ft. Myers, Fla. 33903, and Michael Janiga, 126 Kalla La. East, Aurora, N.Y. 14052

Filed Dec. 14, 1987, Ser. No. 132,424

Int. Cl.[4] B23D *21/06;* **B26B** *27/00;* **E21B** *29/06;* **E02D** *29/10*

U.S. Cl. 30—92.5 **20 Claims**



1. A pipe splitter comprising:

an elongated frame having a first end and a second end;

said elongate frame further including a first side and a second side;

a first roller and a second roller rotatably positioned proximate said first end and said second end of said elongated frame, respectively, to rotatably support said elongated frame along a first longitudinal path of a pipe to be split when positioned into the bore of the pipe to be split;

a first coupling means securably positioned at said first end of said elongated frame to enable said elongated frame to be pulled along a longitudinal dimension of the pipe;

a cutting wheel positioned between said first end and said second end of said elongated frame such that said first and second rollers supportingly engage an internal surface of the pipe to be split and said cutting wheel cuttably engages the thickness of the pipe wall along a second longitudinal path of the pipe to be split thereby splitting the pipe along said second longitudinal path thereof which is opposite said first longitudinal path traveled by said first and second rollers within the bore of the pipe to be split; and

said cutting wheel having a circular dimension being greater than the bore of the pipe and said first and said second rollers are positioned on said elongated frame such that said cutting wheel engages the pipe to be split and forms a single longitudinal split along the second longitudinal path of the pipe.

4,903,407

DEVICE FOR MAKING VEGETABLE AND/OR FRUIT CASES FOR FILLING

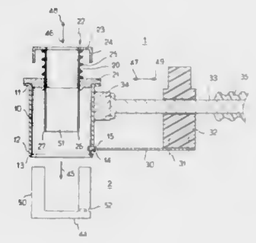
Gérard Fischer, Moulin Rateau, 89260 Saint Martin Sur Oreuse, France

Filed Apr. 21, 1988, Ser. No. 184,296

Claims priority, application France, Apr. 22, 1987, 87 05695

Int. Cl.[4] A47D *43/00*

U.S. Cl. 30—113.1 **13 Claims**



1. A device for cutting out primary edible material and in particular cases for filling, comprising:

means for holding said edible material;

a first cutting means having a cylindrical wall parallel to a longitudinal axis and a cutting edge at one end thereof, said first cutting means being translatable for a first predetermined distance in a direction parallel to said longitudinal axis for forming a first cut in said material, said first cut defining a side wall of a hollow to be formed in said material; and

a second cutting means having a cutting edge at one end thereof, said second cutting means being translatable for a second predetermined distance in a direction perpendicular to said longitudinal axis for forming a second cut in said material, said second cut defining a bottom of said hollow to be formed in said material,

whereby said first and second distances are selected such that said first and second cuts intersect to completely sever a first portion of said material from a second portion of said material, said hollow being formed in said second portion of material upon removal of said first portion of material.

4,903,408

STEEL PLATE CUTTER

Itsuo Tagawa, Tokyo, and Samon Kanno, Saitama, both of Japan, assignors to Sangojuuki Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,541

Claims priority, application Japan, Nov. 25, 1986, 61-278650

Int. Cl.[4] B26B *15/00*

U.S. Cl. 30—228 **14 Claims**

1. A steel plate cutter, comprising:

a stationary arm having a pair of arm members arranged with a predetermined gap therebetween;

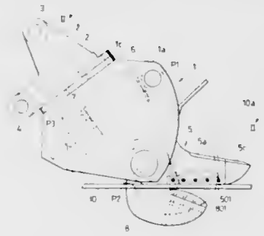
a movable arm arranged between said arm members and pivotally supported at an intermediate portion thereof by said arm members;

a hydraulic cylinder, having a piston rod capable of moving forward and backward, for driving said movable arm to approach and separate from said stationary arm, said cylinder having a stationary end pivotally coupled to proximal ends of said arm members, said piston rod having a distal end pivotally coupled to a proximal end of said movable arm;

a shearing push blade fixed to distal ends of said arm;

a pair of base blades fitted to distal ends of said arm members to oppose said shearing push blade, wherein said shearing push blade is capable of entering and escaping from a space between said base blades and, upon sliding between said base blades, cuts a steel plate in a belt-like manner by a shearing force together with said base blades; and

a bracket member for mounting said steel plate cutter on a construction machine, an arm mounting member on which said stationary arm is fixed, and a flexible joint for mounting said arm mounting member on said bracket member to be capable of pivoting wherein said flexible joint comprises a shaft member having one end fixed to either said arm mounting member or said bracket member and the other end having a first coupling portion and



spring means provided between said arm mounting member and said bracket member and arranged around said shaft member,

said first coupling portion of said shaft member being coupled to a second coupling portion formed on the remaining one of said arm mounting member and said bracket member to be capable of pivoting and

one of said first and second coupling portions comprising a spherical coupling member, a spherical hole fitted with said spherical coupling member being formed in the remaining one of said coupling portions.

4,903,409

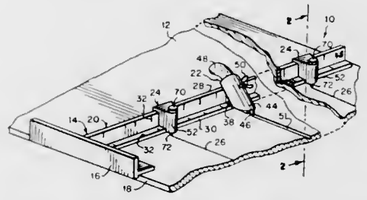
DRYWALL SCRIBING AND SCORING TOOL

Stuart N. Kaplan, 485 Front St. Apt. 221, Hempstead, N.Y. 11550, and Frank Matassa, 1 Anchorage Way, Apt. 111, Freeport, N.Y. 11520

Filed May 19, 1989, Ser. No. 354,900

Int. Cl.[4] B26B *29/00*

U.S. Cl. 30—293 **5 Claims**



1. A drywall scribing and scoring tool for a typical wall board which comprises:

(a) a T-square member having a short head portion which can bear against one edge of the wall board and an elongated arm portion extending perpendicular from said short head portion;

(b) means adjustably carried on said arm portion, for cutting into the wall board parallel to the bearing edge of the wall board that said short head portion slides against so that said wall board can be cut to a predetermined size; and

(c) means adjustably carried on said arm portion, for mark-

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ing lines on the wall board parallel to the bearing edge of the wall board that said short head portion slides against so that wall stud locations can be indicated when the wall board is placed against the wall studs and nailed thereto.

4,903,410

GUIDE BAR FOR A CHAIN SAW

Klaus Wieninger, Waiblingen; Walter Sattelmaier, Ludwigsburg; Wilfried Noll, Waiblingen; Hans P. Stehle, Waiblingen, and Norbert Apfel, Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,229

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1987, 3730171

Int. Cl.[4] B25B *17/02*

U.S. Cl. 30—387 **34 Claims**

1. A guide bar for guiding the saw chain of a chain saw comprising:

an elongated steel plate defining a longitudinal bar axis and having a first longitudinal end adapted for attachment to the chain saw and a second longitudinal end;

said steel plate having a peripheral edge defining a guide groove for guiding the said chain in its movement around the guide bar;

turn around means at said second longitudinal end for guiding the saw chain around said second longitudinal end;

said plate defining an elongated clear and uninterrupted cutout formed therein so as to have a longitudinal cutout axis extending substantially in the same direction as said longitudinal bar axis;

said cutout having a width measured transversely to said cutout axis and a length measured along said cutout axis; said length being a multiple of said width; and,

a plastic insert filling out said cutout and being reinforced with long fibers to form a bonded fiber material with most of said fibers extending substantially parallel to said axes thereby making said insert and said guide bar resistant to bending and torsion forces as well as to compression and tension forces.

4,903,411

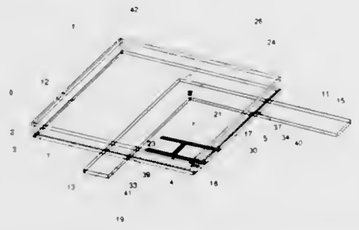
METHOD FOR DETERMINING TYPE SIZE

William S. McArdle, 20 Snyder Ave., Ramsey, N.J. 07446

Filed Dec. 6, 1988, Ser. No. 280,560

Int. Cl.[4] G01B *3/00*

U.S. Cl. 33—430 **34 Claims**



1. A device for determining type size, comprising: a base means, cover means, needle means, and aligning means; said base means and cover means comprising a pair of vertical edges and horizontal edges and further comprising a left and right vertical edge and an upper and lower horizontal edge, said edges being at right angles to each other; said aligning means comprising a horizontal arm and a vertical arm, said arms being at right angles to each other and further comprising an outer edge and inner edge of said horizontal arm and vertical arm, wherein a line is inscribed offset from and parallel to said inner edges; and further, said aligning means is slidably moveable between said base means and cover means; and said needle means is rotatably attached to said base means and cover means by conventional pin means, as well as slidably attached to said aligning means by conventional groove means; whereby the device is laid over a cap to be sized, and, after placement, the device is aligned with said cap so that the base of said cap is aligned with said lower horizontal edge of said base means, wherein present on said lower horizontal edge of said base means is a scale thereon composed of numbers in consecutive order measured in points denoting point size; and the apex of said cap is aligned with the line offset from the inner edge of said horizontal arm of said aligning means, wherein said horizontal arm of said aligning means is perpendicular to said vertical edges of said base means, wherein present on said left vertical edge of the base means is a scale thereon composed of numbers in consecutive order measured in points denoting cap height; wherein said scales of numbers intersect at a vertex point; and further, after said alignment, said vertical arm of said aligning means is moved along said lower horizontal edge of said base means until the line offset from said inner edge of said vertical edge of said aligning means intersects said lower horizontal edge of said base means at a point corresponding to the point size of said cap; and present on said cover means is an arc with a scale inscribed thereon composed of numbers in consecutive order measured in degrees; and further, once said base means, cover means and aligning means of the device are so aligned with said cap, the point of intersection of a line inscribed along the center said needle means with said arc inscribed on said cover means denotes the index number in degrees of the typeface of said cap for the specific point size and cap height of said cap.

4,903,412

ORTHOPEDIC PILLOW AND SIZING KIT THEREFOR

John Pedrow, 14429 Rte. 30, North Huntingdon, Pa. 15642
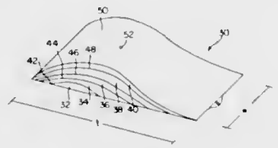
Division of Ser. No. 84,674, Aug. 12, 1987, Pat. No. 4,756,090.

This application Mar. 7, 1988, Ser. No. 164,971

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.[4] A47G *9/00*

U.S. Cl. 33—512 **17 Claims**



1. A sizing kit for determining an appropriate size of orthopedic pillow for use by a patient, said orthopedic pillow comprising a block comprising a material chosen from at least one member of the group consisting essentially of deformable material and rigid material, said block having a perimeter when viewed in plan; an upper surface of said block having a substantially defined surface when said block is viewed in elevation;

said sizing kit comprising:

an ordered multiplicity of members, each of said members having a substantially similar perimeter when viewed in plan, each of said substantially similar perimeters of said multiplicity of members having at least a substantially common first characterizing dimension and a second characterizing dimension, said second characterizing dimensions increasing from ordered member to ordered member such that the number of distinct second characterizing dimensions corresponds to the number of said multiplicity of members;

each of said members having a shape to substantially adapt to the cervical spine of a user; and

each of said ordered multiplicity of members, other than a first member of said ordered multiplicity, having a lower surface which substantially corresponds to said shape of the preceding member in said ordered multiplicity;

said ordered multiplicity of members being dimensioned for being placed one within the other from ordered member to ordered member within a largest of the ordered members according to size order to produce a compact and therefore readily storable package.

4,903,413

SURFACE PROFILE MEASUREMENT OF WORKPIECES

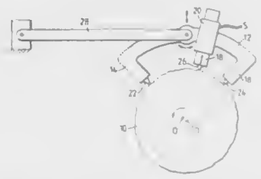
Philip R. Bellwood, Market Harborough, United Kingdom, assignor to Rank Taylor Hobson Limited, United Kingdom

Filed Feb. 5, 1987, Ser. No. 11,102

Claims priority, application United Kingdom, Feb. 7, 1986, 8603060

Int. Cl.[4] G01B *5/20*

U.S. Cl. 33—551 **14 Claims**



1. An apparatus for measuring a surface profile of a workpiece having a generally circular section, comprising a probe assembly, means for rotating the workpiece relative to the probe assembly, the probe assembly comprising a yoke, a pair of feet mounted on the yoke for engagement with the workpiece surface at the section to be measured at first and second locations spaced in the direction of relative movement so that the feet and yoke follow variations in the surface profile upon such movement, and detector means which is mounted on the yoke operable to provide a signal dependent upon the distance relative to the probe assembly of a third location on the work piece surface spaced from the feet locations in the direction of relative movement, the signal varying in accordance with the relative rotational position of the workpiece and the probe assembly, the feet being adapted to follow variations in the surface profile substantially as closely as the detector means, the apparatus further comprising signal processing means responsive to the signal from the detector means for determining the surface profile of the workpiece, said signal processing means being operable to take into account variations in the detected distance due to movement of the yoke caused by the feet engaging irregularities in the surface profile in addition to variations in the detected distance due to surface irregularities directly detected by the detector means.

4,903,414

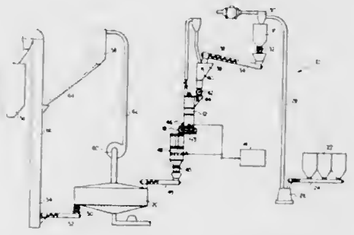
HIGH PRESSURE CONDITIONING SYSTEM

Richard L. White; Richard H. Diven, both of Dallas, Tex., and James H. Bleke, Wolcottville, Ind., assignors to VE Holding Corp., Arlington, Tex.

Filed Jul. 25, 1988, Ser. No. 224,433

Int. Cl.[4] F26B *5/04*

U.S. Cl. 34—15 **36 Claims**



1. An improved system adapted for high pressure conditioning of matter comprising:

(a) a direct fired steam generator for producing a treatment fluid comprising a mixture of steam and oxygen-deficient, non-condensable gases to be introduced into a conditioning vessel for counter-current flow relative to matter passing therethrough;

(b) means for controlling the amount of said mixture of steam and oxygen-deficient, non-condensable gases introduced into said vessel;

(c) means for controlling the temperature of said mixture of steam and oxygen-deficient non-condensable gases introduced into said vessel;

(d) means for pressurizing said vessel;

(e) means for controlling the pressure generated in said vessel;

(f) at least one first valving device disposed in said vessel for the ingress of said matter passing therethrough while preventing the exhaust of steam, gases, and pressure therefrom:

(g) at least one second valving device disposed in said vessel for the egress of said matter having passed therethrough while preventing the exhaust of steam, gases, and pressure therefrom;

(h) a resting chamber to steam said matter egressed from said vessel;

(i) means for pressurizing said chamber;

(j) means for controlling the pressure generated in said chamber;

(k) at least one third valving device disposed in said chamber for the egress of said steamed matter while preventing the exhaust of steam, gases and pressure therefrom; and

(l) a dryer to dry said steamed matter egressed from said resting chamber.

4,903,415

MACHINE FOR FLAW-CHECKING AND DRYING STOCKINGS AND THE LIKE

Carmelo A. Cortese, Via dello Sport 1/4, 40037 Sasso Marconi (Province of Bologna), Italy, assignor to Carmelo Angelo Cortese, Sasso Marconi, Italy

Filed Oct. 4, 1988, Ser. No. 252,969

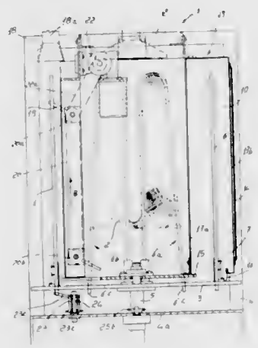
Claims priority, application Italy, Oct. 12, 1987, 3644 A/87; Apr. 14, 1988, 3411 A/88

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—60 **12 Claims**

1. Machine for flaw-checking and drying stockings, pantyhose and like articles, comprising at least one rotatable platform, a plurality of vertically arranged fork-like elements mounted on said platform for supporting the articles, at least

one insertion and inspection station for inserting the articles on said fork-like elements and for detecting flaws thereon, means for intermittently driving said platform to cause said fork-like elements to temporary face said insertion and inspection station, at least one drying station including a chamber internally provided with with heating means, and at least one removal



station for removing dried articles from said fork-like elements, wherein said fork-like elements have an elastically contractable base to facilitate insertion and removal of articles, said drying station being located on part of said platform and said heating means comprising infrared-ray elements, and wherein said heating means are activated only during the rotation of said platform.

4,903,416

HANDHELD CORDLESS HAIR DRYER

Mark R. Levin, 10032 Beacon Pond Ln., Burke, Va. 22015; William M. Nalley, 13601 Forest Dr., Silver Spring, Md. 20904, and Dwight L. Green, 43 S. Bogen St., Hamilton, Va. 22068

Filed Jan. 17, 1989, Ser. No. 297,486
Int. Cl.[4] A45D *2/00*
U.S. Cl. 34—97 10 Claims



1. A handheld cordless hair dryer comprising:

a handholdable body having a handle body portion and a nozzle body portion mounted to a top end of said handle body portion;

battery powered fan means for drawing a flow of air into said nozzle body portion, and for directing said flow of air along a path through said nozzle body portion and out of the nozzle body portion via an air discharge opening located at an outlet end of the nozzle body portion;

a heat exchanger disposed in said path of air directed through said nozzle body portion;

a gas combustion device disposed in said nozzle body portion in heat exchange relationship with air directed along said path via said heat exchanger;

gas fuel supply means for delivering a supply of combustible gas, from a self-contained supply of gas received in a gas container receiving space in said handle body portion, to said gas combustion device;

ignition means for igniting fuel supplied to said gas combustion device; and

manually operable actuation means for activating said gas fuel supply means, ignition means and fan means;

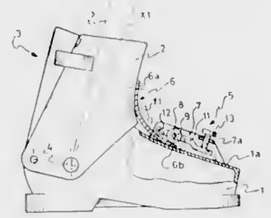
wherein said heat exchanger is comprised of a heat conductive inner duct, an outer duct and heat conductive vanes extending along and between said inner and outer ducts in heat exchange relation to said flow of air along said path; wherein said outer duct extends axially along said nozzle body portion in spaced relationship to an inner surface of a peripheral wall of the nozzle body portion; and wherein said combustion device is mounted in one end of the inner duct and an opposite end of said inner duct opens exteriorly through said peripheral wall of the nozzle body portion whereby said inner duct comprises a combustion tube and exhaust duct for said gas combustion device.

4,903,417

APLINE SKI BOOT HAVING AN UPPER PARTIALLY OR TOTALLY JOURNALLED ON A SHELL BASE

Olivier Senee, Annecy, France, assignor to Salomon, S.A., Annecy, France

Filed Jun. 21, 1988, Ser. No. 209,316
Claims priority, application France, Jun. 29, 1987, 87 09133
Int. Cl.[4] A43B *5/04, 23/26, 23/02*
U.S. Cl. 36—117 69 Claims



1. An alpine ski boot having an cuff mounted on a shell base for pivotal movement about a transverse axis substantially coincident with the ankle of a skier wearing the boot, and including shock absorption apparatus for cushioning pivotal movement of the cuff with respect to the shell base during skiing in response to forward movement of the leg of the skier from an initial position, said shock absorption apparatus comprising:

(a) two elements which are respectively fixed to the cuff and to the shell base and which are engaged with each other; and

(b) control means for varying the coefficient of friction between the two elements during relative displacement of the element;

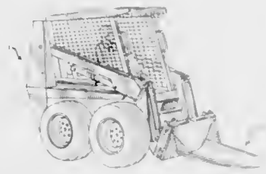
(c) said control means being constructed and arranged such that the coefficient of friction during relative movement of the elements in one direction is different from the coefficient of friction during relative movement of the elements in the opposite direction.

4,903,418

HYDRAULIC LOADER ATTACHMENT

Robert W. Loudon, 26011 N. Fairfield Rd., Lake Zurich, Ill. 60047

Filed Dec. 8, 1988, Ser. No. 281,500
Int. Cl.[4] A01G *23/06;* E02F *3/76*
U.S. Cl. 37—2 R 20 Claims



1. Digger apparatus for attachment to a conventional hydraulic loader, such as a wheel tractor or a crawler type tractor, comprising:

frame means for attaching said digger apparatus to said hydraulic loader;

scooping means secured to said frame, said scooping means being for digging into soil and removing a plant from soil within which the plant is growing with a minimal amount of disruption to the soil, said scooping means including an elongated, concave-shaped upper face and concave-shaped base coupled to said frame means;

said upper face and said base joined to define side edges;

supporting means, said supporting means including pieces affixed to said sides edges of said scooping means and to a forward face of said frame means for supporting and increasing the rearward carrying capacity of said scooping means, and

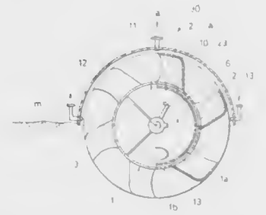
said scooping means and said supporting means cooperating to form an enclosure means, said enclosure means being for stabilizing the plant carried on said scooping means and between said supporting means.

4,903,419

METHOD OF AND APPARATUS FOR DREDGING SLUDGE IN HIGH DENSITY

Yutaka Nishikawa, Higashimurayama, Japan, assignor to TOA Corporation, Tokyo, Japan

Filed May 24, 1988, Ser. No. 197,887
Int. Cl.[4] E02F *3/92*
U.S. Cl. 37—59 5 Claims



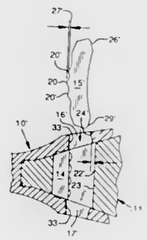
1. Apparatus for dredging sludge in a high density, comprising a sludge storage tank; a cutter wheel rotatable around said sludge storage tank, said sludge storage tank having an inlet port and a discharge port for the sludge dug out by said cutter wheel, said cutter wheel including a cylindrical member rotatably mounted around the circumference of said sludge storage tank in close proximity thereto and having sludge introducing ports registering with said inlet port of said storage tank as said cutter wheel is rotated therearound, and bottom-opened scraping claws implanted in the portions of said cylindrical member adjacent said sludge introducing ports provided therein; and a hood extending around a part of the outer circumference of said cutter wheel and forming an air chamber therein, said hood having means for supplying compressed air to the interior of said hood; said sludge storage tank having agitator wings and means for rotating said wings; said cutter wheel being rotatable around the outer circumference of said sludge storage tank; said hood covering the upper portion of said cutter wheel; said compressed air supply means including means for supplying compressed air at a pressure lower than the pressure of the water in the interior of said hood.

4,903,420

MINING TOOTH POINT

John S. Kreitzberg; Herbert E. Jones, and Terry L. Briscoe, all of Portland, Oreg., assignors to Esco Corporation, Portland, Oreg.

Filed Oct. 20, 1988, Ser. No. 260,080
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—195 1 Claim



1. A method of installing a new tooth point on a used adapter, said adapter being a relatively elongated unitary metal body having a forwardly projecting nose at one end, said nose being defined by upper and lower walls flanked by slightly forward convergent side walls, said upper and lower walls adjacent the nose rear being partial surfaces of revolution generated about a vertical generatrix located adjacent the nose rear, said upper and lower nose walls being generally horizontal adjacent the nose forward end to provide stabilizing surfaces against the negative thrust components of a beam loading, said upper and lower walls adjacent to but spaced from said nose rear being equipped with a vertically-extending cored opening for the receipt of a locking pin, said pin opening having a generally vertical rear wall and being forwardly enlarged to receive a resilient lock, said lock having four vertically spaced, rearwardly projecting cylindrical inserts adapted to confront said locking pin, comprising:

providing a new tooth point which includes a generally wedge-shaped, relatively elongated unitary metal body having a digging edge at its forward end and a socket extending forwardly from its rear end, said socket having interior walls conforming to said side, upper and lower walls of said nose, the upper and lower interior walls of said socket adjacent to but spaced from said point rear end being equipped with aligned upper and lower openings for the receipt of said locking pin for securing said point to said adapter by extending through said cored opening in said nose, said point openings being generally rectangular in cross section and extending from said socket walls to the exterior of said point, each opening being defined by front and rear walls flanked by generally parallel sidewalls, the front walls of said upper and lower openings being co-planar while each of side rear walls are inclined at about 15° so as to be outwardly convergent with its associated front wall,

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mounting said tooth point on said adapter nose with the pin openings of said point being generally aligned with the pin opening of said nose,

inserting a locking pin into the upper pin opening of said point and partway into the pin opening of said nose, said locking pin being a vertically elongated, unitary metal body having front and rear walls, said rear wall having bevels of about 15° adjacent the pin ends, said front wall being equipped with three integral vertically spaced, horizontally extending projections spaced from the pin ends, the forward portions of said three projections being not co-planar with the middle projection extending more forwardly than the uppermost and lowermost projections, said pin rear wall confronting the rear wall of said nose opening and being forwardly concave between said end bevels, and

while exerting a downward force on the upper end of said pin simultaneously sliding the upper end of the pin lower bevel against the rear wall of said nose opening and engaging the middle projection of said pin with an intermediate one of said four inserts to avoid the lowermost projection forcing the lowermost insert against the socket lower interior wall whereby less interference is encountered in installation while, at the same time the combination of the pin rear wall bevels and the forward concavity provide (a) more offset between the inner ends of said point opening rear walls and said nose opening rear wall than the offset characteristic of the same tooth having vertical rear walls in the point openings and using a pin without such concavity, (b) less interference in operation, and (c) increased compression of the center of said lock by the middle of the three projections of said pin to hold the point tighter on the nose.

4,903,421

CONVEX PRESSING BOARD WITH SURFACE PROJECTIONS

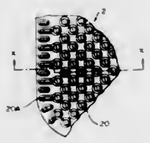
Sorai Saito, 177-1, Sengen-cho 3-chome, Nishi-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Dec. 16, 1988, Ser. No. 285,813

Claims priority, application Japan, Jan. 19, 1988, 63-4152; Jun. 10, 1988, 63-76452

Int. Cl.[4] D06F *81/00*

U.S. Cl. 38—137 **18 Claims**





1. A pressing board combination of a flat pressing iron and a pressing board body, said body being elongated and having longer and shorter sides, said body being further rounded upwardly to form a convex by shaped upper iron working surface thereof so as to substantially provide a line or point contact support on said upper iron working surface of said pressing board body for the bottom surface of said flat pressing iron for reducing the likelihood of creating an unwanted crease in clothing ironed thereon, said upper iron working surface of said pressing board body having a large number of projections extending upwardly and substantially normal to the working surface and which support clothing ironed on the board when pressed on said pressing board body with the bottom surface of the pressing iron.

4,903,422

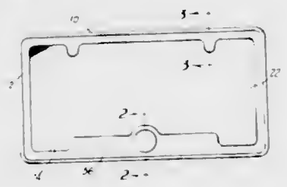
LICENSE PLATE FRAME ASSEMBLY

Paul Varga, 213 Philadelphia Ave., Salisbury, Md. 21801

Filed Dec. 4, 1987, Ser. No. 128,926

Int. Cl.[4] G09F *7/00*

U.S. Cl. 40—201 **10 Claims**



1. A theft resistant license plate frame assembly designed for protecting and displaying a license plate or tag on a vehicle, said assembly comprising:

(a) a substantially planar surface of the vehicle for receiving said assembly, said planar surface having a generally protected rear surface and a front surface adjacent which said assembly is disposed and a frame member having an outer peimeter and an open center portion defining a window for exposing the display surface of the license plate placed within said assembly, said frame member having a wall extension projecting radially from the outer perimeter of said frame member;

(b) a transparent plate means disposed adjacent said frame member and covering said center window portion for protecting the front display surface portion of said license plate;

(c) a back panel secured to the rear of the frame member and having a seal means disposed around the outer perimeter thereof, said sealing means being confined within said wall extension for holding said back panel in place and sealing the area between said back panel and said transparent plate;

(d) fastening means disposed through said planar surface and into said frame member for securing said frame member to said planar surface and preventing removal of said fastening means from said front surface; and

(e) an adhesive means for sealing said frame member for preventing the ingress of contaminants.

4,903,423

SIGN HOLDER

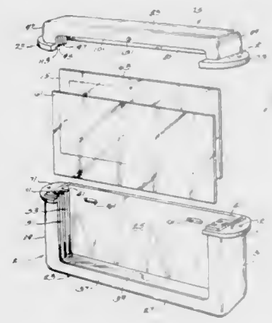
William F. Hinca, 1145-A Whiterock, Waukesha, Wis. 53186

Filed Mar. 14, 1988, Ser. No. 167,548

Int. Cl.[4] G09F *13/08, 13/04*

U.S. Cl. 40—205 **4 Claims**

1. A sign holder comprising a housing including a main body comprising a back wall, and opposed and spaced side walls extending from said back wall, each of said side walls having therein a forward groove and a rearward groove spaced rearwardly from said forward groove, and said main body also comprising a bottom wall extending from said back wall and from said opposed side walls, and said housing also including a cover releaseably secured to said main body and comprising a back wall, and opposed and spaced side walls extending from said cover back wall, each of said cover side walls having therein a forward groove and a rearward groove spaced rearwardly from said cover forward groove, and said cover also comprising a top wall extending from said cover back wall and from said cover side walls, and said sign holder also comprising a first light transmitting panel supported by said housing in said forward grooves of said main body and of said cover, a second panel removably supported by said housing in said rearward grooves of said main body and of said cover and in closely adjacent but rearwardly spaced relation from said first panel and in forwardly spaced relation from said back walls to provide rearwardly of said second panel an illumination space, an



indicia located on said second panel, one of said second panel and said indicia being obtuse to light transmittal and the other of said second panel and said indicia being clear, and a light bulb in said housing rearwardly of said second panel for illuminating the space between said second panel and said back walls, whereby said indicia on said second panel is visually observable by reason of variation in illumination.

4,903,424

MOVABLE DECORATION

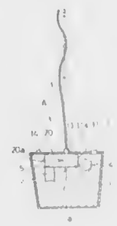
Yasuta Satoh, Nagareyama; Shigeru Nakane, Narashino; Shinya Saitoh, Tokyo, and Isamu Kataoka, Ichikawa, all of Japan, assignors to Takara Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,684

Claims priority, application Japan, Jul. 30, 1988, 63-190822; Sep. 9, 1988, 63-226083; Sep. 20, 1988, 63-236124

Int. Cl.[4] G09F *19/08*

U.S. Cl. 40—414 **25 Claims**



1. A mobile novelty plant assembly comprising:

a casing member;

motor means provided in the casing member;

a transmission assembly connected to the motor means for providing movement including an output member responsive to the activation of the motor means;

an elongated core member connected to the output member and cantilevered vertically above the casing member, the core member has a nonlinear configuration and, when moved by the motor means, portions of the core member travel on paths about a longitudinal axis extending from the output member to create a wobbling visual effect;

a flexible elongated decorative hollow member simulating the appearance of a living plant stem which extends over the core member and is dimensioned to permit relative rotational interior movement of the core member while transmitting the wobbling visual effect to an observer, the flexible elongated hollow member being fixed to the casing member at one end so that it does not rotate with the core member;

means, within the casing member, responsive to predetermined sound characteristics, for activating the motor means;

an outer housing having an inner diameter larger than the casing member and surrounding the casing member; and

an upper simulated plant head assembly attached to the elongated hollow member whereby the novelty decorative plant assembly can appear stationary for a visual effect on an observer and can further exhibit an apparent lifelike wobbling movement of the elongated hollow member and plant head assembly in response to the stimulus of the predetermined sound characteristic for a further pleasing effect on the observer.

4,903,425

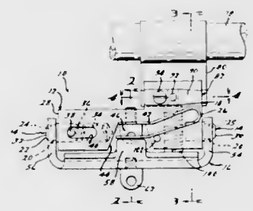
PIVOTAL ADAPTER FOR BIPODS AND ATTACHMENT THEREFOR

Gerald Harris, Rte. 1, Box 33, Barlow, Ky. 42024

Filed Feb. 3, 1989, Ser. No. 306,820

Int. Cl.[4] F41C *29/00*

U.S. Cl. 42—94 **17 Claims**



1. A pivotal adaptor for pivotally attaching a bipod to a fireman comprising:

a mounting bracket;

a means for attachment of a bipod to said mounting bracket;

a base portion adapted to be attached to a fireman;

a means for providing pivotal engagement between said mounting bracket and said base portion, said means for providing pivotal engagement including a pair of opposed pivotal pins on opposite sides of said base portion, and said mounting bracket including a pair of flanges with portions thereof defining a bore for engaging said pivotal pins;

spring means for providing biased engagement between said mounting bracket and said base portion thereby biasing against pivotal movement between said mounting bracket and said base portion for inhibiting unintended pivoting and rattling of said mounting bracket.

4,903,426

DEVICE FOR RECOVERING OF CARTRIDGE CASES FOR A SHOULDER WEAPON

Timour Bammate, Paris, France, assignor to Marianne Bammate

Filed May 26, 1989, Ser. No. 357,984

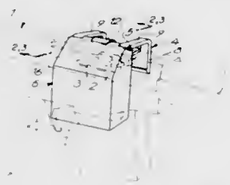
Claims priority, application Switzerland, Jun. 1, 1988, 63-02085

Int. Cl.[4] F41C *27/00*

U.S. Cl. 42—98 **4 Claims**

1. A device for recovering cartridge cases for a shoulder weapon having a loading handle and window for the ejection of the cases of the cartridges shot, comprising a support provided with means for the attachment thereof to the weapon, a container connected to said support, said container having an

entrance opening intended to be positioned opposite said ejection window for the cases in order to collect the cases, and means to permit recovering of the cases collected in the container, comprising a connecting hinge between the support and the container imparting to the latter a possibility of rotation extending from a bottom position in which the entrance opening of the container is swung in front of the case ejection



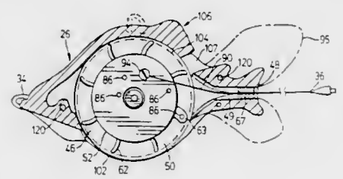
window to a top position in which the collected cases fall by gravity in order to permit their recovery, and means for immobilizing the container so as to be able to hold it temporarily in at least one of its possible positions by a force of retention capable of being overcome by manual rotation of the container, said means for immobilizing comprising means for immobilizing the container so as to be able to hold it in its top and bottom positions.

4,903,427
FISHING ROD
Yoshiro Yamato, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Feb. 7, 1989, Ser. No. 307,338
Claims priority, application Japan, Feb. 10, 1988, 63-16852[U]
Int. Cl.[4] A01K *87/06*
U.S. Cl. 43—22 **10 Claims**



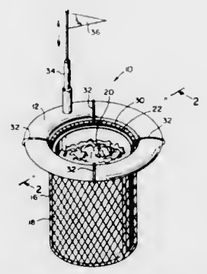
1. A fishing rod, comprising:
(a) a rod body which is hollow, has a gently tapered conical shape, and has a large diameter bottom portion, said bottom portion comprising a grip insertion portion,
(b) a grip fitted into said grip insertion portion, said grip having a predetermined axial length which is greater than an axial length of said grip insertion portion and including one lengthwise side having a first grip portion having a first predetermined length and another lengthwise side having a second grip portion having a second predetermined length, said first length being shorter than said second length, said first grip portion and said second grip portion each comprising fitting means enabling said first grip portion and said second grip portion to be alternately and selectively fitted into said grip insertion portion, and an insertion control means disposed between said first grip portion and said second grip portion, said insertion control means for abutting against an end face of said grip insertion portion thereby to set an insertion position at which said grip is fitted into said rod body, and
(c) fixing means for detachably fixing said grip to said rod body.

4,903,428
FISHING JIGGER
Alexander V. Sluiter, 2242 Wiseman Court, Mississauga, Ontario, Canada (L5J 1P2), and Richard J. Sluiter, 2079 Victoria Ave., Burlington, Ontario, Canada (L7R 1R5)
Filed Mar. 20, 1989, Ser. No. 325,786
Claims priority, application Canada, Nov. 21, 1988, 583621
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—26.1 **19 Claims**



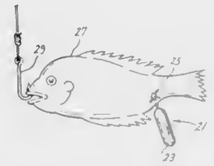
1. A fishing jigger comprising:
a body member having a longitudinal axis and a transverse axis;
said body member having a wheel cavity communicating with the exterior of body said member;
the body member also having a crank port communicating with said wheel cavity and extending along said longitudinal axis;
a paddle wheel mounted for rotation about said transverse axis in said wheel cavity; and
a crank member pivotally mounted on said paddle wheel eccentrically of said transverse axis, such that rotation of said paddle wheel about said transverse axis reciprocates said crank member relative to said port.

4,903,429
DEVICE TO ATTRACT FISH
John Tetenes, 155 S. Ketcham Ave., Amityville, N.Y. 11701
Filed Jul. 21, 1988, Ser. No. 222,050
Int. Cl.[4] A01K *97/00, 97/02, 97/04*
U.S. Cl. 43—44.99 **6 Claims**



1. A device to attract fish which comprises:
(a) a float in shape of a lifesaver disposed onto a body of water;
(b) a net suspended downwardly from said float into the water; and
(c) a bucket held within said net, said bucket holds frozen fish chum therein, so that open top of said bucket is at right distance below water line allowing pieces of defrosted fish chum to be dispensed from said bucket and float on the water to attract the fish.

4,903,430
FISH BAIT
Thomas E. DeWan, 5945 Carrier St., St. Petersburg, Fla. 33714
Filed Feb. 8, 1989, Ser. No. 308,320
Int. Cl.[4] A01K *97/02*
U.S. Cl. 43—44.99 **3 Claims**



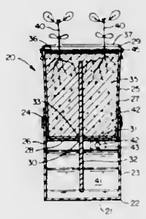
1. Fish bait comprising a body of fish bait material adapted to dissolve in water, and means on the body for attaching the body to a fishing implement, such as a hook, fishing line or bait fish, said attaching means comprising a barbed element adapted for insertion in a bait fish.

4,903,431
TRANSLUCENT PLANT COVER OF FOLDABLE CONSTRUCTION
Mark S. Stoll, Deephaven, Minn., assignor to Liberty Diversified Industries, Minneapolis, Minn.
Filed Dec. 8, 1986, Ser. No. 938,970
Int. Cl.[4] A01G *13/04;* **B65D** *5/10*
U.S. Cl. 47—28.1 **22 Claims**



1. A protecter for placing on the ground to cover a growing plant, said protector comprising:
a plurality of wall panels, each said wall panel extending from and being hingedly connected to another of said wall panels along scored fold lines such that said wall panels form a generally upright self supporting column when folded across said fold lines, the top edges of the wall panels of the column form an open top, said open top defining a plateau region, a depending shoulder region adjoining said plateau region and extending downward to a valley region from said plateau region, and an inclined edge region adjoining said valley region and opposing said plateau region, said inclined region inclining downward toward said valley region; and
at least one lid panel, each said lid panel extending from and being hingedly connected to the top edge of one said wall panel, such that at least one said lid panel may be selectively pivoted between a closed position substantially covering said open top and an open position substantially displaced from said closed position, whereby the protector folded to its generally upright position may be placed over the growing plant with at least one lid panel being selectively opened or closed to permit ventilation or provide protection from the plant.

4,903,432
AUTOCLAVABLE, REUSABLE, STERILE PLANT GROWTH SYSTEM AND METHOD
Ranga R. Velagaleti, Worthington; Sarah Marsh, Springfield, and Randall Velliquette, Xenia, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio
Filed Dec. 21, 1987, Ser. No. 136,205
Int. Cl.[4] A01G *25/00*
U.S. Cl. 47—81 **5 Claims**



1. A method for growing sterile plant seedlings including:
a. providing a sterile plant growth medium that can be sterilized in order to keep the contents sterile in a first plant growth container made from a moisture impermeable material;
b. embedding a fabric like moisture transmitting wick vertically placed within the plant growth medium for uniform distribution of moisture throughout the vertical and horizontal profile of the growth medium and projecting through an aperture in the plant growth container, and through an aperture in a perforated moisture transmitting bottom overlay inside and on the bottom of the plant growth container, and into a second reservoir container below the first container for water or nutrient solution, and into the solution therein;
c. closing the plant growth container and the reservoir container with a moisture impermeable autoclavable sealing means material to provide an autoclavable assembly;
d. providing an autoclavable foil-like cover over the top and sealed to the plant growth container;
e. autoclaving the assembly under sterilizing temperature conditions;
f. opening the moisture impermeable foil-like cover material and planting the sterile seeds in the plant growth medium below the surface of the plant growth medium;
g. adding a sterile granulate material on the upper surface of the plant growth medium and
h. recovering the surface of granulate material with the moisture impermeable cover, while permitting the shoots of plants to grow into the atmosphere, without obstruction, through apertures in the cover.

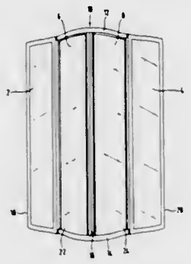
4,903,433
PARTITION, MORE PARTICULARLY FOR A CORNER OR CIRCULAR SHOWER
Heinz G. Baus, Hünibach-Thun, Switzerland, assignor to Altura Leiden Holding B.V., Maastricht, Netherlands
Filed Jun. 6, 1988, Ser. No. 202,675
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719896; Jan. 14, 1988, 3800882
Int. Cl.[4] E06B *3/34*
U.S. Cl. 49—40 **20 Claims**

1. A partition for a corner or circular shower, comprising:
at least one stationary wall-element for connection to a wall,
at least one guide-rail which is connected to said at least one wall-element and is carried by said wall-element, and extends over an entrance-area located at one side of said wall-element,
at least one door-element movable along said guide-rail by

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means of a guide body in order to open and close said entrance area, said guide-rail and said door-element being curved,

at least one pivot-lever having one end hinged to said at least one door-element adjacent an outer vertical longitudinal edge of said door-element, said pivot-lever, in a closed position of the door-element, lying adjacent, behind and substantially in parallel with said at least one wall-element,



and said pivot-lever having another end remote from said door-element pivotally secured to said wall-element by means of a bearing-support, wherein said another end of said at least one pivot-lever is pivotally secured to said wall-element by means of said guide-rail which extends over the entire width of said at least one wall-element, said guide-rail being located behind the wall-element when viewed from outside looking into an interior space delimited by said partition.

4,903,434

HINGE JOINT

Horst Loos, Freudenberg, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,423

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637077

Int. Cl.[4] E05D *15/52*

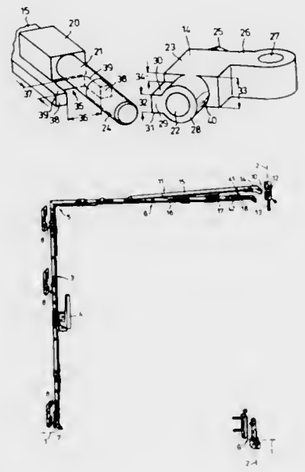
U.S. Cl. 49—192 5 Claims

1. A hinge joint for a window or door closure or the like comprising:

(a) a swing out arm incorporated in a disengaging device the arm having an end in the shape of a fork with two legs encompassing a cutout, the arm carrying a plate having a pivot pin extending therefrom,

(b) a bearing block adapted to be attached to a stationary frame, the block encompassing a pivot bearing receiving a vertical pivot pin, and

(c) an angular intermediate piece between the arm and the block having a first and a second leg, the first leg provided with a bearing eye containing a channel adapted to receive the pinion and about which the piece is rotatable, the legs of the fork pass by the bearing eye on either side so that the eye is contained in the cutout, the bearing eye provided with a cam extending radially therefrom having first and second opposed stop surfaces, each stop surface contacting surfaces of the legs of the fork to lock the arm in either one of two swivel positions of the arm relative to the intermediate piece, which positions are 180° apart, the second leg of the intermediate piece containing a through



hole directed at a right angle to the channel and attachable to the bearing block, pivot bearing a pivot pin.

4,903,435

DEVICE FOR MOTORIZED OPENING AND CLOSING OF PIVOTABLE BODY PANELS OF MOTOR VEHICLES

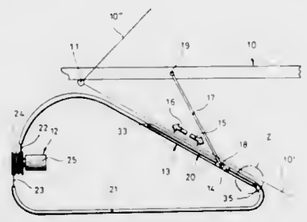
Werner Bittmann, Ruesselsheim, and Gerhard Getrost, Gross-Gerau, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1988, Ser. No. 285,986

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744083

Int. Cl.[4] E05F *15/04*

U.S. Cl. 49—340 17 Claims



1. In an automotive vehicle having vehicle body structure and a body closure panel pivotally connected to the body structure for movement between open and closed positions, and a reversible power operated lever system operatively connected with the body structure and said body panel for effecting movement of said body panel between its positions, the improvement being that said lever system comprises a stationary guide track supported by said body structure, a slide block slidably and guidably supported by said guide track for

movement in opposite closure panel opening and closure panel closing directions, a lever having one end pivotally connected to said slide block and its other end pivotally connected to said body panel and a reversible power operated drive means including a control cable and a driver attached to the cable, said driver being engageable with said slide block to positively move the same in said closure panel opening direction to effect opening movement of said body panel when the drive means is energized to move the cable in said closure panel opening direction, said driver being releasable from said slide block when the drive means is energized to move the cable in said closure panel closing direction, said slide block moving in the closure panel closing direction to effect sloping movement of said body panel due to the weight of said body panel and lever as said cable and driver are moved in said closure panel closing direction.

4,903,436

GUIDE FOR A SLIDING WINDOW

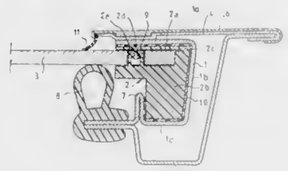
Firmin Rouillard, Epinay sur Orge, France, assignor to Automobiles Peugeot and Automobiles Citroen, Neuilly sur Seine, France

Filed Sep. 8, 1988, Ser. No. 242,252

Claims priority, application France, Sep. 8, 1987, 87 12657

Int. Cl.[4] E05D *15/16*

U.S. Cl. 49—440 16 Claims



1. A guide arrangement for a sliding window of a vehicle comprising, a generally "U" shaped guide rail secured in a frame of the window opening and a runner slidable in said guide rail and which straddles and is fixed to the window, said runner comprising, a thin web disposed between the outer surface of the window and an outer leg of the guide rail, and a seal mounted on the frame of the window opening for sealing against the window, and wherein, the gide rail is welded between an exterior panel and an interior panel of the vehicle.

4,903,437

SLICING MACHINE FOR CUTTING SEMICONDUCTOR MATERIAL

Yutaka Kubotera, Yokohama, and Kazunari Akiyama, Kawasaki, both of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,798

Claims priority, application Japan, Jul. 31, 1987, 62-192475; Jul. 31, 1987, 62-192476

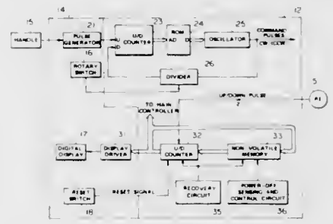
Int. Cl.[4] B25B *49/00*

U.S. Cl. 51—165.71 8 Claims

1. A slicing machine for cutting semiconductor material into wafers, having a feedtable to be adapted to carry thereon a semiconductor material to be cut, a carrying mechanism which moves the feedtable, a driving circuit which drives the carrying mechanism according to command pulses, a main controller which feeds the command pulses to the driving circuit, and a detection means which detects the position of the feedtable and outputs position data, wherein said slicing machine comprises:

(a) a handle operatively connected to the feedtable so as to move the feedtable manually;

(b) a manual pulse generator which produces a series of pulses according to the rotation of the handle; and



(c) a manual pulse controller which transforms the said series of pulses into the command pulses, and supplies the command pulses to the driving circuit.

4,903,438

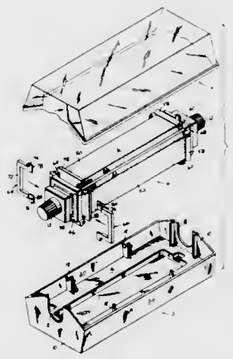
SHARPENING DEVICE

Richard S. Smith, 203 S. Summertime, Hot Springs, Ark. 71913

Filed Nov. 6, 1987, Ser. No. 118,327

Int. Cl.[4] B23F *21/03*

U.S. Cl. 51—211 R 16 Claims



1. A sharpening device comprising:

means for supporting a plurality of sharpening stones, said means being adaptable for holding sharpening stones of different lengths;

means for retaining end portions of said stones engaging around the perimeter of the supporting means adjacent end portions of the stones; and

means for locking said end portion retaining means in position adjacent said stones, said locking means engaging around the perimeter of the supporting means adjacent said end portion retaining means.

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4,903,439

METHOD FOR GRINDING ROUGH-SHAPED OBJECTS TO A CLEAN SPHERICAL FORM

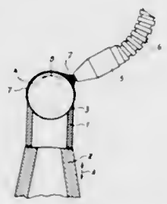
Alfred Hoffmann, Bilthofen, Netherlands, assignor to SKF Industrial and Trading Development Centre, B.V., Nieuwegein, Netherlands

Continuation of Ser. No. 613,103, May 23, 1984, abandoned, which is a continuation of Ser. No. 320,580, Nov. 12, 1981, abandoned. This application Mar. 11, 1985, Ser. No. 709,844

Claims priority, application Netherlands, Dec. 9, 1980, 8006681

Int. Cl.[4] **B24B** *11/02*

U.S. Cl. 51—289 S **4 Claims**



1. A method of grinding rough-shaped spherical objects to a finished spherical form comprising the steps of:

a. freely supporting the rough-shaped spherical object on one end of a vertically oriented tube, said one end being open and having an inside diameter such that a segment portion of the object lies within the tube;

b. applying an abrasive to the surface of the object; and

c. grinding the object by vibrating the tube axially at a frequency in the range of approximately 20–25 KHz. whereby the surface of the object is ground to a truer spherical shape.

4,903,440

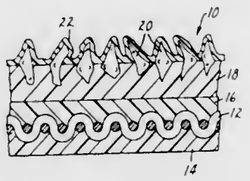
ABRASIVE PRODUCT HAVING BINDER COMPRISING AN AMINOPLAST RESIN

Alan R. Kirk, and Eric G. Larson, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 23, 1988, Ser. No. 276,140

Int. Cl.[4] **C09K** *3/14*

U.S. Cl. 51—298 **38 Claims**



1. An abrasive article comprising abrasive grains, and at least one binder formed from a precursor comprising an aminoplast resin having on average at least 1.1 pendant α,β-unsaturated carbonyl groups per molecule.

4,903,441

PREFABRICATED TRANSPORTABLE MODULAR RESIDENTIAL BUILDING

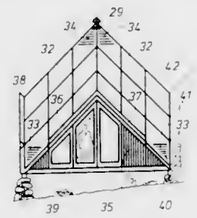
Pierre Nierle, 35 Avenue Eugène-Lance, Grand-Lancy/Geneva, Switzerland

Filed Jul. 21, 1987, Ser. No. 76,140

Claims priority, application Switzerland, Aug. 28, 1986, 3459/86

Int. Cl.[4] **E04H** *1/12;* **E04B** *1/19;* **E04C** *2/26*

U.S. Cl. 52—79.4 **9 Claims**



1. A prefabricated transportable residential building, comprising at least one module adapted to be joined to at least one other module to form a whole, wherein each module is composed of an indeformable, and light triangulated framework, said triangulated framework having an apex at its highest point, whose envelope defines a geometrical volume having a geometrically shaped base and three oblique faces whose slope is greater than 45 degrees, this volume resulting from the division of the faces of a pyramid by vertical planar portions passing through the centers of the sides of the base of the pyramid, the geometrically shaped base being in the plane of the pyramid base, and is further composed of a floor in the plane of the base of the pyramid, each of the three faces being in the plane of a face of the pyramid and extending from the apex to one of the centers of the sides of the base of the pyramid, a leakproof covering of the oblique faces, the vertical portions not contiguous to another module, said vertical portions being provided with walls adapted to be equipped with doors and windows, and open vertical portions serving for the juxtaposition of modules one against the other, the apex of the framework being provided with a suspension means adapted for transport of the module by helicopter.

wherein the oblique faces are composed of a triangulated tubular frame work supporting a panel of polyurethane foam reinforced with plastic trelliswork welded to the frame.

4,903,442

MAST FOR MEASURING OR ILLUMINATION PURPOSES, ESPECIALLY FOR FLIGHT NAVIGATION LIGHTS

Hartmut Trommen, Postbauer-Heng, Fed. Rep. of Germany, assignor to G. A. Pfleiderer GmbH & Co. KG, Neumarkt, Fed. Rep. of Germany

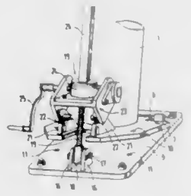
Filed Sep. 23, 1988, Ser. No. 248,455

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731931

Int. Cl.[4] **F21J** *13/10;* **E21B** *3/02, 13/10*

U.S. Cl. 52—116 **3 Claims**

1. A mast for illuminating or measuring purposes such as for supporting flight navigation lights or wind measuring devices, comprising a mast made of glass-fiber or carbon-fiber reinforced plastic material, said mast being disposed on a mast-support foundation, said mast further comprising tilt means operable to tilt said mast relative to said foundation, said mast further comprising an elongated upright section having a longitudinal end, said tilt means comprising a base plate secured to said longitudinal end, a foundation plate secured to said mast-support foundation, hinge means pivotably mounting said base plate on said foundation plate, operable means operably disposed between said base plate and said foundation plate for effecting pivotable movement of said base plate on said foundation plate, said operable means comprising a threaded adjusting spindle means pivotably mounted on said foundation plate, an adjusting support means threadedly mounted on said spindle means, and connectable means connecting said adjusting support means to said base plate, said elongated upright section of said mast being made of a plastic material and said base plate being made of metal, a support pipe welded into said base plate, said plastic elongated upright section of said pipe being mounted on said support pipe, and threaded means for threadedly securing said base plate to said foundation plate when said mast is in an upright position with its longitudinal axis generally perpendicular to said foundation plate.



4,903,443

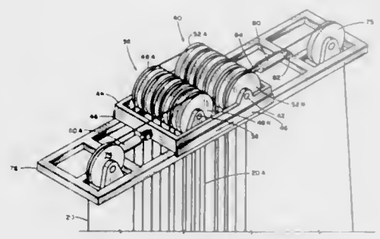
DERRICK HAVING UPPER AND LOWER CROWN BLOCK POSITIONS

Lowell M. Reed, Moore, Okla., assignor to Parker Drilling Company, Tulsa, Okla.

Division of Ser. No. 201,548, Jun. 2, 1988, Pat. No. 4,836,300, which is a division of Ser. No. 922,201, Oct. 23, 1986, Pat. No. 4,796,863. This application Dec. 2, 1988, Ser. No. 279,363

Int. Cl.[4] **B66C** *23/06*

U.S. Cl. 52—120 **3 Claims**



1. A derrick for use in performing drilling operations for drilling well bores in the earth which comprises:

a lower portion of a first selected height and constructed to have a first selected strength;

an upper portion adapted to be connected to said lower portion, the strength of said upper portion being not over about one-half of the strength of the lower portion;

a crown block; and

means to selectively support said crown block from said lower portion and said upper portion.

4,903,444

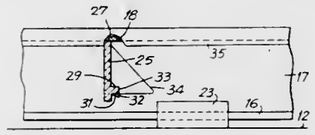
FLOOR GRATING

Fred P. Berndt, Jr., c/o Arden Architectural Specialties, Inc., 181 Ely St., NE., Minneapolis, Minn. 55432

Filed Oct. 3, 1988, Ser. No. 252,699

Int. Cl.[4] **B44D** *5/08*

U.S. Cl. 52—177 **5 Claims**



1. A floor grating assembly of the type comprising

(a) a plurality of tread rails arranged in closely spaced parallel relation,

(b) said tread rails each having a generally vertical web portion provided with alignment openings aligned with similar openings in adjacent tread rails,

(c) a plurality of spacer bars received in said alignment openings,

(d) said spacer bars having spacing notches formed therein for engagement with said tread rails,

(e) said alignment openings being configured to enable lengthwise insertion of spacer bars in one rotational orientation thereof and to cause said rails to be engaged and spaced by said spacer bars in a second rotational orientation thereof, and

(f) said alignment openings having side portions engaging one side of said spacer bars in said second rotational orientation, characterized by

(g) said spacer bars being provided on the side thereof opposite said one side with longitudinally extending flange means projecting laterally therefrom,

(h) at least certain of said alignment openings having locking notches formed therein located closely adjacent to, and adatped for the reception of, said flange means, and

(i) said flange means being locally deformed in the region of aid locking notches after rotation of said spacer bars to said second rotational orientation, whereby portions of said flange means are displaced into said notches to prevent subsequent rotation of said spacer bars out of said second rotational orientation.

4,903,445

ROOF RIDGE VENTILATORS

John P. Mankowski, 70 W. Boston Blvd., Detroit, Mich. 48202

Filed Jan. 9, 1989, Ser. No. 294,400

Int. Cl.[4] **F24F** *7/02;* **E04D** *1/30*

U.S. Cl. 52—199 **16 Claims**

1. A roof ridge ventilator to be installed under a cap shingle, comprising:

a one-piece cover member of an elongated shape including a pair of flaps, each flap having an upper surface over which cap shingles are secured and also having downwardly facing lower surfaces;

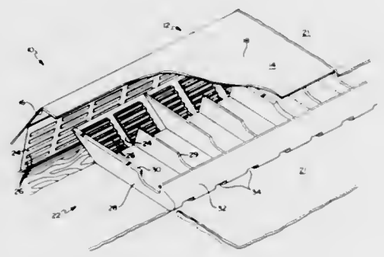
a pair of vents respectively secured to the lower surface of the cover member flaps;

a plurality of longitudinally spaced support walls in each vent that extend substantially vertically to limit entry of foreign particles through the roof ridge;

said support walls extending outwardly from under the cover member and extending beyond the cover member, thereby leaving portions of the support walls uncovered by the cap shingle and exposed to the outer elements;

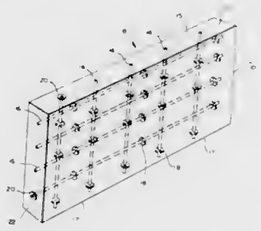
said exposed portions of the support walls including top edges which descend downwardly from the plane of the upper surface, and said top edges being adapted to receive

and be partially covered by the outermost edges of the cap shingle secured to the upper surface of the cover member;
each vent having inner walls with openings to permit air circulation;



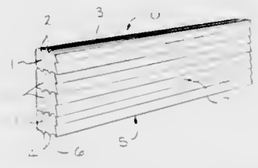
each vent having a longitudinally extending, upwardly projecting outer wall connecting said longitudinally spaced support walls; and
weepage openings in the outer wall at the bottom of the outer wall spaced intermediate said outer support walls to permit collected liquids to drain therethrough.

4,903,446
PRESTRESSED PLASTIC FOAM STRUCTURAL MEMBER
Jack Richards, and Marilyn Richards, both of Palatka, Fla., assignors to Wesley Staples, Palatka, Fla.
Filed Apr. 26, 1988, Ser. No. 186,434
Int. Cl.[4] E04B *1/14;* **E04C** *2/22*
U.S. Cl. 52—223 R **19 Claims**



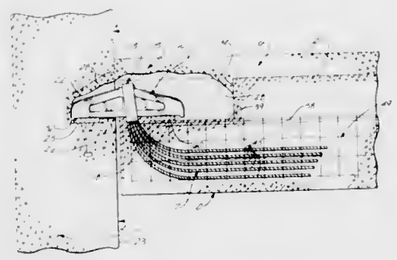
1. A prestressed structural member comprising:
a polymer foam element having an exterior surface; and
at least one tendon disposed within said polymer foam element at a predetermined location, said tendon extending substantially entirely through said foam element from a first predetermined external surface of said foam element to a second predetermined external surface, means for retaining said tendon in tension and in substantially immobile condition within said foam element, wherein said tendon possesses residual stresses thereby inducing a prestress in said structural member, said retaining means comprising a plurality of anchors fastened to and protruding from an exterior surface of said tendon, said plurality of anchors being disposed on a portion of said tendon within said polymer foam element.

4,903,447
LOG PROFILE AND LOG STRUCTURE INCORPORATING SAID LOG PROFILE
Paul R. McDade, 3900 Union School Rd., Oxford, Pa. 19363
Continuation of Ser. No. 194,445, May 16, 1988, abandoned.
This application Jun. 19, 1989, Ser. No. 368,914
Int. Cl.[4] E04B *1/10;* **E04C** *1/10*
U.S. Cl. 52—233 **9 Claims**



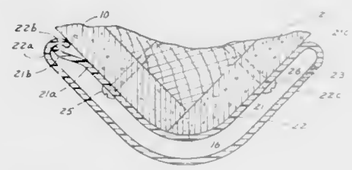
1. A log wall construction comprising a plurality of vertically stacked logs wherein a substantial portion of the weight of the logs near the top of the stack is supported by logs near the bottom of the stack, said log wall construction including a plurality of logs each comprising:
upper and lower, opposed major faces;
an exterior surface;
cooperating means provided on the upper and lower major faces aligning said plurality of logs in a substantially vertical stack;
a flange comprising interior and exterior surfaces substantially vertically oriented, said flange being connected to and depending downwardly from said lower major face so that said exterior surface of said flange constitutes an exterior surface of the wall;
a channel surface positioned adjacent to the upper major face of the log, said channel surface being oriented substantially vertically, in the log wall, opposite and spaced substantially apart from the interior surface of the flange formed on the log positioned above said log and forming therewith a channel; and
a sealant material carried in the channels so formed.

4,903,448
RETRACTABLE HANGERS FOR MOUNTING PRECAST CONCRETE BEAMS AND THE LIKE IN BUILDINGS
Lloyd A. Compton, Three Rivers, Calif., assignor to Kabo-Karr Corporation of California, Visalia, Calif.
Filed Jul. 21, 1989, Ser. No. 383,733
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—252 **19 Claims**



1. A hanger arrangement for load transferring connection of a reinforced concrete beam and the like to a reinforced concrete column and the like, comprising a reinforced concrete beam and, at least at one end of the beam, a hanger member movable in a cavity in an end portion of the beam between a retracted position in which the hanger member is disposed within the cavity and an extended position in which a column end portion of the hanger member extends in cantilever manner from the cavity and the end of the beam for bearing upon a selected feature defined in a recess in a column to which the beam is connectible,
the beam further defining in the cavity, for cooperation with a selected upper central portion of the hanger member in the extended position thereof, a hanger eye device coupled in fixed load bearing relation to the beam and defining an opening in which the hanger member is movable in movement from its retracted to its extended position,
the beam also defining in the cavity a bearing pad engageable with an underside of the hanger member in the extended position thereof adjacent an opposite end of the hanger member.

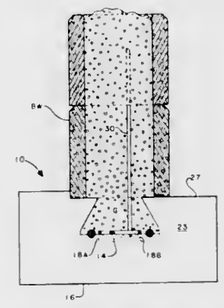
4,903,449
WALL CORNER GUARD STRUCTURE
Chester W. Ellingson, Jr., 13909 Frontier La., Burnsville, Minn. 55337
Filed May 15, 1989, Ser. No. 351,788
Int. Cl.[4] E04F *13/06*
U.S. Cl. 52—238 **1 Claim**



1. A guard structure of a corner formed by the convergence of a pair of walls, comprising
an underlying layer conforming to and overlying a wall corner surface portion,
means securing said underlying layer to said wall surface portion,
an overlying layer spaced outwardly from said underlying layer,
said overlying layer forming a continuation of said underlying layer at one of said underlying layer's ends with a corresponding of said overlying layers end portion,
a living hinge formed intermediate said continuation of said ends of said layers,
said underlying layer having its other end tip portion curved outwardly obliquely from said wall corner surface, and
said overlying layer having its other end portion reversely curved and adapted to interengage said outwardly curved tip portion end of said underlying layer.

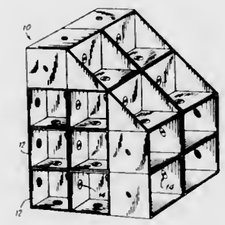
4,903,450
CONCRETE FOOTER BLOCK AND FOUNDATION SYSTEM FORMED THEREFROM
Fred H. Adams, Cary, N.C., assignor to Adams Products Company, Morrisville, N.C.
Filed May 2, 1989, Ser. No. 347,000
Int. Cl.[4] E02D *27/01*
U.S. Cl. 52—293 **20 Claims**

1. A concrete wall and foundation system for a building, comprising:
a footing system including a plurality of elongate concrete masonry footer blocks comprising top, bottom and side surfaces and disposed in side-to-side abutting relationship along a footing axis which is substantially parallel to the concrete wall to be supported by said footing system, wherein said footer blocks each define a cavity therein which extends transversely to the longitudinal axis of the block and downwardly at least into the medial portion of the block, said cavity being open at the top surface and on each side surface of the footer block and having a bottom surface substantially parallel to the bottom surface of said footer block, and said footer blocks each including at least one support means extending across at least a portion of the bottom surface of said cavity substantially parallel to the longitudinal axis of said footer block for supporting one or more reinforcement elements thereon, and wherein



said footer blocks further each define a shoulder on the top surface thereof proximate to the opening of said cavity and extending transversely to the longitudinal axis of said footer block to facilitate alignment of a concrete wall thereon; and
a concrete wall being formed from concrete building blocks supported on said abutting footer blocks and stacked thereon adjacent the shoulders thereof so as to define said concrete wall.

4,903,451
MODULAR SYSTEM AND FASTENING DEVICES THEREFOR
Patrick Gresswell, Welwyn, England, assignor to Gressco, Ltd., Madison, Wis.
Filed Oct. 14, 1988, Ser. No. 257,962
Int. Cl.[4] A47B *47/00*
U.S. Cl. 52—584 **15 Claims**



1. A modular system comprising;
(a) a plurality of building units, each having at least one countersunk aperture for alignment with a countersunk aperture of another building unit; and
(b) fastening means for securing said building units together in any of a plurality of configurations to form said modular system, said fastening means including a plurality of fastening devices, each including:
(i) first bolt means for engagement within a first said countersunk aperture;
(ii) second bolt means for engagement within a second

said countersunk aperture that is in alignment with said first countersunk aperture;

(iii) nut means positioned within said first and second countersunk apertures for securing said first and second bolt means together; and

(c) at least one of said building units having a configuration of a cube.

4,903,452

MODULAR SPACE FRAMED EARTHQUAKE RESISTANT STRUCTURE

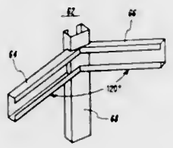
Yeo T. Huang, 9405 Pinewood Dr., Dallas, Tex. 75243

Continuatioo-in-part of Ser. No. 124,832, Nov. 24, 1987, Pat. No. 4,831,191. This applicatioo May 23, 1988, Ser. No. 197,818

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[4] E04H *12/18*

U.S. Cl. 52—646 **6 Claims**



1. A modular construction device comprising first, second and third beams which are interconnected to define a rigid Y-shaped joint with respective space angles between each pair of beams, said first and second beams being adapted to define respective portions of respective first and second horizontal frame members at a particular level of a multi-level space framed structure, said third beam being adapted to define a corresponding portion of a leg of the structure interconnecting said particular level with an adjacent level, said first and second beams intersecting said third beam at a selected position between first and second opposite ends of said third beam, said first and second beams being notched adjacent to their respective intersections with said third beam for receiving a portion of the third beam within the notch so that at least a portion of the third beam projects from the notch in each direction along a major axis of the third beam.

4,903,453

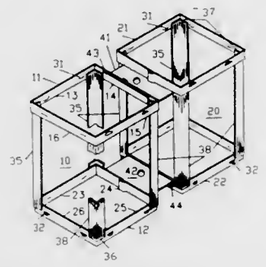
CONSTRUCTION BLOCKS

Bob G. Newsom, HG 83, Box 507, Etty, Ky. 41572

Filed Sep. 20, 1988, Ser. No. 246,261

Int. Cl.[4] E04H *12/00*

U.S. Cl. 52—648 **38 Claims**



7. A construction block, comprising:

first and second identical subassemblies joined together; and each of said subassemblies comprises: (A) a top frame including wall members, one of which connects said top frame via said spacing means to the top frame of the other said subassembly to form the top of said construction block, (B) a bottom frame including wall members, one of which connects said bottom frame via said spacing means to the bottom frame of the other said subassembly to form the bottom of said construction block, (C) a plurality of support members secured between said top frame and said bottom frame, (D) said top and bottom frames are shaped geometrically identical but sized so said top and bottom frames of similar construction blocks will interfit in the manner of a male and female coupling, and (E) said support members are curved such that said construction block assumes a curved shape with said top offset from said bottom.

4,903,454

BUILDING CLADDING SYSTEM

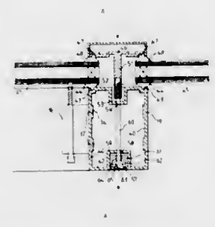
Stephen L. Rose, The Cottage, Schoolhouse Lane, Abbots Bromley, Nr. Rugeley, United Kingdom WS15 3BT

Filed Aug. 11, 1988, Ser. No. 231,378

Claims priority, application United Kingdom, Aug. 13, 1987, 8719178

Int. Cl.[4] E04B *2/00*

U.S. Cl. 52—766 **13 Claims**



1. A building cladding system comprising:

an infill panel having an inwardly facing peripheral portion,

a plurality of frame members provided by elongate mullions and transoms,

an outwardly facing abutment provided on at least one of said frame members,

a clamping member, and

operating means for moving said clamping member into clamping engagement with said infill panel to clamp said inwardly facing portion of said infill panel against said outwardly facing abutment,

said operating means comprising:

a first member extending inwardly from said clamping member to an intermediate position disposed inwardly of said panel,

an elongate second member extending laterally relative to said first member,

means mounting said second member on said at least one frame member for sliding movement longitudinally thereof, and

inter-engageable cam elements including a first cam element associated with said second member and a second cam element associated with said first member operably to interengage said first and second members at said intermediate position, wherein

said second member extends from said intermediate position to a driving position disposed remotely from said intermediate position and accessible from a position disposed inwardly of said panel, and

said second member is engageable at said driving position so as to be slidable longitudinally of said at least one frame

member to cause sliding movement of said first cam element associated with said second member, parallel to said infill panel and longitudinally of said at least one frame member, and to cause movement of said second cam element associated with said first member, in a direction generally perpendicular to said infill panel, to move said clamping member into clamping engagement with said infill panel.

4,903,455

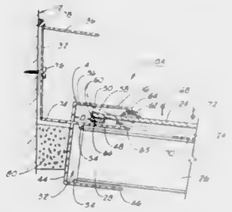
PANEL FOR A WINDOW WELL COVER AND THE LIKE

Robert M. Veazey, 6920 Woodbury, Wichita, Kans. 67226

Filed Feb. 8, 1988, Ser. No. 153,068

Int. Cl.[4] E04C *2/38*

U.S. Cl. 52—822 **8 Claims**



1. A panel for a window well cover and the like, the panel comprising:

a frame comprised of a plurality of frame members, each frame member in cross section comprising:

a base having a top portion and a bottom portion;

a lower arm extending from the bottom portion of the base;

an intermediate arm extending from the base; and

an upper arm extending from the top portion of the base;

a plastic glazing, an outer perimeter of the plastic glazing received in an upper space between the intermediate arm and the upper arm and riding therein, an edge of the outer perimeter of the plastic glazing disposed in a spaced relationship from the base to allow for expansion and contraction of the plastic glazing; and

at least one cross bar, one end of the cross bar received in a lower space between the lower arm and the intermediate arm and secured therein, the cross bar supporting a portion of the plastic glazing thereon.

4,903,456

DEVICE FOR CONTROLLING THE ADVANCE AND THE POSITIONING OF ENVELOPES IN AN INSERTION MACHINE

Jean-Pierre Meur, La Ville Du Bois, France, assignor to SMH Alcatel, Paris, France

Filed Nov. 28, 1988, Ser. No. 276,606

Claims priority, application France, Nov. 26, 1987, 87 16411

Int. Cl.[4] B65H *7/14, 29/20*

U.S. Cl. 53—69 **21 Claims**

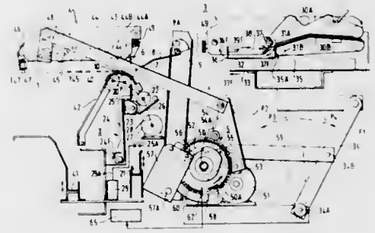
1. A control device for controlling the advance and the positioning of envelopes in an insertion machine, the device comprising transfer means for transferring empty envelopes along a transfer path coupled to the inlet of an insertion station, and ejection means for ejecting envelopes filled at the insertion station, said transfer means and said ejection means being operated during an ejection and feed sequence, which sequence forms a part of a set of control sequences for the machine with the sequences being defined relative to one another for each insertion cycle, the device further including:

a stepper motor coupled in common to said transfer means and to said ejection means in order to control them simultaneously;

a clock circuit generating clock signals for each cycle and in synchronism with the progress of all of said sequences;

an envelope presence detector at an intermediate point along said path; and

a circuit for controlling and governing the speed of said stepper motor, said circuit being coupled to said clock circuit and to said envelope presence detector in order to receive output signals therefrom, and being equipped firstly with first detector means for detecting a first indicator of said ejection and feed sequence on a first defined



clock signal in order to control motor drive and trigger a first or "advance" drive stage on the appearance of said first indicator, and secondly with first governor means for governing said advance stage by detecting motor steps, said first governor means being triggered by the output signal from said envelope presence detector indicating that the envelope has finished going past said intermediate point in order to detect a first determined number of motor steps defined relative to the distance between said intermediate point and the inlet of the insertion station and to cause the motor to stop when said first number of detected motor steps is reached.

4,903,457

DEVICE FOR EJECTING FILLED ENVELOPES, AND AN INSERTION MACHINE USING SAID DEVICE

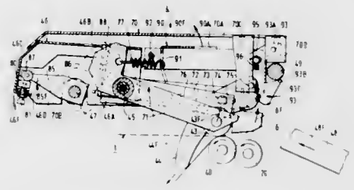
Gérard Dimur, Epinay Sur Orge, France, assignor to SMH Alcatel, Paris, France

Filed Nov. 28, 1988, Ser. No. 276,607

Claims priority, application France, Nov. 26, 1987, 87 16409

Int. Cl.[4] B65H *29/20, 29/58*

U.S. Cl. 53—251 **26 Claims**



1. An ejection device for ejecting filled envelopes from an insertion station in which sheets are filled into successive envelopes that are brought empty into said station, the device including evacuation means which are operated after each insertion and further including tilting means for tilting said filled envelopes and mounted facing said evacuation means, at least in part, actuator means for actuating the tilting means between a first or "raised" position in which they are at a

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distance from the plane of the insertion station and leave the station free to be fed with an empty envelope, and a second or "low" ejection position interferring with the plane of the insertion station and pressing said filled envelope against said evacuation means, and reception means for receiving filled envelopes which are evacuated, said reception means being mounted substantially transversely relative to the plane of the insertion station and being coupled to said evacuation means by said tilting means when the tilting means are actuated to take up their low ejection position.

4,903,458

ARRANGEMENT FOR THE ATTACHMENT OF BENDABLE, ELONGATED OBJECTS, IN PARTICULAR SUCTION TUBES, ALONG THE SIDE OF A PACKING CONTAINER

Jan Hakansson, Eslöv, Sweden, assignor to AB Profor, Lund, Sweden

Filed Aug. 15, 1988, Ser. No. 232,236
Claims priority, application Sweden, Sep. 4, 1987, 8703437
Int. Cl.[4] B65B *61/00*
U.S. Cl. 53—410 **19 Claims**



1. A method for attaching elongated drinking straws wrapped in an envelope of flexible material to a side wall of a container through a heat-activated bonding agent, said drinking straws including a first portion, a second portion and a foldable portion connecting said first and second portions; the method comprising the steps of:

applying the bonding agent to a side wall of the container;

attaching the drinking straw to the side wall of the container by bringing the drinking straw wrapped in the envelope in contact with the bonding agent, said drinking straw wrapped in the envelope being attached to the container such that the first portion of the straw extends diagonally across the side wall of the container and the second portion of the straw projects beyond an edge of the container; and

folding the second portion of the drinking straw wrapped in the envelope along the foldable portion by first folding said second portion in a direction towards the side wall of the container so that the second portion coincides with the side wall of the container and at least parts of the envelope are brought into contact with the bonding agent and thereafter folding said second portion in a direction away from the side wall of the container to thereby control the location of edges of the envelope to ensure that the second portion will be folded down without any portion of the envelope edges being secured to a top surface of the container.

4,903,459

METHOD AND APPARATUS FOR DISCHARGING VACUUM PACKAGED GOODS FROM VACUUM PACKAGING APPARATUS

Keizo Okinaka, Mihara, Japan, assignor to Furukawa Mfg. Co., Ltd., Tokyo, Japan

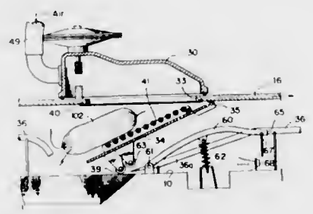
Filed Nov. 28, 1988, Ser. No. 276,710
Claims priority, application Japan, May 29, 1986, 61-125009
Int. Cl.[4] B65B *31/02, 7/06, 51/10, 57/10*
U.S. Cl. 53—434 **7 Claims**

1. A method for discharging vacuum packaged goods from a vacuum packaging apparatus which comprises:

causing a table having drop openings sealed by cover plates pivotally supported at one end on the underside of the table, and chambers held in contact with the upper surface of the table at positions corresponding to the individual drop openings and each defining an airtight space in its interior, to move integrally together along an endless track,

separating each of the chambers from the table for a given period of time within a specified range of rotation angles of the table and the chambers in the course of their making one turn along the endless track, to supply goods to be packaged as contained in a bag onto the corresponding cover plate,

bringing the chamber again into contact with the table to



cover the table with the chamber at a portion surrounding the bag supplied, and then sealing the mouth of the bag by creating a vacuum atmosphere in the internal space of the chamber, and

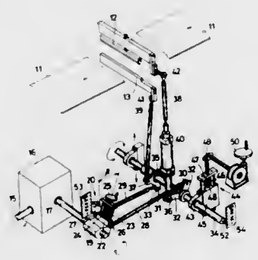
introducing air into the chamber for discharging vacuum packaged goods as provided by sealing the mouth of the bag under the vacuum atmosphere, and simultaneously uncovering the drop opening by opening the cover plate such that the cover plate is inclined downwardly from said one end toward the other end thereby discharging downward the vacuum packaged goods resting on the cover plate through the drop opening before the chamber is completely separated upward from the table.

4,903,460

DEVICE FOR VARYING THE OPENING BETWEEN THE WELDING ELEMENT AND THE COUNTER-WELDING ELEMENT IN PACKAGING MACHINES

Aris Ballestrazzi, and Lamberto Tassi, both of Savignano Sul Panaro, Italy, assignors to Sitma-Societa Italiana Macchine Automatiche S.p.A., Italy

Filed May 31, 1988, Ser. No. 200,590
Claims priority, application Italy, Jun. 3, 1987, 20772 A/87
Int. Cl.[4] B65B *51/30, 9/12, 9/06*
U.S. Cl. 53—550 **10 Claims**



1. A welding device for a packaging machine which packages products arranged in sequence on a conveyor belt in a continuous tubular plastic film, the device comprising:

a car supported for horizontal reciprocation parallel to a running direction of the conveyor belt;

a welding unit including a main welding element and a counter welding element supported by said car and positioned on opposite sides of the tubular plastic film, said welding elements being vertically moveable relative to each other between a rest position in which said welding elements are spaced apart and an engagement position in which said welding elements engage for welding and cutting the tubular plastic film interposed between said welding elements;

drive means, supplying a predetermined constant angle oscillatory motion, for powering vertical reciprocation of said welding elements between said rest and engagement positions; and

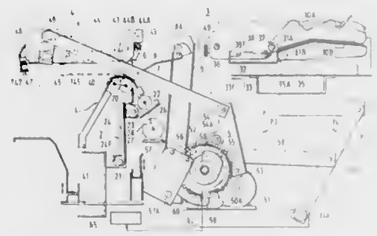
first adjustment control means and second adjustment control means, between said welding unit and said drives means, for varying distances traveled by said welding elements between said rest position and said engagement position for different package heights, said adjustment control means including adjustable crank means, said crank means being operatively and rotatably linked with said drive means on one side thereof and said welding elements on an opposite side thereof.

4,903,461

DEVICE FOR INSERTING SHEETS INTO ENVELOPES

Gérard Dimur, Epinay sur Orge, France, assignor to SMH Alcatel, Paris, France

Filed Nov. 28, 1988, Ser. No. 276,738
Claims priority, application France, Nov. 26, 1987, 87 16410
Int. Cl.[4] B65H *5/30*
U.S. Cl. 53—569 **17 Claims**



1. A sheet insertion device for inserting sheets into envelopes, the device comprising:

a fixed insertion station per se, fed with empty envelopes which are separate from one another;

a fixed sheet inlet station including a fixed inlet tray, said station being at a distance from the insertion station and being fed with sheets which are separate from one another;

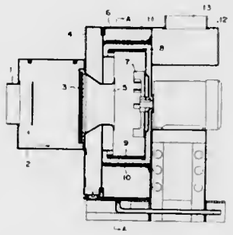
a sheet transfer and insertion tray referred to as a "carriage" which is driven in translation along a "go" stroke from a first position in which it is retracted beneath the fixed inlet tray to a second position in which it is at least partially engaged in the envelope present in the insertion station, and also along an opposite "return" stroke, said carriage being fixed with pusher fingers having forwardlydirected sheet grasping means for grasping the sheet present in the inlet station, said fingers projecting above the level of the inlet station in order to retain the sheet by their grasping means and to push it during said go stroke, wherein said pusher fingers and said forwardly-directed sheet grasping means are fixed relative to each other and are fixed relative to the carriage, with said forwardly-directed grasping means projecting just above the level of the inlet station in order to leave them free to pass beneath a sheet waiting in the inlet station during the return stroke of the carriage, and wherein the sheet insertion device further includes holding-down fingers mounted above the inlet station and controlled to take up a holding-down position against the inlet station at least during the beginning of said carriage go stroke in order to force the sheet beneath said grasping means, thereby ensuring that the sheet is taken by said grasping means of each pulser finger, and also having a retracted position above the inlet station during the remainder of the go stroke and during the return stroke of the carriage in order to leave the inlet station free to be fed with a new sheet.

4,903,462

OIL MIST REMOVER

Tsueno Nagashima, and Makoto Yamane, both of Osaka, Japan, assignors to Tabai Espec Co. Ltd.; Itoman & Co. Ltd., both of Osaka and Taichi Uchida, Kyoto, all of, Japan

Filed Aug. 26, 1988, Ser. No. 237,239
Claims priority, application Japan, Aug. 31, 1987, 62-218123; Aug. 31, 1987, 62-218126; Aug. 31, 1987, 62-133313[U]
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—317 **3 Claims**



1. An oil mist remover comprising:

a main body into which air containing oil mist is sucked through a suction hole and then discharged through an exhaust hole after said oil mist is removed;

a cylindrical rotary filter provided in said main body;

a cylindrical fixed filter provided in said main body, said cylindrical fixed filter surrounding said rotary filter;

a fan provided coaxially with and in said cylindrical rotary filter so that said fan rotates together with said rotary filter;

a driving means which drives said fan and rotary filter, said driving means bringing said air containing oil mist into said main body, sending said air to said exhaust hole through said rotary filter and fixed filter so that said oil mist is adsorbed on said filters and then forced out of said filters;

a spiral ventilation chamber provided in said main body and surrounding said fixed filter, said ventilation chamber being designed so that said air after passing through said fixed filter flows in said ventilation chamber from an inner side to an outer side, and to said exhaust hole, said ventilation chamber being further designed so that its sectional area gradually increases from said inner side to said outer side;

a guide hole provided between the outer side of said ventilation chamber and said exhaust hole, said guide hole changing the flow direction of the air coming from said outer side so as to guide such air flow to said guide hole;

an oil drain hole provided at said outer side end of said ventilation chamber so that said oil, which has been forced into said ventilation chamber through said rotary filter and fixed filter, is drained out of said ventilation chamber; and

a drain chamber wherein said oil drained out through said oil

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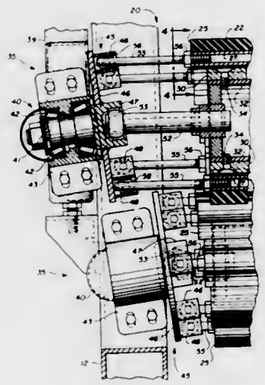
drain hole is temporarily stored therein and then forced out of said main body by air pressure.

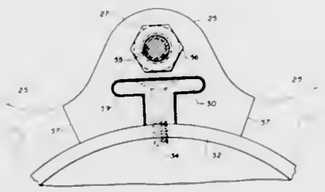
4,903,463

RECIPROCATING LOBED CONDITIONING ROLLS

Gilbert W. Linde, and Emmett G. Webster, both of New Holland, Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Mar. 17, 1989, Ser. No. 325,278
Int. Cl.[4] A01D *82/00*
U.S. Cl. 56—1 **19 Claims**





16. An oscillating mechanism connectable to a conditioning roll having a plurality of lobes equidistantly mounted around the circumference thereof for sliding movement parallel to the axis of rotation of said conditioning roll, said oscillating mechanism being operable to effect a reciprocal sliding movement of said lobes upon rotation of said conditioning roll, comprising:

a hub journaled for rotation along a second axis non-parallel to the axis of rotation of said conditioning roll, said hub being spaced from said conditioning roll in general alignment with the axis of said conditioning roll;

a plate affixed to said hub for rotation therewith in a plane perpendicular to said second axis such that a first portion of said plate is closer to said conditioning roll than a second portion of said plate; and

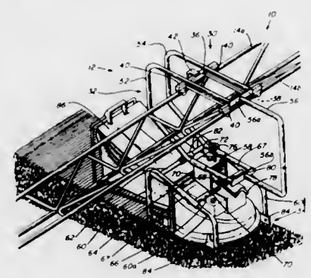
connecting means interconnecting said plate and each of said lobes for transferring rotative motion between said conditioning roll and said plate and for transversely moving said lobes due to the connection thereof with said rotating plate oriented in a non-perpendicular rotating plane.

4,903,464

OVERHEAD PLANT CLIPPING SYSTEM

Ray Debruhl, Jr., 308 Forest Dr., La Grange, N.C. 28551

Filed Mar. 14, 1989, Ser. No. 323,491
Int. Cl.[4] A01D *34/63*
U.S. Cl. 56—10.1 **37 Claims**



1. A method of clipping plants within a greenhouse or plant growing area comprising:

(a) providing an overhead boom structure over underlying plants;

(b) suspending a plant clipping machine from the boom structure;

(c) adjusting the height of the plant clipping machine with respect to the overhead boom structure such that the clipping machine will cut a selected top portion of the plant as the cutting machine is moved thereover;

(d) moving the boom structure over the underlying plants; and

(e) clipping a top portion of the underlying plants as the boom structure and plant clipping machine are moved over the underlying plants.

4,903,465

MOWER GUARD FOR FLEXIBLE MARKERS

Robert K. Hughes, Fort Meyers, Fla., assignor to Flexstake, Inc., Azle, Tex.

Continuation-in-part of Ser. No. 190,482, May 5, 1988, Pat. No. 4,862,823. This application Aug. 8, 1989, Ser. No. 390,775
Int. Cl.[4] A01D *75/20, 34/42, 34/70*
U.S. Cl. 56—12.7 **15 Claims**

1. A mowing apparatus for mowing grass in a grassy area having at least one flexible, resilient marker inserted into the ground of a type which will bend substantially flush with the ground, comprising in combination:

a blade housing having a longitudinal axis parallel to a direction of travel of the housing;

at least one blade carried in and rotatably driven in the housing;

a front guard roller located forward of the blade and a rear guard roller located rearward of the blade, each guard roller extending transversely to the longitudinal axis of the housing at least the full width of the blade; and

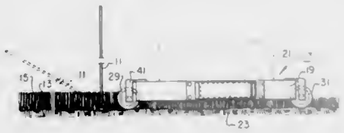
mounting means for mounting the guard rollers rotatably to the housing so as to contact and bend the marker, and for spacing the guard rollers apart from each other in a longitudinal direction a distance less than the height that the marker protrudes above the ground, so as to prevent the marker from flexing upward into contact with the blade as the mower travels over it.

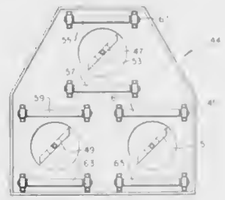
15. A method of mowing grass in a grassy area which has at least one marker inserted into the ground, comprising in combination:

providing the marker with a shaft which is resilient and which will flex sufficiently to allow the marker to bend over substantially flush with the ground;

providing a mower with a blade housing having a longitudinal axis parallel to a direction of travel of the housing and at least one blade carried in and rotatably driven in the housing;

mounting a front guard member to the housing forward of the blade and a rear guard member to the housing rearward of the blade, with each guard member extending transverse to the longitudinal axis of the housing at least the full width of the blade, and mounting the guard members to the housing so as to contact the marker substantially at a point where the marker enters the ground, and spacing the guard members apart from each other in a longitudinal direction a distance less than the height that the marker protrudes above the ground;





rotating the blade and moving the housing over the grassy area;

contacting the shaft of the marker with the front guard member, and moving the housing over the marker, causing the marker to bend over substantially flush with the ground to avoid being struck by the blade; then

contacting the shaft in its bent over position with the rear guard member as the housing continues to move over the marker, maintaining the shaft in its bent over position as the front guard member passes from the marker, so as to prevent the marker from flexing upward into contact with the blade as the mower travels over it.

4,903,466

FEEDING MECHANISM FOR A MACHINE OF THE REAPER-THRESHER-TYPE

Patrick Sionneau, rue Saint-Martin, Villeromain, 41100 Vendome, France

Continuation of Ser. No. 81,768, Aug. 5, 1987, abandoned. This application Aug. 27, 1988, Ser. No. 257,153
Claims priority, application France, Aug. 6, 1986, 86 11650
Int. Cl.[4] A01D *34/04*
U.S. Cl. 56—14.6 **2 Claims**

1. A feeding mechanism adapted to be connected to a cutter bar support of a reaper which is capable of moving along a direction of propagation and of cutting plants which have substantially vertical stems and which includes means for cutting said stems along a line making a given angle with said direction of propagation to form cut stems and means for collecting the cut stems, moving said cut stems in a flux making a given angle with said direction of propagation and bringing them to an opening in the reaper for treatment, said feeding mechanism comprising:

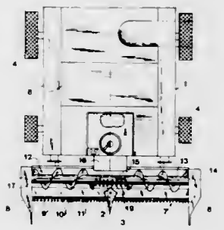
displacing means for laterally displacing an assembly of stems engageable by said mechanism.

inclining means for inclining the displaced stems of said assembly of stems along a direction substantially in the direction of movement of said flux and in order to send said stems onto said flux before its entry into said opening,

guiding means for guiding said flux completed by said assembly of stems towards said opening, and

compressing means for compressing the flux of the plants before said flux enters into said opening;

wherein said feeding mechanism has a longitudinal axis adapted to extend parallel to said direction of propagation, said displacing means of said feeding mechanism is comprised of a first wall lying substantially in a plane in which the stems of the plants to be cut are substantially arranged with said plane making an acute angle relative to said longitudinal axis, said stem inclining means of said feeding mechanism is comprised of a second wall extending from said first wall with said second wall becoming progressively inclined in relation to said plane of said first wall by diverging from the axis of said feeding mechanism and said guiding means of said feeding mechanism is comprised of a third wall starting from the point of said second wall which is the farthest from the axis of said feeding mechanism and ending adjacent the opening substantially on said axis of said feeding mechanism.

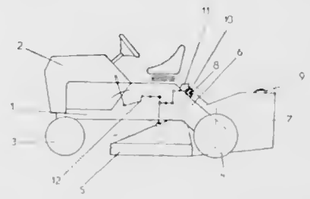


4,903,467

SELF-PROPELLED LAWNMOWER

Pierre Wolf, Wissembourg, France, assignor to Etesia, Wissembourg, France

Filed Jul. 27, 1987, Ser. No. 78,160
Claims priority, application France, Jul. 25, 1986, 86 11158; Jun. 26, 1987, 87 09186
Int. Cl.[4] A01D *34/70*
U.S. Cl. 56—16.6 **4 Claims**



1. Self-propelled lawn mower, essentially constituted by a carrier chassis (1) provided with a forwardly mounted drive motor (2), directional front wheels (3), rear drive wheels (4), and a ventral cutter housing (5) having an ejection channel having an outlet opening, the cutter housing (5) being supported by the chassis (1) and having two synchronized coun-

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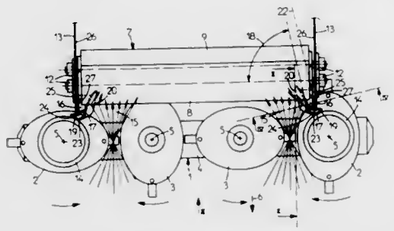
ter-rotating blades, characterized in that the rear drive wheels (4) are mounted on a rear interconnecting member (6) in the form of a portico on which is supported a receptacle (7) for receiving cut grass, directly on the outlet opening of the ejection channel of the cutter housing (5) between the rear wheels (4).

4,903,468

MOWER-CONDITIONER HAVING DEFLECTOR

Jean-Paul Haberkorn, Saverne, France, assignor to Kuhn s.a., Saverne, France

Filed Jun. 27, 1988, Ser. No. 212,328
Claims priority, application France, Jun. 26, 1987, 87 09183
Int. Cl.[4] A01D *34/66, 43/10, 57/26, 82/00*
U.S. Cl. 56—16.4 **15 Claims**



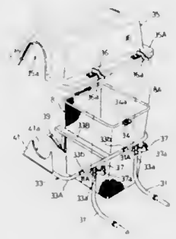
1. A mower-conditioner, comprising:
at least one mowing group comprising mowing means for cutting crop and throwing the cut crop backward when considering a work direction;
conditioning means associated with said at least one mowing group and comprising a middle part, said conditioning means extending behind said associated mowing means, when considering said work direction, for conditioning the thrown crop, said conditioning means comprising two lateral walls and two conditioning rollers rotatably supported in said two lateral walls and crossing the path of the thrown crop, whereby the crop passes between said rollers; and
deflector means associated with said at least one mowing group and said corresponding conditioning means, said deflector means being positioned at least partially in the path of the thrown crop and comprises two deflectors, each one of which extending in the vicinity of a corresponding one of said two lateral walls and comprising:
(a) an upright portion in the path of the thrown crop, said upright portion, in top view, being inclined such that a rear part of said upright portion is closer to said middle part of said conditioning means than is a forward part of said upright portion, said upright portion thus forming a first angle with respect to said rollers, said upright portion also being angled by an acute second angle with respect to a vertical plane in top view at least approximately parallel to said first angle such that a lower part of said upright portion is closer to said middle part of said conditioning means than is an upper part of said upright portion; and
(b) a front portion extending from said forward part of said upright portion outwardly away from the other of said deflectors.

4,903,469

LAWN MOWER

Masatake Murakawa; Niro Bando, both of Sakai; Masatsugu Tone, Hashimoto; Mikio Yuki, Kawachinagano; Junji Miyata, Kyoto; Tetsuaki Hayasbi, Osaka, and Kazuaki Kurohara, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Oct. 16, 1987, Ser. No. 109,347
Claims priority, application Japan, Oct. 21, 1986, 61-251290; Oct. 21, 1986, 61-161736; Oct. 21, 1986, 61-161737
Int. Cl.[4] A01D *34/70*
U.S. Cl. 56—202 **7 Claims**



1. A lawn mower comprising
support frame means including a support frame connectable to a mower body and a support member connected to an upper portion of the support frame,
grass collecting means supported by the support frame means and having a top opening, the grass collecting means including a mouthpiece extending along the periphery of the top opening, and
a projecting piece fixed to one of the support frame means and the mouthpiece, and a receiving bore defined in the other of the support frame means and the mouthpiece, the projecting piece and the receiving bore being engageable with each other to connect the grass collecting means to the support frame means for positioning the grass collecting means,
the support member supporting the periphery of the top opening of the grass collecting means and bearing the entire weight of the grass collecting means and any contents thereof.

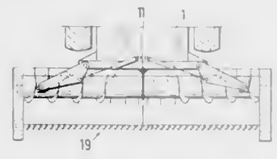
4,903,470

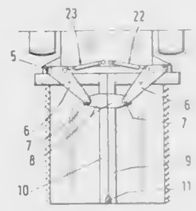
SELF-PROPELLING HARVESTER THRESHER WITH TWO-PART CUTTING MECHANISM

Heinrich Hemker, and Heinrich Ostrup, both of Harsewinkel, Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 238,038
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1987, 3730790
Int. Cl.[4] A01B *73/06*
U.S. Cl. 56—228 **21 Claims**

1. A self-propelling harvester thresher, comprising an inclined conveyor; a two-part cutting mechanism having two cutting mechanism halves which are turnable substantially in a horizontal plane between a working position and a transporting position; and means allowing the turning of said cutting mechanism halves and including two turnable supports and a joint vertically extending hinge axle, said cutting mechanism halves being each connected through a respective one of said turnable supports with said inclined conveyor and also being connected with one another by said hinge axle.



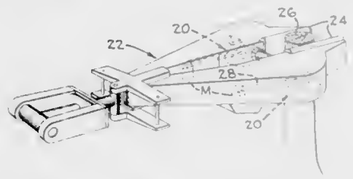


4,903,471

SHAKING METHOD AND APPARATUS FOR MOVING MASSES BETWEEN BALANCED AND UNBALANCED POSITIONS WHILE ROTATING

Philip R. Bunnelle, Santa Clara, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Jul. 8, 1988, Ser. No. 221,957
Int. Cl.[4] A01D *46/26*
U.S. Cl. 56—340.1 **24 Claims**



1. A variable force shaking head comprising:
means for rotating an eccentrically weighted member about the axis of a shaft;
means for supporting an adjustable weight on said shaft for pivotal movement about the axis of said shaft;
means defining at least one hydraulic cylinder in said eccentrically weighted member;
means defining a piston in said cylinder and having a connecting rod connected to said adjustable weight; and
controllable hydraulic power means for directing fluid into said cylinder for controllably moving said adjustable weight about said axis between a position in balance with said eccentrically weighted member for precluding shaking of said shaking head while rotating, and to any one of a plurality of positions out of balance with said eccentrically weighted member for causing said shaking head to shake about said axis when rotating.

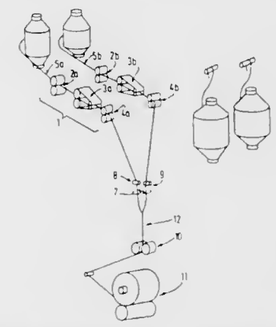
20. A variable force shaking method which comprises steps of:
rotating an eccentrically weighted member secured to a shaft about the axis of the shaft with the eccentrically weighted member having at least one piston and cylinder therein;
pivotally supporting an adjustable weight on the shaft;
connecting the piston to said adjustable weight and
selectively directing hydraulic fluid into said at least one cylinder for pivoting the adjustable weight about said axis between a position in balance with the eccentrically weighted member for precluding shaking about said axis when the shaft is rotating, and a plurality of selected imbalanced positions about said axis for imparting shaking forces of different intensities to said shaft.

4,903,472

PROCESS AND APPARATUS FOR THE SPINNING OF FIBER YARNS, POSSIBLY COMPRISING AT LEAST ONE CORE

Michel Vanhelle, Badditzenbach, Fed. Rep. of Germany, assignor to S.A.R.L. Baulip Fil, Paris, France

Continuation of Ser. No. 940,508, Dec. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 904,768, Sep. 5, 1986, abandoned, which is a continuation of Ser. No. 600,363, Apr. 13, 1984, abandoned. This application Jun. 16, 1988, Ser. No. 208,834
Claims priority, application France, Apr. 14, 1983, 83 06125
Int. Cl.[4] D01H *7/92, 15/00;* **D02G** *3/36*
U.S. Cl. 57—12 **6 Claims**



1. A process for start-spinning or piecing at least two yarns of fiber, which comprises drawing at least two rovings of fibers between deed points of said roving and pairs of drawing rolls, introducing a continuous filament into each roving upstream of the pairs of drawing rolls to form strands for start-spinning or piecing, false twisting the strands, assembling the false-twisted strands at a given point of convergence, cutting each filament, removing the assembled strands with the cut filament from the process, false twisting the assembled strands without the filament and twisting the false-twisted assembled strands without the filament to a twisted yarn.

4,903,473

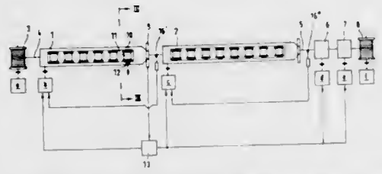
METHOD FOR CONTROLLING A CAGE STRANDING MACHINE

Helmut Classen, Würselen, and Rüdiger Lange, Neuss, both of Fed. Rep. of Germany, assignors to Stolberger Maschinenfabrik GmbH & Co KG, Stolberg, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,583
Int. Cl.[4] D07B *3/06, 7/06*
U.S. Cl. 57—15 **16 Claims**

8. In a stranding machine having at least one rotatable stranding cage configured for accepting a strand core and including a plurality of means for supporting a plurality of material holding spools, wherein said material is wrapped about said strand core to form finish stranded material, and means for removing the stranded material from said cage, the improvement comprising:

means for measuring the centrifugal force acting on at least one of said material spools, and for producing a signal indicative of said measured value, said measuring means including a force sensing pickup operatively associated with at least one of said supporting means and directly coupled to said at least one of said spools, and



controlling means for receiving said signal and for controlling the rotation rate of said stranding cage and the removal rate of the stranded material dependent on the measured value of the centrifugal force.

4,903,474

ARRANGEMENT FOR OPEN-END ROTOR SPINNING

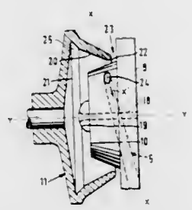
Fritz Stahlecker, Bad Uberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest

Continuation-in-part of Ser. No. 149,175, Jan. 27, 1988, abandoned. This application Nov. 9, 1988, Ser. No. 268,957

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1987, 3704460

Int. Cl.[4] D01H *7/882, 7/892*

U.S. Cl. 57—413 **11 Claims**



1. Open-end rotor spinning apparatus, comprising:

spinning rotor means for spinning yarn arranged on an axis;

a fiber receiving surface in said spinning rotor means which extends circumferentially around said spinning rotor axis;

housing means for housing said spinning rotor means, said housing means being connected to a vacuum source; and

fiber feeding duct means for feeding fibers to said spinning rotor means, said fiber feeding duct means including a mouth area leading into said spinning rotor means where fibers exit said fiber feeding duct means as viewed in the direction of the mouth area centerline, said mouth area exhibiting a circumferential cross-sectional width in said circumferential direction of said fiber receiving surface and including an axial cross-sectional width in said axial direction of said spinning rotor means, wherein said fiber feeding duct means exhibits a cross-sectional shape in an area of the mouth which is rotationally unsymmetrical with respect to the duct centerline and with said circumferential width being greater than said axial width with respect to the duct centerline over the end portion of the length of the duct leading to the mouth area.

4,903,475

APPARATUS FOR THE PRODUCTION OF ORNAMENTAL CHAINS OF THE TYPE KNOWN AS "PEACOCK EYE"

Massimo Bucefari; Corrado Lapini, and Michele Lazzarini, all of Arezzo, Italy, assignors to C.M.S.S.p.A. Costruzione Macchine Speciali, Arezzo, Italy

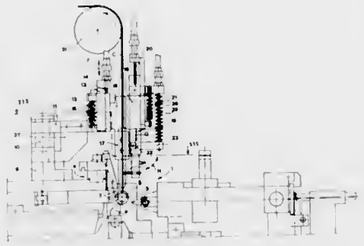
Filed Feb. 5, 1988, Ser. No. 152,731

Claims priority, application Italy, Feb. 6, 1987, 9322 A/87

Int. Cl.[4] B21L *7/00*

U.S. Cl. 59—16 **10 Claims**





1. Apparatus for the production of an ornamental chain of the type known as "peacock eye" in the gold-smithery and jewelry industries, the said chain being formed by a sequence of pairs of links, of the twisted type, each pair comprising one large and one small link, which are concentric, the large link engaging the large and small links forming the preceding pair and subsequent pair, the said apparatus comprising

a production unit for the large links including at least one feed assembly for a material in wire form and for the formation of a spiral therefrom, an assembly for cutting the individual loops of the said spiral after each of its revolutions through 360°, and means for forming links from the said loops;

means for providing the small links, comprising at least one pincer for feeding the latter to the said production unit for the large links, capable of engaging a small link for each loop of the said spiral;

means for pulling the said chain towards a collecting unit operating above the said production unit for the large links, in an intermittent manner at the end of the phase of concatenation and formation of each large link, capable of keeping an end length of chain suspended along an axis perpendicular to that of the said spiral;

means for imparting at least to the said end length of chain an alternating movement along the said axis from an initial position, in which the said pulling means are operational, including a phase of approaching the said spiral, until the last pair of links already formed are brought into alignment with the free end of the spiral, a phase of approaching the said means for forming the link after the concatenation of the appropriate loop of the spiral, and a phase of return towards the said initial position, between the first two phases, during the concatenation of the loop to the said last pair of links already formed, a further alternating movement along the said axis being provided, which takes place in the arc of a complete rotation of the said spiral.

4,903,476

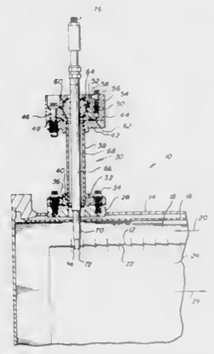
GAS TURBINE IGNITER WITH BALL-JOINT SUPPORT

Charles E. Steber, Scotia; Robert J. Travis, Schenectady, and John A. Rizzo, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1988, Ser. No. 289,892

Int. Cl.[4] F02C *7/266*

U.S. Cl. 60—39.32 **4 Claims**



1. A support for an igniter for a combustor of a gas turbine, said combuster being of a type including a casing and a liner within said casing, comprising:

a ball joint;

means for supporting said ball joint disposed a substantial distance outward from said casing;

a body section of said igniter affixed in said ball joint;

means for permitting said ball joint, and said body section to rotate through a substantial range;

an igniter tip on said body section;

a hole in said liner;

said igniter tip entering through said hole and into an interior of said liner;

said hole being a tight fit to said igniter tip, whereby leakage past said igniter tip through said hole is limited; and

said substantial range being sufficient to permit fitting said igniter tip in said hole in the presence of manufacturing tolerances, and to permit said igniter tip to track said hole in the presence of differential thermal expansion during operation.

4,903,477

GAS TURBINE COMBUSTOR TRANSITION DUCT FORCED CONVECTION COOLING

Graham P. Butt, Ancaster, Canada, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

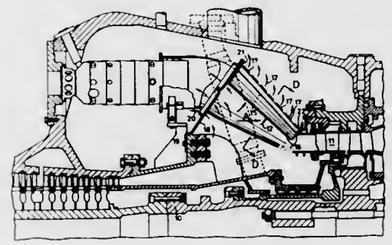
Continuation of Ser. No. 117,980, Nov. 9, 1987, abandoned. This application Jan. 10, 1989, Ser. No. 296,353

Claims priority, application Canada, Apr. 1, 1987, 553623

Int. Cl.[4] F02C *3/00*

U.S. Cl. 60—39.37 **3 Claims**

1. In a gas turbine including a compressor for producing an air flow, a plurality of radially arranged combustors for producing hot combustion gases supplied with air from said compressor, a power turbine, transition ducts coupling said hot combustion gases from said combustors to said power turbine; means to equalize the surface temperature of said transition ducts comprising saddle shaped members overlying a substantial portion of the radially outward surfaces of said transition ducts to direct the said air flow from said compressor to said combustors substantially uniformly over said outward surfaces



of said transition ducts, a seal wall through which said transition ducts pass, said seal wall separating the compressor output from said combustors and forcing all of said airflow from the compressor to flow through apertures in said wall in its path to said combustors.

4,903,478

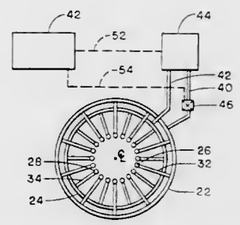
DUAL MANIFOLD FUEL SYSTEM

Stanford P. T. Seto, Loveland, and Richard E. Stenger, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 25, 1987, Ser. No. 66,300

Int. Cl.[4] F02C *9/28*

U.S. Cl. 60—39.281 **2 Claims**



1. A fuel injection system for use in the combustor section of a gas turbine engine said fuel injection system comprising:

a plurality of generally downstream facing fuel nozzles wherein a portion of said fuel nozzles are connected to a shutoff valve means which is interruptible, a means for interrupting said valve means in response to a control signal, and

a means for generating said control signal based on the gas turbine fuel to air ratio.

4,903,479

RADIATION AUGMENTED ENERGY STORAGE SYSTEM

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 18, 1988, Ser. No. 169,701

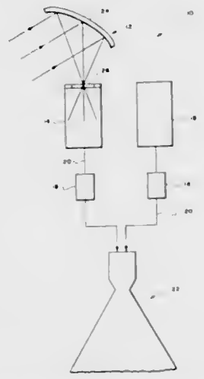
Int. Cl.[4] F02K *9/42*

U.S. Cl. 60—203.1 **2 Claims**

1. A method of converting radiation energy into chemical energy to produce a high-performance propellant, said method comprising:

(a) Photolytically converting oxygen to ozone;

(b) storing and stabilizing the ozone in liquid oxygen to form an ozone/liquid oxygen solution; and



(c) combusting the ozone/liquid oxygen solution with hydrogen.

4,903,480

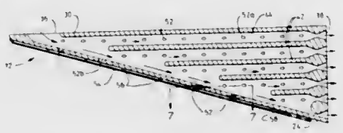
HYPERSONIC SCRAMJET ENGINE FUEL INJECTOR

Ching-Pang Lee, Cincinnati; Kattalaicheri S. Venkataramani, Westchester; Daniel J. Lahti, Cincinnati, all of Ohio, and Vincent H. Lee, Jupiter, Fla., assignors to General Electric Company, Cincinnati, Ohio

Filed Sep. 16, 1988, Ser. No. 245,181

Int. Cl.[4] F02K *7/10*

U.S. Cl. 60—270.1 **6 Claims**



1. A hypersonic scramjet engine fuel injector comprising a housing having a generally horizontal top wall, an inclined bottom wall, and a generally vertical end wall attached together to define in cross section a generally right triangle, said housing also having two generally vertical side walls having a said-generally-right-triangle shape, said side walls attached to said top, bottom, and end walls to define a fuel-tight, generally right-triangular wedge, said top wall having a fuel inlet orifice, said end wall having at least one convergent-divergent fuel outlet nozzle, and at least one wall of said bottom and side walls having a plurality of spaced-apart fuel-exit holes.

4,903,481

DEVICE FOR PROTECTING A LAMBDA PROBE

Hans-Dieter Schuster, Schorndorf, and Gottfried Wollenhaupt, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

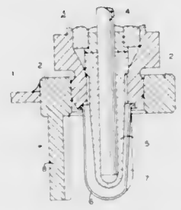
Filed Dec. 19, 1988, Ser. No. 286,164

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 3743295

Int. Cl.[4] G01N *27/58*

U.S. Cl. 60—276 **8 Claims**

1. Device for prolonging the service life and improving the representativeness of the measurements of a heated lambda probe arranged in the exhaust gas flow of an internal combustion engine, wherein a gas deflector plate means is arranged upstream of and separated from the lambda probe in the exhaust gas flow as seen in the direction of flow of the exhaust gases, for deflecting the exhaust gas and water particles



therein, and wherein the lambda probe is located in a lee of the exhaust gas deflector plate means and downstream thereof whereby the lambda probe is protected from impingement of the water particles in the exhaust gas which are deflected sufficiently to pass by the probe.

4,903,482

TWO-STROKE OTTO CYCLE ENGINES

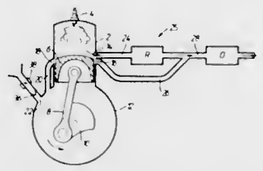
Martin T. Overington; John Stokes; Giles E. Hundleby, and Samuel Lesley, all of West Sussex, England, assignors to Ricardo Group PLC, West Sussex, England

Filed Apr. 26, 1989, Ser. No. 344,014

Claims priority, application United Kingdom, Apr. 27, 1988, 8809922; Jul. 12, 1988, 8816563

Int. Cl.[4] F01N *3/28*

U.S. Cl. 60—301 **10 Claims**



1. A two-stroke engine comprising a cylinder and a piston accommodated in the said cylinder, said cylinder having an inlet port and an exhaust port, said engine further comprising an exhaust system communicating with the said exhaust port and including a first exhaust flow path, a second exhaust flow path in parallel with said first exhaust flow path, a reduction catalyst and an oxidation catalyst, the first exhaust flow path including said reduction catalyst and said second exhaust flow path bypassing said reduction catalyst, said first and second flow paths having respective downstream ends, said downstream ends being connected together upstream of said oxidation catalyst, said exhaust port being so controlled, in operation of said engine, that as said piston performs its downstroke the initial-flow of exhaust gas is substantially through said first flow path and the subsequent flow of exhaust gas is at least partly through said second flow path.

4,903,483

EXHAUST SYSTEM FOR V-TYPE ENGINE

Mamoru Atsumi; Yorio Futakuchi, and Hiroyuki Kosugi, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 16, 1989, Ser. No. 311,637

Claims priority, application Japan, Feb. 17, 1988, 63-35329; Feb. 19, 1988, 63-32850

Int. Cl.[4] F01N *7/10*

U.S. Cl. 60—313 **28 Claims**



1. An exhaust system for an engine having a crankcase and at least a pair of cylinders extending from said crankcase at an angle to each other, said cylinders being staggered transversely of said crankcase so that one of said cylinders is offset relative to the other of said cylinders, said cylinders having like facing exhaust ports, the improvement comprising a first exhaust pipe extending from the exhaust port of said offset cylinder downwardly and to one side of the other of said cylinders and passing at least in part under said crankcase, a second exhaust pipe extending from the exhaust port of the other of said cylinders and passing at least in part beneath said crankcase, and a common atmospheric exhaust gas discharge for said exhaust pipes.

4,903,484

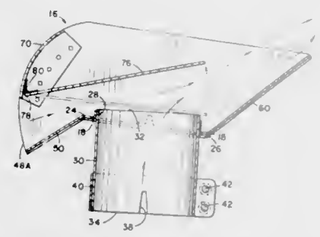
EXHAUST DISSIPATOR AND DEFLECTOR

Clyde I. Yates, 7765 S. Erie Ave., Tulsa, Okla. 74136, and Robert W. Krah, 9433 S. 67th E. Ave., Tulsa, Okla. 74133

Filed May 8, 1989, Ser. No. 350,145

Int. Cl.[4] F02B *35/00;* **F01N** *7/00*

U.S. Cl. 60—316 **8 Claims**



1. An exhaust gas deflector for the top of a vertical truck exhaust stack, comprising:

a vertical tubular portion having an upper and a lower end;

means to attach said tubular portion lower end to the top of a truck exhaust stack;

a generally horizontal body portion affixed to said tubular portion at the upper end thereof and having a forward and a rearward end and a passageway therethrough, and having an opening therein communicating the passageway with said tubular portion;

an intake portion at the forward end of said body portion and having a passageway therethrough, the passageway being inclined upwardly towards said body portion and communicating with the body portion passageway; and

an outlet portion at the rearward end of said body portion and having a passageway therethrough, the passageway being inclined upwardly away from said body portion and communicating with the body portion.

4,903,485

MUFFLER COOLING DEVICE FOR V-TYPE ENGINE

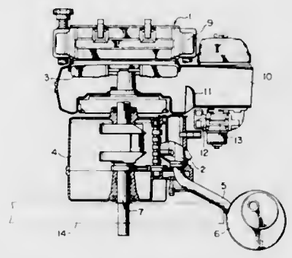
Shinichi Tamba; Shigeru Nishimura, and Akio Miguchi, all of Kobe, Japan, assignors to Kawasaki Jukugyo Kabushiki Kaisha, Japan

Filed Dec. 8, 1988, Ser. No. 281,400

Claims priority, application Japan, Dec. 10, 1987, 62-313715

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—320 **10 Claims**



1. A muffler cooling device for a V-type engine which includes an engine cooling fan disposed at an end of a crankshaft comprising:

passage means for air sucked by said cooling fan, and

means for guiding a part of the air flowing in said passage means to flow from said passage means, through a space defined by a V-bank formed by cylinder heads and an intake manifold, to an area in which a muffler and exhaust pipes extending from said cylinder heads to said muffler are arranged.

4,903,486

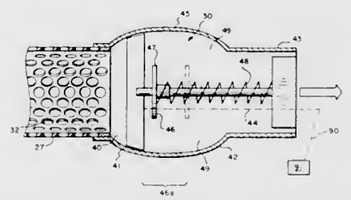
PERFORMANCE RESPONSIVE MUFFLER FOR INTERNAL COMBUSTION ENGINES

Louis J. Finkle, Bellflower, Calif., assignor to Larry K. Goodman, Cerritos, Calif.

Continuation-in-part of Ser. No. 126,657, Dec. 1, 1987, abandoned. This application Oct. 18, 1988, Ser. No. 259,151

Int. Cl.[4] F01N *3/00*

U.S. Cl. 60—324 **11 Claims**



1. An engine muffler responsive to exhaust flow rate for an internal combustion engine, comprising:

a body forming an internal expansion chamber and having an inlet port and an exhaust port spaced apart from one another, to receive and to discharge exhaust gas stream, respectively, and

a variable restrictor downstream from said inlet port and upstream from said outlet port, through which said ex-

haust gas stream must flow to reach said exhaust port, said variable restrictor including a valving element whose operative position can variably occlude said gas stream flow as a function of engine exhaust flow rate, and wherein said variable restrictor is formed with a solid wall disposed about said valving element to define a constricting annular passageway having a cross section that varies with distance from said inlet port and from said exhaust port.

4,903,487

HYDRAULIC BRAKE BOOSTER INCLUDING A TRACKING VALVE

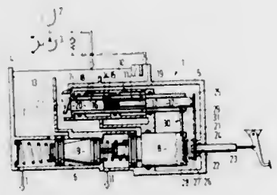
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 653,622, Sep. 24, 1984, abandoned. This application May 30, 1986, Ser. No. 869,818

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337275

Int. Cl.[4] B60T *13/14*

U.S. Cl. 60—547.1 **4 Claims**



1. A hydraulic brake booster for motor vehicles having a housing (5), a booster chamber in said housing, a control valve (10) in said housing disposed at least generally parallel to and beside said booster chamber for monitoring a pressure connection of said booster chamber with said control valve, said booster chamber is defined by a booster piston (8) which is disposed at least generally in axial alignment with a pedal push rod to control a brake circuit fluid pressure, said control valve (10) further comprising a slide (12) and a coaxial relatively movable slide sheath (11), a one piece coupling lever (31) in said housing operatively positioned for a non-pivotable fixed connection between said booster piston (8) and said slide sheath (11) for coupling said booster piston with said slide sheath for movement of said slide sheath by said booster piston in a braking and brake-actuating direction for both a translation and a tracking control between said control valve (10) and said booster piston (8).

4,903,488

TURBOCHARGED ENGINE INCLUDING AN ENGINE DRIVEN SUPERCHARGER

Noriyoshi Shibata, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

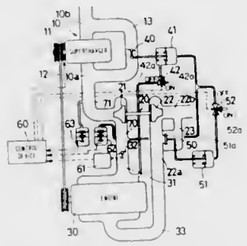
Filed Sep. 30, 1988, Ser. No. 251,403

Claims priority, application Japan, Sep. 30, 1987, 62-246705

Int. Cl.[4] F02B *37/04*

U.S. Cl. 60—609 **3 Claims**

1. A multiple compressed air supply system comprising:
an engine including a power output;
an air supply passage for conducting air to said engine;
an exhaust gas passage for conducting exhaust gas from said engine;
an air supercharger including an air inlet and an air outlet, said air outlet communicating with said air supply passage by means of an air bypass said supercharger including a disengageable clutch operably connected to said power output to enable said supercharger to be driven by said engine when said clutch is engaged;
a turbocharger including a turbine disposed in said exhaust gas passage for being driven by engine exhaust gas and an air compressor driven by said turbine,
said compressor disposed in said air supply passage downstream of said supercharger,
pressure sensing means for detecting pressures at an inlet and an outlet of said compressor;
an exhaust gas bypass interconnecting portions of said exhaust gas passage disposed upstream and downstream of said turbine;
adjustable control valve means for regulating the amount of air flowing through said air bypass;
adjustable wastegate valve means for regulating the amount of exhaust gas flowing through said exhaust gas bypass; and
control means operably connected to said pressure sensing



means, said clutch means, and said control valve means for:
engaging said clutch and closing said control valve means when said engine is operated in a low speed range,
engaging said clutch and partially opening said control valve means when said engine is operated in an intermediate speed range for maintaining the air pressure at said compressor outlet to be no greater than a first preset value, and
fully opening said control valve means when said engine is operated in a high speed range, and for disengaging said clutch when a differential pressure between said compressor inlet and outlet reaches a second preset value,
said control means being operably connected to said wastegate valve means for opening said wastegate valve means to control the operation of said turbine in a manner maintaining compressor outlet pressure no higher than said first preset value when said engine is operated in said high speed range and said clutch is disengaged.

4,903,489

SUPERCHARGED MULTI-CYLINDER RECIPROCATING PISTON-INTERNAL COMBUSTION ENGINE WITH SEVERAL EXHAUST GAS TURBOCHARGERS OPERATING IN PARALLEL

Georg Ruetz, Immenstaad, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

PCT No. PCT/DE87/00432, § 371 Date Jul. 6, 1988, § 102(e) Date Jul. 6, 1988, PCT Pub. No. WO88/06232, PCT Pub. Date Aug. 25, 1988

PCT Filed Sep. 23, 1987, Ser. No. 236,352

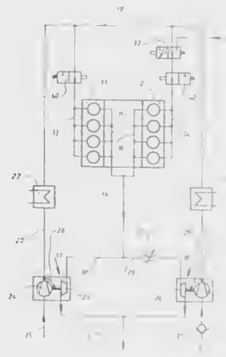
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704967

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—612 **17 Claims**

1. A supercharged internal combustion engine comprising:
a first group of engine cylinders,

a first charging air line for supplying charging air to said first group of cylinders,
a second group of engine cylinders,
a second charging air line for supplying charging air to said second group of cylinders,
a first exhaust gas operated turbocharger arranged in an engine exhaust line, said first turbocharger including means for charging air in a first supercharged charging air line,
a second exhaust gas operated turbocharger arranged in the engine exhaust line in parallel to the first turbocharger, said second turbocharger including means for charging air in a second supercharged charging air line,
cylinder group disabling means for selectively disabling the operation of the second group of cylinders by cutting off fuel flow thereto,



turbocharger disabling means for selectively disabling the operation of the second turbocharger by disconnecting the engine exhaust line from the second turbocharger,
charging air connecting means for connecting both the first and second supercharged charging air lines to the first and second charging air lines during engine operation with both the first and second groups of cylinders,
charging air disconnecting means for disconnecting the second charging air line from the first and second supercharged air lines during engine operation with the second group of cylinders disabled,
and atmospheric air supply means for communicating the second charging air line to local atmospheric air when the second group of cylinders is disabled and disconnected from the supercharged air lines.

4,903,490

CAM-DRIVEN VALVE SYSTEM FOR STEAM TURBINES

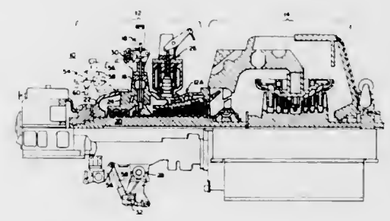
George J. Silvestri, Jr., Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 14, 1988, Ser. No. 257,898

Int. Cl.[4] F01K *13/02*

U.S. Cl. 60—646 **9 Claims**

1. In a steam turbine system including a source of motive steam and a turbine adapted to operate at less than a full load, the turbine including an improved cam-driven valve system for activating a varying number of steam control valves to permit transferring between a maximum arc-admission mode and a minimum arc-admission mode, comprising:
a steam chest for receiving the motive steam from the source, the steam chest including a plurality of valves connected to a corresponding turbine section and set for a minimum admission of motive steam into said turbine below 100 percent;
a first cam lift means for actuating a portion of said plurality of valves, said cam lift means comprising a first camshaft actuated by a first drive means and having thereon at least one cam for actuating one of said valves;
a second cam lift means for actuating the remainder of said plurality of valves, said second cam lift means comprising a second camshaft actuated by a second drive means and



having thereon at least one cam for actuating another of said valves; and
means for controlling each of said cam lift means to permit actuation of said cam lift means either one at a time or in concert.

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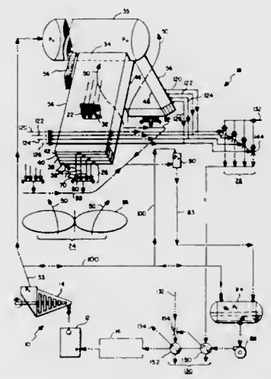
AIR-COOLED VACUUM STEAM CONDENSER

Michael W. Larinoff, 370 Holly Hill Rd., Oldsmar, Fla. 34677

Filed Jun. 13, 1988, Ser. No. 206,094

Int. Cl.[4] F28B *3/00*

U.S. Cl. 60—692 **23 Claims**



1. A steam powered system comprising a turbine for converting steam energy into mechanical energy upon expansion of steam therein, a boiler for generating steam to be fed to the turbine, and a conduit arrangement coupling the boiler to the turbine and then recoupling the turbine exhaust to the boiler through steam condensing mechanisms, the condensing mechanisms including:
a plurality of finned tubes through which the expanded exhaust steam flows and is condensed;
a plurality of bundle front headers at the input ends of the condensing tubes for receiving exhaust steam from the turbine;
a plurality of bundle rear headers at the output ends of the

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condensing tubes for receiving condensate and non-condensible gasses;

a plurality of vertically oriented water leg pipes, one for each bundle rear header of each bundle, coupling each rear header with a water leg manifold;

a hydraulic balance device in the condensate drain system coupling the water leg manifold and a condensate storage tank, the hydraulic balance device providing the means to maintain a predetermined hydraulic pressure therein for thereby sustaining the heights of the condensate in the water leg pipes within predetermined limits for fluid sealing purposes; and

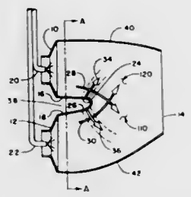
means to remove non-condensible gasses from the rear headers.

4,903,492

DILUTION AIR DISPENSING APPARATUS

Robert C. King, El Paso, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 7, 1988, Ser. No. 246,137
Int. Cl.[4] F02C *1/00*
U.S. Cl. 60—733 **3 Claims**



1. A dilution air dispensing apparatus for a double dome combustor comprising in combination:

a first dome combustor having an inlet opening and an exhaust opening, a first fuel nozzle operatively arranged in said inlet opening to dispense fuel to said first dome combustor,

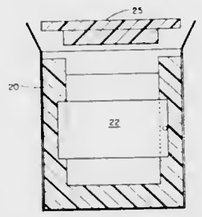
a second dome combustor having an inlet opening and an exhaust opening, a second fuel nozzle operatively arranged in said inlet opening to dispense fuel to said second dome combustor, said first and second dome combustor being joined towards their inlet ends to form a dilution air dispensing cavity therebetween, said dilution air dispensing cavity being formed by the inner adjacent walls of said first and second dome combustors, said dilution air dispensing cavity having a rearward portion which is located approximately one-third of the dome length from the inlets to said first and second dome combustors, first and second rows of dilution holes are formed in the adjacent inner walls of said dilution air dispensing cavity, said first and second rows of dilution holes being located in said rearward portion of said dilution air dispensing cavity and being staggered with respect to each other, said dilution holes admitting dilution air respectively to said first and second dome combustors, said dilution air respectively altering the paths of combustion gas flow in said first and second dome combustors toward the opposite combustor dome exhaust opening.

4,903,493

HEAT SINK PROTECTIVE PACKAGING FOR THERMOLABILE GOODS

Willem H. P. Van Iperen, Westfield; Edmund B. Wilson, III, Randolph, and Robert S. Golabek, Jr., Towaco, all of N.J., assignors to PyMaH Corporation, Fairfield, N.J.

Filed Jan. 17, 1989, Ser. No. 297,879
Int. Cl.[4] B65B *63/08*
U.S. Cl. 62—60 **17 Claims**



1. A method of protecting thermolabile goods having a thermosensitive temperature from high temperatures, said method comprising

(a) packaging said thermolabile goods with a heat sink composition, said composition having a melting point slightly less than the thermosensitive temperature of said goods, said composition being enclosed in a container and consisting of a salt hydrate, a hydrophilic bonding agent and from 1 to 10 percent of this same salt in anhydrous form;

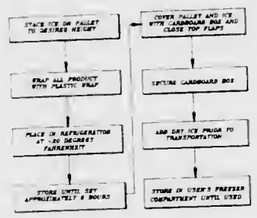
(b) surrounding said goods and said heat sink composition with a layer of insulation, said insulation having a rate of heat transfer through the insulation that is less than the rate of that absorbance by said heat sink.

4,903,494

METHOD FOR PREPARING ICE FOR TRANSPORTATION

Freddie J. Wigley, 118 N. Ash, Ponca City, Okla. 74601

Filed Aug. 21, 1989, Ser. No. 396,092
Int. Cl.[4] B65B *63/08*
U.S. Cl. 62—60 **8 Claims**



5. A method for preparing a quantity of prepackaged ice for transportation to a remote location comprising the steps of:

(a) placing a pallet at a location to be loaded;

(b) placing a piece of insulation material on top of said pallet, sized to cover said pallet;

(c) stacking said prepackaged ice on top of said insulation material, said stack having a dimension equal to or less than the dimensions of said pallet, and to a predetermined height;

(d) wrapping said stacked prepackaged ice with a stretchable material from said pallet to the top of said stack to form a first assembled unit;

(e) placing said first assembled unit in a refrigerated room having a temperature of 20° F. or less for a period sufficient to set said prepackaged ice;

(f) placing cardboard container material having a height greater than said first assembled unit and having flaps with a length at least as long as the shortest dimension of said pallet, around said first assembled unit to form a box around said pallet;

(g) banding said cardboard box with material in a manner to secure said cardboard against said first assembled unit;

(h) moving said flaps to cover said first assembled unit forming a second assembled unit; and

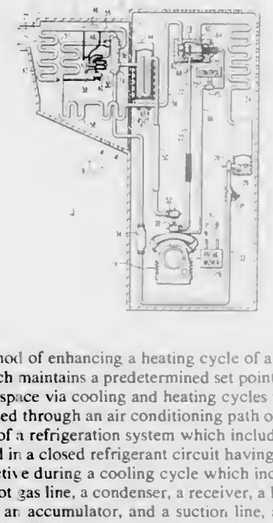
(i) moving said second assembled unit to a refrigerated room for storage.

4,903,495

TRANSPORT REFRIGERATION SYSTEM WITH SECONDARY CONDENSER AND MAXIMUM OPERATING PRESSURE EXPANSION VALVE

Leland L. Hovland, Belle Plaine; David H. Taylor, Minneapolis, and Cynthia J. Satterness, Bloomington, all of Minn., assignors to Thermo King Corp., Minneapolis, Minn.

Filed Feb. 15, 1989, Ser. No. 310,566
Int. Cl.[4] F25B *13/00*; F25D *21/06*
U.S. Cl. 62—81 **8 Claims**



1. A method of enhancing a heating cycle of a refrigeration system which maintains a predetermined set point temperature of a served space via cooling and heating cycles which condition air passed through an air conditioning path of an evaporator section of a refrigeration system which includes a refrigerant disposed in a closed refrigerant circuit having a first active circuit effective during a cooling cycle which includes a compressor, a hot gas line, a condenser, a receiver, a liquid line, an evaporator, an accumulator, and a suction line, and a second active circuit effective during a heating cycle which excludes the condenser and receiver, comprising the steps of:

providing an expansion device between the liquid line and the evaporator to divide the refrigeration system into a high pressure side which includes the condenser and receiver, and a low pressure side which includes the evaporator, accumulator and the suction line which has a suction pressure,

providing a secondary condenser in the air conditioning path of the evaporator section,

directing hot gas from the compressor to the secondary condenser during a heating cycle, increasing the pressure of the low pressure side,

closing the expansion device in response to low side pressure, when there is sufficient refrigerant in the second active circuit to cause the pressure of the low side to increase to a predetermined closing value,

and injecting refrigerant into the evaporator from the receiver and condenser via the expansion device when the refrigerant in the second active circuit is insufficient to close the expansion device and the suction pressure is lower than the high side pressure

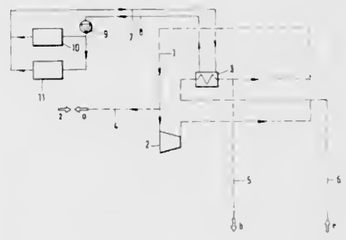
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4,903,496

PLANT AND METHOD FOR PERIODIC CHARGING AND DISCHARGING OF A GAS RESERVOIR

Charles Mandrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 28, 1989, Ser. No. 316,930
Claims priority, application Switzerland, Mar. 4, 1988, 00827/88-3
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—87 **13 Claims**



1. A plant for the periodic charging and discharging of a gas reservoir, said plant comprising

a gas circuit having at least one compressor for compressing a flow of gas and at least one heat exchanger for the flow of gas;

at least one line extending from said gas circuit for connection to a gas reservoir for conveying gas therebetween;

at least a second line in communication with said gas circuit for selectively supplying and discharging gas from said circuit; and

a secondary circuit connected to said heat exchanger for passing a heat exchange medium therethrough in heat exchange with the flow of gas therethrough, said secondary circuit including a refrigerating machine for selectively cooling the heat exchange medium to effect cooling of the gas flow in said heat exchanger and a heater connected in parallel with said refrigerating machine for selectively heating the heat exchange medium to effect heating of the gas flow in said heat exchanger.

4,903,497

METHODS AND DEVICES FOR COOLING A MOTOR OF A REFRIGERATING MACHINE WITH LIQUID AND ECONOMIZER GAS

Bernard Zimmern, 6 New St., East Norwalk, Conn. 06855, and Joseph L. Knopp, Staunton, Va., assignors to Bernard Zimmern, East Norwalk, Conn.

Filed Aug. 30, 1988, Ser. No. 238,279
Claims priority, application France, Sep. 4, 1987, 87 12338
Int. Cl.[4] F25B *31/02*
U.S. Cl. 62—113 **23 Claims**

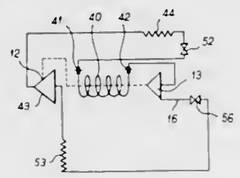
1. A method of cooling an electric motor of a hermetic motor compressor unit for compressing a main flow of refrigerant fluid in an at least partly gaseous state for supplying a refrigerating circuit in which said fluid is liquefied at least in part in a condenser and is vaporised at least in part in an evaporator, said method comprising the steps of:

in said refrigerating circuit, separating a substantially gaseous pressurised first flow of refrigerant fluid from said main flow

supplying said first flow in a motor cavity provided inside a motor housing adjacent to a first side of a stator of said motor, said first side facing a rotor of said motor

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supplying said first flow from said motor cavity into the compressor through an economiser hole thereof subjected, in operation, at least at full load, to a pressure intermediate between an intake pressure and a discharge pressure of said compressor; and



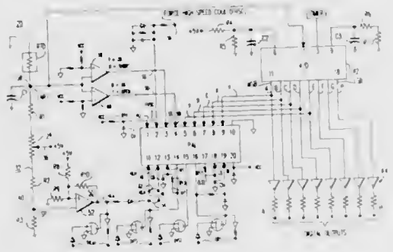
supplying with a second, at least partly liquid, flow of refrigerant fluid a path in which said second flow is in heat exchange relationship with said stator, remote from said first side.

4,903,498

TEMPERATURE CONTROLLING FOR A TRANSPORT REFRIGERATION SYSTEM

Jay L. Hanson, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Aug. 26, 1988, Ser. No. 236,878
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—126 **4 Claims**



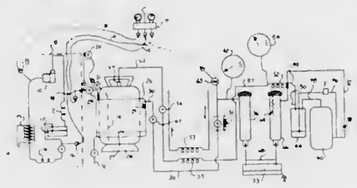
1. A method of controlling the load temperature of a transport refrigeration system having heating and cooling modes, and high and low speed modes, comprising the steps of:
selecting a set point temperature within a first predetermined temperature range,
sensing the load temperature,
providing an analog ratio between the set point temperature and the load temperature,
comparing the analog ratio with first and second predetermined reference values to detect when the load temperature sensed by the sensing step has implausible values,
converting the analog ratio to a digital signal having a predetermined number of bits which provides a predetermined number of bit changes between all logic zeros and all logic ones,
said converting step including the step of scaling the conversion such that all of the predetermined number of bit changes occur within a second predetermined temperature range relative to set point, with the second predetermined temperature range being smaller than the first temperature range,
and providing a logic array programmed to provide a plurality of output signals for controlling the transport refrigeration system in response to predetermined values of the digital signal.

4,903,499

REFRIGERANT RECOVERY SYSTEM

Thomas D. Merritt, Miami, Fla., assignor to High Frequency Products, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 141,811, Jan. 11, 1988, abandoned, and a continuation-in-part of Ser. No. 182,528, Apr. 18, 1988, abandoned. This application Oct. 11, 1988, Ser. No. 255,960
Int. Cl.[4] F25B *45/00*
U.S. Cl. 62—149 **8 Claims**



1. A system for refrigerant recovery, re-cycling, purification and re-charging, the system comprising:
(a) a hollow fluid-type pressure vessel having fluid input means and fluid output means;
(b) a hollow, annular jacket having a surface thereof in thermal communication with said pressure vessel, said annular jacket having an axis in substantial alignment with the gravity vector, said jacket having, at the bottom thereof, liquid accumulation means, said jacket further including fluid input and output means;
(c) fluid communication means for defining a fluid path for refrigerant purification, said path starting internally of said pressure vessel, passing through said vessel, through said fluid output means thereof, continuing externally of said vessel, and extending between said vessel and said input means of said jacket;
(d) before said input means of said jacket, expansion means for selectively changing the volume of fluid flowing from said vessel prior to its entry into said jacket; and
(e) condensing means in fluid communication with said output of said annular jacket, said condensing means itself having an output in fluid communication with said input means of said pressure vessel,
whereby the temperature gradient between said vessel and said jacket may be controlled by reason of the thermal communication between said vessel and said jacket, thereby enhancing the efficiency of refrigerant purification of the system.

4,903,500

METHODS AND APPARATUS FOR DETECTING THE NEED TO DEFROST AN EVAPORATOR COIL

Jay L. Hanson, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Jun. 12, 1989, Ser. No. 364,934
Int. Cl.[4] F25D *21/06*
U.S. Cl. 62—156 **6 Claims**



1. A method of detecting the need to defrost an evaporator coil of a refrigeration system which draws air from a served space, conditions the air by heating and cooling cycles as required to control the air temperature to a predetermined set point, and returns the conditioned air to the served space, comprising the steps of:
measuring the air temperature of the served space for comparison with the set point temperature,
and using the temperature measurement to detect the need to defrost the evaporator coil, with said using step including the steps of:
monitoring the direction and rate of change of the air temperature during a cooling cycle,
and initiating defrost of the evaporator coil as a function of the direction and rate of change of the air temperature.

4,903,501

REFRIGERATOR AIR CONTROL HEATED BAFFLE

James O. Hall, Center Township, Vanderburgh County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 22, 1988, Ser. No. 209,589
Int. Cl.[4] F25D *17/08*
U.S. Cl. 62—187 **10 Claims**



3. In a refrigeration apparatus having wall portions defining a compartment to be cooled, means for providing refrigerated air flow, and an air flow passage through said wall portions in communication with said providing means, an air baffle disposed in said air flow passage comprising:
a first plate including an aperture therethrough defining an opening through which refrigerated air may pass;
a second plate movable relative to said first plate and including an aperture therethrough defining an opening through which refrigerated air may pass;
actuator means for moving said second plate relative to said first plate to position said openings in a preselected alignment to control the movement of refrigerated air through said passage; and
heater means for maintaining said baffle above a preselected minimum temperature, wherein said heater means comprises an electrical resistance wire coupled to an electrical circuit which is operable to develop a current through said wire to generate heat to maintain the baffle above a preselected temperature so that any moisture that accumulates thereon does not freeze and wherein said electrical circuit includes timer means to selectively energize and deenergize said heater in a timed cycle.

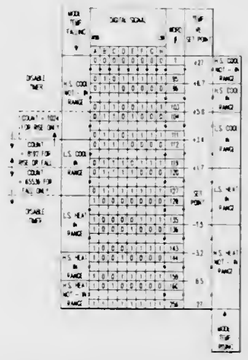
4,903,502

RATE OF CHANGE TEMPERATURE CONTROL FOR TRANSPORT REFRIGERATION SYSTEMS

Jay L. Hanson, Bloomington, and Doyle G. Herrig, Elko, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Aug. 26, 1988, Ser. No. 236,875
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—228.5 **9 Claims**

1. A method of controlling the load temperature of a transport refrigeration system to a selected set point temperature, by operating modes which include a high capacity cooling mode and a lower capacity cooling mode, comprising the steps of:
switching between the higher capacity cooling mode and the lower capacity cooling mode at predetermined load temperatures relative to set point,
starting a timer having a programmable time-out period when the operating mode changes to the lower capacity cooling mode,
monitoring the load temperature relative to set point during the lower capacity cooling mode,
programming the time-out period of the timer in response to predetermined differences between the load temperature



and set point, with the length of the time-out period varying indirectly with the magnitude of the predetermined difference temperature,
said monitoring step including the step of providing a control signal when set point is not reached within a period of time after entering the lower capacity cooling mode which is a function of time and load temperature relative to set point, and to the programmed time-out period of the timer,
and forcing a change from the lower capacity cooling mode to the higher capacity cooling mode in response to said control signal.

4,903,503

AIR CONDITIONING APPARATUS

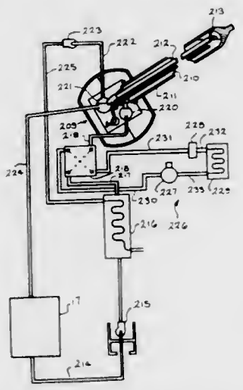
Gershon Meckler, 1703 Channel Tower Dr., Monmouth Beach, N.J. 07750

Continuation-in-part of Ser. No. 49,260, May 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 861,058, May 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 841,454, Mar. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 732,561, May 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 719,357, Apr. 3, 1985, abandoned. This application Jan. 14, 1988, Ser. No. 144,300
Int. Cl.[4] F25B *27/02*
U.S. Cl. 62—238.3 **167 Claims**

1. Air conditioning apparatus for a building having an electrical grid operatively connected to receive electricity from a utility, said apparatus comprising compression refrigeration apparatus including an electric motor operatively connected to drive a compressor, and being operable to make ice by pumping heat from water to a heat sink and to store such ice, absorption refrigeration apparatus, a cogenerator operable to generate electricity and heat, means for operably connecting said cogenerator to provide electricity to the electrical grid of the building, an air handler, a plurality of induction mixing units each of which includes means operable to cause a flow of recirculated air from a space to be conditioned, and, when

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conditioned air is circulated thereto, to deliver to the space a mixture of conditioned air and recirculated air, means for circulating air to be conditioned through said air handler and then to said induction mixing units, means for transferring heat from air in said air handler to ice which has been produced by said compression refrigeration apparatus, means operatively connecting said absorption refrigeration apparatus to pump



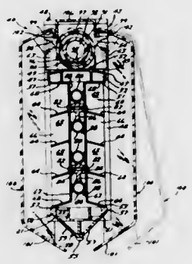
heat to a heat sink from air in said induction mixing units or from air in said air handler, means operatively connecting the electric motor of said compression refrigeration apparatus to the building electrical grid for energization thereby, and means for transferring heat generated by said cogenerator into energizing relationship with said absorption refrigeration apparatus.

4,903,504

EVAPORATOR DEVICE FOR ICE-MAKING APPARATUS

Kenneth L. Nelson, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Filed Jan. 19, 1989, Ser. No. 298,957
Int. Cl.[4] F25C *1/04*
U.S. Cl. 62—347 **10 Claims**



10. In an evaporator and ice-forming device for an ice-making machine having a water inlet adapted for fluid communication with a source of water, an evaporator tube adapted for fluid communication with a source of refrigerant, at least one ice-forming plate assembly disposed in close heat transfer proximity with said evaporator tube, and water distribution means for distributing water from said water inlet to said ice-forming plate assembly, the improvement wherein said ice-forming plate assembly includes an inner plate member having one side thereof disposed in close heat transfer proximity with said evaporator tube and having a number of elongated openings extending therethrough, a number of generally horizontally-extending grid members serially spaced vertically along an outer side of said inner plate member, and a number of generally vertically-extending grid members serially spaced horizontally along said outer side of said inner plate member and interlockingly intersecting said vertically spaced horizontal grid members, said intersecting horizontal and vertical grid members extending laterally outwardly from said inner plate member and intersecting one another to define the sides of a number of rows of open, outwardly-facing water-receiving recesses therebetween with said inner plate member defining the floors of said water-receiving recesses, said vertical and horizontal grid members being disposed on an opposite side of said inner plate member from the evaporator tube to form an interlocking grid subassembly, said grid subassembly having a number of laterally inwardly-protruding tabs thereon, said tabs extending through said elongated openings in said inner plate member and being bent over on the evaporator tube side of said inner plate member in order to interlockingly secure said horizontal and vertical grid members to said inner plate member and to form said ice-forming plate assembly, said ice-forming plate assembly and said evaporator tube being coated with a heat conductive coating after said grid subassembly is secured to said inner plate member, said water distribution means including a horizontally-extending inner water tube and a horizontally-extending outer water tube generally surrounding said inner water tube, said inner water tube being in sealed fluid communication with said water inlet, and sealing means for sealing opposite ends of said inner and outer water tubes to one another, said inner and outer water tubes having an annular space therebetween disposed between said opposite sealed ends, said inner water tube having a number of generally vertically-extending inner tube openings spaced-apart along its length for providing fluid communication between the interior of said inner water tube and said annular space, said inner tube openings being spaced apart on a lower side of said inner water tube, said outer water tube having a number of generally vertically-extending outer tube openings spaced apart along its length for providing fluid communication between said annular space and the exterior of said outer water tube, said outer tube openings being spaced apart on an upper side of said outer water tube, said water distribution means being adapted for providing fluid communication for water from said water inlet, generally horizontally through said inner water tube, generally downwardly through said inner tube openings, and generally upwardly through said annular space on both opposite sides of said inner water tube to be discharged generally upwardly through said outer tube openings to both of opposite sides of the exterior of said outer water tube, said water distribution means being disposed generally along and adjacent an upper generally horizontal edge of said ice-forming plate assemblies in order to allow water from said water distribution means to run therefrom and to flow along the outer sides of both ice-forming plate assemblies.

4,903,505

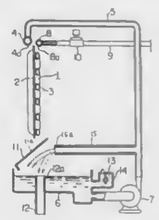
AUTOMATIC ICE MANUFACTURING APPARATUS

Tadashi Sakai, and Hideji Ohta, both of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Jan. 30, 1989, Ser. No. 304,370
Int. Cl.[4] F25C *1/12*
U.S. Cl. 62—347 **9 Claims**

5. An automatic manufacturing apparatus, comprising:
an ice making unit for manufacturing ice in an icing operation cycle;
a water tank disposed below said ice making unit for storing water to undergo phase transformation into ice on said ice making unit;
a first water spray tube disposed above said ice making unit for spraying said water onto said ice making unit;
a water circulating conduit interconnecting said first water spray tube and said water tank;

a circulating pump provided in said water circulating conduit for circulating said water between said water tank and said ice making unit;
a drainage pipe disposed within said water tank for draining water from said water tank externally of the apparatus;
a branch pipe branched from said circulating conduit on the discharge side of said circulating pump for discharging said water through said drainage pipe;
a pressure-actuated valve mounted in said branch pipe for



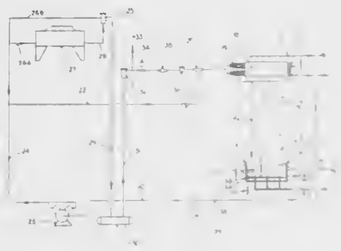
closing a water flow path defined therein when the discharge pressure of said circulating pump is high while opening said flow path when the discharge pressure of said circulating pump is low; and
means for lowering said discharge pressure of said circulating pump at the start of a deicing operation cycle to thereby allow the water remaining within said water tank at the end of the icing operation cycle to be drained externally of the apparatus through said branch pipe and said drainage pipe.

4,903,506

ICE CUBE MAKER

John Delisle, 1545 Quellette Ave., Apt. 1208, Windsor, Ontario, Canada (N8X 1K6); Wayne Delisle, 4285 Longfellow Ave., Windsor, Ontario, Canada (N9G 2B5), and Alfred Delisle, 471 Tecumseh Blvd., Apt. 207, Windsor, Ontario, Canada (N8X 1G8)

Continuation-in-part of Ser. No. 14,385, Feb. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 799,507, Nov. 19, 1985, abandoned. This application Apr. 13, 1988, Ser. No. 183,443
Int. Cl.[4] F25C *1/12*
U.S. Cl. 62—347 **23 Claims**



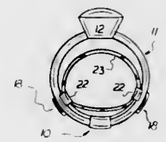
1. An ice cube making apparatus comprising:
an evaporator, including at least one freezing surface and a plurality of rectangular channel ways for transporting refrigerating fluid, said channel ways being parallel and contiguous, and being arranged such that substantially the entire area of said freezing surface is in contact with one side of said channel ways;
said channel ways being connected to a disperser and at least one outlet manifold;
supply means for delivering cooled refrigerant fluid to said system of channel ways during a freezing cycle to effect rapid cooling of the freezing surface;
ice forming means defining a series of compartments for the formation of individual ice cubes, said compartments being arranged such that when in operation, each compartment is bounded by an open side being adjacent said freezing surface, a closed wall bearing a central aperture opposite to said open side, two solid walls lying in the vertical plane, and an upper and a lower slotted side in the horizontal plane, said slotted sides allowing water to pass through said compartment;
means for cascading water in a sheeting action directly against said freezing surface, said water cascading progressively outwards of said freezing surface as ice forms;
means adapted to deliver refrigerating fluid in the hot gaseous state in a harvest cycle to effect rapid warming of the freezing surface, thereby melting the ice surface in contact with said freezing surface, and permitting said ice forming means to be released;
a means to move said ice forming means away from said freezing surface during the harvest cycle;
an ejector means to remove ice cubes from said ice forming means; and
means to return said ice forming means to an operative position at the commencement of the freezing cycle.

4,903,507

ATTACHMENT FOR A FINGER RING

Sheldon Gesensway, 555 NE. 15th St., Gallery 10, Miami, Fla. 33132

Filed May 22, 1989, Ser. No. 355,276
Int. Cl.[4] A44C *9/02*
U.S. Cl. 63—15.6 **5 Claims**



1. An attachment device for a finger ring of substantially circular contour having interior and exterior surfaces, said device comprising:
(a) a clamp of monolithic construction fabricated from a piece of thin sheet stock off a malleable metal and having a base portion elongated between two extremities and adapted to bent so as to lie against said interior surface in close conformity therewith, two gripping portions extending perpendicularly from said base portion adjacent the extremities thereof and adapted to be bent in the same directions so as to embrace the exterior surface of the ring, and a pair of loop-forming portions extending perpendicularly from said base portion adjacent the extremities thereof and in a direction opposite to the direction of the corresponding gripping portions, said loop-forming portions being bendable to form retaining loops positioned on the same side of the ring and adjacent the interior surface thereof, and
(b) a resilient band defining a continuous loop having an unflexed diameter slightly smaller than the diameter of said ring, said band being held by said retaining loops and being disposed in substantially coaxial relationship with said ring when said ring is worn upon a finger.

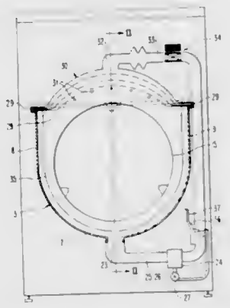
VOL 1111 ISS 4 FE 27 1990 UMI

4,903,508

CLOTHES WASHING MACHINE CONVERTIBLE TO COMBINED CLOTHES WASHING AND DRYING MACHINE

Piero Durazzani, Pordenone, and Giuseppe Carniel, Treviso, both of Italy, assignors to Industrie Zanussi S.p.A., Pordenone, Italy

Filed May 3, 1989, Ser. No. 346,938
Claims priority, application Italy, May 4, 1988, 45722 A/88
Int. Cl.[4] D06F *25/00, 37/28*
U.S. Cl. 68—4 **7 Claims**



1. In a clothes washing machine also employable as a clothes drying machine and including a washing tub of plastic material, a rotatable drum housed in said tub and driven by at least one electric motor, an exhaust manifold connectable to said tub, and a pump for draining wash liquor from said tub through said exhaust manifold, the improvement comprising:

said tub having an opening;

a first interchangeable closing element for sealingly closing said opening when said machine is used to perform clothes washing operations;

a second interchangeable closing element for closing said opening when said machine is used to perform clothes drying operations, said second closing element including at least one heating element and having at least one hole; and

a conduit connectable at one end thereof to said hole and at the other end thereof to said exhaust manifold, said conduit being provided with suction means for creating circulation of air, heated by such heating element, through said machine during the drying operations.

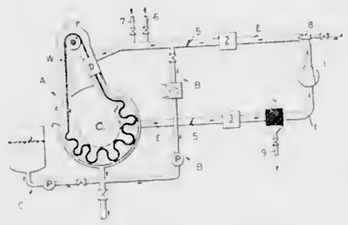
4,903,509

APPARATUS FOR DRYING TEXTILE MATERIAL IN ROPE FORM

Wilhelm Christ, Michelbach, and Hans-Ulrich von der Eltz, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 43,643, Apr. 28, 1987, which is a continuation of Ser. No. 783,415, Oct. 10, 1985, abandoned, which is a continuation of Ser. No. 624,927, Jun. 27, 1984, abandoned. This application Feb. 19, 1988, Ser. No. 158,205
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323506
Int. Cl.[4] D06B *3/28*
U.S. Cl. 68—5 C **1 Claim**

1. Apparatus for wet finishing and at least partially drying endless ropes of textiles consisting essentially of a machine for wet finishing the rope with a treatment liquid, jet means within the machine for propelling treatment liquid through the machine and thereby hydraulically moving the rope through the machine by the treatment liquid, a treatment liquid circulation system connected to receive treatment liquid discharged from the machine and to supply treatment liquid to the machine, means feeding treatment liquid into the circulation system, means for removing treatment liquid from the machine, a gas circulation system separate from the treatment liquid circulation system connected to supply drying gas to the machine at the jet means therein after treatment liquid is removed therefrom and to receive spent gas discharged from the machine, the gas circulation system additionally including cooling means for lowering the temperature of the circulating spent gas thereby



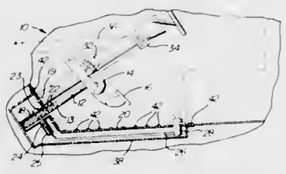
causing moisture to precipitate from that gas, means for removing moisture from the spent gas, blower means for compressing the circulated gas in the system, and heating means for elevating the temperature of the gas supplied to the machine at the jet means whereby the drying gas is propelled through the machine to aerodynamically move and at least partially dry the treated rope by removing moisture therefrom.

4,903,510

VEHICLE ANTITHEFT DEVICE

Keanen T. Surles, 314 W. 150th Pl., Harvey, Ill. 60426

Filed Dec. 20, 1988, Ser. No. 286,962
Int. Cl.[4] F16H *57/00*
U.S. Cl. 70—202 **30 Claims**



1. A vehicle antitheft device assembly (**10**) comprising:

a floor board (**20**);

a brake pedal (**16**);

brake pedal engaging means (**12**) including a shaft portion (**13**) and a J-hook end portion (**14**) for engaging a brake peal (**16**) above the floor board (**20**) and retaining the brake pedal (**16**) in a brake-engaged position (FIG. 2) and for being disengaged and independent from said brake pedal (**16**) when not in the brake engaged position;

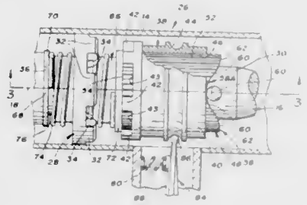
locking means (**11**) depending from said floor board (**20**) for receiving said shaft portion (**13**) of said brake pedal engaging means (**12**) below the floorboard (**20**) of the vehicle at a position aligned with said brake pedal (**16**) and for locking said brake pedal engaging means (**12**) in the brake-engaged position (FIG. 2).

4,903,511

ANTI-THEFT STEERING SHAFT LOCK

Donald A. Niedzielski, Bay City; Indulis Piziks, Saginaw, and Dantar P. Oosterwal, Grand Blanc, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 26, 1989, Ser. No. 370,960
Int. Cl.[4] B60R *25/02*
U.S. Cl. 70—252 **7 Claims**



1. In an automotive steering column including a stationary part and a steering shaft rotatably supported on said stationary part,

a steering shaft lock comprising:

a lock bolt means including an engaging part movable between a locked position and an unlocked position,

a lock keeper means including a receiving part adapted to receive said engaging part in said locked position of said engaging part and prevent relative movement between said lock bolt means and said lock keeper means,

means mounting one of said lock bolt means and said lock keeper means on said stationary part of said steering column, and

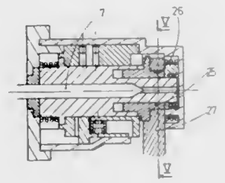
lost motion means mounting the other of said lock bolt means and said lock keeper means on said steering shaft such that said steering shaft is rotatable in substantially unrestrained fashion through a predetermined included angle relative to said other of said lock bolt means and said lock keeper means to relieve restoring torque on said steering shaft in said locked position of said lock bolt means engaging part and thereafter restrained against rotation relative to said other of said lock bolt means and said lock keeper means to render said steering shaft substantially ineffective for steering a vehicle.

4,903,512

LOCK OF THE DISCONNECTABLE ROTOR TYPE

Jean Leroy, La Queue les Yvelines, and Jean-Pierre Bosdevesy, Cergy, both of France, assignors to Nelman, Croissy, France

Filed May 1, 1989, Ser. No. 345,708
Claims priority, application France, May 4, 1988, 88 05970
Int. Cl.[4] E05B *17/04*
U.S. Cl. 70—379 R **7 Claims**



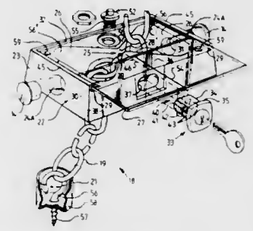
1. A lock of the disconnectable rotor type, comprising a case or body, an intermediate stator sleeve mounted rotatably in said case, a rotor mounted rotatably in the said intermediate stator sleeve, locking means (such as pairs of locking pins or pallets), means mounting the said locking means for cooperation with the rotor and the stator sleeve whereby to couple the rotor and stator sleeve for rotation together in the absence of a key or in the presence of an incorrect key, and whereby further to free the rotor from the stator sleeve upon introduction of a correct key, an indexing member mounted effaceably within the case for cooperation with the said case and the stator sleeve whereby to hold the stator sleeve in a predetermined normal or rest position, the lock further comprising a bolt actuating member (such as a lever or tumbler) and coupling means, for coupling the said rotor with the bolt actuating member in such a way as to couple them together only after rotation of the rotor independently of the stator sleeve, wherein the said coupling means comprise a slide ring, means coupling the slide ring with the rotor for rotation therewith, camming means on the said slide ring and stator sleeve for effecting cooperation between the slide ring and stator sleeve, and first return spring means urging the slide ring towards the rotor, the slide ring comprising at least one actuating finger and the bolt actuating member having aperture means, such that the slide member can slide with respect to the rotor in response to its cooperation with the stator sleeve through the camming means, whereby to engage the said actuating finger or fingers in the aperture means of the bolt actuating member.

4,903,513

ASSEMBLY FOR RETAINING ARTICLES

Brian C. Stobbart, 14 Bedara Court, Robina QLD 4226, Australia

Continuation of Ser. No. 45,765, Apr. 28, 1987, abandoned, which is a continuation of Ser. No. 862,213, Apr. 17, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 273,678
Claims priority, application Australia, Aug. 22, 1984, PG6717; Oct. 24, 1984, PG7797
Int. Cl.[4] E05B *73/00, 73/02*
U.S. Cl. 70—422 **8 Claims**



1. A retaining assembly, comprising:

a body having a wall assembly;

a passage extending through said body for allowing a retaining cable to pass into said body;

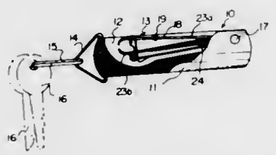
holding means in said body for manually engaging said cable and for preventing retraction of said cable through said passage;

an open storage recess in said body in which a tail portion of said cable engaged in said holding means may be stored;

a fracturable panel slidably retained by said body, said panel being slidable from a covering position at which said panel extends across said open storage recess and said holding means to a disengaged position at which said open storage recess and said holding means are uncovered to provide access thereto, said panel being fracturable to provide access to said holding means and said recess; and

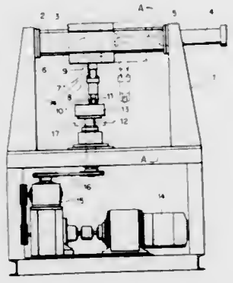
releasable locking means engageable with said body for preventing sliding of said panel to said disengaged position and releasable for enabling the unfractured panel to be removed from said body.

4,903,514
COMBINED NAIL CLIPPER AND KEY HOLDER
Ha Yong Jung, 8534 Harvest View Ct., Ellicott City, Md. 21043
Filed Jul. 17, 1989, Ser. No. 380,296
Int. Cl.[4] E05B *29/10*
U.S. Cl. 70—456 R **3 Claims**



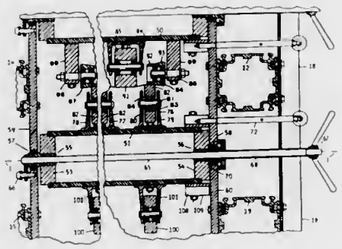
1. A combined nail clipper and key holder comprising:
a nail clipper housing including a hollow portion provided with a pair of lateral grooves disposed on opposite walls of the housing, said nail clipper housing further including an aperture disposed at the rear end and a key ring connecting member rotatably attached to the front end thereof,
a nail clipper having a pair of laterally extending locking pins, said nail clipper being rotatably mounted to the rear end of said nail clipper housing by an end pin which extends into said aperture whereby said nail clipper is rotatable between an inoperative portion where the nail clipper is held in its housing by the functional engagement between the lateral grooves and lateral locking pins and an operative position where the nail clipper is rotated out of the housing about said end pin.

4,903,515
HEATING CONTAINER MANUFACTURING APPARATUS
Kyong-Kwon Park, Da-dong 101, Shinwha A.P.T., 536-4, Shinweol-dong, Gangseo-ku, Seoul, Rep. of Korea
Filed Nov. 30, 1988, Ser. No. 277,709
Claims priority, application Rep. of Korea, Oct. 21, 1988, 1988-13768
Int. Cl.[4] B21D *51/22*
U.S. Cl. 72—85 **3 Claims**



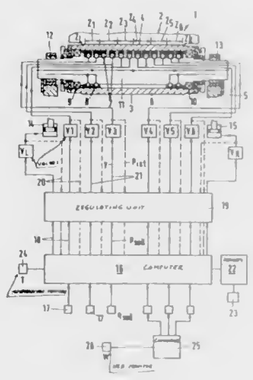
1. An apparatus for manufacturing a heating container which comprises:
a body,
a moving support slidably moved along a pair of guide beds disposed on the top portion of said body,
a horizontal air piston slidably engaged in a horizontal air cylinder disposed on the top portion of said body, said horizontal air piston being connected to said moving support for slidably moving said moving support along said pair of guide beds,
a vertical air piston being slidably engaged in a vertical air cylinder disposed in said moving support,
a roller rotatably attached to the bottom of said vertical air piston through connecting means, said roller having a plurality of teeth disposed thereon,
a rotatable plate mounted on a shaft below said roller for supporting said heating container thereon with its open face down so that the bottom of the heating container is rollingly pressed by said roller, and
a motor means connected to said rotatable plate through transferring means for rotating said rotatable plate.

4,903,516
ROLLING MILL MACHINE FOR LONGITUDINAL BENDING OF PLATE
Sven O. Olsson, Huddinge, and Lars J. Rudman, Farsta, both of Sweden, assignors to Dobel AB, Borlänge, Sweden
Filed Oct. 7, 1988, Ser. No. 255,552
Claims priority, application Sweden, Oct. 9, 1987, 8703922
Int. Cl.[4] B21D *5/08, 13/04*
U.S. Cl. 72—181 **18 Claims**



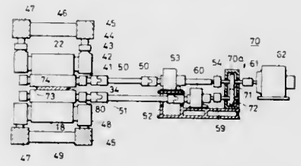
1. A rolling mill machine for bending of plate along the longitudinal axis of the plate as the plate is moved along a path which is generally parallel to the longitudinal axis of the plate through the rolling mill machine to selectively provide one of at least two cross-sectional profiles comprising:
a plurality of shaping stations positioned adjacent to said path of said plate through the rolling mill machine;
at least one drive station for advancing said plate through said plurality of said shaping stations;
each of said shaping stations having first forming means on one side of said plate and second forming means on the other side of said plate;
said first forming means having at least a first set of substantially axially spaced, each of the forming rolls of the first and second sets bein mounted on a separate support non-driven forming rolls and a second set of substantially axially spaced non-driven forming rolls, each of the forming rolls of the second forming means being mounted on a separate support plate to form a first of said cross-sectional profiles; and
said second set of said rolls of said first forming means for cooperating with said rolls of said second forming means to bend said plate to form a second of said cross-sectional profiles.

4,903,517
METHOD OF AND APPARATUS FOR REGULATING THE OPERATION OF CALENDERS AND LIKE MACHINES
Rolf Van Haag, Kerken, and Rainer Schmidt, Steinfurt, both of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany
Filed May 9, 1988, Ser. No. 192,594
Claims priority, application European Pat. Off., May 9, 1987, 87106762.5
Int. Cl.[4] B21B *31/32, 13/00*
U.S. Cl. 72—245 **25 Claims**



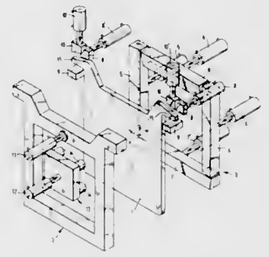
1. A method of regulating the operation of a calender or an analogous machine with at least two neighboring rolls which define an elongated nip and the load parameters, such as the line load or the compressive strain, in a plurality of different longitudinally spaced apart zones of the nip are controlled by discrete actuators which receive a fluid medium at a variable pressure so that they can alter the parameters in the corresponding zones of the nip, and wherein a change to bring about a deviation of the parameter in one of the zones from a reference value tends to entail changes of parameters in other zones of the nip, comprising the steps of establishing at least one pressure reaction matrix with elements which denote those deviations of actual values of parameters for said other zones from reference values which take place in response to a change of parameter in the one zone; utilizing said matrix to individually calculate seriatim for the actuator for each of said other zones that pressure variation which at least partially compensates for departure of actual value of the parameter in the respective zone from the reference value and to further calculate the resulting change of parameter for each other zone until an error function which is dependent upon the differences between the actual values of parameters and the reference values is within a predetermined range of tolerances; and varying the pressure of fluid for the actuators in accordance with the sum of variations which are calculated for the respective actuators.

4,903,518
ROLL DRIVING APPARATUS FOR ROLLING MILL
Tomoaki Kimura, Hitachi, and Teruo Sekiya, Takahagi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
PCT No. PCT/JP87/00762, § 371 Date Mar. 15, 1988, § 102(e) Date Mar. 15, 1988, PCT Pub. No. WO88/02668, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 9, 1987, Ser. No. 205,326
Claims priority, application Japan, Oct. 13, 1986, 61-241333
Int. Cl.[4] B21B *35/00*
U.S. Cl. 72—249 **5 Claims**



1. A roll driving apparatus for a rolling mill having a pair of working rolls and a plurality of support rolls, comprising:
a single motor for driving a plurality of the rolls, a pair of spindles connected with a pair of said rolls, a cam roller for distributing power from the motor to the pair of spindles and a pair of speed reducers disposed on the respective driving shafts for torque intensification; and
each said speed reducer having an inner gearing type planetary reduction gear and a casing respectively, said casing of the planetary reduction gear being fixed for rotation therewith.

4,903,519
APPARATUS FOR STRAIGHTENING CAST ANODES
Rauno K. Hukkanen, Nummela; Olli E. Ylimäki, Espoo, and Seppo I. Kuisma, Helsinki, all of Finland, assignors to Outokumpu Oy, Espoo, Finland
Continuation-in-part of Ser. No. 179,574, Apr. 7, 1988, Pat. No. Claims priority, application Finland, Apr. 16, 1987, 871709
Int. Cl.[4] B21D *3/16*
U.S. Cl. 72—309 **20 Claims**



1. Apparatus for straightening an anode provided with lugs and for eliminating casting fins thereon which anode is on its way to an apparatus for electrolytic refining of materials, including:
a a vertically oriented uniform stopping member which corresponds to the anode in configuration and has an opening in the middle thereof;
a vertically oriented pressing member formed of separate bars placed in opposition to said vertically oriented uniform stopping member for pressing the anode therebetween; and

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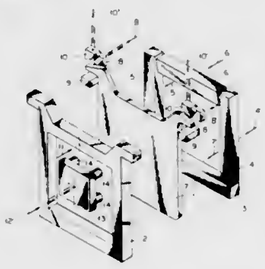
actuating cylinders, at least one of said actuating cylinders for each of said separate bars.

4,903,520

METHOD FOR STRAIGHTENING CAST ANODES

Rauno K. Hukkanen, Nummela; Olli E. Ylimäki, Espoo, and Seppo I. Kuisma, Helsinki, all of Finland, assignors to Outokumpu Oy, Espoo, Finland

Filed Apr. 7, 1988, Ser. No. 179,574
Claims priority, application Finland, Apr. 16, 1987, 871709
Int. Cl.[4] B21D *3/16*
U.S. Cl. 72—309 11 Claims



1. A method for straightening an anode provided with lugs and for eliminating casting fins thereon which anode is on its way to an apparatus for electrolytic refining of metals, comprising the steps of:

placing an anode in a vertical position;

providing a vertically oriented uniform stopping member which corresponds to the anode in configuration and has an opening in the middle thereof;

providing a vertical oriented pressing means formed of several independent pressing members and placing said vertically oriented pressing means in opposition to the vertically oriented uniform stopping member;

positioning said vertically oriented uniform stopping member and said vertically oriented pressing means in a vertical position;

compressing the anode at several spot areas between the vertically oriented uniform stopping member and said independent pressing members of said vertically oriented pressing means for evening out the anode by simultaneously directing the compression at the several spot areas;

directing a separate compression towards each edge of the lugs; and

providing at least one actuating cylinder for each said independent pressing member.

4,903,521

METHOD AND APPARATUS FOR FORMING, REFORMING AND CURLING SHELLS IN A SINGLE PRESS

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

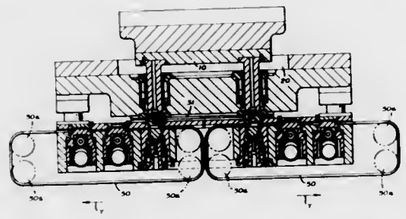
Filed Sep. 2, 1988, Ser. No. 239,948
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—336 21 Claims

1. A method of forming a container end panel from a sheet of material, comprising the steps of:

(a) clamping the sheet of material between opposed pressure members and forming a blank from the sheet of material;

(b) forming a cup from the blank in a continuous press stroke while continuing clamping of the periphery of said blank between said opposed pressure members during a portion of the forming operation;

(c) imparting a preliminary end panel configuration to said cup in the same continuous press stroke; and



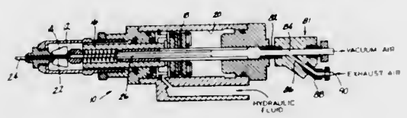
(d) passing said cup through the die used for forming the cup prior to step c.

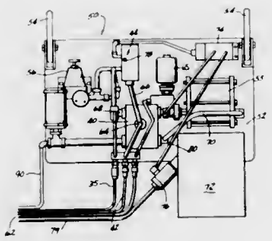
4,903,522

POP RIVETER TOOL

Thomas Miller, 2208 Flint Hill Dr., Wentzville, Mo. 63385

Filed Jan. 11, 1989, Ser. No. 296,202
Int. Cl.[4] B21J *15/34*
U.S. Cl. 72—391 10 Claims





1. A riveting station which comprises:

a hand-held tool for installing break stem fasteners;

said tool having a housing and means for grasping the stem of the fastener;

means for ejecting said stem after said fastener has been installed;

said ejecting means including a bore in said housing and a source of vacuum air communicating with said bore to suck said stem out of said bore; and

means for applying said vacuum air to said bore for a timed period comprising a vacuum transducer, valve means for providing air to said transducer for said timed period, and a timing device for supplying a timed flow of pilot air to said valve means.

4,903,523

TEST OBJECT AND METHOD OF CHARACTERIZATION OF AN ULTRASONIC BEAM AND ITS SIDE LOBES

John J. Flynn, 5435 Sixth Ave., Los Angeles, Calif. 90043

Continuation-in-part of Ser. No. 775,754, Sep. 13, 1985, abandoned. This application Sep. 16, 1987, Ser. No. 97,599
Int. Cl.[4] G01D *18/00*; G01B *15/00*; A61B *8/00*; G09B *23/14*
U.S. Cl. 73—1 DV 11 Claims



1. A test object for use in the testing and calibration of ultrasonic diagnostic equipment used in scanning a plane of tissue by emitting an ultrasonic beam comprising at least one scanning target positioned in the plane occupying an apex position and a plurality of subsequent scanning targets positioned adjacent the plane to form a wedge shaped cluster of scanning targets whose sides diverge from the plane over a range of depths to reflect at least some of the ultrasonic beam for determining the width of the ultrasonic beam in a direction substantially normal to the plane.

4,903,524

METHOD OF AND APPARATUS FOR DETECTING BUBBLES FROM HERMETIC CONTAINER AND METHOD OF DETECTING LEAK IN HERMETIC CONTAINER

Shotaro Kataoka; Yoshio Hasegawa, and Hisashi Muroda, all of Sagamihara, Japan, assignors to Kayaba Industry Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,864
Int. Cl.[4] G01M *3/06*
U.S. Cl. 73—45.5 5 Claims



1. A method of detecting bubbles issuing from a hermetic container, i.e., an object to be measured, which is immersed in a liquid, comprising the steps of:

applying atmospheric pressure to said hermetic container to allow bubbles to be produced from a leaking portion;

allowing said bubbles to pass through a pair of optical fibers arranged with a gap therebetween, a light beam emitted from one of said optical fibers and received by the other being constantly radiated across the intended pathway of said bubbles, said light beam being diffused due to a difference in density between said liquid and each bubble when said light beam is transmitted through successive bubbles, and part thereof is received by said other optical fiber whereby the bubbles produce pulse signals in the light beam;

inputting said pulse signals and timer pulses to a logical circuit to detect the total number of pulses of the pulse signals that are present during a period when said timer pulses continue;

determining the amount of change in the total number of pulses of said pulse signals in the pulse widths of mutually adjacent timer pulses; and

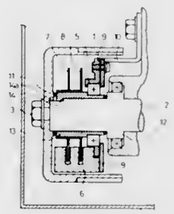
comparing the value thus determined with a preset value to determine the presence or absence of a leak in said hermetic container.

4,903,525

ROTATIONAL POSITION SENSOR DEVICE FOR INTERNAL COMBUSTION ENGINE

Masaaki Chiba, and Shigemi Murata, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1988, Ser. No. 269,092
Claims priority, application Japan, Oct. 9, 1987, 62-282552; Nov. 9, 1987, 62-170981[U]
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 4 Claims



1. A rotational position sensor device for an internal combustion engine, comprising:

a sleeve (**13**; **13***a*) detachably mounted on and rotatable in unison with a cam shaft (**2**);

a mounting member (**9**) rotatably supported on said sleeve and fixedly secured to an engine body journalling said cam shaft;

a rotational position sensor (**6**) mounted on said mounting member; and

a member (**7**,**8**; **7***a*, **8***a*) with a slit mounted on said sleeve and co-operating with said rotational position sensor.

4,903,526

TROUBLE DETECTOR SYSTEM FOR AN INTAKE SYSTEM OF AN AUTOMOTIVE ENGINE

Shuji Miyama, and Hiroya Ohkumo, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

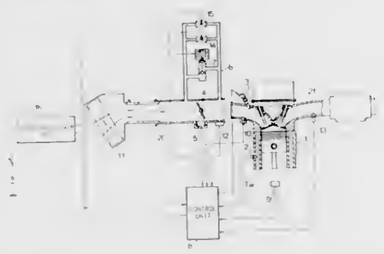
Filed Feb. 9, 1989, Ser. No. 310,068
Claims priority, application Japan, Feb. 16, 1988, 63-033193
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117.3 2 Claims

1. A system for detecting troubles of an intake system of an engine having a bypass around a throttle valve and at least one valve provided in the bypass, comprising:

storing means storing a plurality of reference pressures for pressures in an intake passage of the engine which are arranged to be derived in accordance with speed of the

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engine and opening degree of a throttle valve of the engine;
a pressure sensor for detecting pressure in an intake passage of the engine;
an engine speed detector for producing the speed of the engine;
a throttle position sensor for detecting the opening degree of the throttle valve;
detector means for detecting the opening degree of the valve in the bypass;



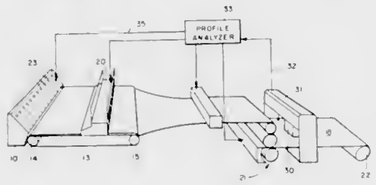
correcting means for correcting the opening degree detected by the throttle position sensor with the opening degree detected by the detector means and for producing a corrected opening degree;
means for deriving a reference pressure from the storing means in accordance with the detected engine speed and the corrected opening degree;
comparator means for comparing a pressure detected by the pressure sensor with the reference pressure derived from the storing means and for producing an abnormality signal when the detected pressure is higher than the reference pressure.

4,903,528

SYSTEM AND PROCESS FOR DETECTING PROPERTIES OF TRAVELLING SHEETS IN THE CROSS DIRECTION

Ramesh Balakrishnan, Stanford, and Gurcan Aral, Cupertino, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Sep. 26, 1988, Ser. No. 249,617
Int. Cl.[4] G01N *33/34, 33/44*
U.S. Cl. 73—159 **20 Claims**



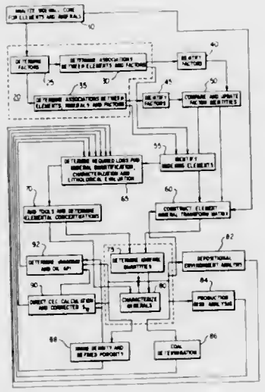
4,903,527

QUANTITATIVE CLAY TYPING AND LITHOLOGICAL EVALUATION OF SUBSURFACE FORMATIONS

Michael M. Herron, Danbury, Conn., assignor to Schlumberger Technology Corp., New York, N.Y.

Continuation of Ser. No. 574,481, Jan. 26, 1984, abandoned. This application Oct. 24, 1988, Ser. No. 262,133
Int. Cl.[4] E21B *49/00*
U.S. Cl. 73—152 **40 Claims**

1. A method for investigating, through logging, an earth formation transversed by a borehole comprising:
(a) determining, by logging the said borehole, the indications of at least two indexers;
(b) determining a value for at least two dominant attributes, including at least one mineral, of said formation by operating with an indexer-to-attribute transform on said at least two indexers, wherein said dominant attributes are identified by a multivariate statistical analysis on data obtained from a formation; and



(c) generating a tangible record of said values of said dominant attributes.

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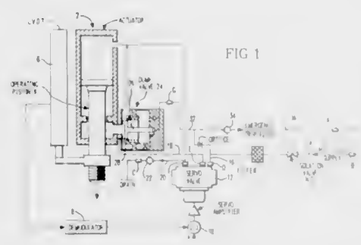
1. A method for determining measurements of a property of travelling sheet materials during production, wherein the reference locations are generally regularly spaced apart, comprising the steps of:
repeatedly traversing a travelling sheet with a scanning sensor and, during each traverse, taking measurements of a property of the sheet at a plurality of slice locations;
selecting a series of reference locations which are spaced apart in the machine direction along the sheet surface;
then, for selected slices, estimating measurement values at locations on the selected slices which are not spaced in the machine direction at the same spacing as the reference locations.

4,903,529

VALVE SYSTEM ANALYZER

James A. Hodge, Gray, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1988, Ser. No. 254,650
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—168 **6 Claims**



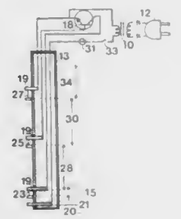
1. A method for testing an hydraulic device of an hydraulic control system, the system having a source of hydraulic fluid under pressure and a fluid reservoir, and the device having a fluid inlet which is releasably coupled to the source when the system is in operation, a fluid outlet which is releasably coupled to the reservoir when the system is in operation, and an element which restricts fluid flow between the inlet and the outlet, said method comprising:
halting operation of the system;
providing a portable analyzing apparatus having a supply of hydraulic fluid, an outlet conduit, means for supplying hydraulic fluid under pressure from the supply to the outlet conduit, a return conduit communicating with the supply, means connected for monitoring fluid pressure in the outlet conduit, and means connected for monitoring fluid flow through the return conduit;
disconnecting the fluid inlet of the device from the source and connecting that fluid inlet to the outlet conduit;
disconnecting the fluid outlet of the device from the reservoir and connecting that fluid outlet to the return conduit;
placing the means for supplying hydraulic fluid under pressure into operation for supplying hydraulic fluid under pressure to the outlet conduit; and
monitoring the fluid pressure in the outlet conduit and the flow of fluid through the return conduit with the monitoring means.

4,903,530

LIQUID LEVEL SENSING SYSTEM

Harold L. Hall, 401 Canyon Way Sp. 43, Spanks, Nebr. 89431

Filed Dec. 8, 1988, Ser. No. 281,065
Int. Cl.[4] G01F *23/24*
U.S. Cl. 73—304 R **6 Claims**



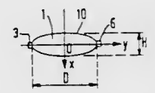
1. A liquid level sensor conductive system comprising; means to connect to a power source, a probe, means for mounting said probe in a liquid conductive substance, a plurality of spaced contact elements cooperating with said probe, means for mounting said probe and said spaced contact elements at various pre-determined levels of said liquid conductive substance, a tri-colored light emitting diode in an indicating electrical box unit, means to change the current flow to said diode from direct current to reverse direct current to alternating current, means to conduct said current flow from said means to connect to a power source, through said diode, through said means to change the direction of current flow and through said contact elements when said contact elements are covered with said liquid conductive substance.

4,903,531

ACOUSTIC GYROMETER

Henri LeBlond, Versailles; Philippe Herzog, and Michel Bruneau, both of Le Mans, all of France, assignors to Badin-Crouzet, France

Filed Sep. 1, 1988, Ser. No. 239,300
Claims priority, application France, Sep. 1, 1987, 87 12124
Int. Cl.[4] G01P *9/00*
U.S. Cl. 73—505 **4 Claims**



1. An acoustic gyrometer for measuring angular speed about an axis of rotation about which the gyrometer is rotated, comprising:
(a) a cavity filled with a medium and rotatable about said axis of rotation;
(b) means for exciting a first acoustic resonance mode in the medium within the cavity, said first mode having pressure extrema arranged on and along a first line which extends perpendicular to said axis of rotation;
(c) means for measuring a second acoustic resonance mode induced by Coriolis force in the medium within the cavity when the cavity is rotated about said axis of rotation, said second mode having pressure extrema arranged on and along a second line which extends perpendicular to said first line; and
(d) said cavity having a shape of a body of revolution rotated about said axis of rotation, said cavity having an axial dimension extending along said axis of rotation and a transverse dimension extending perpendicularly of said axis of rotation, said axial dimension being smaller than said transverse dimension and causing parasitical modes within the cavity to be damped, thereby increasing the sensitivity of the gyrometer.

4,903,532

ELECTROSTATIC CAPACITY TYPE PRESSURE DETECTOR

Mitsuru Tamai; Kimihiro Nakamura; Teizo Takahama, and Mikihiko Matsuda, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Aug. 1, 1988, Ser. No. 226,915
Claims priority, application Japan, Aug. 13, 1987, 62-202221
Int. Cl.[4] G01L *7/08, 9/12*
U.S. Cl. 73—718 **7 Claims**

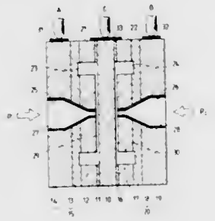
1. An electrostatic capacitance type pressure detector comprising:
a diaphragm deformable by pressure;
a pair of fixed electrodes, each electrode including a pressure introducing hole for introducing pressure into a space defined by said electrode, said pressure introducing hole, and said diaphragm, each of said holes having an inner

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wall, a different one of said fixed electrodes being provided on each side of said diaphragm, and being separated therefrom by a predetermined distance to form a respective capacitance between said diaphragm and each of said fixed electrodes, each of said fixed electrodes including:

a first electrically conductive plate confronting said diaphragm and separated therefrom by a gap;

an insulating plate having a first side joined to said first electrically conductive plate and a second side; and



a second electrically conductive plate joined to said second side of said insulating plate;

conductor means for electrically connecting said first electrically conductive plate and said second electrically conductive plate; and

an annular support joined to said diaphragm and to said insulating plate so as to surround said first electrically conductive plate, said annular support being electrically insulated from said first electrically conductive plate.

4,903,533

TURBINE FLOWMETER

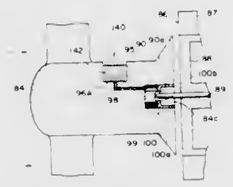
Takashi Kato, Kawasaki; Yutaka Morita, Takarazuka; Takeshi Yamaguchi, Kyoto; Kazuo Tsuge, Yokobama; Kyoji Imamura, Yokohama; Yoshio Kawai, Yokohama; Hiroaki Hasegawa, and Hiroyuki Amemori, both of Kawasaki, all of Japan, assignors to Osaka Gas Co., Ltd., Osaka and Tokico Ltd., Kawasaki, both of, Japan

Continuation-in-part of Ser. No. 106,175, Sep. 30, 1987. This application Feb. 14, 1989, Ser. No. 310,748

Claims priority, application Japan, Sep. 30, 1986, 61-231527; Sep. 30, 1986, 61-150145

Int. Cl.[4] G01F *1/10*

U.S. Cl. 73—861.91 **4 Claims**



1. A turbine flowmeter comprising:

an impeller rotatably provided with a flow passage through which a fluid to be measured flows, said impeller comprising a rotary shaft which rotates together with said impeller;

a pair of bearing members having bearing surfaces for axially supporting said rotary shaft, each end of said rotary shaft and a corresponding one of the bearing surfaces having surfaces defining a space;

oil accumulating means for accumulating a lubricating oil therein;

oil supplying means for supplying the lubricating oil in said oil accumulating means in small quantities to said space; and

an upstream side supporting member provided on an upstream side of said impeller and a down stream side supporting member provided on a downstream side of said impeller, each of said upstream and down stream side supporting members supporting said bearing member,

said oil accumulating means comprising a recess provided within each of said upstream and downstream side supporting members, said recess accommodating first capillary means in which the lubricating oil is contained,

said oil supplying means comprising a second capillary means opening to said space, and communicating means in each of said upstream and downstream side supporting members for communicating said first capillary means to said space through said second capillary means, the lubricating oil being supplied to said space through said second capillary means due to a capillarity introduced in said second capillary means and said space,

a surface tension of the lubricating oil in said space being equal to or larger than a surface tension of the lubricating oil in said first capillary means.

4,903,534

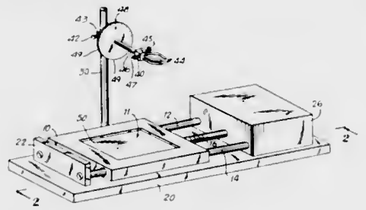
METHOD AND APPARATUS FOR TESTING BRUSHES

Patricia L. Kane, Hauppauge, N.Y., assignor to Estee Lauder, Inc., New York, N.Y.

Filed Dec. 7, 1988, Ser. No. 280,830

Int. Cl.[4] G01N *19/00*

U.S. Cl. 73—865.9 **8 Claims**



1. A method of testing the capacity of a brush having bristles to pick-up an acceptable amount of product comprising:

(a) providing a sample of product at a fixed position at a test sample application area;

(b) providing a device for holding the brush at a predetermined position with respect to the sample of product, the predetermined position being selected so that the bristles of the brush may be moved in relative contact with the sample of product;

(c) placing the brush in the device and moving the bristles of the brush in relative contact with the sample of product a predetermined distance a predetermined number of times; and

(d) determining whether or not the amount of product picked-up by the brush in step (c) above is acceptable.

6. A method of testing the capacity of a brush having bristles for transfering an acceptable amount of a product comprising:

(a) providing a test sample application area;

(b) providing a brush comprising bristles having a product deposited thereon;

(c) providing a device for holding the brush at a predetermined position with respect to the test sample application area, the predetermined position being selected so that the bristles of the brush having product deposited thereon may be moved in relative contact with the test sample application area;

(d) placing the brush in the device and moving the bristles of the brush in relative contact with the test sample application area a predetermined distance a predetermined number of times; and

(e) determining whether or not the amount of product transferred from the bristles of the brush to the test sample application area in step (d) is acceptable.

4,903,535

POWER CONVERTING MECHANISM

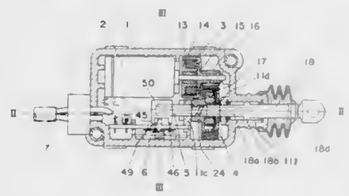
Tomoyuki Kikuta, and Chikara Kawaguchi, both of Kosai, Japan, assignors to ASMO Co., Ltd., Kosai, Japan

Filed Mar. 31, 1988, Ser. No. 176,148

Claims priority, application Japan, Mar. 31, 1987, 62-049030 [U]; May 11, 1987, 62-070062[U]; May 19, 1987, 62-075287[U]; May 26, 1987, 62-079556[U]

Int. Cl.[4] F16H *215/20*

U.S. Cl. 74—89.1 **1 Claim**



1. An electric actuator provided with a power converting mechanism which comprises:

a motor provided with an output shaft;

a centrifugal clutch including a centrifugal clutch driving section connected to the output shaft, and a centrifugal clutch driven section having an internal peripheral surface concentric with said driving section and connectable with said driving section under centrifugal force;

a gear which is integral with said driven sections and rotatably supported on the output shaft of said motor;

a final drive gear meshing with said gear, a drum member concentric with said final drive gear and provided with a boss portion having an internal thread formed in an inner peripheral surface of a central axial opening;

centrifugally actuated clutch means provided between said final drive gear and said drum member;

a screw passing through the axial opening of said boss portion and having an external thread formed on an outer peripheral surface thereof, so that the external thread is threadly engaged with said internal thread; and

a connecting portion at one end of said screw, connected to a driven member, whereby rotary movement of said motor is converted into linear movement of said driven member.

4,903,536

COMPACT CABLE TRANSMISSION WITH CABLE DIFFERENTIAL

J. Kenneth Salisbury, Jr., Cambridge; William T. Townsend, Somerville, both of Mass.; David M. DiPietro, Webster, N.Y., and Brian S. Eberman, Rochester, Minn., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 21, 1988, Ser. No. 184,273

Int. Cl.[4] F16H *27/02*

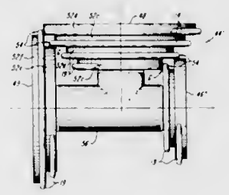
U.S. Cl. 74—89.22 **7 Claims**

1. A compact cable transmission comprising

first and second pulleys that are mounted to rotate about transverse axes and said pulleys each having a generally smooth outer surface that is oriented parallel to the axis of rotation of the associated pulley, and

that is carried on the outer surfaces of both pulleys to operatively couple them to transmit a torque between said first and second pulleys, said cable travelling in a first plane when carried on said first pulley and a second plane distinct from said first plane when carried on said second pulley,

said first and second pulleys having their outer surfaces spaced from one another by a gap G, where $0 \leqq G \leqq R$ and where R is the radius of said cable, at a transfer point where said cable transfers from being carried on said first pulley with a component of force transmitted by the cable



is directed radially inward toward the axis of rotation of said first pulley to being carried on said second pulley with a component of the force transmitted by the cable is directed radially inward toward the axis of rotation of said second pulley,

said cable undergoing a substantially instantaneous change in direction of travel at said transfer point.

4,903,537

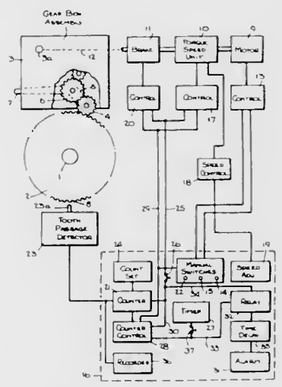
ROTOR SHAFT TURNING APPARATUS

Harry H. Bahrenburg, 11 Sberman Ct., Bethpage, N.Y. 11714

Filed Apr. 29, 1988, Ser. No. 187,862

Int. Cl.[4] F02G *3/00*

U.S. Cl. 74—125.5 **11 Claims**



1. Apparatus for the rotation of a rotatable shaft at spaced intervals of time between two predetermined angular positions thereof, said apparatus comprising:

a gear connected to said shaft for rotation of said shaft;

a drive motor;

driving means interconnecting said motor and said gear for driving said gear and rotating said shaft by said motor, said driving means including an electrically operable clutch means for alternately connecting said motor to said gear and causing driving of said gear by said motor and discontinuing the driving of said gear by said motor;

rotation sensing means for measuring the rotation of said shaft from a first said position in which it is stationary to a second said position;

settable means connected to said position sensing means and to said clutch means for discontinuing the rotation of said shaft by said motor upon the measurement of rotation of said shaft by said settable means by an amount set by said settable means; and

timing means connected to said clutch means for connecting said motor to said gear and causing rotation of said gear and said shaft from said first position.

4,903,538

DRIVE HOUSING FOR A MOWING MACHINE

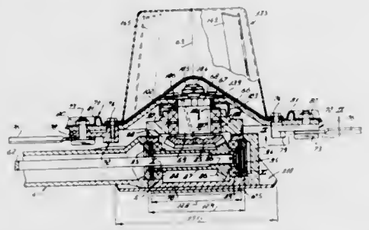
Edwin ver der Lely, Maasland, and Cornelis J. Gerardus, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Division of Ser. No. 772,465, Sep. 4, 1985, Pat. No. 4,693,062. This application Sep. 8, 1987, Ser. No. 94,386

Claims priority, application Netherlands, Jan. 4, 1984, 8400028

Int. Cl.[4] F16H *1/14, 57/02;* **A01D** *34/43*

U.S. Cl. 74—417 **6 Claims**



1. A drive housing for a mowing machine comprising; a sealed outer wall which contains an input drive shaft, an output carrying shaft, and means for transferring the power from said drive shaft to said carrying shaft wherein the drive housing accomodates a sleeve which is coupled with said drive shaft and has a bevel gear wheel, said sleeve bearing axially, under forces imposed by the bevel wheel gear when a cutting unit is driven, on a supporting ring through as least one spacer ring, said supporting ring being rigidly secured in the drive housing.

4,903,539

DIRECT-DRIVE-TYPE MULTI-ARTICULATED ROBOT

Kenichi Toyoda, Hino; Nobutoshi Torii, Hachioji; Ryo Nihei, Musashino; Akibiro Terada, Hino, and Jun Kikuchi, Hachioji, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

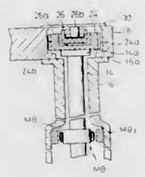
PCT No. PCT/JP88/00070, § 371 Date Sep. 27, 1988, § 102(e) Date Sep. 27, 1988, PCT Pub. No. WO88/05713, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 28, 1988, Ser. No. 275,180

Claims priority, application Japan, Jan. 31, 1987, 62-19640

Int. Cl.[4] B25J *3/04*

U.S. Cl. 74—479 **3 Claims**



1. A direct-drive-type multi-articulated robot comprising: an elongate stationary support shaft having an upper end and a lower end; a cylindrical rotary casing surrounding said stationary support shaft; a first robot arm joined to the upper end of said rotary casing; a second robot arm joined to an extremity of said first robot arm; a direct-drive motor means interposed between said lower end of said rotary casing and said lower end of said stationary support shaft to drive said rotary casing and said first robot arm together for turning motion and a brake means axially spaced from said motor and interposed to operate between said upper end of stationary support shaft and said first robot arm to arrest the turning motion of the first and said lower end of said stationary support shaft to drive said rotary casing and said first robot arm together for turning motion, and a brake means axially spaced from said motor and interposed to operate between said upper end of said stationary support shaft and said first robot arm to arrest the turning motion of the first robot arm.

4,903,540

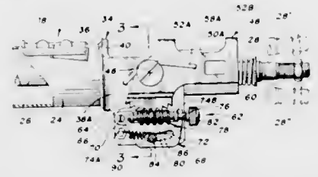
STEERING WHEEL TILT-LOCK

Howard D. Beauch, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1989, Ser. No. 332,269

Int. Cl.[4] B62D *1/18*

U.S. Cl. 74—493 **3 Claims**



1. A tilt-lock for a tilt-adjustable steering wheel on an upper end of a steering column mast jacket comprising:

means defining a worm gear sector,

means mounting said worm gear sector on said steering column mast jacket for pivotal movement as a unit with said steering wheel about a first transverse axis of said mast jacket,

a latch plate mounted on said mast jacket for pivotal movement about a second transverse axis of said mast jacket between a matching position and a releasing position,

spring means between said mast jacket and said latch plate biasing said latch plate to said latching position,

manual lever means on said mast jacket operative to move said latch plate from said latching to said releasing position,

a worm wheel having a spiral worm thread thereon for mesh with said worm gear sector, means mounting said worm wheel on said latch plate for pivotal movement as a unit therewith and for rotation relative thereto,

said worm wheel spiral thread meshing with said worm gear sector in said latching position of said latch plate to capture an angular gross adjusted position of said steering wheel relative to said mast jacket and being remote from said worm gear sector in said releasing position of said latch plate to permit said angular gross adjustment of said steering wheel, and

manual actuation means connected to said worm wheel for rotating said worm wheel in said latching position of said latch plate to effect angular fine adjustment of said steering wheel relative to said mast jacket in said latching position of said latch plate.

4,903,541

ANCHORING AND ADJUSTING ASSEMBLY FOR A CONTROL CABLE

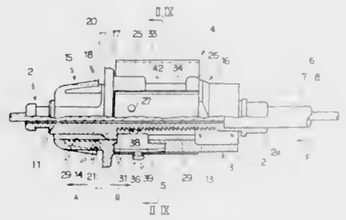
Makoto Shiota, Ikeda, Japan, assignor to Nippon Cable System, Inc., Takarazuka, Japan

Filed Jul. 20, 1989, Ser. No. 382,373

Claims priority, application Japan, Aug. 24, 1988, 63-210340

Int. Cl.[4] F16C *1/10*

U.S. Cl. 74—501.5 R **4 Claims**



1. An anchoring and adjusting assembly for a control cable comprising:

(a) a slider having a tubular shape, an end to be fixed to a conduit of a control cable, an axially extending inner space through which an inner cable of the control cable is inserted and a set of ratchet teeth on an outside surface thereof;

(b) a holder having a fixing portion to be fixed to a static member and a body for holding an engaging claw and a leaf spring member; said body being formed with a through hole having an inside surface supporting the slider for an axial sliding movement;

(c) said leaf spring member having a spring portion formed into a substantially cylinder-like shape with C-shaped cross section and having a certain width in an axial direction,

(d) said engaging claw member engaged with an inside surface of the leaf spring portion, and having a claw portion to be engaged with the set of ratchet teeth of the slider; and

(e) said body of the holder having a cylindrical holding portion for engaging the spring portion of the leaf spring member therearound and having a hollow space formed in a bottom portion of the holding portion to contain the engaging claw member.

4,903,542

BICYCLE HANDLEBAR ASSEMBLY, PARTICULARLY FOR SPORTS BICYCLES

Lucio Borromeo, Turin, Italy, assignor to 3T S.p.A., Turin, Italy

Filed Oct. 9, 1989, Ser. No. 294,708

Claims priority, application Italy, Jan. 7, 1988, 52802/88[U]

Int. Cl.[4] B62K *21/12*

U.S. Cl. 74—551.8 **6 Claims**

1. A bicycle handlebar assembly comprising:

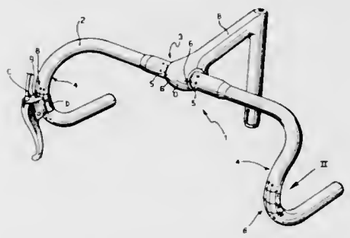
support means,

a handlebar having a substantially horizontally disposed center portion adjustably supported by said support means for rotation relative thereto,

first scale means located on one of said handlebar and support means and complementary indicator means located on the other of said handlebar support means for indicating the angular orientation of said handlebar relative to said support means, said handlebar having a side handle portion at each end of said center portion, each side handle portion having a substantially vertically disposed portion,

brake operating lever means adjustably mounted on each vertically disposed portion and

second scale means located on each vertically disposed portion for cooperation with a respective brake operating lever means for indicating the vertical position of each



brake operating lever means relative to said vertically disposed portion.

4,903,543

CAMSHAFT FOR CONTROLLING VALVES IN INTERNAL COMBUSTION ENGINES AND METHOD OF MANUFACTURING THE CAMSHAFT

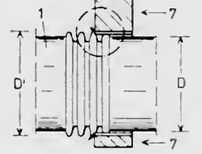
Lukas Matt, Eschen, Liechtenstein, assignor to Etablissement Supervis, Vaduz, Liechtenstein

Filed May 16, 1988, Ser. No. 194,385

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717190

Int. Cl.[4] F16H *53/00;* **F01L** *1/04*

U.S. Cl. 74—567 **3 Claims**



1. In a camshaft for controlling valves in internal combustion engines, the camshaft including a shaft and at least one cam slid onto and connected to the shaft in an area of the shaft, the cam defining a recess for receiving the shaft, the recess having at least one radially inwardly directed projection which engages a corresponding groove defined in the shaft, the improvement comprising at least a portion of the area of the shaft in which the cam is to be connected having a diameter which is greater than the diameter of the shaft, the increased diameter portion of the shaft being a bead-like material displacement which extends circumferentially on the shaft, wherein the cam is configured to be forced onto the increased diameter portion of the shaft with the at least one projection in the recess of the cam forming in a chip-removing manner the groove in the increased diameter portion.

4,903,544

DOUBLE DAMPED FLYWHEEL, ESPECIALLY FOR AUTOMOTIVE VEHICLES

Jacky Naudin, Ermont, and Jacques Paquin, Villeneuve-la-Garenne, both of France, assignors to Valeo, Paris, France

Filed Jan. 24, 1989, Ser. No. 300,840

Claims priority, application France, Jan. 25, 1988, 88 00805

Int. Cl.[4] F16F *15/10*

U.S. Cl. 74—574 **5 Claims**

1. A double damped flywheel for an automotive vehicle, said

flywheel comprising a first mass and a second mass coaxial with said first mass, said masses being mounted for relative rotation with respect to each other against the action of resilient means, said masses delimiting a first sealed cavity, mounting means for mounting said resilient means within said first sealed cavity, said first sealed cavity being filled with a first fluid, viscous damping means being mechanically interposed



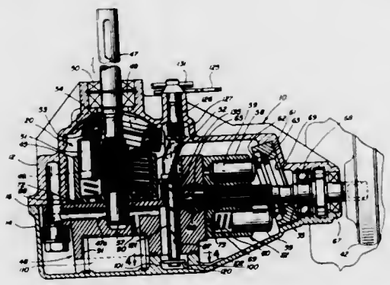
between said two masses and comprising elements of said two masses to define together a second sealed cavity, said second sealed cavity being disposed generally inwardly of said first sealed cavity, said second sealed cavity being filled with a second fluid, said second fluid being different from said first fluid, said second sealed cavity being located close to the axis of rotation of said double flywheel, radially inwardly of said resilient means.

4,903,545

HYDROSTATIC TRANSMISSION CENTER SECTION

Joseph E. Louis, and Alan W. Johnson, both of Ames, Iowa, assignors to Sundstrand-Sauer, Ames, Iowa

Filed Mar. 3, 1989, Ser. No. 319,164
Int. Cl.[4] F16H *57/02;* **F16D** *39/00*
U.S. Cl. 74—606 R **14 Claims**



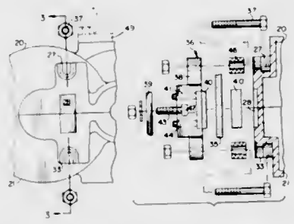
1. In combination, a hydrostatic transmission comprising a pair of hydraulic displacement units, each having a rotatable cylinder block with reciprocal pistons, and a housing for said displacement units providing a fluid sump, said rotatable cylinder blocks having their axes of rotation generally normal to each other, a one-piece generally L-shaped center section positionable in said housing and having first and second face generally at right angles to each other, said center section being positioned to have said first face engage an end of one rotatable cylinder block and the second face engage an end of the other rotatable cylinder block, arcuate fluid ports at the first and second faces of said center section for coaction with said rotatable cylinder blocks, a first straight fluid passage in said center section connecting one of the ports at each face to define a first pair of fluid communicating ports and terminating at one of said pair of ports, and a second straight fluid passage in said center section connecting another of the ports on each face to define a second pair of fluid communicating ports and terminating at one of the ports of said second pair.

4,903,546

TRANSMISSION HOUSING WITH A BRAKE ATTACHED

Mark Quintille, Brunswick, Ohio, assignor to MTD Products Inc., Ohio

Filed Jun. 22, 1988, Ser. No. 209,922
Int. Cl.[4] F16H *57/02, 57/10*
U.S. Cl. 74—606 R **15 Claims**



1. In a transmission having a brake assembly attached to a housing for selectively braking a rotary shaft, the housing having two sections joined by a parting line, the improvement comprising a first slot, said first slot being located in the housing, a second slot, said second slot being located in the housing, a first bolt, said first bolt having an enlarged head, said enlarged head of said first bolt being in said first slot spaced from the parting line of the housing, means to connect said brake assembly to said first bolt, a second bolt, said second bolt having an enlarged head, said enlarged head of said second bolt being in said second slot spaced from the parting line of the housing, and means to connect said brake assembly to said second bolt.

4,903,547

ACTIVATION APPARATUS FOR A DIFFERENTIAL PAWL WITH AN ACTUATOR

Horst Deike, Clauen, Fed. Rep. of Germany, assignor to Wabco Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 44,912, Apr. 30, 1987, Pat. No. 4,819,511.
This application Dec. 27, 1988, Ser. No. 290,654
Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614863
Int. Cl.[4] F16H *1/44*
U.S. Cl. 475—84 **48 Claims**

1. An activation apparatus for a differential pawl, which includes an actuator which can be moved in a direction of an engaged position and in a direction of a disengaged position of such differential pawl by an energy supply to said actuator, a engagement logic circuit to control said energy supply in said direction of said engaged position, said engagement logic circuit including two signal inputs, at a first of said two signal inputs a signal which is a function of a wheel slip can be fed and said control logic circuit being designed so that when only a second signal input of said control logic circuit receives a signal will energy be released to said actuator, a disengagement logic controlling said energy supply to said actuator in said direction of said disengaged position (Arrow L) of such differential pawl, with one signal input, said disengagement logic releasing energy when said one signal input receives an input signal, said signal which is a function of said wheel slip being

fed to a break-delay first timing element and to an inverting second timing element which is synchronized with said first timing element, an output signal of said first timing element

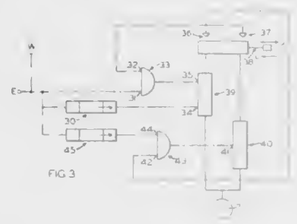


FIG 3

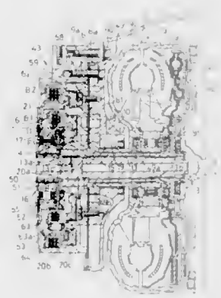
being fed to said second signal input of said control logic circuit, and an output signal of said second timing element being fed to said signal input of said disengagement logic.

4,903,548

SNAP RING SUPPORT DEVICE FOR AN AUTOMATIC TRANSMISSION

Youichi Hayakawa, Toyoake; Chihiro Hosono, Anjo, and Masaaki Nishida, Anjo, all of Japan, assignors to Aisin AW Co., Ltd., Anjo, Japan

Filed Jan. 4, 1989, Ser. No. 293,255
Claims priority, application Japan, Aug. 1, 1988, 63-192354
Int. Cl.[4] F16H *41/00, 57/00*
U.S. Cl. 475—59 **4 Claims**



1. A snap ring support device for use in an automatic transmission comprising:

an automatic transmission mechanism section including an input shaft, at least one planetary gear unit connected to the input shaft and having rotary elements, at least one clutch for connecting the rotary elements, and stop means for stopping the rotary elements of the planetary gear unit,

a torque converter adapted to transmit rotation of an engine output shaft to the input shaft and having a stator shaft situated in the center thereof,

an oil pump assembly situated between the torque converter and the automatic transmission mechanism section, said oil pump assembly having a boss section in the center thereof, an annular recessed section formed at the boss section, and at least one hydraulic actuator,

an annular flange section extending radially outwardly from one end of the stator shaft so that a snap ring groove is defined by the annular flange section of the stator shaft and the annular recessed section of the pump assembly, and

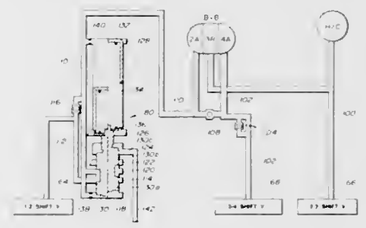
a snap ring installed in the snap ring groove adapted to support a receiving member for a return spring of the hydraulic actuator.

4,903,549

SHIFT CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Akihiro Ueki, Zama, and Kazuhiko Sugano, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 31, 1988, Ser. No. 264,730
Claims priority, applicatioo Japan, Oct. 30, 1987, 62-273225
Int. Cl.[4] B60K *41/10*
U.S. Cl. 74—867 **2 Claims**



1. A hydraulic control system for an automatic transmission including a friction device which is engaged in response to at least one of a hydraulic pressure build-up in a low speed apply chamber and a hydraulic pressure build-up in a high speed apply chamber, the automatic transmission being shiftable to one speed ratio where hydraulic fluid is discharged from both of the low and high speed apply chambers, shiftable to another speed ratio where hydraulic fluid is supplied to the low speed apply chamber, while hydraulic fluid is discharged from the high speed apply chamber, and shiftable to still another speed ratio where hydraulic fluid is supplied to both of the low and high speed apply chambers, the hydraulic control system comprising:

means for allowing the hydraulic pressure build-up in the low speed apply chamber at a controlled gradual rate when the transmission shifts to the another speed ratio; and

one-way valve means for allowing one-way flow of hydraulic fluid from the high speed apply chamber to the low speed apply chamber, whereby when the transmission shifts from the one speed ratio to the still another speed ratio, the hydraulic pressure build-up in the high speed apply chamber is controlled by said means for allowing the hydraulic pressure build-up.

4,903,550

HYDRAULIC CONTROL DEVICE FOR AUTOMATIC TRANSMISSION

Yoshinari Kuwayama, Tokoname; Fumitomo Yokoyama, Anjo, and Masakatsu Miura, Kariya, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

PCT No. PCT/JP87/00431, § 371 Date Mar. 1, 1988, § 102(e) Date Mar. 1, 1988, PCT Pub. No. WO88/00302, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 26, 1987, Ser. No. 181,149
Claims priority, application Japan, Jul. 1, 1986, 61-154693
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—869 **8 Claims**

1. In an automatic transmission of a vehicle having a transmission gear mechanism through which power is transmitted in a respective one of power transmitting paths defined therethrough: frictional engaging means operatively connected to the transmission gear mechanism for selecting the power transmitting path through which power is transmitted in the transmission gear mechanism; hydraulic servos operatively con-

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nected to the frictional engaging means for operating or releasing or for engaging or disengaging the frictional engaging means; first, second and third shift valves operatively hydraulically connected to the respective hydraulic servos and a source of line pressure and which shift valves are normally resiliently held in a first position and are movable to a second position by application of line pressure thereto in opposition to the normal resiliently held position, and in which respective positions the line pressure is supplied toward the servos and the supply of line pressure is interrupted during forward travelling of the vehicle to provide different speeds which can be output by the transmission while the vehicle is travelling forward; and a manual valve operatively hydraulically connected in the transmission between a source of line pressure and the shift valves and which manual valve is settable to a plurality of ranges of forward speed; a hydraulic control device comprising:

a first solenoid valve operatively hydraulically connected between the source of line pressure and said first and said second shift valves for controlling supply of hydraulic fluid to said first and said second shift valves for use in controlling the positions thereof;



a down shift control valve normally resiliently held in a first position and movable to a second position by applicaion of line pressure thereto in opposition to the normal resiliently held position;

a second solenoid valve operatively hydraulically connected between said manual valve and said third shift valve and said down shift control valve for controlling supply of hydraulic fluid to said third shift valve and said down shift control valve for use in controlling the positions thereof; and

hydraulic fluid passages between said manual valve and said down shift control valve and between said down shift control valve and said third shift valve for, when said manual valve is at one of the ranges, line pressure is applied to said third shift valve through said down shift control valve to hold said third shift valve at the first position when said third shift valve and said down shift valve are supplied only with hydraulic fluid through said second solenoid valve, whereby when said manual shift valve is at said one of said ranges, said third shift valve is held in said first position regardless ON condition or OFF condition of said second solenoid valve.

4,903,551

FAILSAFE HYDRAULIC CONTROL SYSTEM FOR VEHICLE AUTOMATIC TRANSMISSION

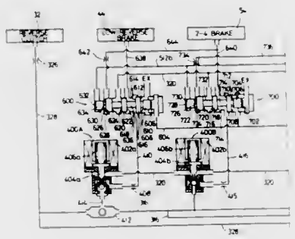
Takeo Hiramatsu, Nagaokakyo, and Tsunefumi Niiyama, Kamifukuoka, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,318
Claims priority, application Japan, Feb. 25, 1987, 62-42037
Int. Cl.[4] B60K *41/10*
U.S. Cl. 74—869 **11 Claims**

1. A hydraulic control system for a vehicle automatic transmission which comprises first and second engaging means respectively engagable for establishing different gear ratios, hydraulic pressure supplying means for supplying hydraulic pressure to cause engagement of each of said first and second engaging means, first hydraulic passage means for connecting said hydraulic pressure supplying means to said first engaging means, first shift means for switching supply and discharge of the hydraulic pressure to and from said first engaging means in accordance with running conditions of the vehicle, second hydraulic passage means for connecting said hydraulic pressure supplying means to said second engaging means, and second shift means for switching supply and discharge of the hydraulic pressure to and from said second engaging means in accordance with the running conditions of the vehicle, said hydraulic control system comprising:

first pressure detecting means for detecting hydraulic pressure in said first hydraulic passage means between said first shift means and said first engaging means;

second pressure detecting means for detecting hydraulic pressure in said second hydraulic passage means between said second shift means and said second engaging means;



valve means coupled to said first hydraulic passage means between said first pressure detecting means and said first engaging means and being movable between a supply position where said valve means opens said first hydraulic passage means for supplying the hydraulic pressure to be supplied to said first engaging means and a discharge position where said valve means discharges the hydraulic pressure supplied to said first engaging means; and

switching means coupled to said valve means for switching said valve means to move said valve means to said discharge position when said first pressure detecting means detects that the hydraulic pressure in said first hydraulic passage means is higher than a first predetermined value and said second pressure detecting means detects that the hydraulic pressure in said second hydraulic passage means is higher than a second predetermined value.

4,903,552

GUIDE FOR FILING SAW CHAIN

Daniel Kuwica, Unit 5 - 3009 Murray Street, Port Moody, British Columbia, Canada (V3H/1Y3)

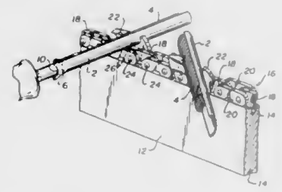
Filed Sep. 22, 1988, Ser. No. 247,880
Int. Cl.[4] B23D *63/12*
U.S. Cl. 76—36 **10 Claims**

1. A sharpening guide for a file to be used in sharpening a chain saw chain, the guide comprising:

a substantially semi-cylindrical body adapted to be a close fit on a round file of predetermined diameter;

a first cylindrical support for the round file at one end of the body;

the first cylindrical support including an opening to receive the round file;,and



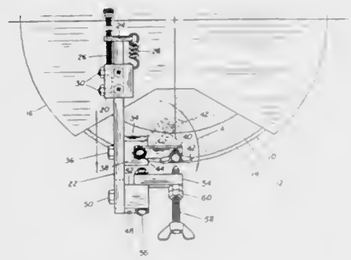
the dimensions of the semi-cylindrical body and the first support allowing the file to rotate in the guide.

4,903,553

DRESSING APPARATUS FOR GRINDING WHEELS

James E. Shepherd, 1231 Dutton Rd., Eagle Point, Oreg. 97524

Filed Apr. 17, 1989, Ser. No. 338,846
Int. Cl.[4] B23D *63/00;* **B24B** *53/02*
U.S. Cl. 76—37 **7 Claims**



1. Dressing apparatus for a grinding wheel of the disc-type having a peripheral portion including a pair of grinding surfaces extending in different planes, said apparatus comprising:

base means arranged to be secured in a fixed position adjacent the grinding wheel,

a pair of grinding wheel dresser means,

support means mounting said wheel dresser means on said base means in selected planes of operation for simultaneously dressing the respective grinding surfaces,

and adjustment means arranged to reposition said pair of wheel dresser means relative to the grinding wheel as the latter wears and requires dressing,

said adjustment means maintaining said pair of wheel dressing means in their selected dressing planes as adjusting positioning between said wheel dresser means and the grinding wheel occurs.

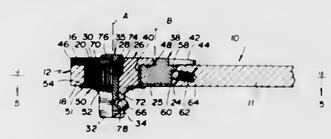
4,903,554

REVERSIBLE RATCHET WRENCH WITH THIN HEAD CONSTRUCTION

David S. Colvin, 23933 Haynes, Farmington Hills, Mich. 48018

Continuation of Ser. No. 203,621, Jun. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 914,336, Oct. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 675,431, Nov. 27, 1984, Pat. No. 4,631,988, which is a continuation-in-part of Ser. No. 461,242, Jan. 26, 1983, Pat. No. 4,485,700. This application Jan. 4, 1989, Ser. No. 293,547
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—63 **13 Claims**

1. A reversible ratchet wrench comprising: a wrench body including a unitary head and a handle extending from the head; the unitary head having first and second oppositely facing planar surfaces that define the maximum thickness of the head; the head also having a circular driver opening extending between the planar surfaces; a pawl recess of a partially circular shape in the first planar surface adjacent the driver opening; the head having a pawl skirt that is unitary therewith and closes the pawl recess adjacent the second planar surface; a driver having a round ratchet portion received within the circular driver opening of the head and supported for rotation about a driving axis; the ratchet portion of the driver having teeth that extend parallel to the driving axis without interruption the entire distance between the first planar surface and the pawl skirt of the unitary head; the driver also including a driving portion; a pawl received within the pawl recess and supported for rotation about a pawl axis between at least two positions; the pawl having oppositely facing planar surfaces and also having spaced teeth for selectively engaging the teeth of the ratchet portion of the driver to prevent rotation thereof with respect to the head in one direction or the other depending upon the pawl position; the pawl teeth extending parallel to



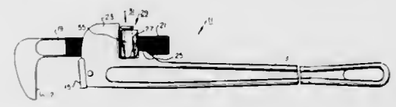
the driving axis to provide engagement thereof with the teeth on the ratchet portion of the driver; the pawl teeth extending the entire distance without interruption from the first planar surface of the wrench head to the pawl skirt and having ends that terminate at the pawl skirt in a spaced relationship to the second planar surface of the wrench head; the pawl having a tab for providing rotation thereof to change the direction of locking of the driver against rotation; the driver including a flange rotatable therewith with respect to the head and having a planar surface that engages the first planar surface of the head around the circular driver opening thereof and also directly engages one planar surface of the pawl; a retainer on the driver; the retainer having a planar surface for engaging the second planar surface of the head such that the driver flange and the retainer cooperate to retain the driver within the circular opening and the pawl within the pawl recess; and means for maintaining the pawl teeth in engagement with the ratchet teeth on the driver to prevent rotation thereof in one direction or the other while permitting rotation of the driver in the opposite direction by ratcheting of the pawl.

4,903,555

AUTOMATICALLY ADJUSTABLE MODERN PIPE WRENCH

Carl B. Howard, Bakersfield, Calif., assignor to Nowata Agricultural Management Co., Inc., Bakersfield, Calif.

Filed Feb. 3, 1989, Ser. No. 305,615
Int. Cl.[4] B25B *13/14*
U.S. Cl. 81—145 **1 Claim**



1. A pipe wrench comprising:

a. a handle with a stationary lower jaw portion;

b. a movable upper jaw with depending stem portion extending downwardly along the backside of said handle;

c. first portion of a holding means for holding an attained

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position of said stem portion with respect to said lower jaw portion; said first portion of said holding means including rack-like stem teeth disposed along the sides of said stem portion, with the front and back surfaces of said stem portion being substantially smooth;

d. a sleeve rigidly connected with said handle below said lower jaw; said sleeve having space for said stem portion to pass slidably therethrough;

e. an upwardly protruding shoulder disposed below said sleeve portion;

f. a slider block clearance space between said shoulder an said sleeve portion;

g. a second portion of said holding means for achieving an attained position; said second portion being adapted to engage said stem portion along its sides for holding said stem portion in an attained position of said upper jaw with respect to said lower jaw; said second portion of said holding means including a slider block having a pair of pivotally mounted dogs, each containing mating teeth blocks adapted to co-engage said teeth along the sides of said stem portion when allowed to return to the normal engaging position; said dogs being of a bell crank design such that depression of a push-button release means at one end of the bell crank causes the other end to move outwardly laterally from said stem teeth to disengage said teeth from the sides of said stem portion when depressed; and

h. releasing means for releasing said stem portion from said second portion of said holding means; said releasing means being adapted to move said second portion of said holding means out of engagement with the sides of said stem when depressed to effect release; said releasing means comprising said push-button release means adapted to release said teeth blocks and move them out of engagement with the teeth of said stem portion when depressed to effect release; and wherein there is a biasing means disposed on said dogs so as to bias said dogs to their normal engaging position;

whereby an operator can depress said releasing means and quickly and easily attain a desired fit with said wrench.

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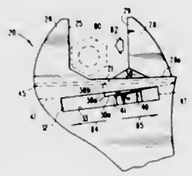
QUICK-ADJUSTING WRENCH

Predrag Spirov, Chicago, Ill., and Tom Masbaum, 5351 W. Giddings, Chicago, Ill. 60630, assignors to Tom Masbaum, Chicago, Ill.

Filed Dec. 23, 1988, Ser. No. 289,565

Int. Cl.[4] B25B *13/24*

U.S. Cl. 81—149 **13 Claims**



1. A wrench comprising:

a handle portion and a head portion formed at one end of said handle portion, said head portion having a fixed jaw with a gripping face projecting outwardly from said head portion, a guide channel formed in said head portion, and a slot formed in said head portion in communication with said guide channel;

an adjustable jaw having a shank which is adapted to slidably be received by said guide channel and move reciprocably therewithin and a gripping face disposed substantially parallel to the gripping face of said fixed jaw, said shank having an angled bottom surface oblique to the direction of movement of the adjustable jaw;

a cleat slidably carried within said slot between said adjustable jaw and head portion and having a top surface and a bottom surface with a side exposed at the slot formed in said head portion, said top surface being disposed in a plane oblique to the direction of movement of the cleat within said slot and oblique to the direction of movement of the adjustable jaw, said slot having a surface portion disposed in a plane oblique to the direction of movement of said adjustable jaw and oblique to the angled bottom surface of said shank, said cleat being adapted to slidably move within said slot; and

means adapted to be engaged by the user extending outwardly from within said slot, said engaging means being affixed to said cleat,

said adjustable jaw being adapted to be moved toward said fixed jaw so as to engage a nut or bolt by movement of said engaging means toward said nut or bolt until the gripping faces of said adjustable jaw and of said fixed jaw engagably abut said nut or bolt, said cleat being cooperatively displaced within said slot by the movement of said engaging means until the oblique top surface of said cleat engages the oblique bottom surface of said shank and the bottom surface of the cleat engages the oblique surface portion of the slot so as to prevent movement of said adjustable jaw in a direction away from said fixed jaw.

4,903,557

ADJUSTABLE WRENCH

Miodrag Jeremic, 405 - 310 Alexander Street, Vancouver, British Columbia, Canada (V6A 1C4)

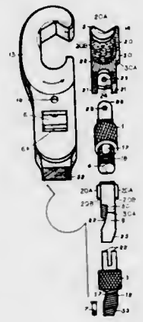
Filed Dec. 21, 1988, Ser. No. 287,028

Claims priority, application Canada, Aug. 30, 1988, 576094

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[4] B25R *13/16*

U.S. Cl. 81—166 **17 Claims**



1. An adjustable wrench comprising:

a handle extending along a wrench axis;

a C-shaped wrench head at one end of the handle end defining a gripping cavity open to one side of the wrench head for receiving objects therein, the gripping cavity including a gripping face facing towards the handle, and an axial keyway in the wrench head opening into the gripping cavity opposite the gripping face;

a key slideable in the axial keyway with a second gripping face confronting the gripping face of the cavity;

key adjustment means including a threaded stem axially and non-rotatably slideable in the axial keyway and a nut threaded onto the stem, the nut extending to the outside of the wrench head through an opening therein such that the nut may be rotated manually to advance or retract the stem in the axial keyway; and

means for detachably connecting the key and the stem.

4,903,558

SLIP-JOINT PLIERS

Don le Duc, 2405 Alvarado Dr., Santa Clara, Calif. 95051

Filed Mar. 6, 1989, Ser. No. 319,358

Int. Cl.[4] B25B *7/06*

U.S. Cl. 81—416 **2 Claims**



1. Pliers comprising two identical plier members for scissor-like assembly, a pivot bolt with nut, a torsion spring for biasing the members, and two jaw adjustment positions;

said plier member having a handle portion, an intermediate portion for the pivot bolt, nut and spring mounting and terminating into work engaging jaws;

said intermediate portion provided with a slot offset at an angle of approximately 45 degrees from a substantially straight work engaging surface at the tip of said jaw;

said intermediate portion recessed to form raised and sunk elements, the elements of one member abutting the elements of the other member in an interlocking manner;

said elements defined by radii drawn from center lines of said slot to form a pair of crescent-shaped ribs, one on each side of the slot, one rib elevated above the other by the first rib's height;

said intermediate portion provided with wire cutting edges to form wire cutting elements for both jaw adjusted positions;

said torsion spring wound to slide and mount over the pivot bolt, it's ends terminating into hooks for positive latching with the inner edges of the handle portions, the moment of latching coinciding with a line-up of said cutting elements of said plier members in both jaw adjusted positions.

4,903,559

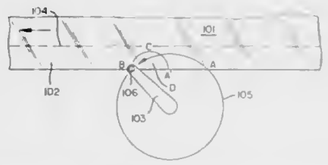
REPETITIVE ARC CUTTING OF CONTINUOUS SHEETING

Harry A. Landeck, Tolland, Conn., assignor to First Brands Corporation, Danbury, Conn.

Filed Sep. 22, 1987, Ser. No. 99,560

Int. Cl.[4] B26F *3/00*

U.S. Cl. 83—24 **43 Claims**



1. A process for making a repetitive arc cut in a continuous manner in a continuous supply of plastic sheeting possessing edges which comprises passing a continuous supply of plastic sheeting across a cutting area and while therein an arc-directed omnidirectional cutting means follows along a 360 degree circular path, a portion of which passes through a cutting area in an arc-defined motion across an edge of the sheeting in the direction of movement of the sheeting at a speed greater than that of the plastic sheeting to puncture at least a portion of the moving plastic sheeting; maintaining the speed of the omnidirectional cutting means at a speed greater than the speed of the plastic sheeting such that the puncture is enlarged to a lineal cut, and thereafter removing plastic sheeting containing the lineal cut and removing the omnidirectional cutting means from the cutting area along the circular path.

4,903,560

PUNCHING DEVICES

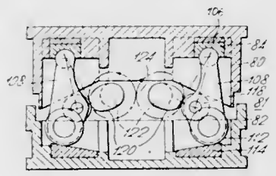
Albert Halff, Jüchen, and Manfred Vossen, Niederkrüchten, both of Fed. Rep. of Germany, assignors to Bobst S.A.

Division of Ser. No. 935,408, Nov. 26, 1986, Pat. No. 4,763,551, which is a division of Ser. No. 609,004, May 10, 1984, abandoned, which is a division of Ser. No. 322,541, Nov. 18, 1981, Pat. No. 4,485,708. This application May 16, 1988, Ser. No. 194,443

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044083

Int. Cl.[4] B26D *7/06;* **B26F** *1/40*

U.S. Cl. 83—277 **14 Claims**



1. A punching device for automatic punching machines for the punching of sheet material, comprising a bottom shoe and a top shoe, wherein one shoe supports punch knives and the other shoe supports a counter-punch, said bottom shoe being stationary and said top shoe being movable to and fro normal to the plane of the counter-punch, impulsion means for moving said top shoe comprising at least one rocking lever, a roller carried by one end of said rocking lever, track means positioned beneath said roller and along which said roller rolls, and drive means for activating said rocking lever, said impulsion means for the top shoe located between the top shoe and a yoke which is connected with the stationary bottom shoe through prestressed tie rods, and a gripper bar arrangement for intermittent forwarding of said sheet material between said bottom and top shoes for punching.

4,903,561

INCLINABLE BLADE BAND SAW

Jean-Loup De Varreux, Saint Germain en Laye, France, assignor to Luren S.A., Domfront, France

Filed Sep. 16, 1988, Ser. No. 245,677

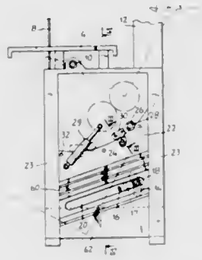
Claims priority, application France, Sep. 16, 1987, 87 12839

Int. Cl.[4] B27B *13/04;* **B23D** *53/04*

U.S. Cl. 83—811 **9 Claims**

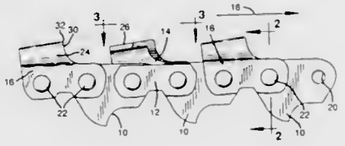
1. Band saw comprising a base supporting a saw table, a casing forming a frame which carries guide pulleys and drive means for a saw blade, the frame being mounted on the base for pivoting about a horizontal axis, the frame including a first wall having a first aperture, the base including a second, substantially vertically oriented wall situated below the saw table adjacent the first wall, the second wall having a second aper-

ture, the first and second apertures being capable of alignment during rotation of the frame about the horizontal axis, and a



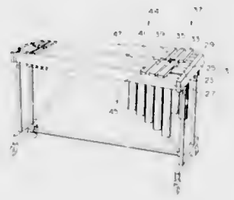
locking member passing through the first and second apertures for locking the frame in an angular position.

4,903,562
BALE CUTTING CHAIN
Brian C. Wunder, Vancouver, Wash., and Rolland E. Talbot, Guelph, Canada, assignors to Blount, Inc., Portland, Oreg.
Filed Sep. 19, 1988, Ser. No. 246,357
Int. Cl.[4] A01F *29/00*
U.S. Cl. 83—833 **4 Claims**



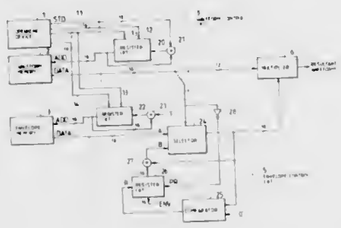
1. A bale cutting saw chain for portable hand held chain saws comprising;
a sequence of chain links including alternating center drive links and pairs of side links, one of said side links of every pair of side links being a cutting link and alternating between left and right hand cutting links;
said cutting links each having a substantially planar body portion and an upwardly projected cutter portion, and said cutting links and the remainder of links in the chain sequence otherwise being devoid of upper projections extending above the planar body portions of the cutting links, said upwardly projected cutter portion including a side plate that on progressing upwardly from said body portion is curved laterally outwardly from the plane of the body portion and then back toward the plane of the body portion, a top plate proceeding from the side plate to terminate at a point substantially over the body portion and short of the midpoint of the overall thickness of the saw chain, said side plate and top plate defining in combination a leading cutting edge extending from the laterally outermost position of the saw chain and continuing to the vertical outermost position of the top plate, and said side plate cutting edge being substantially perpendicular in side view to the axis of the chain.

4,903,563
SOUND BAR ELECTRONIC MUSICAL INSTRUMENT
Masaaki Mizuguchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Continuation of Ser. No. 65,585, Jun. 23, 1987, abandoned. This application Jul. 5, 1989, Ser. No. 376,891
Claims priority, application Japan, Jun. 25, 1986, 61-149917; Sep. 5, 1986, 61-209261; Sep. 5, 1986, 61-209262; Sep. 5, 1986, 61-209263
Int. Cl.[4] G10H *3/20*
U.S. Cl. 84—723 **10 Claims**



1. An improved sound bar electronic musical instrument comprising:
a frame;
a group of sound bars located side by side on said frame for generation of musical tones, an imaginary straight line passing through all of said sound bars;
a member;
means for coupling said member to said frame in the vicinity of said sound bars in a manner permitting said member to be repositioned by a performer at a desired location, substantially along said imaginary line;
a sensor coupled to said member for generation of electric signals in response to vibration of said member when said member is battered; and
a sound generator unit electrically connected to said sensor and processing said electric signals for generation of a musical tone corresponding to vibration of said battered member.

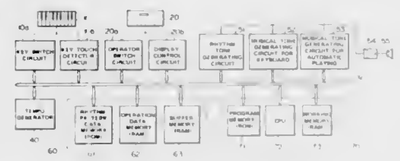
4,903,564
MUSICAL TONE WAVEFORM PRODUCING APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT
Masahiko Hatanaka, Osaka; Daisuke Mori, Kobe, and Masahiro Nakanishi, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Sep. 28, 1988, Ser. No. 253,222
Claims priority, application Japan, Sep. 28, 1987, 62-243315
Int. Cl.[4] G10H *1/057, 1/06, 1/46, 7/00*
U.S. Cl. 84—622 **8 Claims**



5. A musical tone waveform producing apparatus comprising:

a memory storing first and second predetermined signals, the first signal representing a waveform, the second signal representing a degree of attenuation;
means for simultaneously reading the first and second signals from the memory;
means, responsive to the read second signal, for generating a third signal representing an envelope which varies in accordance with the degree of attenuation represented by the read second signal; and
means for combining the read first signal and the generated third signal into a fourth signal representing a tone which depends on the waveform and the envelope represented by the read first signal and the generated third signal, respectively.

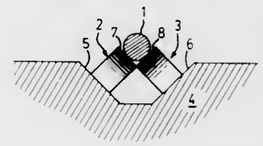
4,903,565
AUTOMATIC MUSIC PLAYING APPARATUS
Yasunao Abe, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed Jan. 4, 1989, Ser. No. 293,437
Claims priority, application Japan, Jan. 6, 1988, 63-1036
Int. Cl.[4] G10H *1/42, 7/00*
U.S. Cl. 84—611 **13 Claims**



1. An automatic music playing apparatus for automatically playing music, the music being composed of consecutive segments having a rhythm, the apparatus comprising:
(a) memory means for storing musical data corresponding to the rhythmic segments;
(b) detecting means for detecting a forthcoming segment;
(c) control means for reading the musical data of the rhythmic segments in a predetermined order and for starting reading data of a preselected rhythmic segment different from the detected segment after completion of reading the rhythmic segment being read, according to an instruction therefor; and
(d) musical tone generating means for generating a musical tone according to the musical data read by the control means.

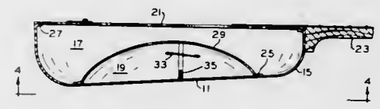
4,903,566
COMPOSITE PICKUP APPARATUS FOR STRINGED INSTRUMENTS
Richard E. D. McClish, 2200 Chapdelaine, apt. 1203, Ste-Foy, Quebec, Canada (G1V 4G8)
Filed Feb. 23, 1988, Ser. No. 159,260
Int. Cl.[4] G10H *3/00*
U.S. Cl. 84—734 **8 Claims**

1. A pickup for a vibratable string of a musical instrument, said pickup comprising:
first pressure transducer means for contacting a first point of said vibratable string and for providing support to said first point in a first direction of vibration of said vibratable string, and
second pressure transducer means, separate from said first pressure transducer means, for contacting a second point of said vibratable string transversly adjacent from said first point, and for providing support to said second point in a second direction of vibration of said vibratable string different from said first direction,



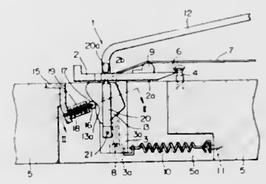
whereby said first and said second pressure transducer means provide independent support to said vibratable string.

4,903,567
GUITAR WITH DUAL SOUND CHAMBERS
Wilbur J. Justus, 209 S. Factory St., Fairmount, Ind. 46928
Filed Feb. 21, 1989, Ser. No. 312,495
Int. Cl.[4] G10D *3/02*
U.S. Cl. 84—294 **10 Claims**



1. A guitar or similar plucked string instrument having a body portion with at least two distinct sound chambers and comprising a contour molded one piece fiberglass member having nested oppositely opening concavities each terminating in first and second spaced apart generally planar rims for receiving a relatively flat sound board and a relatively flat back respectively, a relatively flat sound board having a centrally located air passing opening and a periphery mateable with the first rim, and a relatively flat opening-free back having a periphery mateable with the second rim.

4,903,568
TREMOLO DEVICE FOR A GUITAR
Hiroshi Itoh, Ichikawa, Japan, assignor to Meister Technology Co., Ltd., Tokyo, Japan
Filed Feb. 2, 1989, Ser. No. 305,349
Int. Cl.[4] G10D *3/00*
U.S. Cl. 84—313 **9 Claims**



1. A tremolo device for a guitar comprising:
(1) base plate means including a flat plate pivotably mounted about a fulcrum on a guitar body, and a bar secured to said flat plate, said bar extending from said flat plate into said guitar body and said base plate means being adapted to receive and anchor strings of said guitar;
(2) spring means including at least one tension spring, said tension spring having one end engaged with said guitar body and another end engaged with said bar to thereby

urge said base plate means in a direction of rotation opposite to a rotating force applied to said base plate means in an another direction of rotation due to a tension of said guitar strings;

(3) a tremolo arm extending from and manually engageable with said base plate means to oscillate said base plate means to thereby vary a tension applied to said strings, whereby a tremolo effect is produced; and

(4) stabilizing means for stabilizing said base plate means at a desired position where an initial tuning of said guitar strings can be obtained, to thereby enable a return to the exact initial tuning of said guitar strings after said tremolo arm has been oscillated, said stabilizing means comprising a stabilizing plate provided on said bar, said stabilizing plate having a dead point on the periphery thereof, and abutting means provided on said guitar body and adapted to come into contact with said periphery of stabilizing plate, whereby when said abutting means is on said dead point, said abutting means stably supports said base plate means through the intermediary of said stabilizing plate.

4,903,569

DRUM LUG

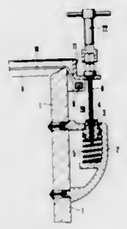
Makoto Kurosaki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed May 16, 1989, Ser. No. 352,261

Claims priority, application Japan, May 17, 1988, 63-63949[U]

Int. Cl.⁴ G10D *13/02*

U.S. Cl. 84—413 2 Claims



1. A drum lug comprising:

a lug case fixed to an outer surface of a drum body; and

a lug nut having a threaded hole which is formed in a center thereof and with which said lug bolt is threadably engaged, said lug nut being housed in said lug case with one end portion of said lug nut being exposed outside said lug case,

wherein a spot-faced hole communicating with said threaded hole is formed in a center of an outer end face of said lug nut in a predetermined depth, and a hole diameter of said spot-faced hole is set to be slightly larger than a major diameter of said threaded hole.

4,903,570

SUPPORT DEVICE FOR PERCUSSION INSTRUMENTS

Werner Sassmannshausen, and Werner Sassmanshausen, both of Bad Berleburg, Fed. Rep. of Germany, assignors to Johs. Link KG, Bad Berleburg, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 282,007

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 68803084[U]

Int. Cl.⁴ G10D *13/02*; **G10G** *5/00*

U.S. Cl. 84—421 6 Claims

1. A support device for a musical percussion instrument, such as a membranophone, the support device being attached to an instrument body of the instrument which acts as a resonator, the support device including a rigid support member fastened to the instrument body and a rigid holding member fastened to a support means for the instrument, a flexible connecting member being arranged between the rigid support member and the rigid holding member, the connecting member being of a non-metal materia with vibration damping and/or vibration absorbing properties, the instrument body having an inner side and an outer side, the instrument body defining openings, tie rods connected between the holding member and the support member extending through the opening, the holding member being exclusively mounted on the outer side of the instrument body, the support member being mounted on the inner side of the instrument body, the flexible connecting member being composed of a first part arranged between the support member and the inner side of the instrument body and of a second part arranged between the holding member and the outer side of the instrument body, one of the first and second parts having a portion engaging into one of the openings in the instrument body.



4,903,571

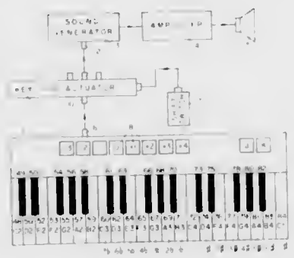
KEY SIGNATURE ACTUATOR FOR A MUSICAL KEYBOARD

Donald K. Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806

Continuation-in-part of Ser. No. 255,751, Oct. 11, 1988, which is a continuation-in-part of Ser. No. 15,718, Feb. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 921,407, Oct. 22, 1986, Pat. No. 4,750,399, which is a continuation-in-part of Ser. No. 736,701, May 22, 1985, Pat. No. 4,640,173. This application Dec. 8, 1988, Ser. No. 281,389

Int. Cl.⁴ G10G *7/00*

U.S. Cl. 84—442 9 Claims



1. An improved key signature actuator for a musical instrument having a group of at least six digitals and means for transmitting numbers to identify the digitals when they are pressed, each of the numbers being transmitted in binary code serially, the improvement comprising:

a first pair of electrical conductors,

receiving means for receiving six digital numbers in binary code serially on the first pair of electrical conductors,

a second pair of electrical conductors,

transmitting means for transmitting fifteen pitch numbers in binary code on the second pair of electrical conductors, the fifteen pitch numbers constituting a succession of integers having an increase of one between consecutive members of the succession,

a number changer connected electrically to the receiving means and the transmitting means, the number changer having a plurality of states in each of which six of the pitch numbers are associated with the six digital numbers, one pitch number to each digital number, the six pitch numbers constituting a series of integers having a sequence of positive differences between consecutive members of the series,

the plurality of states including a first state wherein the sequence of differences is 2-2-3-2-3,

the plurality of states including a second state wherein the sequence of differences is 2-3-2-3-2,

means for selecting from the plurality of states of the number changer a single state.

4,903,572
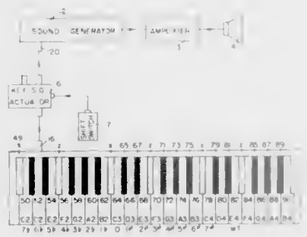
APPARATUS FOR MUSICAL SCALE SELECTION AND KEY SIGNATURE ACTUATION

Donald K. Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806

Continuation-in-part of Ser. No. 15,718, Feb. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 921,407, Oct. 22, 1986, Pat. No. 4,750,399, which is a continuation-in-part of Ser. No. 736,701, May 22, 1985, Pat. No. 4,640,173. This application Oct. 11, 1988, Ser. No. 255,751

Int. Cl.⁴ G10G *7/00*

U.S. Cl. 84—442 15 Claims



1. An improved musical scale selector for a musical instrument having a group of eight digitals, each of the digitals having associated with it an identifying digital number, when each of the digitals is pressed its associated digital number being transmitted in binary code serially, the improvement comprising:

a first pair of electrical conductors,

receiving means for receiving eight digital numbers in binary code serially on the first pair of electrical conductors,

a second pair of electrical conductors,

transmitting means for transmitting fifteen pitch numbers in binary code on the second pair of electrical conductors, the fifteen pitch numbers constituting a succession of integers having an increase of one between consecutive members of the succession,

a number changer connected electrically to the receiving means and the transmitting means, the number changer having a plurality of states in each of which eight of the pitch numbers are associated with the eight digital numbers, one pitch number to each digital number, the eight pitch numbers constituting a series of integers having a sequence of positive differences between consecutive members of the series,

the plurality of states including a first state wherein the sequence of differences is 2-2-2-2-2-2-2,

the plurality of states including a second state wherein the sequence of differences is 2-2-1-2-2-2-1,

means for selecting from the plurality of states of the number changer a single state.

4,903,573

EXPLOSION SUPPRESSION SYSTEM AND COMPOSITION FOR USE THEREIN

John W. Browne, Chester; Anthony Naylor, Northwich, and Henry Ratter, Upton, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 4, 1988, Ser. No. 164,775

Claims priority, application United Kingdom, Mar. 11, 1987, 8705803

Int. Cl.⁴ F42B *33/00*; **F42D** *5/00*; **A62C** *37/06*

U.S. Cl. 86—50 7 Claims

1. An explosion suppression system which comprises a detector for detecting a change in pressure operatively connected to a discharge apparatus which includes a vessel containing a composition, suitable for use as an explosion suppression composition, said composition comprising at least one particulate component selected from alkali metal bicarbonate, alkali metal sesquicarbonate, and alkali metal carbonate, and a free-flow additive, said composition being such that it does not render unfit for human consumption food material which it may come in contact with.

4,903,574

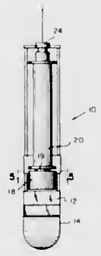
FIBER SPOOL APPARATUS

Richard T. Brown, Manassas, and Clint H. Ashton, Warrenton, both of Va., assignors to Atlantic Research Corporation, Alexandria, Va.

Filed Jun. 13, 1989, Ser. No. 365,363

Int. Cl.⁴ D04C *3/16*, *3/18*; **B65H** *59/02*

U.S. Cl. 87—57 12 Claims



1. A fiber spool apparatus for a braiding machine or the like comprising:

support means;

fiber supply spool means rotatably mounted on said support means;

housing means fixedly mounted on said support means and having a plurality of recessed portions on the inner surface thereof; and

coil spring means disposed within said housing means and having an inner end operatively associated with spool means and an outer end in engagement with the inner surface of said housing means;

whereby rotation of said spool means in a first direction to feed fiber to said braiding apparatus causes said coil spring means to be wound and tensioned by engagement of the outer end thereof in one of said recessed portions until said coil spring means reaches a predetermined tension, continued rotation of said spool means in said first direction

causes the outer end of said coil spring means to slip from one recessed portion to another after said coil spring means reaches said predetermined tension, and said tensioned coil spring causes said spool means to rotate in the opposite direction in the event of slack in said fiber extending from said spool means to said braiding apparatus to maintain tension in said fiber.

4,903,575

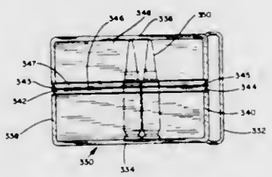
MACHINEGUN AMMUNITION CONTAINER

Ross Capawana, 3250 Pollux Ave., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 162,098, Feb. 29, 1988, which is a continuation-in-part of Ser. No. 929,339, Nov. 12, 1986, abandoned. This application May 4, 1988, Ser. No. 190,023

Int. Cl.[4] F41C *25/04*

U.S. Cl. 89—34 **13 Claims**



7. A machinegun ammunition container comprises a box having a bottom wall, first and second flat parallel side walls, and first and second opposed end walls, and mounting means for removably attaching the container to a machinegun, and

expansion means for permitting the side walls to move between an expanded position and a retracted position said expansion means comprising U-shaped pleat means extending along said opposed end walls of the container and a bottom wall thereof, said pleat means extending around an entire periphery of the container.

4,903,576

SOLENOID-CONTROLLED VALVE ARRANGEMENT

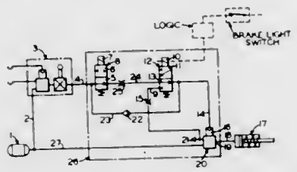
Siegfried Höfler, Hanover; Johannes Möller, Wennigsen; Erwin Petersen, Wunstorf, and Johann Rothen, Sarstedt, all of Fed. Rep. of Germany, assignors to Wabco Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 235,409

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1987, 3730779

Int. Cl.[4] F15B *13/043*

U.S. Cl. 91—459 **33 Claims**



1. A solenoid-controlled valve arrangement for use in a brake system equipped with a skid-protection system, said solenoid-controlled valve arrangement being connected behind a fluid pressure control means for controlling a pressure input to at least one brake actuator, said solenoid-controlled valve arrangement comprising:

(a) a relay valve having a control line and an operating exit port connected to a fluid pressure supply line of such at least one brake actuator;

(b) a solenoid-controlled shifting valve positioned in said control line, said solenoid-controlled shifting valve having an energizable magnet, said solenoid-controlled shifting valve blocking said control line and connecting a portion of said control line which is located downstream of said solenoid-controlled shifting valve with an overpressure-free pressure release area when said energizable magnet is energized;

(c) a solenoid-controlled shut-off valve positioned in said control line of said relay valve upstream of said solenoid-controlled shifting valve, said solenoid-controlled shut-off valve having an energizable magnet, said solenoid-controlled shut-off valve blocking said control line when said energizable magnet is energized; and

(d) a one-way by-pass line having a first end thereof connected ahead of said solenoid-controlled shut-off valve and a second end thereof connected behind said solenoid-controlled shifting valve for by-passing each of said solenoid-controlled shifting valve and said solenoid-controlled shut-off valve on a direction of a flow of said fluid pressure to said fluid pressure control means.

4,903,577

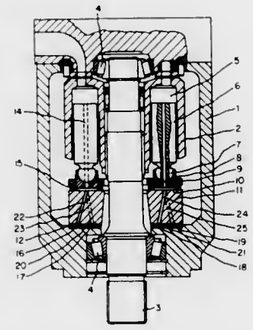
ADJUSTABLE AXIAL PISTON MACHINE WITH A SWASH PLATE DESIGN

Thomas Loffler, Waldaschaff, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 21, 1988, Ser. No. 222,522

Int. Cl.[4] F01B *13/04, 1/20*

U.S. Cl. 91—488 **4 Claims**



1. A swash plate design adjustable axial piston machine having a housing, a rotary drive shaft and a revolving cylindrical drum mounted on said drive shaft, said drum having a plurality of cylindrical bores equispaced from the axis of said drum and equiangularly spaced about the axis of said drum, a reciprocable piston having an elongated substantially axial passage therethrough located in each of said cylindrical bores and having an upper end and a lower end, said lower end of each of said pistons supported in a guide shoe, a bearing box located in said housing concentric with said drive shaft, a tiltable rocker supported in said bearing box within said housing, said rocker having a flat sliding surface forming a glide path for said guide shoes to slide along a circular path, said rocker having two bearing surfaces separated by said drive shaft, said machine including means for hydrostatic pressure release, said means including a pressure pocket in the form of a recess in each of said guide shoes, each of said pressure pockets connected through the passage in the companion piston with the interior of the companion cylindrical bore, passageways in said rocker and four individual unconnected slots lying on circular arcs around the axis of said rocker, said slots being arranged in two pairs and the two slots in each of said pairs being parallel to each other in one of said two bearing surfaces for periodic connection with said pressure pockets

in said guide shoes through said passageways in said rocker as a function of the instantaneous position of said guide shoes on said sliding surface.

4,903,578

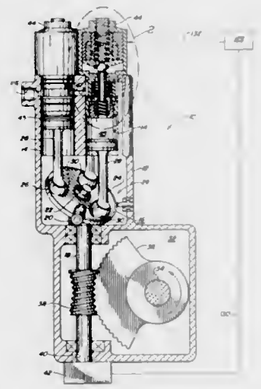
ELECTROPNEUMATIC ROTARY ACTUATOR HAVING PROPORTIONAL FLUID VALVING

Leslie S. Terp, Scottsdale, Ariz., assignor to Allied-Signal Inc., Phoenix, Ariz.

Filed Jul. 8, 1988, Ser. No. 216,753

Int. Cl.[4] F01B *3/00*

U.S. Cl. 91—499 **20 Claims**



1. Rotary actuator apparatus comprising:

a housing defining a plurality of elongate bores, and journaling a rotational shaft therein:

a like plurality of piston members sealingly and reciprocably received individually each in a respective one of said plurality of bores, and cooperating with said housing to define a like plurality of variable-volume chambers;

motion conversion means interconnecting said shaft and said plurality of piston members for producing sequential reciprocation of the latter, and rotation of said shaft in response to said reciprocation:

an output shaft pivotally carried by said housing;

rotary speed reduction means coupling said shaft with said output shaft for pivoting the latter at a reduced speed with a determined torque transmission efficiency in response to rotation of said shaft, and in the opposite direction (back driving) having a certain torque transmission efficiency less than said determined efficiency: and

a like plurality of closed-center three-way solenoid valve means each for communicating a source of pressure fluid with a respective one of said variable-volume chambers, and for alternatively venting said respective chamber to ambient.

4,903,579

PRESSURE-RELEASE VALVE AND CONDUIT FOR PREVENTING DAMAGE TO SEAL OF HYDRAULIC POWER DRIVE UNIT

Harry J. Hamilton, 12 Waltersland Road, Stillorgan, County Dublin, Ireland

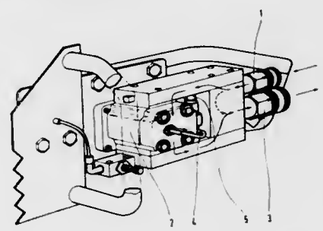
Filed Aug. 24, 1988, Ser. No. 235,959

Int. Cl.[4] F01M *1/10, 1/16, 1/20*

U.S. Cl. 92—86 **4 Claims**

4. In a hydraulic power drive unit comprising a housing, a hydraulic fluid feed pipe leading to the housing, a hydraulic fluid return pipe leading from the housing, a hydraulic motor contained in the housing, a drive shaft one end of which is connected to the hydraulic motor and the other end of which projects from the housing, a hydraulic fluid seal between the drive shaft and the housing to prevent loss of hydraulic fluid from the housing, the hydraulic fluid seal being lubricated by the hydraulic fluid at the lower or return pressure which prevails in the housing, and a bleed pipe for conducting the lubricating hydraulic fluid from the region of the seal to the hydraulic fluid return pipe; the improvement wherein:

the bleed pipe comprises pressure release means for releasing pressure at a pressure level less than the pressure threshold of the hydraulic fluid seal;



the pressure release means comprises a pressure release valve;

the pressure release means comprises bleed pipe walls designed to fail at a pressure level less than the pressure threshold of the hydraulic fluid seal; and

the bleed pipe walls are designed to fail at a pressure level greater than the pressure level at which the pressure release valve operates, whereby in the event of a malfunction of the pressure release valve, the bleed pipe would fail and thus protect the hydraulic fluid seal.

4,903,580

PISTON FOR ALTERNATIVE ENDOTHERMIC ENGINES CREATING OIL CUSHION LUBRICATION

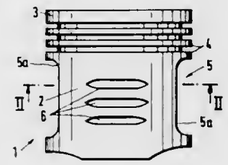
Ludovico Bruni, Turin, Italy, assignor to Borgo-Nova SpA, Turin, Italy

Continuation of Ser. No. 848,963, Apr. 7, 1986, abandoned. This application Jul. 13, 1988, Ser. No. 218,616

Claims priority, application Italy, Apr. 12, 1985, 67346 A/85

Int. Cl.[4] F02F *3/00*

U.S. Cl. 92—158 **5 Claims**



1. An improved piston for alternative, endothermic four-cycle engines, comprising a piston head portion and a piston skirt portion located below said head portion, said piston skirt portion having opposite flattened faces aligned with a piston pin axis, said piston skirt comprising oil cushion lubrication pocket means for holding oil under pressure and comprising a series of elongated closed-end grooves on both side of the piston skirt parallel to the piston pin axis and spaced 90° from said flattened portions and at approximately the height of the piston pin axis, said grooves on each side of said skirt being spaced one above another and parallel to one another and extending approximately 40° centered about a line perpendicu-

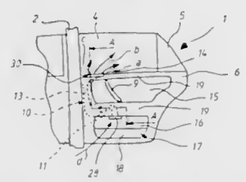
VOL 1111 ISS 4 FE 27 1990 UMI

lar to the piston pin axis, each groove having a profile at its base less than the curvature of the piston skirt.

4,903,581
ARRANGEMENT FOR PREVENTING MIST AND ICE FORMATION ON THE SIDE WINDOW OF A MOTOR VEHICLE

Steo Nilsson, Vänersborg, Sweden, assignor to Saab-Scania Aktiebolag, Sweden

PCT No. PCT/SE87/00422, § 371 Date May 17, 1988, § 102(e) Date May 17, 1988, PCT Pub. No. WO88/02318, PCT Pub. Date Apr. 7, 1988
PCT Filed Sep. 21, 1987, Ser. No. 201,123
Claims priority, application Sweden, Oct. 1, 1986, 8604163
Int. Cl.[4] B60S *1/54*
U.S. Cl. 98—2.04 **17 Claims**



1. Arrangement for preventing mist or ice formation on a side window of a motor vehicle, the window having a bottom part, the motor vehicle having a body part beneath the bottom part of the window;

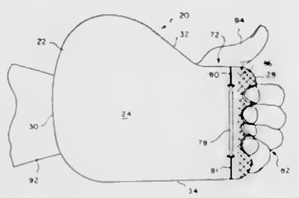
an air supply duct disposed in the body part, the air supply duct having an outlet located at the bottom part of the window, an air blowing fan arranged in the body part below the window, the fan communicating into the air supply duct for feeding air therethrough, and the air supply duct outlet being aimed for blowing air therethrough onto the window above the air supply duct outlet;

the vehicle body part having an inside wall panel toward the interior of the vehicle; an inlet duct having an inlet thereto defined in the inside wall panel toward the vehicle interior and the inlet duct communicating with the fan for supplying air to the fan.

4,903,582
PASSENGER COOLING DEVICE

Tallam I. Nguti, 619 Elmwood Ter., Rochester, N.Y. 14620

Filed Aug. 22, 1988, Ser. No. 234,578
Int. Cl.[4] B60H *1/30*
U.S. Cl. 98—2.12 **8 Claims**

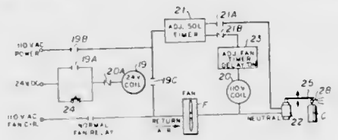


8. An air deflector device for deflecting air into the passenger compartment of a moving vehicle such as a car, a train, a bus or the like, the device including a deflector plate operably movable within an open window of such compartment, and means, fitting around the palm of a hand of the user, for attaching said deflector plate to the palm of such hand, such that said plate can be located and moved with such hand within the open window for deflecting the air into such compartment.

4,903,583
AEROSOL AIR AND DUCT TREATMENT APPARATUS FOR AIR CONDITIONING AND HEATING SYSTEMS

Reuben L. Frazier, 9103 Weymouth, Houston, Tex. 77031

Filed Jun. 16, 1989, Ser. No. 367,717
Int. Cl.[4] F24F *7/00*
U.S. Cl. 98—30 **21 Claims**



1. A central air conditioning and heating system having at least one duct conducting conditioned air to areas to be heated or cooled, a return air duct, a return air filter, a fan for circulating air therethrough and electric circuitry energizing and controlling said system, including

aerosol air and duct treatment apparatus for treating the ducts of said central air conditioning and heating system and the air flowing therethrough comprising;

aerosol dispensing means including a housing supported on the exterior of said duct and in communication with the interior of said duct downstream of said return air filter and fan for discharging air treatment chemicals into the air flowing through said return air duct,

electrical control means including adjustable timer means operatively connected to said air conditioning and heating electrical circuitry and to said aerosol dispensing means, and

said electrical control and adjustable timer means including means manually operable to control the operation of said aerosol dispensing means for a selective period of time and to maintain said fan in the on condition for a selective period of time following the operation of said aerosol dispensing means sufficient to distribute the air treatment chemicals throughout the ducts and into the rooms served thereby.

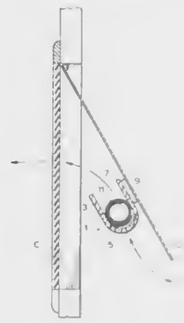
4,903,584
DEODORIZING AIR VENT ATTACHMENT

Toni C. H. Styles, 1 Kipling Place, Barrie, Ontario, Canada (L4N 4W9)

Filed Nov. 21, 1988, Ser. No. 273,488
Int. Cl.[4] A61L *9/00*
U.S. Cl. 98—101 **1 Claim**

1. An in-building air vent set up comprising a vent opening, a damper plate at and movable to different angles for opening and closing said vent opening, and a deodorizer receiving device secured to and movable with said damper plate, said deodorizer device comprising a trough with an open side for receiving said deodorizer with said trough being ventilated for air dispersal of deodorant from the deodorizer, said deodorizer

comprising a deodorant sheet rolled upon itself and fitted within said trough, said sheet having a memory urging said

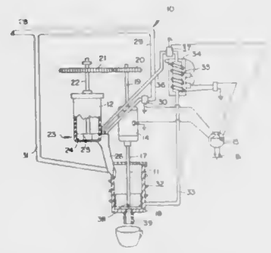


sheet to unroll whereby said sheet is frictionally engaged in said trough.

4,903,585
APPARATUS FOR DISPENSING COFFEE HAVING A FOAMED SURFACE

James E. Wimmers, Marysville, and Thomas B. Winters, Raymond, both of Ohio, assignors to Nestec, S.A., Vevey, Switzerland

Division of Ser. No. 140,365, Jan. 8, 1988, Pat. No. 4,830,869. This application Feb. 21, 1989, Ser. No. 312,787
Int. Cl.[4] A47J *31/00*
U.S. Cl. 99—275 **10 Claims**



1. An apparatus for producing and dispensing a reconstituted coffee beverage having a foamed surface which comprises

a mixing chamber having sidewalls and a bottom wall,

agitator means mounted for rotation in the mixing chamber,

cooling means for dissipating heat from the sidewalls of the mixing chamber,

means for introducing a predetermined amount of cold liquid coffee concentrate into the mixing chamber,

motor means for driving the agitator means at a speed such that the liquid coffee concentrate in the mixing chamber is displaced against the sidewalls of the mixing chamber and air is entrained in the liquid concentrate to foam the concentrate,

valve means associated with said chamber for introducing a predetermined amount of hot water into the mixing chamber, and

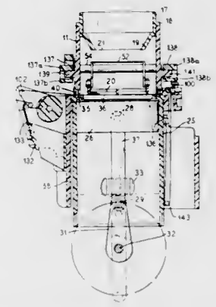
timing means for controlling the sequence of activation of said motor means, the means for introducing liquid coffee concentrate and said valve means,

the bottom wall of said mixing chamber having a discharge opening therethrough for discharging reconstituted coffee beverage from the mixing chamber.

4,903,586
COFFEE BREWER

Alan M. King, 465 Cote St. Antoine Rd., Westmount, Quebec, Canada (H3Y 2K1)

Continuation-in-part of Ser. No. 90,160, Aug. 27, 1987, Pat. No. 4,632,023. This application Aug. 26, 1988, Ser. No. 236,797
Int. Cl.[4] A47J *31/32*
U.S. Cl. 99—287 **4 Claims**



1. A beverage brewing machine comprising in combination,

(a) an upper brewing chamber adapted to receive hot water and a beverage material and having an open lower end,

(b) a lower chamber with an open upper end normally in registration and sealed with said open lower end,

(c) a filter mounted between said upper and lower chambers and said chambers normally clamping said filter therebetween,

(d) a reciprocable piston mounted in said lower chamber for forcing air through said filter into said upper chamber and for withdrawing brewed beverage through said filter,

(e) means for separating and sealing said upper and lower chambers so as to unclamp said filter,

(f) hold-down means mounted within the upper brewing chamber movable between a first position wherein the hold-down means presses down on the filter at least when the piston forces air upwardly through said filter and a second position wherein the hold-down means is released from the filter, and

wherein said piston is driven by a connecting rod which has one end pivotally connected thereto, a crank arm pivotally connected to the second end of said connecting rod, a driving shaft connected to said crank arm, and a driving means connected to said driving shaft and a loose connection between said piston and said driving shaft such that said reciprocable piston stays longer at the top and bottom of its stroke than it would it would if there were no loose connection between said piston and said driving shaft.

4,903,587
AUTOMATIC BAKING APPARATUS

Tosio Nagasaka, Kasukabe, and Kyoichi Saito, Saitama, both of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Kashiwa, Japan

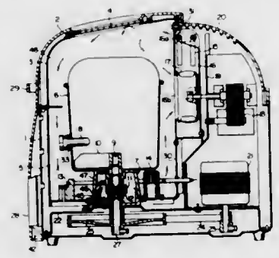
Filed Apr. 1, 1988, Ser. No. 176,415
Claims priority, application Japan, Apr. 2, 1987, 62-82016; Apr. 2, 1987, 62-82017
Int. Cl.[4] A47J *37/01*
U.S. Cl. 99—325 **15 Claims**

1. An automatic baking apparatus having an exterior wall surrounding a heating chamber comprising:

a kneading case doubling as a baking die removably mounted in said heating chamber;

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an air inlet and an air outlet formed in a side wall of the heating chamber;
a fan casing connected with the inlet and the outlet which is disposed along a side wall on the outside of said chamber;
a fan mounted in said fan casing for causing air to flow from said chamber outlet to said chamber inlet;
a heating element in the fan casing between the fan and the air inlet to said heating chamber;
a first motor for driving the fan;
a dough temperature sensor arranged to detect the temperature of a lower portion of the kneading case;
a room temperature sensor mounted in said exterior wall for detecting room temperature independently of the dough



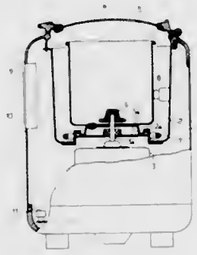
temperature at all times during operation of said baking apparatus;
a lower heating element arranged below the kneading case;
a blade driven within the kneading case;
a second motor for driving the blade; and
a microcomputer including means for controlling the time of operation of said motors and said heaters in accordance with the temperature detected by the dough temperature sensor and by the room temperature sensor to thereby vary the duration of kneading, fermentation, baking and cooling steps, said microcomputer being effective to complete the baking process with uniform product quality within a constant length of time.

4,903,588

BREAD BAKING APPARATUS

Nobuhide Horiuchi, Iwakura; Motoya Sakakibara, Aichi, and Kazuo Kitamura, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 26, 1989, Ser. No. 357,252
Claims priority, application Japan, Sep. 5, 1988, 63-221896; Oct. 19, 1988, 63-261313
Int. Cl.[4] A47J *27/00*
U.S. Cl. 99—348 **14 Claims**



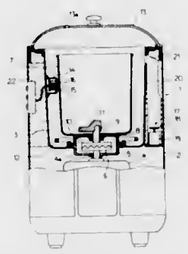
1. A bread baking apparatus comprising:
(a) a container for containing dough stuffs;
(b) an impeller for agitating and kneading the dough stuffs contained in the container;
(c) an electric motor for rotating the impeller;
(d) an electric heater for heating the dough stuffs contained in the container;
(e) alarming means for alarming to inform an operator of the time when a gas removing operation is to be manually executed so that gas contained in dough is removed; and
(f) operation control circuit means selecting either an automatic baking course or a manual gas removal course to be executed when operated by the operator, said operation control circuit means controlling the motor and heater when the automatic baking course is selected, so that kneading, fermenting and baking steps for the dough stuffs contained in the container are sequentially executed and so that the impeller is rotated for a predetermined short period in the fermenting step of the automatic baking course for execution of the gas removing operation, said operation control circuit means further controlling the motor and heater when the manual gas removal course is selected, so that the kneading and fermenting steps are sequentially executed and so that the alarming operation is performed by the alarming means when the gas removing operation is to be performed in the fermenting step, thereby interrupting the fermenting step.

4,903,589

BREAD BAKING APPARATUS

Michishige Aoyama, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 9, 1988, Ser. No. 269,126
Claims priority, application Japan, Nov. 27, 1987, 62-300692
Int. Cl.[4] A47J *27/00*
U.S. Cl. 99—348 **8 Claims**



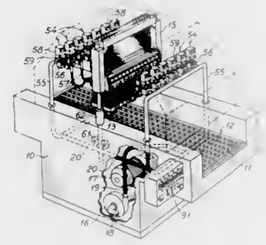
1. A bread baking apparatus comprising:
(a) a container for containing dough and yeast;
(b) a heating element for heating said container so that the dough contained therein is baked;
(c) fan means for directing a current of air to said container so that an upper surface of the dough contained in said container is dried; and
(d) control means for controlling said fan means so that the driving of said fan means is started when the temperature of the dough reaches a predetermined temperature during a temperature increasing stage of the dough after the starting of baking, said predetermined temperature ranging from 65° C. to 75° C.

4,903,590

APPARATUS FOR INJECTING LIQUID INTO PIECES OF FOOD

Frank Müller, Copenhagen, and John Nielsen, Store Heddinge, both of Denmark, assignors to Fomaco Food Machinery Company A/S, Copenhagen and Stevns Maskinfabrik ApS, Heddinge, both of, Denmark

Filed Jul. 1, 1988, Ser. No. 214,678
Claims priority, application Denmark, Jul. 3, 1987, 3437/87
Int. Cl.[4] A22C *17/00*; A23L *1/31*
U.S. Cl. 99—487 **13 Claims**



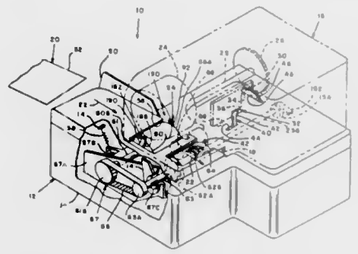
1. An apparatus for injecting liquid into pieces of food and comprising an arrangement of hollow needles divided into groups, means for moving said pieces of food and said arrangement of needles in relation to each other along a path of movement, means for moving said hollow needles into and out of penetrating engagement with said pieces of food, supply means for supplying pressurized liquid to said needles while they are in engagement with said pieces of food, said supply means comprising a common pressurized liquid source for supplying pressurized liquid to said groups of needles, and control means for controlling the amount of liquid supplied to each group of needles, said control means including pressure reducing means for independently reducing the pressure at which the liquid is supplied to each of said needle groups, whereby different amounts of liquid may be injected into various zones of each piece of food so as to obtain a substantially uniform final liquid distribution in each piece of food.

4,903,591

MAILING MACHINE INCLUDING IMPROVED TRIP MEANS

John R. Nobile, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 8, 1989, Ser. No. 307,560
Int. Cl.[4] B41L *47/46*
U.S. Cl. 101—91 **10 Claims**



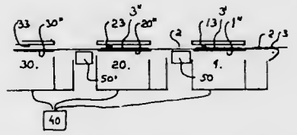
1. In a mailing machine including a postage meter, wherein the postage meter includes rotary printing means for printing indicia on a sheet fed to the machine, wherein the machine includes means for driving the printing means, wherein the machine includes means for feeding a sheet fed thereto downstream in a path of travel through the machine, the sheet feeding means includes an impression roller rotatably mounted beneath the rotary printing means, and wherein the impression roller has an inner end and an outer end, an improvement comprising:
a. trip means including an elongate trip lever and a shaft on which the lever is pivotally mounted, the trip lever extending into the path of travel;
b. the driving means including a trip switch actuatable for starting operation of the driving means;
c. the trip means including a spring connected to the trip lever for normally holding the trip lever in actuating engagement with the trip switch to actuate the trip switch for maintaining the driving means ready for starting operation thereof, the trip lever pivoting about the shaft against the force of the spring when a sheet fed to the machine moves the trip lever, and the trip lever actuating the trip switch for starting operation of the driving means for rotating the printing means when a sheet moves the trip lever; and
d. the trip lever normally extending above the path of travel to permit the printing means to rotate into engagement with the trip lever and pivot the trip lever against the force of the spring for lowering trip lever into the path of travel before engaging a sheet fed to the machine.

4,903,592

SILKSCREEN PRINTING SYSTEM FOR MULTICOLOR PRINTING IN A PREDETERMINED ORDER OF COLORS

Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silkscreen Maskiner AB, Sweden

Filed Apr. 4, 1988, Ser. No. 177,382
Claims priority, application Sweden, Apr. 2, 1987, 8701392
Int. Cl.[4] B41L *13/02*
U.S. Cl. 101—115 **2 Claims**



1. A silkscreen printer arrangement for applying a multiple of color patterns in a given order onto print material such as to obtain a multicolored printed pattern thereon, the printer arrangement includes a multiple of printing tables which are positioned in the path travelled by the print material through the printer arrangement and each of which tables cooperates with a respective stencil to transfer to said print material one single color pattern of said multicolor print, and further includes a material transporting means to advance print material firstly to a first printing table, where said first color print is applied to said material by the stencil located above said first table, and then to a second printing table, where a second color print forming part of said multicolor print is applied to the material by the stencil located above said second table, wherein said material transporting means extends along all of the printing tables in said printer arrangement; said material transporting means is constructed from a material which is not electrically conductive and has a nonelectrically conductive conveying surface perforated with holes through which a region of low pressure and high pressure can act on the print material located on said surface, said high pressure acting through the conveying surface to reduce friction between the print material and the conveying surface so as to facilitate

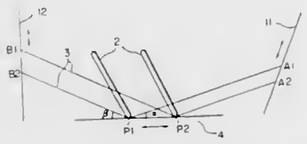
linear displacement of the print material, said low pressure acting through the conveying surface to increase friction between the print material and the conveying surface so as to securely position the print material when said color is applied to the print material; a drying arrangement which operates with electromagnetic waves at a radio frequency of from 10–100 MHz is located in an area provided between mutually adjacent printing tables; and including means for evaluating position of the print material on the printing tables; and means for adjusting said respective stencil, in response to sensed discrepancies in the stencil location, to a position in which the stencil pattern will be transferred to the print material at a predetermined part.

4,903,593

APPARATUS FOR SCREEN LENGTH AND SNAP-OFF ANGLE CONTROL

Oozeki Masanao, 47-301 Sakuradai 3-chome, Nerima-ku, Tokyo, Japan (176)

Division of Ser. No. 76,300, Jul. 22, 1987, Pat. No. 4,858,527.
This application Mar. 9, 1989, Ser. No. 320,968
Int. Cl.[4] B41F *15/42*
U.S. Cl. 101—123 **6 Claims**



1. An improved screen printing machine comprising:
a screen held over a surface to be printed, said screen having first and second movable ends,
a squeegee having an inking edge at a lower end thereof and in contact with said screen for transferring ink to said screen, and
drive means for moving said first and second ends of said screen in unison with said squeegee on said screen along loci so that:
(a) the length of said screen is maintained substantially constant throughout said movement, and
(b) a snap-off angle formed between the screen and the surface, on one side of the squeegee at a position opposite to the inking edge of the squeegee, is maintained substantially constant throughout the entire movement of said squeegee for ink transfer, and
(c) an opposite angle formed between the screen and the surface, on an opposite side of the squeegee, is maintained substantially constant throughout the entire movement of said squeegee.

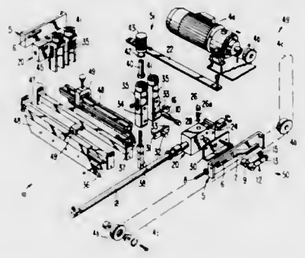
4,903,594

DRIVE ARRANGEMENT FOR KNIVES IN SILK-SCREEN PRINTING MACHINES

Pellegrina Ercole, Rozzano, Italy, assignor to C.M.S. S.r.l., Zibido San Giacomo, Italy

Filed Mar. 7, 1988, Ser. No. 165,088
Claims priority, application Italy, May 27, 1987, 21691/87[U]
Int. Cl.[4] B41F *15/42*
U.S. Cl. 101—123 **6 Claims**

1. Drive arrangement for knives employed to spread and thrust ink through printing matrices on silk-screen printing machines, comprising:
first drive members adapted to control reciprocating movements of said knives relative to a matrix, including
at least one plate element moving with reciprocating movements parallel to said matrix;
a through slot formed in said plate element and substantially parallel to said matrix; and
a pin passed slidingly and rotatably through said through slot and engaging said knives; and
second drive members adapted to control up and down movements of said knives relative to said matrix, including
a blind cutout formed in said plate element and defining a guide extending in a transverse plane to said pin; and
a small lever adjacent to said plate element and having a first end attached transversely to said pin, and a second drive end engaged slidingly with said blind cutout;



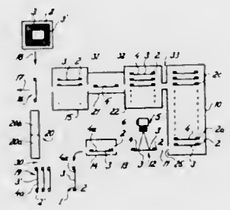
said blind cutout defining said guide having a first stretch extending along an inclined direction to said through slot and a second stretch extending parallel to said through slot; and
said first stretch being in succession to said through slot and said guide forming with said through slot a substantially single continuous groove in said plate element for controlling both reciprocating and up and down movements of said knives relative to said matrix.

4,903,595

ARRANGEMENT FOR PRODUCING A PLURALITY OF PRINTING FORMS AUTOMATICALLY AND IN SEQUENCE

Sylve J. D. Ericsson, Tolléns väg 8, 147 00 Tumba, Sweden

Filed Aug. 22, 1988, Ser. No. 234,958
Claims priority, application Sweden, Aug. 27, 1987, 8703314
Int. Cl.[4] B41C *1/14*
U.S. Cl. 101—128.4 **7 Claims**



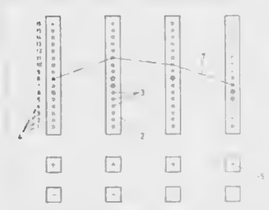
1. A method of producing printing forms in sequence comprising the steps of:
arranging in a magazine a plurality of printing frames, each including a stretched cloth and a light-sensitive coating, said printing frames being arranged in parallel relationship and parallel to an outlet slit of said magazine,
advancing said parallel printing frames within said magazine toward said outlet slit in a first direction,
sequentially passing said printing frames through said outlet slit in a second direction substantially perpendicular to said first direction, said printing frames passing through said slit while remaining parallel to printing frames disposed in said magazine,
terminating movement of each printing frame traveling in said second direction when such printing frame occupies a position in front of an imaging means,
actuating said imaging means to expose the light-sensitive coating to an image corresponding to a desired printing pattern,
initiating movement of said printing frame with the exposed light-sensitive coating to move said last-named printing frame out of said exposing station and into a developing station, and
developing the printing pattern at said developing station.

4,903,596

SYSTEM FOR INDICATING SETTINGS OF INK FEED FOR PRINTING

Willi Jeschke, Heidelberg, and Hugo Rambausek, Wiesloch, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberger, Fed. Rep. of Germany

Continuation of Ser. No. 834,652, Feb. 27, 1986, abandoned, which is a continuation of Ser. No. 612,304, May 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 478,290, Mar. 24, 1983, abandoned, which is a continuation of Ser. No. 211,580, Dec. 1, 1980, abandoned, which is a continuation of Ser. No. 55,914, Jul. 9, 1979, abandoned. This application Sep. 14, 1987, Ser. No. 96,595
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830085
Int. Cl.[4] B41F *7/24, 31/04*
U.S. Cl. 101—148 **18 Claims**



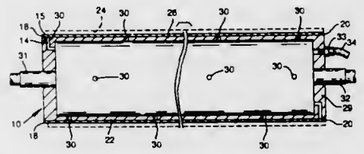
1. Display system for indicating, at a central remote-control location, settings of ink feed for a printing press having a plurality of M ink zones, each ink zone having an adjustable ink zone control member coupled to an ink zone sensor for producing a sensor signal representing a setting value for said settings; the display system comprising a plurality of light indicators arranged as a matrix consisting of a plurality of N rows and a plurality of M columns, each column consisting of N consecutively numbered light indicators ranging from numbers 1 to N, wherein N and M represent positive integer numbers, each of said indicators disposed at a respective crosspoint between a row and a column; said plurality of columns corresponding to and being equal to the plurality of ink zones and the plurality of rows corresponding to and being equal to the plurality of settings; means for producing a coarse setting value signal and a fine setting value signal from said sensor signal for each respective ink zone, means for lighting one light indicator in each column to indicate by its number a respective one of N coarse setting values, and means for simultaneously contrastingly lighting in the same column another light indicator to indicate by its number a respective one of N fine setting values of said control member.

4,903,597

PRINTING SLEEVES AND METHODS FOR MOUNTING AND DISMOUNTING

Carlton A. Hoage, Vancouver, Wash., and Mark A. Borski, Gresham, Oreg., assignors to LaValley Industries, Inc., Vancouver, Wash.

Filed Oct. 24, 1988, Ser. No. 261,501
Int. Cl.[4] B41C *1/00*
U.S. Cl. 101—401.1 **36 Claims**



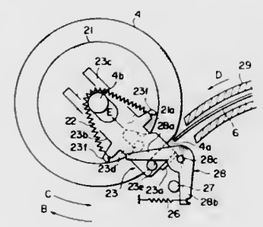
1. A method for axially mounting a cylindrically-shaped printing sleeve onto a complementary cylindrically-shaped printing cylinder and for dismounting said printing sleeve from said printing cylinder, which comprises:
providing said printing sleeve, which is fabricated of a high strength, polymeric laminate material having excellent structural integrity and which is substantially airtight, having a substantially constant cross-sectional configuration, which includes substantially seamless inner and outer cylindrically-shaped wall surfaces, each of said inner and outer wall surfaces having a constant cross-sectional diameter;
expanding said printing sleeve to a diameter slightly greater than the diameter of the printing cylinder;
axially moving said expanded printing sleeve to a position onto said printing cylinder; and
contracting said expanded printing sleeve and mounting said printing sleeve onto said printing cylinder to form a minimum interference fit between said printing cylinder and said printing sleeve, respectively.

4,903,598

PRINTING PAPER SUPPORTING DEVICE OF A PRINTER

Yousuke Kobayashi, and Toshiaki Tohi, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,083
Claims priority, application Japan, May 2, 1988, 63-107604
Int. Cl.[4] B41F *21/04*
U.S. Cl. 101—409 **5 Claims**



1. A paper supporting device of a printer, comprising:
a substantially cylindrical platen supported by a frame of the printer to be rotated around a central axis thereof in a forward and a reverse direction, said platen having a recess formed on a peripheral surface to extend in the axial direction thereof;
a clamp member mounted to said platen to be slidable in a

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radial direction of the platen, said clamp member having pressor portion extending in the axial direction of the platen to oppose a surface of said recess on the platen, and a projection extending from an axial end portion of the clamp member in the axial direction of the platen directed away from the platen, wherein said clamp member is constrained with regard to a movement in a circumferential direction with respect to the platen so that the clamp member is rotated together with the platen when the platen is rotated;

first urging means for urging said clamp member in a radial direction toward the axis of said platen;

a lever pivotably mounted to the frame of the printer at an axial position substantially in alignment with an axial position of said projection formed on an end portion of said clamp member, said lever having an arm which comes into contact with said projection on the clamp member when said clamp member is rotated with the platen;

stopper means for limiting a turning movement of said lever in a first pivoting direction at a predetermined angle at which said arm of the lever is slanted with respect to a circumferential direction of the platen such that an end of said arm is nearer to the axis of the platen than a pivoting portion thereof; and

second urging means for urging said lever in said first direction toward said predetermined angle at which the lever is stopped by said stopper means;

said arm of the lever at said predetermined angle contacting said projection on the clamp member rotated in the forward direction of rotation with the platen to turn the lever in a second direction opposite to said first direction against the urging action of said second urging means by a rotational motion of said projection on the clamp member rotated with the platen, thereby allowing the platen to continue its forward rotation with the pressor portion of said clamp member pressed on the opposing surface of the recess on the platen, while, when said arm of the lever at said predetermined angle comes into contact with said projection on the clamp member rotated in the reverse direction of rotation with the platen, the projection on the clamp member being forced to slide along said arm of the lever stopped at said predetermined position by said stopper means so that the clamp member is slid with respect to the platen in the radial direction away from the axis of the platen against the urging action of said first urging means, thereby forming a gap between said pressor portion of the clamp member and the opposing surface of said recess on the platen.

4,903,599

PRINTED PRODUCTS AND A PROCESS FOR THEIR MANUFACTURE

Rolf Kübler, Stuttgart, and Volker Schabacker, Ludwigsburg, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern Akg., Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 878,530, Jun. 23, 1986, abandoned, which is a continuation of Ser. No. 637,766, Aug. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 413,143, Aug. 30, 1982, abandoned. This application Aug. 17, 1988, Ser. No. 233,940

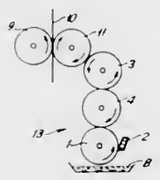
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140360; Jun. 23, 1982, 3223353

Int. Cl.[4] B41F *7/20*

U.S. Cl. 101—450.1 **25 Claims**

2. In a planographic printing process comprising transferring printing inks by means of lithographic printing plates to a printing stock, without employing a dampening liquid, the improvement comprising

said printing inks having a dynamic viscosity of 10 to 250 Pa·s and predominantly containing a solvent consisting essentially of water, a water dispersing agent, or mixtures thereof, and said printing plate having information-bearing areas which are hydrophilic and non-printing areas which are hydrophobic.



4,903,600

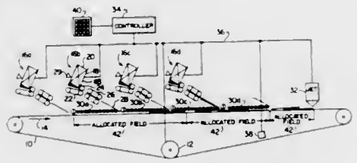
PRODUCT COLLATOR IMBRICATOR AND PRINTER

John A. Long, 41 Lamont Ave., Scarborough, Ontario, Canada (M1S 1A8)

Filed Apr. 24, 1989, Ser. No. 342,322

Int. Cl.[4] B41F *1/34*

U.S. Cl. 101—485 **8 Claims**



1. A method for high throughput printing of sets of products comprising the steps of:

(a) dispensing desired sets of products so that each set forms an imbricated array wherein each product of the set, except the last product dispensed in the set, is partially overlapped by the next adjacent product so that each product has an exposed portion;

(b) conveying said desired imbricated sets of products to a printing station;

(c) printing on the exposed portion of at least some of the products in the desired imbricated sets of products.

4,903,601

PROCESS FOR PRINTING CHARACTERS OR THE LIKE ON A THERMOPLASTIC RESIN MOLDING

Kiichiro Fukui, Fuji, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan

Filed Nov. 3, 1988, Ser. No. 266,830

Claims priority, application Japan, Nov. 16, 1987, 62-288664

Int. Cl.[4] B41F *17/00*

U.S. Cl. 101—488 **4 Claims**

1. A method of making a thermoplastic resin article having printed indicia fixed on at least one surface thereof, comprising the steps of:

(a) applying liquid printing media in the form of preselected indicia upon at least one surface of a molded article which consists essentially of a crystalline thermoplastic resin selected from the group consisting of polyester resin, polyacetal resins, polyphenylene sulfide resins and polyamide resins; and then

(b) fixing said applied liquid printing media in the form of said indicia by (i) directing, towards said at least one surface having said applied liquid printing media thereon, a flow of gas at a pressure of between 0.05 to 5 kg/cm^2 and at a temperature between 100° to 300° C. which is greater than a softening temperature of said resin, and (ii) maintaining said directed flow of gas in contact with said at least one surface for a time between 1 to 120 seconds sufficient to dry said applied liquid printing media and to fix the same onto said at least one surface, yet insufficient to cause distortion and/or discoloration of said molded thermoplastic resin article, whereby said thermoplastic resin article having printed indicia thereupon is obtained.

4,903,602

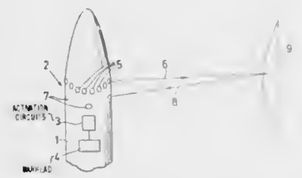
PROXIMITY FUSE

Lars-Erik Skagerlund, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Jun. 10, 1988, Ser. No. 205,247

Int. Cl.[4] F42C *13/02, 13/04*

U.S. Cl. 102—213 **53 Claims**



1. A proximity fuse for a unit in the form of a missile, projectile or the like and comprising transmitter means for emitting electromagnetic radiation in a plurality of part lobes, receiver means for receiving the radiation which is reflected from a proximally adjacent target, and signal processing means for processing an electric signal initiated by the received radiation, wherein said transmitter and receiver means are operative to work with a plurality of narrow part lobes distributed in dense configuration about the circumference of the unit, each of said narrow part lobes respectively impinging in their entirety upon the target; and wherein said receiver means are operative to discern the reflected and received radiation of each respective part of lobe for individual processing in said signal processing means.

4,903,603

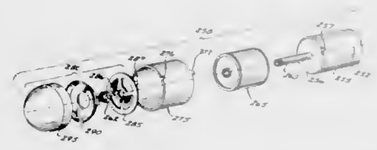
STACKED CIRCUIT CARDS AND GUIDED VEHICLE CONFIGURATIONS

Ernest P. Longerich, Chatsworth, and Saverio A. D'Agostino, Camarillo, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 843,965, Mar. 25, 1986. This application Feb. 2, 1987, Ser. No. 9,988

Int. Cl.[4] F42B *13/00*

U.S. Cl. 102—393 **5 Claims**



1. A guided vehicle configuration, comprising:

a substantially cylindrical aft vehicle section;

a tubular center structural member secured to the aft vehicle section and extending forwardly therefrom;

a tubular vehicle outer structural member;

a vehicle electronics unit arranged to fit within said outer structural member and having a central opening formed therein, the electronics unit being adapted to be assembled with the inner tubular structural member extending through said central opening;

a forward sensor section comprising a sensor platform having a central opening defined therein, the platform adapted to receive the inner tubular support member through the central opening therein; and

fastening means coupled to the forward end of the tubular center member for securing the sensor section and the electronics unit to the aft vehicle body by exerting a compression force thereon.

4,903,604

IGNITION TRANSFER MEDIUM

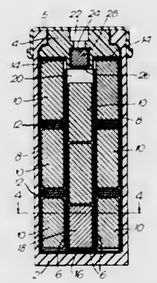
Francis M. Blewett; Gary E. J. Pike, both of Salisbury, and Anne F. Sykes, Hertford, all of England, assignors to The Secretary of State for Defence in Her Majesty's Government of Great Britain and Northern Ireland, London, United Kingdom

Filed Feb. 16, 1989, Ser. No. 311,308

Claims priority, application United Kingdom, Jun. 17, 1986, 8614674

Int. Cl.[4] B41F *31/02;* **C06B** *45/30*

U.S. Cl. 102—364 **12 Claims**



1. An ignition transfer medium comprising a fibrous activated carbon support on which an inorganic oxidant has been deposited, the fibrous activated carbon support having an activity, as measured by its specific heat of wetting with silicone, of between 20 and 120 Joules per gram.

12. A pyrotechnic device comprising a hollow body, a pyrotechnic charge contained within the hollow body, ignition means for igniting the pyrotechnic charge, and an ignition transfer medium disposed between the ignition means and the pyrotechnic charge, wherein the improvement comprises the ignition transfer medium being a fibrous activated carbon support on which an inorganic oxidant has been deposited, the fibrous activated carbon support having an activity, as measured by its specific heat of wetting with silicone, of between 20 and 120 Joules per gram.

4,903,605

AIR MISSILE PROVIDED WITH AT LEAST ONE RELEASABLE POWER UNIT

Jean M. Dupuis, Verrieres Le Buisson, France, assignor to Aerospatiale Soclete Nationale Industrielle, Paris, France

Filed Mar. 14, 1989, Ser. No. 322,902

Claims priority, application France, Mar. 30, 1988, 88 04213

Int. Cl.[4] F42B *15/00*

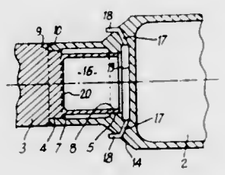
U.S. Cl. 102—377 **8 Claims**

1. Air missile, comprising:

a temporary releasable power unit (2);

a sliding friction fit connecting the front part of said power unit (2) to the aft part of the rest (3) of said missile, said

sliding friction fit ensuring, on the one hand, the connection of said power unit on said rest of the missile as long as the force of propulsion generated by said power unit, added to the friction action of said sliding fit and to the aerodynamic drag of said rest of the missile, overcomes the aerodynamic drag of said power unit, and, on the other and, the sliding separation of said power unit from said rest of the missile, when the aerodynamic drag of said



power unit overcomes said force of propulsion added to said friction action of said sliding fit and to said aerodynamic drag of said rest of the missile, said separation necessitating no active separation means;

an internal space (16) provided between the front part of said power unit and the aft part of said missile; and

a communication means establishing communication between the outside of the missile and said internal space.

4,903,606

MINE HAVING A SENSOR WITH IMPROVED RIGHTING CHARACTERISTIC AFTER MINE LAYING

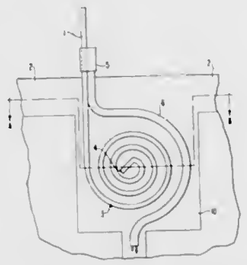
Christoph Mathey, Ockenfels, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jul. 11, 1989, Ser. No. 378,274

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824207

Int. Cl.[4] F41B *23/24*

U.S. Cl. 102—401 **2 Claims**



1. A mine comprising an essentially cylindrical supporting member having a continuously extending guide track open in the axial direction, and an elastic sensor wire wound up in the guide track during laying of the mine, said sensor wire being shaped in the manner of a spiral spring at one end and being attached at said one end to the supporting member via an inner end of the spiral spring, characterized in that the cross section of the sensor wire is rectangular, especially in the zone of the spiral spring, the larger sides of the rectangular cross-sectional area of the sensor wire forming essentially a right angle with a radius vector of the cylindrical supporting member.

4,903,607

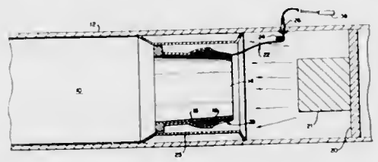
COMMUNICATION LINK WINDING AND DISPENSING PROJECTILE

James Clark, Arlington, Va., assignor to Optelecom, Inc., Gaithersburg, Md.

Filed Aug. 2, 1988, Ser. No. 227,987

Int. Cl.[4] F42B *13/56*

U.S. Cl. 102—504 **7 Claims**



1. A missile and launching tube for deployment of a communication cable comprising a missile body having forward and rearward ends, a spool, mounted adjacent the rearward end of the missile body, a communication cable having a first end and termination end wound on said spool in a plurality of layers, connectors at each end of the cable, the termination end of the cable covered with at least one layer of plastic, a hollow bolt secured at the lower end of the launching tube and through which the termination end of the cable having the at least one layer of plastic is threaded, and a plastic blast protection skirt secured at the forward end of the spool to extend rearwardly over a portion of the cable wound on the spool.

4,903,608

MACHINE FOR LATERALLY DISPLACING A TRACK

Josef Theurer, Vienna, and Friedrich Peitl, Linz, both of Austria, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 331,630

Claims priority, application European Pat. Off., May 18, 1988, 88890125

Int. Cl.[4] E01B *27/17*

U.S. Cl. 104—7.2 **16 Claims**



1. A machine for laterally displacing a track consisting of rails fastened to ties positioned in a common plane, which comprises

(a) a machine frame,

(b) undercarriages supporting the machine frame on the track rails,

(c) at least one vertically adjustable tamping head having reciprocable vibratory tools for tamping ballast under the ties,

(d) a compact operating unit comprising

(1) a common carrier frame,

(2) a vertically and laterally adjustable device for lifting and laterally displacing the track mounted on the common carrier frame and including rail engaging roller tools, and

(3) a vertically and longitudinally adjustable device for orienting obliquely positioned ties to assume an orientation extending substantially perpendicularly to the track in the common plane, the tie orienting device being mounted on the common carrier frame and including a tie engaging tool, and

(e) power-actuated drives linking the carrier frame of the operating unit to the machine frame for vertically and laterally adjusting the carrier frame.

4,903,609

TAMPING BLADE WITH IMPROVED INSERTS

Edmund Isakov, Raleigh, N.C., and Terry A. Manway, Monroeville, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Sep. 23, 1988, Ser. No. 248,861

Int. Cl.[4] E01B *27/16*

U.S. Cl. 104—10 **19 Claims**



1. A tamping blade insert comprising:

a body of hard wear-resistant material having a first side and a second opposed side, first and second opposed major surfaces, said surfaces defining therebetween a thickness of the body, and first and second opposed shoulders defining therebetween a width of the body;

said first side of said body defining a leading edge for a tamping blade, said leading edge being arcuate in shape between the opposed shoulders, and a first relief surface extending inwardly from said first opposed major surface to said leading edge;

said second side and said second major surface being adapted to support the body on said tamping blade for impact loading of said first side of said body.

4,903,610

RAILWAY CARRIER APPARATUS FOR SEMICONDUCTOR WAFERS

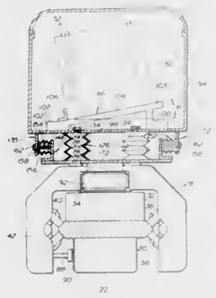
Takashi Matsumoto; Shigeru Tanaka; Tsutomu Shinya, all of Ise; Yoshiyuki Iwasawa, Tokyo; Tsutomu Ishida, Tokyo; Hiroshi Harada, Tokyo; Shintaro Kobayashi, Tokyo, and Kenji Okamoto, Tokyo, all of Japan, assignors to Shinko Electric Co., Ltd. and Shimizu Construction Co., Ltd., both of Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 126,475

Claims priority, application Japan, Nov. 26, 1986, 61-181531[U]; Feb. 18, 1987, 62-34842

Int. Cl.[4] B65G *43/00*

U.S. Cl. 104—118 **15 Claims**



3. A railway carrier apparatus for transporting semiconductor wafers contained in a wafer cassette, each said wafer having front and rear sides, said wafer cassette having an open top, a bottom wall, first and second opposite side walls and internal walls, said first and second side walls extending from said bottom wall to said open top, said internal walls defining, respectively, a plurality of parallel grooves intermediate said first and second side walls for receiving said wafers in parallel aligned relationship along an axis extending between said first and second side walls and substantially perpendicular to said bottom wall, the front sides of the wafers facing said first side wall, the railway carrier apparatus including: a carrier for carrying the wafer cassette; a guide rail, disposed along a line of travel of the carrier, for supporting the carrier to guide the carrier along the line of travel; and drive means for driving the carrier along the line of travel, said carrier comprising:

a carrier body slidably connected to the guide rail for movement along the guide rail;

means for preventing damage to the front sides of said wafers comprising a bedplate member, having an upper face and mounted on the carrier body for supporting the wafer cassette on an upper face of said bedplate member such that the bottom wall of said cassette rests on said upper face with the wafers in said cassette being oriented in parallel with the line of travel of said carrier, the upper face of the bedplate member having one and the other side edges arranged to extend in a direction parallel to the line of travel, said one and the other side edges being disposed adjacent, respectively, to the first and second side walls of the cassette, the upper face being inclined at an angle larger than 0° and not larger than 40° with respect to a horizontal plane in such a manner that said one side edge is positioned at a higher level than the other side edge whereby the rear side of each said wafer in the cassette on said bedplate member leans against an adjacent internal wall of said cassette and the front side of each said wafer is spaced from the adjacent internal wall of said cassette;

and the carrier further including an engaging member, attached to that portion of the bedplate member adjacent to the other side edge of the upper face of the bedplate member, for engaging with the wafer cassette so that the cassette is prevented from slipping down the upper face of the bedplate member.

4,903,611

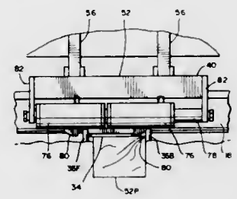
ANCHOR SPREADER APPARATUS AND METHOD

John D. Holley, Montgomery, Ala., assignor to Holley Engineering Company, Inc., Montgomery, Ala.

Filed Mar. 8, 1989, Ser. No. 320,527

Int. Cl.[4] E01B *29/32*

U.S. Cl. 104—307 **20 Claims**



1. A method of spreading anchors on a rail of a railroad track comprising the steps of:

clamping an apparatus to the track, the apparatus having a first pusher which is disposed adjacent to a tie plate after the clamping, which tie plate is in turn adjacent to a first anchor and is on top of a tie; and

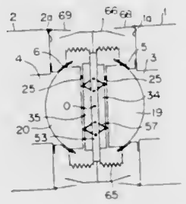
moving the first pusher generally along the rail in a first direction to engage a first side of said tie plate and push said tie plate against said first anchor such that said first anchor is slid along the rail away from the tie.

4,903,612

INTERCAR GANGWAY FOR ARTICULATED CARS

Takamitsu Sassa, Nagoya; Minoru Ishikawa, Konan, and Mikio Hatano, Kasugai, all of Japan, assignors to Nippon Sharyo, Ltd. and Narita Seisakusho Mfg., Ltd., both of, Japan

Filed Jan. 3, 1989, Ser. No. 293,125
Claims priority, application Japan, Mar. 11, 1988, 63-59117
Int. Cl.[4] B60D 5/00
U.S. Cl. 105—18 3 Claims



1. A gangway apparatus of an articulating section for use in articulated cars, comprising:
- a pair of rectangular outer corridors respectively provided to end framing of car bodies to be articulated in such a manner as to project therefrom and surround corridor entrances of said car bodies;
- a pair of rectangular inner corridors each adapted to partially fit with each of said outer corridors in a connected manner; and
- a pair of gate-shaped inner frames each connected to the other end of each of said inner corridors, said inner frames being fitted with each other such as to be swingable in the direction of said articulating section's corridor with lower ends thereof as a supporting point,
- wherein said rectangular outer corridors, said inner corridors, and said inner frames constitute peripheral walls of said articulating section's corridor, fitting portions of said outer corridors and said inner corridors are arranged to be rotatable around a center point of said articulating section's corridor, coupling portions of each of said inner corridors and each of said inner frames are adapted to move together with respect to movement in the direction of said articulating section's corridor and can be slid and displaced relative to each other with respect to a direction perpendicular to that of said articulating section's corridor.

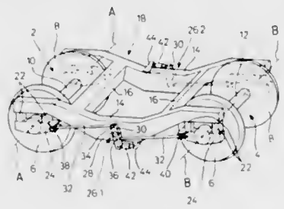
4,903,613

UNDERCARRIAGE FOR A TRACK-BOUND VEHICLE

Hans-Peter Lang, Donauwörth, and Thilo von Madeyski, Hanover, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 21, 1988, Ser. No. 222,156
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1987, 3725574
Int. Cl.[4] B61F 5/38
U.S. Cl. 105—167 9 Claims

1. An undercarriage for a track-bound vehicle comprising:
- truck frame means comprised of right and left longitudinal beams connected by forward and rear transverse beams;
- a forward wheel axle with right and left forward wheels, the forward axle being mounted to the frame adjacent the forward transverse beam between the right and left longitudinal beams, the axle being rotatable and turnable;
- a rear wheel axle with right and left rear wheels, the rear axle being mounted to the frame adjacent the rear transverse beam between the right and left longitudinal beams, the axle being rotatable and turnable; and
- right and left lever system means for converting a longitudinal shift in one wheel axle into an equal and opposite longitudinal shift in the other axle comprising right and left reversing members supported by right and left fulcrums attached respectively to the right and left longitudinal beams, the members being rotatable about the fulcrums, right and left forward and rear lever arms, the right forward lever arm coupling the right end portion of the forward axle to the right reversing member, the right rear lever arm coupling the right end portion of the rear axle to the right reversing member, the left forward lever arm coupling the left end portion of the forward axle to the left reversing member, the left rear lever arm coupling



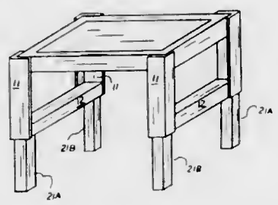
the left end portion of the rear axle to the left reversing member and right and left longitudinal dampers, the right damper being connected between the right reversing member and the right longitudinal beam or between the right forward and rear lever arms, and the left damper being connected between the left reversing member and the left longitudinal beam or between the left forward and rear lever arms, said dampers being provided to dampen oscillations in said right and left lever system means, said right and left lever systems each being adjustable independently of each other.

4,903,614

MULTI-FUNCTIONAL TABLE

John S. Johnson, 1480 Kelley St., Oroville, Calif. 95965

Filed May 10, 1989, Ser. No. 349,813
Int. Cl.[4] A47B 3/00
U.S. Cl. 108—19 5 Claims



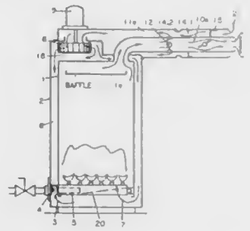
1. A multi-functional table of adjustable height comprising:
- (a) a flat top panel having upper and lower surfaces and adapted to be horizontally disposed,
- (b) four straight main legs extending vertically downwardly from said top panel in a rectangular locus, said main legs being in fixed engagement with said top panel, and having lower extremities disposed in a horizontal plane,
- (c) paired straight hollow housings in opposed parallel relationship, each housing extending between the lower extremities of two opposed contiguous main legs, said housings having open bottom portions, and end portions adjacent each main leg,
- (d) two straight supplementary legs stored within each housing, each supplementary leg having a proximal extremity pivotably secured to the housing adjacent the lower extremity of a main leg, and a distal extremity adapted to swing downwardly into a deployed mode in vertical alignment with an associated main leg,
- (e) holding means located within the end portions of each housing for securing each supplementary leg in its deployed mode, and
- (f) retaining means associated with each housing for preventing inadvertent deployment of the supplementary legs.

4,903,615

ATMOSPHERIC GAS HEATING UNIT WITH EXTERNAL RECYCLING OF EXHAUST GAS TO REDUCE NO_x

Walter Dreizler, Brachetweg 16, D-7000 Stuttgart 75, Fed. Rep. of Germany

Filed Apr. 16, 1987, Ser. No. 39,073
Int. Cl.[4] F23G 5/02
U.S. Cl. 110—204 2 Claims



1. A furnace construction provided with a firebox and a gas burner unit in said firebox, said furnace further including a perforate upper portion, a baffle upstream of said perforate upper portion of said furnace, said baffle adapted to control discharge of at least a portion of gases from said furnace to a stack air pipe downstream of said furnace, a single blower means disposed within said furnace downstream of said baffle, said stack air pipe encompasses an exhaust pipe (10*a*), a throttle valve means in said exhaust pipe downstream of said single blower means, and at least one flow control opening (12, 12*a*) in said exhaust pipe upstream of said throttle valve means adapted to return exiting products of combustion to said single blower means, and said stack air pipe and said exhaust pipe encompassed thereby are provided with diaphragm rings which control flow therethrough.

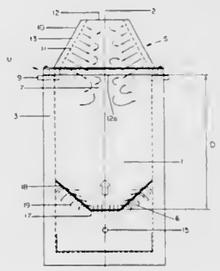
4,903,616

DEVICE FOR SUPPLY OF SECONDARY AIR, AND BOILER WITH THE DEVICE

Konstantin Mavroudis, Götgatan 91 B, S-116 62 Stockholm, Sweden

PCT No. PCT/SE87/00227, § 371 Date Jan. 12, 1988, § 102(e) Date Jan. 12, 1988, PCT Pub. No. WO87/06999, PCT Pub. Date Nov. 19, 1987
PCT Filed May 5, 1987, Ser. No. 144,031
Claims priority, application Sweden, May 12, 1986, 8602124
Int. Cl.[4] F23B 7/00; F23J 5/04
U.S. Cl. 110—234 10 Claims

1. Solid-fuel combustion apparatus, comprising a thermally insulated wall structure defining an upwardly open primary combustion chamber, means disposed in said primary combustion chamber for supporting a solid fuel for combustion, means for supplying primary combustion air to said primary combustion chamber, and a secondary combustion air supply device mounted to said wall structure above said primary combustion chamber, said secondary combustion air supply device comprising a frusto-conical shell open at both axial ends and oriented with its larger axial end opening to said primary combustion chamber, said shell having a spaced inner and outer walls defining a frusto-conical air space therebetween, with said inner and outer walls being circumferentially sealed to one another near both axial ends of said shell and with said inner wall being perforated, and secondary air supply duct means connected in communication with said air space of said frusto-



conical shell for supplying secondary combustion air thereto for ejection through the perforations of said inner wall into an exhaust gas stream generated by the solid fuel burning in said primary combustion chamber.

4,903,617

PROCESS OF REMOVING THE ASH FROM THE GAS PRODUCED BY THE COMBUSTION OF COAL

Ekkehard Weber, and Reinhard Schulz, both of Essen, Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,887
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741604
Int. Cl.[4] F23J 11/00, 15/00
U.S. Cl. 110—345 3 Claims

1. A process of removing liquid ash from a combustion gas comprising:
- combusting coal with air under a pressure between 2 to 30 bars, with a $C:O_2$ mole ratio of 1:0.6 to 1:0.99 to form a combustion gas at a temperature between 1200° and 1700° C.; and
- passing the combustion gas through at least one porous gas-permeable filter element which is disposed in the combustion chamber, the filter element consisting of carbon, carbides of boron, silicon, titanium, zirconium or hafnium, nitrides of boron, silicon, titanium, zirconium or hafnium, borides of titanium, zirconium or hafnium and/or oxides of aluminum, silicon, magnesium or zirconium.

4,903,618

SOIL INJECTION SYSTEM

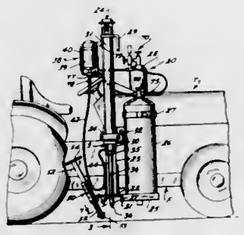
Quinton Blair, 1401 Camellia Dr., Quitman, Ga. 31643

Filed Oct. 17, 1988, Ser. No. 258,680
Int. Cl.[4] A01C 5/04, 23/02
U.S. Cl. 111—118 18 Claims

1. An apparatus for injecting chemicals into the earth and which is mounted to a vehicle having a power system comprising an earth penetrating bit mounted to the vehicle, said bit having upper and lower ends and an elongated axis, a dispensing nozzle means mounted to said bit and terminating in spaced relationship from said lower end thereof, power means for selectively moving said bit from a first elevated position to a second position in which said lower end and said dispensing nozzle means penetrates the earth to create a bore therein, chemical supply means, mounting means for mounting said chemical supply means relative to the vehicle, first conduit means connecting said chemical supply means to said nozzle means, tamping means mounted to the vehicle adjacent said bit, means for guiding said tamping means from a first position

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spaced from the axis of said bit to a second position in contact with the earth and intersecting the axis of said bit so as to close the bore therein, and means for supplying chemical from said supply means and through said first conduit means to said



nozzle means, whereby when said bit is in said second position chemical from said supply means may be supplied to said nozzle means and when said bit is elevated to said first position said tamping means may be moved to said second position to close the bore created by said bit.

4,903,619

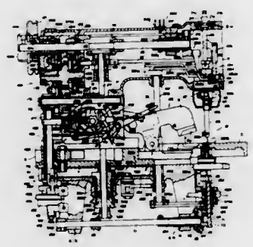
BUTTONHOLE SEWING MACHINE

Kouichi Sakuma, Yamagata, Japan, assignor to Suzuki Manufacturing, Ltd., Japan

Division of Ser. No. 775,008, Sep. 11, 1985, Pat. No. 4,727,817. This application Aug. 12, 1987, Ser. No. 84,551

Int. Cl.[4] D05B *69/00*

U.S. Cl. 112—67 **21 Claims**



1. A button-hole sewing machine comprising:
an electric motor for driving said sewing machine;
a machine body including a bed for holding a work in cooperation with a work clamping means;
a stitch forming device for stitching button-holes in said work and including:
a needle bar driving mechanism for driving a needle bar for supporting a needle,
a looper-spreader mechanism for driving a looper and a spreader, and
a turning mechanism for turning said needle bar, said looper and said spreader,
said needle bar driving mechanism being provided with an up/down moving mechanism and a needle vibrating mechanism;
an arm shaft for driving said up/down moving mechanism;
a bed shaft for driving said looper-spreader mechanism;
a cutting mechanism for cutting button-holes in said work;
a control cam mechanism including a rapid feed mechanism for rapidly feeding said bed, a stitch feeding mechanism and a main control cam for controlling operation of said stitch feeding mechanism and said rapid feed mechanism;
a vertical shaft linked with said arm shaft for driving said needle vibrating mechanism, said bed shaft, and said stitch feeding mechanism;
a mode change-over mechanism including a driving section which receives torque from said rapid feeding mechanism, a driven section for operating said cutting mechanism, and means for operatively connecting and disconnecting said driving section and said driven section.
3. The button-hole sewing machine of claim 1 wherein:
said main control cam is a disc-like member having a central opening through which said vertical shaft extends;
said rapid feeding mechanism includes an intermediate shaft and power transmission means mounted on said intermediate shaft to engage and drive the outer periphery of said main control cam; and
said stitch feeding mechanism includes stepping drive means for turning said main control cam in stepped increments responsive to rotation of said vertical shaft.

4,903,620

AUTOMATIC EXCHANGE OF THE SIZE IN AN AUTOMATIC SEWING UNIT

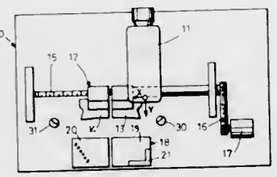
Flavio Bisson, Cava Manara, and Piero Negri, Pavia, both of Italy, assignors to Necchi Societa per Azioni, Pavia, Italy

Filed Mar. 31, 1989, Ser. No. 331,601

Claims priority, application Italy, Jun. 7, 1988, 32306/88[U]

Int. Cl.[4] D05B *21/00, 3/00*

U.S. Cl. 112—121.12 **4 Claims**



1. Automatic size changer on an automatic sewing unit comprising a sewing machine, a clamp set formed at least by two half-clamps, a loader set formed at least by two halfplates for loading the pieces to be sewn in said clamp set, one of said half-clamps and one of said half-plates being mobile for handling various sizes, a motor for moving said mobile clamp and plate and sensor means cooperatable with the mobile half-plate for determining the size of the pieces to be sewn, said sensor means comprising a first pair for determining the tolerance field of the selected size.

4,903,621

HOSIERY TOE CLOSING METHOD AND APPARATUS

Michael J. Hodges, and Sydney Beal, both of High Wycombe, England, assignors to Detexomat Machinery Limited, Buckinghamshire, England

Filed Dec. 13, 1988, Ser. No. 283,966

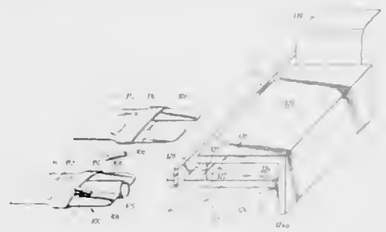
Claims priority, application United Kingdom, Dec. 24, 1987, 8730199

Int. Cl.[4] D05B *21/00*

U.S. Cl. 112—121.15 **13 Claims**

1. A toe closer for closing the toe end of a hosiery blank which terminates in a bead or barrier, a seamer and means to transport the toe end of a blank in a flattened state along a path past the seamer for the latter to generate a toe closing seam across the blank, the closer further including means to position a blank before transport to the seamer, the positioning means comprising an initially open pair of jaws located in a pre-set relation to the path of transport and the seamer, means for presenting the end of a blank through the open jaws, and

means for closing the jaws about the end of a blank presented therebetween, whereby in use a blank is positioned by retrac-



tion of the blank until the terminal bead or barrier thereof abuts the closed jaws.

4,903,622

APPARATUS FOR GUIDING AND BRAKING BANDS IN SEWING MACHINES

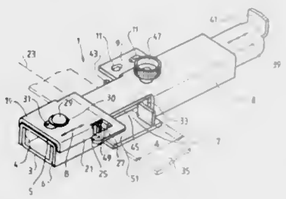
Emmy Frey, Rorschach, and Ernst Dreier, Steckborn, both of Switzerland, assignors to Fritz Gegauf Aktiengesellschaft Bernina-Nähmaschinenfabrik, Steckborn, Switzerland

Filed Nov. 7, 1988, Ser. No. 268,233

Claims priority, application Switzerland, Nov. 18, 1987, 4479/87

Int. Cl.[4] D05B *35/06*

U.S. Cl. 112—152 **17 Claims**



1. Apparatus for guiding and braking bands which are to be sewn to pieces of fabric or like commodities in a sewing machine, comprising a housing defining a transversely extending channel for a band; means for varying the effective width of said channel, said varying means being supported by said housing for movement relative thereto; biasing means overlying the band in said channel; and means for moving said biasing means toward and away from the band in said channel.

4,903,623

HEMMER SEAMER ASSEMBLY

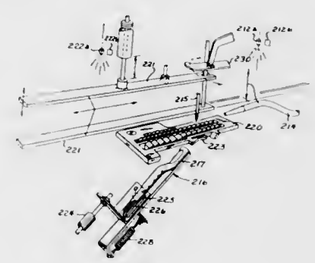
Maximilian Adamski, Palatine; Robert L. Kosrow, Hoffman Estates, and Stephen Ruderman, Oak Park, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Division of Ser. No. 162,919, Mar. 2, 1988, Pat. No. 4,800,830. This application Oct. 11, 1988, Ser. No. 256,815

Int. Cl.[4] D05B *65/06*

U.S. Cl. 112--286 **14 Claims**

1. An apparatus for positioning a chair of stitches for stitching onto fabric having a needle and a throat plate, comprising:
means for positioning the chain of stitches forwardly of the needle; and



means for moving the fabric to the throat plate for sewing the chain onto the fabric.

4,903,624

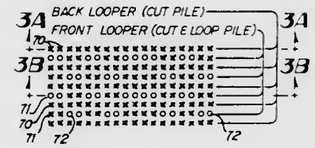
CUT LOOP OVER CUT PILE FABRIC AND APPARATUS FOR AND METHOD OF PRODUCING THE SAME

Roy T. Card, and Joseph L. Card, both of Chattanooga, Tenn., assignors to Card-Monroe Corporation, Chattanooga, Tenn.

Division of Ser. No. 142,925, Jan. 12, 1988. This application Jan. 17, 1989, Ser. No. 266,504

Int. Cl.[4] D05C *17/02*

U.S. Cl. 112—410 **2 Claims**



1. A tufted fabric comprising a backing having longitudinal rows of tufts of first yarns and longitudinal rows of tufts of second yarns interspersed between said longitudinal rows of tufts of first yarns, the rows of tufts of first yarns having successive cut pile tufts and being zig-zagged along its length so that the tufts of the zig-zagged rows of yarns are displaced laterally across adjacent rows of other yarns and the respective rows of tufts of second yarns having both cut pile and loop pile tufts, the cut pile tufts and loop tufts being of the same height.

4,903,625

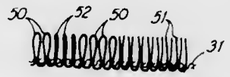
APPARATUS AND METHOD FOR PRODUCING A CUT LOOP OVERLAY OF A LOOP PILE BASE FABRIC IN A SINGLE PASS OF THE BASE FABRIC THROUGH THE TUFTING MACHINE

Roy T. Card, and Joseph L. Card, both of Chattanooga, Tenn., assignors to Card-Monroe Corporation, Chattanooga, Tenn.

Division of Ser. No. 142,926, Jan. 12, 1988, Pat. No. 4,836,118. This application Jan. 31, 1989, Ser. No. 305,007

Int. Cl.[4] D05C *17/02*

U.S. Cl. 112—410 **4 Claims**

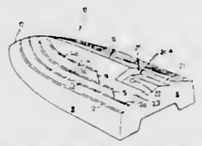


1. A tufted fabric comprising a backing material, a plurality of longitudinal rows of tufts in said backing material, said rows

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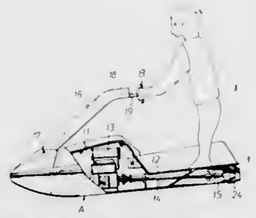
having cut pile and loop pile in certain of said rows, certain of said rows being zig-zagged across other rows to provide cut pile in rows offset from other portions of said certain of said rows along said backing material and a plurality of loop tufts of different heights in said backing material, whereby the cut pile of said certain of said rows covers and hides the low loops and the high loops in certain rows being of approximately the same height as said cut pile.

4,903,626
PLANING MOTOR BOAT HULL
John S. Haines, Brisbane, Australia
Filed Jun. 16, 1988, Ser. No. 207,580
Claims priority, application Australia, Jun. 16, 1987, PI2491
Int. Cl.[4] B63B *1/00*
U.S. Cl. 114—56 **12 Claims**



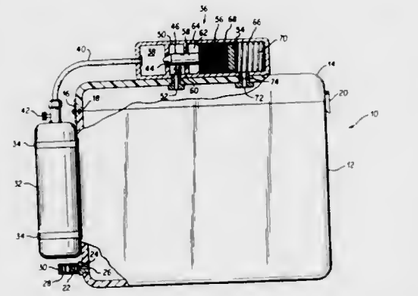
1. A boat hull comprising a bow, a transom, a keel and an undersurface, said undersurface having a transverse step adjacent the transom which extends partially the width of the undersurface and symmetrically on opposite sides of said boat, means defining a recess at least partly bounded by said transverse step and having an end opening through said transom, and a plurality of lift strakes on each side of the keel and disposed symmetrically on opposite sides of said boat, said lift strakes on each side of said boat including an outermost lift strake having an aft end terminating adjacent said transom, at least one intermediate lift strake having an aft end terminating short of said transom and an innermost lift strake located adjacent said keel and having an aft end terminating short of the aft end of said one intermediate lift strake.

4,903,627
STEERING HANDLE DEVICE FOR JET-PROPELLED SMALL-SIZED BOATS
Yukio Nakamura, 5-6, 1-Chome, Tengachayakita, Nishinari-Ku, Osaka-Shi, Japan
Filed Oct. 28, 1988, Ser. No. 264,111
Int. Cl.[4] B63B *35/86*
U.S. Cl. 114—270 **1 Claim**



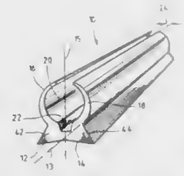
1. A steering handle device for jet-propelled small-sized boats of the type in which the stern of the boat is adapted for use as a floor deck on which the rider stands, with an engine mounted on the front portion of said floor deck, said steering handle device comprising:
- a handle post pivotally connected at its front end to the bow of the boat by a horizontal shaft so that a rear end of the handle post overhanging the deck is swingable;
- a base board for attaching a handle bar integrated with the rear end of the handle post overhanging the floor deck; and
- an attaching plate for the handle bar pivotally connected to the base board by a vertical shaft, wherein
- the attaching plate for the handle bar is an assembly comprising a front plate pivotally connected to the base board by a vertical shaft, and a rear plate attached to the front plate so that it can be longitudinally slid for adjustment,
- said handle bar is constructed substantially in H-shape as seen in front view, with a handle bar body horizontally extending transversely of the boat, and a pair of grips vertically extending integrally from the opposite ends of said handle bar body,
- at least the middle portion of said handle bar body is adapted for use as a straight pivot bar portion of given length orthogonal to said vertical shaft,
- said pivot bar portion is assembled to a grasping bracket fixed to the rear end of said rear plate so that said pivot bar portion extends through said grasping bracket and is rotatable around its own longitudinal axis,
- whereby the position at which the handle bear itself is attached to said base board is set so that it can be longitudinally adjusted in advance, and the tilt angle of the grips with respect to the horizontal plane of the handle bar body is adjustable in advance.

4,903,628
PRESSURE EQUALIZER
William Lansford, P.O. Box 4007, Key West, Fla. 33041
Filed Nov. 7, 1988, Ser. No. 267,101
Int. Cl.[4] B63G *8/00*
U.S. Cl. 114—312 **3 Claims**



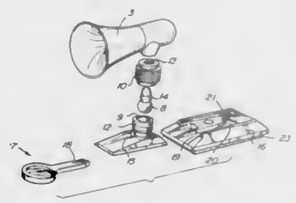
1. A pressure equalizing instrument cabinet for keeping submerged instruments dry comprising:
- a housing having an access port and a door normally closing said port in sealing engagement therewith;
- reservoir means affixed to said cabinet for containing a source of a gas under pressure;
- a cylinder and piston slidably retained therein affixed to the exterior of said cabinet, first port means on a first side of said piston in communication through said cylinder with the ambient, second port means on an opposite second side of said piston in communication through said cylinder and cabinet with the interior of said cabinet;
- pressure equalizing means coupled between said reservoir means and cabinet for admitting gas under pressure to the interior of said cabinet only when the pressure in the first side of the piston exceeds pressure on the second side thereof; and
- bleed valve means mounted on the cabinet for venting gas therewithin to the sea during the ascent when the pressure inside the cabinet exceeds the ambient pressure on the first side; and
- bias means on the second side of said piston normally urging said piston toward the first side and said second port means further comprises lag means for maintaining the pressure within said cabinet higher than the pressure on the second side of said piston and thus higher than ambient pressure.

4,903,629
BOAT SLIDE CHANNEL ASSEMBLY
Marla G. Maudlin, and John C. Maudlin, both of 102 Crowley, Kemah, Tex. 77565
Filed Jan. 6, 1989, Ser. No. 294,382
Int. Cl.[4] B63B *17/00*
U.S. Cl. 114—361 **13 Claims**



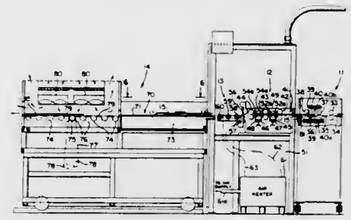
1. A slide channel member for attaching a marine canvas product to a deck surface, comprising:
- an elongated body of flexible material having a mounting base with an underside surface to be mounted against a deck surface;
- said body having a pair of spaced apart sidewalls extending longitudinally of the mounting base to form a groove track adapted to receive a slide insert;
- said sidewalls projecting from the mounting base in an orientation substantially perpendicular to the mounting base and being laterally positioned to locate the groove track substantially directly over the longitudinal centerline axis of the mounting base;
- said underside surface of the mounting base having a concave shape transverse to the longitudinal axis of the body and adapted to deform into a substantially planar surface upon installation against a deck surface.

4,903,630
ANIMAL WARNING ALARM
Leonard Rezmer, Kawkawlin, Mich., assignor to Game Tracker, Flushing, Mich.
Filed Aug. 1, 1988, Ser. No. 226,793
Int. Cl.[4] B06B *1/00*; **G08B** *3/00*
U.S. Cl. 116—22 A **5 Claims**



1. An ultrasonic whistle apparatus for mounting on a vehicle to warn animals of the approach of the vehicle, comprising in combination:
- (a) a funnel for directing air into the apparatus and having an air path therein;
- (b) an ultrasonic whistle mounted in the air path in the funnel and adapted to be actuated by air passing therethrough;
- (c) a base for mounting the apparatus to a vehicle comprising:
  - (1) a spring section having a groove formed therein for slidably receiving a key, the spring section comprising a spring disposed in the groove which is based upwardly and which has a button on an uppermost portion thereof;
  - (2) a socket section which is slidably engagable in the spring section and which has a lower surface with a recess formed therein which retentively receives the button therein to disengagably retain the socket section in the spring section;
- (d) a key for disengaging the socket section from the spring section, the key having a substantially parallelepiped operative end, whereby the operative end of the key may be slidably inserted into the groove, thus pushing the spring downwardly to disengage the button from the recess and enable the socket section to be slidably disengaged from the spring Section, and
- (e) an adjustment means connecting the funnel to the base; the adjustment means comprising means for adjusting the direction in which the funnel is oriented, said adjustment means being adjustable in more than one plane of adjustment.

4,903,631
SYSTEM FOR SOLDERING PRINTED CIRCUITS
Gilbert V. Morris, Amherst, N.H., assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Filed May 27, 1988, Ser. No. 199,604
Int. Cl.[4] B05C *1/02*
U.S. Cl. 118—63 **7 Claims**



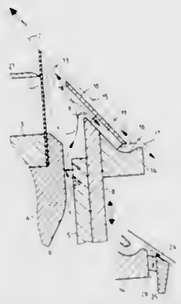
1. A apparatus for soldering printed circuit panels comprising a plurality of stations through which the printed circuit panels are horizontally conveyed, the stations including a preheat station having heating means and rolls for conveying the panels through the preheat station to elevate the temperature of the panels, a flux station for coating the panels with a flux and including rolls for conveying the panels through the flux station, a soldering station including at least one solder immersion chamber defined by upper and lower retainer guide means and two pairs of rolls, the rolls functioning to convey printed circuit panels horizontally through the chamber, each roll pair including an upper roll and a lower roll, the guide means being parallel to the rolls and the lower guide means positioned close to the lower rolls to minimize solder leakage, means adjacent the ends of the pairs of rolls for further enclosing the solder chamber, an opening in the lower guide means parallel to the rolls, a manifold parallel to and below the solder chamber and communicating with the opening in the lower guide means, means for pumping solder into the manifold to flood the solder chamber through said opening, means providing a solder flow path that flows solder around wide panels in the chamber to maintain the chamber full, whereby printed circuit panels conveyed by the rolls through the solder chamber are quickly and efficiently soldered, a solder leveling station at the exit of the solder immersion chamber including upper and lower air knives to level the molten solder and open holes in the panels by removing excess solder, a cooling station including means for conveying the soldered panels from the solder leveling station to the cooling station, an air transport

table in the cooling station including a perforated surface, and means for flowing cooling air through the perforations to convey and support the panel on a cushion of air thereby cooling the panel.

4,903,632
COATING DEVICE

Hans-Peter Sollinger, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith, GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 281,891
Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616645
Int. Cl.[4] B05C *1/04, 1/16*
U.S. Cl. 118—123 **20 Claims**



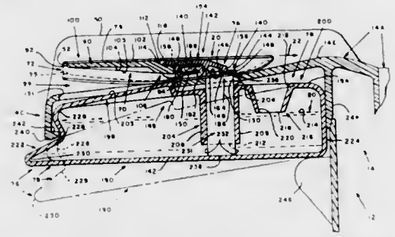
1. A coating device for coating moving material webs running over a backing roll with an axis, and having an entrance side, an exit side and connected to a pressurized coating chamber, said coating device comprising:
a pressurized coating chamber;
a doctor blade at said exit side;
an entrance side front wall movably mounted relative a front wall support cooperating with said backing roll to define a discharge gap;
sideways sealing elements cooperating with said doctor blade and entrance side front wall defining and sealing an application space except for said discharge gap;
a primary feed channel communicating between said pressurized coating chamber and said application space for transferring coating mixture therebetween; and
an elongate baffle parallel to the backing roll axis and disposed at a small acute angle with respect to the backing roll in proximity to said entrance side front wall, said baffle having an elongate backing roll side and an elongate front wall side opposite said backing roll side;
said baffle backing roll side cooperating with said backing roll to define an elongate hydrodynamic pressure gap therebetween having a length substantially equal to that of the elongate backing roll side of said baffle;
said baffle front wall side cooperating with said front wall to define a secondary gap-shaped feed channel for communication of a surplus of the coating mixture between said application space and said hydrodynamic pressure gap, said hydrodynamic pressure gap comprising a return entrance to said application space for said coating mixture.

4,903,633
FLUID SUPPLY APPARATUS

John R. Nobile, Fairfield, and William A. Ross, Darien, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed May 19, 1989, Ser. No. 353,944
Int. Cl.[4] B05C *1/02*
U.S. Cl. 118—268 **9 Claims**

1. Fluid supply apparatus comprising:
(a) a hollow container made of a resilient plastic material, the container including an upper wall, the upper wall including first and second wells formed therein and extending into the interior of the container, one of said wells forming a fluid inlet opening;
(b) a pad made of a wicking material, the other of said wells



forming a fluid outlet opening, said pad mounted within the other of said wells and extending from said container via said fluid outlet opening; and
(c) the container including a side wall having a generally S-shaped transverse cross-section.

4,903,634
DEVELOPING DEVICE

Taizo Ono; Yoshihiro Katayama; Hayato Kamada, all of Osaka, and Hidenori Kunishige, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 871,753, Jun. 9, 1986, abandoned. This application Apr. 14, 1989, Ser. No. 338,522
Claims priority, application Japan, Jun. 13, 1985, 60-128738; Oct. 31, 1985, 60-244484; Oct. 31, 1985, 60-244485; Oct. 31, 1985, 60-244487; Oct. 31, 1985, 60-244490; Nov. 14, 1985, 60-255360; Nov. 14, 1985, 60-255361; Nov. 15, 1985, 60-256920; Feb. 13, 1986, 61-29252; Feb. 26, 1986, 61-41247
Int. Cl.[4] G03G *15/08*
U.S. Cl. 118—653 **21 Claims**



2. A developing device for visualizing a latent electrostatic image formed on a latent image carrier, comprising:
a casing containing developer therein and provided with an outlet;
an endless movable developer carrier arranged in the outlet of the casing for carrying the developer thereon;
a rotatable cylindrical charging body arranged within the casing so that a portion of the casing surrounds part of the cylindrical charging body and adjacent the developer carrier for charging the developer and supplying charged developer adjacent the developer carrier, the developer carrier being arranged between the cylindrical charging body and the outlet of the casing, the cylindrical charging body being arranged between the developer carrier and the developer contained within the casing, the developer carrier and the cylindrical charging body being movable in a common direction at a position where the developer carrier and the cylindrical charging body are in contact, the peripheral speed of the cylindrical charging body being higher than the peripheral speed of the developer carrier, the cylindrical charging body being operative to transfer the charged developer to the developer carrier and to coat the charged developer as a layer on said developer carrier, and the part of the cylindrical resilient body which is surrounded by the casing rotating in a direction from a bottom of the casing toward the developer carrier; and
means for limiting the thickness of said layer of the developer on said developer carrier to a prescribed thickness, said thickness limiting means being arranged downstream of the position where the developer is transferred from the cylindrical charging body to the developer carrier with respect to the direction in which the developer carrier moves.

20. A developing device for visualizing a latent electrostatic image formed on a latent image carrier, comprising:
a casing accommodating a developer, an end of the casing having an outlet;
an endless developer carrier positioned at the outlet of the casing and carrying the developer thereon;
a rotatable cylindrical resilient body contacting an outer circumferential surface of the developer carrier;
means for limiting a layer of the developer to a prescribed thickness, the developer layer extending on the developer carrier in a region downstream, with respect to a direction of movement of the developer carrier, of a position where the developer carrier and the cylindrical resilient body oppose each other; and
a resilient sheet extending in the casing and having first and second ends, the first end being fixed to the casing, the second end engaging the developer, the resilient sheet driving the developer toward the cylindrical resilient body.

4,903,635
HIGH SPEED AUTOMATED INJECTION SYSTEM FOR AVIAN EMBRYOS

John H. Hebrank, Durham, N.C., assignor to Embrex, Inc., Raleigh, N.C.

Continuation-in-part of Ser. No. 881,121, Jul. 2, 1986, Pat. No. 4,681,063. This application Jun. 18, 1987, Ser. No. 63,319
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.
Int. Cl.[4] B65G *59/04*
U.S. Cl. 119—1 **11 Claims**

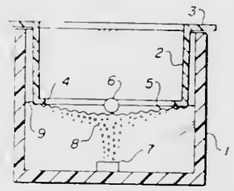


1. A device for injecting an egg with a fluid substance and comprising:
a tubular punch for forming an opening in the shell of an egg;
an injection needle positioned within said tubular punch for movement therethrough and through an opening in an egg shell formed by said tubular punch; and
means for delivering a fluid through said injection needle.

4,903,636
ARTIFICIAL HABITAT FOR AQUATIC ANIMALS

James Kroeker, 2114 SW. 58 Ave., Hollywood, Fla. 33023

Filed Jun. 29, 1987, Ser. No. 66,952
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 **10 Claims**

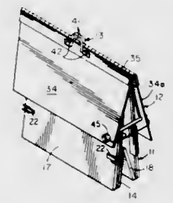


1. Artificial habitat for aquatic worms, comprising a frame defining an opening surrounded by said frame, a screen attached to said frame and covering said opening for supporting aquatic worms, means for supporting said frame with said screen along a given water level such that the aquatic worms are partially above and partially below the given water level, and means for circulating water along at least part of said screen from below for supplying water to the worms and removing waste from said screen.

4,903,637
FOLDABLE HOUSE AND CARRIER FOR SMALL PETS

Jack D. Devault, 238 W. Main, Hope, Id. 83836

Filed Jun. 7, 1988, Ser. No. 203,125
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—19 **1 Claim**



1. A container for the housing, transport and containment of domestic pets comprising, in combination:
a floor element having two similar elongate planar halves hingeably interconnected along their longer adjacent edges to fold only upwardly toward each other from a substantially coplanar relationship;
a first side element, of the same a length as the longer edge of the floor element, hingeably interconnected at its lower inner edge to a first lateral edge of the floor element to extend perpendicularly upwardly therefrom;
similar front and rear end elements each having a lower vertical side wall portion hingeably interconnected, respectively, at opposed vertical end edges of the first side element to fold inwardly relative thereto, each said end element having a triangle-like upper gabled portion hingeably attached to fold upon the outer surface of each side wall portion respectively, said front end element having a door with latch means;
a second side element, similar to the first side element, hingeably interconnected at its lower inner edge to the second lateral edge of the floor element to extend perpendicularly upwardly therefrom;
an elongate roof element, longer than the floor element

formed of two similar elongate halves hingeably interconnected along their adjacent medial edges, the undersurface of one half of said roof element being hingeably interconnected with the upper inner edge of the second side element;

plural latch means to releasably fast the roof element to the first side of the container to fasten the front end element and back end element to the second side, and to fasten the roof sides together when in a folded mode; and

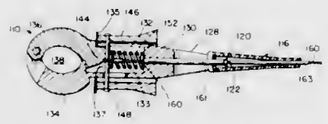
handle means carried by the roof element to aid manual manipulation and carriage of the container.

4,903,638

REMOTELY DETACHABLE ANIMAL LEASH

Leslie Lacey, 24314 Port Gamble Rd., Poulsbo, Wash. 98370

Filed Nov. 15, 1988, Ser. No. 271,507
Int. Cl.[4] A01K *27/00*
U.S. Cl. 119—114 **7 Claims**



1. A leash for an animal collar, comprising: an elongated, flexible tether having releasable collar attachable catch means adjacent one end thereof, and a hand grip adjacent the other end thereof;

the catch means including a pair of relatively reciprocable jaws which are openable to a position in which the jaws enable the catch means to be released from an attachment point on the collar, and closeable about an attachment point on the collar, when the catch means are so engaged, to a position in which the jaws enable the tether to be secured to the collar, and further including a buckle-like structure defining a tether-attaching element to which said tether is connected;

latch means reciprocably mounted by said catch means and moveable relative to said jaws from a position where said jaws are locked into an engaged condition to a position where said jaws are unlocked into a disengaged condition;

manual release means for the latch means, including a hand-operated actuator which is disposed on the tether adjacent the hand grip thereof, and a elongated release cord extending longitudinally through said tether and interconnecting the latch means and the hand-operated actuator to reciprocate the latch means between the jaw-locking position and the jaw-unlocking position thereof, said cord extending through the structure of said tether-attaching element to a point of attachment with said latch means,

and a cord-confining sheath abutting and extending from the catch means tether-attaching element through the tether to said hand-operated actuator, said cord extending through said sheath from its point of departure from said tether-attaching element structure to said hand-operated actuator.

4,903,639

TEAT DISINFECTING METHOD

Dan W. Kessel, P.O. Box 634, Alto, Tex. 75925

Continuation of Ser. No. 918,557, Oct. 14, 1986, abandoned.
This application Aug. 23. 1988, Ser. No. 238,981
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—159 **3 Claims**

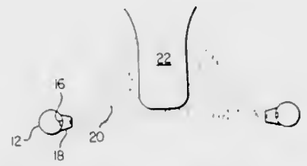
1. A method of disinfecting the teats of a dairy animal, comprising the steps of:

releasably attaching one end of a straight thin walled hollow tube portion of a teat disinfecting device to a source of pressurized disinfecting fluid, the one end being open;

placing the portion of the teat disinfecting device which is formed of thin walled hollow tubing into the shape of a loop about one teat of dairy animal, with the plane of said loop essentially perpendicular to the longitudinal axis of the teat and with the bottom end of the teat positioned slightly above the plane of said loop;

introducing pressurized disinfecting fluid from said source into the open end of said teat disinfecting device;

allowing said pressurized disinfecting fluid to flow from said source through the cavity of said straight tubular portion of the device, through interconnecting means, through the looped tubular portion of the device, and to be emitted from a plurality of spray emitting means as a disinfecting



mist disposed in the plane of the loop about the inner circumference of said looped tubular portion of the device, the spray emitting means directing a conical shaped disinfecting mist toward the longitudinal axis of the teat and above the plane of the loop to cover all surfaces of the teat;

allowing emission of disinfecting mist from said spray emitting means until the teat is suitably treated with such disinfecting mist;

ceasing introduction of pressurized disinfecting fluid into the device;

removing the device from about the teat so treated; and
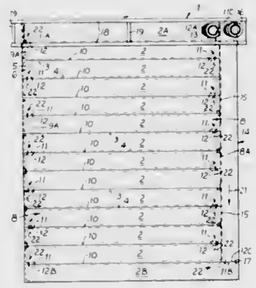
relocating the device to the next teat to be treated with disinfecting fluid and repeating the above steps, beginning with introduction of disinfecting fluid into the device, until treatment is completed.

4,903,640

PANEL ADAPTED FOR COOLANT THROUGH FLOW, AND AN ARTICLE INCORPORATING SUCH PANELS

Peter R. Howard, Sheffield, England, assignor to P. Howard Industrial Pipework Services Limited, Sheffield, England

Filed Apr. 20, 1988, Ser. No. 183,917
Int. Cl.[4] F22B *37/00*
U.S. Cl. 122—6 A **10 Claims**



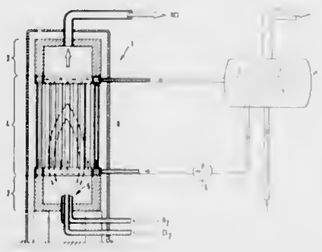
1. An electric arc furnace wall panel adapted the flow of coolant therethrough, having a coolant flow path defined by a plurality of elongate tube lengths having longitudinal axes and formed from hollow, rectangular rolled box section material, said tube lengths being stacked one on top of the other to create a wall panel of desired height, and said tube lengths being of the same pre-selected length to create a wall panel of desired width, with each of said tube lengths comprising four walls, being an inner "hot" wall adapted to face a furnace interior, an opposite and parallel outer "cold" wall, said inner and outer walls being interconnected by mutually spaced-apart, parallel abutment walls, with adjacent external surfaces of said abutment walls of adjacent tube lengths abutting one another, with adjacent tube lengths secured to one another by welding longitudinally along mutually adjacent corner zones defined between both said inner wall and said abutment wall, and between said outer wall and said abutment wall, with opposite ends of each said tube length closed off, and provided, adjacent both said ends of each of said tube lengths, with coolant flow apertures, said apertures communicating between adjacent tube lengths such that, in use, said coolant flows in at one end of each of said tube lengths, along said tube length, and out at the other end of each of said tube lengths, to and through successive tube lengths of said panel, and a coolant inlet tube length defining one lateral side of said panel being welded to ends of said stack of tube lengths at said lateral side of said panel, whereby said inlet tube length extends orthogonally with respect to said axes of said parallel tube lengths, with a coolant outlet aperture provided at a lower end of said inlet tube length and in fluid flow communication with a coolant inlet aperture of the lowermost of said stack of parallel tube lengths, with said inlet tube length disposed vertically and said coolant flow path being down said vertical tube length, into said lowermost of said parallel tube lengths and then, upwardly, in a zig-zag path, through successive ones of said parallel tube lengths, into long and out of an uppermost of said parallel tube lengths.

4,903,641

METHOD AND APPARATUS FOR EXTRACTING SATURATED STEAM IN THE SYNTHESIS OF HYDROGEN CHLORIDE GAS

Eduard Göbl; Johann Müller, and Alois Spaderna, all of Meitingen, Fed. Rep. of Germany, assignors to Sigri GmbH, Meitingen, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 316,415
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807266
Int. Cl.[4] F22B *1/02*
U.S. Cl. 122—33 **7 Claims**



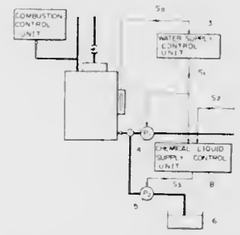
1. A method for generating saturated steam by the combustion of chlorine and hydrogen to produce hydrogen chloride gas, which comprises combusting chlorine and hydrogen to produce hydrogen chloride gas in an elongated synthesis oven having an upper segment, a lower segment and a middle segment having a wall in the form of a heat exchanger, recirculating a heat transfer medium between the heat exchanger and a steam generator while heating the heat transfer medium to between 170° and 230° C. by heat exchange between the heat of the combustion and the heat transfer medium, and generating saturated steam from water at a pressure of at least 7 bar in the steam generator.

4,903,642

APPARATUS FOR CONTROLLING INJECTION OF CHEMICAL LIQUID IN BOILER SYSTEM

Nobuhiro Tamaru, and Tadao Jujita, both of Tokyo, Japan, assignors to Ebara Corporation, Tokyo, Japan

PCT No. PCT/JP87/00979, § 371 Date Oct. 12, 1988, § 102(e) Date Oct. 12, 1988
PCT Filed Dec. 15, 1987, Ser. No. 255,194
Claims priority, application Japan, Dec. 17, 1986, 61-300654
Int. Cl.[4] F22B *37/48;* **F28G** *9/00*
U.S. Cl. 122—401 **2 Claims**



1. An apparatus for controlling injection of a chemical liquid in a boiler system comprising:

a water supply control for keeping means level of can water of a boiler to a proper value;

water supply means for supplying can water to said boiler;

chemical liquid supply means controlled by said supply control means so as to interlock with said water supply means for supplying said chemical liquid to said boiler;

a chemical liquid supply control unit, said control unit including:

chemical liquid basic injection control means for driving said chemical liquid supply means for a specific chemical liquid injection period;

basic injection period storing means for setting or clocking said basic injection period for storage;

accumulative operating period measuring means for measuring an accumulative water supply operating period of said water supply means;

time comparing means for comparing said accumulative water supply operating period of said water supply means with chemical liquid said basic injection period stored in said basic chemical liquid injection period storing means; and

chemical liquid supply stopping means for stopping the operation of said chemical liquid supply means by inhibiting interlocking control of said chemical liquid supply means and said water supply means by said water supply control means in accordance with a comparison result given by said time comparing means when said accumulative water supply operating period is smaller than said basic chemical liquid injection period.

VOL 1111 ISS 4 FE 27 19 90 UMI

4,903,643

TEMPERATURE-SENSING FAN FLUID COUPLING

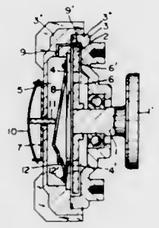
Kazunori Takikawa, and Yuichi Ono, both of Numazu, Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Sunto, Japan

Filed Sep. 14, 1988, Ser. No. 244,698

Claims priority, application Japan, Sep. 22, 1987, 62-145048[U]

Int. Cl.⁴ F01P *7/02*

U.S. Cl. 123—41.12 **12 Claims**



1. A temperature-sensing fan fluid coupling comprising:

a rotatable shaft;

a sealed enclosure rotatably mounted around an end of the shaft, said sealed enclosure comprising a partition dividing the sealed enclosure into a torque transmission chamber substantially surrounding the end of the shaft and an oil reservoir chamber spaced axially from the end of the shaft, said sealed enclosure including a radially outwardly disposed peripheral wall with a circulation passage extending therethrough and connecting radially outwardly disposed portions of the torque transmission chamber with the oil reservoir chamber, said partition of said sealed enclosure being provided with a hole extending therethrough at a location intermediate the peripheral wall of said sealed enclosure and the rotational axis of the shaft;

a driving disk rigidly fixed to the end of the shaft and disposed within the torque transmission chamber;

a temperature-sensing device mounted to the sealed enclosure;

a link member operatively connected to the temperature-sensing device for movement in response to a change in temperature sensed by the temperature-sensing device; and

valve means disposed within the sealed enclosure for controlling the flow of fluid between the oil reservoir chamber and the torque transmission chamber, said valve means including a first portion rigidly mounted in the sealed enclosure at a location disposed radially outwardly from the hole in the partition, a second portion operatively in contact with the link member for movement therewith, and a third portion intermediate the first and second portions of the valve means, said third portion being disposed generally in line with the hole in the partition and being resiliently deflectable in response to movements of the link member for alternately at least partly opening and at least partly closing the hole between the oil reservoir chamber and the torque transmission chamber, whereby the effective contact area of oil in the torque transmission chamber is varied in response to movements of said valve means for controlling torque transmitted from the shaft to the sealed enclosure.

4,903,644

AIR INTAKE SECTION OF AN INTERNAL COMBUSTION ENGINE

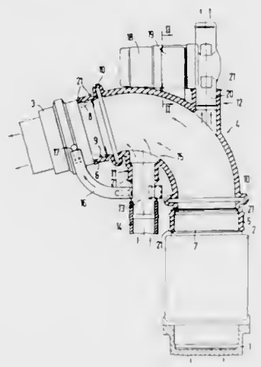
Klaus Gröger, Hemmingen, and Herbert Ampferer, Sachsenheim, both of Fed. Rep. of Germany, assignors to Dr. Ing.h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Jul. 21, 1989, Ser. No. 382,897

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1988, 3824792

Int. Cl.⁴ F02M *35/10*

U.S. Cl. 123—52 MC **8 Claims**



1. An air intake section of an internal combustion engine comprising:

an elastic pipe piece means arranged between an air filter and a throttle housing;

ring-shaped elastic bellows means, which are curved towards an outside of the pipe piece means, positioned adjacent ends of the pipe piece means, the bellow means having a wall thickness less than a wall thickness of the pipe piece means;

pipe socket means for connecting air-carrying pipes to the pipe piece means and

clamping fork means for connecting a component to the pipe piece means.

4,903,645

INTAKE MANIFOLD

Herbert Börger, Heidelberg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

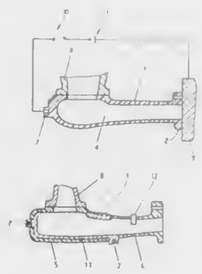
Filed Apr. 18, 1989, Ser. No. 339,683

Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3814955

Int. Cl.⁴ F02M *31/00*

U.S. Cl. 123—52 MC **8 Claims**

1. In an intake manifold for an internal combustion engine, consisting of a flow channel, which is enclosed by an electrically conductive wall and which can be heated in at least a part of its region by the wall, the improvement which comprises that the wall (1) consists at least in the aforementioned part of an electrically conductive, polymeric material and can be connected by connectors (2, 7), which are at a distance from



one another, with a source of voltage (3) and heated by this source.

4,903,646

V-TYPE CYLINDER BLOCK OF INTERNAL COMBUSTION ENGINE

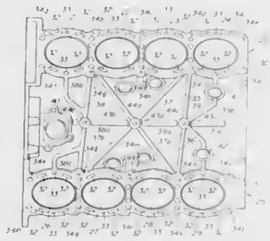
Shunichi Miragawa, Kawasaki; Hiroaki Kuzuoka, Yokohama; Hitoshi Nakamura, Yokohama, and Etsuo Ogami, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 4, 1989, Ser. No. 333,419

Claims priority, application Japan, Apr. 6, 1988, 63-46482[U]

Int. Cl.⁴ F02B *75/22*

U.S. Cl. 123--55 VE **2 Claims**



1. A V-type cylinder block of internal combustion engine, comprising:

two angularly disposed cylinder banks each having a row of cylinders;

a plurality of ribs, said plurality of ribs rising generally from head bolt hole portions defined between two cylinders adjacent each other, said plurality of ribs being provided between said two cylinder banks for interconnecting wall portions of said cylinder banks, said plurality of ribs intersecting at the middle of said cylinder rows for forming intersecting points.

4,903,647

EXHAUST TIMING CONTROL APPARATUS

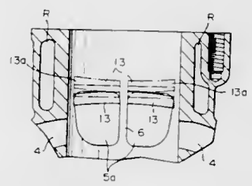
Hitoshi Yamamoto; Kouji Okazaki, and Kanau Iwashita, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 52,131, May 18, 1987, Pat. No. 4,768,473, which is a continuation-in-part of Ser. No. 888,772, Jul. 22, 1986, abandoned. This application Aug. 13, 1987, Ser. No. 85,672

Claims priority, application Japan, Jul. 22, 1985, 60-161477; Aug. 7, 1985, 60-121026; Feb. 14, 1986, 61-30348

Int. Cl.⁴ F02D *39/04*

U.S. Cl. 123—65 PE **10 Claims**



1. An exhaust timing control apparatus for a two-cycle engine cylinder having an exhaust port and passage extending from the side wall of the cylinder, comprising:

a valve body pivotally mounted about a pivot axis in the exhaust passage and extending to a control surface at the exhaust port to define an apparent upper timing edge of the exhaust port, said valve body having a shaft bearing portion about said pivot axis, a plate extending toward the exhaust port from said shaft bearing portion and a ridge upwardly extending from said plate at one end thereof adjacent said control surface, the exhaust passage having a recess in the upper surface thereof to receive said valve body, said recess extending upwardly adjacent the exhaust port to receive said upwardly extending ridge, said control surface and said upwardly extending recess surface are formed as arcs in a plane parallel with the axis of said cylinder with said arcs being concentric with said pivot axis.

4,903,648

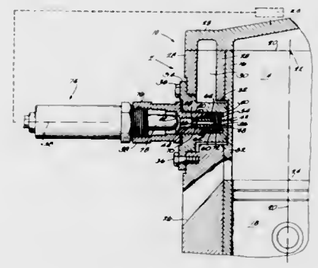
ENGINE WITH IMPROVED EXHAUST GAS SENSING

George G. Lassankse, Oconomowoc, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 14, 1989, Ser. No. 338,743

Int. Cl.⁴ G01N *27/46;* **F01L** *13/00*

U.S. Cl. 123—65 R **21 Claims**



1. A two-stroke internal combustion engine comprising an engine block, a combustion chamber defined in said engine block and adapted to have a piston reciprocate therein along an

axis between a top dead center position and a bottom dead center position, and to have air and fuel combusted therein, thereby causing production of an exhaust gas and at least partially causing the piston to reciprocate, an exhaust port in said engine block and communicating with said combustion chamber and adapted to conduct the exhaust gas away from said combustion chamber, means defining a sensor chamber, a passage extending from said sensor chamber to said combustion chamber at a location axially between said exhaust port and the top dead center position, valve means operable in said passage between an open position for allowing flow of exhaust gas from said combustion chamber to said sensor chamber and a closed position for substantially preventing flow of non-combusted air and fuel from said combustion chamber to said sensor chamber, an exit conduit adapted to conduct at least a portion of the exhaust gas in said sensor chamber away from said sensor chamber, and means at least partially located in said sensor chamber for sensing a condition in the exhaust gas.

4,903,649

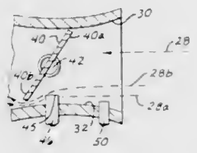
FUEL SUPPLY SYSTEM WITH PNEUMATIC AMPLIFIER

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 178,383, Apr. 6, 1988, Pat. No. 4,840,148, which is a continuation-in-part of Ser. No. 95,356, Sep. 10, 1987, Pat. No. 4,763,626, which is a continuation-in-part of Ser. No. 25,270, Mar. 12, 1987, Pat. No. 4,750,464. This application Dec. 2, 1988, Ser. No. 279,573

Int. Cl.[4] F02B *33/04*

U.S. Cl. 123—73 A **23 Claims**



1. A fuel control system for an internal combustion engine having air intake means supplying combustion air to said engine, and fuel supply means supplying fuel to said engine, a venturi in said air intake means producing a pressure drop, a first pressure sensor sensing pressure outside of said venturi, a second pressure sensor sensing the reduced pressure in said venturi, and means pneumatically amplifying the sensed pressure differential.

4,903,650

APPARATUS FOR RELATIVE ANGULAR ADJUSTMENT BETWEEN TWO SHAFTS IN DRIVE CONNECTION

Rolf Ohlendorf, Weinstadt; Willy Treyz, Neckartailfingen; Gerhard Doll, Pleidelsheim, and Wolfgang Speier, Tübingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Jul. 12, 1989, Ser. No. 378,965

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1988, 3825074

Int. Cl.[4] F01L *1/34*

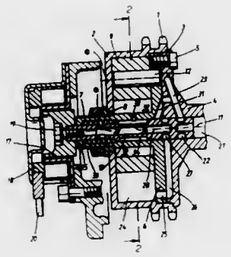
U.S. Cl. 123—90.17 **20 Claims**

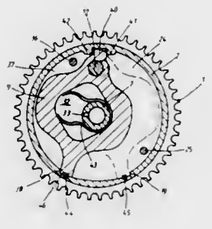
1. Apparatus for obtaining a relative angular adjustment between a crankshaft and at least one camshaft wherein:

a camshaft is positively connected to an end plate of a flange shaft and via an actuating means to a cylindrical hollow shaft, which surrounds the actuating means and has a driving wheel connected to a crankshaft;

the actuating means divides an annular space located between the hollow shaft and the end plate and flange shaft into two separate working spaces;

said actuating means being alternatingly connected with pressure oil, supplied from an engine oil circuit and returned again to it, as a function of the position of a control element located in the flange shaft,





said actuating means being designed as a rocker which is mounted pivotably on the flange shaft about a pivot axis running parallel to an axis of the camshaft and wherein said rocker is in driving engagement with the hollow shaft and is caused to alternatively assume one of two end positions in the annular space between hollow shaft and flange shaft.

4,903,651

ROCKER ARM CLEARANCE REMOVING DEVICE

Masaaki Matsuura, Tokyo; Yoichi Ishida, Asaka; Kentaro Kato, Niiza, and Takashi Kanbe, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

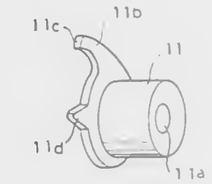
Filed Oct. 27, 1988, Ser. No. 263,457

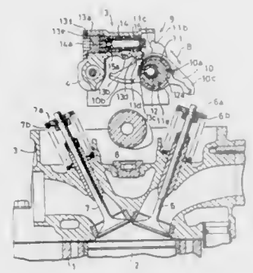
Claims priority, application Japan, Oct. 29, 1987, 62-165935[U]; Oct. 29, 1987, 62-165936[U]

Int. Cl.[4] F01L *1/18, 1/24*

U.S. Cl. 123—90.46 **2 Claims**

1. In a rocker arm clearance removing device wherein torque is applied by a hydraulic adjuster to an eccentric cam which supports a rocker arm and the resulting rotation of the eccentric cam causes the rocker arm to come into pressure contact with a valve operating cam and intake valve or an exhaust valve, the improvement wherein the eccentric cam is supported by a rocker arm shaft extending through an eccentric position of the cam; an outwardly extending, pressure bearing arm is provided curving in the rotating direction of said arm and having a pressure bearing surface extending substantially tangentially to said eccentric cam and facing in a direction opposite to said rotating direction, said pressure bearing arm projecting from an end portion of the eccentric cam; and the hydraulic adjuster, which has a pressurizing surface for abutment with said pressure bearing surface, is disposed nearly perpendicularly to said pressure bearing surface, and wherein a radially extending engaging piece is projectingly provided on said end portion of the eccentric cam circumferentially spaced from said pressure bearing arm; an arm stopper is provided on an opening side of a case of the





hydraulic adjuster to prevent the pressure bearing arm from entering the interior of said case; and a swivel stop means adapted to engage said engaging piece in a rotational position beyond a preset operational range of the eccentric cam to stop the cam is provided at a side part of said case.

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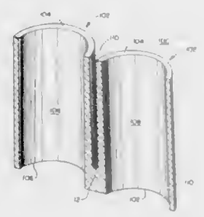
CYLINDER LINER INSERT AND METHOD OF MAKING ENGINE BLOCK THEREWITH

Nathanial L. Field, Northville, and Benjamin P. Winter, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 31, 1989, Ser. No. 386,756

Int. Cl.[4] F02F *7/04*

U.S. Cl. 123—193 C **23 Claims**



1. A cylinder liner insert to be cast-in-place in a light alloy cylinder block for an internal combustion engine, said cylinder liner insert comprising:

at least two generally cylindrical cylinder liners each of which includes an upper end and a lower end, an interior surface for defining a combustion chamber of said engine and an exterior surface adapted to successfully interface with a light alloy during a casting process; and

bridge means for joining said at least two cylinder liners along aligned portions of the exterior surfaces of said cylinder liners, said aligned portions being spaced from said upper ends of said cylinder liners which correspond to combustion ends of the combustion chambers formed therein to permit said light alloy to surround the combustion ends of said cylinder liners and thereby enhance heat transfer adjacent the combustion ends of said combustion chambers, said bridge means also serving to enhance the rigidity of the cylinder block incorporating said cylinder liner insert.

21. A method of making a light alloy cylinder block for an internal combustion engine including a cylinder liner insert which is cast-in-place, said method comprising the steps of:

forming a cylinder liner insert as an integral unit made up of at least two generally cylindrical cylinder liners each of which includes an upper end and a lower end, first bridge means for joining said cylinder liners along first aligned portions of said cylinder liners which first aligned portions are spaced from said upper ends of said cylinder liners, and second bridge means for joining said cylinder liners along second aligned portions of said cylinder liners which second aligned portions are adjacent the upper ends of said cylinder liners;

positioning at least one of said cylinder liner inserts into appropriate casting apparatus;

performing a casting operation to cast-in-place said at least one cylinder liner to form said light alloy cylinder block; and

removing said cylinder block from said casting apparatus.

4,903,653

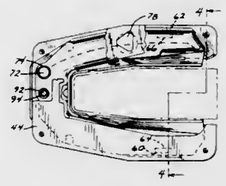
MARINE OUTBOARD DRIVE WITH OIL TANK

Gordoo C. Slattery, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jun. 2, 1989, Ser. No. 360,273

Int. Cl.[4] F02F *7/00*

U.S. Cl. 123—195 P **17 Claims**



1. A Marine outboard drive unit having a powerhead including an internal combustion engine and having a lower depending driveshaft housing extending downwardly from said powerhead and having a lower submerized propeller, an oil tank mounted adjacent said driveshaft housing below said powerhead, a cowl enclosing said engine, and wherein said oil tank is beneath said cowl, and a trim cover extending downwardly from said cowl and spaced outwardly from said driveshaft housing, and wherein said oil tank is in the space between said trim cover and said driveshaft housing.

4,903,654

LUBRICATING APPARATUS FOR ENGINES OF VERTICAL CRANKSHAFT TYPE

Masato Sato, Akaski; Shinichi Tamba, and Toru Ogino, both of Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 20, 1989, Ser. No. 326,566

Claims priority, application Japan, Mar. 23, 1988, 63-70516

Int. Cl.[4] F01M *1/00*

U.S. Cl. 123—196 W **12 Claims**

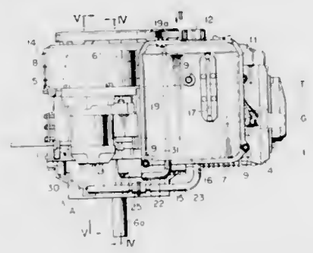
1. A lubricating apparatus for an engine of vertical crank-

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shaft type having a vertical crankshaft and a crank case for supporting said crankshaft, comprising:

an oil pan arranged at a lower portion of said crank case;

an oil tank provided independently from said oil pan and having an intake portion communicated with said oil pan and an outlet portion communicated with each of lubricating portions;



oil pumps arranged between said oil tank and said each of the lubricating portions to supply the oil to said lubricating portions; and

oil feeding means arranged between said oil tank and said oil pan to feed the oil from said oil pan to said oil tank.

4,903,655

MEMBRANE FUEL PUMP WITH PULSE DAMPENER

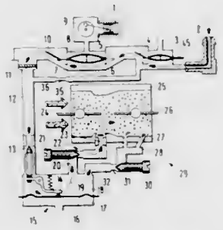
Werner Vonderau, Backnang; Hans Holderle, Freiberg; Armin Speckens, Waiblingen; Jürgen Wolf, Stuttgart, all of Fed. Rep. of Germany, and Roger Simons, Virginia Beach, Va., assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed May 22, 1989, Ser. No. 354,749

Claims priority, application Fed. Rep. of Germany, May 21, 1988, 3817404

Int. Cl.[4] F02B *77/00*

U.S. Cl. 123—198 C **8 Claims**



1. A membrane fuel pump for an internal combustion engine for a work apparatus and especially for a handheld, portable tool such as a motor-driven chain saw and the like, the engine having a piston and a cylinder conjointly defining a combustion chamber and having a crankcase wherein pressure is developed in response to the movement of the piston, the engine being equipped with a fuel tank and a carburetor having a pressure controller, the membrane fuel pump comprising:

a housing defining an enclosed space;

a membrane partitioning said enclosed space into a drive chamber communicating with said crankcase so as to be charged with the pressure therein and a pump chamber;

said pump chamber having a suction end connected to the fuel tank and a pressure end connected to the pressure controller of the carburetor;

first check valve means interposed between said suction end and the fuel tank;

second check valve means interposed between said pressure end and the pressure controller of the carburetor;

bypass means interconnecting said pressure end and said suction end for bypassing said pump chamber and passing fuel from said pressure end back to said suction end; and,

throttle means arranged in said bypass means for throttling the flow of fuel passing through said bypass means.

4,903,656

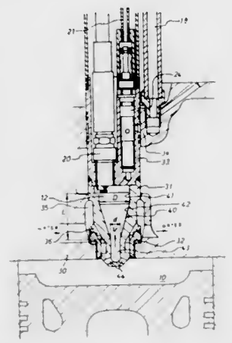
GAS ENGINE

Touru Nakazono; Yoshihiro Natsume, and Takashi Furuta, all of Osaka, Japan, assignors to Yanmar Deisel Engine Co., Ltd., Osaka, Japan

Filed Dec. 29, 1988, Ser. No. 291,895

Int. Cl.[4] F02M *31/00*

U.S. Cl. 123—259 **5 Claims**



1. A gas engine of a pre-chamber type in which a pre-chamber is arranged in communication to a main combustion chamber, an intake passage is arranged to supply lean mixture to the main chamber, a gas pipe is provided to form rich mixture by fuel gas in the pre-chamber, and a spark plug adapted to ignite the rich mixture in the pre-chamber prior to the combustion of lean mixture in the main combustion chamber, characterized in that an area of a section of the pre-chamber gradually decreases toward the main combustion chamber.

4,903,657

APPARATUS FOR AND METHOD OF CONTROLLING INTERNAL COMBUSTION ENGINES

Masaaki Miyazaki; Shinji Kojima, and Hajime Kako, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 309,577

Claims priority, application Japan, Feb. 12, 1988, 63-31193; Feb. 12, 1988, 63-31194; Feb. 12, 1988, 63-31195

Int. Cl.[4] F02D *41/04, 41/06, 41/16*

U.S. Cl. 123—339 **12 Claims**

1. An apparatus for controlling an engine including a key switch connected to a voltage source, a starter for starting the engine, an intake manifold for supplying a mixed gas of sucked air and fuel and a throttle valve for limiting the rate of suction of air, said apparatus comprising:

pressure detecting means provided at a suction passage downstream of said throttle valve for detecting the intake manifold pressure in the form of the absolute pressure;

cranking detecting means for detecting whether said starter is in the ON condition or not;

pressure change detecting means for detecting that the amount of change in pressure detected by said pressure detecting means is equal to or less than a predetermined value during a predetermined period of time within the period from the time when said voltage source is turned on to the time when said cranking detecting means detects that the starter is on; and

memory means responsive to a detection signal from said pressure change detecting means for storing a pressure signal from said pressure detecting means as an atmospheric pressure detection value, whereby the engine is controlled in accordance with an output signal of said memory means.

resuming feedback control at that time.

4,903,659

CARBURETOR CONTROLLING APPARATUS FOR COMBUSTION ENGINE

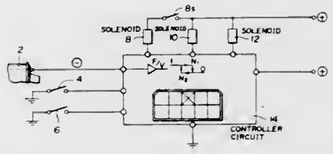
Makoto Inagaki, Hamamatsu; Shoichi Yamaguchi, Hamana, and Fujiyuki Suzuki, Hamamatsu, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Apr. 21, 1988, Ser. No. 184,241

Claims priority, application Japan, Apr. 29, 1987, 62-65588[U]

Int. Cl.[4] F02M *3/06*

U.S. Cl. 123—339 **9 Claims**



1. An apparatus for controlling a carburetor of a combustion engine, comprising: throttle-opening detector switch means for detecting that a throttle valve of said carburetor is opened within a predetermined degree of throttle opening; idle-up means for making said throttle valve perform an idling-up operation; fuel-cut means for cutting a slow speed fuel supply to said carburetor; and control means for causing said idle-up means to perform the idling-up operation in response to a predetermined load applied to the engine and for causing said fuel-cut means to cut the slow speed fuel flow during a reduced speed condition of the engine when said throttle-opening detector switch means detects that said throttle valve of said carburetor is within the predetermined degree of throttle opening, said control means further including means responsive to detection by said switch means that said throttle valve is opened farther than said predetermined degree for inhibiting said idle-up means from performing said idling-up operation.

4,903,658

CONTROL METHOD FOR IDLING SPEED OF AN ENGINE

Shuji Miyama, and Hiroya Ohkumo, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,694

Claims priority, application Japan, Oct. 14, 1987, 62-260616

Int. Cl.[4] F02D *41/16*

U.S. Cl. 123—339 **1 Claim**

1. A control method for the idling speed of an engine by providing valve means for regulating the suction air quantity of the engine and feedback of the control value of said valve means so that the actual idling speed becomes an objective speed, said method comprising the steps of:

monitoring pertinent variables indicating the load operation state of the engine;

setting, from said load operation state, a control value correction quantity of said valve means in accordance with the engine speed at the time of transition to the idling state in the process of transition to feedback control of the idling speed;

setting an initial control value by applying said control value correcting quantity to a learned value of said valve means learned during the preceding feedback control;

maintaining a predetermined time the control value of the valve means at said initial control value;

thereafter causing the valve control value to converge to a specific offset value with respect to said learned value at a variation rate set in accordance with the engine speed at the time of transition to said idling state; and

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4,903,660

FUEL INJECTION CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

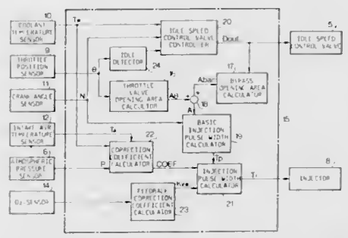
Yoshiyuki Sogawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,654

Claims priority, application Japan, Nov. 19, 1987, 62-293759; Nov. 19, 1987, 62-293760; Nov. 19, 1987, 62-203761

Int. Cl.[4] F02D *41/08*

U.S. Cl. 123—339 **3 Claims**



1. A system for controlling fuel injection of an engine for a motor vehicle having an intake passage, a throttle valve provided in the intake passage, a bypass around the throttle valve,

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an idle speed control valve provided in the bypass, and at least one fuel injector, comprising:

an engine speed sensor producing an engine speed signal dependent on speed of the engine;

a throttle position sensor producing a throttle opening degree signal dependent on an opening degree of the throttle valve;

determining means for producing a basic injection pulse width signal in accordance with the engine speed signal and throttle opening degree signal;

detector means for detecting idling operation of the engine and for producing an idle signal;

control means responsive to the idle signal and the engine speed signal for producing a control value signal for controlling the idle speed control valve; and

correcting means responsive to the control value signal for producing a correction value, and for correcting the basic injection pulse width signal with the correction value and for producing a fuel injection pulse width signal for operating the fuel injector.

4,903,661

FUEL INJECTION PUMPING APPARATUS

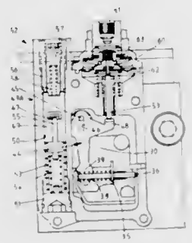
Robert H. Scott, Lordswood Chatham, England, assignor to Lucas Industries Public Limited Company, Birmingham, United Kingdom

Filed Aug. 3, 1988, Ser. No. 227,655

Claims priority, application United Kingdom, Aug. 8, 1987, 8718853

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—383 **4 Claims**



1. A fuel injection pumping apparatus for supplying fuel to a compression ignition engine comprising a high pressure pump operable in timed relationship with the engine, means including a low pressure pump for supplying fuel to the high pressure pump, a component forming part of the high pressure pump which is adjustable to determine the maximum amount of fuel which can e supplied by the high pressure pump to the engine, comprising a single three arm pivotal lever having a first arm, a second arm, and tangs disposed at the ends of said first and second arms, first and second engine operating parameter responsive devices operatively connected to said first and second arms, respectively, said first and second parameter responsive devices having pins movable along axes parallel to but spaced from each other, said pins engaging with tangs positioned at the ends of said first and second arms, said parameter responsive devices imparting pivotal movement to said lever in response to engine operating parameter changes, a pivot pin for mounting said lever, said pivot pin being slidable within a slot and is disposed between said axes, and a third arm of said lever being connected to said component and extending generally at right angles to said first and second arms, said slot being parallel to said third arm.

4,903,662

SPARK TIMING CONTROLLER FOR SPARK IGNITED INTERNAL COMBUSTION ENGINE

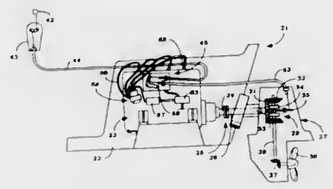
Itsushi Hirukawa; Kazuya Takeuchi, and Nobuki Motoshige, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaishi, Shizuoka, Japan

Filed Sep. 21, 1988, Ser. No. 247,748

Claims priority, application Japan, Sep. 24, 1987, 62-239192

Int. Cl.⁴ F02P *5/15*

U.S. Cl. 123—418 **10 Claims**



1. In a spark ignited internal combustion engine, means for firing the spark plug of said engine at a predetermined spark timing in accordance with a first established spark advance curve having a speed range including idle where the spark timing is fixed, and means for firing the spark plug at a point advanced from said fixed spark advance curve in response to the speed of said engine falling below a predetermined speed.

4,903,663

FUEL COMBUSTION CONTROL APPARATUS FOR AN ENGINE

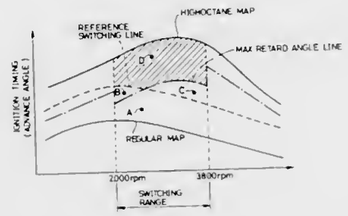
Masayuki Ooki, Yokohama, and Kazuhiro Higashiyama, Kanagawa, both of Japan, assignors to Nissan Motor Co., Inc., Yokohama, Japan

Filed Oct. 7, 1988, Ser. No. 254,641

Claims priority, application Japan, Oct. 9, 1987, 62-253494; Oct. 9, 1987, 62-253495

Int. Cl.⁴ F02P *5/15*

U.S. Cl. 123—425 **7 Claims**



1. A fuel combustion control apparatus for an engine, the fuel combustion control apparatus comprising:

(a) first detecting means for detecting engine operating conditions;

(b) second detecting means for detecting engine knocking;

(c) map storing means, coupled to the first detecting means, for storing a regular map indicative of basic ignition advance angles with respect to engine operating conditions using regular gasoline, a highoctane map indicative of basic ignition advance angles with respect to engine operating conditions using highoctane gasoline, a reference map switching line indicative of standard ignition advance angles with respect to engine operating conditions along which engine control is switched from the regular map to the highoctane map, and a maximum highoctane map retard angle line indicative of engine operating conditions along which engine control is switched from the highoctane map to the regular map;

(d) first commanding means, coupled to the first and second detecting means, for incrementing a current ignition advance angle during use of the regular map when the first detecting means detects engine operating conditions within a predetermined switching range and the second detecting means detects no knocking, and for generating a first command to switch engine control from the regular map to the highoctane map only when an incremented ignition advance angle is equal to or larger than the reference map switching line and the maximum highoctane map retard angle line simultaneously;

(e) second command means, coupled to the second detecting means, for decrementing a current ignition advance angle during use of the highoctane map when the second detecting means detects knocking, and for generating a second command to switch engine control from the highoctane map to the regular map only when a decremented ignition advance angle is smaller than the maximum highoctane map retard angle;

(f) calculating means, coupled to the map storing means and the first and second commanding means, for selecting any one of the regular and highoctane maps in response to commands from the first and second commanding means and for calculating actual ignition advance angles on the basis of basic advance angles stored in a selected map; and

(g) means, coupled to the calculating means, for effecting fuel combustion on the basis of an ignition advance angle calculated by the calculating means.

4,903,664

SPARK IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH FAIL SAFE SYSTEM FOR CYLINDER PRESSURE SENSOR

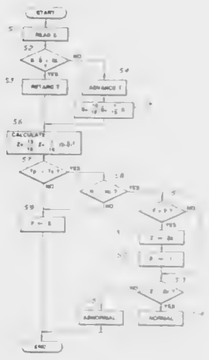
Mamoru Shinshi, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 24, 1988, Ser. No. 261,384

Claims priority, application Japan, Oct. 22, 1987, 62-265342

Int. Cl.⁴ F02P *5/15*

U.S. Cl. 123—425 **10 Claims**



1. A fail safe system for a cylinder pressure sensor used for a spark ignition timing control system which calculates a physical quantity for combustion energy within the combustion chamber of an engine cylinder of an internal combustion engine and corrects the spark ignition timing on the basis of said physical quantity, said fail safe system comprising:

first means for calculating a running average of a statistical dispersion of said physical quantity;

second means for detecting a specific driving condition of said internal combustion engine;

third means for setting said running average to be a first value so as to make said running average larger when said specific driving condition is initially detected; and

fourth means for comparing said running average with a second value when said specific driving condition is detected, and for detecting abnormality of said cylinder pressure sensor.

4,903,665

AIR-FUEL RATIO CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

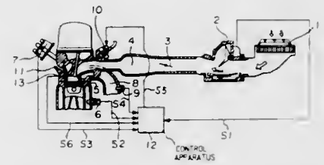
Shoichi Washino, and Satoru Ohkubo, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,244

Claims priority, application Japan, Sep. 29, 1987, 62-246562; Sep. 29, 1987, 62-246563

Int. Cl.⁴ F02D *41/04;* **F02M** *51/00*

U.S. Cl. 123—435 **8 Claims**



1. An air-fuel ratio control apparatus for an internal combustion engine adapted to measure an intake air quantity and an engine revolution number to thereby calculate a basic fuel injection quantity based on said measured intake air quantity and said engine revolution number and to output an instruction signal to inject an amount of fuel to a cylinder, which comprises a pressure detecting means to detect an inner pressure of cylinder, a crank angle detecting means to detect a crank angle of the engine, and a control device which is adapted to receive the output signals of said pressure detecting means and said crank angle detecting means so as to obtain the maximum value of a rate of pressure increase in an ignition cycle of the engine or the mean value of the maximum values in a predetermined number of cycles of the engine, and to control a fuel injection quantity in response to the thus obtained maximum value or the mean value.

5. An air-fuel ratio control apparatus for an internal combustion engine adapted to measure an intake air quantity and an engine revolution number to thereby calculate a basic fuel injection quantity based on said measured intake air quantity and said engine revolution number and to output an instruction signal to inject an amount of fuel to a cylinder, which comprises a pressure detecting means to detect an inner pressure of cylinder, a crank angle detecting means to detect a crank angle of the engine, an exhaust gas temperature detecting means to detect a temperature of exhaust gas and a control device which is adapted to receive the output signals of said pressure detecting means, said crank angle detecting means and said exhaust gas temperature detecting means, to calculate a state quantity based on the signals of said inner pressure of cylinder in an ignition cycle, and to control a fuel injection quantity by using said state quantity and a value of exhaust gas temperature T_e obtained by the output of said exhaust gas temperature detecting means.

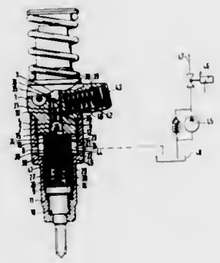
VOL 1111 ISS 4 FE 27 1990 UMI

4,903,666

FUEL INJECTION DEVICE

Dominique Buisson, Villeurbanne; Francois Henry, Ste Foy les Lyon; Jean Leblanc, Lyons, all of France; Helmut Pfeifle, Stuttgart, Fed. Rep. of Germany, and Jean Pigeroulet, Villeurbanne, France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 870,468, Jun. 4, 1986, Pat. No. 4,805,580.
This application Dec. 6, 1988, Ser. No. 281,144
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521427
The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.
Int. Cl.[4] F02M 39/00
U.S. Cl. 123—447 9 Claims



1. A fuel injection device for internal combustion engines, comprising:

a pump housing that receives a pump cylinder and a reciprocally driven pump piston being guided therein;

a pump work chamber defined by said pump piston within said pump cylinder;

a fuel injection value;

a fuel injection line connectable at its one end to said fuel injection valve, which fuel injection line is arranged to be made to communicate with said pump work chamber at its other end;

a pressure valve having a pressure valve closing member guided tightly in a guide cylinder, which pressure valve closing member defining at its rear side a spring chamber receiving a first spring to act upon said valve closing member, means for connecting said spring chamber with a relief chamber, said valve closing member further being arranged to cooperate with stop means to thereby define the stroke of said valve closing member in said guide cylinder, said valve closing member further having a front side forming a sealing face matching with a valve seat which defines a flow cross section of said injection line, said front side further forming a pressure shoulder joining said sealing face and defining part of a chamber, which chamber is permanently connected to a part of said injection line between said injection valve and said valve seat; and

a control valve;

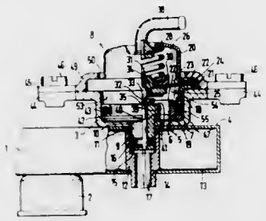
said control valve includes an electrically controlled valve, said electrically controlled valve includes a closing member which cooperates with a valve seat defining a flow cross section in said relief conduit, said relief conduit communicates at one end with said work chamber and at its opposite end with a fuel supply source which, during the intake stroke of the pump piston, communicates with the pump work chamber via the relief conduit.

4,903,667

PRESSURE REGULATING VALVE

Alfred Sonnenmoser, and Klaus Matthiesen, both of Blaichach, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 4, 1989, Ser. No. 293,286
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 8801816[U]
Int. Cl.[4] F02M 39/00
U.S. Cl. 123—463 9 Claims



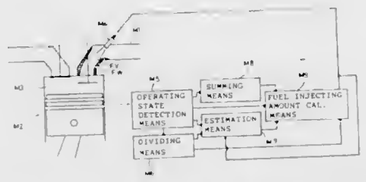
1. A pressure regulating valve for a fuel supply system of an internal combustion engine which comprises a valve housing, said valve housing including a rigid bottom part (19), an intermediate part (18) having one end that rests upon said bottom part and a shoulder (21), a cap (20) including a collar (22), a diaphragm (23) secured between said shoulder on said intermediate part and said collar of said cap, said intermediate part including means which secures said cap to said intermediate part, said diaphragm dividing said valve housing to form a spring chamber and a fuel chamber, at least one inflow opening for admitting fuel into said fuel chamber, a one piece outlet fitting (9) secured to said bottom part in axial alignment with said valve housing, said one piece outlet fitting including a passage therethrough and a valve seat on one end thereof, a valve plate secured to said diaphragm in said fuel chamber, said valve plate cooperating with said valve seat on said outlet fitting to close and open said passage in said outlet fitting, and a connection to said cap for subjecting said diaphragm to a pressure differential.

4,903,668

FUEL INJECTION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Akira Ohata, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 19, 1988, Ser. No. 221,227
Claims priority, application Japan, Jul. 29, 1987, 62-189889; Jul. 29, 1987, 62-189891
Int. Cl.[4] F02D 41/04, 41/34
U.S. Cl. 123—478 9 Claims



1. A fuel injection system of an internal combustion engine (M2) for determining a fuel injecting amount q of a fuel injection valve (M4) based on a physical model describing a behavior of fuel coming into a cylinder (M3) of the engine (M2) utilizing an amount fw of fuel adhering to an inner wall of an intake pipe (M1) and an amount fv of vapor fuel in the intake pipe (M1) as state variables, the system comprising:

an operating state detection means (M5) for detecting a rotating speed ω of the engine (M2), an evaporating amount Vf of the fuel adhering to the inner wall of the intake pipe (M1), a fuel/air ratio λ of a mixture coming into the cylinder (M3), and an amount m of air coming into the cylinder (M3);

a dividing means (M6) for dividing the evaporating amount Vf by the engine speed ω;

an estimation means (M7) for calculating estimation values fw and fv of the adhering fuel amount fw and the vapor fuel amount fv, based on a product λ·m of the detected fuel/air ratio λ and the detected air amount m, said division Vf/ω at the dividing means (M6) and the injecting amount q, utilizing a first equation determined from the physical model;

a summing means (M8) for summing up a difference m·(λ−λr) between the product λ·m and a product λr·m of a preset target fuel/air ratio λr and the air amount m; and

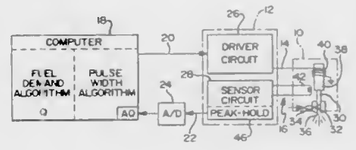
a fuel injecting amount calculation means (M9) for calculating the fuel injecting amount q, based on the division Vf/ω, the estimated values fw and fv, the product λr·m, and the difference summed up at the summing means (M8), utilizing a second equation determined from the physical model.

4,903,669

METHOD AND APPARATUS FOR CLOSED LOOP FUEL CONTROL

Edward G. Groff, Troy; Arun S. P. Solomon, Utica, and Stephen F. De Nagel, Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1989, Ser. No. 332,204
Int. Cl.[4] F02D 41/14
U.S. Cl. 123—478 8 Claims



1. Means for controlling the fuel quantity delivered by a fuel injector to an engine comprising:

a positive displacement fuel injector activated by a control signal and having a plunger which moves in proportion to the amount of fuel delivered,

means for measuring plunger displacement and generating a displacement signal representing fuel quantity,

command means for generating a desired fuel signal representing desired fuel quantity,

control means responsive to the desired fuel signal for generating the control signal to activate the injector for effecting a fuel delivery, and

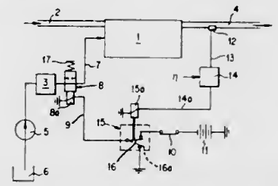
the control means including a closed loop means responsive to the desired fuel signal and the displacement signal for adjusting the fuel delivery to the engine to match the actual quantity to the desired quantity.

4,903,670

CONTROL DEVICE FOR A DIESEL INTERNAL COMBUSTION ENGINE

Richard Bauder, Neckarsulm, Fed. Rep. of Germany, assignor to Audi AG, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,065
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3705972
Int. Cl.[4] F02M 39/00
U.S. Cl. 123—489 1 Claim



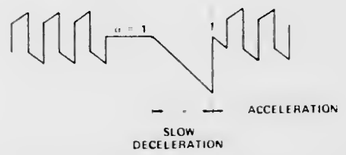
1. A diesel internal combustion engine comprising an air intake, a fuel injection pump, an exhaust pipe and a device for bringing the engine to a standstill, said device comprising either a means for interrupting the fuel supply to the engine, a means for closing the air intake pipe or a means for closing the exhaust pipe, the improvement including a control comprising a lambda lean probe in the exhaust pipe for determining the oxygen contents in the exhaust gas and generating a signal proportional to said oxygen contents, an engine speed sensor arranged to supply a speed-dependent signal, and an electronic comparator circuit arranged to receive the signals of said lambda lean probe and engine speed sensor and comprising a characteristic curve of speed-dependent lambda nominal values and to compare the lambda actual value determined by said lambda probe with the lambda nominal value at the engine speed sensed by said speed sensor, and to actuate said device if the lambda actual value falls below the lambda nominal value.

4,903,671

AIR/FUEL RATIO CONTROL SYSTEM FOR FUEL INJECTION INTERNAL COMBUSTION ENGINE WITH IMPROVED ACCELERATION CHARACTERISTICS AFTER DECELERATION

Akihiko Araki, and Junichi Furuya, both of Gunma, Japan, assignors to Japan Electronic Control Systems Company, Limited, Isezaki, Japan

Filed May 24, 1988, Ser. No. 197,847
Claims priority, application Japan, May 28, 1987, 62-129891
Int. Cl.[4] F02D 41/10, 41/14
U.S. Cl. 123—489 14 Claims



1. An air/fuel ratio control system for a fuel injection internal combustion engine, said air/fuel ratio control system comprising:

a fuel injection valve disposed within an induction passage for injecting a controlled amount of fuel at a predetermined timing in synchronism with engine revolution;

a first sensor means for monitoring an air/fuel ratio indicative parameter for producing an air/fuel indicative first sensor signal;

a second sensor means for monitoring an engine driving

parameter representative of an engine driving condition for producing an engine driving condition indicative second sensor signal, said engine driving parameter including a deceleration and acceleration magnitude representing factor representative of a magnitude of deceleration and acceleration;

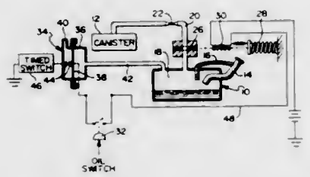
a controller means, operable in a feedback mode when said engine driving condition satisfies a predetermined feedback condition and in an open loop mode otherwise, for deriving a fuel injection amount for driving said fuel injection valve on the basis of said second sensor signal, said controller means operating in said feedback mode for deriving an air/fuel ratio dependent correction value for correcting said fuel injection amount based on said first sensor signal, said controller means detecting deceleration of said internal combustion engine at a magnitude smaller than a given deceleration criterion and subsequent acceleration at a magnitude smaller than a given acceleration criterion for setting said air/fuel ratio dependent correction value at a predetermined value.

4,903,672

FUEL TANK OVERFILL PREVENTION

Donald T. MacKinnon, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 27, 1989, Ser. No. 316,042
Int. Cl.[4] F02M *33/02*; B01D *53/04*
U.S. Cl. 123—520 **2 Claims**



1. In a vehicle that produces oil pressure only when running, and which has a fuel tank, a vapor storage canister, and a vent line running from a vapor pressure chamber at the top of said fuel tank to said canister, a tank overfill protection system, comprising,

a normally open blocking valve in said vent line that can be moved to a closed position,

an electromechanical device adapted to close said said blocking valve when energized,

an electrical vehicle switch that is open only when said vehicle is running,

a tank pressure activated electrical switch that moves from an open to a closed position when the pressure in said vapor pressure chamber rises above a predetermined threshold value, and,

a timed electrical switch which is set to stay closed and pass current for only a predetermined time after it is first energized, and which then automatically opens to interrupt any circuit of which it is a part, and,

a connecting circuit joining all of said switches in series, so that that current reaches said electromechanical device only when all three of said switches are closed,

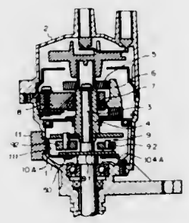
whereby, when said vehicle is not running and said tank is being filled, said vehicle switch will be closed, so that when said fuel level rises to the point that the pressure in said vapor pressure chamber rises above said threshold value, said tank pressure switch will close as well, thereby energizing said timed switch and said electromechanical device to close said blocking valve, thereby preventing any more fuel from entering said tank, and when said tank is not being filled, said electromechanical device will be deenergized to allow said blocking valve to reopen said vent line by virtue of said timed switch automatically opening or by said vehicle switch opening when said vehicle is restarted.

4,903,673

IGNITION DISTRIBUTOR FOR AN INTERNAL COMBUSTION ENGINE

Masaaki Chiba; Hideki Maruhashi; Yutaka Ohashi; Shigemi Murata, and Hidetoshi Miyaji, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,504
Claims priority, application Japan, Jul. 24, 1987, 62-185933; Jul. 24, 1987, 62-114006[U]; Jul. 24, 1987, 62-114007[U]
Int. Cl.[4] F02P *7/073*
U.S. Cl. 123—617 **5 Claims**



1. An ignition distributor for an internal combustion engine comprising a shaft rotated by said engine, a reluctor for discriminating between the cylinders of an engine that is adapted to rotate in response to the rotation of said shaft, and a sensor cooperating with said reluctor to generate a signal for discriminating between the cylinders of said engine;

said ignition distributor characterized in that the gravity center of said reluctor is located on the rotational axis of said shaft;

said reluctor being an elongated reluctor having one end associating with said sensor to generate said signal, the other end of said reluctor having the shape of a fan so that the two ends balance each other, wherein said fan-shaped end has at least one folded portion.

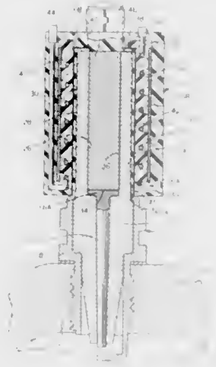
4,903,674

SPARK DEVELOPING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Norris J. Bassett; James A. Boyer, both of Anderson, and John B. Savage, Indianapolis, all of, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 13, 1989, Ser. No. 322,374
Int. Cl.[4] F02P *3/02*
U.S. Cl. 123—634 **20 Claims**

1. Apparatus for developing sparks to ignite the combustible mixture in a cylinder of an internal combustion engine comprising, an internal combustion engine having a cylinder, a secondary spark developing unit comprising a spark plug supported by said engine having a pair of electrodes associated with said cylinder, said spark plug having first insulator means for supporting and for electrically insulating said electrodes from each other and having second insulator means extending axially of said first insulator means, said second insulator means having a bore, a core formed of a magnetic material located within said bore, a secondary coil winding carried by said second insulator means and disposed about said core, the opposite ends of said secondary winding being electrically connected respectively to said electrodes, means for causing a voltage to be induced in said secondary winding which is high enough to cause an arc to be developed across said electrodes comprising a primary winding unit that is a part that is separate from said secondary spark developing unit, said primary winding unit having a bore, and means for supporting said primary winding unit relative to said secondary spark developing unit such that said second insulator means, said secondary winding and said core are located within said bore, said primary winding unit having a primary winding disposed about said bore,



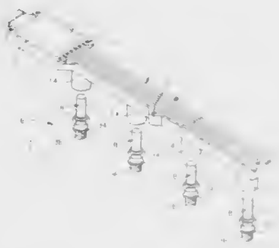
said primary winding when energized developing a magnetic flux that passes through said core to induce said voltage in said secondary winding, said primary winding unit being completely separable from said secondary spark developing unit.

4,903,675

INTERNAL COMBUSTION ENGINE IGNITION APPARATUS HAVING A PRIMARY WINDING MODULE

Dwayne A. Huntzinger, Pendleton; Thomas E. Welsh, Jr., and James A. Boyer, both of Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 13, 1989, Ser. No. 322,373
Int. Cl.[4] F02P *3/00*
U.S. Cl. 123—635 **12 Claims**



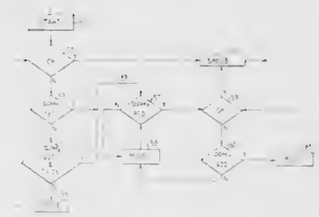
1. A primary winding ignition module that is adapted to be mounted on an internal combustion engine and which is adapted to be magnetically coupled to a plurality of separate spark developing units associated with the cylinders of the engine comprising, an elongated support, a plurality of spaced tubular members carried by said support, a primary coil winding located in each tubular member having a bore, and conductor means carried by said support connected respectively to opposite ends of a respective primary winding for energizing a respective primary winding, said bores adapted to receive portions of said secondary spark developing units when said module is mounted on an engine.

4,903,676

METHOD AND ARRANGEMENT FOR IMPROVING THE STARTING ABILITY OF AN INTERNAL COMBUSTION ENGINE DURING AN ENGINE START

Per Gillbrand, Mariefred; Hans Johansson, and Jan Nytomt, both of Åmål, all of Sweden, assignors to Saab-Scania Aktiebolag, Sweden

Filed Aug. 25, 1988, Ser. No. 236,665
Claims priority, application Sweden, Aug. 28, 1987, 8703330
Int. Cl.[4] F02P *15/08*
U.S. Cl. 123—639 **24 Claims**



1. A method for improving the starting ability of a four-stroke internal combustion engine of the type including an ignition system having a charging circuit for storing charge; a coil for receiving discharges from the charging circuit; and a spark plug having a pair of electrodes spaced by a gap, energized by the coil, and associated with a cylinder containing a piston; the method comprising the steps of:

determining when a difficult engine starting condition exists;

when such difficult engine starting condition is detected, causing the charging circuit to discharge repeatedly across the spark plug gap when a crankshaft of the engine is positioned in a range between a position about 10° before a top-dead center position and about 60° after the top-dead-center position, irrespective of whether the piston is in its compression or exhaust stroke, thereby to produce a spark shower across the plug gap at each exhaust stroke, so as to burn off any deposits on the spark plug electrodes; and

terminating the shower of sparks upon determining that a difficult engine starting condition has ceased.

4,903,677

POWER SPRING BOW

David E. Colley, 1715 Ozora Rd., Loganville, Ga. 30249; Donald G. Fain, 365 Jordan Dr., Tucker, Ga. 30084, and Frederick R. Arnett, 1609 Carter Rd., Decatur, Ga. 30032

Filed Nov. 2, 1988, Ser. No. 266,066
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—23 R **20 Claims**

1. An archery bow, comprising:

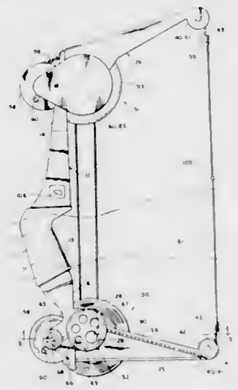
a frame member having means defining a hand grip;

an arm on each end of the frame member and extending outwardly therefrom to a free end;

at least one recoil assembly mounted to said frame member, said recoil assembly including flat wound coil spring means; and

a bow string extended between said arm free ends and having its ends connected to said flat wound coil spring means, whereby movement of said bow string from an at-rest position to a drawn position causes said spring to

wind up, storing energy therein so that release of said bow string results in release of the stored energy in the coil



spring to the string to return it to its initial position and thus propel an arrow nocked therein.

4,903,678

ARCHERY BOW CABLE GUARD

Beeby G. Walker, Rte. #1, Box 136 E, Yoncalla, Oreg. 97499

Filed Jul. 21, 1988, Ser. No. 222,140
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—90 **4 Claims**



1. A cable guard device for attachment to a compound bow having a central hand grip section, upper and lower limbs, a first anchorage and first pulley means at the free end of the upper limb, a second anchorage and second pulley at the free end of the lower limb, a bow string extending between the free ends, a first cable extending from the first anchorage means and about the second pulley means to one end of the bow string, and a second cable extending from the second anchorage means and about the first pulley means to the other end of the bow, the cable guard device comprising:

a rod for mounting on a mid-portion of the central hand grip section to extend rearwardly therefrom generally normal thereto, and to the region of said bow string extending between the free ends of the upper and lower bow limbs, said first and second cables extending between respective ones of the first and second pulley means and respective ones of the second and first anchorage means,

first and second rollers rotatably mounted on the rod in said region of the bow string, the rollers being slidable axially on the rod, each of the rollers having a peripheral groove for guiding engagement with one of the first and second cables,

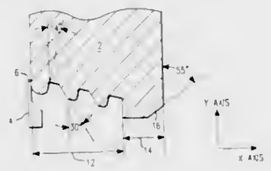
the first and second rollers being of different diameters to maintain the first and second cables in spaced relation radially outwardly of the rod to prevent contact between the first and second cables throughout the length of the cables whereby wear and shortened service life of the oppositely moving cables are prevented, and an annular sound-suppression disk disposed about the rod and between the first and second rollers.

4,903,679

DRESSING OF GRINDING WHEELS

William E. Kiger, Germantown, and Carlos E. Pfaff, King, both of N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 14, 1988, Ser. No. 257,901
Int. Cl.[4] B24B *53/08*
U.S. Cl. 125—11 R **11 Claims**



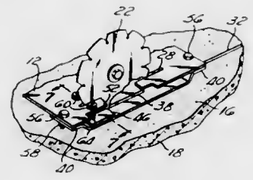
1. In a method for dressing a grinding wheel by advancing a diamond nib adjacent the outer circumference of the wheel while the wheel rotates about its axis, which method includes causing the diamond nib to execute a plurality of passes in a direction parallel to the axis of wheel rotation while displacing the nib perpendicular to the axis of wheel rotation in a pattern corresponding to the profile to be created at the wheel circumference, which profile includes at least one annular groove having at least one side wall which extends in a given angular direction at an angle of no greater than 20, to a plane perpendicular to the axis of wheel rotation, the improvement comprising providing the wheel with a circumferential portion which will not be used for a subsequent grinding operation and forming, by means of the nib, an inclined surface on said circumferential portion which extends in the given angular direction at an angle to a plane perpendicular to the axis of wheel rotation which is greater than the angle of said at least one groove wall in order to create an even wear of the nib.

4,903,680

SKID PLATE FOR CONCRETE SAW

Edward Chiuminatta, 16405 Evrett, and Alan R. Chiuminatta, 18525 Wood Rd., both of Riverside, Calif. 92504

Filed Sep. 15, 1988, Ser. No. 244,939
Int. Cl.[4] B28D *1/04*
U.S. Cl. 125—13 R **43 Claims**



1. A skid plate for a saw that is used to cut grooves in concrete with a rotating cutting blade having a predetermined thickness, the skid plate having a leading end, and opposite thereto, a trailing end, with a slot in the skid plate through which the rotating cutting blade can extend, the slot extending from adjacent the leading end toward the trailing end, comprising:

an aperture at the end of the slot in the skid plate nearest the leading edge;

an insert made of a wear resistant material, the insert being insertable into the aperture, the insert having a slot therein the location of which corresponds to the slot in the skid plate when the insert is inserted into the aperture so as to provide a continuation of at least a portion of the slot in the skid plate, the insert being positioned in the skid plate so that a cutting edge of the cutting blade passes through the slot in the insert, the slot in the insert having a first closed end and a second end that opens toward and encompasses the cutting edge of the cutting blade, with the slot extending less than the entire length of the blade; and

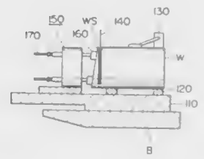
means for retaining the insert in the aperture as the cutting blade passes through the slot in the insert during operation of the saw.

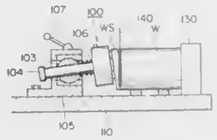
4,903,681

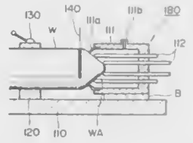
METHOD AND APPARATUS FOR CUTTING A CYLINDRICAL MATERIAL

Katsuo Honda, and Shuichi Tsukada, both of Mitaka, Japan, assignors to Tokyo Seimitus Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1988, Ser. No. 156,748
Claims priority, application Japan, Feb. 24, 1987, 62-40764; Feb. 24, 1987, 62-40765; Feb. 24, 1987, 62-40766; Jan. 6, 1988, 63-1052; Jar. 6, 1988, 63-1053
Int. Cl.[4] B24B *27/06;* **B28D** *1/04*
U.S. Cl. 125—13 R **13 Claims**







3. An apparatus for cutting a cylindrical material in which a blade is rotated to cut the cylindrical material with a base end side thereof being fixed, characterized in that an end face of a cutting side of said cylindrical material is adsorbed and held by adsorbing and holding means before the starting of said cutting, and said cutting of said cylindrical material is performed while maintaining said adsorbing and holding state until said cutting is completed;

wherein said adsorbing and holding means comprises:

a plurality of slide members disposed opposed to said cutting side end face of said cylindrical material with the base end side thereof being fixed;

attraction means for generating adsorbing forces so that said cutting side end face of said cylindrical material can be brought into contact with and held by leading ends of said plurality of slide members;

a cylinder section interposed substantially centrally among said plurality of slide members and at least one piston slidable within said cylinder section;

a plurality of clamp pins disposed so as to extend radially from said cylinder section toward said plurality of slide members;

means responsive to the operation of said piston to transmit pressing forces to said plurality of clamp pins in such a direction in which said plurality of clamp pins press and fix said plurality of slide members;

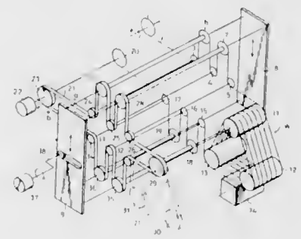
wherein said plurality of slide members are respectively fixed with said leading ends thereof being in contact with said cutting side end face of said cylindrical material in accordance with the shape of said end face.

4,903,682

WIRE SAW

Takayasu Kurokawa, Omihachiman, Japan, assignor to Technoslice Ltd., Kyoto, Japan

Continuation of Ser. No. 44,328, Apr. 30, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,645
Int. Cl.[4] B28D *1/06*
U.S. Cl. 125—16 R **4 Claims**



1. A differential type rotational wire saw having a wire supplied from a wire feeding unit and wound around fixed rollers and at least one movable roller arranged upstream and downstream of a group of working rolls, at least one of which working rolls is driven, and said wire being gradually moved toward a wire withdrawing unit by a reciprocal movement of the wire on the working roll group caused by movements of the movable rollers toward or away from the fixed rollers;

an endless transmission strip for transmitting a drive force to at least one roll of said working roll group and wound around fixed guide rings and at least one movable guide ring moving toward or away from the fixed guide rings upstream and downstream of the working roll group, each fixed roller and each corresponding fixed guide ring, and each movable roller and each corresponding movable guide ring, being connected by parallel connecting rods, respectively;

a size of each fixed roller and a size of each movable roller being defined in such a manner that each portion of the wire between each fixed roller and each adjacent movable roller can be moved in a parallel direction, and a size of each fixed guide ring and a size of each movable guide ring being defined in such a manner that each portion of the endless transmission strip between each fixed guide

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ring and each adjacent movable guide ring can be moved in a parallel direction;

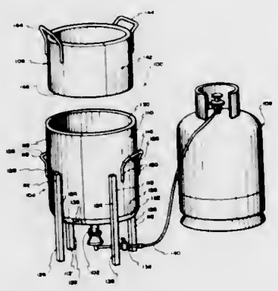
the movement of the at least one movable roller toward or away from the fixed rollers and of the at least one movable guide ring toward or away from the fixed rings upstream of the working roll group, and the movement of the at least one movable roller away from or toward the fixed rollers and of the at least one movable guide ring away from or toward the fixed guide rings downstream of the working roll group are simultaneously performed in a rectilinear direction, by moving simultaneously the at least one movable roller upstream of the working roll group and the at least one movable roller downstream of the working roll group in the same reciprocal direction.

4,903,683

APPARATUS AND METHOD FOR DUTCH OVEN COOKING OVER CHARCOAL

Darwin W. Larsen, 46 W. 1st North, Logan, Utah 84321, and Jack C. Thompson, 75 W. Center, Providence, Utah 84332

Filed Oct. 3, 1988, Ser. No. 253,164
Int. Cl.[4] A47J *37/00*; F24B *3/00*
U.S. Cl. 126—25 B **24 Claims**



1. Self-contained fuel igniting apparatus comprising two separable units, the first separable unit comprising a source of flowable fuel, burner means in communication with the fuel source and comprising volatile fuel dispensing means by which a continuous controlled open flame is sustained, and support means with which the fuel dispensing means of the burner means are associated and means which define an open access to said flame;

the second separable unit transportable basket means comprising porous bottom means into which charcoal articles to be ignited and oxidized are placed and held in contact with the flame during ignition and initial oxidation of the charcoal articles;

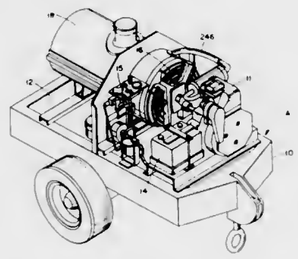
the second separable unit comprising discharge means for placing the ignited charcoal at a first cooking site and the means which define an open access to said flame of first separable unit being such as to accommodate cooking with the first separable unit at a second cooking site after separation of the second separable unit from the first separable unit.

4,903,684

AIR CONTROL SYSTEM FOR A BURNER

Thomas J. Gruber, Mayfield Heights; Dale G. Putnat, Mentor, and Ernest J. Zajaczkowski, Maple Heights, all of Ohio, assignors to Hunter Manufacturing Co., Cleveland, Ohio

Division of Ser. No. 192,390, May 10, 1988, Pat. No. 4,850,853.
This application Apr. 25, 1989, Ser. No. 342,949
Int. Cl.[4] F24H *3/00, 1/00*
U.S. Cl. 126—116 A **8 Claims**



1. A heater apparatus comprising:

a burner housing having a combustion chamber defined therein;

a heat exchanger comprising a plurality of spaced concentric tubes wherein said burner housing extends into an innermost one of said plurality of tubes;

a fan for providing air to said heat exchanger and said burner;

a fuel primary air injection nozzle communicating with said combustion chamber;

a first supply means for admitting fuel and primary air to said nozzle;

a second supply means for admitting secondary air into said combustion chamber;

a first control means for controlling the amount of excess fuel which is to be by-passed around said first supply means in a fuel return line; and,

a second control means for controlling the amount of secondary air which is admitted by said second supply means of said combustion chamber.

4,903,685

VARIABLE EXHAUST CONTROLLER FOR COMMERCIAL KITCHENS

Stephen K. Melink, 6558 Miami Ave., Cincinnati, Ohio 45243

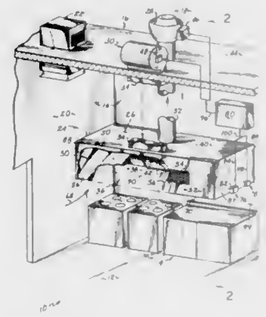
Filed Jan. 24, 1989, Ser. No. 301,538
Int. Cl.[4] F23J *11/02*
U.S. Cl. 126—299 D **42 Claims**

1. A method of controlling the volume rate of air exhausted from a hood adjacent a cooking unit and through an exhaust passage coupled to the hood, the hood positioned to collect heat and cooking by-product generated by the cooking unit, the method comprising:

defining a flow path through the hood and between the cooking unit and the exhaust passage;

sensing outside the flow path a level of cooking by-product escaping from the flow path;

varying the volume rate at which air is exhausted through the exhaust passage in accordance with at least the sensed



level of cooking by-product, whereby to seek to contain cooking by-product within the flow path

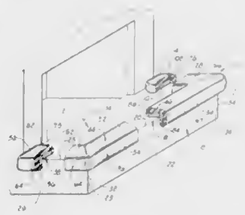
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4,903,686

OUTER HEARTH PAD

Thad Jennings, 11300 Cimarron Rd., Oklahoma City, Okla. 73162

Filed Nov. 9, 1988, Ser. No. 269,474
Int. Cl.[4] F24B *13/02*
U.S. Cl. 126--500 **14 Claims**



1. An outer hearth pad for covering a portion of an outer hearth having an elevated edge comprising:

a frame assembly comprising a plurality of interconnected structural members and having an inner surface and an outer surface, the inner surface being sized for overlaying the elevated edge of the outer hearth; and

a cover assembly connected to the frame assembly and extending over a substantial portion of the outer surface of the frame assembly, the frame assembly with the cover assembly connected thereto being disposable over the elevated edge of the outer hearth and the cover assembly protectively covering a portion of the elevated edge over which it extends when the frame assembly with the cover assembly connected thereto is disposed over the elevated edge, the frame assembly supporting a substantial portion of the cover assembly a distance above the elevated edge.

9. A method for constructing an outer hearth pad for covering a portion of an outer hearth having an elevated edge formed by the intersection between a top surface extending generally in a horizontal plane, and a side surface, extending a distance generally in an upwardly direction and intersecting the top surface to form the elevated edge, wherein the outer hearth pad includes a frame assembly and a cover assembly overlying the outer surface of the frame and secured to the frame assembly comprising the step of:

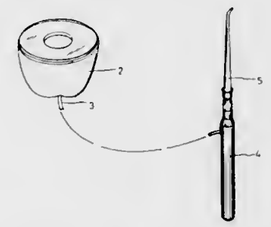
sizing the frame assembly with the cover assembly connected thereto so a portion of the outer hearth pad extends over a portion of the side surface generally adjacent the elevated edge and so another portion of the outer hearth pad extends over a portion of the top surface generally adjacent the elevated edge and so the outer hearth pad interferingly fits over the elevated edge for cooperating to retain the outer hearth pad connected to the outer hearth.

4,903,687

PORTABLE DENTAL CLEANING SYSTEM

Ke Lih-Sheng, No. 14, Lane 561, Chong Shang Rd., Sha Lu Village, Taichong County, Taiwan

Filed Aug. 18, 1988, Ser. No. 233,605
Int. Cl.[4] A61H *9/00*; A61G *17/02*
U.S. Cl. 128—66 **4 Claims**



1. A portable dental cleaning system for controlling water velocity and pressure passing from a water jet tip member comprising:

(a) a hollow apple-shaped lower housing forming an internal reservoir chamber, said lower housing having an upper substantially planar wall member having an upper through opening formed therethrough, said lower housing further including a lower wall member having a lower through opening formed therethrough, said upper through opening having mounted therein a washer member secured to said planar wall member and having a central opening formed therethrough for forced fit insert of one end of a water faucet, said lower through opening being coupled to a liquid conduit member;

(b) an apple-shaped upper housing removably coupled to said lower housing, said lower housing having a shoulder adjacent said upper plane wall for matingly interfacing with said upper housing, whereby said upper housing and said lower housing are coupled when said portable dental system is non-operational to provide a substantially closed contour system when being stored; and,

(c) a liquid passage member secured to said liquid conduit member for receiving liquid from said lower housing for egress through a water jet tip outlet member.

4,903,688

TOOTH CLEANING TOOTHBRUSH AND SYSTEM

Kenneth Bibby, 222 Codman Rd., Norwood, Mass. 02062, and Frank R. Ring, Jr., 477 East St., Walpole, Mass. 02081

Continuation of Ser. No. 151,451, Feb. 2, 1988, abandoned. This application May 11, 1989, Ser. No. 352,712
Int. Cl.[4] A61H *9/00*; A61G *17/02*
U.S. Cl. 128—66 **8 Claims**

1. A system for the removal of plaque and other unwanted debris from the teeth of a user comprising

a toothbrush comprising

a handle,

a distal head, and

a multiplicity of bristles each comprising a shaft having a base associated with a surface of said head, said shaft extending away from said surface and terminating in a proximal end disposed in relation to proximal ends of other said shafts for mutual engagement with teeth

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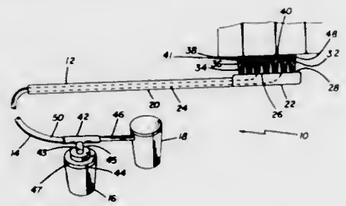
surfaces of a user, said multiplicity of bristles defining a multiplicity of interconnected restricted flow pathways therebetween.

said surface of said head defining an orifice surrounded by the bases of said bristles,

means defining a conduit having a distal end terminating in said orifice,

said bristles, in combination with said surface of said head and said teeth surface, forming an enclosed volume,

a source of low pressure air associated with the proximal end of said conduit for supplying a flow of low pressure air through said conduit and said orifice into said enclosed volume,



means for dispersing liquid in said multiplicity of interconnected restricted flow passageways between said bristles to form a moist environment within said closed volume,

means for delivering said flow of air from said orifice to combine with the liquid dispersed in said pathways between said bristles in a manner to form a multiplicity of small, air-containing bubbles within said pathways, and

means for directing said air-containing bubbles along said pathways and means for driving said air-containing bubbles to burst with impulsive force against the engaged teeth surfaces in a manner to remove plaque and other debris from said teeth surfaces.

4,903,689

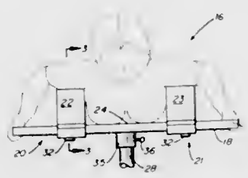
SHOULDER SUPPORT SYSTEM WITH BREAST STRESS RELIEVER FOR A CHIROPRACTIC OR MEDICAL TREATMENT OR MASSAGE TABLE

Marc W. Lannertone, 433 E. Napa St., Sonoma, Calif. 95476

Continuation-in-part of Ser. No. 154,915, Feb. 11, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 299,756

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—72 13 Claims



1. A chiropractic treatment table, comprising:

a table substructure,

patient support means for supporting a recumbent patient, said support means being mounted on said substructure and having a normally flat patient support surface for support of most of the body of the patient with a first well leading down therethrough and a pair of guide means extending laterally thereacross so that said first well lies between said guide means,

means for reducing stress on the chest or breast area of a patient comprising a pair of separated shoulder support means, each having support surfaces and being movably supported by said guide means for supporting a patient's upper body by the shoulders when the patient is lying on the table,

means mounting said shoulder support means on said guide mass for movement laterally apart from each other along said guide means to provide in said first well between them a recess the size of which is varied by moving said shoulder support means,

whereby a patient can lie face down on said patient support means and be supported by the body with the shoulders resting on the support surfaces of the shoulder support means and, where the patient is a woman, her breasts will rest in said recess between said support surfaces, to provide breast stress relief.

4,903,690

SPINAL ORTHOTIC DEVICE AND METHOD OF USING SAME

Clayton J. Campbell, 17181 Eastview Dr., Chagrin Falls, Ohio 44022

Filed Sep. 14, 1988, Ser. No. 244,091

Int. Cl.[4] A61F *5/01*

U.S. Cl. 128—78 2 Claims



1. The method of treating vertebral subluxation complex of the human spine comprising the steps of:

(a) providing permanent lightweight one-piece containment means for the region of the spine to be treated;

(b) freely positioning the region of the spine to be treated within the confines of said containment means without restraint;

(c) interposing a pliable membrane means between said containment means and said region of the spine to be treated;

(d) placing an exothermic reacting expanding polymer foam in said containment means in the area approximated by the region of the spine to be treated;

(e) permitting said polymer foam to expand between said containment means and said membrane and to apply corrective pressure to said region of the spine to be treated;

(f) permitting said polymer foam to form an impression of said region of the spine to be treated without permitting said polymer foam to immobilize the patient;

(g) permitting said polymer foam impression to solidify while in corrective pressure contact with said region of the spine to be treated, without restrictively enveloping any portion of the body;

(h) freely removing said portion of said spine to be treated from the confines of said impression after a period of from approximately fifteen to forty-five minutes; and

(i) freely repositioning said region of the spine to be treated on said containment reinforced impression for a period of from five to forty-five minutes daily to correct any dysfunction which may have occurred since the previous use of said reinforced impression.

4,903,691

SET OF SURGICAL INSTRUMENTS FOR JOINING BONE FRAGMENTS

Thomas Heinl, Rottendorfer Strasse 22a, D-8708 Gerbrunn, Fed. Rep. of Germany

Filed Jan. 21, 1987, Ser. No. 5,718

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3601715

Int. Cl.[4] A61F *5/04*

U.S. Cl. 606—70 37 Claims



1. An assembly for joining bone fragments by osteosynthesis for cranial, facial, vertebral nor hand fractures, comprising:

a plurality of plates of various shapes and curvatures, each plate of said plurality of plates having one or more holes therein,

a plurality of screws for joining two or more bone fragments to one another with plates of said plurality of plates with each screw of said plurality of screws having a head with an equator which is formed as a cylindrical sleeve, said plurality of screws to communicate with the holes of said plurality of plates; and

screwdriver means, having a blade and a handle, for joining bone fragments to one another with said plurality of plates by means of said plurality of screws.

4,903,692

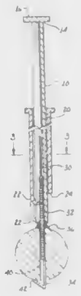
BONE CLAMP INSTALLATION TOOL

Hewitt W. Reese, 1940 E. Southern Ave., Tempe, Ariz. 85282

Filed May 8, 1989, Ser. No. 348,593

Int. Cl.[4] A61F *5/04*

U.S. Cl. 606—99 6 Claims



1. A bone clamp installation tool, comprising:

a hollow barrel;

a hollow piston having a longitudinal slot at least at the lower end thereof, said piston having disposed therein a shank end and at least one of a plurality of truncated cones of a bone clamp, said bone clamp having a locking button thereon engagable with successive cones that is seated against an open end of said piston, said piston being manually adjustably slideably disposed within said barrel; and

means on said barrel positioned in said slot for engaging said at least one cone to cause motion of said shank relative to said button.

4,903,693

XENON INHALATION APPARATUS

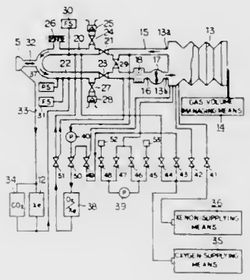
Naoto Yasue, Yokohama, Japan, assignor to Anzai Sogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 125,459, Nov. 24, 1987, abandoned. This application Jul. 14, 1989, Ser. No. 379,716

Claims priority, application Japan, Aug. 19, 1987, 62-204266

Int. Cl.[4] A61M *15/00*

U.S. Cl. 128—203.12 11 Claims



1. A diagnostic gas inhalation apparatus for introducing a mixed gas of a diagnostic gas and oxygen into the lungs of a patient, which apparatus comprises:

a respiration face mask for introducing the mixed gas into the lungs of a patient;

a mixed gas circulating system having a variable volume chamber having an exhalation port and an inhalation port and which is for holding a volume of mixed gas therein, and conduit means including an inhalation and exhalation tube extending in a loop between said exhalation port and said inhalation port, and a respiration tube branched from said inhalation and exhalation tube and extending to said respiration face mask, said inhalation and exhalation tube being free of check valves;

gas flow rate control means connected to said conduit means for controlling the flow rate of the mixed gas in the inhalation and exhalation tube, said gas flow rate control means including a blower connected in said inhalation and exhalation tube between said respiration tube and said inhalation port for flowing gas toward said inhalation port, and gas flow sensors connected to said inhalation and exhalation tube at positions immediately upstream and downstream of said respiration tube for sensing gas flow through said inhalation and exhalation tube in response to respiration of the patient and connected to said blower for controlling the speed of said blower for maintaining flow in said inhalation and exhalation tube in response to the sensed flows in a direction from said exhalation port to said inhalation port;

diagnostic gas concentration detecting means connected to said respiration face mask for detecting the concentration of diagnostic gas in the gas flowing into said respiration face mask;

diagnostic gas supplying means for supplying diagnostic gas into said mixed gas circulating system; and

oxygen supplying means for supplying oxygen into said mixed gas circulating system.

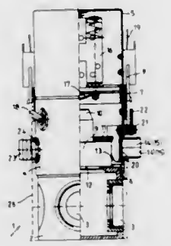
VOL 1111 ISS 4 FE 27 1990 UMI

4,903,694

VENTILATING APPARATUS FOR A PROTECTIVE SUIT

Volker Hager, Vienna, Austria, assignor to J. Blaschke Pumpen-Filteranlagen, Vienna, Austria

Filed Mar. 9, 1989, Ser. No. 321,280
Claims priority, application Austria, Mar. 9, 1988, 623/88; Jan. 16, 1989, 75/89
Int. Cl.[4] A61M 16/00
U.S. Cl. 128—204.15 9 Claims



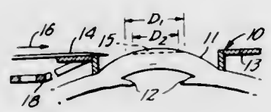
1. In a ventilating apparatus for ventilation of a protective suit comprising a blower driven by an electric motor mounted in a portable housing, said blower having a vacuum side and a high pressure side, and a connector for connection to said protective suit on said high pressure side of said blower, the improvement comprising a plurality of said connectors on said high pressure side of said blower having different flow rates.

4,903,695

METHOD AND APPARATUS FOR PERFORMING A KERATOMILEUSIS OR THE LIKE OPERATION

John W. Warner, Newtown, Conn., and Francis A. L'Esperance, Jr., Englewood, N.J., assignors to LRI L.P., New York, N.Y.

Filed Nov. 30, 1988, Ser. No. 278,272
Int. Cl.[4] A61N 5/06
U.S. Cl. 606—4 13 Claims



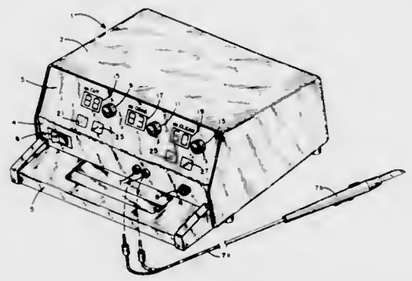
1. The method of changing optical properties of an eye by operating upon the cornea without invasion of the optically used central area of the anterior surface of the cornea, which method comprises surgically separating a lenticle from the anterior of the cornea at a circumferential intercept which is substantially concentric with the optical axis of the eye but which externally surrounds the optically used central area, thus exposing within said central area only stroma tissue of a remaining body of the cornea, the surgical separation of the lenticle being substantially in a single radial plane about the axis optical of the eye, and the separation being via a diametral cutting displacement which enters the cornea on one side of the axis optical of the eye and which fully traverses the optically used central area and terminates prior to completion of separation, whereby a relatively narrow flexible tissue connection exists between the lenticle and the remaining body of the cornea; hingedly removing the lenticle via articulation about said flexible connection; selectively applying tissue-ablating laser radiation to thus-exposed stroma tissue while the lenticle is thus removed, said tissue-ablating laser radiation being with depth penetration solely into stroma tissue and to a predetermined curvature profile; and, after laser-ablating exposure, replacing the lenticle via return articulation about said flexible connection, whereby fidelity of replaced-lenticle orientation is assured by said connection.

4,903,696

ELECTROSURGICAL GENERATOR

Peter Stasz, Moundsview, Minn., and Scott R. Grabinger, Maple Grove, Mass., assignors to Everest Medical Corporation, Brooklyn Center, Minn.

Filed Oct. 6, 1988, Ser. No. 254,203
Int. Cl.[4] A61B 17/39
U.S. Cl. 606—37 8 Claims



1. Electrosurgical apparatus of the type comprising an electrosurgical blade secured in a blade supporting handle, said blade carrying a cutting electrode, a coagulating electrode and a common electrode, said handle including at least two manually operable switches for initiating the application of an RF voltage between said cutting electrode and said common electrode or between said coagulating electrode and said common electrode and an ultrasonic transducer for imparting vibrations to said blade, an improved electrosurgical generator comprising:

(a) signal source means for producing radio frequency signals alternating in polarity about a zero voltage axis;

(b) a first power amplifier circuit having an input terminal and a plurality of output terminal means for connection to said electrodes;

(c) first gated switch means coupled to receive radio frequency signals from said signal source means and deliver, when enabled, said radio frequency signals to said input terminal of said first power amplifier circuit;

(d) means associated with said two manually operable switches on said handle for selectively generating a "cut" control pulses signal and a "coag" control pulse signal, said control pulse signals having a leading and a trailing edge;

(e) means for synchronizing the leading edge of said "cut" and "coag" control pulse signals with the crossings of said zero voltage axis by said radio frequency signals; and

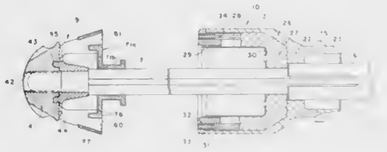
(f) means coupling the synchronized "cut" and "coag" control pulse signals to said first gated switch means for enabling said gated switch means at a time when said radio frequency signals are at a zero voltage level.

4,903,697

CARTRIDGE ASSEMBLY FOR A SURGICAL STAPLING INSTRUMENT

Semion Resnick, 47b Deganmiot Street, Kiriat Tivon 36 000, and Jacob Goldman, Naharya, both of Israel, assignors to Semion Resnick, Kiriat Tivon, Israel

Continuation of Ser. No. 110,047, Oct. 15, 1987, abandoned, which is a continuation of Ser. No. 844,949, Mar. 27, 1986, Pat. No. 4,700,703. This application Sep. 1, 1988, Ser. No. 240,346
Int. Cl.[4] A61B 17/10
U.S. Cl. 227—178 4 Claims



1. A disposable cartridge assembly for a surgical stapling instrument and comprising:

a staple carrying component mounted on an elongated tubular element and having one or more annular arrays of staples surrounding a cylindrical scalpel and having a cylindrical scalpel knife edge disposed adjacent to and inwardly of the staples, said staple carrying component being furthermore provided with a staple and scalpel driver;

an anvil carrying component mounted on said elongated tubular element so as to be capable of relative movement towards and away from the staple carrying component and having an annular anvil surface formed with one or more annular arrays of staple clinching grooves and including an annular element located inwardly of said clinching grooves and penetrable by said scalpel knife edge;

a cylindrical bushing formed integrally with said annular element surrounding said elongated tubular element and extending therefrom in the direction of said staple carrying component so that when the components are brought together, the bushing extends into a narrow hollow space of the staple carrying component;

said anvil carrying component furthermore comprising constituent anvil elements articulated with respect to each other and presenting said annular anvil surface, each segment being integrally secured at one end thereof to a central hub portion by a relatively flexible linkage and being formed at an opposite end thereof with a component anvil surface, said component anvil surfaces together forming said annular anvil surface;

biasing means for biasing said elements into a retracted position wherein said annular anvil surface has a first diameter;

a locking element for releasable interengagement with said anvil elements so as to maintain them in an expanded position against a biasing force exerted by said biasing means wherein said anvil surface has a second larger diameter and so as to lock said elements against relative displacement so that upon disengagement of said locking element from said anvil elements, the latter are displaced under said biasing force into said retracted position;

each anvil segment being formed adjacent said opposite end with a slot which together form a groove, said locking element being constituted by said annular element adapted to fit into said groove so as to maintain said segments in their expanded position, said annular element being furthermore formed with a succession of tooth like projections adapted to project into the spaces between the segments thereby to prevent movement of the segments with respect to each other.

4,903,698

PACIFIER STRAP AND FASTENER FOR ATTACHMENT TO A GARMENT

Gloria L. Huber, 10537 Caminito Memosac, San Diego, Calif. 92131, and Lawrence L. Lee, 3776 Martha St., San Diego, Calif. 92117

Filed Mar. 20, 1989, Ser. No. 325,868
Int. Cl.[4] A61J 17/00
U.S. Cl. 606—235 7 Claims



1. A tether for an infant's pacifier of the like, comprising:

an elongated strap having opposite first and second ends;

first attachment means at said first end for detachable attachment to a pacifier; and

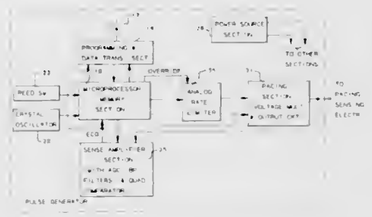
opposed finger clip means comprising a flat panel of substantially rigid material having a pair of spaced apart parallel slots extending side by side and connected by an irregular cut at the center thereof for defining a pair of normally aligned opposed fingers with serrated tips lying in the plane of said panel said finger clip means being attached to the second end of said strap for detachable attachment to clothes.

4,903,699

IMPLANTABLE CARDIAC STIMULATOR WITH AUTOMATIC GAIN CONTROL

Ross G. Baker, Jr., Houston; Edward A. Haluska, Angleton, and Joseph W. Vandgriff, Freeport, all of Tex., assignors to Intermedics, Inc., Angleton, Tex.

Filed Jun. 7, 1988, Ser. No. 203,493
Int. Cl.[4] A61N 1/36
U.S. Cl. 128—419 PG 3 Claims



1. An implantable cardiac stimulator for detecting cardiac cycles by analyzing electrical signals produced by the heart, comprising:

means for detecting electrical signals produced by the heart; and

amplifier means responsive to the detected signals and having dual signal paths for said detected signals, one of said paths having a feedback loop with means for automatically adjusting the gain of the amplifier means, the other

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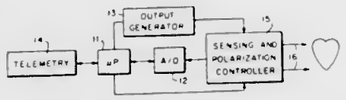
said signal paths enables the determination of a sensing level, said means for automatically controlling the gain including an algorithm controlling gain requiring a ratio of greater than 1 to 1, said algorithm controlling gain requiring sensing of two lows in a row to increase gain and sensing one high to decrease gain whereby the gain and threshold relationships between said dual signal paths maybe altered to produce variable sensing margins.

4,903,700

PACING PULSE COMPENSATION

Robert H. Whigham, Aurora, and Tibor A. Nappholz, Englewood, both of Colo., assignors to Telectronics N.V., Curacao, Netherlands Antilles

Division of Ser. No. 891,479, Aug. 1, 1986, Pat. No. 4,821,724. This application Dec. 13, 1988, Ser. No. 283,609
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 PG **14 Claims**



1. A method of minimizing the after-potential at a pacing electrode of a cardiac pacemaker following the generation of a pacing stimulus, comprising the steps of:

(a) sensing cardiac activity by coupling the stimulating and reference electrodes of the pacemaker to the inputs of a differential amplifier,

(b) while sensing cardiac activity, maintaining a quiescent voltage across a capacitor coupled to the stimulating electrode which is equal to the offset voltage of the differential amplifier,

(c) generating a triphasic stimulus whose first and third phases are of one polarity, and whose second phase is of the other polarity,

(d) delivering the first and second phases of the stimulus through said capacitor, with said first and second phases having voltage drives which are substantially proportional to each other, and with the first phase beginning with the quiescent voltage across the capacitor, and

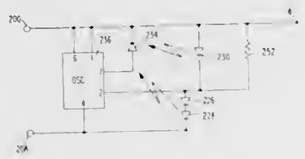
(e) for the third phase using the voltage across the capacitor to drive a current through the capacitor and the stimulating electrode until the voltage across the capacitor equals said quiescent voltage.

4,903,701

OXYGEN SENSING PACEMAKER

Alan A. Moore, Blaine, and Dennis A. Brumwell, Bloomington, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 58,300, Jun. 5, 1987, Pat. No. 4,750,495. This application Mar. 10, 1988, Ser. No. 166,591
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **3 Claims**



1. A cardiac pacemaker comprising:

pulse generator means for generating stimulating pulses at a controlled frequency; and

lead means for implantation into the vascular system in contact with the blood stream of the patient, said lead means comprising a two wavelength reflectance oximeter including a first light source for generating light at a first frequency, a second light source for generating light at a second frequency, and a light responsive means responsive to light generated by said first and second light sources as reflected by said blood stream, said oximeter requiring a power input for operation and including means for generating an information signal indicative of the amount of said light from both said first and second light sources reflected by said blood stream;

said lead means further comprising means for carrying power to said oximeter and for carrying said information signal from said oximeter, said conductor means consisting of only two mutually insulated electrical conductors; and

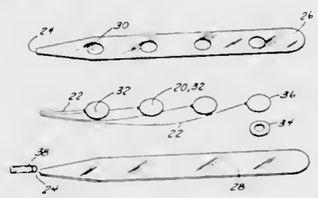
wherein said pulse generator means provides a power input to said oximeter and includes means responsive to said information signal from said oximeter for varying said controlled frequency of said stimulating pulses.

4,903,702

BRAIN-CONTACT FOR SENSING EPILEPTOGENIC FOCI WITH IMPROVED ACCURACY

David A. Putz, Racine, Wis., assignor to Ad-Tech Medical Instrument Corporation, Racine, Wis.

Filed Oct. 17, 1988, Ser. No. 286,763
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—642 **20 Claims**



1. In an electrical brain-contact device for sensing and mapping electrical epileptogenic discharges within the brain of the type having a dielectric base member and an array of electrical sensing contacts mounted thereon in spaced fashion with separate leads extending therefrom, the improvement comprising a radiopaque dielectric material adjacent to at least one of the sensing contacts whereby the intracranial positions of the sensing contacts of the array may readily be determined by x-ray without effect on the electrical sensing qualities of the sensing contacts.

4,903,703

CONVERSATION DEVICE OF MR IMAGING APPARATUS

Yoshiki Igarashi, and Tuyosi Shudo, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 18, 1988, Ser. No. 195,296
Claims priority, application Japan, May 19, 1987, 62-121600
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—653 A **8 Claims**

1. A magnetic resonance imaging apparatus provided with a conversation device, comprising:

a magnet for generating a static magnetic field;

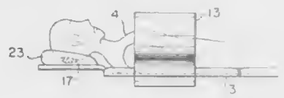
a gradient field coil disposed between a pair of pole pieces of the magnet for generating a gradient magnetic field, the gradient magnetic field being used for endowing a nuclear magnetic resonance signal with positional information;

high-frequency transmitting and receiving coils disposed in the gradient field coil for transmitting an electromagnetic wave and for detecting the nuclear magnetic resonance signal, respectively;

means for forming a magnetic resonance image based on the nuclear magnetic resonance signal;

bed means, disposed in the high-frequency transmitting and receiving coils, for holding a person to be inspected by the magnetic resonance imaging apparatus;

an auxiliary member mounted on the bed means for keeping a portion of the to-be-inspected person in a predetermined position on the bed means; and



a communication system for realizing a conversation between the to-be-inspected person and an operator of the magnetic resonance imaging apparatus, the communication system including:

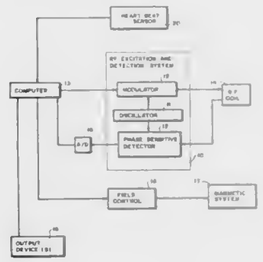
a bone conduction microphone mounted on the auxiliary member so that the bone conduction microphone can be kept in contact with that portion of an upper half part of the to-be-inspected person which can conduct the voice of the to-be-inspected person by a bone, the bone conduction microphone being substantially insensitive to a magnetic field and surrounding noise.

4,903,704

METHOD AND APPARATUS FOR MR IMAGING

Johannes M. Van Eggermond, Bridgeport; Russell Whitman, II, Ansonia; Abraham Naparstek, Orange, and Stamatis M. Rombotis, Huntington, all of Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed Aug. 14, 1986, Ser. No. 896,547
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—653 A **14 Claims**



1. Apparatus for in vivo measurement of magnetic resonance characteristics of biological tissue which is subject to a cyclic physical variation comprising:

means for sensing the cyclic variation and for producing control signals representative thereof;

means responsive to the control signals which synchronize the application of magnetic resonance-exciting fields to the tissue with the cyclic variation;

means for acquiring magnetic resonances data from the tissue in response to the resonance-exciting fields and for employing the data so acquired to calculate the magnetic resonance characteristic;

means which respond to an irregularity in the period of the cyclic variation which cause the means for acquiring data to cease data acquisition during, and for a period of M cycles after the end of the irregularity while, at the same time, allowing the continued application of the resonance-exciting fields; and

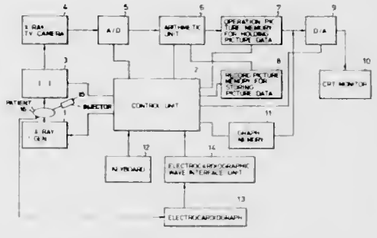
means which determine the end of the irregularity and the M following cycles and which cause the means for acquiring data to then reacquire any data which was actually acquired during a predetermined number, N, cycles prior to the start of said irregularity and to utilize said reacquired data in the calculation of said magnetic resonance characteristic.

4,903,705

DIGITAL RADIOGRAPHY APPARATUS

Kazushi Imamura, Kashiwa, and Masami Kamiya, Noda, both of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 259,426
Claims priority, application Japan, Nov. 9, 1984, 59-236050
Int. Cl.[4] A61B *6/00*
U.S. Cl. 128—654 **4 Claims**



1. A digital radiography apparatus comprising:

electrocardiographic wave detecting means for detecting electrocardiographic waves of a subject before and during an x-ray photographing operation, and means for converting the waveforms of the electrocardiographic waves into signals for display;

contrast medium injection means for injecting contrast medium into a portion of the subject to be photographed with x-rays;

x-ray photographing means for irradiating the subject with X-rays and generating an optical X-ray image of the portion of the subject to be photographed;

means for controlling said contrast medium injection means and said X-ray photographing means and generating images at predetermined times both before and after injection of the contrast medium into the subject;

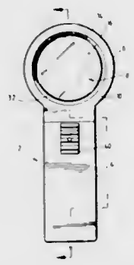
means for converting the X-ray images before and after injection of the contrast medium into the subject into television signals in time-series;

means for successively converting the television signals to digital signals and performing a subtraction operation between the digital signals before and after injection of the contrast medium into the subject;

display means for displaying a resultant X-ray image obtained through the subtraction operation and the waveform of the electrocardiographic wave detected by said electrocardiographic wave detecting means; means for inputting a marker on the displayed waveform of the electrocardiographic wave with a cursor; and

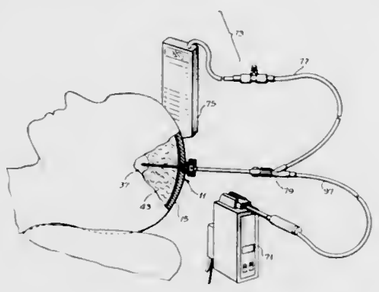
means for detecting a specific wave phase in the electrocardiographic wave and setting the timing for the X-ray photographing operation based upon the position of the cursor relative to the position of the specific wave phase.

4,903,706
UNIDIRECTIONAL OCCLUDER
Alejandro A. Vila-Cora, Madrid, Spain, and Antonio A. Vila-Cora, Houston, Tex., assignors to Board of Reagents, The University of Texas System, Austin, Tex.
Filed Jan. 13, 1988, Ser. No. 143,660
Int. Cl.[4] A61B *3/00*
U.S. Cl. 128—745 **15 Claims**



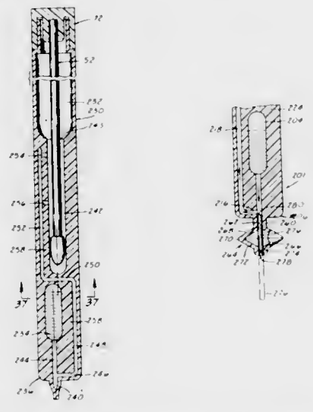
1. An ophthalmologic occluder apparatus comprising:
(a) a support; and
(b) means, connected to the support, for occluding at least one eye of an individual while permitting observation of ocular movements of the occluded eye, said occluding means including—
a disk mounted on the support, the disk formed of a reflective transparent material and having two sides; and
means connected to the support for opaquing one side of the disk relative to the other.

4,903,707
VENTRICULAR CATHETER ASSEMBLY
Wallace L. Knute, Leucadia, and Stephens Sato, Del Mar, both of Calif., assignors to Camino Laboratories, San Diego, Calif.
Filed Apr. 22, 1988, Ser. No. 185,173
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—748 **12 Claims**



1. A ventricular catheter assembly for monitoring a brain parameter through an opening in a skull of a living patient, the catheter assembly comprising:
bolt means having an elongated chamber therethrough, a proximal extremity, and a distal extremity adapted for insertion into an opening in the skull in sterile relation;
a catheter disposed through the chamber in the bolt means, and including a lumen, and a flexible distal extremity for penetrating a ventricle of the brain, the flexible extremity having an opening from the lumen to the exterior of the flexible distal extremity; and
clamping means connected to the proximal extremity of the bolt means and operative to forcibly engage the catheter and constrain the catheter against movement relative to the bolt means such that a predetermined depth of insertion of the catheter into the brain can be maintained.

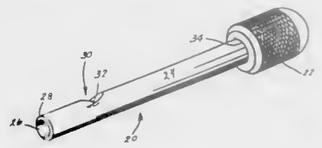
4,903,708
SWAB TRANSPORT SYSTEM
Elmer F. Saint-Amand, Canyon Country, Calif., assignor to Saint-Amand Manufacturing Co., Inc., San Fernando, Calif.
Continuation-in-part of Ser. No. 107,408, Oct. 13, 1987, Pat. No. 4,813,432. This applicatioo Dec. 23, 1988, Ser. No. 288,987
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—749 **9 Claims**



1. A swab transport apparatus for containing and transporting a swab of the character having an elongated stem and a bibulous swab material carried proximate one end of the stem, said apparatus comprising an elongated plastic body having a longitudinally extending axis, resiliently deformable side walls and first and second ends, said body being open at said first end and including:
(a) a first elongated chamber located proximate to and communicating with said first open end for receiving at least a portion of the swab;
(b) a second chamber having resiliently, deformable side walls for containing fluid therewithin, said second chamber being axially offset and longitudinally displaced from said first chamber;
(c) a reduced diameter portion disposed intermediate said first and second chambers, said reduced diameter portion being in communication with both said first and second chambers; and
(d) a tubular segment disposed proximate said second end of said body, said segment having a fluid passageway extending therethrough for interconnecting said second chamber with atmosphere.

4,903,709
BIOPSY METHOD
Bruce A. J. Skinner, 115 Lipton Road, Sault St. Marie, Ontario, Canada (P6A 3W2)
Division of Ser. No. 247,169, Sep. 21, 1988, Pat. No. 4,873,991. This application Jun. 21, 1989, Ser. No. 369,697
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—754 **12 Claims**

1. A method for sampling body tissue comprising:
providing a biopsy needle having a sidewall defining a hollow interior portion, a sharpened end associated with said sidewall for severing the tissue as the needle is inserted, and a lanced section disposed along said sidewall, said lanced section being formed from material of said sidewall itself and defining a rearwardly sloping, rearwardly facing blade penetrating said hollow interior portion;
inserting said biopsy needle into the tissue;
severing said tissue with said sharpened end;



passing said tissue into said hollow interior; and
slicing off a tissue sample with said rearwardly sloping, rearwardly facing blade by rotating said needle and said blade 360 degrees;
withdrawing said needle and said tissue sample from said body.

4,903,710
SURGICAL ISOLATION DRAPES
John G. Jessamine, 34 Waterloo Road, Workingham, Berkshire, RG11 2JH, United Kingdom, and Martin Taube, 21 Swiss Valley, Llanelli, Dyfed, Wales
Filed Jan. 5, 1988, Ser. No. 141,475
Claims priority, application United Kingdom, Jan. 6, 1987, 8700160
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—849 **13 Claims**



1. A surgical drape for use in urological, gynaecological or proctorlogical surgical procedures or examination of patients, comprising a sheet of flexible transparent or translucent plastics material, one end of the sheet being provided with means for attaching the sheet to the patient's legs, so that the remainder of the sheet hangs down therefrom, the sides of the sheet in the region of the end remote from that provided with leg attachment means being provided with means to enable the sides to be joined, to form the remote region of the sheet into a funnel which is open at both ends, and a central part of the sheet being provided with apertures sealed by flexible members which permit passage of the surgeon's hands.

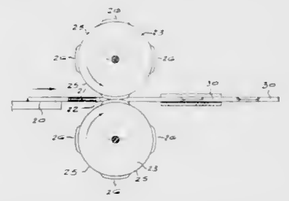
4,903,711
DEVICE FOR PREVENTING INFANT COLIC
Roland E. Gunther, R.D. 1 - Box 282, New Berlin, N.Y. 13411
Filed Oct. 21, 1988, Ser. No. 260,527
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—874 **11 Claims**

1. A device for preventing infant colic and stomach discomfort, said device comprising:
means for attachment to said infant; and
means in operative relationship with said attachment means for visually indicating the position of said infant's torso with respect to vertical, wherein said indicating means



include indicia for visually displaying a range of desirable positions with respect to vertical for said infant's torso during nursing by said infant, whereby collection of air in the infant's stomach and intestine can be reduced or avoided.

4,903,712
CIGARETTES AND METHODS OF MAKING THEM
Mauritz L. Strydom, Stellenbosch, South Africa, assignor to Tobacco Research and Development Institute Limited, Switzerland
Continuation of Ser. No. 60,975, Jun. 17, 1987, abandoned, which is a continuation of Ser. No. 809,734, Dec. 17, 1985, abandoned. This application Jun. 13, 1989, Ser. No. 366,296
Claims priority, application South Africa, Dec. 19, 1984, 84/9891; Nov. 14, 1985, 85/8737
Int. Cl.[4] A24C *5/14, 5/18*
U.S. Cl. 131—84.1 **3 Claims**



1. A method of making cigarettes each of which incorporates a hollow tobaccoless region surrounded by air-impervious material characterized in that a continuous strip of an air-impervious combustible material is formed into a tube, the tube is nipped at equally spaced intervals to form a string of chubs closed at each end, the string thus formed is fed into the chimney of a cigarette making machine for a continuous cigarette rod to be formed around the string, the rod is cut into sections at alternate nip positions, a filter is joined to each section and the filter tipped sections are cut into individual cigarettes with an end of a chub adjacent a filter, so that each section contains a pair of chubs and each cigarette has a chub in it.

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4,903,713

CONVEYOR SYSTEM FOR ROD-LIKE ARTICLES

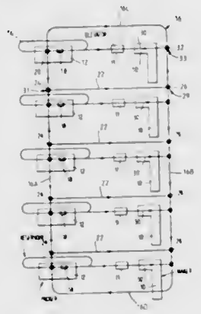
Peter A. Clarke, High Wycombe, England, assignor to Molins PLC, London, England

Continuation of Ser. No. 168,435, Mar. 15, 1988, abandoned. This application Jun. 29, 1989, Ser. No. 373,669

Claims priority, application United Kingdom, Mar. 17, 1987, 8706321; Apr. 16, 1987, 8709263

Int. Cl.[4] A24C *5/35, 5/14*; **B65G** *1/00, 37/00*

U.S. Cl. 131—283 **23 Claims**



1. A conveyor system for rod-like articles of the tobacco industry, comprising a plurality of delivery device, a plurality of receiving devices, conveyor means for conveying said articles between said delivery devices and receiving devices, said conveyor means defining a path for conveying said articles, and means for preventing passage of said articles along at least a portion of said path at selected times, whereby when said preventing means is in operation said articles can be conveyed by said conveyor means on different parts of said path and remain segregated, wherein said delivery devices and receiving devices are arranged in a plurality of combinations, each of said combinations comprising at least one delivery device and at least one receiving device, said conveyor means including first means for conveying said articles on a relatively direct path between said delivery devices and receiving devices in each of said combinations and second means for conveying said articles between different combinations, said second means including a closed loop path which is separate from any of said direct paths.

4,903,714

SMOKING ARTICLE WITH IMPROVED MOUTHEND PIECE

Russell D. Barnes, Belews Creek; Gary R. Shelar, Greensboro, both of N.C.; Edward P. Bullwinkel, Roswell, Ga.; William F. Cartwright, Roswell, Ga.; Leon E. Chambers, Jr., Roswell, Ga.; Donald F. Durocher, Roswell, Ga.; Robert G. Geer, Woodstock, Ga.; Loyd G. Kasbo, and Fred R. Radwanski, both of Norcross, Ga., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 25, 1987, Ser. No. 89,692

Int. Cl.[4] A24D *1/00, 3/04*

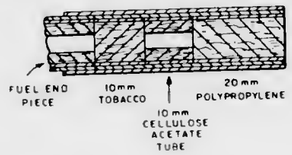
U.S. Cl. 131—335 **51 Claims**

1. A cigarette-type smoking article comprising:

(a) a fuel element;

(b) a physically separate aerosol generating means longitudinally disposed behind the fuel element including at least one aerosol forming material; and

(c) means for delivering the aerosol produced by the aerosol generating means to the user, the delivery means including a segment formed from non-woven thermoplastic fibers.



4,903,715

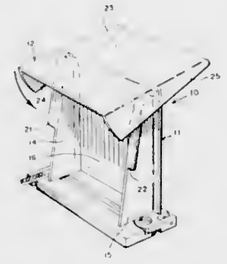
HAIR FROSTING PURSE

Louis N. Thomas, 990 NE. 156th Terrace, N. Miami Beach, Fla. 33162

Filed Jun. 19, 1989, Ser. No. 367,792

Int. Cl.[4] A45O *19/18*

U.S. Cl. 132—270 **2 Claims**



1. A hair frosting or streaking purse comprising, in combination, a substantially rectangular enclosure body member having longitudinally-extending side-walls and defining a three-sided enclosure, a substantially rectangular cover member, means pivotally and swingably interconnecting said body member with said cover member for movement of said cover member between a first position overlying the back of said body member and a second position overlying the front thereof in fully enclosing position with respect thereto, a base member integrally formed with said body member and defining an under-surface adapted to seat against the scalp when in use, and means for releasably clamping hair strands against said base member prior to moving said cover member from said first to said second position, said pivotally and swingably interconnecting means comprising a pair of opposed flange portions extending outwardly of the peripheral edge of said sidewalls, said cover member having opposed sidewalls overlying said body member sidewalls, said cover member sidewalls being integrally formed with a pair of opposed, inwardly directed guide pins captured, respectively one each, behind said pair of opposed flange portions.

4,903,716

RECREATIONAL VEHICLE TANK FLUSHING SYSTEM

Charles F. Stevens, 19991 Wrightwood Court, Yorba Linda, Calif. 92886

Filed Dec. 18, 1987, Ser. No. 134,768

Int. Cl.[4] B08B *9/08*

U.S. Cl. 134—56 R **10 Claims**

9. A recreational vehicle tank flushing system comprising:

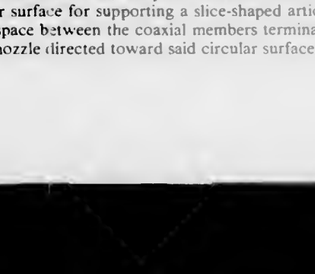
a control system;

a drain valve for connection to the recreational vehicle tank for draining the tank, said drain valve being connected to said control system for opening and closing upon command by said control system;

a water spray nozzle for positioning in the recreational vehicle tank for spraying the walls of the tank;

a pressurized water supply valve connected to said spray nozzle for supplying water to said spray nozzle, said pressurized water control valve being connected to said control system;

a fluid chemical dispensing tank, a chemical dispensing control valve connected to said chemical dispensing tank, said chemical control valve being for connection to the recreational vehicle tank so that upon opening of said chemical dispensing valve, chemical is dispensed to the recreational vehicle tank, said chemical dispensing valve being connected to said control system so that said control system controls said valves to spray the walls of the recreational vehicle tank, drain the tank and dispense chemicals into the tank;



wherein the tank to which said recreational vehicle tank flushing system is to be connected is a black water tank and said chemical tank is an enzyme treatment tank, said control system being connected to supply enzyme treatment chemical to the black water tank after the black water tank is drained and said drain valve is closed; and

said water supply valve being for connection to the black water tank and being connected to be controlled by said control system so that said control system opens said spray water valve and opens said drain valve for spraying down the walls of the black water tank and thereupon said control system closes said spray water valve and said drain water valve and opens said water supply valve to fill the black water tank and upon completion of filling said control system closes said water supply valve and opens said drain valve until the black water tank is empty and thereupon said control system closes said drain valve and opens said chemical supply valve to place enzyme treatment chemical in the black water tank.

4,903,717

SUPPORT FOR SLICE-SHAPED ARTICLES AND DEVICE FOR ETCHING SILICON WAFERS WITH SUCH A SUPPORT

Franz Sumnitsch, Klagenfurt, Austria, assignor to Sez Semiconductor-Equipment Zubehoer Fuer die Halbleiterfertigung Gesellschaft m.b.H, Kaernten, Austria

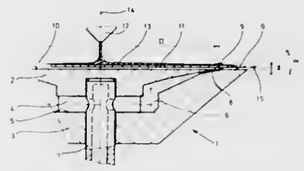
Filed Nov. 9, 1988, Ser. No. 269,017

Claims priority, application Austria, Nov. 9, 1987, 2958/87

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—9 **9 Claims**

1. Device for treating slice-shaped articles with a liquid, comprising a tank and a support disposed within said tank, said support comprising a pair of coaxial members mounted for rotation within said tank, said pair of coaxial members defining a circular surface for supporting a slice-shaped article and an annular space between the coaxial members terminating in an annular nozzle directed toward said circular surface, said nozzle being adapted to receive compressed gas for the formation of a gas cushion between said support and a slice-shaped article, said nozzle having an outlet orifice forming an acute angle with said circular surface, said support further comprising



stops arranged on said circular surface and adapted to face a said slice-shaped article and provide lateral support therefor; said tank comprising at least two annular ducts opening interiorly of said tank, and means for changing the relative position of said support within said tank.

4,903,718

FLEXIBLE ULTRASONIC CLEANING BAG

Jerry F. Sullivan, Ridgewood, N.J., assignor to Ipco Corporation, White Plains, N.Y.

Filed Oct. 19, 1988, Ser. No. 259,926

Int. Cl.[4] B08B *3/12*

U.S. Cl. 134—184 **26 Claims**



1. A container for cleaning articles, such as dentures, dental or medical instruments, or the like, to be subjected to ultrasonic vibrations for cleaning, the container comprising:

a flexible, soft, pliable receptacle for receiving articles to be cleaned and being capable of transmitting ultrasonic vibrations therethrough;

inlet means for admitting a cleaning solution into said receptacle;

openable lock means permitting said articles into said receptacle and for selectively closing said receptacle; and

outlet means for discharging said cleaning solution for said receptacle, whereby said articles placed in the container filled with said solution and subjected to ultrasonic vibrations are cleaned in said container.

4,903,719

APPARATUS AND METHOD FOR PROVIDING SECONDARY CONTAINMENT OF FLUIDS IN A PIPING SYSTEM

Robert L. Rains, 2135 Napoli Dr., Oxnard, Calif. 93035

Filed May 15, 1989, Ser. No. 352,396

Int. Cl.[4] F16L *55/18*

U.S. Cl. 137—15 **31 Claims**

1. An apparatus for providing secondary containment of fluids along a portion of a piping system having a fluid regulation control device disposed about a portion of said piping system, comprising:

(a) a lower housing for containing at least a lower portion of said fluid regulation control device, said lower housing

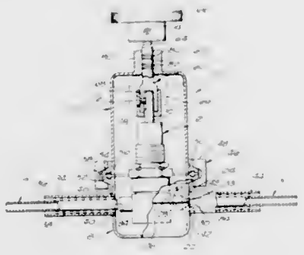
having an inlet opening formed therein for a sealable introduction of an inlet for said fluid regulation control device, and an outlet opening formed therein for sealable introduction of an outlet for said fluid regulation device, said lower housing including,

(i) a lower section having a sealed lower end and an open upper end, said upper end having an upper edge surface with recesses thereon forming lower segments of said inlet and outlet openings; and

(ii) an upper section having an open upper end and an open lower end, the lower end of the upper section having a lower edge surface being sealably and securably attached to the upper edge surface of said lower section, said upper section having recesses thereon forming upper segments of said inlet and outlet openings; and

(b) an upper housing for containing at least part of an upper portion of said fluid regulation control device, said upper housing having an open lower end thereof being sealably and securably attachable to the open upper end of the upper section of said lower housing; and

(c) means for sealably and securably attaching said upper housing to said lower housing.



23. A method for providing secondary containment of fluids along a portion of a piping system having a fluid regulation control device disposed about a portion of said piping system, comprising the steps of:

(a) providing said fluid regulation control device with at least an inlet and an outlet;

(b) positioning a lower section of a lower housing about at least a lower portion of said fluid regulation control device, said lower section having a sealed lower end and an open upper end, said upper end having an upper edge surface with recesses thereon, said inlet and outlet being positioned adjacent respective recesses;

(c) positioning a lower end of an upper section of said lower housing adjacent said upper end of said lower section, the lower end of said upper section having a lower edge surface with recesses formed thereon cooperatively mating with the recesses in said upper edge surface of said lower section to form inlet and outlet openings for said inlet and outlet;

(d) sealably and securably attaching said upper section to said lower section;

(e) sealably and securably attaching said inlet and outlet to surfaces of said upper and lower sections forming said recesses; and

(f) sealably and securably attaching an upper housing to said lower housing.

4,903,720

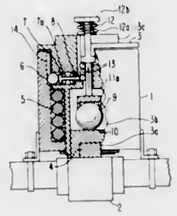
SAFETY SHUT OFF DEVICE

James C. McGill, Rte. 1, Box 545-A, Whites Creek, Tenn. 37189

Filed Mar. 7, 1988, Ser. No. 165,281

Int. Cl.[4] F16K *17/36*

U.S. Cl. 137—38 **21 Claims**



1. A vibration or shock activated shut-off device comprising:

a housing;

a first member mounted within said housing for rectilinear movement between a first position and a second position;

a second member mounted within said housing for movement between a third position and a fourth position;

said second member being in said third position when said first member is in said first position, and said second member being movable to said fourth position when said first member is moved to said second position;

an engaging member operably positioned with respect to said housing to be, in response to movement of said second member, movable relative to said housing and with respect to a component of a power supply between an opening position, at which said second member is in said third position and the component maintains the power supply open, and a closing position, at which said second member is in said fourth position and said engaging member causes the component to close the power supply;

moving means for, upon said first member moving from said first position to said second position, moving said second member from said third position to said fourth position and moving said engaging member from said opening position to said closing position; and

inertia responsive means for, upon a shock being imparted to said device, moving said first member from said first position to said second position, thereby allowing said moving means to move said second member from said third position to said fourth position, and moving said engaging member from said opening position to said closing position, thereby causing the component to close the power supply, said inertia responsive means comprising an inertia ball positioned loosely for free movement within a cavity, said first member extending into said cavity, and said inertia ball being separate from and not connected to said first member but being abuttable therewith upon the shock being imparted to said device.

4,903,721

FUEL PRESSURE REGULATOR

Gerhard A. Maier, Mundelein, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

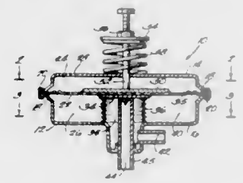
Filed Apr. 3, 1985, Ser. No. 719,586

Int. Cl.[4] F16K *17/36, 31/12;* **F02M** *39/00*

U.S. Cl. 137—811 **20 Claims**

1. A fuel pressure regulator comprising a housing, a movable diaphragm mounted within said housing, said diaphragm including a first side communicating with the atmosphere and an opposite second side having first and second portions, a fuel chamber partially defined by said first portion of said second side of said diaphragm, a constant pressure chamber closed to the atmosphere partially defined by said second portion of said

second side of said diaphragm, fuel inlet means communicating with said fuel chamber, and fuel outlet means including an outlet conduit having an inlet end located adjacent said dia-



phragm within said fuel chamber and being selectively communicable with said fuel chamber in response to movement of said diaphragm relative to said inlet end.

4,903,722

EXTRACTION VALVE HEAD FOR TANKS

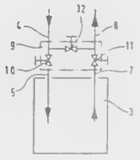
Frank Joseph, Gernsheim, and Holger Jürgensen, Aachen, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

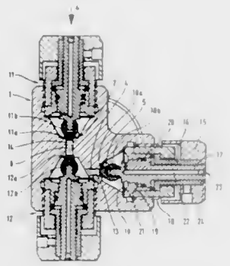
Filed Mar. 30, 1989, Ser. No. 330,501

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811041

Int. Cl.[4] F16K *11/00*

U.S. Cl. 137—209 **7 Claims**





1. An extraction valve head for a tank (3) used for containing high-purity and/or toxic liquid chemicals, the valve head having an inlet valve for a filler gas, which joins a gas inlet line and a tank inlet, and an outlet valve, which joins a tank outlet to an extraction line, a bypass, which can be shut off by a purging valve, connecting the gas inlet line to the extraction line;

wherein the inlet valve (1), the outlet valve (11) and the purging valve (12) are metal diaphragm valves and are fitted in a common metallic valve housing block; wherein a valve seat (10*a*) for the inlet valve (10) is arranged between the gas inlet line (4) and the tank inlet (5);

wherein a valve seat (11*a*) for the outlet valve (11) is arranged between the tank outlet (7) and the extraction line (8);

wherein a valve seat (12*a*) for the purging valve (12) is arranged between the gas inlet line (4) and the extraction line (8); and

wherein all valve seats (10*a*, 11*a*, 12*a*) are arranged in close spatial proximity to one another in the valve housing block (9).

4,903,723

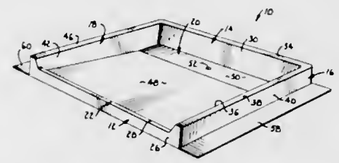
COLLECTION BASIN AND DRAIN FOR DISHWASHER LEAKAGE

Tommy J. Sublett, 2406 Florida Ct., Columbia, Mo. 65201

Filed Apr. 3, 1989, Ser. No. 331,857

Int. Cl.[4] D06F *35/00*

U.S. Cl. 137—312 **5 Claims**



1. A device for collecting leakage from a dishwashing machine including a single structure, said structure comprising:

sidewalls cooperating with front and rear walls and a bottom surface to form a collection basin with a hollow interior and an open top, said front wall being fixed and extending a distance intermediate the height of said sidewalls forming a cutout portion necessary to provide a clearance to accommodate passage of the diswashing machine pump means or other components which typically extend beneath the dishwashing machine, said bottom surface being inclined downwardly toward said rear wall;

means associated with said inclined bottom surface for effectively removing the leakage collecting in said basin; and

said sidewalls having outer flange surfaces extending therefrom for providing a guide surface for guiding support legs of the dishwashing machine, said support legs movable along said flange surfaces and guided by the sidewall outer wall surfaces to maintain the dishwashing machine in proper alignment while making installation and removal exceedingly easy when there is only a slight gap between the dishwashing machine and wall structure means.

4,903,724

LIQUID LEVEL CONTROL SYSTEM

Gilles R. Simard, 557, Boul. Blais E., Berthier-sur-Mer/Quebec, Canada (G0R 1E0)

Filed Apr. 3, 1989, Ser. No. 332,026

Int. Cl.[4] F16K *31/26, 31/34, 33/00*

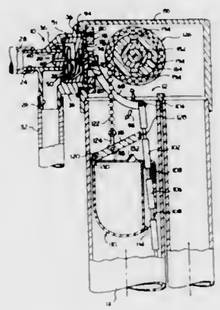
U.S. Cl. 137—414 **7 Claims**

1. A liquid level control system for automatically stopping the flow of a fluid coming from a supply conduit, into a reservoir when the level of fluid in the reservoir has reached a predetermined height in the reservoir, said liquid level control system comprising:

a vertical chamber adjacently located outside said reservoir and hydraulically linked to said reservoir so that said level of fluid in said reservoir corresponds to a level of fluid in said vertical chamber;

an adjustable level control mechanism containing a float hanging from a flexible link and adapted to slide inside said vertical chamber for adjusting the height of said float within said chamber, said float being adapted to be vertically actuated when said level of water, in said vertical

chamber, reaches a height for producing a predetermined buoyant effect on said float, said link adapted to loosely fold upon an upward movement of said float;



a flow control means positioned adjacent the outlet of said supply conduit and adapted to stop said flow of fluid coming from said supply conduit into said reservoir only upon the upward movement of said float without the moving effect of the loosely fold link.

4,903,725

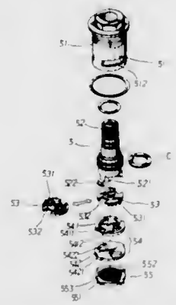
FAUCET VALVE ASSEMBLY HAVING A FLOW BUFFER DISK

Hsi-Chia Ko, No. 69, La. 22, Chang Ting Rd., Lu Kang Chen, Changhua Hsien, Taiwan

Filed Mar. 30, 1989, Ser. No. 330,506

Int. Cl.[4] F16K *25/00*

U.S. Cl. 137—454.5 **4 Claims**



1. An improved rotary-type faucet valve assembly housed in a tubular cavity of a faucet seat with a turning knob in registry with the top of said valve assembly, comprising:

a valve jacket defined in tubular form with a pair of symmetric water outlet slots disposed on the wall at the bottom end thereof, said outlet slots being in alignment and communication with the flow conduit of said faucet seat; external threads being disposed at the upper end of said valve jacket for fixing purpose;

a control shaft assembly disposed within the interior of said valve jacket and having a pair of step-like engagement legs disposed at the bottom end thereof, defining a restraint groove between said engagement legs;

a flow buffer disk having a round protrusion disposed at one side thereof and a plurality of upright protrusions planted at the other side thereof with a pair of symmetric recesses disposed on the periphery thereof;

a flow control disk assembly including a ceramic rotor disk and stator disk having passage ports disposed respectively thereon, which can be in selective communication with each other by rotation of said control shaft assembly to effect the control of the flow of fluid through said valve assembly, said rotor disk being in engagement with said engagement legs of said control shaft assembly;

a seal ring disposed at the bottom of the valve jacket;

wherein the characteristic improvement lies in the adoption of said flow buffer disk disposed under said control shaft assembly and within said restraint groove and in engagement with said engagement legs, which is used to alleviate the turbulence of flow therethrough, resulting in the noise reduction in operation of the faucet.

4,903,726

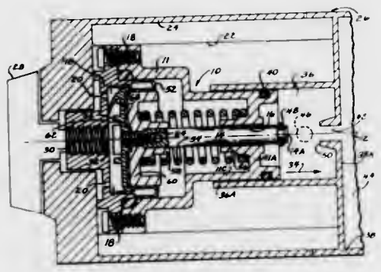
MEDICAL VACUUM REGULATING CARTRIDGE

Gordon D. Martin, Palatine, Ill.; Douglas D. Carden, Barneveld, Wis., and Colin Hodge, Columbia, Md., assignors to Aeros Instruments, Inc., Northbrook, Ill. and The BOC Group, Inc., Ohmeda Division, Columbia, Md.

Filed Aug. 10, 1987, Ser. No. 83,571

Int. Cl.[4] G05D *16/06*

U.S. Cl. 137—505.13 **26 Claims**



26. In a vacuum regulating cartridge having a body with a vacuum regulation chamber connectable with a supply of vacuum pressure and a valve head mounted to the body for movement relative thereto, the improvement being a regulating mechanism for controlling the movement of the valve head, comprising:

a resilient diaphragm mounted within the body to define a relatively air tight movable wall of the vacuum regulation chamber in a forward part of the body;

means for linking the valve head to the membrane to cause the valve head to move rearwardly toward the body with rearward movements of membrane; and

a spring carried by the diaphragm within the body but outside of the vacuum regulation chamber for resiliently resisting forward movement of the diaphragm at relatively higher pressures including a plurality of cantilevered spring arms.

4,903,727

SAFETY VALVE

Helmut Motzer, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Herion-Werke KG, Fellbach, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 344,352

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817120

Int. Cl.[4] F15B *13/043*

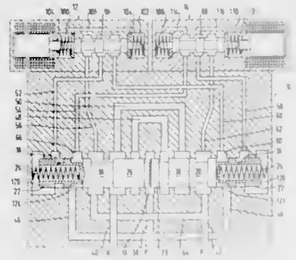
U.S. Cl. 137—596.16 **7 Claims**

1. A safety valve assembly, comprising:

a valve housing defining a bore and having a fluid inlet port, a tank port and a working port connected to a fluid operated system;

valve means including two valve bodies movable in opposite

direction towards each other in said bore of said housing, each of said valve bodies including a working piston and at least one control piston connected to said working piston for regulating the flow of a pressure fluid between said fluid inlet port, said tank port and said working port wherein said working port is connectable to said tank port upon occurrence of a faulty switching; and



actuating means for displacing said valve bodies in said bore of said housing and including one pilot valve designed as a proportional pressure differential valve, said control piston of said working piston operatively connected with said proportional pressure differential valve being provided with fine control notches.

4,903,728

SAFETY VALVE

Helmut Motzer, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to HERION-Werke KG, Fellbach, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 344,351

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817122

Int. Cl.[4] F15B *13/043*

U.S. Cl. 137—596.16 **9 Claims**

1. A safety valve assembly, comprising:

valve housing defining a bore and having a fluid inlet port, two tank ports and two working ports, with said working ports being connected to a fluid operated system;

valve means including two valve bodies movable in opposite direction towards each other in said bore of said housing, each of said valve bodies including a working piston actuated by a pressure fluid and provided with axially spaced control pistons for regulating the flow of pressure fluid between said fluid inlet port, said working ports and said tank ports; and

actuating means for displacing said valve bodies in said bore of said housing between a normal position and a switching position to allow said fluid inlet port to be alternately connected to one of said working ports while the other one of said working ports is pressure-relieved wherein upon occurrence of a faulty switching of said actuating means during switching between said normal position and said switching position, said control pistons maintain the previous connection between said fluid inlet port and said one working port while said other working port remains pressure-relieved.

4,903,729

SAFETY VALVE

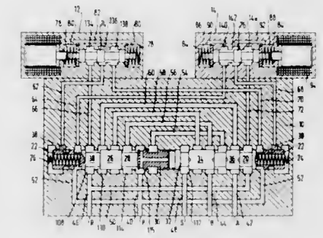
Helmut Motzer, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Herion-Werke KG, Fellbach, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 344,354

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817123

Int. Cl.[4] F15B *13/043*

U.S. Cl. 137—596.16 **7 Claims**



1. A safety valve assembly, comprising:

a valve housing defining a bore and having a fluid inlet port, two tank ports and two working ports adapted for connection to a fluid operated system to allow alternate supply of a pressure fluid to the latter;

valve means including two valve bodies movable in opposite direction towards each other in said bore of said housing, each of said valve bodies including a working piston and control pistons connected to said working piston for regulating the flow of a pressure fluid between said fluid inlet port, said tank ports and said working ports; and

actuating means for displacing said valve bodies in said bore of said housing and including one pilot valve designed as a proportional pressure differential valve, said control pistons of said working piston which are operatively connected with said proportional pressure differential valve being provided with fine control notches.

4,903,730

PIPE COUPLING USED WITH AUTOMATIC CONNECTING AND DISCONNECTING DEVICE

Noboru Otsuki, Hyogo; Katsumi Tomioka, Kobe, and Toshihiko Onishi, Hyogo, all of Japan, assignors to Nippon Air Brake Kabushiki Kaisha, Kobe, Japan

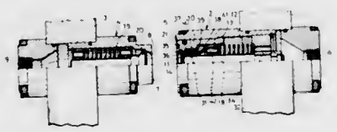
Filed Jul. 12, 1989, Ser. No. 378,912

Int. Cl.[4] F16L *37/28*

U.S. Cl. 137—614.03 **4 Claims**

1. A pipe coupling used with an automatic connecting and disconnecting device, comprising a cylindrical first main body having a connection opening in a front end face thereof, a second main body having a front end portion of an outer diameter which can fit in said connection opening and a second valve hole in a front end face thereof, said first and second main bodies arranged to face each other on a common axis and adapted to allow mutual approaching and departing movement, a valve seat disposed in said first main body and urged against said connection opening by a first spring, said valve

seat having a first valve hole in a front end wall thereof and being slidable along said axis, a first check valve of a small diameter adapted to close said first valve hole of said valve seat from the outside thereof, a second check valve of a large diameter adapted to be urged by a second spring to close said second valve hole of said second main body from the inside thereof, and an annular sealing member disposed on one of the front end face of said valve seat and the front end face of said



second main body, characterized in that said coupling further comprises a passageway for connecting a specific area of said front face of said first main body which is enclosed by said annular sealing member when both said main bodies are put in contact to the interior cavity of said first main body, and a third check valve disposed in said passageway for inhibiting fluid in said interior cavity from flowing out through said passageway into said specific area.

4,903,731

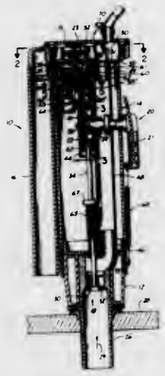
WATER CLOSET TANK FILL VALVE

George K. Pappy, 11809 Moon Beam Dr., Oklahoma City, Okla. 73162

Filed Jun. 9, 1989, Ser. No. 363,810

Int. Cl.[4] B67D *5/30*

U.S. Cl. 137—624.11 **9 Claims**



1. A self closing valve for a water closet tank, comprising:
an upright casing having a top and having a depending inlet tube forming a water inlet port;
a valve seat in the inlet port;
a valve mating with said seat for opening and closing the inlet port,
said valve having an upstanding stem;
control wheel means including a wheel having a gear rack adjacent its periphery and having a camming surface bearing against the end of said valve stem opposite the valve for seating or unseating said valve in accordance with the angular position of said control wheel;
means biasing said valve toward the valve seat;
water wheel means including a water wheel having radially disposed vanes journalled by the casing adjacent its top;
tube means communicating at one end with the inlet port downstream from the valve seat and having its other end disposed adjacent the water wheel means in water wheel angular rotating position; and,
water wheel driven gear train means operatively interposed between said water wheel and said control wheel for angularly rotating said control wheel to a valve closed position in response to a predetermined number of revolutions of said water wheel.

4,903,732

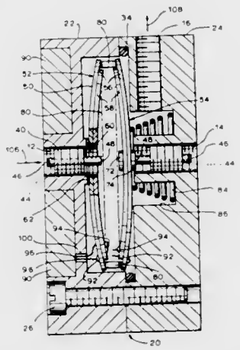
PIEZOELECTRIC VALVE

Alton K. Allen, Great Neck, N.Y., assignor to A. K. Allen Company, Mineola, N.Y.

Filed Jan. 19, 1989, Ser. No. 300,564

Int. Cl.[4] F15B *13/044*

U.S. Cl. 137—625.65 **23 Claims**



1. A piezoelectric valve for controlling fluid flow through a valve port, comprising:
(A) a fluid-tight valve body defining a pair of valve ports;
(B) a diaphragm disposed within said valve body and including a plurality of piezoelectric members, said members being selectively piezoelectrically deflectable in opposite directions in a plane of operation thereof in response to voltages applied thereto to produce a cumulative excursion to selectively assume one of two functionally opposite positions relative to one of said valve ports, said members in one of said positions operatively blocking said one valve port and in the other of said positions unblocking said one valve port, at least one of said members being disposed intermediate said pair of valve ports; and
(C) electrical means operatively connected to said members for piezoelectrically deflecting the same to one of said positions.

4,903,733

SLIDING EXHAUST BRAKE SYSTEM

Ryoichi Suzuki, Mishima, Japan, assignor to USUI Kokusai Sangyo Kaisha Ltd., Sunto, Japan

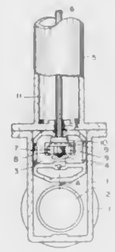
Filed Sep. 20, 1988, Ser. No. 246,628

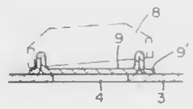
Claims priority, application Japan, Sep. 26, 1987, 62-147250[U]

Int. Cl.[4] F16K *3/02*

U.S. Cl. 137—630.12 **5 Claims**

1. A sliding exhaust brake system comprising:
a housing having an exhaust passage extending therethrough and a valve working space communicating with the exhaust passage;
a main valve mounted in the valve working space for reciprocating movement into and out of the exhaust passage, the main valve comprising a generally flat bottom wall for selectively blocking the exhaust passage, an exhaust pressure adjusting hole extending through the bottom wall;
a cylinder and piston assembly mounted in proximity to the valve working space of the housing, said assembly comprising a piston rod having an end reciprocally movable in the valve working space selectively toward and away from the exhaust passage;
a block mounted to the piston rod in spaced relationship to the end thereof, said block being disposed to engage the main valve in response to movement of the end of the piston rod away from the exhaust passage;
a support frame of substantially C-shaped cross section, said support frame comprising a base and a pair of arms connected to and extending from the base, said base being mounted to said piston rod intermediate the end thereof and the block; and
a liner comprising a generally flat portion slidably movable along the flat bottom wall of the main valve for selectively





opening and closing the exhaust pressure adjusting hole extending through the bottom wall, said liner comprising a pair of opposed longitudinal ends angularly aligned to the flat portion thereof and extending away from the bottom wall of the main valve member, said ends of said liner being loosely engaged intermediate the base and the arms of the support frame, said liner further comprising at least one tongue disposed intermediate the support frame and the bottom wall of the main valve for preventing contact between the support frame and the bottom wall of the main valve, wherein movement of the end of the piston rod away from the exhaust passage moves the liner away from the exhaust pressure adjusting hole and subsequently urges the block against the main valve for urging the main valve out of the exhaust passage, and wherein movement of the end of the piston rod toward the exhaust passage urges the liner over the exhaust pressure adjusting hole and urges the main valve into the exhaust passage.

4,903,734

PRESSURE FLUID RESERVOIR

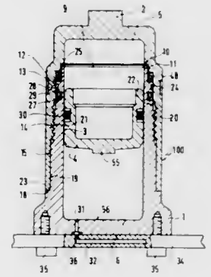
Dieter Merklein, Ludwigsburg, and Ernst-Dieter Schaefer, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

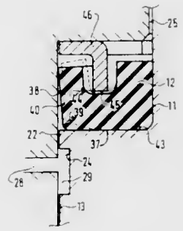
Filed Jan. 4, 1989, Ser. No. 293,287

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1988, 3803095

Int. Cl.[4] F16L *55/02*

U.S. Cl. 138—31 **7 Claims**





1. A pressure fluid reservoir for making available a predetermined energy content in a pressure fluid chamber for a system requiring a predetermined energy, comprising first and second housing components forming a housing, said first and second housing components are threaded together and sealed off by at least one seal, said first housing component has an opening serving as a guide track for a piston, a piston disposed axially movably in said first housing component, said piston separates a first chamber to be filled with a compression fluid from a second chamber to be filled with a pressure fluid, a connection opening connected with said first housing component, said first housing component **(1)** includes an open end **(10)** oriented toward said second housing component **(2)**, said open end has an outer circumference that forms a first segment **(11)** having a first diameter, at least one sealing element **(12)** surrounding said first segment, a second segment contiguous with said first segment, said second segment **(13)** has a second diameter which is larger than said first diameter, a third segment **(14)** contiguous with said second segment and having a third diameter which is larger than said second diameter, an outer thread **(20)** on said third diameter of said third segment, a fourth segment **(15)** having a fourth diameter which is larger than said third diameter, said fourth segment adjoins said third segment, said second housing component **(2)** includes an open end portion that is adapted to protrude beyond said open end of said first component **(1)** and includes an inner circumference having a first guide face **(19)** which in an assembled position contacts said fourth segment **(15)** of the first housing component, said second housing component includes a threaded portion contiguous with the first guide face **(19)** of said second

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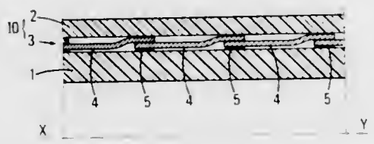
housing component, said threaded portion has an inner thread (21) of smaller diameter than said first guide face which engages the outer thread (20) of said third segment of said first housing component, the inner thread (21) of said threaded portion being adjoined by a second guide face (22) which contacts the second segment (13) and the sealing element (12) of the first housing component (10), and that said first guide face (19) and said second guide face (22) of said second housing component (2) are disposed with an axial length and spaced apart from one another at the inner circumference such that when said first and second housing components (1, 2) are assembled, before the inner thread (21) and the outer thread (20) of the components (1, 2) touch one another, the first guide face (19) of the second component (2) protrudes at least partway beyond the fourth segment (15) of said first housing component, and the second guide face (22) protrudes at least partway beyond both the second segment (13) and at least one sealing element (12) of said first housing component.

4,903,735

PIPE USABLE PARTICULARLY FOR TRANSPORTING FLUIDS AND ALLOWING THE PERMEABILITY TO THE FLUIDS TRANSPORTED TO BE LIMITED

Jacques Delacour, Paris; Jacques Jarrin, Rueil-Malmaison; Bernard Dewimille, Grigny, and Francois Dawans, Bougival, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

PCT No. PCT/FR86/00194, § 371 Date Apr. 8, 1987, § 102(e) Date Apr. 8, 1987, PCT Pub. No. WO86/07432, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 6, 1986, Ser. No. 26,757
Claims priority, application France, Jun. 11, 1985, 85 08938; Sep. 20, 1985, 85 14019
Int. Cl.[4] F16L *11/00*
U.S. Cl. 138—133 **19 Claims**



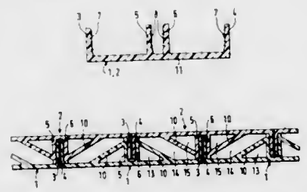
1. A pipe useful for transporting fluids which may be under pressure having limited permeability to fluids transported therein, said pipe comprising a flexible inner sheath made of a thermoplastic material or elastomer, an outer sheath comprised of an outer envelope of a flexible polymeric material and a metal layer disposed around said inner sheath, said metal layer comprising at least one layer of flexible, thin and flat metal band wound spirally at a winding angle α greater than 50° and less than 90° to an axis of the pipe, turns of said at least one layer of a flexible, thin and flat metal band having overlapping zones to ensure total wrapping of said inner sheath, said overlapping zones being provided by consecutive turns of the at least one layer of a flexible, thin and flat metal band, the overlapping zones of the turns and zones between said overlapping zones both having widths at least equal to a degree of deformation imposed on the outer sheath by maximum stretching and bending of the pipe; said metal layer being cemented to at least one of the inner sheath and the outer envelope.

4,903,736

HOLLOW CYLINDRICAL BODY MADE FROM SPIRALLY WOUND EXTRUDED PLASTIC STRIP MATERIAL

Artur Baston, Homburg-Einod, and Karl-Heinz Baston, Contwig, both of Fed. Rep. of Germany, assignors to Vobau Artur Baston Gesellschaft für Vorrichtungsbau mit Beschränkter Haftung, Blieskastel-Breitfurt, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,562
Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717418
Int. Cl.[4] F16L *9/16;* **B23B** *3/04*
U.S. Cl. 138—154 **14 Claims**



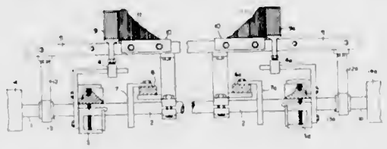
1. A hollow body comprising a bottom spirally wound channel having turns with adjacent side walls lying closely against each other, and a top spirally wound channel inter-engaged with said bottom channel, said top channel having turns with adjacent side walls lying closing against each other, said top and bottom channels each having an E-shaped cross section with a base web having two outer limbs each carrying one of the side walls of the channel, and two spaced apart middle limbs, said two middle limbs of one channel being spaced apart by a distance to closely receive the outer limbs of two adjacent turns of the other channel, said two middle limbs of one channel having inner side surfaces which engage inner side surfaces of the outer limbs of two adjacent turns of the other channel.

4,903,737

PRODUCING A MULTI-PLY FABRIC ON A LOOM HAVING AUXILIARY END REEDS

Wolfgang Böttger, Ködnitz, and Kurt Biedermann, Kulmbach, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Fed. Rep. of Germany

PCT No. PCT/DE87/00105, § 371 Date Nov. 4, 1987, § 102(e) Date Nov. 4, 1987, PCT Pub. No. WO87/05638, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 11, 1987, Ser. No. 132,954
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608136
Int. Cl.[4] D03D *49/68, 11/00*
U.S. Cl. 139—190 **4 Claims**



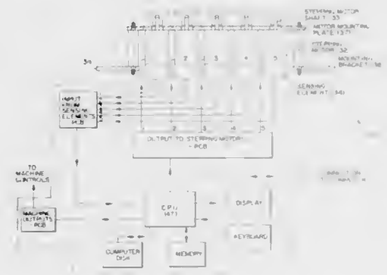
1. A method of producing a fabric which has warp and weft threads, said warp threads being made of a delicate material and said weft threads being present in an amount of at least 20 weft threads per cm of warp threads, said method comprising the steps of
(1) mounting warp threads made of a delicate material on a loom having a main reed,
(2) forming a shed between said warp threads on said loom,
(3) inserting without beating a plurality of weft threads in said shed,
(4) beating together said plurality of weft threads with said main reed of said loom, and
(5) repeating steps (2), (3) and (4).

4,903,738

JACQUARD EMULATOR

Robert G. Pongrass, and Mark A. Buchen, both of Chippendale, Australia, assignors to Wilcom Pty. Ltd., Australia

Continuation-in-part of Ser. No. 3,407, Dec. 5, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 325,134
Claims priority, application Australia, Apr. 19, 1985, PH00207
Int. Cl.[4] D03C *19/00*
U.S. Cl. 139—317 **6 Claims**



1. Apparatus, for use in a textile machine having a Jacquard mechanism of the type having elongate pins extending along a mutually parallel pin axis and terminating in pin ends, for actuating predetermined patterns of the pins in accordance with program data, said apparatus comprising:
at least one disk mounted on a respective shaft for rotation about a shaft axis which extends parallel to the pin axis;
said at least one disk having a face which is position adjacent the pin ends and which is formed with axially extending holes arranged at predetermined locations; and
means for rotating said at least one disk about the shaft axis to orientate the at least one disk such that the holes are aligned with predetermined ones of the pin ends in accordance with the program data.

4,903,739

METHOD FOR THREADING A PICK INSERTION DEVICE ON WEAVING MACHINES, AND A DEVICE WHICH USES THIS METHOD

Jo Tacq, Ieper, Belgium, assignor to Picanol N.V., Belgium

Filed Apr. 22, 1988, Ser. No. 185,047
Claims priority, application Belgium, May 12, 1987, 8700520
Int. Cl.[4] D03D *47/30*
U.S. Cl. 139—435.3 **13 Claims**



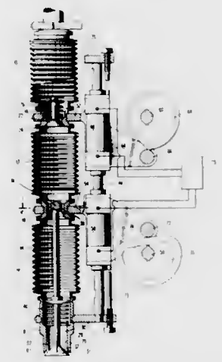
1. A method for threading a weft insertion device on a weaving machine of the type including a sley, said weft insertion device including at least one first nozzle mounted beside the sley and at least one second nozzle arranged to move with the sley, said method comprising: maintaining the first nozzle a distance from the second nozzle during normal operation of the weaving machine and/oriented relative to the second nozzle such that threading the first and second nozzles from a single weft supply by blowing the weft thread from a thread exit opening of the first nozzle into a thread induction opening of the second nozzle is normally uncertain, upon occurrence of an unthreaded condition of the nozzles, moving the sley to a pre-determined stopped position, operating the weaving to cause machine thread exit opening of the first nozzle to be presented to said respective thread induction opening of the second nozzle by moving the nozles relative to each other, and, while the weaving machine is stopped, leading a weft thread to be threaded through both nozzles by first presenting the weft thread to the thread induction opening of the first nozzle and generating an airflow through at least one of said first and second nozzles.

4,903,740

METHOD AND APPARATUS FOR MINIMIZING FOAM IN FILLING CARTONS

Donald G. Corniea, Inver Grove, and Dale J. Kelash, Apple Valley, both of Minn., assignors to Tetra Pak Finance & Trading S.A., Pully, Switzerland

Filed Jun. 10, 1988, Ser. No. 205,271
Int. Cl.[4] B65B *3/06*
U.S. Cl. 141—1 **21 Claims**



17. A method of dispensing liquids into cartons comprising
(a) providing a fixed nozzle above a carton that is to be filled, said nozzle having a discharge valve element mounted for reciprocating axial movement between an open and closed position,
(b) providing first and second sleeves in substantially axial alignment with said nozzle, with a first bellows between said nozzle and said second sleeve, and a second bellows between said second and said first sleeve, and a third bellows between said first sleeve and a liquid inlet, said first, second and third bellows being mounted in substantially vertical alignment,
(c) displacing said second sleeve toward said nozzle while maintaining the volume of said first and second bellows substantially constant,
(d) opening said discharge valve element in response to said second sleeve displacing, to allow discharge of liquid from the nozzle,
(e) displacing said first sleeve toward said nozzle at a prede-

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termined rate to compensate for the flow of liquid from said nozzle,

(f) closing said discharge valve element, and

(g) subsequently displacing said first sleeve away from said nozzle to recharge liquid in said first and second bellows, said first sleeve including a check valve to control liquid flow between said second and third bellows.

4,903,741

PNEUMATIC ACTION DISPENSER FOR FILLING BOTTLES WITH SODA AND CARBON DIOXIDE

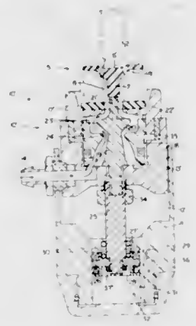
Alberto A. Ibanez, Nogoya, Argentina, assignor to Industrias Marsel S.A.I.C.I.A., Nogoya, Argentina

Filed Dec. 17, 1987, Ser. No. 134,396

Claims priority, application Argentina, Dec. 22, 1986, 306,293

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—350 **3 Claims**



1. Pneumatic action dispenser for filling bottles with soda and carbon dioxide where each of said bottles has a normally closed valvular closure unit in a neck thereof which is openable by pressing a coaxial rod located in the central zone of the neck, this unit being supplemented with a discharge tube within the bottle which extends coaxially until near the bottom of the bottle without touching it, said dispenser comprising a hollow body with an open end and a closed end in whose interior are two coaxial cavities, the first cavity located near the closed end of said hollow body, and the second cavity near the open end of said hollow body, within which a single mobile body within both cavities moves in two opposite directions by the action of a double-action pneumatic unit comprising a piston formed on an end of said mobile body which is located in one of said cavities, which cavity is in communication with compressed air means which actuates the axial movement of said piston and said mobile body, provided with a side inlet extending through said hollow body and connected to said mobile body, said inlet comprising a connector for a hose for the feed or return of soda and carbon dioxide, and with a mouthpiece slidably mounted within the opposite end of said mobile body and extending from the open end of said hollow body, including bottleneck connection means, connectable by axial placement thereof with respect to a neck of said bottle, said mouthpiece including a passage communicating between said side inlet and said bottleneck connection means, valve means mounted in said passage and activated in response to movement of said mouthpiece with respect to a neck of said bottle, said valve means including a thrust finger extending therefrom and capable of being placed against the rod in the central zone of the neck of said bottle to actuate said valve means.

4,903,742

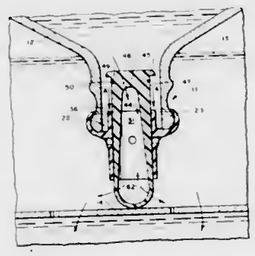
LIQUID DISPENSING APPARATUS BOTTLE VALVE

Paul L. Gagnon, P.O. Box 267, Port Hueneme, Calif. 93041

Filed Oct. 11, 1988, Ser. No. 255,397

Int. Cl.[4] B67C *3/00*

U.S. Cl. 141—353 **20 Claims**



1. A liquid container with a spout and discharge outlet in combination with a valve assembly, said valve assembly comprising:

a valve housing enclosing said outlet having attachment means for releasable securement to said spout, said housing providing a central aperture in communication with said outlet, said aperture defined by a sleeve-shaped sidewall with an inner wall surface; and,

a valve means controlling liquid flow through said aperture comprising a valve head section having a ring part for sealing engagement with said inner wall surface and an actuator stem comprising segments spaced-apart adjacent said inner wall surface and extending from said ring part a predetermined distance past said outlet whereby movement of said stem will provide a corresponding movement of said head section for seating and unseating said section from said aperture.

4,903,743

WOODWORKING MACHINE

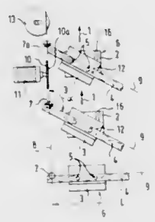
Siegfried Zweig, Oberkochen, Fed. Rep. of Germany, assignor to Okma Oberkochener Maschinen GmbH, Oberkochen, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,362

Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717731

Int. Cl.[4] B27C *9/00*; **B27F** *5/00, 1/16*

U.S. Cl. 144—3 R **6 Claims**



1. A woodworking machine for a longitudinal workpiece, comprising:

(a) at least one tenoning-and-mortising spindle,

(b) at least one length cutting device comprising a vertically oriented saw blade;

(c) a roller table which includes a roller carriage and a table pivotally mounted thereon, said roller carriage being spaced from said length cutting device and being mounted for movement parallel to a first plane defining the side of said saw blade facing said roller table;

(d) means for mounting a workpiece to said table plate, a side of said workpiece defining a second plane which intersects said first plane;

(e) the intersection of said planes defining a vertical pivot axis around which said table plate pivots; the intersection of said planes subtending an angle greater than 90° on a side of said first plane facing said roller table;

(f) engagement means connecting said roller carriage and said table plate defining a given radius between said vertical axis and said engagement means.

4,903,744

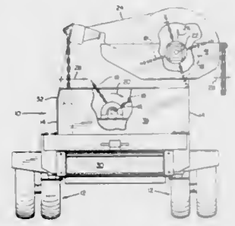
SIDE LOADING DEBARKING/DELIMBING APPARATUS AND METHOD

Arnold N. Peterson, and Larry A. Sprague, both of Eugene, Oreg., assignors to Peterson Pacific Corp., Eugene, Oreg.

Filed Aug. 30, 1988, Ser. No. 238,905

Int. Cl.[4] B27L *1/00*

U.S. Cl. 144—241 **6 Claims**



1. An apparatus for debarking/delimbing tree stems comprising,

a housing, debarking/delimbing members contained in the housing and defining a debarking/delimbing station having a front, rear and opposed sides, said housing having an inlet at the front of the station and an outlet at the rear of the station for directing tree stems into and through the debarking/delimbing station and establishing thereby a front-to-rear stem feeding direction,

said housing having a side opening at one side of the debarking/delimbing station to permit entry of a stem bundle into the station directed crossway to the stem feeding direction, and said apparatus adapted to accommodate a vehicle pathway around the apparatus in close proximity to the side opening at the side of the debarking/delimbing station and thereby permit a skidder type stem hauler to circle around the housing on the pathway and in the process achieve lateral maneuvering of a stem bundle being hauled by the hauler through the side opening and into the debarking/delimbing station of the apparatus.

4,903,745

WALLET WITH REMOVABLE CLIP

D. Garry Roman, 1250 LaVenta #211, Westlake Village, Calif. 91361

Filed Sep. 22, 1987, Ser. No. 99,563

Int. Cl.[4] A45C *1/06, 13/18*

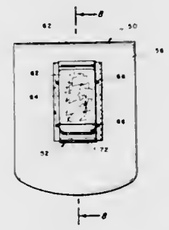
U.S. Cl. 150—134 **9 Claims**

1. In a wallet for carrying valuables having a plurality of compartments on first and second flaps joined by a pliable section allowing said wallet to be folded in half the improvement comprising;

pocket means formed on an exterior surface of one of said two flaps;

an S-shaped money clip formed of a metal plate folded twice to form three legs having a pair of bights at the end of each leg of said S-shaped money clip;

one leg of said s-shaped money clip constructed to removably fit into said pocket means on the exterior of said one flap;



whereby said wallet with said money clip inserted in said pocket means may be worn on the waistband of pants and concealed, or said money clip may be removed for using said wallet and money clip separately.

4,903,746

ADAPTOR DISK FOR ATTACHING AN ANTI-SKID DEVICE TO A WHEEL DISK OR RIM

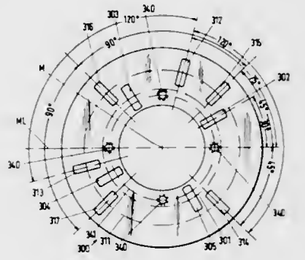
Rosel Preusker, and Werner Preusker, both of Atzelgift, Fed. Rep. of Germany, assignors to Confon AG, Rheineck, Switzerland

Filed Sep. 10, 1986, Ser. No. 905,859

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 8526164; Oct. 19, 1985, 8529687; Oct. 29, 1985, 8530606; Aug. 29, 1986, 8623171

Int. Cl.[4] B60C *27/20*

U.S. Cl. 152—216 **2 Claims**



1. In an anti-skid device, particularly for motor vehicle wheels with pneumatic tires for driving on ice and snow, which comprises a fixing disk which can be fastened to the wheel disk or rim and which is provided with openings for fastening to the rim screw or wheel studs; and a supporting disk, held on a shaped-on hub of the fixing disk and lockable by means of a retaining ring, and having a plurality of equidistantly spaced, radially disposed anti-skid arms, each formed with a pre-bent profile from a resilient elastic material, which engage over the tire tread and are provided externally and internally on their free ends with a gripping profile and externally having spikes or metal bodies; wherein the improvement comprises an adaptor disk carried on a side of the fixing disk remote from the supporting disk, said adaptor disc being connected by screw connections to the fixing disk and having a plurality of radially directed elongated holes provided on at least two circular lines around the adaptor disk center having different diameters and including four equidistance holes on

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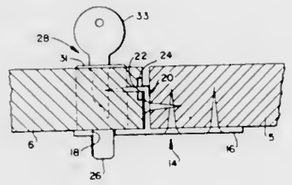
the circular line adjacent the center of the adaptor disk, and six holes on the outer circular line at equal and unequal distances from one another, the six holes on the outer circular line including a first group of three elongated holes formed equidistantly in the adaptor disk, the spacing of, in each case, two of these elongated holes in the first group being approximately 120° and a first of the three elongated holes in the first group being at a distance of approximately 75° from an axis passing through the center of the adaptor disc, and in a second group of three elongated holes, a first elongated hole is at a distance of approximately 45° from the axis and two other elongated holes are arranged counterclockwise at distances of approximately 90° from each other in the adaptor disk, the adaptor disk further including four or five equidistantly arranged threaded fixing disk fastening screw reception bores located on a third circular line.

4,903,747

LOCK FOR BI-FOLD DOORS AND THE LIKE

Robert U. Johnson, 1707 N. Harrison St., Fort Wayne, Ind. 46808

Filed Jul. 28, 1989, Ser. No. 387,508
Int. Cl.[4] E06B *3/48*; E05B *15/02*
U.S. Cl. 160—117 **3 Claims**



1. In a pair of bi-fold assemblies, each comprising an end panel and an inner panel having a hinge stile and a lock stile, each end panel being hinged to a frame jamb and each inner panel being hinged to an end panel, wherein the inner panel of one bi-fold assembly and the inner panel of a second bi-fold assembly abut at their respective lock stiles when the pairs are closed,

a lock comprising:

a latch assembly mounted in the lock stile of a first inner panel and including a latch bolt adapted for linear movement perpendicular to the plane of the respective panel between a retracted position and a locking position extending beyond the interior surface of the first inner panel, and

a catch assembly including

a base plate secured to the interior surface of the lock stile of the second inner panel and adapted to extend across the interior surface of said lock stile of the first inner panel, when said bi-fold assemblies are in their closed position, the extending portion defining an opening adapted to receive said latch bolt when in its extended position, and

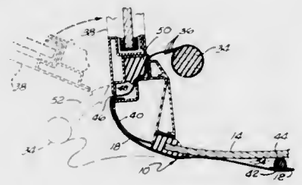
a leg extending perpendicular to said base plate and adapted to be positioned between the abutting lock stile edges of said inner panels, said leg having a locator tab extending perpendicular to said leg and adapted to engage the abutting lock stile of the first inner panel to resist relative movement of the inner panels out of coplanar relationship when said bi-fold assemblies are in their closed position.

4,903,748

AUTOMOBILE WINDSHIELD COVER

Timothy H. Foraker, 3245 Calle Bonita (P.O. Box 565), Santa Ynez, Calif. 93460

Filed Jun. 10, 1988, Ser. No. 205,442
Int. Cl.[4] B60J *1/20*
U.S. Cl. 160—370.2 **19 Claims**



1. A cover for a selected exterior portion of a vehicle, said cover comprising:

a central body portion sized and shaped to cover the selected portion of the vehicle to be covered;

bead means fixed to an inner surface of the body portion, for spacing the body portion from the selected portion of the vehicle to be covered such that the spacing provides vent means wherein air freely passes; and

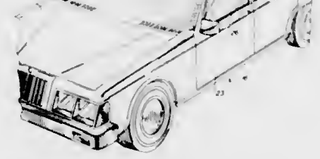
at least one clamping portion extending from the central body portion and having a length adapted to extend between a vehicle closure member and the vehicle body.

4,903,749

AUTOMOBILE PROTECTIVE COVER

Amnon Hanania, 4809 Laurel Grove #27, North Hollywood, Calif. 91607

Filed Dec. 20, 1988, Ser. No. 286,686
Int. Cl.[4] B60J *11/00*
U.S. Cl. 160—370.2 **20 Claims**



1. A cover for covering the windshield and the front portion of the roof and front door windows of a car or truck having two front doors, and door frames, said front doors have front, rear, top and bottom sides and windows therein, comprising:

a window-covering segment made of thin, flexible sheet material, said window-covering segment being sufficiently large to cover the windshield of a car or truck from top to bottom and from side to side;

a roof-covering segment made of thin, flexible sheet material, said roof-covering segment being attached at the front thereof to the rear of said window-covering segment at a location approximately adjacent the top of the windshield, said roof-covering segment extending back on the roof of the car or truck from said window-covering segment to at least the rear of said front doors, and being sufficiently large to cover the front portion of the roof of the car or truck from one side of the roof of the car or truck to the other;

a first combination side window covering and anti-theft side segment consisting of a single thin, flexible sheet material, said first side segment being attached to the left sides of said window-covering segment and said roof-covering segment, said first side segment being configured similarly to the shape of a window frame of a left front door of the car or truck, and sufficiently large enough to cover substantially all of the side window, said first side segment being located and secured between the left front door of the car or truck and the left front door frame of the car or truck whereby said first side segment is releasably retained between the left front door and the left front door frame; and

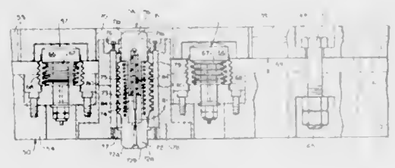
a second combination side-window covering and anti-theft side segment consisting of a single thin, flexible sheet material, said second side segment being attached to the right sides of said window-covering segment and said roof-covering segment, said second side segment being configured similarly to the shape of a window frame of a right front door of the car or truck, and sufficiently large enough to cover substantially all of the side window, said second side segment being installed and secured between the right front door of the car or truck and the right front door frame of the car or truck, whereby no additional means other than said first and second side segments are required to releasably hold said cover in place.

4,903,750

CONTINUOUS CASTER ROLL MONITOR

Kenneth D. Ives, Valparaiso, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1988, Ser. No. 238,379
Int. Cl.[4] B22D *11/16*
U.S. Cl. 164—150 **6 Claims**



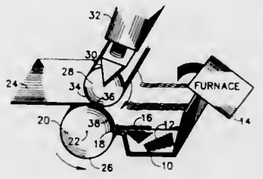
1. In a continuous casting machine for molten metal of the type having sets of rolls disposed in opposed pairs separated by space gaps and defining a path of travel for a workpiece, each roll including at least two aligned roll segments, the combination of a roll gap monitor for monitoring the gaps between the opposed pairs of rolls, the monitor comprising opposite sides with one opposite side facing the roll segments on one side of the path of travel, and the other opposite side being segmented in accordance with said aligned roll segments but being substantially coextensive with said one opposite side, each segmented other opposite side being independently retractably movably away from said one opposite side toward the other side of the path of travel and against the aligned roll segments on the other side of the path of travel, bias means in the monitor for moving the other opposite sides against an aligned roll segment so as to retain the monitor in place within the path of travel, a gap sensor for each segmented other opposite side supported by the monitor for measuring the space gaps between each opposed pair of roll segments, each gap sensor extending perpendicular to the direction of path of travel of the monitor and including heads mounted for relative movement normal to the direction of moving of the monitor and simultaneously engageable with the corresponding segment of corresponding pairs of rolls successively along the direction of movement and transducer means operatively connected with the heads for transmitting signals representative of the measurements of the gaps of each pair of rolls.

4,903,751

TWO WHEEL MELT OVERFLOW PROCESS AND APPARATUS

Lloyd E. Hackman, Worthington, Ohio, assignor to Ribbon Technology Corporation, Gahanna, Ohio

Filed Nov. 4, 1988, Ser. No. 267,260
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—480 **16 Claims**



1. A method for the production of a film or sheet of finely controlled thickness and microstructure from a molten material which utilizes spaced, first and second parallel rolls rotating in opposite directions to form a kissing zone between the rolls, the method comprising:

contacting a molten material overflowing from the uppermost portion of a molten material receptacle onto the rotating first roll and cooling thereon to form an at least partially solidified first film of predetermined thickness, wherein the direction of rotation of said first roll is such that the partially solidified film is conveyed upward and away from the surface of the molten material and over the uppermost portion of said first roll;

rotating the second roll around a higher circumferential axis than the first roll, whereby the second roll does not contact the molten material in the molten material receptacle;

pressing the first film on the first roll with the second roll in the kissing zone to form a substantially solidified film product, whereby neither the first nor the second roll is immersed in the molten material;

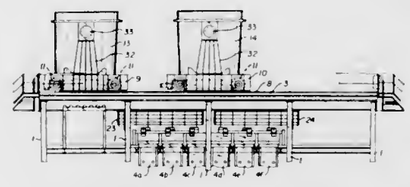
removing the solidified film product.

4,903,752

HOT METAL SUPPLY FOR CONTINUOUS CASING AND THE LIKE

Joseph Rokop, Pittsburgh, Pa., assignor to Rokop Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1988, Ser. No. 230,626
Int. Cl.[4] B22D *11/10*
U.S. Cl. 164—488 **3 Claims**



1. A method of supplying hot metal to a continuous casting machine which comprises providing a tundish from which hot metal flows to the continuous casting machine, positioning a first ladle containing hot metal above said tundish, discharging

hot metal from the first ladle to said tundish, positioning a second ladle containing hot metal above said tundish while the first ladle is discharging hot metal into said tundish, commencing discharge of hot metal from the second ladle to said tundish as the first ladle empties, and repeating the steps whereby an uninterrupted flow of hot metal is maintained from the ladles to said tundish.

4,903,753

CASTING TECHNIQUE FOR LEAD STORAGE BATTERY GRIDS

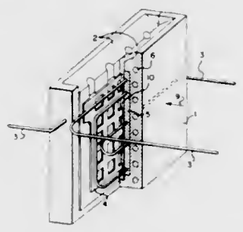
Hans-Joachim Golz, Hanover, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 487,906, Apr. 22, 1983, abandoned. This application Mar. 27, 1986, Ser. No. 843,814

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3216432

Int. Cl.[4] B22D *27/04*

U.S. Cl. 164—493 **9 Claims**



1. Method of casting electrode grids for electric lead storage batteries in a casting mold having casting surfaces provided with a porous, electrically poorly conducting or non-conducting coating, comprising the steps of:

providing a lead melt which has been heated prior to introduction to said casting mold;

filling said casting mold with said lead melt so that the casting surfaces of said mold are heated by the incoming melt; and

at least partially compensating for heat flowing out of the lead melt during said filling by generating an additional heat pulse within the melt during said filling so that the lead melt is prevented from cooling below a temperature which would permit solidification of the lead melt before said filling is complete.

4,903,754

METHOD AND APPARATUS FOR THE TRANSMISSION HEAT TO OR FROM PLATE LIKE OBJECT

Hans Hirscher, Bad Ragaz, and Rudolf Wagner, Fontnas, both of Switzerland, assignors to Balzers Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Oct. 26, 1988, Ser. No. 262,816

Claims priority, application Switzerland, Dec. 3, 1987, 04747/87

Int. Cl.[4] F28F *7/00, 13/00*

U.S. Cl. 165—1 **15 Claims**

1. An apparatus for transmitting heat to or from a plate-like object comprising:

carrier means having a surface for receiving the object with a gap between the object and the surface, said carrier means being adapted to be at a different initial temperature from that of the object for one of heating and cooling the object;

a gas source providing pressurized gas;

first gas passage means connected to the gas source for one of supplying gas to and removing gas from the gap between the object and the surface of said carrier means;

a cover mounted for movement relative to said carrier means for covering and uncovering the object on said carrier means;

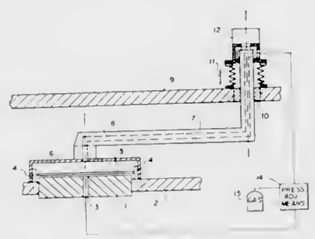
positioning means engageable by said cover for positioning said cover with respect to said carrier means to define a space between the object and said cover;

drive means connected to said cover for moving said cover to engage said positioning means for covering and uncovering the object;

second gas passage means connected to said gas source for supplying gas to the space between the object and said cover when said cover is engaged with said positioning means; and

pressure adjustment means operatively connected to said gas source and to said first and second gas passage means for establishing a pressure differential between gas in the space and gas in the gap, gas pressure in the space being greater than gas pressure in the gap for pressing the object onto the surface of the carrier means.

12. A method of transmitting heat to or from a plate-like object comprising:



placing the object on the surface of a carrier;

covering the object with a cover;

mechanically pressing the cover against a base plate which is connected to the carrier for closing a space between the object and the cover;

introducing a gas into the space between the object and the cover;

moving gas through a gap between the carrier and the object;

adjusting the pressure of the gas in the space and in the gap so that the pressure of gas in the space exceeds the pressure of gas in the gap so as to press the object onto the surface of the carrier;

controlling the temperature of the carrier for a selected change in temperature of the object;

maintaining the object in position on the carrier for a selected period of time to permit a change in temperature of the object; and

removing the cover from base plate to equalize pressure between the interior of the cover and the exterior thereof for exposing the object for further processing.

4,903,755

APPARATUS FOR PREHEATING COMBUSTION AIR, ACCOMPANIED BY SIMULTANEOUS REDUCTION OF NO_x CONTAINED IN THE FLUE GASES

Sigfrid Michelfelder, Gummersbach, and Stanislaw Michalak, Ratingen, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

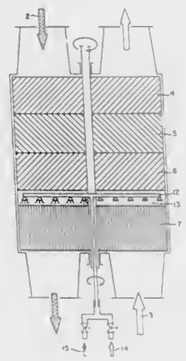
Division of Ser. No. 882,245, Jul. 7, 1986, Pat. No. 4,738,826, which is a division of Ser. No. 657,394, Oct. 4, 1984, Pat. No. 4,602,673. This application Apr. 25, 1988, Ser. No. 185,861

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1983, 3335917

The portion of the term of this patent subsequent to Jul. 29, 2003, has been disclaimed.

Int. Cl.[4] F28D *19/00;* **B01J** *15/00*

U.S. Cl. 165—7 **3 Claims**



1. An apparatus for preheating air for combustion for a combustion process while simultaneously reducing the NO_x content of hot flue gases utilized to effect said preheating, said apparatus comprising:

a revolving regenerative air heater that includes heat exchange elements having surfaces that are exposed to said hot flue gases, with said surfaces having a coating that acts as a catalyst for the reduction of NO_x, whereby said regenerative air heater is a revolving drum that is divided in a radial direction into individual chambers that contain said heat exchange elements, which are in the form of a heat storage mass comprised of a plurality of movable individual elements that are respectively provided with said catalyst coating.

4,903,756

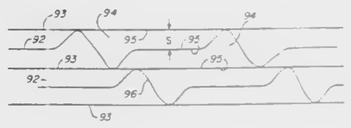
HEAT GENERATOR

Richard J. Monro, 102 Ramapoo Rd., Ridgefield, Conn. 06877

Continuation-in-part of Ser. No. 749,000, Jun. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 578,378, Feb. 8, 1984, abandoned. This application Sep. 12, 1986, Ser. No. 906,524

Int. Cl.[4] F28D *19/04;* **F28G** *9/00*

U.S. Cl. 165—8 **3 Claims**



1. A rotary air preheated for improving the efficiency of a heat generator wherein an inflow of air is used and gas is generated which exhausts as a flue gas at an elevated temperature and contains particulates and gaseous pollutants comprising:

a rotary air preheater having a rotor with a plurality of axially uninterrupted heat-exchange elements with axial passages therebetween to enable said air and flue gas to flow therethrough, said rotor being mounted for rotation so as to move the heat-exchange elements in rotational sequence from an air slide where the inflow of air passes to a flue gas side where the flue gas passes for a preheating of the air, said rotary air preheater being selected so that the heat exchange relationship between the inflow of air and the flue gas is sufficient to reduce the temperature of the flue gas from a transfer of heat therefrom to the inflow of air for an enhanced thermal efficiency of the heat generator, and with the temperature of the flue gas being reduced by said transfer of heat by the heat exchange elements to a level where at least a sulfuric acid pollutant condenses out from the flue gas within the heat-exchanger; said rotor and heat-exchange elements being formed of a material that corrodes when exposed to sulfuric acid; the cross-sectional size of the passages between said heat-exchange elements being so selected so as to suppress the formation of an aerosol by said condensed sulfuric acid pollutant and promote the condensation of said pollutant onto said heat-exchange elements.

4,903,757

HEAT EXCHANGER ROTOR AND A METHOD OF MANUFACTURING SUCH A ROTOR

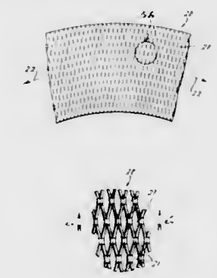
Thomas Berendt, Waldenburg, Fed. Rep. of Germany, assignor to Masco GmbH, Sandhausen, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,569

Claims priority, application Fed. Rep. of Germany, May 30, 1987, 3718264

Int. Cl.[4] F28D *19/00*

U.S. Cl. 165—8 **7 Claims**



1. A regenerative heat exchanger rotor with an outer casing which comprises:

a plurality of layers of a helically wound strip orientated so that its width direction is radial with respect to the rotor;

a core on which the strip is wound and which is permeable for the medium with which the rotor is to be used;

said strip having channels therein to allow the radial passage of the current of the medium;

a second strip on the rotor being free of channels and being also wound on the permeable core helically so as to be associated with the channeled strip so that the layers or turns of the unchanneled strip alternate with those of the channeled one with each layer or turn of the channeled strip being followed by one layer or turn of the unchanneled one;

the individual layers of the unchanneled strip being respectively comprised in a single plane; and

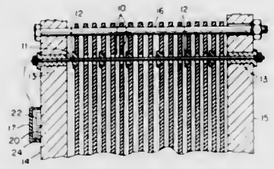
the unchanneled strip having axially extending openings therein.

4,903,758

PLATE HEAT TRANSFER APPARATUS WITH LEAKAGE DETECTOR

Colin T. Cowan, Dormans Park, near East Grinstead, Great Britain, assignor to Baker Perkins plc, Peterborough, United Kingdom

Filed Aug. 5, 1988, Ser. No. 229,177
Claims priority, application United Kingdom, Aug. 7, 1987, 8718735
Int. Cl.[4] F28F *11/00, 3/10*
U.S. Cl. 165—11.1 **6 Claims**



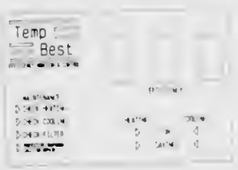
6. A plate heat transfer apparatus having a plurality of plates in a stack; vented leakage passages from transfer areas of the plates leading to dead spaces between the plates; and a monitoring system for sensing accumulation of material, in at least one of the dead spaces, arranged to produce a warning signal whenever accumulation therein reaches a predetermined magnitude, the monitoring system comprising an electrode which passes through the dead spaces and extends along the apparatus through apertures in the plates forming the apparatus.

4,903,759

APPARATUS AND METHOD FOR MONITORING AND CONTROLLING HEATING AND/OR COOLING SYSTEMS

John G. Lapeyrouse, P.O. Box 91445, Mobile, Ala. 36609

Filed Sep. 25, 1987, Ser. No. 101,176
Int. Cl.[4] G05D *23/00*
U.S. Cl. 165—11.1 **18 Claims**



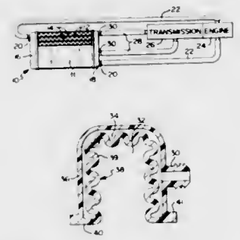
1. In an apparatus for changing the temperature of air in a conditioned space and having a first temperature sensor for sensing the temperature of air in the conditioned space and a temperature modifying unit for circulating a flow of air through the conditioned space and changing the temperature of the flowing air, the unit being operatively connected with and responsive to the first temperature sensor, an improved system for monitoring the efficiency of operation of the apparatus and comprising: second and third temperature sensors for sensing the temperature of circulating fluids; said second temperature sensor sensing the temperature of a supply fluid circulated to said temperature modifying unit; said third temperature sensor sensing the temperature of a return fluid circulated from said temperature modifying unit; processor means operatively connected with and responsive to said temperature sensors for comparing the temperatures sensed by said second and third temperature sensors and determining the temperature differential therebetween and the percentage of a predetermined optimum differential between the sensed return air and supply air temperatures which has been attained and generating a percentage signal representative of such percentage; and annunciator means operatively connected with said processor means and responsive to the generation of a percentage signal for displaying a visual indication of such percentage.

4,903,760

INTEGRAL OIL COOLER AND RADIATOR TANK

Shrikant M. Joshi, Getzville, and Lee C. Whitehead, Middleport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 24, 1989, Ser. No. 356,101
Int. Cl.[4] F01P *11/08*
U.S. Cl. 165—41 **3 Claims**



1. An integral molded oil cooler and coolant tank for an automotive radiator comprising a singular polymer shell having an outer wall exposed to the ambient environment and a common wall with internal and external sides located interior of and extending along a predetermined portion of said outer wall, said common wall having a body portion spaced from said outer wall and a periphery extending completely thereabout integral with the periphery of said predetermined portion of said outer wall whereby said walls cooperatively define an open sided coolant reservoir between said external side of said body portion and the region of said outer wall outside said predetermined portion and whereby said walls also cooperatively define an enclosed oil reservoir between said internal side of said body portion and said predetermined portion of said outer wall, an oil inlet fitting and an oil outlet fitting open to said oil reservoir at opposite ends thereof formed integral with said predetermined portion of outer wall, a coolant fitting open to said coolant reservoir formed integral with said outer wall in said region outside said predetermined portion, and said body portion having an undulating cross sectional shape to maximize the surface area of both said internal side and said external side.

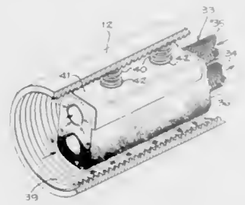
4,903,761

WICK ASSEMBLY FOR SELF-REGULATED FLUID MANAGEMENT IN A PUMPED TWO-PHASE HEAT TRANSFER SYSTEM

Richard M. Cima, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jun. 3, 1987, Ser. No. 56,845
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.25 **24 Claims**

1. A closed-loop heat transfer system comprising:
(a) an evaporator having a capillary channel on an interior heat-exchange surface thereof for distributing working fluid in liquid phase over said heat-exchange surface by capillary action;
(b) a condenser;
(c) a vapor conduit connecting said evaporator to said condenser, said vapor conduit enabling working fluid in vapor phase to pass from said evaporator into said condenser;
(d) a wick assembly disposed within said evaporator, said wick assembly comprising:
(i) means for delivering working fluid in liquid phase to said capillary channel on said interior heat-exchange surface of said evaporator for evaporation therefrom to vapor phase, and
(ii) means for withdrawing from said evaporator substantially all working fluid in liquid phase in excess of an amount needed to keep said capillary channel on said interior heat-exchange surface of said evaporator continuously wetted with working fluid in liquid phase;
(e) a condensate line connected to said condenser for withdrawing from said condenser substantially all working fluid that has condensed from vapor phase to liquid phase in said condenser;
(f) a return line connected to said means for withdrawing from said evaporator substantially all working fluid in liquid phase in excess of said amount needed to keep said capillary channel continuously wetted with working fluid



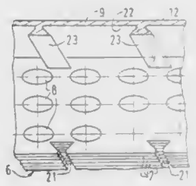
in liquid phase, said return line by-passing said condenser and merging with said condensate line;
(g) a pump, an inlet of said pump communicating with said merging condensate and return lines, said pump providing sufficient suction to withdraw from said condenser working fluid that has condensed to liquid phase therein, and to withdraw from said evaporator working fluid in liquid phase in excess of said amount needed to keep said capillary channel continuously wetted with working fluid in liquid phase; and
(h) a feed line connecting an outlet of said pump to said means in said evaporator for delivering working fluid in liquid phase to said capillary channel on said interior heat-exchange surface of said evaporator, said feed line delivering working fluid in liquid phase from said pump to said evaporator.

4,903,762

HEAT EXCHANGER INCLUDING A BANK OF FINNED TUBES AND A SHELL SURROUNDING SAID BANK

Christian Marsais, Rambouillet, and Herve Dupuis, Montreuil, both of France, assignors to VALEO, Paris, France

Filed Nov. 22, 1988, Ser. No. 274,905
Claims priority, application France, Nov. 27, 1987, 87 16451
Int. Cl.[4] F28F *1/10*
U.S. Cl. 165--149 **2 Claims**



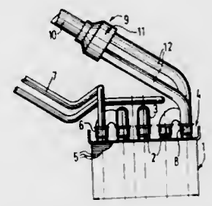
1. A heat exchanger, in particular for motor vehicles, including at least one water tank disposed at one end of a bank (6) of tubes (8) with fins (7) through which a first fluid flows, and a shell (2), such as a casing (9), defined by walls (12, 13, 14, 15), surrounding said bank and through which a second fluid flows, in which heat exchanger two sides of the bank are adjacent to the walls (12, 13, 14, 15) of the casing (9), which are braced against one another by assembly means that position the bank (6) and are supported thereby, characterized in that the assembly means comprise sliding mortise and tenon mutual engagement means (21, 23, 25, 26, 34) carried respectively by the bank (6) and at least one of the walls (12, 13, 14, 15) of the casing (9), forming means of bracing and retaining said walls, and wherein said tenon (23) is formed on an inside face (22) of at least one wall (12, 13) of the casing (9), the mortise (21) being formed on at least one front face of the bank (7) of tubes (8) having fins (7).

4,903,763

FINNED TUBE EVAPORATOR WITH COLLECTOR ASSEMBLY FOR JOINING PLURAL TUBE OUTLETS TO SECTION LINE WITH MINIMUM TURBULENCE

Jean-Louis Laveran, Asnieres; Gérard Poitier, Gennevilliers, and Patrice Leblond, Laval, all of France, assignors to Valeo, Paris, France

Filed Jan. 27, 1989, Ser. No. 302,268
Claims priority, application France, Jan. 28, 1988, 88 00962
Int. Cl.[4] F28F *9/02;* **F25B** *39/02*
U.S. Cl. 165—175 **9 Claims**



1. (amended) A heat exchanger for changing the state of a fluid, for example an evaporator for the fluid used in an air conditioning apparatus for an automotive vehicle, the heat exchanger comprising tubular circuits extending through fins, and a distributor assembly for the fluid in a first state, connecting a fluid delivery tube to the input ends of the said tubular circuits, the heat exchanger further comprising a collector assembly for collecting the fluid in a second state, the collector assembly being so disposed as to connect the outlet ends of the tubular circuits with a suction tube, the heat exchanger being characterized in that the collector assembly comprises a cylindrical part forming a coaxial extension of the suction tube and being of larger radius than the suction tube and wherein the cylindrical part has a first end face and a second end face opposed to each other with the first end face proximal to the suction tube and with bores formed through the second end face, the heat exchanger comprising means joining the said bores to the outlet ends of the tubular circuits, and the cylindrical part including means bringing the said bores into communication with the suction tube.

4,903,764

SWIVELSUB

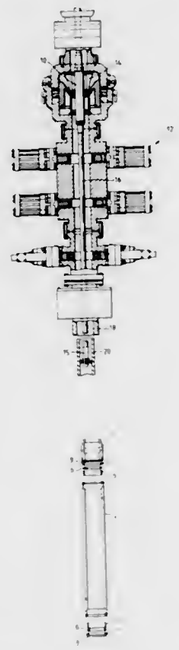
Svein Gleditsch, 9420 Lundens, Norway

Filed Jul. 18, 1988, Ser. No. 220,555
Claims priority, application Norway, Jul. 27, 1987, 873143
Int. Cl.[4] E21B *29/12*
U.S. Cl. 166—78 **5 Claims**

1. A swivelsub, for use with an annular preventer of a blowout preventer, said annular preventer having expandable rubber elements to seal off the drill string and to provide a sealable and pressure controlling passage for a drill string, comprising:

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a sleeve member, positioned around said drill string and surrounded by said annular preventer so as to be lockable by said annular preventer and sealable by said expandable rubber elements of said annular preventer;



retaining means, positioned at one end of the sleeve member, for locking around said drill string for rotation therewith; and

means, positioned at at least one end of the sleeve member, for enabling relative rotation between the sleeve member and the drill string.

4,903,765

DELAYED OPENING FLUID SAMPLER

Gary D. Zunkel, Chickasha, Okla., assignor to Halliburton Company, Duncan, Okla.

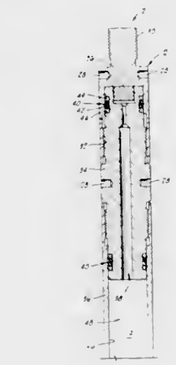
Filed Jan. 6, 1989, Ser. No. 294,323
Int. Cl.[4] E21B *49/08*
U.S. Cl. 166—162 **20 Claims**

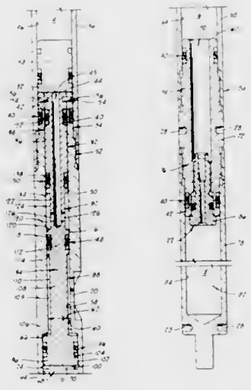
1. A fluid sampling tool, comprising:

a body having a first chamber, a second chamber, a third chamber and a port defined therein;

means, disposed in said body between said second and third chambers, for impeding fluid flow from said second chamber to said third chamber; and

valve means, disposed in said body between said port and said first chamber for being moved relative to said body in response to pressure acting on said valve means through said port, for communicating said port with said first





chamber only after a predetermined time delay after said pressure begins moving said valve means.

4,903,766

SELECTIVE GEL SYSTEM FOR PERMEABILITY PROFILE CONTROL

Paul Shu, West Windsor, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,127
Int. Cl.[4] E21B *33/138, 43/22, 43/24*
U.S. Cl. 166—270 **18 Claims**

1. A process for closing pores in a more permeable zone of a formation comprising:

(a) placing into an aqueous solution a first composition sufficient to form ex-situ a size selective, shear thinning first gel which comprises

(i) a xanthan biopolymer, and

(ii) a transitional metal ion;

(b) placing into said aqueous solution a second composition sufficient to form thermally a second in-situ gel which is substantially more resistant to formation conditions than said first gel which composition comprises

(i) an aldehyde, and

(ii) a phenolic compound;

(c) allowing said aqueous solution sufficient time to form the ex-situ gel; and

(d) injecting said aqueous solution containing said gel into said permeable zone where it reheals, is heated by the formation and thereafter forms a solid gel substantially more resistant to formation conditions than said first gel.

4,903,767

SELECTIVE GELATION POLYMER FOR PROFILE CONTROL IN CO_2 FLOODING

Paul Shu, West Windsor, N.J., and Krishnaswamy Sampath, Carrollton, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,128
Int. Cl.[4] E21B *33/138, 43/22*
U.S. Cl. 166—270 **39 Claims**

1. A method for closing at least one zone in a subterranean formation where a carbon dioxide flooding process has caused the existence of carbon dioxide break-through fingers comprising:

(a) introducing a gas selected from a member of the group consisting of carbon dioxide and gases containing carbon dioxide into a subterranean deposit containing carbon dioxide break-through fingers;

(b) after said carbon dioxide break-through fingers have sorbed a predetermined amount of said gas, stopping the flow of said gas into said subterranean formation;

(c) after stopping the flow of said gas into said subterranean formation, introducing an effective amount of a gel-forming composition into said subterranean formation and into said carbon dioxide break-through fingers, said gel-forming composition being operable, when contacting carbon dioxide break-through fingers containing an aqueous fluid which has absorbed substantial amounts of carbon dioxide, to form a gel in said fingers which is operable for retarding the flow of said gas through said fingers, said gel-forming composition comprising

(i) an aqueous solution containing a water soluble xanthan polymer; and

(ii) a partially and a fully alkylated melamine resin sufficient to cross-link said polymer;

(d) injecting selectively said gel-forming composition into the break-through fingers of said formation where selectively is imparted by a higher viscosity resultant from said partially alkylated resin; and

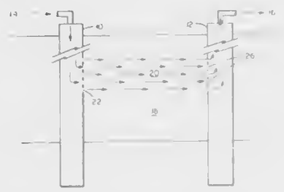
(e) allowing said composition to remain in the formation for a time sufficient for the fully alkylated resin to form an active resin which results in the creation of a stable solid gel which closes said fingers.

4,903,768

METHOD FOR PROFILE CONTROL OF ENHANCED OIL RECOVERY

Paul Shu, West Windsor, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 3, 1989, Ser. No. 292,796
Int. Cl.[4] E21B *33/138, 43/22, 43/24*
U.S. Cl. 166—270 **10 Claims**



1. A method for profile control in ehanced oil-recovery in a high permeability zone of a formation comprising:

(a) conducting an enhanced oil recovery process in a formation which process removes hydrocarbons from a high permeability zone until breakthrough occurs;

(b) ceasing use of the enhanced oil recovery process after breakthrough occurs;

(c) injecting steam into the formation and heating the high permeability zone to a temperature sufficient to cause a temperature activated gellable mixture to form a solid gel;

(d) terminating steam injection into the formation;

(e) injecting into said formation a temperature activated gellable mixture which mixture enters said heated high permeability zone; and

(f) activating said mixture by the temperature in the heated zone which temperature is sufficient to cause a solid gel to form and close pores in said heated high permeability zone.

4,903,769

METHOD OF CONTROLLING PERMEABILITY DAMAGE OF HYDROCARBON FORMATIONS DURING STEAM INJECTION USING BICARBONATE IONS AND SOURCES OF AMMONIA

Liming Hsueh, Buena Park, and Marion G. Reed, Hacienda Heights, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 132,519, Dec. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 97,254, Sep. 17, 1987, abandoned, which is a continuation of Ser. No. 909,971, Sep. 22, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 278,908
Int. Cl.[4] E21B *43/24, 47/00, 47/06*
U.S. Cl. 166—272 **2 Claims**

1. A method for inhibiting permeability damage of a hydrocarbon formation containing clay minerals in the vicinity of a well penetrating said formation comprising injecting a wet steam that includes:

an amount of ammonia in the vapor phase of said wet steam resulting from the addition of anyhydrous ammonia to the wet steam to produce a concentration of ammonium in the vapor phase condensate of the wet steam effective to inhibit permeability damage of the formation in the vicinity of said vapor phase; and

an amount of bicarbonate salt of the alkali metals, or mixtures thereof, effective to raise the liquid phase pH of the wet steam to within the range of about 7.5 to about 10.5.

4,903,770

SAND CONSOLIDATION METHODS

Robert H. Friedman; Billy W. Surles, both of Houston, and Philip D. Fader, Katy, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 239,373, Sep. 1, 1988, abandoned. This application May 30, 1989, Ser. No. 357,571
Int. Cl.[4] E21B *43/24, 33/138*
U.S. Cl. 166—288 **29 Claims**

1. A method for consolidating unconsolidated mineral particles including sand in a subterranean petroleum formation penetrated by a well in fluid communication with at least a portion of the formation, comprising:

(a) providing a sand consolidating fluid comprising a polymerizable monomer, diluent for the monomer, and a non-volatile strong acid catalyst capable of causing polymerization of the monomer at fluid injection temperatures;

(b) mixing the sand consolidating fluid with steam to form a multiphase treating fluid;

(c) injecting said treating fluid into the formation to occupy the void space of at least a portion of the formation adjacent to the well; and

(d) allowing the injected fluids to remain in the formations for a period of time sufficient to accomplish at least partial polymerization of the monomer, forming a permeable consolidated mass around the wellbore.

24. A method for forming a fluid impermeable zone in a

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permeable, subterranean oil-containing formation adjacent to a wellbore penetrating said formation, comprising

a. providing a fluid comprising a polymerizable monomer, a diluent for said monomer, and a strong acid catalyst which causes polymerization of the monomer at steam temperatures;
b. forming a mixture of said fluid from step (a) with steam
c. injecting said fluid mixture into the formation to saturate at least a portion of the formation; and
d. allowing said fluid to remain in the formation for a period of time sufficient to accomplish at least partial polymerization of said monomer, forming a fluid impermeable barrier between the well and the formation.

4,903,771

METHOD FOR ESTABLISHING EFFECTIVE BARRIERS TO PRODUCTION OF UNDESIRED FLUIDS IN THE RECOVERY OF OIL

Jan E. Hanssen, Harfsfjord, and Steinar Ekrann, Stavanger, both of Norway, assignors to Rogalandsforskning, Stavanger, Norway

Filed Sep. 2, 1988, Ser. No. 239,637
Claims priority, application Norway, Sep. 2, 1987, 873675
Int. Cl.[4] E21B *43/32*
U.S. Cl. 166—292 **8 Claims**

1. A method of establishing barriers to flow of undesired reservoir fluids in the recovery of oil from a reservoir through an oil well, comprising:

injecting a barrier-forming fluid mixture from the oil well so that a zone of the reservoir becomes at least partially saturated with the barrier-forming fluid mixture;

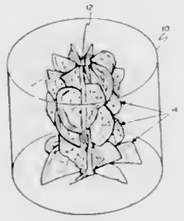
said barrier-forming fluid mixture having, at reservoir conditions, an intermediate density between the density of the oil and the density of the undesired reservoir fluids.

4,903,772

METHOD OF FRACTURING A GEOLOGICAL FORMATION

James O. Johnson, 2679-B Walnut, Los Alamos, N. Mex. 87544

Filed Nov. 16, 1987, Ser. No. 121,131
Int. Cl.[4] E21B *43/17*
U.S. Cl. 166—299 **14 Claims**



1. A method of fracturing a geological formation surrounding a cased well bore, comprising the steps of:

(a) emplacing at least one explosive charge in a well bore provided with a casing in the vicinity of said explosive charge, said charge being no larger than that necessary to initiate formation breakdown in said formation when said formation is pressurized to a pressure less than the formation breakdown pressure of said formation;
(b) emplacing a suitable fluid in said well bore and hydraulically pressurizing said fluid to a pressure less than the formation breakdown pressure and greater than the fracture propagation pressure of said geological formation; and
(c) detonating said explosive charge while said fluid is pressurized, so as to obtain a multiplicity of fractures in said geological formation.

4,903,773

METHOD FOR INJECTING WATER IN FLUID-STORING ROCKS CONTAINING CLAY MATERIALS

Sándor Doleschall, Budapest; Györgyi Gaál, Nagykanizsa; Miklós Kristóf, Szolnok; Gyula Milley; Tibor Paál, both of Nagykanizsa; József Pápay, Budapest; Antal Szittár, Zalaegerszeg, and Géza Udvardi, Nagyanizsa, all of Hungary, assignors to Magyar Szénhidrogénipari Kutató-/fejlesztö Intézet, Szazhalombatta, Hungary

Continuation of Ser. No. 96,752, Sep. 11, 1987, abandoned, which is a continuation of Ser. No. 899,253, Aug. 22, 1986, abandoned. This application Mar. 3, 1989, Ser. No. 319,830
Claims priority, application Hungary, Aug. 29, 1985, 3263/85
The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.
Int. Cl.[4] E21B *43/22, 43/24*
U.S. Cl. 166—303 **7 Claims**

1. In a post-primary hydrocarbon recovery process including the injecting of solution in water, in one or more organic solvents, or in a mixture of one or more organic solvents and one or more inorganic solvents, into rock strata containing the hydrocarbon to be recovered, the improvement which comprises stabilizing said rocks containing swellable clay minerals, the rock strata including sandstones, sands and marlitic sandstones, water storing rocks, geothermal circulation sites and zones in the vicinity of hydrocarbon production wells, which stabilizing comprises the steps of

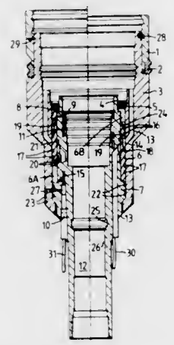
(a) forming an aqueous solution of from about 0.1 to about 500 g/l of a compound or mixtures of compounds having a cation or cations with a hydrated cation diameter of between about 0.13 and about 0.15 nm, and a coordination number of 12; and
(b) injecting the solution of step (a) into said rock strata.

4,903,774

ANNULUS SHUT-OFF MECHANISM

Christopher E. Dykes, Aberdeen, Scotland; Peter W. Francis, London, England, and Hans P. Hopper, Aberdeen, Scotland, assignors to The British Petroleum Company p.l.c., London, England

Filed Jan. 17, 1989, Ser. No. 297,737
Claims priority, application United Kingdom, Jan. 28, 1988, 8801850
Int. Cl.[4] E21B *33/043*
U.S. Cl. 166—363 **12 Claims**



1. An annulus shut-off mechanism with fail-as-is logic suitable for use in the annulus of a concentric bore tubing hanger of an oil well comprising:

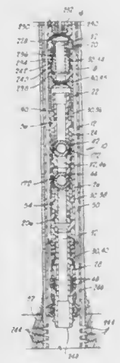
an enclosure across the annulus sealed from access to annulus fluids having inlet and exit ports,
a sleeve, capable of sliding in the enclosure, having an aperture capable of aligning with the inlet and exit ports,
primary means for sliding the sleeve to the open or closed position, and
secondary means independent of the primary means, for sliding the sleeve in the event of failure of the primary means.

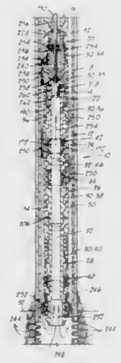
4,903,775

WELL SURGING METHOD AND APPARATUS WITH MECHANICAL ACTUATING BACKUP

Kevin R. Manke, Marlow, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 6, 1989, Ser. No. 294,439
Int. Cl.[4] E21B *34/10, 34/14, 37/08, 43/12*
U.S. Cl. 166—373 **20 Claims**





1. A well surging apparatus comprising:

a valve assembly portion defining a central flow bore therethrough and comprising a ball valve disposed across said flow path;
pressure operating means for actuating said ball valve in response to a pressure differential between said flow bore and a well annulus around said valve assembly portion; and
mechanical operating means for mechanically actuating said ball valve and comprising a portion separable from, and positionable adjacent to, said valve assembly portion.

18. A method of surging a well comprising the steps of:

positioning, at a predetermined position in a well bore of said well, a tool string comprising upper and lower spaced ball valves and a packer;
initially orienting said ball valves in a closed position such that a surge chamber is defined therebetween;
setting said packer into sealing engagement with said well bore at a position above a zone to be surged;
after setting said packer, opening said lower ball valve such that fluid is surged from said well zone into said tool string past said open lower ball valve and into said surge chamber; and
selectively opening said upper ball valve by at least one of pressure actuated and mechanical actuated ball valve operating means, wherein said step of opening said upper ball valve is initially attempted by using said pressure actuated ball valve operating means and comprises subsequently using said mechanical actuated ball valve operating means if opening said upper ball valve is not accomplished by pressure actuation.

4,903,776

CASING HANGER RUNNING TOOL USING STRING TENSION

Philippe C. Nobileau, Paris, France; Bradley D. Beitler, Houston, Tex., and Fergus D. S. McGhie, Aberdeen, Scotland, assignors to Vetco Gray Inc., Houston, Tex.

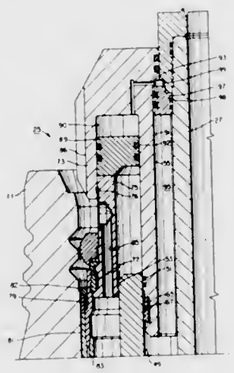
Filed Dec. 16, 1988, Ser. No. 285,791
Int. Cl.[4] E21B *33/043, 23/04*
U.S. Cl. 166—382 **7 Claims**

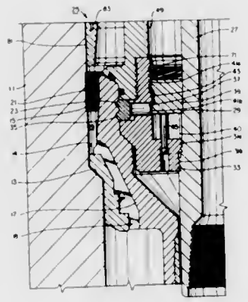
1. A tool for setting a packoff between a casing hanger and a wellhead, comprising in combination:

a mandrel having means for connection to a string of drill pipe;
a body carried by the mandrel, the mandrel being axially movable relative to the body;
a setting sleeve carried by the body for connection to the packoff;
a setting sleeve piston carried by the body for movement relative to the body and positioned to contact an upper end of the setting sleeve;
a mandrel piston carried by the mandrel for movement therewith; and
means located in the body communicating the mandrel piston with the setting sleeve piston and containing a fluid, whereby movement of the mandrel piston and mandrel

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relative to the body due to movement of the drill string will increase the pressure of the fluid to exert a downward





force on the setting sleeve piston to move the setting sleeve downward to set the packoff.

4,903,777

DUAL SEAL PACKER FOR CORROSIVE ENVIRONMENTS

Henry J. Jordan, Jr., Huntsville; Frank X. Mooney, The Woodlands; John L. Baugh, and Charles A. Ledet, both of Huntsville, all of Tex., assignors to Baker Hughes, Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 922,592, Oct. 24, 1986. This application Aug. 26, 1987, Ser. No. 90,431

Int. Cl.[4] E21B *33/129*

U.S. Cl. 166—387 **22 Claims**

1. A dual seal packer adapted to be releasably set within a surrounding conduit in a well bore, comprising:

a central mandrel having upper connecting means for connection in a well string extending to the well surface;

a cage assembly circumscribing the mandrel at one axial location;

a lower seal assembly carried on the mandrel below the cage assembly and above a lower abutment;

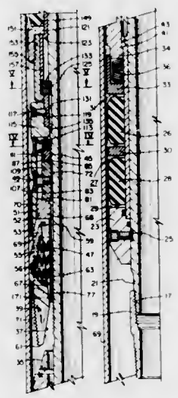
an expander ring carried about the mandrel above the lower seal assembly, the expander ring having a compression surface for contacting the lower seal assembly and an oppositely arranged, tapered cone surface, the lower seal assembly being expansible radially outward upon contact with the compression surface of the expander ring between a retracted position and an extended position in engagement with the surrounding conduit;

a plurality of rocker type slips carried by the cage assembly at spaced circumferential locations above the expander ring, each slip having a length defined by opposing ends thereof, an upper serrated gripping surface at one of said opposing ends and an unserrated drag block surface at the other of said opposing ends, each slip having a tapered lower surface for engagement with the cone surface of the expander ring, an oppositely tapered support surface, and a pivot point which allows the slip to pivot between a retracted position and an extended gripping position in which the serrated gripping surface of the slip engages the surrounding conduit, the cage assembly being provided with a mating support surface for engaging the support surface of each slip when the cone surface of the expander ring engages the tapered lower surface of the slip and the slip moves to the extended, gripping position; and

an upper seal assembly carried on the mandrel above the cage assembly and below an upper abutment.

15. A method of setting a dual seal packer within a surrounding conduit in a well bore, comprising the steps of:

providing a central mandrel having an external surface and upper connecting means for connection in a well string extending to the well surface;



providing a cage assembly circumscribing the mandrel at one axial location;

locating a lower seal assembly on the mandrel below the cage assembly and above a lower abutment;

providing an expander ring carried about the mandrel above the lower seal assembly, the expander ring being axially slidable with respect to the lower seal assembly, having a compression surface for contacting the lower seal assembly, and an oppositely arranged, tapered cone surface, the lower seal assembly being expansible radially outward upon contact with the compression surface of the expander ring between a retracted position and an extended position in engagement with the surrounding conduit;

providing a plurality of rocker type slips carried about the mandrel at spaced circumferential locations above the expander ring, each slip having a length defined by opposing ends thereof, an upper serrated gripping surface at one of said opposing ends and an unserrated drag block surface at the other of said opposing ends, the slips being carried within windows provided in the cage assembly, each slip having a tapered lower surface for engagement with the cone surface of the expander ring, an oppositely tapered support surface, and a pivot point which allows the slip to pivot between a retracted position and an extended gripping position in which the serrated gripping surface of the slip engages the surrounding conduit, the cage assembly being provided with a mating support surface located at the approximate pivot point of each of the slips for engaging the support surface of each slip when the cone surface of the expander ring engages the tapered lower surface of the slip and the slip moves to the extended, gripping position;

locating an upper seal assembly on the mandrel above the cage assembly and below an upper abutment;

providing the central mandrel with upper and lower externally threaded regions which are spaced apart on the mandrel exterior surface, the upper threaded region being engagable with an internally threaded running ring when the seal assemblies and slips are in the retracted position and wherein the lower threaded region is engagable with an internally threaded setting ring when the seal assemblies and slips are in the extended position;

running the mandrel into position on the well string;

rotating the well string to the right while holding tension on the string to release the running ring and allow the mandrel to slide upwardly with respect to the cage assembly; and

continuing to pull tension on the string to engage the lower threaded region with the setting ring.

4,903,778

METHOD FOR ROLLING SOD WITH GRASS SIDE OUT

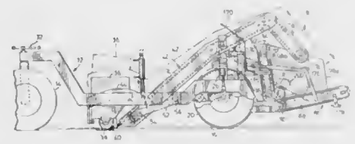
Gerardus J. Brouwer, Keswick, and Henry Zwambag, Sutton, both of Canada, assignors to Brouwer Turf Equipment Limited, Keswick, Canada

Division of Ser. No. 923,558, Oct. 27, 1986, Pat. No. 4,832,130. This application Apr. 28, 1989, Ser. No. 344,771

Claims priority, application Canada, Oct. 28, 1985, 494053

Int. Cl.[4] A01B *45/04*

U.S. Cl. 172--1 **3 Claims**



1. A method of harvesting sod, comprising: undercutting a length of sod, moving the cut sod to a raised position, and then rolling the sod to form a sod roll having its grass side facing outwardly, thereby facilitating later laying of the sod and reducing drying of the roots of said sod.

4,903,779

HYDRAULIC CONTROL APPARATUS FOR TRACTOR

Toshihiko Takemura, Osaka, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Nov. 22, 1988, Ser. No. 274,842

Claims priority, application Japan, Dec. 4, 1987, 62-308386; Dec. 4, 1987, 62-308387; Dec. 4, 1987, 62-308388

Int. Cl.[4] A01B *63/112*

U.S. Cl. 172--10 **14 Claims**

1. A hydraulic control apparatus for a tractor comprising:

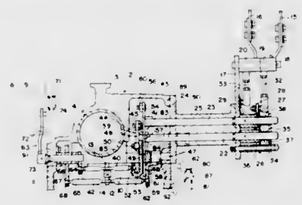
a control valve for controlling a hydraulic unit to power a work device to a lifting, stopping or lowering act;

a position control lever and a draft control lever for changing over the control valve to a lifting, stopping or lowering position through position and draft link assemblies respectively;

a position feedback assembly for returning the control valve to the stopping position when the work device is lifted or lowered to a position set by the position control lever;

a draft feedback assembly for switching the control valve to maintain the draft load on the work device at an approximately constant amount in response to the set position of the draft control lever; and

a position control spool operating arm pivotally connected to a spool of the control valve in an intersecting relation therewith and having one end connected to the position link assembly and the other end connected to the position feedback assembly, the apparatus being characterized in



that a draft control spool operating arm separate from the position control spool operating arm is pivotally connected to the spool in intersecting relation therewith at a point intermediate the draft control spool operating arm's ends and has one of said ends connected to the draft link assembly and the other of said ends associated to a bracket, wherein the draft feedback assembly is operatively connected to the draft link assembly.

4,903,780

MOBILE, SELF-PROPELLED CRUSHING MACHINE

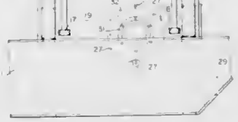
Elda Barbieri, 31 Via Pasubio, 36030 Villaverla (Vincenza), Italy

Filed Jul. 10, 1987, Ser. No. 72,101

Claims priority, application Italy, Jul. 11, 1986, 85576 A/86

Int. Cl.[4] A01B *33/02*

U.S. Cl. 172—122 **13 Claims**



1. A mobile, self-propelled crushing machine comprising:

a support structure having two longitudinal, generally parallel beams supporting a central frame, said central frame having at least four corners;

a rotor housed within the central frame, said rotor having a cylindrical member;

means for moving the rotor generally orthogonally to the generally parallel beams in order to move the rotor away from ground beneath the crushing machine and toward and into the ground, said means for moving being positioned at least at each of the four corners of the central frame;

a series of flanges and spacers provided on the rotor, said flanges being separated from one another by the spacers;

hammers detachably affixed to the flanges on the rotor; and

means for rotating the rotor, said means for rotating being operatively connected to and located within the rotor.

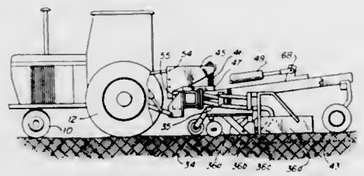
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4,903,781

FLEXIBLE MOUNTING SYSTEM FOR AGRICULTURAL IMPLEMENTS

Edward H. Smit, Sheffield, Iowa, assignor to Sukup Manufacturing Company, Sheffield, Iowa

Filed Jun. 3, 1988, Ser. No. 202,538
Int. Cl.[4] A01B 61/02
U.S. Cl. 172—316 19 Claims



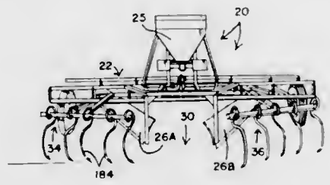
1. An implement having a short frame, a plurality of tool gangs attached to said frame, each of said gangs being movable vertically relative to the other of said gangs and relative to said short frame, and a hitch arrangement for attachment to the hitch mechanism of a tractor which includes lower lift link means and upper stabilizer link means, said hitch arrangement including first attachment means affixed to said short frame for engagement with said lower lift link means and for lifting of said implement thereby, a load transfer member pivotally attached to said short frame for pivoting movement relative to said frame, second attachment means on said load transfer member for engagement with said upper stabilizer link means, support means on said short frame for supporting a resiliently yieldable means, and means engaging said load transfer member and said support means for resiliently resisting pivotal movement of said load transfer member in a direction away from a link engaged with said second attachment means and thereby transmitting compressive forces from said hitch mechanism to said implement in a predetermined relative pitch orientation of said implement and permitting relative pitch movement between said tractor and said implement for stress relief of said hitch.

4,903,782

LEVEE SQUEEZER

Timothy V. McClellan, P.O. Box 212, Hwy. 97, Kingsland, Ark. 71652

Filed Jun. 20, 1989, Ser. No. 369,066
Int. Cl.[4] A01B 13/02, 49/02
U.S. Cl. 172—799.5 14 Claims



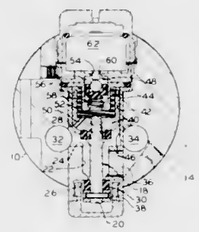
1. A levee squeezer for rice farming comprising:
a rigid frame adapted to be coupled to a tow vehicle such as a tractor, said frame having a front, a rear, a top, and a longitudinal axis;
a tow bar coupled to said frame for attaching said levee squeezer to said tow vehicle;
first and second levee squeezing blades secured beneath said frame and extending generally from said frame front to said frame rear in a "V" configuration, said blades forming a wide mouth at the frame front and converging to a narrower levee discharge output beneath the frame rear;
a wheel system secured to said frame deployable in a first position to transport said squeezer over a road to a field and in a second out-of-the way position for making levees;
first hydraulic means for selectively activating said wheel system;
a bar ditch reduction tine system for controlling levee ruts created by said blades, said tine system comprising a pair of spaced-apart tine bars having tines adapted to be forced into the ground during levee construction, a transverse tine control axle journalled to said frame, and a pair of tine bar struts extending rearwardly from said tine control axle rearwardly diverging from each other and secured generally perpendicularly to said tine bars; and,
second hydraulic means for selectively vertically positioning said tine system.

4,903,783

SOLENOID CONTROLLED AIR TOOL

Joseph Rushanan, Bedford, and James Steverding, Mentor, both of Ohio, assignors to The Stanley Works, New Britain, Conn.

Filed Aug. 14, 1986, Ser. No. 896,596
Int. Cl.[4] B23Q 5/00
U.S. Cl. 173—12 12 Claims



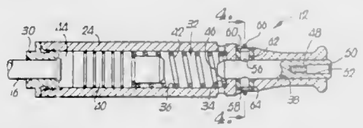
1. A power tool comprising:
a housing having a fluid supply inlet;
a fluid operated motor assembly mounted in said housing, said motor assembly including a motor fluid inlet;
valve means connecting said fluid supply inlet and said motor fluid inlet, said valve means being operable between a first position permitting fluid communication between said fluid supply inlet and said motor fluid inlet and a second position restricting fluid communication between said fluid supply inlet and said motor fluid inlet; and
a positioning device having a chamber including a chamber exhaust valve in a first end and a chamber fluid inlet in a second end; a piston disposed in said chamber between said first end and said second end, said piston being slidable in said valve chamber between a first position toward said first end and a second position toward said second end; fluid communication means between said chamber first and second ends, said fluid communication means having a smaller cross-section area than said chamber exhaust valve; and piston biasing means urging said piston toward said chamber second end and away from said chamber first end, said piston biasing means responsive to a fluid pressure differential between said first and second chamber ends above and below a predetermined level to move said piston into said first and second positions, respectively,
said positioning device operatively connected to said valve means wherein said positioning device first and second positions correspond to said valve means first and second positions, respectively.

4,903,784

IMPACT HAMMER POWER TOOL

Donald A. Glaser, Emporia, Kans., assignor to Glendo Corporation, Emporia, Kans.

Filed Sep. 30, 1988, Ser. No. 252,044
Int. Cl.[4] B25D 9/14
U.S. Cl. 173—116 17 Claims



1. An impact power tool for use in delicate hand-working operations, the tool comprising:
a body presenting a bore and having a first end and a second end, said bore having a central longitudinal axis;
a piston received within the bore and shiftable relative to the body along the longitudinal axis of the bore;
an impact transmitting member received within the bore at the first end of the body and shiftable relative to the body along the longitudinal axis of the bore;
positioning means for fixing the axial and rotational position the impact transmitting member relative to the bore, the positioning means including a transverse member interposed between the impact transmitting member and the body, the positioning means including first support means for rigidly supporting the transverse member on one of the impact transmitting member and the body, and second support means for resiliently supporting the transverse member for limited axial and rotational movement relative to the other of the impact transmitting member and the body; and
drive means for driving the piston along a stroke length between an impact position engaging the impact transmitting member and an extended position out of contact with the impact transmitting member.

4,903,785

DRILLING AND CHISELING TOOL BIT

Walter Odoni, Vaduz, Liechtenstein; Oliver Berchtold, Zollikon, and Wilhelm Gerber, Grabs, both of Switzerland, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Dec. 23, 1988, Ser. No. 289,979
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743817
Int. Cl.[4] E21B 1/00
U.S. Cl. 175—293 9 Claims

1. A drilling and chiseling tool bit for working in concrete, rock, masonry and the like, comprising an axially elongated shank having a first end and a second end spaced apart in the axial direction, a tool bit head at the first end of said shank and an insertion end at the second end of said shank for insertion into a drilling or chiseling device, said insertion end includes means for rotational entrainment with the drilling or chiseling device, wherein the improvement comprises that said shank is divided into a plurality of axially aligned separate individual shank members of similar length and shape, said tool bit head and said insertion end are separate from said shank, the mass of each of said shank members, said tool bit head and said insertion end is approximately the same, and means separate from said shank for interconnecting said tool bit head and said insertion end so that said head and end are rotationally connected together and are axially movable relative to one another, said interconnecting means for connecting said tool bit head and insertion end comprises means for transmitting torque from said insertion end to said tool bit head and axial stop means cooperating with corresponding means at said tool bit head and insertion end.

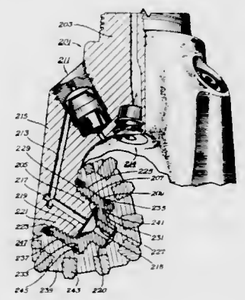


4,903,786

EARTH BORING BIT WITH IMPROVED TWO PIECE BEARING AND SEAL ASSEMBLY

Michael F. Welsh, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jun. 23, 1988, Ser. No. 210,682
The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.
Int. Cl.[4] E21B 10/20, 10/22
U.S. Cl. 175—367 3 Claims



1. An earth boring bit having an improved two piece bearing and seal assembly which comprises:
a bit body which includes at least one leg and a cantilevered bearing lug that extends downwardly and inwardly;
a thread formed on the bearing lug to extend outwardly from an inner, end region to an outer, base region having a transverse shoulder;
a threaded bearing sleeve having a circumferential bearing surface secured to the bearing lug, and a mouth at one end intersecting the transverse shoulder;
a rotatable cutter with a bearing surface assembled on the bearing sleeve;
a lubrication system in the body, including a hydrostatic pressure compensator to lubricate said bearing surfaces and exclude ambient drilling fluids;
a cutter seal groove formed near the outermost region of the

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bearing surface in the cutter to have a circumferential wall and an end wall;

a circumferential shaft seal surface in the bearing lug to align with the bearing sleeve circumferential surface and oppose the cutter seal groove circumferential wall and to connect with an end wall in the lug;

retainer means for retaining the rotatable cutter on the bearing sleeve;

seal means for sealing against the circumferential walls of the cutter groove and lug seal surface;

the transverse shoulder of the bearing lug and mouth of the bearing sleeve being positioned inwardly of the region where the seal means engages the lug seal surface toward the inner end region of the lug and away from contact with the seal means to avoid exposure of the mouth of the sleeve to the ambient drilling fluid and to assure that lubricant resides on each side of the intersection of said shoulder and said mouth.

4,903,787

ROCK DRILL

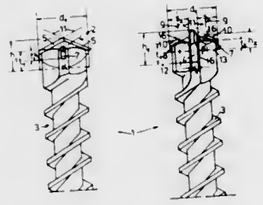
Bernhard Moser, Altshausen, and Wolfgang Peetz, Fronhofen-Blitzenreute, both of Fed. Rep. of Germany, assignors to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 284,651

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742661

Int. Cl.[4] E21B *10/36, 10/44, 10/58;* **B28D** *1/14*

U.S. Cl. 175—410 **14 Claims**



1. A rock drill, in particular for hammer drills or the like, having a helical shank and having at least one main cutting tip of sintered carbide, said tip extending over the entire diameter of the drill head, sloping in the shape of a roof in side elevation and having cutting edges, and said rock drill having secondary cutting tips, arranged transverse to said main cutting tip and comprising at least one piece, to form a cruciform cutting head, wherein, in side elevation, each secondary cutting tip arranged to the side of the main cutting tip is designed as a roof-shaped cutting element having a bit point enclosing an obtuse angle β.

4,903,788

VIBRATING TRAY SCALE WITH CONVEYING MECHANISM

Robert A. Cordery, Danbury, and David W. Hubbard, Stamford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

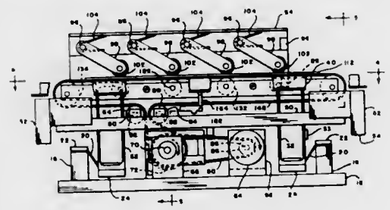
Division of Ser. No. 141,441, Jan. 7, 1988, Pat. No. 4,856,602.

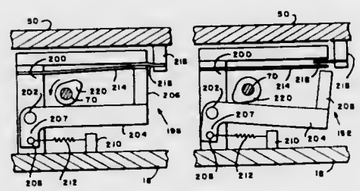
This application Aug. 7, 1989, Ser. No. 390,939

Int. Cl.[4] G01G *3/14, 19/00, 23/02*

U.S. Cl. 177—210 FP **6 Claims**

1. A vibrating tray weighing scale having a frame, a base attached to the frame by isolation springs, a tray connected to the base by flexure members, a transducer operatively connected to a flexure member to generate a voltage responsive to the degree of flexuring of the flexure member, conveying mechanism for transporting an object to be weighed onto and off of the tray, a mechanism for vibrating the tray, and a computing device for determining the weight of the article of the tray in response to the voltage generated by the transducer, this improvement comprising: said flexure members have a





parallelogram configuration wherein two spaced, parallel flexible plates are connected to one another at both ends by connecting members.

4,903,789

POWER STEERING APPARATUS

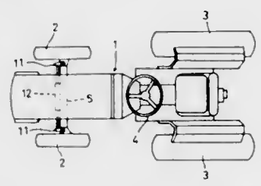
Masaru Nakata, and Yuji Tomiyama, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 13, 1988, Ser. No. 180,877

Claims priority, application Japan, Apr. 13, 1987, 62-91672; Apr. 13, 1987, 62-91673

Int. Cl.[4] B62D *5/10, 7/16*

U.S. Cl. 180—155 **4 Claims**



1. A power steering apparatus comprising:

an axle (**5**) for supporting steerable wheels (**2**) at opposite ends thereof, said axle being oscillatably supported by an axle frame (**6**) through a center shaft (**7**) having an axis extending longitudinally of a vehicle body in a substantially middle portion thereof,

steering arms (**11**) for steering said steerable wheels, respectively,

a power cylinder (**12**) extending substantially parallel to said axle, said power cylinder including piston rod means (**15, 16**) slidably mounted in a cylinder tube (**13**) and operatively connected to said steering arms at a position in a substantially longitudinal axis, and

a connecting device (**20**) for connecting said cylinder tube of said power cylinder to said axle to be movable in three-dimensional directions, said connecting device including

an oscillatable member (**27**) having a support shaft (**26**) at a base end thereof extending substantially parallel to said axle and pivotally supported by a first bracket (**5A**) connected to and projecting from said axle (**5**), said oscillatable member being movable in a plane perpendicular to said axle, and

universal joint means (**24**) for interconnecting said oscillatable member and a second bracket (**13A**) extending from said cylinder tube, said universal joint means for interconnecting said second bracket has an axis extending perpendicular to an axis of said center shaft to permit omnidirectional pivotal movements of said cylinder.

4,903,790

MOTORCYCLE

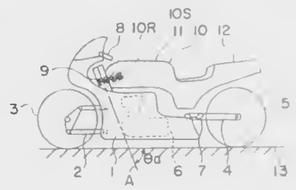
Satoru Horiike, Tokyo; Yasuhiko Nakano, Saitama; Shigetaro Okano, Saitama; Shigeru Kimura, Saitama; Toshiteru Yamamoto, Saitama; Masanobu Matsuzaki; Eiji Hamano, both of Tokyo, and Mikio Kubo, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

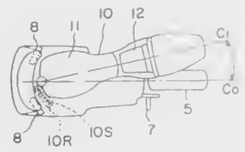
Filed Mar. 14, 1988, Ser. No. 167,888

Claims priority, application Japan, Mar. 13, 1987, 62-59233

Int. Cl.[4] B62D *9/02, 37/04*

U.S. Cl. 180—219 **17 Claims**





1. A motorcycle comprising:

a fixed frame portion;

a front wheel, suspended from said fixed frame portion;

a rear wheel suspended from said fixed frame portion;

said motorcycle negotiating a corner with said fixed frame portion, said front wheel and said rear wheel inclined at a lean angle O_b with respect to vertical with the center of gravity of thereof located along a center of gravity axis defined by said lean angle;

a moveable frame portion including a seat; and

means for moveably mounting said moveable frame portion to said fixed frame portion to allow the said moveable frame portion to be shifted further inside the corner to shift the center of gravity of said moveable frame portion to the inside of the corner to thereby shift the center of gravity of the entire motorcycle inside the corner and increase the effective lean angle of the entire motorcycle.

4,903,791

FRAME CROSSBEAM ASSEMBLY FOR ALL-WHEEL DRIVE VEHICLE

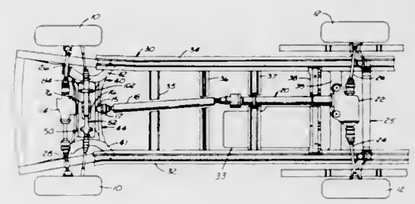
Dugald Cameron, Grosse Pointe Woods, Mich.; Karl Friedrich, Leibnitz, Austria; Klaus Eder, and Franz Bachhiesl, both of Graz, Austria, assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Nov. 2, 1988, Ser. No. 266,181

Claims priority, application Austria, Dec. 15, 1987, 3299/87

Int. Cl.[4] B60G *3/00*

U.S. Cl. 180—252 **1 Claim**



1. In combination with a four wheel drive vehicle having a front transaxle driving front wheels and a rear axle driving rear wheels, said vehicle having a chassis of the type having a frame including first and second spaced apart longitudinally extending side members, a power train including a longitudinally extending drive shaft assembly drivingly interconnecting said front tranaxle and said rear axle for driving said rear axle wheels, a steering assembly for said front wheels, at least one transversely extending crossbeam assembly rigidly affixed at its opposite ends to an associated one of said frame side members, the improvement wherein said crossbeam assembly comprising:

a lower crossmember formed by sheet stamping and supported between said frame side members formed with an upwardly concave arcuate shaped depression including a thinned valley portion substantially aligned on the longitudinal centerline of said chassis frame;

a transversely positioned upper bridge member formed with a bifurcated portion intermediate its co-planer outwardly directed end extensions with each said end extension affixed to an associated underlying end portion of said lower crossmember, said bifurcated portion in the form of fore and aft longitudinally spaced upwardly arched branch sections, whereby said bifurcated portion overlies said lower crossmember thinned valley section defining a passage therebetween receiving therethrough a longitudinal portion of said drive shaft assembly;

a transverse tube portion of said vehicle steering assembly received in an open channel defined between said upper bridge member fore and aft branch sections with each end of said tube portion attached by bolting to an associated underlying bridge member end extrusion, whereby said steering assembly transverse tube portion is arranged in an orthogonal overlying manner with a portion of said subjacent longitudinal drive shaft;

said upper bridge member formed by sheet stamping into upper and lower half-shells affixed together along associated peripheral flanges establishing a medial seam line which circumscribes said half-shells defining a closed hollow-section structural member;

said upper and lower half-shells forming said upper bridge member fore and aft branch sections structured with each section having associated medial seam portions defining identical substantially sinusoidal shapes in transverse section; and

wherein said lower crossmember thinned valley portion being formed with a cross-sectional vertical dimension about one-half the cross-sectional vertical dimension of its adjacent outboard portions.

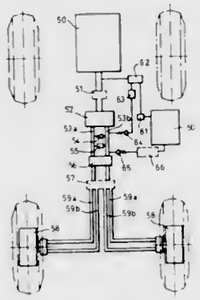
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4,903,792

HYDRAULIC MOTORS AND VEHICLE HYDROSTATIC TRANSMISSION SYSTEM OF WHEEL MOTOR TYPE

Tan Ze-ying, 331 Central Rd., Nanjing, Jiangsu Province, China

Continuation-in-part of Ser. No. 913,732, Sep. 30, 1986, Pat. No. 4,777,866. This application Mar. 30, 1987, Ser. No. 32,287
Int. Cl.[4] B60K *17/10*
U.S. Cl. 180—308 **6 Claims**



1. A vehicle hydrostatic transmission system of a wheel motor type, which comprises an engine, an oil pump driven by said engine, oil pipe lines including a high pressure line and a low pressure line, an oil tank connected to the oil pump by a charge pump circuit, and at least one wheel motor receiving oil output from the oil pump and driven thereby, wherein the wheel motor is a variable displacement hydraulic motor with a rotating casing and fixed shaft having:

(a) a casing having a plurality of planar surfaces on the inner surface;

(b) a cover therefor;

(c) bearings fitted in the central part of said casing and cover;

(d) an eccentric shaft with an eccentric supported between said bearings, said eccentric shaft having two separated groups of fluid passages disposed therein and fluid distributing means communicating therewith for conducting a fluid, one group of said fluid passages being connected to a high pressure fluid system and the other group of fluid passages to a low pressure fluid system;

(e) a cylinder block rotatably mounted on the outer periphery of the eccentric of said eccentric shaft, said cylinder block having a plurality of cylinders corresponding to said plurality of the planar surface in said casing, radially arranged in a plane perpendicular to the axis of said eccentric and eccentric shaft;

(f) a sliding piston fitted in each said cylindres, each piston having an outer flat end contacting with a planar surface in said casing, whereby when said casing is provided with rotary movement relative to said eccentric shaft, said eccentric urges said pistons to reciprocatingly slide in said cylinders in turn; and

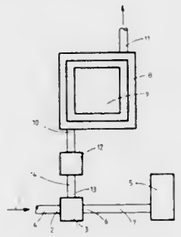
wherein the eccentric of the eccentric shaft and eccentric sleeve with a bore and two separate arcuate fluid distributing grooves communicating respectively with said two separate groups of fluid passages in said eccentric shaft and with said cylinders in said cylinder block in turn to work as a distributing valve, said eccentric sleeve being rotatably mounted on said eccentric shaft through its bore and with said cylinder block mounted on the outer periphery thereof, the dimension of said combined eccentric being adjustable continuously by a controlling means to control the relative angular position of said eccentric sleeve to said eccentric shaft to adjust the displacement of said hydraulic motor or pump continuously.

4,903,793

NOISE SUPPRESSION BY GAS LIQUID MIXTURE

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Filed May 11, 1989, Ser. No. 350,800
Int. Cl.[4] G10K *11/00*
U.S. Cl. 181—0.5 **6 Claims**



1. The combustion of a noisy machine:

wherein the improvement comprises:

jacket means for containing a fluid and comprising a fluid inlet and a fluid outlet;

positioning means for positioning said jacket means for containing to largely surround said noisy machine;

a source of gas;

a source of liquid comprising a liquid source inlet and a liquid source outlet;

mixer means for creating a mixture of gas bubbles within a liquid comprising a gas inlet, a liquid inlet and a mixer outlet;

means for circulating said mixture of gas bubbles in liquid from said mixer outlet through said jacket containing means from said fluid inlet thereof to said fluid outlet thereof;

means for connecting said gas source to said gas inlet of said means for creating a mixture;

means for connecting said liquid source outlet to said liquid inlet of said means for creating a mixture.

4,903,794

ACOUSTICAL AMPLIFYING STETHOSCOPE

Don H. Klippert, and Don E. Klippert, both of P.O. Box 3868, Napa, Calif. 94558

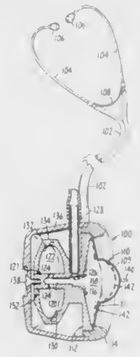
Filed Mar. 23, 1988, Ser. No. 171,956
Int. Cl.[4] A61B *7/02;* **H04R** *25/00*
U.S. Cl. 181—131 **31 Claims**

1. A stethoscope including a transducer communicating with ear seals by way of a lumen wave guide, for use in auscultating sounds from a subject, wherein the transducer comprises:

a housing;

means supported on one end of the housing for interfacing with the subject being auscultated to receive the sounds from the subject; and

a separate enclosed acoustic chamber formed in an opposite end of the housing from the interfacing means and communicating with the lumen wave guide by way of a passageway which extends through the housing and connects the interfacing means to the enclosed acoustic chamber



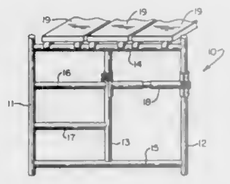
for enhancing the sounds received by the interfacing means.

4,903,795

MOVABLE SCAFFOLD RUNG

Michael P. Cummings, 1547 N. 11th St., Cambridge, Ohio 43725

Filed Oct. 21, 1988, Ser. No. 260,697
Int. Cl.[4] E04G *1/26*
U.S. Cl. 182—92 **2 Claims**



1. A construction scaffolding movable rung assembly constructed to fit between an outside vertical support of the scaffolding and an intermediate vertical support spaced between the outside supports of the scaffolding, and constructed to be positioned as an extension of a fixed horizontal rung that is between the intermediate vertical support and an outer vertical support to provide an extension of the horizontal rung to another outer vertical support, said movable rung assembly comprising:

(a.) first rung portion having a tubular configuration;

(b.) a second rung portion having a tubular configuration and an integrally attached pin member that slidably engages the interior of said first rung portion;

(c.) a first semi-cylindrical clamp portion fixably secured to extreme opposite ends of said movable rung portion;

(d.) a second semi-cylindrical clamp portion hingedly joined to said first semi-cylindrical clamp portion at one end of said movable rung;

(e.) a third semi-cylindrical clamp portion hingedly joined to the other semi-cylindrical clamp portion at the opposite end of said movable rung, said third semi-cylindrical clamp portion constructed to be above said intermediate horizontal rung of the scaffolding when the movable rung assembly is in position between the intermediate and vertical support and the outer vertical support; and

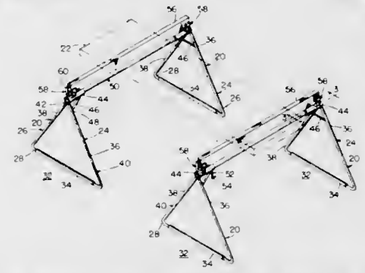
(f.) quick disconnect thread fastener means releasably joining said first semi-cylindrical clamp portions to said second and third semi-cylindrical clamp portions, wherein the quick disconnect fastener means comprises at least one tab on each clamp half with a threaded tension screw means pivotly connected to one of said tabs having a fastener knob threaded thereon, with the fastener knob and screw means rotatable to engage at least one tab on the other clamp half, providing a clamping effect between the clamp halves when the fastener knob is screwed down on the said other tab.

4,903,796

REUSABLE QUICKLY ASSEMBLED AND QUICKLY KNOCKED DOWN WORK SUPPORTS, USED SINGLY AND WITH OTHERS FOR MANY PURPOSES AND CONVENIENTLY CARRIED AND STORED

William A. Magyar, 1121 6th St., and Jack R. Sloboden, 10844 NE. 68th #103, both of Kirkland, Wash. 98033

Filed Oct. 6, 1988, Ser. No. 254,428
Int. Cl.[4] B27B *21/00;* **B25H** *1/06*
U.S. Cl. 182—129 **16 Claims**



1. Work supports, quickly assembled and quickly knocked down, used singly or with others, with and without accessories for many work supporting purposes, comprising:

(a) a pair of leg assemblies, wherein:

(i) each leg has an overall planar triangular shape made of a continuous linear member, arranged, via bending, to have a horizontal lower linear member side for ground or floor contact, and two upstanding oppositely slanting linear member sides;

(ii) a larger cross sectional area linear horizontal member secured to the two upstanding oppositely slanting linear member sides; and

(iii) two short length linear bracing members, each extending at an angle between a respective upstanding opposite slanting linear member side and the underside of the larger cross sectional area linear horizontal member; and

(b) a longer linear horizontal member having a different cross sectional area removably securable at the ends thereof, to the respective larger cross sectional area linear horizontal members, which are secured to the respective two upstanding oppositely slanting linear member sides of the respective legs, thereby spacing and positioning the respective legs of this work support and completing a work support.

4,903,797

APPARATUS FOR ESCAPING FROM BUILDING ON FIRE

Masako Matsuda, 1-6-5, Shinkadokawa, Uozu, Toyama-ken, Japan

Filed Mar. 17, 1989, Ser. No. 325,188
Int. Cl.[4] A62B *1/02*
U.S. Cl. 182—142 **7 Claims**

1. An apparatus for escaping from a building on fire comprising;

a body frame provided with a gondola,

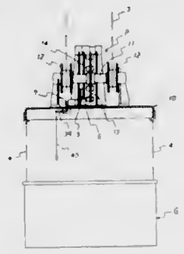
a pin-wheel rotatably pivoted on said body frame; said pin-

wheel being provided with a plurality of pin-rollers projected in the vicinity of an outer circumferential edge of at least one side thereof at predetermined intervals in a circumferential direction and rotatable around an axis parallel to an axis of rotation of the pin-wheel,

a rolling drum disposed integrally with said pinwheel; said rolling drum being provided with a rope for hanging said pin-wheel therearound,

an anchor hung down under the conditions that one side thereof is closer to said pin-rollers and that it is swingable around an axis shaft line parallel to the axis of rotation of said pin-wheel above said pin-wheel,

a weight disposed on a lower end side of said anchor,



an inside block positioned on a rotation locus of said pin-rollers under the condition that said anchor is swung and stopped,

an guide block disposed outside in a radial direction of said inside guide block to be positioned on the rotation locus of said pin-rollers under the condition that the swing of said anchor is stopped and goes off the rotation locus when said anchor is swung in the direction going away from the rotation axis of the pin-wheel,

a projection projected outward from an outside edge of an almost middle portion in the circumferential direction of said anchor, and

a pair of stoppers disposed on a movement locus of said projection to control a swinging amplitude of said projection.

4,903,798

HYDRAULIC APPARATUS FOR AN AUTOMATIC TRANSMISSION

Haruki Takemoto, Chiryu; Takenori Kano; Fumitomo Yokoyama, both of Anjo; Mamoru Niimi, Handa, and Isao Takase, Hazu, all of Japan, assignors to Aisin AW Co. Ltd., Anjo, Japan

Filed Jan. 4, 1989, Ser. No. 293,395
Claims priority, application Japan, Oct. 28, 1988, 63-273955
Int. Cl.⁴ F01K *1/10*
U.S. Cl. 184—6.24 **2 Claims**



1. A hydraulic device for an automatic transmission comprising a transaxle housing, a transaxle casing, a transaxle cover, and an oil sump formed in the bottom of the transaxle housing wherein the improvement comprises

a tightly sealed space formed in the lower part of the transaxle housing and placed in communication with an oil pump in such a manner that it can be opened by the removal of a cover member which is secured to the transaxle casing in a freely mountable and removable manner;

an oil strainer housed in the tightly sealed space; and

an intake adapter provided for communication between the tightly sealed space and the oil sump.

4,903,799

BRAKE-OPERATING LEVER, WITH AN ADJUSTABLE TRANSMISSION RATIO

Antonio Romano, Via Paruta 32, Padova, Italy

Filed Sep. 16, 1988, Ser. No. 245,114
Claims priority, application Italy, Oct. 2, 1987, 67838 A/87
Int. Cl.⁴ B60T *1/00*; **G05G** *11/00, 1/04*; **F16C** *1/10*
U.S. Cl. 188—20 **11 Claims**



1. A brake-operating device for cycles, motorcycles and the like, comprising a lever, a support structure to which the lever is articulated about an axis, and a flexible brake-operating cable connected to the lever,

wherein the device also includes means for selectively adjusting the distance between the axis of articulation of the lever and a point of connection of the flexible cable to the lever, said means operating to maintain the selected distance constant throughout a rotation of the lever about its axis of articulation.

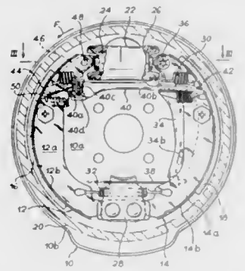
4,903,800

SELF-ADJUSTING DRUM BRAKE

Eric Michoux, Villiers Sur Marne, France, assignor to Bendix France, Drancy, France

Filed Nov. 29, 1988, Ser. No. 277,613
Claims priority, application France, Dec. 1, 1987, 87 16617
Int. Cl.⁴ F16D *65/56*
U.S. Cl. 188—79.54 **4 Claims**

1. A Self-adjusting drum brake comprising a support plate on which are slidably mounted two brake shoes carrying friction members adapted to be brought into contact with a rotating drum by a brake motor interposed between two adjacent ends of the shoes, a spacer of variable length interposed between the shoes in the proximity of the brake motor, automatic adjustment means effecting the elongation of the spacer when operation of the brake moves said ends of the shoes apart to an extent exceeding a predetermined operating clearance, and first resilient means urging the shoes against the spacer, characterized by a first shoe carrying by means of a pivot pin a lever against which the brake motor and the spacer normally bear through the action of said first resilient means, second resilient means bearing against the first shoe to apply to the lever a force tending to hold the lever in abutment against the first shoe, a first moment of the force in relation to the pivot pin of the lever being opposite to a second moment of a force exerted on the lever by the brake motor and determining a limit value of said second moment, beyond which value the operation of the brake motor effects the pivoting of a spacer engaging



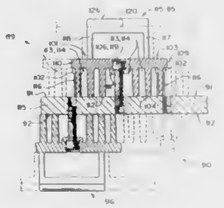
portion of the lever towards the other shoe, thereby neutralizing the automatic adjustment means.

4,903,801

SEGMENTED BRAKE DISC

Jacob Kobelt, 6110 Oak Street, Vancouver, British Columbia, Canada (V6M 2W2)

Continuation of Ser. No. 8,746, Jan. 30, 1987, abandoned. This application Jun. 20, 1988, Ser. No. 208,796
Int. Cl.⁴ F16D *65/12*
U.S. Cl. 188--218 XL **17 Claims**



1. Brake disc assembly, comprising:

(a) a main disc member rotatable on an axis and including first and second main surfaces disposed normal to said axis;

(b) a plurality of adjacently disposed complementary segments, each segment shaped as a truncated sector of a circle and each segment including an outer surface and an inner surface and a plurality of radially disposed ridge means extending from said inner surface for defining a plurality of grooves;

(c) a plurality of means extending parallel to said axis through each segment for releasably and removably securing each segment to one of said main surfaces so that each ridge means seats on the associated main surface and said grooves thereby form radially extending cooling channels and further so that each segment may move relative to the adjacent segments and to said disc member for causing thermally induced distortion to be reduced when said segments are frictionally engaged by a brake pad means;

(d) at least some of said ridge means include a plurality of radially aligned and spaced ridges; and,

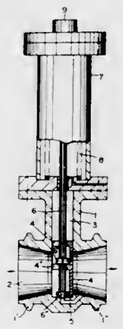
(e) each of said securing means is disposed between a radially aligned and spaced two of said ridges.

4,903,802

SLIDE TYPE EXHAUST BRAKE

Kazunori Takigawa, Numazu, and Ryoichi Suzuki, Mishima, both of Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Shimizu, Japan

Continuation of Ser. No. 122,041, Nov. 18, 1987, abandoned. This application Dec. 2, 1988, Ser. No. 279,355
Int. Cl.⁴ F02D *9/06*
U.S. Cl. 188—273 **2 Claims**



1. A slide type exhaust brake of the type having a housing which has a flow passage for exhaust gas defined by wall portions for connection with exhaust pipes which project in opposite directions at upstream and downstream sides of said housing, said housing further comprising a guide passage for receiving a plate-shaped valve member and guiding reciprocating motion thereof, said guide passage being in communication with said flow passage so that said plate-shaped valve member is selectively extendable into and retractable from said flow passage in a direction substantially perpendicular to the axis of said flow passage, and a piston rod of an air cylinder which is rigidly secured directly to said housing such that an end of said piston rod moves reciprocally in said guide passage, a portion of the piston rod being mounted to the upstream side of the plate-shaped valve member and thereby activating said plate-shaped valve member to open or close said flow passage and to perform an exhaust pressure regulating operation in response to the axial movement of said piston rod, wherein the improvement comprises:

an exhaust pressure regulating passage formed in the wall portions of said housing and extending directly between an outlet at a location in said flow passage downstream of said plate-shaped valve member and an inlet at location in said flow passage upstream of said plate-shaped valve member, the inlet being at a location in said housing substantially opposite said guide passage and in line with the end of the piston rod;

an exhaust pressure regulating valve disposed at the end of said piston rod and in alignment with the inlet of said exhaust pressure regulating passage, said exhaust pressure regulating valve being movable with the piston rod to alternately block and open the inlet to the exhaust pressure regulating passage;

a block fixedly mounted to said piston rod at a location spaced from the end thereof; and

first and second spaced apart walls extending rigidly from the upstream side of said plate-shaped valve member and generally transverse to the alignment of said piston rod, said first wall being disposed intermediate the block and the exhaust pressure regulating valve and at a location on said plate-shaped valve member such that the block urges said plate-shaped valve member into position for closing the flow passage substantially when the exhaust pressure regulating valve blocks the inlet to the exhaust pressure regulating passage, said second wall being disposed on

said plate-shaped valve member intermediate the block and the cylinder, such that movement of the piston rod into the cylinder initially causes the exhaust pressure regulating valve to completely open the inlet to the exhaust pressure regulating passage, and such that subsequent movement of the piston rod into the air cylinder causes the block to contact the second wall and urge the plate-shaped valve member out of the flow passage, whereby initial movement of the piston rod into the air cylinder relieves pressure on the upstream side of the plate-shaped valve member and facilitates the subsequent opening of the plate-shaped valve member by the block and the piston rod.

4,903,803

LOCK-UP DAMPER DISK OF A TORQUE CONVERTER

Masahiko Koshimo, Higashiosaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP87/00798, § 371 Date Jun. 2, 1988, § 102(e) Date Jun. 2, 1988, PCT Pub. No. WO88/03621, PCT Pub. Date May 19, 1988
PCT Filed Oct. 16, 1987, Ser. No. 210,043
Claims priority, application Japan, Nov. 6, 1986, 61-170593[U]
Int. Cl.[4] F16H *45/02*
U.S. Cl. 192—3.28 **2 Claims**



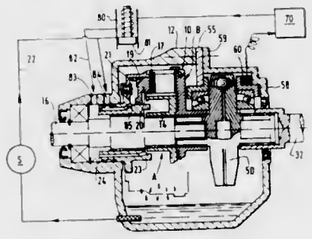
1. A damper disc for a lock-up clutch for a torque converter having a damper disc disposed between a front cover connected to a pump of the torque converter and a turbine of the torque converter connected to an output shaft and including an axially movable clutch plate for frictionally engaging said front cover and a plurality of circumferentially extending damper springs for elastically connecting said clutch plate to said turbine; characterized in that a drive plate made of sheet metal is fixed at radially inner portions thereof to said clutch plate, said clutch plate, at its outer periphery, having an axially extending clutch plate rim extending axially toward said turbine, said drive plate including rims and support walls for holding radially outer and inner sides of said damper springs, respectively, as well as, radially outer projections and inner projected walls located between adjacent of said circumferentially extending damper springs for engaging ends of said adjacent damper springs, claws rigidly connected to said turbine disposed between said radially adjacent projections and said projected walls, respectively, said drive plate rims extending axially toward said turbine radially inside said clutch plate rim and spaced radially inwardly from said clutch plate rim for forming a clearance therebetween, said drive plate rims including radially inwardly inclined stoppers at the ends thereof and projecting axially beyond the end of said clutch plate rim for preventing axial movement of said damper springs, and spring seats fitted into ends of said damper springs, respectively, said inner projected walls being circumferentially retracted with respect to said projections so that said damper springs may form nearly linear shapes when said torque converter is at rest or turning at relatively low speed rather than radially outwardly curved shapes formed by said damper springs at higher speeds of said torque converter.

4,903,804

CLUTCH, PARTICULARLY FOR AN AUTOMOTIVE VEHICLE

Carlo Beccaris, Santena, and Massimo Rubatto, Turin, both of Italy, assignors to Valeo, Paris, France

Filed Mar. 27, 1989, Ser. No. 329,311
Claims priority, application France, Mar. 30, 1988, 88 04172
Int. Cl.[4] F16D *7/02, 43/20*
U.S. Cl. 192—56 F **7 Claims**



1. A clutch, particularly for an automotive vehicle, of the kind generally comprising a first clutch part coupled with a first shaft for rotation therewith and a second clutch part coupled with a second shaft for rotation therewith, an annular friction disc or a plurality of annular friction discs spaced apart axially, said friction disc or discs being mounted around said first clutch part, said second clutch part comprising a pressure plate and a reaction plate for axially gripping said friction disc or discs between them, control means associated with said pressure plate and adapted to act upon said pressure plate to urge it towards the reaction plate, said clutch further comprising a cam mechanism adapted for variable expansion in response to variation in the transmitted torque, said cam mechanism comprising two parts defining a gap between them, spacing means coupling said parts of said cam mechanism to each other, said cam mechanism being coupled to one of said first and second shafts for rotation therewith, said clutch being further characterised by a cam mechanism housing disposed outside the space defined between said pressure plate and said reaction plate, means coupling said cam mechanism to one of said clutch parts for rotation therewith, and means mounting said cam mechanism housing to said fixed support means, said housing carring a detector for detecting longitudinally acting forces associated with said cam mechanism, and a monitoring unit to which said detector is connected, for monitoring control pressure exerted by said control means on said pressure plate.

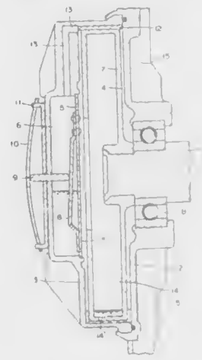
4,903,805

TEMPERATURE-CONTROLLED FAN FLUID COUPLING

Yuichi Ono, Numazu, Japan, assignor to USUI Kokusai Sangyo Kaisha Ltd., Sbizuoka, Japan

Filed Nov. 4, 1988, Ser. No. 267,493
Claims priority, application Japan, Nov. 18, 1987, 62-291522
Int. Cl.[4] F16D *35/00*
U.S. Cl. 192—58 B **6 Claims**

1. A temperature-controlled fan fluid coupling comprising:
an enclosed housing which is driven and includes a cover and a case;
cooling fan members mounted on the outer periphery of the housing;
a partition plate that divides the inside of the housing into an oil reservoir chamber and a torque transmission chamber;
an outflow-adjusting hole formed in the partition plate for adjusting outflow of oil;
a driving rotating shaft having a front end mounted inside the torque transmission chamber said shaft the housing via a bearing;
a driving disk mounted to the front end of the rotating shaft;
a dam formed on a part of the inner surface of the housing which is opposite to the outer periphery of the driving disk and on which oil is collected during rotation of the rotating shaft;
a circulatory passage located close to the dam and extending from the torque transmission chamber to the oil reservoir chamber;
a temperature-sensing element which is mounted on the cover and which, when the ambient temperature varies, deforms
a valve member which opens or closes the outflow-adjusting hole in the partition plate according to the deformation of the temperature-sensing element;



a gap formed between the outer portion of the driving disk and the opposite outer portion of the housing for transmitting torque;
an idle oil chamber formed inside the driving disk;
at least one small hole formed in the outer wall of the idle oil reservoir chamber and communicating with the torque transmission chamber, the diameter of the small hole being so set that the flow rate of oil flowing out through this small hole is less than the flow rate of oil flowing out of the dam;
a communicating means formed in the driving disk for placing the idle oil chamber in communication with the torque transmission chamber only when the engine is stopped;
and wherein the effective contact area of oil in the gap is increased or decreased to control the torque transmitted from the driving, rotating shaft to the driven housing.

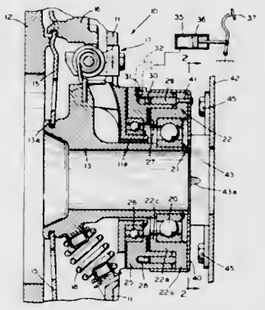
4,903,806

HYDRAULICALLY ACTUATED RELEASE MECHANISM FOR A CLUTCH

Richard A. Flotow, Butler, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed May 6, 1988, Ser. No. 190,859
Int. Cl.[4] F16D *25/08*
U.S. Cl. 192—85 CA **28 Claims**

1. A release mechanism for a clutch having a release sleeve which is moveable between first and second positions comprising:
a piston housing disposed about the release sleeve, said piston housing defining a chamber therein;
a piston disposed in said chamber;
means for selectively providing fluid pressure in said chamber, said piston being moveable from a first position to a second position when fluid pressure is provided in said chamber;
a pressure ring disposed about the release sleeve and moveable by said piston from a first position to a second position when fluid pressure is provided in said chamber, said pressure ring having a flat portion formed thereon and being adapted to move the release sleeve from its first



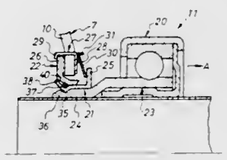
position to its second position when moved by said piston; and
means cooperating with said flat portion for preventing rotation of said pressure ring.

4,903,807

RELEASE BEARING MECHANISM OF A CLUTCH

Yoshiaki Kabayama, Hirakata, and Hiroshi Takeuchi, Osaka, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Continuation of Ser. No. 38,120, Apr. 14, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 270,371
Claims priority, application Japan, Apr. 18, 1986, 61-90834
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 **5 Claims**



1. A release bearing mechanism of a clutch comprising:
a release bearing connected to an operation mechanism for applying an operating force to the bearing in a direction axially outwardly of the clutch, and including an inner race which is provided with a cylindrical extension in a direction axially inwardly of the clutch;
a cylindrical wedge collar disposed around said cylindrical extension; and
a lever plate connected to a diaphragm spring of the clutch and disposed around the wedge collar;
said wedge collar and said lever plate being movable through a predetermined axial distance relative to each other, said wedge collar being provided at an axially outer portion with a radially outward projection, said lever being provided at an axially inner portion with a radially outward projection, said radially outward projections being located at opposite sides of said diaphragm spring;
an axially inner portion of said wedge collar including a radially elastically deflectable portion with an inner engagement portion engaging a groove formed on the outer peripheral surface of an axially inner end portion of said cylindrical extension of said inner race, so that radially outward deflection of said deflectable portion permits

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radial movement of said inner engagement portion to a position disengaged with said groove and that radially inward deflection thereof permits radial movement of said inner engagement portion to a position engaged with said groove;

said cylindrical extension of said inner race being operable to prevent radially inward deflection of said deflectable portion when said cylindrical extension engages said inner engagement portion;

said lever plate being operable at an axially inner position in said axial movable distance to prevent radially outward deflection of said deflectable portion and operable at an axially outward position in said axial movable distance to permit radially outward delfection of said deflectable portion; and

said axially inner end portion of said wedge collar being tapered to form an enlarged outer portion, and a snap ring is fitted around a groove formed on an outer periphery of said engagement portion.

4,903,808

GUIDE DEVICE FOR RELEASE BEARING IN PULL TYPE FRICTION CLUTCH

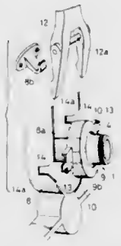
Kiyokazu Okubo, and Shinji Fujimoto, both of Utsunomiya, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,115

Claims priority, application Japan, Jun. 1, 1988, 60-71735[U]

Int. Cl.⁴ F16D *23/14*

U.S. Cl. 192—98 **6 Claims**



1. A guide device for a release bearing used in a pull type friction clutch in which a cylindrical shaft portion projecting out of a transmission case in inserted into, and fitted in the inner periphery of, a release bearing of a clutch unit assembled to the crank shaft of an engine, and a relase fork assembled to the transmission case is engaged with engagement portions formed on one of the release bearing members, said guide device comprising:

projecting pieces formed on said one of the release bearing members, each projecting piece extending outwards in a diametrical direction; and

guide grooves formed on the transmission case receiving said projecting pieces inserted thereinto from the axially front side of the cylindrical shaft portion keeping said one of the release bearing members properly aligned while the clutch is being assembled.

4,903,809

REVERSIBLE CLUTCH RELEASE BEARING ASSEMBLY

Daniel F. Kiblawi, Rochester Hills; Eugene A. Wolbers, Northville, and Thomas M. Frusti, Farmington Hills, all of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Continuatioo of Ser. No. 148,534, Jan. 26, 1988, abandoned. This application Mar. 3, 1989, Ser. No. 319,821

Int. Cl.⁴ F16D *23/12*

U.S. Cl. 192—98 **20 Claims**



1. A clutch release bearing assembly (**20**) for engaging and disengaging a clutch (**22**) comprising;

a housing (**22**) having first and second parts (**34** and **35**) defining an internal bearing cavity (**37**) and a clutch engagement means for engaging a clutch release member (**38**);

an anti-friction bearing (**39**) provided within said bearing cavity (**37**) and having an inner race (**40**), an outer race (**42**), and rolling elements (**44**); and

said clutch engagement means (**38**) being aligned relative to a plane extending radially through the center of the rolling elements (**44**) to render said housing (**32**) symmetrical relative to the plane and thereby permit the clutch release bearing assembly to be secured to a shaft with either the first part or the second part of the housing adjacent to the clutch.

4,903,810

CLUTCH SHOE CONSTRUCTION AND METHOD OF MAKING SAME

George W. Stock, and David L. Heldt, both of Canton, Ohio, assignors to Dyoeer Corporation

Filed Sep. 22, 1983, Ser. No. 534,820

Int. Cl.⁴ F16D *23/10, 43/06*

U.S. Cl. 192—103 B **12 Claims**

1. An improved clutch shoe construction of the type adapted to be mounted on a drive rotor of a centrifugal clutch, said shoe construction including:

(a) first and second arcuate-shaped shoe halves, each having a generally L-shaped configuration with a web and an integral outer shoe table portion;

(b) a projection formed integrally on the web of the first shoe half extending outwardly therefrom in a direction opposite to that of the shoe table portion;

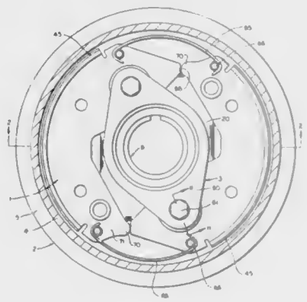
(c) an annular boss formed integrally on the web of the first shoe half surrounding an opening formed in said web, said boss extending outwardly from the web in a direction opposite of the projection;

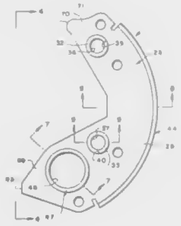
(d) a hole formed in the web of the second shoe half complementary to the projection formed on the web of the first shoe half;

(e) an annular boss formed integrally on the web of the second shoe half surrounding an opening formed in said web and extending outwardly from the web in the same direction as the shoe table portion, said boss and opening being complementary to the boss and opening formed on and in the first shoe half;

(f) the projection of the first shoe half being press fitted in the hole of the second shoe half connecting said shoe half webs in abutting relationship, with the annular bosses and openings of the shoe halves aligning with each other, and with the bosses extending in opposite directions to each other forming a cylindrical sleeve extending outwardly from said connected webs; and

(g) a mounting bushing having a cylindrical outer sleeve telescopically mounted with a press fit in the sleeve formed by the aligned bosses of the shoe halves.





4,903,811

TRANSFER DEVICE FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

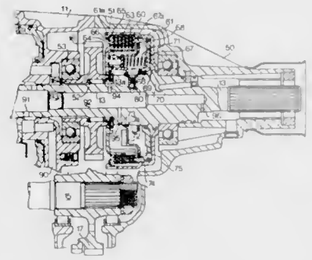
Toshio Kobayashi, and Katsuhisa Ozawa, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 303,694

Claims priority, application Japan, Feb. 16, 1988, 63-033199

Int. Cl.⁴ F16D *43/28*

U.S. Cl. 192--106 F **3 Claims**



1. A transfer device for a four-wheel drive motor vehicle for transmitting output of a transmission and for distributing the output to front wheels and rear wheels through a front power train and a rear power train, comprising;

a fluid operated clutch having a drive drum and a driven drum which are engaged with each other by pressurized oil, the drive drum being secured to the output shaft of the transmission and to one of the front and rear power trains and the driven drum being secured to the other power train, and a piston slidably mounted in a piston chamber and operated by oil supplied to the piston chamber for engaging the drive drum with the driven drum;

a centrifugal force oil chamber formed in the fluid operated clutch opposite to the piston chamber, interposing the piston;

an oil supply passage for supplying oil in the piston chamber and for operating the piston;

a spring provided in the centrifugal force oil chamber for urging the piston in a releasing direction;

a connecting passage connecting the centrifugal force oil chamber with the oil supply passage;

a check valve provided in the connecting passage so as to maintain oil in the centrifugal force oil chamber, whereby centrifugal force of the oil in the oil chamber acts on the piston to release the clutch.

4,903,812

CLUTCH DISC

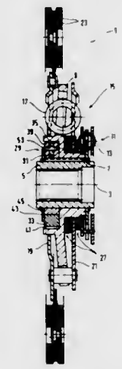
Matthias Fischer, Euerbach, and Harald Jeppe, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed May 26, 1988, Ser. No. 198,984

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718848

Int. Cl.⁴ F16D *3/66*

U.S. Cl. 192—106.2 **13 Claims**



1. A clutch disc for a motor vehicle friction clutch, comprising

(a) a hub rotatable about a rotation axis,

(b) a first disc part rotatable about the rotation axis within a limited rotational play in relation to the hub,

(c) at least one first spring coupling the first disc part rotationally elastically with the hub and dimensioned for idling operation,

(d) a second disc part rotatable in relation to the hub and the first disc part,

(e) at least one second spring, dimensioned for operation under load, which rotationally elastically couples the second disc part with the first disc part,

(f) clutch friction linings connected with the second disc part,

(g) a friction device acting between the hub and the first disc part and controllable by at least one centrifugal weight

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body stressed by a spring contrarily of its centrifugal direction, the friction torque of which device commences above the idling rotation rate and increases with increasing rotation rate, the first disc part has a cylindrical inner wall coaxial with the axis of rotation and wherein the centrifugal weight body is mounted on the hub pivotably about a pivot axis parallel to the rotation axis and for the achievement of a self-intensifying effect comprises a part-cylindrical friction face arranged, seen in the circumferential direction of the cylindrical inner wall, exclusively on one side of the pivot axis, which friction face rests on the inner wall when the centrifugal weight body is pivoted radially outwards, the centrifugal weight body is curved in arcuate form around a centrifugal weight carrier which annularly surrounds the hub and is non-rotatably held thereon, from which carrier a mounting bracket provided with a slot protrudes radially, for the mounting of the centrifugal weight body, and wherein the centrifugal weight body carries, at its end adjacent in the circumferential direction to the mounting bracket, a flange pivotably guided in the slot, which flange is supported, on the side of the mounting bracket remote from the friction face, through a compression spring on the centrifugal weight carrier.

4,903,813

CLUTCH DISK ASSEMBLY

Naoyuki Maki, Oaza-Tsuigome, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 29, 1988, Ser. No. 250,747
Claims priority, application Japan, Sep. 30, 1987, 62-246271
Int. Cl.[4] F16D *47/02*
U.S. Cl. 192—106.2 **8 Claims**



1. A torque transmitting clutch disk assembly comprising:
hub means including a hub member and a hub flange extending radially of said hub member, said hub flange being arranged for limited rotation relative to said hub member;
spring means acting circumferentially between said hub member and said hub flange;
disk means coaxially and rotatably mounted to said hub member and disposed axially adjacent said hub flange;
a first hysteresis mechanism axially resiliently arranged between said disk means and said hub member; and
a second hysteresis mechanism axially resiliently arranged between said disk means and said hub flange, said second hysteresis mechanism including independently operable first and second hysteresis portions, said second hysteresis portion generating a continuously variable hysteresis and comprising:
a plate member, a spring member and a friction lining member, said plate member provided with an axially open recess in which said spring member is positioned;
a cam face formed on one of said plate member and said spring member;
a projection formed on the other of said spring member and plate member and slidably contacting with said cam face; and
an engaging member provided between said plate member and said hub member.

4,903,814

CLUTCH DISC

Hroshi Tomotake, Ikeda, and Yasunobu Fukatani, Hirakata, both of Japan, assignors to Kabushi Kaisha Daikin Seisakusho, Osaka, Japan

Filed Dec. 15, 1987, Ser. No. 141,664
Claims priority, application Japan, May 12, 1986, 61-71161
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[4] F16D *13/60*
U.S. Cl. 192—107 C **7 Claims**



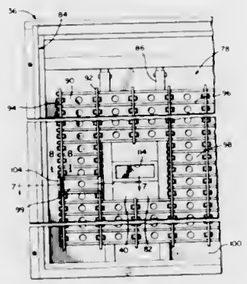
1. A clutch disc having an organic facing for light loads and a cerametallic facing for heavy loads said facings being arranged adjacent to each other in a circumferential direction of a driven plate, characterized by that a cushion is formed at a part of said driven plate on which said organic facing is fastened to said driven plate, and a reinforcing plate is positioned between said organic facing and said driven plate, said reinforcing plate being fixed to said driven plate.

4,903,815

AUTOMATIC VENDING MACHINE AND SYSTEM FOR DISPENSING ARTICLES

Gidoon Hirschfeld, and Abraham Shotland, both of Ein Harod Meuhad, Israel, assignors to I.V.D.M. Ltd., Ein Harod Meuhad, Israel

Filed Mar. 25, 1988, Ser. No. 173,717
Int. Cl.[4] G07F *7/06;* **B65G** *1/06*
U.S. Cl. 194—205 **27 Claims**



6. A machine for storing, dispensing and receiving articles,

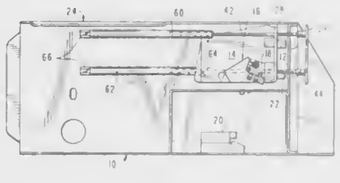
comprising: a cabinet, a transaction port in said cabinet through which the articles are delivered and returned, gripper means for clamping thereto the articles positioned in a predetermined orientation within said port, robotic transport means connected to the gripper means for travel of the clamped articles to and from said port, storage means for establishing a plurality of separate zones respectively receiving the articles therein from said gripper means, and realigning means mounted within one of said zones for restoring articles inserted therein in a misaligned condition with respect to said predetermined orientation of said articles clamped in said gripper means to said predetermined orientation prior to said travel of the clamped articles to another of said zones of said storage means.

4,903,816

COIN DROP MOUNTING MECHANISM

Bruce L. Reeder; Joseph M. Wilson, both of Frederick, and Stephen D. Wade, Keymar, all of Md., assignors to North American Philips Corporation, New York, N.Y.

Filed May 15, 1989, Ser. No. 352,589
Int. Cl.[4] G07F *9/00, 1/04*
U.S. Cl. 194—350 **5 Claims**



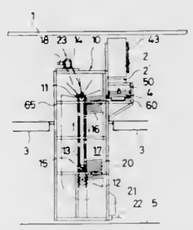
1. A coin drop mechanism for installation on a panel of a meter box of a vending machine comprising, in combination:
a first plate defining a first slot for coin insertion;
a second plate defining a second slot for coin insertion;
the first and second plates being adapted to sandwich between them the panel of the meterbox so that the first slot and the second slot are aligned to permit passage of coins;
two threaded studs, each stud having a first end which is attached to a rear surface of the first plate so that the studs extend normal from the rear surface adjacent opposite sides of the first slot;
two guide rods, each guide rod being concentrically affixed to and extending from an end of a corresponding one of the studs, which end is remote from the rear surface, and having an external diameter which is smaller than the external diameter of the corresponding stud;
said second plate further defining two holes which are disposed to engage the studs when the panel is sandwiched between the plates and the slots are aligned; and
two tubular locking members, each locking member having an internally threaded first end adapted for engagement with one of the studs, an opposite, fixtured second end adapted for engagement with an installation tool, the locking members each further defining an internal passage which extends from the first end, concentric with the internal thread and which is adapted to receive one of the guide rods to align the internal thread with the stud.

4,903,817

APPARATUS FOR TRANSPORTING LITHOGRAPHIC PLATES

Akio Yaguchi, Hidaka, and Takatsugu Kyoo, Iruma, both of Japan, assignors to Tsubakimoto Chain Co., Japan

Filed Apr. 8, 1988, Ser. No. 179,422
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—406 **2 Claims**



1. Apparatus for transporting lithographic plates from a first location at which the plates are delivered on edge by an overhead conveyor to a second location vertically below the first location, comprising:
input means at the first location for loading individual said lithographic plates, said input having a chute means defining a curved path for receiving the lithographic plates as oriented on edge and re-orienting the lithographic plates along the curved path for substantially horizontal placement; and,
storage means for receiving the lithographic plates at the first location and delivering the lithographic plates in succession to the second location, the storage means having a rotary shelf conveyor in which a series of plate trays mounted on an endless loop and operable to bear the lithographic plates on their sides are moved around an endless path including a portion extending vertically between said first and second locations, and the plate trays being upwardly inclined from the endless loop during movement thereof along said portion of the path extending vertically between the first and second locations, the input means delivering the lithographic plates onto the plate trays at a substantially horizontal orientation, and the input means having a transfer conveyor for transferring the lithographic plates received from the chute means onto an adjacent tray of the rotary shelf conveyor.

4,903,818

APPARATUS FOR INSERTING AND/OR REMOVING PRINTED CIRCUIT BOARDS INTO AND FROM SLOTTED CHANGE PALLETS

Hans-Guenter Loehr, Calw, and Gunter Herrmann, Wiernsheim, both of Fed. Rep. of Germany, assignors to Loehr & Herrmann GmbH, Neuhausen, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 196,499
Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717628
Int. Cl.[4] B65G *25/00*
U.S. Cl. 198—409 **18 Claims**

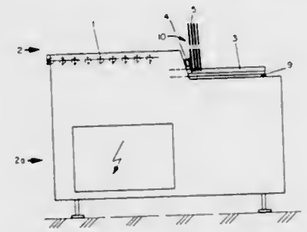
1. Apparatus for inserting printed circuit boards into a slotted change pallet for holding a plurality of printed circuit boards in a generally upright orientation and out of contact with each other in respective, transversely spaced apart, parallel slots of said pallet, comprising
a board holder, which is mounted to be pivotally movable between upper and lower positions and in said upper position is adapted to receive and grip a printed circuit board when the latter has a generally horizontal orientation, and in said lower position is adapted to hold said printed circuit board at its bottom edge and to release said

printed circuit board when the latter has a generally vertical orientation,

a roller conveyor for conveying a printed circuit board in a generally horizontal orientation in a predetermined direction of travel to said board holder when the latter is in said upper position,

a pallet carriage, which is adapted to carry a change pallet formed with said slots which are at right angles to said direction of travel and adapted to support said printed circuit boards in said slots in a generally vertical orientation,

a carriage drive for moving said pallet carriage in said direction of travel to positions in which respective ones of said slots are disposed below said board holder and adapted to receive a printed circuit board in a generally vertical



orientation from said board holder when the latter is in said lower position,

a board holder drive for pivotally moving said board holder from said upper position to said lower position and from said lower position to said upper position, wherein

said board holder comprises a plurality of laterally spaced apart gripping jaws which are arranged to extend into said gaps when said board holder is in said lower position,

said board holder comprises pivoted arm means, and

each of said pairs of gripping jaws comprises a fixed gripping jaw that is fixed to said arm means and a movable gripping jaw which is mounted on said pivoted arm and is movable relative to said pivoted arm means to clamp said printed circuit board against said fixed gripping jaw and to release said printed circuit board.

4,903,819

APPARATUS FOR TRANSPORTING GARMENT HANGERS

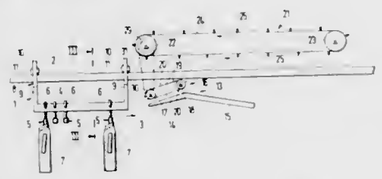
Hans Heinold, Dietzenbach; Josef Rau, Heppenheim, and Thomas Unverzagt, Naubeim, all of Fed. Rep. of Germany, assignors to Sussman, Jennewein Bekleidungstechnik GmbH, Mörfelden-Walldorf, Fed. Rep. of Germany

Filed Mar. 2, 1989, Ser. No. 317,735

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807280

Int. Cl.[4] B65G *47/34*

U.S. Cl. 198—465.4 **9 Claims**



1. Apparatus for transporting garment hangers of the type having hooks, comprising means for delivering a series of hangers in a predetermined direction along a predetermined path, including a first support for the hooks of hangers; means for accepting hangers from said delivering means, including a second support for the hooks of hangers, said second support having a receiving section adjacent a predetermined portion of said path, said receiving section including an upwardly sloping first ramp and said second support further comprising a downwardly sloping second ramp following said upwardly sloping ramp; and means for transferring the hooks of hangers of said series from said first support onto said receiving section, said transferring means comprising a conveyor having a plurality of entraining elements for the hooks of hangers reaching said portion of said path, and means for transporting said entraining elements along a second path having a portion adjacent said portion of said predetermined path so that an entraining element moving along said portion of said second path engages an oncoming hook and conveys the hook from the predetermined path onto and along said first ramp toward said second ramp.

4,903,820

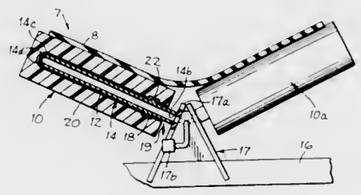
IDLER ROLLERS FOR BELT CONVEYORS

Edward R. Fyfe, 1341 Ocean Ave., Del Mar, Calif. 92014

Continuation-in-part of Ser. No. 133,266, Dec. 5, 1987, Pat. No. 4,830,179, which is a continuation of Ser. No. 869,909, Jun. 3, 1986, abandoned. This application Nov. 1, 1988, Ser. No. 265,513

Int. Cl.[4] B65G *39/00*

U.S. Cl. 198—501 **24 Claims**



20. A conveyor idler roller for a belt conveyor comprising:

(a) a cylindrical body over which said belt conveyor advances formed with a central opening along the axis thereof, said central opening having an open end:

(b) a tubular shaft disposed in said central opening through the open end thereof and disposed within said central opening with the axis thereof coextensive with the axis of said cylindrical body, said cylindrical body being freely rotatable about the axis of said tubular shaft for the advancement of said belt conveyor thereover, said tubular shaft having a proximal end and a distal end with an opening at said proximal end and with an opening at said distal end; and

(c) a source of coolant communicating with the opening at said proximal end of said tubular shaft, said coolant advancing through said tubular shaft and discharging through said opening in the distal end of said tubular shaft, said coolant advancing through a space between said cylindrical body and said tubular shaft to be vented to atmosphere at the said proximal end of said tubular shaft for reducing heat build-up in said idler roller.

4,903,821

INTERMITTENT DRUM FEEDER WITH ADJUSTABLE LOADING POSITION

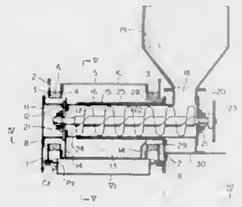
Tameaki Yamaguchi, Toyonaka, Japan, assignor to Tsubakimoto Bulk Systems Corporation, Osaka, Japan

Filed Jun. 9, 1988, Ser. No. 204,711

Claims priority, application Japan, Sep. 6, 1987, 62-88022[U]; Sep. 6, 1987, 62-88023[U]

Int. Cl.[4] B65G *47/00*

U.S. Cl. 198—550.7 **6 Claims**



1. A feed mechanism comprising:

a cylindrical trough having at the lower part thereof an axially extending material discharge opening,

a feed auger screw disposed coaxially with said trough,

means to feed material to one end of said auger screw,

means to rotate said auger screw to distribute the material from said one end along the length of said trough, and

a sleeve circumscribing said trough and said opening, said sleeve having an opening adapted to at least partially register with the opening of said through whereby the flow passing through said through opening may be regulated by angularly adjusting said sleeve on said trough to afford restriction of the flow of material from said trough along its length through said registering openings, said sleeve extending from the feed end of said trough to a point spaced from the opposite end of said through opening so as to cause said trough opening to be unrestricted at said opposite end of said trough.

4,903,822

TUBE FEED APPARATUS

John J. Borzyia, 4820 Schoolbell, Birmingham, Mich. 48010

Filed Jan. 29, 1988, Ser. No. 149,430

Int. Cl.[4] B65G *29/00*

U.S. Cl. 198—524 **10 Claims**

1. A power feed apparatus for tubing or the like comprising:

(A) a pair of feed rollers adapted to drive the tubing along a tube feed path;

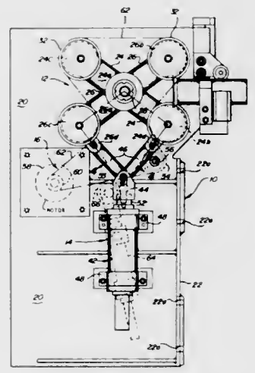
(B) means for moving said rollers relative to each other between a drive position engaging opposite sides of the tubing and a rest position withdrawn from the tubing feed path;

(C) means for rotationally driving said rollers and including a drive belt having a path of movement that varies in length in response to relative movement of said feed rollers;

(D) belt tensioning means operative in response to relative movement of said rollers to vary the length of said belt path in compensation for the variation in belt path length resulting from said relative movement of said feed rollers so as to maintain a relatively constant path length and thereby a relatively constant belt tension;

(E) said means for relatively moving said rollers including a pair of arms mounted for movement about a fixed pivot axis and each defining a free end;

(F) said feed rollers being respectively mounted on the free ends of said arms;



(G) said apparatus further including a pulley mounted on the free end of each of said arms in driving relation to the respective feed roller; and

(H) said drive belt being trained around said pulleys.

4,903,823

SPATIAL CONVEYOR FOR TRANSFERRING NEWSPAPERS, BOOKS AND MAGAZINES

Dmitry A. Plesser, ulitsa Seleznevskaya, 30, korpus 3, kv. 14; Grigory A. Radutsky, ulitsa Pervomaiskaua, 66, kv. 45, and Sergei K. Gutov, ulitsa Ramenki, 7, korpus 1, kv. 76, all of Moscow, U.S.S.R.

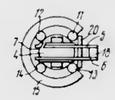
PCT No. PCT/SU87/00109, § 371 Date May 27, 1988, § 102(e) Date May 27, 1988, PCT Pub. No. WO88/02337, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 30, 1987, Ser. No. 239,952

Claims priority, application U.S.S.R., Oct. 1, 1986, 4122339

Int. Cl.[4] B65G *39/20*

U.S. Cl. 198—845 **2 Claims**



1. A spatial conveyor for transferring newspapers, books and magazines or the like, comprising a trackway made in the form of a plurality of support elements **(11, 12, 13, 14)** disposed equidistantly and uniformly relative to the longitudinal axis of the conveyor along the entire length thereof and making up a closed regular polygon in a section perpendicular to the axis of the conveyor; a draw member **(1)** having load-carrying means **(2)** mounted for movement on spherical supports **(4)** along said trackway, said draw member **(1)** consisting of links each of which comprises interconnected plate cheeks **(5,6)** having

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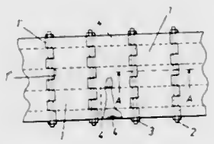
cavities with spherical surfaces (7,8), some of said cavities (8) accommodating connecting elements connecting the adjacent plate cheeks, while the other cavities (7) accommodate the spherical supports (4) running over said trackway.

4,903,824

CONVEYOR BELT MADE OF CARBON OR CERAMIC FIBERS

Susumu Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo K.K., Japan

Filed Feb. 6, 1989, Ser. No. 306,114
Claims priority, application Japan, Feb. 8, 1988, 63-15272
Int. Cl.[4] B65G *17/06*
U.S. Cl. 198—853 2 Claims



1. A conveyor belt for use at a high temperature, which comprises a plurality of flattened cylinders made of a material selected from the group consisting of carbon and ceramic fibers, said fibers extending substantially in alignment with a running direction of the conveyor belt, said cylinders being hinged to each other in series by tenon joints integrally formed from each cylinder, and by hinge pins which pass through said joints, said pins also being made of said material.

4,903,825

HOLDER FOR ENCASED COLLECTOR'S COINS

Sven Harlan, and Ernest A. Verina, both of Norwalk, Conn., assignors to 21st Century Coin Products, Inc., Norwalk, Conn.

Filed Jun. 5, 1989, Ser. No. 361,639
Int. Cl.[4] A45C *11/28*
U.S. Cl. 206—0.8 5 Claims



1. A device for holding coins confined within plastic cases comprising:

(a) a substantially rigid thin panel of rectangular configuration having at least one series of uniformly spaced apertures in a straight line array paralleling a side of said panel, and

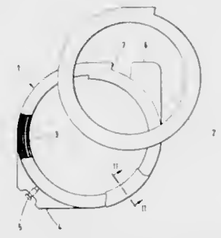
(b) a suction cup held by each apertures, said suction cups being identical, fabricated as a monolithic structure from a resilient plastic, and comprised of a stem and a conical portion, said stem being inserted into and protruding through said apertures, all said conical portions being disposed to face outwardly from one surface of said panel, causing the protruding portions of said stems to be disposed upon the opposite surface of said panel.

4,903,826

DISPENSER FOR SURGICAL GUIDEWIRE

Harold J. Pearce, Tetbury, England, assignor to EMS Medical Group Ltd., Unit 3, Stonehouse, United Kingdom

Filed Feb. 3, 1989, Ser. No. 306,819
Claims priority, application United Kingdom, Feb. 9, 1988, 8802935
Int. Cl.[4] A61B *17/06*
U.S. Cl. 206—63.3 21 Claims



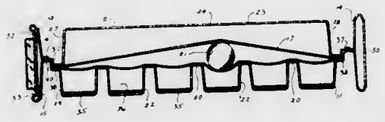
1. A dispenser for surgical guide wire including a generally circular housing with a cover therefor, said housing and cover forming a cassette, said housing having a spirally formed channel therein for accommodating said guide wire, an outlet aperture of said cassette disposed substantially tangentially to the housing, from which aperture said guide wire may be uncoiled, a tubular member releasably fixed to said outlet aperture and protruding therefrom, an axial passage in said tubular member enabling said guide wire to be transportable therethrough, and said tubular member being manually removable from said cassette.

4,903,827

SUSPENDED LOAD CONTAINER

Randall J. Phelps, Watertown, and Thomas W. Thomsen, Marion, both of Wis., assignors to Menasha Corporation, Neenah, Wis.

Filed Apr. 12, 1989, Ser. No. 337,027
Int. Cl.[4] B65D *81/10, 85/30*
U.S. Cl. 206—204 12 Claims



1. A container for at least one fragile article comprising:

a tray portion and a cover portion each including an outwardly extending and continuous peripheral wall encompassing cavity portions, said peripheral wall of said tray and cover portion constructed and arranged to present the cavity portions in a face-to-face relationship;

partitions extending between opposing sides of said tray portion to define in part at least one open compartment;

an absorbent material in said compartment;

a first flexible membrane disposed between said partitions in a hammock like manner to support said fragile article; and

a second flexible membrane disposed over said cavity portion in said cover portion;

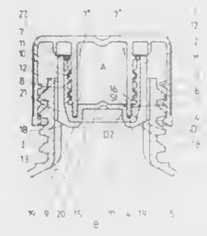
said flexible membranes providing a fluid dampening effect for said fragile article placed on said first flexible membrane disposed between said partitions when said tray portion and said cover portion are engaged, and said first flexible membrane spaced from said tray walls to provide a fluid passage to said absorbent material with a major portion of said absorbent material being disposed on a side of said first flexible membrane opposite said fragile article.

4,903,828

BOTTLE CLOSURE CAP FOR TWO-COMPONENT PACKAGES

Robert G. Finke, Finnentrop, and Clemens Schumacher, Sundern, both of Fed. Rep. of Germany, assignors to Robert Finke Kommanditgesellschaft, Finnentrop, Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 23,061
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 8606224[U]
Int. Cl.[4] B65D *51/24*
U.S. Cl. 206—221 7 Claims



1. A closure cap system for a bottle in a two-component package, comprising

a cup-shaped closure cap with a thread extending along an inner wall of the cap for engaging a screw-on thread of said bottle;

a container having a cylindrical wall with a thread on the inner side and projections on the outer side of the cylindrical wall, said container being insertable within a neck of the bottle to be closed by said cap;

a collar extending from the bottom of the cup-shaped cap, the collar having a thread engageable with the container thread for bearing said container via said container thread, said collar thread being directed opposite the cap thread to bring the container guided by said projections into non-rotatably but axially displaceable coupling engagement with an inner wall of the bottle neck; and wherein

an annular groove is located on the bottom of the container, and an end of the collar fits within said annular groove.

4,903,829

CONTAINER FOR COMPACT DISC

Philip M. Clemens, 2424 Forest Park Blvd., Fort Wayne, Ind. 46805

Filed Oct. 7, 1988, Ser. No. 255,034
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—310 21 Claims

1. A container for a disc of the type having a top surface including a radially outer information storage portion and a radially inner mounting portion, a bottom surface and an aperture substantially in the center thereof, said container comprising:

a body having a base portion and a lid portion, each of said portions having an inner surface and an outer surface;

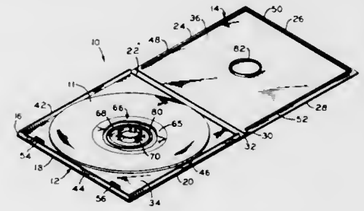
said base portion further having a sidewall protruding axially inwardly and extending along a portion of the periphery of its inner surface;

said base portion and said lid portion being of substantially similar configuration and being in substantial alignment with each other when said container is in its closed position so that said inner surface of said base portion and said inner surface of said lid portion are facing each other;

hinge means for connecting said lid portion to said base portion;

cooperating latch means in said base portion and said lid portion for releasably locking said container in its closed condition, said cooperating latch means comprising latch tab means positioned on one of said base portion or lid portion inner surface, each of said latch tab means being spaced from a sidewall of said one of said base or lid portion to form a channel therebetween, said latch tab means having projections extending therefrom, said cooperating latch means further comprising engagement means associated with a retaining wall of the other of said lid portion or base portion inner surface for releasably engaging at least a portion of said retaining wall in said channel, said engagement means including respective projections adapted to engage respective projections of said latch tabs whereby said container is maintained in its closed condition; and

clamp means for seating the disc in the container and protecting the disc from axial movement within said container, said clamp means comprising a protrusion on the inner surface of said lid portion.

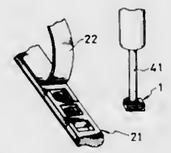


4,903,830

AUTOMATIC MOUNTING CHIP COMPONENT

Toshiya Onodera, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

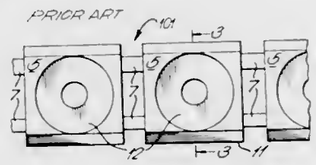
Filed Jan. 25, 1989, Ser. No. 301,782
Claims priority, application Japan, Feb. 12, 1988, 63-17653[U]
Int. Cl.[4] H02H *1/00*
U.S. Cl. 206—328 8 Claims



1. An automatic mounting chip component comprising at least one metal sheet each having one surface which is solderable and other surface which is not solderable, said metal sheet being arranged to form a cylindrical body of a rectangular cross section in such a manner that said one solderable surface lies inside thereof, at least one of the outer surface portions of said cylindrical body being formed as an anchoring surface which is formed of the superimposed metal sheet portions.

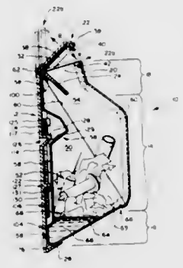
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4,903,831
AUTOMATIC NAILER SYSTEM
Terry E. Francis, Poplar Court, Cae Hopkin, Abercrave, Powys SA9 1TP, Wales
Division of Ser. No. 97,512, Sep. 15, 1987, Pat. No. 4,795,074, which is a continuation-in-part of Ser. No. 766,107, Aug. 15, 1985, abandoned. This application Sep. 22, 1988, Ser. No. 247,678
Claims priority, application United Kingdom, Aug. 15, 1984, 8420747; May 14, 1985, 8512208
Int. Cl.[4] B65D *85/24*; F16B *41/00*
U.S. Cl. 206—347 8 Claims



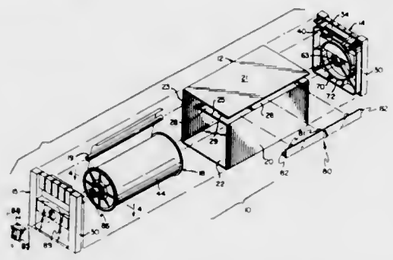
1. A strip, for use with an automatic nailer, comprising a plurality of plastic ferrules, arranged in a longitudinal row, for receiving a complementary plurality of nails, each ferrule being attached to adjacent ferrules by at least one severable plastic web, each ferrule provided with means whereby a trim can be fixed onto a substrate onto which the ferrule has been attached, the fixing means including a step in the ferrule which is adapted to co-operate with a surface of the substrate to form a groove for receiving a flange on the trim and the thicker part of the stepped ferrule is tapered to assist in fitting the trim.

4,903,832
METHOD AND APPARATUS FOR CLEANLY STORING AND DISPOSING OF DISCARDED ARTICLES
Gene L. Stewart, San Diego, Calif., assignor to Winfield Corporation, San Diego, Calif.
Filed Jan. 19, 1989, Ser. No. 299,732
Int. Cl.[4] B61D *83/10*
U.S. Cl. 206—366 40 Claims



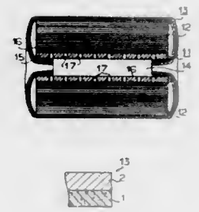
1. A unitary, disposable, fluid-trapping receptacle for discarded articles, the receptacle comprising:
(a) a rear panel having a back wall, two side walls projecting from said back wall, and a floor extending from said back wall at an acute angle interconnecting said side walls to form a reservoir for trapping fluid contained in the discarded articles, said reservoir having an entry bounded by said back wall, said side walls, and an edge of said floor extending between said side walls separated from said back wall;
(b) a face panel pivotably attached to said edge of said floor by an integral hinge, said face panel being engagable with said side walls to close a first portion of said entry and to retain said face panel in an opposing relationship with said back wall; and
(c) mounting means for securing said receptacle to a support.

4,903,833
CARTRIDGE FOR WEB-TYPE MEDIA MATERIAL
Jack Beery, Centerville, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Oct. 17, 1988, Ser. No. 258,970
Int. Cl.[4] B65D *85/60*
U.S. Cl. 206—407 10 Claims



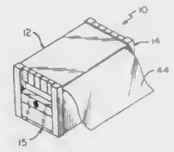
1. A cartridge for storing and dispensing web-type media material from a spool of such material in which outer surface only of such material is sensitive to both light and pressure, comprising:
a light-tight spool housing having a pair of generally rectangular end caps,
means rotatably mounting said spool in said housing between said end caps,
said housing further having a generally rectangular closure board extending between said end caps encircling said spool and defining a housing top wall, a front wall, a back wall and a bottom wall,
said board having means in said front wall thereof defining a transverse media material exit slot extending between said end caps and adjacent the junction of said front wall with said top wall, said exit slot having a width which exceeds the width of said media material and a height which substantially exceeds the thickness of said material,
said board having a flap extending inwardly of said housing from the edge of said slot remote from said top wall, said flap extending generally parallel to said top wall and terminating at an inner end in spaced relation to said back wall,
said flap defining a light-trapping passage of a width and height corresponding to those of said exit slot and leading from an inlet formed between said inner end and said back wall within said housing interior forward to said slot, in which said passage is bounded by said flap, said top wall and said end caps,
web material guide means in said housing extending between said end caps adjacent said passage inlet, said guide means positioned to receive said material from said spool by engaging said material only on the inner side thereof and to redirect said material from said spool into said passage inlet and through said slot with said outer surface in spaced relation to and free of contact with said top wall.

4,903,834
PACKAGE FOR THERMOSENSITIVE RECORDING MATERIALS
Mutsuo Akao, Kanagawa; Kotaro Nakamura, and Takao Hayashi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan
Filed Mar. 5, 1987, Ser. No. 22,135
Claims priority, application Japan, Mar. 10, 1986, 61-33208[U]; Apr. 19, 1986, 61-59419[U]
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[4] B65D *81/30*
U.S. Cl. 206—410 14 Claims



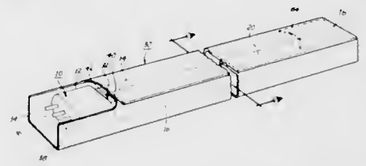
1. A package for diazo thermosensitive recording materials coiled round a core, which comprises a packaging paper having a water vapor permeability of more than 50 g/m^2.24 hours, said packaging paper consisting essentially of a light-reflecting paper layer located as outer layer and a light-shielding paper layer located as inner layer.

4,903,835
CARTRIDGE FOR WEB-TYPE MEDIA MATERIAL
Jack Beery, Centerville, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Oct. 7, 1988, Ser. No. 258,966
Int. Cl.[4] B65D *85/38*
U.S. Cl. 206—416 4 Claims



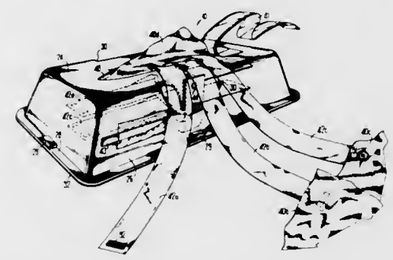
1. In a cartridge containing a spool of light and pressure sensitive media material, the improvement in spool construction comprising a cylindrical core having a smooth outer surface free of irregularities and discontinuities, and having open ends, a pair of identical spool end flanges, each of said end flanges having an axially-extending portion adapted to be received in one core end and forming a close fit therewith and further having an annular wall, which wall extends radially of said core at the side thereof facing said core, interfitting torque transmitting means on said axially-extending end flange portions and in said core open ends forming a torque transmitting connection between said core and said end flanges, said end flanges proportioned to be insertable onto said core after said media is wound thereon to engage said interfitting torque transmitting means without introducing a radial stress into said core.

4,903,836
CARTON FOR TWIN TUBE FLUORESCENT LAMP
Kenneth Combs, Warrensville Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 13, 1989, Ser. No. 322,584
Int. Cl.[4] B65D *85/42*
U.S. Cl. 206—419 24 Claims



1. A carton for a twin tube type of fluorescent lamp which lamp comprises two spaced apart and parallel tube or leg members having a predetermined spacing therebetween and longitudinally extending from a base to which they are connected at one end and connected at a point along their length by a transverse member spaced apart from said base, said carton comprising a rectangular sleeve having a first front panel, first and second side panels, a rear panel, a second front panel and a locking panel, wherein said panels are hingedly connected along generally parallel fold lines, with the surface of said locking panel generally parallel to said side panels and perpendicular to said front and rear panels, wherein said locking panel is of a length and thickness so as to enable it to fit into said longitudinal space separating said leg members, between said base and said transverse member, wherein said second front panel connects said locking panel to said second side panel and wherein a portion of said second front panel extends across the width of said lamp.

4,903,837
APPARATUS FOR DISPENSING AND ACCOUNTING ABSORBENT SURGICAL ARTICLES
Leonard E. Duello, Woodstock, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Aug. 16, 1988, Ser. No. 232,724
Int. Cl.[4] B65D *83/00*
U.S. Cl. 206—440 15 Claims



1. A dispenser for absorbent surgical sponges, comprising:
a dispenser having an opening to its interior; and
at least one elongated flexible strip rigidly secured at a first end to an interior surface of the dispenser and a distal end associated with an absorbent surgical pad sized to fit with the strip within the dispenser, the pad and the distal end of the strip having means for reassociating the pad with the strip.

4,903,838

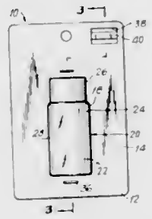
PRODUCT PACKAGE

Becky Broers, and Lois Gaelen, both of New York, N.Y., assignors to Noxell Corporation, Hunt Valley, Md.

Filed Dec. 22, 1988, Ser. No. 288,341

Int. Cl.[4] B65D *73/00*

U.S. Cl. 206—459 **2 Claims**



1. A package for a product having color as a critical parameter for choice, comprising a main mounting and packaging element defining a principal opening to receive said product and a secondary opening; and, a color strip mounted within said secondary opening and covering less than the entire area of said second opening, said strip being of a color matching the color of said product, said product being in a container and said container being mounted within said principal opening.

4,903,839

STACK OF BAGS EACH HAVING CONGRUENT CUTOUTS AND PERFORATED LINES

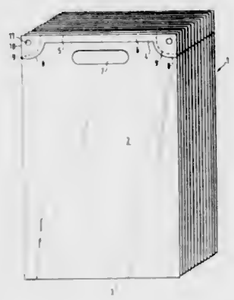
Günter Mattiebe, Maschinenbautechniker, and Klaus Ullmann, Maschinenschlosser, both of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Aug. 13, 1987, Ser. No. 84,950

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628031; Jan. 14, 1987, 3700914

Int. Cl.[4] B65D *33/14*

U.S. Cl. 206—554 **6 Claims**



1. A stack of bags comprising:
rectangular sections of synthetic thermoplastic film joined together at bottom fold lines and forming front and rear walls of each bag,
seam welds at each lateral side of each bag,
an open end provided in each bag opposite its bottom fold line,
perforation lines, provided only in said rear wall of each bag, defining two upper, laterally disposed corner portions of said rear wall of each bag of approximately single quadrant shape,
cutouts provided in said front wall only of each bag defining an approximately single quadrant-shaped cutout portion in each of two upper, laterally disposed corner portions of said front wall,
said cutouts being substantially congruent, parallel to and radially offset corresponding to said perforation lines of each bag,
each bag further including hanger holes in said upper, laterally disposed corner portions thereof aligned with hanger holes in the other bags in said stack of bags, and
each bag including grip holes located adjacent its open end and centrally between said two upper, laterally disposed corner portions of said rear wall and said cutouts of said front wall.

4,903,840

SELF ADHESIVE NAIL COATINGS

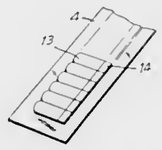
Dae S. So, Seoul, Rep. of Korea, assignor to Hwo Young Park, Cliffside Park, N.J.

Filed May 27, 1988, Ser. No. 200,015

Claims priority, application Rep. of Korea, May 29, 1987, 5390

Int. Cl.[4] A45D *29/00*

U.S. Cl. 206—581 **7 Claims**



1. A product for providing a finger nail polish coating to a fingernail comprising:
(a) a backing sheet of paper having an adhesive coating
(b) a substantially uniformly thick, flat layer of partially cured, nail polish material, in the general shape of a fingernail, deposited as liquid on said backing sheet of paper, said layer, when removed from said backing sheet having at least some of said adhesive coating on its bottom surface for securement to a fingernail; said layer, when removed from said backing sheet, being non-liquid yet conformable, three-dimensionally to the curvature of a fingernail; and
(c) said backing sheet of paper and said layer of nail polish material being stored, prior to use, in a substantially airtight package to inhibit further curing until said package is desirably opened.

4,903,841

POUCH WITH SUPERPOSED TEAR LINES

Shigeyuki Obsima, Nakano, and Yoshiji Moteki, Saitama, both of Japan, assignors to Kabushiki Kaisha Hosokawa Yoko, Tokyo, Japan

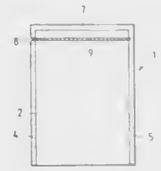
Filed Nov. 16, 1988, Ser. No. 271,792

Claims priority, application Japan, Sep. 29, 1988, 63-127646[U]

Int. Cl.[4] B65D *17/28*

U.S. Cl. 206—604 **8 Claims**

1. A pouch for containing a product, said pouch including a rectangular front wall and a rectangular rear wall having a shape identical with said front wall, at least three heat sealed sections including a first side seam (**4**) sealing together confronting side edges of said front and rear walls, a second side seam (**5**) sealing together opposite confronting side edges of said front and rear walls, and a top seam (**7**) sealing together confronting top edges of said front and rear walls, wherein:
said front and rear walls are formed of a laminate sheet comprising a plastic film layer (**15**), a product blockage layer (**14**) formed over said plastic film layer, and an aluminum foil (**12**), one of said plastic film layer and said product blockage layer being bonded to said aluminum foil;
said first side seam is formed with a notch (8); and
said plastic film layer of said front and rear walls is formed



with first and second surface roughened zones (**9**) each extending from said first side seam to said second side seam in parallel with said top seam, one end of each of said surface roughened zones being in alignment with said notch, and said first and second surface roughened zones being superposed with each other.

4,903,842

CONTAINER

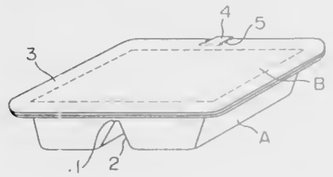
Koichi Tokuda, Takarazuka; Kazuo Yasuda, Takatsuki, and Kazuhiro Yoshida, Kobe, all of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 248,281

Claims priority, application Japan, Mar. 23, 1987, 62040916; Jul. 9, 1987, 62104513; Jul. 21, 1987, 62110605; Aug. 4, 1987, 62118867

Int. Cl.[4] B65D *17/00, 1/24*

U.S. Cl. 206—604 **17 Claims**



1. A pack type container from which contents contained therein can be easily removed, comprising a lid and a main body, said lid and main body being sealed at least at a peripheral flange of the main body, said main body being bendable outwardly and divided by the portion for bending into two contents-holding portions designed such that they may be pressed together when the container main body is bent, said lid comprising at least one monoaxially oriented film whose direction of orientation coincides with the lengthwise direction of said portion for bending, wherein a non-sealed portion is provided at an edge portion of the flange corresponding to at least one end of said portion for bending, and at least two slit lines for initiating tear are provided in a part of the lid which constitutes said non-sealed portion.

4,903,843

FOIL SHEATH FOR OBJECTS, ESPECIALLY PACKAGES OF GOODS

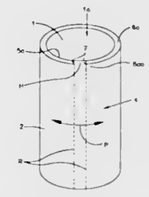
Jules Fischer, Widen, Switzerland, assignor to Folien Fischer AG, Switzerland

Filed Mar. 22, 1988, Ser. No. 171,848

Claims priority, application Switzerland, Mar. 25, 1987, 01131/87

Int. Cl.[4] B65D *75/62*

U.S. Cl. 206—609 **13 Claims**



1. A foil sheath for an object, especially a package of goods, comprising:
a sheath body (**2, 3**) for enveloping a circumferential surface (**4**) of the object, said sheath body being formed at least partially of a shrink foil prestretched in a circumferential direction, the sheath body having at least one foil edge (*5a, 5b*) and having a foil rim portion (*6a, 6b*) located adjacent to the foil edge; and
at least one pair of predetermined tear zones (**7-13**) extending into the foil rim portion located adjacent to the foil edge, the predetermined tear zones extending along a limited length in the foil rim portion and being circumferentially spaced on the wrapped object (**1**), the predetermined tear zones having a reduced tear and/or separation resistance as compared to adjacent portions of the foil.

4,903,844

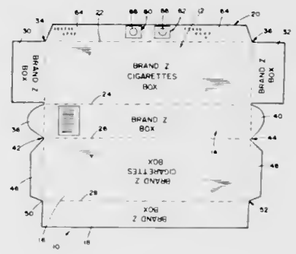
RELEASE COATING ON CIGARETTE CARTON TOP FLAP

Robert L. Oglesby, Kernersville, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Dec. 29, 1988, Ser. No. 291,798

Int. Cl.[4] B43M *7/00;* **B65D** *3/26, 27/14;* **A61F** *13/02*

U.S. Cl. 206—631.1 **14 Claims**



1. A releasably sealed container, comprising:
a carton blank having side walls, end flaps, a top flap, and an opposed closure portion for sealingly engaging said top flap;
an adhesive-releasing layer formed on at least one predetermined region of one of said top flap and carton closure portion;

permanent adhesive means for sealing said end flaps upon assembly of said carton;

a permanent adhesive layer on only said adhesive releasing layer and in an area out side of said region of the top flap and the carton closure portion opposite to said adhesive releasing layer, said permanent adhesive layer bonding to said top flap and the opposed closure portion in the region of said adhesive-releasing layer to initially releasably seal said carton closure upon closing of said top flap;

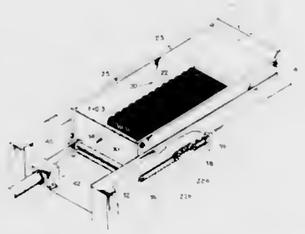
wherein at least a portion of the remaining area outside of the region of said top flap and closure portion surrounding said region having adhesive-releasing layer form a permanent adhesive receiving area for permanently resealing said carton top flap to the closure after release of said initial seal.

4,903,845

MACHINE AND METHOD FOR SEPARATING FINES FROM WOOD CHIPS

Adrian Artiano, Mukilteo, Wash., assignor to Acrowood Corporation, Everett, Wash.

Filed Feb. 12, 1988, Ser. No. 155,270
Int. Cl.[4] B07B *13/07*
U.S. Cl. 209—671 **30 Claims**



1. A machine for separating fines from wood chip material, said machine comprising:

a plurality of side-by-side coplanar rollers collectively providing a generally horizontal bed having its length extending transverse of said rollers between an infeed and a discharge end, said rollers having a minimum outer radius and a maximum outer radius, and having an outer circumferential surface area which extends across said bed and is provided with tapered chip-agitating protuberances separated by tapered valleys, said protuberances extending from said minimum outer radius to said maximum outer radius, the protuberances on adjacent rollers being spaced apart by a narrow protuberance gap for passage therethrough of fines only, and said valleys being shallow for receiving and passing fines through said bed by way of the valleys;

feed means for feeding wood chip material to said bed adjacent said infeed end; and

drive means for turning said rollers in the same direction of rotation whereat the upper portions of the rollers turn toward said discharge end, whereby fines in the chip material fed to said bed will normally pass through said bed by way of said valleys and protuberance gap while the chip material is tumbled and conveyed by the rotating rollers along said bed for discharge at said discharge end.

4,903,846

VERTICAL STORAGE POLE ASSEMBLY AND METHOD

Marvin E. Smith, 7646 Devon Ave., Chicago, Ill. 60631

Continuation of Ser. No. 808,061, Dec. 12, 1985, abandoned.
This application Mar. 4, 1988, Ser. No. 166,830
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—113 **24 Claims**



1. A method of constructing a vertical storage pole from an assembly of cooperating parts, comprising:

providing a plurality of non-circular tubular pole sections having external decorative means;

slidably inserting a connector having non-circular shape complementary to inside dimensions of said pole sections partially into an end portion of at least one of said plurality of pole sections so that a portion of said connector extends from said end portion;

aligning said plurality of pole sections end-to-end with said portion of said connector extending from said end portion facing a neighboring one of said plurality of pole sections;

substantially matching said external decorative means of neighboring ones of said plurality of pole sections; and

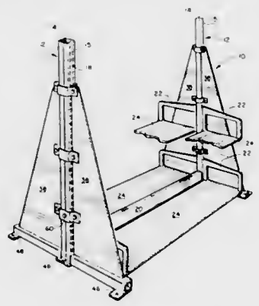
assembling said neighboring one of said pole sections over said portion of said connector so that respective ends of said pole sections abut one another and form a joint to maintain said pole sections in alignment and maintain said pole sections against relative rotation, said substantially matched external decorative means providing a substantially continuous composite decorative appearance on said vertical storage pole.

4,903,847

LIBRARY SHELF ASSEMBLY

James C. Duffy, 9300 Dillon Dr., La Mesa, Calif. 92041

Filed Sep. 22, 1988, Ser. No. 247,635
Int. Cl.[4] A47F *43/00*
U.S. Cl. 211—187 **2 Claims**



1. A library shelf assembly comprising:

at least two vertically oriented post assemblies laterally spaced apart a predetermined distance, said post assemblies being integrally formed from a single piece of sheet metal that has been bent into a configuration having a rear wall, laterally spaced side walls, a front wall left side panel, a front wall right side panel, and said respective front wall panels each having an inwardly extending flange, each of said post assemblies having a predetermined width D1 as measured from the outside surfaces of its respective side walls, said post assemblies each having a top end and a bottom end, said bottom ends having a slot formed in each of the side walls of said post assemblies for mating with slots formed in horizontally oriented tubular base support members, said post assemblies having vertically oriented double rows of spaced slots on its respective side walls for receiving mating fingers from shelf brackets;

an elongated tie beam having its opposite ends secured to said respective post assemblies adjacent their bottom ends;

a plurality of elongated shelves each having a shelf bracket attached to its respective ends, said shelf brackets having fingers extending from them that are removably received in said vertically spaced slots in the respective side walls of said post assemblies;

a pair of post assembly reinforcing units each of which comprises a transversely extending elongated horizontally oriented tubular base support having a top surface, a front wall, a rear wall and a bottom surface, a pair of vertically oriented gussets each having a vertical edge and a horizontal edge, each of said gussets being formed of a sheet of mild steel and each having a right angularly shaped configuration, the vertical edges of said respective gussets being laterally spaced apart a distance substantially equal to the width D1 of said post assemblies which is received therebetween, the horizontal edges of said gussets being welded to the top surface of said tubular base support, and means for securely holding each of said respective post assemblies between the vertical edges of said respective gussets; and

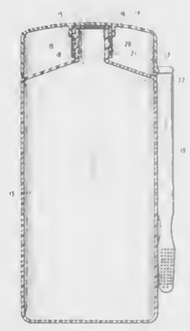
said means for securely holding each of said respective post assemblies between the vertical edges of said gussets comprising a plurality of strap assemblies each having a pair of hat-shaped brackets that are secured to each other by bolts passing through them and said respective gussets.

4,903,848

MOUTHWASH PACKAGING

Ronald L. Chattman, Lakeside Apartments, Unit 2A, Millburn, N.J. 07041

Filed Jul. 26, 1988, Ser. No. 224,164
Int. Cl.[4] B65D *69/00*
U.S. Cl. 215—227 **6 Claims**



2. Apparatus for supporting a brush on a bottle of liquid, said apparatus comprising:

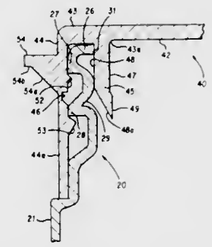
support means for overfitting onto a bottle, a pair of extensions extending from said support means; flexible protrusions attached to each of said extensions, said protrusions being located for cooperatively supporting a brush therebetween said support means including exterior surfaces thereon formed to enable said support means to serve as a handle for said brush.

4,903,849

TAMPER EVIDENT CAP AND BOTTLE

Irwin Wallman, 41 Irish Hill Rd., Shelburne, Vt. 05482

Filed Apr. 24, 1989, Ser. No. 342,732
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—256 **10 Claims**



1. A molded plastic cap having a central disk having a substantially uniform thickness,

a rim region surrounding said central disk,

a thin walled outer skirt downwardly descending from the outer edge of the rim,

a score line extending circumferentially around the outer skirt to divide the skirt into an upper section and a lower tear ring section,

a substantially circumferential rib on the inner wall of said outer skirt below said score line, and

an inner, positive sealing, guide skirt descending from the inner edge of said rim region,

characterized by a substantially rigid, arcuate, buttressed lifting tab perpendicular to and positioned on the exterior surface of said outer skirt, and covering less than 25% of the circumference of the outer surface of the outer skirt and supported substantially beneath its entire surface by a smooth, arcuate buttress.

4,903,850

VAPORIZING DEVICE

Bernard Frank, 300 71st St., Suite 435, Miami Beach, Fla. 33141, and Melvin B. Greenberg, North Miami Beach, Fla., assignors to Bernard Frank, Miami Beach, Fla.

Filed Mar. 14, 1989, Ser. No. 323,464
Int. Cl.[4] H05B *3/12;* **F22B** *1/28*
U.S. Cl. 219—271 **39 Claims**

1. A vaporizing device for directing steam in a downstream direction to the region of a user's face, said device including:

(a) a steam generating and control section including a lower body section upstream of an upper body section, said upper body section having a peripheral sidewall defining an interior passage, a cup member for receiving a liquid to be vaporized and a heater means for heating said liquid being retained in said lower body section, said upper body section including slot means in the peripheral sidewall thereof and an adjustable valve assembly downstream of the cup member and the slot means for regulating the volume and velocity of steam flow exiting from said steam generating and control section;

(b) a hood section having an upstream end attached to said steam generating and control section and including slot

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means aligned with the slot means in the peripheral sidewall of the upper body section of the steam generating and control section for communicating the interior passage of the upper body section with ambient air, said hood section extending in a downstream direction above the upper



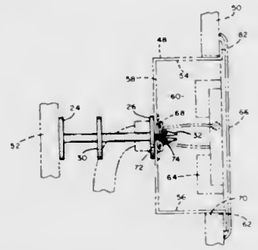
body section and terminating in an upper margin, said upper margin receiving a user's face adjacent thereto and defining a steam-flow confining passageway for directing steam to a region of the user's face aligned with said confining passageway.

4,903,851

MOLDED PLASTIC STUD BOX SUPPORT AND BOX

Donovan L. Slough, 3301 Brunswick Ave. N., Crystal, Minn. 55422

Filed Jul. 7, 1988, Ser. No. 215,988
Int. Cl.[4] H02G *3/08*
U.S. Cl. 220—3.9 2 Claims



1. An electrical outlet box and an apparatus for supporting said electrical outlet box with respect to parallel and spaced apart first and second structural wall panels, said apparatus comprising: an outlet box having a plurality of side walls and a back wall defining a chamber with an open front, a flange means aligned with said open front and parallel with said back wall, and an access bore formed through said back wall,

a unitary support member including an elongate shaft, a first abutment member formed at a rearward end of said shaft, disposed transversely of the shaft and having a substantially planar and transverse first abutment surface, and a second abutment member formed proximate a forward end of the shaft, said second abutment member having a substantially planar and transverse second abutment surface;

a mounting segment disposed forwardly of said second abutment member and substantially coaxially with said shaft, said mounting segment including two parallel and spaced apart flexible legs extending forwardly of the second abutment member, each leg converging to a tip region, and two flared extensions, one flared extension projected rearwardly and transversely outwardly of the tip region of each of said legs, each flared extension including a rearward end portion spaced apart from its associated leg, said flared extensions together defining a forwardly converging cone having a forward tip and said rearward portions together defining a shoulder of the cone; and

a flexible retaining member and means forming a retainer opening through the retaining member larger in diameter than said forward tip and smaller in diameter than said shoulder, said legs being flexible to permit their transversely inward displacement a sufficient amount to permit passage of said cone through said access bore of said outlet box and said retainer opening; whereby said retaining member is positionable about said shaft between said shoulder and said back wall of said outlet box, with said mounting portion extended through said access bore of said outlet box and into the chamber of said outlet box, with said flexible retaining member being elastically compressed to urge said shaft forward and thereby retain said second abutment member against said back wall of said outlet box with said second abutment surface contiguous with said back wall of said outlet box; and

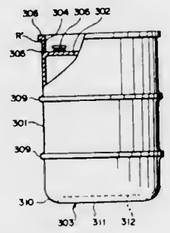
wherein a first distance between said first and second abutment surfaces is predetermined in accordance with the separation between said first and second structural wall panels, whereby said first abutment surface of said first abutment member is contiguous with one of said panels, and said flange means of said outlet box is contiguous with the other of said wall panels, with said shaft normal to said panels.

4,903,852

PLASTICS CONTAINER

Kazuhiro Masumoto, Ichihara, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 783,591, Oct. 3, 1985. This application Jan. 25, 1989, Ser. No. 301,285
Claims priority, application Japan, Oct. 4, 1984, 59-207101; Dec. 12, 1984, 59-187355; May 22, 1985, 60-25098; May 22, 1985, 60-108249; May 22, 1985, 60-108250
Int. Cl.[4] B65D *7/00*
U.S. Cl. 220—5 R 1 Claim



1. A plastics container molded by a blow-molding operation and provided with a chime in its top-portion, comprising:

an annular projection formed in an outer periphery of said chime;

suitable number of ring-like bands formed in an outer circumferential surface of a trunk portion of said plastics container, said ring-like band being in its outer diameter similar to that of said annular projection of said chime;

a ground plate provided with a curved surface portion in its outer periphery and having its bottom surface adapted to an inner diameter of said chime by means of said curved surface portion; and

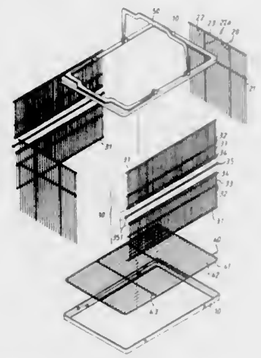
a cross-like rib containing a pinch-off portion therein and provided inside said ground plate in projecting manner.

4,903,853

FOLDING BASKET WITH NOVEL JOINT STRUCTURE

Chin C. Lin, P.O. Box 1-79, Taipei, Taiwan

Filed Jun. 9, 1989, Ser. No. 363,851
Int. Cl.[4] B65D *6/12*
U.S. Cl. 220—6 3 Claims



1. A folding basket with novel joint structure comprising:

an upper frame;

a lower frame;

a first pair of opposite fences each having a horizontal large diameter main rod, a horizontal support rod, and plural vertical slender rods connected to said main rod and support rod;

a second pair of opposite fences, disposed perpendicularly to said first fences, each having symmetrical upper portion and lower portion, each of said symmetrical portions having a horizontal large diameter rod, a horizontal slender rod, and plural vertical slender rods connected to said horizontal large diameter rod and horizontal slender rod, each of said vertical slender rods having a circular free end located in middle portion of said second fence whereby a shaft rod can go through said circular free ends a hinge-like joint structure rotarily connect said symmetircal portions, permitting them to be inward folded up; and

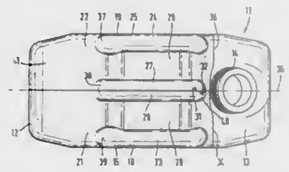
a bottom fence disposed on said lower frame, said main rods of said first fences being rotarily mounted on said upper frame whereby said first fences can be pushed inward manually to permit said second fences to be folded up inward and convert said folding basket into a floded up flat form.

4,903,854

BLOWN THREE-HANDLED CONTAINER INCLUDING DEVICE AND PROCESS FOR ITS PRODUCTION

Wolfram Schiemann, Eugen- Nagele-Strasse 17, 7140 Ludwigsburg, Fed. Rep. of Germany

Filed Nov. 28, 1988, Ser. No. 276,773
Int. Cl.[4] B65D *25/28*
U.S. Cl. 220--94 A 5 Claims



1. A three-handled blown container made from plastic having a head portion, an outer wall and two injection molded partial shells, each comprising an external handle with handle roots, a recessed grip located between the handle roots and a wall region having an outer surface which follows the contour of the three-handled container in the regions of the handle roots, the outer wall, the recessed grip, and the head portion; wherein both partial shells are of a form that is essentially symmetrical to the central parting line of the container and are arranged essentially symmetrically to the central parting line of the container, and blown plastic extends between the partial shells, and wherein:

(a) the wall regions of the partial shells extend to the center line of the container and within the wall regions there is a wall of blown plastic,

(b) each partial shell carries a continuous channel-shaped half of a central handle, divided along the center line of the container, such that the halves of a central handle combine to form a complete central handle, and

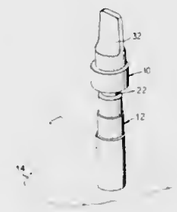
(c) a strand of blown plastic, which projects from the wall as in (a) above, extends in the space enclosed by the halves of a central handle.

4,903,855

CLOSURE AND PORT ASSEMBLY

James Ducay, Grayslake; Josef Schmidt, Libertyville, both of Ill., and Hugh Forman, Waukesha, Wis., assignors to Baxter International Inc., Deerfield, Ill.

Filed Nov. 25, 1988, Ser. No. 276,273
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—356 21 Claims



9. A tamper evident closure for removably sealing an opening of a port comprising:

a first end for gripping the closure;

a second end, defining a sleeve portion, for circumscribing a portion of the port when the closure is positioned so that it seals the opening of the port;

an intermediate segment extending between the first end and the second end, the intermediate segment having a portion that has a reduced cross-sectional thickness with respect to other portions of the intermediate portion, the portion having a sufficiently reduced cross-sectional thickness allowing a portion of the closure located on a first side of the portion having a reduced thickness to separate from a portion of the closure located on a second side of the portion having a reduced thickness, when the sleeve is secured to the port and a sufficient pulling force is exerted on the first end; and

the closure cooperating with the port to provide a tack seal upon sterilization of the closure and port.

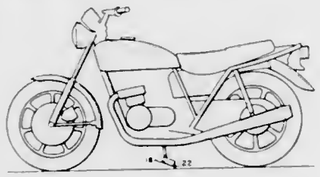
VOL 1111 ISS 4 FE 27 1990 UMI

4,903,856

MAGNETIC PROTECTING DEVICE FOR VEHICLE TIRES

Frank Watts, 1553 E. 73rd St. North, Tulsa, Okla. 74128

Filed Oct. 20, 1988, Ser. No. 260,115
Int. Cl.[4] B60R *19/00*
U.S. Cl. 280—160 **5 Claims**



1. A device for protecting the tire of a vehicle comprising:
a web attachable to a vehicle such that said web hangs in a vertical planar relationship facing a forward treaded surface of the tire;
a magnet having forward and rearward portions, and having a width at least approximately equal to the width of the treaded surface of the tire;
means for hinging said forward portion of said magnet to a bottom of said web; and
means for restricting a rotation of said magnet about said hinging means to a preselected maximum angle below horizontal;
said web comprising a plurality of tiers of spaced apart plates, each of said plates having an upper and a lower horizontal bore therethrough transverse to the longitudinal axis of said plates, said upper bores of each said tier of plates being alternately axially aligned with said lower bores of the next higher said tier of plates, a plurality of means for hingably connecting said tiers of plates, one said hingably connecting means disposed through bores aligned on the same axis, and means disposed on said hingably connecting means for securing each of said hingably connecting means in position in said bores.

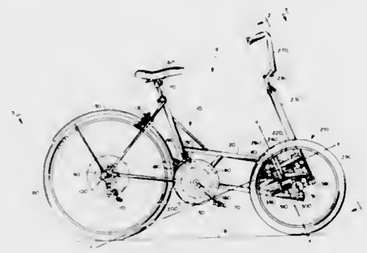
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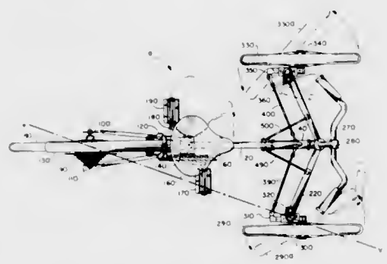
LEANING VEHICLE WITH CENTRIFUGAL FORCE COMPENSATION

King L. Klopfensteln, 10 Drake Ter., Prospect Heights, Ill. 60070

Filed Oct. 18, 1988, Ser. No. 259,333
Int. Cl.[4] B62D *9/02*; **B62K** *5/08*
U.S. Cl. 280—267 **28 Claims**

1. A vehicle comprising:
a forward frame having two forward wheels;
steering means attached to said forward frame and coupled to said two wheels;
an aft frame having a single rear wheel; and
control means coupling said aft frame to said steering means and to said forward frame for pivotally displacing in a leaning manner said aft frame into a turn in response to turning of said steering means and the execution of a turn by the vehicle and for maintaining said forward frame and





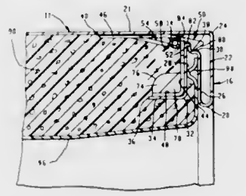
the two wheels coupled thereto as well as said steering means upright.

4,903,858

REFRIGERATOR CABINET ASSEMBLY

Oliver R. Clark, Louisville, Ky., and John M. Powell, Charlestown, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Apr. 20, 1989, Ser. No. 340,921
Int. Cl.[4] B65D *88/74*
U.S. Cl. 220—430 **12 Claims**



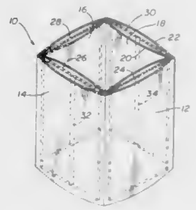
1. A cabinet assembly for a refrigerator having two top front corners comprising:
an outer sheet metal shell having a top panel, side panels and a front face, said front face is formed to provide a first U-shaped portion which includes a first outer wall perpendicular to the side panel to form a corner and a second inner wall spaced from the first outer wall, both walls being connected by the first U-shaped portion, said second inner wall being reversely bent to form a third wall and provide a second U-shaped portion formed between the second inner wall and the third wall, said first, second and third walls being in spaced parallel planes with the third wall bent at a right angle to form a flange having a free terminal edge, said second U-shaped portion being formed to provide a groove area therein; and
a brace located at each of the two top front corners of the cabinet and having two integrally joined sections at right angles to each other and each section is formed as an inwardly open U-shaped channel having a base, a first leg and a second leg spaced apart and integrally joined to the base, said base being adjacent the rear surface of the third wall of the front face with the first leg parallel to and abutting the side and top panels of the cabinet and the second leg parallel to and abutting the flange of the front face, said brace having at least one resilient hook shaped latch element on each of the two formed sections and extending from the first leg beyond the base and engaging the second U-shaped portion in the groove area to secure the brace to the outer metal shell.

4,903,859

CONTAINER FOR FLOWABLE MATERIALS

Norwin C. Derby, Sherman, and Ernest J. Benson, Dallas, both of Tex., assignors to Better Agricultural Goals, Inc., Dallas, Tex.

Filed Sep. 23, 1988, Ser. No. 248,097
Int. Cl.[4] B65D *25/14*
U.S. Cl. 220—462 **18 Claims**



1. An improved flexible semi-bulk material container suitable for use with fluidized materials such as fluidized solids, semi-solids, slurry and liquids and having adequate stability to stand alone, said container comprising:
a flexible body portion formed with side walls, a top wall and a bottom wall;
each of said side walls being double-layer side walls sealed at the side edges thereof to provide a space therebetween;
access spouts in the body portion to fill and empty the body portion with fluidized materials; and
rigid panels associated with at least two opposing ones of the body side walls, a separate one of said rigid panels inserted in said space in at least two of said opposing double-layer side walls to provide rigidity sufficient to impart adequate stability to the flexible body portion to enable it to stand alone on said bottom wall when filled with a fluidized material.

4,903,860

NITROGLYCERINE PILL-DISPENSER WORN ABOUT NECK

Norbert Leopoldi, Chicago, and William Heinrich, McHenry, both of Ill., assignors to The Cloverline, Inc., Chicago, Ill.

Filed Jan. 5, 1989, Ser. No. 293,802
Int. Cl.[4] A47F *1/04*
U.S. Cl. 221—4 **1 Claim**

1. A dispenser for pills, such as nitroglycerine, comprising:
a pill-storage container in which may be stored pills, said pill-storage container comprising a closed lower end portion and an open upper end portion, said open upper end portion having a dispensing outlet by which the stored pills may be dispensed;
slidable cover means telescopingly and slidingly mounted about a portion of the length of said pill-storage container, said cover means closing off said dispensing outlet of said open upper end portion of said pill-storage container when positioned thereabout, and allowing access thereto when slid away therefrom to allow for dispensing of the pills;
means for releasably retaining said cover means about said dispensing outlet in said closing-off state thereof, so that said cover means may be easily slid away from said dispensing outlet when dispensing of a pill is required;
said means for releasably retaining comprising a pair of O-rings mounted about said upper end portion, said dispensing outlet being positioned between said pair of O-rings, said pair of O-rings also sealing the interior of said pill-storage container from ambient conditions;
ring means connected to said upper end portion of said pill-storage container for connection to a chain, whereby said pill storage container may be hung from the neck of a person as a necklace;
means for securement about a neck of a person, said means for securement passing through said ring means, so as to



form a necklace with said pill-storage container serving also as an ornament, whereby ready and easy access to the pills stored in said pill-storage container is provided;
said cover means comprising a hollow sleeve defining open lower and upper ends; said sleeve having a length less than the length of said pill-storage container such that, when said sleeve is in its downwardmost position, said dispensing outlet is exposed for dispensing pills;
said lower end portion of said pill-storage container comprising an enlarged, peripheral flange member having a diametric expanse greater than that of said sleeve, whereby removal of said cover means from said pill-storage container is prevented when said sleeve is lowered for the dispensing of pills;
said closure cover means comprises an upper visible surface comprising orientation means for indicating the location of said dispensing outlet, in order to expedite removal of a pill;
said upper end portion comprising a pair of circular recesses in which are mounted said pair of O-rings, one said O-ring in one said circular recess.

4,903,861

MEDICINE FEEDER

Shoji Yuyama, 3-8, Honan-cho Nishi 4-chome, Toyonaka-shi, Osaka, Japan

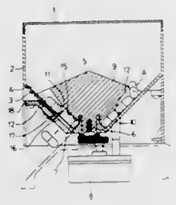
Filed Dec. 29, 1988, Ser. No. 291,785
Claims priority, application Japan, Aug. 8, 1988, 63-104805
Int. Cl.[4] B65H *3/00*
U.S. Cl. 221—265 **1 Claim**

1. A medicine feeder for feeding capsules of medicine or the like, comprising:
a container having a funnel-shaped bottom plate tapered toward the center thereof;
a rotor rotatably mounted in said container on said bottom

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plate and having a conical top surface tapered toward its peripheral edge;

said rotor having formed in its peripheral edge a plurality of medicine feed channels angularly spaced from one another and having a bottom surface tapered so as to be complementary with said funnel-shaped bottom plate of said container, said bottom surface of said rotor being formed with a plurality of pockets angularly spaced from one another, said pockets being in communication with said medicine feed channels;



said bottom plate of said container being formed with a feed opening with which said pockets are brought into alignment one after another when said rotor rotates, thereby discharging the capsules in said pocket out of the medicine feeder one by one; and

a tongue member provided to cover the pocket in alignment with said feed opening to prevent more than one capsule from being discharged out of said pocket at a time.

4,903,862

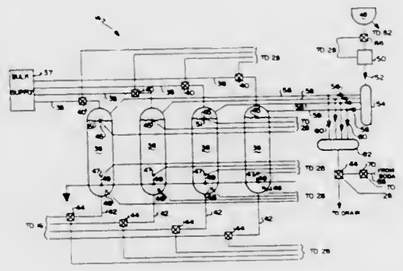
SOFT DRINK DISPENSER

Joseph W. Shannon; Thomas S. Green, both of Kent, and Jeffrey C. Rice, Hudson, all of Ohio, assignors to ABC/Sebrn Tech. Corp., Inc., Akron, Ohio

Filed Oct. 13, 1987, Ser. No. 107,403

Int. Cl.[4] B67D *5/08*

U.S. Cl. 222—54 **29 Claims**



1. A beverage dispenser, comprising:

a pour head;

first means for dispensing soda through said pour head;

second means for dispensing a flavoring syrup through said pour head; and

control means interconnected between said first and second means for regulating timed periods of dispensing each of said soda and flavoring syrup through said pour head during a dispensing cycle to obtain a desired drink;

wherein said first means comprises means within said carbonation tank for monitoring pressure therein, said control means regulating said timed periods of dispensing said soda as a function of said pressure within said carbonation tank.

4,903,863

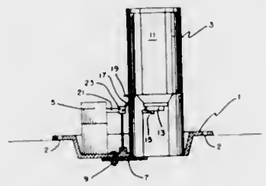
SECURITY SYSTEM

Jeffrey L. Fink, 832 W. 1st St., Birdsboro, Pa. 19508

Filed Apr. 1, 1987, Ser. No. 33,349

Int. Cl.[4] B65D *83/14*

U.S. Cl. 222—61 **1 Claim**



1. A protective anti-theft device which, when activated by an intruder, will release noxious gases under pressure from a canister into the surrounding environment, comprising:

a support plate;

a vertically disposed housing mounted on the support plate;

a trigger mechanism; and

an impact plate mounted for rotation on the support plate from a first position partially covering the bottom of the housing to a second position opening the bottom of the housing;

the trigger mechanism being made from a resilient material mounted at its one end adjacent the bottom of the housing with its other end free to move away from the housing and having an at rest position adjacent the housing;

a canister support formed on the upper end of the trigger mechanism adapted to pass through an opening in the housing into the interior of the housing when the trigger mechanism is at its at rest position and to withdraw from the housing when the trigger mechanism is moved away from the housing;

activating means operatively connected with the trigger mechanism adapted to move the trigger mechanism from its at rest position adjacent the housing to away from the housing, whereby;

when a canister is placed within the housing it is supported by the upper surface of the canister support and is free to fall by gravity and strike the impact plate when the activating means causes the trigger mechanism to move away from the housing and the canister support is withdrawn from the housing.

4,903,864

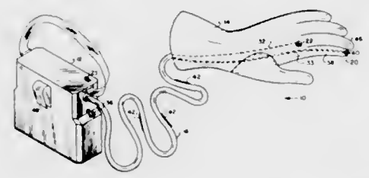
GLOVE AMUSEMENT DEVICE

Eddie A. Sirhan, 2410 Olympic Dr., South San Francisco, Calif. 94080

Filed Jun. 14, 1988, Ser. No. 206,574

Int. Cl.[4] B67D *5/64*

U.S. Cl. 222—78 **18 Claims**



1. A glove amusement device for squirting liquid, comprising:

separable storage means for storing liquid including pump means for pumping liquid from the storage means;

a glove having an opening for squirting liquid and trigger means for activating the pump means; and

umbilical cord means connecting the storage means and the glove opening for transporting liquid from the storage means to the glove opening,

thereby, upon activation of the pump means the liquid is transported to the glove opening and squirted therethrough.

4,903,865

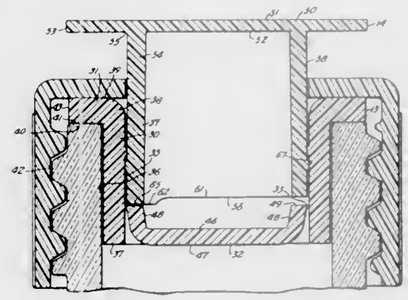
PUSH BUTTON CAP CONTAINING AN ADDITIVE FOR CONTAINERS

C. Michael Janowitz, 303 Fifth Ave., New York, N.Y. 10016

Filed Sep. 19, 1988, Ser. No. 245,694

Int. Cl.[4] B67B *7/24*

U.S. Cl. 222—83.5 **9 Claims**



1. In a combination of a container having a threaded neck forming an opening communicating with the interior of said container and a liquid dispensing element selectively threaded upon said neck element, the improvement comprising said liquid dispensing element including an outer cap having a planar end wall having a central opening therethrough, and a cylindrical internally threaded side wall; a capsule element having a first lower member and a second upper member slideably engaged therewith; said first lower member including a cylindrical side wall having a radially extending flange at an upper end thereof forming a seal between said threaded neck of said container and said outer cap, and a lower wall frangibly interconnected to said last-mentioned cylindrical side wall at a lower end thereof; said second upper member including an upper wall and a cylindrical hollow shank having a principal axis perpendicular to the plane of said upper wall and penetrating said opening in said planar end wall of said cap, said shank having a lower free edge overlying an area of frangible interconnection between said lower wall and said cylindrical side wall of said second upper member; said capsule element being positioned within said cap such that said upper wall of said second upper member contacts said upper end wall of said cap, engagement of said cap with said threaded neck of said container serving to elevate said capsule element relative to said cap and move said upper wall of said second upper member into spaced relation relative to said planar end wall; whereby downward pressure exerted upon said upper wall serves to cause movement of said shank relative to said lower wall of said first lower member to sever the frangible interconnection between said lower wall and said cylindrical side wall.

4,903,866

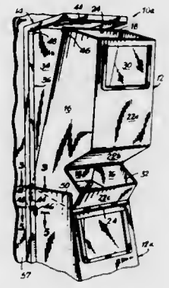
GRAVITY DISPENSING BIN SYSTEM

Jonathon Loew, East Meadow, N.Y., assignor to Design Display Group Inc., Fairlawn, N.J.

Filed Aug. 16, 1988, Ser. No. 232,806

Int. Cl.[4] B67D *5/64*

U.S. Cl. 222—129 **10 Claims**



1. A gravity dispensing bin system comprising:

a frame;

a least two gravity dispensing bins, each including an enclosure having side walls, a bottom wall, an upper filling opening provided in an upwardly facing top of said bin and a lower dispensing opening; and

means provided on at least one of said frame and bins for removeably mounting at least two of said bins on said frame in substantially vertically aligned relationship, and wherein said mounting means comprise means for pivotally mounting a lower one of said bins on said frame for movement with respect to an axis passing through a rearward lower region of said bin between a first operating position wherein said bottom wall of a next adjacent upper bin substantially overlies said filling opening of said lower bin, and a second pivoted filling position wherein access is provided to said filling opening of said lower bin.

4,903,867

DISPENSER FOR PASTY COMPOSITIONS

Herbert Mettenbrink, Lohne, Fed. Rep. of Germany, assignor to Bramlage Gesellschaft mit beschränkter Haftung, Lohne/Oldenburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 28,063, Mar. 19, 1987, abandoned, which is a continuation of Ser. No. 787,941, Oct. 16, 1985, abandoned. This application Jul. 15, 1988, Ser. No. 219,804

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1984, 3438579

Int. Cl.[4] B65D *37/00*

U.S. Cl. 222—207 **13 Claims**

1. In a dispenser for pasty compositions having a housing containing a piston which is displaceable in use only in an emptying direction, and a head piece, the latter being compressible by pressing in an actuating condition as a bellows in a direction towards the piston, said head piece having a dispenser outlet opening from which an inwardly directed tube extends the tube having an inner mouth-end extending freely into the pasty compositions in every position of the bellows, the improvement comprising

a cover of the housing,

a hard-walled peripheral mounting collar to which the bellows is mounted, said mounting collar extends upwardly from said cover, said collar with said cover forming a pot-like chamber,

the inner mouth-end of the tube extends within an upper

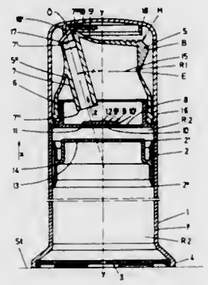
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edge of the mounting collar, the inner mouth-end extending into the pot-like chamber,

the dispenser further having only one valve, said one valve comprising a flap valve centrally disposed in said cover below the inner mouth-end of the tube in a rest condition of the dispenser, said flap valve having a passage opening, said flap valve being substantially flat such that said flap valve is located below said upper edge of the mounting collar in a position of said flap valve closing said passage opening, said cover defining a substantially flat bottom of said pot-like chamber so that the latter is a free unimpeded chamber filled with the pasty compositions into which the inner mouth-end of the tube extends,

said piston forms at its top a flat-surface wall which extends parallel to the housing cover,

said flap valve has a hinge connected to said cover and is disposed on said cover such that when pressing said bellows in said actuating condition said passage opening is closed,



the inner mouth-end of said tube extends toward said flap valve and having an axis which intersects said flap valve substantially in a range between said hinge and a center of said cover when said bellows is not pressed, and

said inner mouth-end of said tube is spaced above said flap valve by a distance substantially equal to an inner diameter of said tube, said flap valve having a length from said hinge substantially greater than said distance so as to enable abutment of said flap valve against the inner mouth-end of said tube when said bellows is released from said actuating condition,

said inner mouth-end of said tube swinging away from said flap valve such that the axis of said inner mouth-end of said tube is displaced substantially from intersection with said flap valve upon pressing said bellows in said actuating condition, said abutment of the inner mouth-end of said tube and said flap valve for assisting closure of said passage opening upon a pressing of said bellows and, said abutment impeding a back flow of pasty compositions in said tube upon a release of pressure on said bellows.

4,903,868

VISCOUS FLUID DISPENSER

Takashi Ichihara, Kanagawa; Akiyoshi Umehara; Shigeo Iizuka, both of Chiba, and Tadao Saito, Tokyo, all of Japan, assignors to Lion Corporation and Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,299

Claims priority, application Japan, Jul. 8, 1987, 62-104725[U]

Int. Cl.[4] G01F *11/00;* **B67D** *5/42*

U.S. Cl. 222—256 **12 Claims**

1. A viscous fluid dispenser comprising:

(a) a cylindrical body for storing viscous fluid therein which has upper and lower ends;

(b) said cylindrical body being integrally formed with a top plate for closing said upper end;

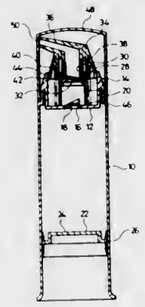
(c) a movable bottom lid fluid-tightly and slidably fitted in said cylindrical body through said lower end;

(d) said top plate being formed at a substantially central portion thereof with a suction hole;

(e) said top plate being integrally formed with a first check valve which is arranged at said suction hole;

(f) said top plate being formed thereon with an upwardly extending cylinder in a manner to surround said suction hole;

(g) a piston fluid-tightly and slidably fitted in said cylinder of said top plate above said first check valve;



(h) said piston being formed at a substantially central portion thereof with a discharge pipe;

(i) said discharge pipe being provided with a second check valve to selectively close said discharge pipe;

(j) said second check valve being formed integrally with said piston;

(k) the inner surface of said cylinder and said first and second check valves defining a metering chamber for the viscous fluid;

(l) a push button mounted on said piston and having a discharge nozzle; and

(m) a spring arranged between said push button and said top plate to constantly bias said push button and said piston upwardly.

4,903,869

BRUSH STORAGE AND FLUID DISPENSING DEVICE

Marvin G. McKenna, North Vancouver, Canada, assignor to McPride Marketing Inc., White Rock, Canada

Filed May 3, 1988, Ser. No. 189,906

Int. Cl.[4] A47L *13/56*

U.S. Cl. 222—449 **9 Claims**

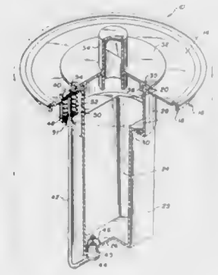
1. A dispensing apparatus for dispensing fluid from a container having an annular flange at its top, said apparatus comprising:

a cover portion attachment means for releasably mounting said cover to the container in order to seal the container;

an aperture in said cover portion communicating with a well portion that extends from said cover portion;

a well cover for movable mounting over said aperture in order to seal said well portion;

valve means for allowing fluid into said well comprising a valve member adapted for sealing engagement within an aperture in said well portion, said valve member being movable between a normally closed position to seal said aperture and an open position to allow fluid into said well portion through said aperture, actuating means mounted in said cover plate, and an actuating rod interconnecting said actuating means with said valve member whereby operating said actuating means acts to move said valve



member to the open position to allow fluid into said well portion

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4,903,870

DISPENSING CLOSURE

Donald La Vange, Cumberland, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Oct. 19, 1988, Ser. No. 259,598

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—482 **14 Claims**

1. A dispensing closure comprising a cap base member, said cap base member being adapted to be associated with a container having contents, a first dispensing opening formed in said cap base member, a cap lid member, means for securing said cap lid member for rotation with respect to said cap base member, said cap lid member being adapted to assume a closed position with respect to said cap base member wherein said first dispensing opening is sealed, said cap lid member being adapted to assume an open position with respect to said cap base member by rotating said cap lid member upwardly with respect to said cap base member around said means for securing in a first direction of rotation such that said first dispensing opening is unobstructed, whereby said contents of said container may be dispensed through said first dispensing opening, a second dispensing opening formed in said cap lid member, said second dispensing opening being generally concentric with said first dispensing opening when said cap lid member is in said closed position, an elongated groove formed in said cap lid member, and a rotatable spout member mounted for rotation in said elongated groove in a second direction of rotation which is opposite to said first direction of rotation, a longitudinal dispensing passage formed in said spout member, said spout member being adapted to assume a closed position with respect to said cap lid member wherein in said spout member closes off said second dispensing opening, said spout member being adapted to assume an open position with respect to said cap lid member by rotating said spout member upwardly with respect to said cap lid member whereby said longitudinal passage and said second dispensing opening are aligned such that, when said cap lid member is in said closed position for said cap lid member, said contents of said container may be dispensed through said aligned second dispensing opening and longitudinal passage.

4,903,871

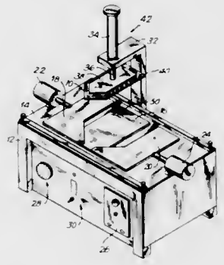
POCKET CREASING MACHINE

Lee Y. Glassman, Scranton, Pa., assignor to Automated Components International, Inc., Dunmore, Pa.

Filed Jun. 2, 1988, Ser. No. 201,731

Int. Cl.[4] A41H *33/00*

U.S. Cl. 223—38 **8 Claims**



1. An apparatus for folding an creasing pockets comprising:

a table having a heat plate mounted thereon; first and second side die plates movably mounted upon the table and being attached to means for lateral movement; a top die assembly movable in upward and downward directions and mounted, above the table, to a support bar extending from the table, the top die assembly being raised and lowered by actuating means and comprising a lower and an upper die plate, the lower die plate being slightly wider than the upper die plate, the plates being spaced to receive material to be folded therebetween.

4,903,872

VEHICULAR MOUNTED FOOD RECEPTACLE

Douglas A. Henricksen, 9156 Bedford Dr., Boca Raton, Fla. 33434; Joseph R. Clemente, Plantation Acres, and Thomas P. Miller, Sunrise, both of Fla., assignors to Douglas Alan Henricksen, Boca Raton, Fla.

Continuation-in-part of Ser. No. 70,354, Jul. 7, 1987, Pat. No. 4,813,582. This application Sep. 9, 1988, Ser. No. 242,483

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[4] B65D *1/24*

U.S. Cl. 224—42.43 **4 Claims**



1. A food receptacle, comprising in combination:

means for containing food;

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a flexible strap having a first portion adapted for insertion into a window pocket of an automobile door, and a second portion having a first end and a free end, said first end being attached to said first portion, said second portion including a plurality of slots, each of said slots being spaced a unique distance from said first portion, said strap being flexible under the weight of said food containing means; and

hook means, attached to said food containing means, for connecting said food containing means to said flexible strap by engaging said hook means in a selected one of said slots of said strap.

4,903,873

INFANT CARRIER FOR USE IN AN AQUEOUS ENVIRONMENT

Allison S. Poole, 518 Gregory Ave., Apt. A309, Weehawken, N.J. 07087, and Jodi R. Badaglincca, 70 Riverside Dr., Apt. 6A, New York, N.Y. 10024

Filed Apr. 7, 1989, Ser. No. 334,715
Int. Cl.[4] A41D *7/00;* **A47D** *13/02*
U.S. Cl. 224—160 **8 Claims**



1. An infant carrier for use in an aqueous environment, comprising:

a pouch of a soft, flexible textile material suitable for use in an aqueous environment;

the pouch including an open top for receiving an infant to be supported in the pouch, opposite open sides through which the infant's legs extend, a crotch portion upon which the infant rests, a continuous belt-like member of a webbing material, first and second panels of a mesh material, each of which has a top and a bottom, and the first panel being secured at its top to the belt-like member and the second panel being secured at its top to the belt-like member in opposite spaced relation to the first panel, and the bottoms of the first and second panels being secured together, whereby the pouch is provided with the open top, the opposite open sides and the crotch portion;

a harness of a soft, flexible textile material suitable for use in an aqueous environment;

the harness including a belt and a pair of shoulder straps, the belt having opposite free ends and each of the pair of shoulder straps having one end secured to the belt and an opposite free end;

a buckle for each of the belt and shoulder strap free ends, each of the buckles being of a material suitable for use in an aqueous environment;

each of the buckles including a first member arranged with a corresponding free end and a second member carried by the pouch;

the first and second members being engageable for joining the pouch and the harness whereby the belt is disposed around the upper torso of a user and the shoulder straps are disposed over the user's shoulders for supporting the pouch in front of the user, and being disengageable whereby the pouch and harness are separable from each other; and

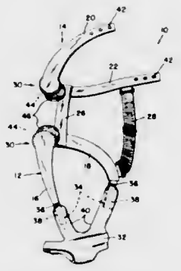
each of the first buckle members arranged with its corresponding free end so that the belt length is adjustable to accommodate the girth of the user and the length of the shoulder straps is adjustable to accommodate the height at which it is desired to support the pouch.

4,903,874

SHOULDER HOLSTER

Randy R. Shoemaker, 4819 St. Andres, LaVerne, Calif. 91750

Filed Oct. 6, 1988, Ser. No. 254,039
Int. Cl.[4] F41C *33/02*
U.S. Cl. 224—206 **2 Claims**



1. A shoulder holster comprising:

right and left pairs of shoulder straps, each strap pair including a front shoulder strap and a separate rear shoulder strap having upper free ends and lower ends,

strap means joining the two rear shoulder straps,

a handgun holder,

means securing said gun holder to the lower ends of the front and rear shoulder straps of one of said shoulder strap pairs,

lower shoulder strap joining means joining the lower ends of the front and rear shoulder straps of the other shoulder strap pair,

hook and loop fastening pads on the free upper ends, respectively, of the front and rear shoulder straps of each shoulder strap pair and releasably joining the upper shoulder strap ends of each shoulder strap pair, and wherein

said shoulder holster is worn with the respective fastening pads engaged and positioned over the shoulders of the wearer, and said fastening pads are relatively adjustable laterally and rotatably to permit relative angular, lateral, and edgewise adjustment of the upper ends of the corresponding front and rear shoulder straps.

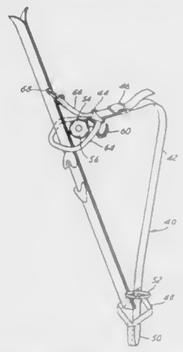
4,903,875

SKI-CARRYING DEVICE

Peter E. Smart, and Patricia G. Smart, both of "Romany", 100 Oakhill Road, Sevenoaks, Kent, United Kingdom (TN13 1NU)

PCT No. PCT/GB87/00343, § 371 Date Feb. 11, 1988, § 102(e) Date Feb. 11, 1988, PCT Pub. No. WO87/07170, PCT Pub. Date Dec. 3, 1987
PCT Filed May 20, 1987, Ser. No. 153,822
Claims priority, application United Kingdom, May 20, 1986, 8612188; Aug. 1, 1986, 8618795
Int. Cl.[4] A45F *3/14*
U.S. Cl. 224—258 **10 Claims**

1. A ski-carrying device comprising a flexible strap of adjustable length which is folded at one end to form a bight; a band secured to said one end of the strap and to a portion of the strap adjacent said end thereby forming with said bight a pocket having an unrestricted pocket mouth and being adapted to receive the ends of two skis; and fastening means formed at the opposite end of said strap and being adapted to grip the skis at a point intermediate their length, the strap being of a sufficient length to enable the skis to be carried substantially vertically with the strap over the user's shoulder and the device being foldable, when not in use, to approximately pocket size,



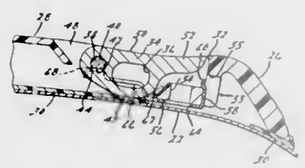
wherein said fastening means comprises a suction element adapted to grip one of the skis through a suction effect.

4,903,876

ARTICLE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed Jun. 13, 1988, Ser. No. 207,063
Int. Cl.[4] B60R *9/04;* **B61D** *45/00*
U.S. Cl. 224—321 **11 Claims**



1. An article securing assembly for receiving a device to secure an object on a plurality of elongated slats mounted on an exterior horizontal surface of an automobile, said assembly comprising:

means forming a cavity in one of the slats and having a first upper surface;

securing means adapted for receiving a device to secure an object on the slats, said securing means being disposed within said cavity and having a second upper surface, said securing means being adapted for pivotal movement between a closed position in which the second upper surface of said securing means does not extend above the first upper surface of the slat and an open position such that a portion of the securing means extends above the first upper surface of the slat; and

pivot means for allowing pivotal movement of said securing means between said open and closed positions, said pivot means including a flat circumferential portion;

biasing means for biasing said securing means in said closed position;

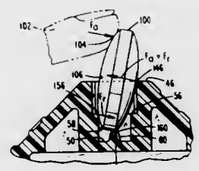
said biasing means comprising a spring disposed within said cavity and having a pair of laterally spaced and longitudinally extending arms for cooperating with said flat circumferential portion of said pivot means when said securing means is in its closed position to bias said securing means in said closed position.

4,903,877

TABLET BREAKING APPARATUS

William Hnatuk, Maple Glen, Pa., assignor to Merck & Co, Inc., Rahway, N.J.

Filed Apr. 29, 1988, Ser. No. 187,942
Int. Cl.[4] A61J *3/00;* **B26F** *3/00*
U.S. Cl. 225—93 **13 Claims**



1. Apparatus for breaking a tablet into parts comprising:

a body having a recess, formed to have a base, a side wall that is sized and shaped to loosely receive a predetermined portion of said tablet inserted therein and a projection extending normal to said base of said recess so as to contact the tablet inserted into said recess when one half of the tablet is entered into the recess; and

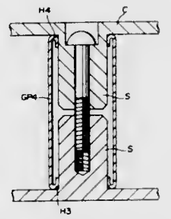
a fulcrum point on said body, located with respect to said side wall so as to contact a surface of the tablet when the tablet is forcibly pushed against said fulcrum point by a user-applied force, the application of said user-applied force generating a first reaction force by contact between the fulcrum and said tablet and a second reaction force by contact between said side wall and a portion of the tablet received within the recess, the coaction of said user-applied force and said first and second reaction forces producing breakage of the table substantially at said fulcrum, wherein a portion of said side wall of said recess is constricted, whereby the location of said constriction determines the location of said second reaction force between said side wall and said tablet.

4,903,878

METHOD FOR MANUFACTURING A TAPE GUIDE CYLINDER OF SMALL THICKNESS

Mamoru Usami, Tokyo, and Yoshitaka Kawamura, Owariasahi, both of Japan, assignors to Sanwa Needle Bearing Co., Ltd., Aichi and Asahi Seiki Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Oct. 17, 1988, Ser. No. 258,824
Claims priority, application Japan, Apr. 15, 1988, 63-92776
Int. Cl.[4] B65H *23/08*
U.S. Cl. 226—190 **7 Claims**



1. A method for manufacturing a tape guide cylinder of small thickness comprising;

drawing a metal sheet repeatedly so as to form a slender bottomed cylinder of small thickness,

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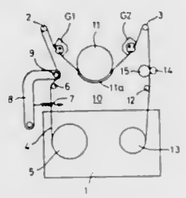
subjecting the bottomed cylinder to flange processing to form a flange at an open top thereof,
subjecting the bottomed cylinder to piercing at the bottom thereof so as to form a substantially flange-like inward portion having a prescribed inside diameter,
trimming the flange so as to shape the open top, and
subjecting the trimmed open top to curl so as to form another substantially flange-like inward portion having the same inside diameter as the former inward portion at the top of the cylinder.

4,903,879

STATIONARY TAPE GUIDE FOR A MAGNETIC TAPE RECORDER

Yoshihiro Noguchi, Tokyo, and Hideo Kitazawa, Komagane, both of Japan, assignors to Nakamichi Corporation, Kodaira and Kabusiki Kaisha Sankyo, Shimosuwa, both of, Japan

Filed Nov. 4, 1988, Ser. No. 267,159
Claims priority, application Japan, Nov. 17, 1987, 62-175168[U]
Int. Cl.[4] G11B *11/665*
U.S. Cl. 226—199 **4 Claims**



1. A stationary tape guide of the type comprising a guide block having on its front face a laterally extending guide path across a plurality of tape-face guides integrally formed on said block, at least a tape-edge guide having a guide surface extending from the guide block above the guide path for restricting lateral movement of the tape and means for securing said guide block in close proximity to a helical scanning cylinder of a magnetic tape recorder, comprising
said tape-edge guide being formed as a detachable part from the guide block and slidably mounted on said guide block;
means for adjusting the distance between said tape-edge guide and said guide block; and
bias means disposed between said tape-edge guide and said guide block for urging said tape-edge guide to said adjusting means and for urging said guide block to chassis.

4,903,880

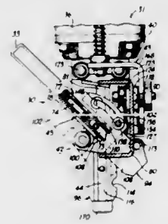
SIDE LOAD MAGAZINE FOR A FASTENER DRIVING TOOL

Ronald Austin, Hazelcrest, and Dale M. Flowers, Prospect Heights, both of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Continuation-in-part of Ser. No. 63,416, Jun. 18, 1987, Pat. No. 4,801,062. This application Sep. 28, 1988, Ser. No. 250,311
Int. Cl.[4] B25C *5/13, 7/00*
U.S. Cl. 227—8 **20 Claims**

6. A magazine assembly carried by a tool frame for feeding fasteners into a drive track of a fastener driving tool having a first side and a second side comprising:
an elongated carrier disposed to be in communication with said drive track for carrying fasteners;
means for pivotally supporting said elongated carrier about an axis parallel to the longitudinal axis of said elongated carrier, offset from said drive track for movement between an operative position and a refill position to allow fasteners to be loaded from the first side of the tool; and
means for feeding fasteners one at a time into the drive track.

9. A fastener driving tool for driving fasteners into a workpiece comprising:
a housing;
a nosepiece assembly carried by said housing including a front nosepiece and a rear nosepiece pivotally connected together to form a drive track for movement between a first position and a second position;



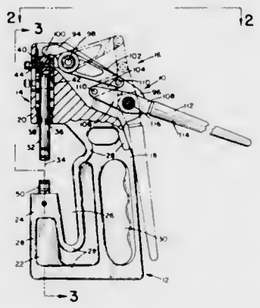
a fastener carrier in communication with said drive track for driving fasteners into the workpiece;
means for advancing the fasteners toward said drive track; and
means for latching said front and rear nosepieces together in said first position.

4,903,881

PORTABLE FASTENER SETTING PRESS

Howard N. Wieland, Jr., Holliston, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 9, 1988, Ser. No. 269,439
Int. Cl.[4] B21J *15/10*
U.S. Cl. 227—143 **5 Claims**



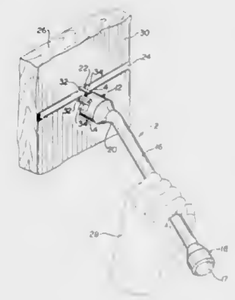
1. A manually operable press for installing fasteners in flexible material comprising:
a relatively rigid frame of generally C-shape having a vertically extending back portion and a pair of laterally extending and vertically spaced upper and lower legs, said lower leg including an upwardly extending base portion which extends generally parallel to said back portion to define a vertically open throat;
a ram member carried in said upper leg and guided for reciprocating movement along a path generally parallel to said back portion toward and away from said base portion of said lower leg; and,
drive means for driving said ram member toward said base portion of said lower leg, said drive means including first and second drive levers mounted for pivotal movement in the upper leg of said frame about fixed axes which extend transversely of the path of movement of said ram, said first drive lever having a first end in direct driving engagement with said ram and a second end extending rearwardly of said path, said second end of said first drive lever drivingly connected to a first end of said second drive lever by a connecting link member having a first end pivotally connected to the second end of said first drive lever and a second end pivotally connected to the second end of said second drive lever, and a second end of said second lever constituting a manual drive handle and arrange to extend generally parallel to the back portion of said frame when said second lever has been moved to a position wherein said ram member is driven to generally the maximum extent of movement toward said lower leg and, further wherein said second drive lever is mounted so that the second end thereof can pivot from a position where it extends generally perpendicular to said back portion to a position where it extends generally parallel to said back portion.

4,903,882

DRIVING TOOL FOR AN ELECTRICAL STAPLE

Gregory T. Long, Box 21, Star Rte. 2, Tionesta, Pa. 16353

Continuation of Ser. No. 837,842, Mar. 10, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 143,300
Int. Cl.[4] B25C *7/00*
U.S. Cl. 227—147 **6 Claims**



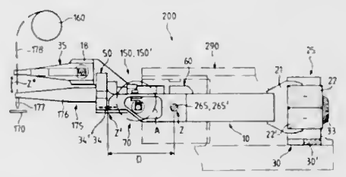
1. An elongated tool for driving an electrical staple and the like into a working surface in the operation of said tool in order to mount an electrical cable-like member onto said working surface, said tool being used with an instrument for imparting a pounding force against said tool for said driving of said staple, said tool comprising:
an elongated body member having a hand gripping area and a longitudinal axis,
a striking surface forming a part of said body member at one end thereof for receiving said pounding force,
staple carrying means formed at the other end of said body member for carrying said staple,
said staple carrying means having two opposed sidewalls, a floor surface fixedly connected to said sidewalls extending in a plane parallel to that of said floor surface for and extending there between and stop surfaces on said sidewalls limiting the depth of said staple when driven into said working surface,
said sidewalls and said floor surface defining a recessed area with an open passageway extending perpendicular to said axis of said body member, and having permanently fixed, non-movable means associated with said passageway for receiving, carrying, holding, and freely allowing a release of said staple from said passageway,
said open passageway extending along the entire length of said recessed area in that said recessed area is open on both sides of said staple carrying means,
said open passageway further being such as to be totally open and unobstructed when receiving said staple and to remain totally open and unobstructed during said operation of said tool as to allow said recessed area and said staple in said recessed area to freely receive said cable-like member in said driving of said staple into said working surface, with said fixed, non-movable means of said recessed area being in a non-contacting relationship with said cable-like member, thereby preventing damage from occurring to said cable-like member, and whereby said staple is driven into said working surface and is released from said recessed area of said tool by moving said tool away from said working surface without any relative movement occurring between said fixed, non-movable means associated with said open passageway of said recessed area and said elongated tool,
said non-movable means for receiving, carrying, holding, and allowing a release of said staple consisting of a slot formed in said each opposed sidewall and communicating with said floor for receiving and frictionally holding said staple, and magnet means in said floor cooperating with said slot in said each opposed sidewall for holding said staple in said recessed area.

4,903,883

APPARATUS FOR ULTRASONIC CONTACTING WIRE CONNECTION OF CIRCUITS TO ELECTRONIC COMPONENTS

Silvan Thurlemann, Hagendorn; Claudio Meisser, Cham, and Hans Eggenschwiler, Steinhausen, all of Switzerland, assignors to ESEC SA, Cham, Switzerland

Filed May 5, 1989, Ser. No. 347,854
Claims priority, application Switzerland, May 5, 1988, 1704/88; May 5, 1988, 1705/88; Dec. 28, 1988, 4814/88
Int. Cl.[4] B23K *20/10*
U.S. Cl. 228—1.1 **13 Claims**



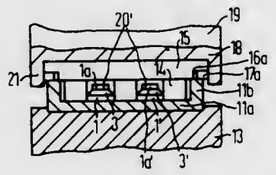
1. In an apparatus for bonding wire connection to electronic components for use in semiconductor connecting technology, particularly for an ultrasonic bonding wire connection of circuits to electronic components, comprising bonding means mounted so as to pivot about an axis and including a first support frame operatively connected to and movable by an electromotive drive, a second support frame, and an energy transducer including a capillary element and received in said second support frame, said capillary element being engageable with individual electronic components to apply wire connection thereto, the improvement comprising a carrier member, said first and second support frames together with said transducer being mounted so as to pivot about an axis Z in said carrier member, and the second support frame with said transducer being additionally movable about an articulation (Z') spaced at a distance (D) from the axis (Z) relative to the first support frame, and wherein for obtaining a necessary positional stability, said first and second frames and said transducer have a common mass center (M) and are pivotable together about the axis (Z) on a symmetry axis (S) within an imaginary circle (E), a center of which is located on an imaginary line formed between the axis (Z) and the articulation (Z').

4,903,884
SOLDERING APPARATUS
Lindsay I. Royston, Mount Waverley, and Ian M. Eastham, Blackburn South, both of Australia, assignors to Royel International Pty. Ltd., Notting Hill, Australia
Filed Dec. 14, 1988, Ser. No. 284,257
Claims priority, applicatioo Australia, Dec. 17, 1987, PI5967
Int. Cl.[4] B23K 3/02
U.S. Cl. 228—51 9 Claims



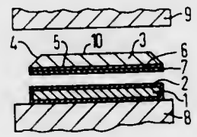
1. Soldering apparatus of the kind having a replaceable tip element, the tip element being elongate and having a first end which defines a soldering face and a second end remote from the first end, the apparatus further comprising an elongate, tubular frame assembly in which the tip element is held such that the first end of the tip element projects beyond an end of said assembly; the frame assembly including:
(a) an inner frame portion which defines an elongate bore in which the second end of the tip element is longitudinally received;
(b) an outer frame retaining portion received on the inner frame portion, and adapted to retain the tip element in heat conducting relationship with the inner frame portion; and
(c) a contact assisting member within the bore of said inner frame portion, said member having a body portion which provides a relatively low electrical resistance between said contact assisting member and said inner frame portion, and a contact assisting formation on said body portion adapted to embed itself at least partially into the tip element adjacent said second end;
wherein said outer retaining portion is retained in assembly with the inner frame portion such that the tip element is retained in heat conducting relationship with the inner frame portion and such that said contact formation of the contact assisting member is caused to embed itself at least partially within said tip element adjacent said second end to promote a relatively low electrical resistance between said tip element and said inner frame portion.

4,903,885
METHOD AND APPARATUS FOR FASTENING ELECTRONIC COMPONENTS TO SUBSTRATES
Herbert Schwarzbauer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Mar. 1, 1989, Ser. No. 317,558
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806979
Int. Cl.[4] H01L 21/58; B23K 20/02
U.S. Cl. 228—106 4 Claims



1. A method for fastening an electronic component to a substrate by pressure sintering, comprising the steps of:
applying a paste of a metal powder and of a solvent to a boundary surface having a contact layer to be fastened between the component and the substrate;
completely drying said paste applied at the boundary surface;
placing the component in place on the substrate;
placing the component and the substrate into a receptacle composed of a floor part and of a lateral wall part that is augmented by a die which is movable in a direction toward said floor part to form a closed receptacle chamber, said floor part being supported against a first press ram and said die being supported against a second press ram;
placing a deformable member of temperature resistant elastically deformable material into said receptacle; pressing together said first and second pressing rams at a sintering temperature and at a pressure of at least 900 N/cm^2, said deformable member having a volume which completely fills an interior of the receptacle chamber not occupied by the component and the substrate when said pressure is reached so that direct contact between said die and the component and substrate is avoided.

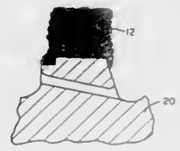
4,903,886
METHOD AND APPARATUS FOR FASTENING SEMICONDUCTOR COMPONENTS TO SUBSTRATES
Herbert Schwarzbauer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Mar. 1, 1989, Ser. No. 317,596
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806980
Int. Cl.[4] H01L 21/58; B23K 20/02
U.S. Cl. 228—106 6 Claims



1. A method for fastening a surface of a semiconductor component to a surface of a substrate by diffusion welding, comprising the steps of:
providing a surface of a semiconductor component to be joined to a substrate with a metallization, said metallization being a first precious metal contacting layer;
providing a surface of said substrate to be joined to said component with a second precious metal contacting layer;
placing said surface of said semiconductor component on said substrate;
heating said semiconductor component and said substrate to a temperature in a range of approximately 150 to 250 degrees C.; and
pressing said semiconductor component onto said substrate in an air-filled space with a pressing force in a range of approximately 500 through 2500 kp/cm^2 while heating.

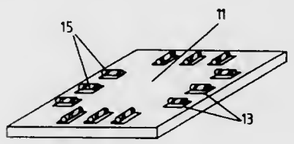
4,903,887
INERTIA WELD IMPROVEMENTS THROUGH THE USE OF STAGGERED WALL GEOMETRY
Jack S. Thrower, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 21, 1988, Ser. No. 287,219
Int. Cl.[4] B23K 20/12
U.S. Cl. 228—112 2 Claims
1. In the inertia welding of hollow high strength superalloy articles, the improvement which comprises:
providing a first article to be joined, said first article having an inside diameter and an outside diameter and a centerline,
providing a second article to be joined, said second article having an inside diameter and an outside diameter and a centerline,
wherein the inside diameter of the first article is less than the inside diameter of the second article and the outside diameter of the first article is less than the outside diameter of the second article, so that when the first article and second articles are placed together, with their respective center lines coincident, radial steps are formed at the interface between the article, and so that upon welding an "S" shaped curved weld zone results.

4,903,888
TURBINE SYSTEM HAVING MORE FAILURE RESISTANT ROTORS AND REPAIR WELDING OF LOW ALLOY FERROUS TURBINE COMPONENTS BY CONTROLLED WELD BUILD-UP
Robert E. Clark, Orlando, Fla., and Dennis R. Amos, Rock Hill, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 5, 1988, Ser. No. 190,324
Int. Cl.[4] B23K 31/00
U.S. Cl. 228--119 32 Claims



1. A method of repairing a worn surface of a low alloy ferrous steam turbine component comprising:
(a) providing a steam turbine component having a worn surface thereon, said component comprising about 1,05% to about 1.35% by weight Cr, about 1.00% to about 1.30% by weight Mo, about 0.21% to about 0.29% by weight V and about 0.27% to about 0.34% by weight C;
(b) depositing a first layer of weld metal on said worn surface, said depositing step producing a heat-affected-zone in said component; and
(c) depositing a second layer of weld metal on said first layer with higher heat than that used to apply said first layer to temper at least a portion of said heat-affected-zone in said component.

4,903,889
CONNECTION TO A COMPONENT FOR USE IN AN ELECTRONICS ASSEMBLY
Svendsen, Leo G., Redwood City; Rebecca A. Leary, Milpitas, and Gary I. Geschwind, Palo Alto, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 270,890, Nov. 14, 1988, abandoned.
This application Jul. 19, 1989, Ser. No. 383,223
Int. Cl.[4] B23K 1/12, 35/14, 35/22
U.S. Cl. 228--180.2 39 Claims
1. A component for use in an electronics assembly, comprising:
(a) a contact; and
(b) a solder preform in the form of a column, which comprises:
(i) a solder body, and
(ii) a tubular support, longitudinally and/or radially spaced apart portions of the wall or walls of the support that extend parallel to its longitudinal axis having apertures therein communicating between the interior and the exterior of the support,
the solder of the body being enclosed at least partially within the support, the apertures being so arranged that



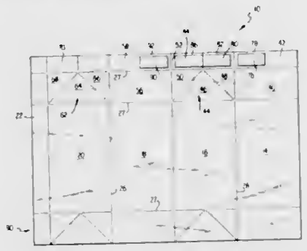
when the solder within the support is molten, it is capable of remaining substantially within the support by virtue of its surface tension;
the preform being connected to the contact by means of a solder connection such that the longitudinal axis of the preform is approximately parallel to the plane of the contact at the point at which the connection between the contact and the preform is made.

4,903,890
GOLD-PALLADIUM-NICKEL-COPPER-MANGANESE FILLER METAL FOR JOINING SUPERALLOY
Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.
Division of Ser. No. 262,384, Oct. 26, 1988, Pat. No. 4,853,291, which is a division of Ser. No. 174,278, Mar. 28, 1988, Pat. No. 4,839,141. This application Apr. 10, 1989, Ser. No. 335,340
Int. Cl.[4] B23K 35/22
U.S. Cl. 228—263.13 4 Claims
1. The method of joining metal parts made of a superalloy having a solution heat treating temperature of 1025°–1080° C. comprising the steps of disposing a brazing alloy at the joint between the parts, the brazing alloy having a solidus temperature above 1000° C. and a liquidus temperature above 1018° C. and having a composition of, in weight percent, 5–30 gold, 15–35 palladium, 10–30 nickel, 20–48 copper, 5–25 manganese, and brazing the parts at a temperature of 1025°–1080° C. to form a uniform fillet at the joint.

4,903,891
GABLE TOP CARTON SEALING CONSTRUCTION
Robert L. Gordon, Monroe, N.Y., assignor to International Paper Company, Purchase, N.Y.
Filed Jul. 7, 1989, Ser. No. 376,455
Int. Cl.[4] B65D 5/74
U.S. Cl. 229—48 T 2 Claims
1. A thermoplastic coated paperboard blank for forming a

VOL 1111 ISS 4 FE 27 19 90 UMI

gable top type carton, the blank provided with fold and crease lines to form side panels, bottom closure panels, and gable top panels, each of said gable top panels having an upper free edge, the gable top panels including two alternate gable roof forming panels and two alternate gusset panels, each gusset panel including three triangular panels and a fin seal panel, each roof panel including a fin seal panel, one of said gusset panels termed a spout panel which is adapted to form a pour spout, an



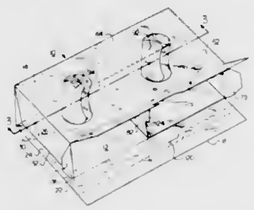
adhesive coating on said spout panel extending from contiguous to said free edge down towards said side panels and covering at least a portion of the fin seal panel of said spout panel, an adhesive coating on a portion of the fin seal panels of each of those roof panels adjacent said spout panel, said adhesive coatings comprised of a polyvinylacetate, the adhesion between said adhesive coatings being greater than the adhesion between said adhesive coatings and said thermoplastic coating on the paperboard.

4,903,892

FRAGILE ARTICLE CARTON

William E. McNair, Durham, and R. H. Allen, Burlington, both of N.C., assignors to Mebane Packaging Corp., Mebane, N.C.

Filed Aug. 17, 1988, Ser. No. 233,139
Int. Cl.[4] B65D *5/48*
U.S. Cl. 229—120.14 **16 Claims**



1. A carton for packaging articles to provide an end cushion, comprising:

(a) bottom, top, front, and rear rectangular wall panels, said panels having interior and exterior surfaces;

(b) a pair of opposed end wall panels, the first of said end panels joined at one upper longitudinal edge to the side end edge of said top wall;

(c) a first offset strip joined at one edge to the lower longitudinal edge of said first end wall and joined at the opposite edge to the side end edge of said bottom wall, said offset strip being joined to the interior surface of said bottom wall to offset the lower longitudinal edge of said first end wall inwardly from the side edge of said bottom wall;

(d) the second of said end panels joined at one lower longitudinal edge to the side and edge of said bottom wall; and

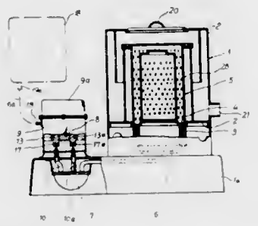
(e) a second offset strip joined at one edge to the upper longitudinal edge of said second end wall and joined at the opposite edge to the side end edge of said top wall, said offset strip being joined to the interior surface of said top wall to offset the lower longitudinal edge of said second end wall inwardly from the side edge of said top wall.

4,903,893

AUTOMATIC DEVICE FOR CONTROLLING THE SUPPLY OF FUEL TO A HEATER

Cheol Kim, 892-68 Jaegi-Dong, Kyungdong Miju Apt. B-206, Dongdaemoon-Ku, Seoul, Rep. of Korea

Filed Aug. 30, 1988, Ser. No. 238,244
Int. Cl.[4] G05D *23/12;* **F24H** *3/00*
U.S. Cl. 236—1 A **4 Claims**



1. An automatic fuel supplying device for use in a heater, which comprises:

a body member having a cap and a support plate disposed between said body member and said cap, said support plate having first and second apertures,

first and second push rods passed through said first and second apertures, said first and second push rods being inserted into said first and second magnetic units at one end thereof,

first and second on/off switches disposed at the other end of said first and second push rods for being operatively associated with first and second drain holes disposed in the bottom surface said body member, and

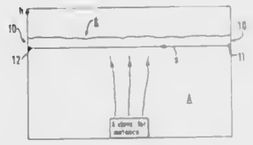
a fuel storage tank operatively associated with said body member through first and second fuel conduits, whereby, upon the operation of the electric source, the magnetic units are energized causing the pushing rods to fixedly engage with first and second cylinders of the magnetic units and the on/off switches to automatically open, thereby maintaining the fuel supplying action, and upon the sensing of a higher room temperature than a predetermined temperature of a thermostat connected to the second magnet unit, the electric source is disconnected and the second magnetic unit is no longer energized causing the pushing rod to disengage with the second cylinder and the second switch to automatically close, thereby stopping the fuel supplying action so that the heating is reduced and also, when the electric source for the automatic device is at the off position, the magnetic units are no longer energized and the first and second on/off switches close so that the heater automatically puts out the fire.

4,903,894

VENTILATION CONTROL PROCEDURE AND VENTILATION CONTROL MEANS

Teuvo Pellinen, Kausala; Mertsi Niemelä, Kausankoski, and Erkki Aalto, Kausala, all of Finland, assignors to Halton Oy, Finland

PCT No. PCT/FI88/00009, § 371 Date Sep. 2, 1988, § 102(e) Date Sep. 2, 1988, PCT Pub. No. WO88/05517, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 25, 1988, Ser. No. 246,664
Claims priority, application Finland, Jan. 27, 1987, 870361
Int. Cl.[4] F24F *7/04*
U.S. Cl. 236—492 **15 Claims**



1. A displacement ventilation method wherein the first air is introduced into a room space or equivalent chamber, and in which impure air is removed from an upper part of said room space or equivalent chamber from above an impurity boundary layer created in said room space or equivalent chamber, comprising the steps of

observing occurrence of said impurity boundary layer above a staying zone within said room space or equivalent chamber,

when said impurity boundary layer descends below a given limiting height in said space of chamber, increasing air flow entering into said space or chamber,

when said impurity boundary layer rises above a given upper limit within said space or chamber, reducing amount of fresh air entering into said space of chamber, and

disposing measuring means for observing location of said boundary layer above said staying zone for carrying out said observing step,

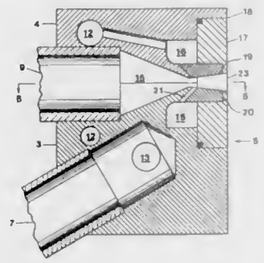
whereby comparatively low absolute value measuring accuracy is required for implementing and controlling said displacement ventilation method.

4,903,895

SNOW MAKING NOZZLE ASSEMBLY

John T. Mathewson, Rte. #44 West, Norfolk, Conn. 06058, and Harold Humphrey, Jr., Harwinton, Conn., assignors to John T. Mathewson, Norfolk, Conn.

Filed Mar. 13, 1989, Ser. No. 322,289
Int. Cl.[4] F25C *3/04*
U.S. Cl. 239—14.2 **4 Claims**



1. A snow making nozzle assembly for use in atomizing water and projecting the atomized water into atmosphere having an ambient temperature below the freezing point of the atomized water to form snow, said nozzle assembly comprising;

a converging diverging flat nozzle extending outwardly from an inlet on the upstream side of said nozzle to an exit on the down stream side of said nozzle, a plurality of spaced water outlet slots machined into removable nozzle plates, said nozzle plates forming an integral portion of upper and lower flat surfaces of said converging diverging nozzle, the width of each of said slots in each of said nozzle plates being equal to the distance between said slots, the depth of the said slots increasing from a center slot of each of said nozzle plates to the outermost slot in said nozzle plates, by at least 20%, said slots being sufficiently angled toward the exit of said converging diverging nozzle to direct the atomized water out of said nozzle;

upper and lower water distribution means overlying said upper and lower nozzle plates;

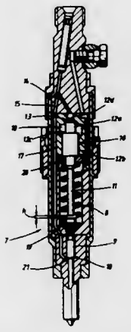
means for supplying water under pressure to said upper and lower water distribution means for passage through said outlet slots in separate streams for atomization upon impact with a high velocity air stream, the atomized water being carried into the sub freezing atmosphere for the formation of snow.

4,903,896

FUEL INJECTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE HAVING PREINJECTION AND MAIN INJECTION AIR COMPRESSION AND SELF-IGNITION

Ulrich Letsche, Stuttgart; Günther Häfner, Berglen, and Karl-Ernst Noreikat, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Apr. 6, 1989, Ser. No. 333,960
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1988, 3811885
Int. Cl.[4] F02M *45/08, 63/02*
U.S. Cl. 239—88 **20 Claims**



1. Fuel injection device for an air compression and self-ignition internal combustion engine having preinjection and main injection, comprising:

a high pressure multi-pump element injection pump with an injection line leading from each pump element to a line bifurcation which is continuously connected to a main injection nozzle and to a feed bore of a preinjection nozzle;

the preinjection nozzle having a nozzle needle moveably guided in a nozzle body;

the nozzle needle being lifted off a value seat against the force of a restoring spring in response to fuel pressure of

the fuel pump in the feed bore and counter to a direction of flow of fuel in the feed bore;

wherein the preinjection nozzle has a body in which a stepped piston is longitudinally displaceable;

the stepped piston is biased onto a sealing seat by spring force from the prestoring spring and is connected to the feed bore by a connecting channel; and

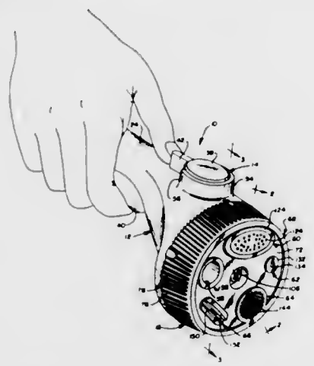
wherein fuel pressure from the fuel injection pump in the feed bore is controlled by the high pressure injection pump to reach a closure initiating pressure in the feed bore which is above an opening pressure and which causes the stepped piston to open and move the nozzle needle into a closed position to end preinjection and to maintain the needle in said closed position until fuel pressure from the injection pump drops to a value allowing the stepped piston to close.

4,903,897

TURRET NOZZLE WITH BALL VALVE FLOW ADJUSTMENT

Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.

Filed Aug. 12, 1988, Ser. No. 231,567
Int. Cl.[4] B05B *1/16*
U.S. Cl. 239—394 **21 Claims**



1. A hose nozzle comprising

a tubular body having means on one end portion thereof for connecting the same to an end of a hose containing a source of water under pressure,

said tubular body extending from said one portion a distance sufficient to provide a hand grip portion adjacent said one end portion suitable to be grasped in one hand with the thumb naturally extended into an actuating position on an opposite end of the hand grip portion,

said tubular body defining an interior water passage extending through the one end portion and hand grip portion thereof for confining water under pressure communicated therewith from a hose containing a source of water under pressure connecting with said hose end connecting means,

an annular ball valve seat in said tubular body facing toward and in water communicating relation with said passage,

a ball valve disposed in said passage in cooperating relation with said ball valve seat for varying the flow rate of water under pressure confined within said passage through said valve seat between zero and maximum,

said ball valve being mounted for pivotal movement about an axis transverse to the extent of said hand grip portion between fully opened and fully closed positions with respect to said valve seat corresponding to zero and maximum flow rate respectively,

a manually actuatable flow direction assembly mounted on said tubular body adjacent the opposite end of said hand grip portion for receiving water flowing through said valve seat when said ball valve is out of its fully closed position and for directing the same into the atmosphere in different stream formations determined by the manual actuation thereof, each of which extends into the atmosphere in a direction generally parallel with the direction of extent of the hand grip portion of said tubular body such that when the stream formation is directed horizontally the actuation position is disposed in an upper location on said opposite end of said hand grip portion, and

an actuating member disposed on the exterior of said tubular body adjacent the opposite end of said hand grip portion,

said actuating member being mounted in fixed relation with said ball valve for pivotal movements therewith about the pivotal axis of said ball valve,

said actuating member having thumb-engaging means thereon disposed in said actuating position for effecting pivotal movements of said actuating member about the pivotal axis of said ball valve by engagement therewith of the extended thumb of the hand gripping said hand grip portion,

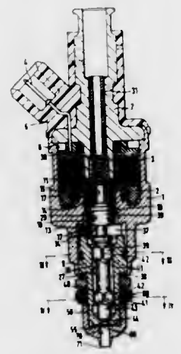
the mounting of said ball valve and said actuating member together and with respect to said tubular body and valve seat being such that (1) the actuating member is retained in any position of pivotal movement into which it is moved by thumb engagement and (2) the ball valve is retained in a corresponding position for determining the variable flow rate of water under pressure through said valve seat.

4,903,898

FUEL INJECTION VALVE

Wilhelm Kind, Bamberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 124,526, Nov. 24, 1987, abandoned. This application Feb. 10, 1989, Ser. No. 310,025
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 8632002[U
Int. Cl.[4] F02M *61/12*
U.S. Cl. 239—533.12 **8 Claims**



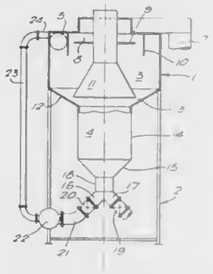
1. A fuel injection valve for fuel injection systems of internal combustion engines, comprising a nozzle holder, said nozzle holder having a valve seat face, a valve needle having a longitudinal axis and a sealing section cooperating with said valve seat face, said valve needle including a first guide section upstream of said sealing section and a second guide section upstream of said first guide section, said first and second guide sections each having a plurality of flat faces separated by rounded corners distributed uniformly over their perimeter in which said flat faces are approximately parallel to the longitudinal axis of said valve needle, said first and second guide sections are arranged to guide said valve needle in a guide bore, a flat plate (55) secured across a lower end of said nozzle holder (9), said flat plate including a plurality of equally spaced fuel metering bores (80) therein, and the number of flat faces formed on said first guide section (40) is greater by one than the number of fuel metering bores (80) in said flat plate (55).

4,903,899

SEPARATOR

Timothy J. Lamb, Clevedon, United Kingdom, assignor to Hydro International Limited, England

Filed Dec. 14, 1988, Ser. No. 284,348
Claims priority, application United Kingdom, Dec. 14, 1987, 8729155
Int. Cl.[4] B02C *23/36*
U.S. Cl. 241—14 **8 Claims**



1. A method for separating a first, relatively hard component of a liquid mixture from a second, relatively soft component of the mixture, the method comprising:

introducing the liquid mixture into a settlement vessel having a cylindrical wall, a base, a solids collection region centrally disposed of the base and an outlet means disposed in an upper region of the vessel and permitting settleable solids to settle under the action of gravity in the settlement vessel;

abstracting the settled solids from the settlement vessel and passing the abstracted, settled solids through a shearing means to alter the settlement characteristics of the relatively soft component;

returning the abstracted, sheared solids to the settlement vessel, there being a rotational flow of liquid in the vessel of sufficiently low energy to permit the relatively hard component of the liquid mixture to settle under gravity on the base and be swept toward the solids collection region but sufficiently high to maintain the relatively soft component whose settlement characteristics have been altered in suspension so that the soft component may be removed from the upper region of the vessel via the outlet means.

4,903,900

METHOD AND APPARATUS FOR SHREDDING PAPER OR THE LIKE

David Rousseau, 2372 Palermo Dr., San Diego, Calif. 92126

Filed Feb. 10, 1989, Ser. No. 309,681
Int. Cl.[4] B02C *18/16*
U.S. Cl. 241—30 **18 Claims**

1. A paper shredder comprising:

housing means having enclosed sides with an inlet therein for permitting the entrance of at least one sheet of paper and an outlet therein for permitting the discharge of shredded paper fragments;

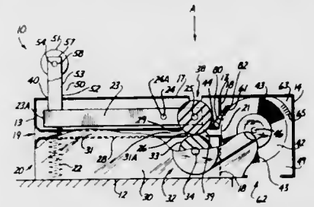
pathway means for defining a given pathway of travel to permit the passage of said paper in a given path traversing from said inlet to said outlet;

means for shredding said paper as it traverses from said inlet to said outlet, said shredding means including a plurality of bristles whose tip portions form a cylindrical surface;

said pathway means including means defining a drive pathway extending along a section of said given pathway of travel;

means for moving said paper along said drive pathway and into intersecting engagement with the bristles of said shredding means;

elongated arcuate plate means having an arcuate surface throughout its length, said length being substantially coextensive with the longitudinal length of said shredding means;



means for mounting said arcuate plate means in a parallel spaced-apart confronting relationship relative to a given sector of the cylindrical surface formed by said tip portions of said shredding means;

means including said sector of the cylindrical surface formed by the rotating bristle tip portions and the arcuate surface of said plate means for defining an arcuate shredding pathway, said given pathway of travel including said arcuate shredding pathway; and

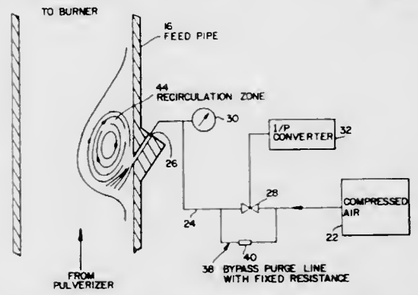
means driving rotatably said shredding means for moving the paper being shredded into and along substantially the entire arcuate shredding pathway so the plane surface of the paper being shredded comes into shredding engagement with said means for shredding over and along substantially the entire arcuate shredding pathway.

4,903,901

PULVERIZED COAL FLOW CONTROLLER

Raymond K. Kim, 4731 Tanglewood Cir., NE., Canton, Ohio 44714, and John B. Kitto, 1150 Seventh St., NE., North Canton, Ohio 44720

Continuation-in-part of Ser. No. 197,926, May 24, 1988, which is a continuation of Ser. No. 106,830, Oct. 6, 1987, Pat. No. 4,830,287. This application Nov. 28, 1988, Ser. No. 276,822
Int. Cl.[4] B02C *23/20*
U.S. Cl. 241—33 **15 Claims**



1. An apparatus for controlling the flow of fluid transported solid particles, comprising:

a vessel for containing a mixture of primary fluid with suspended particles;

at least one feed pipe connected to said vessel for supplying a flow of said mixture from said vessel;

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means for injecting a fluid under pressure into each feed pipe, said injecting means being situated so that the injected fluid creates a recirculation zone proportional in size to the injection pressure of the fluid in each feed pipe, the size of the recirculation zone proportionally regulating the flow of primary fluid;

means for measuring the flow in each feed pipe and establishing a signal indicative thereof, said measuring means being positioned downstream from said injection means; and

means for controlling the fluid injection pressure for each feed pipe responsive to the flow signal.

4,903,902

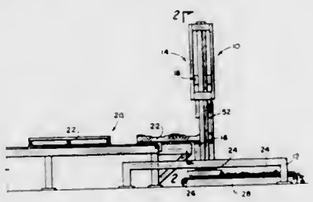
MACHINE FOR CRUSHING WOOD PALLETS

Paul L. Hufnagel, 3849 S. 99 East Ave., Tulsa, Okla. 74146

Filed May 11, 1989, Ser. No. 350,579

Int. Cl.[4] B02C *1/00*

U.S. Cl. 241—84 **8 Claims**



1. A machine for crushing wood pallets comprising:

a stationary table having a grid providing vertical passages therethrough;

a ram mounted above said table and reciprocable towards and away from said table and having an array of downwardly extending cutters which, when the ram is fully advanced towards said table, extend at least partially through said table grid;

means of reciprocating said ram alternately towards and away from said table;

conveyor means for moving wood pallets onto said table; and

means below said table for collecting broken pieces of crushed wood pallets passing through said table grid.

4,903,903

MOBILE CRUSHING PLANT

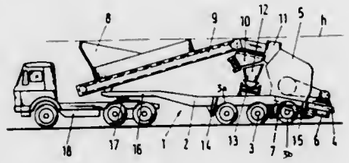
Günther Benen, Münster, Fed. Rep. of Germany, assignor to Salzgitter Maschinenbau GmbH, Salzgitter-Bad, Fed. Rep. of Germany

Continuation of Ser. No. 116,466, Nov. 3, 1987, abandoned. This application Mar. 21, 1989, Ser. No. 326,468

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637389

Int. Cl.[4] B02C *21/02*

U.S. Cl. 241—101.7 **4 Claims**



1. A mobile crushing plant, comprising a semitrailer including a frame having a front end and a rear end and including a set of ground-contacting wheels at said rear end, said frame having a first position in which said front end thereof is located at a first distance from the ground and is connectable to a towing vehicle, and a second position in which said front end is located at a second distance from the ground, said second distance being less than said first distance; a crushing machine mounted on said frame at said rear end; a feeding device mounted on said frame and including an inlet at said front end of said frame for material to be crushed and a conveyor for conveying the material to said crushing machine; lifting means mounted on said frame at said rear end, which lifting means lift said rear end so that said frame pivots from said first position to said second position and thereby displaces said front end and said inlet of said feeding device towards the ground; and support means mounted on said frame in front of said set of wheels and spaced apart from said crushing machine, said support means having a rest position clear of the ground and an operative position in contact with the ground, and said support means defining in said operative position a substantially horizontal axis which extends transverse to said frame and constitutes a pivot axis for pivoting of said frame from said first to said second position.

4,903,904

COMMINUTING DEVICE FOR TURNINGS

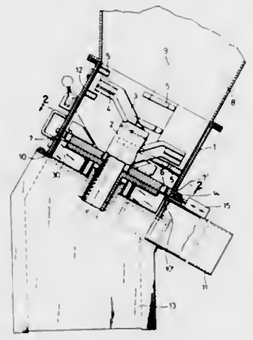
Richard Steimel, Frankfurter Strasse 135, D-5202 Hennef, Fed. Rep. of Germany

Continuation of Ser. No. 681,217, Dec. 12, 1984, abandoned. This application May 15, 1989, Ser. No. 352,130

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 8335662[U]

Int. Cl.[4] B02C *13/282*

U.S. Cl. 241—154 **4 Claims**



1. A comminuting device for metal turnings; comprising a housing having an inlet, an inner comminuting space, and an outlet located beneath said inner comminuting space, a rotor located in said inner comminuting space, rotatable in opposite directions, and having at least one arm arranged in a region of said inlet, a plurality of rotary precomminuting knives carried by said one arm, and a plurality of peripherally spaced rotor knives located in a region of said outlet and positioned in a common plane; a plurality of stationary precomminuting knives located in said inner comminuting space, secured to said housing in the region of said inlet, and cooperating with said plurality of rotary precomminuting knives to break the turnings fed through said inlet into precomminuting turnings, a plurality of stator knives located in said inner comminuting space, supported on said housing, located in said common place, and cooperating with said rotor knives to break the precomminuting turnings into fine portions; and a block radially displaceable in said common plane for supporting at least one of said stator knives for outward radial displacement in said common plane to enable delivery of an unbroken coarse lump through said outlet in case of a jamming of the unbroken coarse lump between said one knife and one of said rotor knives, said block having opposite converging outer surfaces, said housing including guide means having complementary converging surfaces cooperating with said opposite converging outer surfaces of said block to guide said block in in its radial displacement in said common plane.

4,903,905

METHOD OF BALANCING A YARN WINDER

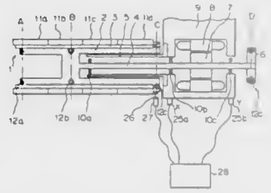
Katsumi Hasegawa; Michio Ohno, both of Kusatsu, and Akira Kadotsuji, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

Division of Ser. No. 290,844, Dec. 29, 1988, Pat. No. 4,852,810, which is a continuation of Ser. No. 15,218, Feb. 17, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,099

Claims priority, application Japan, Feb. 20, 1986, 61-35821; Feb. 20, 1986, 61-35824

Int. Cl.[4] B65H *54/02*

U.S. Cl. 242—18 R **20 Claims**



1. In a method of balancing a spindle in a yarn winder, wherein the yarn winder comprises:

(a) a base mounted on a machine frame for supporting a yarn take-up means, and

(b) the yarn take-up means including,

(b-1) a spindle driving mechanism mounted to the base,

(b-2) a long spindle comprising,

(b-2-1) a bobbin holding portion more than 800 mm in length including a first cylindrical hollow body, a cylindrical and substantially solid body connected to the first cylindrical hollow body and a second cylindrical hollow body connected to the cylindrical solid body, and

(b-2-2) a shaft extending from a center of the inner end of the cylindrical solid body along the axis thereof through the interior of the second cylindrical hollow body and projecting therefrom, the shaft being connected to the spindle driving mechanism,

(b-3) bearing means for rotatably supporting the spindle on the base, and

(b-4) a bobbin holding mechanism secured around the periphery of the bobbin holding portion, for detachably mounting thereon at least a bobbin for taking up a yarn,

the steps which comprise balancing the bobbin holding portion dynamically by field-balancing carried out by adjusting a test weight in each of at least three planes defined at opposition ends of the bobbin holding portion and an intermediate point therebetween, each of the weights being determined from sensing vibration data obtained by vibration testing carried out with and without an added test weight in each of said at least three planes extending at an angle to the axis of said spindle.

4,903,906

ENDLESS LOOP TRANSPORT AND STORAGE SYSTEM

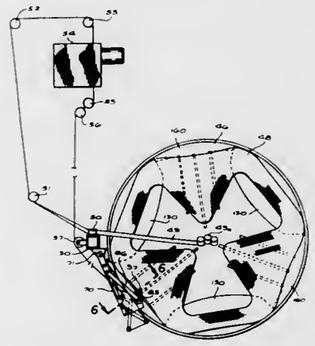
Richard P. Eddy, Gardena, Calif., assignor to Christie Electric Corp., Torrance, Calif.

Continuation of Ser. No. 120,031, Nov. 13, 1987, abandoned. This application Jul. 13, 1989, Ser. No. 380,726

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[4] B65H *20/26*

U.S. Cl. 242—55.19 R **32 Claims**



1. In an apparatus for continuously storing a strip of material in a coil, including a frame, a flat platter and drive means for rotating said platter on said frame, the coil lying edgewise on said platter and the strip including an incoming strip portion leading to the coil periphery and an outgoing strip portion leading from the coil center, the improvement comprising:

a strip application roller carried on said frame and spaced from the coil for applying the incoming strip portion to the periphery of the coil of the strip on said platter as said platter rotates, in an even number of substantially straight strip sections joined at curved corners providing alternating even and odd straight strip sections;

a pusher roller carried separate from and movable relative to said application roller; and

pusher pressure means carried on said frame with said pusher roller mounted thereon for continuously applying an inward pressure by said pusher roller to said strip sections at the outer periphery thereof to form only said even strip sections into concave strip sections and to maintain only said odd strip sections substantially straight.

4,903,907

WEB WINDING APPARATUS

Joseph Yokajty, and Michael Long, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 12, 1988, Ser. No. 242,568

Int. Cl.[4] B65H *19/26, 23/24*

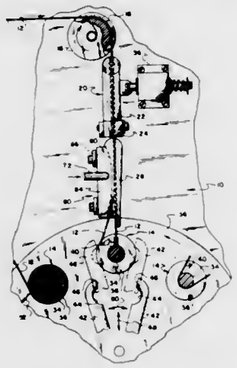
U.S. Cl. 242—56 R **1 Claim**

1. In an apparatus for winding a plurality of convolutions of a web or film onto a spool in response to rotation of the spool, the apparatus having a cutting mechanism spaced from the spool and a guide between the cutting mechanism and the spool defining one side of a substantially straight path along which the film can be advanced from the cutting mechanism to the spool prior to attachment of the film to the spool, and the spool being rotated in a direction to urge the film away from the guide as the film is wound onto the spool due to an increase in diameter of the film on the spool as each successive convolution of the film is wound onto the spool, the improvement comprising:

an air bar located along the film path between the cutting mechanism and the spool and located on the opposite side

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of the path from the guide, the air bar having a substantially semi-cylindrical surface directly opposite the guide and facing the path, the axis of curvature of the surface extending in a direction substantially perpendicular to the film path, the center portion of the air bar surface being nearer to the guide than other portions of the air bar surface, means defining an air manifold in the air bar, means for connecting the manifold to a source of air under pressure, and a plurality of openings in the air bar between the manifold and the air bar surface located so that air



under pressure leaving the openings is directed toward the film path to hold the film substantially straight in the portion of the path between the cutting mechanism and the center portion of the air bar while enabling limited movement of the film toward the air bar surface between the center portion of such surface and the spool in response to an increase in the diameter of the film on the spool during winding of the film onto the spool, the openings in the air bar being arranged in a plurality of substantially parallel rows extending in a direction substantially parallel to the film path.

4,903,908

METHOD OF, AND APPARATUS FOR, PROCESSING FLAT PRODUCTS, ESPECIALLY FOLDED PRINTED PRODUCTS, ARRIVING IN AN IMBRICATED FORMATION

Egon Hänsch, Wetzikon, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Continuation of Ser. No. 497,142, May 23, 1983, abandoned. This application Mar. 16, 1988, Ser. No. 169,044

Claims priority, application Switzerland, Jun. 3, 1982, 3411/82

Int. Cl.[4] B65H *29/70;* **B65B** *63/04*

U.S. Cl. 242—59 **15 Claims**

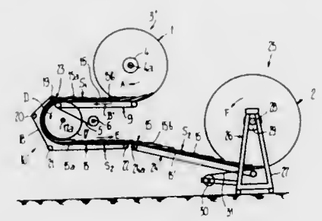
1. A method of processing essentially flat products, such as printed products and especially folded printed products, comprising the steps of:

infeeding said products in the form of an imbricated product formation in which each product of said products rests upon a preceding one of said products,

winding up said infed imbricated product formation in underfeed in order to form an intermediate product package;

unwinding said intermediate product package in order to form an unwound imbricated product formation in which each product of said products rests upon a subsequent one of said products;

inverting said unwound imbricated product formation such that an upper side thereof becomes a lower side thereof and each product rests upon a preceding one of said products; and



winding up said inverted unwound imbricated product formation in underfeed in order to form a primary product package.

4,903,909

BRAKE FOR PAPER ROLL BEARING SHAFT IN PAPER ROLL SUPPORT FRAME OF WEB FEEDER FOR ROTARY PRESS

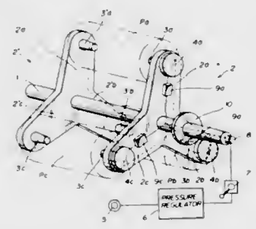
Seiji Suzuki, Yokohama, Japan, assignor to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Continuation of Ser. No. 126,836, Nov. 30, 1987, abandoned. This application Mar. 21, 1989, Ser. No. 326,469

Claims priority, application Japan, Dec. 15, 1986, 61-191782[U]

Int. Cl.[4] B65H *19/00*

U.S. Cl. 242—75.4 **6 Claims**



1. A brake system for paper roll bearing shafts in a rotatably supported support frame of a web feed for a rotary press, which support frame includes at least two pairs of radial paper roll support arms each with a paper roll bearing shaft rotatably supported therebetween, said frame being rotatable for successively advancing said support arms to a paper feeding first position, a web pasting second position, a paper roll loading third position locating the now-loaded paper roll in position for repeat cycling, said brake system comprising a pneumatic brake on said support frame and individually associated with each paper roll bearing shaft, a pneumatic circuit for feeding compressed air to each of said pneumatic brakes, a plurality of solenoid valves on said support frame and connected in said pneumatic circuit and respectively associated with each of said pneumatic brakes for individually controlling the operation of said brakes, and solenoid valve switching means on said support frame for selectively and individually operating each solenoid valve according to a turning phase of each paper roll support arm, said switching means comprising actuation means for simultaneously energizing two of said solenoid valves during a web pasting operation to maintain tension on spliced webs from two paper rolls mounted on said respective bearing shafts and support arms located with a brake operating zone

extending to and between said web pasting second position and said paper feeding first position.

4,903,910

ROLL CORE RELEASING DEVICE

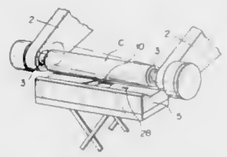
Hiromi Tamura, Kawasaki, Japan, assignor to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,837

Claims priority, application Japan, Oct. 30, 1987, 62-273170[U]

Int. Cl.[4] B65H *19/12*

U.S. Cl. 242—81 **3 Claims**



1. In a rolled object holding apparatus whose holding members hold both ends of a roll core in combination with a core receiving member for receiving the empty core, a roll core releasing device comprising a core pushing mechanism, the core pushing mechanism further comprising:

a core pushing member; and

a driving means for moving the core pushing member at least in the direction of radius of the core, said core pushing mechanism being mounted on said core receiving member.

4,903,911

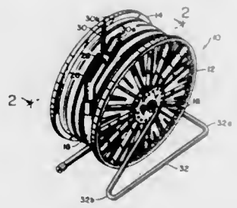
HOSE REEL FOR CENTRAL VACUUM CLEANING SYSTEM

Arnold L. Sepka, Hudson, Ill., assignor to The Eureka Company, Bloomington, Ill.

Filed Oct. 24, 1988, Ser. No. 261,686

Int. Cl.[4] B65H *75/18*

U.S. Cl. 242—86 **7 Claims**



1. A combination portable hose reel and a hose, said real having an axle for winding a length of said hose thereon for a central vacuum cleaning system comprising: a pair of spaced flanges on said axle, one of said flanges having a hole therethrough, said hose having a rigid connecting member being a tubular connection at one end passing through the hole in said one flange whereby only said member projects outside said one flange and comprises a crank means for rotating the reel to wind the hose on the axle thereof.

4,903,912

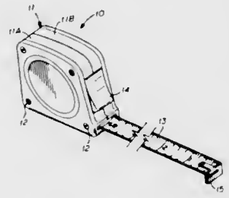
TAPE MEASURE BRAKING DEVICE

Eric J. Coughlin, Barrie, Canada, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 12, 1988, Ser. No. 231,292

Int. Cl.[4] B65H *75/48*

U.S. Cl. 242—107.3 **4 Claims**



1. A measuring tape, comprising:

a measuring tape casing having an opening;

a tape blade coiled in the casing, said tape blade having an extension moveable in and out of said opening;

a tape hook attached to said tape blade;

motor means for retracting the extension substantially into the casing;

lock means for movement from a position in which it is out of engagement with the tape blade to a position in which it engages the tape blade, locks the tape blade and holds it in a particular position of extension out the opening; and

brake means for braking the tape blade when the lock means releases the tape blade and the tape blade is retracted by the motor means, said brake means contacting said tape blade inside of said casing and preventing said tape hook from striking the casing with substantial force, yet allowing the tape blade to be substantially retracted into the casing.

4,903,913

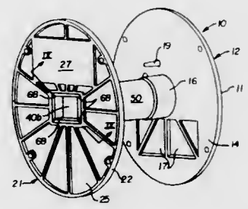
KNOCK-DOWN SPOOL ASSEMBLY

James A. McCaffrey, Alpharetta, Ga., assignor to Advanced Products Incorporated, Pittsburgh, Pa.

Continuation of Ser. No. 86,276, Aug. 17, 1987, abandoned. This application Aug. 2, 1988, Ser. No. 227,376

Int. Cl.[4] B65H *75/18*

U.S. Cl. 242—115 **7 Claims**



1. An improved knock-down spool assembly comprising an elongated cylindrical spindle body having a cylindrical sidewall, a hollow interior and opposed cylindrical end portions, each end portion having an axially projecting, radially yieldable locking means including a flat transitional surface extending radially inwardly from the cylindrical sidewall, at least one spacer portion forming a flat anti-rotation surface and an edge portion having a restraining surface; a pair of spaced-apart end plates detachably interlocked to respective end portions of said spindle body, each end plate having first and second surfaces

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and having a cylindrical hub formed on and extending substantially normal to said second surface to receive an end portion of said cylindrical spindle body therein, each end plate having a through opening formed within an area surrounded by said hub including means formed in said opening to interlock with the yieldable locking means carried by said spindle body, said end plates each having at least one flat surface formed in said hub opening to register with said at least one spacer portion of said locking means of the spindle body between said flat transitional surface and said restraining surface, whereby engagement of each end portion on said spindle body with an end plate positively interlocks the end plates to said body to form a spool assembly and registry of said at least one flat anti-rotation surface of said spacer portion of said locking means on said spindle body and said flat surfaces formed in said hub openings on said end plates prevents relative rotation between said spindle body and said end plates.

4,903,914

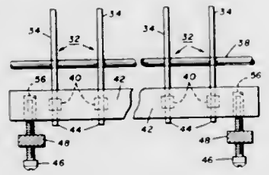
WARPING YARN ACCUMULATOR

Douglas K. Seaborn, Rte. 3, Box 809T, Cantonment, Fla. 32533, and Louis B. Williams, Jr., Milton, Fla., assignors to Douglas K. Seaborn, Cantonment, Fla.

Continuation-in-part of Ser. No. 273,733, Nov. 14, 1988, abandoned, which is a continuation of Ser. No. 642,456, Aug. 20, 1984, abandoned. This application Jun. 16, 1989, Ser. No. 367,122

Int. Cl.[4] B65H *59/10, 59/36*

U.S. Cl. 242—147 M **1 Claim**



1. A yarn accumulator for continuously storing a quantity of each of a plurality of yarns in a running weftless warp sheet, each of said yarns having a normal running tension, said accumulator comprising:

(a) sensing means, responsive to occurrence of tension in any given one of said yarns equal to a predetermined level, for releasing the stored quantity of said given one yarn whereby the tension in said given one yarn does not exceed said predetermined level, said sensing means comprising a like plurality of sensors, each of said sensors comprising a finger associated with a corresponding one of said yarns for engaging and normally holding its said associated yarn in a running bight constituting said stored quantity, each said finger being pivotally mounted on a common axis for movement between:

(1) a normal position wherein said finger restrains its said associated yarn against the normal running tension of said associated yarn, and

(2) a release position wherein said finger releases said bight upon occurrence of said predetermined level of tension in its said associated yarn; and

(b) adjusting means for selectively adjusting said sensing means whereby said predetermined level of tension is simultaneously adjusted for all of said yarns, said adjusting means comprising:

(1) a support member extending substantially parallel to and at a given distance from said axis, said member being adjacent to each of said sensors,

(2) means providing a magnetic coupling between said support member and each of said sensors when said fingers are in said normal position, the strength of said magnetic coupling being substantially the same for each of said sensors and being selected to maintain said fingers in said normal position against said normal running tension and to release any of said fingers upon occurrence of said predetermined level of tension in its said associated yarn, and

(3) adjusting means for selectively adjusting said given distance and for aligning said support member substantially parallel to said axis, whereby said predetermined level of tension is simultaneously adjusted for all of said sensors.

4,903,915

TAPE CASSETTE HAVING MEANS FOR LOCKING REELS THEREOF

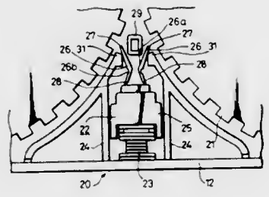
Yuji Iwahashi, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 6, 1989, Ser. No. 306,667

Claims priority, application Japan, Mar. 31, 1988, 63-80131

Int. Cl.[4] G03B *11/04;* **G11B** *15/32*

U.S. Cl. 242—198 **8 Claims**



1. A tape reel lock and release device for a pair of tape reels rotatably provided within a cassette half of a cassette housing, wherein a tape is wound around the tape reels, comprising:

(a) gear portions formed around outer peripheries of the tape reels;

(b) a tape reel locking member having a slider portion and a pair of engaging members coupled to said slider portion for engagement with said gear portions of the tape reels, said engaging members having base end portions adjacent to said slider portion, tips for engaging said gear portions, curved portions between said base end portions and said tips so that said tips extend toward said gear portions, and hinge portions connecting the base end portions to said slider portion so as to facilitate displacement of said engaging members toward one another;

(c) means for spring-biasing said slider portion between the pair of tape reels in a direction in which said tape reel locking member engages said gear portions of said pair of tape reels; and

(d) an operation member extending from the cassette half to between said engaging members and, when said slider portion is moved in the direction in which the tape reel locking member engages the gear portions of the tape reels, said operation member cams said engaging members into engagement with said gear portions, whereby the tape reels are prevented from being rotated inadvertently.

4,903,916

CASSETTE REEL SPRING HAVING ROLLED EDGES

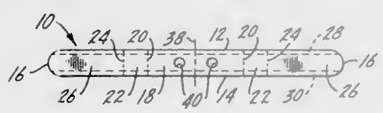
William M. Carroll, Milwaukee, Wis., assignor to Koller Manufacturing Corporation, Milwaukee, Wis.

Filed Jan. 25, 1989, Ser. No. 301,389

Int. Cl.[4] G11B *23/087*

U.S. Cl. 242—199 **14 Claims**

1. A reel spring for a magnetic tape cassette comprising an elongated strip of resilient material having first and second side edges extending substantially throughout its length, and at least one longitudinal stiffener of resilient material attached to the strip, the stiffener having a width less than that of the strip and being in contact substantially throughout its width with the strip to provide at least two layers of resilient material at the point of its attachment.



4,903,917

PROJECTILE WITH ROTATABLE STABILIZING DEVICE

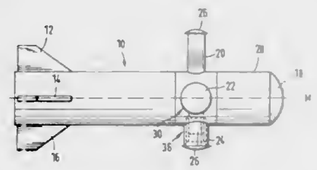
Helmut Peller, Düsseldorf; Hartmut Schilling, Kaarst; Hanjoerg Becker, and Gerhard Glotz, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,460

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628129

Int. Cl.[4] F42B *15/053*

U.S. Cl. 244—3.21 **10 Claims**



1. A projectile having a predetermined caliber, comprising a stabilizing device including a plurality of cylinders each having a longitudinal axis; said cylinders being arranged equidistantly about the periphery of the projectile; the respective longitudinal axes of the cylinders lying in a common radial plane of the projectile; each cylinder having a different diameter, a different surface profile, a different length and a different exterior shape; said cylinders having a withdrawn position in which they are situated within the confines of the projectile caliber and a deployed position in which they project beyond the projectile caliber; said cylinders being movable from one of said positions into the other.

4,903,918

RAKED CIRCULAR-CONE AEROBRAKING ORBITAL TRANSFER VEHICLE

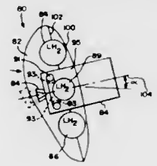
Chul Park, Saratoga, and Carol B. Davies, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 54,988, May 28, 1987, abandoned. This application May 4, 1989, Ser. No. 348,081

Int. Cl.[4] B64G *1/24*

U.S. Cl. 244—158 R **15 Claims**

1. An aerobraking orbital transfer vehicle, which comprises an aerobraking shield having a raked-off circular-cone configuration with a forwardly extending nose, an elliptically shaped base having a major diameter in a pitch direction and a minor diameter in a yaw direction, and a frustrum geometry which, in combination with said major diameter of said elliptically shaped base in a pitch direction, provides a base flow clearance angle greater than the base flow turning angle of said shield to avoid reattachment of the air stream to the vehicle and resultant undesirable heat transfer from the air stream to the vehicle.



4,903,919

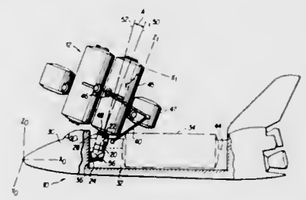
APPARATUS AND METHOD FOR DOCKING SPACECRAFT

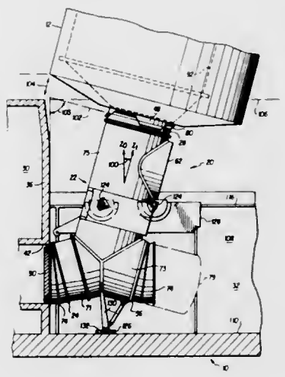
Caldwell C. Johnson, and Maxime A. Faget, both of Dickinson, Tex., assignors to Space Industries, Inc., Webster, Tex.

Filed Nov. 27, 1987, Ser. No. 125,993

Int. Cl.[4] B64G *1/64*

U.S. Cl. 244—161 **18 Claims**





1. A spacecraft comprising a crew cabin, a payload bay, a bulkhead between said crew cabin and said payload bay, a port in said bulkhead for allowing crew passage between said crew cabin and said payload bay, at least one payload bay door communicating between said payload bay and the exterior of the spacecraft, and a docking apparatus carried by said spacecraft for joining the spacecraft to a second spacecraft, said docking apparatus comprising:

a rigid pressure vessel having first and second ports and an

interior passage extending therebetween, said first port communicating with said bulkhead port; and

a docking interface associated with said second port for coupling the docking apparatus to the second spacecraft; said first port and said docking interface being positioned on said pressure vessel in a manner such that the respective planes thereof form an oblique included angle with respect to each other, such that said second spacecraft assumes a canted position with respect to the first spacecraft upon coupling with the docking interface so that a portion of the second spacecraft extends into the open payload bay of the first spacecraft, and the dimensions of the docking apparatus being such that the docking apparatus is completely enclosed within the payload bay of the first spacecraft when the payload bay door is closed.

4,903,920

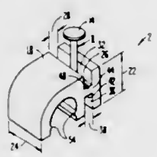
CABLE CLIP

James A. Merritt, P.O. Box 206, Pleasanton, Calif. 94566

Filed Apr. 22, 1988, Ser. No. 185,017

Int. Cl.[4] F16L *3/04*

U.S. Cl. 248—71 **9 Claims**



9. A clip assembly for retaining a cable against a mounting surface comprising:

an elongate fastener, having a length and a transverse dimension;

a body having an upper surface, a lower surface and a body length;

said upper surface defining a first slot having a first slot width, a first slot depth and a first slot bottom;

said lower surface defining a cable retaining opening sized for receipt of the cable; and

said lower surface further defining a second slot having a second slot width, a second slot depth and a second slot bottom, said first and second slot bottoms defining a slot separation wall therebetween, said slot separation wall having a thickness about 75% to 150% of the transverse dimension of the elongate fastener and being adapted for being penetrated by the elongate fastener.

4,903,921

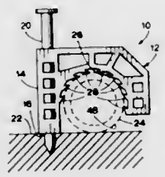
PIPE HOLDERS

Duane D. Logsdon, Fullerton, Calif., assignor to Logsdon Foundation, Stanton, Calif.

Filed Dec. 28, 1988, Ser. No. 290,985

Int. Cl.[4] F16L *3/08*

U.S. Cl. 248—74.5 **12 Claims**



1. A pipe holder having a body portion, means on said body portion for attaching said body portion to a support member, an at least partially cylindrical surface of larger diameter than a pipe to be held by said holder located on said body portion, and a plurality of fins for engaging a pipe located on said cylindrical surface so as to extend therefrom in which the improvement comprises:

said fins being identical fins formed of a self-supporting, resilient, flexible material,

each of said fins being of a substantially triangular cross-sectional configuration and having a base and two sides of unequal length, said sides being joined to one another by an apex and being joined to said base by corners, the base of each of said fins extending along and being joined with said cylindrical surface between said corners,

when each of said fins is viewed in cross-section the angle between a line connecting the apex of the fin to the midpoint of a line extending between the corners of the fin and the latter line being such that as a pipe is held within said holder, the longer of said sides abuts said pipe such that the apex will not contact the periphery of the pipe so as to tend to be directed towards the periphery so as to tend to pierce it,

the length of said line connecting said apex and the midpoint of said line extending between said corners being sufficiently long and the length of said line extending between said corners being sufficiently short so that said fin will be bent from its normal configuration between its apex and its base as it is used to hold a pipe, said fins being sufficiently resilient so that a pipe held by said fins is resiliently supported by said fins.

4,903,922

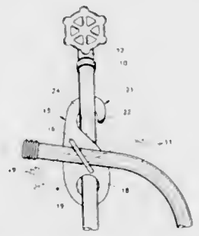
HOSE HOLDING FIXTURE

John H. Harris, III, 4518 Sehoy Cir., Pensacola, Fla. 32504

Filed Oct. 31, 1988, Ser. No. 264,372

Int. Cl.[4] A62C *23/04*

U.S. Cl. 248—75 **14 Claims**



1. A combination comprising a faucet, a hose having two ends with one end connected to said faucet, a hose holding fixture comprising a flat planar element in its unstressed state and providing a mounting portion having spaced connecting portions within the plane of said element both of which at least partially enclose said hose and mount said fixture on said hose, at least one of said connecting portions having a hook shape releasably connected on said hose intermediate its ends, said connecting portions operating to deflect said hose between said connecting portions holding said fixture against movement relative to said hose, said fixture providing a support portion extending laterally from said plane releasably supporting the other of said ends of said hose.

4,903,923

COMPONENT KNOCK DOWN DISPLAY RACK

Kenneth A. Krentel, 716 N. Broad St., Philadelphia, Pa. 19130

Filed Aug. 30, 1988, Ser. No. 238,303

Int. Cl.[4] A47G *23/02*

U.S. Cl. 248--153 **6 Claims**



1. A display rack to provide a container support for merchanise which comprises:

(a) a container;

(b) a top section adapted to receive said container;

(c) a bottom section adapted to support said top section including first means to releaseably interconnect with said top section at a plurality of connection points and to contact said top section at a plurality of distinct contact points and further adapted to fit within said top section in a nested manner for shipment; and,

(d) said top section having a bottom portion with second means to interconnect with and contact said bottom section and adapted to receive said container.

4,903,924

COUPLING FOR THE DETACHABLE CONNECTING OF TWO COAXIAL PIPES AND CARRYING COLUMN FOR A ROOM DIVIDER CONTAINING THE COUPLING

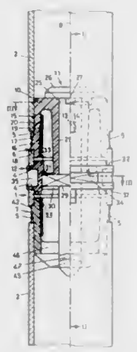
Wendolin Rütsche, Rüti, and Rudolf Menzi, Wagen, both of Switzerland, assignors to Embru-Werke, Mantel & Cie., Ruti, Switzerland

Filed Jan. 27, 1989, Ser. No. 302,798

Claims priority, application Switzerland, Jan. 28, 1988, 291/88

Int. Cl.[4] F16B *7/20;* **E04B** *2/78*

U.S. Cl. 248--159 **9 Claims**



1. Coupling for the detachable connecting of two coaxial pipes (2, 3) of the same cross section, which both have adjacent to their face surfaces (4) two diametrically oppositely lying breakthroughs (5), characterized in that the coupling (1) consists of a first coupling part (6) intended to be inserted into the end of the one pipe (2) and a second coupling part (7) intended to be inserted into the end of the other pipe (3), that the first coupling part (6) comprises a bushing (10) with at least two radially resilient rest lugs (16) for snapping into the breakthroughs (5), a coupling bolt (11) turnable about the coupling axis (8), extending along this axis (8), as well as a coaxial ring (12) jointed secure against turning with the coupling bolt (11) with a radial support shoulder (32) on both sides for abutting against the two face surfaces (4) of the pipes, a centering protrusion (33) on both sides insertable in the respective pipe end and with wrench engagement elements (34) between the support shoulders (32), that the coupling bolt (11) abuts with a head (26) turnably on the bushing (10) and carries at the opposite end a crosspiece (45) the width of which is less than the width of an axial oblong hole (46) in the second coupling part (7), which presents further radially resilient rest lugs (42) for snapping into the breakthroughs (5) of the other pipe (3), in which system after sliding of the crosspiece (45) through the oblong hole (46) and after the turning of the coupling bolt (11) the crosspiece (45) grips behind the second coupling part (7).

4,903,925

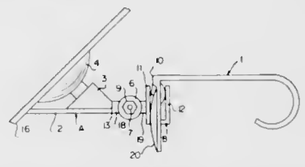
EYEGLASS HOLDER

Steve S. Park, 70 Woodcrest Dr., Syosset, N.Y. 11791

Filed Oct. 5, 1988, Ser. No. 253,493

Int. Cl.[4] B60R *11/00*

U.S. Cl. 248—206.1 **3 Claims**



1. A removable holder to be mounted on a surface for supporting a pair of eyeglasses, said eyeglasses having a pair of rims for containing the lenses and connected together by a nose piece and a bow extending from each of said rims, said holder comprising:

a. base means comprising an extended plate;

b. a suction cup means for supporting said suction cup on one side of said plate directed toward one end of and at an angle to said plate, wherein said means for supporting said suction cup comprises a triangular shaped member having one surface thereof on one side of said base, a second surface having means attached to said suction cup, and one corner of said triangular shaped member adjacent said base attached to said support means thereby providing a rigid structure;

c. support means for said pair of eyeglasses pivotally attached to the end of said plate opposite to said suction cup; and

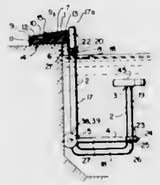
d. said support means comprising a pair of spaced, parallel rectangular elements joined by a curved center element means having a sine wave shape with the top of said wave directed to the same side of said plate as said suction cup, said suction cup being mounted on a surface having a vertical component, said one end of said plate making contact with said surface below said suction cup to bolster said holder and prevent rattling of said eyeglasses.

4,903,926

DETACHABLE IMMERSIBLE SUPPORT FOR SUPPORTING ARTICLES IN A SWIMMING POOL

Daniel G. McNarry, and Mark A. Baker, both of Gloucester, Canada, assignors to Poolside Peripherals Ltd., Gloucester, Canada

Filed Nov. 28, 1988, Ser. No. 277,010
Int. Cl.[4] A47C *31/00*
U.S. Cl. 248—214 4 Claims



1. A detachable immersible support for supporting articles in a swimming pool comprising a mooring bracket, a U-shaped frame member, an article support, and a frame member spacer, wherein

the mooring bracket is comprised of two substantially horizontal oppositely disposed ends of a vertical central portion,

one end is adapted to be fastened to the coping on the pool or the ground beside the coping,

the vertical portion is adapted to be spaced a short distance inside the wall of the pool,

the second horizontal end extends outwardly from the vertical member,

the U-shaped frame member is comprised of a down leg, a horizontal leg and an up leg,

the upper end of the down leg is fastened to the mooring bracket and is adapted to be suspended substantially parallel to and spaced from the pool wall,

the horizontal leg of the U-shaped frame member is arranged at substantially 90 degrees relative to the down leg,

the up leg of the U-shaped frame member is arranged at substantially 90 degrees relative to the horizontal leg and substantially parallel to the down leg,

the top of the up leg contains a support means to receive and support an article,

the frame member spacer is comprised of a member disposed between the lower portion of the down leg of the U-shaped frame member and the pool wall at right angles to the down leg of the U-shaped frame member.

4,903,927

ELECTRICAL EQUIPMENT CLUSTER MOUNT

Marion R. Farmer, Shelby, Tenn., assignor to Aluma-Form, Inc., Memphis, Tenn.

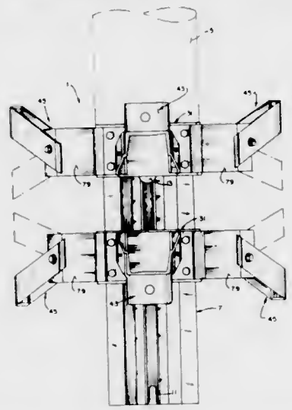
Continuation-in-part of Ser. No. 251,125, Sep. 29, 1988. This application Aug. 14, 1989, Ser. No. 393,124
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—219.4 13 Claims

1. An electrical equipment cluster mount for use upon a utility pole or the like comprising:

an elongated bearing plate adapted to be mounted to the utility pole;

an elongated and polygonally configured structural member having a plurality of elongated interconnected sides and open ends, said structural member being attached to said elongated bearing plate along one side thereof; and

a plurality of individual bracket means mounted to said structural member in predetermined spaced relationship to one another along the elongated sides thereof and also being structurally interlocked with at least one other adjacent bracket means on said structural member for



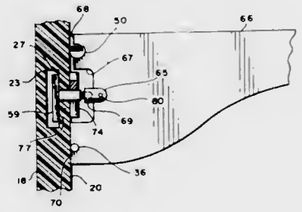
mounting electrical equipment in a predetermined clustered array relative to said utility pole.

4,903,928

BRACKET ARRANGEMENT

Irving W. Shell, Pompano Beach, Fla., assignor to Friedkin Industries, Inc., Boca Raton, Fla.

Continuation of Ser. No. 19,646, Feb. 27, 1987, abandoned. This application Jun. 23, 1988, Ser. No. 212,162
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—225.1 10 Claims



1. A bracket and slotted wall system comprising a wall having at least one elongated slot

extending along said wall and in any direction therealong, said slot comprising an entrance opening and an inside opening which is wider than said entrance opening, and at least one flange member over said inside opening extending from a side thereof to said entrance opening

a bracket attached to said at least one elongated slot, against said wall and extending away from said wall, said bracket having a back portion comprising a flat plate having a first axis along a plane of said flat plate and a second axis perpendicular to the plane of said flat plate

positioning means attached to said back portion of said bracket and fitting within said inside opening of said slot for positioning said bracket such that said flat plate is positioned vertically and said second axis is positioned parallel to said wall, said positioning means comprising a bar member, and means for attaching said bar member to said back portion of said bracket for allowing said bar member to rotate relative to said bracket, whereby the longitudinal axis of said bar member may be positioned transverse to the longitudinal axis of said slot to which the bracket is to be attached, and

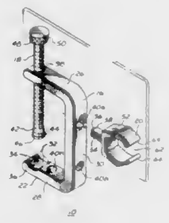
cam means attached to said back portion of the bracket for fixedly securing said bracket in said position against said wall by clamping said flange member of the slot between said cam, a back edge of said bracket and said positioning means.

4,903,929

PORTABLE APPARATUS FOR HOLDING OBJECTS

Ronald W. Hoffman, 10431 W. Catalina, Phoenix, Ariz. 85039

Filed Feb. 13, 1989, Ser. No. 309,110
Int. Cl.[4] B25B *1/00*
U.S. Cl. 248—229 12 Claims



1. A portable holding apparatus for supporting a pole-shaped object, said apparatus comprising:

(a) a first member having a gripping surface;

(b) a second member having a gripping surface, said second member being movably coupled to said first member so that a distance between said first member gripping surface and said second member gripping surface varies to clamp a fixture between said first and second member gripping surfaces; and

(c) retaining means including

(i) an open, resilient curved member extending away from said first member for receiving and gripping said pole-shaped object, said member having opposing sides for surrounding said object, said curved member being compressible from an expanded position in which said sides are sufficiently far apart to allow installation and removal of said pole-shaped object to a quiescent position in which said sides are sufficiently close together to grippingly confine said pole-shaped object, and

(ii) snap-in connection means comprising a retainer opening formed in said first member, said retainer opening being surrounded by an opening wall; and a plug member coupled to said curved member, said plug member being dimensioned to conform with said retainer opening and being formed from a deformable, resilient material which compresses away from a quiescent shape during installation into said retainer opening and which expands after installation to substantially fill said retainer opening, thereby creating sufficient frictional clamping forces between said plug and said wall to rotatably retain said plug in said retainer opening.

4,903,930

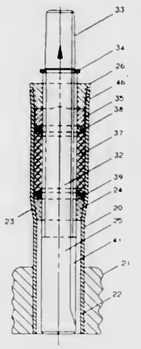
CHAIR HEIGHT ADJUSTMENT MECHANISM

James M. Jann, 1650 Glen Forest, Ada, Mich. 49301

Filed Nov. 4, 1988, Ser. No. 267,386
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—406.2 22 Claims

1. A height-adjustment mechanism for a chair, said mechanism including a housing, a threaded spindle, radial bearing means positioning said spindle on a normally vertical axis in said housing, a nut in threaded engagement with said spindle, a compression spring normally below said nut and surrounding said spindle, thrust bearing means in said housing below and supporting said spring, and clutch means adapted to rotatively fix said nut with respect to said housing under the action of said spring, and to release said nut for rotation with said spindle in response to downward movement of said spindle, wherein the improvement comprises:

an upper bearing constituting one of said radial bearing means, said upper bearing being secured above the nut to



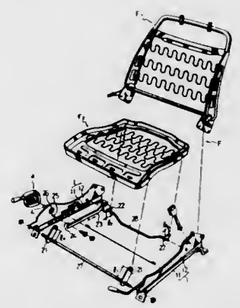
the upper extremity of said housing, and putting closely over said threaded spindle such that said spindle has freedom of axial and rotational movement but is restrained by said upper bearing from lateral movement, said clutch means being provided by axial interengagement of said nut and a member fixed with respect to said housing above said nut.

4,903,931

LIFTER FOR AUTOMOTIVE SEAT

Mitsuo Shimazaki, Akishima, Japan, assignor to Tachi-S Company, Ltd., Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,715
Claims priority, application Japan, Jun. 30, 1988, 63-87020[U]; Jun. 30, 1988, 63-87021[U]
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—421 7 Claims



1. A lifter for an automotive seat, in which the seat includes a seat frame and slide rail device, comprising:

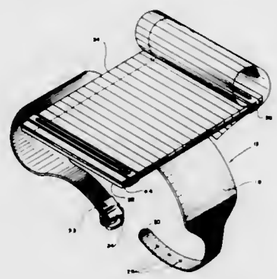
a drive means disposed between said seat frame and slide rail, said drive means including a link means;

a drive shaft adapted to impart a drive force to said drive means;

a housing equipped with an operation lever, said housing being rotatably provided on said drive shaft;

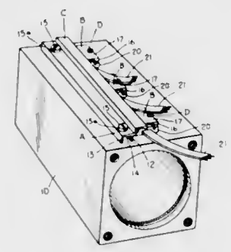
a gear provided in said housing and fixedly connected via a non-reversible brake device to said drive shaft;
a first pawl member rotatably provided in said housing, said first pawl member being disposed such as to be engageable with one side of said gear, to thereby permit said gear to be rotated in a first direction;
a second pawl member rotatably provided in said housing, said second pawl member being disposed such as to be engageable with the other side of said gear, to thereby permit said gear to be rotated in a second direction opposite to said first direction;
a switch-over cam provided in said housing, said switch-over cam being adapted to bring either of said first and second pawl member into engagement with said gear,
whereby rotation of said operation lever causes said drive shaft to rotate in either of said first and second directions and thus impart said drive force therefrom to said drive means so as to adjustably raise or lower said seat.

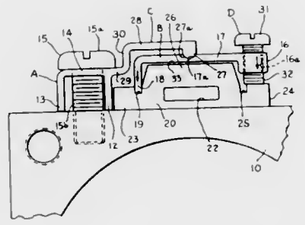
4,903,932
CLIP BOARD
Isaac Stewart, Jr., 1512 Bonvillain St., Houma, La. 70360
Filed Apr. 11, 1988, Ser. No. 180,123
Int. Cl.[4] A47B *17/00*
U.S. Cl. 248—444 **10 Claims**



1. A combination consisting essentially of a clip board and a note pad for positioning on the clip board, said note pad having substantially equal width with said clip board for holding the note pad during writing, comprising:
a writing tablet means having a front surface for positioning said note pad thereon and a rear surface, a top portion and a bottom portion wherein said note pad has a plurality of sheets of paper and is substantially the same width as said clip board;
means for securing the note pad on the front surface of the clip board, wherein said means for securing note pad comprises a continuous stretchable band wrapped about the front and rear surfaces of the writing tablet means, wherein said stretchable band secures the sheets of paper folded over the top of the clip board on the rear surface of the writing tablet means;
an attachment means for detachably securing the writing tablet menas to a thigh of a user; and
means for selectively positioning the writing tablet means in relation to the attachment means and locking the writing tablet means in a selected position.

4,903,933
CLAMPING APPARATUS FOR ADJUSTABLY POSITIONING SWITCHES
Lawrence F. Yuda, P.O. Box 176, Westminster, S.C. 29693
Filed Jul. 27, 1988, Ser. No. 224,677
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—500 **7 Claims**

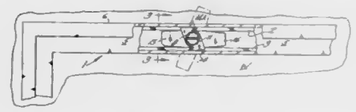




1. Apparatus consisting of longitudinally adjustable switches, means for positioning
said switches upon a base member, and said base member, comprising:
an elongated longitudinally extending rail with which said switches are aligned positionable in fixed relation upon said base member;
a locking bracket extending transversely over and engaging respective switches adjacent one side thereof adjacent said rail;
a transversely extending rocker arm fixed upon said rail for extending over respective locking brackets for exerting a force against an intermediate portion of said locking brackets; and
means for bearing against said switches adjacent an opposite side of said switches remote from said rail urging a free end of said locking bracket away from said switch and, thereby, urging said intermediate portion of locking bracket into engagement with said rocker arm;
whereby said locking brackets clamp said one side of said switches against said base member and said means for bearing against said switches clamps said opposite side of said switches against said base member.

4,903,934
PICTURE FRAME FASTENING MEANS
Gregory E. Fremstad, 84554 Springfield Creswell Hwy., Pleasant Hill, Oreg. 97455
Filed Apr. 15, 1988, Ser. No. 182,220
Int. Cl.[4] A47G *1/16*
U.S. Cl. 248—551 **3 Claims**

1. Picture frame installation and retention means for removably securing frames of channel section having edgewise opposed flanges to a wall surface in a concealed manner, said means comprising,
an elongated multisided base including an appendage having an edge for momentary engagement with a tool for rotation of the base,
screw means for rotatably attaching said base to a wall, and
said base having an aperture through which said screw means extends for rotatably mounting of the base on the screw means, said base including a locking member having a pair of opposite sides shorter than a remaining pair of

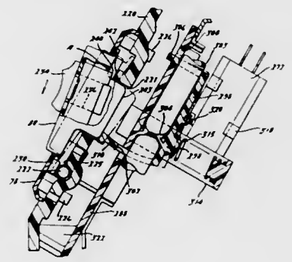


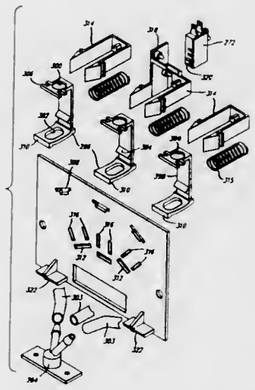
opposite sides, said remaining pair of opposite sides having recesses therein, said locking member having a first dimension permitting base entry into the area between said opposed flanges for frame unlocking and a second dimension of greater magnitude than said first dimension for overlying said opposed flanges of the frame to lock the frame to prevent horizontal movement of the frame away from wall, projections of a flexible nature defined by said recesses for yieldable wiping engagement with the frame interior to inhibit base rotation.

4,903,935
BOTTLED WATER COOLER WITH IMPROVED VALVE CONSTRUCTION
Ronald J. Mrugala, Rockford; Doyle Raymer, Davis; Dipak J. Negandhi, Freeport, all of Ill., and Robert L. Latzko, Wauwatosa, Wis., assignors to King-Seeley Thermos Company, Prospect Heights, Ill.
Filed Mar. 31, 1988, Ser. No. 175,925
Int. Cl.[4] F16K *7/06*
U.S. Cl. 251—9 **12 Claims**

1. A valve construction for fluid control systems comprising:
a valve plate defining a plane and having a first portion defining a first valve seat area extending beyond and on a first side of said plane;
a lever arm carried on said valve plate for limited rotational movement about a fulcrum axis;
said lever arm having an actuation portion extending beyond said plane and having a second valve seat area in general registration with said first valve seat area;
a fluid conducting resiliently deformable tube carried between said lever arm and said valve plate;
said lever arm being rotatable between a first position relative to said valve plate in which said tube is pinched between and occluded by the coaction of said first and second valve seat areas, and a second position relative to said valve plate in which said tube is not pinched between and occluded by the coaction of said first and second valve seat areas;
wherein said plate includes first and second slots and wherein said lever arm includes a first mounting tab portion disposed in said first slot, said first slot and said first mounting tab portion defining said fulcrum axis and wherein said actuation portion extends into said second slot;
wherein said first mounting tab portion has a given external dimension and wherein said first slot includes an enlarged portion of internal dimension sufficient to permit said first mounting tab portion to pass through said first slot; and

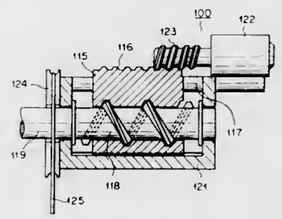
wherein said first mounting tab portion and first slot define means for retaining said first mounting tab portion within





said first slot whereby removal of said first mounting tab portion from said first slot is inhibited.

4,903,936
THROTTLE VALVE ACTUATOR INCLUDING SEPARATE VALVE DRIVING DEVICES
Yasuya Kajiwara, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 22, 1988, Ser. No. 247,550
Claims priority, application Japan, Sep. 22, 1987, 62-144597[U]; Oct. 22, 1987, 62-268452; Dec. 4, 1987, 62-308197
Int. Cl.[4] F02D *9/10, 11/10;* **F16H** *37/14*
U.S. Cl. 251—14 **5 Claims**



1. A throttle valve actuator comprising:
accelerator pedal means;

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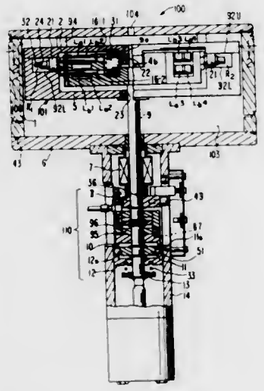
air pressure type drive means adapted to be controlled by the accelerator pedal means, for sliding a drive rod thereof;
sliding/rotating movement converting means connected to said drive rod and a universal joint, for converting sliding force of said drive rod into first rotation force;
output shaft means connected to said sliding/rotating movement converting means, for transporting said first rotation force to throttle valve means;
housing means for rotatably supporting said output shaft means; and,
motor means for rotating said throttle valve means via said housing means and output shaft means by second rotation force, whereby said throttle valve means is driven by both said first and second rotation force, and said second rotation force exerted by said motor means does not give any force to said accelerator pedal means via said sliding-/rotating movement converting means universal joint, and air pressure type drive means.

4,903,937

ISOLATION VALVE FOR VACUUM AND NON-VACUUM APPLICATION

Antoni F. Jakubiec, San Mateo, and Thomas M. Daley, San Jose, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 101,060, Sep. 24, 1987, abandoned. This application Mar. 21, 1989, Ser. No. 326,398
Int. Cl.[4] F16K *31/124*
U.S. Cl. 251—26 **18 Claims**



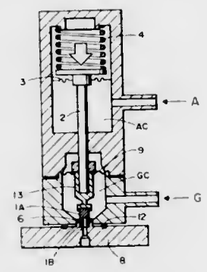
1. A valve comprising:
a housing having a first opening therein;
a first member for sealing said first opening;
a shaft;
means for linking said first member to said shaft comprising a pin-mounted link between said first member and said shaft;
means for guiding said first member, said means for guiding being carried by said shaft;
resilient means mounted between said means for guiding and said shaft for exerting a force biasing said means for guiding away from said shaft;
means for driving said shaft along its central axis, said means for driving including means for selecting a force level from a plurality of force levels for driving said shaft; and
means for stopping movement of said means for guiding; said means for driving being capable of driving said shaft from a first position to a second position wherein said means for stopping stops movement of said means for guiding and from said second position to a third position, said means for guiding being stationary relative to said housing as said shaft is driven from said second position to said third position,
said resilient means for exerting a force holding said means for guiding relative to said shaft so that said link and said first member are in a retracted position during movement of said shaft from said first position to said second position, said shaft moving relative to said means for guiding during movement of said shaft from said second position to said third position so that said link and said first member are moved to an extended position wherein said first member seals said first opening, said means for guiding being configured so that motion of said first member is perpendicular to a flat surface of said housing containing said first opening as said first member seals said first opening.

4,903,938

MICRO FLOW CONTROL VALVE

Jun-ichi Nishizawa; Shinzo Kasai; Tetsuo Okada, all of Sendai, and Mitsuhiko Dohzono, Izumi, all of Japan, assignors to JGC Corp., Tokyo, Japan

Filed Apr. 11, 1988, Ser. No. 179,942
Claims priority, application Japan, Apr. 13, 1987, 62-90094; Apr. 13, 1987, 62-90095
Int. Cl.[4] F16K *1/36, 1/42*
U.S. Cl. 251—61.5 **7 Claims**



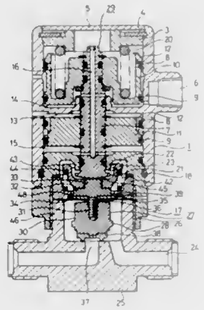
1. A micro flow control valve comprising a valve tip installed at one end of a stem, a cylindrical valve seat installed at the bottom of a gas chamber, the valve tip and the cylindrical valve seat each having a flat surface, the flat surfaces being arranged to provide a gap therebetween for a gas to flow into a passageway in the center of the valve seat;
a driving system for controlling the gap within a range of elastic deformation of the valve tip and valve seat and without permanent deformation thereof, the driving system including pressing means for pressing the valve against the valve seat, and reverse forcing means for providing a controllable force against the pressing of the valve against the valve seat and for opening the gap;
the reverse forcing means including a pneumatic system having an air chamber, a diaphragm connected to the stem, and means for controlling the air pressure within the air chamber and on the diaphragm; and
the pressing means and reverse force means being arranged so than an amount of opening of the gap can be controlled independently of the pressure of gas flowing through the gap.

4,903,939

PNEUMATICALLY-OPERATED VALVE

Ryozo Ariizumi; Masakuni Kaiouma; Toshikazu Aoki; Shoji Suda; Mitsunori Hoshi, all of Saitama, and Takashi Ejiri, Tokyo, all of Japan, assignors to Fujikura Rubber, Ltd., Tokyo, Japan

Division of Ser. No. 168,092, Mar. 14, 1988, Pat. No. 4,840,347. This application Apr. 24, 1989, Ser. No. 369,348
Int. Cl.[4] F16K *31/122*
U.S. Cl. 251—63.4 **15 Claims**



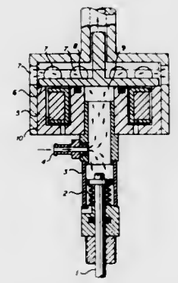
1. A pneumatically-controlled valve for controlling the flow of fluid through a fluid passageway by movement of said valve between a normally-closed position and an open position with respect to a valve seat defined upon said fluid passageway, comprising:
valve means, disposed within the vicinity of said fluid passageway and spring-biased toward said open position, for controlling said flow of fluid through said fluid passageway;
a cylinder having a longitudinal axis defined therein;
a closure means for closing one end of said cylinder;
a transversely extending annular partition plate disposed within said cylinder for dividing said cylinder into first and second piston chambers;
an axially disposed piston rod movable within said cylinder between first operative and second inoperative positions, and extending through said annular partition plate so as to have opposite end portions thereof disposed within said first and second piston chambers;
first piston means fixedly secured upon one end of said piston rod and disposed within said first piston chamber;
spring biasing means, disposed within said first piston chamber and interposed between said closure means and said first piston means, for normally biasing said piston rod to said first operative position;
second piston means fixedly secured upon a first axially central portion of said piston rod and disposed within said second piston chamber, a second end portion of said piston rod being disposed within the vicinity of said valve means for engaging said valve means and moving said valve means to said normally closed position when said piston rod is disposed at said first operative position by said spring-biasing means;
inlet port means defined within a sidewall portion of said cylinder for introducing pressurized fluid into said first piston chamber in order to move said piston rod from said first operative position to said second inoperative position;
axially extending fluid passageway means defined within said piston rod from a second axially central portion of said piston rod to a third axially central portion of said piston rod;
a first transversely extending fluid passageway means defined within said second axially central portion of said piston rod for providing fluidic communication between a first end portion of said axially extending fluid passageway means of said piston rod and said first piston chamber; and
a second transversely extending fluid passageway means defined within said third axially central portion of said piston rod for providing fluidic communication between a second end portion of said axially extending fluid passageway means of said piston rod and said second piston chamber.

4,903,940

DEVICE FOR POSITIONING AN ADJUSTING MEMBER

Bertold Grützmacher, Schriesheim, and Peter T. Blaser, Dielheim, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jan. 12, 1988, Ser. No. 142,992
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3700971
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.16 **3 Claims**



1. Device for positioning an adjusting member which includes a pneumatic adjusting cylinder and an electromagnetically actuated valve operating in a low-wattage range for controlling aertion and venting, respectively, of the adjusting cylinder, comprising an electromagnetic system as well as an armature plate serving simultaneously, as a valve member for venting the cylinder, said armature plate being displaceable from a position thereof at which it defines a maximum air gap with said electromagnetic system to a thereof at which it defines a zero air gap with said electromagnetic system in an excited condition of said electromagnetic system, said electromagnetic system in said excited condition thereof closing the cylinder against venting, and in said unexcited condition thereof opening the cylinder for venting.

4,903,941

PRESSURE EQUALIZING ROTARY JOINT

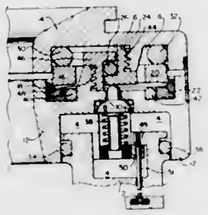
Rene T. Nuytten, North Vancouver, Canada, assignor to International Hard Suits, Inc., North Vancouver, Canada

Filed Aug. 30, 1988, Ser. No. 239,117
Claims priority, application Canada, Sep. 4, 1987, 546235
Int. Cl.[4] F16K *51/00*
U.S. Cl. 251—148 **13 Claims**

1. A rotary joint comprising:
(a) first annular member means adapted to be connected to the end of a first tube-like object;
(b) second annular member means adapted to be connected to the end of a second tube-like object;
(c) intermediate member means adapted to be positioned between the first annular member means and the second annular member means and being capable of moving independently of the first and second annular member means, said intermediate member means defining a first chamber between said intermediate member and the first

annular member and a second chamber between said intermediate member and said second annular member;

(d) first sealing means associated with the first annular member means and the intermediate member means and adapted to seal the first chamber from the interior and exterior of the joint;



(e) second sealing means associated with the second annular member means and the intermediate member means and adapted to seal the second chamber from the interior and exterior of the joint; and,

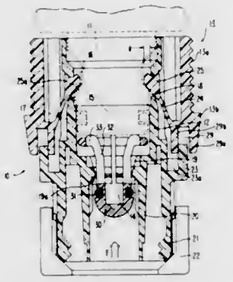
(f) resilient valve means adapted to enable pressure in the first chamber and pressure in the second chamber to equalize when the respective pressures are unequal.

4,903,942

COUPLING DEVICE WITH RETAINED ACTUATING MEMBERS

Maria Licciardello, Pordenone, and Alladino Borghese, Montereale Vallcelina, both of Italy, assignors to Uniflex Utiltime S.p.A., Pordenone, Italy

Filed May 3, 1989, Ser. No. 346,936
Claims priority, application Italy, May 4, 1988, 45723 A/88
Int. Cl.[4] F16L *37/28*
U.S. Cl. 251—149.1 **16 Claims**



1. A quick-release plug-in coupling device for the breakaway connection of hoses, particularly hoses for the distribution of fluids, said device comprising:

a female member to be connected to one hose and including a body, a valve seat internally of said body, and at least one opening through said body;

a male member to be connected to another hose and including a body sealingly fittable into said body of said female member, said male member body having formed therein at least one recess;

a valve member positioned within said female member for movement between a closed position, whereat said valve member seals against said valve seat, and an open position, whereat said valve member is spaced from said valve seat;

at least one actuating member positioned outwardly of said female member and having an integrally formed elastic member extending inwardly through said opening in said body of said female member, said elastic member having an inner end fittable into said recess in said body of said male member, said actuating member being selectively manually movable axially of said female member between a locking position, whereat said inner end of said elastic member fits into said recess to thereby retain said male member within said female member, and a release position, whereat said inner end of said elastic member is withdrawn from said recess to thereby enable said male member to be withdrawn from said female member; and

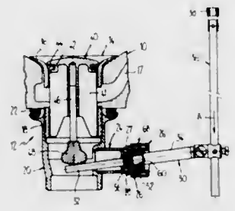
said actuating member including means for preventing said actuating member from being separated from said female member when said actuating member is in said release position and for preventing unintentional axial displacement of said actuating member relative to said female member when said actuating member is in said locking position.

4,903,943

LEAKPROOF BALL-AND-SOCKET JOINT ARRANGEMENT

Ferdinand Hochstrasser, Auenstein, Switzerland, assignor to KWC AG, Unterkulm, Switzerland

Filed Aug. 15, 1989, Ser. No. 393,984
Claims priority, application Switzerland, Sep. 1, 1988, 03266/88
Int. Cl.[4] F16K *31/44*
U.S. Cl. 251—235 **10 Claims**



1. An actuating pin mounting assembly for leakproof introduction of an actuating pin into the interior of a valve housing, the mounting comprising:

a tubular socket projecting laterally from a valve housing, a generally spherical part for engagement with an intermediate portion of an actuating pin, and a one piece holding element for holding the generally spherical part, the holding element comprising:

fastening means for fastening the holding element to the tubular socket, a spherical zone sealing surface formed in the holding element for sealing against an outside surface of the generally spherical part, and resilient pressing means extending from the sealing surface and integral thereto, said spherical part being received in the pressing means for pressing the spherical part against the sealing surface to achieve a sealed arrangement therebetween prior to the fastening means fastening the holding element to the tubular socket.

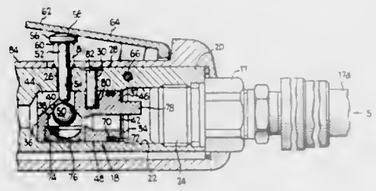
4,903,944

VALVE ASSEMBLY AND METHOD

James K. Butzen, Grayslake, Ill., and Kenneth C. Happ, Silver Lake, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jan. 31, 1989, Ser. No. 304,268
Int. Cl.[4] F16K *1/14, 31/60*
U.S. Cl. 251—240 **18 Claims**

1. A valve assembly for use with a fluid-driven tool comprising: an elongated conduit including a bore extending axially therethrough, said bore having a first portion of substantially constant first diameter and a second portion of a second diameter no less than said first diameter, said conduit including an inlet port for connection to the source and communicating with said second portion, said first and second portions and said inlet port being generally coaxial, said conduit including an opening extending radially therethrough; an elongated valve member extending axially in said first portion and having proximal and distal ends, said valve member having a chamber defining a seat generally aligned with said opening, an inlet passageway extending from said chamber to said proximal end and communicating with said inlet port upstream from said valve member, and an outlet passageway extending from said seat to said distal end and communicating with said first portion downstream from said valve member; a ball in said chamber and having a size to sealingly engage against said seat and being driven into sealing engagement against the seat by the fluid; a valve pin slidably received in said opening and having an inner end directed toward said seat and an outer end extending out of said conduit; means for moving said valve pin between an outer position with said inner end spaced from the ball, and an inner position with said inner end engaged adjacent said ball for a sufficient distance to move the ball away from said seat and permit passage of the fluid from the source through said inlet port and said inlet passageway into said chamber, and past said seat into said outlet passageway and said bore downstream from said valve member; and means for sealing said valve member to said conduit to prevent passage of fluid therebetween.

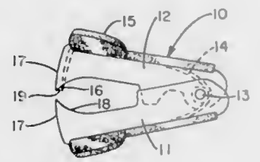


4,903,945

STAPLE REMOVER

Yun L. Wang, 424 Barrenwood Dr., Wadsworth, Ohio 44281

Filed Mar. 25, 1988, Ser. No. 173,267
Int. Cl.[4] B25C *11/02*
U.S. Cl. 254—28 **7 Claims**



1. A staple removing device comprising:

a pair of levers pivotally coupled at one end on an axis such that their other ends are capable of movement toward one another;

bias means acting on said levers for biasing said levers into an open position;

extraction means on said other end of said levers having engaging ends extending toward the other of said levers for engaging the underside of a staple embedded in a material to lift said staple away from said material;

an engaging means attached to one of said levers and located adjacent said extraction means extending substantially parallel to said extractions means but spaced therefrom for engaging the top side of a staple at about the center thereof simultaneously with engagement of said engaging ends of said extraction means with the underside of said staple;

said engaging means extends at least to a plane which includes said engaging ends of said extraction means and said pivotal axis of said levers;

wherein said engaging means will anchor said staple to said material at a middle portion thereof and the extraction means will uniformly withdraw the staple ends for removal.

4,903,946

LIFTING DEVICES FOR CONTAINERS

Crister Stark, Johannesberg, Axtavägen, S-596 00 Skänninge, Sweden

PCT No. PCT/SE87/00548, § 371 Date Jul. 29, 1988, § 102(e) Date Jul. 29, 1988, PCT Pub. No. WO88/04276, PCT Pub. Date Jun. 16, 1988
PCT Filed Nov. 20, 1987, Ser. No. 225,753
Claims priority, application Sweden, Dec. 1, 1986, 8605150
Int. Cl.[4] B66F *7/26*
U.S. Cl. 254—45 **9 Claims**



1. Arrangement in a lifting system for a container, including four lifting columns, each adapted for being removably connected to one of the four vertical corner edges of the container, each lifting column being telescopable with the aid of a power means, driven by a power source under the actuation of a control means with controls, said lifting columns being in pairs, respectively, included in two separate lifting aggregates placed at opposite sides of the container, and the power means for said pairs of columns being arranged and interconnected such that they achieve a simultaneous displacement of the two pairs of lifting columns of the/each lifting aggregate, the improvement wherein:

each lifting aggregate comprises a closed loop circulation circuit, including in order, a connecting piping (7;8) from the controls (20';20'') of the control means (19) to the first lifting column (10;12) of a pair of lifting columns, a first interconnection (14;16) from the first lifting column (10;12) to the second lifting column (11;13) of a lifting aggregate and a second interconnection (15;17) from said second lifting column (11;13) back to the control means (19), thereby defining a first closed loop (20''-7-10-14-11-15-20'') at one side of the container (1) completely separated from a second closed loop (20'-8-12-16-13-17-20') at the other side of the container for effecting synchronous and equal displacement of said lifting column pairs for each of said two separate lifting aggregates.

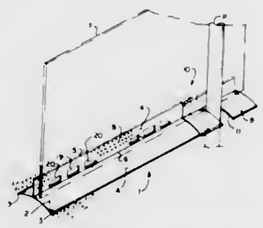
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4,903,947

FENCE OR OTHER STRUCTURE VEGETATION BARRIER

George D. Groves, Arnold, Mo., assignor to B & G Consultants, Inc., Arnold, Mo.

Filed Apr. 29, 1988, Ser. No. 188,449
Int. Cl.[4] E04H *17/06*
U.S. Cl. 256—32 22 Claims



1. A length of vegetation barrier for use under a fence and for eliminating the growth of grass, weeds, and the like, in the vicinity of the lower edge of such fencing, or other structures, and wherein a series of such lengths of barriers are longitudinally connected end-to-end to form a continuous vegetation barrier under such fencing, comprising, a base member provided for location under the lower edge of such fencing, and upon the ground, said base member having a width for extending laterally to at least one side of the fence to allow clearance for any lawn mower or other cutter to at least partially override thereon during lawn trimming, said base member having an upper surface therefor, an upstanding leg integrally formed and extending upwardly for the length of the base member, said upstanding leg extending upwardly for a distance to allow for its fixation to a fence, and interlocking means provided at least at one end of each length of barrier, for connection end-to-end with the next adjacent length of barrier, said interlocking means comprising there being an open ended slot provided proximate the location of connection of the upstanding leg with the base member for the barrier, and said slot extending into the barrier a fixed distance from one end thereof, said slot having a height approximating the thickness of the base member and provided for accommodating the insertion of the end of the next adjacent length of barrier for providing an interconnection of a series of lengths of vegetation barrier together, said interlocking ends of the adjacent lengths of barrier overlapping to provide continuity of coverage in the functioning of the installed barrier for overlying the vegetation throughout the length of the fence to which it attaches.

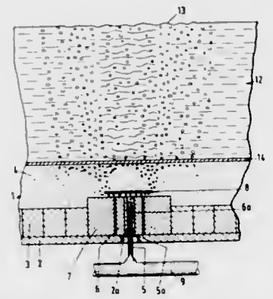
4,903,948

METALLURGICAL VESSEL

Josef Wolf, Moers-Schwafheim, and Fritz-Jürgen Strunck, Voerde, both of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,396
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742861
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—220 10 Claims

1. A metallurgical vessel for the treatment of metal melts having means for introducing stirring gases into the metal melt, the vessel having an outer sheet metal jacket, a refractory lining, a stirring device disposed in the furnace hearth or bottom, the furnace hearth or bottom comprising a permanent lining of refractory bricks and a wear lining of a refractoring rammed mass, wherein the stirring device is disposed in the



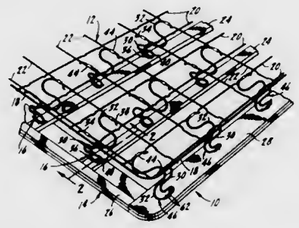
permanent lining, and a deflector place is disposed in the wear lining above the stirring device.

4,903,949

FOUNDATION UNIT HAVING COLLAPSIBLE SUPPORT MEMBERS

Martin Schulz, Jr., Brenham, Tex., assignor to Steadley Company, Carthage, Mo.

Filed May 8, 1989, Ser. No. 348,406
Int. Cl.[4] F16F *3/02*
U.S. Cl. 267—103 10 Claims



1. In a foundation unit having a flat top bearing structure composed of spaced grid wires, the foundation unit being of determined depth and generally rectangular in shape and having opposite longitudinal end edges and opposite lateral side edges, said foundation unit further having a bottom substructure and support means intermediate the top bearing structure and the bottom substructure for maintaining the determined depth, the improvement comprising

a. said support means comprises a plurality of spaced, parallel rows of support members extending substantially between the opposite lateral side edges of the top bearing structure, with a plurality of said rows of support members being located intermediate said end edges,

b. at least a portion of said rows of support members being composed at least in part of a plurality spring wire segments, each of said spring wire segments comprising a pair of generally flat support elements each lying in a plane, each support element having top and bottom attachment legs, the bottom attachment legs of each segment being located substantially adjacent one another and the top attachment legs of each segment being spaced from one another such that the planes of said elements form a generally V-shaped configuration, and

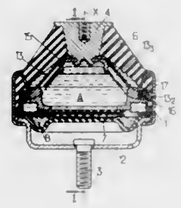
c. means hingedly securing said spring wire segments to said top bearing structure and said bottom substructure such that said V-shaped configuration is eliminated to permit collapse of the foundation unit about one of the support elements of each of said spring wire segments.

4,903,950

HYDRAULIC ANTIVIBRATORY SUPPORTS

Daniel Gregoire, Chateaudun, France, assignor to Hutchinson, France

Filed Oct. 21, 1988, Ser. No. 260,675
Claims priority, application France, Oct. 23, 1987, 87 14695
Int. Cl.[4] F16M *5/00, 13/00;* F16F *1/36*
U.S. Cl. 267—140.1 9 Claims



1. A hydraulic antivibratory device having a central axis and adapted to be placed between rigid elements, comprising a rigid base capable of being fixed with respect to one of the two rigid elements, a rigid annulus capable of being fixed with respect to the other rigid element, a resilient annular support wall sealingly connecting the base to the annulus and a flexible membrane connected sealingly to the annulus, the resilient annular support wall together with the base, the annulus and the flexible membrane forming a sealed case, the inside of the sealed case being divided, by a sealed dividing wall connected to the annulus between the annular wall and the membrane, into two chambers, namely a work chamber on the annular wall side of the dividing wall and a compensation chamber on the membrane side of the dividing wall, these two chambers permanently communicating with each other through a restricted passage, a liquid mass filling the two chambers as well as the restricted passage, and at least one flexible traction resistant cable section situated inside the work chamber and secured both to the rigid base and to the rigid annulus so that the relative movements of the rigid base with respect to the rigid annulus in their axial mutual moving away from each other is limited by said cable section being placed under traction, the cable section being in the form of a continuous closed loop, the axis of which merges with that of the hydraulic antivibratory device, the cable loop having two first segments resting on two guide channels fixed to the base and two second segments disposed in two guide slots associated with the annulus and extending to the periphery of the said dividing wall.

4,903,951

FLUID-FILLED VIBROISOLATING DEVICE

Yasuo Miyamoto, and Keiichi Uchiyama, both of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,443
Claims priority, application Japan, May 12, 1987, 62-115489; Jun. 19, 1987, 62-152894; Mar. 3, 1988, 62-48627
Int. Cl.[4] F16F *9/08*
U.S. Cl. 267—140.1 17 Claims

1. A fluid-filled vibroisolating device comprising:

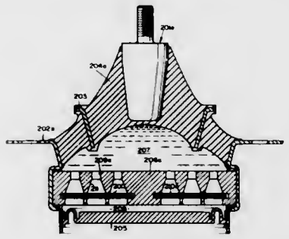
a joint member adapted to be joined to a vibrating body;

a support member adapted to be supported on a supporting body and defining an expandable and contractable auxiliary fluid chamber filled with a fluid;

An elastomeric member interconnecting said joint and support members and disposed in a vibrating, direction in which the vibrating body vibrates, said elastomeric member, said joint member, and said support member jointly defining an expandable and contractable main fluid chamber filled with fluid.

a partition mounted in said support member and separation said main and auxiliary fluid chambers from each other;

said partition having a storage chamber defined therein and held in communication with said main and auxiliary fluid chambers through a plurality of first orifices opening into said main fluid chamber and a plurality of second orifices opening into said auxiliary fluid chamber in coaxial relation to the first orifices as pairs; and



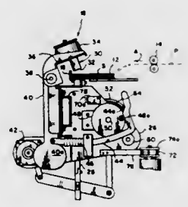
flow regulating means comprising a movable plate movably disposed in said storage chamber and movable at least axially of said first and second orifices dependent on the difference between fluid pressures in said main and auxiliary fluid chambers, said first and second orifices having openings opening toward said movable plate, said openings of at least one of said first and second orifices having tapered portions flaring toward said movable plate.

4,903,952

FINISHER APPARATUS

Steven M. Russel, Pittsford; John T. Bricklemyer, Honeoye Falls, and Robert H. Shea, Victor, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1988, Ser. No. 237,352
Int. Cl.[4] B42B *1/02*
U.S. Cl. 270—53 21 Claims



1. A finishing apparatus adapted to receive a plurality of sheets, and bind such sheets into a completed set, said apparatus comprising:

means for moving sheets seriatem along a path, and compiling such sheets in a stack;

a frame including a channel member located substantially parallel to an edge of a compiled stack of sheets;

a binding unit including a stapler having a body member slidably mounted on said channel for movement relative to such sheet path in juxtaposition to the edge of such compiled stack of sheets, a selectively actuated stapler drive head supported by said stapler body member, a selectively actuated clincher assembly supported by said stapler body member, and means for actuating said drive head to initiate formation of a staple and for actuating said

clincher assembly to locate said clincher assembly in engagement with a compiled stack of sheets opposite said drive head and complete staple formation initiated by said drive head; and

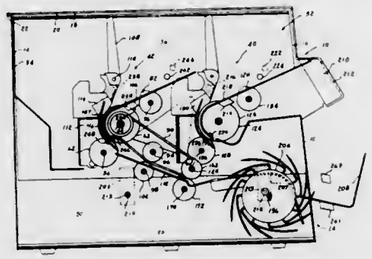
drive means for controlling movement of said binding unit whereby said binding unit can effect binding of a compiled stack of sheets at any of a plurality of locations along said edge.

4,903,953

SIMPLIFIED CURRENCY DISPENSER

Theodore Winkler, Levittown, Pa.; Peter L. Helgeson, Laurelton, N.J.; William Sherman, III, Medford, N.J., and Thomas B. Snow, Palmyra, N.J., assignors to Brandt, Inc., Bensalem, Pa.

Filed Apr. 20, 1988, Ser. No. 183,978
Int. Cl.[4] B65H 5/06
U.S. Cl. 271—4 **14 Claims**



12. Apparatus for dispensing a predetermined mix of bills of higher and lower denominations including in combination, means for holding a first stack of bills of said higher denomination, means for holding a second stack of bills of said lower denomination, first means adapted to be activated to advance bills from the bottom of said first supply toward a first location below the bottom of said first stack, second means adapted to be actuated to advance bills from the bottom of said second supply toward a second location below the bottom of said second stack, a delivery tray, means mounting said delivery tray at a third location spaced above said first and second locations, a stacker mechanism at said third location, said stacker mechanism comprising a stacker wheel and a shaft adapted to be driven to cause said stacker wheel to deposit bills delivered thereto on said tray, a single conveyor belt common to said first and second and third location, a pully on said shaft for receiving said conveyor belt, means at said first location forming a nip with said belt for receiving bills from said first advancing means, means at said second location forming a nip with said belt for receiving bills from said second advancing means and means for driving said belt and said shaft to cause said belt to convey bills from said first and second locations to deliver said bills to said stacker wheel at said third location and to cause said stacker wheel to deposit said bills on said tray.

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SHEET TRANSPORTING APPARATUS

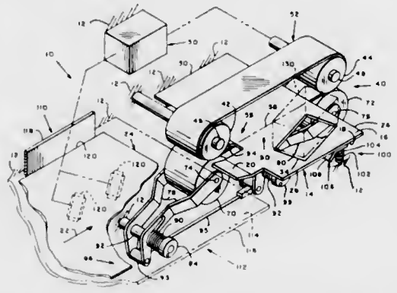
Atholi A. Robertson, Ridgefield, and William G. Hart, Jr., Stamford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 128,015, Dec. 2, 1987, Pat. No. 4,821,049. This application May 11, 1988, Ser. No. 193,311
Int. Cl.[4] B65H 5/02
U.S. Cl. 271—7 **22 Claims**

1. Apparatus for transporting a sheet in a predetermined path of travel, the apparatus comprising:

a. a plate having a lower surface extending parallel to and defining the path of travel, the plate including an aperture;

b. sheet feeding means including a first pair of rollers spaced apart from one another and an endless belt looped about the first rollers, the belt having a lower belt run extending between the first rollers and beneath the plate, the feeding means including means for driving one of the first rollers for moving the lower belt run in the direction of the path of travel, the feeding means including a second pair of rollers disposed beneath the plate, each of the second



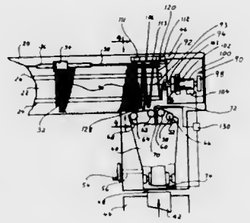
rollers being made of a compliant material, the feeding means including means for resiliently urging the compliant rollers toward the path of travel for urging a sheet feed to the apparatus into contact with the belt and the lower surface of the plate, whereby the belt engages and feeds the sheet with a portion thereof in the path of travel when fed past the aperture, and the resilient urging means including means for connecting the compliant rollers to one another for movement in unison with one another toward and away from the plate.

4,903,955

DOCUMENT STACKING APPARATUS

G. William Manzke, Quakertown, Pa., assignor to Bell & Howell Phillipsburg Company, Allentown, Pa.

Filed Sep. 23, 1988, Ser. No. 248,457
Int. Cl.[4] B65H 29/42
U.S. Cl. 271—176 **7 Claims**



1. A mailing machine including apparatus for stacking a plurality of on-edge documents side-by-side on one edge thereof, said apparatus comprising:

means for feeding documents on-edge and in seriatim in a direction of document feed motion that is disposed substantially in the plane of said documents;

a revolvable hollow helix device adapted for receiving said on-edge documents between the turns of said helix, said helix device having an axis disposed substantially orthogonally to the plane of said documents being received by said helix device;

drive means for revolving said helix device about said axis;

clutch means for intermittently connecting said drive means to said helix device;

control means for controlling intermittent engagement of said clutch means;

sensing means for sensing when each one of said documents is being received by said helix device and for providing signals to said control means to indicate the entry of a document into said helix;

said control means being operative in response to receipt of said signal to cause said clutch to engage said drive means to rotate said helix one revolution and disengage said drive means thereafter;

a stack-accumulating raceway; and,

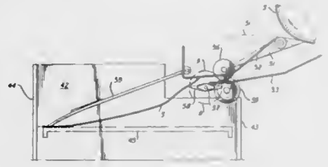
stop means disposed on the opposite side of said axis relative to the side from which said documents are received by said helix device, said stop means being in a position to be struck by said documents that are being received by said helix device, and wherein rotation of said helix device transports said documents, whose said feed motion has been stopped by said stop means, onto said stack-accumulating raceway.

4,903,956

SHEET STACKING APPARATUS HAVING POSITIVE CONTROL SYSTEM FOR TRAILING SHEET ENDS

David J. Stephens; Rodney G. Mader; Homer D. Durst, and Sven Sonnenberg, all of Diconix Inc., Dayton, Ohio 45420

Filed Oct. 31, 1988, Ser. No. 264,724
Int. Cl.[4] B65H 29/40
U.S. Cl. 271—178 **2 Claims**



1. In a sheet stacking apparatus having means for supporting a plurality of sheets from an output device and wall means for directing such sheets into an orderly stack, an improved device for positively controlling the trailing edge of sheets successively fed into said wall means, said device comprising:

(a) means, including upper and lower guide members defining a sheet guide path with an outlet end located above said supporting means, for directing the leading edge of an incoming sheet from an inlet side of said wall means toward an opposite, abutment side of said wall means;

(b) trail edge control means including a shaft rotatably mounted adjacent the outlet end of said lower guide member and a pair of paddle arms extending from said shaft at 180° to each other, said shaft being located and said arms being constructed so that in a first position said arms are generally coplanar with said lower guide member;

(c) drive means for selectively rotating said shaft in 180° increments from said first position; and
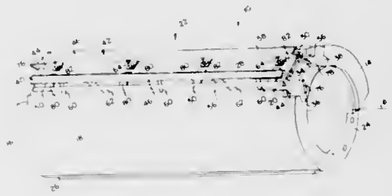
(d) means for synchronizing actuation of said drive means with sheet feed along said sheet guide path so that said paddle arms remain in said first position during passage of a leading sheet edge and subsequently rotate one 180° increment to positively move the trail edge of such sheet out of said path and toward the stack top.

4,903,957

DYNAMICALLY STABLE SHEET CLAMPING SYSTEM FOR HIGH SPEED SHEET HANDLING DRUMS

Alan M. Binder, Lexington; Walter P. Hainberger, Topsfield; Theodore J. LaBelle, Dorchester, and Kenneth A. McAuley, Boston, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 2, 1988, Ser. No. 265,994
Int. Cl.[4] B65H 5/04
U.S. Cl. 271—277 **14 Claims**



1. A clamping system for high speed sheet handling drum comprising:

a light weight clamping bar having a generally planar support web and a clamping lip extending at an acute angle from the support web;

means for mounting said clamping bar at axially spaced intervals along the length of the drum in a manner preventing axial but allowing limited radial movement with said support web lying in a chordal plane subtending an arc of less than 180° in the cylindrical periphery of the drum; and

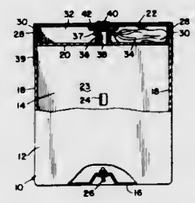
actuating means attached on said mounting means in a manner preventing radial but allowing limited axial movement, for moving said clamping bar from an extended sheet loading position in which said clamping lip is spaced from the cylindrical periphery of the drum to a retracted sheet clamping position in which said clamping lip is substantially tangent to the cylindrical periphery of the drum in response to axial movement of said actuating means.

4,903,958

BALLOON AMUSEMENT DEVICE

Fernando DiCarlo, 407 W. "C" St., Ontario, Calif. 91762, and Tony DiCarlo, Ontario, Calif., assignors to Fernando DiCarlo, Ontario, Calif.

Filed Jan. 23, 1989, Ser. No. 299,321
Int. Cl.[4] B64B 1/50
U.S. Cl. 272—27 N **27 Claims**



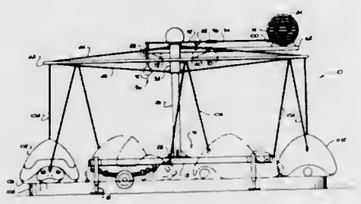
1. An amusement device comprising:

a compressed air container having an air discharge port;

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a movable wall structure mounted on said container in overlying relation to said air discharge port to form a balloon storage compartment;
a deflated balloon located within said storage compartment, said balloon having an inflation neck in sealed fluid communication with said air discharge port;
means to retain the balloon in fluid communication with the air discharge port;
means controlled by the movable wall structure for preventing the flow of compressed air through the discharge port into the balloon;
whereby movement of the wall structure away from the container permits compressed air to flow into the balloon, the balloon being maintained in fluid communication with said discharge port after inflation of the balloon by the compressed air flow.

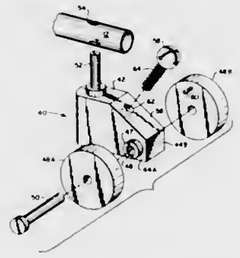
4,903,959
HORIZONTAL FERRIS WHEEL
Gerald L. Barber, 10 Whittington Ct., Greenville, S.C. 29615
Filed Oct. 5, 1988, Ser. No. 254,439
Int. Cl.[4] A63G *1/08, 1/28*
U.S. Cl. 272—29 **21 Claims**



1. An amusement ride, comprising:
a central, upright support mast;
support structure, rotatably mounted on the top of said upright support mast, and projecting axially outward from said mast, for free rotation thereabout generally in a plane perpendicular to the longitudinal axis of said mast;
passenger compartments suspended from said support structure generally near the periphery thereof;
at least one rotatably drivable propeller supported on said support structure, such that rotation of said propeller generates a flow of air creating a driving force acting generally tangentially at said support structure periphery, whereby said passenger compartments may be rotated about said central mast for forming a horizontal ferris wheel-type amusement ride having relatively smooth acceleration and deceleration characteristics; and
a speed responsive safety means for automatically limiting the rotational speed of said amusement ride.

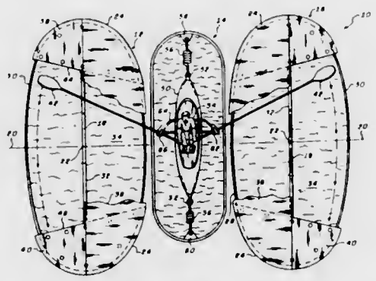
4,903,960
AUDIBLE BABY CONVEYANCE
Cearan C. Caffrey, 11 Vincent Dr., Monroe, Conn. 06468
Filed Nov. 21, 1988, Ser. No. 274,389
Int. Cl.[4] A47D *13/04*
U.S. Cl. 272—70.3 **8 Claims**

1. A baby walker comprising:
a lower support member;
an upper support member;
struts supporting the upper support member above the lower support member;
seat means, suspended below the upper support member, for seating a baby with its feet extending through leg holes in the seat means and touching a floor surface;
a plurality of wheel assemblies attached to the lower support member for supporting the baby walker for movement about the floor surface, at least one of the wheel assemblies having a self-contained sound producing means in response to movement of the baby walker about the floor surface, each of the at least one wheel assemblies comprising:
a body member having two parallel side surfaces and a transverse hole extending through the body member from one side surface to the other side surface;
an axle pin having two ends and extending through the transverse hole through the body member, the two ends of the axle pin extending beyond the body member; and



two wheels, each wheel mounted to an end of the axle pin on a respective side of the body member for rotation with respect to the body member;
said sound producing means comprises:
a bell means mounted to the body member; and a striking pin mounted to an inside surface of at least one of the wheels for contacting the bell means when the wheel rotates with respect to the body member, wherein said bell means is a bell having a stalk which is inserted into a mounting hole in the body member.

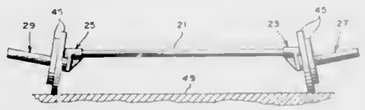
4,903,961
ROWING MACHINE
Frank Solymosi, 255 Violet St., Massapequa Park, N.Y. 11762
Filed Sep. 9, 1988, Ser. No. 243,260
Int. Cl.[4] A63B *69/06*
U.S. Cl. 272—72 **11 Claims**



1. A rowing machine comprising:
a pair of generally oblong tanks having adjacent inner side walls spaced a predetermined distance apart and each having a bottom and generally vertical side walls, which tanks are fillable with water to a predetermined height, each tank having a central longitudinal axis extending between first and second ends thereof, and a central transverse axis extending perpendicularly to said central longitudinal axis through the center of each tank, with said longitudinal axis of each of said tanks being in parallel relationship;

a rowing attachment positioned intermediate said inner side walls of said pair of generally oblong tanks, said rowing attachment comprising a base having a track extending along a longitudinal axis, at least one seat slideable forwardly and rearwardly on said track, and a pair of oarlocks mounted on said rowing attachment along said central transverse axis through the center of each tank adjacent said inner side walls of each of said generally oblong tanks, said longitudinal axis of said track being parallel to said central longitudinal axis of each of said generally oblong tanks;
a pair of oars receivable in said oarlocks; and
at least one flow diverter mounted in each of said generally oblong tanks, said flow diverter including a plurality of horizontally-disposed, vertically spaced apart flow plates.

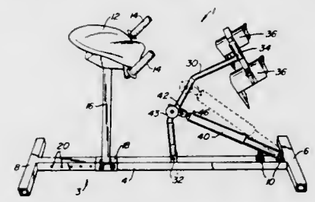
4,903,962
ANGLED WEIGHTLIFTING BAR
Lance Pollack, 740 NE. 178th Ter., North Miami Beach, Fla. 33162
Filed Jan. 23, 1989, Ser. No. 299,133
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 **8 Claims**



1. A weightlifting bar adapted to receive weight plates thereon to form a barbell comprising:
a straight center section having a longitudinal axis,
a pair of connector sections extending radially from each end of said center section, said connector sections being freely rotatable with respect to said center section, and
a pair of straight weight-receiving side sections extending sidewardly from said connector sections in a common plane, each side section being freely rotatable with respect to the connector section to which it is attached, whereby said weightlifting bar, when symmetrically loaded with weight plates on said side sections and supported by said center section, has a center of gravity that is substantially lower than said center section, and the position of said center of gravity relative to said center section remains substantially constant regardless of the rotational position of said center section around said longitudinal axis, wherein each of said side sections extends sidewardly at an acute angle with respect to said center-section longitudinal axis and radially inwardly towards said longitudinal axis.

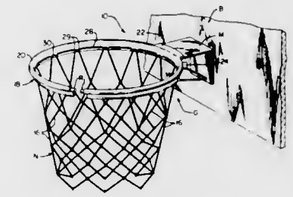
4,903,963
ABDOMINAL MUSCLE EXERCISER
Byran R. Garnett, 23 Stowe Ct., Seaside, Calif. 93955
Filed Jan. 23, 1989, Ser. No. 300,363
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—130 **11 Claims**

10. An abdominal muscle exerciser including:
a seat;
a lever arm rotatable in directions toward and away from the seat;
a base to which the seat and the lever arm are attached;
a pneumatic cylinder operatively connected between the base and the lever arm, the cylinder having a resistance stroke which provides significant resistance against rotation of the lever arm in the direction toward the seat;
front and rear ends of the base;
front and rear legs mounted transverse to the base on the front and rear ends of the base, respectively;



a cross bar mounted transverse to the lever arm; and
a pair of foot stirrups mounted on the cross bar.

4,903,964
DETACHABLE NETTING FOR BASKETBALL GOAL
Gerald E. Anderson, 1342 S. Race St., Denver, Colo. 80210
Filed Jan. 24, 1989, Ser. No. 301,047
Int. Cl.[4] A63B *63/08*
U.S. Cl. 273—1.5 R **6 Claims**

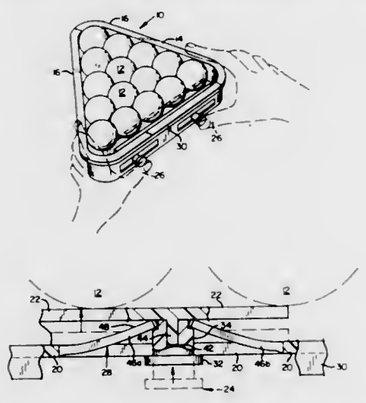


1. In a basketball goal wherein a standard rim is mounted in an elevated position, the combination therewith comprising:
a generally tubular netting having upper net cords;
an annular member including a rim-engaging portion disposed in pressfit engagement with said rim, said portion being of channel-shaped, cross-sectional configuration detachably secured to and supported by said rim;
means for attaching said upper net cords to said annular member;
said goal includes a mounting bracket extending radially from said rim for attachment to a backboard, and a horizontal support bracket extending radially outwardly from said rim engaging portion and supported by said mounting bracket.

4,903,965
POOL RACK
Franklin G. Smith, 2944 SE. Tibbetts, Portland, Oreg. 97202
Filed Jun. 16, 1988, Ser. No. 207,225
Int. Cl.[4] A63D *15/00*
U.S. Cl. 273—22 **10 Claims**

1. A pool rack apparatus for grouping pool balls on a pool table into a tight triangular shape comprising:
an equilateral triangular-shaped frame with upstanding walls including a rear wall and opposite side walls extending from said rear wall and merging at an apex of said frame, the frame being sized to enclose and loosely group the balls;
a push bar extending inside and along the rear wall;
spring means for resiliently mounting said push bar to said rear wall and biasing said push bar toward said rear wall, said spring means comprising leaf-type spring means forming an integral portion of said rear wall; and
push means for manually extending said push bar away from

said rear wall and toward the apex of said frame in opposition to the spring means for engaging the balls to urge the



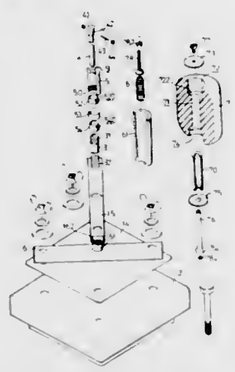
group snugly against said opposite side walls and thereby into a tight triangular group.

4,903,966

DEVICE FOR BATTING AND STRIKING PRACTICE

Leon Liao, No. 85-3, Yue Ming Street, Chung Chuean Li, Chunghwa, Taiwan

Continuation-in-part of Ser. No. 194,089, May 16, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 341,831
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—26 R **8 Claims**



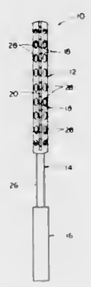
1. A device for batting and striking practice having a base assembly to provide a firm support, said device comprising:
a lower tube having an upper threaded end and a lower threaded end, said lower threaded end being threadedly engaged to said base assembly;
a centrally bored sleeve being cylindrical in shape, said sleeve having an internally threaded end at a lower section thereof while an upper section being tapered to a slightly narrower bored section, said sleeve engaging with said upper threaded end of said lower tube at said internally threaded end;
a set of cylindrical packing rings being fitted within said sleeve, said packing rings being centrally bored to releasably secure an intermediate tube;
said intermediate tube being slidably inserted through said sleeve, said set of packing rings and said lower tube; said packing rings being compressed within the sleeve to contract about said intermediate tube when said sleeve threadedly engages with the lower tube; said intermediate tube having a tapered head at one end thereof for securely mounting a spring; said intermediate tube being of sufficient length to afford a range of height adjustments;
a cylindrical protective housing being centrally bored to receive said spring, said protective housing having a center hole at the lower surface thereof to accommodate said intermediate tube, said head of said intermediate tube being pressable into a lower portion of said spring secured by the tension of said spring;
a body assembly for practicing batting or striking being mounted on said protective housing, said body assembly being engaged with a bolt interconnects between said body assembly and an upper portion of said spring.

4,903,967

RACKET FRAME HAVING HOLES FOR TAILORING FRAME STIFFNESS

Harry M. Ferrari, and Michael R. Swartz, both of Pittsburgh, Pa., assignors to Ferrari Importing Company, Inc., Pittsburgh, Pa.

Filed Jan. 27, 1989, Ser. No. 303,782
Int. Cl.[4] A63B *49/06*
U.S. Cl. 273—73 C **20 Claims**



1. A racket frame, comprising:
(a) a head portion encompassing an open region and having a first plurality of stringing holes for attaching stringing to said head portion and across said open region;
(b) a handle portion;
(c) a throat portion extending between and interconnecting said head and handle portions; and
(d) means defining a second plurality of non-stringing holes in at least said head portion being separate from said first plurality of stringing holes for forming voids in the material of said head portion to reduce the weight and tailor the stiffness thereof in a manner which reduces axial and torsional deflections of said head portion upon striking a ball by the stringing across said open region of said head portion.

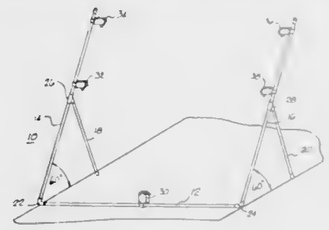
4,903,968

GOLF SWING TRAINING APPARATUS

James R. Hargrave, P.O. Box 25, Loveland, Colo. 80539

Filed May 11, 1989, Ser. No. 350,455
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 A **6 Claims**

1. A golf swing training apparatus comprising:
frame means positioned on a substantially horizontal surface;
a plurality of light sensor/alarm units positioned in a common plane on said frame means, each of said plurality of light sensor/alarm units being responsive, during such period of time that a light beam is incident thereon, for emitting an audio signal; and
handle means generally elongate in shape, said handle means



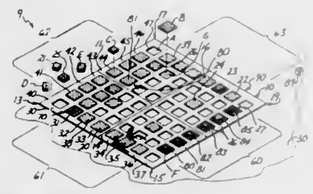
adapted to be gripped by the user in like manner to a golf club, said handle means further comprising light beam source means for emitting a focused light beam from each end thereof, each of the focused light beams being generally axially aligned with said handle means.

4,903,969

BOARD GAME APPARATUS

Justin C. Williams, Jr., Milwaukee, Wis., assignor to George J. Chanos, San Diego, Calif.

Filed Nov. 1, 1988, Ser. No. 265,854
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—248 **15 Claims**



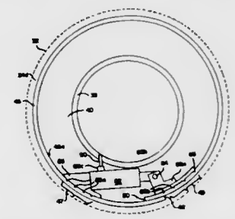
1. A game apparatus comprising:
four groups of movable game board pieces, each group being distinguishable one from another, each of said pieces including means defining indicia thereon, each one of said pieces of any given group having similar means defining indicia to identify them as forming a part of said given group, each one of said pieces of the other groups of said movable game board pieces including similar means defining indicia to identify them as forming a part of such other groups, said means defining indicia of each of the four groups being distinguishable from each of the other groups so that each one of the movable game board pieces of the same group are arrangeable to form changeable pathways of travel according to the rules of the game;
a game board having a playing area, said game board playing area being subdivided into four separate quadrants, each quadrant being rectangularly shaped for adjoining other quadrants;
each quadrant of said game board playing area being arranged in an equal number of columns and rows;
said columns and rows including means defining subdivisions, each one of said means defining subdivisions being constructed to receive any one of the movable game board pieces of any one of said groups;
each one of said movable game board pieces having on the front side thereof only a single element for forming a segment of the changeable pathway of travel and having on the rear side thereof only a single means for engaging an individual board subdivision, each group of movable game board pieces having the same number of pieces as every other group of movable game board pieces;
four groups of movable position marking player pieces, each group being distinguishable one from another and movable along selected ones of said movable game board pieces, each of said player pieces having front and reverse sides, each one of said player pieces of any given group having similar front means defining indicia on its front side to identify it as forming a part of said given group, each one of said player pieces of any given group having similar rear means defining indicia on its reverse side and corresponding to its front means defining indicia to further identify it as forming a part of said given group, said front and rear means defining indicia of each player piece of a given group corresponding to a corresponding one of said means defining indicia of a corresponding one of the groups of movable game board pieces, said front and rear means defining indicia of each of the four groups being distinguishable from each of the other groups, each corresponding group of player pieces and game board pieces having similar means defining indicia thereon being associated collectively with an individual player of the game and being moved by their associated player according to the rules of the game;
each one of said player pieces being movable substantially only on its own corresponding game board pieces having similar means defining indicia according to the game rules;
move determining means having means defining at least one numerical indicia for determining either the move of the player pieces to count as moves along selected ones of said movable game board pieces defining a pathway of travel, or to count as moves the interchanging a pair of selected ones of said movable game board pieces of different groups among the game board area subdivisions for changing a pathway of travel, according to the rules of the game
each one of said player pieces having progression indicia means fixed to its reverse side for determining its path progression when exposed to view according to the game rules.

4,903,970

APPARATUS FOR PROVIDING A WATERTIGHT SEAL FOR MANHOLE PIPE CONNECTIONS INCLUDING A FOLDABLE GASKET AND CLAMPING BAND ASSEMBLY AND EXPANSION MEANS FOR INSTALLING THE GASKET AND CLAMPING BAND ASSEMBLY

Jack Ditcher, and James A. Westhoff, both of Langhorne, Pa., assignors to A-LOK Products, Inc., Tullytown, Pa.

Division of Ser. No. 778,690, Sep. 23, 1985, Pat. No. 4,711,455. This application Aug. 31, 1987, Ser. No. 91,408
Int. Cl.[4] B23P *19/00;* **F16J** *15/10;* **F16L** *5/02, 21/08*
U.S. Cl. 277—9.5 **8 Claims**



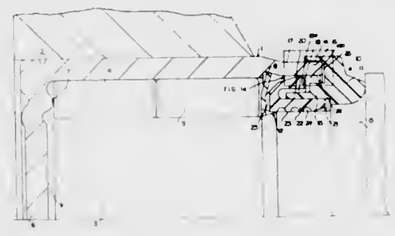
4. In a combination, a gasket assembly for providing a watertight seal with an opening having a surface for supporting the gasket assembly and an expansion means for installing said gasket assembly, comprising:

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a substantially tubular-shaped gasket having a hollow interior and being, formed of a resilient compressible material and having an end portion adapted to be positioned against the surface of the opening;
an annular clamping band formed of a material substantially impervious to corrosive influenced normally encountered in sewage systems and arranged to be positioned against the inner periphery of the end portion positioned within said opening;
said band having a discontinuity to define first and second ends thereof;
said first and second ends being positionable in abutting relationship to lock the band against the outer flange and maintaining the outer flange under compression between said band and said gasket supporting surface;
said band encircling a hollow region when said first and second ends are in abutting relationship;
said expansion means being releasably positioned within the hollow region surrounded by said clamping band for expanding the clamping band outwardly and against the outer flange so that substantially all of said expansion means is in said hollow region;
said expansion means including first and second member engaging the clamping band and means for moving said first and second members apart;
said first and second members having projections with elongated ends engaging the clamping band for expanding the clamping band when the first and second members are moved apart; the inner periphery of the band being provided with first and second elongated grooves each arranged a spaced distance inward from said first and second ends, at least one of said grooves receiving the elongated end of one of said projections.

8. In combination, a gasket assembly for providing a watertight seal with an opening having a surface for supporting the gasket assembly, and an expansion means for installing said gasket assembly, comprising:
a substantially tubular-shaped gasket formed of a resilient compressible material and having an end portion adapted to be positioned against the surface of the opening;
an annular clamping band formed of a material substantially impervious to corrosive influences normally encountered in sewage systems and arranged to be positioned against the inner periphery of the end portion position within said opening;
said band having a discontinuity to define first and second ends thereof;
said first and second ends being positionable in abutting relationship to lock the band against the outer flange and maintaining the outer flange under compression between said band and said gasket supporting surface;
said expansion means being releasably positioned within said clamping band for expanding the clamping band outwardly and against the outer flange;
said expansion means including first and second members engaging the clamping band and means for moving said first and second members apart;
said first and second members having projections engaging the clamping band for expanding the clamping band when the first and second members are moved apart; the inner periphery of the band being provided with first and second elongated grooves each arranged a spaced distance inward from said first and second ends, at least one of said grooves receiving one of said projections;
the clamping band being provided with a groove along the inner periphery thereof spaced inwardly from said first end;
the projection of said first member being positioned in said groove and the projection of said second member engaging the second end of said band for expanding said clamping band as said first and second members are moved apart;
said expansion means comprises an expansion jack for moving said first and second members apart;
said expansion jack comprising a cylinder;
a piston arranged for reciprocating movement in the cylinder;
a piston rod coupled to said piston and extending outwardly from said piston and beyond one end of said cylinder;
one of said first and second members being pivotally mounted to said cylinder and having one surface portion being slidably engaged by the free end of said piston rod to move the free end of the pivotally mounted member along a curved path; and
the remaining one of said first and second members being coupled to said cylinder.

4,903,971
SEAL FOR BEARING BUSHINGS
Bernhard Bauer, Hassfurt, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany
Filed Oct. 20, 1988, Ser. No. 260,618
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 8714948[U]
Int. Cl.[4] F16C *33/78*
U.S. Cl. 277—152 **4 Claims**

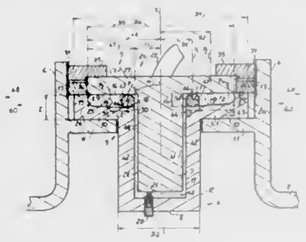


1. Seal for sealing the space between a bearing bushing (1) and the journal (3) of a machine part supported therein, the seal comprising inner sealing ring member (12) between the bearing bushing (1) and journal (3) and an outer sealing ring member (11) located between the open end of the bearing bushing (1) and a shoulder of the machine part supported in the bearing bushing, said inner sealing ring member (12) having a sleeve like section (22) mounted on a stepped portion of the journal (3), the outer sealing ring member (11) having a pair of circumferentially extending axially spaced sealing lip sections (14,15), the outermost lip section (14) confronting and engaging with pretension an outer surface 17 of the bearing bushing (1) in the preassembled state and being displaced radially upon assemly on the joint pin (3) to provide a gap between the outermost lip section (14) and said outer surface (17), the innermost sealing lip section (15) overlying and snugly seated on the sleeve like section (22).

4,903,972
DEVICE FOR SEALING AN ENCLOSURE CONTAINING AN EXPANDABLE FLUID, ESPECIALLY WITHIN AN ELECTRICAL CONNECTION ASSEMBLY
Etienne Ombredane, Bure sur Yvette, France, assignor to Thomson-CGR, Paris, France
Filed Dec. 21, 1987, Ser. No. 135,231
Claims priority, application France, Dec. 23, 1986, 86 18086
Int. Cl.[4] B61D *53/00*; **B61F** *15/22*
U.S. Cl. 277—171 **11 Claims**

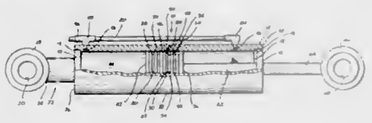
1. A device for sealing an enclosure containing an expandable fluid, including at least one O-ring seal, the enclosure being constituted by the assembly of at least two components between which an internal space contains the expandable fluid, the seal being contained within an annular recess located between the two components about an axis of symmetry, said recess being adapted to communicate with the internal space,

said seal being clamped between two opposite walls of said recess, wherein provision is made along the section of the annular recess for a length L1 in which the seal is capable of moving and of occupying n positions, the length L1 of the annular recess being constituted by an initial clamping space and by a clearance space, the initial clamping space being such as to correspond to an initial first position P1 of the seal and the clearance space being located on one side of the seal which is remote from the internal space so that the seal penetrates into said clearance space under the pressure of the expanded fluid,



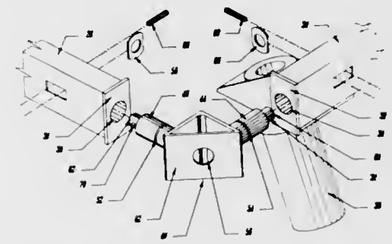
the two components between which the annular recess is formed being constituted by a female component and a male component of which the body is engaged in said female component, the male and female components being such as to form a high-voltage electrical connection assembly, the internal space being defined between the body of the male component and the internal surface of the female component, the male and female components being provided respectively with a first and a second annular attachment flange between which is disposed the annular recess containing the seal.

4,903,973
FLUID CONTROLLED STEERING STABILIZER
Todd E. Bray, 1529 Ace McMillian Rd., Dacula, Ga. 30211
Filed Jul. 19, 1988, Ser. No. 221,274
Int. Cl.[4] B62D *5/10*
U.S. Cl. 280—89 **17 Claims**



1. A fluid controlled steering stabilizer for a non-steerable axle of a vehicle having a tie rod associated with said axle comprising:
(a) a housing;
(b) first and second chambers formed within said housing;
(c) a first piston freely slidable within said first chamber of said housing;
(d) a second piston freely slidably within said second chamber of said housing and having a hole through its center;
(e) a piston rod slidably extending through said hole of said second piston having a first end extending through said housing at a first end for connecting said piston rod to an axle or tie rod and a second end capable of contacting said first piston;
(f) means for providing fluid to said chambers for maintaining said first piston and said second piston toward the center of said housing to inhibit movement of said axle relative to said tie rod;
(g) means for connecting the remaining end of said housing to the remaining one of said axle or tie rod;
(h) a snap ring provided in a radially extending snap ring groove located at the approximate centerpoint of said housing between said first piston and said second piston to provide a positive centerpoint to said stabilizer; and
(i) a check valve located in a breather hole entering said housing at said snap ring groove for allowing excess fluid to pass out of said housing.

4,903,974
OFF-THE-ROAD-VEHICLE
Dennis M. Frink, Lidcombe, Australia, assignor to JAC Tractor Limited, Sydney, Australia
Continuation-in-part of Ser. No. 893,247, Aug. 5, 1986, abandoned. This application Oct. 26, 1987, Ser. No. 112,176
Int. Cl.[4] B60K *17/358, 17/34*
U.S. Cl. 180—253 **20 Claims**



1. A vehicle comprising:
(i) a flexible frame having a pair of side members and a pair of end members,
(ii) connector means at each corner of said frame, each said connector means including a pivotal connection between the connector means and the end of the side member and the end of the end member at the respective corners whereby each side member and each end member may pivot relative to the connector means to which they are connected, said connector means accommodating increased distances which occur between the ends of the side members and the ends of the end members during operation of the vehicle,
(iii) a front wheel at one end of each side member and a rear wheel at the other end of each side member,
(iv) a platform within the said flexible frame and connected thereto by front and rear pivot means which extend from the platform to the end members and by side pivot means which extend from the platform to each side member whereby said end members and said side members may pivot relative to the respective pivot means,
(v) said wheels being connected to the side members at locations between the side pivot means and the pivotal connection means so that the wheels do not tilt laterally when the end members pivot on said front and rear pivot means.

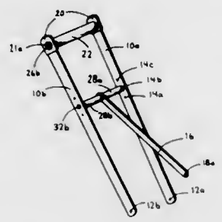
4,903,975
REAR BICYCLE ATTACHMENT HANDLE
Diane B. Weisbrodt, and Richard G. Weisbrodt, both of Raleigh, N.C., assignors to R&D Ventures, Inc., Raleigh, N.C.
Filed Oct. 11, 1988, Ser. No. 255,961
Int. Cl.[4] B62H *7/00*
U.S. Cl. 280—93 **9 Claims**

1. A rear bicycle attachment handle mechanism for a child's bicycle comprising:
two elongated attachment members of equal length each having an upper hole located near one end of said attachment members and a lower hole located near the opposite end of said attachment members, a plurality of adjustment

holes located near the central portion of said attachment members, and a protector cap covering the upper-most ends of said attachment members preventing said attachment members from damaging other objects,

means for joining said attachment members at said upper holes whereby a cushioned handle is permanently bolted between and at right angles to said attachment members with an elongated handle bolt and two locking nuts,

means for joining said attachment members at said adjustment holes with a centrally located support section, said support section having one elongated support member having an upper hole located near one end of said support member and a lower hole located near the opposite end of said support member, two cushioned spacer bars positioned adjacent and at right angles to said upper hole of said support member, and an elongated support bolt horizontally inserted through said spacer bars and said support



member, said support section then being positioned between said attachment members allowing said support bolt to be inserted through one matched pair of said adjustment holes where two removable nuts temporarily fasten said support section to said attachment members, said removable nuts furthermore allowing said support section to be easily removed from one pair of said adjustment holes and re-inserted through another pair of said adjustment holes providing variations in the invention's angular positions, and

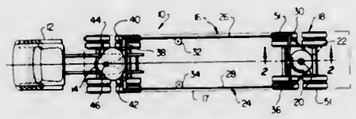
means to secure said rear bicycle attachment handle mechanism through said lower holes of said attachment members and through lower hole of said support member to the rear portion of a child's bicycle providing a walking person with the means to propell said bicycle forward without interfering with or limiting the independent use of said bicycle.

4,903,976

LOCKING MECHANISM FOR SELF STEERING SEMI-TRAILER

Lloyd A. Baillie, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 27, 1988, Ser. No. 199,544
Int. Cl.[4] B26D *13/02*
U.S. Cl. 280—426 **6 Claims**



1. In a system for controlling the turning of a semi-trailer of a tractor-trailer unit relative to the tractor, said trailer including a frame and a rear wheel bogie assembly supported for pivotable movement about a generally vertical pivot axis relative to said frame, elongated cable means for turning said bogie to steer said trailer, said cable means including opposed cable traces extending along said frame and connected to said bogie, the improvement comprising:

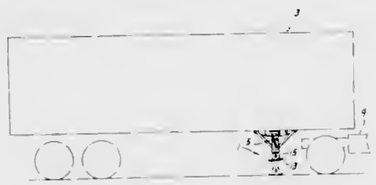
means for preventing turning of said bogie with respect to said frame in at least one direction in response to a predetermined degree of slack in at least one of said cable traces.

4,903,977

LANDING GEAR FOR A VEHICLE

Bobby G. Baxter, Warrenton, Mo., assignor to The Binkley Company, Warrenton, Mo.

Continuation of Ser. No. 48,597, May 11, 1987, Pat. No. 4,824,136. This application Aug. 26, 1988, Ser. No. 237,291
Int. Cl.[4] B60S *9/00*
U.S. Cl. 280—475 **14 Claims**



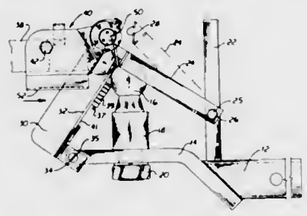
1. Landing gear for a vehicle such as a trailer, comprising a leg, a foot at the lower end of the leg adapted for engagement with the ground, a pair of substantially identical generally channel-shaped members each having a web and a pair of generally parallel flanges extending away from the web and terminating in edges, the members being disposed so that the edges of the flanges of one channel-shaped member face the edges of the flanges of the other channel-shaped member to form a tube of generally rectangular cross section which extends up from the foot and telescopically receives the lower end of said leg, an elastomeric member disposed in the tube between the lower end of the leg and the foot, bearing plate means on the tube interposed between the elastomeric member and the lower end of the leg, and means attaching the tube to the lower end of the leg and permitting limited telescopic movement of the leg and the foot whereby said foot is adapted to move upwardly relative to the leg as the landing gear accepts the weight of the vehicle thereby resiliently to compress the elastomeric member between the foot and said bearing plate means.

4,903,978

SELF ALIGNING TRAILER HITCH

Peter N. Schrum, III, 11751 69th Way N., Largo, Fla. 34643

Filed Jun. 14, 1989, Ser. No. 365,971
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—477 **7 Claims**



1. In a self aligning trailer hitch assembly for use with a towing vehicle having a ball member mounted on a rear end of the towing vehicle and a frame device having a ball socket mounted on a tongue of a towed trailer, the improvement comprising:

(a) a first hitch assembly frame pivotally mounted on a hitch bracket extending laterally from the rear of the towing vehicle, the first hitch assembly having a back plate vertically mounted over the hitch bracket, a release arm pivotally mounted at a first end to the back plate and at a second end holding a front edge of a flat plate having side guide plates integral thereto, in an upward inclined position, the flat plate having a pair of pivoting release doors between the guide plates,

(b) a second hitch assembly frame mounted over a ball socket located at a distal end of a trailer tongue, the second hitch assembly frame having multiple rolling members on a front surface engaging the flat plate and the guide plates upon moving the towing vehicle and its first hitch assembly to engage the second hitch assembly,

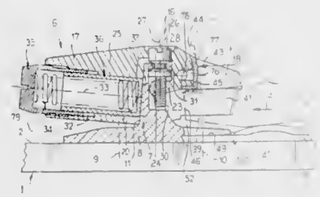
(c) the second hitch assembly frame engaging and tripping the second end of the release arm to allow the flat plate to fall over the ball and actuate the pair of pivoting release doors so that the ball protrudes through the release doors and allows the socket to fall by gravity over the ball to engage the trailer to the towed vehicle.

4,903,979

SAFETY SKI BINDING

Jean-Pierre Dimier, Rumilly, France, assignor to Salomon S.A., Annecy Cedex, France

Continuation of Ser. No. 766,201, Aug. 16, 1985, Pat. No. 4,763,908. This application Feb. 2, 1988, Ser. No. 151,486
Claims priority, application France, Aug. 17, 1984, 84 12909
The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.
Int. Cl.[4] A63C *9/81*
U.S. Cl. 280--628 **64 Claims**



1. A ski binding adapted to releasably hold the front of a ski boot on a ski, wherein said front of said boot comprises a front end, wherein said binding comprises:

(a) a jaw adapted to hold said front end of said boot and adapted to laterally pivot in response to pivoting of said boot;

(b) a support on said ski, wherein said support comprises two upwardly diverging lines of support, wherein said jaw is adapted to laterally pivot around either one of said two upwardly converging lines of support; and

(c) a support zone means on said jaw, for supporting said front end of said boot when said front end of said boot is held by said jaw, wherein said support zone means comprises means for generating substantially zero torque around each of said two upwardly converging lines of support on said jaw when said boot is held prior to release in response to forward pressure of said front end of said boot on said support zone means.

4,903,980

CONNECTOR FOR CHILD STROLLER SUB-ASSEMBLIES

Leo Schwartz, Montreal, Canada, assignor to Dorel Industries Inc., Montreal, Canada

Filed Nov. 9, 1988, Ser. No. 269,069
Claims priority, application Canada, Sep. 6, 1988, 576591
Int. Cl.[4] B62B *7/08*
U.S. Cl. 280—647 **8 Claims**



1. A connector for a child stroller, carriage or similar child vehicle for connecting sub-assemblies thereto for easy removal of said sub-assemblies by a user person and wherein said vehicle has a tubular frame to which said sub-assemblies are each secured through a respective one of said connectors, said sub-assemblies each having a connecting portion for close mating fit with connecting free end portions of said tubular frame, said mated portions being interconnected by a spring-biased connecting member provided in one of said mated connecting portions or connecting free end portions, and having a lock element automatically locatable in a through bore in the other portion, said lock element having means for retracting same inwardly of said through bore for disconnecting said mated portions whereby one or more of said sub-assemblies may be disconnected and removed from said tubular frame without the use of special tools, said spring member being a V-shaped leaf spring member formed with a bottom leaf portion and a top lock element carrying portion, said spring being located in compression in an enclosure adjacent said mating wall section having said hole with said lock element aligned with said hole, said spring being retained in tight friction fit in said enclosure by compression force exerted on enclosure walls by said leaf spring, said bottom leaf portion having an inwardly bent engageable free end section extending toward said top lock element carrying portion and elevated above an inner surface of said enclosure, said engageable end section permitting ease of locating and removal of said spring member in said enclosure.

4,903,981

REAR SUSPENSION FOR MOTOR VEHICLES OF THE TYPE WITH INDEPENDENT WHEELS WITH TRANSVERSE QUADRILATERALS

Guido Alesso, Savigliano; Gian Luigi Perello, Strambino, and Raffaele Leonardis, Turin, all of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Dec. 30, 1988, Ser. No. 292,152
Claims priority, application Italy, Dec. 30, 1987, 68147-A/87
Int. Cl.[4] B62D *5/00*
U.S. Cl. 280—691 **7 Claims**

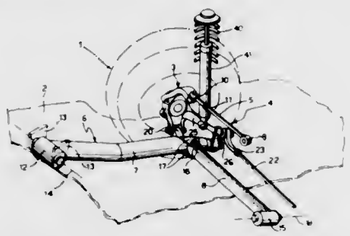
1. A rear suspension for motor vehicles, of the type with independent wheels, in which the support (3) for each wheel (1) is connected to the structure (2) of the motor vehicle by means of an articulated quadrilateral system (4) including an upper transverse member (5) and a lower transverse member (6), characterised by the combination of the following characteristics:

(a) the upper transverse member (5) is constituted by a transverse arm having one end articulated to the structure of

the motor vehicle (2) and its opposite end articulated by a ball joint (10) to the wheel support (3),

(b) the lower transverse member is constituted by a triangular structure (6) including a longitudinally extending main lower arm (7) and a transversely extending auxiliary lower arm (8) to the main lower arm (7),

(c) the two lower arms (7, 8) have ends (12, 15) articulated to the motor vehicle structure (2) with the interposition of bushes of resiliently deformable material,



(d) the portion of the lower triangular structure (6) formed by the connection between the two lower arms is connected to the wheel support (3) by means of a ball joint articulation (20) which, together with the ball joint articulation (10) of the upper transverse arm, defines a steering axis (21) of the wheel (1),

(e) the wheel support (3) is provided with a projecting arm (25) to which a steering control rod (22) is connected, and

(f) the projecting arm (25) of the wheel support (3) is connected to the main lower arm (7) by a connecting rod member (26).

4,903,982

SUSPENSION CONTROL APPARATUS AND METHOD FOR A VEHICLE

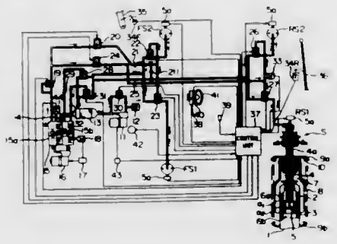
Mitsuhiko Harara; Sbozo Takizawa; Tadao Tanaka, all of Okazaki, and Shunichi Wada, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1988, Ser. No. 267,871

Claims priority, application Japan, Nov. 5, 1987, 62-169216[U]

Int. Cl.[4] B60G *17/00*

U.S. Cl. 280—707 4 Claims



1. A suspension control apparatus for a vehicle comprising:

a plurality of suspension units each disposed between a road wheel and the body of a vehicle for suspending the corresponding road wheel from the vehicle body, each of said suspension units being communicated with a working fluid by corresponding valve means;

an acceleration sensor sensing a transverse acceleration of the vehicle and providing an output signal which is representative of the sensed transverse acceleration;

a vehicle-speed sensor sensing the speed of the vehicle and providing an output signal representative of the sensed vehicle speed;

a steering sensor sensing the steering condition of the vehicle and providing an output signal representative of the sensed steering condition; and

control means connected to receive the output signals from said acceleration sensor, said vehicle-speed sensor and said steering sensor for calculating the rolling state of the vehicle due to the transverse acceleration thereof and actively controlling said respective suspension units based on the calculated rolling state of the vehicle and also based on a drive time of said valve means so as to suppress the rolling of the vehicle, said control means serving to determine the frequency of change in the direction of the detected transverse acceleration of the vehicle and control said suspension units so as to stop the roll-suppression control when the frequency of change exceeds a prescribed level

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4,903,983

ACTIVELY CONTROLLED AUTOMOTIVE SUSPENSION SYSTEM WITH IMPROVED CORNERING CHARACTERISTICS

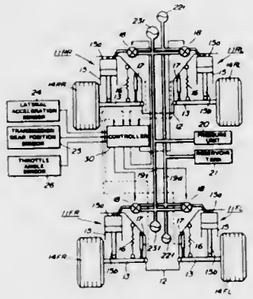
Naoto Fukushima, Kamakura, and Shouji Torii, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 22, 1987, Ser. No. 52,934

Claims priority, application Japan, May 23, 1986, 61-118675

Int. Cl.[4] B60G *17/00*

U.S. Cl. 280—707 15 Claims



1. A suspension system for an automotive vehicle comprising:

damper assemblies disposed between a vehicle body and a plurality of suspension members supporting respectively associated road wheels, each of said damper assemblies including hydraulic means having adjustable hydraulic pressure;

a hydraulic circuit connected to said hydraulic means for supplying pressurized working fluid thereto;

sensor means for monitoring predetermined vehicle driving condition indicating parameters relating to driving forces on the vehicle to produce a driving condition indicating sensor signal and for monitoring at least one running condition indicating parameter relating to lateral forces on the vehicle to produce a running condition indicating sensor signal; and

a controller responsive to said driving condition indicating sensor signal and said running condition indicating sensor signal to derive a desired load distribution at respective road wheels, said controller producing pressure control signals for respective ones of said hydraulic means to cause a change of hydraulic pressure in each damper assembly in such a manner that the combination of adjusted hydraulic pressure causes an offset of the gravity center of the vehicle body from a predetermined neutral gravity center position at a controlled magnitude and controlled direction to obtain desired load distribution for desired optimum vehicle driving characteristics.

4,903,984

SUSPENSION DEVICE

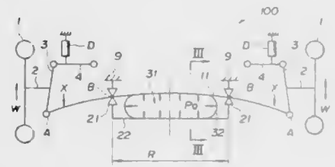
Hajime Kajiwara; Masami Ogura, both of Saitama; Shoichi Sano, and Masataka Kumata, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 142,309, Dec. 29, 1987, Pat. No. 4,835,714, which is a continuation-in-part of Ser. No. 167,589, Mar. 14, 1988, Pat. No. 4,858,950, which is a continuation of Ser. No. 711,977, Mar. 14, 1985, abandoned. This application May 13, 1988, Ser. No. 193,823

Claims priority, application Japan, May 15, 1987, 62-118381; May 15, 1987, 62-118382; May 20, 1987, 62-75737

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—712 16 Claims



1. A suspension device in a motor vehicle having a road wheel and a vehicle body, comprising:

at least one component in which vertical movement of a road wheel can be transmitted, said component being separate from a damper;

said component comprising a resilient member having a first portion operatively coupled to said road wheel, and supported on a vehicle body at a second portion spaced from said first portion for giving vertical resiliency to said road wheel;

said component having a section which is flexible under an external force applied to said component from said road wheel in response to vertical movement of the road wheel;

counteracting load means for applying, to said section, a counteracting load which is variable dependent on an amount of flexing of said section; and

a rate of an increase in said counteracting load of said counteracting load means to an increase in said external force from said road wheel is variable.

4,903,985

WHEEL SUSPENSION

Karl-Heinz Muhr, Attendorn, and Leo Schnaubelt, Haiger, both of Fed. Rep. of Germany, assignors to Muhr Und Bender, Attendorn, Fed. Rep. of Germany

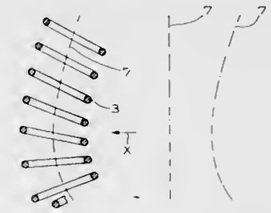
Filed Oct. 11, 1988, Ser. No. 255,581

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 3741551; Dec. 22, 1987, 3743450

Int. Cl.[4] B60G *15/00*

U.S. Cl. 280—724 13 Claims

1. A wheel suspension comprising a spring leg, which is connected to the body on the one end and the wheel on the other and having a helical compression spring, a shock absorber, and a transverse control arm, wherein in an unloaded



state the spring center line of said helical compression spring has an approximately S-shaped course.

4,903,986

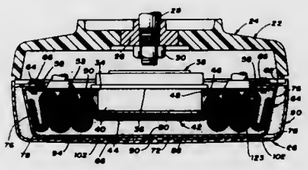
MODULAR OCCUPANT RESTRAINT SYSTEM

David A. Cok, Birmingham, Mich.; Robert L. Jones, Centerville, Ohio, and Jeffery L. Pearson, Grosse Pointe Farms, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1988, Ser. No. 270,609

Int. Cl.[4] B60R *21/20*

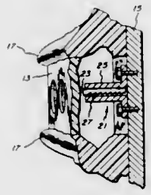
U.S. Cl. 280—743 9 Claims



1. A modular occupant restraint system for a vehicle occupant comprising, in combination, a box-like container including a base wall, first and second pairs of spaced side walls joined to the base wall and to each other, a folded inflatable occupant restraint cushion within the container, the cushion being folded to provide a first cushion portion opposite the base wall of the container and second cushion portions, each second cushion portion being located opposite a respective one of the first pair of side walls of the container, means in the walls of the container defining integrally hinged first and second pairs of flaps forcibly separable from the container for movement between a normally closed position and an open position upon inflation and deployment of the cushion, the first pair of flaps being located substantially entirely within the first pair of side walls of the container and being forcibly separated from the container and moved to open position by expansion of the second portions of the cushion to provide alternate paths of deployment of the cushion through the side walls of the container generally parallel to the occupant during initial inflation and deployment of the cushion, the second pair of flaps being located substantially entirely within the base wall of the container and being separated from the container and moved to open position by the first portion of the cushion to permit deployment of the cushion along the intended path through the base wall of the container toward the occupant.

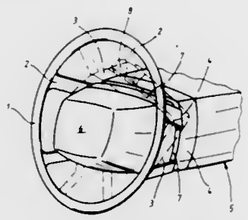
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4,903,987
ENERGY ABSORBING AUTOMOTIVE INSTRUMENT PANEL
Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 045,989, May 4, 1987, abandoned. This application Aug. 2, 1988, Ser. No. 227,226
Int. Cl.[4] B60K *37/00*; **B60R** *21/045*
U.S. Cl. 280—752 **4 Claims**



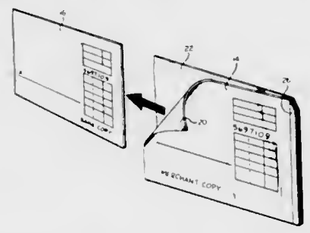
1. An instrument panel for use in a vehicle comprising:
a beam member supported at either end by the frame of the vehicle, the central portion of the beam spaced away from the frame, said beam member flexing elastically in the transverse direction when impacted by a vehicle occupant; and
recoil restrain means secured intermediate to the ends of said beam and secured to said frame for permitting motion of said beam in the transverse direction towards the frame when impacted and preventing transverse motion away from said frame so that said recoil restraint means stores the impact energy in said elastically flexed beam member.

4,903,988
STEERING ASSEMBLY FOR MOTOR CARS
Arno Jambor, Vaihingen/Enz, and Dieter Gürtler, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany
Filed Dec. 5, 1988, Ser. No. 279,809
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741130
Int. Cl.[4] B62D *1/10*
U.S. Cl. 280—771 **3 Claims**



1. Steering assembly for motor cars having:
a fixed casing tube means which centrally houses a steering column in its interior;
the steering column is enclosed at an upper region in front of a steering wheel by two covering segments arranged side by side;
a steering wheel hub is located adjacent said upper region and connected to spokes of the steering wheel which pass through an opening between the two covering segments;
at least one of the two covering segments which is remote from the steering wheel, being rotatively locked and unlocked relative to the casing tube;
wherein each segment has a spring loaded connecting means which lockingly engages said covering segment with said casing tube means and which is lockingly disengageable by a obstruction which prevents rotation of at least one of the steering wheel hub or a steering wheel spoke which would interfere with rotation of the steering wheel if the spring loaded locking engagement where not disengaged in order that at least one of the two covering segments can rotate with the steering wheel; and
wherein the spring loaded connecting means can be reengaged after the obstruction of rotation ceases.

4,903,989
BUSINESS FORM WITH PROTECTIVE COVER SHEET
Joseph A. McCormick, Manhattan, Ill., assignor to General Credit Forms, Inc., Earth City, Mo.
Filed Sep. 21, 1988, Ser. No. 247,275
Int. Cl.[4] B41L *1/20*
U.S. Cl. 282—9 R **15 Claims**



1. In a pack of detachably joined paper sheets, wherein at least one of said paper sheets includes a duplicating carbon surface on one face thereof, the improvement comprising a cover sheet adapted in size to cover said duplicating carbon surface, and attachment means for attaching one end of the cover sheet to a respective end of said paper sheet to enable the cover sheet to lay in a covering position adjacent the duplicating carbon surface when said paper sheet and cover sheet are removed from the pack, thereby inhibiting user contact with the duplicating carbon surface during handling of said removed paper sheet.

4,903,990
PROBLEM SHEET FOR SELF-EVALUATED MATHEMATICS EXAMINATION
John A. Crowdis, 202 N. Baptist Dr., Blakely, Ga. 31723
Filed Apr. 26, 1989, Ser. No. 343,437
Int. Cl.[4] G09B *19/02*
U.S. Cl. 283—44 **8 Claims**

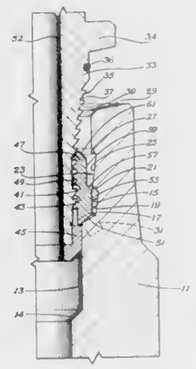
1. A sheet of paper having inscribed thereon
an arrangement of numerals that represent first and second cardinal numbers, said numerals being so positioned in the arrangement as to indicate a mathematics problem selected from the group consisting of a problem calling for the first and second numbers to be added together, a problem calling for the second number to be subtracted from the first number, a problem calling for the first number to be multiplied by the second number, and a problem calling for the second number to be divided by the first number, in each instance the correct answer to the problem being a third number having at least two digits,
said arrangement being devoid, however, of any numerals representing said third number,
but said arrangement including one or more additional numerals representing as a fourth number the sum of all of the digits of said third number.

4,903,991
DOCUMENT SECURITY SYSTEM
Richard F. Wright, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Jul. 18, 1983, Ser. No. 514,406
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—95 **19 Claims**



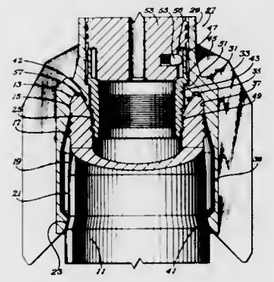
3. The document of claim 2 wherein said microcapsules have associated therewith an image-forming agent which is imagewise mobilized by said internal phase upon rupturing said microcapsules.

4,903,992
LOCKING RING FOR OIL WELL TOOL
Charles E. Jennings, and L. Steven Landriault, both of Houston, Tex., assignors to Vetco Gray Inc., Houstoo, Tex.
Filed Apr. 14, 1989, Ser. No. 338,283
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—24 **6 Claims**



1. A connection means for securing a tubular member into a tubular housing having a bore, comprising in combination:
a frusto-conical threaded section on the tubular member having a set of threads;
at least one circumferential recess formed in the bore of the housing, defining an upward facing lower shoulder and a downward facing upper shoulder;
a collet ring having a set of internal threads, an external downward facing lower shoulder and an external upward facing upper shoulder;
slot means formed in the collet ring to allow at least the upper portion of the collet ring to expand radially outward from a relaxed position to an engaged position, the internal threads of the collet ring having a generally cylindrical configuration while in the relaxed position, and having a frusto-conical configuration while in the engaged position;
the lower shoulder of the collet ring being positioned to contact the housing lower shoulder as the tubular member stabs into the housing, with further downward movement of the tubular member causing the threaded section to slide on the internal threads of the collet ring with the slot means allowing the collet ring to expand outward and causing the collet ring upper shoulder to engage the housing upper shoulder; and
anti-rotation means in the housing for preventing rotation of the collet ring relative to the housing, enabling the tubular member to be removed from the housing by rotating the tubular member to unscrew the internal threads from the threaded section.

4,903,993
TIEBACK CONNECTOR WITH TWO POINT INTERFERENCE FIT
Norman Brammer, Fivie Turriff, Scotland, assignor to Vetco Gray Inc., Houston, Tex.
Filed Dec. 28, 1988, Ser. No. 291,187
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—24 **6 Claims**

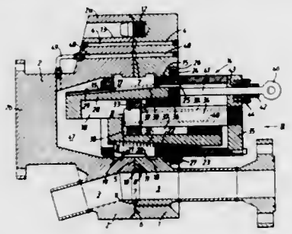


1. In a tieback connector for connecting a conductor to a subsea wellhead having an upward extending mandrel, the tieback connector having a tubular body from which depends a downward opening funnel, the improvement comprising:
mandrel upper and lower bearing surfaces formed on the mandrel, vertically spaced apart from each other, the mandrel lower bearing surface protruding outward from the mandrel;
a locking means carried by the funnel for securing the funnel to the mandrel without rotation of the funnel; and
funnel upper and lower bearing surfaces formed in the funnel and dimensioned to frictionally engage the mandrel upper and lower bearing surfaces, respectively, when the locking means secures the funnel to the mandrel.

4,903,994
CONNECTORS
Norman Buckley, Aberdeen, Scotland, assignor to Hunting Oilfield Services Limited, Scotland
Filed Nov. 7, 1988, Ser. No. 268,182
Claims priority, application United Kingdom, Nov. 17, 1987, 8726879
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—26 **18 Claims**

1. A connector assembly for connecting together fluid-carrying lines, comprising two hubs, each hub having an end face, at least one bore for fluid extending through each said hub and opening into the end face thereof, and an opening in each said end face for clamping means, said bores and openings being alignable when said hub end faces are juxtaposed, the clamping

means comprising a clamp body associated with said opening in one of said hubs, a plurality of clamping members carried by said clamp body and movable relative to said clamp body between retracted, inoperative positions and extended, operative positions, an operating member movable in an axial direction relative to said clamp body, said operating member comprising a plurality of planar surface portions inclined relative to said axial direction of movement of said operating member,



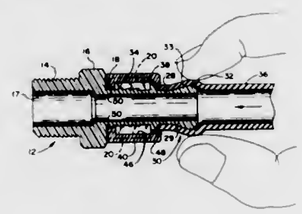
each said clamping member being associated with a respective planar surface portion and having an inner face arranged to slide over said respective surface portion upon relative movement of said operating member and said clamp body to move said clamping members from their inoperative to their operative positions, said clamping members being adapted in their operative positions to engage at least said other hub to clamp said hubs together when said openings and bores in said hubs are aligned and said end faces thereof are juxtaposed.

4,903,995

SELF-TIGHTENING SOFT TUBING FITTING AND METHOD OF USE

Brian J. Blenkush, Maple Grove, and Blaine C. Sturm, Anoka, both of Minn., assignors to Colder Products Company, St. Paul, Minn.

Filed Sep. 30, 1988, Ser. No. 252,254
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—38 **42 Claims**



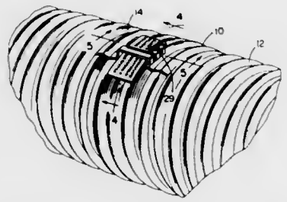
1. An improved fitting for use with soft tubing, comprising:
a body section defining an axially extending passage therein;
stem means adapted for receiving a section of soft tubing over at least a portion thereof, said stem means extending axially from said body section and having a passage defined therein which is in communication with said body section passage;
radially extending flange means at an end of said stem means that is distal from said body section and adapted for sealing against an inner wall of the tubing;
sleeve means mounted for sliding movement on said stem means and having an annular contact surface defined thereon adapted for sealing against an outer wall of the tubing;
the radial distance between said flange means and the contact surface of said sleeve means being less than the thickness of the soft tubing;
stop means intermediate of the radially extending flange means and the body section for limiting axial movement of the sleeve means toward the radially extending flange means; and
means for releasably locking said sleeve means with respect to said stem means, whereby a section of soft tubing may be tightly secured, in communication with said passages, between said sleeve means and said flange means.

4,903,996

FASTENER SYSTEM FOR PIPE COUPLING BANDS

Richard W. Herr, Miami, Fla., assignor to Man-O-War, Inc., Miami, Fla.

Filed Sep. 14, 1987, Ser. No. 95,857
Int. Cl.[4] F16L *21/06*
U.S. Cl. 285—39 **9 Claims**



1. A coupling band for circumferentially encircling a pair of adjacent pipe ends to form a pipe joint therebetween, the coupling band having adjustable fastener means at opposite ends of the band comprising an elongated tongue at one end of the band, a longitudinal array of first ratchet teeth provided on the tongue, a channel-shaped tongue receiver on the opposite end of the band, and a longitudinal array of second ratchet teeth in the receiver complementary to the first ratchet teeth, the respective ratchet teeth being configured to allow the tongue to be fed lengthwise through the receiver in a band-tightening direction and to hold the tongue against withdrawal from the receiver in a band-releasing direction, wherein the tongue has a leading end and a trailing end and wherein substantially only a trailing end portion of the tongue is secured to the coupling band at a location which is spaced from the respective end of the band whereby in securing the band around adjacent pipe ends, an end portion of the band under the tongue can be worked beneath an opposite end portion of the band under the receiver when the tongue is worked through the receiver.

4,903,997

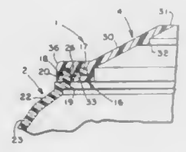
ROOF FLASHING

David E. Kifer, Parma, Ohio, assignor to Oatey Co., Cleveland, Ohio

Division of Ser. No. 102,272, Sep. 28, 1987, abandoned, which is a continuation of Ser. No. 606,194, May 2, 1984, abandoned, which is a division of Ser. No. 257,936, Apr. 27, 1981, Pat. No. 4,526,407. This application Mar. 21, 1989, Ser. No. 327,410
The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.
Int. Cl.[4] E04B *5/48*
U.S. Cl. 285—43 **9 Claims**

1. A roof flashing comprising a base member adapted to be secured to a roof, and a collar for establishing a weather-proof seal with an upstanding pipe passing through an opening in the roof, both said base member and collar being made of a plastic material, said base member having a truncated, generally conical dome portion with an opening at its apex and a radially inwardly extending flange portion surrounding said opening,

said flange portion having a plurality of circumferentially spaced slots therethrough and a radially outer surface, and said collar having a truncated, generally conical portion and a lower, generally radially outwardly extending annular connecting portion molded to said flange portion of said base member, said connecting portion having an upper portion overlying an upper surface of said flange portion, a radially



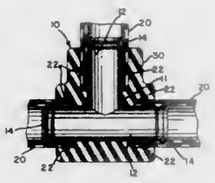
outer depending portion overlying said radially outer surface of said flange portion, a radially inner depending portion extending around a radially inner edge of said flange portion, and an intermediate depending portion radially between said radially inner and outer depending portions, said intermediate depending portion extending through said slots in said flange portion and radially underneath said flange portion.

4,903,998

BRANCHED HOSE CONSTRUCTION

John H. Stanley, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 31, 1988, Ser. No. 238,385
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—156 **1 Claim**



1. A branched hose construction comprising:
an insert, the insert having at least three legs and being devoid of annular shoulders or flanges adjacent the intersection of the legs; each leg having a lip;
a plurality of hoses, the number of hoses being equal to the number of legs, each hose having one end fitted over a leg of the insert less than the total length of the leg;
metallic annular straps, one strap associated with each leg, the metallic straps crimped to apply compressive force to the outer perimeter of the hoses and to press the hoses against their respective legs; and
a molded saddle encapsulating the insert and the junctions of its legs with the hoses, including the annular end surface of each hose, the saddle also encapsulating each of the metallic annular straps.

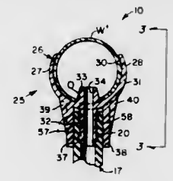
4,903,999

CLAMP FOR SECURING A FLEXIBLE HOSE TO A WATER PIPE FOR POULTRY, SMALL ANIMALS AND LIKE WATERING SYSTEMS

Frederick W. Steudler, Jr., New Providence, Pa., assignor to Val Products, Inc., Bird-in-Hand, Pa.

Filed Mar. 7, 1989, Ser. No. 320,181
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—197 **15 Claims**

1. A clamp for securing a flexible watering tube to a water pipe comprising a body having a generally U-shaped saddle adapted to embrace the exterior of a water pipe, a tubular stem projecting in a direction away from an outer surface of said saddle, a passage in said tubular stem opening through an inner surface of said saddle, means projecting from an exterior surface of said tubular stem for gripping an interior surface of a flexible watering tube which is in exterior telescopic relationship to said tubular stem, at least one resilient leg circumscribing less than the total circumference of said tubular stem which is integral with and projects from said saddle outer surface in adjacent spaced relationship to said tubular stem thereby defining a gap for receipt of a flexible watering tube, and second projecting means and an inner surface of said one projecting leg defining a predetermined distance less than the wall thickness of a flexible watering tube sandwiched therebetween in external telescopic relationship to said tubular stem whereby the resilience of said one leg effects radial outward deflection during watering tube insertion upon said tubular stem and creates a radially inwardly directed clamping force against the inserted watering tube to clamp the inserted watering tube in the aforesaid sandwiched relationship.

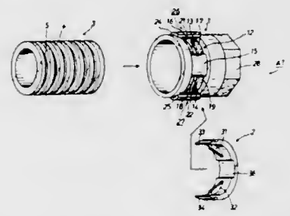


4,904,000

CONNECTION FITTING FOR A CORRUGATED TUBE

Kazuhiro Matsui, Toyoake, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Continuation of Ser. No. 183,240, Apr. 19, 1988, abandoned. This application Jul. 13, 1989, Ser. No. 379,661
Claims priority, application Japan, Apr. 28, 1987, 62-64296
Int. Cl.[4] F16L *33/00*
U.S. Cl. 285—305 **6 Claims**



1. A connection fitting for a corrugated tube comprising:
a cylindrical housing for receiving an end of the corrugated tube, said housing having
a sunken portion formed on a side surface of the housing, the sunken portion having a circumferential width of about half a circumference of the cylindrical housing,
a slit divided into two slit portions by a wall element provided in the sunken portion, the wall element having a wall element surface, the two slit portions running circumferentially at a bottom of the sunken portion and
a pair of covering elements formed at opposite sides of said slit portions; and
a U-shaped locking element received within the sunken portion for fixing the corrugated tube, said locking element having

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an inner peripheral surface with a rib projecting from the inner peripheral surface of the locking element and divided into two rib portions by a recess in the locking element inner peripheral surface, the two rib portions corresponding to the two slit portions, such that the rib fits into the slit, the rib having a width slightly smaller than a width of the slit in the cylindrical housing for receiving the rib within the slit, the recess corresponding in size to and receiving the wall element such that substantially the entire wall element surface is in contact with the recess, and a pair of hooklike elements for positively engaging with the covering elements.

4,904,001

FLUID COUPLING

Takeya Sasa; Yoshikazu Kobayashi, and Reichi Makishima, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

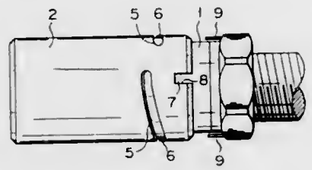
Filed Nov. 8, 1988, Ser. No. 268,721

Claims priority, application Japan, Nov. 10, 1987, 62-171802[U]

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.⁴ F16L *37/22*

U.S. Cl. 285—316 **5 Claims**



1. A fluid coupling comprising:

a coupling body having first and second end portions, an axial through hole, and a cylindrical outer peripheral surface arranged on the first end portion side, said through hole including a pipe insertion portion arranged on the first end portion side and a fluid passage portion arranged on the second end portion side;

clamp means for radially and inwardly clamping, with a circumferentially uniform force, an outer peripheral surface of an end portion of a pipe inserted in the pipe insertion portion, said clamp means being axially immovable with respect to the pipe;

a sleeve having first and second end portions and engaging means, and slidably mounted on the cylindrical outer peripheral surface of the coupling body, said engaging means being capable of moving the clamp means toward the second end portion of the coupling body;

a spiral guide groove formed on one of the sleeve or the outer peripheral surface of the coupling body, both ends of said spiral guide groove being closed;

a pin member formed on the other of the sleeve or the outer peripheral surface of the coupling body and slidable along the guide groove;

rotation preventing means for engaging a plate like resilient stopper member with an engaging surface after said stopper member has run onto the second end portion of said sleeve at a position where the sleeve is moved for a predetermined distance from the first end portion of the coupling body to the second end portion as the pin member is guided along the guide groove, thereby preventing the sleeve and the coupling body from rotating further relative to each other at said position.

4,904,002

FLUID COUPLING

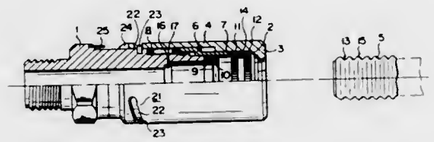
Takeya Sasa; Yoshikazu Kobayashi, and Reichi Makishima, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,703

Claims priority, application Japan, Nov. 10, 1987, 62-171800

Int. Cl.⁴ F16L *37/22*

U.S. Cl. 285—316 **11 Claims**



1. A fluid coupling for a corrugated pipe, comprising:

a coupling body including a front end portion, a rear end portion, an axial through hole, and a cylindrical outer peripheral surface adjacent to the front end portion, said through hole having a pipe insertion opening at the front end portion, adapted to receive an end portion of the corrugated pipe therein, and a fluid passage disposed at the rear end portion;

a metallic seal means arranged in said coupling body inward of said pipe insertion opening, for sealing an end of a corrugated pipe;

an internal sleeve having a front end portion and a rear end portion, and slidably mounted on the outer peripheral surface of the front end portion of said coupling body, said front end portion havaing a first tapered surface which converges toward the rear end portion, projecting axially outward from the front end portion of said coupling body;

ring-shaped engaging members adjoining said first tapered surface of said internal sleeve, and having inside diameters reducible to less than an outside diameter of top portions of the corrugated pipe;

a retaining means for retaining said engaging members at a predetermined position in the axial direction wherein the end portion of the corrugated pipe is pressed against said metallic seal means;

wherein said retaining means further comprises an external sleeve overlapped and slidably engaged with respect to said internal sleeve, said external sleeve having a corrugated pipe insertion opening in its center, and an annular projecting portion at one end thereof in opposing relationship to said first tapered surface of said internal sleeve, and said annular projection portion having a second tapered surface converging toward said front end portion, said engaging members being disposed between said first and second tapered surfaces so that said first and second tapered surfaces cooperate to press said ring-shaped engaging means radially inwardly into a root portion of the corrugated pipe inserted into said pipe insertion opening when said external sleeve is moved toward the rear end portion of said body.

4,904,003

LATCH DEVICE FOR INCLINABLE BACK REST CUSHION MOUNTED IN SEATBACK

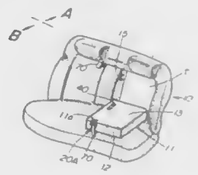
Hiroshi Yamazaki; Toshiyuki Hara, both of Yokohama; Yuji Tanaka, and Takayuki Mouri, both of Ayase, all of Japan, assignors to Ikeda Bussan Co., Ltd., Ayase and Ohi Seisakusho Co., Ltd., Yokohama, both of, Japan

Filed Jan. 20, 1988, Ser. No. 146,066

Claims priority, application Japan, Jan. 23, 1987, 62-8522; Apr. 30, 1987, 62-65887

Int. Cl.⁴ B60N *1/10*

U.S. Cl. 292—126 **21 Claims**



1. In a seatback which is provided, in a tunnel thereof, with an inclinable back rest cushion,

a latch device for latching said back rest cushion to said seatback when said cushion is snugly received in said tunnel, which comprises:

a striker secured to said seatback;

a latch member pivotally mounted in said back rest cushion in a manner to latchingly engage with said striker upon said cushion being received in said tunnel;

first means for biasing said latch member in a direction to achieve the latched engagement between said latch member and said striker;

an actuation member pivotally mounted in said back rest cushion in a manner to push and pivot said latch member in a releasing direction to cancel the latched engagement between said latch member and said striker when pivoted in a give direction;

second means for interrupting said actuation member from pivoting in said releasing direction, said second means including a stopper pin which is projectable into a travelling way of said actuation member, a pivoting lever pivotally mounted in said back rest cushion and having one end pivotally connected to said stopper pin, and an elongated rod having one end pivotally connected to the other end of said pivoting lever, said elongate rod having the other end which is exposed to the outside of said back rest cushion through an opening formed in a back portion of said back rest cushion;

a base member secured to a rigid portion of said back rest cushion and having an opening through which said pin portion passes; and

third means for manually actuating said second means form a back side of said back rest cushion.

4,904,004

MODULAR STRUCTURAL LATCH

Andrzej Bartczak, Markham, Canada, assignor to Magna International Inc., Markham, Canada

Filed Mar. 29, 1988, Ser. No. 174,942

Claims priority, application Canada, Mar. 30, 1987, 533372

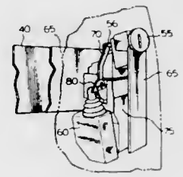
Int. Cl.⁴ E05C *3/26*

U.S. Cl. 292—216 **69 Claims**

1. An integrated structural latch for vehicle doors comprising a structural latching module and a non-structural actuating module;

the structural latching module comprising a metal plate having an opening therethrough and having metal latching means secured thereto adjacent the opening, the latching means for engaging a striker passing through the opening, the striker disposed adjacent one end of a vehicle door;

the non-structural actuating module being secured to the structural latching module and comprising a housing having an opening therethrough aligned in use with the opening through the structural latching module, the non-



structural actuating module having disposed therewith actuation means for engaging and disengaging the latching means of the structural latching module in use;

whereby the structural latching module and the non-structural actuating module are assembled and when assembled, provide an integrated structural latch.

4,904,005

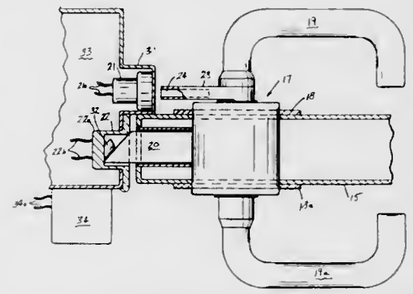
ENTRANCE SECURITY SYSTEM

George Frolov, Farmington, Conn., assignor to Harrow Products, Inc., Grand Rapids, Mich.

Filed Nov. 18, 1988, Ser. No. 272,992

Int. Cl.⁴ E05C *17/56*

U.S. Cl. 292—251.5 **18 Claims**



1. A door security system where there is means defining a door entryway and a door pivotally attached to one said of said defining means, said door closing on the other side of said entryway and having a latch bolt extending into a keeper in said defining means, said latch bolt being movable between a latched and an unlatched position with respect to said keeper, an electromagnetic lock for securing said door in said entryway when said electromagnetic lock is energized, said electromagnetic lock comprising an electromagnet mounted to one of said door and said entryway and an attractable armature on the other of said door and entryway, a first handle on one side of said door positionable between first and second positions for actuating said latch bolt between latching and unlatching states, a first switch responsive to the position of said first handle being between first and second positions to latch or unlatch said latch bolt and to cause said first switch to move between open and closed states, a second handle on the other side of said door independent of said first handle for actuating said latch bolt, a second switch in said door entryway defining means being normally open when said latch bolt is in latching position but closed when said latch bolt is retracted, a third

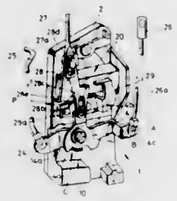
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normally closed switch operable by an authorized entry device, said switches being in series and arranged to complete an electrical circuit to said electromagnet when all switches are closed.

4,904,006
DOOR LOCK ASSEMBLY FOR AUTOMOTIVE VEHICLES

Shigeru Hayakawa, Chiryu; Ryoichi Fukumoto, Nagoya, and Nozomu Torii, Hekinan, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 1, 1987, Ser. No. 103,458
Claims priority, application Japan, Oct. 6, 1986, 61-237690; Oct. 6, 1986, 61-237691; Apr. 30, 1987, 62-107542
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—336.3 **14 Claims**

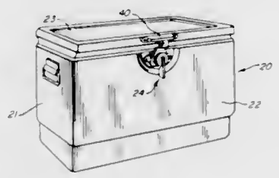


1. A door lock assembly comprising:
a door lock operating unit having a locking arm, and
an actuator for driving said locking arm to a locked position and an unlocked position, said actuator including:
an operating lever which rocks together with said locking arm;
a neutral position restoration lever which, when in a neutral position, is in a state non-engagable with said operating lever and, when displaced from the neutral position, drives said operating lever to the locked position and unlocked position;
an output member which makes contact with and separates from said neutral position restoration lever for driving said neutral position restoration lever to the locked position and unlocked position; and
a motor for driving said output member.

4,904,007
RELEASING LATCH ASSEMBLY FOR PICNIC COOLERS

David D. Woodruff, Wichita, Kans., assignor to Coleman Outdoor Products, Inc., Wichita, Kans.

Filed Apr. 7, 1989, Ser. No. 335,049
Int. Cl.[4] E05C *19/02*
U.S. Cl. 292—341.15 **10 Claims**

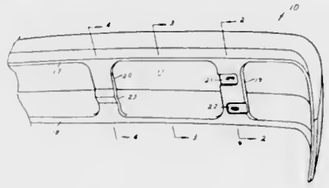


1. A safety latch assembly for a cooler having a container body and a lid, the safety latch assembly including a handle mounted on the lid and being provided with a recess which opens toward the lid and which is closed by the lid when the handle is mounted on the lid,
a flexible and resilient latch spring position within the recess in the handle and being retained within the handle by the lid, the latch spring including a mounting portion which is slidably positioned within the recess of the handle before the handle is mounted on the lid and a strike portion which extends downwardly from the mounting portion and the handle.

4,904,008
MOLDED ONE-PIECE BUMPER

Patrick M. Glance, Plymouth, Mich., assignor to Concept Analysis Corporation, Plymouth, Mich.

Filed Sep. 2, 1986, Ser. No. 902,690
Int. Cl.[4] B62D *35/00*
U.S. Cl. 293—120 **4 Claims**

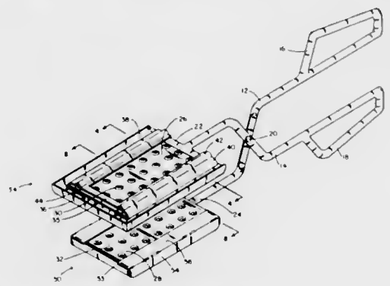


1. An elongated normally horizontal bumper injection molded in one piece from a moldable plastic material, and having a generally C-shaped frontal shell with upper and lower rear edges and a hollow interior, wherein the improvement comprises:
relatively narrow isolated vertical strips integrally molded in the bumper and interconnecting the upper and lower rear edges of said frontal shell, certain of said strips forming mounting surfaces for attachment to support members, and at least one other of said strips being interposed between said certain strips said other strip having an accordion-like off-set portion that provides for vertical elongation of the other strip under tension as said other strip is pulled toward a straight-line configuration on rearward deflection of said frontal shell.

4,904,009
FOOD HANDLING TONGS

Kent W. Kozlinski, Box 71, Cadogan, Alberta, Canada (T0B 0T0)

Filed Sep. 30, 1988, Ser. No. 251,242
Int. Cl.[4] A47J *43/28*
U.S. Cl. 294—7 **5 Claims**

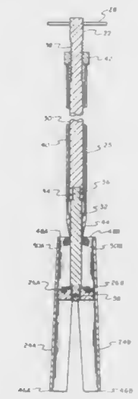


1. Food handling tongs, comprising:
a pair of pivotally connected stem members;
a handle portion adjacent a first end of each of said stem members;
a food contact plate attached adjacent a second end of each of said stem members;
said food contact plates movable between opened and closed positions by manual manipulation of said handle portions;
each of said food contact plates provided with a plurality of apertures, each of said apertures surrounded by an outwardly facing frusto conical rim;
and a selectively removable drip pan attachment on each of said food contact plates.

4,904,010
GRIPPING TOOL

Richard J. Lacey, 187 Hwy. 28 East, and Robert L. Carribou, Box 48, both of Farson, Wyo. 82932

Filed Aug. 23, 1988, Ser. No. 235,195
Int. Cl.[4] B25B *27/14*; B25J *15/08*
U.S. Cl. 294—19.1 **8 Claims**



1. A gripping tool comprising:
an elongate support shaft;
a first gripping jaw having a first end and a second end, said first gripping jaw being pivotedly mounted to said support shaft at a location midway between said first and second ends, said second end being fitted with a rotatably mounted roller;
a second gripping jaw having a third and a fourth end, said second gripping jaw being pivotedly mounted to said support shaft at a location midway between said third end and said fourth end, and said fourth end being fitted with a rotatably mounted roller; said first and third ends being spacedly mounted opposite from one another to define an opening therebetween;
a wedge-shaped engagement member slidably mounted on said support shaft to be slidably displaceable along a length thereof, said engagement member being positionable in abutment against said second and fourth ends to urge said second and fourth ends outwardly away from said support shaft, thereby urging said first and third ends into said opening to retainingly engage an object positioned within said opening;
said engagement member having a female threaded socket mounted on an end thereof; and
a male threaded extension mounted on an end of said support shaft, said extension being in threaded engagement with said socket, said engagement member being reciprocably displaceable along a length of said extension.

4,904,011
SHOVEL AND METHOD OF MAKING THE SAME

Ernest D. Hawk, 7463 Canyon Dr., Yucca Valley, Calif. 92284

Filed Jun. 2, 1988, Ser. No. 201,604
Int. Cl.[4] A01B *1/22*; B25G *3/02*
U.S. Cl. 294—49 **6 Claims**



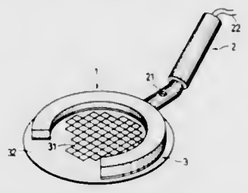
1. A shovel, which comprises:
(a) an elongate handle having a lower end,
(b) a generally T-shaped handle-retaining member mounted on said lower end of said handle,
said handle-retaining member having a generally tubular central body portion secured over said lower end of said handle in concentric coaxial relationship relative thereto, said central body portion having a lower end,
said handle-retaining member also having a generally tubular portion connected to said lower end of said central body portion in substantially right-angle relationship to said central body portion,
said last-named tubular portion having opposite end portions which project laterally substantially equal distances from said lower end of said central body portion, thereby forming lateral projections,
each of said lateral projections having an outer end,
(c) a first side member having an upper arm portion and a lower arm portion,
said upper arm portion having an upper end, said upper end of said upper arm portion being connected fixedly to said outer end of one of said lateral projections,
(d) a second side member having an upper arm portion and a lower arm portion,
said upper arm portion of said second side member having an upper end,
said upper end of said upper arm portion of said second side member being connected fixedly to said outer end of the other of said lateral projections, and
(e) a shovel blade having generally parallel side edges that connect to said lower arm portions of said first and second side members,
said blade having lower edge portions remote from said side members and adapted to cut into the earth,
said blade also having an upper edge adapted to be engaged by the foot of the operator to force said lower edge portions into the earth, said first and second side members being sufficiently large that said lateral projections and said central body portion of said handle-retaining member are spaced away from said upper edge of said blade a distance sufficient that the foot of the operator may be disposed therebetween,
said first and second side members being spaced from each other a distance sufficient that said foot of said operator may be disposed therebetween,
whereby said operator may place his foot on said upper edge of said blade between said side members and below said handle-retaining member to press said blade into the earth.

4,904,012

SUCTION DEVICE

Masanori Nishiguchi, and Takeshi Sekiguchi, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 123,788, Nov. 23, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 293,614
Claims priority, application Japan, Nov. 26, 1986, 61-181596
Int. Cl.[4] B25J *15/06*
U.S. Cl. 294—64.1 **5 Claims**



1. A suction device for handling a semiconductor wafer having a surface including a central processed region and a peripheral unprocessed region, said suction device comprising:
a handling section having upper and lower surfaces, a plurality of suction ports defined through said lower surface so as to define a substantially arc-shaped suction port configuration, said handling section being sized and said suction ports being disposed so that when said lower surface of said handling section is placed in facing relation to and in operative contact with a surface of a semiconductor wafer, said suction ports are in facing relation to an unprocessed peripheral portion of the wafer and said handling section is free from operative contact with a processed portion of the semiconductor wafer;
a pressure reduction means operatively coupled to said suction ports for producing a negative pressure;
means for releasing said negative pressure produced by said pressure reduction means; and
a grip element coupled to said handling section.

4,904,013

MOVABLE SUN VISOR

Jean C. Canadas, Remiremont, France, assignor to Rockwell-Cim Societe Anonyme, Rupt-sur-Moselle, France

Filed May 5, 1989, Ser. No. 348,563
Claims priority, application France, May 5, 1988, 88 06056
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.4 **14 Claims**



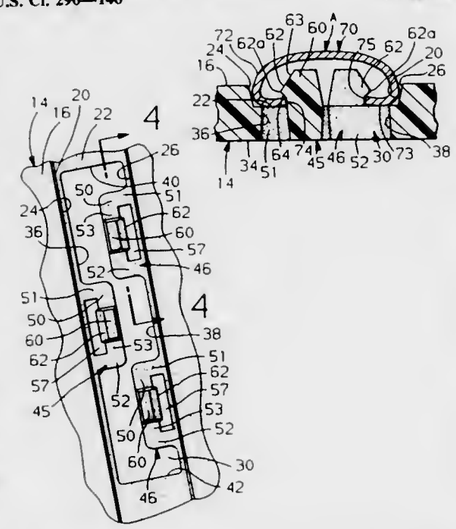
1. A movable sun visor consisting of a sun visor body, which is supported in a carriage in lateral side guide curves via a rear pair of bearing points which are oppositely formed at the lateral edges in the area of a rear edge of the sun visor body, and a front pair of bearing points, which are oppositely formed at the lateral edges between the rear pair of bearing points and a front edge of the sun visor body, there being two equal guide curves for the front pair of bearing points which differ in the pattern of curvature of and being longer than two equal guide curves which are provided for the rear pair of bearing points, and the first pair of guide curves (A) for the front pair of bearing points follows an S-shaped course with a convex curvature in a first set of path segments (A0, A1 and A2), and a concave curvature in a second set of path segments (A3, A4, A5 and A6), and the second pair of the guide curves (B) for the rear pair of bearing points has a convex curvature over the entire length of the curve, wherein the greatest curvature of the guide curve (B) for the rear pair of bearing points is formed in a set of path segments (B3, B4, B5 and B6), which correspond to the second set of path segments (A3, A4, A5 and A6) on the guide curve (A) for the front pair of bearing points.

4,904,014

DECORATIVE TRIM MOLDING ASSEMBLY

Stephen J. Azarovitz, Clawson; John F. Rosenberg, Grosse Pointe Woods, and Leonard R. Skupinski, Livonia, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1988, Ser. No. 240,039
Int. Cl.[4] B60J *1/00*
U.S. Cl. 296—146 **5 Claims**



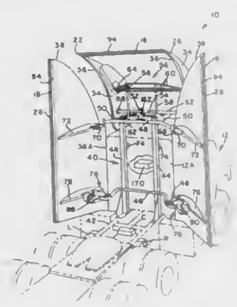
1. In combination, a reveal plastic panel for an automotive vehicle, a generally C-shaped decorative reveal molding having curled end portions whose interior surfaces face towards each other, said end portions terminating in free ends which are spaced from each other a predetermined distance to define a slot extending longitudinally of the molding, and means for snap fittingly attaching and retaining said reveal molding onto said panel, the improvement being that said panel has front and back sides, said front side of said panel having a longitudinally extending recess which is defined by a bottom surface and first and second laterally spaced side surfaces, said panel having a plurality of longitudinally spaced slots therethrough extending from the bottom surface of said recess to the back side thereof, said panel having first and second fasteners formed integral therewith and located within said slots at longitudinally spaced locations, said fasteners comprising a base portion integral with an adjacent side wall of said panel defining said slot and lying within said slot said fasteners further comprising a barbed projection integral with said base portion at a location remote from said side wall defining said slot, said barbed projections extending transversely of said base portion and slot toward said front side of the panel and being located above the plane of said bottom surface of said recess in said panel, said projections having upper and lower tapered surfaces which converge towards each other to define a barb having an apex facing toward one of said side surfaces of said recess, but being spaced therefrom, said apices of said first and second fasteners when the latter are in a free state position free of any externally imposed forces lying in spaced parallel planes and with the perpendicular distance between the planes being greater than said predetermined distance between said free ends of said C-shaped reveal molding, said molding being attachable to said panel by force fitting said curled end portions of said molding over said barbed projections and with the projections of said first and second fasteners being deflectable from their free state position towards each other as the curled ends are moved into engagement with said projections until said ends of said curled end portions pass over said barbs whereupon said projections will return back toward their free state position to biasingly retain said curled end portions against the bottom surface of said recess and toward engagement with the side surfaces of said recess to retain said molding in place on said panel.

4,904,015

AIR DEFLECTION SYSTEM

Edwin L. Haines, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 11, 1988, Ser. No. 230,939
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—180.3 **27 Claims**



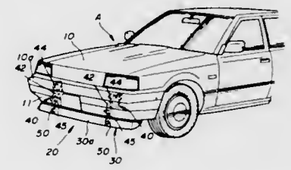
1. An air deflector system for use with a drive vehicle coupled together in tandem towing relationship with a trailer, the drive vehicle having a frame and a cab portion mounted upon said frame, said air deflector system comprising:
(a) a mounting frame attached to the frame of the drive vehicle;
(b) a top fairing movably attached to said mounting means having an outer surface adjacent to a top portion of the cab and extending rearwardly toward said trailer for aerodynamically blending the top portion of the cab with a top portion of the trailer;
(c) two side fairings movably attached to said mounting frame, one on each side of the drive vehicle, each extending from the drive vehicle rearwardly towards the trailer and having a top portion which mates with the top fairing; and wherein said top and side fairings move during the operation of the vehicle.

4,904,016

FRONT SPOILER ARRANGEMENT

Hisato Tatsumi; Kunio Sakai; Yukio Hamanoue, all of Yokohama, and Satoshi Ishizuka, Zama, all of Japan, assignors to Nissan Motor Co., Ltd. and Ohi Seisakusho Co., Ltd., both of Yokohama, Japan

Filed May 14, 1987, Ser. No. 49,486
Claims priority, application Japan, May 16, 1986, 61-112177
Int. Cl.[4] B62D *37/02*
U.S. Cl. 296—180.5 **18 Claims**



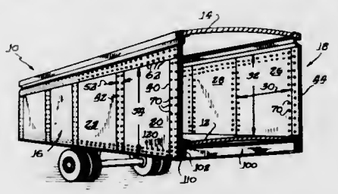
1. A front spoiler arrangement for an automotive vehicle, comprising:
a spoiler fin movably disposed at front end section lower part of a body of the vehicle and extending generally in direction of width of the vehicle body, said spoiler fin selectively movable to an operative position and an inoperative position;
a plurality of swingable arms each of which has a first end section and a second end section, said second end section connected to said spoiler fin, each swingable arm being swingable and selectively taking first and second positions which correspond respectively to the operative and inoperative positions of the spoiler fin;
a plurality of drive mechanisms each of which includes a rotatable drive shaft to which said swingable arm first end section is securely connected, and means for rotating said drive shaft to cause said swingable arm to selectively take first and second positions; and
a plurality of elastic members each of which is interposed between said rotatable drive shaft and said swingable arm first end section so that said swingable arm is elastically mounted on said rotatable drive shaft each of said elastic members providing sufficient elasticity to enable lateral movement of said swingable arm proximate thereto to compensate for misalignment of said shafts.

4,904,017

TRAILER CONSTRUCTION

Rodney P. Ehrlich, Monon, Ind., assignor to Monon Corporation, Monon, Ind.

Filed Feb. 26, 1985, Ser. No. 705,609
Int. Cl.[4] B62D *27/02*
U.S. Cl. 296—181 **15 Claims**



1. A trailer body construction comprising a floor, a roof, and a pair of sidewalls, wherein each of said sidewalls comprises a plurality of similar, generally flat rectilinear side panels of lightweight metallic material of a predetermined thickness, width and height aligned side-by-side in contiguous abutting relation, and a plurality of joining panels of second lightweight

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metallic material situated only on one surface of each sidewall for joining and strengthening respective adjacent pairs of said side panels; each said joining panel including at least a relatively flat rectilinear plate-like joining portion of a thickness of about the thickness of said side panels, of a with equal to a minor fractional portion of the width of said side panels, and of a height equal to a major fractional portion of the height of said side panels; and a plurality of fasteners for coupling said joining panels to respective adjacent pairs of said side panels to both join and strengthen said side panel.

4,904,018
ALL-TERRAIN FOLDABLE SEAT
Noah W. Young, R.R. 2, Box 823, Monrovia, Ind. 46157
Filed Oct. 20, 1988, Ser. No. 260,123
Int. Cl.[4] A47C *9/10*
U.S. Cl. 297—4 **15 Claims**



1. A foldable seat device, comprising, in combination:
a flexible seat;
a first leg means providing diagonally extending support legs along both sides of the device, and rigidly interconnected by a rear transverse upper support bar, the support legs extending from a rearward upper end to a forward downward end providing a front support leg engagement of the ground;
a second leg means providing diagonally extending supportive upper legs along both sides of the device, and rigidly interconnected by a forward transverse upper support bar, the supportive upper legs extending from a forward upper end to a lower end, there being pivot means, at each side of the device, pivotally connecting the lower end of each respective one of the said supportive upper legs to a generally central portion of the respective support leg of the first leg means;
and the said second leg means also providing diagonally extending supportive lower legs, along both sides of the device, the said supportive lower legs at their lower ends providing rear support leg engagement of the ground;
there being a supportive connection connecting the upper portion of the said supportive lower legs of the said second leg means to the respective support legs of the said first leg means, said supportive connection being at a location spaced from the said pivot means;
the respective supportive upper legs and the supportive lower legs of the second leg means being non-co-linear, and with the second leg means at each side of the device receiving force from the supportive upper legs of the second leg means by transmission of such force through a portion of the first leg means which is between the said pivot means and the said supportive connection.

4,904,019
THREE-WAY RECLINER
Teddy J. May, Tupelo, Miss., assignor to Super Sagless Corporatioo, Tupelo, Miss.
Filed Oct. 1, 1987, Ser. No. 103,886
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—85 **13 Claims**



1. A three-position reclining chair having a base, a seat and arms assembly, a backrest, and a mechanism on each side of the base for supporting the assembly and backrest on the base for movement between upright, TV and reclining positions, each of said mechanisms comprising
a base plate,
a roller link movable fore and aft on the base plate between front and rear extreme positions,
front and rear pivot links pivotally mounted on the roller link and carrying a support link above the roller link for swinging movement therewith,
a pair of swing links extending downwardly from the support link and carrying a seat mounting link for fore and aft swinging motion with respect to the support link,
a backrest mounting link pivotally connected to the seat mounting link and carrying the backrest,
handle operated actuating means mounted on the seat mounting link for pivoting the pivot links to initiate movement of the support link to move the seat and backrest from the upright to the TV position without moving the swing links relative to the support links,
means forming part of the mechanism and responsive to backwardly directed pressure on the backrest when the chair is in the TV position to move the set backrest to the fully reclined position,
and roller link actuating means connected to the roller link and one of the swing links for moving the roller link to an intermediate position between the extreme positions in response to movement of said one swing link with the support link when the seat and backrest move to the TV position and to move the roller link to the forwardmost position in response to swing motion of said swing link when the seat and backrest move from the TV position to the fully reclined position.

4,904,020
CHAIR COMPRISING A SEAT, A BACK AND A FRAME
Basse Hollesen, Rungsted Kyst, Denmark, assignor to Danaction Consult-Invest A/S, Rungsted Kyst, Denmark
PCT No. PCT/DK88/00002, § 371 Date Aug. 26, 1988, § 102(e) Date Aug. 26, 1988, PCT Pub. No. WO88/04902, PCT Pub. Date Jul. 14, 1988
PCT Filed Jan. 7, 1988, Ser. No. 238,343
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—317 **1 Claim**

1. Chair comprising a seat and a back and a frame, wherein said seat is guided with respect to the frame by means of a foremost pair of guideways and a rearmost pair of guideways into which pins connected with the seat extend, and wherein said back is guided with respect to the frame by a pair of guideways into which pins connected with said back extend, all of said guideways having a shape such that the angular position of the seat with respect to the frame is readjustable from a first position to a more rearwardly inclined second position, and that the angular position of the back with respect to the frame is readjustable from a first position and to a more rearwardly inclined second position, whereby said seat and said back in their said second positions form an angle with each other which is greater than the angle which they form with each other in their said first positions, and wherein said back is pivotally connected with the seat at a distance from the rear



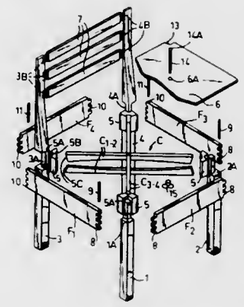
edge of said seat; wherein said pivot connection between said back and said seat comprises rigid hinge parts, one end of which being fixedly extending forwardly connected with said back and below said seat and the other end of which being pivotally connected with said seat forwardly of the rear edge, said hinge parts, adapted so as to maintain said back lifted in said first position of said back, each of said guideways comprising an insert with a guiding groove for receiving said seat and back pins, said inserts being inserted into said frame with the guiding grooves of the inserts of each pair of guideways facing each other.

4,904,021
LEANING SUPPORT FOR A VEHICLE SEAT BACK
Edith R. Clemmer, 2021 Fairhill, Fort Wayne, Ind. 46808
Filed Nov. 7, 1988, Ser. No. 268,375
Int. Cl.[4] A47C *1/10*
U.S. Cl. 297—397 **19 Claims**



1. In combination with a backrest of a seat having an occupant supporting surface, a vertical elongated column contiguous with the occupant supporting surface of the backrest to provide a lateral support upon which a person may lean while occupying the seat, said column having a soft, resilient, outer body that frictionally grips the surface of the backrest to resist sliding of the column relative to the backrest when lateral force is applied to the column, the column further comprising a deformable, malleable inner core extending within said column, said inner core being covered by said outer body, the column further comprising an upper edge and back, the upper portion of said column being bent inwardly over the edge and back of said backrest whereby said backrest provides support to hold said column in its vertical position.

4,904,022
FURNITURE STRUCTURE WITH ARCH STIFFENERS EXERTING THRUST ON THE JOINTS
Massimo Morozzi, Milan, Italy, assignor to Giorgetti S.P.A., Meda, Italy
Filed Aug. 31, 1988, Ser. No. 239,216
Claims priority, application Italy, Sep. 4, 1987, 21803 A/87
Int. Cl.[4] A47C *7/00*
U.S. Cl. 297—440 **12 Claims**



1. A furniture structure with sectional elements, comprising a plurality of individual elements equipped with bearing fixings and hinges for connecting to one another, said elements being assembled in an intended bearing position and the structure being stiffened for use by means of a spider comprising a pair of opposed arches having oppositely inclined ends, which ends exert a thrust action on wedge-shaped supports, these supports in turn acting against said hinges and thrusting them outwards, under the action of a tie member which tends to bring the arches of the spider nearer to each other and consequently to force the inclined ends into respective seats formed by said wedge-shaped supports.

4,904,023
FORCE-LIMITING ENERGY ABSORBER FOR SAFETY BELT SYSTEMS
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany
Filed Jun. 3, 1988, Ser. No. 202,803
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723772
Int. Cl.[4] A62B *35/04*
U.S. Cl. 297—472 **12 Claims**



4. A force-limiting energy absorber for a safety belt system comprising two end fittings and a plurality of stretch members which are connected in series between said end fittings, each stretch member comprising a border portion defining an opening and being deformable under tensile load, said border portion having an inner wall, and a pair of limiting elements projecting into said opening from opposite sides of said border portion in a direction transverse to the longitudinal direction of

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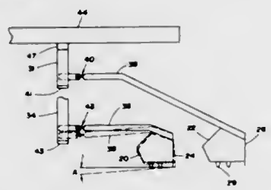
said series-connected stretch members, each of said limiting elements having a base portion connected to said inner wall of said border portion and a head portion which prior to deformation of said stretch members under tensile load is spaced from the head portion of the other of said pair of limiting elements and which, after said deformation, abuts the head portion of said other of said pair of limiting elements to limit under tensile stress the deformation of said deformable border portion in a direction transverse to the direction of the tensile stress.

4,904,024

ASPHALT PAVEMENT GRINDER ASSEMBLY

Patrick C. Wiley, #303, 35 - 2nd Ave. S., Williams Lake, B.C., Canada (V2G 3W3)

Filed Jun. 23, 1988, Ser. No. 210,660
Int. Cl.⁴ E02F *5/00*; E01C *23/12*
U.S. Cl. 299—39 **6 Claims**



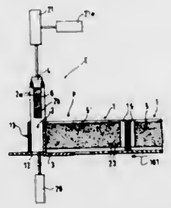
1. A grinding assembly for grinding asphaltic pavement attachable to a vehicle frame, comprising:
- a grinder having a plurality of protruberances the ends of which define a cylindrical grinder surface;
- a brace assembly affixed to said grinder;
- an adjustable brace coupling affixed to said frame, connectable to said brace assembly and adjustable so as to pivot said grinder to change an elevation of a bottom of said grinder surface relative to a lower edge of said blade
- wherein the bottom of said grinder surface defines a cutting depth of said grinder.

4,904,025

METHOD OF AND APPARATUS FOR SUPPLYING BATCHES OF BRISTLES TO MAGAZINES OF BRUSH MAKING MACHINES

Walter Steinebrunner, and Benno Dörflinger, both of Todtnau, Fed. Rep. of Germany, assignors to Anton Zahoransky, Todtnau, Fed. Rep. of Germany

Filed Oct. 5, 1988, Ser. No. 254,237
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1987, 3735329
Int. Cl.⁴ A46D *1/04*
U.S. Cl. 300—7 **35 Claims**



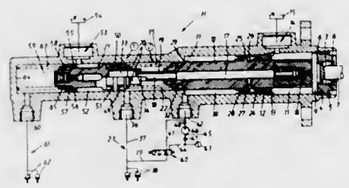
1. A method of supplying bristles to at least one bristle processing machine, comprising the steps of establishing and maintaining at least one supply of loose substantially parallel bristles; mechanically separating from the supply successive batches of bristles, including repeatedly introducing a separating tool into the supply of bristles to thus separate successive batches from the supply; aligning the bristles in the supply at least in the regions of introduction of the tool; and transporting the separated batches to the at least one processing machine.

4,904,026

BRAKE SYSTEM

Wolfgang Bernhardt, Korntal-Muenchingen, and Michael Tischer, Abstatt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 254,558
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734601
Int. Cl.⁴ B60T *13/16, 8/44, 17/00*
U.S. Cl. 303—10 **20 Claims**



1. A brake system comprising a master brake cylinder, a cylinder housing (1), a stepped bore (2) in said cylinder housing, a piston (10) in said stepped bore, a piston rod (7) acted upon on one end by a brake pedal, said piston rod contacts one end of said piston, a slide ring (12) surrounding said piston (10), a ring flange (25) on said piston, a variable annular chamber (26) surrounding said piston between said slide ring (12) and said ring flange, a fluid return pump; a compensation chamber (30) which surrounds said piston and communicates directly with a fluid outlet of said fluid return pump, a pressure chamber (22) acted on by said piston in said stepped bore, an outlet connection (36) from said pressure chamber to a brake line (37) in which said brake line leads to wheel brake cylinders of at least one brake circuit, said pressure chamber (22) communicates on one end with said annular chamber (26) and said brake line (37) communicates with a compensation chamber (30), the volumes of said pressure chamber (22) and said annular chamber (26) being variable relative to one another by a movement of said piston (10), and a fluid switching valve (40) connected with said brake line (37) between said pressure chamber (22) and said compensation chamber (30), by way of which in a second position valve fluid flow is blockable.

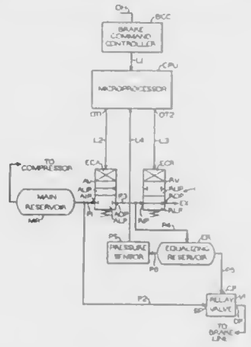
4,904,027

DIGITAL AIR BRAKE CONTROL SYSTEM

Elmer T. Skantar, East Pittsburgh, and Walter J. Sanders, Jeannette, both of Pa., assignors to American Standard Ioc., Wilmerding, Pa.

Filed Oct. 3, 1988, Ser. No. 252,941
Int. Cl.⁴ B60T *15/14, 13/68, 15/58*
U.S. Cl. 303—15 **18 Claims**

1. A digital air brake control system for railway vehicles comprising, means for initiating a desired brake demand signal, means responsive to the desired brake demand signal for providing timing and control signals, means including a pair of magnet valves conditioned by the timing and control signals for controlling the pressure of the brake line by monitoring the pressure in an equalizing reservoir, means for sensing the pressure in the equalizing reservoir and for providing a feedback signal to the timing and control means for calculating the difference between the desired brake command signal and the feedback signal to produce an error signal which causes the magnet valves of the pressure controlling means to be concurrently moved to opposite positions and then concurrently pulses the magnet valves in opposite positions with one of the magnet valves being decreasingly pulsed ON and alternately



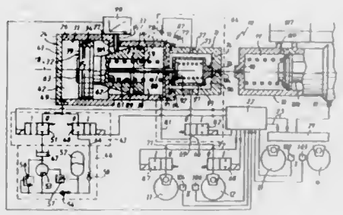
pulsed OFF until the pressure in the equalizing reservoir substantially coincides with that of the desired brake demand signal.

4,904,028

BRAKE PRESSURE SETTING DEVICE

Heinz Leiber, Oberriexingen, and Manfred Steiner, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Apr. 17, 1989, Ser. No. 339,122
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812831
Int. Cl.⁴ B60T *8/32, 8/40, 13/10*; G05D *13/00*
U.S. Cl. 303—110 **20 Claims**



1. Brake pressure setting device for automatic control of brake pressure change and brake pressure retention phases of an antilocking control system and a drive slip control system for stabilizing the dynamic behavior of the vehicle by acting on the wheel brakes of a road vehicle, comprising:
- wheel brakes means for two driven vehicle wheels which are combined into a static brake circuit;
- each of said wheel brakes means being operable to be shut off individually or jointly from a main brake pipe by means of a solenoid brake pressure control valve means;
- a solenoid connection control valve means switchable to shut off the main brake pipe from an outlet pressure space, associated with a static brake circuit of a main brake unit provided for brake pressure supply and operable by the driver;
- a pressure modulator unit designed as a stepped cylinder which has two housing steps of different diameters, within which, movable boundaries of a control pressure space and a modulation chamber are formed by diameter flanges of a modulator piston means corresponding to the two housing steps of different diameters;
- wherein the modulation chamber is a smaller diameter chamber than the control pressure space and is connected to the main brake pipe of the static brake circuit between the connection control valve means and the brake pressure control valves means;
- wherein there is a return spring urging the modulator piston means into an end position associated with a maximum volume of the modulation chamber;
- wherein function control valve means are provided to alternatively connect the control pressure space of the pressure modulator to a pressure outlet of an auxiliary pressure source or to a non-pressurized sump container for displacing the modulator piston for controlling brake pressure changes;
- a position indicator means for generating an electrical output signal, characteristic of the position of the modulator piston means;
- an electronic control means generating the output signals necessary for correct triggering of the connection control valve means, the function control valve means and the brake pressure control valve means by processing the output signals of the position indicator and output signals of wheel rotational speed sensors, which generate electrical output signals characteristic of the dynamic behavior of the vehicle wheels;
- wherein there is a mechanical controlled valve means connected between the outlet pressure space associated with the brake circuit of the driven vehicle wheels and the connection control valve means;
- a valve chamber connected to the modulation chamber of the pressure modulator via an outlet non-return valve which can be driven into its open position by higher pressure in the modulation chamber relative to a pressure in the valve chamber;
- said mechanically controlled valve is a displacement-controlled valve means having a valve body that is displaced in direction of a shut-off position for causing the outlet pressure space of the brake unit to be shut off relative to the valve chamber in response to displacement of the modulator piston means for reducing a volume of the modulation chamber from an intermediate position of the piston means corresponding to a volume of the modulation chamber of between 75% and 50% of its maximum volume;
- said mechanically controlled valve being designed as a pressure-controlled valve which, at least when the modulator piston means is located in the intermediate position or in a position corresponding to a larger volume of the modulation chamber, can be driven into an open position by pressure in the outlet pressure space of the main brake unit, which pressure is higher than pressure in the valve chamber;
- wherein upon an appearance of a locking tendency of the rear wheel brakes of the static brake circuit, the electronic control means generates output signals operating the antilocking control by displacing the modulator piston means into its intermediate position, subsequently switches the connection control valve means into its shut-off position, drives the brake pressure control valve means of a rear vehicle wheel brake not tending to lock into its shut-off position, and switches the function control valve means into a functional position causing pressure relief of the control pressure space;
- wherein, upon the appearance of a spin tendency on one of the driven vehicle wheels, the electronic control means generates an output signals by which drive slip control operation is controlled, so that: the function control valve means is driven into a functional position causing connection of the control pressure space to the pressure outlet of the auxiliary pressure source, the connection control valve means is driven into a shut-off position, and the brake pressure control valve means of a vehicle wheel not tending to spin is also driven into its shut-off position; and wherein
- in normal braking not subject to a control system, the con-

VOL 1111 ISS 4 FE 27 1990 UMI

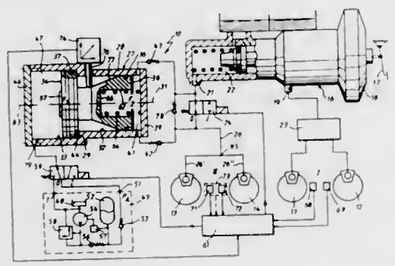
nection control valve means and the brake pressure control valves means are held in a through-flow position and the modulator piston means, monitored by means of the position indicator means, is held in a position which at least corresponds to the volume of the modulation chamber associated with its intermediate position.

4,904,029

ANTILOCKING SYSTEM

Heinz Leiber, Oberriexingen, and Manfred Steiner, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Apr. 17, 1989, Ser. No. 339,526
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812829
Int. Cl.[4] B60T *8/40*
U.S. Cl. 303—116 16 Claims



1. Antilocking system for a road vehicle with a hydraulic two-circuit brake installation in which rear wheel brakes are combined in a static brake circuit, which is connected to an output pressure space of a main brake unit means which can be actuated by means of a brake pedal;

wherein said main brake unit means is capable of generating an output pressure proportional to the actuating force of the pedal;

wherein said output pressure is connected to the wheel brakes of said static brake circuit by means of brake pressure control valve means provided for controlling brake pressure reduction, brake pressure retention and brake pressure restoration phases;

wherein the antilocking system operates on the pump-back principle according to which, in a brake pressure reduction phase, brake fluid is drained from wheel brakes subject to the control system and is pumped back by a return pump means into the output pressure space of the main brake unit means associated with the static brake circuit;

wherein said return pump means is a piston pump which is driven hydraulically by a drive pressure space being subjected to and relieved from pressure by control of solenoid valve means;

wherein an output pump chamber of the piston pump is connected to wheel brakes currently subjected to the control system via an inlet non-return valve and via an outlet non-return valve to the output pressure space of the main brake unit associated with the static brake circuit;

wherein an antilocking control takes place on the select-low principle according to which, independent of whether a locking tendency occurs on one or both rear wheels of the vehicle, brake pressure applied to both rear wheel brakes by the main brake unit means is always kept at the same value;

wherein control signals generating means for switching of the brake pressure control valve means and the solenoid valve means controlling the pump operation are provided by an electronic control unit means, which generates these signals by a process of comparing and differentiating—with respect to time—electrical output signals from wheel rotational speed sensors whose output signals, in level and/or frequency, are a measure of the wheel peripheral speeds of the vehicle wheels;

wherein the brake pressure control valve means is a 2/2-way solenoid valve which is located hydraulically in parallel with the output pump chamber and the inlet and outlet non-return valves connected to it, between an output of the main brake unit means associated with the static brake circuit and a section of a main brake pipe of the rear axle brake circuit branching to the wheel brakes of the static brake circuit;

said 2/2-way solenoid valve associated with normal braking operation not subject to control, is in a through-flow position wherein it connects the pressure space of the main brake unit means to the rear wheel brakes;

wherein a change of volume of the outpump chamber between a minimum and maximum value is at least ½ of a volume of that quantity of brake fluid which must be forced into the rear axle brake circuit in order to generate a maximum possible brake installation design pressure in the wheel brakes of said brake circuit;

wherein the electronic control unit means for controlling brake pressure reduction phases of the antilocking control generates a combination of output signals by means of which the brake pressure control valve means is switched into its shut-off position and the drive pressure space of the return pump means is initially connected to a sump tank of an auxiliary pressure source and is subsequently reconnected to a pressure output, of the auxiliary pressure space for controlling the brake pressure retention phases by connecting the drive pressure space of the return pump means to the pressure output of the auxiliary pressure source while the brake pressure control valve means is held in its shut-off position; and

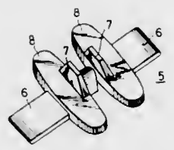
wherein for controlling brake pressure restoration phases, the electronic control means generates signal combination by means of which the drive pressure space of the return pump is connected to the high pressure output of the auxiliary pressure source and the brake pressure control valve is switched back into its through-flow position.

4,904,030

RUBBER CRAWLER

Yoshihiko Ono, Kanagawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 224,044
Claims priority, application Japan, Jul. 24, 1987, 62-185174
Int. Cl.[4] B62D *55/24*
U.S. Cl. 305—35 EB 4 Claims



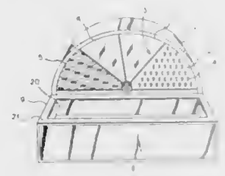
1. An endless crawler for mounting on a vehicle having rollers, the crawler having interior entirely coplanar running surfaces for rolling upon by the rollers and comprising an endless rubber belt and a plurality of cores arranged in the belt at predetermined intervals longitudinally with respect to the belt, each of the cores having a base embedded in the belt below the running surfaces, guide projections formed on the base and projecting from the base to above the running surfaces and extensions formed on the base, extending from the base longitudinally with respect to the belt and each having an exposed surface constituting a portion of the running surfaces.

4,904,031

EARRING STORAGE DEVICE

Nancy L. Bunten, 4128 - 34th St., San Diego, Calif. 92104

Filed May 23, 1988, Ser. No. 197,677
Int. Cl.[4] A47B *53/00*; B65D *5/50*; A47F *5/03*
U.S. Cl. 312—295 2 Claims



1. An earring storage device comprising:

a. a rectangular boxlike base;

b. a chamber extending from a top surface of the rectangular boxlike base;

c. a half-section of a circular rigid disk, with a plurality of pins attached to the half-section at an upward angle to the top surface of the base, attached and normal to the top surface with a hole near the vertex of the half-section;

d. a plurality of quarter-sections of a circular rigid disk having a hole near the vertex of the quarter-sections of the rigid disk;

e. a shaft that passes through the hole of the half-section and of each quarter-section and around which the quarter-sections may rotate;

f. a knob on an end of the shaft;

g. a semicircular cover attached to the top surface of the rectangular boxlike base and extending around the quarter-sections;

h. a radius of the quarter-sections being less than an inside radius of the semicircular cover; and

i. a plurality of semi-circular spacer tracks affixed to an inside perimeter of the semicircular cover for guiding and for providing axial spacing between the quarter-sections.

4,904,032

SHELF SUPPORT SYSTEM FOR A REFRIGERATOR CABINET

Thomas E. Jenkins, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 9, 1989, Ser. No. 294,309
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—350 13 Claims

1. A refrigerator cabinet including:

a liner including a pair of substantially parallel side walls, a rear wall, a top wall, and a bottom wall;

a cooling compartment defined by said liner and having its walls constituted by said walls of said liner;

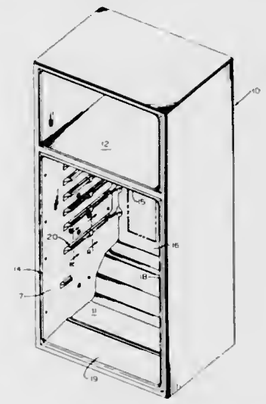
said liner having a plurality of shelf support means mounted on each of said substantially parallel side walls constituting side walls of said cooling compartment defined by said liner, each of said shelf support means mounted on one of said side walls of said liner being in the same horizontal plane as one of said shelf support means mounted on the other of said side walls;

each of said shelf support means including an upper surface;

each of said shelf support means having stop means for preventing removal of a fixed shelf supported on said upper surface by cooperating with a portion of the fixed shelf supported on said upper surface of said shelf support means;

each of said shelf support means having limit means for limiting forward motion of a slidable shelf supported on said upper surface of said shelf support means by cooperating with a portion of the slidable shelf supported on said upper surface of said shelf support means;

support means mounted on said rear wall of said liner for supporting one side of a cantilever half shelf having its other side supported by said upper surface of one of said shelf support means mounted on one of said side walls of said liner, said rear wall of said liner constituting a rear wall of said cooling compartment defined by said liner;



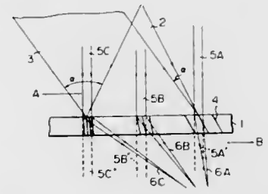
and said stop means of each of said shelf support means including preventing means for preventing swinging of the cantilever half shelf supported on said upper surface of said shelf support means by cooperating with a portion of the cantilever half shelf supported on said upper surface of said shelf support means.

4,904,033

METHOD FOR CONSTRUCTING HOLOGRAMS

Hiroyuki Ikeda; Fumio Yamagishi; Shinya Hasegawa; Syunji Kitagawa; Kozo Yamazaki, and Takefumi Inagaki, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 467,773, Feb. 18, 1983, abandoned.
This application May 18, 1988, Ser. No. 196,754
Claims priority, application Japan, Feb. 23, 1982, 57-029637; Feb. 23, 1982, 57-029638; Mar. 16, 1982, 57-042455; Mar. 30, 1982, 57-051497; Apr. 28, 1982, 57-071828; May 31, 1982, 57-092823
Int. Cl.[4] G03H *1/20*
U.S. Cl. 350—3.69 14 Claims



1. A method for constructing a hologram, forming a copy hologram, and reconstructing the copy hologram utilizing first order transmission diffraction beam, the transmission diffraction beam produced using a master hologram plate having a base plate with a master hologram including a predetermined

pattern of interference fringes formed thereon by optical interference of a plurality of constructing coherent light beams incident upon the base at different angles, the constructing coherent light beams having incident angles different from the incident angles of a reconstruction beam of a copy hologram except for one specific point, said method comprising the steps of:

(a) forming a photosensitive medium in which the hologram is to be formed, on a copy hologram plate; and

(b) copying the master hologram onto the photosensitive medium by impinging a copying light beam onto the master hologram at an incident angle substantially different from the incident angles of the constructing coherent light beams, to produce a zero-order transmission beam passing through the associated interference fringes of the master hologram and a first order diffraction beam diffracted by the associated interference fringes of the master hologram, whereby a desired copy hologram having the same pattern of interference fringes as the master hologram is constructed in the photosensitive medium by optical interference of the zero-order transmission beam and the first-order diffraction beam, said copy hologram being reconstructed with a reconstruction beam substantially different from the constructing coherent light beams, so that a beam issuing from the copy hologram has a corrected aberration.

4,904,034

SCANNING APPARATUS

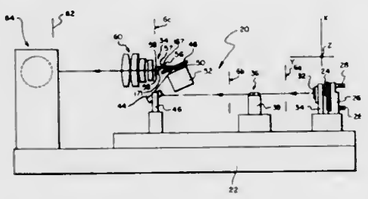
Badhri Narayan; James E. Roddy; Richard A. Stark, all of 901 Elmgrove Rd., and Dennis A. Thompson, 121 Lincoln Ave., all of Rochester, N.Y. 14650

Continuation of Ser. No. 848,426, Apr. 4, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 150,469

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.[4] G02B *26/10, 5/32*

U.S. Cl. 350—3.71 **8 Claims**



1. Scanning apparatus for providing a substantially straight line scan of a radiation spot with a selected shape and orientation comprising:

a source of coherent radiation having a wavelength λ;

a radial hologon mounted for rotation about an axis and having at least one pattern of parallel grating lines with a pitch d;

means for forming radiation from said source into a collimated beam having an oblong cross-sectional shape and for directing said beam onto the hologon at a predetermined incident angle and with the long axis of the oblong cross-sectional shape of the beam, where incident on the hologon, being radial of the axis of rotation of the hologon;

a target station for receiving the scanned beam;

lens means between the hologon and the target station for focusing the beam to a spot at the target station; and

prismatic means between the hologon and the lens means for so modifying the cross-sectional shape of the beam that the spot at the target station has the selected shape and orientation;

the wavelength of the radiation and the grating factor (nλ)/d (wherein n is the grating order number) of the hologon being selected to produce a bow in the scanned beam between the hologon and the prismatic means approximately equal and opposite to the bowing tendency imposed by the prismatic means on the scanned beam whereby the scan line at the imaging station is substantially straight.

4,904,035

COUPLING DEVICE FOR GUIDING A LIGHT BEAM

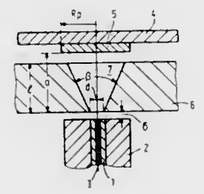
Siegfried Heckmann, Wuppertal, and Johannes Rybach, Langenfeld, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Aug. 17, 1988, Ser. No. 233,313

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1987, 3728077

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.2 **22 Claims**



1. A coupling device for guiding a light beam sent through an end portion of an optical waveguide to the light-sensitive surface of a photodiode of a measuring intrument comprising an absorbing aperture plate associated with the end face of the optical waveguide, and having an aperture which widens conically towards the light-sensitive face of a photodiode, the aperture plate facing the end face of the optical waveguide with its side where the diameter of said aperture is smallest but slightly larger than the diameter of said end face of the optical waveguide, where in the light beam is directed straight to the light-sensitive surface of the photodiode, and the angular aperture β of the conical inner surface of the aperture plate is larger than 2 arc tan α_{max}, $\tan \alpha_{max}$ being the maximum permissible numerical aperture of an optical waveguide to be connected in accordance with the specifications of the measuring instrument.

4,904,036

SUBASSEMBLIES FOR OPTOELECTRONIC HYBRID INTEGRATED CIRCUITS

Greg E. Blonder, Summit, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 3, 1988, Ser. No. 163,688

Int. Cl.[4] G02B *6/12*

U.S. Cl. 350—96.11 **21 Claims**

17. An optoelectronic integrated circuit subassembly comprising

a single-crystal silicon base having a major surface and an insulative layer formed on said surface,

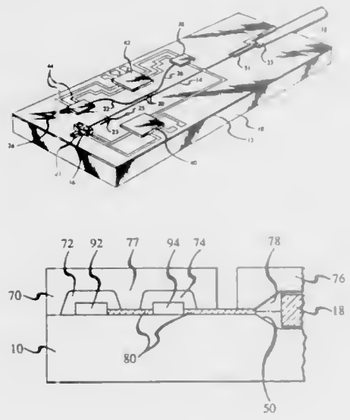
optical waveguides integrally formed on said surface,

at least two optoelectronic chips mounted on said base and optically coupled to said waveguides, said chips being physically separated from one another,

a single-crystal silicon lid on said base, said lid including at least two physically separate cavities for receiving said chips, said cavities being separated by material in said lid which electrically and optically isolates said chips from one another,

at least one of said waveguides extending from under said lid to the exterior thereof,

means exterior to said lid for coupling said at least one waveguide to an optical fiber,



said lid having a dimension measured parallel to said surface which is less than the corresponding dimension of said base and further including electrical contacts on said base which extend from said chips under said lid to the exterior thereof.

4,904,037

WAVEGUIDE TYPE OPTICAL DEVICE WITH THERMAL COMPENSATION LAYERS

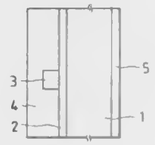
Katsuyuki Imoto, Sayama; Hirohisa Sano, Kokubunji, and Yasuo Hira, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 226,014

Claims priority, application Japan, Aug. 28, 1987, 62-212760

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.12 **5 Claims**



1. A waveguide type optical device comprising:

a substrate;

a buffer layer formed on a front surface of the substrate, having a coefficient of thermal expansion considerably different from that of the substrate;

a core layer formed on the buffer layer, having a coefficient of thermal expansion smaller than that of the buffer layer;

a cladding layer formed on at least said core layer, having a coefficient of thermal expansion larger than that of said core layer; and

a first compensation layer formed on a rear surface of the substrate, having a coefficient of thermal expansion substantially equal to that of said buffer layer.

4,904,038

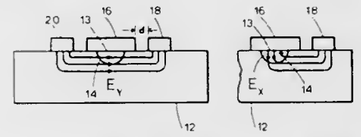
GUIDED WAVE OPTICAL FREQUENCY SHIFTER

Chin-Lung Chang, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 30, 1984, Ser. No. 615,111

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.14 **29 Claims**



1. A frequency shifter for receiving an optical carrier signal having a carrier frequency and for providing a sideband output that is shifted in frequency from the carrier frequency, comprising

waveguide means comprising an optical waveguide formed in an electro-optically active material for guiding an optical signal in the electro-optically active material; and

means for forming a rotating waveplate in said waveguide means to shift the frequency of the optical signal to provide a sideband having a frequency shift dependant upon the rotation rate of said rotating waveplate the rotating waveplate forming means including;

a first electrode adjacent a length of the optical waveguide;

a second electrode spaced apart from said optical waveguide proximate a first side of said first electrode;

a third electrode spaced apart from said optical waveguide proximate a second side of said first electrode;

means for applying a first voltage between said first electrode and said third electrode to form a first electric field extending between said first and third electrodes through said optical waveguide; and

means for applying a second voltage between said second electrode and said third electrode to form a second electric field extending between said second and third electrodes through said optical waveguide perpendicular to said first electric field, the first and second voltages having a phase relationship such that the first and second electric fields form a resultant field that rotates around a length of the optical waveguide

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4,904,039

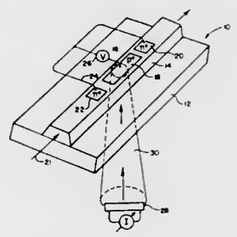
ELECTRO-OPTIC DEVICES UTILIZING A SAPPHIRE SUBSTRATE

Richard A. Soref, Newton Centre, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 18, 1988, Ser. No. 273,379

Int. Cl.[4] G02B *6/10*; G02F *1/015*

U.S. Cl. 350—96.14 **20 Claims**



1. An electro-optical device comprising:

VOL
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19 90
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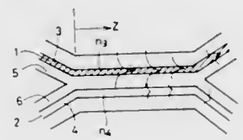
a transparent sapphire substrate;
a silicon layer positioned on said substrate and formed into an optical waveguide;
a p-n junction formed in said silicon waveguide for selectively changing the refractive index of said waveguide;
a current source for supplying activating energy to said p-n junction; and
an optical source positioned for providing a beam of light that is transmitted through said sapphire substrate and into said silicon waveguide in order to change the refractive index of the waveguide.

4,904,040

OPTICAL WAVEGUIDE COUPLER FOR MONITORING

Toshiharu Takesue, and Hiroyoshi Yamamoto, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 204,106
Claims priority, application Japan, Jun. 10, 1987, 62-144909
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **8 Claims**



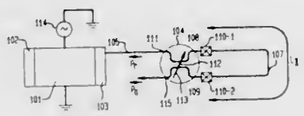
1. An optical waveguide coupler comprising:
at least two light propagating optical portions closely spaced from each other for allowing light propagating in one of said optical portions to couple into one or more others of said optical portions, said optical portions comprising materials having different refractive indices respectively such that the splitting ratio of the coupler is reduced to a selected maximum at predetermined multiples of the coupling length of the coupler.

4,904,041

SHORT OPTICAL PULSE GENERATOR HAVING A LOOPED DIRECTIONAL COUPLER EXTERNAL CAVITY

Hossein Izadpanah, Randolph, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Dec. 20, 1988, Ser. No. 287,395
Int. Cl.[4] G02B *6/26*; H01S *3/098, 3/083*
U.S. Cl. 350—96.15 **14 Claims**



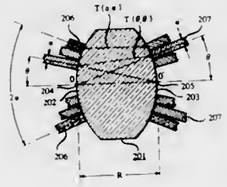
1. An optical pulse generator comprising:
a semiconductor laser diode including a reflective end and a nonreflective end, optical radiation being emitted from said nonreflective end when said diode is driven; and
an external cavity disposed to capture the optical radiation emitted from said nonreflective end and having a partially reflective end for reflecting a portion of the captured optical radiation back into said diode to induce mode-locking in said laser and generation of a stream of optical pulses
characterized in that
said external cavity comprises a 2×2 directional coupler having first and second input ports and first and second output ports, and a fiber loop, said first input port being connected to receive the optical radiation emitted from said nonreflective end, and said first and second output ports being connected together by means of said fiber loop, said coupler coupling portions of said emitted radiation onto both ends of said fiber loop to counter-propagate thereon and for coupling portions of the counter-propagating radiation back to said laser diode to induce and maintain said mode-locking, an output in the form of an optical pulse train of short optical pulses being produced at the second input port of said coupler at a frequency which is a function of the length of said fiber loop.

4,904,042

N×N OPTICAL STAR COUPLER

Corrado Dragone, Little Silver, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 3, 1988, Ser. No. 189,900
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.16 **9 Claims**



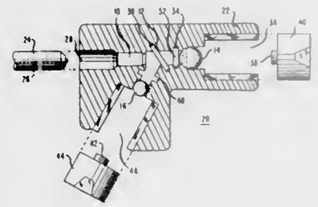
1. A device for simultaneously transmitting optical signals representative of intelligence from N sources to N′ detectors, comprising
(a) a medium capable of transmitting optical radiation with loss less than 1 db/cm;
(b) an array of N injection means of aperture a_i for injecting, into a substantially two dimensional plane within the said medium, optical radiation; and
(c) an array of N′ extraction means of aperture a'_i, for extracting transmitted optical radiation from the said medium; the invention characterized in that
(1) the injection and extraction means comprise single mode waveguides;
(2) the array of N injection means are located along a segment of a circle with radius of curvature substantially equal to R, the length, L, of the segment given substantially by $L=\Sigma a$;
(3) the array of N′ extraction means are located along a segment of a circle of radius of curvature substantially equal to R, the length, L′, of the segment given substantially by $L'=\Sigma a'$;
(4) the center of curvature of the circle whose segment determines the configuration of each array lies substantially on the circle segment which defines the other array;
(5) the axis of symmetry of each of the elements is substantially directed to the center of curvature of the circle whose segment defines that array; and
(6) the distance R is selected to substantially maximize the transmission between marginal injection elements and marginal extraction elements.

4,904,043

OPTICAL DATA LINK DUAL WAVELENGTH COUPLER

Rudolph C. Schweizer, Allentown, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 15, 1988, Ser. No. 207,342
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 **30 Claims**



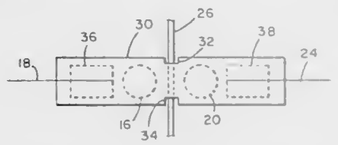
1. A dual wavelength optical communication arrangement for providing optical communication between an optical fiber and a pair of colocated semiconductor optical devices, the arrangement comprising
a first semiconductor optical device operable with a first optical signal at a first wavelength;
a second semiconductor optical device operable with a second optical signal at a second wavelength;
a first lens positioned to couple said first optical signal associated with said first semiconductor optical device;
a second lens positioned to couple said second optical signal associated with said second semiconductor optical device;
a dichroic filter positioned between said first lens and second lens so as to prevent both said first optical signal from entering said second lens and said second optical signal from entering said first lens; and
a third lens positioned between said dichroic filter and said optical fiber for coupling said first and second optical signal with said optical fiber.

4,904,044

CONTINUOUSLY VARIABLE FIBER OPTIC ATTENUATOR

Thomas W. Tumulevich, Chelmsford, Mass., assignor to Light Control Systems, Inc., Tyngsboro, Mass.

Filed Sep. 8, 1988, Ser. No. 241,606
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 **26 Claims**



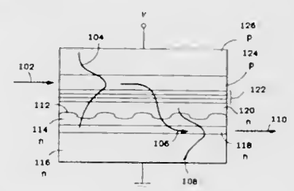
1. A continuously variable optical attenuator apparatus for attenuating an optical signal between a first optical fiber and a second optical fiber, said apparatus comprising:
a. a housing having means for attachment to fiber optical application apparatus;
b. a first optical lens;
c. means for allowing the first optical fiber to communicate with said first optical lens;
d. a second optical lens in optical communication with the first lens along an axis of alignment;
e. means for allowing the second optical fiber to communicate with said second optical lens;
f. a flexible optical filter disposed between said first and second lenses and extending beyond the periphery of each lens, the optical filter having a density gradient which varies along the length of the filter; and
g. a reciprocating means operably connected to said optical filter, said reciprocating means allowing movement of the optical filter to thereby provide a continuously variable optical filter density between the lenses, the flexible filter following a curved path to at lest one side of the lenses.

4,904,045

GRATING COUPLER WITH MONOLITHICALLY INTEGRATED QUANTUM WELL INDEX MODULATOR

Rodney C. Alferness, Holmdel; Thomas L. Koch, Middletown; Uziel Koren, Fairhaven, and Jane E. Zucker, Aberdeen, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 25, 1988, Ser. No. 173,503
Int. Cl.[4] G02B *6/34*
U.S. Cl. 350—96.19 **9 Claims**



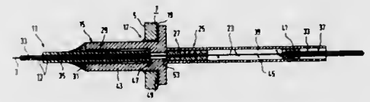
1. A device comprising
(a) a quantum well structure,
(b) a guided wave structure, and
(c) a grating coupler designed to couple at least two propagation modes of the guided wave structure,
the invention characterized in that,
the grating coupler has a pitch which yields phase matched grating coupling in a wavelength range which is energetically substantially below the absorption edge of the quantum well device.

4,904,046

PROCESS OF AND APPARATUS FOR LEADING AN OPTICAL WAVEGUIDE THROUGH A WALL VIA A HERMETIC SEAL

Hartmut Paschke, Ergolding; Gerd Kreutzmann, Landshut, and Hrabanus Hack, Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Mar. 8, 1989, Ser. No. 320,639
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 3807491
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **15 Claims**



1. An improvement in apparatus for hermetically leading a flexible optical waveguide (3; 403) made of glass, covered by a multiple-ply protective layer (33; 433) through a wall (5; 405) of a housing (7; 407) into the interior of the housing; wherein according to the improvement the optical waveguide (3; 403) is retained in a bushing (15; 415), has a first section (23; 423) free of the protective layer (33; 433) and a first sealing area (25; 425)

which is connected with a hermetic seal to the bushing by glass solder (27; 427); the waveguide further having a load-relieving section (37; 437) leading out of the bushing (15; 415) and being fastened by fastening means (41; 51) to the bushing (15; 415), the bushing (15; 415) extending through a wall (5; 405) of the housing (7; 407); having a portion adjacent the housing sealed in a second sealing area (17; 417) hermetically against the wall and having a first section extending into the housing and terminating as a free end within the housing, the optical waveguide being surrounded in a first section (37; 437) extending from the bushing into the housing interior by at least one inner ply (33; 433) of the multiple-ply protective layer (13; 413); a glass solder seal (27; 427) extending from the portion of the bushing adjacent the housing in an elongated solder glass pipe (39; 439) in which the optical waveguide is guided, the solder glass pipe (39; 439) providing via an end section at the portion of the brushing adjacent the inner surface of the wall of the bushing, protection from bending for the optical waveguide (3; 403).

4,904,047

OPTICAL FIBRE CABLES

Robert J. W. Powell, Wembley, and Brian A. Irving, Northwood, both of England, assignors to Telephone Cables Limited, United Kingdom

Filed Mar. 14, 1989, Ser. No. 323,286
Claims priority, applicatioo United Kingdom, Mar. 18, 1988, 8806543; Dec. 2, 1988, 8828220
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 14 Claims

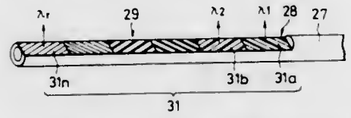
1. An optical fibre cable including, within a surrounding cover, at least one optical fibre extending longitudinally, and a hydrogen-absorptive material in which the active part consists solely of a metallic cation and an organic anion.

4,904,048

MECHANISM FOR BENDING ELONGATED BODY

Ichiro Sogawa; Nao-omi Maeda; Kazuhiko Hayashi; Masahiko Kanda, and Koro Yotsuya, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 9, 1988, Ser. No. 153,910
Claims priority, application Japan, Feb. 9, 1987, 62-28640; Feb. 9, 1987, 62-28641; Feb. 9, 1987, 62-28642; Feb. 9, 1987, 62-28643; Feb. 9, 1987, 62-28644
Int. Cl.[4] G02B 23/26
U.S. Cl. 350—96.26 25 Claims



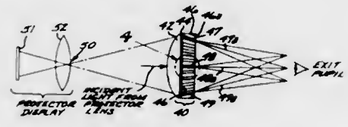
1. In a mechanism for bending an elongated body including an optical fiber, the improvement wherein said optical fiber comprises a core for leading a heating light beam and a cladding, a predetermined portion of said cladding is cut away, and a shape-memorizing alloy is inserted in the cut-away portion of the cladding such that said shape-memorizing alloy is heated with light leaking from said core of the optical fiber thereby bending said shape-memorizing alloy and in turn said elongated body.

4,904,049

HIGH-CONTRAST FIBER OPTIC DIFFUSION FACEPLATE WITH RADIUSED FIBERS

Ronald G. Hegg, Inglewood, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 1, 1988, Ser. No. 239,250
Int. Cl.[4] G02B 6/08
U.S. Cl. 350—96.27 3 Claims



1. An optical apparatus, comprising:
a diffusion holographic optical element comprising means for diffracting a beam of light incident upon any particular point on said element from a predetermined direction toward an exit pupil; and
a fiber optic faceplate comprising a substantially flat external surface facing said exit pupil and having light absorbing material and a plurality of optical fibers therein, said faceplate positioned with respect to said holographic optical element so that diffracted light passes therethrough, and wherein the optical fibers are each characterized by an optical axis, with the optical fibers oriented so that the diffracted light passed through each optical fiber is substantially directed to said exit pupil;
wherein ambient light incident on said external flat surface from outside said exit pupil is substantially absorbed by said light absorbing material, thereby enhancing the contrast provided by said optical apparatus.

4,904,050

METHODS OF AND SYSTEMS FOR OPTICAL FIBER SENSING

Lawrence R. Dunn, Flowery Branch; Ian A. White, Roswell, and Willard C. White, III, Doraville, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell laboratories, Murray Hill, N.J.

Filed Aug. 31, 1988, Ser. No. 238,810
Int. Cl.[4] G02B 6/00
U.S. Cl. 350—96.29 23 Claims



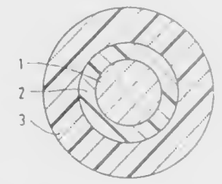
1. An optical fiber sensing system, which comprises:
source means for providing successive optical signals;
optical splitter means connected to said source means for splitting each successive optical signal into a set of two subsignals and for providing said subsignals as outputs, said splitter means also being effective to recombine each said set of subsignals after each said set of subsignals have travelled in opposite directions around a common path;
an optical fiber path which begins and ends at said optical splitter means for receiving each said set of subsignals which have been split from an incoming signal from said source and which provides a common path for carrying said subsignals in opposite directions therealong and for returning said subsignals to said splitter means where they are recombined; and
detector means for detecting changes in an optical transmission characteristic between successive sets of subsignals which are returned to said splitter means.

4,904,051

OPTICAL FIBER PROVIDED WITH A SYNTHETIC RESIN COATING

Dirk J. Broer; Cornelis M. G. Jochem; Theodorus N. Meeuwsen, and Daniel C. L. Vangheluwe, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 29, 1988, Ser. No. 251,631
Claims priority, application Netherlands, Oct. 8, 1987, 8702395
Int. Cl.[4] G02B 6/10
U.S. Cl. 350—96.30 7 Claims



1. An optical fiber having a synthetic resin coating and comprising a glass fiber, a first enveloping layer of a synthetic rubber having a modulus of elasticity of from 0.1 to 10 MPa, and a second enveloping layer of a synthetic resin having a modulus of elasticity larger than that of the first layer, wherein the thickness of the first layer is of from 5 to 20 μm and the modulus of elasticity of the second layer is more than 1000 MPa.

4,904,052

POLARIZATION PRESERVING OPTICAL FIBER AND METHOD OF MANUFACTURING

Stephen C. Rand, Agoura, and Joseph A. Wysocki, Oxnard, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 43,565, Apr. 28, 1987, Pat. No. 4,824,455.
This application Jan. 23, 1989, Ser. No. 300,386
Int. Cl.[4] G02B 6/22
U.S. Cl. 350—96.33 12 Claims

1. An improved polarization preserving elongated birefringent fiber optic member comprising:
a cross-sectional circular core member formed of soft glass and having an anisotropic index of refraction;
a cross-sectional circular cladding surrounding the core member, and
a metallic coating on the cladding with a variation in thickness about the cladding to provide an anisotropic compressional strain on the core member to create the anisotropy of the refractive index of the core member.

4,904,053

CURABLE COMPOSITION

Yoshimasa Kinaga, Kanagawa; Shigeo Murofushi, Hiratsuka, and Kenji Seko, Yokosuka, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Division of Ser. No. 130,505, Dec. 9, 1987, Pat. No. 4,833,207.
This application Mar. 14, 1989, Ser. No. 322,966
Claims priority, application Japan, Dec. 18, 1986, 61-303514; Jun. 9, 1987, 62-144475; Jul. 2, 1987, 62-166059
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[4] G02B 6/00
U.S. Cl. 350—96.34 7 Claims

1. An optical fiber comprising:
(a) a core fiber formed from a transparent material having a refractive index of about 1.43 to about 1.60; and
(b) a cladding formed on said core, said cladding consisting essentially of:
(i) a polymerizable double bond-containing resin prepared by reacting a copolymer comprising, as comonomers, (a) a fluoroalkyl acrylate or methacrylate represented by the formula (I)

$$CH_2=C(R)—COO(CX_2)_m(CF_2)_nX \quad (I)$$

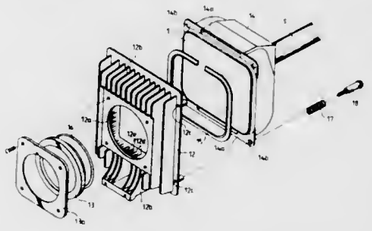
wherein R is methyl or hydrogen, X is fluorine or hydrogen, m is 1 or 2 and n is an integer of 1 to 12, and (b) a vinyl monomer containing a functional group for introducing a polymerizable double bond with a compound containing a functional group reactive with the functional group of the vinyl monomer and a polymerizable double bond to introduce the polymerizable double bond into the side chain of the copolymer; and
(ii) a fluoroalkyl acrylate or methacrylate of the formula (I).

4,904,054

PROJECTION APPARATUS FOR PROJECTION TELEVISION RECEIVER

Yasunori Hiroshima, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

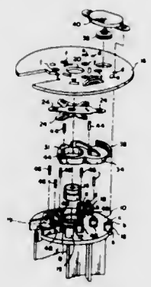
Filed Sep. 19, 1988, Ser. No. 246,471
Claims priority, application Japan, Sep. 17, 1987, 62-140926[U]
Int. Cl.[4] G02B 7/02; H04N 5/74
U.S. Cl. 350—253 5 Claims



1. A projection apparatus for use with a projection television receiver, comprising:
a projection tube;
a coupler having a front face provided with a window;
a lens mounted in a window;
packing sandwiched between the whole outer periphery of a front face of the projection tube and the coupler;
cooling liquid that fills a confined space between the lens and the front face of the projection tube; and
corrugation means formed on an inner surface of the coupler which defines one wall of the confined space.

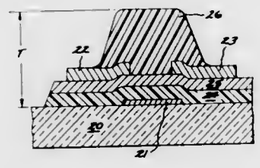
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4,904,055
VARIABLE APERTURE FORMED BY LINEARLY MOVABLE ELEMENTS
Mark E. Bridges, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 3, 1988, Ser. No. 251,641
Int. Cl.[4] G02B *26/02*
U.S. Cl. 350—272 **8 Claims**



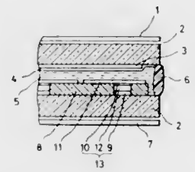
1. Apparatus for providing an aperture in an optical path comprising:
at least three blades having openings with sides that cooperate to define an aperture;
means for mounting said blades for rectilinear movement to vary the size of said aperture; and
cam means actuable for simultaneously moving said blades to vary said aperture.

4,904,056
LIGHT BLOCKING AND CELL SPACING FOR LIQUID CRYSTAL MATRIX DISPLAYS
Donald E. Castleberry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 240,366, Aug. 30, 1988, abandoned, which is a continuation of Ser. No. 756,909, Jul. 19, 1985, abandoned. This application Jul. 25, 1989, Ser. No. 384,929
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—333 **36 Claims**



1. A liquid crystal display comprising:
a pair of flat substrate, at least one of which is transparent;
a quantity of liquid crystal material disposed and contained between said substrates;
an array of pixel electrodes disposed on said at least one substrate;
at least one ground plane electrode disposed on the other use of said substrates, so that liquid crystal material is disposed between said pixel electrodes and said ground plane electrode, with said at least one ground plane electrode and said array of pixel electrodes being transparent;
an array of amorphous silicon semiconductor switch elements associated with said pixel electrodes; p1 a set of electrically conductive data lines;
a set of electrically conductive gate lines, said switch elements, said data lines and said gate lines being electrically connected to permit voltages appearing on said data lines to be applied to select pixel electrodes in accordance with signals present on said gate lines; and
cured photopatterned polyimide light blocking spacer material disposed between said substrates so as to determine the distance between said substrates and disposed so as to block light from said semiconductor switch elements.

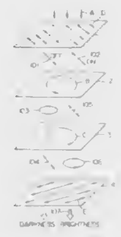
4,904,057
LIQUID CRYSTAL DEVICE WITH A SMECTIC CHIRAL LIQUID CRYSTAL AND WITH A RECTIFIER IN SERIES WITH EACH PIXEL
Hiroyuki Sakayori, Machida, and Ippei Kobayashi, Atsugi, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan
Division of Ser. No. 128,583, Dec. 4, 1987. This application Dec. 1, 1988, Ser. No. 278,569
Claims priority, application Japan, Dec. 6, 1986, 61-291272; May 15, 1987, 62-118599
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—333 **5 Claims**



1. A liquid crystal device comprising:
a pair of substrates;
a ferroelectric liquid crystal layer interposed between said substrates;
an electrode arrangement provided on both sides of said liquid crystal layer in order to define a plurality of pixels in said liquid crystal layer;
means for supplying a pulsed signal to said electrode arrangement; and
a plurality of rectifiers respectively in series with said plurality of pixels.

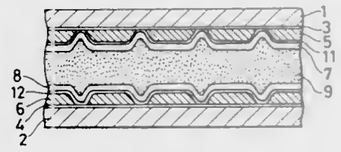
4,904,058
LIQUID CRYSTAL DISPLAY PANEL
Sboichi Kato, Kawasaki; Kaoru Arai, Suzaka, and Ikuo Tomita, Ebina, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Oct. 13, 1988, Ser. No. 257,010
Claims priority, application Japan, Oct. 13, 1987, 62-257633; Oct. 13, 1987, 62-257634; Jun. 13, 1988, 63-143553
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—335 **11 Claims**

1. A double-layered super-twisted nematic liquid crystal display panel, comprising:
(A) a first liquid crystal cell including:
(i) a first super-twisted nematic liquid crystal layer having a first layer thickness d_1 and a first twist angle of not less than 180° in a first direction and containing first liquid crystal molecules having a first birefringence Δn_1, and
(ii) transparent matrix-type electrodes sandwiching said first super-twisted nematic liquid crystal layer and selectively modulating a state of twist of said first liquid crystal molecules of said first super-twisted nematic liquid crystal layer by selectively applying a voltage thereto;
(B) a second liquid crystal cell stacked with said first liquid crystal cell, said second liquid crystal cell including a second super-twisted nematic liquid crystal layer having a second layer thickness d_2 and a second twist angle of not less than 180° in a second direction and containing second liquid crystal molecules having a second birefringence Δn_2, said second twist angle being almost the same as said first twist angle, said second twist direction being reverse to said first twist direction; and
(C) polarizing means for visibly enhancing modulated and non-modulated states of said first liquid crystal molecules in said first liquid crystal cell;



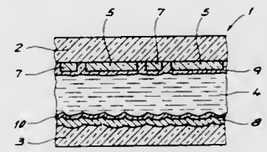
wherein a product $\Delta n_1 d_1$ of said first birefringence Δn_1 and said first layer thickness d_1 of said first liquid crystal layer is in a range of 0.51–1.68 μm and is 1.02–1.20 times larger than a product $\Delta n_2 d_2$ of said second birefringence Δn_2 and said second layer thickness d_2 of the second liquid crystal layer.

4,904,059
LIQUID CRYSTAL DISPLAY ELEMENT HAVING A NONCONDUCTING LAYER OF PARTICULAR INDEX OF REFRACTION
Tsunemitsu Torigoe, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed Nov. 14, 1988, Ser. No. 270,702
Claims priority, application Japan, Feb. 12, 1988, 63-28824
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—339 R **2 Claims**



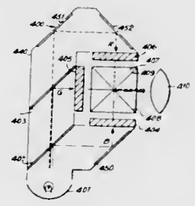
1. A liquid crystal display element comprising first and second transparent electrodes supported on first and second glass substrates respectively, first and second orientation films supported in operative relationship with said first and second transparent electrodes, respectively, with liquid crystal charged in a space therebetween, wherein said liquid crystal display element is provided with a first insulating film made of a single crystal material having a refractive index greater than that of the transparent electrodes disposed between one of said first and second transparent electrodes and its corresponding orientation film; and a second insulating film made of a single crystal material having a refractive index smaller than that of the transparent electrodes disposed between the other of said first and second transparent electrodes and its corresponding orientation film, wherein the average value of the refractive index of said first insulating film and that of said second insulating film is substantially equal to the refractive index of the transparent electrodes.

4,904,060
LIQUID CRYSTAL DISPLAY CELL HAVING A DIFFUSELY-REFLECTIVE COUNTER ELECTRODE
Joachim Grupp, Peseux, Switzerland, assignor to Asulab, S.A., Switzerland
Filed Nov. 22, 1988, Ser. No. 274,551
Claims priority, application France, Nov. 23, 1987, 87 16319
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—339 D **12 Claims**



1. A liquid crystal display cell of the type having a reflector-diffuser and at most one polarizer, comprising
a first transparent plate,
a second plate,
a liquid crystal layer disposed between said first and second plates,
a plurality of transparent control electrodes disposed between said first transparent plate and said liquid crystal layer in a display area,
a plurality of electronic components connected each to one of said control electrodes, and
a counter electrode situated between said second plate and said liquid crystal layer, said counter electrode being of light-reflecting material and having irregularities over its entire surface situated in said display area so as to reflect and diffuse impinging light, whereby said counter electrode is also said reflector-diffuser.

4,904,061
PROJECTION-TYPE LIQUID CRYSTAL DISPLAY DEVICE WITH EVEN COLOR
Shuji Aruga, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Continuation of Ser. No. 233,297, Aug. 17, 1988, which is a continuation-in-part of Ser. No. 908,479, Sep. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 786,438, Oct. 11, 1985. This application Apr. 14, 1989, Ser. No. 338,521
Claims priority, application Japan, Oct. 22, 1984, 59-221556; Jul. 31, 1985, 60-169442; Nov. 26, 1985, 60-265289; Aug. 18, 1987, 62-204768; Aug. 28, 1988, 63-106072
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—339 F **28 Claims**



1. A projection-type display device comprising:
a light source for generating light;
color separating means for separating the light into at least its primary colors;
liquid crystal light valve means for producing colored images based on the colored light;

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optical synthesizing means for combining the colored images to form a synthesized image; and

projection lens means for projecting the synthesized image toward an object for viewing of the image;

said optical synthesizing means including reflection means for reflecting at least one of the colored images and directing the synthesized image toward the projection lens means;

wherein the liquid crystal light valve means includes three light valves filled with liquid crystal material, the liquid crystal material of one light valve being twisted in a direction opposite to the directions in which the liquid crystal materials of the other two light valves are twisted.

4,904,062

COLLIMATING LENS FOR USE IN OPTICAL MEMORIES

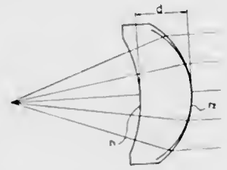
Ichiro Morishita, Iwanuma, and Hiroko Hanzawa, Shiroishi, both of Japan, assignors to Alps Electric Co. Ltd., Tokyo, Japan

Filed Mar. 8, 1989, Ser. No. 321,484

Claims priority, application Japan, May 20, 1988, 63-123706

Int. Cl.[4] G02B *3/02*

U.S. Cl. 350—432 **1 Claim**



1. A collimating lens for use in optical memories, comprising : a first surface for receiving the incident beam which is concave, and a second surface for emitting the outgoing beam which is convex and non-spherical, characterized in that the said collimating lens satisfies the following conditions:

(1) $-1<r_1-f+d<5$

where r_1 is the radius of curvature of the first surface, f the focal distance, and d the thickness of the lens at its centre;

(2) In the meridian plane of the cartesian coordinate where it is assumed that the optical axis of the non-spherical shape of the second surface is the X axis, the radial direction of the lens the Y axis, and the peak of the non-spherical surface the origin of the coordinate.

$$X=(y^2/r_2)/\{1+\sqrt{1-(1+k)(y^2/r_2^2)}\}$$

where r_2 is the radius of curvature of the second surface, and k the conic constant;

(3) The said conic constant should satisfy the following condition,

$$-0.005<k+(1/n)^2<0.015$$

where n is the refractive index of the material of the lens.

4,904,063

LIQUID CRYSTAL LENSES HAVING A FRESNEL LENS

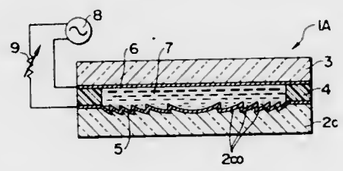
Takao Okada, Hachioji; Hisanari Shimazu, Akishima; Akitoshi Toda, Hachioji, and Susumu Sato, Akita, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Continuation of Ser. No. 17,275, Feb. 20, 1987, abandoned. This application May 27, 1988, Ser. No. 199,535

Claims priority, application Japan, Mar. 5, 1986, 61-047510

Int. Cl.[4] G02F *1/13*; G02B *1/06*

U.S. Cl. 350—347 V **8 Claims**



1. A liquid crystal lens including a cell formed by lens component members, each being uniformly coated with a transparent conductive layer, and in which a liquid crystal is charged, at least one of said lens component members having a Fresnel lens surface, characterized in that

a number of annular ring-shaped Fresnel grooves forming said Fresnel lens surface are formed by leveling their crests and troughs with a uniform depth.

4,904,064

ELECTRONIC ADDRESSING OF FERROELECTRIC AND FLEXOELECTRIC LIQUID CRYSTAL DEVICES

Sven T. Lagerwall, Gothenburg, Sweden, and Jürgen Wahl, Bad Soden, Fed. Rep. of Germany, assignors to S.A.R.L. S T Lagerwall, Bandol, France

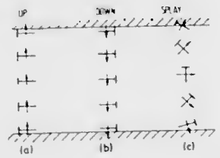
PCT No. PCT/SE86/00476, § 371 Date Jun. 15, 1987, § 102(e) Date Jun. 15, 1987, PCT Pub. No. WO87/02495, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 14, 1986, Ser. No. 72,981

Claims priority, application Sweden, Oct. 14, 1985, 8504760-3

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S **8 Claims**



1. An addressing method for driving an array of electro-optic elements with a linear electric response, comprising a helix-free polymer or non-polymer liquid crystal with a ferro-electric or flexoelectric response and with at least two states, termed UP and DOWN polarization, interposed between a pair of substrates covered, on their opposing sides by, respectively, one set of $N \geq 1$ lines, comprising horizontal stripe electrode rows and one set of $M \geq 1$ lines, comprising vertical stripe electronic columns, and with each row-column crossing defining an electro-optic picture element or pixel, said method comprising a first step where, during a line addressing Time τ_e, one type of voltage pulse train with a shape distributed over n time slots τ, $\tau_e = n\tau$, is fed to a selected row whereas simultaneously one of two kinds of different pulse trains of the same duration is fed to each column, said pulse trains being so shaped that in the corresponding superimposed pulse train

resulting from their superposition on each of the pixels in the selected row, there will appear a polar switching pulse of positive or negative sign, according to whether the pixel should be written in the UP or DOWN state, respectively, said polar pulse being characterized by an area in pulse amplitude and duration $A_s=(V\tau)_s$ larger than a critical threshold value A_c, whereas the pulse trains applied to pixels of the non-selected rows only contain voltage pulses having a subcritical area, $A_{ns}<A_c$, said method further comprising repeating said step whereby rows are addressed in succession, thus writing the complete information embodied in all UP and DOWN states in one and the same scan of duration $N\tau_e$.

4,904,065

LIQUID CRYSTAL OPTICAL ELEMENT AND METHOD OF PRODUCING THE SAME USING FERROELECTRIC POLYMER LIQUID CRYSTAL

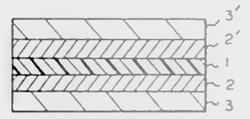
Kimihiro Yuasa; Kenji Hashimoto; Shunji Uchida; Kazuharu Morita, and Satoshi Hachiya, all of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,937

Claims priority, application Japan, Jun. 22, 1987, 62-153538; Jun. 30, 1987, 62-161029

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S **5 Claims**



1. A liquid crystal optical element comprising:

(a) an oriented ferroelectric liquid-crystalline polymer layer which exhibits chiral smectic C phase and which is oriented by a stretching method, and

(b) two electrically conducting layers which support the oriented ferroelectric liquid-crystalline polymer layer between them, where at least one of the two electrically conducting layers is transparent.

4,904,066

ELECTRO-OPTICAL DEVICES USING LIQUID CRYSTAL POLYMERS

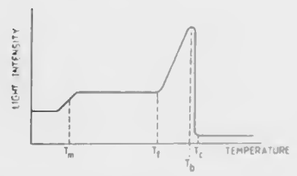
George W. Gray, Cottingham; Gary Nestor, Euxton nr. Chorley; David Lacey, Hull, and Ciaran B. McArdle, Pinner, all of England, assignors to The General Electric Company, p.l.c., England

Filed Jun. 22, 1987, Ser. No. 65,271

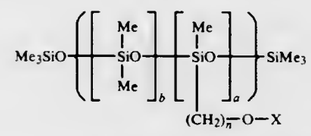
Claims priority, application United Kingdom, Jun. 25, 1986, 8615527

Int. Cl.[4] G02F *1/13*; C08G *77/20*

U.S. Cl. 350—350 S **13 Claims**

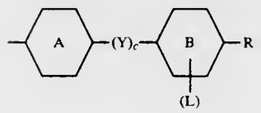


1. An electro-optic information storage device comprising two substantially parallel walls, defining a space therebetween, each wall having an electrode layer on that one of its major surfaces which faces the other said wall; and a quantity of liquid crystal polymer (LCP) optical storage medium within said space and in contact with each said electrode, said liquid crystal polymer optical storage medium having a general formula I

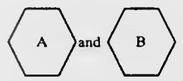


I

wherein X is a mesogenic group having a general structure



wherein



may carry lateral methyl, fluro or chloro substituents, and are selected from phenyl, trans-cyclohexyl, pyridyl, pyri midyl, dioxanyl and bicyclo-(2,2,2)-octyl;

wherein Y is COO, OOC or CH_2CH_2, C is 0 or 1;

wherein n is an integer between 4 and 9 inclusive;

wherein R is F, CF_3, CN, R^1, OR^1 or $COOR^1$ where R^1 is alkyl, and (L) indicates that a lateral methyl or fluoro substituent may be present;

in cases other than when R is CN and Y is COO and n=5 and C=1, L=CH_3: wherein the ratio b:a is less than 3 and greater than 0;

the polymer being a random or substantially random polymer.

4,904,067

SELECTION DEVICE

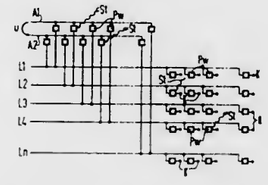
Guenter Doemens, Holzkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,986

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710597

Int. Cl.[4] G02F *1/11*

U.S. Cl. 350—358 **13 Claims**



1. A device for selecting at least two of a plurality of lines L1, through Ln, comprising at least two selection lines connected to every line, L1 through Ln, via a photoresistor; and every photoresistor being controllably chargeable with light; and means for charging the photo resistors wherein said means

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for charging the photoresistors includes means for producing a deflectable beam, which causes a first selection line of said two selection lines to be connected via a respective photoresistor, that is charged by said means for charging, to one line of said plurality of lines, L1 through Ln, and a second selection line of said at least two selection lines to be connected via another respective photoresistor, that is charged by means for charging, to another different line of said plurality of lines, L1 through Ln.

4,904,068

OPTICAL DEVICE WITH PHASE-LOCKED DIODELASER ARRAY

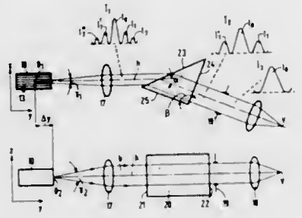
Kimio Tatsuno, Tokyo, Japan; Carolus J. van der Poel, and Gerard A. Acket, both of Eindhoven, Netherlands, assignors to Hitachi Ltd., Tokyo, Japan and U.S. Philips Corporation, New York, N.Y.

Filed Mar. 2, 1988, Ser. No. 162,828

Claims priority, application European Pat. Off., Oct. 5, 1987, 87201896.5

Int. Cl.[4] G02B *13/10, 27/46;* **G11B** *7/00*

U.S. Cl. 350—421 **14 Claims**



1. An optical device comprising:
a phase-locked diodelaser array having a p-n junction layer in a first plane for producing a radiation beam on an optical axis;
means for collimating said beam;
prism means for enlarging said beam in a lateral plane parallel to said first plane and intersection said axis; and
spatial filter means in the far field of said array for confining said beam in said lateral plane.

4,904,069

FRESNEL-TYPE ASPHERIC PRISM LENS

Yutaka Nakata, Isehara, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

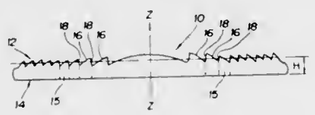
Filed Dec. 13, 1988, Ser. No. 283,719

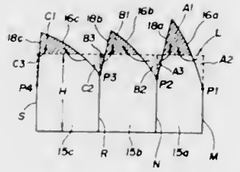
Claims priority, application Japan, Dec. 14, 1987, 62-314290; Dec. 16, 1987, 62-316051

Int. Cl.[4] G02B *3/08, 13/18*

U.S. Cl. 350—452 **4 Claims**

1. A Fresnel lens including a body having a front surface and back surface, the frontal surface being formed by a plurality of annular Fresnel-type prism elements concentrically disposed and the back surface being formed substantially flat,
each of said Fresnel-type prism elements being composed of a first prism portion defined by an aspherical surface which refracts the light beam outgoing from the focus in a direction substantially parallel to the optical axis and a riser, and a second prism portion defined by first and second virtual cylindrical surfaces perpendicular to said back surface and spaced from each other a pitch between said Fresnel-type prism elements, and said back surface; and
the volume of a portion of each prism element at which the first prism portion is intersected by a virtual plane spaced a predetermined distance from said back surface and parallel to said back surface being substantially equal to the sum of the volume of a region defined by said first virtual cylindrical surface, said virtual plane and said aspherical





surface and that of a region defined by said second virtual cylindrical surface, said virtual plane and said riser.

4,904,070

TELEPHOTO LENS SYSTEM

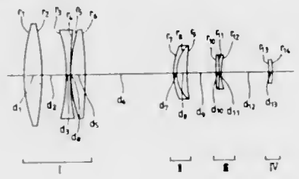
Jun Hirakawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 311,917

Claims priority, application Japan, Feb. 19, 1988, 63-36624

Int. Cl.[4] G02B *13/02*

U.S. Cl. 350—454 **1 Claim**



1. A telephoto lens system comprising, in order from an object side along an optical axis, a first lens group having a positive refractive power, a second lens group having a smaller refractive power than the first lens group, a third lens group having a negative refractive power, and a fourth lens group having a positive refractive power;
said first lens group comprising a first positive lens element, a second negative lens element and a third positive lens element;
said second lens group being a cemented lens comprising a fourth negative meniscus lens element and a fifth positive lens element, said cemented surface of said second lens group being convex toward said object;
said third lens group comprising a sixth positive lens element and a seventh negative lens element;
wherein focusing is effected by moving said third lens group along said optical axis, said lens system further satisfying the following conditions:

$$0.4f < f_I < 0.8f \quad (1)$$

$$\nu_1, \nu_3 > 70 \quad (2)$$

$$0.4f < |1/\Phi_3| < 0.7f,\ \Phi_3 < 0 \text{ (where } \Phi_3 = (n_2 - 1)/r_3) \quad (3)$$

$$0.4f < |1/\Phi_8| < 0.6f,\ \Phi_8 < 0 \text{)where } \Phi_8 = (n_5 - n_4)/r_8) \quad (4)$$

$$0.2f < |f_{III}| < 0.4f,\ f_{III} < 0 \quad (5)$$

$$\nu_6 < 35,\ \nu_7 > 50 \quad (6)$$

where
f: the overall focal length
f_I: the focal length of said first lens group
f_{III}: the focal length of said third lens group
n_i: the refractive index of an ith lens element at the d-line
ν_i: the Abbe number of an ith lens element
r_3: the radius of curvature of a surface of the second lens element on said object side
r_8: the radius of curvature of said cemented surface in said second lens group
Φ_3: the power of a surface of the second lens element on said object side
Φ_8: the power of said cemented surface in said second lens group.

4,904,071

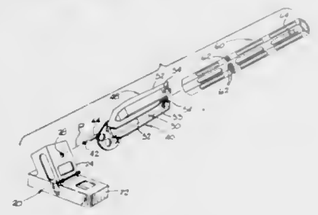
EQUATORIAL MOUNTING SYSTEM AND DRIVE THEREFOR

David A. Harbour, P.O. Box 6081, Enid, Okla. 73702-6081

Filed Oct. 18, 1988, Ser. No. 259,972

Int. Cl.[4] G02B *23/16*

U.S. Cl. 350—568 **20 Claims**



16. A drive system for slewing an equatorial mount about its polar axis to track a celestial body, said equatorial mount including a substantially stationary base, a U-shaped member defining a trough and a pair of mounting arms extending outwardly therefrom for each receiving a mounting stud secured to an optical instrument, said mounting studs defining a declination axis, and an axle lying along said polar axis pivotably mounting said U-shaped member to said base, said drive system comprising:
an arcuate sector fixedly connected to said axle which lies along said polar axis and to the trough of said U-shaped member;
a threaded rod rotatably mounted on said substantially stationary base;
friction means secured to an end of said arcuate member and engaged by said threaded rod to be driven thereby;
a pair of curved guides mounted adjacent a curved periphery of said arcuate sector, said curved guides enclosing at least a portion of said threaded rod.

4,904,072

NO-FOG MAGNIFYING SHOWER MIRROR WITH AUTOMATICALLY ALIGNING SPRAY HOSE

Thomas R. Christianson, Pala Alto, Calif., assignor to Shower-Tek, Inc., Napa, Calif.

Filed Feb. 17, 1989, Ser. No. 311,744

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[4] G02B *5/10, 7/18*

U.S. Cl. 350—607 **18 Claims**



17. A mirror, comprising:
a circular mirror panel, said mirror panel having front and rear surfaces which are flat and parallel when said mirror panel is in a free state with no significant external force applied thereto;
an annular frame surrounding said mirror panel and extending back from said rear surface of said mirror panel;
a circular back plate, said back plate having a diameter larger than the internal diameter of the portion of said frame behind said mirror panel;
said frame being sized so that when it surrounds said mirror panel and said back plate is not positioned in said frame, said frame will not apply any significant force to said mirror panel so that said front and rear surfaces of said mirror panel will remain flat and parallel;
said back plate being positioned in said frame behind and parallel to said mirror panel such that said back plate expands the diameter of the portion of said frame behind said mirror panel and concomitantly compresses the diameter of the portion of said frame surrounding said mirror panel so as to cause the front surface of said mirror panel to assume a concave shape and thereby become a magnifying mirror; and
a resilient tube positioned adjacent said rear surface of said mirror and and said inner surface of said back plate, said tube extending around and adjacent the periphery of said mirror.

4,904,073

FRACTAL TILING FOR MULTIPLE MIRROR OPTICAL DEVICES

Wayne M. Lawton, and Howard L. Resnikoff, both of Cambridge, Mass., assignors to Aware, Inc., Cambridge, Mass.

Filed Aug. 10, 1988, Ser. No. 230,529

Int. Cl.[4] G02B *7/18*

U.S. Cl. 350—613 **10 Claims**

7. A mirror for use in a multiple mirror reflecting telescope having a large number of substantially identically shaped mirrors, said mirror having an approximately fractal peripheral boundary of more than six sides such that a group of seven

VOL 1111 ISS 4 FEB 27 1990 UMI

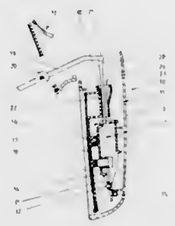
such mirrors, one of which is bounded symmetrically by the other six, has a boundary shape which is approximately geometrically similar to that of each of the mirrors forming the group.

4,904,074

BREAKAWAY MIRROR RESET

Robert Gilbert, Lonsdale, Australia, assignor to Britax Rainsfords Pty. Ltd., Lonsdale, Australia

Filed Jun. 5, 1989, Ser. No. 361,420
Claims priority, application Australia, Jun. 17, 1988, PI8823
Int. Cl.⁴ G02B *5/08*
U.S. Cl. 350—635 **6 Claims**



1. Reset means in a "break-away" mirror assembly of the type having a mounting base, a pivoted assembly pivoted thereto to allow displacement of the pivoted assembly both forwardly and rearwardly, a mirror backing plate, swivel mounting means mounting the mirror backing plate within the pivoted assembly, a mirror carried by the mirror backing plate, a tilt control lever pivoted with respect to the mounting base and having an outer end so engaging track surfaces fixed with respect to the mirror backing plate that manipulation of the lever can tilt the backing plate,

the reset means comprising a head on the outer end of the tilt control lever which disengages from the track surfaces upon said displacement, an extensible resilient tension member, first coupling means connecting an inner end of the tension member to the head, further coupling means connecting an outer end of the tension member to the pivoted assembly, and guide surfaces of the pivoted assembly so located as to guide the head back into engagement with the track surfaces upon reset of the pivoted assembly from a displacement position.

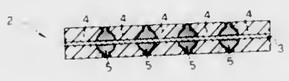
4,904,075

FLEXIBLE SPECTACLE FRAME

Oreste Blumenthal, Turin, Italy, assignor to Giuseppe Ratti Industria Ottica S.p.A., Turin, Italy

Filed Jul. 6, 1988, Ser. No. 215,759
Claims priority, application Italy, Jul. 7, 1987, 67580 A/87
Int. Cl.⁴ G02C *5/16*
U.S. Cl. 351—114 **10 Claims**

1. A spectacle frame comprising a front assembly (1) for supporting the lenses, and a pair of bows (2) hinged to said front assembly (1); each said bow (2) comprising an elongated longitudinal core (3), and a plurality of blocks (4) arranged side-by-side with said core (3) extending centrally through each said block (4); characterized in that a plurality of unitary connecting elements (5) are located between a pair of said blocks (4) or between one of said blocks and an adjoining part of said bow (2), each of said blocks (4) being mounted on said core (3) and having a pair of opposed convex lateral surfaces (6), and an opposing pair of first ridges (7) projecting perpendicularly to the axis of the said core (3); each said block (4) having a pair of opposed concave surfaces (8) designed to mate directly with respective concave surfaces (6) on said connecting elements (5) and pairs of second ridges (9), each facing a respective first ridge (7) on said connecting elements (5), at least one of said first (7) and second (9) ridges being elastically deformable so that when said bow (2) is flexed, at least one of said first and second ridges on one side of the said bow will be gradually elastically deformed in order to follow the deformation of the said bow (2).

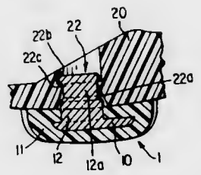


4,904,076

NOSE PAD FOR A SPECTACLE FRAME

Manfred Kappler, Pforzheim; Bruno Herter, Königsbach, and Rolf Winkler, Eisingen, all of Fed. Rep. of Germany, assignors to Frey & Winkler GmbH & Co., Königsbach, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,469
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707297
Int. Cl.⁴ G02C *1/00, 5/02, 5/12*
U.S. Cl. 351—138 **11 Claims**



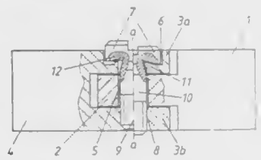
1. In a spectacle frame including a front piece for supporting spectacle lenses; a nose pad attached to the front piece; said nose pad having a relatively hard base body, a relatively soft, skin-friendly and slip-resistant covering on the base body; and securing means having a first part affixed to the base body and projecting from said covering; said securing means having a second part formed in said front piece; said first and second parts being interconnected for attaching the nose pad to the spectacle frame; the improvement wherein said first part of said securing means comprises at least two spaced anchoring pins each having a length; a recess provided in at least one of said anchoring pins; said second part of said securing means comprises bores defined by bore hole walls in said front piece; each bore directly receiving a respective said anchoring pin; a projection extending from at least one of said bore hole walls into said recess of said at least one anchoring pin for forming a snap-in connection therewith; said snap-in connection resisting a separation of the nose pad from the front piece by forces applied to the nose pad and directed away from said front piece; said front piece having, in zone of said bores, a thickness dimension at least as large as said length of said anchoring pins; further comprising apertures provided in said base body; part of said covering extending through said apertures for immobilizing said covering with respect to said base body.

4,904,077

EYEGLASS FRAME WITH LOCKED SCREW JOINT

Günther Drlik, Pforzheim, Fed. Rep. of Germany, assignor to OBE-Werk Ohnmacht & Baumgartner GmbH & Co. KG, Ispringen, Fed. Rep. of Germany

Filed Oct. 26, 1988, Ser. No. 262,987
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1987, 3737126
Int. Cl.⁴ G02C *5/12, 5/22*
U.S. Cl. 351—141 **19 Claims**



1. An eyeglass frame provided with a screw and a screw joint which is locked against separation and connects frame members, which particularly consist of two hinge members, wherein a bore is provided at one end with female screw threads and at its other end with a flat abutment surface which extends radially outwardly from said bore and is provided with a wall to define a receptacle for receiving a screw head, characterized in that at least one of said hinge members and screw head are made from a deformable material, a conical elevation surrounding the bore is provided on the abutment surface for the screw head, an inner edge of a shank of the screw having a conical constriction under the screw head, whereby the shank is screwed in, the conical elevation surrounding said bore is deformed to extend into and is locked in the constriction.

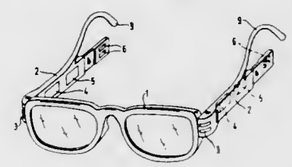
4,904,078

EYEGLASS FRAME WITH ELECTROACOUSTIC DEVICE FOR THE ENHANCEMENT OF SOUND INTELLIGIBILITY

Rudolf Gorike, Sternwartestrasse 57c, Vienna, Austria

Filed Jun. 15, 1988, Ser. No. 207,272
Claims priority, application Austria, Mar. 22, 1984, 972/84
Int. Cl.⁴ G02C *1/00;* **H04R** *25/00*
U.S. Cl. 351—158 **15 Claims**

1. An eyeglass frame with an attached electroacoustical device for enhancement of the sound intelligibility and clarity, the eyeglass frame a temple mounted to each end of said main frame part on opposite ends of said main frame, each of said temples including an arm portion near a rear end thereof, each temple extending away from said main frame part, and an electroacoustic transducer mounted on each arm portion and oriented to face an outer ear of the wearer, each of said arm portions being positioned so that the transducer lies adjacent the wearer's ear without disturbing entry of lower frequencies naturally into the auditory meatus, including sound reflections from the human pinna of the wearer, a unilaterally directional microphone connected to each of said temples around said front of said main frame each positioned to have a front direction of maximum sensitivity, and a rear direction of minimum sensitivity and having a spacing between said microphones substantially equivalent to the spacing between said transducers and between the ears of the wearer, electronic amplification means having a frequency range of amplification in the range above 1 kHz, mounted to each temple and connected to each unilaterally directional microphone respectively, said transducer of each arm being connected to said electronic amplification means of each respective temple for receiving amplified higher frequency signals from each respective unilaterally directional microphone and transmitting the corresponding amplified sounds to the wearer's respective ears.

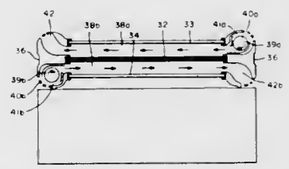


4,904,079

LIQUID CRYSTAL DISPLAY DEVICE FOR OVERHEAD PROJECTOR

Makoto Yoshimura; Haruyoshi Hanada, and Hirofumi Fukuoka, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 84,586, Aug. 12, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 338,412
Claims priority, application Japan, Aug. 13, 1986, 61-190239; Aug. 18, 1986, 61-193157
Int. Cl.⁴ G03B *21/00*
U.S. Cl. 353—122 **15 Claims**



1. In an liquid crystal display device for an overhead projector with a light-transmissive liquid crystal display cell placed below an upper protective plate and above a lower protective plate, the improvement wherein said liquid crystal display and said lower protective plate form therebetween an air passage for a unidirectional air flow therethrough from an inlet opening to an outlet opening, said device comprising a fan disposed inside a fan room which connects to said air passage through said inlet opening, said air passage at said inlet opening being so shaped that said fan causes air entering said air passage through said inlet opening to be blown directly on said display cell.

4,904,080

METHOD OF MONITORING SOLIDIFICATION OF A LIQUID COMPOSITION

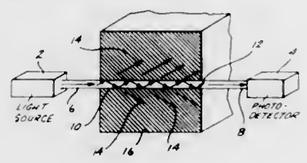
Martin A. Afromowitz, Seattle, Wash., assignor to The Board of Regents of The University of Washington, Seattle, Wash.

Filed Jan. 22, 1988, Ser. No. 147,234
Int. Cl.⁴ G01N *21/41, 21/84*
U.S. Cl. 356—133 **8 Claims**

1. A method of monitoring a process wherein a liquid com-

position passes from a liquid phase to a solid phase comprising the steps:

(a) passing an optical waveguide having an index of refraction n_1 through the liquid composition having an index of refraction n_2, such that n_2 is less than n_1, the liquid composition, in the solid phase, having an index of refraction n_3, such that n_3 substantially equals n_1;



(b) subjecting the liquid composition containing the optical waveguide to conditions that cause the liquid composition to solidify;

(c) transmitting light through the optical waveguide; and

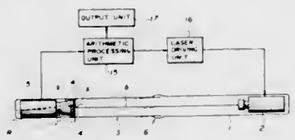
(d) determining a transmission characteristic of the portion of the optical waveguide passing through the solidifying composition.

4,904,081

SURVEYING APPARATUS

Kenji Miyahara, 16-3 Soya 8-chome, Ichikawa-shi, Chiba-ken, Japan

Filed Nov. 24, 1987, Ser. No. 125,460
Int. Cl.[4] G01B *11/26*; G01C *15/10*; F16C *11/06*
U.S. Cl. 356—152 **6 Claims**



1. A surveying apparatus comprising:

a subjective cylinder;

an objective cylinder connected to said subjective cylinder;

joint means connecting said subjective and said objective cylinders so as to be bendable relative to one another about said joint means; and

measuring means for determining the angle at which said cylinders are bent relative to one another about said joint means,

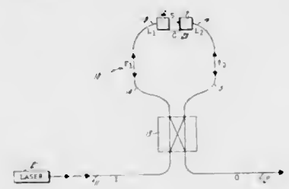
said measuring means including a laser oscillator means incorporated in said subjective cylinder for irradiating a laser beam in a predetermined direction, a target incorporated within said objective cylinder and positioned relative said laser oscillator means so as to be impingeable by laser beams irradiated by said laser oscillator means, image pickup means operatively associated with said target for detecting the location on the target at which a laser beam irradiated by said laser oscillator means impinges said target and for outputting a signal indicative of said location, and a control system operatively connected to said image pickup means for determining said angle by comparing said location to a reference position on said target, said joint means being disposed substantially midway between said laser oscillator means and said target.

4,904,082

FRINGE VISIBILITY ENHANCEMENT ARRANGEMENT AND METHOD

James P. Waters, Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1988, Ser. No. 289,863
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—345 **20 Claims**



1. An arrangement for smoothing a coherent laser beam of a limited yet substantial coherence length due to the presence of several discrete optical frequencies therein, comprising

means for subdividing the coherent laser beam into a plurality of partial beams of substantially the same intensity;

means for conducting each of said partial beams in a different path, the length of at least one of said paths differing from that of another by a distance amounting to a fraction of said coherence length; and

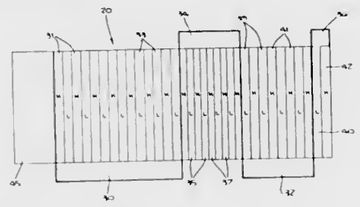
means for combining at least some of said partial beams after passage thereof through said conducting means into a coherent output beam in which the partial beam issued from said one path is shifted by said distance relative to that issued from said other path.

4,904,083

PARTIALLY TRANSPARENT MIRROR FOR A RING LASER

Samuel Lu, Moorpark, and Kevin D. Grobsky, Canyon Country, both of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Continuation of Ser. No. 96,130, Sep. 11, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 320,786
Int. Cl.[4] G01C *19/64*
U.S. Cl. 356—350 **12 Claims**



1. A specialized partially transparent mirror for use in a multioscillator gyro operating at a predetermined wave length, comprising:

a substrate;

a first set of a plurality of layers coated upon said substrate, each layer of said first set having a thickness that is one quarter of said predetermined wavelengths;

a second set of a plurality of layers coated upon said first set, each layer of said second set having a thickness other than one quarter of said predetermined wavelength;

a second set of a plurality of layers coated upon said second set, each layer of said third set having a thickness that is one quarter of said predetermined wavelength; and

said second and said third sets of a plurality of layers adjusted to establish said partially transparent mirror with an average transmission of 0.02% and a transmission ratio of P - polarized light to S - polarized light at near unity.

4,904,084

ARRANGEMENT FOR TESTING COMPLEX CONCAVE REFLECTING SURFACES FOR SHAPE DEVIATIONS

Joseph M. Geary, Las Cruces, N. Mex., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1988, Ser. No. 289,865
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—360 **7 Claims**



1. An arrangement for testing a concave reflecting surface of a barrel-optic solid body for deviations of its actual shape from its ideal shape, comprising

means for emitting a laser beam;

optical means interposed between said emitting means and the reflecting surface to be tested and operative for so optically modifying said laser beam as to propagate between said optical means and the reflecting surface along a predetermined path that is substantially normal to the reflecting surface and to be reflected from the reflecting surface for propagation substantially along said predetermined path and through said optical means back toward the generating means as a return laser beam having a wave front indicative of the actual shape of the reflecting surface and any optical aberrations of said optical means;

means for forming an interference pattern between said laser beams; and

means for evaluating said interference pattern, including

means for generating an initial signal representative of said interference pattern,

means for providing a reference signal representative of the ideal shape of the reflecting surface,

means for storing an additional signal representative of the influence of the aberrations of said optical means on the interference pattern, and

means for correlatedly subtracting said reference signal and said additional reference signal from said initial signal to obtain a final signal representative only of the difference between the actual and ideal shapes of the reflecting surface.

4,904,085

POLARIMETRIC FIBER OPTIC SENSOR TESTING APPARATUS

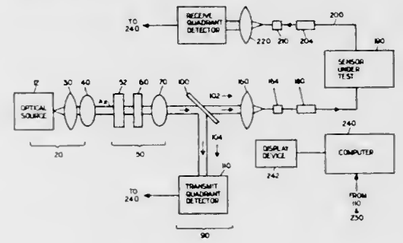
William B. Spillman Jr., Charlotte; Robert E. Rudd III, Middlebury, and Frederick G. Hoff, Bristol, all of Vt., assignors to Simmonds Precision Products, Inc., Wilmington, Del.

Filed May 4, 1988, Ser. No. 190,291
Int. Cl.[4] G01J *4/04*
U.S. Cl. 356—364 **25 Claims**

1. An apparatus to generate and detect any form of polarized light transmitted and received from a fiber optic sensor, said fiber optic sensor having a first fiber optic through which optical energy is supplied to the sensor and a second fiber optic through which said optical energy transmitted by said sensor is transmitted comprising:

optical energy source means for generating and transmitting a beam of optical energy along an optical path, said beam having a first polarization state;

polarization changing means disposed along said optical path, said polarization changing means being adapted to change the polarization state of said beam having a first polarization state to form a beam of light having a second polarization state;



a first detector means adapted to detect the polarization of said beam of light having a second polarization state after said beam having a second polarization state exits said polarization changing means;

means for transmitting said beam having a second polarization state along said optical path to a sensor to be tested, said sensor being adapted to transmit said beam; and

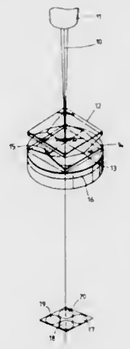
a second detector means adapted to detect the polarization state of said beam transmitted by said sensor.

4,904,086

LIGHT ALIGNMENT DETECTION DEVICE

Paul E. G. Cope, Fareham, England, assignor to The Marconi Company Limited, England

Filed Jan. 5, 1989, Ser. No. 293,933
Claims priority, application United Kingdom, Jan. 8, 1988, 8800368
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—400 **5 Claims**



1. An optical alignment detector device comprising: means for focussing an incoming beam of light, a Fresnel bi-prism mounted with its base towards the focussing means such that when the beam is in alignment with the optical axis of the focussing means the beam strikes the base substantially normally and is brought to a focus adjacent the ridge of bi-prism, and a pair of photodetectors disposed to receive light transmitted through the prism and located on either side of the plane containing the ridge of the bi-prism.

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4,904,087

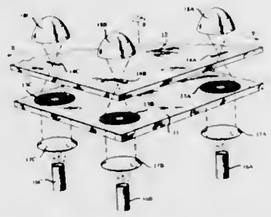
METHOD FOR ALIGNING PHOTOMASKS

George T. Harvey, Princeton, and Laurence S. Watkins, Pennington, both of N.J., assignors to American Telephone & Telegraph Co., AT&T Bell Laboratories, Murray Hill, N.J. and American Telephone & Telegraph Company, New York, N.Y.

Division of Ser. No. 69,901, Jul. 6, 1987, Pat. No. 4,835,078. This application Nov. 21, 1988, Ser. No. 274,215

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—400 **8 Claims**



1. A method for aligning first and second planar members, comprising the step of forming first and second light confining elements in the first planar member, forming first and second transparent openings, each of smaller width than length, in the second member so as to be approximately aligned, respectively, with the first and second light confining elements, locating first and second photodetectors, respectively, adjacent the first and second openings and opposite the first planar member, directing a first light beam through the first light confining member toward the second planar member, direction a second light beam through the second light confining member toward the second member, causing the first beam to scan the first opening in a direction traverse to the width of the first opening, causing the second beam to scan the second opening in a direction traverse to the width of the second opening, and causing movement of the second member relative to the first member until the first beam is transmitted through the first opening and is detected by the first light detector and the second light beam is simultaneously transmitted through the second opening and detected by the second detector.

4,904,088

METHOD AND APPARATUS FOR DETERMINING RADIATION WAVELENGTHS AND WAVELENGTH-CORRECTED RADIATION POWER OF MONOCHROMATIC LIGHT SOURCES

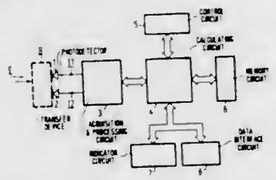
Vladimir Blazek, and Jürgen Seidenberg, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 762,181, Aug. 2, 1985, abandoned. This application Sep. 13, 1988, Ser. No. 244,577

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429541

Int. Cl.[4] G01J *3/50*

U.S. Cl. 356—402 **20 Claims**



1. In a method of determining radiation wavelengths of substantially monochromatic optical radiation comprising the steps of

transmitting monochromatic optical radiation to at least two photodetectors having different spectral sensitivity variations,

supplying electrical output signals from said photodetectors to an electronic circuit for acquisitioning and processing measurement values, and

supplying output signals depending on said optical radiation from said electronic circuit to an indicating circuit, said indicating circuit being calibrated to directly indicate radiation wavelengths,

wherein the improvement comprises for a calibration technique the steps of obtaining said optical radiation from a calibrated monochromatic light source having a variable wavelength, obtaining said electrical output signals of said photodetectors at different wavelengths of said light source, distributing said different wavelengths substantially uniformly over a relevant measuring range, and storing said relevant measuring range in a digital memory circuit in association with said different wavelengths;

wherein the improvement comprises for a subsequent measuring technique the step of comparing said electrical output signals of said photodetectors with sets of signals stored in said digital memory circuit for associated wavelengths, and providing an indication of conformity between wavelengths of said electrical output signals of said photodetectors and said associated wavelengths by said indicating circuit, and

wherein in said calibration technique said light source includes an isoenergetic monochromatic light source of known power, said electrical output signals of said photodetectors obtained at different wavelengths, said wavelength being stored in said memory circuit in association with both wavelength and a respective radiation power where power correction factors are L(g); and wherein for measuring said radiation power, absolute values and wavelengths of respective electrical output signals of said photodetector are compared to combinations of values stored in said memory circuit, conformity between stored values and measured values being indicated by said indicating circuit.

4,904,089

PARTICLE WETTING PROCESS AND APPARATUS

Harvey R. Dunton, Anaheim, and Donald H. Rez, Newport Beach, both of Calif., assignors to Standard Concrete Products, Inc., Santa Ana, Calif.

Continuation of Ser. No. 194,227, May 16, 1988, Pat. No. 4,830,505. This application May 16, 1989, Ser. No. 352,468

Int. Cl.[4] B28C *7/00;* **B01F** *15/02*

U.S. Cl. 366—6 **7 Claims**

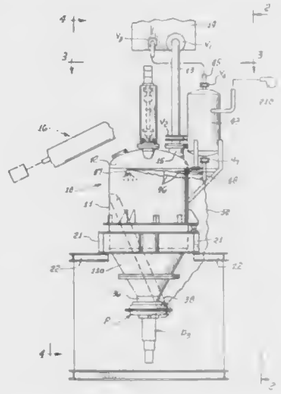
1. The method of mixing particulate cement and water in a primary mixing vessel to form a slurry batch, that includes:

(a) introducing a measured quantity of water into the vessel,

(b) introducing a measured quantity of particulate cement into the vessel,

(c) agitating the water and cement in the vessel to form a slurry,

(d) and, while continuing said agitating, pumping slurry received from the lower interior extent of the vessel for flow to an auxiliary mixing vessel for mixing with aggregate, and also for flow as a stream back into the slurry in the vessel to enhance mixing of water and cement in the vessel.



4,904,090

TEMPERATURE SENSING ARRANGEMENT

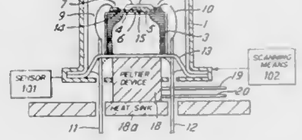
Colin C. Oliver, Slough, England, assignor to Thorn EMI plc, London, England

Filed Nov. 27, 1987, Ser. No. 125,991

Claims priority, application United Kingdom, Nov. 29, 1986, 8628610

Int. Cl.[4] G01J *5/32;* **H01L** *27/14*

U.S. Cl. 374—124 **7 Claims**



1. A temperature sensing arrangement including a temperature sensor device incorporating:

(a) a housing;

(b) within the housing a reference sensor for monitoring the temperature of the housing;

(c) also within the housing a further sensor for monitoring the temperature of a zone remote from the housing by means of infra-red radiation emitted by said zone and entering said housing;

(d) electrically driven control means for controlling the temperature of said housing;

(e) an electrical circuit arrangement responsive to the output of said reference sensor and said further sensor including means for producing electrical signals effective to drive said electrically driven control means in a sense tending to cause the temperature of said housing to approach that of said zone;

(f) means for monitoring the temperature of said housing so as to provide an indication of the temperature of said zone; and

(g) means to vary the drive operation of the electrical circuit arrangement in accordance with the operation of the sensors.

4,904,091

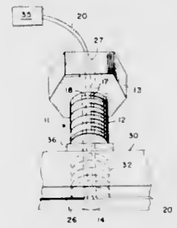
THREADED AVERAGE TEMPERATURE THERMOCOUPLE

Stanley W. Ward, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 244,376, Sep. 15, 1988, abandoned. This application Aug. 10, 1989, Ser. No. 391,694

Int. Cl.[4] G01K *7/02;* **H01L** *35/08*

U.S. Cl. 374—179 **5 Claims**



1. A device for measuring the average temperature of a test material of a determined thickness and having substantially parallel inner and outer surfaces, said outer surface being subjected to wind tunnel testing comprising:

a threaded bolt having a flat end face in a tip end and of a length greater than the width of said test material and having a bored cylinder along its longitudinal axis of symmetry and extending therethrough, said bolt being composed of a material having thermal properties similar to those of said test material;

a ceramic insulator rod with two parallel holes through the length thereof and securely fitted inside said bored cylinder;

a thermocouple wire having two cylindrical leads of equal diameter and which each extend from a remotely situated temperature sensing device, through a parallel hole at the head end of said bored cylinder, and exit at the tip end of said bored cylinder in said bolt;

two opposite radial grooves of a depth slightly greater than the diameter of said cylindrical leads formed in said end face in the tip end of said threaded bolt and communicating with said bored cylinder and disposed so that each of said cylindrical leads of said thermocouple wire is fully received and secured in an opposite radial groove in electrical contact with said tip end of said bolt;

ceramic insulator means for covering said cylindrical leads in said grooves and thereby bonding said cylindrical leads flush to the flat end face of said tip end of said bolt;

insulating means for securing said thermocouple wire to the head end of said threaded bolt;

a threaded cylindrical receptacle extending through said test material transverse to said inner and outer surfaces;

a locking means for securing said bolt into said receptable such that said bolt is in intimate contact with said inner surface of said test material and the flat end face of said tip end of said bolt is flush with the outer surface of said test material, but does not create any holes or protuberances on the outer surface thereof;

whereby the average temperature of the tip end of said bolt subject to wind tunnel tests is quickly and efficiently measured, said measured average temperature of said end face of said tip end of said bolt corresponding to and thus the measurement of the average temperature of said outer

VOL 1111 ISS 4 FEB 27 1990 UMI

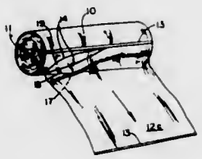
surface of said test material subject to the said wind tunnel testing.

4,904,092

ROLL OF THERMOPLASTIC BAGS

Pat C. Campbell; James A. Greiner, both of Palmyra, N.Y., and Bruce E. Nattinger, New Berlin, Wis., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 19, 1988, Ser. No. 259,840
Int. Cl.[4] B65D *33/00*
U.S. Cl. 383—35 20 Claims



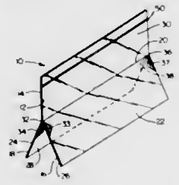
1. A continuous roll of bags formed from thermoplastic material comprising series of individual bags each having an outside back surface facing the core of the roll and an outside front surface facing away from the core of the roll, each individual bag being joined to the next by a transversely positioned seal line which defines the bottom of the bag and each bag having a transversely disposed weakened area in the area of said seal line which defines the top of a bag, each said bag being removed from said roll by tearing along said weakened area, and each said bag having on one of said outside back or front surfaces an area of permanently tacky, pressure-sensitive adhesive, capable of temporarily adhering to said thermoplastic material whereby when removing each bag from said roll the temporary adherence of said pressure sensitive adhesive to said thermoplastic material causes the front and back surfaces at the top of the bag being removed to separate slightly.

4,904,093

GUSSETTED PLASTIC BAGS HAVING RELIEF SEALS AND METHOD OF MAKING SAME

Timothy R. Woods, Midland; Fred Stevenson, Beaverton, and R. Douglas Behr, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1988, Ser. No. 236,056
Int. Cl.[4] B65D *30/20*
U.S. Cl. 383—120 3 Claims



1. A gussetted plastic bag for containing a product comprising:

(a) a pair of sidewalls, each having an upper sidewall and a lower sidewall;

(b) a gusset folded at a gusset crest to form gusset walls, the edges of each of said gusset walls and each corresponding said lower sidewall being joined together to form at least two pouches for containing product, both of said pouches opening to a spout formed by said upper sidewalls, and the ends of said gusset crest being sealed between said sidewalls to form gusset joints marking the dividing line between said upper and lower sidewalls;

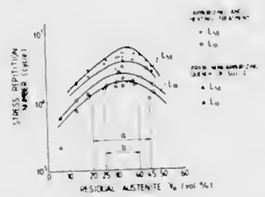
(c) a pair of relief seals formed adjacent each said gusset joint between said corresponding gusset wall and each side edge of said lower sidewalls, each relief seal positioned below a relief line extending downwardly from each said gusset joint at an angle of about 45° from said side edges of said lower sidewalls.

4,904,094

BALL-AND-ROLLER BEARING SYSTEM

Kyozaburo Furumura, Kanagawa; Yasuo Murakami, Yamato; Youichi Matsumoto, Fujisawa; Kenji Takei; Takaaki Shiratani, both of Hiratsuka, and Soji Nishida, Fujisawa, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,899
Claims priority, application Japan, Aug. 25, 1987, 62-209167
Int. Cl.[4] F16C *19/49*
U.S. Cl. 384—492 5 Claims



1. A rolling bearing, comprising an inner race, an outer race and rolling members which roll therebetween, at least one of said inner and outer races having been subjected to carburizing and heating treatment, and wherein:

said one of said inner and outer races is made with carbon steel containing 0.1 to 0.7 wt.% of carbon and has a track surface layer with a residual austenite content of 20 to 45 vol.%, and said rolling members are made with carbon steel containing 0.7 to 1.1 wt.% of carbon and have been subjected to carbonitriding and heating treatment on respective surface layers thereof, with the residual austenite content in said surface layers of said rolling members being 20 to 45 vol.% and the carbonitride in said surface layers of said rolling members being 3 to 15 vol.%.

4,904,095

MOUNTING ARRANGEMENT FOR BEARINGS

Jean-Pierre Fournier, Ecos, and Gilles Turin, Vernon, both of France, assignors to Societe Europeenne De Propulsion, Suresnes, France

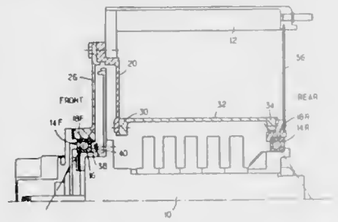
Filed Dec. 20, 1988, Ser. No. 287,077
Claims priority, application France, Dec. 23, 1987, 87 18080
Int. Cl.[4] F16C *23/06*
U.S. Cl. 384—517 5 Claims

1. An arrangement for mounting two bearings supporting a shaft within a housing, each said bearing having an inner race secured to the shaft and an outer race, the arrangement comprising:

two annular spacer membranes having a high radial stiffness and a predetermined axial flexibility, said spacer membranes having an outer edge and an inner edge;

the inner edge of each spacer membrane being secured to the outer race of a respective bearing and the outer edge of each spacer membrane being secured within the housing, both said spacer membranes being subjected to a predetermined amount of axial deformation with respect to their unstressed condition, whereby the spacer membranes exert a precisely determined axial preload onto said outer races of said bearing;

said two spacer membranes being located close to each other, whereby both spacer membranes are subjected to almost identical environmental conditions, the outer edges of both spacer membranes being secured within the housing in propinquity to each other, the inner edge of the first spacer membrane being secured to the outer race of a first bearing, said arrangement further comprising:



an elongated tubular sleeve surrounding said shaft, said sleeve having a first end portion secured to the inner edge of the second spacer membrane and a second end portion secured to the outer race of the second bearing; and

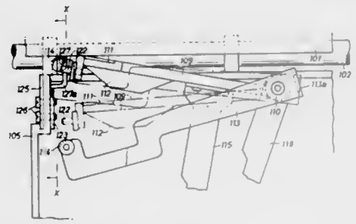
a centering membrane having an outer edge secured within the housing and an inner edge secured to the second end portion of the sleeve, said centering membrane having a high radial stiffness and a negligible axial stiffness.

4,904,096

PRINTING DEVICE

Takashi Okumura, and Koshiro Yamaguchi, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 947,915, Dec. 29, 1986, Pat. No. 4,838,718. This application Jan. 9, 1989, Ser. No. 294,756
Claims priority, application Japan, Jan. 8, 1986, 61-1535; Jan. 8, 1986, 61-1536
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—120 8 Claims



1. A printing device comprising:

a platen extending in a predetermined direction;

guide means extending parallel to said platen;

a carriage provided with a printhead thereon and supported to move on said guide means;

means for printing on a printing sheet placed on said platen by said printhead of said carriage;

arm means having a nose end on which is mounted said printhead, a base end which is mounted on said carriage such that said nose end moves both toward and away from said platen, and an end portion; and

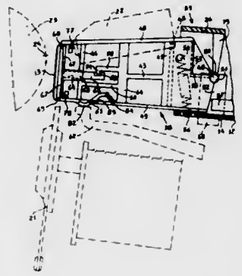
position determining means provided between an opposite end of said arm means with respect to said base end and said carriage for engaging said end portion in order to restrain vertical movement of said printhead and of said end portion when said end portion approaches said platen.

4,904,097

CARTRIDGE FOR A PRINTING RIBBON

Remo Falconieri, S. Giorgio Case, and Sergio Uggetti, Ivrea, both of Italy, assignors to Ing.C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 95,219, Sep. 11, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 259,417
Claims priority, application Italy, Sep. 11, 1986, 67702 A/86
Int. Cl.[4] B41J *32/00, 35/04*
U.S. Cl. 400—248 5 Claims



1. A cartridge for a printing ribbon for a typewriter of the type comprising a platen roller having a typing point, a printing ribbon having a plurality of tracks which can be selected for the printing operation, a casing for housing the printing ribbon having a pair of oscillating arms having terminal portions and movably mounted in the casing from a rest position wherein the typing point is visible to successive printing positions wherein the plurality of tracks are positioned in front of the typing point, wherein said casing and said pair of oscillating arms define a combination comprising:

two arm portions projecting from the casing toward the platen roller and having two openings respectively arranged to accommodate the pair of oscillating arms;

two supports positioned in said two arm portions adjacent to the respective openings comprising two seats respectively;

two pins each fixed at one end of each oscillating arm, wherein the pair of oscillating arms are movable on two vertical planes substantially parallel therebetween and perpendicular to the platen roller by means of said pins which are pivotally mounted in the respective seats;

two tongue portions positioned in said two arm portions opposite to said two supports having their ends positioned adjacent to the respective pins for preventing the disengagement of the pins from the respective seats;

two guide elements each positioned at the other end of each oscillating arm, opposite to the pin and pivotally mounted with respect to the respective oscillating arm during the selection of one of the plurality of tracks while maintaining uniform tension across the width of the printing ribbon, wherein each guide element comprises a cylindrical stem and a main front plate which is perpendicular to a pivotal axis defined by the cylindrical stem and defines the plane of the external run of the printing ribbon parallel to the platen roller,

each of the other ends of the pair of oscillating arms comprises a central sleeve having a cylindrical seat for freely housing the cylindrical stem of the corresponding guide element,

said two guide elements are pivotally mounted to move in a clockwise or counterlockwise direction on two planes

substantially coplanar therebetween, parallel to the platen roller and perpendicular to the vertical planes through the cylindrical stems which are freely housed in the cylindrical seats, and

wherein the tension of the printing ribbon is capable of freely modifying the angular positions of the guide elements in such a way that they turn one in the clockwise direction and the other in the counterclockwise direction, modifying their angular positions with respect tot he oscillating arms from time to time for re-balancing the tension and for maintaining a constant and uniform tension at the edges and at the middle section of the printing ribbon independently of the selected track during the movements from the rest position to the successive printing positions of the pair of oscillating arms and vice versa, wherein each of the guide elements comprises an internal shoulder, and wherein each oscillating arm comprises an arresting element cooperative with the internal shoulder for limiting the rotary movement of each of said guide elements.

4,904,098

FLEXIBLE PRINT RIBBON SHIELD

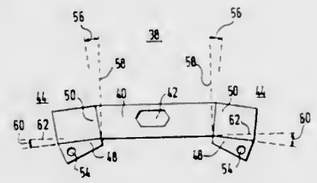
Thomas A. Hamilton, Dalgety Bay, United Kingdom, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Feb. 1, 1988, Ser. No. 150,806

Claims priority, application United Kingdom, Sep. 5, 1987, 8720912

Int. Cl.[4] B41J *35/04*

U.S. Cl. 400—248 **9 Claims**



1. An impact printer for printing on a presented document, said printer comprising:

a hammer operative when in use to push the document against an ink ribbon and for the ink ribbon to be pushed in turn against a rotatable print surface to leave a record of a selected character upon the document;

a shield disposed between the document and the ink ribbon to prevent contact other than when said hammer is in operation, said shield including a shielding portion having opposite extremities along its longitudinal axis, said shielding portion having at least one hole-like aperture and first and second folded portions integral respectively with said opposite extremities, said first and second folded portions being displaced relative to said shielding portion so that said shielding portion is disposed at an offset angle relative to the plane which lies at 90 degrees to the direction of approach of said hammer towards said print surface when said shield is mounted in its operative position in said impact printer by said first and second folded portions;

said shield being flexible and, when said document is pushed towards said ink ribbon by said hammer via said aperture, said shield moving under pressure from the document towards said print surface to allow contact between the document and said ink ribbon.

4,904,099

ELECTRONIC TYPEWRITER

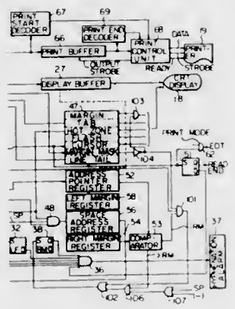
Shintaro Abe, and Tomoyuki Haganuma, both of c/o Ricoh Company, Ltd., 3-6, 1-chome Nakamagome, Ota-ku, Tokyo, Japan

Continuation of Ser. No. 639,871, Aug. 13, 1984, abandoned, which is a continuation of Ser. No. 381,095, May 24, 1982, abandoned, which is a continuation of Ser. No. 866,634, Jan. 3, 1978, abandoned. This application Jun. 6, 1988, Ser. No. 205,614

Claims priority, application Japan, Jan. 14, 1977, 52-3156; Apr. 19, 1977, 52-44707; Apr. 19, 1977, 52-44709

Int. Cl.[4] B41J *21/04, 19/66*

U.S. Cl. 400—348 **20 Claims**



1. An electronic typewriter comprising:

operator controlled keyboard means for inputting data and having a margin release key;

display means for displaying one line of data entered from the keyboard means and a right margin mark;

a printer for printing the line of data;

operator controlled cursor means connected to the display means for movably positioning a cursor on the display means relative to the line of data;

margin release means for controlling the display means and printer means to display and print data of a line entered from the keyboard means leftwardly and rightwardly of the right margin mark after the cursor is moved and stopped under the right margin mark and the margin release key is depressed, said margin release means having a storage device which is set to a margin release state in response to the depression of said margin release key; and

control means for causing the line of data to be transmitted from the display means to the printer means for printing and causing said storage device in the margin release means to be reset from said margin release state, and controlling, for subsequent lines of print data, the display means and printer means to display and print data entered from the keyboard means only leftwardly of the right margin mark.

4,904,100

CARTRIDGE AND PRINTER SYSTEM FOR USING ROLL PRINT MEDIA

Bruce W. Enix, Huber Heights, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,084

Int. Cl.[4] B41J *15/04*

U.S. Cl. 400—613 **5 Claims**

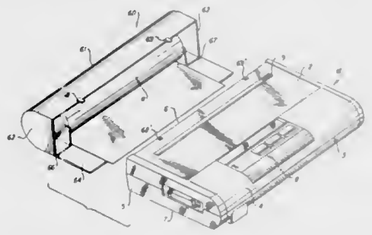
1. For use with a portable printer having a housing with a print media ingress in its lower rear wall and a print media egress in its top wall, a print media cartridge comprising:

(a) a cartridge housing including: (i) an elongated member of generally U-shaped cross-section having a top wall portion and a bottom wall portion with a planar bottom surface and (ii) two end wall portions closing the ends of said elongated member;

(b) a cartridge door of size and shape corresponding to the open side of said elongated member;

(c) means for hingedly coupling said cartridge door to the lip of said bottom wall portion of said elongated member;

(d) means for latching said cartridge door in a closed position to said cartridge housing; and



(e) a roll of print media supported within said cartridge housing in an orientation such that the roll ends face respective end wall portions and that its lead edge unwinds adjacent said bottom wall portion;

said cartridge door being a planar element constructed to rest, in an open condition, on a flat surface coplanar with said bottom wall portion and be held under the printer housing so that the printer weight retains an operative cartridge position vis-a-vis said printer.

4,904,101

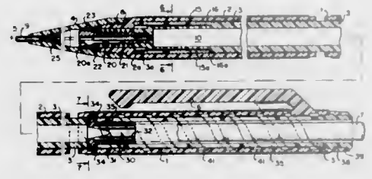
ERASER DISPENSER AND WRITING INSTRUMENT EQUIPPED WITH ERASER DISPENSER

Tor Petterson, Rancho Palos Verdes, Calif., assignor to Pentel of America, Ltd., Torrance, Calif.

Filed Mar. 14, 1988, Ser. No. 167,549

Int. Cl.[4] B43K *29/02*

U.S. Cl. 401—52 **3 Claims**



1. A writing instrument comprising: means defining an inner barrel having forward and rearward portions and having therein a storage compartment for storing writing leads; an outer front barrel disposed over and encircling the forward portion of the inner barrel; a writing tip connected to the forward end of the front barrel; means mounting the inner barrel to undergo limited axial displacement in forward and rearward directions within the outer front barrel but not angular displacement relative thereto; lead-advancing means for incrementally advancing a lead fed from the storage compartment to the writing tip in response to forward axial displacement of the inner barrel; an outer rear barrel disposed over and encircling the rearward portion of the inner barrel; means mounting the outer rear barrel to undergo angular displacement about the inner barrel but not axial displacement relative thereto; an eraser holder disposed within the rearward portion of the inner barrel and releasably holding an elongate eraser; and means mounting the eraser holder to undergo axial displacement in forward and rearward directions within the inner barrel in response to angular displacement of the outer rear barrel in opposite directions to thereby effect retraction and extension of the eraser relative to the rear end of the inner barrel according to the direction of angular displacement of the rear barrel.

4,904,102

BASE PLATE FOR A LOOSE-LEAF HOLDER

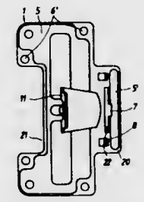
Anthony Handler, Vienna, Austria, assignor to Koloman Handler Gesellschaft m.b.H., Vienna-Atzgersdorf, Austria

Filed Sep. 1, 1988, Ser. No. 239,508

Claims priority, application Austria, Sep. 8, 1987, 2269/87

Int. Cl.[4] B42F *13/22*

U.S. Cl. 402—34 **2 Claims**



1. A base plate for a closure mechanism of a loose-leaf holder for sheets defining holes along an edge thereof, the base plate carrying fixed, straight prongs for receiving the holes of the sheets and pivotal prongs cooperating with the fixed prongs, and the base plate being delimited by a first pair of parallel edges opposite each other and a second pair of parallel edges extending substantially perpendicularly to the first pair of edges, one of the edges of the first pair defining an inwardly projecting recess and the opposite edge of the first pair defining a protruding portion projecting outwardly in the same direction as the inwardly projecting recess, the inwardly projecting recess and the outwardly projecting protruding portion being substantially congruent and in alignment with each other.

4,904,103

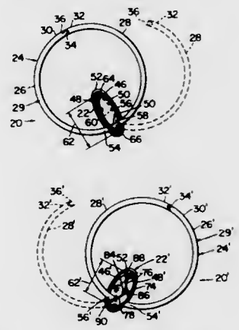
LOOSE-LEAF BINDER

Darryl Im, 9441 Imperial Ave., Garden Grove, Calif. 92644

Continuation-in-part of Ser. No. 132,781, Dec. 14, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 283,727

Int. Cl.[4] B42D *13/24, 13/26*

U.S. Cl. 402—35 **19 Claims**



7. A loose-leaf binder according to claim 1, wherein:

said spine includes means for releasibly securing said spine

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members to one another when said spine members and ring members occupy their closed positions, thereby to retain said binder rings closed.

4,904,104

FASTENER FOR UNPERFORATED WRITTEN MATTER

Friedrich Gloeckle, Korb, Fed. Rep. of Germany, assignor to Hetzel & Co., Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 202,232

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718664; Oct. 13, 1987, 3734569

Int. Cl.[4] B42F *13/00*

U.S. Cl. 402—80 R **21 Claims**



1. A clamping folder for holding flat sheets such as paper sheets, comprising:

a front folder cover and a back folder cover, said front and back folder covers being interconnected along a back defining a spline;

a cross-sectionally substantially U-shaped clip operable to slide over the spline and holding the front and back folder covers between a front leg and a rear leg of the clip, the clip having on the rear leg thereof at least one tongue, substantially coplanar with said rear leg, the tongue being engageable in an opening formed on said back folder cover, the clip being secured from detachment fron the front and back folder covers by engagement with an edge formed on the folder.

4,904,105

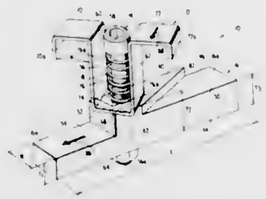
TENSIONED GRATING FASTENER

Robert E. Myers, 18507 Prince Willian La., Houston, Tex. 77058

Filed Nov. 3, 1988, Ser. No. 266,600

Int. Cl.[4] F16B *2/12*

U.S. Cl. 403—24 **8 Claims**



1. A tensioned grating fastener for fastening a grating formed of laterally spaced parallel bars interconnected by longitudinally spaced cross bars to an underlying support having a flange at one side perpendicular to said laterally spaced parallel bars said fastener comprising:

an elongated foot having a first end positionable in contact with said flange on a face of said flange opposite that in contact with said grating parallel bars:

a second end positionable in contact with one of said parallel bars proximate to said support;

a headed rod mounted at one end to the foot and projecting outwardly of the face of said foot, contacting said grating, said rod positionable between adjacent parallel bars;

a hook element having a base portion with a hole therein, at least one hook element side wall unitary with said base and projecting at right angles thereto to the side of said hole, said hook element side wall terminating at an end remote from said base in a reversely bent hook, sized to fit over and about one of said parallel bars, said headed rod projecting through said hole within said base and coupled to said foot; and

a coil spring concentrically mounted about said rod having one end in contact with said headed end of said rod and another end in contact with said base; and

wherein the height of said grating parallel bars, the height of said rod and said hook element side wall and the axial length of said coil spring are such that with said hook fitted over one of said parallel bars, axial displacement of said rod through said hook element base hole in the direction of said foot, causes said coil spring to be placed under compression, permitting rotation of said foot from a position in line with hook element, to a position at an angle therewith and engagement of respective ends of said foot with said support flange and said one grating parallel bar with said coil spring maintained under compression, thereby tensioning said hook engaged grating against said flange support to resist disengagement as a result of vibration or the like.

4,904,106

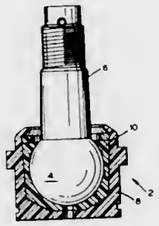
SOCKET BEARING

Mickey L. Love, Oklahoma City, Okla., assignor to Dana Corporation, Toledo, Ohio

Filed Jun. 26, 1989, Ser. No. 371,370

Int. Cl.[4] F16C *11/00*

U.S. Cl. 403—39 **10 Claims**



1. In a ball and socket joint, a socket bearing adapted for accommodating a ball, said bearing having an internal bearing surface for engagement with and support of said ball, said internal bearing surface comprising a plurality of lubrication grooves, each groove defining a depth, each adjacent pair of grooves defining a land therebetween, each groove defining a pair of arcuate sidewalls, each sidewall defining an interface boundary with one land; an improvement comprising each of said grooves defining a groove radius, and wherein each sidewall interface boundary defines a boundary radius, said boundary radius being at least fifty percent of said groove radius.

4,904,107

BALL JOINT AND ITS MANUFACTURING METHOD

Takao Fukukawa, and Masahiro Yamada, both of Shizuoka, Japan, assignors to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 285,748

Claims priority, application Japan, Dec. 25, 1987, 62-329179

Int. Cl.[4] F16C *11/00;* **B21D** *53/10*

U.S. Cl. 403—122 **5 Claims**

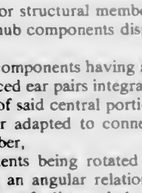
1. A ball joint comprising:

a housing including spaced apart ends and an inside surface that defines an opening extending through said housing from one of said ends to the other of said ends;

a plurality of engagement recesses on said inside surface;

a ball stud having a global head and an integral shank extending therefrom, said global head being disposed in said opening inside of said housing with said shank projecting out of said opening at one of said ends of said housing; and

a bearing seat formed of a hard synthetic resin inserted in said opening between said inside surface of said housing and said global head of said ball stud, said bearing seat



having an engagement portion that engages said engagement recesses, said engagement portion being caulked over at least one of said housing ends and forced into bitting engagement with said engagement recesses to secure said bearing seat against rotation relative to said housing.

4,904,108

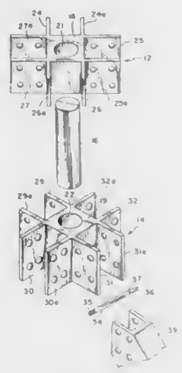
GEO HUB

Wendel R. Wendel, 184 Main St., Cold Spring Harbor, N.Y. 11724

Filed Mar. 28, 1988, Ser. No. 174,210

Int. Cl.[4] F16B *7/00*

U.S. Cl. 403—173 **20 Claims**



1. A connection for structural members comprising:

at least a pair of hub components disposed in abutting relationship,

each of said hub components having a central portion and a plurality of spaced ear pairs integrally extending from the circumference of said central portion,

each said ear pair adapted to connect with the end of a structural member,

said hub components being rotated with respect to each other to define an angular relationship between the respective ear pairs of adjacent hub components,

said central portion of each said hub component being provided with a through opening disposed in axial alignment with an identical through opening in an abutting hub componeat,

rod means extending through and positively attached to the through opening of each said central portion to connect said hub components into a unitary structure and serving to transfer all forces and moments between the individual hub components,

said rod means having at least one end thereof forming a flush smooth surface on the same plane and in contiguous relationship with the surface of one of said hub components,

said rod means being an elongated cylinder having a diameter equal to at least two-thirds the width of said central portion of each said hub component and having a length substantially equal to the combined thickness of said hub components.

4,904,109

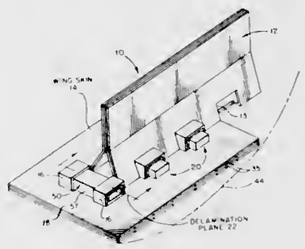
INTERLOCKING STRUCTURAL MEMBERS EMPLOYING TRANSVERSE LOCKING WEDGES

Robert E. Anderson, Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 11, 1987, Ser. No. 131,699

Int. Cl.[4] F16B *2/14*

U.S. Cl. 403—374 **3 Claims**



1. An expansion fastener comprising:

a hollow parallelepiped receptacle having

(a) a central section having slitted open ends to permit expansion of the ends in the horizontal and vertical directions;

a wedge having a rectangular cross section inserted into each end to force expansion thereof, each wedge having

(a) tapered surfaces for contacting mating tapered surfaces formed inwardly of the receptacle ends;

(b) ridges formed on the tapered surfaces of the wedge for engaging mating ridges on the receptacle tapered surfaces.

4,904,110

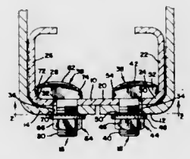
FASTENING ARRANGEMENT FOR SHELVING SYSTEM OR THE LIKE

Herbert H. Klein, Arlington Heights, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Jun. 17, 1988, Ser. No. 208,148

Int. Cl.[4] A47B *47/00*

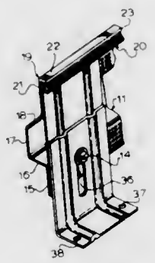
U.S. Cl. 403—379 **3 Claims**



1. In a shelving system or the like, a combination comprising:

(a) a columnar post, which has a front wall and a lateral flange extending from the front wall and merging with the front wall along a curved corner of the columnar post, the curved corner defining a concavely curved bearing surface, the front wall having an aperture bounded by a margin;
(b) an outer plate, which is adapted to be removably fastened to the front wall, and which has an aperture bounded by a margin, similar to the aperture of the front wall, and adapted to overlie the aperture of the front wall when the outer plate is disposed for being fastened to the front wall;
(c) means for fastening the outer plate removably to the front wall, said means including:
(1) a bolt having a threaded shank and a transverse head, which is integral with the threaded shank, the transverse head having two opposite portions and being smaller than the aperture in the outer plate and smaller than the aperture in the front wall, the bolt being adapted to be successively inserted through the aperture of the outer plate with the head preceding the shank, inserted through the aperture of the front wall with the head preceding the shank, rotated about the threaded shank in a given rotational sense in relation to the columnar post, and drawn outwardly until the transverse head bears against the curved corner where the lateral flange merges with the front wall so as to prevent further rotation of the bolt in the same rotational sense, the apertures being shaped so as to allow substantially straight-through insertion of the bolt axially in relation to the threaded shank with the head preceding the shank, one of said two opposite portions of the transverse head having a convexly curved bearing surface conformed to the concavely curved bearing surface defined by said corner so as to bear in surface-to-surface contact with said concavely curved bearing surface, the transverse head being adapted to bear at the opposite portions against the margin of the aperture in the front wall, on opposite sides of the aperture in the front wall, when the bolt is drawn outwardly, so as to prevent axial withdrawal of the bolt; and
(2) a fastener, which is threadable onto the threaded shank, and which is adapted to draw the bolt outwardly, when the fastener is threaded onto the threaded shank, until the fastener bears against the margin of the aperture of the outer plate.

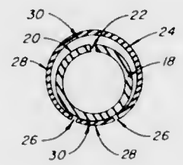
4,904,111
ADJUSTABLE SUPPORT FOR USE WITH METAL KEYWAY FORMS FOR ABOVE GRADE CONCRETE SLAB
Albert P. Weisbach, Louisville, Ky., assignor to Cardinal Manufacturing Co., Louisville, Ky.
Filed Feb. 21, 1989, Ser. No. 312,740
Int. Cl.[4] E01C *11/06, 11/04*
U.S. Cl. 404—48 **7 Claims**



1. An adjustable support securable to metal decking to support a metal keyway form comprising:
a. a generally flat, rectangular metal strip containing a plurality of ridges running vertically the length of the strip, a plurality of closely spaced serrations across the top portion of the ridges and a securing means opening located in the lower portion of the strip;
b. a generally L-shaped support member containing an elongated vertical oval opening and a plurality of valleys on the back of the member which align with the ridges of the metal strip; and
c. a means for securing the L-shaped support member to the metal strip through the elongated vertical oval opening in the L-shaped support member and the securing means opening in the metal strip.

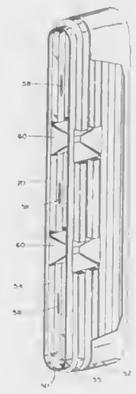
7. A process for the pouring of a concrete slab on metal decking to produce a keyway comprising
a. securing an adjustable support to metal decking, wherein the adjustable support is comprised of a generally flat rectangular metal strip containing a plurality of ridges running vertically the length of the strip, a plurality of closely spaced serrations across the top portion of the ridges and a securing means opening located in the lower portion of the strip; a generally L-shaped support member containing an elongated vertical oval opening and a plurality of valleys on the back of the member which align with the ridges of the metal strip; and a means for securing the L-shape support member to the metal strip through the elongated vertical opening in the L-shaped support member and the securing means opening in the metal strip;
b. placing a metal keyway form containing an inverted hook portion with an inwardly facing lip onto the adjustable metal decking support and pushing the keyway form securely over the metal strip; and
c. pouring concrete flush with the metal keyway form and the adjustable metal decking support.

4,904,112
UNDERGROUND IRRIGATION SYSTEM
Carroll W. McDonald, 3680 42nd Way S., #D, St. Petersburg, Fla. 33711
Filed Jul. 26, 1989, Ser. No. 385,565
Int. Cl.[4] E02B *13/00*
U.S. Cl. 405—45 **10 Claims**



1. An underground irrigation system comprising;
an inner plastic cylindrical pipe impervious and inert to water connected to a pressurized water input source, the inner pipe having a plurality of apertures located on a top portion to permit flow of water from the interior to the exterior of the inner pipe, an outer cylindrical pipe slightly larger in interior diameter from an outer diameter of the inner pipe, the outer pipe being impervious to water and inert to soil chemicals enclosing the inner pipe, the inner pipe sealed at an end distal from the water input source to form a closed system, the outer pipe having a plurality of longitudinal slots located on a bottom portion with a bottom portion of the inner pipe resting on the bottom portion of the outer pipe, the outer pipe resting on an underground soil strata and being covered with soil, the slots permitting water to trickle from the outer pipe into the surrounding soil area which requires at least one pound per square inch pressure to be exerted on the water supply within the inner pipe.

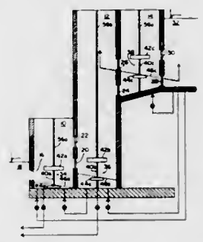
4,904,113
HIGHWAY EDGEDRAIN
James B. Goddard, Powell, Ohio; Leon H. Zimmerman, Nashville, Tenn., and Larry L. Martin, Hamilton, Ohio, assignors to Advanced Drainage Systems, Inc., Columbus, Ohio
Filed Aug. 18, 1987, Ser. No. 86,678
Int. Cl.[4] E02B *11/00*
U.S. Cl. 405—45 **20 Claims**



1. A hydraulic structure comprising a flexible, corrugated tube having alternating annual peaks and valleys, said tube surrounded by a fibrous sheath
said tube having first and second relatively flat opposing spaced corrugated panels
said panels of said corrugated tube having a plurality of apertures in selected valleys of the tube arranged transversely to the longitudinal axis of the tube, and
means extending between said panels within said tube for supporting said panels in a spaced relation, said means comprising inwardly projecting cuspations located on said first panel opposite cuspations on said second panel.

4,904,114
FISH CONVEYING APPARATUS
Joseph Warner, and James Schjelderup, both of Vancouver, Canada, assignors to Warner Technologies, Inc., Vancouver, Canada
Filed Sep. 14, 1988, Ser. No. 245,988
Claims priority, application Canada, Sep. 15, 1987, 546891
Int. Cl.[4] F02B *8/08*
U.S. Cl. 405—82 **9 Claims**

6. Apparatus for assisting live fish to circumnavigate an obstacle between a downstream portion and an upstream portion of a waterway, said apparatus comprising:
primary gate means for closing a primary port arranged between a first chamber and an adjacent section of the downstream portion of the waterway;
said primary port having a lowermost part thereof disposed at a first level which is located below the level of the adjacent section of the downstream portion of the waterway;
a vertically movable, buoyant first confinement means including a generally planar screen-like first bottom for confining the fish within a predetermined region of the first chamber;
means to fill said first chamber with water to raise the first bottom to a second level disposed above the level of the adjacent section of a downstream portion of the waterway;
hydraulically actuated means for lockingly engaging said first confinement means in its lower position and in its upper position, wherein said bottom is at or below said first level and at said second level, respectively;
secondary gate means for closing a secondary port arranged between said first chamber and a second chamber;
said secondary port having a lowermost part thereof disposed at the second level;
a vertically movable, buoyant second confinement means including a generally planar screen-like second bottom for confining the fish within a predetermined region of the said second chamber;

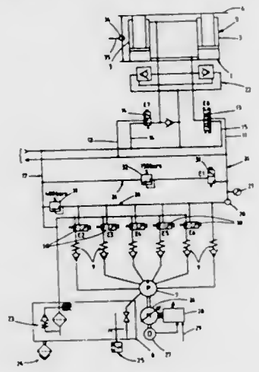


means to fill said second chamber with water to raise the second bottom to a third level disposed near the level of an adjacent section of the upstream portion of the waterway;
means for locking said second confinement means in its lower position and in its upper position, wherein said bottom is at said second level and at said third level, respectively;
tertiary gate means for closing a third port arranged between said second chamber and said adjacent section of the upstream portion of the waterway;
said tertiary port having a lowermost part thereof disposed at the third level; and
means for selectively draining said first and second chambers.

4,904,115
METHOD AND DEVICE FOR CONTROLLING THE TRAJECTORY OF A SHIELD-TYPE TUNNELLING MACHINE
Vincent Lebreton, Creil, France, assignor to Charbonnages de France, Rueil-Malmaison, France
Filed Apr. 18, 1988, Ser. No. 182,833
Claims priority, application France, Apr. 16, 1987, 87 05443
Int. Cl.[4] E21D *9/06*
U.S. Cl. 405—143 **13 Claims**

1. A method of controlling the path of a shield-type tunnelling machine equipped with displacement control hydraulic rams divided into at least three groups comprising the steps of:
(a) setting an intended set point trajectory of advance for said machine along a desired path of curvature for advance of said machine;
(b) computing a theoretical instantaneous flow rate of fluid to be applied to each of said groups of rams in order to advance said machine along said intended set point trajectory;

(c) applying said theoretical instantaneous flow rate of fluid to each of said groups of rams; and



(d) continuously and cyclically repeating steps (a)-(c) for each point along said desired path of curvature.

4,904,116

APPARATUS FOR MAKING TUNNELS IN THE GROUND AND FOR LAYING SUPPLY LINES

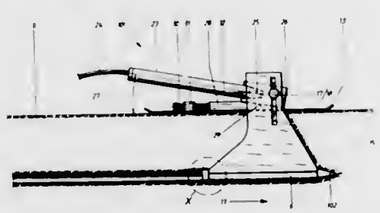
Alfons Hesse, Lennestadt, Fed. Rep. of Germany, assignor to Paul Schmidt, Lennestadt, Fed. Rep. of Germany

Filed Feb. 23, 1989, Ser. No. 315,416

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810410; Aug. 4, 1988, 8809959[U]

Int. Cl.[4] E02F *5/10*; F16L *1/00*

U.S. Cl. 405—183 **17 Claims**



1. Apparatus for making for making tunnels in the ground and for laying supply lines in the ground comprising;

an earth displacing machine guided by a sword projecting above the ground, wherein the displacing machine has a wing formed for guiding the sword, said wing having a first portion extending above the ground and a second portion extending below the ground, said first portion having a means for impacting said sword and said second portion having an impact tip.

4,904,117

ACCESS APPARATUS CONNECTING A FIRST AND SECOND CHAMBER AT GREAT WATER DEPTHS

Bjornar Svensing, Trondheim, Norway; Rune Swensson, Höllviken, and Lars Truedsson, Klagstorp, both of Sweden, assignors to Den Norske Stats Oljeselskap A.S., Norway

Filed Feb. 19, 1988, Ser. No. 157,866

Claims priority, application Norway, Feb. 23, 1987, 870704

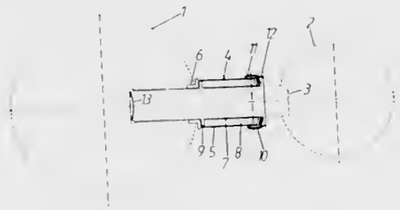
Int. Cl.[4] B63C *11/34*

U.S. Cl. 405—189 **6 Claims**

1. An apparatus for access between a first and second chamber located underwater wherein said first and second chamber are at equal pressure, the apparatus comprising:

(a) an outer tubular member having one end attachable to a first chamber;

(b) an inner tubular member positioned concentrically inside said outer tubular member and in sliding arrangement with said outer tubular member, said inner tubular member having one end facing said first chamber and another end facing away from said first chamber, said inner tubular member and said outer tubular member defining a ring room therebetwen;



(c) a mating means for forming a seal around portion of a second chamber, said mating means attached to the other end of said inner tubular member;

(d) a ring shaped member attached eternally to said inner tubular member and forming a hydraulic piston arrangement in said ring room; and

(e) a hydraulic system for actuating movement of said inner tubular member by means of said hydraulic piston arrangement.

4,904,118

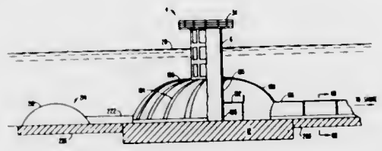
STRUCTURE FOR VIEWING AN UNDERWATER ENVIRONMENT

Henry J. Thiemann, III, P.O. Box 14292, So. Lake Tahoe, Calif. 95702

Continuation-in-part of Ser. No. 933,402, Nov. 20, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 214,695

Int. Cl.[4] B63C *11/00*; E02D *29/00*

U.S. Cl. 405—195 **19 Claims**



1. A structure for observing an underwater environment comprising:

a first housing affixed to a support and having a portion thereof disposed a substantial length below the surface of a body of water;

a housing extension disposed on a side of the housing and extending outwardly therefrom into the underwater environment;

means for receiving a person into the housing extension; and

viewing means, disposed on the housing extension, for viewing the underwater environment from inside the extension, the viewing means including means for viewing the underwater environment above the extension, the viewing means being disposed beyond an outer perimeter of the housing for providing an unobstructed view to the surface of the body of water, the viewing means comprising:

first and second ribs, each rib extending arcuately upwardly from a point located on the bottom of the body of water spaced apart from the first housing to a point located on the first housing above the bottom of the body of water; and

a transparent shell connected to each rib and arcuately extending from the first housing to the bottom of the body of water.

4,904,119

PROCESS FOR PLACING A PILING IN THE GROUND, A DRILLING MACHINE AND AN ARRANGEMENT FOR IMPLEMENTING THIS PROCESS

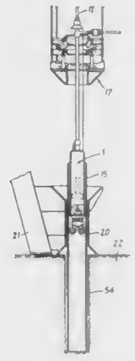
Yves Legendre, Balloy, and Hervé Barthelemy, Croissy/sur/-Seine, both of France, assignors to Soletanche, Naterre, France

Filed Oct. 19, 1987, Ser. No. 109,946

Claims priority, application France, Oct. 22, 1986, 86 14657

Int. Cl.[4] E02D *7/28*

U.S. Cl. 405--228 **6 Claims**



1. A method for installing a piling of a predetermined target depth in the ground, paticularly on the ocean floor comprising the steps of:

(a) lowering a pipe having predetermined inner diameter and outer diameter into the ground together with a drilling machine set inside said pipe, said machine having rotatable cutters movable from a first position in which their transverse dimension is less than the inner diameter of the pipe to a second position in which their transverse dimension is greater than the outer diameter of the pipe;

(b) holding said pipe fixed while independently lowering the drilling cutters while in said first position to a location below the pipe;

(c) moving said cutters to said second position;

(d) rotating said cutters to drill a hole of a predetermined incremental portion of said target depth, said hole having a diameter larger than the outer diameter of the pipe;

(e) retracting said cutters to their first position and raising the drilling machine back within the pipe;

(f) lowering the pipe and the drilling machine to the bottom of said hole to said incremental portion of said predetermined target depth;

(g) repeating in sequence steps (b) through (f) until the total target depth is reached;

(h) removing the drilling machine from said pipe to establish an annular space between the wall of the hole and the exterior surface of the pipe; and

(i) filling said annular space with cement.

4,904,120

FRAME FOR FORMING COVERINGS ON GROUND OPENINGS

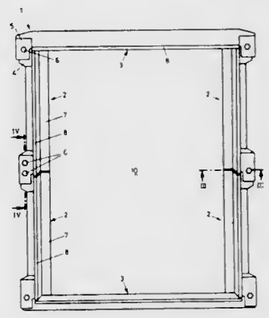
Hansruedi Spiess, Delemont, and Francois Galvanetto, Alle, both of Switzerland, assignors to Von Roll AG, Gerlafingen, Switzerland

Filed Sep. 28, 1988, Ser. No. 250,341

Claims priority, application Switzerland, Oct. 12, 1987, 3976/87

Int. Cl.[4] E02D *3/00*

U.S. Cl. 405—258 **15 Claims**



1. A frame for forming coverings for ground openings and formed for receiving one or more juxtaposed covers or gratings, the frame comprising a plurality of frame parts each including a frame wall and a frame base; a plurality of screw couplings connecting said frame parts to each other for forming said frame, each of said frame parts including connecting lugs for receiving the screw couplings, said lugs being provided at ends of the frame parts and being formed each with at least one bore for receiving the screw coupling projecting over an end of the frame wall, a first connecting lug of said lugs provided at one end of the frame wall being positioned below a second connecting lug provided at another end of the frame wall in such a way that in the frame assembled of two adjacent frame parts the connecting lugs superimpose one another, are spaced from one another, extend parallel with each other and are connected to each other in spaced relationship by the screw coupling, one of said lugs having at a side thereof facing another of said lugs a cavity and another of said lugs having at least one web at a side thereof facing said one lug; and a solidifiable filling material filling said cavity and surrounding said web and a bolt of said screw coupling received in said bore of each lug for positively fixing said lugs with said screw couplings when said material is solidified.

4,904,121

DEVICE FOR STABILIZING BULK MATERIAL

Carl R. Hallberg, Kongsberg, Norway, assignor to A/S Platon, Notodden, Norway

Continuation-in-part of Ser. No. 48,821, May 12, 1987, Pat. No. 4,798,498, which is a continuation-in-part of Ser. No. 13,786, Feb. 12, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 288,449

Claims priority, application Norway, Feb. 24, 1986, 860684; Feb. 24, 1987, 870764

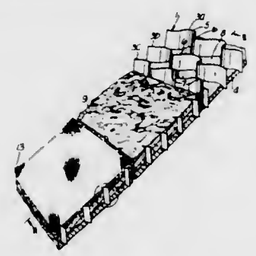
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[4] E02D *17/20*; E02B *3/12*

U.S. Cl. 405—258 **18 Claims**

1. A device, especially for stabilizing bulk material to a support surface, wherein an initially relative thin, substantially flat web having a top side and a bottom side and in a first direction is provided with rows of consecutively arranged slit

means extending between said sides; said rows of slit means are staggered relative to each other in said first direction so that the web by stretching in a second direction which is angled to said first direction, forms oppositely undulating strips which in turn defme rows of side by side arranged cells or pockets between a top side portion of the web adjacent one side of the



slit means with a bottom side portion of the web adjacent another side of the slit means; and wherein the cells or pockets in one row are offset in said first direction from the cells or pockets in an adjacent row; and further wherein the web has an introductory stretching which is effected during the production of the web which will initiate the direction in which the strips are to undulate during the final stretching.

4,904,122

ANCHORING DEVICE, SUCH AS A ROCK ANCHOR

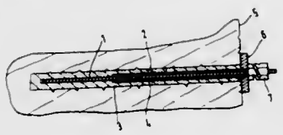
Thomas Herbst, Wessling, and Lorenz Schnitzler, Pöcking, botb of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,758

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726098

Int. Cl.⁴ E21D *21/00*

U.S. Cl. 405—260 **6 Claims**



1. Anchoring device such as a rock anchor and the like. including a tension member, said tension member comprises and axially extending steel anchor rod having an axially and circumferentially extending outside surface with ribs extending helically along and projecting outwardly from the outside surface, said ribs forming at least a partial thread on said anchor rod, an unitary anchor nut having a central axis coaxial with the axis of said anchor rod and threadedly engageable on said ribs on said anchor rod, said anchor nut having a first end and a second end spaced apart in the axial direction with the first end arranged to face toward a body into which said anchor rod is inserted and said second end facing in the opposite direction, the first end of said anchor nut arranged to be supported against the body into which the anchored rod is inserted, said anchor nut has at least two portions extending in the central axis direction and each portion has an internal thread for threaded engagement with said anchor rod, said portions being spaced apart at a given dimension in the central axis direction and being arranged to rotate as a unit, said portions being displaceable in the central axis direction relative to one another free of rotational movement therebetween by the given distance when a predetermined anchoring force acting on the anchoring device is exceeded so that said portions achieve a force-locking engagement with the rod one after the other and the displacement by the given distance affords an indication that the predetermined anchoring force has been exceeded, said portions comprise a first portion extending from the first end toward the second end and a second portion extending from the second end toward the first end, at least said first portion is formed of a material having a lower strength than material forming said anchor rod, said first portion having a dimension in the central axis direction that it loses its force-locking engagement with said ribs on said anchor rod when the predetermined anchoring force is exceeded whereby the anchoring force is transmitted to at least said second portion.

4,904,123

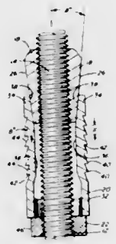
EXPANSION ASSEMBLY FOR MINE ROOF BOLTS UTILIZED IN SMALL DIAMETER BORE HOLES

Frank Calandra, Jr.; Mike Cokus, both of Pittsburgh; John C. Stankus, Canonsburg, and Paul Yacisin, Patton, all of Pa., assignors to Jennmar Corporation, Pittsburgh, Pa.

Filed Jun. 19, 1989, Ser. No. 367,553

Int. Cl.⁴ E21D *20/02*

U.S. Cl. 405—261 **14 Claims**



1. An expansion assembly for a mine roof bolt having a nominal diameter of five-eighths of an inch to be utilized in a bore hole having a nominal one inch diameter, said mine roof bolt having a threaded portion at one end and a bolt head at the other end, said expansion assembly comprising:

a tapered plug having a body portion with a threaded internal bore adapted to be threaded onto said bolt threaded end portion, said tapered plug having four tapered surfaces on the exterior of said body portion that taper inwardly as said four tapered surfaces extend toward said bolt head when said plug is threaded onto said bolt threaded portion, said four tapered surfaces each forming an angle of at least 6.5° to the axis of said bolt when said plug is threaded onto said bolt;

an expansion shell having four expansion leaves integrally formed with a support ring and positioned on said bolt so that said support ring is closer to said bolt head and said leaves extend in an axial direction toward said bolt threaded portion, said leaves each having a serrated outer surface and a smooth inner surface, said expansion leaves surrounding said bolt at equal circumferentially spaced distances from each other when said expansion shell is positioned on said roof bolt, each of said leaf smooth inner surfaces being in abutting contact with one of said tapered plug tapered surfaces whereby said leaves are forced radially outwardly when said tapered plug is threaded axially onto said roof bolt and said leaves are restrained from axial movement relative to said roof bolt, each of said leaf serrated outer surfaces being formed with seven serration edges extending circumferentially around said leaf outer surface in parallel planes perpendicular to the axis of said bolt and being equally spaced a distance of no more than 0.190" and no less than 186" apart, said edges of said serrations being formed by intersecting surfaces with the surface closer to said bolt head being a planar surface perpendicular to said bolt axis and the surface closer to said bolt threaded portion being a frusto-conical surface whose conical elements are at an angle of 72.3° to said planar surface; and

a stop washer threaded onto said bolt threaded portion closer to said bolt head than said expansion shell whereby said stop washer restricts said expansion shell from axial movement as said plug is threaded onto said bolt threaded portion to force said leaves radially outwardly.

4,904,124

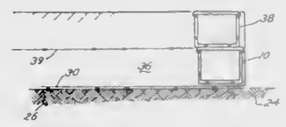
CONSTRUCTIONAL WORK AND METHOD OF CONSTRUCTION OF VERTICAL RETAINING WALL

Philip D. Egan, Great Falls, Va., assignor to The Reinforced Earth Company, Arlington, Va.

Filed Jun. 14, 1989, Ser. No. 365,974

Int. Cl.⁴ E02D *5/00*

U.S. Cl. 405—262 **19 Claims**



1. An improved constructional work comprising in combination:

(a) a first soil reinforcing layer of tensile elements in a generally horizontal array on a compact of soil, said layer defining a line which establishes a front face for an earthen wall of particulate material;

(b) a flexible fabric overlaying at least a portion of the first layer of elements and extending vertically and continuously upward at the front face;

(c) a formed basket of a generally rigid lattice of tensile members, said basket having a front side, a back side and, a bottom connecting the front and back sides said backside being spaced from the front side, the front side being generally vertical and parallel to the back side, the front side being generally in the front face of the wall with the flexible fabric overlying the outside of the front wall of the basket;

(d) particulate material compacted in the basket; and

(e) particulate backfill material over the reinforcing elements and against the back side of the basket; said fabric continuing to over lie the top of the basket and extending into the backfill material to thereby form a partial envelope about the basket, said grid co-acting with the backfill material at least partially by friction to thereby provide earth retaining means.

4,904,125

PROCESS FOR STRENGTHENING GEOLOGICAL FORMATIONS

Manfred Schmidt, Dormagen; Manfred Kappe, Bergisch Gladbach; Max Mann, Odenthal; Peter Vehlewald, Leichlingen; Manfred Dietrich, Leverkusen; Frank Meyer, Essen; Wolfgang Cornely, Gladbeck, and Hans E. Mehesch, Essen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Bergwerksverband GmbH, Essen, both of, Fed. Rep. of Germany

Filed May 8, 1989, Ser. No. 348,849

Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3815947

Int. Cl.⁴ E02D *3/12; C08G 18/76*

U.S. Cl. 405—264 **11 Claims**

1. A process for strengthening geological formations and underground workings or mines by introducing a reaction mixture into the formation to be strengthened, the reaction mixture comprising

(a) a polyisocyanate component,

(b) a polyol component and

(c) a positive amount of up to about 5% by weight, based on the weight of component (b), of a fatty acid ester having a hydroxyl number of about 10 to 630 and an acid number of at most 10, said fatty acid ester being based on (i) an acid component having a carboxyl functionality of at least 1.5 and comprising polymerized unsaturated fatty acids containing at least 12 carbon atoms or mixtures thereof with unpolymerized, saturated or unsaturated fatty acids containing at least 12 carbon atoms and (ii) a polyol component comprising at least one polyhydric alcohol.

4,904,126

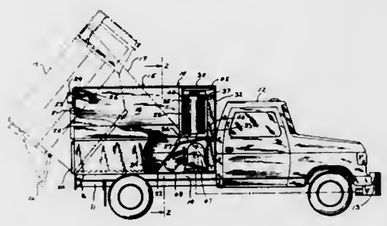
TRUCK MOUNTED VACUUM LOADING APPARATUS

Donald J. Voith, Milwaukee, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Filed Feb. 24, 1989, Ser. No. 315,385

Int. Cl.⁴ B65G *53/40*

U.S. Cl. 406—39 **13 Claims**



1. A truck-mounted mobile vacuum loading apparatus comprising:

a housing defining:

a substantially enclosed primary particulate settling chamber having a particulate air inlet for receiving a flow volume of particulate-laden air and a particulate collecting bin in the bottom of the chamber, and

a substantially enclosed secondary settling and filter chamber having a separating wall common with the primary chamber;

particulate air passage means in said common separating wall for directing the flow of particulate-laden air from the primary chamber to the filter chamber;

a filter unit having a particulate filter media of a pleated construction with its outer surface exposed to the particulate-laden air and its interior surface defining a clean air chamber having one open end;

a clean air plenum in open communication with the open end of said clean air chamber and having a clean air outlet;

a separator axially disposed in the clean air chamber and dividing the same into a plurality of sub-chambers each opening into said clean air plenum;

a compressed air nozzle for each sub-chamber, said nozzles disposed in the clean air plenum adjacent the sub-chamber openings;

a source of compressed air operatively connected to said nozzles; and,

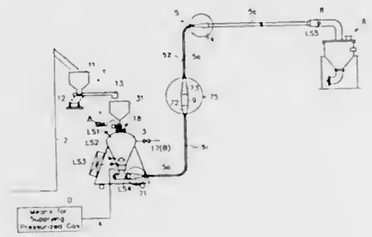
control means for directing a pulse of compressed air sequentially from each nozzle into its adjacent sub-chamber.

4,904,127

HIGH-DENSITY PNEUMATIC TRANSPORT METHOD FOR USE IN POWDERED OR GRANULAR MATERIALS AND SYSTEM FOR PRACTISING THE METHOD

Kiyoshi Morimoto; Akikazu Iwamoto; Masno Moriyama, all of Shizuoka, and Junji Nakagawa, Osaka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo and Kabushiki Kaisha Matsui Seisakusho, Osaka, both of, Japan

Filed Jun. 20, 1988, Ser. No. 209,122
Claims priority, application Japan, Jun. 22, 1987, 62-154921
Int. Cl.[4] B65G 53/66, 53/04, 53/52, 53/34
U.S. Cl. 406—50 2 Claims





2. A high density pneumatic transport system for pneumatically transporting powdered or granular materials stored in an airtight storage container to a collector through a material transport pipe by use of pressurized gas, comprising:

said airtight storage container having an outlet and provided with a pair of sensors, one of the sensors being adapted to detect an upper limit level of the materials contained in the storage container, and the other of the sensors being adapted to detect a lower limit level of the materials contained in the storage container;

a material feeding means for sequentially feeding the materials from a material supply station into said storage container while splitting the materials into a plurality of batches;

said material transport pipe having a base end;

said collector receiving said material and being connected to said storage container through the material transport pipe;

a pair of sensors for detecting the existence of the materials contained in the storage container, one of the sensors being installed in a position below the lower limit level, and the other of the sensors being installed in a position at the base end of the material transport pipe close to the outlet of said storage container;

a transport plug adapted to be inclose contact with the inner surface of said material transport pipe and to be inserted into the base end of the material transport pipe;

a decompressing means for discharging a pressurized gas charge in the storage container;

a gas supply means for feeding pressurized gas into the base end of the material transport pipe so as to pneumatically transport the materials delivered into the transport pipe and to carry forward said transport plug; and

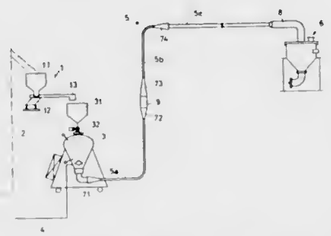
a controller unit for controlling the gas supply means, the material supply means, and the gas decompression means in response to detection signals from the sensors.

4,904,128

HIGH-DENSITY PNEUMATIC TRANSPORT METHOD FOR USE IN POWDER OR GRANULAR MATERIAL AND SYSTEM FOR PRACTISING THE METHOD

Kiyoshi Morimoto, Mishima; Akikazu Iwamoto, Sunto; Masuo Moriyama, Numazu, and Atsuroh Sonoda, Hirakata, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo and Kabushiki Kaisha Matsui Seisakusho, Osaka, both of, Japan

Filed Oct. 20, 1987, Ser. No. 112,105
Claims priority, application Japan, Oct. 21, 1986, 61-251173
Int. Cl.[4] B65G 53/52
U.S. Cl. 406—195 3 Claims



1. A high density pneumatic transport method of pneumatically transporting a powder or granular material placed in an airtight storage container to a collector through a transport pipe by the use of pressurized gas, the method comprising the steps of:

supplying the pressurized gas to the airtight storage container so as to take the material out of the container under pressure and feed the material into a lower horizontal pipe of the transport pipe;

increasing the speed of the material in the lower horizontal pipe;

moving the material in high density in a vertical raiser pipe connected to the lower pipe;

reducing the speed of the material and again increasing the speed of the material midway through its vertically upward transfer inside the vertical pipe;

shifting the direction of the material in high density to a horizontal direction by means of a upper horizontal pipe connected to the vertical pipe;

immediately thereafter reducing the speed of the material in the upper horizontal pipe whereby the material is successively formed into a long column inside the upper horizontal pipe and pneumatically transported to the collector at very slow speed; and

receiving the material which has been transported in the form of a long column into the collector under substantially gravitational fall.

4,904,129

ANNULAR MILLING CUTTER FOR MACHINING BEVEL GEAR

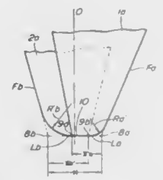
Masaki Sugimoto, Yokosuka; Akira Nakayama, Fujisawa; Isao Nakagawa; Noboru Maruyama, both of Yokohama; Kunihiko Morikawa, Fujisawa, and Hideji Yoshioka, Zama, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Feb. 28, 1989, Ser. No. 317,273
Claims priority, application Japan, Feb. 7, 1988, 63-52974
Int. Cl.[4] B26D 1/12
U.S. Cl. 407—21 1 Claim

1. An annular milling cutter for machnining a bevel gear, comprising:

body and an inner cutter body disposed in said outer cutter body and rotatable relative to said outer cutter body; and

at least one set of blades, each set including an inner blade and an outer blade disposed in an overlapping manner, one of said inner and outer blades having a blade point width larger than a blade point width of the other blade, and having a corner of a head thereof rounded with a curvature having a radius longer than a radius of a curvature which a corner of a head of the other blade is rounded with.

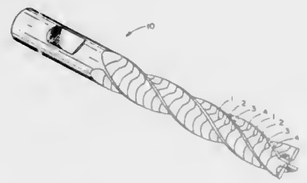


4,904,130

CUTTING TOOLS WITH DEPTH INDICATION

Jeremy W. Gorman, 1095 Middlebury Rd., Middlebury, Conn. 06762

Filed Jan. 11, 1989, Ser. No. 295,527
Int. Cl.[4] B23B 51/02; B27B 33/08; B23D 61/02
U.S. Cl. 408—16 15 Claims



1. A cutting tool apparatus for use with metal, wood, plastic, ceramic, masonry or other materials which comprises;

a cutting surface;

a support surface for holding said cutting surface;

a plurality of indicia disposed on said support surface for indicating the depth of said cutting surface in an associated work piece, the distance between adjacent indicia being uniform;

said plurality of indicia being arrayed in at least two spaced sets, each set consisting of a plurality of indicia of a plurality of colors, and each of the sets having the same colors.

4,904,131

CHUCK HEAD FOR AUTOMATIC MACHINE TOOLS

Artemio Affatcati, Cadeo, Italy, assignor to Jobs S.p.a., Piacenza, Italy

Filed Mar. 28, 1988, Ser. No. 174,432
Int. Cl.[4] B23C 1/12
U.S. Cl. 409—216 3 Claims

1. A chuck head for automatic machine tools comprising:

a moveable robot arm having an arm shell (2);

a fork (1) having a pair of fork arms, rotatably mounted about an arm axis (A—A) to said arm shell;

a thrust bearing (12) connected between said arm shell and said fork for rotatably mounting said fork to said arm shell;

a spindle housing (3) with driven chuck therein, mounted for rotation about a fork axis (X—X) between said fork arms, said fork axis extending perpendicularly to said arm axis;

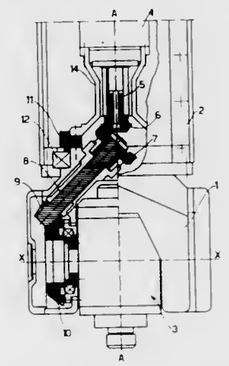
first drive means in said arm shell including an output shaft (5) mounted for rotation parallel to said arm axis;

a first bevel gear (6) connected to said output shaft;

a bevel gear shaft (8) extending at an angle to said arm axis into one of said fork arms;

a second bevel gear (7) connected to one end of said bevel gear shaft and meshed directly with said first bevel gear;

a third bevel gear (9) connected to an opposite end of said bevel gear shaft;



a fourth bevel gear (10) fixed to said spindle housing and meshed directly with said third bevel gear, said fourth bevel gear being mounted for rotation in one of said fork arms; and

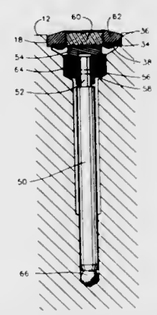
second drive means mounted in said arm shell and including a drive gear (11) connected to said fork and rotatable in said arm shell about said arm axis.

4,904,132

OPTI-MECHANICAL DISPLACEMENT INDICATOR WITH HIGH SENSITIVITY

Charles H. Popenoe, 6307 Wiscasset Rd., Bethesda, Md. 20816

Filed Mar. 9, 1989, Ser. No. 321,072
Int. Cl.[4] F16B 31/12
U.S. Cl. 411—13 22 Claims



1. A device for visually indicating extremely small changes in displacement between two points of a structure through changes in color or brightness comprising:

actuating means for responding in a predetermined manner to a displacement between the two points in the structure;

a colored indicator portion attached to said actuating means;

an indicator window;

window mount means attached to the structure in axial relationship with said actuating means for holding and limiting the movement of said indicator window;

biasing means for resiliently biasing said colored indicator portion and said indicator window towards each other;

means for absorbing an initial portion of the relative displacement between said two points until a preselected displacement has occurred, and transmitting subsequent displacement to vary the distance between said indicator windows and said colored indicator portion: and

flexible indicator means positioned between said indicator window and said colored indicator portion for altering the amount of light transmitted to said indicator window from said colored indicator portion, whereby the observed color change of the indicator will be concentrated in a selected portion of the total displacement change between the said two points.

4,904,133

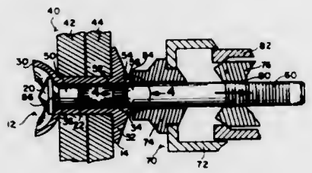
FASTENER WITH INTEGRAL LOCKING MEANS

Jewel L. Wright, Santa Ana, Calif., assignor to Textroo Inc., Providence, R.I.

Filed Jul. 11, 1988, Ser. No. 217,318

Int. Cl.[4] F16B *13/04, 13/06*; B21D *39/00*

U.S. Cl. 411—43 **8 Claims**



1. A fastener sleeve for use with a mandrel having an enlarged head and a generally cylindrical stem with a locking groove therearound to securely and economically fasten a plurality of members, comprising:

a generally tubular portion for abutting the mandrel head and surrounding a portion of the mandrel stem adjacent the mandrel head;

a flange extending radially from the end of the tubular portion opposite said mandrel head, said flange having an axially inner face adjacent said tubular portion and an axially outer face distal said tubular portion; and

a protrusion extending axially from said flange opposite said tubular portion, said protrusion being dimensioned so as to begin deforming upon application of axial compression thereto after said tubular portion has been upset, the members have been compressed, and the mandrel stem has been elongated, and to substantially fill the mandrel locking groove before the mandrel stem breaks, wherein said protrusion is a plurality of segments.

4,904,134

SPREADING PLUG FOR ANCHORING IN UNDERCUT BOREHOLES

Artur Fischer, Waldachtal, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co. KG, Tumlingen/-Waldachtal, Fed. Rep. of Germany

Filed Nov. 7, 1988, Ser. No. 268,293

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737549

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—54 **10 Claims**

1. A spreading plug for anchoring in an undercut borehole having a bottom, said spreading plug comprising a spreading body having an outer spreading surface and an end surface facing the bottom of the borehole; a plug shaft including a plurality of spreading segments extending in a direction toward said outer spreading surface and having inner surface means, said spreading segments being spreadable over said outer spreading surface upon axial displacement of said plug shaft relative to said spreading body; thread means connecting said spreading body and said plug shaft for enabling rotation of said plug shaft relative to said spreading body to provide for the axial displacement of said plug shaft relative to said spreading body, said plug shaft having a mounting portion facing away from said outer spreading surface and means provided on said mounting portion for cooperation with a rotary tool for rotating said plug shaft; a safety element projecting from said end



surface of said spreading body for engaging the bottom of the borehole to prevent rotation of said spreading body upon rotation of said plug shaft; and means for facilitating displacement of said spreading segments over said outer spreading surface and comprising receptacle means formed in said inner surface means of said spreading means and sliding ring means arranged in said receptacle means for engaging said outer spreading surface and displacement thereover upon spreading of said spreading segments over said outer spreading surface.

4,904,135

CONE EXPANSION WALL-PLUG

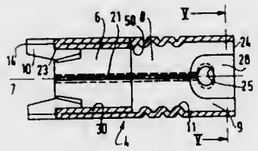
Jean-Pani Barthomeuf, Bourg de Peage, and Gérard Revol, Chabeuil, both of France, assignors to Societe de Prospection et d'Inventions Techniques (S.P.I.T.), Bourg-les-Valence, France

Filed Mar. 2, 1989, Ser. No. 318,397

Claims priority, application France, Mar. 2, 1988, 88 02599

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—55 **14 Claims**



1. A cone expansion wall-plug, comprising:

a shank having first threaded means defined upon one end portion thereof;

an expansion cone having second threaded means provided thereon for threaded engagement with said first threaded means of said shank such that when said shank is rotated, said threaded engagement of said first and second threaded means will cause said expansion cone to undergo translational movement relative to said shank; and

an expandable socket disposed about said shank and including an expansion zone for cooperation with said expansion cone such that when said expansion cone undergoes said translational movement, said expansion cone will cause expansion of said expansion zone of said expandable socket,

said expandable socket being formed from a sheet metal blank and including means defining a bend line within the region of an end portion thereof which is operatively cooperable with said expansion cone; a plurality of expansion lugs bent about said bend line so as to extend in a first direction relative to said bend line and thereby define said expansion zone within said expandable socket; and a plurality of expansion teeth extending from said bend line in a second direction, relative to said bend line, which is opposite to said first direction in which said expansion lugs extend, such that free end portions of said expansion teeth, located at an axial extremity of said expandable socket, operatively engage said expansion cone for thereby guiding said expansion cone into said expansion zone of said expandable socket as said expansion cone undergoes said translational movement relative to said shank and said expandable socket as a result of said threaded engagement of said first and second threaded means of said shank and said expansion cone.

4,904,136

THREAD SECURING DEVICE USING ADHESIVE

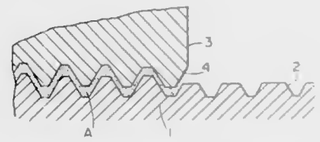
Osamu Matsumoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 137,911

Claims priority, application Japan, Dec. 26, 1986, 61-314216

Int. Cl.[4] F16B *39/02, 39/22*

U.S. Cl. 411—32 **2 Claims**



1. A securing device in which a cylindrical male member having a first thread provided on the outside circumferential surface of said male member and to which an adhesive is applied is screw-engaged into a second thread in a tapped hole of a female member from the entrance of said hole so that said cylindrical male member is secured in a prescribed position inside said female member, wherein said second thread has a series of thread turns having a larger equal inner diameter in the portion of said female member from the entrance of said hole to said prescribed position than in the prescribed position having inner thread turns of a smaller diameter.

4,904,137

RIVET INSTALLATION METHOD AND CONSTRUCTION

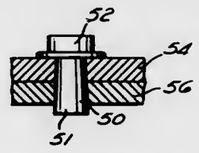
Josip Matuschek, Newport Beach, Calif., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 766,778, Aug. 16, 1985, Pat. No. 4,688,317. This application Jul. 9, 1987, Ser. No. 71,757

Int. Cl.[4] F16B *19/06*

U.S. Cl. 411—501 **21 Claims**

1. A rivet comprising a shank with a tail on one end, said tail having been axially upset to form a cylindrical portion which is larger in diameter than said shank, and said rivet having interposed between said shank and said cylindrical portion a flattened ring sheared axially from said cylindrical portion but remaining integral with the end of said cylindrical portion adjacent said shank, with the outer diameter of said ring being larger than the diameter of said cylindrical portion, said ring having the structural characteristics created as a result of the ring having been formed by a compressive load applied to the annular outer part of said cylindrical portion by the end of a



tubular tool while the ring is backed by a workpiece and the other end of the rivet is supported to withstand said load.

4,904,138

METHOD AND A DEVICE FOR THE OPERATION OF A MACHINE FOR BINDING SETS OF PAGES BY GLUING

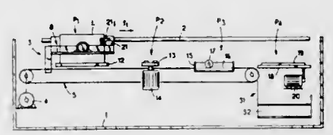
René Champeaux, and Jean-Pierre Merlo, both of Bourgoin Jallieu, France, assignors to C.P. Bourg Industries S.A., La Tour du Pin, France

Filed Apr. 6, 1989, Ser. No. 333,944

Claims priority, application France, Apr. 14, 1988, 88 05186

Int. Cl.[4] B42C *9/00*

U.S. Cl. 412—8 **15 Claims**



1. A method of operating the motor means of an adhesive binding machine for sets of pages, said motor means being adapted to cause reciprocation along a guide path of a carriage comprising a gripper formed by a moving jaw and fixed jaw, in such a manner as to position the carriage successively at a loading station, a routing station, a gluing station and an encasing station, characterized by the following steps:

a detecting by means of a sensor the thickness of a set of pages after input into the machine, while the set of pages is being held between the jaws of the carriage, and

controlling the motor means in order to modify its speed in a manner inversely proportional to the thickness of the set of pages being detected.

4,904,139

BINDING MACHINE

René Champeaux, and Jean-Pierre Merlo, both of Bourgoin Jallieu, France, assignors to C.P. Bourq Industries S.A., La Tour du Pin, France

Filed Mar. 17, 1989, Ser. No. 324,831

Claims priority, application France, Mar. 21, 1988, 88 03902

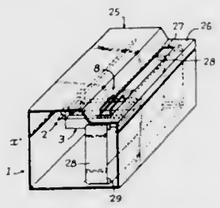
Int. Cl.[4] B42C *9/00*

U.S. Cl. 412—37 **8 Claims**

1. A book binding machine for binding sets of pages by gluing and the application of a cover, comprising a frame defining a straight guide path supporting a carriage which is adapted to be loaded with a set of pages and is coupled with a drive member adapted to reciprocate the carriage along the path, the said frame supporting in relation to the path a carriage loading station for charging the carriage with a set of such pages so as to be supported vertically by the carriage, a routing station for routing the back surface of the set of pages, a gluing station for applying adhesive to the routed back surface of the set, an encasing station for applying the cover on the back routed surface to which adhesive has been applied, in

a cover and a discharge conveyor, said machine further comprising:

a movable hood carried by the frame, covering the aligned stations and defining, for the carriage, an elongated passage window, parallel to the path and whose length is equal to the course of reciprocating movement of the carriage,



and a band of relatively flexible material fixed and held taut at both ends of the carriage, having a width in excess of the window and guided by the frame so that a part thereof always shuts off the window at both ends of the carriage whatever the position thereof, said band extending in a plane under the window and above the stations.

4,904,140

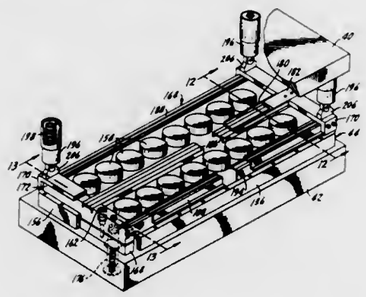
DUAL LANE CONVERSION SYSTEM

Frank J. Herdzina, Schaumburg, and Rollie M. Goodrich, Palatine, both of Ill., assignors to Service Tool Die & Mfg. Co., Elk Grove Village, Ill.

Division of Ser. No. 143,585, Jan. 13, 1988. This application Oct. 6, 1988, Ser. No. 254,194

Int. Cl.[4] B65G *15/58;* **B21D** *43/05*

U.S. Cl. 413—56 3 Claims



1. In a press for converting work pieces into parts, the press having lower tooling including a tool shoe mounted on a bed and upper tooling mounted on a reciprocating ram which moves the upper tooling into and out of operative engagement with the lower tooling, the upper and a lower tooling having a plurality of stations where work is performed on the work pieces, and an endless conveyor having a forward run disposed between the upper and lower tooling for successively advancing work pieces to each of the stations of the tooling, the conveyor having openings therein in which work pieces rest normally spaced from the tooling, the improvement comprising a traveling vacuum box which applies a vacuum to the side of the conveyor opposite the work pieces so as to hold them on the conveyor, the vacuum box comprising:

an open-top case surrounding the lower tooling stations and fixed to the lower tool shoe; and

a frame engageable with the case and vertically slidable with respect to the case, at least one of the frame and case having seal means engageable with the other such that the frame and case are slidable in sealing relation, the frame having a pair of inwardly-facing, longitudinal tracks which support the lateral edges of the conveyor such that the conveyor moves vertically with the frame, the frame being open on its top and bottom to permit access by the top and bottom tooling to the work pieces.

4,904,141

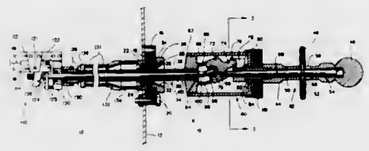
MANIPULATING DEVICE FOR HIGH VACUUM CHAMBER

Jose L. Contin, Orinda, Calif., assignor to MDC Vacuum Products Corporation, Foster City, Calif.

Filed Oct. 28, 1987, Ser. No. 114,543

Int. Cl.[4] B25J *3/00*

U.S. Cl. 414—8 10 Claims



1. A motion transmitting mechanism for transmitting manual movements through the wall of a high vacuum vessel, the mechanism including:

a central mounting flange for securing the mechanism in vacuum sealing arrangement with said vessel through a suitable orifice formed in the wall thereof,

ball joint means movably journalled within said mounting flange to enable said mechanism to be moved angularly relative to said vacuum vessel wall through a predetermined range of limited angular displacement,

a coaxial shaft assembly comprising an outer tube and a central shaft, the assembly being axially slidable through a central opening of said ball joint means to enable axial movements of said mechanism to be transmitted within said vacuum vessel throughout a predetermined range of limited axial displacement,

rotation means connected to said coaxial shaft assembly for imparting unrestricted multi-revolution rotational movement to the central shaft relative to the outer tube, and

extensible vacuum sealing means including said outer tube and extending from said flange on the vacuum side thereof and being completed at said rotation means, for vacuum sealing the interior of said coaxial shaft assembly from the ambient.

4,904,142

APPARATUS FOR INSERTING ELONGATED HEAVY ARTICLES INTO STOWAGE CELLS ON SHIPS

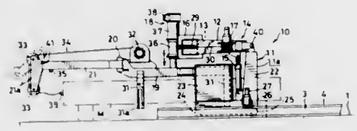
Kenji Sato, Osaka, Japan, assignor to Hitachi Zosen Corporation, Osaka, Japan

Filed Mar. 3, 1989, Ser. No. 318,201

Claims priority, application Japan, Mar. 8, 1988, 63-54687

Int. Cl.[4] B66C *19/00*

U.S. Cl. 414—142.6 8 Claims



1. An apparatus for use on a ship for inserting a multiplicity of elongated heavy articles into a stowage, the stowage being provided in the hull of the ship and including a multiplicity of cells in a latticework arrangement and each having an opening in a deck for stowing the respective articles, the apparatus comprising a lower structure having a pair of opposed carriages guidable respectively on a pair of rails extending parallel to each other and disposed on the deck outwardly of the respective opposite sides of the stowage, an upper structure supported by the lower structure pivotally movably upward and downward and having a horizontal beam extending transversely of the ship and a slider slidably mounted on the horizontal beam, a boom connected to the slider and having a pair of guide arms for guiding and holding the article, the boom being positionable horizontally along the direction of travel of the carriages and also vertically by the pivotal movement of the upper structure, and lift means provided on the boom for suspending the article.

4,904,143

APPARATUS FOR THE CONTINUOUS FEEDING OF MATERIAL TO BE MELTED

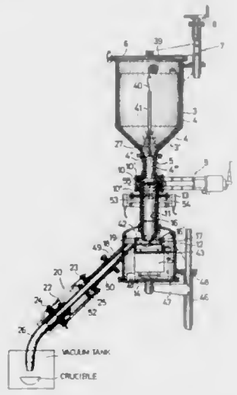
Dieter Drechsel, Bruchkoebel, and Karl Jericho, Hanau, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Jan. 27, 1988, Ser. No. 148,926

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1987, 3737051

Int. Cl.[4] B01J *4/00;* **C30B** *15/02*

U.S. Cl. 414—217 13 Claims



1. Apparatus for the continuous feeding of material for melting to a melting crucible in the pulling of monocrystals in a vacuum tank, comprising:

sealable containers at a distance from each other, a lock valve, one container having a shape being provided with an internal lining corresponding to the container shape, with a funnel-shaped section and a cylindrical outlet adjoining said funnel-shaped section, a second container having a connecting pipe, the lock valve being disposed between the outlet of the one container and the connecting pipe of the second container, means for displacing the outlet through the lock valve into the connecting pipe, and the second container having an outlet tube brought through a wall of a vacuum tank into an area above a crucible.

4,904,144

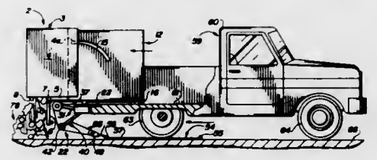
TRUCK DUMPING AND UNLOADING APPARATUS

Kirk A. Phillips, 2300 Briar W. Blvd. #3701, Houston, Tex. 77077

Filed Jan. 9, 1989, Ser. No. 294,421

Int. Cl.[4] B65G *67/24*

U.S. Cl. 414—383 20 Claims



1. A truck dumping and unloading apparatus comprising sled means adapted for carrying refuse, said sled means carried by the bed of the truck; sled guide means carried by the truck rearwardly of said sled means; friction means adapted for selective deployment on the truck in non-functional configuration and on the road surface substantially in alignment with the rear wheels of the truck in functional configuration, and connecting means having one end attached to said friction means, said connecting means engaging said sled guide means and the opposite end of said connecting means attached to said sled means, whereby operation of the truck in reverse causes the tires thereof to traverse said friction means, tension said connecting means and displace said sled means rearwardly in the bed of the truck to said sled guide means, for emptying the contents of said sled means.

4,904,145

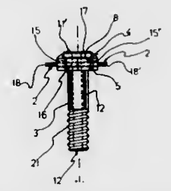
STUD WITH AN ADAPTED HEAD

Theodore Koutsoupidis, Kecropos 39,, Glyfada, Athens 166-75, Greece

Filed Oct. 31, 1986, Ser. No. 925,674

Int. Cl.[4] F16B *23/00*

U.S. Cl. 411—396 1 Claim



1. A bolt member comprising plural elements, a first element comprising a shank with a threaded portion at one end and an extension at the other end thereof, said extension defined by a cube portion extending radially outwardly beyond said shank and a cylindrical protuberance extending radially outwardly beyond said cube portion, said cube portion having a radial passage extending therethrough, said shank having a bore extending axially therethrough;

a second element comprising a nut head received on said extension of said shank, said nut head having a cube opening and cylindrical bore for reception of said cube portion and cylindrical protuberance, respectively; said nut head having a cavity on each side of said cube opening;

and a third element comprising an elongated pin of relatively hard but deformable metal received through said nut head cavities and said radial passage and having its ends forged into said nut head cavities to secure said nut head to said shank.

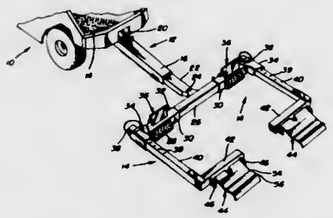
VOL 1111 ISS 4 FE 27 1990 UMI

4,904,146

WHEEL RETAINER BLADE FOR WHEEL LIFT APPARATUS

Walter G. Lock, Signal Mountain, Tenn., and Vernon S. Moore, Ringgold, Ga., assignors to Holmes International Inc., Chattanooga, Tenn.

Filed May 17, 1988, Ser. No. 194,855
Int. Cl.[4] B60P 3/06
U.S. Cl. 414—563 20 Claims



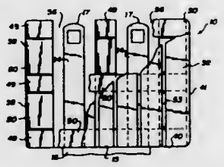
1. Apparatus for use with wheel lift towing equipment for supporting the tires of a vehicle lifted and towed thereby, said apparatus comprising a transversely elongated tow bar adapted to be positioned beneath said vehicle, mounting means for carrying a cradle at a respective opposite end portion of said tow bar for supporting a respective tire of said vehicle, each of said cradles having front support means for supporting a front surface portion of the respective tire and rear support means for supporting a rear surface portion thereof, said support means including an elongated arm and a leg secured to and rigidly extending transversely to the arm, means for mounting said rear support means to a respective end portion of said tow bar such that said leg is spaced from said front support means, a foldable plate carried by said leg and selectively moveable at least between an operative position with an extremity thereof extending substantially upright for engaging the rear surface of the respective tire and a rearwardly extending position having said extremity extending in a direction generally opposed to said front support means, and means for holding said plate in said operative position for providing support to the rear surface of said tire.

4,904,147

LOAD CARRYING APPARATUS

Mike Wasylyshyn, Kamloops, Canada, assignor to Miro Enterprises, Kamloops, Canada

Continuation of Ser. No. 509,312, Jun. 30, 1983, Pat. No. 4,808,060. This application Dec. 12, 1988, Ser. No. 283,290
Claims priority, application Canada, Jul. 13, 1982, 407120
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[4] B66B 9/20
U.S. Cl. 414—608 4 Claims



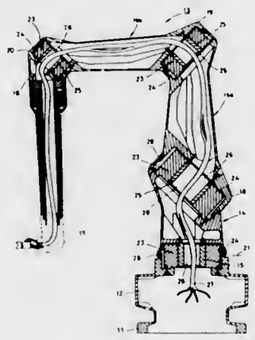
1. A load carrying apparatus for a vehicle equipped with lifting forks projecting horizontally forward from a vertical abutment and having floor-contacting wheels near the outer ends of the lifting forks, said lifting forks being modified to provide a reduced effective length measured from the vertical abutment to outer ends of the forks and to place the foremost edge of the wheels in close proximity to but not projecting beyond the outer ends of the forks, in combination therewith a pallet comprising a rectangular base frame and a deck providing the pallet with side edges and end edges, said side edges being longer than said end edges, said side edges being spaced apart a distance not greater than the effective length of the lifting forks, said base frame having floor contacting members extending parallel to one another from side edge to side edge one at each end edge and another at the center of the base frame, spacer members longitudinally spaced along each floor-contacting member one at each side edge and another at the center of the base frame, longitudinal members mounted upon the spacer members to extend from end edge to end edge one at each side edge and another at the center of the base frame, said deck being constructed of a plurality of deck members extending from side edge to side edge normal to and resting on the longitudinal members, said base frame and deck defining a pair of transverse channels enterable by the lifting forks from either side edge of the platform whereby the forks are raisable into engagement with the undersides of the longitudinal members, and also defining a pair of longitudinal channels enterable by the lifting forks from either end edge of the pallet whereby the forks are raisable into engagement with the undersides of the deck members, the effective length of the lifting forks being no greater than the side edge to side edge width of the pallet so that when the lifting forks are fully entered into the pair of transverse channels, one side edge is in contact with the vertical abutment of the vehicle and the outer ends of the lifting forks are located within the other side edge of the pallet, said lifting forks having upper surfaces which engage the undersides of said three longitudinal members when the lifting forks are in the transverse channels and which entire upper surfaces engage the underside of said deck when the lift forks are in the longitudinal channels, said longitudinal channels being longer than the effective length of the lifting forks.

4,904,148

ROBOT ARM FOR AN INDUSTRIAL ROBOT

Ove Larsson, Gothenburg, Sweden, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP87/00913, § 371 Date Jul. 20, 1988, § 102(e) Date Jul. 20, 1988, PCT Pub. No. WO88/03856, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 26, 1987, Ser. No. 237,794
Claims priority, application Sweden, Nov. 26, 1986, 8605070
Int. Cl.[4] B25J 17/00
U.S. Cl. 414—680 5 Claims



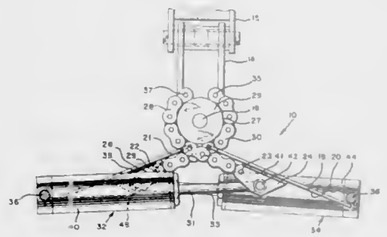
1. A robot arm adapted for use as an industrial robot comprising a plurality of hollow arm members each having joint portions at opposite ends thereof and a center axis, means for rotatably connecting said arm members to each other at said joint portions; said arm members including an upper arm member, a lower arm member and at least one intermediate arm member therebetween; said intermediate arm member having an outer boundary at each of its joint portions, ends of said joint portions each including a joint face which is inclined at a certain inclination angle with respect to the center axis of an associated arm member, each joint portion having a joint axis disposed at a right angle to its associated joint face, the center axis intersecting the joint axes at opposite joint faces of the same arm member at points of the joint face provided with driving means for each adjacent joint portion; said driving means including an electric motor having a rotor fixed at a joint portion and a rotating shaft thereof being aligned with the associated joint axis, said driving means further including a stator of said electric motor fixed at another of the adjacent joint portions, and a plane through the joint faces on opposite ends of said intermediate arm member intersecting each other at a point located outward of each outer boundary of said intermediate arm member.

4,904,149

SWING MECHANISM FOR AN EARTH-MOVING APPARATUS

John S. Pilch, Ware, Mass., assignor to Ware Machine Works, Inc., Ware, Mass.

Filed Aug. 19, 1988, Ser. No. 234,306
Int. Cl.[4] B66F 9/14
U.S. Cl. 414—695.6 13 Claims



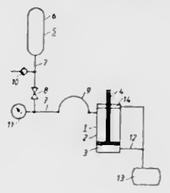
1. A swing mechanism for an earth moving apparatus comprising:
a main frame having a front and a rear,
a pivot means at said front having a vertical axis,
a swing frame for swinging movement about said vertical axis,
the improvement comprising:
(a) a first guide which is fixed to said main frame and which extends horizontally and laterally of said vertical axis toward one side of said main frame and having a first longitudinal slide surface,
(b) a second guide which is fixed to said main frame and which extends horizontally and laterally of said vertical axis towards the opposite side of said main frame, and having a second longitudinal slide surface,
(c) a first slide member which is in sliding engagement with said first slide surface,
(d) a second slide member which is in sliding engagement with said second slide surface,
(e) a first elongated flexible drive connector, one end of which is connected to said first slide member and the other end of which is connected to said swing frame so that movement of said first slide member away from said vertical axis toward said one side of said main frame causes said swing frame to swing toward said opposite side of said main frame,
(f) a second elongated flexible drive connector, one end of which is connected to said second slide member and the other end of which is connected to said swing frame so that movement of said second slide member away from said vertical axis toward the opposite side of said main frame causes said swing frame to swing toward said one side of said main frame,
(g) a first single acting fluid actuator one end of which is pivotally connected to said main frame for pivotal movement about a vertical axis, the other end of said first single acting fluid actuator being pivotally connected to said first slide member, whereby extending movement of said first single acting fluid actuator causes said first slide member to slide along said first slide surface away from said vertical axis toward said one side of said main frame, and
(h) a second single acting fluid actuator, one end of which is pivotally connected to said main frame, for pivotal movement about a vertical axis, the other end of said second single acting fluid actuator being pivotally connected to said second slide member, whereby extending movement of said second single acting fluid actuator causes said second slide member to slide along said second slide surface away from said vertical axis toward the opposite side of said main frame, wherein when viewed from the top, the longitudinal centerline of said first fluid actuator being at a convergent angle to said first longitudinal slide surface and the longitudinal centerline of said second single acting actuator being at a convergent angle to said second longitudinal slide surface.

4,904,150

BALANCING UNIT FOR PIVOTABLE MECHANICAL ELEMENTS, SUCH AS DOORS, ROBOT ARMS, ETC.

Roland Svensson, Västerås, and Åke Österberg, Eskilstuna, both of Sweden, assignors to Asea Brown Boveri AB, Sweden

Filed May 12, 1988, Ser. No. 192,910
Claims priority, application Sweden, May 29, 1987, 8702255
Int. Cl.[4] B66C 23/00; F15B 1/00
U.S. Cl. 414—719 2 Claims



1. A balancing unit for moving pivotable mechanical elements which comprises:
a cylinder having an interior and defining a first end wall and a second end wall,
a piston having a piston head which is positioned in the interior of said cylinder and a piston rod which extends away from said piston head and sealingly through an opening in said first end wall, said piston head dividing the interior of said cylinder into first and second spaces on opposite sides of said piston head,
a high pressure system for supplying a high pressure medium to said first space,
a container defining a closed third space, and
means connecting said second space with said closed third space consisting of a tube to convey to said closed third space any high pressure medium which has leaked from said first space past said piston head into said second space,
wherein said cylinder includes an interior wall between said first end wall and said second end wall and through which said piston rod extends, said first end wall and said interior wall defining a fourth space therebetween, and including

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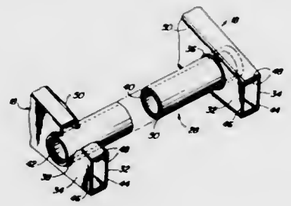
means connecting said fourth space with said closed third space so as to convey to said closed third space any high pressure medium which has leaked from the interior of said cylinder past said interior wall into said fourth space.

4,904,151

LOADER LIFT ARM STRUCTURE

Marinus A. Biemans, Wainfleet, and Henry Friesen, Niagara Falls, both of Canada, assignors to Deere & Company, Moline, Ill.

Filed Jul. 7, 1988, Ser. No. 216,060
Int. Cl.[4] B66F 9/08
U.S. Cl. 414—727 5 Claims



1. Lift arm structure for use in a power loader including a pair of laterally spaced, fore-and-aft extending lift arms,

each arm being comprised of a generally tubular member having spaced apart inner and outer vertical walls;

and an improved torque tube structure extending between the two lift arms characterized by:

first and second rigid tubular members extending between the two arms, each member having an opposite end portion extending through the spaced apart inner and outer vertical walls of each arm;

the second rigid tubular member carried within the first rigid tubular member;

the first rigid tubular member being rigidly connected to the inner and outer vertical walls of each arm; and

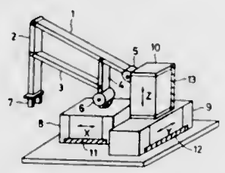
the second rigid tubular member being rigidly fastened to only the outer ends of the first rigid tubular member.

4,904,152

INDUSTRIAL ROBOT

Makoto Doi; Akiyoshi Nakada, both of Osaka; Toshitsugu Inoue, Kyoto; Mikio Hasegawa, Osaka; Kenji Sogawa, Osaka, and Toshihiro Ide, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

PCT No. PCT/JP86/00363, § 371 Date Mar. 25, 1987, § 102(e) Date Mar. 25, 1987, PCT Pub. No. WO87/00478, PCT Pub. Date Jan. 29, 1987
Continuation of Ser. No. 46,917, Mar. 25, 1987, abandoned. This PCT application Jul. 16, 1986, Ser. No. 315,253
Claims priority, application Japan, Jul. 26, 1985, 60-165133
Int. Cl.[4] B66C 1/10
U.S. Cl. 414—730 5 Claims



1. An industrial robot including an arm mechanism for producing movement of an operating member in a plurality of mutually perpendicular directions, drive means for driving said arm mechanism for movement of said operating member in respective ones of said directions, position sensing means for sensing amounts of displacement of said operating member, and a control apparatus for controlling said drive means to move said operating member, and characterized in that said control apparatus includes changeover means operable for selectively establishing a position control mode and a force control mode for controlling movement of said operating member, and in that during operation in said position control mode said operating member is driven to a predetermined position corresponding to a position control signal produced by said control apparatus, while during operation in said force control mode said operating member is driven from said predetermined position in a fixed direction until said control apparatus detects a cessation of movement of said operating member resulting from contact with a workpiece, said cessation of movement being detected by said control apparatus as a cessation of change in an output signal from said position sensing means, with a predetermined level of drive current supplied to said drive means following said cessation of movement, said current level being determined by a force control signal, wherein said drive means comprises a plurality of drive sections for driving said operating member in respective ones of said mutually perpendicular directions, and further comprising velocity sensing means for sensing a velocity of said operating member and current sensing means for sensing levels of drive current applied to said drive means, and in which during operation in said position control mode said control apparatus establishes for each of said drive sections a position control loop for controlling drive power applied to said each drive section in accordance with an error between a corresponding position control signal and an output signal from said position sensing means, a velocity control loop for controlling said drive power utilizing an output signal from said velocity sensing means as a feedback signal, and in which during operation in said force control mode said control apparatus establishes, for one of said drive sections which is currently selected to be actuated, a force control loop for controlling drive power applied to said one drive section in accordance with an error between a corresponding force control signal and an output signal from said velocity sensing means, and establishes a current control loop for controlling said drive power utilizing an output signal from said current sensing means as a feedback signal.

4,904,153

TRANSPORTING ROBOT FOR SEMICONDUCTOR WAFERS

Yoshiyuki Iwasawa; Tsutomu Ishida; Hiroshi Harada; Shintaro Kobayashi; Kenji Okamoto, all of Tokyo; Takashi Matsumoto, Ise; Kiwamu Yamamoto, Ise, and Toshio Takasu, Ise, all of Japan, assignors to Shimizu Construction Co., Ltd. and Shinko Electric Co., Ltd., both of Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,839
Claims priority, application Japan, Nov. 20, 1986, 61-277056; Dec. 3, 1986, 61-288356; Dec. 3, 1986, 61-288357
Int. Cl.[4] B25J 15/08
U.S. Cl. 414—735 11 Claims

1. A transporting robot for semiconductor wafers contained in a wafer cassette, the robot being used in a clean room in which a laminar flow of air moves downward from an air-supplying means of the clean room, the robot comprising: a guide rail disposed substantially horizontally under the air-supplying means of the clean room; a robot body depending from the gude rail and slidably connected to the guide rail for movement along the guide rail; first drive means for driving the robot body along the guide rail; a tubular enclosure enclosing the entire length of the guide rail; and suction means for drawing the air thereinto from the inside of the enclosure so that

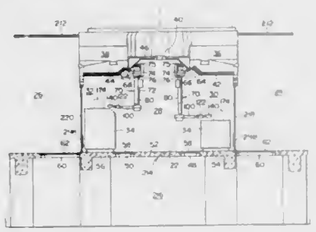
dust produced inside the enclosure is prevented from blowing out of the enclosure, said robot body comprising:

clamping means for releasably clamping the wafer cassette;

an arm assembly, extending between the guide rail and the clamping means, for controlling the position of the clamping means; and

a wrist assembly, interposed between the arm assembly and the clamping means, for adjusting the orientation of the clamping means, said wrist assembly comprising:

a) a wrist frame connected via a horizontal pivot to the arm assembly for upward and downward movement, the wrist frame rotatably supporting the clamping means for turning movement of the clamping means about a shaft perpendicular to said horizontal pivot;



b) second drive means for pivoting the wrist frame relative to the arm assembly; and

c) third drive means for turning the clamping means relative to the wrist frame,

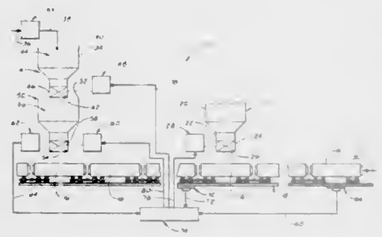
said enclosure having a slender opening extending therealong and opening sideward, the slender opening allowing the robot body to pass out of the enclosure therethrough, said suction means comprising an air intake duct in communication with the inside of the enclosure, the air intake duct having a suction opening which opens upward at the lower edge of the slender opening of the enclosure so that an air flow directed to the suction opening forms an air curtain covering the slender opening of the enclosure, whereby dust produced in the enclosure is prevented from blowing out of the enclosure through the slender opening.

4,904,154

LOADING SYSTEM FOR RAILROAD CARS

John A. L. Campbell, Oklahoma City, Okla.; Robert L. Elder, Columbus, Miss.; Tony G. Gardner, Oklahoma City, Okla.; Jerry L. Hughes, Gillette, Wyo.; Kenneth E. Krause, Edmond, and Ronald K. Pepper, Moore, both of Okla., assignors to Kerr-McGee Coal Corporation, Oklahoma City, Okla.

Filed Nov. 3, 1988, Ser. No. 266,852
Int. Cl.[4] B65G 67/22
U.S. Cl. 414—786 16 Claims



1. A method for loading particles into railroad cars wherein a control weight of a railroad car loaded with particles is established and a maximum permissible weight of a railroad car loaded with particles is known, the control weight being less than the maximum permissible weight, including a continuous loading system wherein particles are dischargable through a discharge end of a mass storage bin and wherein a bin gate is connected to the discharge end of the mass storage bin having an opened and a closed position, the particles being dischargable through the discharge end of the mass storage bin in the opened position of the bin gate for loading the particles into a railroad car under the mass storage bin and the particles being prevented from being discharged from the mass storage bin in the closed position of the bin gate, and including a batch loading system wherein particles are dischargable through a discharge end of a weigh bin and wherein a weigh gate is connected to the discharge end of the weigh bin having an opened and a closed position, the particles being dischargable through the discharge end of the weigh bin in the opened position of the weigh gate for loading particles into railroad cars and the particles being prevented from being discharged from the weigh bin in the closed position of the weigh gate, the railroad cars continuously moving under the mass storage bin and the weigh bin in a direction of travel, and wherein particles are dischargable through the discharge end of a surge bin into the weigh bin and wherein a surge gate is connected to a discharge end of the surge bin having an opened and a closed position, the particles being dischargeable through the discharge end of the surge bin for loading the particles into the weigh bin in the opened position at the surge gate and the particles being prevented from being discharged from the surge bin in the closed position of the surge gate, comprising the steps of:

weighing each railroad car prior to loading particles into the railroad car to determine an unfilled weight of each railroad car;

comparing the unfilled weight of each railroad car with a preset partial weight to determine a first difference weight for each railroad car and storing each first difference weight along with an associated car identification code uniquely identifying the particular railroad car associated with each first difference weight, the preset partial weight being a weight less than the control weight by an amount sufficient substantially to assure that no railroad car will be overloaded from the mass storage bin by an amount such that the weight of the railroad car loaded with particles exceeds the maximum permissible weight, and the partial preset weight being as close as possible to the control weight while still substantially assuring that the partially filled weight of none of the railroad cars exceeds the maximum permissible weight, thereby minimizing the weight of the coal to be loaded by the batch loading system;

loading particles from the mass storage bin into each railroad car and terminating the loading of particles from the mass surge bin when about the first difference weight of particles has been loaded into each railroad car;

weighing each of the railroad cars after loading the railroad cars with particles from the mass storage bin to determine a partially filled weight of each of the railroad cars and determining a second difference weight equal to the difference between the control weight and the partially filled weight;

adjusting the amount of particles loaded into the railroad cars from the mass storage bin in response to the determined second difference weight whereby the amount of particles loaded into the railroad cars from the mass storage bin in as close as possible to the first difference weight;

loading particles from the surge bin into the weigh bin prior to unloading particles from the weigh bin into the railroad cars;

weighing the particles in the weigh bin as the particles are being loaded into the weigh bin and terminating the loading of particles into the weigh bin when a weight of particles has been loaded into the weigh bin about equal to the second difference weight associated with the railroad car

to be loaded with that second difference weight of particles; and

loading the second difference weight of particles from the weigh bin into the railroad car to be loaded with that second difference weight of particles.

4,904,155

VACUUM PUMP

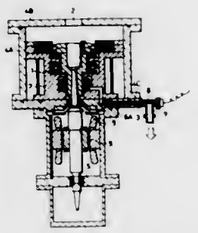
Takashi Nagaoka, Tsukuba; Ichiro Gyobu, Ibaraki; Kimio Muranatsu; Keiji Ueyama, both of Takasaki; Masahiro Mase, Ooaza Marubayashi; Yoshihisa Awada, Shimoinayoshi, and Akira Nishinchi, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 217,887

Claims priority, application Japan, Jul. 15, 1987, 62-174695

Int. Cl.⁴ F01D *1/36*

U.S. Cl. 415—90 **15 Claims**



1. A vacuum pump comprising a housing having a suction port, an exhaust path, a rotor rotatably supported inside said housing, means for elevating a temperature and pressure of a process gas sucked from said suction port from compression of the process gas, means for discharging the process gas from said exhaust path reduced in pressure to near the atmospheric pressure, means for preventing adhesion of the solid reaction product in the discharging means including heating means disposed in said exhaust path for heating the solid reaction product.

4,904,156

SCREWED ATTACHMENT OF A BODY OF REVOLUTION TO AN ANNULAR FLANGE IN A TURBINE ENGINE

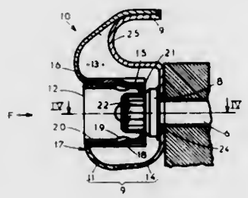
Eric Touzé , Le Mee sur Seine, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Dec. 16, 1988, Ser. No. 285,631

Claims priority, application France, Dec. 16, 1987, 87 17548

Int. Cl.⁴ F04D *29/54*

U.S. Cl. 415—190 **6 Claims**



1. Attachment means for fixing a body of revolution to an annular flange in a tubular engine, comprising a plurality of evenly distributed screws, each of said screws having a head provided with teeth disposed around a peripheral portion thereof, an annular fairing forming a bolt guard over the heads of said screws, said bolt guard having means defining access holes to said screws in the face of said bolt guard opposite said screws, a plurality of first tubular sockets within said bolt guard and respectively aligned with said screws, said first sockets being wider than the heads of said screws and being rigidly fixed ot said bolt guard in the region of said access holes, and a plurality of second tubular sockets respectively disposed within said first sockets and each having an inturned downstream edge impressed on and engaged with said teeth on the head of the respective screw, each of said second sockets having at least one aperture in the wall thereof, and each of said first sockets having a slightly inwardly bent tongue cooperating with said aperture in said second socket to retain said second socket in said first socket.

4,904,157

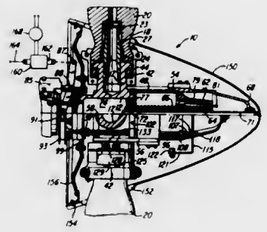
AIRCRAFT PROPELLER ASSEMBLY WITH BLADE PITCH RESET FOR GROUND IDLE

Loy D. Pace; Donald C. Stackhouse; Earl W. Jones, and Dennis S. Zimpfer, all of Piqua, Ohio, assignors to Hartzell Propeller Inc., Piqua, Ohio

Filed Nov. 21, 1988, Ser. No. 274,466

Int. Cl.⁴ B64C *11/40*

U.S. Cl. 416—46 **18 Claims**



1. An aircraft propeller assembly comprising a propeller hub adapted to be driven by a turbine engine on an aircraft, said hub supporting a plurality of angularly disposed and radially projecting adjustable pitch propeller blades, pitch changing means including a hydraulic fluid cylinder and piston for changing the pitch of said blades between a feather position and a reverse pitch position through a low pitch in-flight idle position and a lower pitch on-ground idle position in response to actuation of said piston by hydraulic fluid, feedback control means including a valve for controlling the flow of the fluid to said piston, a plurality of feedback control rods extending parallel to the propeller axis of rotation and having rearward end portions connected to actuate said valve, first positive actuated means for moving said control rods and closing said valve in response to axial movement of said piston and rotation of said blades to said in-flight idle position, second positive actuated means for moving said control rods and closing said valve in response to further axial movement of said piston and rotation of said blades to said on-ground idle position, and means for precisely adjusting said first and second positive actuated means for precisely selecting the pitch of said blades at said in-flight idle position and said on-ground idle position.

4,904,158

METHOD AND APPARATUS FOR CRYOGENIC LIQUID EXPANSION

Lealie C. Kun, Grand Island, N.Y., assignor to Uninn Carbide Corporation, Danbury, Conn.

Filed Aug. 18, 1988, Ser. No. 233,379

Int. Cl.⁴ F01D *5/04*

U.S. Cl. 416—183 **17 Claims**

11. An expansion turbine for work expanding a cryogenic

liquid with reduced cavitation comprising: a shaft, an impeller mounted on the shaft, and a plurality N of turbine blades



mounted on the impeller, N being within the range of from 0.8 to 1.2 times 20 $D^{0.25}$ where D is the outside diameter of the impeller in inches.

4,904,159

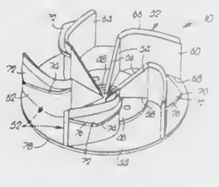
PUMP IMPELLER

Dean R. Wickoren, Paola, Kans., assignor to Suburbia Systems, Inc., Olathe, Kans.

Filed Jul. 18, 1988, Ser. No. 221,031

Int. Cl.⁴ F04D *7/04*

U.S. Cl. 416--183 **6 Claims**



1. An impeller for pumping highly viscous liquids comprising:

a substantially circular drive plate having first and second sides, a geometric center, and a marginal edge, said drive plate being adapted for rotation within a pump housing;

a plurality of symmetrical, evenly spaced blades extending radially outwardly to present a tip, each of said blades being connected only to said drive plate and extending substantially normal thereto to present a sharpened top edge opposite said drive plate,

each of said blades including a leading face corresponding to the direction of rotation of said impeller during operation and a trailing face oriented away from a direction of rotation of said impeller during operation thereof,

each of said blades including winglet means secured to the leading face thereof and located intermediate said top edge and said drive plate and positioned more proximate to said top edge than to said drive plate, said winglet being oriented substantially parallel to said drive plate and extending outwardly to said tip to inhibit the flow of said liquid to said top edge during pumping of said highly viscous liquid.

4,904,160

MOUNTING OF INTEGRAL PLATFORM TURBINE BLADES WITH SKEWED SIDE ENTRY ROOTS

Albert J. Partington, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 3, 1989, Ser. No. 332,187

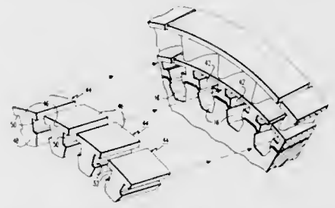
Int. Cl.⁴ F01D *5/32*

U.S. Cl. 416—193 A **5 Claims**

1. A system for attaching an integral platform blade group to a rotor of a steam turbine, the integral platform blade group comprising a plurality of blade foils connected into an integral group by a common platform, the system comprising:

a plurality of spaced roots formed on the platform and oriented so as to extend radially inward when the platform is positioned in a turbine, the roots being skewed with respect to an axis of the turbine rotor, a platform groove being defined between each adjacent pair of roots;

a plurality of circumferentially spaced steeples extending



radially outward from the turbine rotor, a rotor groove being defined between each adjacent pair of steeples, each of the rotor grooves being aligned with a corresponding one of the platform grooves when the steeples are in abutting relationship with the roots, each platform spanning a plurality of said spaced steeples; and

a plurality of connecting members adapted for insertion into the aligned grooves of the platform and rotor for connecting each integral blade group to the rotor.

4,904,161

APPARATUS FOR CONTROLLING HYDRUALIC PUMP

Takao Kamide, Oiso; Kentaro Nakamura, Hiratsuka; Takaichi Saigo, Chigasaki, and Katsumi Yoshida, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

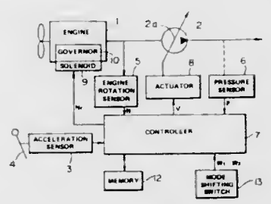
PCT No. PCT/JP87/00610, § 371 Date Mar. 25, 1988, § 102(e) Date Mar. 25, 1988, PCT Pub. No. WO88/01349, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 15, 1987, Ser. No. 183,742

Claims priority, application Japan, Aug. 15, 1986, 61-191248; Oct. 17, 1986, 61-247085; Dec. 3, 1986, 288366; Dec. 18, 1986, 61-302343

Int. Cl.⁴ F04B *49/08*

U.S. Cl. 417—22 **16 Claims**



1. An apparatus for controlling a variable displacement type hydraulic pump including an engine as a driving power source comprising;

means for detecting the number of revolution of said engine,

means for detecting a pressure of hydraulic oil delivered from said hydraulic pump,

means for setting a pump absorption torque characteristic which monotonously decreases with reference to the number of revolutions of the engine,

means for looking for an inclination angle of a swash plate in

the pump with reference to said pump absorption torque characteristic and said pressure of hydraulic oil delivered from the pump,

means for controlling said swash plate in the pump so as to assure said inclination angle of the swash plate, and

means for reducing the number of revolutions of the engine under a condition that an absorption torque absorbed by the pump does not exceed a rated torque of the engine.

4,904,162

FUEL SUPPLYING PUMP

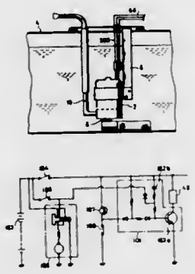
Ryozo Suzuki; Jun Shiraga; Shingo Iwai, and Tetsuo Okashiro, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 491, Jan. 5, 1987, abandoned. This application Jul. 5, 1988, Ser. No. 215,208

Claims priority, application Japan, Jan. 17, 1986, 61-5243[U]

Int. Cl.[4] F04D *15/02*

U.S. Cl. 417—44 **1 Claim**



1. A fuel supplying pump control system for a motor vehicle comprising:

(a) a pump mechanism having,

a suction port from which fuel in a fuel tank is sucked;

a rotor rotating in a pump chamber for sucking said fuel; an electric motoro for rotating said rotor; and

an output port from which said sucked fuel is exhausted;

(b) a control circuit disposed in said pump mechanism having,

a transistor having an emitter which is grounded, a collector which is connected to said pump mechanism, and a base; and

a capacitor connected to the base of said transistor;

(c) a warning lamp disposed on an instrument panel of a car;

(d) a first switch disposed on an engine of said motor vehicle, responsive to oil pressure, said oil pressure being proportional to rotation speed of said engine, said first switch closing when said engine stops, said first switch having a terminal coupled to said base of said transistor and to said warning lamp;

(e) an ignition switch, having one terminal connected to said electric power source and an other terminal connected to said pump mechanism and said capacitor; and

(f) a starting switch, having one terminal connected to said power source and an other terminal connected to a starting means for starting said engine and said base of said transistor.

4,904,163

OIL REGULATING PUMP FOR LUBRICATING ENGINES AND METHOD OF CONTROLLING THEREOF

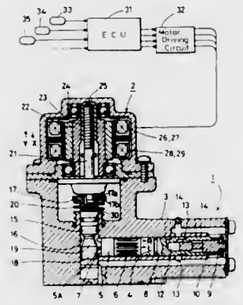
Kozi Tachi, Kosai, and Hideo Saji, Chita, both of Japan, assignors to Nippondenso Co., Ltd., Kariya and Asmo Co., Ltd., Kosai, both of, Japan

Filed Oct. 28, 1988, Ser. No. 263,895

Claims priority, application Japan, Oct. 30, 1987, 62-167704[U]; Feb. 15, 1988, 63-32522; Mar. 23, 1988, 63-68816

Int. Cl.[4] F04B *19/02, 7/06*

U.S. Cl. 417—53 **4 Claims**



1. An oil regulating pump for supplying oil to an engine, comprising:

a pump housing provided with a suction route and a discharge route;

a drive shaft disposed in said housing and rotated by the engine;

a primary plunger rotated by the drive shaft;

a secondary plunger inserted into a hole provided in an end of the primary plunger and forming a pump chamber communicable with the suction route and the discharge route;

a stepper motor having a rotor and output shaft and provided with a mechanism for converting rotation of the rotor into linear movement of the output shaft;

a cam shaft abutting an end of said drive shaft and linearly disposed by the output shaft in order to reciprocate said drive shaft and to change the reciprocation stroke of said drive shaft;

a stopper disposed adjacent to said stepper motor for stopping displacement of the output shaft in a standard position; and

control means for positioning the output shaft to a desired command control position; said control means further including correction means for periodically returning the output shaft, in accordance with predetermined conditions, to the standard position prior to recommencing a command control position.

4,904,164

SCROLL TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

Atsushi Mabe, and Kiyoshi Terauchi, both of Isesaki, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Jun. 30, 1988, Ser. No. 213,337

Claims priority, application Japan, Jun. 30, 1987, 62-160968

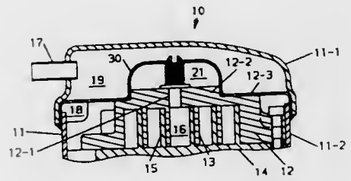
Int. Cl.[4] F04B *49/02, 49/08;* **F04C** *18/04*

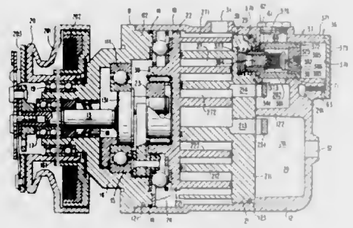
U.S. Cl. 417—308 **10 Claims**

1. In a scroll type compressor including a housing having an inlet port and outlet port, a fixed scroll disposed within said housing and having a circular end plate from which a first spiral element extends into the interior of said housing, an orbiting scroll capable of being driven in an orbital motion and being prevented from rotating during the orbital motion having a circular end plate from which a second spiral element extends, said first and second spiral elements interfitting to make a plurality of line contacts and to define at least one pair of fluid pockets including a central fluid pocket within the interior of said housing, said circular end plate of said fixed scroll dividing the interior of said housing into a front chamber and a rear chamber, said front chamber communicating with said inlet port, and said rear chamber being divided into a discharge chamber, which communicates between said outlet port and the central fluid pocket, and an intermediate pressure chamber, at least one pair of holes formed through said circular end plate of said fixed scroll forming a fluid channel between the fluid pockets and said intermediate pressure chamber, a communication channel formed through said circular end plate of said fixed scroll to form a fluid channel between said intermediate pressure chamber and said front chamber, means for controlling fluid communication between said intermediate pressure chamber and said front chamber, said controlling

a single member having a first portion adapted to be located in and sealed to said casing;

said member having a second portion adapted to be fixedly sealed to said compressing means whereby said member





coacts with said casing and said compressing means to divide said casing into a suction plenum and a discharge plenum;

said member having a third portion defining a muffler.

4,904,165

MUFFLER/CHECK VALVE ASSEMBLY FOR SCROLL COMPRESSOR

Howard H. Fraser, Jr., Lafayette; William R. Lane, Dewitt, and Shahrokh Etemad, East Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 2, 1988, Ser. No. 227,389

Int. Cl.[4] F04B *39/12*

U.S. Cl. 417—312 **7 Claims**

1. A combined muffler and separator plate for use in a hermetic compressor having a casing and compressing means in said casing comprising:

means comprising a first valve element associated with said intermediate pressure chamber and a second valve element, said second valve element controlling a motion of said first valve element, said first valve elementcomprising a cylinder and a piston slidably disposed within said cylinder, the top of said piston of said first valve element capable of receiving pressure of compressed fluid from said discharge chamber by virtue of said second valve element, said cylinder of said first valve element having both first and second openings, said first opening formed at said intermediate pressure chamber side of said cylinder, said second opening formed at said communication channel side of said cylinder, the improvement comprising:

a bottom of said piston of said first valve element which abuts said second opening of said cylinder of said first valve element when said top of said piston of said first valve element receives compressed fluid pressure from said discharge chamber.

4,904,166

VERTICAL AXIS MOTOR-PUMP ASSEMBLY FOR CLOTHES WASHING MACHINE

William A. Wasemann, Mansfield, Ohio, assignor to White Consolidated Industries, Inc., Mansfield, Ohio

Filed Nov. 30, 1988, Ser. No. 277,991

Int. Cl.[4] F04B *39/14*

U.S. Cl. 417—360 **9 Claims**

1. A motor-pump assembly for a clothes washing machine comprising:

a motor with a casing having a top end bell and a bottom end bell, said motor including a generally vertical drive shaft rotatably supported by said end bells, the upper end of said shaft extending above said top end bell;

a dishlike drip shield having a plurality of downwardly extending leg portions with distal ends that engage the said top end bell, said top end bell supporting said drip shield, said drip shield including a generally centrally located aperture through which the upper end of said drive shaft freely extends;

a water pump positioned above said drip shield, said pump having a pump casing defining a chamber enclosing a rotatable impeller, the upper distal end of said drive shaft carrying and rotatably driving said rotatable impeller, said impeller being fitted over the said upper distal end of said drive shaft so that it can be removed from said drive shaft by manually moving said pump away from said drip shield, said pump casing including another plurality of downwardly extending leg portions with distal ends that engage said drip shield, said drip shield supporting said pump casing, said drip shield diverting away from said motor any water that may leak downwardly from said pump; and

means for applying a biasing force to said pump casing to hold it in position against said drip shield, said biased pump casing in turn applying a biasing force against said

VOL 1111 ISS 4 FE 27 1990 UMI

drip shield to hold it in position against said top end bell of said motor.

4,904,167

MEMBRANES AND NEIGHBORING MEMBERS IN PUMPS, COMPRESSORS AND DEVICES

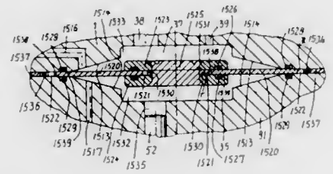
Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagwa-Ken, Japan

Filed Jan. 22, 1988, Ser. No. 146,929

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706188

Int. Cl.[4] F04B *43/06*

U.S. Cl. 417—395 **6 Claims**



1. A pump, comprising, in combination a first body **1** with at least one inlet valve, at least one outlet valve and an inner chamber **37**, a second body **91** with a piston reciprocable in a cylinder with said cylinder communicated to an outer chamber **35** in said second body and a chamber separation member between said bodies and said chambers,

wherein said separating member is a radially planar ring **1520** with an inner radius "r" and an outer radius "R",

wherein said ring has a radial inner portion radially inwards of its medial portion and a radial outer portion radially outwards of said medial portion,

wherein said first and second bodies form radial planar axial end faces,

wherein said end faces are distanced from each other by a distance ring **1537** of a first axial thickness,

wherein said radially planar ring has a second axial thickness,

wherein said second axial thickness is slightly shorter than said first thickness,

wherein seal beds are provided in said end faces and flexible seal rings **1538** and **1529** are inserted into said seal beds,

wherein said radial outer portion of said radially planer ring is inserted between said end faces and radially inwards of said distance ring with a clearance **1522** formed between said outer radius "R" and the inner diameter of said distance ring **1537**,

wherein said radial outer portion extends radially outwardly beyond said seal beds and said seal rings,

wherein said radial inner portion of said radially planer ring is subjected to closing of the inner bore of said radially planer ring by an interior closing device,

wherein said interior closing device is formed by two rings **1523** and **1524** with an inner distance ring **1530** between them with an axial thickness equal to said first thickness,

wherein seal beds with therein provided elasticly deformable seal rings **1526** and **1527**, are formed in said two rings,

wherein said radial inner portion of said radial planar ring **1520** is inserted between said two rings,

wherein a clearance **1521** is formed between the radial inner diameter "r" of said radially planar ring and the outer diameter of said inner distance ring, and,

wherein the radial inner portions of said two rings are clamped together by an inner ring **1525** which forms clamping portions **1531** which axially and radially partially embrance said inner portions of said two rings.

4,904,168

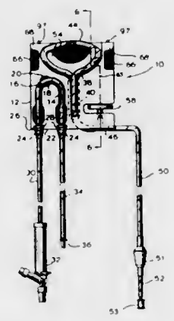
CASSETTE ASSEMBLY FOR OPHTHALMIC SURGERY SYSTEM

Robert Cavoto, Hauppauge; Anthony DiGiacomo, Babylon; Christopher V. Kayser, Bay Shore, and Joseph D. Spinosa, Wantagh, all of N.Y., assignors to United Sonics, Inc., Hauppauge, N.Y.

Filed Dec. 28, 1988, Ser. No. 291,947

Int. Cl.[4] F04B *43/12*

U.S. Cl. 417—477 **15 Claims**



1. A cassette for an ophthalmic surgery system or the like, comprising:

a channel extending through at least a portion of said housing and adjoining said race; and

a slot defined by said housing at the junction of said channel and said race, said slot being defined by an upper surface, a lower surface and an inner surface extending substantially perpendicularly with respect to said upper and lower surfaces and connecting said upper and lower surfaces.

4,904,169

SCROLL TYPE COMPRESSING APPARATUS HAVING STRENGTHENED SCROLL MEMBER

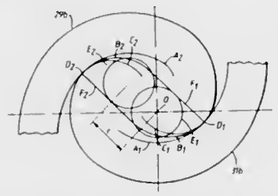
Tutomu Ichikawa, Fujinomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,272

Claims priority, application Japan, Aug. 28, 1987, 62-214324

Int. Cl.[4] F04C *18/04*

U.S. Cl. 418—55 **4 Claims**



1. A scroll type compressing apparatus comprising:

a driving section; and

a compressing section associated with the driving section for compressing gaseous fluid, the compressing section including:

a stationary scroll member including a first spiral wrap having a prescribed length defined in part by inner and outer involute side wall surfaces, and

a movable scroll member including a second spiral wrap having a prescribed length defined in part by inner and outer involute side wall surfaces engaging with the first spiral wrap of the stationary scroll member in order to establish at least one variable volume compressing cell between the first and second spiral wraps by orbital movement,

each spiral wrap having an inner wall surface end portion which is defined by an arcuate wall surface and a straight line wall surface, the straight line wall surface of one spiral wrap being tangent to an involute generation circle of the other spiral wrap from a first line contacting point at which the end portion of said one spiral wrap contacts the inner involute side wall surface of the other spiral wrap when the gaseous fluid in the compressing cell defined between said first and second spiral wraps is compressed at a prescribed target compression ratio, the arcuate wall surface having a prescribed radius and being disposed between an arc having a predetermined orbital movement radius and an involute curve derived from the involute generating circle of said one spiral wrap, said arcuate wall surface being connected at one end thereof to the straight line wall surface and at another end thereof to the inner involute side wall surface of one of said spiral wraps at a second line contacting point at which the end portion of the other spiral wrap contacts the inner involute side wall surface of said one spiral wrap when the gaseous fluid in the compressing cell is compressed at the prescribed target compression ratio.

4,904,170

SCROLL-TYPE FLUID MACHINE WITH DIFFERENT TERMINAL END WRAP ANGLES

Kazutaka Suefuji, Shimizu; Takao Sensbu, Shizuoka; Tetsuya Arata, Shimizu; Masatoshi Muramatsu, Shimizu; Jyoji Okamoto, Shimizu, and Akira Murayama, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

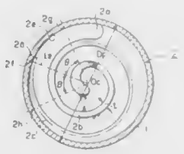
Filed Aug. 17, 1988, Ser. No. 233,000

Claims priority, application Japan, Aug. 21, 1987, 62-207505

Int. Cl.[4] F01C *1/04*

U.S. Cl. 418—55 **8 Claims**





1. A scroll-type fluid machine having a cylindrical casing, a stationary scroll member and an orbiting scroll member, each of said members having a disk-shaped plate and a spiral wrap protruding upright from one end of said disk-shaped plate along an involute curve of a basic circle, said stationary scroll member and said orbiting scroll member being assembled together in the cylindrical casing such that their wraps mesh with each other, said orbiting scroll member being capable of making, without rotating about its own axis, an orbiting motion such that a center of the basic circle on said orbiting scroll member revolves at a predetermined radius of revolution about the center of the basic circle on said stationary scroll member while keeping sliding contact between walls of the spiral wraps on both scroll members, the improvement wherein an involute angle of a terminal end of the spiral wrap on said stationary scroll member is greater than an involute angle of a terminal end of the spiral wrap on said orbiting scroll member, the center of said basic circle of the spiral wrap on said orbiting scroll member corresponds with the center of said disk-shaped plate of said orbiting scroll member while the center of said basic circle of said spiral wrap on said stationary scroll member coincides with or substantially coincides with a center axis of said casing, the terminal end of said spiral wrap on said orbiting scroll member is located substantially on an outer peripheral edge of said disk-shaped plate of said orbiting scroll member while the terminal end of said wrap on said stationary scroll member is located substantially on an inner periphery of said cylindrical casing, and an involute angle λ_{ef} of the terminal end of said spiral wrap on said stationary scroll member and an involute angle λ_{eo} of the terminal end of said spiral wrap on said orbiting scroll member are determined to meet the following condition:

$$60° \leqq \lambda_{ef} - \lambda_{eo} \leqq 120°.$$

4,904,171

LUBRICATING APPARATUS FOR CLAY EXTRUDERS

Jack B. Greer, P.O. Box 247, Siler City, N.C. 27344

Filed Dec. 13, 1988, Ser. No. 288,621

Int. Cl.[4] B29C *47/94*

U.S. Cl. 425—97 **4 Claims**



1. A lubricating device for ceramic extruders of the type used in a brickmaking process in which raw clay is moved along a cylindrical barrel by a screw or ram and forced through a forming die having a rectangular outlet and a generally circular inlet, said lubricating device comprising:

(a) an outer annular member having a cylindrical inner wall and including means associated therewith for removably connecting said annular member between the downstream end of said cylindrical barrel and the upstream end of said forming die;

(b) at least one lubricating port extending through said annular member and forming a passageway for lubricant between the exterior of said annular member and said inner wall thereof;

(c) a relatively thin, frustoconical liner or wear plate having an upstream edge and a downstream edge extending around said cylindrical inner wall, the diameter of the upstream edge being less than the diameter of the downstream edge, the upstream edge of said liner being secured in spaced arrangement to said inner wall and the downstream edge of said liner being spring-biased against the surface of said inner wall, whereby a reservoir is formed between said annular member and said liner;

(d) a plurality of grooves extending longitudinal of the surface of said inner wall and providing a spaced series of outlets for said lubricant between said inner wall and said downstream edge of said liner;

(e) whereby, when connected to said extruder, said lubricating device provides for the continuous delivery of oil

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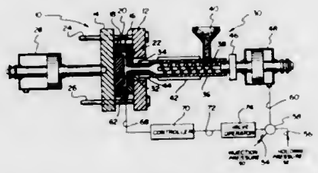
under pressure to the reservoir formed between said annular member and said frustoconical liner from which is passes through said grooves beneath the downstream edge of said liner and into said clay material adjacent the entrance to said forming die.

4,904,172

APPARATUS FOR DATA ACQUISITION AND APPLICATION IN AN INJECTION MOLDING PROCESS

Frederick J. Baja, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1988, Ser. No. 208,930
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[4] B29C *45/77, 45/80*
U.S. Cl. 425—140 **5 Claims**



1. In an injection molding machine having a pair of separable mold elements forming a mold cavity with a part-line therebetween, means for opening and closing the mold elements, and injection means for injecting a moldable material into said mold cavity at a first pressure causing the mold elements to separate and for exerting a second pressure on said moldable material as it cures in said cavity, the improvement comprising apparatus for data acquisition and application in said injection machine comprising means for measuring the separation of the mold elements during the injection of the moldable material, means for changing the injection pressure from said first pressure to said second pressure upon detecting a predetermined separation known to produce an acceptable product, means for maintaining said second pressure until the thermoplastic material has cured, said separation measuring means arranged to continue the measurement of the separation of the mold elements following the changing of the pressure, means for sensing when the separation of the mold elements stops increasing and registering the cessation as the maximum separation of said mold elements, means for accumulating said maximum separations from a plurality of mold cycles while producing acceptable product, means for then selecting a value for said separation of said mold elements based on the maximum separations accumulated, and means for substituting said selected value of said separation for said predetermined separation for use during subsequent cycles to improve product quality.

4,904,173

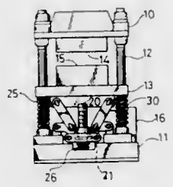
PLASTIC MOLDING DEVICE FOR A SEMICONDUCTOR ELEMENT

Minoru Tanaka, and Itaru Matsuo, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 829,087, Feb. 13, 1986, Pat. No. 4,755,124. This application Mar. 29, 1988, Ser. No. 174,816
Claims priority, application Japan, Feb. 13, 1985, 60-26841; Feb. 13, 1985, 60-26842; Feb. 13, 1985, 60-26844; Feb. 13, 1985, 60-26845; Feb. 13, 1985, 60-26847; Feb. 13, 1985, 60-26848; Feb. 13, 1985, 60-26850; Feb. 13, 1985, 60-26851; Feb. 13, 1985, 60-21852; Sep. 30, 1985, 60-218611; Sep. 30, 1985, 60-218612
Int. Cl.[4] B29C *3/06*
U.S. Cl. 425—149 **2 Claims**

1. A plastic molding device for plastic molding a semiconductor element on a lead frame comprising:

an upper platen, a lower platen, and a movable platen which are all interconnected by at least one tie bar;
an upper metal mold and a lower metal mold provided on the upper platen and the movable platen, respectively;
a motor for applying a driving force for driving the movable platen toward the upper platen;



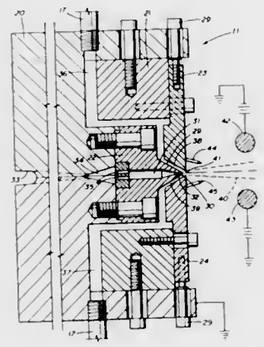
means for detecting the relative position of the upper metal mold and the movable platen, said means for detecting outputting an absolute value for avoiding the use of a counter; and
a driving control apparatus for driving the motor so that the movable platen reaches a desired position relative to the upper mold.

4,904,174

APPARATUS FOR ELECTRICALLY CHARGING MELTBLOWN WEBS (B-001)

Peter Mooamayer, 1c, Ch. de Gilly, Grand-Lancy, Geneva, Switzerland (1212); Jean-Pierre Budliger, 31, Rte de Loex, Onex, Geneva, Switzerland (1213); Erwin Zurcher, 21, Ave. du Lignon, Le Lignon, Geneva, Switzerland (1219), and Larry C. Wadsworth, 2024 Bishop's Bridge Rd., Knoxville, Tena. 37922

Filed Sep. 15, 1988, Ser. No. 245,137
Int. Cl.[4] B29C *47/30, 71/04*
U.S. Cl. 425—174.8 E **12 Claims**



1. A meltblown apparatus for manufacturing meltblown electrostatic charged webs which comprises
(a) an elongate die having a plurality of orifices formed in a die tip thereof and being electrically grounded;
(b) means for extruding molten thermoplastic resin through the die tip orifices to form a plurality of side-by-side fibers;
(c) means for blowing converging air streams on the fiber extruded from the die tip orifices to form a fiber-air stream;
(d) a pair of elongate and horizontal electrodes spaced from the outlets of the die tip orifices, one electrode being above the fiber-air stream and one below the fiber-air stream;

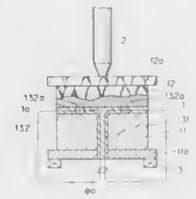
(e) a pair of emitter means secured to the die and being electrically grounded thereto and protruding outwardly therefrom, one emitter means being positioned above the die tip and the other below the die tip, and each emitter means having an outer end in close proximity to the die tip orifice outlets; and
(f) means for applying a high voltage source with positive polarity to the electrodes to establish an electrostatic field between the electrodes and the emitter means.

4,904,175

MAGNETIC PLASTIC ROTOR DISK MANUFACTURING APPARATUS

Kinya Horibe; Masazumi Kawai; Yasukazu Hoshino; Koichiro Tsuji, and Kiyofumi Uchida, all of Skizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Apr. 25, 1989, Ser. No. 342,786
Claims priority, application Japan, Apr. 28, 1988, 63-104166
Int. Cl.[4] B29C *33/00, 39/26, 45/40*
U.S. Cl. 425—174.4 **5 Claims**



1. A magnetic plastic rotor disk manufacturing apparatus for manufacturing diametrically magnetized magnetic plastic rotor disks comprising;
a metal mold comprising a pair of half molds for molding a magnetic plastic material containing synthetic resin matrix and magnetic powder into a plurality of disks, and having a plurality of cavities along the splitting surface thereof;
a magnetic field creating coil for creating and applying the magnetic field along said parting surface of said metal mold to magnetize and orient the magnetic particles of said magnetic powder injected into said plurality of cavities;
a first yoke provided in the central portion of said metal mold so as to extend on one side thereof perpendicularly to said parting surface; and
a second yoke provided in the metal mold so as to extend along said parting surface;
said plurality of cavities being formed on a circle concentrically formed with said second yoke; so that the magnetic flux of said magnetic field created by said magnetic field creating coil is concentrated in the central portion of said second yoke by way of said first yoke, and is guided radially by said second yoke from the central portion toward the periphery thereof.

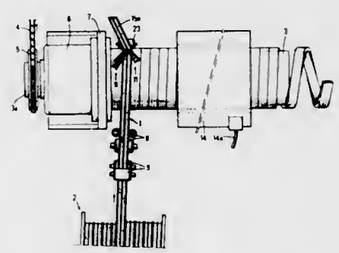
4,904,176

DEVICE FOR CONTINUOUSLY PRODUCING REINFORCED STABILIZABLE PROFILED BODIES BY A MANDREL AND A SUPPORT

Michel Havey, Bougival, France, assignor to Institut Francais due Petrole, Rueil Malmaison, France

Filed Jun. 15, 1988, Ser. No. 206,841
Claims priority, application France, Jun. 15, 1987, 87 08329
Int. Cl.[4] B29C *53/62*
U.S. Cl. 425—391 **24 Claims**

1. Device for continuously producing profiled section bodies of a reinforced stabilizable material, the device comprising a mandrel means, means for rotationally driving said mandrel means around a longitudinal axis thereof, at least one profiled sectional support means wound helically onto said mandrel means, means for moving to make said at least one profiled sectional support means longitudinally on said mandrel means, means for winding reinforcement elements impregnated with stabilizable material around the mandrel means and onto said at least one profiled sectional support means means disposed along at least one part of a length of the mandrel means for stabilizing the stabilizable material, means for separating the reinforced material having undergone stabilization from the mandrel means, said at least one profiled sectional support



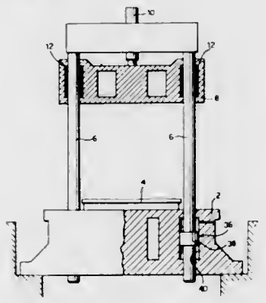
means being wound at a first extremity of the mandrel means and separated from the mandrel means at a second extremity thereof, and wherein a first elevated zone is provided at the first extremity of said mandrel means upon which said at least one profiled sectional support means is wound, said first zone having a length sufficient to enable a driving of the at least one profiled support means through a capstan effect relative to the mandrel means without impeding a forward movement of the at least one profiled sectional support means on said mandrel means.

4,904,177

VERTICAL PRESS FOR THE MOULDING OF PLASTICS MATERIALS, PARTICULARY THERMOSETTING PLASTICS MATERIALS

Franco Chiesi, Milan, Italy, assignor to Fiat Autn S.p.A., Torino, Italy

Filed Nov. 18, 1988, Ser. No. 273,446
Claims priority, application Italy, Dec. 3, 1987, 68040 A/87
Int. Cl.[4] B29C *45/67, 33/24*
U.S. Cl. 425—406 **1 Claim**



1. A vertical press for the moulding of plastics materials, comprising:
a support structure,
a fixed plate supported by said structure, guide columns movably mounted on said fixed plate perpendicular

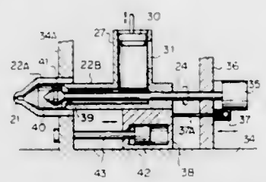
thereto and a movable plate slidably mounted on said guide columns;
first fluid-operated actuator means connected between said columns and said movable plate for moving said movable plate along the guide columns;
a plurality of fluid-operated clamping means carried by said movable plate for clamping said movable plate against relative movement with respect to each guide column; and
second fluid-operated actuator means on said fixed plate acting on said guide columns to move said guide columns vertically relative to said fixed plate;
wherein each of said fluid-operated clamping means is comprised of an annular recess in said movable plate surrounding one of said columns, a pair of annular steel bushing elements located in said recess in spaced relation to each other to define an annular pressure chamber therebetween, fluid passage means extending through said movable plate into communication with said pressure chamber for supplying pressurized fluid to said chamber, each of said bushing elements having a first portion disposed in sliding engagement with said bushing, sealing means between said first portion and said movable plate and said column, respectively, a second portion spaced from said recess and having a circular cylindrical friction surface disposed in engagement with said column, and a frusto-conical part spaced from a bottom wall of said recess and said column and extending between said second portion and an end wall of said recess whereby upon introduction of pressurized fluid into said pressure chamber each of said annular bushings will undergo elastic deformation to clamp said movable plate to said guide column.

4,904,178

APPARATUS FOR INJECTING RESIN INTO A MOLD

Takefumi Sonoda, and Kiyoshi Hashimoto, both of Ube, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Division of Ser. No. 852,573, Apr. 16, 1986, Pat. No. 4,767,306.
This application Jun. 7, 1988, Ser. No. 203,169
Claims priority, application Japan, Apr. 16, 1985, 60-79197; Jul. 31, 1985, 60-168898
The portion of the term of this pateot subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[4] B29C *45/54*
U.S. Cl. 425—667 **6 Claims**



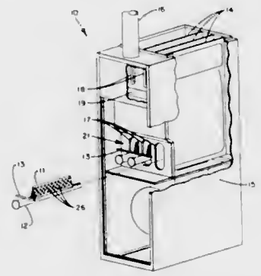
1. An injection apparatus for injecting thermosetting resin having fibers into a mold, comprising:
a double barrel arrangement including an outer cylindrical barrel having an injection nozzle at a free front end thereof, said double barrel arrangement also including an inner cylindrical barrel slidably disposed within said outer barrel, and said inner barrel being engaged with an inner surface of said outer barrel;
a stuffer of a jack for feeding the fibrous resin to said injection nozzle, said inner barrel communicating with said outer barrel at said free front end, said inner barrel also communicating with a feed outlet of said jack stuffer;
a plunger disposed in said double barrel arrangement for axial, reciprocating and rotation, said plunger including a peripheral portion having a cross-section narrower than the diameter of said inner barrel, said peripheral portion and said inner barrel defining a continuous annular gap along a substantial length of said inner barrel to channel the thermosetting resin containing the fibers;
check valve means for preventing a back flow of the fibrous resin and including a piston-cylinder arrangement for actuating said movable inner barrel relative to said outer barrel;
a jack for activating said plunger relative to said inner barrel;
motor means for rotating said plunger, said plunger and said inner barrel in combination being activated by cooperation of said piston-cylinder arrangement and said jack to move axially toward said injection nozzle;
a metering or volume chamber having a variable volume for the fibrous resin being defined by the inner surface of said outer barrel, the free front end thereof, said check valve means and said inner barrel, wherein the fibrous resin is forced to enter from said jack stuffer into said inner barrel, and said plunger being forced to rotate with the fibrous resin and having freedom to move axially, together with said inner barrel, away from said injection nozzle against a back pressure applied thereto, the fibrous resin passing through said check valve means to fill said metering chamber, whereby said check valve means is closed to prevent a back flow of the metered resin from said metering chamber, said plunger and said inner barrel urged axially toward said injection nozzle to thereby inject the fibrous resin out of said nozzle.

4,904,179

LOW NO_x PRIMARY ZONE RADIANT SCREEN DEVICE

Thomas E. Drago, Liverpool, and Chester D. Ripka, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 767,580, Aug. 20, 1985, abandoned.
This application Nov. 21, 1986, Ser. No. 935,070
Int. Cl.[4] F23D *14/12*
U.S. Cl. 431—2 **5 Claims**



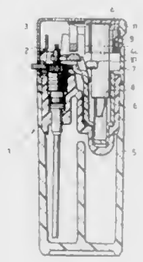
1. A combustion system for a gas-fired furnace comprising:
a combustion type burner to provide a two-zone diffusion flame during combustion of a mixture of fuel and air, the flame having a primary zone and a cooler secondary zone surrounding the primary zone said primary zone having an outer surface forming an interface with said secondary zone;
a heat exchanger defining a flow path for combustion products said heat exchanger having an inlet and an outlet said burner disposed within said heat exchanger near said inlet; and
a means for inhibiting formation of oxides of nitrogen by controlling peak combustion flame temperatures and residence times at the peak flame temperatures said means including a piece of metal material having a plurality of apertures therethrough, said piece of material mounted to said burner for generally contacting the entire said outer surface of the primary zone of the flame and positioned at the interface of the primary zone and the secondary zone whereby the primary zone and secondary zone are entirely separated by said piece of material to allow said piece of material to absorb thermal energy from hotter primary zone at a rate which limits peak flame temperatures whereby the formation of oxides of nitrogen are inhibited, said piece of material having a generally inverted V-shaped transverse cross-section with the open end of the V-shaped material extending along and adjacent edges of the burner wherein substantially all of the products of combustion flow through said apertures in said piece of material.

4,904,180

GASLIGHTER EQUIPPED WITH A LOCKING MEANS TO PREVENT UNDESIRED IGNITION

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

Filed Jun. 6, 1989, Ser. No. 362,536
Claims priority, application Japan, Jun. 7, 1988, 63-74779[U]
Int. Cl.[4] F23D *11/36*
U.S. Cl. 431--153 **2 Claims**



1. A gaslighter equipped with a locking means to prevent undesired ignition comprising:
a gaslighter housing having an intervening mount on its top, a windshield fixed to said intervening mount and a flame-striking thumb-pusher adjacent to said windshield; and
a stopper slidably fitted on said flame-striking thumb-pusher, said stopper being spring-biased and urged towards said windshield by rubber, coil spring, leaf spring or any other resilient means until it has been put in locking position in which the forward end of said stopper is directly above said intervening mount, thus causing the forward end of said stopper to be caught by said intervening mount when said flame-striking thumb-pusher is tried to be lowered without pulling back said stopper, thereby preventing the descent of said flame-striking thumb-pusher.

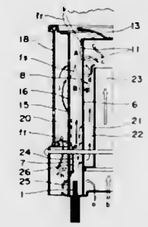
4,904,181

COMBUSTION EQUIPMENT

Katsuhiko Uno, Nara; Katsuhiko Ishikawa, Ikoma, and Shojiro Inoue, Kitakatsuragi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 27,819, Mar. 19, 1987, Pat. No. 4,790,746. This application Sep. 28, 1988, Ser. No. 251,087
Claims priority, application Japan, Mar. 25, 1986, 61-66359; May 8, 1986, 61-105219; Jun. 20, 1986, 61-145169
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[4] F23D *3/02, 3/14*
U.S. Cl. 431--314 **9 Claims**

1. A combustion apparatus for burning a vaporizable fuel by mixing said fuel with air, which comprises:
a vertically oriented outer flame cylinder having a lower vaporizing portion, which lower vaporizing portion has a first plurality of through holes therein and an upper red heat portion above said vaporizing portion, said upper red heat portion having a second plurality of through holes therein;
a vertically oriented inner flame cyliner within and spaced inwardly of said outer flame cylinder, said inner flame cylinder having a plurality of holes therein, said inner flame cylinder defining with said outer flame cylinder a vertically extending annular combustion portion;
an outer cylinder around and spaced outwards of said outer flame cylinder;
a wick vertically movable mounted in a lower end of said combustion portion adjacent said first plurality of holes and arranged for movement between a minimum height position and a maximum height position for adjusting the amount of combustion in said apparatus in accordance with the height of said wick;
an outer control cylinder positioned inward of said outer flame cylinder, said outer control cylinder extending from a position above the maximum height position of said wick



and spaced radially inwardly from said outer flame cylinder for forming an outer control zone between said outer control cylinder, and said outer flame cylinder being directed upwardly along the inside of said outer flame cylinder, said outer control cylinder having a bottom closure member thereon by which said outer control cylinder is mounted on said flame cylinder and for defining a lower extent of the outer control zone;
an air control cylinder positioned inward of said inner flame cylinder, said air control cylinder extending upwardly from a position above the maximum height position of said wick and terminating at a position adjacent to an upper portion of said inner flame cylinder, said air control cylinder spaced from said inner flame cylinder including means for closing the bottom of said control zone to define a vertically extending annular air control zone between said air control cylinder and said inner flame cylinder, said air control cylinder defining a vertically extending inner air path therewithin.

4,904,182

CATALYTIC BURNER WITH DUAL MODE VENTURIS

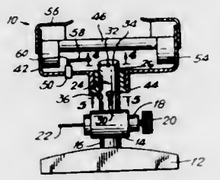
Michael D. Leshner, 6481 Belleview Dr., Columbia, Md. 21046

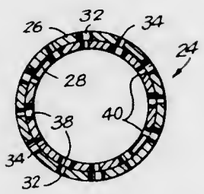
Filed Jul. 22, 1988, Ser. No. 223,233
Int. Cl.[4] F23D *14/62*
U.S. Cl. 431—354 **8 Claims**

1. A venturi for a gas burner comprising: a venturi having an elongated tubular member; means at one location on said tubular member for receiving gas fuel under pressure; variable sized gas exit apertures at a second location on said tubular member; an air inlet aperture at a third location having means for varying the size thereof; and means operable by a user for simultaneously increasing the size of said exit apertures and decreasing the size of said air inlet aperture so that a gas exit velocity is

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less than a flame speed, and for simultaneously decreasing the size of said exit apertures and increasing the size of said inlet





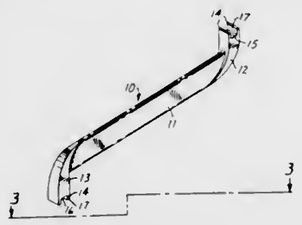
aperture so that the gas exit velocity is greater than the flame speed.

4,904,183

ORTHODONTIC DEBONDING METHOD AND TOOL

Clarence W. Hannan; Wilford A. Snead, both of San Dimas; Jirina V. Pospisil, Monrovia, and Robert P. Eckert, Alta Loma, all of Calif., assignors to Unitek Corporation, Monrovia, Calif.

Continuation-in-part of Ser. No. 47,786, May 8, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 171,966
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—3 **16 Claims**



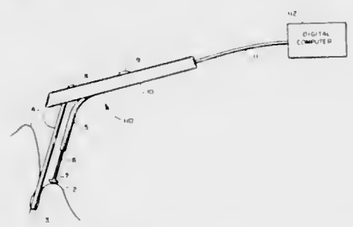
1. A debonding tool for removing an adhesively bonded orthodontic bracket from a tooth, the bracket having a body with opposed noncircular surfaces of known contour and spacing, the tool comprising a central handle portion and a pair of fixed, spaced-apart tips having surfaces with a contour and spacing substantially identical to said known contour and said spacing of said opposed bracket surfaces, said tips extending from the central portion and being separated and contoured to define a slot in which the bracket body can be fitted with the tips in mating engagement with said bracket surfaces so the tool and bracket can be rotated together about an axis generally perpendicular to the tooth surface to break the adhesive bond.

4,904,184

PERIODONTAL PROBE INSTRUMENT

Gordon J. Murphy, 638 Garden Court, and Robert J. Ceisel, 1450 Ammer Rd., both of Glenview, Ill. 60025

Filed Jan. 17, 1989, Ser. No. 296,989
Int. Cl.[4] A61C *19/04*
U.S. Cl. 433—72 **18 Claims**



1. A periodontal probe instrument for measuring the depth of a periodontal pocket in the gingiva adjacent a tooth, said instrument comprising:

a probe handle member;

a displacement sensor being movably mounted within a sleeve which is connected to said probe handle member, said displacement sensor terminating externally of said handle member in a tip;

a probe element including an external end and being also mounted in said handle member, said probe element being disposed adjacent and parallel to said displacement sensor;

said tip of said displacement sensor being aligned with said external end of said probe element in a first reference position;

pressure transducer means mounted in said handle member and being responsive to a force applied to said external end of said probe element for generating a first output signal indicative of the magnitude of the force;

said probe element being inserted into the periodontal pocket until the external end thereof contacts the bottom of the pocket as the tip of said displacement sensor is resting on the gingival margin of the tooth, said tip being retracted in said sleeve from the first position to a second position when the external end of said probe element is contacting the bottom of the pocket;

displacement transducer means mounted in said handle member for constantly encoding the displacement of said tip as it is moved from the first position to the second position to generate a second output signal indicative of the depth of the periodontal pocket;

comparator means responsive to said first output signal indicative of the magnitude of the force, a low threshold signal, and a high threshold signal for generating a logic signal only when said first output signal is in the range between said low and high threshold signals;

indicating means responsive to said logic signal to produce an indication to generate an actuation signal; and

activating means including a switch which is operated when the indication is produced for generating an actuation signal to cause a computer to read the second output signal indicative of the depth of the periodontal pocket.

4,904,185

DENTAL INSTRUMENT

John T. McSpadden, 6918 Shallowford Rd., Chattanooga, Tenn. 37421

Filed Jan. 10, 1948, Ser. No. 267,032
Int. Cl.[4] A61C *3/08*
U.S. Cl. 433—164 **6 Claims**

1. An instrument for use with a dental hand piece for thermomechanically obturating a root canal with a thermoplastic material by a process wherein the thermoplastic material is

softened by the friction executed by the rotation of the instrument, said instrument comprising an elongated member having a shank at one end thereof which includes a fitting for engagement with a dental hand piece, a tapered working portion at the other end of said member, the diameter of said working portion progressively decreasing away from said shank portion, flute means on said working portion defining a spiral flute



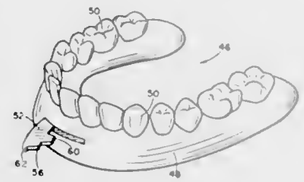
having a shoulder facing away from said shank and making an angle with the longitudinal axis of the working portion of greater than 90 degrees to provide a negative rake angle as said instrument is rotated to advance thermoplastic material towards the end of said working portion remote from said shank and a peripheral land adjacent said shoulder having a width which is at least about 40 percent of the pitch of said spiral flute.

4,904,186

ATTACHMENT FOR REMOVABLY SUPPORTING A DENTURE IN THE MOUTH OF THE USER

Ralph C. Mays, 6740 S. 69th East Ave., Tulsa, Okla. 74133

Continuation-in-part of Ser. No. 90,456, Aug. 28, 1987, Pat. No. 4,784,608. This application Jul. 19, 1988, Ser. No. 221,212
Int. Cl.[4] A61C *13/22*
U.S. Cl. 433—172 **3 Claims**



1. An attachment for removably supporting a denture in the mouth of a user having at least two spaced apart dental posts installed in the users alveolar ridge, comprising:

an anchor member fitable semi-permanently into the mouth of the user for anchoring, such as by screws, to dental posts, the anchor member being curved to generally the shape of the alveolar ridge of the user and the anchor member having a bar portion extending between spaced apart dental posts, the anchor member having a proximal surface adjacent the user's alveolar ridge and an opposed distal surface;

a denture member which conforms generally to the anchor member and engagable in proximity with said anchor member distal surface, the denture member being castable into a denture having simulated gum portions and teeth portions, said anchor member having retention means and the denture member having retention means which removably interlocks with said anchor member retention means when a denture having said denture member formed thereon is in usable position within the mouth of the user, and the anchor member being of a curved form within a general plane and said denture member being a generally correspondingly curved form within a general plane, said planes being generally parallel to each other when said denture member is formed in a denture and the denture is in position within the mouth of a user, (and) said anchor member retention means being in the form of spaced apart recesses each having an axis inclined at generally the same acute angle relative to said anchor member plane and said denture member retention means being in the form of integrally extending projections removably receivable within said anchor member recesses, each projection having an axis inclined at generally the same acute angle relative to said denture member plane, said recesses and projections being dimensioned to permit limited movement of said denture member relative to said anchor member; and

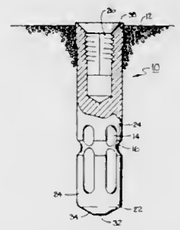
locking means attached to said denture member releasably engagable with said anchor member bar portion and moveable between a locked and an unlocked position, whereby when said locking means is in the unlocked position a denture having said denture member may be inserted into or removed from the mouth of a user, said anchor member bar portion and said locking means configured to permit limited pivotal movement therebetween, said denture member being pivotable about said bar member within limits established by said recesses and projections when said denture member is locked to said anchor member.

4,904,187

DENTAL IMPLANT

William F. Zingheim, Escondido, Calif., assignor to Tri-Stage, Inc., Solana Beach, Calif.

Filed Apr. 13, 1988, Ser. No. 180,990
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—173 **17 Claims**



1. A device implantable in bone for holding objects while substantially eliminating stress risers at the interface between the bone and the implant which comprises:

a tubular cylinder having an open end and a closed end, with an outer surface between said ends and a cavity extending longitudinally into said device from said open end toward said closed end;

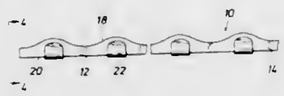
a plurality of oblong-shaped shallow grooves each of said grooves defining a rounded transition between said groove and outer surface which is rounded and has an arc length less than thirty degrees, said grooves being formed into said surface near said closed end with the longitudinal axes of said grooves aligned substantially parallel to the longitudinal axis of said cylinder to inhibit rotation of said device in said bone;

an annular depression traversing each of said grooves and defining a transition between said depression and said outer surface which is rounded and has an arc length less

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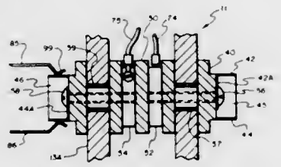
than thirty degrees, said depression being formed into said surface to inhibit displacement of said device in said bone.

4,904,188
DIRECT BONDED ARCH BAR FOR MAXILLO-MANDIBULAR INJURIES
Harold Baurmash, 1600 Parker Ave., Fort Lee, N.J. 07024
Filed May 20, 1988, Ser. No. 196,735
Int. Cl.[4] A61C *5/00*
U.S. Cl. 433—215 **15 Claims**



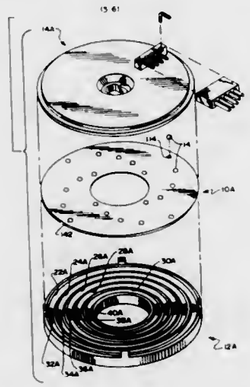
1. An arch bar for direct bonding to the teeth of a patient for the management of maxillo-mandibular injuries, comprising:
(a) an elongated arch bar forming facial, lingual, occlusal and gingival portions thereof and being capable of conforming to the configuration of at least a portion of the buccal and facial surfaces of the teeth of an alveolar arch of the patient and further adapted for contact with a plurality of said teeth;
(b) a plurality of ligature hook elements extending from said occlusal portion and projecting in spaced relation with said facial portion and extending toward the gingival; and
(c) a substantially continuous elongated strip of mesh material being adhered to said lingual portion of said arch bar and extending substantially along the entire length of said lingual portion and functioning as a bonding base for bonded fixation of said arch bar to the teeth of the patient.

4,904,189
ROTATING CONTACT ASSEMBLY FOR ELECTRICAL SUPPLY
Leonard L. Hallings, Rochester, N.Y., assignor to MDT Corporation, Rochester, N.Y.
Filed Mar. 3, 1989, Ser. No. 318,758
Int. Cl.[4] H01R *39/64*
U.S. Cl. 439—13 **17 Claims**



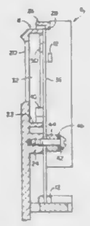
1. An electrical contact assembly constituting means for transferring electrical current from a source to an electrical device through a rotating mechanical linkage, comprising:
a hollow post;
a mechanical linkage assembly structurally associated with such post, said linkage assembly having first and second elements capable of 360° rotation with respect to each other;
an arm member mounted transversely to said post through said first and second elements;
an insulating core mounted inside said post, said core housing a plurality of contact terminals in electrical isolation from each other;
an insulating collar concentric to said insulating core mounted external said post;
a plurality of conductive contact rings concentric to said post, each said contact ring being electrically and mechanically connected to said contact terminal through said collar;
an electrical brush assembly carried by said arm;
a plurality of conductive brush elements, extending from said brush assembly, each said brush element being in electrically conductive association with a said conductive ring through a biased friction surface contact;
a plurality of first conductors extending from electrical connection to respective said plurality of contact terminals through said hollow post, said first conductors constituting means for carrying electrical current from or to a first remote location; and
a plurality of second conductors extending from electrical connection to respective of said plurality of brush elements through said arm, said second conductors constituting means for carrying electrical current to or from a second remote location.

4,904,190
ELECTRICAL CONNECTOR ASSEMBLY FOR VEHICULAR STEERING WHEEL
Edward J. Plocek, Lisle, Ill., and William H. Hyslop, Sylvan Lake, Mich., assignors to Molex Incorporated, Del.
Filed Oct. 3, 1988, Ser. No. 252,308
Int. Cl.[4] H01R *39/02, 39/28*
U.S. Cl. 439—15 **24 Claims**



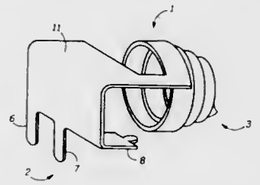
1. An electrical connector assembly for achieving electrical connection between first and second members at least one of which is rotatable relative to the other, said assembly comprising:
a first housing mountable to said first member and comprising a nonconductive portion having a mating face and a plurality of annular conductive portions plated on said mating face;
a second housing mountable to said second member and comprising a nonconductive portion having a mating face disposed in generally opposed relationship to the mating face of said first housing, said first and second housings being rotatable relative to one another, said second housing having a plurality of annular conductive portions plated on the mating face thereof generally in register with the annular conductive portions on the mating face of said first housing to define pairs of opposed annular conductive portions, the annular conductive portions of said first and second housings being in spaced relationship to one another; and
at least one resilient conductor member disposed between the mating faces of said first and second housings and retained at a radial position for resiliently engaging both annular electrically conductive portions in one said pair of opposed annular conductive portions for achieving electrical connection therebetween while permitting rotation of said first and second housings relative to one another.

4,904,191
CONTACT STRUCTURE EMPLOYING AN ELASTOMERIC CONNECTOR
Mark L. Munday, and William P. Doby, both of Raleigh, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 26, 1988, Ser. No. 186,424
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—68 **2 Claims**



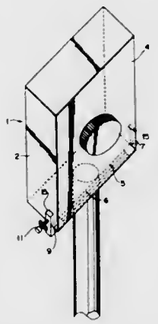
1. A circuit assembly comprising: a one-piece molded support member having first and second planar support surfaces which extend parallel to one another, with both of said planar support surfaces facing in the same direction; a first circuit device positioned on said first planar support surface and having a row of first contact elements formed to have contact surfaces all lying in a first common plane; a second circuit device having a first planar surface and having a row of second contact elements disposed on said first planar surface and formed to have contact surfaces all lying in a second common plane, said second circuit device being secured to said support member such that said first planar surface of said second circuit device bears against said second planar support surface and said contact surfaces of said second contact elements face said contact surfaces of said first contact elements, each first contact element is aligned with a respective second contact element, and said first and second common planes are parallel to one another and are spaced a predetermined distance apart; and an elastomeric connector interposed and compressed between said first and second circuit devices for conductively connecting each first contact element to the respective second contact element with which said first contact element is aligned, wherein said support member has two projecting parts each having an outer surface consisting a part of said second support surface, and said support member further has a third planar support surface located to extend alongside and parallel to said row of second contact elements when said second circuit device is secured to said support member, said third support surface being at least approximately coplanar with said second support surface and being located to oppose warping of said row of second contact elements; wherein said support member is molded in a mold having two mold halves and said first and second support surfaces are formed by one of the mold halves; wherein said support member has two projecting parts each having an outer surface constituting a part of said second support surface; and wherein each said projecting part has a tapped opening and further comprising threaded connectors engaging in said tapped openings for securing said second circuit device to said projecting parts.

4,904,192
BATTERY CONTACTS
Harold Holden, and John R. Benyo, both of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 5, 1989, Ser. No. 293,849
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—78 **7 Claims**



1. A battery contact manufactured in one piece from electrically conductive sheet metal and comprising a first portion for coupling to an electric circuit and a second portion in the form of a helical spring for coupling to a battery, said first portion including at least one tab for soldering to an electric circuit and at least one retainer prong for locating and fixing the battery contact to the electric circuit prior to soldering.

4,904,193
ELECTRICAL GROUNDING CLAMP
Thomas F. Graves, Fort Worth, Tex., assignor to Southwestern Bell Telephone Company, St. Louis, Mo.
Filed Apr. 20, 1988, Ser. No. 183,902
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—92 **32 Claims**



1. An electrical grounding clamp adapted to be removably attached to a fixture, said clamp comprising:
(a) an elongated member comprising an electrically-conductive metal, said elongated member having a first end and a second end;
(b) a first grasping arm and a second grasping arm, each of said arms comprising means for gripping an exterior surface of said fixture, wherein each of said grasping arms is substantially L-shaped said gripping means on each of said arms comprising means for establishing physical and mechanical contact with said exterior surface of said fixture when said clamp is attached to said fixture;
(c) means for attaching an external grounding wire to at least one of said grasping arms;
(d) means for attaching said first grasping arm to said first end of said elongated member;
(e) means for mounting said second grasping arm on said second end of said elongated member; and

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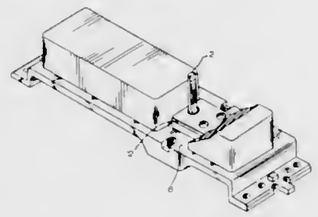
(f) spacing adjustment means, located at one of said ends of said elongated member, for varying the spacing between said first grasping arm and said second grasping arm when said grasping arms are positioned on said first and second member ends.

4,904,194

POLARIZED GROUNDING PIN

Jan A. Kilsdonk, Corona, and Norman L. Hug, Cypress, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 24, 1989, Ser. No. 342,068
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—101 **11 Claims**



1. A grounding pin that provides an electrical path between the shells of mated connectors, wherein the grounding pin is retained by a male connector shell and a mating female connector shell has a pin receiving aperture, comprising:

(a) a post, and

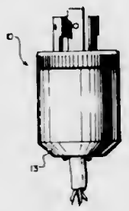
(b) a spring attached to said post, for pushing said post into contact with said connector shells, when said post and said spring are received by said female connector shell aperture.

4,904,195

TWIST-LOCK FEMALE-MALE PLUG ADAPTER

Michael Thackeray, 2380 Stafford Rd., Thousand Oaks, Calif. 91361

Filed Jun. 24, 1988, Ser. No. 210,867
Int. Cl.[4] H01R *29/00, 31/06*
U.S. Cl. 439—173 **17 Claims**



1. An auxiliary male plug-adapter for a female twist-lock plug adapter, comprising:

a mounting frame means, said frame means defining an upper surface face and a lower surface face;

a first set of three arcuately spaced-apart male electrode prongs projecting outwardly from said upper face of said frame means;

a second set of at least two spaced-apart male electrode prongs projecting from said lower surface face, whereby either of said first and second sets may be coupled to a female twist-lock plug adapter for subsequent connection of the free set to another female plug;

each said prong of said second set being electrically coupled to one respective said prong of said first set;

a first female, twist-lock plug means comprising three terminal means for selectively receiving therein the prongs of said first and second sets;

means for housing said female plug means and said frame means together to form one complete unit, said twist-lock plug means also comprising cord means comprising a plurality of conductors and having an end thereof electrically coupled to said three terminal means, one of said first and second sets of prongs being received in said female twist-lock plug means, each said terminal means of said twist-lock plug means comprising means for electrically connecting a respective conductor of said cord means thereto;

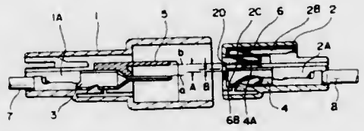
and a second female plug means different from said first plug means in which is received said other of said first and second sets of prongs when said one set is received in said first plug means.

4,904,196

RELEASABLE CONNECTOR FOR ELECTRIC CIRCUITS

Tadahiro Sueyoshi; Tetsuo Kato, and Akira Maeda, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jul. 14, 1988, Ser. No. 218,916
Claims priority, application Japan, Jul. 17, 1987, 62-109075[U]
Int. Cl.[4] H01R *13/703*
U.S. Cl. 439—188 **6 Claims**



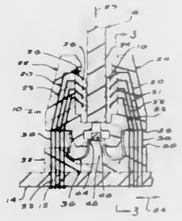
1. A releasable connector for preventing malfunctions in electric circuits, comprising a male connector housing and a female connector housing adapted to fit in each other in face-to-face relation, characterized in that one of said male and female connector housings is provided interiorly, and adjacent to a guide aperture opened at the interface thereof, with a terminal receiving cavity and a short-circuit member receiving cavity with a communicating space formed therebetween, whereby said terminal receiving cavity is provided with a plurality of terminals disposed therein, at least one of said terminals being provided with a projection formed from an electrically conductive material which extends outwardly from said terminal into said short-circuit member receiving cavity, said short-circuit member receiving cavity having disposed therein a resilient short-circuit member formed of electrically conductive material in such a manner that said member extends through the communicating space so as to be brought into resilient contact with the respective projections of said terminals to protect the electrical circuits from malfunctions due to external magnetic and electric fields when the housings are apart, the other of said connecting housings being provided with an insulator member recessively mounted within an interior cavity of the housing, said insulator member being adapted, when the two connector housings are fitted in each other, to be thrusted in between the short-circuit member and the terminals with which the short-circuit member has been in resilient contact, said short-circuit member and the respective projections of said terminal elements being configured so as to orient and guide said insulating member therebetween.

4,904,197

HIGH DENSITY ZIF EDGE CARD CONNECTOR

Michael K. Cabourne, Santa Ana, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jan. 13, 1989, Ser. No. 296,566
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—260 **15 Claims**



1. An electrical connector for connecting to a removable module, comprising:

a base;

a pair of frame elements of dielectric material, said elements having module-facing portions that are spaced apart to form a module-receiving region between them, said elements being moveable substantially in lateral directions toward and away from said module-receiving region;

a plurality of elongated electrically conductive contacts, each contact having a middle portion held in one of said frame elements, each contact having a terminal end portion projecting from the frame element with a directional component toward said module-receiving region, and each contact having a flexible elongated tail portion extending between the frame element and said base and supporting the frame element in movement toward and away from said module-receiving region by bending of the flexible tail portion;

each of said frame elements holding the middle portions of a plurality of said contacts, with said plurality of contacts having their tail portions extending primarily parallel but spaced apart;

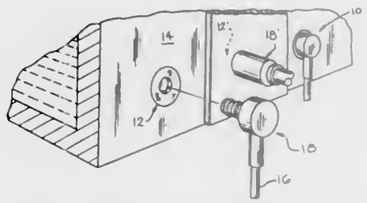
a device coupled to said frames and actuatable to cause said frames to move toward and away from said module-receiving region.

4,904,198

VIBRATION-PROOF PLUG AND SOCKET

Bruce A. Begitschke, Sylvania, and David B. Potter, Toledo, both of Ohio, assignors to Rowe Industries, Inc., Toledo, Ohio

Continuation of Ser. No. 101,684, Sep. 28, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 265,329
Int. Cl.[4] H01R *13/52*
U.S. Cl. 439—281 **20 Claims**



1. In a single conductor high voltage electrical connector, the improvement comprising:

a socket having a circular blind aperture defined by an inner wall and an inwardly extending face at one end of said aperture, a radially outwardly extending face at the other end of said aperture, a circumferential recess in said inner wall disposed an axial distance from said face at the other end of said aperture and an electrical contact disposed in the center of said blind aperture, and

a plug having a circular barrel, a body defining a face radially outwardly extending from said barrel, an electrical contact disposed in the center of said barrel,

retaining means for mechanically securing said plug in said socket including a larger rib disposed on said barrel having a cross section substantially complementary to the cross section of said recess and disposed said axial distance from said face extending from said barrel and

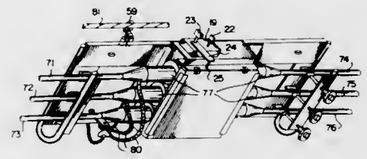
seal means for providing an anti-corona seal including at least one smaller rib disposed on said barrel between said larger rib and the end of said barrel.

4,904,199

SUPPORT FOR DETACHABLE JUNCTION BETWEEN CABLES

Francis L. Ducassou, Yerres, France, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 17, 1989, Ser. No. 297,696
Claims priority, application France, Jan. 22, 1988, 8800675
Int. Cl.[4] H01R *13/46*
U.S. Cl. 439—304 **9 Claims**



1. A support for a detachable junction between at least two cables each one equipped with a connecting socket characterized in that it comprises:

a box **(1,6,7,16)** having a slot arranged for receiving the two joined sockets **(77)**;

first stop means **(9)** provided on the box and cooperating with the sockets to oppose their separation;

a cover **(17)** to close the box;

a lock **(19)** and a key **(22)** mounted on the cover and a latch **(24)** mounted on the box or the other way round, the locking being arranged to enable the operation of the key and its release only when the latch cooperates with the lock, the disposition of the lock and of the latch being such as the said latch can cooperate with the lock only when the cover is in a position assuring the closing of the box, and

second stop means **(31,32)** provided on the box, arranged for cooperating with the cover **(17)** and with the sockets **(77)**, in such a way that in case one at least of the sockets is missing, these means oppose the closing of the box.

4,904,200

TEST PROBE APPARATUS

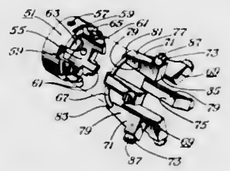
Robert A. Williams, 55 Bounty Rd. East, Fort Worth, Tex. 76132

Continuation-in-part of Ser. No. 104,813, Oct. 1, 1987, Pat. No. 4,850,893, which is a continuation-in-part of Ser. No. 50,091, May 14, 1987, abandoned. This application May 8, 1989, Ser. No. 348,721
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—349 **11 Claims**

1. A test probe apparatus, comprising:

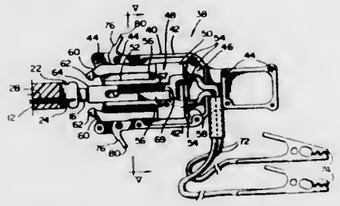
tubular body means having a front end and a rear end,

structure including electrical contact means supported at said front end of said tubular body means,
electrical leads connected to said electrical contact means and extending through said tubular body means toward said rear end,
forward structure coupled to the front portion of said tubular body means forming a wall spaced from and surrounding said tubular body means defining a surrounding space located between said wall and said tubular body means and having an opening facing rearward,
a plurality of angularly spaced apart openings formed through said wall,
a movable sleeve means located around said tubular body means,
said sleeve means being movable between forward and rearward positions,
at least the forward portion of said sleeve means being located for movement in said surrounding space,



a plurality of latch means located in said surrounding space and having coupling portions pivotally coupled to said forward structure at angularly spaced apart positions and latching portions located to move to outward and inward positions through said plurality of openings respectively,
said latching portions being located rearward of said coupling portions,
engaging means for engaging said plurality of latch means when said sleeve means is moved toward said forward position for moving said latching portions of said plurality of latch means outward through said plurality of openings for use for latching said test probe apparatus to structure of an opening,
retracting means for retracting said latching means to their inward positions when said sleeve means is moved toward said rearward position.

4,904,201
TELECOMMUNICATIONS CONNECTOR
Claude Pelletier, Laval, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Mar. 16, 1989, Ser. No. 324,156
Int. Cl.[4] H01R *13/54*
U.S. Cl. 439—352 **7 Claims**



1. A telecommunications connector for connection to an insulation displacement terminal of a terminal array, the connector comprising a dielectric housing, at least one electrically conductive blade member extending from one side of the housing, a latch means extending from said one side of the housing for mounting the connector on a terminal member carrying the terminal array, the latch means comprising at least one resilient latch and a cam member is associated with the latch, the cam member being rotatable upon the housing and operably engaging the latch for flexing the latch into a latching position and for allowing for release of the latch from the latching position.

4,904,202
SPRING LOCKING DEVICE FOR CONNECTOR
Kanzaburo Uchida, Mooka City, Japan, assignor to Daiichi Denshi Kogyo Kabushiki Kaisha, Japan
Filed May 23, 1989, Ser. No. 355,908
Claims priority, application Japan, May 30, 1988, 63-70334[U]
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—372 **3 Claims**

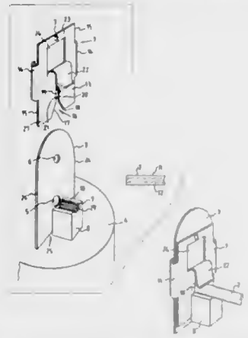


1. A spring locking device for a connector including a female connector member and a male connector member, said spring locking device including two pairs of bearings arranged on both ends of a mounting flange of one connector member, respectively, each of the bearings having openings in directions substantially perpendicular to longitudinal directions of the one connector member and having a semicylindrical inner surface, and locking members made of a springy wire, each locking member having two legs spaced in parallel with each other and two support pins bent outwardly relative to the legs and rotatably supported in said one pair of bearings, thereby locking the two connector members by turning the locking members into slits formed in the other connector member after the two connector members are connected, wherein each of the locking members comprises the legs having lower ends outwardly bent and the support pins continuous to the lower ends and having bent corners between the lower ends and the support pins, and said bent corners are positioned inside of the bearings and in contact with bottoms of the bearings and said support pins are in contact with semicircular edges of the bearings and extend therefrom out of the bearings on sides opposite to those of the legs when the locking members are mounted in the bearings.

4,904,203
DEVICE FOR CONNECTING A WIRE TO A MOTOR TERMINAL
Patrick S. Wang, Hong Kong, Hong Kong, assignor to Johnson Electric Industrial Manufactory, Limited, Chaiwan, Hong Kong
Filed Apr. 8, 1988, Ser. No. 179,233
Claims priority, application United Kingdom, Apr. 13, 1987, 8708786
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—399 **18 Claims**

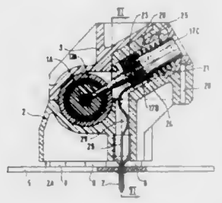
1. In an electric motor having a terminal for electrical connection to a wire of a power supply for the motor, the terminal projecting from a generally planar surface of an end cap of the motor, the improvement comprising a support on the motor, the support being spaced from and separate to the terminal for supporting said wire above said surface so that said wire is spaced from said surface, said terminal having an aperture and said wire support having a groove both for receiving said wire, and said groove and said aperture are aligned for enabling said wire to lie in said groove and to project through said aperture;

and a connecting device formed separately to the terminal and wire support, the connecting device including means for slidably connecting the connecting device to the motor terminal to make an electrical connection therewith and including means



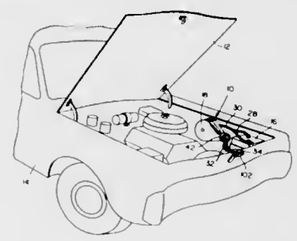
in the form of a slot for straddling and gripping said wire supported by the wire support to make an electrical connection with the wire as the connecting device is slidably connected with the terminal.

4,904,204
INSULATION-PIERCING CONNECTOR FOR COAXIAL CABLES
Jean-Paul Heng, Lyon; André Marmonier, Bron, and Henri Guernet, Lyon, all of France, assignors to CGEE Alsthom, Levallois Perret, France
Filed Sep. 12, 1988, Ser. No. 242,995
Claims priority, application France, Sep. 11, 1987, 87 12605
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—425 **8 Claims**



1. Insulation-piercing connector for coaxial cables directly positionable on a support on equipment to be served by the coaxial cable or on a plug or socket attached to the coaxial cable either before or after the connection is made to the coaxial cable, said connector comprising a base member and a complementary bracket member together defining a conduit for said coaxial cable, said base member and said bracket member being separable at a first surface of said base member to fit around said coaxial cable and to be clamped together to immobilize said coaxial cable in said conduit, said base member being attachable to a support, and having a second, bearing surface on said base member for bearing on said support when said base member is attached to said support, terminals on said base member projecting beyond said bearing surface, connecting spikes projecting from said base member adapted to pierce said coaxial cable and to connect inner and outer conductors of said coaxial cable to respective terminals, a guide transverse to said conduit and opening into said conduit and externally of said base member in which said connecting spike adapted to connect said inner conductor of said coaxial cable to the respective terminal is removably housed, and an inner conductor connecting spike locating guide on said base member disposed obliquely to said bearing surface and opening externally of said base member opposite said bearing surface and laterally of said bracket member, whereby said inner conductor connecting spike is insertable and removable even when said connector is attached to said support by said base member.

4,904,205
RETRACTABLE BOOSTER CABLES
Mark D. Rice, Rte. 1, Box 27A, Montrose, Ark. 71658
Filed Jun. 2, 1988, Ser. No. 202,009
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—504 **6 Claims**



1. Retractable booster cables for connecting storage batteries of vehicles for boosting the electrical capacity of one of the batteries from the other of the batteries comprising a housing adapted to be mounted under the hood on a vehicle, a reel positioned in the housing, means rotatably supporting the reel in the housing, spring means interconnecting the reel and housing to spring bias the reel rotatably in one direction, a pair of booster cables wound on the reel with the reel being spring biased to wind the cables on the reel but enabling the cables to be pulled outwardly of the housing by rotating the reel against the spring means, means on the free end of each cable to electrically connect the cables to a battery associated with a vehicle different from the one in which the housing is mounted, means electrically connecting the other end of each cable to the battery in the vehicle in which the housing is mounted, said means connecting the ends of the cables to the battery in which the housing is mounted including means transmitting electrical energy from the terminal posts of the battery to the individual cables while maintaining electrical contact and circuit insulation during rotation of the reel, said means transmitting electrical energy from the battery in the vehicle in which the housing is mounted to the cables including concentric conductive rings mounted on the housing in a non-rotative manner, a pair of concentric conductive rings mounted on the reel in electrical contact with the rings on the housing, said rings on the housing being concentrically and radially spaced and the rings on the reel being concentrically and radially spaced, means mounting the rings on the housing biasing the rings on the housing toward and into engagement with the rings on the reel to maintain good electrical contact, and an insulation ring mounted on the housing between the concentric rings mounted thereon with the insulation ring being thicker than the conductive rings and extending laterally beyond the conductive rings on the housing and extending into the space between the rings on the reel to maintain the rings in alignment and electrically insulate the concentric rings from each other.

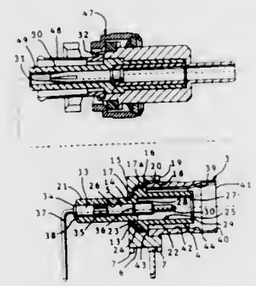
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4,904,206

HIGH VOLTAGE COAXIAL CONNECTOR

Ronald C. Laudig, Mechanicsburg; George W. Michael, III, Harrisburg, and Douglas M. Johnescu, York, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 180,413, Apr. 12, 1988, abandoned. This application Jul. 17, 1989, Ser. No. 382,079
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—578 **6 Claims**



1. In a coaxial connector in which a conductive housing is provided with a projecting electrical terminal, a conductive shell and an insulative body are encircled by the housing, a central electrical contact for transmitting an electrical signal is concentrically encircled by the insulative body, and an electrical terminal portion of the contact is encircled by a portion of the insulative body that projects outwardly from the shell, a clearance separates the housing from the electrical contact and defines a clearance path for an electrical short of a high voltage signal, and a voltage creepage path extends along an exterior surface of the dielectric body, from the terminal portion of the contact to a nearest surface of the shell, the improvement comprising;

an extended axial stem portion of the insulative body is uncovered and projects substantially outwardly from the conductive housing in a space outwardly of the conductive housing,

the terminal portion of the electrical contact projects outwardly from the conductive housing and in said space,

the stem portion encircles the terminal portion to provide a lengthy voltage creepage path and a lengthy clearance path from the terminal portion to the housing to prevent an electrical short of a high voltage signal,

the terminal portion protrudes uncovered from the stem portion and is bent to extend transversely of the stem portion and in the same direction as the projecting electrical terminal,

the housing encircles the shell with an interference fit, and

the shell and the insulative body are received in a bore of the housing, with the shell overlapping the insulative body and being encircled by the housing with an interference fit.

4,904,207

ISOLATED SOLDER JACK

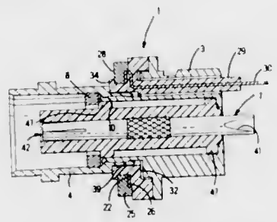
Donald L. Smith, Middletown; Ronald C. Laudig, Mechanicsburg, and Tracey L. Smith, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 30, 1989, Ser. No. 373,419
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—585 **5 Claims**

1. An electrical connector comprising, a conductive central contact concentrically within a dielectric body, a conductive shell concentrically encircling the dielectric body, and a conductive ring having a conductive tab projecting outwardly from the shell, wherein the improvement comprises;

the dielectric body is assembled in the shell by movement to the rear,

the ring and the tab are surrounded by insulation material formed with an annulus and a tube,



the ring is assembled over a rear shell portion of the shell with the tab and the tube received along a tunnel in the rear shell portion, and

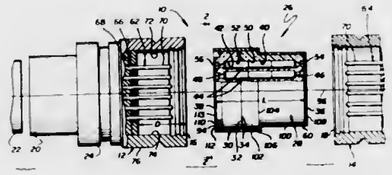
a front shell portion of the shell is assembled by movement to the rear concentrically between the annulus and the rear shell portion.

4,904,208

CONNECTOR SYSTEM WITH MODULAR SOCKET INSERT ASSEMBLY

Lloyd J. Powell, Newmarket, and John B. Gerow, Oshawa, both of Canada, assignors to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 748,111, Jun. 24, 1985, abandoned. This application Sep. 10, 1986, Ser. No. 908,861
Int. Cl.[4] H01R *25/00*
U.S. Cl. 439—654 **1 Claim**



1. A connector system comprising:

(a) A pair of receptacle connectors and a separate plug assembly for mounting with and between said receptacle connectors;

(b) each said receptacle connector having a shell with a hollow end portion, said shell holding an insulation member containing a plurality of spaced pin contacts extending into said hollow end portion, with the pin contacts arranged in a predetermined pattern;

(c) said plug assembly comprising:

(i) a housing, other than said shells, containing first and second insulators, each said insulator having an inner end that substantially abuts the inner end of the other insulator, and each having an outer end, said insulators forming a plurality of through holes arranged in a pattern corresponding to the pattern of said pins;

(ii) a plurality of elongated socket modules each mounted in a respective one of said through holes, each said socket module having a pair of opposite ends with holes for receiving the pin contacts of said receptacle connectors;

(iii) each said through hole having a wide diameter portion extending from the inner end of the insulator for receiving a socket module, and each said through hole having a narrow portion near its outer end that is too narrow to pass the socket module therethrough, said wide diameter portions being long enough to receive said socket modules, with opposite ends of each socket module lying in different ones of said insulators;

(iv) means for releasably holding said first and second insulators together in said housing with said socket modules in the insulators to form a self-contained assembly, said holding means permitting intentional removal of the insulators from said housing to remove and replace the socket modules therein; and

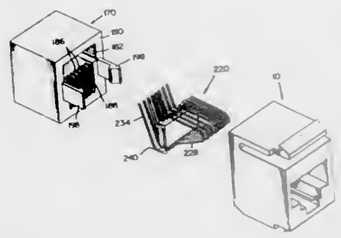
(d) each end of said plug assembly being slidably insertable into a different one of said connector hollow ends with the pins of said receptacle connectors received in the ends of said socket modules, said plug assembly being withdrawable from said receptacle connectors by sliding the plug assembly out of said connector hollow ends.

4,904,209

MODULAR PLUG COUPLER

Richard A. Nelson, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 128,835, Dec. 4, 1987, abandoned. This application Jan. 24, 1989, Ser. No. 302,066
Int. Cl.[4] H01R *23/02*
U.S. Cl. 439—676 **13 Claims**



1. An electrical coupler which can electrically interconnect two identical electrical plugs, the coupler comprising:

a first insulative housing member comprising a front mating face having a plug receiving opening therein, and a rear face having a pocket recessed from the rear face, the housing further comprising laterally aligned vertical grooves in the rear face which are in transition with channels which extend from the grooves to a position proximate the front mating face;

a second housing member comprising a front mating face having a second plug receiving opening therein, the second housing member having a mounting face which abuts the rear face of the first housing member, and a second plurality of laterally aligned grooves; and

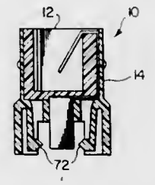
a terminal subassembly which includes a plurality of electrically conductive contact elements integrally insert molded and encapsulated within a web of insulative material intermediate the ends of the contact elements, the subassembly being formed with the web profiled slightly smaller than the pocket for receipt within the recessed pocket, with the web and intermediate portions of the contact elements extending parallel to the front mating face, with first sections of the intermediate portions extending from one side edge of the web and disposed within the laterally aligned grooves and thereafter formed to extend forward towards the front mating face, and thereafter reversely bent to extend diagonally inwardly, thereby forming a first plurality of contact members; the terminal subassembly further comprising second sections of the intermediate portions extending from an opposite side of the web as the first said sections, the second sections forming a second plurality of contact members.

4,904,210

TELECOMMUNICATIONS CONNECTOR

Alex G. Cristescu, Montreal, and Eugene F. Marc, St. Lambert, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 18, 1988, Ser. No. 220,191
Int. Cl.[4] H01R *23/02*
U.S. Cl. 439—676 **8 Claims**



1. A telecommunications connector comprising:

a modular jack having a dielectric body with two ends, sides extending between the ends, the body formed with a chamber and an aperture to the chamber at one end of the body for accepting a plug into the chamber, and a plurality of conductive lines, said plurality of conductive lines having cantilever terminals projecting into the chamber and blade terminals projecting away from the other end of the body in a direction opposite to the facing direction of the aperture, the cantilever terminals being connected, one to each blade terminal, by intermediate line portions extending from the cantilever terminals along the outside of the body, around an edge of the body and along the outside of the other end of the body;

and dielectric retaining means comprising a retaining member with a base and walls extending in spaced apart positions from the base with the jack body mounted between them and with the other end of the jack body engaging the base and said intermediate line portions enshrouded between the body and a wall and base of the retaining member, the blade terminals passing through and extending from elongate section holes formed in the base and which hold the blade terminals in desired locations and orientations relative to the body of the jack.

4,904,211

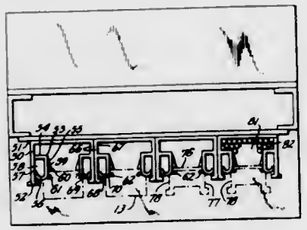
FRAME CRADLE FOR TELEPHONE CONNECTOR BLOCKS

Carl Meyerhoefer, Dix Hills, and Helmuth Neuwirth, Garden City, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Apr. 3, 1989, Ser. No. 332,529
Int. Cl.[4] H01R *9/22*
U.S. Cl. 439—719 **3 Claims**

1. An improved cradle for mounting plural telephone connector blocks of rectangular configuration comprising an elongated planar base wall having first and second opposed ends, means for mounting said ends upon a supporting surface; a plurality of flexible laterally extending members projecting from a surface of said base wall, said laterally extending members having generally planar opposed side surfaces; and a flexible hook member carried by at least one of said side surfaces and extending in a plane perpendicular to the plane of said base wall, said hook member having inner and outer surfaces; the inner surface of said hook member defining a first an

enclosed area for the reception of a group of elongated conductors, the outer surface of said hook member having resilient



means for engaging a corresponding recess in a telephone connector block.

4,904,212

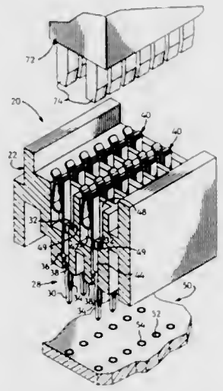
ELECTRICAL CONNECTOR ASSEMBLY

Roger W. Durbin, Lancaster; Mark P. Hoffecker, Dillsburg; John P. Kling, Mount Joy, and Brian W. Vernau, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 31, 1988, Ser. No. 239,100

Int. Cl.[4] H01R *13/42*

U.S. Cl. 439—751 **19 Claims**



1. An electrical connector assembly, comprising:

an insulated housing member having first and second side portions, the housing member further having at least one passageway formed therein between the first and second side portions of the housing member;

a compliant pin terminal carried in the passageway in the housing member, the compliant pin terminal having first and second end portions thereof; and

an electrical contact portion disposed in the housing member and secured to the compliant pin terminal intermediately of the first and second end portions of the compliant pin terminal,

the electrical contact portion being laterally offset from the second end portion of the compliant pin terminal, such that the second end portion of the compliant pin terminal is accessible from externally of the second side portion of the housing member, whereby a tool may be used to push against the second end portion of the compliant pin terminal directly without interference from the contact portion, thereby enabling the compliant pin terminal to be secured in the housing member and insertion force to be applied to the compliant pin portion without applying said insertion force to said contact portion.

4,904,213

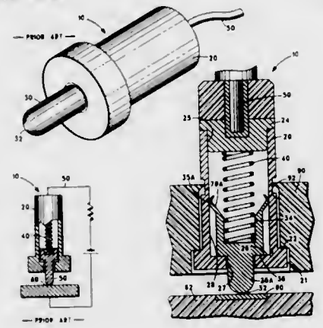
LOW IMPEDANCE ELECTRIC CONNECTOR

See S. Hock, and Chan S. Loon, both of Penang, Malaysia, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1989, Ser. No. 334,024

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—824 **10 Claims**



1. A low impedance, spring loaded connector for connecting electrical signals, comprising:

a cylindrical body adapted to receive an electrically conductive wire attached thereto for electrical connection to an electrical circuit;

a plunger guided by said body and slidingly movable between an extended position and a retracted position relative to said body, said plunger having a tip for making electrical contact with a conductive surface external to said body;

spring means interposed between said body and said plunger for biasing said plunger toward the extended position; and

cantilever means adapted to make electrical sliding contact between said plunger and said body so as to establish an electrical path short-circuiting said spring means and the electrical path so established providing a constant low resistance and inductance path independent of the state of the spring means.

4,904,214

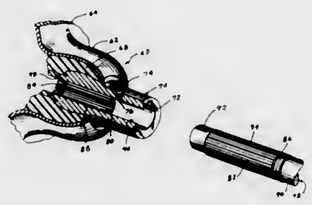
MARINE STERN DRIVE WITH LUBRICATED AND SEALED OUTPUT COUPLER

Edward C. Eick, Stillwater, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 13, 1989, Ser. No. 322,519

Int. Cl.[4] B63H *23/00*

U.S. Cl. 440—83 **8 Claims**



1. A marine drive having an engine output coupler driven to rotate about an axis and having a splined axial opening therein extending along said axis and being open-ended at both the forward and rearward ends thereof, a splined output driveshaft received in said splined axial opening of said coupler and operatively coupled to a propeller for driving same, said coupler having a grease fitting for introducing grease therein and a grease passage extending from said grease fitting and communicating with said splines to lubricate the latter, front and rear axially spaced seals trapping and retaining said grease therebetween to maintain lubrication of said splines; said coupler comprises a hub having said axial opening therethrough, said opening and said driveshaft having axially overlapping splined sections in mating driving engagement, said front seal is spaced axially forward of said overlapping splined sections, said rear seal is spaced axially rearward of said overlapping splined sections, a forward portion of at least one of said driveshaft and said hub opening has a nonsplined section axially between said front seal and said overlapping splined sections, and wherein rearward portion of at least one of said driveshaft and said hub opening has a nonsplined section axially between said rear seal and said overlapping splined sections.

4,904,215

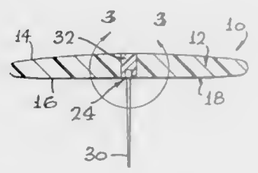
SURFBOARD FIN RETAINER

Kent Sherwood, Santa Monica, Calif., assignor to Fiberfoam Inc., Los Angeles, Calif.

Filed Feb. 9, 1989, Ser. No. 308,657

Int. Cl.[4] A63C *9/32*

U.S. Cl. 441—79 **14 Claims**



1. In a water board which includes a rigid foam core of moderate weight per unit volume, having upper and lower sides, a stronger surface layer lying around and bonded to the core and having upper and lower surface layer portions lying respectively against said upper and lower sides of said foam core, and a fin box with upper and lower surfaces lying in the core for holding the upper end of a fin that projects downwardly from the fin box, the improvement comprising:

a retainer of rigid plastic foam lying in said foam core, said retainer having an upper surface lying substantially even with the upper side of said foam core and bonded to said upper surface layer portion, said retainer having a lower surface bonded to the upper surface of said fin box, and said fin box having a lower surface bonded to said lower surface layer portion, whereby to hold the assembly of the retainer and fin box to both the upper and lower surface layer portions to resist breakout of the fin box when the fin is pushed sidewardly

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4,904,216

PROCESS FOR PRODUCING THE CENTER ELECTRODE OF SPARK PLUG

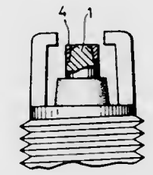
Junichi Kagawa, and Toru Hayashi, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Sep. 12, 1984, Ser. No. 649,775

Claims priority, application Japan, Sep. 13, 1983, 58-167573; Jun. 27, 1984, 59-132740

Int. Cl.[4] H01T *21/02*

U.S. Cl. 445—7 **4 Claims**



1. A process for producing a center electrode for a spark plug comprising the following steps:

providing a cylindrical electrode body of a less noble metal which is predominantly made of a nickel alloy or a composite thereof with a copper core, said electrode body having a larger diameter portion and a concentric, smaller-diameter projection from the tip of the larger diameter portion of said body;

placing on the tip of said electrode body a disk which has a center hole into which said projection fits and which is made of a noble metal such as platinum or an alloy thereof;

electrically welding said noble metal disk to the tip of said electrode body; and

drawing and extruding the assembly to reduce its outside diameter to a diameter less than the original diameter of said larger diameter portion so that the layer of said noble metal or alloy thereof covers at least the side wall of the part close to the tip of said electrode body while leaving exposed a center portion of the end face of said electrode body.

4,904,217

VACUUM TUBE INCLUDING AN ELECTRON-OPTICAL SYSTEM

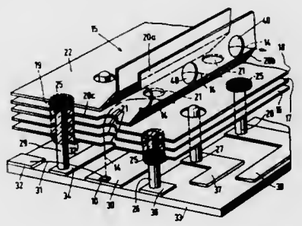
Petrus J. M. Peters, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 156,376, Feb. 16, 1988, Pat. No. 4,853,586. This application May 22, 1989, Ser. No. 355,719

Claims priority, application Netherlands, Feb. 27, 1987, 8700487

Int. Cl.[4] H01J *9/18*

U.S. Cl. 445—34 **9 Claims**

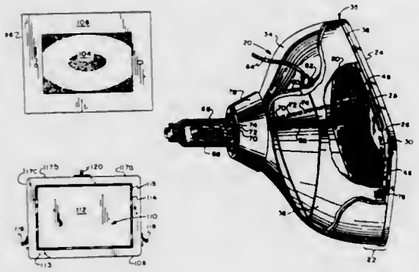


1. A method of manufacturing an electron-optical system for a vacuum tube provided with at least one semiconductor cath-

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ode supported on an insulating plate and having an emissive surface for emitting electrons and an electron-optical system for deflecting at least one electron beam emitted by the surface comprising a plurality of spaced apart grids of a conducting material, and a plurality of spaced apart electrically conducting pins secured to said plate, characterized in that an assembly of at least some of the grids mutually separated by spacers is secured to the pins by means of a ceramic glass material and in that the ceramic glass is subsequently cured, the spacers being removed after curing and apertures being provided in the grids.

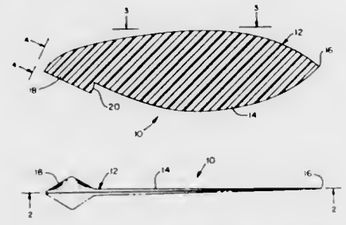
4,904,218
BLACKENING OF NON-IRON-BASED FLAT TENSIONED FOIL SHADOW MASKS
Hua Sou Tong, Mundelein, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Division of Ser. No. 174,660, Mar. 29, 1988, which is a continuation-in-part of Ser. No. 127,724, Dec. 2, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 287,799
Int. Cl.[4] H01J *9/00, 29/07*
U.S. Cl. 445—47 **29 Claims**



1. A process for manufacturing a tensioned mask color cathode ray tube which includes a faceplate having on its inner surface a phosphor screen and a support structure for said mask, the process comprising:
providing a non iron-based apertured foil shadow mask, said shadow mask comprising between about 75 to 85 weight-percent nickel, between about 3 and 5 weight-percent molybdenum, with the balance iron and incidental impurities;
depositing a thin layer of iron on the surface of said shadow marks;
converting said thin layer of iron to iron oxide; and
securing said shadow mask to said support structure while under tension in registration with said phosphor screen.

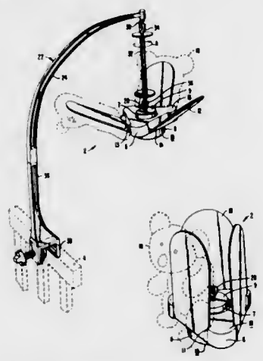
4,904,219
HAND FLYER
Glenn M. Cox, P.O. Box 450, Glide, Oreg. 97443
Filed Aug. 26, 1988, Ser. No. 237,278
Int. Cl.[4] A63H *27/12;* **A63B** *65/00*
U.S. Cl. 446—36 **2 Claims**

1. A plastic aerial flyer toy adapted to be launched in a straight path in a substantially vertical direction, and upon reaching its maximum altitude to descend in a spiral path comprising:
(a) a head having a substantially pointed front end, the top of said head diverging in a gradual manner rearwardly from said front end and the bottom of said head diverging in a straight line rearwardly, the sides of said head diverging outwardly from said front end to a point substantially midway along said head and then converging inwardly toward a junction where the head is joined to the body of said toy to form a mound like projection extending symmetrically from both sides of said head; and,
(b) a body substantially longer than said head integrally connected to said head at said junction, said body terminating at a point at its rearmost end, said body further having flat sidewalls which extend linearly from said



junction and converge at said rearmost point, the top of said body portion diverging slightly from said junction and then converging rapidly to said point, and the bottom of said body portion diverging smoothly from said junction and then converging smoothly to said point whereby both the top and bottom of said body portion form substantially convex arcuated aerodynamic shapes.

4,904,220
PUPPET MOBILE
David M. Williams, New York, and Lois E. Kelly, Brooklyn, both of N.Y., assignors to The Child Growth & Development Corporation, New York, N.Y.
Filed Mar. 31, 1988, Ser. No. 175,703
Int. Cl.[4] A63H *33/00*
U.S. Cl. 446—227 **14 Claims**



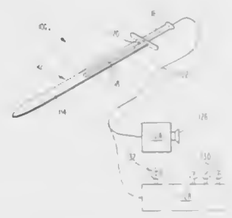
1. A device comprising:
a base with a flat lower surface for supporting said base on a horizontal surface;
a receiving hook attached to said base for suspending said device as a mobile;
hand puppet retaining means pivotally attached to said base, said means being movable between first and second positions wherein said first position is angled with respect to a horizontal plane and said second position is upright with respect to said horizontal plane.

4,904,221
MISSISSIPPI TURKEY CALLER
Archie Taylor, Rte. 1, Box 12-C, Lake, Miss. 39092
Filed Aug. 5, 1988, Ser. No. 228,685
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—397 **3 Claims**



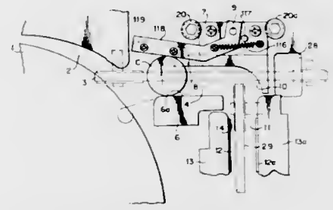
1. A wild turkey caller, comprising:
a plate, said plate being substantially rectangular and capable of being held comfortably, but firmly in a cupped hand;
a striker, said striker composed of a hard plastic material and having an essentially oval shaft, said shaft terminating in a flat end wherein a tone is produced when said flat end of said striker is moved across the surface of said plate that replicates the calls of wild turkeys and an end opposite said flat end, said opposite end flaring outwardly and upwardly to form a center section of a handle; and two pieces of plastic material rigidly attached one to each side of said center section of said handle.

4,904,222
SYNCHRONIZED SOUND PRODUCING AMUSEMENT DEVICE
Raymond F. Gastgeb, Doylestown, and Edward Tom, Philadelphia, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.
Filed Apr. 27, 1988, Ser. No. 186,519
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—405 **12 Claims**



8. An amusement device, comprising:
a sword having a handle and a blade, said blade is fabricated from a material which flexes when the sword is waved by hand;
a flexible piezoelectric element attached to the blade of said sword for producing an oscillatory electrical signal when the blade is repeatedly flexed; and
sound generating means electrically connected to said element and responsive to said electrical signal for producing sound which synchronously varies with the repeated flexure of said blade, said sound generating means including circuitry for producing a first tone which varies in loudness proportionally with the voltage of said oscillatory electrical signal and a second tone which varies in loudness proportionally with the voltage of said oscillatory electrical signal when the frequency of said oscillatory electrical signal exceeds a predetermined value.

4,904,223
COIN SORTING APPARATUS
Hideshi Seotoku, Tokyo, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan
Filed Oct. 5, 1988, Ser. No. 253,610
Claims priority, application Japan, Oct. 6, 1987, 62-252202
Int. Cl.[4] G07D *3/00*
U.S. Cl. 453—7 **9 Claims**



1. A coin sorting apparatus comprising:
a rotary disc disposed in a substantially horizontal plane for rotation so as to receive and distribute various denominations of coins of various diameters,
guide plate means disposed adjacent to a periphery of said rotary disc and extending substantially tangentially therefrom for engaging with an end surface of a coin which is introduced from said rotary disc,
guide member means disposed spaced from said guide plate means and extending in parallel with the guide plate means for defining a path of travel with said guide plate means,
a slanted surface formed on said guide member means for engaging with a larger diameter coin than a diameter of a predetermined denomination of coin so that the larger diameter coins climb up the slanted surface so as to be separated from the predetermined denomination of coin and coins of a smaller diameter than the diameter of the predetermined denomination of coin,
a lead wall formed on the guide member means for engaging with an end surface of the predetermined denomination of coin and the smaller diameter coin to lead them downstream along the guide plate means,
restricting means disposed over the slated surface of the guide member means for resiliently engaging with the larger diameter coins which are introduced to the slanted surface as the larger diameter coins move downstream,
a pair of selecting rail means disposed in parallel with each other at a position downstream and adjacent to the guide plate means and the guide member means for engaging with the predetermined denomination of coin and leading the predetermined denomination of coin downstream and for excluding the smaller diameter coin by passage of the smaller diameter coin between said selecting rail means due to gravity,
said lead wall of said guide member means being formed with an arcuate portion for deflecting the predetermined denomination of coin and the smaller diameter coin therealong toward said selecting rail means away from a direction in which the larger diameter coin is led.

4,904,224

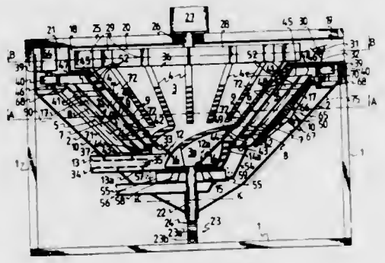
HARVESTING MACHINE

Lauri Pohjala, Kankola, SF-38210 Vammala, Finland

Continuation-in-part of Ser. No. 893,315, Jul. 22, 1986, abandoned. This application May 27, 1988, Ser. No. 200,079

Int. Cl.[4] A01F *7/04, 12/40*

U.S. Cl. 460—59 **14 Claims**



1. A harvesting machine comprising means for feeding seed plants with seeds such as grain into the machine, a threshing unit and a sieve set for threshing said seed plant and for separating the seeds from the rest of the vegetable material, means for recovering the seeds from the machine and means for removing the residual vegetable material characterized in that in the apparatus

the threshing unit is formed of a drum having an outer surface and of beaters or flails, which drum is conical and is fitted in the apparatus in a vertical position so that it widens from the bottom towards the top, and the flails are installed on the outer surface of the said drum;

the sieve set being formed of at least two sieves which are at least partly conical and are nested coaxially around each other and the threshing unit a threshing space defined between said drum and said sieve set;

a conical shroud, and the threshing unit and the sieve set are fitted inside the shroud, and in between the sieve set and the shroud there is provided a collecting bin, whereby the seeds are gathered to the bottom part of the collecting bin, where an opening is provided for removing them.

4,904,225

DIVIDED FLYWHEEL

Gunter Worner, Kernen, and Ernst Tscheplak, Weinstadt, both of Fed. Rep. of Germany, assignors to Daimler-Benz, Stuttgart, Fed. Rep. of Germany

Filed Jul. 11, 1988, Ser. No. 217,409

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1987, 3723015

Int. Cl.[4] F16F *15/12, 15/30;* **F16D** *13/60*

U.S. Cl. 464—67 **13 Claims**

1. Divided flywheel comprising:

first and second coaxial flywheel elements with flywheel weights distributed therebetween and a slip coupling means and spring arrangement which partly exhibits play and couples the flywheel elements, said slip coupling means and spring arrangement comprising:

an intermediate support coaxial with both flywheel elements and coupled propulsively to the first flywheel element through said slip coupling means and to both flywheel elements through respective separate soft and hard helicoidal spring sets, one of the helicoidal spring sets comprising springs having a circular arcuate helical axis with a center of curvature lying on the flywheel axis,

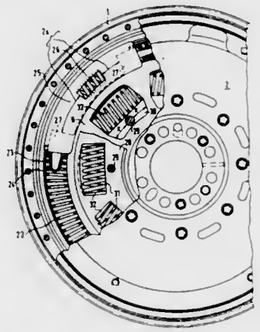
said intermediate support, through the slip coupling means and the separate soft and hard helicoidal spring sets, providing the sole coupling between both flywheel elements,

wherein the hard spring set, which coupled the intermediate support to the second flywheel element comprises relatively short-strike springs which are relatively unaffected by centrifugal force during high speed rotation of the first flywheel element,

wherein the soft spring set, which couples the intermediate support to the first flywheel element, is formed by the helicoidal springs have the circular arcuate helical axis,

wherein the springs of the soft spring set are soft enough and with such a long stroke that they will also operate as a stiffened spring to provide an additional friction force as a function of centrifugal force as the soft spring set is urged by centrifugal force, occasioned by the first flywheel element, radially outwards against bearing surfaces on the intermediate support and on the first flywheel element during high speed rotation of the first flywheel element;

wherein during low rotational speeds the soft springs will not be acted on by the additional force, and



wherein there is at least one stop spring means operative only in the case of major relative rotation between the first flywheel element and the intermediate support to add resistance to the soft spring set, and wherein the slip coupling means which exhibits play is arranged in parallel with the soft spring set and operates at relative speeds between the two flywheel elements above a predetermined relative speed to effectively disengage the soft spring set from the hard spring set so that the first flywheel element is operatively coupled to the second flywheel element via the slip coupling means and the hard spring set; and wherein during low rotational speeds of the first flywheel element, both the hard and soft spring sets operatively couple the first and second flywheel elements through the intermediate support.

4,904,226

TORSION-DAMPING DEVICE FOR A TORQUE TRANSMISSION SYSTEM

Gustave Chasseguet, Taverny, France; John Willyard, Farmington Hills, Mich., and Dominique Despres, Clichy, France, assignors to Valeo, Paris, France

Filed Aug. 19, 1987, Ser. No. 86,889

Claims priority, application France, Aug. 21, 1986, 86 11935; Oct. 23, 1986, 86 14727

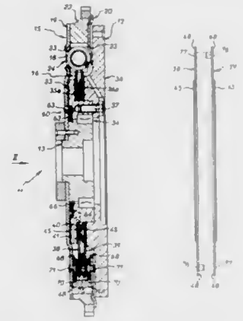
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[4] F16D *3/12;* **F16F** *15/10*

U.S. Cl. 464—68 **22 Claims**

1. A torsion-damping device, particularly for a clutch said torsion damping device comprising two coaxial parts mounted for limited rotation relative to each other, a first of said coaxial parts comprising two substantially parallel annular flanges and a second of said coaxial parts comprising at least one web arranged axially between said flanges, and parts of pedestals

mounted on one of the parts, springs arranged substantially circumferentially between said pedestals, each of said pedestals having first engagement means cooperable with matching engagement means on one of said coaxial parts to define therebetween at least one first rotary bearing zone, and second



engagement means cooperable with matching engagement means on the other of said coaxial parts to define therebetween at least one second rotary bearing zone, at least one of said coaxial parts and pedestals having damping means of elastic material disposed proximate to said engagement means for damping impacts between said pedestals and said coaxial parts.

4,904,227

STOPPER APPARATUS FOR INNER MEMBER IN SLIDING UNIVERSAL JOINTS

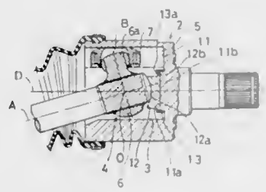
Akira Sasaki; Seiji Esaki, both of Utsunomiya; Yasushi Hashimoto, and Shigeo Kurita, both of Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,141

Claims priority, application Japan, Apr. 30, 1987, 62-66093

Int. Cl.[4] F16D *3/20*

U.S. Cl. 464—111 **1 Claim**



1. A sliding universal joint comprising:

an outer member having an axis and an inner member accommodating chamber formed therein, said chamber having an end wall, said end wall having a central part and a raised portion integrally formed in said central part, said raised portion having an outer periphery, a diameter, and a bearing surface formed thereon perpendicular to said axis of said outer member;

an inner member positioned in said chamber and having an end surface urged toward said end wall;

a stopper slidably seated on said bearing surface of said end wall and receiving said end surface of said inner member, said stopper having a base and an annular flange extending laterally from said base, said flange having a front surface and a diameter smaller than said diameter of said raised portion of said end wall; and

retainer means provided on said end wall for preventing said stopper from coming off of said bearing surface, said retainer means comprising a cylindrical member having one end fitted to said outer periphery of said raised portion and an engagement portion on its other end, said engagement portion engaging with said front surface of said flange, said cylindrical member enclosing said flange in such a manner as to leave play in a radial direction.

4,904,228

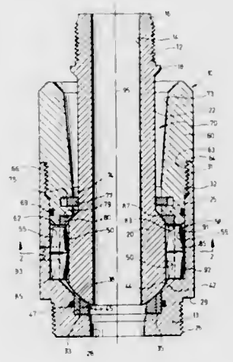
UNIVERSAL BALL JOINT

Lawrence Frear; John S. Davis, both of Sandy, and Craig R. Hyland, Magna, all of Utah, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Continuation of Ser. No. 610,026, May 14, 1984, abandoned. This application Jun. 20, 1984, Ser. No. 622,548

Int. Cl.[4] F16D *3/16*

U.S. Cl. 464—152 **26 Claims**



1. A universal ball joint for use between a driving and driven member and wherein there is essentially no axial movement between the two, and wherein in the neutral position of the members there is a central axis, comprising:

first shaft means having spherical ball means on one end thereof, said shaft extending in a direction opposite of said ball means,

second shaft means cooperating with said first shaft means and including receptacle means for receiving said ball means,

said receptacle means including a plurality of spaced elongated axially extending grooves of arcuate cross section and of uniform depth along their axis and oriented in spaced parallel relation to said center axis,

said ball means including a plurality of spaced elongated axially extending grooves of arcuate cross section and of uniform depth along their axis and oriented in spaced parallel relation to said center axis, and oriented in spaced parallel relation to said center axis,

the grooves of said receptacle means and the grooves of said ball means cooperating to form a plurality of elongated axially extending chambers between said ball means and said receptacle means and which are oriented in spaced parallel relation to said center axis,

means to maintain said shafts essentially axially fixed with respect to each other,

pin means received in said chambers and forming a driving connection between said shafts,

each of said pin means having substantially linear tapered surfaces extending from its midpoint to its end portions whereby there is relative arcuate movement between said shafts, and

one of said shafts being driven and the other being a driving shaft.

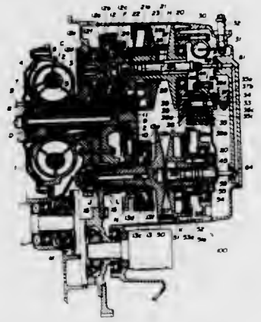
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4,904,229

BELT-AND-PULLEY TYPE CONTINUOUSLY VARIABLE TRANSMISSION AND METHOD FOR CONTROLLING THE SAME

Torao Hattori, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1988, Ser. No. 188,293
Claims priority, application Japan, Apr. 30, 1987, 62-107019
Int. Cl.[4] F16H *11/02*
U.S. Cl. 474—12 6 Claims



1. A method for controlling a speed ratio of a belt-and-pulley type continuously variable transmission having an input shaft, a drive pulley mounted on said input shaft and comprising a stationary conical member and a movable conical member, an output shaft, a driven pulley mounted on said output shaft and comprising a stationary conical member and a movable conical member, a V-belt trained around said drive and driven pulleys, first and second hydraulic pressure chambers for axially moving said movable conical members to vary effective diameters of said drive and drive pulleys for thereby controlling a speed ratio, and an oil pressure source and an oil reservoir operatively coupled to said first and second hydraulic pressure chambers, said method comprising the steps of:

maintaining oil pressure within said hydraulic pressure chambers of said drive and driven pulleys at a predetermined oil pressure, while said speed ratio is maintained at a constant valve;

communicating the hydraulic pressure chamber of one of said drive and driven pulleys, the effective diameter of which is to become larger at that time, with said oil pressure source to thereby supply larger oil pressure than said predetermined oil pressure into said hydraulic pressure chamber of said one of said drive and driven pulleys; and

releasing the hydraulic pressure chamber of the other of said drive and driven pulleys, the effective diameter of which is to become smaller at the time, to said reservoir no earlier than said communication of the hydraulic pressure chamber of said one of said pulleys to said oil pressure source, for thereby starting to move said movable conical members of said drive and driven pulleys in synchronism with each other.

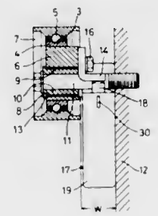
4,904,230

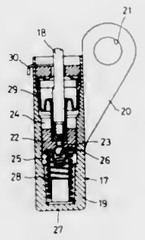
BELT AUTOTENSIONER

Kazuki Kawashima, and Hisashi Hayakawa, both of Iwata, Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

Filed Jul. 21, 1989, Ser. No. 382,938
Int. Cl.[4] F16H *7/12*
U.S. Cl. 474—112 2 Claims

1. A belt autotensioner for imparting a desired tension of a belt, comprising a rolling bearing including an outer ring in the form of a tension pulley adapted to be pressed against said belt, an inner ring rotatably mounted in said outer ring and a plurality of rolling elements interposed between said outer ring and said inner ring, an eccentric shaft fixedly mounted in said inner ring and formed with a hole arranged eccentrically with respect to the axis of said rolling bearing, a stopper fixedly mounted on one end face of said eccentric shaft, a direct acting actuator for dampening the pivotal motion of the eccentric shaft when the tension of the belt is increasing, said actuator





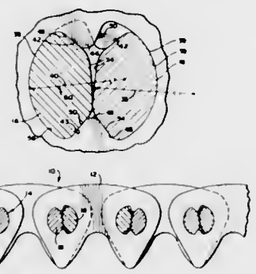
having a damper cylinder and an urging means slidably mounted therein, said urging means having one end thereof protruding from said cylinder and in abutment with said stopper, a bolt means extending through said hole in said eccentric shaft and said actuator so as to pivotally support said eccentric shaft, and a spring means for biasing said eccentric shaft to pivot it in such a direction as to increase the tension of said belt.

4,904,231

ROCKER JOINT FOR CHAIN

George A. Zimmer, Ithaca, N.Y., assignor to Magna International, Inc., Markham, Canada

Filed Feb. 22, 1989, Ser. No. 313,531
Int. Cl.[4] F16G *13/04*
U.S. Cl. 474—214 5 Claims



1. A rocker joint for a power transmission chain constructed of an assembly of links and pivot members, the chain comprising a plurality of sets of links interleaved with other sets of links, each link having ends and a central body portion and a

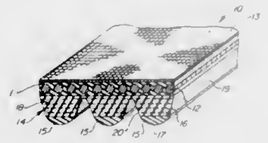
pair of generally round and spaced openings each of which has a wall defined by a pair of arcs separated by spaced and generally inwardly extending lugs, each lug being defined by a pair of diverging substantially planar walls, said lugs being spaced such that one of the arcs is smaller than the other arc, said pivot members comprising a pair of pins having substantially identical cross-sectional shapes with front convex working surfaces engaging and rocking on one another, each pin of a pair of pins having the working front surface defined only by a first radius, and a convex back surface defined only by a second radius matching that of said smaller arc of said opening, said first radius being larger than said second radius, the front and back surfaces being joined by generally planar surfaces which diverge from the front surface to the back surface, one of said pins of a pair of pins being received in the openings of one set of links between a pair of the lugs thereof such that its back surface engages the surface defined by said smaller arc and its planar surfaces engage the planar surfaces of the adjacent lugs, thereby preventing rotation of said pin relative to the links of that set, the other pin of said pair of pins being received in the openings of the interleaved set of links with the same relative relationship with said openings as said one set of links, the back surfaces of said pins being movable in the other openings of the links as the working front surfaces move relative to one another when the chain articulates about its joints.

4,904,232

POWER TRANSMISSION BELT

Koji Kitahama, and Toshimi Kumasaki, both of Kobe, Japan, assignors to Mitsuboshi Belting, Ltd., Kobe, Japan

Filed Oct. 31, 1988, Ser. No. 265,004
Int. Cl.[4] F16G *1/08*
U.S. Cl. 474—238 13 Claims



1. A multiribbed power transmission belt comprising:

an outer portion having a plurality of transversely spaced, longitudinally extending tensile cords embedded therein;

a fabric cover on an outlet surface of said outer portion of the belt; and

a compression section extending inwardly from said outer portion and defining a plurality of laterally spaced, longitudinally extending ribs, each rib having an outer portion formed of a first rubber material and defining inwardly converging planar opposite side surfaces for engaging complementary pulley groove side surfaces, and an inner portion formed of a second rubber having a hardness less than the hardness of said outer portion and defining inwardly converging circular opposite side surfaces and an inner tip portion, said outer portion planar side surfaces being tangent to said inner portion circular side surfaces respectively at a junction of said outer and inner portions of said compression section ribs,

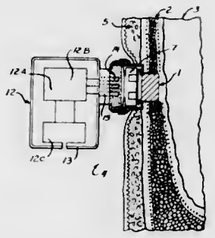
said inner tip portion defining an arcuate inner surface which contributions to the resistance of the belt ribs to wear and cracking

4,904,233

ARRANGEMENT IN A HEARING AID DEVICE

Bo Håkansson, Splintvedsgatan 7, S-416 80 Gothenburg, and Peder Carlsson, Rosensköldsgatan 11, S-412 58 Gothenburg, both of Sweden

Continuation of Ser. No. 861,508, May 9, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 136,456
Claims priority, application Sweden, May 10, 1985, 8502341
Int. Cl.[4] H04R *25/00*
U.S. Cl. 600—25 6 Claims



1. Hearing aid apparatus for mechanical transmission of sound information from a sound-generating apparatus to the skull bone of a hearing impaired person, comprising

a fixture means (1) made of a material compatible with the body of a person,

means adapted for anchoring said fixture means to the skull bone of the wearer,

a housing means including an interior cavity (6) anchored to said fixture means and extending in a direction away from the skull bone through the skin of the wearer,

an oscillator means (7) releasably disposed within said interior cavity of said housing means for producing mechanical vibration of said information to the skull of the wearer in response to electrical signals,

a lid for said housing means,

a first electrical connecting means in said lid for connecting to said oscillating means, and

a casing, having

a microphone, and

an amplifier, and

a battery power supply interconnected and disposed within said casing and being connected to a second electrical connecting means,

said first and said second electrical connecting means being adapted to be releasably interconnected.

4,904,234

APPARATUS FOR COLLECTING PLASMA

Yasushi Shimomura; Masahiko Yamaguchi; Yuuzou Kuromatsu, and Koichiro Fukuzaki, all of Ichihara, Japan, assignors to UBE Industries, Yamaguchi, Japan

Filed Jan. 27, 1988, Ser. No. 149,029
Claims priority, application Japan, Jun. 29, 1987, 62-161973; Jul. 17, 1987, 62-178728; Jul. 17, 1987, 62-178729
Int. Cl.[4] A61M *1/03*
U.S. Cl. 604—5 4 Claims

1. An apparatus for use in the collection of plasma from blood comprising:

a blood access device;

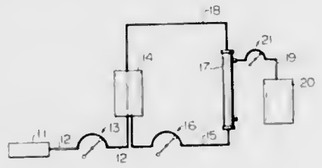
a dual-purpose pump connected at one side to said device to collect blood from a donor and to return to the donor blood cells partially free of plasma;

a reservoir connected to the other side of said dual-purpose pump through a tubular conduit;

said blood access device, said dual-purpose pump, and said tubular circuit defining a blood withdrawal and return flow segment with said reservoir;

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a circulating circuit independently connected to and from said reservoir and having:
a plasma separator, with a blood inlet, a blood outlet and a plasma outlet, said blood outlet being connected to said reservoir, and
a circulating pump connected at one side to said reservoir and at the other side to said blood inlet; and



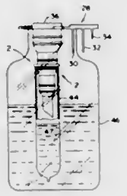
a plasma circuit connected to said plasma outlet and having:
a plasma reservoir, and
a plasma collecting pump interposed between said plasma outlet and said plasma reservoir;
whereby said blood withdrawal and return flow segment and said circulating circuit are in flow communication only through said reservoir.

4,904,235

DIALYSIS BAG HOLDING DEVICE

Avraham Yaniv, and Arnona Gazit, both of Holon, Israel, assignors to Bel-Art Products, Inc., Pequannock, N.J.

Filed Feb. 3, 1988, Ser. No. 151,949
Int. Cl.[4] A61F 2/16
U.S. Cl. 604—6 **6 Claims**



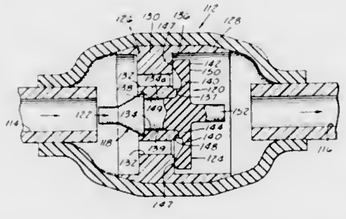
1. A dialysis device, comprising:
a plurality of different-sized dialysis bag means for receiving dialysate, each of said bag means including an open end and a closed end;
a plurality of dialysis vessel means for receiving said different-sized bag means, said plurality of vessel means including openings of different sizes, respectively;
a hollow funnel-like member including a plurality of annular sections of different diameters coaxially connected to each other in order of progressing diameter, the annular section of smallest diameter defining a first open end and the annular section of greatest diameter defining an opposite second open end;
each of the annular sections for disposition of a dialysis bag means of a different size thereon and including a plurality of exterior, radially projecting, circumferential rings in axially spaced relation to each other;
the open end of the dialysis bag means of desired size being passed over the first open end of the funnel-like member and disposed on the annular section of appropriate diameter extending over one of the rings thereon;
means for securing the desired-size dialysis bag means disposed on the appropriate annular section to the funnel-like member;
hanger means supported by the funnel-like member for suspending the funnel-like member from the opening of one of said plurality of dialysis vessel means, with the closed end of the dialysis bag means disposed thereon extending into the one vessel means; and
means for capping the second open end of the funnel-like member.

4,904,236

FLUID FLOW CONTROL VALVE

Russell J. Redmond, Goleta, and Claude Vidal, Santa Barbara, both of Calif., assignors to VIR Engineering, Goleta, Calif.

Continuation-in-part of Ser. No. 9,516, Jan. 30, 1987, Pat. No. 4,781,674. This application May 3, 1988, Ser. No. 189,761
The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—9 **18 Claims**



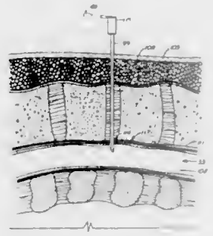
1. A fluid flow control device for controlling the flow of fluid from one region of the body to be drained to another region, said device comprising a housing having a fluid inlet and a fluid outlet and a valve assembly carried within said housing intermediate said fluid inlet and said fluid outlet, said valve assembly comprising:
(a) an elastomeric valve member including a valve stem and a valve element carried by said valve stem said valve element including a thin centrally disposed annular portion, a thicker first annular portion spaced radially outwardly from said central portion and defining a seat engaging surface, and a second annular portion spaced radially inwardly from said central portion, said second annular portion having a thickness less than the thickness of said first annular portion; and
(b) a valve body, said valve body comprising a rim portion closely receivable within said housing and a transversely extending web portion, said web portion having a fluid passageway therethrough and including:
(i) a valve seat for engagement by said valve element to control the flow of fluid through said fluid passageway; and
(ii) valve member positioning means for positioning said valve member within said valve body so that said seat engaging surface of said first annular portion is normally maintained in pressural engagement with said valve seat.

4,904,237

APPARATUS FOR THE EXCHANGE OF CEREBROSPINAL FLUID AND A METHOD OF TREATING BRAIN AND SPINAL CORD INJURIES

Woodrow W. Janese, Janus Medical Instruments, 2806 N. Navaro, Suite M, Victoria, Tex. 77901

Filed May 16, 1988, Ser. No. 194,363
Int. Cl.[4] A61M 1/00
U.S. Cl. 604—28 **17 Claims**



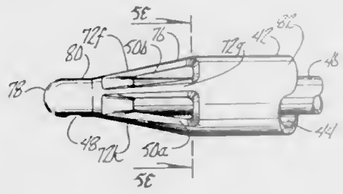
1. An apparatus for the exchange of cerebrospinal fluid comprising:
a collection means for obtaining cerebrospinal fluid, wherein said collection means includes a catheter for indwelling in the subarachnoid compartment of a spinal canal, said catheter having a flange for retarding cerebrospinal fluid leakage from said spinal canal and a cannula for puncturing the spinal canal and providing a conduit for said catheter;
a processing means, attached to said collection means, for monitoring the exchange of cerebrospinal fluid; and
a regulation means for controlling the processing means and regulating the exchange of cerebrospinal fluid; and
an interface for connecting the processing means to the regulation means.

4,904,238

IRRIGATION/ASPIRATION HANDPIECE

Rodger W. Williams, Arlington, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Dec. 21, 1987, Ser. No. 135,730
Int. Cl.[4] A61M 7/00
U.S. Cl. 604—43 **30 Claims**



1. An improved apparatus for supplying fluid to and withdrawing fluid from a surgical site, said apparatus comprising:
a handle member having distal and proximal ends, an intermediate body section, and a bore therethrough;
a nose chamber means having a proximal end in fluid communication with the distal end of the handle member, an enclosed hollow interior means forming an irrigation fluid reservoir substantially across the interior cross-sectional width and through a substantial portion of the longitudinal length of the nose chamber means, and a distal end extending outwardly from the distal end of the handle member;
a surgical tip means having a housing defining a hollow interior of smaller cross-sectional width than the hollow interior means of the nose chamber means in fluid communication with the reservoir of the nose chamber, a proximal end open for direct, unobstructed fluid communication with the fluid reservoir at the distal end of the nose chamber means, and a distal end extended away from the distal end of the nose chamber means, the housing of the tip means having a unitary uninterrupted outer surface extending from the proximal end and including the distal end, which is enclosed, the surface including only smooth, rounded portions without any joints, junctions, exposed projections, and interruptions related to any other parts of the apparatus;
irrigation fluid outlet means and aspiration inlet means both positioned at the distal end of the tip means adjacent to the enclosed, rounded distal end, facilitating fluid communication with the exterior of the distal end of the surgical tip means, the irrigation fluid outlet means comprising a plurality of outlet ports at or near the distal end of the surgical tip means and distributed at generally equally spaced apart positions radially about the longitudinal axis of the surgical tip means with solid portions of the housing separating the irrigation ports, except for a blocking solid portion, substantially wider than the solid portions, positioned immediately longitudinally adjacent the aspiration inlet means between the aspiration inlet means and any outlet ports of the irrigation fluid outlet means, the outlet ports of the irrigation fluid outlet means allowing increased and improved irrigation around a majority of the radial perimeter of the tip means, the blocking solid portion blocking irrigation fluid from being directly oriented towards the aspiration inlet means and from creating interference with aspiration of the apparatus, the irrigation outlet ports and the aspiration inlet means having smooth, rounded edges without exposed and raised joints, junctions and interruptions;
irrigation fluid conduit means extending through said proximal end, body section, and distal end of the handle member for supplying irrigation fluid to the fluid reservoir of the nose chamber means, irrigation fluids to the irrigation fluid outlet means being supplied through the hollow interiors of the nose chamber means and the surgical tip means;
aspiration fluid conduit means extending from the proximal end of the nose chamber through the body section to the proximal end of the handle member for conducting aspirated fluid and materials out of the proximal end of the handle member;
an aspiration fluid cannula means being entirely enclosed in and extending from the distal end of the surgical tip means, through the hollow interior of the surgical tip means and the nose chamber means for transferring aspirated fluid between the aspiration inlet means and the aspiration fluid conduit means, the aspiration fluid cannula means having an end opening in stationary sealed fluid communication with the aspiration inlet means at the distal end of the surgical tip means.

4,904,239

INFUSOR HAVING A DISTAL FLOW REGULATOR

David A. Winchell, Spring Grove, and Derek Walsh, Fox Lake, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 51,174, May 14, 1987, Pat. No. 4,741,733, which is a continuation of Ser. No. 689,420, Jan. 7, 1985, abandoned. This application May 2, 1988, Ser. No. 189,095
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—51 **1 Claim**

1. An infusion device for dispensing a liquid under pressure at a predetermined flow rate comprising in combination:
(a) an elastomeric bladder for receiving the liquid under pressure;
(b) a housing containing said bladder and defining an aper-

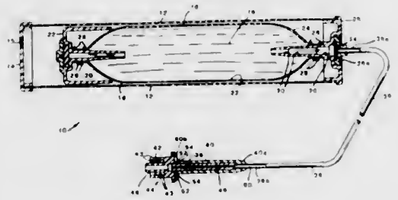
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ture extending therethrough, the inside of said bladder being in fluid communication with said defined aperture;

(c) tubing having proximal and distal ends, said proximal end secured to said aperture for transporting the liquid from said bladder to an infusion site of a patient;

(d) a non-adjustable flow regulator having a pre-selected flow rate through a defined bore and including upstream and downstream ends, said flow regulator bore being in fluid communication with the lumen of said tubing, said flow regulator being spaced substantially downstream of said tubing proximal end, and placing a maximum limit on the flow rate of liquid out of said infusion device;

(e) connecting means in fluid communication with said tubing lumen and said flow regulator bore and secured to said infusion device downstream of said tubing and said flow



regulator, said connecting means being adapted for securing said infusion device to a separate assembly adjacent to the patient;

(f) wherein upon priming of said infusion device, liquid from said elastomeric bladder flows through said tubing upstream of said flow regulator before flowing through said flow regulator, so that the amount of time required to prime said infusion device is largely proportional to the length of said flow regulator and is relatively unaffected by the length of said tubing upstream of said flow regulator; and

(g) further wherein the air in said tubing, upstream of said regulator housing, is expressed from said tubing upstream of said flow regulator before the liquid from said elastomeric bladder flows through said flow regulator.

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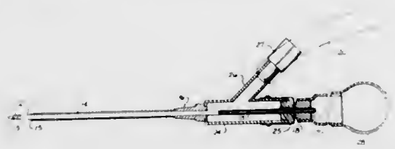
METHOD AND APPARATUS FOR STARTING INTRAVENOUS SOLUTIONS

Rocklin L. Hoover, Route 3, Box 314X-4, Sumter, S.C. 29154

Filed Jun. 9, 1988, Ser. No. 204,246

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—53 **7 Claims**



1. A catheter placement apparatus for starting and feeding intravenous solutions from an administrative tube set into a blood vessel of a human body comprising:

a first chamber having a first interior;

a permanent tube port carried on said first chamber in fluid communication with said first interior for receiving intravenous solutions from said tube set and delivering said solutions into said first interior upon connection of said tube and said permanent port;

a catheter carried by said first chamber having a second interior in fluid communication with said first interior so that said intravenous solutions can flow from said first interior of said first chamber into said second interior of said catheter;

a resealable port carried by said first chamber opposite said catheter;

a hollow needle having a third interior, said hollow needle having a beveled tip at a first end for penetrating said body, and said hollow needle having a second end opposite said tip;

said hollow needle being slidably positioned within said catheter and traveling said first chamber through said resealable port, said tip of said hollow needle being outside said catheter and said second end of said hollow needle being outside said resealable port so that said third interior is isolated from said first and second interiors; and

indicator means for signaling that said hollow needle has penetrated said blood vessel in said body which includes a transparent flash chamber having one end carried by said hollow needle in tandem with said first chamber, a squeeze bulb carried by an opposite end of said flash chamber in tandem with said flash chamber which creates a vacuum in said hollow needle and flash chamber upon being squeezed and released for urging blood into said flash chamber, and said flash chamber and squeeze bulb being carried coaxially and sequentially in tandem with said hollow needle so that said flash chamber is unobstructed for detecting blood inn said flash chamber upon vein puncture.

4,904,241

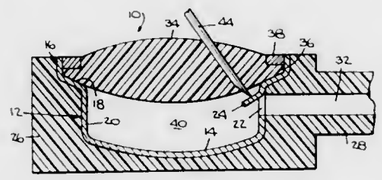
SEPTUM WITH A NEEDLE STOP AT THE FLUID TRANSFER PORT

Jeffrey E. Bark, Racine, Wis., assignor to Medical Engineering Corp., Racine, Wis.

Continuation of Ser. No. 919,905, Oct. 16, 1986, abandoned. This application Oct. 21, 1988, Ser. No. 262,145

Int. Cl.[4] A61M *11/00*

U.S. Cl. 604—93 **2 Claims**



1. A septum comprising,

a cup-shaped needle stop member defining a central fluid chamber, said needle stop member including a base with a peripheral sidewall extending therefrom defining an open mouth portion, said sidewall having a port therein and a support surface,

fluid flow means in communication with said port for establishing a fluid flow path with said fluid chamber, and

a needle penetrable self-sealing member supported by said support surface and sealing said open mouth portion of said fluid chamber, said needle stop member including a needle stop portion at said port to prevent a needle accessing said fluid chamber through said self-sealing member from a penetrating said fluid flow means,

said needle stop portion including a conduit extending from said port into said fluid chamber, said conduit being formed of a material impermeable to needles, and including openings remote from said needle penetrable sealing means such that said openings are inaccessible to a needle penetrating said sealing means.

4,904,242

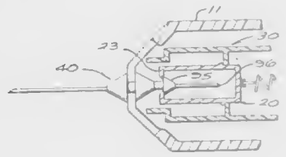
PHLEBOTOMY SET WITH SAFETY RETRACTING NEEDLE

John C. Kulli, 30 Widewaters La., Pittsford, N.Y. 14534

Continuation-in-part of Ser. No. 43,691, Apr. 29, 1987, Pat. No. 4,747,381. This application May 31, 1988, Ser. No. 200,638

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—110 **27 Claims**



1. A safety device for use in withdrawing liquid from a patient and for thereafter protecting people from contact with portions of the device that have been within the patient; said device being for use with a liquid-receiving unit; and said device comprising:

a hollow needle for piercing such patient and for guiding and carrying such liquid into or out of the patient, said needle having a hollow shaft with at least one sharpened end, for receiving such liquid from the patient, and another end for discharging such liquid to such liquid-receiving unit;

a needle holder that includes:

a handle suited to be grasped by a user of the device,

means, secured to the handle, for gripping the needle shaft and holding the needle in position with its sharpened and projecting forward from the handle for insertion into such patient to receive such liquid through the hollow shaft from such patient, and

a skirt, projecting rearward from the handle, for generally shielding the other end of the needle shaft against inadvertent contact with the user's hands, while permitting access of such liquid-receiving unit to said other end of the needle shaft;

manually actuable means for releasing the gripping means and for substantially permanently retracting the sharp end of the needle beyond reach of such people's fingers;

wherein the releasing and retracting means are manually actuable, and comprise a separate safety container for receiving and enclosing the entire needle for disposal;

whereby the needle is retracted and removed entirely from the handle.

4,904,243

DEVICE FOR SELF-ADMINISTRATION OF DRUGS OR THE LIKE

Eduardo Brucra, 140 Michener Park, Edmonton, Alberta, Canada (T6H 4M4)

Filed Jul. 11, 1988, Ser. No. 217,349

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—183 **1 Claim**

1. A device for subcutaneous self-administration of drugs or the like, including means enabling said device to be carried on body of a patient under treatment, said device being associated with a container to contain fluid to be administered to and by said patient and a remote needle to inject said fluid in said patient, said device comprising

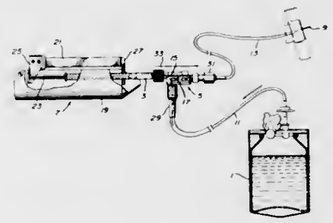
coupling means including a one way valve system;

a first flexible tube connecting said coupling means to said container;

a second flexible tube connecting downstream side of said coupling means to said needle;

said one way valve system incorporating means preventing back-flow of blood from said patient or administered fluid, and out flow of said fluid back into said container;

a calibrated syringe including a plunger mounted in a syringe holder on upstream side of said coupling means;



said syringe holder having means enabling said plunger to withdraw a predetermined portion of fluid from said container and thereafter to inject all said predetermined portion to said patient.

4,904,244

APPARATUS FOR SAFELY REMOVING NEEDLES FROM HYPODERMIC SYRINGES

Don J. Harsh, 5670 S. 920 East; Linda R. Hills, 6298 S. Lorreen Dr., both of Salt Lake City, Utah 84121, and Kennalyn Howard, 3706 Market St., West Valley City, Utah 84119

Filed Feb. 22, 1988, Ser. No. 158,767

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—187 **16 Claims**



1. An apparatus for removing needles from a hypodermic syringe, said syringe having a barrel having a needle socket at one end thereof such that a needle can be removably attached to said needle socket, the apparatus comprising:

removal means disposed between a needle attached to the syringe and the syringe barrel; and

means for causing said removal means to move generally away from the syringe barrel such that the needle becomes disengaged from the syringe socket, wherein said means for causing said removal means to move comprises at least one arm in communication with said removal means at its distal end and integrally molded to the syringe barrel at its proximal end, said at least one arm extending outwardly from the syringe barrel, such that when the outwardly extending portion of the arm is moved inwardly toward the syringe barrel, said removal means simultaneously moved forward a sufficient distance to disengage the needle from the needle socket, said arm being constructed such that when pressure on said arm is released it returns to its original configuration.

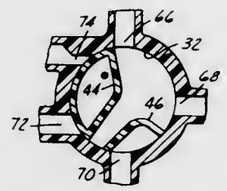
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4,904,245

SURGICAL VALVE ASSEMBLY FOR URINARY BLADDER IRRIGATION AND DRAINAGE

Allen Chen, Belleville, Mich., and Werner W. Ciupke, Sunnyvale, Calif., assignors to Allen S. Chen, West Bloomfield, Mich.

Filed Dec. 7, 1988, Ser. No. 280,965
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—248 **12 Claims**



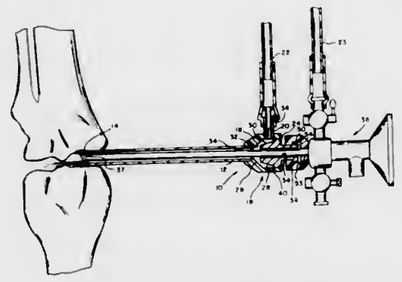
1. In a catheter arrangement for irrigating a patient's bladder the combination comprising a valve body having a circular bore and a circular cylindrical core rotatively retained in said bore, said body having first, second, third, fourth and fifth ports spaced successively around the periphery of the body and communicating with said bore, said first port being connected with a source of irrigating fluid, the second port being connected to a syringe, the third port being connected to a drainage fluid container, the fourth port being connected to a first lumen of a urinary catheter adapted to be extended into the patient's bladder and the fifth port being connected to a second lumen of said catheter, said core having first and second separate and distinct passageways therein, said first passageway having generally diametrically opposite ends extending to said bore, one of said ends having a dimension circumferentially of said bore much larger than the other end, said second passageway being located at one side of said first passageway, said passageways and ports being dimensioned and arranged circumferentially relative to each other so that in a first rotative position of said core the large end of said first passageway communicates with both the first and second ports, the small end of the first passageway is sealed by said bore and the remaining ports are sealed from said first passageway and from each other by said core so that the syringe can be operated to draw a quantity of irrigating fluid from said source through said large end of said first passageway and into the syringe, said core being rotatable in one direction from said first position to a second position wherein said large end of said first passageway connects with said second port, the smaller end of the first passageway connects with said fourth port and the first, third and fifth ports are sealed from each other and from said first passageway by said core so that the syringe can be operated first to discharge the fluid therein through said first passageway and into the first lumen of the catheter and then to draw the fluid from the bladder back into the syringe through said first lumen, said core being rotatable in said one direction from said second position to a third position wherein said large end of the first passageway communicates with both the second and third ports, the small end of the first passageway is sealed by said bore and the remaining ports are sealed from each other and from said first passageway by said core so that the syringe can be operated to discharge the fluid therein that has been withdrawn from the bladder into said drainage container through said large end of the first passageway, said core being rotatable still further in said one direction from said third position to a last position wherein the large end of the first passageway communicates with both the third and fourth ports and the second passageway interconnects the first and fifth ports and the second port is sealed from said passageways and from the remaining ports by said core to permit irrigating fluid to be directed into the bladder at a controlled rate through the second passageway and the second lumen of the catheter and simultaneously drained from the bladder through the first lumen or, in the alternative, when flow of fluid from the source is arrested, to permit the patient's bladder to drain in an ordinary urinary manner through said first lumen into said drainage container.

4,904,246

CANNULA ASSEMBLY

Robert W. Atkinson, Dover, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio

Filed Jul. 19, 1988, Ser. No. 221,384
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—264 **2 Claims**



1. A cannula assembly comprising a tubular body with an end fitting at one end and an outlet at an opposite end, the body and end fitting defining a bore extending longitudinally therethrough in communication with the outlet for receiving a scope at the one end, the end fitting defining a chamber surrounding the scope when the latter is received within the body and end fitting, the end fitting defining an inlet port communicating fluid into the chamber, the end fitting defining an inner frusto conical surface leading to a passage communicating the chamber with the bore such that fluid communicated from the inlet to the chamber is directed by the inner frusto conical surface toward the passage and into the bore, the end fitting defining an outer frusto conical surface cooperating with the inner frusto conical surface to direct fluid flow from the inlet through the chamber toward the passage, and the outer frusto conical surface approaching the inner frusto conical surface toward the passage for uniform fluid flow from the inlet toward the outlet.

4,904,247

PRESSURE-SENSITIVE HYDROPHILIC LAMINATE STRUCTURES FOR USE IN WOUND DRESSING, TRANSDERMAL AND TOPICAL DRUG DELIVERY

Donald J. Therriault, Lowell; Samuel C. Temin, Needham, both of Mass., and Kishore R. Shah, Bridgewater, N.J., assignors to Kendall Company, Lexington, Mass.

Continuation-in-part of Ser. No. 646,550, Aug. 31, 1984, abandoned. This application Oct. 2, 1985, Ser. No. 782,848
Int. Cl.[4] A61F *13/00*
U.S. Cl. 604—304 **10 Claims**

1. A hydrophilic polymer blend laminate for use as a wound dressing and/or as a drug delivery construction, comprising:
- at one non-pressure-sensitive adhesive hydrophilic polymer blend layer adapted for forming a hydrogel upon equilibration with water, said layer being characterized by imparting strength and bacterial barrier properties to said laminate composite;
- and at least one pressure-sensitive adhesive hydrophilic polymer blend layer adapted for attachment to skin, said layers being in fluid contact.

4,904,248

FEMALE INCONTINENT URINE COLLECTION DEVICE

Vincent L. Vaillancourt, Livingston, N.J., assignor to Sherwood Medical Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 830,362, Feb. 18, 1986, abandoned. This application Feb. 11, 1987, Ser. No. 13,638
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—329 **15 Claims**



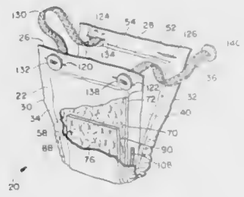
1. An incontinent female collection device including
- a receptacle of a generally ovoid and open cup-shaped configuration providing a cavity with an open bore from and through a wall portion of said cavity;
- an outer lip-edge formed on said open cup-shaped receptacle, said lip-edge providing a generally ovoid saddle-shape configuration;
- a resilient, soft, compliant outer-rim portion extending around the full perimeter of said lip-edge, said rim portion being comprised of a material which provides for deflection and compression of said rim portion so as to accommodate individual female anatomical differences in and of the skin area of the folds of the user's labia and in a wet environment;
- means for securing said rim portion to said lip-edge of said receptacle so that a fluid-tight seal therebetween is established and maintained;
- a very thin liner of very flexible plastic film secured to the outer surfaces of said rim portion and lying adjacent at least the upper portion of the inner surface of said cup-shaped receptacle; and
- means for attaching said collection device to a conduit and collection container.

4,904,249

ABSORBENT UNDERGARMENT WITH FLUID TRANSFER LAYER AND ELASTICIZED CROTCH DESIGN

Peggy H. Miller, Kimberly, and Gary D. Winters, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 6, 1988, Ser. No. 203,222
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—378 **25 Claims**



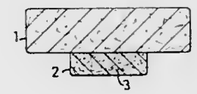
1. An absorbent garment defining an initial expanded shape having longitudinal and transverse axes and comprising:
- a liquid-impervious backing member;
- a liquid pervious body-side liner joined to said backing member approximate a periphery of said joined liner and backing member;
- a generally rectangular absorbent positioned between said bodyside liner and said backing member in board of the periphery of said joined liner and backing member;
- elastic gathers aligned along longitudinally extending margins of the periphery, rendering said garment elastically contractible and body-conforming adjacent the crotch of a wearer; and
- a generally rectangular pledget disposed between said absorbent and said backing member, said pledget being positioned symetrically relative to the longitudinal and transverse axes of the expanded garment and dimensioned to have a length and width less than the length and width of said absorbent, wherein said pledget, said elastic gathers and said absorbent function together to form a cup-shaped portion adjacent the crotch of the wearer when said garment is worn.

4,904,250

ABSORPTION BODY INTENDED FOR DISPOSABLE ARTICLES SUCH AS DIAPERS, SANITARY NAPKINS AND THE LIKE

Ingela Ternström, Mölnlycke, Sweden, assignor to Molnlycke AB, Gothenuborg, Sweden

Filed Jul. 16, 1986, Ser. No. 886,097
Claims priority, application Japan, Jul. 31, 1985, 60-169629
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—379 **7 Claims**



1. An absorption body for disposable articles such as diapers, sanitary napkins and the like, comprising a first layer which is adapted to be placed against the wearer's body and which is soft and has a bulk exceeding 10 cm^3/g and which thereby has a poor liquid-distributing capacity, at least one second layer which is substantially more heavily compressed than said first layer and has a bulk of less than 10 cm^3/g and which thereby has a substantially higher liquid-distributing capacity than said first layer, and a highly absorbent material distributed within said at least one second layer.

4,904,251

DISPOSABLE DIAPER

Takamitsu Igaue, Kawanoe; Hideaki Kitaoka, Funabashi, and Hiroyuki Tanji, Kawanoe, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Continuation-in-part of Ser. No. 31,673, Mar. 30, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 176,324
Int. Cl.[4] A41B *13/02*
U.S. Cl. 604—385.2 **10 Claims**

1. A disposable diaper, comprising:
- a liquid-permeable topsheet (**11**), a liquid-impermeable backsheet (**12**), and an absorbent body (**13**) interposed between said topsheet (**11**) and said backsheet (**12**),
- said diaper including a pair of generally upstanding elastic leg gathers extending longitudinally of said diaper on respective lateral sides of said absorbent body, each said leg gather including an inner elastic element (**22**), and an outer covering sleeve including a portion secured to at least one of said topsheet (**11**) and said backsheet (**12**),
- each said elastic element (**22**) being in the form of an elongated elastic strip and being folded over within the respective covering sleeve (**17**) along at least a portion of its

length to thereby establish an outer folded surface and an inner folded surface of said elastic element and to thereby increase the effective thickness of at least said portion of said elastic element, each said leg gather further including



securement means (40) securing said elastic element (22) within the respective covering sleeve (17), said securement means (40) being provided along at least a portion of the longitudinal extent of the outer surface of the elastic element (22).

4,904,252

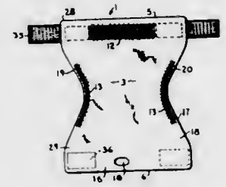
TOY DIAPER

Terry L. Fitzgerald, 15036 S. Alden, Olathe, Kans. 66062

Continuation-in-part of Ser. No. 138,642, Dec. 28, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 276,907

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385.1 **6 Claims**



1. A reusable toy diaper adapted for use on toy dolls with legs and a midsection, which comprises:

(a) a main body; said main body is comprised of a layer of bulky non-absorbent material having the appearance of highly absorbent material used in disposable baby diapers and a layer of single ply material having the appearance of non-absorbent materials used in the outer layer of actual baby disposable diapers; and

(b) hook and loop fastener means releasably connectable at the inner corners of the main body and comprising a hook section and a loop section for connecting two corners of the main body in overlapped disposition to form said toy diaper to the legs and midsection of the toy doll.

4,904,253

PRESSURE-SENSITIVE ADHESIVE TAPE

Alan J. Sipinen, and Del A. Kauss, both of Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 219,338, Jul. 14, 1988, abandoned, which is a division of Ser. No. 824,868, Jan. 1, 1986, Pat. No. 4,769,283. This application Apr. 24, 1989, Ser. No. 342,647

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—389 **14 Claims**

1. A disposable diaper having attached thereto a diaper closure comprising a pressure-sensitive adhesive tape comprising a film comprising a blend of crystalline isotactic polypropylene and very low density polyethylene, said film having a longitudinal secant modulus of less than about 3700 kg/cm^2, a transvere secant modulus of less than about 3700 kg/cm^2, a longitudinal elastic modulus of less than about 5200 kg/cm^2, a transverse elastic modulus of less than about 5200 kg/cm^2, a longitudinal stiffness of less than about 1.7, and a transverse stiffness of less than about 3.0, and a surface energy of less than about 40 erg/cm^2 and, on one side thereof, a normally tacky pressure-sensitive adhesive.

4,904,254

CORRECTION OF INCOMPETENT VENOUS VALVES

Rodney J. Lane, Cremorne, Australia, assignor to Vaso Products Australia PTY.Limited, North Sydney, Australia

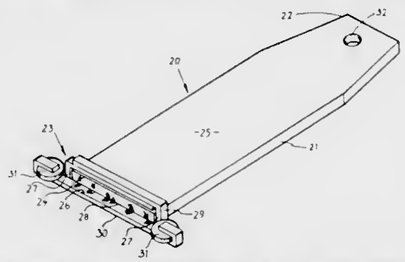
PCT No. PCT/AU87/00215, § 371 Date Mar. 4, 1988, § 102(e) Date Mar. 4, 1988, PCT Pub. No. WO88/00454, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 13, 1987, Ser. No. 191,168

Claims priority, application Australia, Jul. 17, 1986, PH6992; Feb. 10, 1987, PI0270; Mar. 24, 1987, PI1053

Int. Cl.[4] A61F *2/24;* **A61B** *17/00*

U.S. Cl. 623—2 **18 Claims**



1. A cuff for restoring competence to an incompetent venous valve, said cuff comprising a band of biocompatible implantable material that is not stretchable at blood flow pressures, the band being of sufficient length to encompass the vein at the site of the venous valve with portions of the band overlapping, the overlapping portions being joinable together to form a cuff of desired circumference small enough to restore competence yet not too tight to decrease blood flow; and said band being notched to accommodate application at a venous junction.

4,904,255

COMPLETE ARTIFICIAL HEART WITH TWO PUMPING MODULES CONNECTED TOGETHER BY A FUNCTIONAL CONNECTION

Jean-Louis Chareire, Levallois, and Didier Lapeyre, Pacy-Sur-Eure, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 16, 1986, Ser. No. 942,272

Claims priority, application France, Dec. 16, 1985, 85 18600

The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.

Int. Cl.[4] A61F *2/22*

U.S. Cl. 623—3 **6 Claims**



1. In a complete artificial heart including two pumps, repre-

sentative respectively of the right heart and of the left heart formed:

by a pericardial module intended to be housed in the cavity of the natural heart to be replaced and enclosed in a sealed envelope having at least three orifices for connection respectively to the right auricle, to the pulmonary artery and to the left auricle, said orifices for connection to the right auricle and to the pulmonary artery being provided with valves for serving respectively as inlet port and outlet port to a first pump of the membrane type housed in said envelope and intend to provide the function of the right heart of the natural heart to be replaced;

by an extra-pericardial module intended to be housed in a physiologically neutral space of the receiving patient and to provide the function of the left heart of the natural heart to be replaced, this extra-pericardial module including a second pump of the membrane and pusher plate type having an actuation system, and being enclosed in a sealed envelope provided with an inlet orifice and an outlet orifice each equipped with a valve;

a functional connection between said modules including at least:

a tube passing through said envelope of said pericardial module and connecting the orifice thereof corresponding to the left auricle with the inlet port of the second pump incorporated in said extra-pericardial module;

gas communication means between the sides of said first and second pumps opposed to the blood passing therethrough; said communication means including:

a first duct for bringing to said first pump the gas displaced by the second pump, so that said displaced gas actuates said first pump in the blood expulsion direction; and

a second duct for bringing the gas from the first pump to said second pump.

4,904,256

MAGNETIC ARTIFICIAL ANUS HAVING SPHINCTER FUNCTION

Takashi Yamaguchi, Hamamatsu, Japan, assignor to Meito Sangyo Kabushiki Kaisha, Aichi, Japan

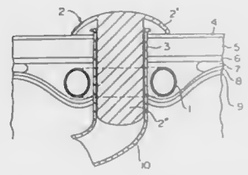
PCT No. PCT/JP87/00119, § 371 Date Oct. 20, 1987, § 102(e) Date Oct. 20, 1987, PCT Pub. No. WO87/04917, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 24, 1987, Ser. No. 130,382

Claims priority, application Japan, Feb. 24, 1986, 61-37448

Int. Cl.[4] A61F *2/48, 2/51*

U.S. Cl. 623—14 **5 Claims**



1. An implantable magnetic artificial anus having sphincter functions comprising:

a flexible annular hollow bag formed of a bioaffinitive flexible film having a film thickness of 0.1 to 0.5 mm and filled with a magnetic fluid; and

a plug member having in combination a cylindrical body defining upper and lower ends, and an umbrella shaped cap integral with the upper end thereof, said cylindrical body having permanent magnet disposed therein and said body having a hollow ventilation chamber extending from the upper to the lower end, said ventilation chamber having gas permeating filters disposed at each end thereof and said chamber being filled with gas permeating material, whereby said annular bag is disposed about the periphery of a natural or artificial colon and the cylindrical body of the plug member is inserted into the colon directly adjacent the annular bag such that the permanent magnet in the cylindrical body causing the flexible bag to constrict about said colon in a natural sphincter manner thereby securing the plug member within the colon.

4,904,257

FIBROUS BONE FILLER AND PROCESS OF PRODUCING THE SAME

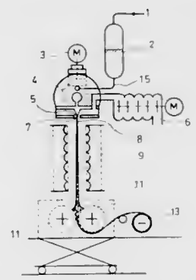
Shoichi Mori, Ooimachi; Shigeo Fujii, Kawagoe; Masao Yoshizawa, Tokyo; Kenji Miyasaka, Ooimachi; Jyoichi Tabuchi, Ooimachi; Kazufumi Egawa, Ooimachi; Minoru Hirano, Kurume, and Yoshikazu Yoshida, Fukuoka, all of Japan, assignors to Toa Nenryo Kogyo K. K. and Asahi Kogaku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 28,589, Mar. 20, 1987, abandoned. This application Jul. 6, 1988, Ser. No. 215,782

Claims priority, application Japan, Mar. 20, 1986, 61-63044

Int. Cl.[4] A61F *1/00*

U.S. Cl. 623—16 **20 Claims**



1. A method of filling a void in a bond which comprises filling the void with a fibrous bone filler comprising fibers containing intact hydroxyl apatite formed by solution spinning an aqueous suspension comprised of 5 to 70 percent by weight of hydroxyl apatite, 5 to 40 percent by weight of a water-soluble binder and 10 to 90 percent by weight of water, wherein said fibrous bone filler is immersed in an immersion liquid selected from the group consisting of water, physiological saline, chondroitin solution, and hyaluronic solution.

4,904,258

BIOCOMPATIBLE, HYDROPHILIC MATERIAL, METHOD OF MANUFACTURE AND USES OF SAME

Jean-Claude Pommier, Gradignan; Joel Poustis, Pessac; Charles Baquey, St Medard en Jalles, and Dominique Chauveaux, Bordeaux, all of France, assignors to La Cellulose Du Pin and Universite de Bordeaux II, both of Bordeaux, France

Filed Jul. 16, 1987, Ser. No. 74,047

Claims priority, application France, Jul. 16, 1986, 86 10331

Int. Cl.[4] A61F *2/28;* **C08B** *9/00*

U.S. Cl. 623—16 **11 Claims**

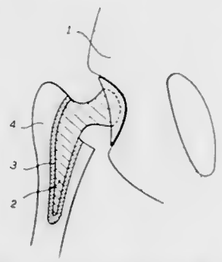
1. A method for the manufacture of a biocompatible hydrophilic material based on purified cellulose, from which material the majority of the water has been removed by drying, and which has a modulable potential for water recovery of up to an amount of water of approximately 60%, comprising the following steps:

a. preparing alkali-cellulose by steeping cellulose pulp using bisulfite acid in a sodium hydroxide solution followed by drying and pressing to achieve a weight of dry cellulose of between 30 and 40%,

b. then sulfurating the alkali-cellulose using carbon sulfide at

least in stoichiometric quantities, in order to obtain sodium xanthate,

c. dissolving the sodium xanthate in a diluted sodium hydroxide solution to obtain a viscose solution containing cellulose and sodium hydroxide in well-determined proportions,



d. submitting the viscose obtained to heat treatment so as to provoke the coagulation of the viscose and to treatment for removal of the sulfur, so as to obtain an amorphous material with rubber-like characteristics,

e. and drying the material obtained.

4,904,259

COMPOSITIONS AND METHODS FOR REPAIR OF CARTILAGE AND BONE

Samuel Itay, 16/3 Sharet St., Kfar-Saba, Israel (44456)

Continuation-in-part of Ser. No. 187,730, Apr. 29, 1988. This application Dec. 5, 1988, Ser. No. 280,122

Int. Cl.[4] A61F *2/28*; A61K *35/12*

U.S. Cl. 623—16 **23 Claims**

12. A method of regenerating skeletal tissue in a person, comprising the steps of:

a. obtaining a bone marrow sample from a donor;

b. culturing a proliferative cell population comprising bone marrow osteogenic-chondrogenic progenitor cells;

c. harvesting the cells;

d. manipulating the cells in suspension above soft agar at a concentration in excess of 2×10^6 cells/ml of medium for at least five days;

e. embedding the cells at a concentration in excess of 80×10^6 cells/ml of a biological resorbable immobilization vehicle (BR1V) including in excess of 10% serum, 100 mg/ml fibrinogen and 60 units/ml thrombin in 60 mM $CaCl_2$ and 2000 units of aprotonin;

f. removing a damaged part of the person's skeletal tissue to leave a clean geometric shaped defect; and

g. filling the defect with an implant at least including the combined cell concentration and BR1V.

4,904,260

PROSTHETIC DISC CONTAINING THERAPEUTIC MATERIAL

Charles D. Ray, Wayzata, and Terry P. Corbin, Golden Valley, both of Minn., assignors to Cedar Surgical, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 87,424, Aug. 20, 1987, Pat. No. 4,772,287. This application Jul. 25, 1988, Ser. No. 223,400

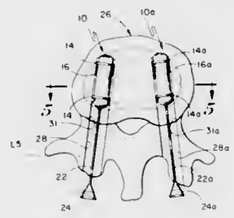
The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] A61F *2/44*; A61M *31/00*

U.S. Cl. 623—17 **17 Claims**

1. An elongated cylindrical prosthetic intervertebral disc capsule having a diameter approximating the height of a human disc space and a length approaching the sagittal diameter of the vertebral body, said capsule comprising:

a flexible bladder which is chemically and biologically inert and comprises a semi-permeable membrane enclosing a fluid containing a therapeutic material that is slowly diffusible through the semi-permeable membrane, and



a layer of strong fibers encompassing the fluid-filled membrane.

4,904,261

SPINAL IMPLANTS

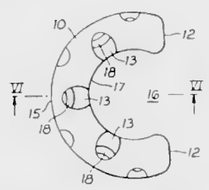
John Dove, Park Hill, England; Philip H. Hardcastle, Nedlands, Australia; John K. Davis, Endon, and Brian M. King, Longton, both of England, assignors to A. W. Showell (SURGICRAFT) Limited, Redditch, England

Filed Aug. 4, 1988, Ser. No. 228,331

Claims priority, application United Kingdom, Aug. 6, 1987, 8718627

Int. Cl.[4] A61F *2/52*

U.S. Cl. 623—17 **7 Claims**



1. A spinal implant comprising a rigid generally horseshoe shape of biocompatible material having upper and lower planar faces converging towards the ends of the horseshoe, and at least one hole from each planar face emerging in the outer curved face of the horseshoe.

4,904,262

JOINT PROSTHESIS AND PROCESS FOR ITS MANUFACTURE

Günter Bensmann, Essen, Fed. Rep. of Germany, assignor to Fried. Krupp GmbH, Fed. Rep. of Germany

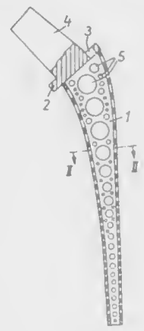
Filed May 6, 1988, Ser. No. 191,642

Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3715000

Int. Cl.[4] A61F *2/30*

U.S. Cl. 623—18 **5 Claims**

1. Joint prosthesis comprising (a) a hollow shaft comprised of a perforated sheet metal and (b) a collar attached to the shaft and containing a protrusion for attaching to a ball joint, wherein the shaft is comprised of individual, perforated strips of sheet metal which are welded together to form the hollow shaft, and the collar is welded at the upper end of the shaft, the collar having an opening leading to the inside of the hollow shaft, whereby it is possible to insert, after implantation of the



prosthesis, through the collar opening ground or cut up bone chips .

4,904,263

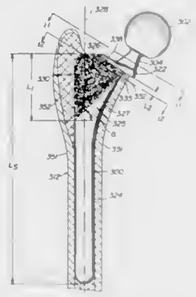
PROSTHESES WITH INTERLOCKING FIXATION AND PROVIDING REDUCTION OF STRESS SHIELDING

Frederick F. Buechel, 76 Crest Dr., South Orange, N.J. 07079, and Michael J. Pappas, 61 Gould Pl., Caldwell, N.J. 07006

Division of Ser. No. 830,208, Feb. 18, 1986, Pat. No. 4,752,296, which is a continuation-in-part of Ser. No. 492,131, May 6, 1983, abandoned. This application May 13, 1988, Ser. No. 194,041

Int. Cl.[4] A61F *2/30, 2/32*

U.S. Cl. 623—18 **17 Claims**



1. A joint prosthesis for a bone having a resected proximal end, said prosthesis comprising a stem for mounting in the bone, said stem having opposed proximal and distal ends and an exterior surface extending therebetween, said exterior surface including an anterior face, a posterior face, a medial face and a lateral face, proximal areas of at least the anterior and posterior faces being provided with interlocking means for bone ingrowth interlocking fixation to the bone, remaining portions of said anterior and posterior faces being substantially smooth for preventing bone ingrowth interlocking fixation to the bone, such that the interlocking means on the anterior and posterior faces defines a distal boundary adjacent the smooth portions thereof, said interlocking means being disposed such that the distance between the distal boundary of the interlocking means and the medial face of the stem increases at further distances from the proximal end of the stem, whereby the disposition of the interlocking means is operative to transfer loads to portions of the bone adjacent the resected proximal end of the bone for preventing stress shielding thereof.

4,904,264

ARTIFICAL JOINT SYSTEM

Rüdiger Scheunemann, Lohmar-Donrath, Fed. Rep. of Germany, assignor to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

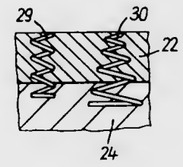
PCT No. PCT/EP85/00197, § 371 Date Oct. 24, 1985, § 102(e) Date Oct. 24, 1985, PCT Pub. No. WO85/05027, PCT Pub. Date Nov. 21, 1985

PCT Filed May 4, 1985, Ser. No. 795,493

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416872; May 29, 1984, 3420035; Jun. 27, 1984, 3423667

Int. Cl.[4] A61F *2/30*

U.S. Cl. 623—18 **31 Claims**



1. An artificial joint system for cement-free implantation into a bone provided with a resection plane and a bore for accommodating at least a portion of the artificial joint system, the artificial joint system comprising:

an implant comprised of an intermediate member having a contact face provided thereon, which contact face engages the resection plane of the bone when the artificial joint system is implanted therein, and having at least one pin positioned on and protruding from the contact face, which at least one pin has a threaded section; and

a clamping device comprised of a shaft having defined therein at least one threaded bore for receiving and threadedly engaging the at least one pin,

wherein the artificial joint system has a surface and is provided, along at least a portion of the surface thereof adjacent to the bone, with a transition structure, the transition structure comprising a matrix which is at least partially resorbable and a plurality of projecting members, which plurality of projecting members extend perpendicularly outwardly and away from said at least a portion of the surface of the artificial joint system adjacent to the bone, are one of flexible metallic wires and flexible fibers, are surrounded by and embedded in the matrix, have a shape which is one of a pin shape, a helical shape, and a wavy shape, and have a modulus of elasticity corresponding to the modulus of elasticity of the bone tissue which surrounds same when the artificial joint system is implanted.

4,904,265

CEMENTLESS ACETABULAR IMPLANT

Maureen A. MacCollum, Warsaw, Ind.; C. McCollister Evarts, Humelstown, Pa., and Richard R. Tarr, Warsaw, Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Sep. 9, 1988, Ser. No. 243,479

Int. Cl.[4] A61F *2/34*

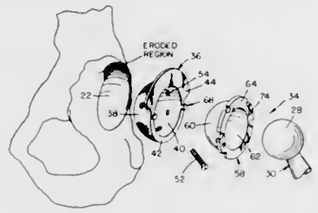
U.S. Cl. 623—22 **7 Claims**

1. A cementless acetabular implant for use in instances of a bony defect in the pelvis at the acetabular cavity requiring substantial rebuilding thereof by use of bone graft material comprising:

a substantially rigid metallic support cup, generally hemispherical in shape, having an outer convex surface for contiguous reception with the bone within the acetabular cavity, an inner concave surface, a peripheral planar rim being generally positioned at an equator of said support

cup intermediate said outer convex surface and said inner concave surface, said support cup including a flange lying generally in the plane of said peripheral rim and extending outwardly from said outer convex surface for supportive engagement on bone stock located beyond the acetabular cavity and for containing the bone graft beneath said rim, said flange having a medial surface in communication with said outer convex surface and a lateral surface in communication with said peripheral rim, said outer convex surface and said medial surface being porous for attachment by bone ingrowth to the bone within and surrounding the acetabular cavity;

a bearing insert of low friction material adapted to be mounted on said support cup, said insert having an external convex surface contiguously engaged with said inner concave surface of said support cup, a spherical seat for



engageably receiving a ball shaped member of a femoral prosthetic component to permit universal pivotal movement of the femoral component relative to the pelvis, and an annular lip intermediate said external convex surface and said spherical seat; and

fixation means on said support cup including a pair of diametrically opposed holding tabs on said rim thereof extending in a direction away from said rim and spaced apart by a distance less than the breadth of said annular lip of said bearing insert, said holding tabs being undercut to form gripping surfaces and said bearing insert being deformable for reception on said support cup with said gripping surfaces overlying and engaging said annular lip for thereby fixedly mounting said bearing insert on said support cup and for positively preventing removal of said bearing insert from said support cup.

4,904,266

BONE JOINT IMPLANT AND METHOD

Forrest C. Barber, P.O. Box 911001, Fort Worth, Tex. 76111

Filed Jun. 27, 1988, Ser. No. 212,283

Int. Cl.[4] A61F *2/32*

U.S. Cl. 623—23 **3 Claims**

1. A prosthetic device for repair or replacement of joints of skeletal bones, by implantation in skeletal bone, said prosthetic device comprising:

an elongated stem having a linear axis defining distal and proximal portions;

an intermediate portion having one end integral with said stem and extending medially a predetermined length from said proximal portion;

a depth restricting collar joining said intermediate portion;

a neck portion extending outwardly from said collar;

an articulating ball attached to said neck portion and shaped for rotary movement in a socket;

a pliable sheath of a synthetic material which is slidably received about said elongated stem to thereby form a snugly fitting cover for said stem when said stem is implanted in said skeletal bone;

wherein said pliable sheath comprises two half-sections which are slidably received about the exterior surface of said stem; and

wherein said sheath half-sections each have an interior, an exterior and longitudinal side edges, said edges being



slidably retained within mating recesses provided on the exterior surface of said stem.

4,904,267

METHOD AND DEVICE FOR FIXING A JOINT PROSTHESIS

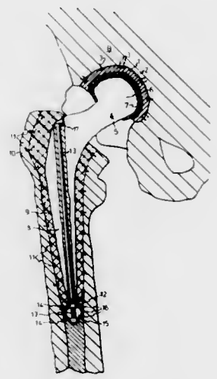
Lars M. Bruce, and Ingrid E. Bruce, both of Viken, Sweden, assignors to AB Idea, Sweden

PCT No. PCT/SE84/00332, § 371 Date Jun. 5, 1986, § 102(e) Date Jun. 5, 1986, PCT Pub. No. WO86/02260, PCT Pub. Date Apr. 24, 1986

PCT Filed Oct. 9, 1984, Ser. No. 876,870

Int. Cl.[4] A61F *2/32, 2/30*

U.S. Cl. 623—23 **18 Claims**



1. A method for fixing a prosthesis in relation to living bone tissue comprising applying between the prosthesis and the bone tissue and in contact with the bone tissue, a plurality of fixing elements of a material and a surface structure which allows bone tissue to grow thereon, wherein the fixing elements have a first end which is inserted into the bone and a second end with a contact head or projection thereon to provide an attachment surface for the bone cement; said fixing elements being inserted into the bone so that the projections or contact heads are spaced apart from the prosthesis and the bone and applying a bone cement which is capable of adhering to the prosthesis, between the bone tissue and the prosthesis, such that the prosthesis whereby the projections or contact heads are completely embedded in said bone cement through said bone cement and said elements, is connected to the bone tissue.

4,904,268

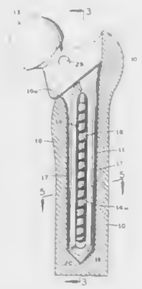
PROSTHETIC DEVICE

Alfredo Alvarado, 4310 Bayview Dr., Ft. Lauderdale, Fla. 33308

Filed Sep. 12, 1988, Ser. No. 242,827

Int. Cl.[4] A61F *2/36, 2/30, 2/32*

U.S. Cl. 623—23 **4 Claims**



1. A prosthetic device for implantation in a person's femur having the femoral head removed, leaving the stump of the femoral neck exposed, comprising:

a screw having an enlarged head on one end, a substantially cylindrical shank segment joined at one end to said head, and a shank with sharp-edged screw teeth thereon extending from the opposite end of said substantially cylindrical shank segment;

a body having an elongated slotted stem with a closed, tapered, inner end of insertion into the femoral neck along the medulla, said body having an opposite outer end away from said inner end of the slotted stem, said body at said outer end thereof having a brace segment joined to said slotted stem and projecting laterally beyond said stem on one side to engage the stump of the femoral neck, said brace segment having a passage therethrough with an enlarged counterbone which is open at the outer end of said body, said stem having a longitudinal recess therein registering with said passage through said brace segment and extending to said closed, tapered, inner end of the stem, said stem for a substantial part of its length having circumferential arcuate side segments partially bordering said longitudinal recess and diametrically opposed surfaces between said side segments, said surfaces defining substantially parallel longitudinal planes, each of said surfaces having concave longitudinal slots formed therein which open into said longitudinal recess, said side segments being internally screw-threaded and screw-threadedly engaged by portions of said teeth of the screw while the remainder of said teeth project out through said longitudinal slots in the stem for engagement in the cancellous bone around the medulla without projecting beyond said parallel longitudinal planes, said passage through the brace segment being shaped and dimensioned to slidably pass said shank of the screw with said screw teeth thereon, said substantially cylindrical segment of the screw being slidably received in said passage through the brace segment, and said head on the screw being seated in said counterbore.

4,904,269

HIP JOINT PROSTHESIS

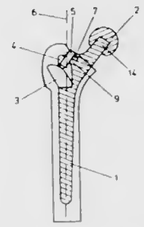
Martin Elloy, Fenton, England; Paulo Gallinaro, Via Governolo 28, 10128 Turin, and Giacomo Masse, Via Sant-andrea 20, 12038 Savigliano (Ca), both of Italy, assignors to Paulo Gallinaro, Turin and Giacomo Masse, Savigliano, both of, Italy

Continuation of Ser. No. 112,679, Oct. 23, 1987, abandoned. This application May 30, 1989, Ser. No. 361,666

Claims priority, application United Kingdom, Oct. 25, 1986, 8625603; Aug. 26, 1987, 8720084

Int. Cl.[4] A61F *2/32*

U.S. Cl. 623—23 **10 Claims**



1. A hip prosthesis comprising a stem having a distal end for introduction into a medullary cavity of a femur and a proximal end, a head connected to the proximal end at a first point on the stem in a direction generally perpendicular to the anterior/posterior plane of the stem, and serving to replace a natural femoral head, said stem having a slot formed therein at the proximal end thereof at a second point generally diametrically opposite said first point;

an anchoring plate, said plate being substantially flat and broad and dimensioned to be movably mounted in said slot; and

positioning means formed in the stem adjacent the proximal end and operatively connected to said slot,

whereby said plate may be moved from an inoperative position, a position where the plate is housed in the slot substantially within the general confines of the stem for introducing the stem into the medullary cavity, to an operative position by coupling a positioning drive means to said positioning means thereby operatively displacing the plate generally radially in a unidirectional outward operative position in which it projects laterally from the stem to engage and anchor itself in an adjacent cancellous bone of the trochanter.

4,904,270

HIP JOINT FOR PROSTHETIC LEG

John E. Cooper, Surrey, United Kingdom, assignor to J. E. Hanger & Company Limited, London, United Kingdom

Filed Mar. 24, 1988, Ser. No. 172,363

Claims priority, application United Kingdom, Mar. 27, 1987, 8707378

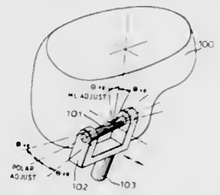
Int. Cl.[4] A61F *2/80*

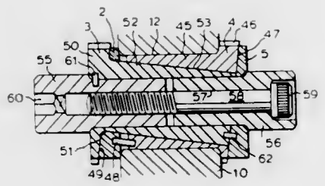
U.S. Cl. 623—38 **16 Claims**

1. A hip joint for a prosthetic leg, wherein first and second members are pivoted together by a pin extending through the first member, the pin including outer spindle means rotatable in a bearing in said first member and inner spindle means rotatable in a bearing in said outer spindle means and carrying pivot means for said second member, wherein said inner spindle means is also in said first member, said inner spindle means having an axis skew to the outer spindle means so that, firstly, an angle between the pivot axis of the joint and said first member may be set by adjusting the relative angular positions of said inner and outer spindle means, and secondly, an attitude of said pivot axis may be set by adjusting the angular position of

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said outer spindle means relative to said first member, the pivot means including means for preventing rotation of the inner and





outer spindle means once the said relative positions have been set.

4,904,271

FINNED PHALANGEAL DEVICE

Robert Gabourie, St. Catharines, Canada, assignor to Niagara Prosthetics & Orthotics Corp., St. Catharines, Canada

Filed May 22, 1989, Ser. No. 354,771

Claims priority, application Canada, Feb. 21, 1989, 591690

Int. Cl.[4] A61F *2/00*

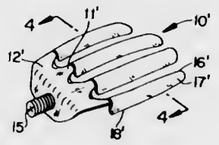
U.S. Cl. 623—65 **8 Claims**

1. A finned phalangeal device comprising;

(a) a plurality of spacially disposed phalanges that at one end merge into a body portion;

(b) attachment means defined by the body portion for attachment of the body portion to a protruding section of a human limb whereby to secure the device thereto; and,

(c) a plurality of longitudinal flexible fin elements overlaying each phalange and having protruding longitudinal margins, the margins protruding beyond each phalange and adapted, to feather against the phalange when the device



is moved through a liquid in one direction and hence to allow passage of the liquid between adjacent phalanges and when the device is moved through the liquid in the opposite direction to move into an extended and protruding position to make overlaying contact with the margin of an adjacent element so as to form a fluid barrier or seal between adjacent phalange.

4,904,272

CROSSLINKED POLYURETHANE MEDICAL PROSTHESIS

Ian P. Middleton, Liverpool, United Kingdom, and Jerzy Paprotny, Gliwice, Poland, assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 61,758, Jun. 15, 1987, Pat. No. 4,798,607.

This application Jul. 22, 1988, Ser. No. 222,997

Claims priority, application United Kingdom, Jul. 4, 1986, 8616416

Int. Cl.[4] A61F *2/54, 2/06*

U.S. Cl. 623—66 **2 Claims**

1. A polyurethane medical prosthesis which is an electrostatically spun product comprising a structure of fibrous polyurethane material wherein the polyurethane material in the individual fibers is at least partially crosslinked with the a vaporizable halo-alkylisocyanate,

wherein there is substantially no crosslinking between the fibers.

4,904,273

FOAM TREATMENT

Alfred E. Laubenauer, Horn, Switzerland, assignor to Adnovum AG, Switzerland

PCT No. PCT/EP86/00242, § 371 Date Dec. 12, 1986, § 102(e) Date Dec. 12, 1986, PCT Pub. No. WO86/06424, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 21, 1986, Ser. No. 23,121

Claims priority, application United Kingdom, Apr. 23, 1985, 8510296

Int. Cl.[4] D06L *3/06*

U.S. Cl. 8—108.1 **10 Claims**

1. A peroxide bleaching method for a textile substrate, said method comprising the steps:

(a) providing a substrate having a water content of not more than about 30% below and not more than about 50% above a Foam Transit Water Content applicable to said substrate.

(b) preparing an alkaline hydrogen peroxide composition;

(c) preparing a foam of said composition;

(d) applying said foam to said substrate under pressure; and

(e) subjecting said substrate to a heat treatment process with an active heat transfer medium having a temperature higher than that of said foam-containing substrate.

4,904,274

COLORING HAIR WITH AMINOALKYL-OR AMINOHYDROXYALKYL-CATECHOLS

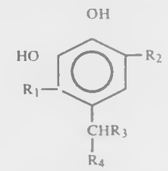
Thomas M. Schultz, Highland Mills, N.Y.; Leszek J. Wolfram, Stamford; Keith C. Brown, New Canaan, both of Conn., and Giuseppe Prota, Naples, Italy, assignors to Clairol Incorporated, Stamford, Conn.

Filed May 12, 1988, Ser. No. 193,694

Int. Cl.[4] A61K *7/13*

U.S. Cl. 8—406 **16 Claims**

1. A process for coloring hair which comprises treating said hair with a metal salt capable of assisting the conversion of a catechol compound to a melanin-like material and an aminoalkyl- or aminohydroxyalkyl-catechol having the formula:



wherein:

(a) R_1 and R_2 are radicals selected from the group consisting of H, OH, alkyl, alkoxy, alkoxyalkyl, NO_2, —COOH and carboalkoxy;

(b) R_3 is selected from the group consisting of R_1 and NH_2;

(c) R_4 is selected from the group consisting of H, $-CH_2NHR_5$, —CHOHNHR$_5$, —CH(alkyl)NHR$_5$, —CH(NHR$_2$) NHR$_5$, CH(NO$_2$)NHR$_5$, —CH(alkoxy)NHR$_5$, CH(NHR$_2$)NHR$_5$, —CH(alkoxy)NHR$_5$ —CH(carboxy)NHR$_5$, —CH(carboalkoxy)NHR$_5$), —CH(aryl)NHR$_5$ —CH(aryloxy)NHR$_5$, or —CH(halogen)NHR$_5$; wherein R_5 is selected from H, alkyl or aryl, and wherein

(d) at least one of R_1, R_2, R_3 or R_4 is an amino group bonded to a ring carbon atom of said formula through an alkylene bridging group.

4,904,275

HAIR DYEING COMPOSITION BASED ON OXIDATION DYES AND BIO-HETEROPOLYSACCHARIDES

Jean F. Grollier, Paris, France, assignor to L'oreal, Paris, France

Continuation of Ser. No. 811,763, Dec. 20, 1985, abandoned.

This application Dec. 10, 1987, Ser. No. 132,652

Claims priority, application Luxembourg, Dec. 21, 1984, 85705

Int. Cl.[4] A61K *7/13;* **C08L** *5/00*

U.S. Cl. 8—408 **12 Claims**

1. In combination,

(A) a dyeing composition for keratinous fibres and especially for human hair, said dyeing composition being intended to be mixed at the time of use with an oxidation composition containing an oxidizing agent, containing 0.001 to 10% by weight of at least one oxidation dye precursor relative to the total weight of the dyeing composition and 0.1 to 5% by weight of at least one water-soluble bio-heteropolysaccharide, relative to the total weight of the dyeing composition in a cosmetically acceptable medium, with the proviso that the dyeing composition does not contain an oxidizing agent which develops the at least one oxidation dye precursor, the said bio-heteropolysaccharide being a xanthan gum having a viscosity of between 850 and 1,650 cP for an aqueous composition containing 1% of xanthan gum, measured in a Brookfield LVT viscometer at 60 rpm and a molecular weight of between 1,000,000 and 50,000,000; and

(B) an oxidation composition containing an oxidizing agent which develops the at least one oxidation dye precursor of the dyeing composition.

4,904,276

NITROAMINOPHENOLS, THE PROCESS FOR PREPARATION THEREOF AND THEIR USE IN DYEING KERATINOUS FIBRES, AND NEW INTERMEDIATE NITROAMINOBENZENES AND THEIR USE IN DYEING KERATINOUS FIBRES

Alex Junino, Livry-Gargan; Gérard Lang, Saint-Gratien, and Alain Genet, Aulnay-sous-Bois, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 850,692, Apr. 11, 1986, Pat. No. 4,749,379.

This application Apr. 21, 1988, Ser. No. 191,075

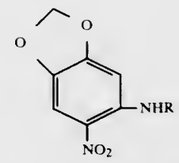
Claims priority, application Luxembourg, Apr. 16, 1985, 85853

Int. Cl.[4] A61K *7/13*

U.S. Cl. 8—429 **36 Claims**

2. A process for direct dyeing human hair comprising applying to said hair in an amount sufficient to dye said hair a composition comprising, in a cosmetically acceptable medium and in an amount ranging from 0.001 to 5 weight percent based on the total weight of said composition, at least one compound of formula II

(II)



wherein R represents hydrogen, alkyl having 1–6 carbon atoms, hydroxyalkyl having 1–6 carbon atoms, polyhydroxyalkyl having 2–6 carbon atoms or alkoxy alkyl wherein the alkoxy moiety has 1–3 carbon atoms and the alkyl moiety has 1–6 carbon atoms, permitting said composition to remain in contact with said hair for a period of time ranging from 5 to 40 minutes, rinsing said hair and drying said hair.

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4,904,277

REHYDRATING INHIBITORS FOR PREPARATION OF HIGH-SOLIDS CONCENTRATION LOW RANK COAL SLURRIES

Mitri S. Najjar, Hopewell Junction; James R. Pascoe, Wappingers Falls, both of N.Y., and Ralph Garcia, Gulf Port, Fla., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 17, 1986, Ser. No. 840,233
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 **3 Claims**

1. A method for preparing a high solids content low rank coal of a coal/water slurry for a coal gasification process which method comprises:
(a) dehydrating a low rank coal feed with a solvent in the presence of an inert atmosphere of nitrogen at a temperature ranging from about 90° to about 110° C. and under a pressure of about 14.7 to about 1400 psi for a period of about 1.0 minute to about 1.0 hours;
(b) treating said dehydrated coal with about 10.0 wt % by weight of said coal of an alkanol selected from the group consisting of butanol, pentanol, hexanol, 2-ethyl-hexanol, hexadecanol, decyl and lauryl alcohol or combinations thereof rehydrating inhibitor; and
(c) adding between about 0.001 and about 3.0 wt. % of a surfactant to said treated coal, whereby the solids content of the coal/water slurry is increased from about 5 to about 20 wt. % and the BTU/lb of said coal feed is increased by about 5 percent to about 15 percent.

3. A method for preparing a high solids content low rank coal of a coal/water slurry for a coal gasification process which method comprises:
(a) dehydrating a low rank coal feed with a solvent in the presence of an inert atmosphere of nitrogen at a temperature ranging from about 90° to about 110° C. and under a pressure of about 14.7 to about 1400 psi for a period of about 1.0 minute to about 1.0 hour;
(b) treating said dehydrated coal with about 10.0 wt % by weight of said coal of a poly methyl methacrylate rehydrating inhibitor; and
(c) adding between about 0.001 and about 3.0 wt % of a surfactant to said treated coal, whereby the solids content of the coal/water slurry is increased from about 5 to about 20 wt. % and the BTU/lb of said coal feed is increased by about 5 percent to about 15 percent.

4,904,278

MODIFIED SUCCINIMIDES

Robert H. Wollenberg, San Rafael, and Frank Plavac, Novato, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 722,939, Apr. 12, 1985, Pat. No. 4,612,132, which is a continuation-in-part of Ser. No. 632,777, Jul. 20, 1984, abandoned. This application May 16, 1986, Ser. No. 864,166
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—63 **62 Claims**

1. A fuel composition comprising a hydrocarbon boiling in the gasoline or diesel range and from 10 to 10,000 parts per million of a polyamino alkenyl or alkyl succinimide wherein one or more of the nitrogens of the polyamino moiety is substituted with a hydroxyhydrocarbyl oxycarbonyl wherein the hydroxyhydrocarbyl group of said hydroxyhydrocarbyl oxycarbonyl contains from 2 to 20 carbon atoms and 1 to 6 hydroxy groups with the proviso that there is no hydroxy substitution on the hydrocarbyl carbon atom attaching the hydroxyhydrocarbyl group to the oxy atom of the oxycarbonyl group and with the further proviso that when more than one hydroxy group is contained in the hydroxyhydrocarbyl group, no more than one hydroxy group is attached to the same carbon atom and the number of carbon atoms in the hydroxyhydrocarbyl group is minimally one greater than the number of hydroxy groups.

4,904,279

HYDROCARBON FUEL COMPOSITION CONTAINING CARBONATE ADDITIVE

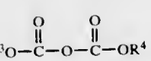
Diane D. Kanne, Yorba Linda, and Ross Y. Iwamoto, Huntington Beach, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Jan. 13, 1988, Ser. No. 143,516
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[4] C10L *1/18*
U.S. Cl. 44—70 **29 Claims**

1. A composition comprising:
(a) a particulate emissions reducing amount of an additive comprising at least two carbonates, a first of said carbonates having the general formula:



wherein R_1 and R_2 are the same or different monovalent non-aromatic organic radicals with between 1 and 10 carbon atoms, with the second carbonate compound being a dicarbonate having the general formula:



wherein R_3 and R_4 are the same or different monovalent non-aromatic organic radicals with between 1 and 10 carbon atoms, said dicarbonate being present in an amount between 0.5 and 10 parts, by volume, for each part of said first carbonate; and
(b) a liquid hydrocarbon fuel heavier than gasoline, said carbonate additive constituting between about 0.1 and about 49.9 weight percent of the total weight of the composition.

4,904,280

CONDITIONING BLOCK FOR SHARPENING STONES

Stanley W. Cygan, and Muni S. Ramakrishnan, both of Northboro, Mass., assignors to Norton Company, Worcester, Mass.

Filed Jul. 18, 1988, Ser. No. 220,637
Int. Cl.[4] B24D *3/00*
U.S. Cl. 51—296 **4 Claims**

1. A porous slab for reconditioning cutting tool sharpening stones comprising abrasive grain and a foamed organic polymer bond therefor, said porous slab having an amount of porosity of from 40% to 80%, said abrasive grain having a grit size of from about 46 to about 220 based on U.S. Standard Sieve Series.

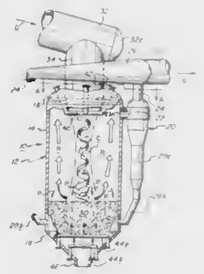
4,904,281

METHOD AND APPARATUS FOR SEPARATION OF SOLIDS FROM A GASEOUS STREAM

Michael F. Raterman, Doylestown, Pa., assignor to Engelhard Corporation, Edison, N.J.

Filed Jul. 15, 1988, Ser. No. 219,955
Int. Cl.[4] B01D *45/12*; C10G *11/18*
U.S. Cl. 55—1 **24 Claims**

1. A method for separating particulate solids from a gaseous stream laden with the solids, the method comprising:
(a) passing a solids-laden gaseous stream to a containment vessel, said vessel comprising a containment wall and defining a first separation zone comprised of (i) a substantially vertical, elongate core zone and (ii) an annular return zone having an upper portion, the return zone encircling the core zone and separating it from the containment wall, and discharging to the solids-laden gaseous stream with a swirling movement in downward flow into and through the core zone;
(b) reversing the direction of flow of the gaseous stream emerging from the core zone and flowing the emerging gaseous stream in an upward direction through the annular return zone to the upper portion thereof, thereby separating at least some of said solids from the gaseous stream to provide a solids-depleted, first stage gaseous stream;



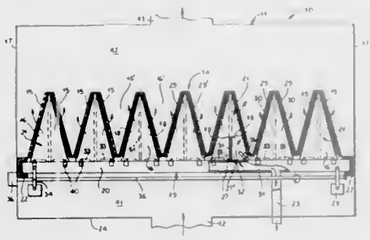
(c) maintaining at the bottom of the core zone a bed of the solids separated from the gaseous stream and effectuating the reversing of step (b) by impinging the swirling gaseous stream onto the bed of separated solids; and
(d) withdrawing the first stage gaseous stream from the upper portion of the return zone of the containment vessel and separately withdrawing from the containment vessel solids therein separated from the gaseous stream.

4,904,282

FILTER APPARATUS AND METHOD OF OPERATING SAME

Helmut Stüble, Stuttgart; Heinz Burkhardt, Tamm, and Josef Velinsky, Kornwestheim, all of Fed. Rep. of Germany, assignors to LTG Lufttechnische GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 15, 1988, Ser. No. 207,260
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1987, 3730788
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—96 **20 Claims**



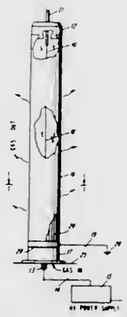
1. A filter apparatus for removing fiber fragments from air drawn from a region of a textile machine, comprising:
a filter housing;
a fixed filter collector in said housing formed with a plurality of active filter portions permeable to air and having generally extended surfaces upon which textile fragments collect, each surface having a recess defined by two side walls inclined to one another;
an inlet on said housing through which air entraining filter fragments is drawn into said housing and an outlet on said housing through which air freed from said fragments is discharged from said housing after passing through said fixed filter collector and depositing said filter fragments on said surfaces; and
pneumatic cleaning means in said housing for separately cleaning said surfaces of said active filter portions, said pneumatic cleaning means including:
a plurality of suction devices juxtaposed with said surfaces of said portions on a side thereof upon which said fiber fragments collect, said suction devices with adjoining walls forming a suction nose projecting into said recess, said suction nose capable of cleaning across a full width and movable vertically along a full length of said recess,
guide means in said housing forming a straight linear guide path extending generally parallel to a longitudinal dimension of said one of said portions,
means for displacing said suction device along said straight guide path, said suction device extending along said one of said portions in a direction transverse to the direction of displacement of said suction device along said guide path,
means for applying suction to said device so that fiber fragments accumulated on said surface of said one of said portions are evacuated therefrom through said suction device and said one of said portions is cleaned in a single movement of said suction device in a straight line, and
means for selectively applying suction and automatically operating said suction devices individually in succession and in a predetermined sequence during a cleaning cycle.

4,904,283

ENHANCED FABRIC FILTRATION THROUGH CONTROLLED ELECTROSTATICALLY AUGMENTED DUST DEPOSITION

Louis S. Hovis, Cary; Norman Plaks, Raleigh, and Bobby E. Daniel, Durham, all of N.C., assignors to Government of the United States as represented by Administrator Environmental Protection Agency, Washington, D.C.

Continuation of Ser. No. 129,395, Nov. 24, 1987, abandoned, which is a continuation of Ser. No. 824,817, Jan. 31, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 257,119
Int. Cl.[4] B03C *3/00*
U.S. Cl. 55—131 **5 Claims**



1. An electrostatically enhanced fabric filtration system utilizing a high voltage source for separating particulate matter from a gas stream, comprising:
a substantially cylindrical fabric filter element having a first end and a second end and comprised at least in part of a grounded electrically conductive material;

a substantially rigid and substantially cylindrical open-ended metal sleeve member so attached to the first end of said filter element as to maintain said first end in open condition for communication therewith, said sleeve having a gas inlet aperture open to the interior of said sleeve and said filter element such that a particulate laden gas stream may flow through said aperture and said sleeve to the interior of the filter element;

a closure means at the second end of said filter element maintaining said second end in closed condition;

a linear corona electrode connected to said high voltage source to receive a high voltage therefrom relative to ground, coaxially disposed within said filter element and having one end attached to the closure means at the second end of the filter element and having its other end extended through said gas inlet aperture, said sleeve and said first end of said filter element;

an electrical insulating means interposed between said corona electrode and said closure means, whereby said electrode is electrically insulated from said filter element at said second end thereof;

an electrical insulating means surrounding said corona electrode for insulating said corona electrode from said sleeve at the region where the electrode extends through the gas inlet aperture and the sleeve;

whereby a corona discharge is generated along said corona electrode when a high voltage is applied to said corona electrode, said corona discharge providing an electrical charge to the particulate matter entering the filter element and simultaneously generating an electrostatic field between the corona electrode and said grounded electrically conductive material that is a part of said fabric filter element, whereby the charged particles are attracted toward an inside surface of the filter element under the influence of the electrostatic field.

4,904,284

CENTRIFUGAL TYPE GAS-LIQUID SEPARATOR

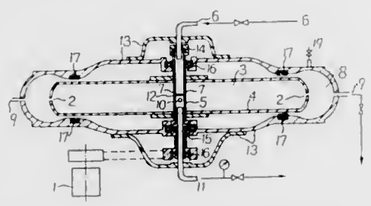
Osamu Hanabusa, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 307,287

Claims priority, application Japan, Feb. 16, 1988, 63-31799

Int. Cl.[4] B01D *19/00*

U.S. Cl. 55—165 **5 Claims**



1. A centrifugal type gas-liquid separator comprising:

a rotatable hollow disc-shaped gas-liquid separation chamber having a separated liquid outlet on its outer circumferential surface,

a housing surrounding said gas-liquid separation chamber liquid-tightly outside thereof so as not to restrain its rotation and liquid-tightly defining a reservoir chamber for separated liquid between the inner circumference of its outer portion and the outer circumference of said gas-liquid separation chamber,

a separated liquid extraction port through which separated liquid can be extracted continuously from said reservoir chamber of said housing,

tubular rotary shafts inserted at the proximity of the rotary center axis of said gas-liquid separation chamber along said rotary center axis from opposite sides of said separation chamber for feeding gas-liquid mixture fluid into siad gas-liquid separation chamber through one of said tubular rotary shafts and for ejecting separated gas through the other said tubular totary shaft, and

means actuated by separated liquid within said disc-shaped gas-liquid separation chamber for extracting the separated liquid through said separated liquid outlet on the outer circumference of said gas-liquid separation chamber.

4,904,285

DEAERATOR FOR PARTICULATES

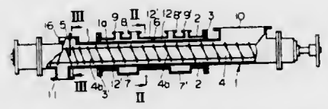
Yasuo Yamada; Mamoru Nakayama, and Kazuo Sagara, all of Kitakyushu, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,760

Claims priority, application Japan, Jul. 29, 1987, 62-187729; May 30, 1988, 63-130215

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—191 **17 Claims**



1. A deaerator for particulate materials comprising:

a cylindrical body having a charge port at one end, a discharge port at the other end, and a perforated cylindrical section intermediate its ends, said perforated cylindrical section including a filter;

an outer cylinder surrounding said intermediate section to define an evacuation chamber therebetween, said evacuation chamber having an evacuation opening and a compressed air opening; and

a screw conveyor rotatably mounted within said cylindrical body to transport particulates from said charge port to said discharge port upon rotation, said screw conveyor extending from said charge port to said discharge port and having a basic screw pitch section and a gradually decreasing reduced screw pitch section, said basic screw pitch section having a substantially uniform screw pitch and extending from said charge port to a downstream end of said perforated cylindrical section, and said reduced pitch section extending between the downstream end of said perforated cylindrical section and said discharge port.

4,904,286

CYCLONE SEPARATOR HAVING WATER-STEAM COOLED WALLS

Byram J. Magol, Covent Station; John D. Fay, Randolph, and Michael Garkawe, Madison, all of N.J., assignors to Foster Wheeler Energy Corporation, Clinton, N.J.

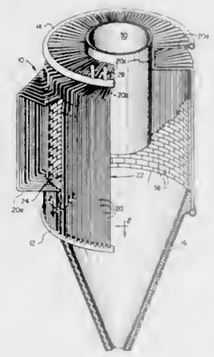
Continuation-in-part of Ser. No. 69,930, Jul. 6, 1987, Pat. No. 4,746,337. This application Apr. 11, 1988, Ser. No. 179,818

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[4] B01D *45/12*

U.S. Cl. 55—269 **7 Claims**

1. A cyclone separator comprising an inner cylinder, an outer cylinder extending around said inner cylinder in a coaxial relationship to define an annular chamber between the two cylinders, said outer cylinder comprising a plurality of tubes extending vertically and circumferentially in a parallel relationship for at least a portion of their lengths, a first ring header connected to the upper ends of said tubes and a second ring header connected to the lower ends of said tubes for circulating a cooling fluid through said outer cylinder, means for directing gases containing solid particles through said annular chamber for separating the solid particles from said gases by centrifugal forces, the separated gases exiting through said inner cylinder and the separated solids falling to the bottom of said outer cylinder for disposal or recycle, the upper end portions of said tubes being bent radially inwardly towards said inner cylinder and radially outwardly to form a roof for said annular chamber, and means for passing water or steam or a steam and water mixture through said ring headers and said tubes to cool said outer cylinder.



4,904,287

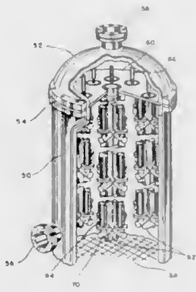
COMPACT CERAMIC TUBE FILTER ARRAY HIGH-TEMPERATURE GAS FILTRATION

Thomas E. Lippert, Marysville, Pa., and David F. Ciliberti, deceased, late of Marysville, Pa. (by Paula Ciliberti, executrix), assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Dec. 22, 1988, Ser. No. 288,698

Int. Cl.[4] B01D *46/24*

U.S. Cl. 55—302 **7 Claims**



1. A hot gas filter system comprising

a pressure vessel including an internal wall dividing said pressure vessel into first and second vessel portions,

a gas inlet for directing a hot gaseous stream having particulate matter entrained therein into said first portion and a gas outlet for exhausting a filtered gaseous stream from said second vessel portion,

a plurality of gas filter units supported by said internal wall and extending into said first vessel portion, each filter unit including

a central gas plenum having an outer wall with one end of said outer wall attached to said internal wall,

a plurality of filter modules supported by said central gas plenum, each module including

a ceramic tube having one closed end and one open end and a flange around said open end, and support means extending from said central gas plenum for supporting said ceramic tube and communicating gas between said ceramic tube and said central gas plenum, said support means including a seat for receiving said flange, and means for maintaining said flange in said seat including weight means on said closed end of said tube, and

means for periodically applying a backflow of gas through said plurality of gas filter units to said ceramic tubes for dislodging particulate matter from the outer surface of said tubes.

4,904,288

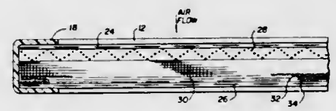
FILTER ELEMENT FOR CIRCULATING AIR SYSTEMS

Robert D. d'Augereau, 90 Luke Dr., 106-C, Lafayette, La. 70506, assignor to Mike D. Shoffiett and Robert D. d'Augereau, both of Rayne, La.

Filed Jun. 21, 1989, Ser. No. 369,148

Int. Cl.[4] B01D *46/10*

U.S. Cl. 55—485 **6 Claims**



1. A reusable air filter assembly for removing solid particles entrained in and flowing with an air stream to be filtered, comprising,

an inlet stage filter medium consisting of a single layer of fabric woven from polypropylene yarn in an egg-crate pattern producing high and low surface areas in the direction of air flow through the filter assembly,

an outlet stage filter medium consisting of two layers of fabric woven from polypropylene yarn in an egg-crate pattern producing high and low surface areas in the direction of air flow through the filter, said two layers being in overlying relation with the egg-crate pattern producing air spaces between the two layers, the polypropylene yarn employed to weave the outlet stage filter medium being smaller and the weave substantially closer than in the first stage filter medium,

a low velocity precipitation chamber between said inlet stage filter medium and said outlet stage filter medium, said low velocity precipitation chamber being defined and maintained by a layer of corrugated metal screen engaging and separating said inlet and outlet layer filter media, said low velocity precipitation chamber having a thickness, measured in the direction of flow of air through the filter, which is at least equal to the combined thickness of the filter media of the inlet and outlet stages,

expanded metal grid members extending over the inlet side of the inlet stage filter medium and the outlet side of the outlet stage filter medium, and

a rigid, corrosion resistant frame extending around the periphery of and supporting the filter assembly and said grid members.

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DEODORIZING APPARATUS

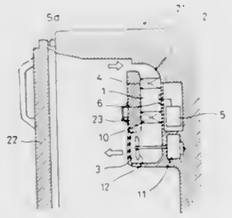
Junji Miyakami, Suita; Yuzo Yoshioka, Takatsuki; Kazuhiko Otozi, Yao; Hiroyasu Nakagawa, Kashihara; Toshiyuki Shirouzu, and Fumio Yada, both of Yao, all of Japan, assignors to Sharp Kabushki Kaisha, Osaka, Japan

Filed Mar. 11, 1988, Ser. No. 167,320

Claims priority, application Japan, Mar. 13, 1987, 62-37520; Mar. 25, 1987, 62-44989; Mar. 25, 1987, 62-44990; Apr. 17, 1987, 62-59013; Apr. 20, 1987, 62-60501; Apr. 21, 1987, 62-60369; Apr. 22, 1987, 62-60892; Apr. 24, 1987, 62-62918; Jul. 17, 1987, 62-110211

Int. Cl.[4] F24F *3/16*

U.S. Cl. 62—157 **30 Claims**



1. A deodorizing apparatus comprising:

a case having an air flow channel provided therein having an air inlet disposed at a first end of said air flow channel and an air outlet disposed at a second end of said air flow channel opposite to said first end;

an ozone generator disposed in said air flow channel between said air inlet and said air outlet, said ozone generator being of a discharge type;

first acceleration means disposed in said air flow channel adjacent to said air outlet for accelerating the decomposition of odors and ozone;

a fan disposed within said case;

an electric motor disposed with said case for driving said fan; and

second acceleration means disposed in said air flow channel adjacent to said air inlet for preventing an excess of ozone from flowing out by accelerating the decomposition of odors and ozone.

4,904,290

COBALT BASED ALLOYS WITH CRITICAL CARBON CONTENT FOR MAKING AND USING IN GLASS FIBER PRODUCTION

David J. Gaul, and Dennis L. McGarry, both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

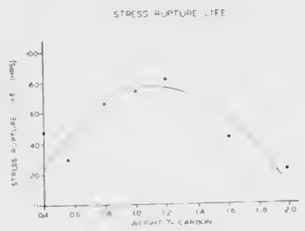
Filed Sep. 30, 1988, Ser. No. 251,281

Int. Cl.[4] C03B *37/04, 37/095*

U.S. Cl. 65—1 **18 Claims**

1. As a composition of matter a glass corrosion resistant, high strength, low creep alloy which is free of hafnium and yttrium and dysprosium and which consists essentially of the following elements in approximate amounts expressed in weight percent

chromium	33% to 40%
nickel	5% to 15%
tungsten	5% to 10%
tantalum	1.5% to 4%
zirconium	0.01% to 0.5%
carbon	0.75% to 1.3%
boron	0.005% to 0.5%



-continued

cobalt	Balance

and optionally containing 0–0.2% by weight silicon and 0–2% by weight of iron and incidental impurities.

11. A spinner for forming glass fibers from molten glass comprising an apertured wall formed from the composition of claim 1.

15. In a method of making mineral or glass fibers comprising passing molten material through a foraminous wall of a metal alloy spinner to form such fibers, the improvement wherein the spinner comprises the composition of claim 1.

4,904,291

PROCESS FOR THE MANUFACTURE OF OPEN POROUS SINTERED BODIES BEING PREPRONDERANTLY COMPOSED OF GLASS CERAMICS

Friedrich Siebers; Werner Kiefer, both of Mainz, and Maria Sura, Ingelheim, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Sep. 19, 1988, Ser. No. 246,360

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1987, 3731649

Int. Cl.[4] C03B *19/06;* **C03C** *10/04*

U.S. Cl. 65—18.1 **39 Claims**

1. A process for them manufacture of open porous sintered bodies at least predominantly consisting of glass ceramics comprising the steps of:

(a) mixing a sinterable powder with a ground crystallizable glass powder to form a main constituent, the sinterable powder comprising a ground solder glass having a viscosity which si below the viscosity of the crystallizable glass powder when heated to a sintering temperature

(b) adding to the main constituent an inorganic salt of defined grain size to form a molding material, the melting point of the salt being above the densification temperature of the sinterable powder,

(c) submitting the molding material to a molding process for the formation of a molded body,

(d) sintering the molded body in a sintering process to form a sintered body, the salt and sinterable powder being selected such that an ion exchange occurs between the salt and the sinterable powder during the sintering process,

(e) cooling the sintered body,

(f) leaching the salt contained in the sintered body to form pores within the body, and

(g) transforming the sintered body into a final glass-ceramic body having open pores.

4,904,292

SPHERULIZING FURNACE AND PROCESS OF MANUFACTURING VITREOUS BEADS

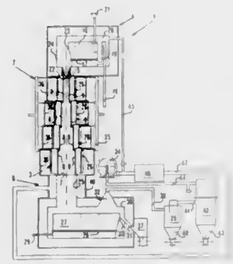
Hubert Neusy, Montignies-sur-Sambre, Belgium, assignor to Glaverbel, Brussels, Belgium

Filed Jul. 8, 1988, Ser. No. 216,647

Claims priority, application United Kingdom, Jul. 9, 1987, 8716189

Int. Cl.[4] C03B *19/10*

U.S. Cl. 65—21.3 **8 Claims**



5. A process for manufacturing vitreous beads, comprising:

providing fluidized particles of feedstock as a fluidized bed thereof in a feedstock reservoir provided with particle fluidizing means

delivering the fluidized particles of feedstock under gravity by fluidized overflow from the feedstock reservoir to a spherulizing zone of a spherulizing furnace;

spherulizing the fluidized particles of feedstock by passing same through the spherulizing zone where they are heated and converted to vitreous beads; and

collecting the vitreous beads.

4,904,293

PRODUCTION OF HIGH SILICA GLASS MICROSPHERES

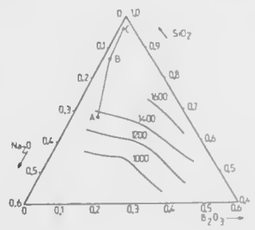
Patrick Garnier, Paris; Daniel Abriou, Gagny, and Benoit Beghin, Paris, all of France, assignors to Saint Gobain Vitrage, Courbevoie, France

Continuation-in-part of Ser. No. 20,800, Mar. 2, 1987, Pat. No. 4,778,502, which is a continuation-in-part of Ser. No. 747,141, Jun. 20, 1985, Pat. No. 4,661,137. This application Aug. 2, 1988, Ser. No. 227,401

Claims priority, application France, Aug. 5, 1987, 87 11126

Int. Cl.[4] C03B *19/10*

U.S. Cl. 65—21.4 **22 Claims**



1. A process for the production of hollow microspheres with a high silica content from a starting glass whose silica content is less than 80% by weight, with the balance being essentially boron oxide and one or more alkaline oxides, which process comprises:

grinding the starting glass into fine particles;

passing these fine particles through the flame of a burner at a temperature of at least about 1500° C. but less than about 1750° C. to form molten hollow microspheres;

suddenly cooling the molten hollow microspheres to solid hollow microspheres;

recovering the microspheres; and

contacting the recovered microspheres with a gaseous dealkalization agent of a temperature greater than 200° C. but below that which would alter the structure of the microspheres to increase the silica content of the microspheres to at least 92%.

4,904,294

BELT ASSISTED PRESS BENDING

Stephen J. Schultz, Pittsburgh; Terry L. Wolfe, Allison Park, both of Pa., and Richard E. Wilhelm, Galion, Ohio, assignors to PPG Industries, INc., Pittsburgh, Pa.

Filed Dec. 22, 1988, Ser. No. 288,348

Int. Cl.[4] C03B *23/03*

U.S. Cl. 65—106 **22 Claims**

1. A method of shaping heat softenable sheet material comprising:

heating said sheet material;

transferring said sheet onto an advancing flexible support such that there is no relative movement between said sheet and said portions of said advancing support supporting said sheet;

continuing to advance said support to position said sheet relative to a horizontally stationary upper shaping surface;

stopping said advancing of said flexible support; and

moving said flexible support and said shaping surface toward each other to urge said sheet against said shaping surface to shape said sheet between said flexible support and said shaping surface.

20. An apparatus for shaping softenable sheet material comprising:

a shaping surface;

a compliant support member;

a scissored table with first and second scissor arrangements positioned along opposing sides of said table wherein each of said scissor arrangements include a first arm with a first end supporting an upstream portion of said support member, pinned to a second arm supporting a downstream portion of said support members;

means to pivot each of said first and second arms of said scissor assemblies relative to each other from a first position wherein said support member assumes an initial configuration to a second position wherein said support member assumes a different configuration; and

means to move said support member and said shaping surface relative to each other to urge said support member against said shaping surface and generally conform said support member to said shaping surface.

4,904,295

SELECTIVE WEED CONTROL IN CEREAL GRAIN CROPS

Paul G. Mayland, Fargo, N. Dak., assignor to Hoechst Roussel Pharmaceuticals, Inc., Somerville, N.J.

Filed Jun. 15, 1988, Ser. No. 207,975

Int. Cl.[4] A01N *43/52*

U.S. Cl. 71—88 **30 Claims**

1. A method of protecting a cereal grain crop plant from a weed which comprises applying to the plants or their environment a composition comprising effective herbicidal and antiphytotoxic amounts of Fenoxaprop-ethyl, 2,4-D and MCPA, where the proportions of the components based on weights are within the range of Fenoxaprop-ethyl:2,4-D:MCPA = 1.0:0.2–5.0:0.3–5.0.

4,904,296

FUNGICIDAL AND PLANT GROWTH-REGULATING NOVEL SUBSTITUTED 1-HYDROXYALKYL-AZOLYL DERIVATIVES

Graham Holmwood; Erik Regel, both of Wuppertal; Gerhard Jäger, Leverkusen; Karl H. Büchel, Burscheid; Klaus Lürssen, Bergisch Gladbach; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

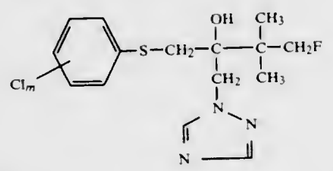
Filed Nov. 17, 1987, Ser. No. 121,552

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202601

Int. Cl.[4] A01N *43/653;* C07D *249/08*

U.S. Cl. 71—92 **4 Claims**

1. A substituted 1-hydroxyalkylazolyl-derivative of the formula



(I)

in which
m is 1 or 2,
or an addition product thereof with an acid or metal salt.

4,904,297

COMBATING FUNGI WITH SUBSTITUTED 1-AZOLYL-BUTAN-2-ONES AND -2-OLS

Wolfgang Kramer, Wuppertal; Karl H. Büchel, Burscheid; Hans-Ludwig Elbe, Wuppertal; Udo Kraatz, Leverkusen; Erik Regel, Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Klaus Lürssen, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

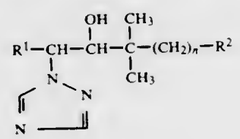
Filed Mar. 18, 1988, Ser. No. 169,912

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048266; Dec. 20, 1980, 3048267

Int. Cl.[4] A01N *43/653;* C07D *249/08*

U.S. Cl. 71—92 **8 Claims**

1. A substituted 1-azolyl-butan-2-ol of the formula



in which
R[1] is benzyl or chlorobenzyl,
R[2] is methoxycarbonyl, ethoxycarbonyl, isopropoxycarbonyl
n is 0 or 1,
or an acid addition salt or metal salt complex thereof.

4,904,298

1-HYDROXYETHYL-AZOLE COMPOUNDS AND AGRICULTURAL COMPOSITIONS

Graham Holmwood, Wuppertal; Karl H. Büchel, Burscheid; Klaus Lürssen, Berg-Gladbach; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

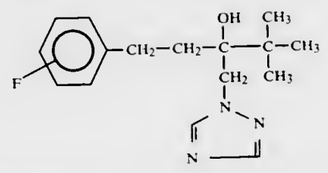
Division of Ser. No. 621,968, Jun. 18, 1984, Pat. No. 4,723,984, which is a division of Ser. No. 549,867, Nov. 8, 1983, which is a continuation of Ser. No. 260,479, May 4, 1981, abandoned. This application Jun. 5, 1987, Ser. No. 58,479

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018866; Feb. 19, 1981, 3106076

Int. Cl.[4] A01N *43/653;* C07D *249/08*

U.S. Cl. 71—92 **8 Claims**

1. A 1-hydroxyethyl-azole of the formula



or an acid addition salt or metal salt complex thereof.

4,904,299

HERBICIDAL N-HYDROXY-N'-SULFONYLGUANIDINES

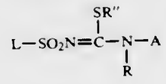
Rafael Shapiro, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Division of Ser. No. 60,212, Jun. 10, 1987, Pat. No. 4,750,930, which is a division of Ser. No. 736,950, May 22, 1985, Pat. No. 4,689,070, which is a continuation-in-part of Ser. No. 551,381, Nov. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 455,504, Jan. 4, 1983, abandoned. This application Feb. 17, 1988, Ser. No. 156,891

Int. Cl.[4] C07D *239/42, 401/12, 409/12;* A01N *43/54*

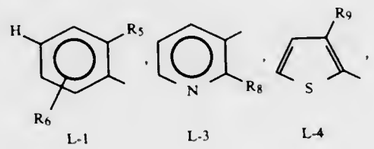
U.S. Cl. 71—92 **4 Claims**

1. A compound having the formula



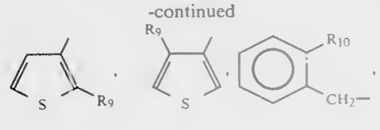
(I)

wherein
R is H or CH_3;
R'' is C_1–C_3 alkyl;
L is

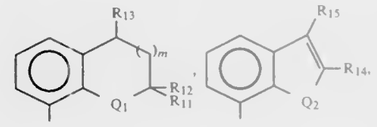


L-1 L-3 L-4

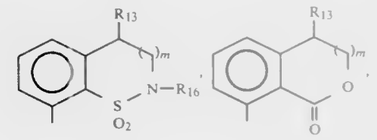
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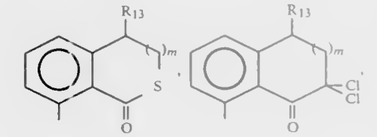
L-5 L-6 L-7



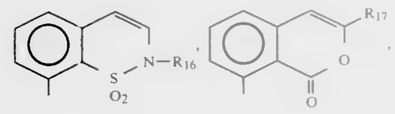
L-8 L-9



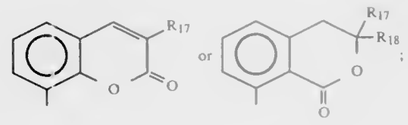
L-10 L-11



L-12 L-13

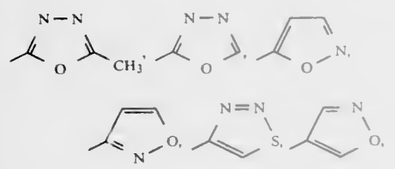


L-14 L-15

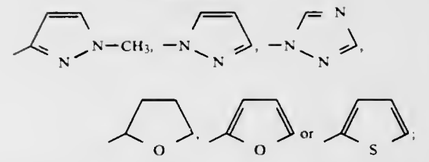


L-16 L-17

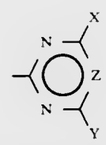
R_5 is C_3–C_4 alkyl, C_3–C_4 alkoxy, $OCH_2CH_2OCH_3$, F, Cl, Br, NO_2, CF_3, CO_2R_{19}, $SO_2NR_{20}R_{21}$, $SO_2N(OCH_3)CH_3$, OSO_2R_{22}, $S(O)_nR_{23}$, WCF_3, $WCHF_2$, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_1–C_2 alkyl substituted with OCH_3 or OCH_2CH_3, C_6H_5,



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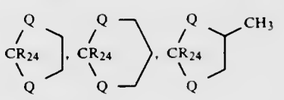


R_6 is H, F, Cl, Br, CF_3, CH_3, OCH_3, SCH_3 or OCF_2H;
R_8 is CH_3, CH_2CH_3, OCH_3, OCH_2CH_3, F, Cl, Br, $SO_2NR_{20}R_{21}$, $SO_2N(OCH_3)CH_3$ or $S(O)_nR_{23}$;
R_9 is C_2–C_3 alkyl, F, Cl, Br, NO_2, CO_2R_{19}, $SO_2NR_{20}R_{21}$, $SO_2N(OCH_3)CH_3$ or $S(O)_nR_{23}$;
R_{10} is Cl, NO_2, CO_2CH_3, $CO_2CH_2CH_3$, $SO_2N(CH_3)_2$, OSO_2CH_3, SO_2CH_3, $SO_2CH_2CH_3$, OCH_3 or OCH_2CH_3;
R_{11} is H, CH_3 or CH_2CH_3;
R_{12} is H, CH_3 or CH_2CH_3;
R_{13} is H or CH_3;
R_{14} is H or CH_3;
R_{15} is H or CH_3;
R_{16} is CH_3 or CH_2CH_3;
R_{17} is H or C_1–C_4 alkyl;
R_{18} is H or CH_3;
R_{19} is C_1–C_4 alkyl, $CH_2CH_2OCH_3$, CH_2CH_2Cl or $CH_2CH{=}CH_2$;
R_{20} is C_1–C_3 alkyl;
R_{21} is C_1–C_3 alkyl;
R_{22} is C_1–C_3 alkyl or $N(CH_3)_2$;
R_{23} is C_1–C_3 alkyl or $CH_2CH{=}CH_2$;
m is 0 or 1;
n is 0 or 2;
Q_1 is O, S, SO_2 or NR_{17};
Q_2 is O, S or NR_{17}; and
W is O, S or SO_2;
A is



A-1

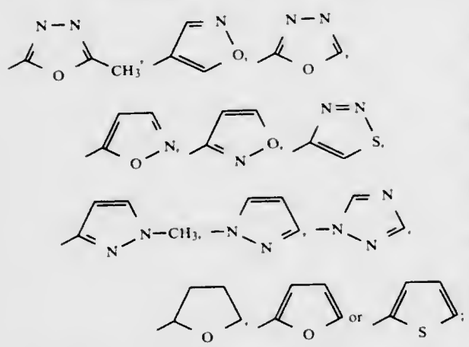
X is CH_3, OCH_3, OCH_2CH_3, Cl, F, Br, OCF_2H, CH_2F or CF_3;
Y is H, CH_3, OCH_3, OCH_2CH_3, CH_2OCH_3, $CH_2OCH_2CH_3$, $N(CH_3)_2$, CH_2CH_3, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, OCH_2CF_3, $OCH_2CH_2OCH_3$, CH_2SCH_3, OCF_2H, SCF_2H, $CR_{24}(QCH_3)_2$,



or $CR_{24}(QCH_2CH_3)_2$;
Q is O or S;
R_{24} is H or CH_3;
Z is CH;
provided that
(1) the total number of carbon atoms of R_{20} and R_{21} is less than or equal to four;
(2) when m is 1, then R_{13} is H;
(3) when L is L-17, then R_{17} and R_{18} are not simultaneously H;
(4) when X is Cl, F or Br, then Z is CH and Y is OCH_3, OCH_2CH_3, $N(CH_3)_2$ or OCF_2H;
(5) when X or Y is OCF_2H, then Z is CH;

provided that

(1) when L is L-1, then R_5 is C_2-C_4 alkyl, C_2-C_4 alkoxy, $OCH_2CH_2OCH_3$, OSO_2R_{22}, $S(O)_nCH_2CH{=}CH_2$, WCF_2, $WCHF_2$, C_3-C_4 alkenyloxy, C_3-C_4 alkynyloxy, C_1-C_2 alkyl substituted with OCH_3 or OCH_2CH_3,



(2) when L is L-3, then R_8 is $SO_2NR_{20}R_{21}$, $SO_2N(OCH_3)CH_3$ or SO_2R_{23};

(3) when L is L-4, L-5 or L-6, then R_9 is C_1-C_3 alkyl, F, Cl, Br, NO_2, $SO_2NR_{20}R_{21}$, $SO_2N(OCH_3)CH_3$ or $S(O)_nR_{23}$.

4. A method for the control of undesired vegetation which comprises applying to the locus of the undesired vegetation a herbicidally effective amount of a compound of claim 1.

4,904,300

IMIDAZOLE DERIVATIVES

Hans-Dieter Schneider, Weil am Rhein, Fed. Rep. of Germany; William R. Lutz, Riehen; Henry Szczepanski, Wallbach, both of Switzerland, and Werner Töpfl, Dornach, Switzerland, assignors to Ciba-Geigy Corp., Ardsley, N.Y.

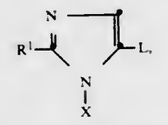
Filed Aug. 17, 1988, Ser. No. 233,299

Claims priority, application Switzerland, Aug. 26, 1987, 03262/87

Int. Cl.[4] A01N *43/50;* **C07D** *405/04*

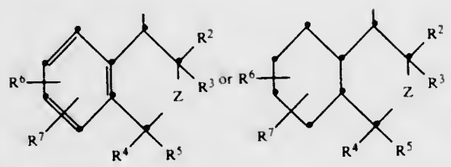
U.S. Cl. 71—92 **26 Claims**

1. Imidazole derivatives of formula I



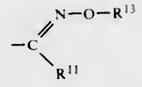
(I)

the stereochemically isomeric forms thereof, and salts thereof, in which X is a radical of the formula



R^1 is hydrogen or —SH, and

L is cyano, —COOH, —$COOR^8$, —$COSR^8$, —$CONR^9R^{10}$, —$CO{-}R^{11}$, —$CH_2{-}O{-}R^{12}$ or a group



Z is oxygen, sulfur, —SO—, or —SO_2—

each of R^2 and R^2, independently of the other, is hydrogen, C_1-C_4alkyl, C_2-C_4alkenyl or C_2-C_4alkynyl or together they form a spirocyclically linked C_2-C_6alkylene chain,

each of R^4 and R^5, independently of the other, is hydrogen or C_1-C_4alkyl or together they form an oxo function,

R^6 is hydrogen, cyano, halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylthio, C_1-C_4haloalkylthio or nitro,

R^7 is hydrogen, C_1-C_4alkoxy, halogen or C_1-C_4alkyl,

R^8 is C_1-C_6alkyl, C_3-C_7cycloalkyl, C_2-C_6alkoxyalkyl, benzyl, —$CR^{15}R^{16}$—C_2-C_4alkenyl or —$CR^{15}R^{16}$—C_2-C_4alkynyl,

R^9 is hydrogen, C_1-C_4alkyl, C_1-C_4alkoxy, phenyl, benzyl, —$CR^{15}R^{16}$—C_2-C_4alkenyl or —$CR^{15}R^{16}$—C_2-C_4alkynyl,

R^{10} is hydrogen or C_1-C_4alkyl, or

R^9 and R^{10} together with the nitrogen atom carrying them form a pyrrolidine, piperidine or morpholine radical,

R^{11} is C_1-C_6alkyl, C_3-C_7cycloalkyl, C_1-C_4haloalkyl, or phenyl that is unsubstituted or substituted by C_1-C_4alkyl, C_1-C_4alkoxy, nitro or by halogen,

R^{12} is hydrogen, C_1-C_6alkyl, phenyl that is unsubstituted or substituted by C_1-C_4alkyl, C_1-C_4alkoxy, halogen or by nitro, C_1-C_6alkylcarbonyl, C_1-C_4haloalkylcarbonyl, or benzoyl that is unsubstituted or substituted by C_1-C_4alkyl, C_1-C_4alkoxy, halogen or by nitro,

each of R^{15} and R^{16}, independently of the other, is hydrogen or C_1-C_4alkyl.

18. A method for selectively controlling weeds in crops of useful plants, which method comprises applying to the crops of useful plants a compound of formula 1 as defined in claim 1 in an amount that is herbicidally effective against the weeds.

4,904,301

5-FLUOROMETHYL-1,2,4-TRIAZOLO(1,5-A)-PYRIMIDINES

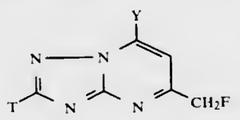
Norman R. Pearson, Walnut Creek; William A. Kleschick, Martinez, both of Calif., and Chrislyn M. Carson, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 19, 1988, Ser. No. 183,570

Int. Cl.[4] A01N *43/90;* **C07D** *487/04*

U.S. Cl. 71—92 **7 Claims**

1. A compound of the formula



wherein

Y represents H, Cl, OH, CH_3, C_2H_5, or OCH_3, and

T represents HS, (C_2-C_4)alkylthio, benzylthio, or $ClSO_2$.

4,904,302

ROLLER IN ROTARY COMPRESSOR AND METHOD FOR PRODUCING THE SAME

Soichi Shimomura, Yono, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

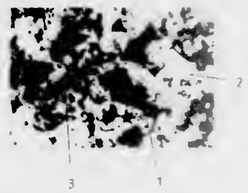
Filed Nov. 14, 1988, Ser. No. 270,652

Claims priority, application Japan, Nov. 20, 1987, 62-291746

Int. Cl.[4] C22C *29/12*

U.S. Cl. 75—233 **3 Claims**

1. A roller for use in a rotary compressor, which roller comprising a sintered body consisting essentially of 0.5-2.0% by weight of C, 1.0-5.0% by weight of Cu, 1.2-3.0% by weight of Mo and a balance of Fe and unavoidable impurities;



and wherein hard particles of Fe-Mo alloy are dispersed in one of pearlitic and tempering martensitic matrix, and sintered pores of said sintered body are sealed with tri-iron tetroxide.

4,904,303

WATER-DILUTABLE PRINTING INK BINDER SYSTEM AND USE THEREOF AS PRINTING INK

Albert Rudolphy, Wiesbaden, and Helmut Eckes, Eppstein/-Taunus, both of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Division of Ser. No. 924,355, Oct. 28, 1986, Pat. No. 4,792,356. This application Sep. 29, 1988, Ser. No. 251,662

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1985, 3538549

Int. Cl.[4] C09D *11/08*

U.S. Cl. 106—30 **6 Claims**

1. A printing ink containing printing additives selective from the group consisting of carbon black and colored pigments and a water-dilutable printing ink binder system based on a binder in the form of a clear and stable, dilute, ammoniacal or amine-containing solution, the binder being a product of reacting a natural ressin acid and formaldehyde in at least one stage, the amount of (100% strength) formaldehyde being 1 to 25% by weight, based on the natural resin acid, and the reaction having been carried out under atmospheric or superatmospheric pressure in the absence or in the presence of 0.1 to 2% by weight of a Lewis acid catalyst.

4,904,304

CHEMICAL GROUT FOR GROUND INJECTION AND METHOD FOR ACCRETION

Yoshitane Watanabe; Eiji Okumura, and Mikio Ando, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 137,940

Claims priority, application Japan, Dec. 29, 1986, 61-315855

Int. Cl.[4] C04B *14/04;* **C09K** *17/00*

U.S. Cl. 106—85 **15 Claims**

1. A chemical grout for ground injection, comprising:

an aqueous sol having an original pH of 8 to 10.5, said aqueous sol comprising (a) 5to 25% by weight of colloidal SiO_2 having a particle size of 3 to 7 mμ, (b) 0.05to 1.5% by weight of Na_2O and (c) water;

0.1 to 4.5 parts by weight of sulfamic acid per 100 parts by weight of said aqueous sol; and

0.2 to 10.0 parts by weight of a water soluble magnesium salt selected from the group consisting of magnesium sulfamate, magnesium sulfate and a mixture thereof per 100 parts by weight of said aqueous sol.

4,904,305

NOVEL ASPHALTIC COMPOSITION

Ludo Zanzotto, Calgary; Albert J. Faber, Lloydminster; Dennis P. Foley, Calgary; Royston B. Jeffries, Calgary, and R. David Watson, Calgary, all of Canada, assignors to Nova Husky Research Corporation, Calgary, Canada

Filed Dec. 9, 1988, Ser. No. 281,782

Claims priority, application Canada, Jan. 26, 1988, 557339

Int. Cl.[4] C08L *95/00*

U.S. Cl. 106—284 **14 Claims**



1. A novel asphaltic composition for use in road construction consisting of from about 2% to about 10% w/w of a hydrocracking residue and from about 98% to about 90% w/w of asphalt, said hydrocracking residue being the distillation residue obtained from a hydrocracking process of heavy crude oil and said asphalt being an asphalt with a penetration at 25° C. between 20 dmm and 600 dmm.

4,904,306

SEPARATION AND PURIFICATION OF GAMMA CYCLODEXTRIN

Robert N. Ammeraal, Worth, Ill., assignor to American Maize-Products Company, Hammond, Ind.

Filed Jul. 22, 1988, Ser. No. 223,267

Int. Cl.[4] C13K *13/00;* **C08B** *37/16*

U.S. Cl. 127—46.1 **3 Claims**

1. A process for separating and purifying gamma cyclodextrin comprising the sequential steps of:

(a) adding a precipitant to an aqueous solution containing gamma cyclodextrin;

(c) mixing the resulting aqueous solution containing gamma cyclodextrin and said precipitant for a period of about one to six days to form a precipitate containing gamma cyclodextrin;

(c) recovering said precipitate;

(d) washing the recovered precipitate with water;

(e) separating the precipitant from the washed precipitate in the presence of added water by heating; and

(f) passing the resulting product containing gamma cyclodextrin through a matrix upon which a gamma cyclodextrin inclusion compound has been bound to recover a substantially pure gamma cyclodextrin.

4,904,307

METHOD FOR MAKING BRANCHED CYCLODEXTRINS AND PRODUCT PRODUCED THEREBY

Robert N. Ammeraal, Worth, and Edward D. DeBoer, Sauk Village, both of Ill., assignors to American Maize-Products Company, Hammond, Ind.

Filed Aug. 15, 1988, Ser. No. 232,389

Int. Cl.[4] C13F *3/00, 5/00;* **C08B** *37/16;* **C13K** *13/00*

U.S. Cl. 127—63 **8 Claims**

1. A method for making branched cyclodextrin comprising:

(a) heating dried, crystalline cyclodextrin free of non-carbohydrate materials to a temperature between about 135° C. to about 220° C. to form a product containing branched cyclodextrin;

(b) cooling the product containing branched cyclodextrin; and

(c) separating the branched cyclodextrin from the product.

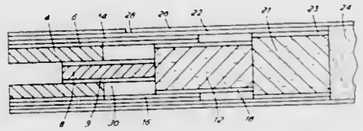
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4,904,308

ADJUSTABLE SMOKER'S MOUTHPIECE

John Charlton, Washington, and Paul F. Clarke, South Shields, both of England, assignors to Cigarette Components Limited, London, United Kingdom

Filed Sep. 2, 1987, Ser. No. 92,203
Claims priority, application United Kingdom, Sep. 2, 1986, 8621156
Int. Cl.[4] A24F 5/00
U.S. Cl. 131—198.2 14 Claims



1. A ventilated smoker's mouthpiece, comprising:

a cylindrical buccal end core member comprising a radially outer tubular portion snugly slidably surrounding a radially inner portion disposed coaxially therewith; said buccal end core member having a first end and a second end; at least one of said radially outer tubular portion and said radially inner portion being capable of having smoke and air drawn longitudinally therethrough and out said first end of said buccal end core member;

a cylindrical second core member comprising a cylindrical plug of cigarette filter material through which cigarette smoke may be drawn longitudinally while being filtered; said second core member having a first end and a second end; said second core member being coaxially arranged with said buccal end core member with said second end of said buccal end core member disposed adjacent said first end of said second core member; said second core member further including an air-impervious outer peripheral wrap;

a ventilating outer sleeve engagingly peripherally surrounding said buccal end core member and said second core member thereby securing said radially outer tubular member of said buccal end core member in relation to said second core member; said second core member being snugly longitudinally slidably received in relation to said ventilating outer sleeve; said ventilating outer sleeve being radially pervious to air towards said second core member adjacent said first end of said second core member adjacent said second end of said buccal end core member;

said radially inner portion of said buccal end core member being externally accessible from said first end of said buccal end core member, so that said radially inner portion may be pushed axially upstream relative to said radially outer tubular portion, and thereby push the second core member axially upstream relative to the ventilating outer sleeve, from an initial position in which said air-impervious outer peripheral wrap to a first, greater degree prevents air from being drawn through said ventilating outer sleeve by suction on said first end of said buccal end core member, to a variably selected use position in which said air-impervious outer peripheral wrap to a second, lesser degree prevents air from being drawn through said ventilating outer sleeve by suction on said first end of said buccal end core member; and

means permitting attachment of said ventilated smoker's mouthpiece to a cigarette so that said second end of said second core member is disposed nearest the cigarette, so that a user may push-in the radially inner core portion by a selected amount in order to regulate the proportion of air and smoke which is drawn through the first end of said buccal end core member by sucking thereon while the cigarette is attached to the ventilated smoker's mouthpiece and being smoked by the user.

4,904,309

CHEMICAL CLEANING METHOD OF THE INTERIOR OF POLYMERIZATION REACTOR

Takamichi Komabashiri; Toragoro Mitani, both of Takasago; Hiroaki Yamauchi, Kakogawa, and Hideo Yasui, Kobe, all of Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

Continuation of Ser. No. 57,878, Jun. 2, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 263,956
Claims priority, application Japan, Jun. 6, 1986, 61-132574
Int. Cl.[4] B08B 3/08
U.S. Cl. 134—42 13 Claims

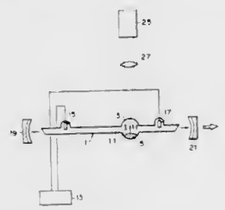
1. A method of chemical cleaning the interior surfaces such as the inside wall, an agitator, and baffle-plates of a polymerization reactor which has been used for emulsion polymerization or suspension polymerization of polymerizable monomers comprising butadiene in the presence of an initiator, wherein said method comprises chemical cleaning said surfaces by contacting them with an aqueous solution or suspension at a temperature from 40° C. to 100° C. and comprising at least one alkali selected from the group consisting of sodium and potassium silicate and phosphate salts, further comprising at least one alkali other than a silicate or phosphate, and at least one surfactant.

4,904,310

METHOD OF GENERATING A METAL VAPOR IN A METAL VAPOR LASER

Kenji Hirata; Hideki Ninomiya; Shigetoshi Yoshino; Hiromu Inoue, all of Matsuyama, and Jue Mizutani, Takamatsu, all of Japan, assignors to Shikoku Research Institute Incorporated, Yashimanishi, Japan

Filed Aug. 26, 1988, Ser. No. 236,880
Claims priority, application Japan, Aug. 28, 1987, 62-214276
Int. Cl.[4] B23K 9/00
U.S. Cl. 148—4 4 Claims



1. A method of generating a metal vapor required for a metal vapor laser to oscillate, said method comprising the steps of:

irradiating a localized region of a solid metal piece placed in a metal reservoir within a metal vapor laser discharge tube, from outside, through the discharge tube wall, with a condensed laser beam, whereby the irradiated region of the metal piece is heated, melted and vaporized, and

generating a metal vapor in a new location on a surface of the metal piece by moving a focus position of a condenser optical system of the condensed laser beam where vaporization of the metal is produced.

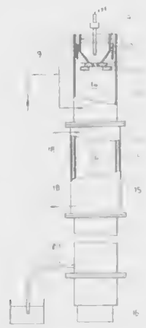
4,904,311

METALLIC POWDER AND A PASTE MADE FROM IT, AND A METALLIC POWDER MANUFACTURE DEVICE

Kitada Katsutsugu, Kanagawa, Japan, assignor to Electroplating Engineers of Japan, Limited, Japan

Filed Dec. 29, 1988, Ser. No. 291,504
Claims priority, application Japan, Jan. 14, 1988, 63-4837
Int. Cl.[4] B23K 35/34
U.S. Cl. 148—24 7 Claims

1. A metallic powder made by extrusion of molten metal from multiple microscopic nozzle holes in an inert gas atmosphere, cooled while falling, and during that cooling changing its overall shape from droplet shape to generally spherical



shape and hardening, said metallic powder being characterized by having non-curved sections in parts of the generally curved surface forming the sphere.

4,904,312

METHOD OF ELECTROLYTICALLY ETCHING LINEAR IMPRESSIONS IN ELECTRICAL STEEL

Philip Beckley, Newport, and David Snell, Abertillery, both of United Kingdom, assignors to British Steel plc, London, England

Filed Aug. 10, 1988, Ser. No. 230,429
Claims priority, application United Kingdom, Aug. 22, 1987, 8719872
Int. Cl.[4] H01F 1/04
U.S. Cl. 148—110 11 Claims

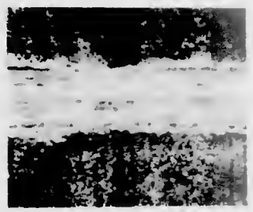
1. A method of enhancing linear impressions formed in the surface of grain oriented electrical steel strip comprising electrolytically etching said impressions in an electrolyte comprising a mild acid.

4,904,313

METHOD OF PRODUCING STABLE MAGNETIC DOMAIN REFINEMENT OF ELECTRICAL STEELS BY METALLIC CONTAMINANTS

S. Leslie Ames, Sarver, and Jeffrey M. Breznak, Springdale, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Jun. 10, 1988, Ser. No. 205,711
Int. Cl.[4] H01F 1/04
U.S. Cl. 148—113 10 Claims



1. A method for refining the magnetic domain wall spacing of grain-oriented silicon steel sheet having an insulation base coating thereon, the method comprising:

removing portions of the base coating to expose a line pattern of the underlying silicon steel;

applying a metallic contaminant to the exposed silicon steel, the metallic contaminant having a diffusion rate slower than iron in the silicon steel, the exposed steel being free of thermal and plastic stresses;

thereafter annealing the steel and contaminant thereon at time and temperature of 1400° F. or more in a protective atmosphere to diffuse sufficient and controlled amounts of contaminant into the exposed steel to produce lines of permanent pores stable up to 2100° F. to effect heat resistant domain refinement and reduced core loss of substantially stress-free steel.

4,904,314

METHOD OF REFINING MAGNETIC DOMAINS OF BARRIER-COATED ELECTRICAL STEELS USING METALLIC CONTAMINANTS

S. Leslie Ames, Sarver, and Jeffrey M. Breznak, Springdale, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Jun. 10, 1988, Ser. No. 206,051
Int. Cl.[4] H01F 1/04
U.S. Cl. 148—113 10 Claims



1. A method for refining the magnetic domain wall spacing of grain-oriented silicon steel sheet having an insulation base coating thereon, the method comprising:

applying to the base coated steel a barrier coating having a primary constituent selected from the group of phosphorus, silicate, and combinations and compounds thereof for sealing the forsterite base coating;

removing portions of the base coating to expose a line pattern of the underlying silicon steel;

applying a metallic contaminant to the steel on the areas of exposed steel, the metallic contaminant selected from the group of copper, tin, nickel, zinc, antimony, combinations and compounds thereof, the exposed steel being free of thermal and plastic stresses and the forsterite base coating having the barrier coating thereon; and

thereafter annealing the steel having the barrier coating and contaminant thereon at time and temperature in a reducing atmosphere to diffuse sufficient and controlled amounts of the metallic contaminant and an element from the barrier coating into the exposed steel to produce a line of permanent porosity to effect heat resistant domain refinement and reduced core loss.

4,904,315

METHOD FOR IMPROVING MAGNESIUM OXIDE STEEL COATINGS USING NON-AQUEOUS SOLVENTS

Michael W. Howe, Pittsburgh, Pa., assignor to Marine Magnesium Company, Corapolis, Pa.

Continuation of Ser. No. 176,572, Apr. 1, 1988, Pat. No. 4,799,969, which is a division of Ser. No. 45,490, May 4, 1987, Pat. No. 4,753,687. This application Dec. 20, 1988, Ser. No. 287,936
Int. Cl.[4] C23C 22/02
U.S. Cl. 148—245 1 Claim

1. A method for coating silicon steel, comprising initially coating the steel, prior to high temperature annealing, with a slurry comprising: 0.1 to 20%, by weight, magnesium oxide,

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and b) the balance a non-aqueous solvent in which said magnesium oxide is insoluble.

4,904,316

PRODUCTS WITH IMPROVED WEAR RESISTANCE/IRON NITRIDE LAYER

Cyril Dawes, West Midlands, and Donald F. Tranter, Worcestershire, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Division of Ser. No. 37,192, Apr. 10, 1987, Pat. No. 4,793,871. This application Oct. 25, 1988, Ser. No. 262,310

Claims priority, application United Kingdom, Apr. 10, 1986, 8608717

Int. Cl.[4] **C21D** *1/74*

U.S. Cl. 148—318 **4 Claims**

1. A component formed from a low carbon structural steel containing niobium and vanadium or titanium as the sole alloying elements, the component having at a surface thereof an iron nitride compound layer, which layer is non-porous and extends into the component to a depth of 18 micron and has a hardness between about 800 to about 1000 HV.

4,904,317

EROSION RESISTANT AG-SNO_2 ELECTRICAL CONTACT MATERIAL

Shinhoo Kang, Wayland; Charles Brecher, Lexington, both of Mass., and Philip C. Wingert, Greensboro, N.C., assignors to Technitrol, Inc., Pa.

Filed May 16, 1988, Ser. No. 194,353

Int. Cl.[4] **C22C** *32/00*

U.S. Cl. 148—431 **6 Claims**

1. An electrical contact material consisting essentially of from about 10 to about 20 volume percent SnO_2; from about 0.4 to about 4.0 volume percent of a dopant oxide selection from the group consisting of TiO_2, CeO_2, ZrO_2, HfO_2, and combinations thereof; and the balance being substantially silver.

4,904,318

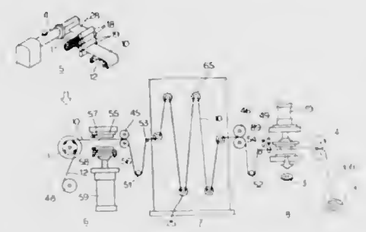
METHOD FOR MANUFACTURE OF DIAPHRAGM AND APPARATUS THEREFOR

Fumio Goto; Mitsutaka Kondou, both of Gifu; Noboru Nakagawa, Ichinomiya; Tamiyosi Ohashi, and Massatoshi Kondo, both of Aichi, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Cootinuatioo of Ser. No. 885,595, Jul. 1, 1986, abandoned. This applicatioo Aug. 4, 1988, Ser. No. 229,771

Int. Cl.[4] **B29C** *69/00;* **B32B** *31/18, 31/20*

U.S. Cl. 156—64 **7 Claims**



1. A method for manufacturing a plurality of ring-shaped diaphragms, comprising:

continuously extruding at least one sheet of rubber having a substantially uniform thickness both lengthwise thereof and widthwise thereof throughout the full width thereof;

stretching said sheet of rubber, after said sheet of rubber has been extruded, but before said sheet of rubber has been applied to a substrate fabric, so as to provide said sheet of rubber with an adjusted substantially uniform wall thickness;

providing a substrate fabric having two opposite surfaces and a lateral edge;

forming a mark on the lateral edge of a defective portion of said substrate fabric prior to the application of said rubber layer thereto so conspicuously as to be visually discerned even after application of said rubber layer to said substrate fabric;

continuously applying said sheet of rubber facewise to a respective one of said surfaces of said substrate fabric so as to provide a fabric-containing sheet;

applying adjacent said mark a locating woven fabric of a color different from the color of said rubber layer to a surface of said rubber layer after attachment of said rubber layer to said substrate fabric, so that the defective portion in the fabric-containing sheet or in a diaphragm produced therefrom can be detected by sensing the presence of said locating woven fabric;

continuously feeding said fabric-containing sheet through a press-vulcanizing station at which successive increments of said fabric-containing sheet are press-vulcanized; each such increment being sufficiently long and wide as to permit punching of at least one complete ring-shaped diaphragm therefrom, and all such increments being both substantially equal in length and equally spaced in succession longitudinally of said fabric-containing sheet;

in said press-vulcanizing station, as each said increment of said fabric-containing sheet is press-vulcanized by press platens, forming at least one shape mark into each increment of said fabric-containing sheet at a uniform location on such increments;

continuously feeding said fabric-containing sheet, after vulcanization thereof, through a punching station at which said successive increments of said fabric-containing sheet are punched using a ring punch at uniformly spaced intervals lengthwise thereof to produce a series of ring-shaped diaphragms;

at said punching station, sensing said shape marks and correlating the position thereof with the position of punching of said fabric-containing sheet so as to punch successive ring-shaped diaphragms from like positions on said successive increments of said fabric-containing sheet; and

inspecting said fabric-containing sheet in connection with continuously feeding said fabric-containing sheet through said punching station, using a color-discriminating sensor, and using sensing of said different color of said locating fabric on respective particular increments of said fabric-containing sheet to control a punching operation in said punching station so as to avoid punching ring-shaped diaphragms which would contain a marked substrate fabric defect.

3. Apparatus for manufacturing a plurality of ring-shaped diaphragms, comprising:

an extruder for continuously extruding a sheet of rubber having a substantially uniform thickness both lengthwise thereof and widthwise thereof throughout the full width thereof, said sheet being substantially equal in width to the cumulative width of a whole number of said diaphragms, said number being between 1 and 9;

means for continuously applying said sheet of rubber facewise to a respective one of two opposite surfaces of a substrate fabric so as to provide a fabric-containing sheet;

said means for continuously applying said sheet of rubber facewise to a surface of said substrate fabric including applicator rolls having a nip through which the sheet of rubber and the substrate fabric may be co-fed for squeezingly applying the sheet of rubber to the substrate fabric;

pinch roll means interposed between said extruder and said applicator rolls for tensioning said sheet of rubber before said sheet of rubber is applied to said substrate fabric;

a press-vulcanizing station including means for continuously feeding said fabric-containing sheet therethrough and means for press-vulcanizing successive increments of said fabric-containing sheet such that each successive increment is sufficiently long and wide as to permit at least one complete ring-shaped diaphragm to be punched therefrom, and such that all such increments are both substantially equal in length and equally spaced in succession longitudinally of said fabric-containing sheet;

said press-vulcanizing means includes press platen means having means for forming at least one shape mark into each increment of said fabric-containing sheet at a uniform location on such increment;

a punching station including means for continuously feeding said fabric-containing sheet, after press-vulcanization thereof, through said punching station, and at least one ring punch means for punching said successive increments of said fabric-containing sheet, at uniformly spaced intervals lengthwise thereof so as to produce a series of ring-shaped diaphragms;

said punch means comprising a slide moving radially inner and outer blades, means for simultaneously moving said blades towards and away from said fabric-containing sheet, and opposed to said blades, a receiving base having a blade guide plate supported thereon for guiding said blades as said blades cut through said fabric-containing sheet;

said inner blade of said punch means being attached to said slide so as to slightly protrude forwardly of said outer blade by means of a spring which is adapted to be contracted during punching, said spring having a spring constant large enough to impart to said inner blade a force capable of cutting through said fabric-containing sheet, said blade guide plate possessing a surface hardness enough to avoid sustaining damage by said inner and outer blades, and said receiving base including a portion which supports said blade guide plate and is formed of an elastic material;

said punching station including means for sensing said shape marks and for correlating the position thereof with the position of punching of said fabric-containing sheet so as to punch successive ring-shaped diaphragms from like positions on said successive increments of said fabric-containing sheet;

a color-discriminating sensor arranged to detect on said fabric-containing sheet entering said punching station the presence of an applied mark of predetermined color on any said increment of said fabric-containing sheet; and

said color-discriminating sensor being operatively connected to said punching means for preventing said punching means from punching from any said increment a ring-shaped diaphragm which, if punched from said fabric-containing sheet, would contain a said applied mark of predetermined color;

said means for sensing said shape marks and for correlating the position thereof with the position of punching of said fabric-containing sheet comprises a sensor disposed upstream of said ring punch means, for detecting said shape marks;

said continuously feeding means of both of said press-vulcanizing station and of said punching station including upstream means for unrolling said fabric-containing sheet from a rolled condition and downstream means for re-rolling said fabric-containing sheet into a rolled condition; and

said means for re-rolling said fabric-containing sheet into a rolled condition downstream of said punching station including means for rollingly driving this means for re-rolling, and an automated control circuit operatively connecting said sensing device and said rollingly driving means so that said rollingly driving means is driven in relation to timing of detection of said shape marks.

4,904,319

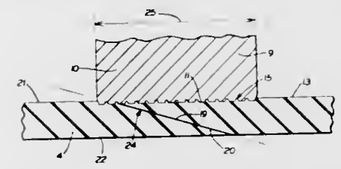
METHOD OF ULTRASONIC SPLICING TIRE TREAD STRIP EDGES

Costantino L. Divincenzo, Parma, and Ira L. Wood, Akron, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 101,887, Sep. 28, 1987, abandoned. This application Jan. 10, 1989, Ser. No. 295,741

Int. Cl.[4] **B29C** *65/08;* **B65H** *69/08*

U.S. Cl. 156—73.4 **10 Claims**



1. A method of splicing together a pair of beveled mating edges of an unvulcanized rubber compound tire tread strip which is free of any internal reinforcing cords and has a thickness of at least ⅛ inch, including the steps of:

(a) bringing the beveled edges of said tire tread strip of unvulcanized rubber compound into a partial overlapping contiguous relationship to form a splice joint extending angularly between outer opposed surfaces of t he strip;

(b) pressing a contact face of an ultrasonic welding horn against one surface of the strip at the splice joint at a first pressure within the range of 20 psi to 80 psi;

(c) applying ultrasonic energy against said one surface for a first time period within the range of 2 to 12 seconds at the first pressure range to heat and soften the rubber compound without vulcanizing along a first portion of the splice joint adjacent said one surface sufficiently for the compound to bond together across said first portion of the splice joint without bonding a second portion of the splice joint located adjacent the other surface of the opposed strip surfaces; and

(d) maintaining a second pressure against said one strip surface by the face of the ultrasonic generator for a second time period within the range of 0.5 to 2 seconds after stopping the application of the ultrasonic energy permitting the softened rubber compound to cool sufficiently to form a stronger bond between the beveled edges of the splice joint along said first portion adjacent the said one strip surface.

4,904,320

METHOD FOR FORMING CHLORINATED LIQUID CENTER OF A WOUND GOLF BALL CORE AND PRODUCT

Edward J. Isaac, Acushnet, and Joseph P. Lala, Fairhaven, both of Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Dec. 19, 1988, Ser. No. 286,371

Int. Cl.[4] **A63B** *39/00;* **C09J** *5/02*

U.S. Cl. 156—146 **10 Claims**

1. A method for forming a liquid center of a wound golf ball core comprising the steps of:

(a) chlorinating an envelope;

(b) injecting a liquid into said envelope to fill said envelope;

(c) patching said envelope; and

(d) abrading the entire surface of said chlorinated, liquid-filled patched envelope so as to aid in holding subsequently wound thread.

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4,904,321

MANUFACTURE OF A FLEXIBLE CORE FOR AN OPTICAL CABLE

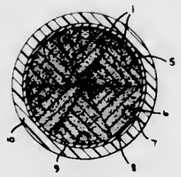
Peter Harvey, London, England, assignor to BICC Public Limited Company, United Kingdom

Filed Jun. 10, 1988, Ser. No. 205,336

Claims priority, application United Kingdom, Jun. 12, 1987, 8713792

Int. Cl.[4] **B29D** *11/00;* **G02B** *6/44;* **B65H** *81/02*

U.S. Cl. 156—185 **20 Claims**



I. A method of manufacturing a flexible core of approximately circular transverse cross-section comprising a plurality of flexible elongate bodies of approximately sector-shaped transverse cross-section helically laid up together, each of which bodies throughout its length is made of a composition comprising a multiplicity of longitudinally stressed flexible elongate non-metallic reinforcing elements substantially encapsulated in extruded plastics material and each of at least some of which elongate bodies has in its outer arcuate surface a longitudinally extending groove, which method comprises the steps of:

(a) drawing a multiplicity of flexible elongate non-metallic reinforcing elements under tension in the direction of their lengths through electrically insulating plastics material which is in a liquid or semi-liquid state; causing the multiplicity of non-metallic reinforcing elements encapsulated in electrically insulating plastics material in a liquid or semi-liquid state to pass through an elongate die having an outlet orifice having a transverse cross-section approximating to a sector of a circle to form a flexible elongate body of approximately sector-shaped transverse cross-section, which die, between its ends, is of such a shape that non-metallic reinforcing elements adjacent to the arcuate surface of the flexible elongate body so formed are travelling at a greater linear speed than non-metallic reinforcing elements remote therefrom, and which has means protruding inwardly of the die and forming in the arcuate surface of the body a longitudinally extending groove;

(b) causing the flexible elongate body as it emerges from the die to follow a helical path within an imaginary cylinder of substantially circular transverse cross-section in such a way that the arcuate surface of the body is maintained outermost and so treating the helically advancing body that the plastics material in which the reinforcing elements are encapsulated sets;

(c) at least partially filling the groove in the arcuate surface of the helically advancing flexible elongate body with a water-impermeable medium of a grease-like nature and continuously feeding into the water-impermeable medium in the groove at least one optical fiber;

(d) laying up the helically advancing flexible elongate body housing in its groove at least one optical fiber with a plurality of helically advancing flexible elongate bodies of similar transverse cross-section and construction to form a flexible core of approximately circular transverse cross-section which has in its outer surface a plurality of circumferentially spaced, helically extending grooves in which optical fibers are loosely housed and which is rotating about its longitudinal axis; and

(e) taking up the flexible core in such a way that any residual torsion in the core arising from said rotation is removed.

4,904,322

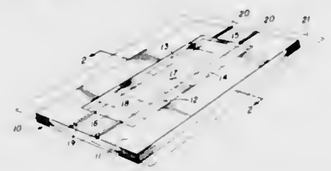
METHOD FOR MANUFACTURING A TENSION BELT

Richard O. Mertens, 108 Cooley Dr., Carl Junction, Mo. 64834

Continuation-in-part of Ser. No. 28,229, Mar. 20, 1987. This application Feb. 3, 1989, Ser. No. 307,179

Int. Cl.[4] **B32B** *31/20*

U.S. Cl. 156—196 **8 Claims**



I. The process for making a tension belt for securing a printing plate to a flexographic press cylinder and wherein said tension belt has an elastic strip means having first and second ends, each end having contact portions, and a mid-portion, a first flexible plastic strip means having a contact side, a second flexible plastic strip means having a contact side, said process comprising:

(a) coating a portion of each of said contact sides of said first and second plastic strip means with a solvent for said flexible plastic strip means;

(b) placing said coated portion of said contact side of said first and second flexible plastic strip means in contact with said first and second end contact portions, respectively, of said elastic strip means,

(c) applying heat and pressure to said first and second ends of said elastic strip means and to said mid portion, and to said first and second flexible plastic strip means over said contact sides, respectively, to fuse same, and;

(d) forming said remaining portion of said first and second flexible plastic strip means in a manner so that said printing plate can be secured to said flexographic press cylinder.

4,904,323

MANUFACTURE OF PLASTIC JACKETED STEEL PIPE

Serge Nadeau, Montreal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 15, 1988, Ser. No. 244,763

Int. Cl.[4] **B29C** *47/28*

U.S. Cl. 156—203 **13 Claims**



1. A method of making pipe having a metal inner layer surrounded by an extruded outer jacket comprising:

providing a metal strip having on each side a plastic coating compatible with the material of the outer layer to be formed;

forming the metal strip into a tube by turning longitudinal edges of the strip inwardly toward each other to bring said edges into overlapping relationship, one with the other, and so that the plastic coatings oppose one another at the overlapped edges;

forming an assembly of outer layer and tube by extruding the outer layer onto the metal tube with insufficient extrusion pressure to cause collapse of the tube and with the inside of the tube unsupported and in which the outer layer is formed so as to surround and be spaced from the tube and is then drawn down towards the tube; and

subsequently subjecting the drawn down outer layer to radial inward pressure which is also insufficient to cause collapse of the tube, so as to reduce the outside diameter of the outer layer and press it against the outer plastic coating on the tube with the material at the inner surface of the outer layer having sufficient residual extrusion heat stored therein to cause softening of the outer plastic coating to fuse it to the outer layer and to cause fusion together of the two opposing coatings at the overlapped edges of the tube.

6. Apparatus for making pipe having a metal inner layer surrounded by an extruded outer layer, the apparatus comprising, in a downstream direction along a passline for the pipe:

means for forming metal strip into a tube with overlapped edges extending longitudinally of the tube;

an extruder having an extruder head having a core tube surrounding a passline for the metal tube, the extruder head having a die orifice for the outer layer surrounding the core tube with a downstream end of the core tube disposed in relation to the die orifice such that the outer layer is extruded onto the metal tube with a larger inside diameter than the outside diameter of the metal tube;

tension applying means for causing draw down immediately downstream from the extruder, of the outer layer onto the outer coating on the tube; and

means for subjecting the drawn down outer layer to radial inward pressure insufficient to cause collapse of the tube.

4,904,324

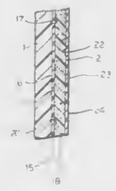
METHOD OF MAKING PLASTIC CONTAINER WITH MULTILAYER LABEL APPLIED BY IN-MOLD LABELING

James E. Heider, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation of Ser. No. 947,144, Dec. 29, 1986. This application May 16, 1988, Ser. No. 195,457

Int. Cl.[4] **B65C** *3/26;* **B29C** *49/24*

U.S. Cl. 156—214 **8 Claims**



1. The method of labeling a plastic container which comprises

forming a label by heat bonding a relatively thick cellular layer to a thin inner non-cellular layer compatible with the cellular layer without adhesives and to a thin outer non-cellular layer compatible with the cellular layer without adhesives, said inner layer being made of a material compatible for heat bonding with said container without adhesives such that the layers are bonded to one another without an intervening adhesive layer therebetween,

positioning said label on a mold cavity with the outer layer engaging the mold,

positioning a hot parison at molding temperature adjacent the cavity,

expanding the parison by fluid pressure against the side wall of the mold to form a container,

providing a thickness and a density for said cellular layer so that the cellular layer comprises the major portion of the thickness of the label such that the inner layer is insulated from the outer layer of the label by the intermediate non-cellular layer so that the heat from the container heats the inner surface of the inner layer sufficiently to heat bond the label to the outer surface of the container without an adhesive layer between the container and the inner layer and without distorting the label.

4,904,325

TRANSFER-METALLIZING METHOD

Guenther Crass, Taunusstein; Klaus Paschke, Bad Homburg, and Lothar Bothe, Mainz, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Division of Ser. No. 775,329, Sep. 12, 1985, Pat. No. 4,777,081. This application May 27, 1988, Ser. No. 199,788

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434298

Int. Cl.[4] **B29C** *47/06;* **B32B** *27/18, 31/30;* **B44C** *1/00*

U.S. Cl. 156—233 **6 Claims**

1. A transfer-metallization method comprising the steps of (a) applying a metal coating to a top layer of a metallizing film, then (b) bringing said film into contact with a substrate such that said coating is transferred from said top layer to said substrate, and (c) repeating steps (a) and (b) at least once such that said film is used on both sides in each repetition, wherein said metallizing film is a biaxially-oriented transfer metallizing film comprising:

(a) a propylene homopolymer base layer;

(b) at least one top layer applied on each side of said base layer, said top layer consisting essentially of a propylene homopolymer and receiving a quantity of at least one migrating compound from said base layer;

(c) a first quantity of at least one compound capable of migrating from said base layer, said first quantity being contained in said top layer and being at least partially depleted from said top layer by transfer of said metal layer, said compound comprising a mixture of stearic acid amide and a hydroxyethylalkylamine that comprises an alkyl group containing 14 to 30 carbon atoms;

(d) a second quantity of at least one migrating compound contained in said base layer, said second quantity being capable of migrating from said base layer to said top layer to replenish said first quantity upon transfer of said metal layer, wherein said second quantity is comprised of a mixture of stearic acid amide and a hydroxyethylalkylamine that comprises an alkyl group containing 14 to 30 carbon atoms.

4,904,326

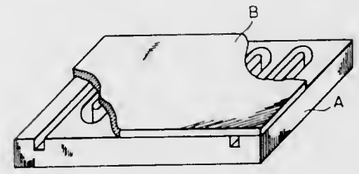
PROCESS OF MAKING A HOLLOW STRUCTURE OF CARBON MATERIAL

Yoshihisa Suda, Maebashi, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1988, Ser. No. 239,270

Int. Cl.[4] **B29C** *65/54;* **C01B** *31/02*

U.S. Cl. 156—242 **8 Claims**



1. A process for producing a hollow structure of carbon materials comprising the steps of:

mixing at least one member selected from the group consisting of a monomer and a precondensated polymer of a thermosetting resin with carbon powder to produce a mixture,

kneading the mixture in a kneader capable of applying a high shearing force to produce a molding paste composition having carbon powder uniformly dispersed therein;

molding the molding paste composition into at least two portions of a hollow structure by a method selected from

the group consisting of an injection molding method, an extrusion molding method, a casting method and a fluidizing method,

bonding the two portions of a hollow structure together with a bonding paste composition to produce a bonded hollow structure, precarbonizing the bonded hollow structure to produce a hollow structure, and

calcining the hollow structure in an inert gas atmosphere.

4,904,327

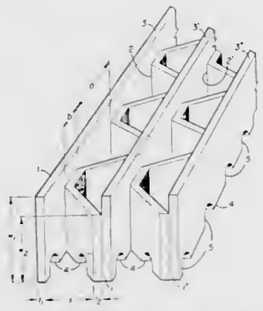
METHOD OF MAKING A SUPPORT FOR TUBESHEETS IN HOLLOW FIBER PERMEATORS

George B. Clark, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 838,961, Mar. 12, 1986, abandoned. This application Apr. 26, 1989, Ser. No. 344,772

Int. Cl.[4] B32B *31/04*

U.S. Cl. 156—250 **8 Claims**



1. A method of making a foraminous plate having practical utility as an effluent—conveying support, between a hollow fiber tubesheet and a backing member, in a hollow fiber type permeability separatory device,

said method comprising rolling up together a supporting tape and a spacing means, said tape having first and second edges which define corresponding first and second faces of the resulting coil or roll,

said spacing means not extending across said tape as far as said first tape edge and, at the time that said tape and said means are being rolled up together, being so sized and shaped and so positioned between the tape wraps in the resulting coil or roll that said means occupies only a minor portion of the space between said wraps and does not prevent free flow of said effluent from said first face to said second face through the portion of said space not occupied by said means,

and said coil or roll, as it exists immediately upon being formed by said rolling up, without being subjected to further treatment other than imposing on it such restraint against uncoiling as may be necessary, constituting said plate, in which said spacing means will not block off any hollow fiber lumens when said plate is placed between said tubesheet and said backing member with said first face against said tubesheet.

4,904,328

BONDING OF FRP PARTS

James F. Beecher, Akron, and H. William Cocain, Cuyahoga Falls, both of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Continuation-in-part of Ser. No. 93,676, Sep. 8, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 258,521

Int. Cl.[4] B05D *3/06;* **B32B** *31/12*

U.S. Cl. 156—272.2 **4 Claims**

1. A process for bonding FRP parts comprising:

treating at least two thermoset FRP parts for a period of from about 0.1 to about 10 seconds with from about 0.05 to about 10 watts/cm^2 ultraviolet radiation of a short wavelength to remove from about 1 to about 200 angstroms of material to provide cleaned substrate surfaces;

coating at least one of said cleaned substrate surfaces with an epoxy-based adhesive, a polyurethane-based adhesive, or combinations of said epoxy-based adhesive and said polyurethane-based adhesive;

joining a said adhesive coated cleaned substrate surface and a said cleaned substrate surface of another said FRP part together so that said adhesive is positioned between two cleaned substrate surfaces of said FRP parts; and

curing and heat treating said adhesive so as to form a bond between said parts.

4,904,329

PROCESS FOR STRIPPING OFF AN ADHERED-ON COATING AND DEVICE FOR CARRYING OUT THE PROCESS

Josef T. Hein, Dortmund, and Herbert Dittmar, Langenfeld, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

PCT No. PCT/EP87/00772, § 371 Date Aug. 19, 1988, § 102(e) Date Aug. 19, 1988, PCT Pub. No. WO88/04617, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 11, 1987, Ser. No. 249,919

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643446

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—344 **9 Claims**

1. A process for removing the coating from a composite comprising a coating, a substrate and an adhesive therebetween comprising injecting pulses of substantially air-free stripping fluid under pressure and through a needle nozzle zone into the adhesive to soften or decompose the adhesive, prior to attempting removal of said coating and thereafter removing said coating from the substrate.

4,904,330

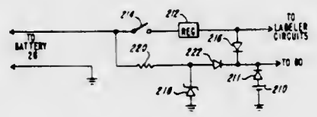
HAND-HELD LABELER HAVING IMPROVED WEB POSITION SENSING AND PRINT HEAD CONTROL

James L. Vanderpool, Kettering, and James M. Bain, Xenia, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 792,123, Oct. 28, 1985, Pat. No. 4,737,229, which is a division of Ser. No. 596,346, Apr. 3, 1984, Pat. No. 4,584,047. This application Feb. 26, 1988, Ser. No. 160,593

Int. Cl.[4] B65C *9/46, 11/02*

U.S. Cl. 156—384 **12 Claims**



1. A hand-held labeling machine comprising; a housing having a manually engageable handle, the housing having means for holding a label supply roll of a composite web having labels releaseably adhered to a backing strip, means for printing on a label at a printing position, means for peeling the printed labels from the backing strip, means disposed adjacent the peeling means for applying printed labels, means for advancing the web to peel a printed label from the backing strip at the peeling means and to advance the printed label into label applying relationship with the label applying means and to advance another label into the printing position, means for entering selected data to be printed, the printing means including a thermographic print head having a plurality of individually selectable print elements for printing on a label at the printing position, means coupled to said data entering means for electrically processing the selected data and energizing the individual print elements in a predetermined sequence determined by the selected data to print data on the label, said processing means including memory means of the type requiring the continuous application of electrical energy thereto to maintain the memory function, circuit means including an on-off switch electrically connected to a first source of electrical energy for automatically applying electrical energy from said first source of electrical energy to said printing means and said processing means when said on-off switch is one and for automatically applying electrical energy from said first source to said memory means when said on-off switch is off, said circuit means further including means electrically coupled to a second source of electrical energy for automatically applying electrical energy from said second source of electrical energy to said memory means when said first source is inoperative or disconnected from said circuit means.

4,904,331

APPARATUS FOR THE MANUFACTURE OF PILE FABRICS

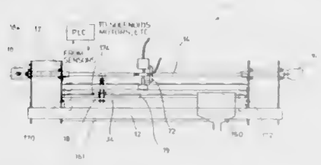
Stephen C. Martin, Upper Hutt, New Zealand, assignor to George-Martin Textiles Limited, Napier, New Zealand

Filed Oct. 15, 1987, Ser. No. 108,669

Claims priority, application New Zealand, Oct. 17, 1986, 217982

Int. Cl.[4] B32B *5/00*

U.S. Cl. 156—435 **31 Claims**



1. Apparatus for producing pile fabric comprising:

a frame;

feed means for feeding a continuous length of pile fibre;

a course former rotatably mounted within said frame and about which pile fibre from said pile fibre feed means can be wound;

drive means for rotating said course former;

an adhesive applicator carried by said frame for applying adhesive to said pile fibre when wound about said course former;

backing sheet feed means for feeding a backing sheet; and

means for contacting the pile fibre about said course former and the backing sheet one with the other after application of the adhesive to the pile fibre;

means carried by said frame for cutting said pile fibre wound about said course former free from said former,

the apparatus being such that in use a length of pile fibre from said pile fibre means is wound about said course former and has adhesive applied thereto before being contacted with the backing sheet from said backing sheet feed means for bonding with the backing sheet, the wound pile fibre then being cut free of the course former by the cutting means to leave a course of pile fibre adhesively bonded to the backing sheet.

4,904,332

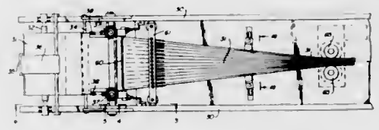
APPARATUS FOR PRODUCING DISPOSABLE HEADDRESS

Thomas J. McKeown, Pennsauken, N.J., assignor to Cellucap Manufacturing Company, Philadelphia, Pa.

Division of Ser. No. 812,269, Dec. 23, 1985, Pat. No. 4,691,390. This application May 1, 1987, Ser. No. 44,472

Int. Cl.[4] B32B *1/00*

U.S. Cl. 156—461 **4 Claims**



1. Apparatus for producing a continuous sequence of headdresses from a longitudinally continuous running length of fabric and elastic cords, comprising in combination,

(a) a supply of a longitudinally extending fabric web of substantially constant width and having side edges and a thermoplastic surface,

(b) means for longitudinally tensioning the fabric web so that the margins of the side edges are flat,

(c) a supply of thermoplastically coated elastic cord and means for stretching the cord,

(d) means for positioning a stretched elastic cord parallel adjacent to and inward from each of the longitudinally extending side edges of said fabric web,

(e) means for heating said cords and thermoplastic surface of the web to soften the thermoplastic materials before securing the cords to the web,

(f) means for turning the heated side edges of said web inward around the heated stretched elastic cords to envelope the latter,

(g) means for securing the heated stretched elastic cords continuously to the heated contiguous enveloping surfaces of the web and for securing the inturned side edges of the web to the web,

(h) means for cooling the enveloped corded web contact to seal the cords and web together before they can separate, by thermally fusing their surfaces together,

(i) plural means for pleating the web, for tightly securing together against relative movement the pleats of the tensioned web and the secured stretched elastic cords at a predetermined fixed spacing interval along the length of the tensioned web, and for severing the web at points lying outside of the said fixed spacing interval.

4,904,333

DECORATIVE BINDING APPARATUS

John D. Zoltner, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1985, Ser. No. 748,061

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—479 **1 Claim**

1. A tape binding apparatus for applying a section of paper-backed tape along the spline and adjacent side edges of a stapled/stitched/adhesive bound set of sheets comprising:

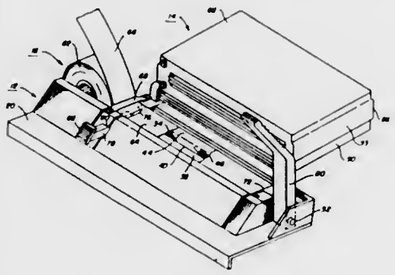
a base having two opposing gripping surfaces at least one of which being moveable toward and away from the other against which the side edges adjacent the spline of the set is placed,

means for moving said one surface toward and away from said other surface,

a tape dispenser positioned at one end of said base containing self-adhering adhesive tape being arranged for the manual playing out of the tape by the operator adjacent said surfaces for the length thereof, and means associated with

said tape dispenser for stripping the tape from its paper backing during playing out thereof,

means mounted on said base for cutting the tape after the same has been played out to the length of the spline to be applied,



means for manually guiding the spline of a set of sheets toward and against the strip of tape and between said surfaces whereby upon movement of said one surface toward the other applies pressure to the tape against said adjacent edges of the set.

4,904,334

APPARATUS FOR COLOR HIGHLIGHTING

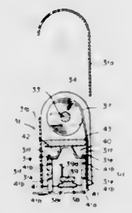
Shigeo Honma, and Kazuyoshi Hara, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 23, 1988, Ser. No. 159,293

Claims priority, application Japan, Feb. 27, 1987, 62-45797

Int. Cl.[4] B44C *1/17;* **B32B** *31/00*

U.S. Cl. 156—540 **5 Claims**



1. An apparatus for color highlighting an image portion of a photocopy comprising:

a housing provided with a storage compartment for storing a roll of transfer material and an opening for extraction of one end of said transfer material in a moving direction;

a pressure member attached to said housing for exerting pressure and heat on the transfer material being extracted from said storage compartment through the opening to transfer a part of the transfer material onto the surface of a photocopy for receiving the transfer material;

a first guiding member disposed upstream of said pressure member as viewed in the moving direction of the transfer material;

a second guiding member disposed downstream of said pressure member as viewed in the moving direction of the transfer material, said first and second guiding members protruding past a pressure surface of said pressure member and adapted to prevent the transfer material from contacting said pressure member while the apparatus is not in operation; and

an urging member disposed resiliently relative to said housing and said pressure member for urging said guiding member in a direction in which they protrude past said pressure surface thereby to prevent the transfer material from contacting said pressure member while the apparatus is not in operation.

4,904,335

DEVICE FOR PICK-UP AND ASSEMBLY OF ELEMENTS OF IDENTIFICATION OF CABLES AND ELECTRICAL APPLIANCES

Flavio Morosini, 27, rue du Rouvion, F-54800 Hatrize, France

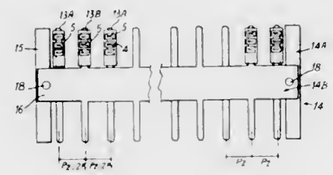
PCT No. PCT/FR87/00318, § 371 Date Jun. 13, 1988, § 102(e) Date Jun. 13, 1988, PCT Pub. No. WO88/01432, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 12, 1987, Ser. No. 218,288

Claims priority, application France, Aug. 14, 1986, 86-11768; Italy, Jul. 31, 1987, 43519 A/87

Int. Cl.[4] B32B *31/16*

U.S. Cl. 156—584 **24 Claims**



1. Device for the realization of coded messages of identification of wire strands and electric terminals consisting of

a carrier (**1**) with distinct rows (**2**) for the elements of identification,

elements of identification (**4**), at least partly tubular, arranged on the distinct rows (**2**) in spaces of a well-defined step P1 which on each row (**2**) carry the same symbol,

carriers (**5**) which are able to receive each a series of elements of identification (**4**), composing a coded message of identification, and capable of being fixed to the wire strands and the electrical terminals,

characterized in that it consists of: a comb (**9**, **14**) with teeth (**13**) arranged in parallel at two opposite sides of the comb and said teeth spaced at a step **P2** the value of which is equal to, or several times, the value of step **P1** of the elements of identification (**4**) in rows (**2**), whereby these teeth (**13**) conform to receive and carry, in a removable manner, a carrier (**5**) for the elements of identification (**4**).

4,904,336

METHOD OF MANUFACTURING A SINGLE CRYSTAL OF COMPOUND SEMICONDUCTOR AND APPARATUS FOR THE SAME

Shoichi Ozawa, Yokohama; Katsumi Wagatsuma, Tokyo, and Toshio Kikuta, Yokohama, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,476

Claims priority, application Japan, Apr. 28, 1987, 62-103115; Apr. 28, 1987, 62-103116; May 6, 1987, 62-108993

Int. Cl.[4] C30B *21/02*

U.S. Cl. 156—601 **17 Claims**

1. An apparatus for manufacturing a single crystal of compound semiconductor comprising at least two elements, the apparatus comprising:

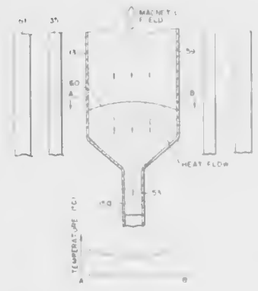
a growth susceptor;

a crucible for receiving and storing a first material containing at least one type of element and having a seed crystal arranged at a lower end portion thereof;

a gas material susceptor, arranged below said crucible, for receiving and storing a material containing one type of element, said gas material susceptor and said crucible being arranged in said growth susceptor so as to be capable of communicating with each other;

main heating means for heating and melting material in said crucible and for cooling the melt material from a lower portion thereof to grow a single crystal;

sub heating means for heating and evaporating material in said gas material susceptor and for allowing the evaporated material to react with the melt material in said crucible; and



magnetic field applying means for applying a vertical magnetic field in the melt material in said crucible so that a surface of the melt material in said crucible which is grown to a single crystal is lower in temperature at a central portion thereof than at a peripheral portion thereof in a radial direction and at the same time projects upward;

said main heating means including control means for gradually decreasing the temperature of the heat applied to the melt material upward from a seed crystal, thereby growing a single crystal of compound semiconductor from the seed crystal.

4,904,337

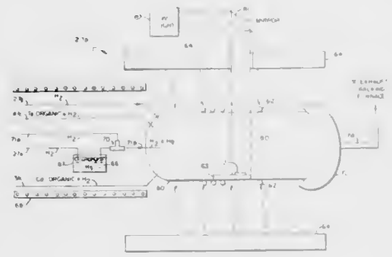
PHOTO-ENHANCED PYROLYTIC MOCVD GROWTH OF GROUP II-VI MATERIALS

James Elliott, Allston; William E. Hoke, Wayland, and Vilnis G. Kreismanis, Belmont, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 6, 1988, Ser. No. 202,645

Int. Cl.[4] C30B *25/10*

U.S. Cl. 156—610 **4 Claims**



1. A method of providing layer comprising mercury cadmium telluride, over a substrate comprises the steps of:

directing a flow of cadmium organic towards the substrate, said substrate being disposed at an elevated temperature of less than about 400° C.;

directing mercury towards said substrate;

directing a flow comprising a tellurium organic towards the substrate, said tellurium organic having at least one organic group selected from the group consisting of a secondary alkyl, a tertiary alkyl, an allyl, a benzyl, or a cycloallyl group bonded directly to the tellurium atom; and

pyrolyzing said flows by thermally decomposing the organics at the substrate to form the mercury cadmium telluride layer on the substrate while illuminating the substrate with a source of radiation having an intensity in the range of 0.1 w/cm^2 to 1 w/cm^2 over a wavelength range of about 250 nm to 1200 nm to increase the surface energy of cadmium, mercury, and tellurium from the pyrolyzed flows as the layer of mercury cadmium telluride is formed.

4,904,338

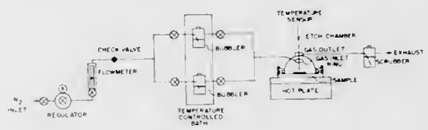
CARBON ENHANCED VAPOR ETCHING

Michael N. Kozicki, Tempe, Ariz., assignor to Arizona Board of Regents, Tempe, Ariz.

Filed Sep. 23, 1988, Ser. No. 248,773

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—628 **13 Claims**



1. A method of effecting pattern definitions on or in silicon dioxide comprising etching said silicon dioxide in hydrogen fluoride in the selective presence of carbon.

4,904,339

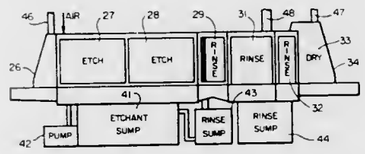
VERTICAL SPRAY ETCH REACTOR AND METHOD

Paulo A. Diehl, Cupertino; William R. Bjorge, Los Gatos, and Norvell J. Nelson, Palo Alto, all of Calif., assignors to PSI Star, Fremont, Calif.

Filed May 26, 1989, Ser. No. 358,551

Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—640 **28 Claims**



12. In a process for removing copper from a generally planar workpiece by reaction with an etching solution containing nitric acid, a polymer and a surfactant, the steps of: conveying the workpiece in a generally upright position successively through an etch chamber and first and second rinsing chambers, effecting a gentle sheeting flow of the etching solution down the workpiece as the workpiece passes through the etch chamber, spraying the workpiece in the first rinsing chamber with a rinsing solution to remove etching solution and dissolved copper from the workpiece and to adsorb by-product gases from the etching reaction, effecting further rinsing of the workpiece in the second rinsing chamber, and exhausting gases from the second rinsing chamber after said gases have passed through the first rinsing chamber and the second rinsing chamber.

4,904,340

LASER-ASSISTED LIQUID-PHASE ETCHING OF COPPER CONDUCTORS

Robert F. Miracky, Cedar Park; Kantesh Doss, Austin, both of Tex., and Bryan Seppala, Renton, Wash., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Oct. 31, 1988, Ser. No. 264,564

Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **19 Claims**



1. A process for laser-assisted liquid-phase etching of copper conductors, comprising the steps of:

immersing a substrate having copper conductor lines on a dielectric in an etchant solution comprising sulfuric acid and hydrogen peroxide; and

irradiatig select copper lines at select areas with a focused laser beam to etch said lines at said select areas.

4,904,341

SELECTIVE SILICON DIOXIDE ETCHANT FOR SUPERCONDUCTOR INTEGRATED CIRCUITS

Richard D. Blaugher, Pittsburgh; Joseph Buttyan, Wilkins Township, Allegheny County, and John X. Przybysz, Peon Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 22, 1988, Ser. No. 234,992

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **8 Claims**

1. An improved method for providing silicon dioxide with openings which expose contact pad areas for connections to superconductor in the preparation of superconducting integrated circuits, said method being of the type utilizing depositing of a silicon dioxide film on a substrate which has superconductor on parts of its surface, placing a resist film on the silicon dioxide film, patterning the resist film to expose portions of the silicon dioxide, and reactive ion etching the exposed portions of the silicon dioxide film to expose contact pad areas of superconductor; said improved method comprising:

utilizing an etchant gas consisting essentially of 50–95 volume percent nitrogen trifluoride and 5–50 volume percent rare gas for said reactive ion etching of the exposed portions of the silicon dioxide film to expose contact pad areas of superconductor, whereby carbon-containing etchant is not used and polymer by-produces of the etching process are essentially completely avoided.

4,904,342

PROCESS FOR PULPING LIGNOCELLULOSE-CONTAINING MATERIAL

Peter Arnoldy, and Leonardus Petrus, botb of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 12, 1988, Ser. No. 243,004

Claims priority, application United Kingdom, Sep. 14, 1987, 8721528

Int. Cl.[4] D21C *3/20*

U.S. Cl. 162—76 **6 Claims**

1. A process for the pulping of softwood lignocellulose-containing material, wherein the material is contacted with a pulping medium containing at least 90 by weight of a solvent system, which solvent system comprises (a) from 30 to 45% by weight formic acid; (b) from 5 to 15% by weight of methanol or ethanol; and (c) from 40 to 70% by weight of acctic acid; and digesting the material at a temperature in the range of from 160° to 190° C.

4,904,343

NON-WOVEN ACTIVATED CARBON FABRIC

Robert D. Giglia, Rye, N.Y., and Edward A. Battistelli, Stratford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 725,527, Apr. 23, 1985, Pat. No. 4,565,727, which is a continuation-in-part of Ser. No. 531,366, Sep. 26, 1984, abandoned. This application Nov. 13, 1985, Ser. No. 797,539

Int. Cl.[4] A62B *23/00, 23/04;* **B01D** *39/14, 39/16*

U.S. Cl. 162—145 **4 Claims**

1. An air and water vapor permeable, toxic vapor absorptive, non-woven fabric material consisting essentially of a wet-laid sheet containing fibrillated acrylic fiber and activated carbon fiber wherein the concentration of fibrillated acrylic fiber ranges from about 5–60%, by weight, based on the total weight of fibrillated acrylic fiber and activated carbon fiber and the concentration of said activated carbon fiber ranges from about 40%–95%, by weight, same basis.

4,904,344

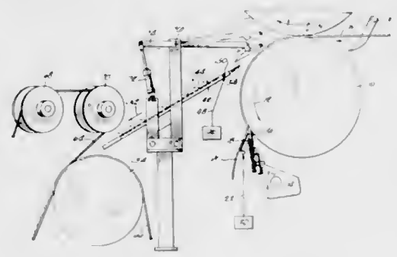
AUTOMATIC WEB THREADING APPARATUS AND METHOD

Robert E. Peiffer, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 17, 1989, Ser. No. 339,538

Int. Cl.[4] D21F *1/36, 7/00*

U.S. Cl. 162—193 **10 Claims**



1. Apparatus for guiding and conveying a traveling web strip having an outer surface in a web processing apparatus from one section of the apparatus to a downstream section of the apparatus, the apparatus including a first roll having a surface on a portion of which the strip is supported, the combination comprising:

strip deflector means for separating the web strip from the first roll and maintaining a first space between the traveling strip and a portion of the first roll surface over which it is disposed;

foil means above the strip over the first roll for establishing a second space between the foil means and the outer surface of the strip over the first space, said foil means structured and arranged to establish in the second space a pressure lower than the pressure on the side of the web in the first space facing the first roll, whereby the strip is guided away from the first roll;

web strip severing means disposed adjacent the foil means for intercepting the web strip between the first and second spaces and for severing the web strip;

support plate means located in a plane and downstream of the web strip severing means for receiving the upstream portion of the severed strip and conveying the strip to the downstream section for further processing.

9. A method for automatically guiding and conveying a traveling web strip in a web processing apparatus from one section of the apparatus to another section of the apparatus, the apparatus including a first roll on which the strip is supported and a second roll downstream in spaced adjacency to the first roll, the steps including:

separating the oncoming web strip from the surface of the first roll to establish a first space between the web strip and the surface of the first roll;

maintaining the first space between the traveling web strip and the first roll over which it is disposed;

guiding an upstream portion of the strip away from the surface of the first roll and producing a bight portion in the web strip by using a foil means above the strip over the first roll and thereby establishing a second space between the foil means and the outer surface of the strip over the first space, said foil means establishing in the second space a pressure lower than the pressure on the side of the web in the first space facing the first roll; directing the bight portion the guided web strip onto

a web severing means to sever the web strip; supporting the oncoming severed end of the web strip for a substantial distance;

conveying the traveling web strip into the downstream section of the web processing apparatus.

4,904,345

METHOD AND APPARATUS FOR CLEANING PETROLEUM EMULSION

Malcolm McCants, 2400 Augusta, Suite 260, Houston, Tex. 77057

Filed Dec. 3, 1986, Ser. No. 937,248

Int. Cl.[4] C10G *33/00*

U.S. Cl. 196—46.1 **8 Claims**



1. A method of removing dirt and water from a petroleum emulsion comprising the steps of:

(a) screening the emulsion to remove large, nonpumpable impurities;

(b) heating the screened emulsion from step (a) to decrease the viscosity thereof;

(c) separating dirt from the heated emulsion from step (b);

(d) mixing the separated dirt with a fuel to dilute residual petroleum on the dirt with fuel thereby producing a combustible mixture;

(e) burning the combustible mixture and using the heat produced therefrom to evaporate water from the emulsion from step (c) to yield a clean petroleum of low water and dirt content; and

(f) using residual heat in the clean petroleum from step (e) to heat the emulsion in step (b).

7. An apparatus for removing dirt and water from a petroleum emulsion comprising:

(a) screen means for removing large, non-pumpable, impurities from the emulsion;

(b) heater means for receiving and heating the screened emulsion to reduce the viscosity thereof;

(c) separator means for receiving heated emulsion from the heater means and removing dirt from the heated emulsion so received;

(d) mixing means for receiving and mixing the removed dirt with fuel to produce a combustible mixture of residual petroleum from the dirt and fuel;

(e) burner means for burning the combustible mixture;

(f) evaporator means for receiving emulsion from the separator means and heat from said burner means to evaporate water from the received emulsion to yield a clean petroleum of low water and dirt content; and

(g) petroleum discharge means for discharging clean, warm petroleum from said evaporator means through said heater means for heating the emulsion by heat exchange.

4,904,346

SEPARATION OF M-DIISOPROPYL BENZENE FROM P-DIISOPROPYL BENZENE BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg

Filed Sep. 15, 1989, Ser. No. 407,861

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[4] B01D *3/40;* **C07C** *7/08*

U.S. Cl. 203—60 **5 Claims**

1. A method for recovering m-diisopropylbenzene (m-DIPB) from a mixture of m-DIPB and p-diisopropylbenzene (p-DIPB) which comprises distilling a mixture of m-DIPB and p-DIPB in a rectification column in the presence of an extractive agent, recovering the m-DIPB as overhead product and obtaining the p-DIPB and the extractive agent from the still-pot, wherein said extractive agent comprises diphenyl ether.

4,904,347

METHOD AND APPARATUS FOR DISTILLING LIQUID HYDROCARBON PRODUCTS

Pierre Cros, and Christian Daumas, both of Paris, France, assignors to Spie Batignolles, Puteaux and Electricite de France, Paris, both of, France

Filed Dec. 17, 1987, Ser. No. 134,036

Claims priority, application France, Dec. 19, 1986, 86 17816

Int. Cl.[4] B01D *3/10*

U.S. Cl. 203—73 **12 Claims**

1. In a process for distilling a residue drawn from the bottom of an atmospheric distillation column of a crude oil refinery, the process including heating the residue in a furnace to a maximum temperature allowable for avoiding thermal deterioration of the residue and then introducing said residue into at least one vacuum distillation column, wherein the improvement comprises:

passing the liquid residue leaving the furnace through at

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least one cyclonic separator, the pressure in said at least one cyclonic separator being intermediate between atmospheric pressure and the pressure inside the at least one vacuum distillation column,

conducting said liquid residue into contact with a side wall of said cyclonic separator in a thin film and heating said side wall to a temperature sufficient to partially vaporize the liquid residue, said temperature being close to the maximum value allowable for avoiding thermal deterioration of the liquid residue;

withdrawing the vapor phase formed from the heated liquid residue in a central zone of said separator and then introducing said vapor phase into said at least one vacuum distillation column; and

taking a remaining liquid phase of the residue from said separator and introducing said remaining liquid phase into said vacuum distillation column, wherein

the vapor phase formed in said cyclonic separator is introduced into said at least one vacuum distillation column at a level which is higher than the level of introduction of said remaining liquid phase onto said at least one vacuum distillation column.

11. In an apparatus for distilling residue drawn from the bottom of an atmospheric distillation column of a crude oil refinery, the apparatus including a furnace in which said residue is heated to a maximum temperature allowable for avoiding thermal deterioration of the residue, a vacuum distillation column and means for coupling the vacuum distillation column to the furnace for receiving said residue, wherein the improvement comprises

a plurality of cyclonic separators connected to each other in series, the pressures inside the plurality of cyclonic separators decreasing successively in the range between atmospheric pressure and the pressure maintained in the vacuum distillation column,

each of said cyclonic separators including a feed inlet, the feed inlet of a first cyclonic separator in the series of cyclonic separators being connected to the furnace for receiving the residue to be vaporized, the inlet being arranged to place said residue in contact with a side wall of the cyclonic separator,

each of said cyclonic separators including a conduit for collecting, in a central zone of the cyclonic separator, a vapor phase formed on the cyclonic separator, said conduit having a vapor outlet, and

each of said cyclonic separators including a liquid outlet at the bottom of the cyclonic separator, the liquid outlet of each cyclonic separator except the last in the series of cyclonic separators being connected to the feed inlet of the next cyclonic separator in the series;

means for heating the side wall of each of the plurality of cyclonic separators to a temperature close to the maximum temperature allowable at the pressure maintained in the cyclonic separator for avoiding thermal deterioration of the residue;

means for connecting the vapor outlets of the successive plurality of cyclonic separators directly to successively lower levels of the vacuum distillation column; and

means for connecting the liquid outlet of the last cyclonic separator to the vacuum distillation column below the lowest connection level of the vapor outlets of the plurality of cyclonic separators.

4,904,348

METHOD FOR THE PRODUCTION OF DENTAL SPARE PARTS, SUCH AS TOOTH CROWNS- AND BRIDGES, BY MEANS OF SPARK EROSION

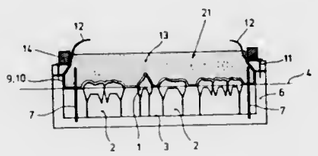
Antoa Domes, Bruchköbel, and Alfred Höritzer, Stuttgart, both of Fed. Rep. of Germany, assignors to Heraeus Edelmetalle GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,622

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735558

Int. Cl.[4] C25D *1/00*

U.S. Cl. 204—4 **11 Claims**



1. A method for the production of dental spare parts comprising:

disposing individual positive wax models on carriers a small distance from each other in a casting frame in such a way, that the widest horizontal cutting plane of each positive wax model is situated in a common equator plane;

filling areas between the individual positive wax models with a molding mass up to the equator plane to provide a first model;

inserting in at least two interspaces respectively one orientation pin, said orientation pins being disposed vertically to the equator plane;

cleaning a surface of the first model;

forming a silver coating on the cleaned surface of the first model;

electroplating the silver layer with a copper reinforcement;

providing a stabilizing rear construction on the copper reinforcement to form a first electrode;

finishing the first electrode and removing it from the casting frame;

rotating the first model through 180 degrees about an axis disposed in the equator plane;

inserting the rotated first model into a casting frame filled with a hardening carrier mass;

detaching the carriers and the molding mass after the hardening of the carrier-mass to provides a second model;

forming a silver layer on a surface of the second model;

electroplating the silver layer with a copper reinforcement layer;

providing a stabilizing rear construction on the copper layer to provide a second electrode;

finishing the second electrode and separating it from the casting frame;

eroding a first surface of a body with the first electrode;

eroding a second surface of the body, opposed from said first surface, with the second electrode; and

removing remaining cross-pieces from the resulting eroded body in the area of the equator-plane to provide the spare parts.

4,904,349

METHODS FOR PRODUCING OPTOMAGNETIC RECORDING MEDIA AND SYSTEMS FOR THEIR USE

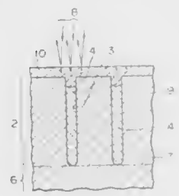
Tadao Tokushima, and Makoto Shiraki, both of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Division of Ser. No. 846,713, Apr. 1, 1986, Pat. No. 4,761,330. This application Apr. 28, 1988, Ser. No. 187,381

Claims priority, application Japan, Apr. 3, 1985, 60-70724

Int. Cl.[4] C25D *11/20*

U.S. Cl. 204—27 **8 Claims**



1. A method for producing an optomagnetic recording medium, comprising the steps of:

forming a base plate comprising aluminum;

applying anodic oxidation to a surface of said base plate to form a porous anode oxidized coat thereon;

packing a first magnetic material in pores in said anode oxidized coat;

grinding said surface of said anode oxidized coat until exposed ends of said first magnetic material in said pores are substantially flush with said anode oxidized coat immediately surrounding said pores; and after said grinding,

depositing a thin film of a second magnetic material having a saturation magnetization of at least about 0.5 T on at least said exposed ends of said first magnetic material and on at least said anode oxidized coat immediately surrounding said pores.

4,904,350

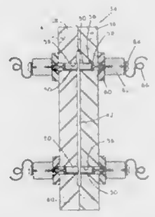
SUBMERSIBLE CONTACT CELL-ELECTROPLATING FILMS

Jonathan D. Reid, Johnson City; Eugene P. Skarvinko, Binghamton, both of N.Y., and Arthur G. Starks, New Milford, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,852

Int. Cl.[4] C25D *7/06, 17/00*

U.S. Cl. 204—28 **5 Claims**



5. A method of improving the efficiency of electroplating onto a strip of material from plating bath of plating solution comprising the steps of:

providing at least one electrical current supply device disposed in said bath,

said device having a slot extending therethrough with exit and entrance openings therein;

providing electrical contact means within said current supply deice, passing said strip through said slot in contact with the contact means,

supplying current to contact means,

and providing plating solution in said slot but limiting the amount of plating solution surround said contact device so as to provide electrical resistance in the solution sufficiently high to prevent any appreciable plating occurring on said contact.

4,904,351

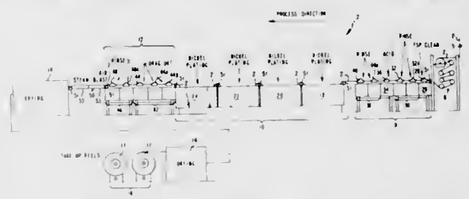
PROCESS FOR CONTINUOUSLY PLATING FIBER

Louis G. Morin, Tarrytown, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 507,440, Jun. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 358,637, Mar. 16, 1982, abandoned. This application Jul. 13, 1988, Ser. No. 218,628

Int. Cl.[4] C25D *7/06*

U.S. Cl. 204—28 **21 Claims**



1. A process for electroplating graphite fiber comprising:

(a) passing the fiber continuously through an electrolyte solution in a tank in which a metal anode is immersed;

(b) passing D.C. current through the fiber to the anode by delivering said current to the fiber at a contact immediately prior to the surface of the electrolyte in the tank;

(c) maintaining the voltage across the electrolyte from the fiber to the anode above 16 volts; and

(d) maintaining the fiber cool enough outside the bath to prevent degradation by recycling the electrolyte to bathe the fiber from the point of contact to the point of immersion into the electrolyte bath whereby metal from the anode migrates to the fiber and is bonded thereto.

4,904,352

ELECTRODEPOSITED MULTILAYER COATING FOR TITANIUM

Erwin C. Witte, Placentia, Calif., assignor to Microdot Inc., Darien, Conn.

Filed Jan. 13, 1988, Ser. No. 143,814

Int. Cl.[4] C25D *5/38, 5/10*

U.S. Cl. 204—32.1 **12 Claims**

1. A method for electrodepositing a multilayered coating on a titanium substrate comprising the steps of:

(a) cleaning the substrate, whereby oxides and surface contaminants are removed therefrom;

(b) activating the clean substrate in an agitated bath comprising about 40 to 60 percent by volume 20° Bé hydrochloric acid for a short period, said activating bath being maintained substantially at room temperature;

(c) cathodically coating the substrate with a nickel base coat

by means of a nickel strike in an agitated aqueous nickel bath at room temperature; and



(d) cathodically depositing a zinc layer of a desired thickness on the nickel base coat from an alkaline aqueous bath maintained at a temperature no greater than 100° F.

4,904,353

OPTICALLY BLACK COBALT SURFACE

Donald F. Shepard, Evergreen, and Robert J. Fenolia, Broomfield, both of Colo., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Aug. 31, 1988, Ser. No. 232,422
Int. Cl.[4] C25D *11/02, 5/50*
U.S. Cl. 204—37.1 **13 Claims**



6. A method for the preparation of optically black cobalt-/cobalt oxide surfaces having an absorptivity of at least about 0.95 and an emissivity in the range of about 0.4–0.8, which are stable against loss of absorptivity when exposed to temperatures in excess of 450° C. for prolonged periods, comprising the steps of:

(a) electroplating metallic cobalt from an electroplate bath onto a substrate; and

(b) anodizing said electroplated surface under anodizing conditions.

4,904,354

AKALINE CYANIDE-FREE CU-ZU STRIKE BATHS AND ELECTRODEPOSITING PROCESSES FOR THE USE THEREOF

Robert Stavitsky, Bronx, and Basil D. Lovelock, Massapequa Park, both of N.Y., assignors to LeaRonal Inc., Freeport, N.Y.

Continuation of Ser. No. 35,977, Apr. 8, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 269,240
Int. Cl.[4] C25D *3/58, 5/10*
U.S. Cl. 204—40 **33 Claims**

1. An alkaline cyanide-free strike bath capable of electrodepositing a copper-zinc alloy onto a substrate comprising zinc and consisting essentially of, dissolved in chelated form therein, copper, zinc, and chelating agent for said copper and zinc,

said bath having a pH of about 7.5 to 12.0,

each of said copper and zinc being present in amounts of about 1 to 15 grams/liter, and

said chelating agent being capable of chelating divalent metal ions and being selected from the group consisting of organic phosphonic acids, organic phosphonates, pyrophosphates, polyphosphates, aminocarboxylic acids, 1,3-diketones, amino alcohols, aromatic heterocyclic bases, phenols, oximes, Schiff bases, tetrapyrroles, sulfur compounds, polyethylenimine, polymethacryloylacetone, and poly(p-vinylbenzyliminodiacetic acid) and derivatives and mixtures thereof, and being present in excess of the amount thereof required to completely complex the amount of copper and zinc present therein.

14. In a multistep electroplating process for electroplating a metal substrate comprising zinc with a copper coating without forming an immersion coating which process includes the step of electrodepositing an initial copper containing strike coating onto said substrate from an alkaline strike bath having a pH of about 7.5 to 12.0 and which is free of cyanide and glucoheptonic acid and salts thereof, the improvement which comprises adding zinc to said strike bath to prevent or retard the plating of copper on said substrate by immersion.

4,904,355

PLATING BATH FOR ELECTRODEPOSITION OF ALUMINUM AND PLATING PROCESS MAKING USE OF THE BATH

Setsuko Takahashi, Misato, Japan, assignor to Nisshin Steel Co., Ltd. and Mitsubishi Petrochemical Co., Ltd., both of Tokyo, Japan

Filed Apr. 19, 1989, Ser. No. 340,492
Claims priority, application Japan, Apr. 26, 1988, 63-103100
Int. Cl.[4] C25D *3/44*
U.S. Cl. 204—58.5 **12 Claims**

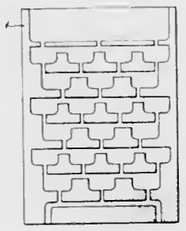
1. A plating bath for electrodeposition of aluminum, comprising a molten mixture comprising from 20 to 80 mol% of an aluminum halide, and from 20 to 80 mol% of a 1-alkylimidazolium halide wherein the alkyl group has 1 to 12 carbon atoms, or a 1,3-dialkylimidazolium halide selected from the group consisting of 1-ethyl-3-methylimidazolium, 1,3-diethylimidazolium, 1-butyl-3-propylimidazolium and 1-decyl-3-ethylimidazolium halide.

4,904,356

ELECTRODE FOR ELECTROREFINING

Derek J. Fray, Trumpington, England, assignor to National Research Development Corporation, London, England

Filed May 1, 1989, Ser. No. 348,104
Claims priority, application United Kingdom, Nov. 25, 1986, 8628137; Feb. 18, 1987, 8703698
Int. Cl.[4] C25C *3/00*
U.S. Cl. 204—64 R **15 Claims**



1. An electrode for use in electrowinning or electrorefining metals, comprising an electronically conductive block having

an upright, generally planar face, the face having formed therein a network of interconnecting channels, the channels being disposed to provide a plurality of continuous routes for molten metal to flow overall downwardly across said face, said routes comprising a plurality of downward channels fluidly coupled to a single horizontal distribution-and-mixing channel fluidly coupled to at least one further downward channel so that the routes are interconnected by the horizontal channel, thereby promoting mixing and break-up of liquid streams flowing therethrough.

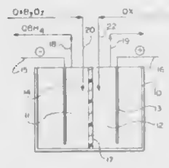
13. A method of electrowinning a metal, using a cell according to claim 10, comprising passing a stream of a solution or melt of a salt of the molten metal through the channels of a first electrode in a molten salt or a salt in a conductibe solution saturating the diaphragm, and making the first electrode anodic with respect to a second electrode, and recovering a refined metal which appears in cathode channels.

4,904,357

PRODUCTION OF QUATERNARY AMMONIUM AND QUATERNARY PHOSPHONIUM BOROHYDRIDES

Hossein Sharifian, and John S. Dutcher, both of Austin, Tex., assignors to Southwestern Analytical, Houston, Tex.

Filed May 30, 1989, Ser. No. 358,884
Int. Cl.[4] C25B *3/00, 3/04*
U.S. Cl. 204—73 R **52 Claims**



1. A process for preparing quaternary ammonium and quaternary phosphonium borohydrides in an electrolysis cell which comprises an anolyte compartment containing an anode and a catholyte compartment containing a cathode, the anolyte and catholyte compartments being separated from each other by a divider, said process comprising

(A) charging an anolyte comprising an aqueous solution containing a quaternary ammonium or a quaternary phosphonium salt compound to the anolyte compartment;

(B) charging a catholyte comprising an aqueous solution prepared from a quaternary ammonium boron oxide or a quaternary phosphonium boron oxide to the catholyte compartment;

(C) passing a current through the electrolysis cell to produce the quaternary ammonium borohydride or quaternary phosphonium borohydride in the catholyte compartment; and

(D) removing at least a portion of the catholyte from the catholyte compartment.

4,904,358

GOLD AND SILVER RECOVERY PROCESSES BY ELECTROLYTIC GENERATION OF ACTIVE BROMINE

Peter L. Hess, Coeur d'Alene, Id., assignor to Inland Aqua-Tech Co., Inc., Spokane, Wash.

Filed Feb. 16, 1988, Ser. No. 156,321
Int. Cl.[4] C25C *1/20*
U.S. Cl. 204—111 **18 Claims**

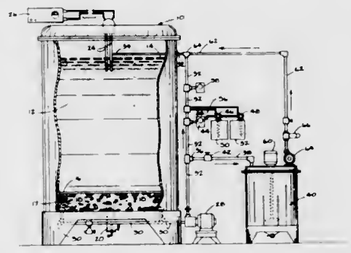
1. A process for recovering gold or silver from a material containing gold or silver, the process not requiring use of cyanide, the process comprising the following steps:

combining the material with a volume of 5% to 50% NaBr solution to produce a mixture of material and NaBr solution;

passing a quantity of electric current through the mixture of material and NaBr solution to electrochemically generate a quantity of HOBr dissolved in solution within the mixture, the quantity of electric current being applied through the mixture of material and NaBr solution in a single chambered vessel as opposed to a multi-chambered vessel having separate anolyte and catholyte compartments, and thereby;

oxidizing with HOBr a substantial portion of base metal sulfides present in the material into acid soluble base metal compounds, and;

oxidizing with HOBr available gold to $AuBr_3$ or available silver to AgBr, the $AuBr_3$ or AgBr present being substantially complexed into a soluble form with the NaBr in solution, and thereby;



creating a pregnant NaBr solution, the pregnant NaBr solution containing both dissolved base metal compounds and dissolved $AuBr_3$ or AgBr;

adding lime to the pregnant NaBr solution to precipate the base metal compounds from the pregnant NaBr solution;

separating gold from the complexed $AuBr_3$ in the pregnant NaBr solution or silver from the complexed AgBr in the pregnant NaBr solution while simultaneously generating Br^- ions in solution from the complexed $AuBr_3$ or complexed AgBr; and

combining the Br^- ion containing solution with the mixture containing the volume of 5% to 50% NaBr solution and material to make the Br^- ions in such solution available for electrochemical regeneration into HOBr whereby only a minimal amount, if any, of bromine from the 5% to 50% NaBr solution is depleted in the process.

4,904,359

LIQUID DETERGENT COMPOSITION CONTAINING POLYMERIC SURFACTANT

Eugene J. Pancheri, Montgomery; Young S. Oh, Fairfield, and Rodney M. Wise, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 918,567, Oct. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 793,530, Oct. 31, 1985, abandoned. This application Jul. 8, 1988, Ser. No. 218,437
Int. Cl.[4] C11D *1/83, 3/10*
U.S. Cl. 252—548 **11 Claims**

1. A high sudsing liquid dishwashing detergent composition containing by weight:

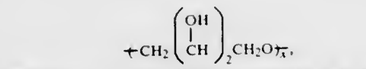
(a) from about 5% to about 50% anionic surfactant;

(b) from about 0.1% to about 10% of polymeric surfactant selected from the group consisting of:

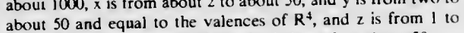
$$[R^1—R^2O—_n—R^3O—_m]_x[R^4] \quad [1]$$

wherein each R^1 is hydrogen, wherein each R^2 or R^3 is an alkylene group containing from two to about six carbon atoms with no more than about 90% of said molecule comprising R^2 or R^3 groups containing two carbon atoms; wherein R^4 is selected from the group consisting of alkylene groups containing from one to

about 18 carbon atoms and having from two to about six valences,

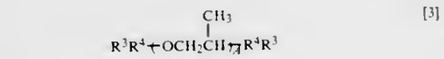


$(=NR^2N=)$, and $=N-R^2NH-_x$, wherein n is from 0 to about 500, m is from 0 to about 500, n+m is from about 5 to about 1000, x is from about 2 to about 50, and y is from two to about 50 and equal to the valences of R^4, and z is from 1 to about 6, and the product of z and x is from 2 to about 50;



[2]

where:
R^1 is H, or CH_3, or $CH_3(CH_2)_n$, or unsaturated analogues
where:
n=1-17
each of x and y=2-500
R^2—$O(CH_2)_z$ or unsaturated analogue of these where z=1-18;



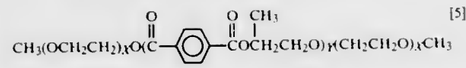
[3]

where:
R^3 is sulfate or sulfonate
R^4 is nothing or $-OCH_2CH_2-B$
A is 5-500
B<A/2;



[4]

wherein X is from 8-17, and Y is from 4-14; and



[5]

wherein X is from 7.5-16, and Y is about 2.75;

(c) from 0% to about 10% of a suds stabilizing nonionic surfactant selected from the group consisting of fatty acid amides, trialkyl amine oxides, and mixtures thereof;

(d) from 0% to about 10% of a detergency builder selected from inorganic phosphates, inorganic silicates, and inorganic carbonates, organic carboxylates, organic phosphonates, and mixtures thereof;

(e) from 0% to about 15% alkanol containing from one to about six carbon atoms; and

(f) from about 20% to about 90% water, said composition containing sufficient magnesium ions to neutralize at least about 10% of said anionic surfactant when there is less than about 10% alkylpolyethoxylate sulfate surfactant containing from about ½ to about ten ethoxy groups per molecule in the composition on the average; said composition having a pH of greater than about six when the composition contains said alkylpolyethoxylate sulfate surfactant; and said composition having a viscosity of greater than about 100 cps or being substantially free of alkylpolyethoxylate detergent surfactants when the amount of anionic surfactant is less than about 20%.

4,904,360

WATER-COMPATIBLE COATING COMPOSITION

Thomas H. Wilson, Jr., St. Paul, and Alphonsus V. Pocius, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 906,795, Sep. 12, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 149,434

Int. Cl.[4] C25D *13/06;* **C08L** *63/00*

U.S. Cl. 204—181.7 **4 Claims**

1. A process for coating a metallic substrate with cathodic electrophoretically depositable structural adhesive bonding primer, comprising the steps of:

(A) placing said substrate in fluid contact with an anode and a coating composition comprising

(i) water-compatible curable resin having a substantially linear structure of the formula:



wherein:

each E is independently a residue of a diepoxide;

each L is independently a residue of a linking compound having an average of two epoxide-reactive groups;

each C is independently a cationic water-compatible ammonium, sulfonium or phosphonium group;

each A is independently the conjugate base of a water-soluble acid HA having a pK_a for use under cathodic electrodeposition conditions; and

y has an average value of about 1 to about 20;

(ii) crosslinking agent selected from the group consisting of bis-maleimide and sparingly-soluble chromate pigments;

(iii) water; and

(iv) resin solvent or coalescing solvent, said curable resin containing tertiary nitrogen before or after electrodeposition but being substantially free, before and after electrodeposition, of mercaptan groups, primary amino groups and secondary amino groups, with the proviso that said nitrogen comprises tertiary aromatic amine if said crosslinking agent consists of said pigment;

(B) passing electrical current between said substrate and said anode for a time period sufficiently long to attain a continuous coating of said primer on said substrate;

(C) removing excess primer from said substrate; and

(D) heating said primer, in the absence of a UV photoinitiator or a UV curecycle, at a curing temperature and for a curing time sufficient to crosslink said primer to a solvent-resistance state.

4,904,361

ELECTRODEPOSITION COATING COMPOSITION

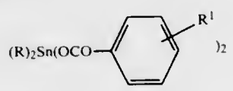
Akira Motohashi, Yokohama; Yoshimitsu Tsukahara, Yokosuka; Kazuo Masuda; Hidehiko Haneishi, both of Yokohama; Masafumi Kume, and Hirokazu Hayashi, both of Hiratsuka, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo and Sankyo Organic Chemicals Co., Ltd., Kanagawa, both of, Japan

Filed Mar. 3, 1989, Ser. No. 318,720

Int. Cl.[4] C25D *13/06;* **C08L** *63/00*

U.S. Cl. 204—181.7 **13 Claims**

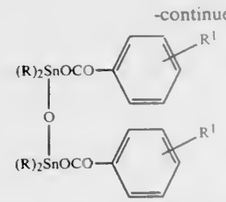
1. An electrodeposition coating composition containing blocked isocyanate groups comprising at least one dialkyltin aromatic carboxylic acid salt represented by the following formula



[1]

or

-continued



[II]

wherein R represents an alkyl group having 1 to 12 carbon atoms, and R^1 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

4,904,362

BAR-SHAPED MAGNETRON OR SPUTTER CATHODE ARRANGEMENT

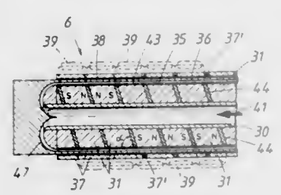
Walter Gaertner; Franz Koroschetz, both of Gmunden; Alfred Wagendristel, Perchtoldsdorf, and Herwig Bangert, Vienna, all of Austria, assignors to Miba Gleitlager Aktiengesellschaft, Laakirchen, Austria

Filed Jul. 19, 1988, Ser. No. 221,383

Claims priority, application Austria, Jul. 24, 1987, 1881/87; Sep. 1, 1987, 2193/87

Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—192.12 **18 Claims**



12. Sputtering process for sputtering with a magnetron or other type sputter cathode arrangement, such process being suitable for sputtering surfaces having curved areas such as the inner surfaces of hollow bodies, such process comprising the steps of:

relatively moving the surfaces to be sputtered and a sputtering cathode arrangement that includes a carrier tube on which different target materials are deposited, the carrier tube having a plurality of rings of different target materials shrunk thereon sequentially in the axial direction of the carrier tube, the cathode arrangement being held fixed and the surface or the body carrying the surface being moved, the cathode arrangement and the surfaces to be sputtered being subjected to a mutual relative motion in the longitudinal direction of the carrier tube of the cathode arrangement.

4,904,363

SELECTIVE PLATING SYSTEMS

Richard J. Comp, Milford, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Apr. 25, 1989, Ser. No. 343,011

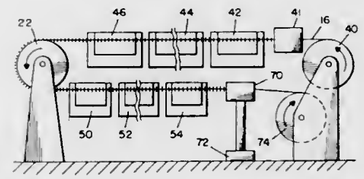
Int. Cl.[4] C25D *17/00*

U.S. Cl. 204—202 **8 Claims**

1. An apparatus for selectively electroplating portions of elongated members, said apparatus comprising:

a flexible conveyor belt for receiving said elongated members, one portion of each said elongated member extending from one side of said conveyor belt and a second portion of each said elongated member extending from another side of said conveyor belt;

guide means for said conveyor belt, constraining the travel thereof into a loop defined by a substantially vertical plane, with the web of said conveyor belt oriented in a substantially horizontally alignment, said loop having upper and lower regions, said guide means causing said one portion of each said elongated member to be oriented downwardly from said belt in said upper region and said second portion of each said elongated member to be oriented downwardly from said belt in said lower region;



at least one plating tank adjacent said upper region for contacting said one portion of each said elongated member; and

at least a second plating tank adjacent said lower region for contacting said second portion of each said elongated member.

4,904,364

ANODE ASSEMBLY FOR SELECTIVELY PLATING INTERIOR SURFACES OF ELECTRICAL TERMINALS

Thomas F. Davis, Camp Hill, and Richard M. Wagner, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 23, 1988, Ser. No. 275,812

Int. Cl.[4] C25D *17/12*

U.S. Cl. 204—224 R **10 Claims**



1. An anode assembly adapted for use in a plating cell and for selectively plating contact areas on the interior surface of socket terminals, said cell including means for providing a cathodic charge to said terminals, the anode assembly comprising:

a conductive body member having an anode means extending forwardly from a body section, said body section including a reference surface related to said anode means, said anode means being concentric with said reference surface;

a dielectric body member adapted to be secured to a forward portion of said conductive body member including said reference surface, said dielectric member having a passageway therethrough for receiving said anode means;

sheath means extending forwardly from said dielectric body member and along said anode means and extending angularly around at least one selected circumferential portion thereof and concentric with said conductive reference surface, lateral edge surfaces of said sheath means defining at least one slot extending axially along said anode means such that at least one axially extending portion of said anode means is exposed along said slot, said sheath means having a diameter smaller than the inner diameter of a terminal to be plated; and

means securing said dielectric body member to said forward portion of said conductive body member;

whereby upon mounting said anode assembly in said plating cell, moving said sheathed anode means of said assembly into the interior of an electrical terminal, supplying plating solution upon said exposed anode portion of said anode means, and providing an electrical current flow from said anode means, through said solution and into said cathodically charges terminal, a layer of plating is selectively deposited on the internal surface portion of the terminal that is generally aligned with said at least one exposed anode portion, the sheath means providing a barrier to prevent plating on the remaining internal terminal surface portions.

4,904,365

ELECTRODEPOSITION COATING FACILITY

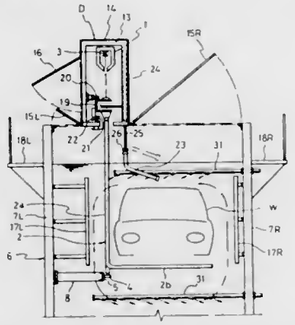
Toshio Kawamura, Toyota; Norihisa Nihei, Yokohama; Tadamichi Hirono, Nagoya, and Tadayoshi Hyodo, Minoo, all of Japan, assignors to Trinity Industrial Corporation, Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 316,704

Claims priority, application Japan, Feb. 29, 1988, 63-24977[U]; Feb. 29, 1988, 63-24981[U]

Int. Cl.[4] C25D *17/06, 17/08*

U.S. Cl. 204—299 EC **5 Claims**



1. An electrodeposition coating facility comprising:

conveyor means for conveying articles to be coated,

hanger means each suspended from the conveyor means for carrying an article to be coated and formed into an L-shaped configuration composed of a vertical portion and a horizontal portion,

hanger support roller means, each disposed at or near the lower end of said L-shaped hanger means, and

guide rail means laid along an electrodeposition coating line for guiding and holding said hanger support roller means, and

support means each comprising a stud made of insulating reinforced plastic secured to an electrodeposition vessel and a metal support applied with insulative coating and secured in connection with the top end of said stud for fixing the guide rail to the electrodeposition vessel.

4,904,366

INSTRUMENT FOR DETERMINATION OF THE BASE SEQUENCE OF NUCLEIC ACID

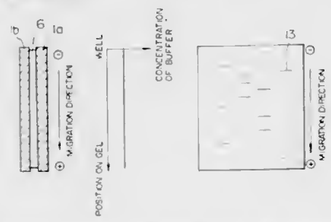
Jiro Tokita, Kokubunji; Keiichi Nagai, Higashiyamato; Tamotu Simada, Akishima; Ken'ichi Watanabe, Kudamatsu; Ryusei Nakano, Kokubunji, and Tomoaki Sumitani, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 4, 1987, Ser. No. 128,885

Claims priority, application Japan, Dec. 12, 1986, 61-294780

Int. Cl.[4] C25B *7/00*

U.S. Cl. 204—299 R **9 Claims**



1. An apparatus for determination of a base sequence of a nucleic acid, comprising:

an electrophoretic matrix having a migration lane and buffer therein;

means for introducing sample containing nucleic acid fragments into a first end of said electrophoretic matrix;

means for applying an electrical potential between positive and negative electrodes for electrophoresis so that a negative potential is applied to said first end of said electrophoretic matrix and a positive potential is applied to a second end of said electrophoresis matrix;

detection means located at said migration lane and substantially separated from said first end of said electrophoretic matrix for detecting in real time the nucleic acid fragments successively arriving at a detection part; and

the ionic strength of said buffer in said electrophoretic matrix is higher at least at one position in a region spaced from the detection part towards said first end than at the detection part.

4,904,367

REMOVING HAZE FROM DEWAXED HYDROCARBON OIL MIXTURE BOILING IN THE LUBRICATING OIL RANGE

Douglas G. Ryan, Rockaway, and Donald B. Trust, Denville, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 787,384, Oct. 15, 1985, abandoned. This application Sep. 29, 1987, Ser. No. 102,389

Int. Cl.[4] C10G *73/06;* **B03C** *5/00*

U.S. Cl. 208—33 **18 Claims**



1. A method of removing wax from a hazy hydrocarbon oil mixture boiling in the lubricating oil range using a rotary drum filter, said filter comprising a filter vat for containing a quantity of oil solvent-diluted hazy oil mixture and a rotatable drum in the vat having a horizontal axis of rotation and also having filter cloth thereon, said method comprising the steps of:

introducing oil solvent-diluted hazy oil mixture into said filter vat to a depth such that, at any instant, a sector of the drum surface is immersed in the oil solvent-diluted hazy oil mixture in said filter vat;

rotating the drum;

applying suction to the rotating filter drum over the immersed sector thereof, so as to draw filtrate through the filter cloth and form a wax cake on said cloth;

removing a portion of the wax cake from the filter cloth on the rotating filter drum in a further sector;

introducing free charge which is net unitpolar into a charge carrier liquid, at least predominantly by electron emission which causes the carrier liquid to act as a medium through which volumetric distribution of the introduced charge takes place by charge motion relative to the carrier liquid; and

directing the charged liquid onto the wax cake, there being a sufficient excess of free charge introduced as to promote removal of wax in the rotary drum filter.

4,904,368

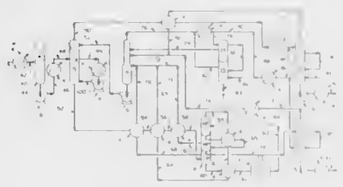
METHOD FOR REMOVAL OF FURFURAL COKE FROM METAL SURFACES

Joe D. Turner, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 115,782, Oct. 30, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 262,923

Int. Cl.[4] C10G *9/12, 9/16*

U.S. Cl. 208—48 R **17 Claims**



1. A process for preparing furfural coke for removal from metallic surfaces comprising: heating ship furfural coke without causing an evolution of heat capable of undesirably altering metallurgical properties of said surfaces in the presence of a gas with a total pressure of less than 100 p.s.i.g. containing molecular oxygen, said gas being at a sufficient temperature below 800° F. (427° C.) for a sufficient time to change the crush strength of the coke so as to permit removal with a water jet at a pressure of about 5000 p.s.i.

4,904,369

RESIDUAL OIL CONVERSION PROCESS

John G. Gatsis, Des Plaines, Ill., assignor to UOP, Des Plaines, Ill.

Filed Nov. 14, 1988, Ser. No. 270,986

Int. Cl.[4] C10G *21/02, 21/06, 6/714*

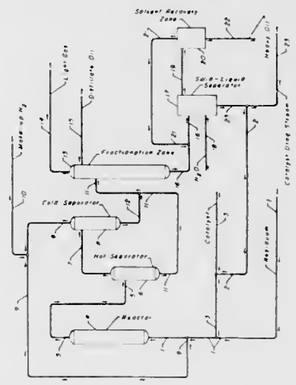
U.S. Cl. 208—96 **22 Claims**

1. A process for the production of hydrogenenriched hydrocarbonaceous products which process comprises:

(a) converting a heavy, asphaltene-containing hydrocarbonaceous residual oil, wherein at least 80% of said residual oil boils above 650° F. (343° C.), in the presence of hydrogen and a particulate catalyst at residual oil conversion conditions in a reaction zone to produce a liquid effluent stream comprising particulate catalyst and normally liquid hydrocarbonaceous compounds;

(b) contacting at least a portion of said liquid effluent stream from step (a) with water and a hydrocarbonaceous solvent comprising at least one aromatic hydrocarbon; and

(c) gravitationally separating the resulting admixture from



step (b) into a solvent phase comprising said normally liquid hydrocarbonaceous compounds and essentially free of solids, and an aqueous phase comprising essentially all of said particulate catalyst.

4,904,370

ELECTROCHEMICAL ORGANIC REACTIONS VIA CATALYTIC HALIDE SUBSTITUTION

Kenneth J. Stutts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 9, 1988, Ser. No. 192,748

Int. Cl.[4] C25B *3/10*

U.S. Cl. 204—59 R **18 Claims**

1. A process for converting a lower organic halide compound to an organic product compound comprising

(1) a first chemical reaction wherein the lower organic halide compound is catalytically in situ converted to a higher organic halide compound by the addition to the lower organic halide compound of a catalytically effective amount of a higher halide compound with the proviso that reaction conditions are such that the conversion of the lower organic halide compound to the higher organic halide compound is essentially complete;

(2) an electrochemical reaction comprising reducing, at a potential less negative than that required to reduce the lower organic halide compound, the higher organic halide compound formed in step (1) to (a) a reduced organic compound and (b) the higher halide ion catalyst; and

(3) a second chemical reaction wherein the reduced organic halide compound formed in step (2) reacts under conditions sufficient to form the organic product compound;

wherein the step (2) is carried out in the presence of a cathode selected from the group consisting essentially of stainless steel, aluminum, carbon, Group 1B metals, and Group VIIA metals and an anode selected from the group consisting essentially of platinum, magnesium, ruthenium or titanium and carbon.

4,904,371

PROCESS FOR THE PRODUCTION OF MESOPHASE PITCH

Walter M. Kalback, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 13, 1988, Ser. No. 258,301

Int. Cl.[4] C10G *27/00;* **C10C** *3/04, 3/02*

U.S. Cl. 208—39 **15 Claims**

1. A process for producing a mesophase pitch suitable for

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carbon fiber manufacture which comprises heating a carbonaceous feedstock substantially free of mesophase pitch in the presence of an oxidatively reactive sparging gas at a temperature above 350° C. for a period of time ranging up to about 6 hours, thereafter subjecting the carbonaceous feed to heat soaking in the absence of a sparging gas for up to 20 additional hours at a temperature above 350° C., and then heating the carbonaceous feed in the presence of a non-oxidative sparging gas for up to 10 hours at a temperature above 350° C. and thereby forming mesophase pitch.

4,904,372

PROCESS AND APPARATUS FOR RECOVERING HEAT ENERGY FROM CATALYST REGENERATOR FLUE GASES

Alan R. Goelzer, Atkinson, N.H., assignor to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Nov. 18, 1988, Ser. No. 273,266
Int. Cl.[4] C10G *11/18*
U.S. Cl. 208—113 **19 Claims**

1. In a fluidized catalytic cracking-regeneration process for cracking heavy hydrocarbon feedstocks or the vapors thereof with a cracking catalyst in a riser conversion zone to produce hydrocarbon conversion products, and then separating the catalyst particles having hydrocarbonaceous deposits thereon from said hydrocarbon conversion products and continuously regenerating said separated catalyst particles successively in separate first and second catalyst regeneration zones by combusting said hydrocarbonaceous deposits on the catalyst in the presence of a source of oxygen and under conditions to produce a first regeneration zone flue gas rich in carbon monoxide and a second regeneration zone flue gas rich in carbon dioxide, wherein the improvement comprises:

(a) combusting the first regeneration zone flue gas in the presence of a source of oxygen to produce a combusted effluent gas containing less than about 1200 volumetric parts per million carbon monoxide;

(b) combining the combusted effluent gas from step (a) with the second regeneration zone flue gas to produce a combined regeneration zone flue gas;

(c) expanding the combined regeneration zone flue gas from step (b) to recover energy therefrom and wherein said energy is employed to produce compressed air; and

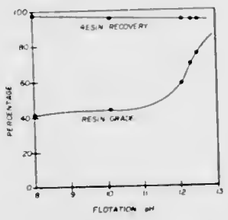
(d) passing the compressed air from step (c) to the first and second regeneration zones to supply all of the combustion and fluidizing requirements for regeneration of catalyst therein.

4,904,373

FOSSIL RESIN FLOTATION FROM COAL BY SELECTIVE COAGULATION AND DEPRESSION OF COAL

Jan D. Miller; Qiang Yu, and Ye Yi, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Apr. 4, 1989, Ser. No. 333,606
Int. Cl.[4] B03D *1/02, 1/08*
U.S. Cl. 209—167 **17 Claims**



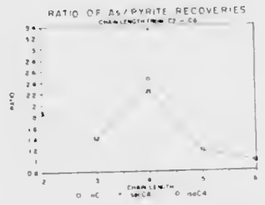
10. A method for separating minute resin particles from a slurry mixture of minute resin particles and minute coal particles comprising adjusting the pH of the slurry mixture of minute resin particles and minute coal particles to above about 12 and subjecting the pH adjusted slurry mixture of particles to froth flotation in the presence of a frothing agent, to produce a froth fraction enriched with respect to said minute resin particles.

4,904,374

FROTH FLOTATION

Haimi N. Singer, Johannesburg, and Amor Jordaan, Sasolburg, both of South Africa, assignors to Sentrachem Limited, Transvaal, South Africa

Filed Oct. 4, 1988, Ser. No. 253,032
Claims priority, application South Africa, Oct. 8, 1987, 87/7568
Int. Cl.[4] B03D *1/02, 1/06*
U.S. Cl. 209—166 **11 Claims**



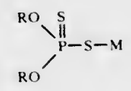
1. A method of selectively recovering a mineral comprising at least one of arsenopyrite and pyrhotite, while selectively rejecting pyrite, from a material containing said mineral together with pyrite, said method comprising the steps of

providing a slurry containing said material, said slurry having an upper surface,

adding a water soluble copper salt as a promotor for said mineral and adding a collector for said mineral to the slurry,

passing a gas through the slurry causing the mineral to be selectively carried to the surface of the slurry and report in a float concentrate while pyrite selectively remains in the resultant slurry, and

recovering the mineral from the float concentrate, wherein the collector comprises, in a combination, a dialkyl-dithiophosphte of formula (I) and a monoalkyl-dithiocarbamate of formula (II) wherein the formulas for (I) and (II) are:

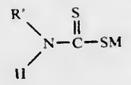


(I)

wherein

R=alkyl of 3 to 8 carbon atoms; and

M=alkali metal or ammonium



(II)

wherein

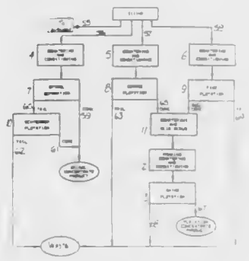
R'=alkyl of 3 to 10 carbon atoms, and M=alkali metal or ammonium.

4,904,375

SODIUM SILICATE AS A PHOSPHATE FLOTATION MODIFIER

Robert E. Snow, Lakeland, Fla., assignor to IMC Fertilizer, Inc., Northbrook, Ill.

Continuation of Ser. No. 863,865, May 16, 1986, abandoned.
This application Dec. 9, 1987, Ser. No. 130,483
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—166 **12 Claims**



1. A method of beneficiating a finely divided phosphate-containing ore wherein said ore is preliminarily conditioned for a period at least about 1 minute in aqueous slurry form with anionic agents, said conditioned slurry thereafter being subjected to froth flotation separation to provide a phosphate-containing froth concentrate fraction and separate said froth concentrate fraction from the gangue in said ore, the improvement comprising the addition to said slurry during the final period of said conditioning not more than about 30 seconds before the end of said conditioning of an amount of sodium silicate sufficient to enhance the said separation.

4,904,376

METAL CATCHING COVER

Gerald A. Hease, 1005 Country Club Rd., Lake Oswego, Oreg. 97034

Filed Sep. 16, 1988, Ser. No. 245,840
Int. Cl.[4] B03C *1/30*
U.S. Cl. 209--215 **4 Claims**



1. A removable cleaning cover for magnetic cleaning devices of the type having a magnet-containing means, the cover comprising:

(a) a longitudinally flexible, elongated housing formed of non-magnetic material,

(b) the elongated housing incorporating at least one longitudinally elongated, forwardly projecting pocket having a hollow interior, the pocket being defined by a front end wall, lateral side walls, longitudinal end walls, and an open rear end.

(c) the pocket extending along the length of the housing and configured to removably receive, within the confines of its hollow interior, the magnet-containing means of the magnetic cleaning device in a friction fit for securing the housing releasably onto the magnetic cleaning device, and

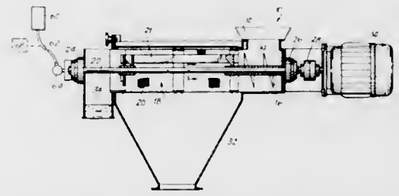
(d) a tray means on at least one of said lateral side walls adjacent the open rear end of the pocket and extending forwardly towards said front end wall and being spaced from said one lateral side wall of the pocket thereby forming a debris-catching space therebetween, the front end wall of the pocket being spaced forwardly of the open rear end and beyond the tray means.

4,904,377

SIFTING APPARATUS

Goutam Datta, Woodbridge, N.J., assignor to Kason Corporation, Linden, N.J.

Filed Jul. 26, 1988, Ser. No. 224,100
Int. Cl.[4] B07B *1/55, 1/18*
U.S. Cl. 209—380 **3 Claims**



1. In a centrifugal sifter apparatus characterized by an elongated sifting chamber having a central axis, a coaxial screen surface therein and a series of paddles mounted on a shaft driven for rotation about said central axis for urging siftable material through said screen surface to separate fines from overs, the improvement comprising a series of nozzle means mounted on said shaft for rotation therewith, said nozzle means being oriented to direct gas streams at said screen surface whereby any of said fines which agglutinate are dislodged from each other and are directed through said screen surface, and a source of compressed air operatively connected to said nozzle means by a portion of said shaft, said shaft portion being hollow to form a conduit for said compressed gas; said hollow portion having a first section to which said nozzle means are mounted having an interior bore operatively connected to a plurality of radial bores, said nozzle means being mounted in said radial bores, and a second section having an interior bore of a lesser diameter than said interior bore of said first section, said first and second shaft sections being joined together in an end-to-end relationship to form an interior passageway through said bores; said second section being coupled to said compressed gas source by a rotary coupling to create a leak proof joint during rotation.

4,904,378

FLAT ELEMENT FOR FILTERING AND SEPARATION

Koichi Arai, Kanagawa, Japan, assignor to Arai Machinery Corporation, Japan

Filed Apr. 20, 1988, Ser. No. 184,078
Claims priority, application Japan, Apr. 20, 1987, 62-095458
Int. Cl.[4] B07B *1/46*
U.S. Cl. 209—400 **5 Claims**

1. A porous flat element for filtering and separation including; in combination:

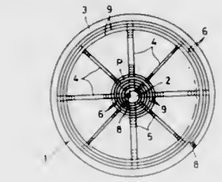
(a) a central member having at least a portion of a first helical groove of a desired cross section formed therein;

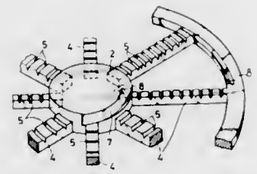
(b) an annular member coaxial with said central member and having at least a portion of a second helical groove of a desired cross-section formed therein;

(c) a plurality of radially extending support frames extending between said central member and said annular member;

(d) locking grooves provides in said support frames;

(e) a wire of uniform cross section formed into a helix and extending from said first helical groove in said central member to said second helical groove in said annular member and engaging said locking grooves in said radially extending frame members;





(f) a locking member on said central member to fix said wire into said first helical groove in said central member; and
(g) a locking member on said annular member to fix said wire in said second helical groove in said annular member.

4,904,379

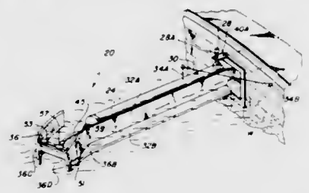
SKIMMER-DIVERTER ASSEMBLY FOR REMOVING DEBRIS FROM SWIMMING POOLS AND THE LIKE

John F. Ward, 402 Bunker Hill Dr., Pensacola, Fla. 32506

Continuation-in-part of Ser. No. 86,508, Aug. 18, 1987, Pat. No. 4,789,470. This application Nov. 4, 1988, Ser. No. 267,449

Int. Cl.⁴ E04H *3/20*

U.S. Cl. 210—169 **47 Claims**



1. A skimmer-diverter assembly for swimming pools having a water circulation and filtration system and a skimmer intake at a side wall thereof and having an established flow direction of circulation, said assembly comprising:
elongated arm means having one end thereof adapted to be positioned adjacent the downstream side of said skimmer intake and an opposite end for diverting the flow of said circulation system toward said side wall; and
flow augmenting means positioned on said arm means for augmenting current flow along said elongated arm means to enhance the entrainment of debris thereby and accelerate said entrained debris toward said pool side wall.

4,904,380

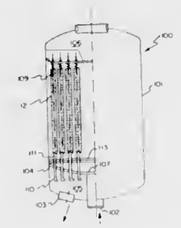
PRECOAT FILTER ASSEMBLY

Ashok K. Bhanot, Cortland, and John D. Miller, Ithaca, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Jan. 26, 1988, Ser. No. 148,607

Int. Cl.⁴ B01D *29/38, 25/10*

U.S. Cl. 210—193 **24 Claims**



2. A filter assembly for a precoat type filter unit with a filter element chamber for holding liquid at high pressure and having an interior wall, an upper end, a lower end, and a liquid inlet comprising:
a filter element including
a central cylindrical support and drainage core with an upper end, a lower end, a central drainage space, and a perforate wall to allow filtrate to flow into the drainage space and thence to an end of the core and
means for supporting a precoat including a septum surrounding and generally coaxial with said core and
a flow distributor with a wall surrounding and generally coaxial with said core and said septum, said wall having openings defining an open area through which liquid may flow, the local ratio of the open area to the total surface area of the wall varying along the length of the septum.

4,904,381

MAGNETIZATION TREATMENT APPARATUS OF FLUID

Kazuko Urakami, 6-18, Hibarigaoka 1-chome, Takarazuka-shi, Hyogo 665, Japan

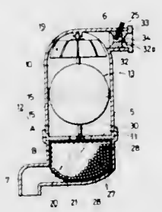
PCT No. PCT/JP87/00523, § 371 Date Jun. 22, 1988, § 102(e) Date Jun. 22, 1988, PCT Pub. No. WO88/03513, PCT Pub. Date May 19, 1988

PCT Filed Jul. 16, 1987, Ser. No. 238,212

Claims priority, application Japan, Nov. 10, 1986, 61-172358; Dec. 5, 1986, 61-188034; Mar. 27, 1987, 62-46505; Apr. 9, 1987, 62-53817

Int. Cl.⁴ B01D *35/06*

U.S. Cl. 210—223 **19 Claims**



1. Apparatus for magnetization treatment of a fluid comprising a fluid passage means, a magnetic field generator means rotatably disposed in said fluid passage means, and air introduction means in said passage means operable to draw in ambient air into said passage means to thereby introduce air into the fluid as the latter passes through said passage means and the fluid is subjected to the magnetic field generated by said magnetic field generator means, said air introduction means comprising a first and a second contiguous fluid passage section such that the fluid passes from said first fluid passage section to said second fluid passage section, said first fluid passage section having a cross-sectional area less than the cross-sectional area of said second fluid passage section such that the fluid moves faster through said first fluid passage section than said second fluid passage section, said air introduction means further comprising an air conduit in said second passage section opening up into said second fluid passage section such that air is drawn into said second fluid passage section through said air conduit, said fluid passage means comprising an inlet conduit connected to a housing, said generator means being disposed in said housing, said air introduction means being disposed in said inlet conduit.

4,904,382

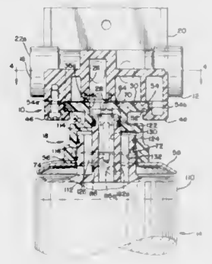
FILTER CARTRIDGE SECURITY FOR LOCKING BETWEEN OPERATING AND NON-OPERATING POSITIONS

Jack W. Thomsen, La Grange Park, Ill., assignor to Everpure, Inc., Westmont, Ill.

Filed Nov. 23, 1987, Ser. No. 124,156

Int. Cl.⁴ B01D *27/08*

U.S. Cl. 210--236 **63 Claims**



1. A filter assembly comprising:
(a) a manifold member adapted to be fixedly mounted, said manifold member including fluid inlet and outlet conduits;
(b) a pair of linearly extending rails connected to said manifold member for carrying a slide member thereon;
(c) a push-pull slide member for supporting a filter cartridge therein, said slide member being slidably supported by said rails and movable linearly thereon, between a load-/unload position and a running position;
(d) a filter cartridge sealingly and releasably supported in said slide member, said filter cartridge having inlet and outlet ports formed in one end thereof;
(e) means defining fluid passages in said slide member, for establishing fluid communication between inlet and outlet conduits in said manifold member and said filter cartridge when the slide member is in its running position.

4,904,383

SYSTEM FOR DEMINERALIZING WATER

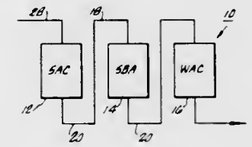
David C. Auerswald, 908 Firmona Ave., Redondo Beach, Calif. 90278

Division of Ser. No. 45,079, May 1, 1987, Pat. No. 4,820,421. This application Mar. 7, 1989, Ser. No. 320,115

Int. Cl.⁴ C02F *1/42*

U.S. Cl. 210--269 **34 Claims**

1. A system for use in demineralizing source water for subsequent use in a water-using apparatus, the system comprising (a) a series of at least three ion exchange resin beds arranged in sequential order comprising (i) a strong acid cation resin bed comprising a strong acid cation resin for removing cations from the source water passing therethrough to yield a first effluent, (ii) a first anion resin bed comprising an anion resin for removing anions from the first effluent passing therethrough to yield a second effluent, and (iii) a weak acid cation resin bed comprising a weak acid cation resin for removing cations from the second effluent passing therethrough without substantially splitting any salts present in the second effluent to yield a third



effluent, (b) means for introducing the source water into the strong acid cation resin bed, (c) means for passing the first effluent from the strong acid cation resin bed to the first anion resin bed, (d) means for passing the second effluent from the first anion resin bed to the weak acid cation resin bed, and (e) means for delivering the third effluent from the weak acid cation resin bed to the apparatus without passing the third effluent through any additional ion exchange resin beds.

4,904,384

APPARATUS HOUSING A PLURALITY OF FILTER ELEMENTS FOR SEPARATING CONTAMINANTS FROM A FLUID

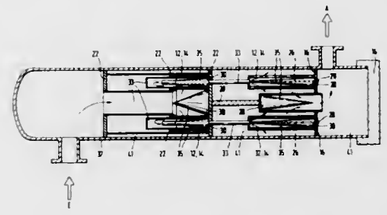
Karl Pötz, Oberursel, Fed. Rep. of Germany, assignor to Filtan Filter-Anlagenbau GmbH, Langenselbond, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 136,188

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644489

Int. Cl.⁴ B01D *29/24, 29/26*

U.S. Cl. 210—309 **9 Claims**



1. An apparatus for separating contaminants comprising:
a plurality of filter elements with each element including a tubular filter body having an inner flow space which is separated by a filter layer, the filter layer presenting respective opposed sides, from an outer flow space, the filter body presenting respective, opposed, open and closed ends, and the inner flow space of said filter body having a flow element disposed away from the open and towards the opposed end of the filter body for continuous narrowing of the inner flow space and being in flow contact through the filter layer with the outer flow space on the one filter layer side and through the open end on the opposed filter layer side,
the filter elements being arranged in at least two series-connected groups with a plurality of filter elements in each group and arranged in a series and with the filter body of the filter layer of a filter element in one of the groups

simultaneously forming the filter body, respectively the filter layer of the adjacent filter element of the one group being in flow contact with a filter element of the other group.

4,904,385

POROUS FILTER MEDIA AND MEMBRANE SUPPORT MEANS

Ritchie A. Wessling, Midland; Larry D. Yats, Clare, and Alan F. Burmester, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 851,178, Apr. 14, 1986, Pat. No. 4,765,915, which is a continuation-in-part of Ser. No. 737,113, May 23, 1985, abandoned. This application May 19, 1988, Ser. No. 196,176

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—490 14 Claims

9. A supported membrane comprising a membrane discriminating layer on at least one major surface of a lofted fiber-reinforced porous composite sheet.

4,904,386

METHOD OF PURIFYING LIQUIDS LIKE WASTEWATER BY MEANS OF A FILTER BED CONTAINING AQUATIC PLANTS PLANTED IN SUCH FILTER BED

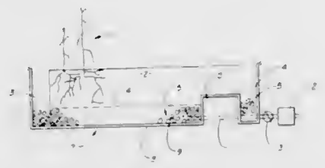
Reinhold W. Kickuth, Gilsbergstrasse 9, D-3436 Hess.-Lichtenau, Fed. Rep. of Germany

Division of Ser. No. 31,339, Mar. 26, 1987, Pat. No. 4,855,040. This application Mar. 28, 1989, Ser. No. 329,769

Claims priority, application United Kingdom, Mar. 27, 1986, 86 07653

Int. Cl.[4] C02F *3/32*

U.S. Cl. 210—602 25 Claims



1. A method of purifying a liquid, comprising the steps of:

passing the liquid to be purified from infeed means through an aquatic plant-containing filter bed to outfeed means and producing an outflow of liquid from said aquatic plant-containing filter bed;

during said step of passing said liquid to be purified through said aquatic plant-containing filter bed, setting up in said aquatic plant-containing filter bed a predetermined throughflow pattern by controlling the outflow of liquid from said aquatic plant-containing filter bed; and

adjusting said outflow and thereby said predetermined throughflow pattern such as to maintain a predetermined hydromorphous state of said aquatic plant-containing filter bed.

4,904,387

WASTE TREATMENT AND WATER RECYCLING TOILET SYSTEM

Edward J. Jordan, Brighton, Mich., assignor to Thetford Corporation, Ann Arbor, Mich.

Filed Jun. 17, 1988, Ser. No. 208,737

Int. Cl.[4] C02F *3/30*

U.S. Cl. 210—605 8 Claims

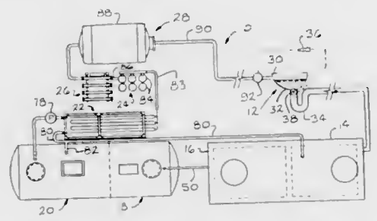
1. In a substantially closed loop multi-stage method for treating toilet waste and recycling treated liquid therefrom, the steps of:

a. receiving said waste at a first stage and flushing said waste from said first stage with flush water containing nitrates thereby to form a liquid mixture of the waste and nitrate-containing flush water;

b. transferring said liquid mixture to a trap in which non-waste solid particles are separated from said liquid mixture;

c. transferring said liquid mixture through a sump to regulate the flow of said liquid mixture to a second stage whereby said mixture is agitated and is maintained under anoxic conditions so as to cause denitrification of said liquid mixture and generation of nitrogen gas, said nitrogen gas being vented from said second stage in such manner as to prevent the entry of oxygen into said second stage thereby to assist in maintaining the anoxic conditions in said second stage;

d. transferring liquid from said second stage to a third stage containing biologically active solids and liquid and being



maintained under aerobic conditions, air being passed through the mixture in said third stage at a sufficient rate to cause nitrification of nitrogeneous compounds in said mixture, thereby to produce nitrates therein, the dissolved oxygen in the mixture in said third stage being greater than 2 mg/l;

e. transferring the nitrate-containing mixture from said third stage directly to a filtering stage wherein said mixture is filtered to separate nitrate-containing water therein from the solids therein said nitrate-containing mixture being transferred to said filtering stage at a rate in excess of said filtering stage capacity to filter said mixture so as to create a flow of nitrate-containing liquid to wash solids from said filtering stage;

f. cycling filtered nitrate-containing water from said filtering stage to said first stage thereby to serve as said nitrage-containing flush water in said first stage; and

g. recirculating a portion of said nitrate-containing wash liquid to said trap to maintain a substantially constant flow of nitrate-containing liquid into said trap.

4,904,388

PROCESS FOR SLUDGE THICKENING

Kenji Baba; Shoji Watanabe; Hayao Yahagi, and Hitoshi Ogasawara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

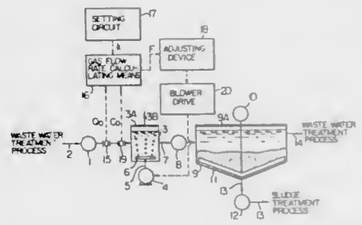
Continuation of Ser. No. 782,900, Oct. 2, 1985, abandoned, which is a division of Ser. No. 598,463, Apr. 9, 1985, abandoned, which is a continuation of Ser. No. 327,117, Dec. 3, 1981, abandoned. This application Oct. 21, 1988, Ser. No. 262,212

Claims priority, application Japan, Dec. 5, 1980, 55-172189; Dec. 5, 1980, 55-172190

Int. Cl.[4] C02F *11/04*

U.S. Cl. 210—605 9 Claims

1. A process for sludge thickening, the processing comprising: allowing suspended solids of a sludge supplied to a gravity settling type sludge thickener to settle by their own weight while being thickened; subjecting the sludge to be supplied to the sludge thickener to aeration in a sludge aerator means; retaining the sludge in the sludge aerator means for less than one hour for stripping gas bubbles on surfaces around and interiorly of the sludge particles and dissolved gas in a mixed



liquour containing sludge particles to the atmosphere without biological decomposition of organic materials contained in the sludge.

4,904,389

PROCESS FOR THE SEPARATION OF DICARBOXYLIC ACIDS

Heinrich Waldhoff, Langenfeld; Joachim Schindler, Hilden, and Holger Vichweg, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 17, 1988, Ser. No. 208,342

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720261

Int. Cl.[4] C07C *51/42, 57/13, 55/02;* B01D *13/00*

U.S. Cl. 210—637 22 Claims

1. A process for the separation of mixtures of dicarboxylic acids which comprises maintaining an aqueous feed solution of a multicomponent mixture of dicarboxylic acids in a membrane filtration zone, adjusting the pH value of said solution such that the membrane is made preferentially impermeable to at least one component of the dicarboxylic acid mixture, and recovering a dicarboxylic acid filtrate containing less of at least one component than said aqueous feed solution.

4,904,390

METHOD FOR VARYING THE CAPACITY OF AN ION EXCHANGER FOR A SPECIFIC CHEMICAL ELEMENT

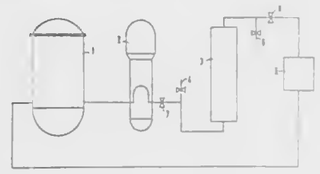
Werner Schweighofer, Erlangen; Christian M. Z. Schwabedissen, Herzogenaurach; Brigitte Siewert-Posielek, Leinburg; Karl Habeck, Neustadt/Aisch, and Klaus Seifert, Schwebheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 177,180

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711018

Int. Cl.[4] B01D *15/04;* C02F *1/42*

U.S. Cl. 210—664 15 Claims



12. A method for varying the capacity of an ion exchanger used for absorbing a specific variety of valent chemical element from a liquid said specific chemical element existing in more than one chemical form, said ion exchanger having different capacities for different valences of said specific chemical element, which method comprises the steps of varying the chemical valence form of the chemical element in the liquid from which it is to be absorbed immediately upstream of said ion exchanger by adding redox substances to said liquid for converting said chemical element to a valence form for which the ion exchanger has a greater capacity than for this chemical element in its original state, then passing said liquid through said ion exchanger to remove said element, and then removing said adding redox substances from the liquid immediately downstream from the ion exchanger.

4,904,391

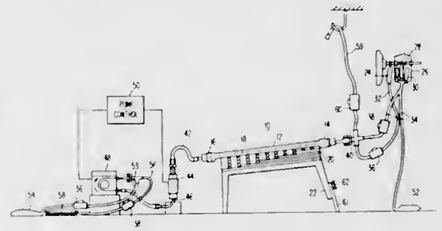
METHOD AND APPARATUS FOR REMOVAL OF CELLS FROM BONE MARROW

Richard B. Freeman, 1920 NW. 31st Ter., Gainesville, Fla. 32605

Filed Oct. 9, 1985, Ser. No. 785,729

Int. Cl.[4] B03C *1/00, 1/02*

U.S. Cl. 210—695 9 Claims



1. In a method for removing cells from bone marrow wherein said cells, bound to monoclonal antibodies, conjugated to magnetic particles, said method comprising flowing a liquid sample containing said bone marrow and magnetic conjugated antibodies bound to said cells through a zone provided with an inlet and an outlet associated with a magnetic field such that said liquid sample flowing there through and passes through said magnetic field whereby said bound cells and unconjugated particles are removed from said liquid sample by magnetic attraction, the improvement wherein:

said magnetic field through which said liquid sample flows is non-uniform and is an ascending gradient from said inlet to said outlet.

4,904,392

METHOD OF SEPARATING, FROM A LIQUID MIXTURE, A LIQUID IN DISPERSED PHASE FROM A LIQUID IN CONTINUOUS PHASE

Erik Dahlquist, Västerås, Sweden, assignor to ABB Atom AB, Västerås, Sweden

Filed Apr. 5, 1989, Ser. No. 333,553

Claims priority, application Sweden, Apr. 8, 1988, 8801288

Int. Cl.[4] B01D *35/00*

U.S. Cl. 210—708 7 Claims

1. A method comprising: separating in a liquid mixture, a liquid in a continuous phase from a liquid in the form of drops in a phase dispersed therein, by providing a apparatus including a chamber (10) having a liquid-permeable layer (11, 12) for the passage of the liquid mixture therethrough, the layer having through-holes of which at least the majority has a cross-sectional area which is greater than the cross-sectional area of at least the majority of the drops of the liquid in the dispersed phase, means for shearing said liquid mixture, including a rotor (23) arranged in the chamber on the inlet side of the liquid-permeable layer for maintaining a film (24) of liquid, movable along the layer, from the dispersed phase on the layer, and means for maintaining a higher pressure on the inlet side of the layer. than on its outlet side sufficient to cause drops of the

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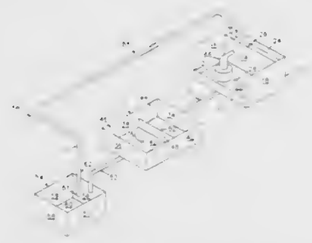
liquid in the dispersed phase to coalesce in the firm and in the through-holes of the layer, feeding said liquid mixture to said inlet side, withdrawing continuous phase and coalesced dispersed phase from said outlet side, and separating said continuous phase depleted from the dispersed phase from said coalesced dispersed phase.

4,904,393

METHOD FOR CONTROLLING OVERSPRAY IN PAINT SPRAY BOOTHS

David B. Mitchell, Palatine, and Thomas P. Curran, Lake Zurich, both of Ill., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 27, 1988, Ser. No. 199,969
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—712 **18 Claims**



1. A method of detackifying spray booth water containing paint particles from paint spray comprising the steps of:
(a) adding to the spray booth water at least about 150 ppm of a polymer which is a reaction product of an aldehyde with either a urea or an aminotriazine, or both, and which has a molecular weight of at least about 5000;
(b) adding to the spray booth water at least about 100 ppm total of a modified tannin which is a reaction product of a condensed tannin with both an aldehyde and an amino compound, together with either a diallydialkyl quaternary ammonium polymer or a polymer derived by reacting dimethylamine, diethylamine or methylethamine with an epihalohydrin;
(c) providing a pH above about 6.5 in the spray booth water such that the polymer added in step (a) and the modified tannin added in step (b) form a pin floc which is dispersed in the spray booth water for detackification, with the polymer added in step (b) stabilizing said pin floc and improving detackification and (d) separating the floc and paint particles from said spray booth water.

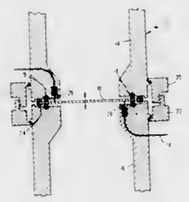
4,904,394

METHOD FOR SELECTIVE FILTERING OF A FLUID USING POROUS PIEZOELECTRIC MATERIAL

David J. Clarke, and Barrie C. Blake-Coleman, both of Salisbury, England, assignors to Public Health Laboratory Service Board, London, United Kingdom

PCT No. PCT/GB86/00334, § 371 Date Apr. 1, 1987, § 102(e) Date Apr. 1, 1987, PCT Pub. No. WO86/07284, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 11, 1986, Ser. No. 10,888
Int. Cl.[4] B01D *33/00, 35/20*
U.S. Cl. 210—739 **3 Claims**

1. A method for selective filtering of a fluid containing at least two distinct species of microorganisms or macromolecule, comprising the steps of providing a filter body having a planar surface opposing the fluid, the body being formed of porous piezoelectric material, the pores of which provide filtrate passages extending through the body, which filtrate passages are capable statically of passing both said species; continuously applying an oscillating electric field to said body to vibrate the body and effect a displacement in the plane of said planar surface, said displacement having an amplitude between about 0.5 and 10 times the mean dimension of the



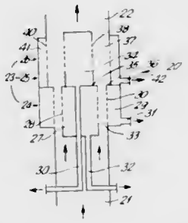
pores in said plane; and varying the frequency of said oscillating field and thus of said displacement selectively to either pass both said species or block one and pass the other of said species.

4,904,395

METHOD AND APPARATUS FOR THICKENING FIBER SUSPENSION

Kaj O. Henricson, Kotka, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Dec. 9, 1987, Ser. No. 130,403
Claims priority, application Finland, Dec. 17, 1986, 865136
Int. Cl.[4] C02F *1/00*
U.S. Cl. 210—741 **9 Claims**



2. A method of thickening fiber suspension by extracting liquid from the suspension under the influence of a pressure difference acting over filtering surface, comprising the steps of:
providing a channel equipped with the filtering surface;
leading suspension to the channel so that it flows as a plug flow consisting of a multi-dimensional fiber network at a flow rate decelerating evenly in a flow direction; and
controlling amounts of extracted filtrates so that internal friction of the fiber suspension remains larger than surface friction between the fiber suspension and the filtering surfaces.

4,904,396

EXTRACTION APPARATUS AND PROCESS

Daniel Benet, Villemomble, France, assignor to Roussel Uclaf, Paris, France

Filed Dec. 16, 1988, Ser. No. 285,205
Claims priority, application France, Dec. 17, 1987, 87 17633
Int. Cl.[4] B01D *21/00*
U.S. Cl. 210—745 **9 Claims**

8. An automatic process for the selective extraction of one phase of a multiphase system in a receptacle with the phases having different opacities comprising displacing along the axis of the receptacle (2) a stirrup (1) with a means (5) sensitive to the change of opacity of the phases and a means (6) for effecting extraction of a phase until means (6) penetrates the phase (3) to be removed, extracting the phase (3) with means (6) until



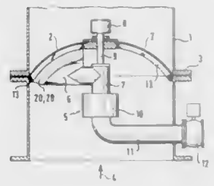
means (5) detects the phase (4) of different opacity and then stopping the said extraction.

4,904,397

DEVICE FOR THE MECHANICAL CLEANSING OF FLUIDS

Klaus Eimer, Ratingen; Hans-Werner Schildmann, Heiligenhaus; Detlef Taprogge, Wetter Ruhr; Klaus-Michael Bitzer, Moers, and Dieter Patzig, Ratingen, all of Fed. Rep. of Germany, assignors to Taprogge Gesellschaft mbH, Wetter, Fed. Rep. of Germany

Filed Nov. 27, 1987, Ser. No. 126,029
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640631; European Pat. Off., Aug. 21, 1987, 87112162
Int. Cl.[4] B01D *29/38*
U.S. Cl. 210--791 **11 Claims**



11. Method for the mechanical cleansing of fluids in a cooling water feeding pipe with a device including:
a rotationally symmetric filter body disposed in and extending over the entire cross section of a cooling water feeding pipe, said filter having upstream and downstream filter surfaces as seen in a given flow direction through the cooling water feeding pipe, radial ridges projecting from said upstream surface against said given flow direction forming chambers with said upstream surface and subdividing said upstream surface into individual sectors each having a given central angle and a two-dimensionally domed shape, said radial ridges having free edges, a rotatable suction device coaxial with said filter body, means for rotating said suction device for partially acting upon and completely successively sweeping said upstream filter surface, said suction device having a sector-shaped nozzle with a central angle substantially equal to said given central angle, said nozzle having edges circulating at a distance from said free edges of said radial ridges defining a gap therebetween, and flexible sealing lips attached to said free edges of said radial ridges and being at least as wide as said gap and bridging said gap;
which comprises successively running the suction nozzle discontinuously against the individual sectors while liquid flows through the filter in the given flow direction, and holding the suction nozzle against a sector until a sufficient build-up of a back-flow and a suction of sediments has occurred.

4,904,398

CLASS D FIRE EXTINGUISHING

Jay S. Greene, Manheim, Pa., assignor to Environmental Security Incorporated, Gloucester, Mass.

Continuation-in-part of Ser. No. 904,279, Sep. 8, 1986, and Ser. No. 695,349, Jan. 25, 1985, and Ser. No. 744,771, Jun. 14, 1985, abandoned. This application Mar. 14, 1988, Ser. No. 167,719
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[4] A62D *1/00*; A62C *1/00, 3/00*
U.S. Cl. 252—2 **9 Claims**

1. A liquid formulation for use as a Class D firefighting agent and consisting essentially of a mixture of:
a linear alkylbenzene sulfonate, non-ionic detergent and lauric superamide detergent mixture comprising the majority of the total mass of the formulation;
vitamin B-6 in the amount of 0–3 percent by weight of the detergent mixture;
sodium chloride in the amount of about 4.5–41% percent by weight of the detergent mixture;
bicarbonate of soda in the amount of about 0–18 percent by weight of the detergent mixture;
0–4 percent by weight of the detergent mixture coloring and perfuming agents; and
a volume of water large enough only to provide effective mixing of the other components of the formulation and insufficiently large to interfere with the use of the formulation as an effective Class D firefighting agent.

4,904,399

PROCESS FOR PREVENTING GREASE FIRES IN STEEL MILLS AND OTHER METAL PROCESSING MILLS

John A. Waynick, Bolingbrook, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 31, 1989, Ser. No. 332,510
Int. Cl.[4] C10M *125/10*
U.S. Cl. 252—11 **20 Claims**

1. A process for preventing grease fires, comprising the steps of:
emitting a flame in the presence of an oxygen-containing, combustion-supporting gas;
positioning said flame near a grease;
said grease comprising a material for substantially minimizing combustion of said grease; and
substantially preventing said grease from combusting.

4,904,400

METHOD OF IMPROVING THE SHEAR STABILITY OF LITHIUM SOAP GREASES

Terrance O. Brown, Corunna; David A. Slack, and A. G. Alexander, both of Sarnia, all of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 80,454, Jul. 31, 1987, Pat. No. 4,822,503. This application Dec. 21, 1988, Ser. No. 287,933
Int. Cl.[4] C10M *105/14*
U.S. Cl. 252—32.7 E **27 Claims**

1. In a method for preparing a grease containing
(i) a lubricating oil,
(ii) a lithium soap of an hydroxy fatty acid,
(iii) a polyhydric alcohol having at least three hydroxy groups, and
(iv) at least two metal hydrocarbylthiophosphate compounds in which the metal is different in at least two compounds,
by the steps comprising
(a) forming a mixture of the lubricating oil and the lithium soap of an hydroxy fatty acid at a temperature between about 150° and about 220° F.,
(b) increasing the temperature of the product from step (a) to between about 350° and about 400° F. for a period of tie sufficient to improve crystallization of the lithium soap in the oil,

(c) cooling the product from step (b) to a temperature between about 150° and about 200° F., and
(d) adding the polyhydric alcohol and the metal hydrocarbylthiophosphate to the product from step (c),
the improvement which comprises adding at least a major portion of the polyhydric alcohol to the mixture of lubricating oil and lithium soap of an hydroxy fatty acid before step (b) to increase the shear stability of the grease.

4,904,401

LUBRICATING OIL COMPOSITIONS

David E. Ripple, Kirtland, and Calvin W. Schroeck, Eastlake, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 206,113, Jun. 13, 1988. This application Sep. 8, 1988, Ser. No. 242,038
Int. Cl.[4] C10M *137/06, 141/06*
U.S. Cl. 252—32.7 E **43 Claims**

1. A lubrication oil composition for internal combustion engines which comprises:
(A) a major amount of oil of lubrication viscosity
(B) at least about 2.5% by weight of at least one carboxylic derivative composition produced by reacting
(B-1) at one substituted succinic acylating agent with
(B-2) at least one amine compound characterized by the presence within its structure of at least one HN< group wherein said substituted succininc acrylating agents consist of substituent groups groups wherein the substituent groups are derived from polyalklene, said polyalkene being characterized characterized by an Mn value of 1300 to about 5000 and an Mw/Mn value of about 1.5 to about 4.5, said acylating agents being characterized by the presence within their structure of an average of at least 1.3 succinic groups for each equivalent weight of substituent groups, and
(C) from about 0.05 to about 5% by weight of a mixture of metal salts of dihydrocarbyl phosphorodithioic acids wherein in at least one of the dihydrocarbyl phosphorodithioic acids, one of the hydrocarbyl groups (C-1) is an isopropyl or secondary butyl group, the other hydrocarbyl group (C-2) contains at least five carbon atoms, and at least about 25 mole percent of all of the hydrocarbyl groups present in (C) are isopropyl groups, secondary butyl groups or mixtures thereof.

4,904,402

OXIDIZED SULFURIZED ISOBUTYLENE LUBE OIL ADDITIVES

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 108,595, Oct. 15, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 322,336
Int. Cl.[4] C10M *143/06*
U.S. Cl. 252—46.3 **10 Claims**

1. A process for making a lubricant additive consisting of reacting a liquid sulfurized isobutylene with a mild oxidizing agent in a mole ratio of oxidizing agent to sulfurized isobutylene of between about 0.5 and about 2.5 moles of equivalent oxygen to 1 mole of sulfurized isobutylene at a reaction temperature between about 20° C. and about 95° C. under conditions sufficient to effect the appearance of new infra red frequency bands at 1300 cm^{-1} and 1030 cm^{-1} indicative of the formation of sulfoxides and sulfones and recovering a liquid oxidized sulfurized isobutylene product soluble in a lubricating composition.

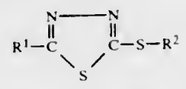
4,904,403

POLYALKYLATED 1,3,4-THIADIAZOLES AND LUBRICATING COMPOSITIONS CONTAINING SAME

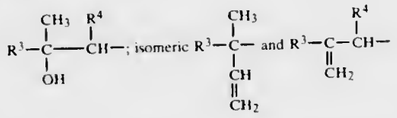
Thomas J. Karol, Norwalk, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed Jun. 12, 1989, Ser. No. 364,415
Int. Cl.[4] C10M *1/38*
U.S. Cl. 252—47.5 **4 Claims**

1. A compound having the structural formula



wherein R^1 represents hydroxy, amino, mercapto, alkylthio, 2-hydroxyalkylthio or R^2S-group and R^2 represents a polyolefin residue and is characterised by the formulae



wherein R^3 is an alkyl group having 50 to 400 carbon atoms and R^4 is hydrogen or methyl group.

4,904,404

LUBRICATING OIL CONTAINING VISCOSITY INDEX IMPROVER

Christopher S. Liu, Poughkeepsie; Nicholas Benfaremo, Wappingers Falls; Maria M. Kapuscinski, Carmel, and Larry D. Grina, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 84,355, Aug. 12, 1987, Pat. No. 4,812,261. This application Mar. 7, 1989, Ser. No. 320,187
The portion of the term of this patent subsequent to Mar. 14, 2009, has been disclaimed.
Int. Cl.[4] C10M *149/06*
U.S. Cl. 252—51.5 A **27 Claims**

1. A composition comprising a carbon-carbon backbone polymer containing residual unsaturation, and bearing graft moieties derived from a graft monomer containing ethylenic unsaturation and an epoxide moiety which graft polymer has been functionalized with, per mole of polymer, (a) 0.25–2 moles of a Mannich base formed by the reaction of (i) an aldehyde, (ii) a polyamine containing at least one primary or secondary amine group and (iii) a non-hindered phenol and with (b) 0.1–1.5 moles of N-vinyl pyrrolidone or a functionalizing polyamine bearing a Zerewitinoff active hydrogen atom bonded to a nitrogen atom.

12. A lubricating composition comprising a major portion of a lubricating oil and a minor effective viscosity index improving portion of a composition comprising a carbon-carbon backbone polymer containing residual unsaturation, and bearing graft moieties derived from a graft monomer containing ethylenic unsaturation and an epoxide moiety which graft polymer has been functionalized with, per mole of polymer, (a) 0.25–2 moles of a Mannich base formed by the reaction of (i) an aldehyde, (ii) a polyamine containing at least one primary or secondary amine group and (iii) a non-hindered phenol and with (b) 0.1–1.5 moles of N-vinyl pyrrolidone or a functionalizing polyamine bearing a Zerewitinoff active hydrogen atom bonded to a nitrogen atom.

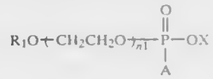
4,904,405

AEROSOL PREPARATIONS CONTAINING MIXTURES OF PHOSPHATE ESTERS

Yasushi Kajihara, Kasukabe; Noriyoshi Fujisawa, Sakura, and Masatoshi Arisawa, Matsudo, all of Japan, assignors to Kao Corporation, Tokyo, Japan

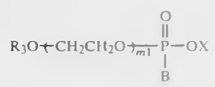
Filed Feb. 28, 1989, Ser. No. 316,942
Claims priority, application Japan, Feb. 29, 1988, 63-47020
Int. Cl.[4] C11D *17/00, 1/34*
U.S. Cl. 252—90 **3 Claims**

1. An aerosol preparation comprising:
a cleansing agent comprising a phosphate ester surfactant obtained by mixing (A) a first alkylphosphate salt represented by the following formula (I):



(I)

wherein R_1 means a saturated or unsaturated hydrocarbon group having 12–14 carbon atoms, X denotes a hydrogen atom, alkali metal, ammonium or alkanolamine having 2–3 carbon atoms, n1 stands for a value of 0–10, A is $R_2O-(CH_2CH_2O)_{n2}$ or —OY, R_2 meaning a saturated or unsaturated hydrocarbon group having 12–14 carbon atoms, Y denoting a hydrogen atom, alkali metal, ammonium or alkanolamine having 2–3 carbon atoms and n2 being a value of 0–10, and the weight ratio of monoalkyl ester to dialkyl ester is from 100/0 to 50/50, with (B) a second alkylphosphate salt represented by the following formula (II):



(II)

wherein R_3 means a saturated or unsaturated hydrocarbon group having 16–18 carbon atoms, m1 stands for a value of 0–10, B denotes $R_4O-(CH_2CH_2O)_{m2}$ or —OY, R_4 meaning a saturated or unsaturated hydrocarbon group having 16–18 carbon atoms, m2 being a value of 0–10 and Y having the same meaning as defined above, X has the same meaning as defined above, and the weight ratio of monoalkyl ester to dialkyl ester is from 100/0 to 50/50, at a weight ratio of the first alkylphosphate salt (A) to the second alkylphosphate salt (B) of from 70:30 to 20:80; and
a propellant in a proportion of 1–80 parts by weight per 100 parts by weight of the cleansing agent.

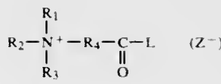
4,904,406

QUATERNARY AMMONIUM COMPOUNDS FOR USE IN BLEACHING SYSTEMS

James R. Darwent, West Kirby; Keith C. Francis, Oxton; John Oakes, Winsford, and David W. Thorntbwaite, Neston, all of Great Britain, assignors to Lever Brothers Company, New York, N.Y.

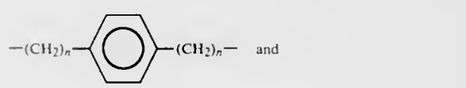
Filed Feb. 21, 1989, Ser. No. 313,112
Claims priority, application United Kingdom, Mar. 1, 1988, 8804816; Nov. 14, 1988, 8826619
Int. Cl.[4] C11D *3/395;* **D06L** *3/02;* **C01B** *15/00, 15/055*
U.S. Cl. 252—102 **6 Claims**

1. A bleaching-detergent composition comprising:
(i) from 2 to 40% by weight of a peroxide bleaching compound capable of yielding hydrogen peroxide in aqueous solution;
(ii) from 0.1 to 20% by weight of a peroxycarboxylic acid precursor having the formula:

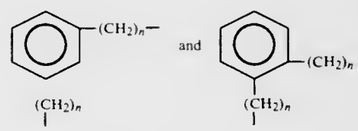


(Z⁻)

wherein
R_1, R_2 and R_3 are each a radical selected from the group consisting of alkyl, alkenyl, hydroxyalkyl and polyoxyalkylene containing from 1 to 18 carbon atoms;
or two or more of R_1, R_2 and R_3 together with the N-atom form an optionally substituted, nitrogen-containing heterocyclic ring system;
R_4 is a bridging group selected from



and



wherein
each n can individually be 0, 1 or 2;
L is a leaving group, the conjugate acid of which has a pK_a in the range of from 4 to 13, and
Z^- can be a chloride, bromide, hydroxide, nitrate, methosulphate, bisulphate, acetate, sulphate, citrate, borate or phosphate anion;
(iii) from 0 to 50% by weight of a surface-active material selected from the group consisting of anionic, nonionic, amphoteric, zwitterionic and cationic surfactants and mixtures thereof;
(iv) from 0 to 80% by weight of a detergency builder.

4,904,407

AZEOTROPE-LIKE COMPOSITIONS OF 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, METHANOL, NITROMETHANE, 1,2-DICHLOROETHYLENE AND 1-CHLOROPROPANE

Ellen L. Swan, Ransomville; Rajat S. Basu; David P. Wilson, both of Williamsville, and Earl A. E. Lund, West Seneca, all of N.Y., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 1, 1988, Ser. No. 278,404
Int. Cl.[4] C11D *7/50, 7/30*
U.S. Cl. 252—171 **21 Claims**

11. Azeotrope-like compositions consisting essentially of 1,1,2-trichloro-1,2,2-trifluoroethane, methanol, nitromethane, at least about 0.4 weight percent cis-1,2-dichloroethylene and at least about 20.0 weight percent 1-chloropropane which boil at about 38.5° C.±1° C. at 760 mm Hg.

12. Azeotrope-like compositions consisting essentially of 1,1,2-trichloro-1,2,2-trifluoroethane, methanol, nitromethane, at least about 10 weight percent 1-chloropropane and a mixture of at least about 16.3 weight percent trans-1,2-dichloroethylene and at least about 0.4 weight percent cis-1,2-dichloroethylene which boil at about 39.2° C.±1° C. at 760 mm Hg.

13. The method of cleaning a solid surface which comprises treating said surface with an azeotrope-like composition as defined in claim 1.

4,904,408

USE OF GRAFT POLYMERS BASED ON POLYALKYLENE OXIDES AS GRAYNESS INHIBITORS IN THE WASH AND AFTERTREATMENT OF TEXTILE MATERIAL CONTAINING SYNTHETIC FIBERS

Alexander Kud, 57 Am Heilbrunn, 6509 Eppelsheim; Wolfgang Trieselt, 1 Alwin-Mittasch-Platz, 6700 Ludwigshafen, and Heinrich Hartmann, 46 Weinheimer Strasse, 6703 Limburgerhof, all of Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 176,333

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[4] C11D *3/37*

U.S. Cl. 252—174.24 **8 Claims**

1. A detergent comprising surfactants and builders which contains, as an added soil antiredeposition agent, from 0.1 to 5% by weight of a graft polymer which is obtainable by grafting

(a) a polyalkylene oxide which has a number average molecular weight of from 30 to 100,000 and is based on ethylene oxide, propylene oxide and/or butylene oxide with

(b) N-vinylpyrrolidone and

(c) a vinyl ester derived from a saturated monocarboxylic acid containing from 1 to 6 carbon atoms and/or a methyl or ethyl ester of acrylic or methacrylic acid in a weight ratio (a):(b):(c) of from 1:0.3:1 to 1:5:30, the order of the addition of monomers (b) and (c) in the graft polymerization being immaterial.

4,904,409

OPTICALLY ACTIVE-1-(2-HALOGEN-SUBSTITUTED-PHENYL)-ETHANOL AND ITS DERIVATIVE

Kazutoshi Miyazawa; Ohno Kouji; Naoyuki Yoshida, and Masakazu Kaneoya, all of Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

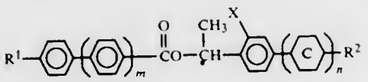
Filed Sep. 1, 1988, Ser. No. 239,277

Claims priority, application Japan, Oct. 9, 1987, 62/255326; Oct. 9, 1987, 62/255325

Int. Cl.[4] G02F *1/13;* **C07C** *69/76;* **C07D** *239/02, 211/72*

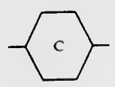
U.S. Cl. 252—299.61 **2 Claims**

1. An optically active compound expressed by the formula

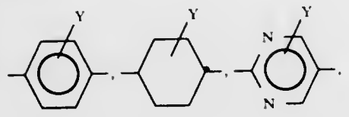


(I)

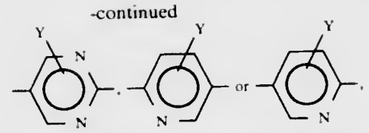
wherein R^1 and R^2 each represent an alkyl group or an alkoxy group each of 1 to 20 carbon atoms or hydrogen atom, m and n each represents 1 or either one thereof represents zero, n represents 1 or 0, X represent fluorine atom, chlorine atom, bromine atom or cyano group and



represents



-continued



wherein Y represent either one of hydrogen atom, halogen atom or cyano group.

2. A liquid crystal composition comprising at least two components, at least one of which is an optically active compound as set forth in claim 1.

4,904,410

MESOMORPHIC COMPOUND AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Hiroyuki Nohira, Urawa; Masanao Kamei, Annaka; Shinichi Nakamura, Urawa; Takashi Iwaki, Atsugi; Kazuharu Katagiri, Tama, and Yoko Yamada, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 174,384

Claims priority, application Japan, Mar. 31, 1987, 62-78001

Int. Cl.[4] G02F *1/13;* **C09K** *19/34;* **C07D** *239/02*

U.S. Cl. 252—299.61 **21 Claims**

1. An optically active compound represented by the following formula (I):

(I)

wherein R_1 and R_2 are respectively an alkyl group having 1 to 16 carbon atoms, and C* denotes an asymmetric carbon atom.

4,904,411

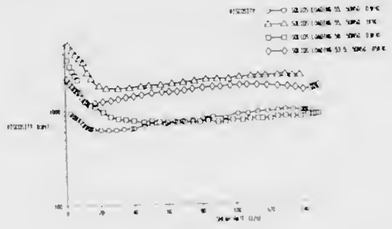
HIGHLY LOADED, POURABLE SUSPENSIONS OF PARTICULATE MATERIALS

Bruce E. Novich, Lexington; Mark A. Occhionero, Arlington, and Richard L. Pober, Waban, all of Mass., assignors to Ceramics Process Systems Corp., Milford, Mass.

Continuation-in-part of Ser. No. 856,803, Apr. 25, 1986, Pat. No. 4,816,182, and a continuation-in-part of Ser. No. 45,684, May 1, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 242,726

Int. Cl.[4] B01J *13/02;* **C04B** *35/02, 35/10, 33/32*

U.S. Cl. 252—309 **13 Claims**



1. A pourable slurry composition for the fabrication of sintered articles, comprising:

(i) narrow size range, colloidal sinterable particles selected from the group consisting of ceramics, metals, and mixtures thereof;

(ii) a solvent system; and

(iii) a dispersant polyethylene imine-based polyelectrolytes, the dispersant present in an amount effective to achieve a

solids loading of at least 55% by volume and to provide a slurry viscosity of less than 7,500 cPs at 100 sec^{-1}.

4,904,412

EMULSION-FORMING COMPOSITION

Karl Schügerl, Hemmingen, and Wilfried Gutknecht, Hanover, both of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 109,981, Oct. 16, 1987, Pat. No. 4,775,479. This application Jun. 9, 1988, Ser. No. 204,378

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1986, 3635450

Int. Cl.[4] B01F *3/08, 17/22;* **B01J** *13/00*

U.S. Cl. 252—357 **3 Claims**

1. An emulsion-forming composition for forming an emulsion for use in a process for selectively recovering geranium or arsenic from an aqueous solution thereof by liquid membrane technology, said composition consisting essentially of:

a solvent mixture consisting essentially of:

70 to 75% by volume of a hydrocarbon which is a predominantly straight-chain saturated C_{16}–C_{20} hydrocarbon or kerosine

20 to 25% by volume of a mononuclear aromatic hydrocarbon, and

1 to 5% by volume of a halogenated C_1–C_5 hydrocarbon; and

more than 0.1% by weight of an oil-soluble polyisobutylene-succinic anhydride/polyamine condensation product surfactant.

4,904,413

COOLING WATER CORROSION CONTROL METHOD AND COMPOSITION

John E. Hoots, and Donald A. Johnson, both of Naperville, Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 122,528, Nov. 18, 1987, abandoned, which is a continuation of Ser. No. 844,415, Mar. 26, 1986, abandoned. This application Dec. 20, 1988, Ser. No. 287,633

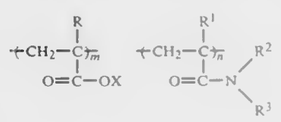
Int. Cl.[4] C23F *11/06, 11/16;* **C02F** *5/10*

U.S. Cl. 252—389.23 **3 Claims**

1. A composition for inhibiting corrosion in industrial cooling waters which contain hardness and have a pH of at least 8 which composition comprises:

I. a phosphonate blend of 2-phosphonobutane-1,2,4-tricarboxylic acid and 1-hydroxyethylidene-1,1-diphosphonic acid, and

II. a water-soluble non-crosslinked random terpolymer of 40 to 90 weight parts of an acrylic acid, 5 to 30 weight parts of methacrylic acid, and 5 to 50 weight parts of a t-butylacrylamide, based on a total of 100 weight parts of polymer, said polymer having a weight average molecular weight in the range of about 1,000 to 50,000, and the polymerized units of an acrylic acid and a t-butyl acrylamides are defined by the following formula:



where

m is in the range of about 10–700 and n is in the range of about 0.1 to 350, subject to the molecular weight limitations,

R and R^1 are individually selected from hydrogen and methyl;

X is selected from hydrogen, sodium, potassium, calcium, ammonium, and magnesium moieties;

and R^2 and R^3 are individually selected from hydrogen, and substituted and unsubstituted groups each containing a total of 1 to 8 carbon atoms, wherein the substituents on R^2 and/or R^3 are selected from alkyl, aryl, and keto groups, provided that either R^2 and/or R^3 is t-butyl, with the weight ratio of polymer:phosphonate blend being within the range of 0.2/1 to 2.1.

4,904,414

ELECTRICALLY CONDUCTIVE ADHESIVE FOR A BROAD RANGE OF TEMPERATURES

Hanns-Heinz Peltz, Munich, Fed. Rep. of Germany, and Dietrich Wolfer, Salzburg, Austria, assignors to Siemens Aktiengesellschaft, Berlin and Wacker-Chemie GmbH, Munich, both of, Fed. Rep. of Germany

Filed Sep. 18, 1987, Ser. No. 98,184

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632628

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—514 **24 Claims**

1. An electrically conductive adhesive for the planar joining of correspondingly planar parts to one another, the planar parts having mutually different temperature coefficients of the expansion of their materials, the adhesive being useful through a temperature range of approximately −60° C. to about +180° C., the adhesive is manufactured by the following steps:

forming a composition that is cross-linkable to form an elastomer by the addition of organo polysiloxane with Si-bonded hydrogen (e), the composition comprising: (a) a di-organo polysiloxane with vinyl dimethyl siloxane units as end-position units, whereby the two Si-C-bonded organic radicals in the di-organo siloxane units are hydrocarbon radicals which are free from aliphatic multiple bonds; (b) silicon dioxide, employable as a filler, having a BET surface of approximately 100 to about 200 m^2g; (c) an organic solvent; and (d) a catalyst for promoting the agglomeration of Si-bonded hydrogen to vinyl groups, the di-organo polysiloxane (a) comprising approximately 10 to about 30 weight percent of the total composition that comprises constituents (a), (b), (c), and (d), the inorganic oxide (b) being present in the composition in a quantity of approximately 10 to about 40 weight percent with respect to the weight of the di-organo polysiloxane (a);

stirring into the composition a sufficient amount of particle-shaped silver, chosen from the group consisting of dentritic silver, lamina-shaped silver, and spherical-shaped silver, so that the silver content is sufficiently great in the thickened condition of the resultant composition that the required electrical conductivity needed is present, the silver content, to afford the required electrical conductivity, comprises a minimum of 75% by weight of the resultant composition;

after the particle-shaped silver is stirred into the composition, the resultant mixture containing the particle-shaped silver is thickened until a pasty working consistency is achieved and the solvent is eliminated; and

mixing the resultant mixture obtained with organo polysiloxane (e) to effect cross-linking by heating the mixture, the organo polysiloxane (e) comprising approximately 1 to about 3 weight percent of the overall weight of the constituents (a) through (e) and of the silver constituent.

4,904,415

OXIDE GLASSES HAVING LOW GLASS TRANSFORMATION TEMPERATURES

John W. Lau, Gaithersburg, Md., and Anastasia M. Conlon, Easton, Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Aug. 22, 1988, Ser. No. 235,066

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—514 **15 Claims**

1. A homogeneous composition suitable for use in forming a conductive adhesive comprising

a powdered glass composition having a glass transformation temperature below about 300° C., comprising PbO, B_2O_3,

and Ag_2O in a respective weight ratio of 76–88:10–15:2–10 and

conductive particulates present in an electrically conductive effective amount.

4,904,416

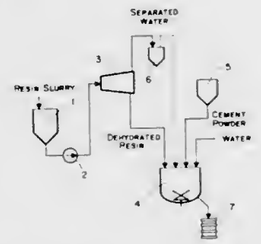
CEMENT SOLIDIFICATION TREATMENT OF SPENT ION EXCHANGE RESINS

Rey Sudo, Fukuoka; Norimitsu Kurumada, Ibaraki; Fukuzo Todo, Ibaraki; Masao Hara, Ibaraki, and Kenzo Sauda, Yokohama, all of Japan, assignors to Kyushu Electric Power Co., Ltd., Fukuoka and JGC Corp., Tokyo, both of, Japan

Filed Jul. 26, 1988, Ser. No. 223,961

Int. Cl.[4] G21F *9/16*

U.S. Cl. 252—628 **6 Claims**



1. A process for cement solidification treatment of spent ion exchange resins, which comprises dehydrating the wet resin particles to remove free water therefrom; applying a small amount of cement powder thereon under stirring as pre-treatment to coat the surface of the resin particles with the cement powder; then, adding cement powder and water to the pre-treated resin particles and kneading to form a uniform mixture of cement past; and finally casting the cement paste into a vessel to solidify it therein.

4,904,417

FLUORINE-CONTAINING POLYETHER AND PROCESS FOR PREPARING THE SAME

Yohnosuke Ohsaka; Takashi Tohzuka; Yoshitaka Honda, and Norio Yanagisawa, all of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Jun. 1, 1988, Ser. No. 201,032

Claims priority, application Japan, Jun. 2, 1987, 62-139518

Int. Cl.[4] C07C *55/40, 59/00, 59/135*

U.S. Cl. 562—849 **5 Claims**

1. A fluorine-containing polyether of the formula:

$$A—X—A' \quad (1)$$

wherein A and A' are the same or different and are each —COF, —COCl or —COOH, and X is $—CF_2CF_2—R_f—O—C_mF_{2m}—O—R_f'CF_2CF_2—$ in which R_f and R_f' are the same or different and are each a fluorine-containing polyether chain of the formula:

$$—(CH_2CF_2CF_2O)_a—(CHClCF_2CF_2O)_b—(CCl_2CF_2CF_2O)_c—(CHFCF_2CF_2O)_d—(CFClCF_2CF_2O)_e—(CF_2CF_2CF_2O)_f—$$

wherein a, b, c, d, e and f are each 0 or a positive integer and satisfy the following equations:

$$2 \leqq a+b+c+d+e+f \leqq 200 \text{ and}$$

$$1 \leqq a+c+d+f$$

and m is a number of from 1 to 6.

4,904,418

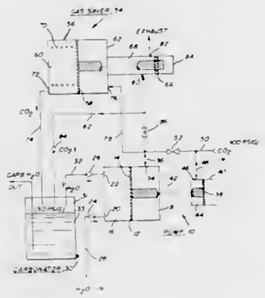
MOTORLESS CARBONATOR PUMP WITH GAS SAVING DEVICE

Lawrence B. Ziesel, Marietta, and Robert D. Hughes, Atlanta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Mar. 29, 1989, Ser. No. 330,366

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—35 **11 Claims**



1. Carbonator pump apparatus, comprising:

a single acting motorless pump having both a pumping cycle and a return cycle and including a water pump chamber and a gas activated drive chamber separated by a pumping member, said pumping member being connected to gas return spring means having a gas activated drive chamber including a spring member,

a carbonator tank having a head space therein and including a carbonating gas inlet means and carbonating gas outlet means;

gas saving means including a vent port coupled between said pump and said carbonator tank for controlling the venting of gas from said drive chamber of said pump during said return cycle;

a first gas control valve connected between said drive chamber of said return spring means and said drive chamber of said pump and being open during said pumping cycle and closed during said return cycle,

means for connecting a source of carbonation gas to said drive chamber of said return spring means and said first control valve, said first control valve when open during said pumping cycle delivering gas to said drive chamber of said pump from both said source and said drive chamber of said return spring means to pump water from said pump chamber;

means for coupling gas during both said cycles between said drive chamber of said pump and said gas saving means;

a second gas control valve connected between said pump drive chamber and said gas inlet means of said carbonator tank and said vent port and being open during said return cycle to deliver gas from said pump chamber to said carbonator tank and said gas saving means and being closed during said pumping cycle; and

means for coupling gas between said gas outlet means of said carbonator tank and said gas saving means.

4,904,419

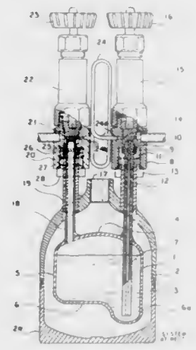
PROCESS AND APPARATUS FOR VAPOR TRANSFER OF VERY HIGH PURITY LIQUIDS AT HIGH DILUTION

Warren D. Reynolds, 3455 Spanish Way, Carlsbad, Calif. 92008

Filed Mar. 14, 1989, Ser. No. 322,921

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—64.1 **17 Claims**



1. A bubbler system allowing for the bubbling of a carrier gas that is not exposed to the atmosphere through a liquid at ambient temperature having a chemical composition essentially uniform to develop a carrier gas stream having a predetermined dilute vapor-to-gas ratio comprising:

a carrier gas source external to said bubbler system;

a liquid having a chemical composition essentially uniform allowing for the liquid vapor enhancement of said carrier gas;

a using system external to said bubbler system allowing for the use of said carrier gas once enhanced;

a primary container composed of a closed inner chamber surrounded and enclosed by a closed outer chamber allowing for the containment of said liquid having chemical composition essentially uniform, the closed inner chamber having a bottom well;

an inlet valve externally located to said primary container allowing for the importation of said carrier gas into said closed inner chamber of said bubbler system;

an outlet valve externally located to said primary container allowing for the exportation of said carrier gas enhanced by the saturation vapor of said liquid having a chemical composition essentially uniform within said closed inner chamber of said bubbler system to said system;

an inlet tube extending from the inferior portion of said inlet valve to the superior portion of said inner chamber and passing to said bottom well of said closed inner chamber allowing for flow of the carrier gas entering near the upper portion of said inlet tube and passing into said closed inner chamber;

an inlet tube protective sleeve surrounding said inlet tube and extending from the inferior portion of said inlet valve to said closed outer chamber;

an outlet tube extending from the inferior portion of said outlet valve to the superior portion of said closed inner chamber allowing for flow of said carrier gas exiting from the upper portion of said outlet tube and passing from said closed inner chamber;

a by-pass tube of predetermined length and diameter connecting a peripheral port from said inlet valve to a peripheral port of said outlet valve allowing for the transportation of a stream of said carrier gas in order to equalize the flow of said carrier gas from said inlet tube to said outlet tube.

4,904,420

METHOD AND A DEVICE FOR INTRODUCING A GAS INTO A LIQUID

Jan Cornelissen, The Hague, Netherlands, assignor to Pielkenrood Vinitex B.V., Netherlands

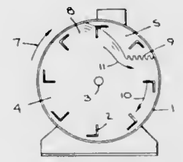
PCT No. PCT/NL87/00012, § 371 Date Apr. 1, 1988, § 102(e) Date Apr. 1, 1988, PCT Pub. No. WO87/07886, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 18, 1987, Ser. No. 163,754

Claims priority, application Netherlands, Jun. 19, 1986, 8601602

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—92 **10 Claims**



1. A method for introducing a gas into a liquid by using a vessel for taking in the liquid with a paddle assembly rotatable therein, having a mainly horizontally rotatable shaft, said paddles being adapted to introduce the gas into the liquid from the gas space above the liquid, characterised in that said vessel (1) is partly filled with a liquid (4), and the paddles (2) are driven with such a speed that the liquid is pushed upwards (8) in the sense of rotation, after which the liquid shooting downwards brings about a hydraulic jump (9), and the overturning part of the liquid splashes down into said jump (9) thus introducing a gas into the liquid.

4,904,421

SOFT OCULAR LENS AND METHOD FOR ITS PREPARATION

Ichiro Ando, and Toru Kawaguchi, both of Nagoya, Japan, assignors to Tomei Sangyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 12, 1987, Ser. No. 119,540

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—2.6 **8 Claims**

1. A method for preparing a soft ocular lens, which comprises machining a machinably hard polymer blend body composed essentially of a soft lens material and a hard polymer into an ocular lens shape, and removing completely the hard polymer or the non-fixed portion of the hard polymer from the shaped product.

4,904,422

OZONE AND WEAR RESISTANCE IN STYRENE-BUTADIENE RUBBER

Joseph Silverman, Silver Spring, Md., assignor to University of Maryland, College Park, College Park, Md.

Filed Feb. 4, 1988, Ser. No. 152,291

Int. Cl.[4] C08F *279/02;* **C08J** *3/28;* **C08K** *3/30*

U.S. Cl. 264—22 **5 Claims**

1. A method for improving physical and chemical characteristics of styrene-butadiend rubber comprising adding to a styrene-butadiene copolymer composition 0.1 phr–0.08 phr sulfur, 0–0.5 phr accelerator and 0.05 phr–2 phr 3,9-divinyl-2,4,8,10 tetraoxyspiro- undecane as a crosslinking agent, placing said mixture in a mold, and exposing the mold to moderate heat for sufficient time to form a preform having strength sufficient to retain the integrity of the molded form, and thereafter exposing said preform to an irradiation dosage of 5–25 Mrad of 10 MeV electron equivalent, wherein said sulfur, accelerator and crosslinking agent concentration, and irradiation dosage, are selected so as to provide tear resistance, in the product of that

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process, of 180–183 lbs/in, and an ozone resistance of at least 35 days, under standard ozone tests ASTM-D 1149, without evidence of ozone corrosion.

4,904,423

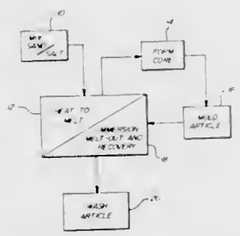
PRESSURE MOLDING PROCESS USING SALT CORES AND COMPOSITION FOR MAKING CORES

Robert W. Foreman, Bloomfield Hills, and Michael T. Ives, Romulus, both of Mich., assignors to Park Chemical Company, Detroit, Mich.

Continuation of Ser. No. 477,580, Mar. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 449,898, Dec. 15, 1982, abandoned. This application Oct. 30, 1984, Ser. No. 666,493

Int. Cl.[4] **B29C** *33/52, 33/54*

U.S. Cl. 264—25 14 Claims



1. A premix composition for producing mold cores for use in process for making molded plastic articles by forming a moldable material around solidified salt cores or mold cores made of particles of inert material intimately mixed and covered with fused salt comprising the steps of:

(A) preparing a bath by means of mixing and heating the particles and salt to obtain a homogeneous molten bath mixture:

(B) forming a mold core of given shape from a portion of the molten bath mixture and cooling and solidifying the formed core;

(C) pressure molding a moldable plastic material around the resulting solid core to cause the moldable material to solidify and thus obtain a solid structurally rigid molded article containing the core; and

(D) thereafter heating the molded article positioned in or over the molten bath under temperature conditions sufficient to melt and recover the core from the article into the bath but insufficient to adversely affect the article thus freed of the core; wherein said premix composition is comprised of:

an unfused, blended, dry mixture of granulated mold core salt and an inert material selected from the group consisting essentially of: glass fibers, carbon fibers and mica flakes.

7. A process for making molded articles by forming a moldable material around solidified cores made of particles of inert material selected from the group consisting essentially of: glass fibers, carbon fibers, and mica flakes, at least one of which is of such physical character as to add tensile strength and flexibility to said cores, said inert materials being intimately mixed and covered with fused salt said process comprising the steps of:

(A) preparing a bath by mixing and heating the particles and salt to obtain a homogeneous molten bath mixture;

(B) forming a mold core of given shape from a portion of the molten bath mixture and cooling and solidifying the formed core; and

(C) pressure molding a moldable plastic material around the resulting solid core to cause the moldable material to solidify and thus obtain a solid structurally rigid molded article containing the core.

4,904,424

CERAMIC ALLOYS FROM COLLOIDAL METAL ALLOY SUSPENSIONS

Robert E. Johnson, Hoboken, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed May 29, 1987, Ser. No. 55,221

Int. Cl.[4] **D01D** *10/02;* **D01F** *9/22;* **C04B** *35/56*

U.S. Cl. 264—29.2 22 Claims

1. A process for preparing molded products of ceramic alloys which comprised molding a preceramic composition comprising (a) from about 5 to 95% by weight based on the composition of at least one powdery metal alloy or a unitary powdery intimate mixture of alloying metals or alloying metallic compounds, said powdery metal alloy or intimate mixture comprising at least one refractory metal or metal compound selected from silicon, boron and compounds of silicon or boron and a second alloying metal comprising aluminum which lowers the melting point of said alloy below the melting point of said refractory metal or metal compound and, wherein the average particle size of said powdery metal alloy or unitary powdery intimate mixture is not greater than about 50 microns, and (b) a precarbonaceous polymer, curing said molded preceramic composition to harden some and, heating said cured molded preceramic composition at a temperature and in a pyrolyzation atmosphere sufficient to carbonize said polymer and cause reaction between said powdery metal alloy or intimate mixture and carbon.

4,904,425

METHOD OF REDUCING TENSION IN WEBS OF THERMOPLASTIC MATERIAL

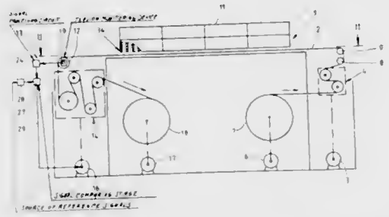
Albert Hebels, Hamburg, and Ralph Pagendarm, Halstenbek, both of Fed. Rep. of Germany, assignors to Pagendarm Beschichtungstechnik GmbH, Hamburg, Fed. Rep. of Germany

Filed Jun. 24, 1988, Ser. No. 211,351

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722346

Int. Cl.[4] **B29C** *61/02*

U.S. Cl. 264—40.1 5 Claims



1. A method of thermally influencing tension in a running elongated web of thermoplastic material, comprising the steps of ascertaining the tension in a plurality of longitudinally extending sections of the elongated web which are disposed side by side as considered transversely of the web; and admitting heat to said longitudinally extending sections at a rate which is a function of the ascertained tension in the respective sections to thereby influence the tension in said sections, including supplying lesser quantities of heat to sections wherein the tension is higher and supplying greater quantities of heat to sections wherein the tension is lower.

4,904,426

PROCESS FOR THE PRODUCTION OF FIBERS FROM POLY(ETHERETHERKETONE)-TYPE POLYMERS

Richard A. Lundgard, Antioch, and Henry N. Beck, Walnut Creek, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 31, 1988, Ser. No. 175,716

Int. Cl.[4] **D01D** *5/247*

U.S. Cl. 264—41 24 Claims

1. A process for preparing microporous poly(etheretherketone)-type fibers, comprising

A. forming an extrusion mixture of

(1.) at least one unsulfonated poly(etheretherketone)-type polymer,

(2.) a solvent comprising at least one organic compound consisting predominantly of carbon and hydrogen and optionally oxygen, nitrogen, sulfur, halogen, and mixtures thereof, wherein the organic compound has a molecular weight of between about 160 and 450, contains at least one six membered aromatic ring structure, possesses a boiling point of between about 240 and 480 degrees Celsius, and is capable of dissolving at least about 10 weight percent of the poly(etheretherketone)-type polymer present at the extrusion temperature,

B. extruding the fluid to form solid or hollow fibers;

C. conveying the fibers through at least one quench zone wherein the fibers cool and solidify;

D. conveying the fibers through at least one leach zone wherein a substantial portion of the solvent is removed; and

E. drying the fibers;

wherein the fibers so formed possess interconnecting or non-interconnecting pores.

4,904,427

PROCESS OF PREPARING INORGANIC LIGHT WEIGHT FOAM

Hirosuke Kojima, Tokyo, Japan, assignor to Nissho Giken Corporation, Ltd., Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 234,757

Claims priority, application Japan, Feb. 24, 1988, 63-41520

Int. Cl.[4] **B29C** *39/02, 43/02, 67/20*

U.S. Cl. 264—42 2 Claims

1. A process for preparing inorganic light weight foam, the process comprising the steps of:

kneading a composition, whose main components are an inorganic powder and a vinyl chloride-based resin, at 140° C. to 200° C. while applying a shearing force on the composition;

mixing an organic solvent having a solubility parameter (δ) of 7 to 10 and a boiling point of 80° to 140° C., and a foaming agent with the kneaded composition at 40° to 80° the ratio by weight of the organic solvent to the total amount of the inorganic powder and the vinyl chloride-based resin ranging from 60:40 to 40:60, thereby forming a foamable composition wherein the organic solvent penetrates into the main components; and

molding end foaming the foamable composition under pressure at 150 to 180° C.

4,904,428

METHOD OF MAKING A FOAM INSULATED WATER HEATER

Eugene L. West, Grand Rapids, and Robert J. Marcinkewicz, Plainwell, both of Mich., assignors to Bradford-White Corporation, Philadelphia, Pa.

Filed Jun. 11, 1985, Ser. No. 743,422

Int. Cl.[4] **B29C** *67/22*

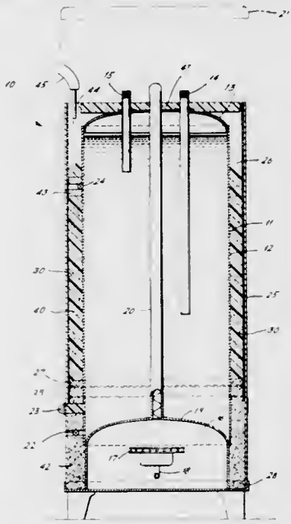
U.S. Cl. 264—46.5 9 Claims

1. In a method of insulating a water heater having a water tank with an expandable polyurethane foam insulating material, the steps comprising:

(a) placing a flexible sleeve over the tank surface, the sleeve being dimensioned larger than the tank to permit positioning of said material between said sleeve and said tank, said sleeve being open along its top and sealed about the tank along its bottom;

(b) securing a jacket around the tank and over the sleeve, the jacket being dimensioned to provide a space therebetween in which said sleeve is positioned;

(c) introducing an expandable polyurethane foam forming liquid having an initial viscosity of less than about 300 cps when measured at a temperature of 25° C. and under



atmospheric pressure and a relative humidity of about 50%, a flow index ≧ about 0.7, a gel index ≧ about 0.8 and which generates a maximum pressure of ≦ about 1.0 psig, between the sleeve and the tank; and

(d) securing a cover on the top of the jacket to close off the top of the jacket, whereby the foam forming liquid expands within the sleeve and against the tank to fill said space, and

(e) causing the resulting polyurethane foam to solidify in place.

4,904,429

METHOD OF PRODUCING A MOLDING OF FOAMED RESIN HAVING A SECTION FOR FITTING AN ELECTRICAL PART

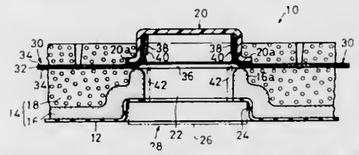
Kan-ichi Takahashi, and Toshihiro Inoue, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1988, Ser. No. 281,319

Claims priority, application Japan, Dec. 9, 1987, 62-309393

Int. Cl.[4] **B29C** *67/22*

U.S. Cl. 264—46.7 5 Claims



1. A method for producing a molded foamed article comprising a coupler (**20**) having a peripheral edge portion for receiving an electrical part, a flexible printed circuit (**30**) having terminals (**38**) which are disposed in said coupler (**20**) to be

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electrically connected to the electrical part, and an opening contiguous with the interior of said coupler to allow access of the electrical part to the interior of the coupler (**20**), said method comprising the steps of:

positioning a first metal mold part (**66**) in molding alignment with a second metal mold part (**70**), the first metal mold part (**66**) having disposed thereon a pressing member (**16***a*) which forms a wall surrounding said opening of said molded foamed article;

removably mounting a back portion of the coupler (**20**) in such position on the second mold part (**70**) so that the peripheral edge of said coupler (**20**) faces the pressing member (**16***a*);

disposing said flexible printed circuit board (**30**) between the pressing member (**16***a*) and the coupler (**20**), the terminal (**38**) of the flexible printed circuit board (**30**) facing the interior of the coupler (**20**);

pressing said metal mold parts together to cause the pressing member (**16***a*) and the coupler (**20**) to retain the flexible printed circuit (**30**) therebetween;

pouring an undiluted solution of foam resin into a cavity defined by the said metal mold parts to create a foamed molding of said molded foamed article; and

releasing the metal mold parts creating a molded foamed article having a coupler for receiving an electrical part.

4,904,430

METHOD AND AN APPARATUS FOR BACKING UP VEHICLE MAT

Kohei Yamada, Hashima, Japan, assignor to Daiwa Company, Ltd., Gifu, Japan

Filed Oct. 7, 1987, Ser. No. 106,529

Claims priority, application Japan, Oct. 12, 1986, 61-241721; Oct. 30, 1986, 61-259426; Nov. 15, 1986, 61-272667; Nov. 21, 1986, 61-279255

Int. Cl.[4] **B27N** *3/10*; **B28B** *19/00*

U.S. Cl. 264—102 **4 Claims**

1. A method for backing up vehicle mats comprising the steps of:

mounting a plurality of detachable metal molds on a turntable having mounting frames;

applying resin to the metal molds by releasing resin from a tank, transporting the resin through a pipe from the tank to nozzles and injecting the resin from the nozzles into the molds;

removing air from the resin by sealing a vacuum pad having air intake holes on its upper surface and packing on its lower surface to the mounting frame, and connecting suction hoses from a vacuum pump to the vacuum pad;

heating the resin in the metal mold by means of a metal mold heater which heats the bottom surface of the metal mold;

providing a fabric mat on the resin by transporting a fabric mat to the metal mold using conveying means, setting the fabric mat onto the resin using setting means, and pressure bonding the fabric mat to the resin using pressure means;

cooling the resin in the metal mold by means of a metal mold cooler which cools the bottom surface of the metal mold and;

removing a finished vehicle mat from the mold by clamping the finished fabric mat with a clamping device having rotatable clamping pawls and injecting air on an outer edge of the clamping pawls by means of air nozzles to peel off an end edge of a base cloth from the finished fabric mat.

4,904,431

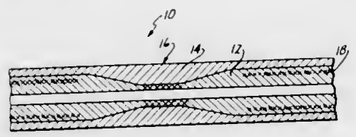
PROCESS FOR MANUFACTURING CATHETERS

Samuel L. O'Malcki, Brea, Calif., assignor to Baxter International, Inc., Deerfield, Ill.

Filed Aug. 12, 1988, Ser. No. 231,037

Int. Cl.[4] **B29C** *47/06*

U.S. Cl. 264—103 **5 Claims**



1. A process of forming soft tin catheters comprising:

extruding a first cylindrical layer of a rigid polymer having at one or more prescribed locations a depression formed by said layer first decreasing in thickness and then increasing in thickness;

extruding a second cylindrical layer of a soft, pliable polymeric material over said first layer, with said first and second layers being extruded to form a cylinder body having a substantially constant thickness; and

dissecting said cylindrical body first at each of said depressions and further by cutting said formed cylindrical body to form separate catheters, each having the same coefficient of friction extending the entire internal length of each catheter.

4,904,432

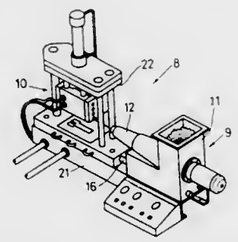
MANUFACTURE OF STRUCTURAL MEMBERS, IN PARTICULAR FURNITURE COMPONENTS

Brian Harmer, Benoni, South Africa, assignor to Agrifibre Developments Limited, Channel Islands, Channel Islands

Filed Mar. 8, 1988, Ser. No. 165,709

Int. Cl.[4] **B29C** *43/02*

U.S. Cl. 264—112 **12 Claims**



1. A method for producing an article comprising the steps of admixing form 50–94% by weight of sub-divided straw, bagasse, or mixtures thereof, from 6–30% by weight of a synthetic resin or plastics material suitable for binding the straw of bagasse together, and from 0–45% by weight of non-vegetable fillers, colorants or other additives to form a loose mixture; compressing the loose mixture in a feed auger having a portion, in which compression takes place, of decreasing diameter and pitch from an inlet towards an outlet of the feed auger to result in a partially compressed mixture at the outlet of the feed auger; introducing said partially compressed mixture into a cavity of a press-mold; and press-molding an article in said press-mold by further compression under conditions chosen to cause curing or hardening of said synthetic resin or plastics material.

4,904,433

METHOD FOR DIE RELEASE DURING CATHETER TIPPING

Victor A. Williamitis, Dayton, Ohio, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Feb. 27, 1989, Ser. No. 315,967

Int. Cl.[4] **B29C** *57/00*

U.S. Cl. 264—130 **8 Claims**

1. A method for forming a shaped tip on a polyurethane catheter comprising:

(a) applying a film of a noncuring aminoalkyl terminated polysiloxane lubricant to an untipped polyurethane catheter tubing;

(b) mounting said tubing onto a mandrel;

(c) engaging said tubing to a die heated to a temperature sufficient to soften said polyurethane and cause the tip of said tubing to assume the shape of said die; and

(d) cutting the shaped catheter tubing to give a tipped catheter and removing same from said die and from said mandrel.

4,904,434

METHOD OF FORMING AN IMPROVED WIPER BLADE

Michael L. Hyer, Weatherford, Tex., assignor to JMK International, Inc., Fort Worth, Tex.

Filed Oct. 28, 1988, Ser. No. 263,915

Int. Cl.[4] **B29C** *69/00*

U.S. Cl. 264—146 **7 Claims**



4. A method of forming a wiper blade, comprising the steps of:

extruding a continuous length of uncured silicone rubber through a die having a die opening shaped to produce a pair of wiper blades joined at a mid-section thereof in edge-to-edge relation, said continuous length of uncured silicone rubber having a top and bottom surfaces which define a thickness therebetween;

scoring the mid-section of the continuous length of uncured silicone rubber as it leaves the extruder die and prior to curing to produce a score line; then

curing the continuous length of silicone rubber by heating to an elevated temperature above ambient; then

separating the continuous length of silicone rubber into two separate lengths of wiper blade while it is at a temperature above ambient by pulling the separate lengths apart along the score line; and

cutting the separate lengths of wiper blade into individual wiper-sized segments

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4,904,435

METHOD FOR MAKING TAMPER-EVIDENT CONTAINER CLOSURE

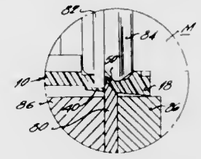
David E. Babcock, and Daniel Luch, both of Williamsport, Pa., assignors to The West Company, Phoenixville, Pa.

Division of Ser. No. 810,923, Dec. 19, 1985, Pat. No. 4,744,480. This application Dec. 29, 1987, Ser. No. 139,275

Int. Cl.[4] **B29C** *53/02*

U.S. Cl. 264—154 **2 Claims**

1. A method for making a tamper-evident closure cap consisting of the steps of forming a one-piece closure cap from a plastic material having a top, a skirt depending from the top, and a tamper-evident band depending from the skirt and having a radially inward directed rib adjacent a lower terminal edge of the tamper-evident band and an annular portion between the skirt portion of the cap and the tamper-evident band and thereafter engaging the annular portion with a cutting blade having a cutting edge and a series of spaced notches and



relatively rotating the cap and cutting blade so that the cutting blade penetrates the annular portion to thereby form a plurality of circumferentially spaced bridges and a series of angularly inwardly disposed tabs.

4,904,436

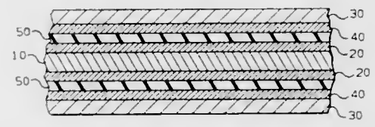
CONSOLIDATION OF THERMOPLASTIC PANELS

Duane M. Rachal, Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 29, 1988, Ser. No. 149,756

Int. Cl.[4] **B29C** *43/20, 43/02*

U.S. Cl. 264—258 **14 Claims**



1. In a process for consolidating a fibrous reinforcement with a thermoplastic resin to form a sheet containing the fibrous reinforcement in a continuous thermoplastic matrix, wherein a mixture of fibrous reinforcement and thermoplastic resin in the form of at least one flat prepreg sheet is positioned between a pair of first caul plates which are in turn positioned between a pair of platens which are urged together with sufficient force to consolidate the mixture of fibrous reinforcement and thermoplastic resin to form the sheet containing the fibrous reinforcement in the continuous thermoplastic matrix, the improvement comprising:

positioning a first resilient pad, having a thickness within the range of about 0.1 to about 10 millimeters, and a third caul plate between one of the first caul plates and one of the platens so as to have on at least one side of said mixture the sequence: platen, caul plate, resilient pad and caul plate, prior to urging the platens together.

4,904,437

METHOD FOR PRODUCING A SYRINGE BODY FOR A DENTAL COMPOUND

Ernst Mühlbauer, Elbgaustrasse 248, 2000 Hamburg 53, Fed. Rep. of Germany

Division of Ser. No. 60,245, May 29, 1987, Pat. No. 4,798,596. This application Sep. 13, 1988, Ser. No. 243,682

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1985, 8528512[U]

Int. Cl.[4] **B29C** *53/08*

U.S. Cl. 264—295 **7 Claims**

1. Process for producing an applicator syringe for a dental compound, with a syringe body tapering integrally into a thin curved discharge tube and made of thermoplastic material, characterized by the steps of producing the entire syringe body and discharge tube axially in alignment with one another as a

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unitary, integral piece having a straight axial channel extending therethrough from an entrance opening in the body to a



discharge opening in the discharge tube , the channel having a cross sectional area no greater than about 10 mm^2 and subsequently bending the discharge tube.

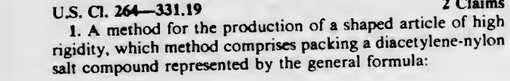
4,904,438

DIACETYLENE-NYLON SALT COMPOUND AND METHOD FOR PRODUCTION OF TWO-DIMENSIONAL MACROMOLECULAR CRYSTALS AND SHAPED ARTICLES USING SAID COMPOUND

Hiro Matsuda; Hachiro Nakanishi; Masao Kato; Yoshio Tanaka, all of Ibaraki, and Kazuo Nakayama, Ushiku, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Division of Ser. No. 90,099, Aug. 27, 1987, Pat. No. 4,814,404.
This application Jan. 10, 1989, Ser. No. 296,616
Claims priority, application Japan, Sep. 4, 1986, 61-208714; Sep. 4, 1986, 61-208715; Mar. 9, 1987, 62-53432
Int. Cl.[4] B29C *33/42*
U.S. Cl. 264—331.19 **2 Claims**

1. A method for the production of a shaped article of high rigidity, which method comprises packing a diacetylene-nylon salt compound represented by the general formula:



wherein R_1 and R_2 independently stand for at least one member selected from the class consisting of alkylene groups, substituted alkylene groups, cycloalkylene groups, substituted cycloalkylene groups, arylene groups, and substituted arylene groups, in a mold of a desired shape and then thermally polymerizing said compound in said mold at a temperature in the range of 100° to 400° C. under a pressure in the range of 0.5×10^4 to 15×10^4 atmospheres.

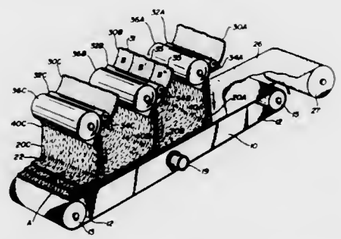
4,904,439

METHOD OF MAKING A NON-WOVEN FIBER WEB USING A MULTI-HEADED DUCTLESS WEBBER

Allan P. Farrington, Englishtown, and Gerald M. Marshall, Somerville, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Jul. 18, 1988, Ser. No. 220,293
Int. Cl.[4] D04H *1/72*
U.S. Cl. 264—510 **13 Claims**

1. A method of forming a non-woven fiber web comprising the steps of:
- feeding at least one source of fibrous material into engagement with at least one lickerin;
- rotating the at least one lickerin at such a speed that the material is opened so as to form individual fibers moving with the lickerin;
- deflecting the individual fibers from the lickerin in the the form of a stream of fibers by positioning one end of a deflector plate parallel to the lickerin, adjacent to the peripheral surface of the lickerin and another remote end away from the lickerin, so a guiding surface of the deflector plate guides the fibers from the lickerin;
- keeping the lickerin free of air streams which would tend to doff the fibers from the lickerin;



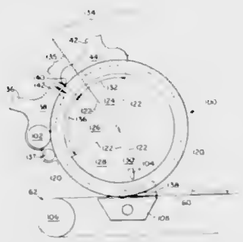
- keeping the stream of fibers free of confining ducts; and
- intercepting the stream of fibers with a moving conveyor and accumulating the fibers on the conveyor to form a web of material.

4,904,440

APPARATUS FOR AND METHODS OF AIRLAYING FIBROUS WEBS HAVING DISCRETE PARTICLES THEREIN

John J. Angstadt, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 868,217, May 28, 1986, abandoned.
This application Jul. 1, 1988, Ser. No. 218,508
Int. Cl.[4] D04H *1/16*
U.S. Cl. 264—517 **61 Claims**



1. An apparatus for forming airlaid fibrous webs having a multiplicity of layers or discrete particles dispersed through at least a portion of the web, said apparatus comprising:
- airlaying means having a foraminous forming element for forming an airlaid fibrous web;
- dusting layer deposition means positioned adjacent a first portion of the periphery of said airlaying means for directing a dusting layer stream of air-entrained fibers to said foraminous forming element of said airlaying means and for depositing the fibers on said foraminous forming element so as to form a dusting layer, said dusting layer deposition means having a first sector and a second sector;
- primary deposition means positioned adjacent a second portion of the periphery of said airlaying means for directing a primary stream of air-entrained fibers to said foraminous forming element of said airlaying means and for depositing the fibers onto said foraminous forming element over the dusting layer so as to form a primary layer over a dusting layer;
- dusting layer vacuum means for drawing fiber-depleted air through siad foraminous forming element, said dusting layer vacuum means being positioned subjacent said first sector of said dusting layer deposition means; and
- primary vacuum means for drawing fiber-depleted air through said foraminous forming element, said primary vacuum means being positioned subjacent both said primary deposition means and said second sector of said dusting layer deposition means so as to prevent the dusting layer formed on said foraminous forming element from being damaged or destroyed.

19. An apparatus for forming airlaid fibrous webs having a multiplicity of layers or discrete particles dispersed through at least a portion of the web, said apparatus comprising:
- a laydown drum having a foraminous forming element disposed about the periphery of said laydown drum, a primary vacuum chamber, and a dusting layer vacuum chamber;
- a dusting layer hood having a first sector and a second sector, said dusting layer hood being positioned adjacent a dusting layer portion of the periphery of said laydown drum;
- a primary hood positioned adjacent a primary portion of the periphery of said laydown drum and adjacent said dusting layer hood; and
- wherein said primary hood and said dusting layer hood intersect at at least a point of intersection, said point of intersection being positioned so that a gap between said primary hood and said dusting layer hood and the outer surface of said laydown drum is formed adjacent said point of intersection, said gap being not greater than about ½ inch, and wherein each of said primary hood and said dusting layer hood has a relatively wide circular taper adjacent said point of intersection so that the shear velocity of each of the primary fiber stream and the dusting layer fiber stream adjacent said point of intersection is less than about 4000 feet per minute.

27. A method for forming airlaid fibrous webs having a multiplicity of layers or discrete particles dispersed through at least a portion of the web, said method comprising the steps of:
- a. providing a dusting layer stream of air-entrained fibers;
- b. depositing said dusting layer stream of air-entrained fibers on a foraminous forming element to form a dusting layer;
- c. transferring said dusting layer to the influence of a pressure differential maintained by a vacuum means positioned subjacent the foraminous forming element while said dusting layer is still positioned under said dusting layer stream of fibers;
- d. providing a primary stream of air-entrained fibers;
- e. passing said dusting layer from under the dusting layer stream of fibers to under the primary stream of fibers while the dusting layer is under the influence of the pressure differential maintained by said vacuum means; and
- f. depositing said primary stream of air-entrained fibers on the foraminous forming element over said dusting layer so as to form an airlaid fibrous web having a primary layer over a dusting layer.

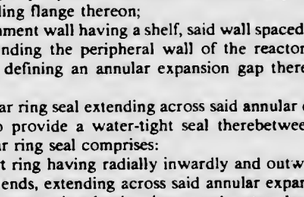
4,904,441

METHOD OF FORMING A PELLET OF CONDENSED GAS AND A PELLET INJECTOR FOR INJECTING THE SAME INTO A REACTOR

Hans Sorensen, Roskilde; Bjarne Saas, Tåstrup, and Knud V. Weisberg, Roskilde, all of Denmark, assignors to Forskningscenter Riso, Roskilde, Denmark

Filed Sep. 22, 1988, Ser. No. 247,941
Claims priority, application Denmark, Oct. 23, 1987, 5568/87
Int. Cl.[4] G21B *1/00*
U.S. Cl. 376—101 **17 Claims**

1. A pellet injector for injecting pellets of condensed gas into a reactor, said pellet injector comprising
- a continuous length of a metal tube,
- a first mass of heat conductive material arranged around a freezing section of said tube length in good thermal contact with the outer surface thereof,
- second and third masses of heat conductive material arranged on either side of and closely axially spaced from said first mass and in good thermal contact with the outer surface of the tube length,
- means for introducing a gas into the tube length,



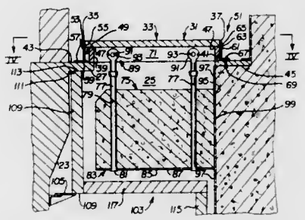
- cooling means for providing a temperature below the condensing temperature of said gas and being thermally connected to each of said masses so as to condense the gas within the freezing section,
- means for selectively heating said masses to control the size of the pellet, and
- means for pneumatically expelling a pellet formed in the freezing section from the tube length.

4,904,442

PERMANENT CAVITY SEAL RING FOR A NUCLEAR REACTOR CONTAINMENT ARRANGEMENT

Kenneth J. Swidwa, N. Versailles; Robert B. Saltoo, Plum Borough, and James R. Marshall, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1988, Ser. No. 270,878
Int. Cl.[4] G21C *19/00, 11/00*
U.S. Cl. 376—203 **18 Claims**



1. A nuclear reactor containment arrangement including:
- a reactor pressure vessel which thermally expands and contracts during cyclic operation of the reactor, the vessel having a peripheral wall and a horizontally outwardly extending flange thereon;
- a containment wall having a shelf, said wall spaced from and surrounding the peripheral wall of the reactor pressure vessel defining an annular expansion gap therebetween, and
- an annular ring seal extending across said annular expansion gap to provide a water-tight seal therebetween, which annular ring seal comprises:
- a support ring having radially inwardly and outwardly disposed ends, extending across said annular expansion gap, said support ring having inner and outer downwardly extending cylindrical sections, said inner cylindrical section spaced from said radially inwardly disposed end and resting on the horizontally outwardly extending flange of the reactor pressure vessel, and said outer cylindrical section resting on the shelf of the containment wall;

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a vertically extending, L-shaped, flexible inner seal, extending between the radially inwardly disposed end of said support ring, with the leg thereof flush with said horizontally extending flange sealing the space between said radially inwardly disposed end and said horizontally extending flange; and

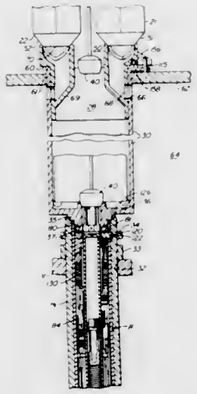
a vertically extending, L-shaped, flexible outer seal extending between said outer cylindrical section and the shelf of said containment wall, sealing the space between said outer cylindrical section and said shelf.

4,904,443

CONTROL ROD DRIVE WITH UPWARD REMOVABLE DRIVE INTERNALS

John C. Carruth, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Jun. 2, 1988, Ser. No. 202,864
Int. Cl.[4] G21C *7/00, 19/00*
U.S. Cl. 376—233 **6 Claims**



1. In a nuclear reactor having a reactor vessel, a core for the containment of fissionable materials with discrete fuel bundles comprising said core, an orificed fuel support casting for supporting four of said fuel bundles and channeling coolant to said fuel assemblies for a controlled nuclear reaction and the generation of steam, a core plate for providing an aperture for said fuel support casting between a lower coolant inlet plenum on one side and said fuel bundles on the upper side, a control rod for the insertion to and from a position between said fuel bundles wherein the nuclear reaction of said fissionable materials within said fuel bundles can be controlled, a control rod guide tube for supporting said orificed fuel support casting and fuel bundles and for receiving said control rods upon withdrawal from a position between said fuel bundles, and a control rod drive housing depending downwardly below said reactor vessel for receiving a control rod drive, the improvement to said control rod drive, control rod drive housing and control rod guide tube comprising:

said control rod drive dependingly attached to the bottom of said control rod guide tube;

a coupling interconnecting the top of said control rod drive to the top of sid control rod drive housing whereby said control rod drive is removable with and integrally dependent from the bottom of said control rod guide tube.

4,904,444

METHOD FOR MANIPULATING AND/OR STORING A NUCLEAR REACTOR FUEL ASSEMBLY INCLUDING AN ELONGATED SKELETON WITH FUEL RODS, AND A NUCLEAR REACTOR FUEL ASSEMBLY ESPECIALLY FOR USE WITH THIS METHOD

Roland Kühnel, Dietzenbach; Frank Niedner, Oberursel; Ulrich Ristow, Neu-Isenburg; Friedrich Born, Alzenau; Walter Dassbach, Hanau, and Manfred Vogt, Limeshain, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Reaktor-Brennelement Union GmbH, Hanau, both of, Fed. Rep. of Germany

Continuation of Ser. No. 358,701, Mar. 16, 1982, abandoned. This application Sep. 24, 1985, Ser. No. 781,184
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110582
Int. Cl.[4] G21C *19/10*
U.S. Cl. 376—261 **8 Claims**



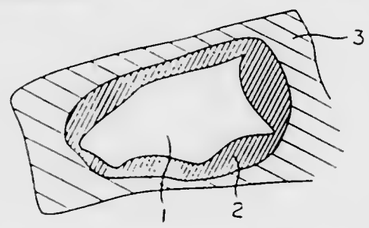
1. Method for manipulating a nuclear reactor fuel assembly without a handle but including an elongated skeleton structure with fuel rods by means of a holding device which does not fit and cannot manipulate the fuel assembly, which comprises fastening a supplemental body with neutron-absorbing material and a handle to the skeleton structure, while placing the neutron-absorbing material adjacent the fuel rods to maintain undercriticality and fitting the handle to a coupling part of the holding device.

4,904,445

PROCESS FOR PRODUCING A TOUGH CERMET

Yusuke Iyori, Fukaya, and Hisaaki Ida, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo and Hitachi Carbide Tools, Inc., Chiba, both of, Japan

Continuation-in-part of Ser. No. 869,716, Jun. 2, 1986, Pat. No. 4,778,521. This application Mar. 23, 1988, Ser. No. 172,237
Claims priority, application Japan, Feb. 20, 1986, 61-35777
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—13 **2 Claims**



1. A process for producing a tough cermet having a three-phase grain microstructure consisting of a core phase rich in titanium carbonitride, an intermediate phase rich in tungsten carbide surrounding said core phase, and an outer phase of a (titanium, tungsten) carbonitride solid solution surrounding said intermediate phase, the tough cermet including from 20-92% by weight of titanium carbonitride powder, 5-50% by weight of tungsten carbide fine powder and 3-30% by weight of metal powder in the iron group, the process comprising the steps of:

(a) uniformly mixing the titanium carbonitride powder and up to 70% by weight of the total amount of the tungsten carbide fine powder,

(b) melting the resulting mixture to form a solid solution of (titanium, tungsten) carbonitride,

(c) pulverizing said solid solution,

(d) uniformly mixing the resulting (titanium, tungsten) carbonitride powder with the remaining amount of tungsten carbide fine powder, and

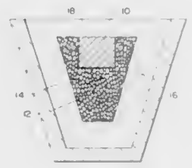
(e) sintering the mixture at temperatures of 1325°-1650° C.

4,904,446

PROCESS FOR PREPARING SELF-SUPPORTING BODIES AND PRODUCTS MADE THEREBY

Danny R. White, Elkton, Md., and Terry D. Claar, Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Jan. 13, 1989, Ser. No. 296,774
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—13 **6 Claims**



1. A method for producing a self-supporting body, comprising:

selecting a parent metal;

heating said parent metal in a substantially inert atmosphere to a temperature above its melting point to form a body of molten parent metal;

contacting said body of molten parent metal with a permeable mass comprising boron nitride;

maintaining said temperature for a time sufficient to permit infiltration of molten parent metal into said permeable mass and to permit reaction of said molten parent metal with said boron nitride to form at least one boron-containing compound; and

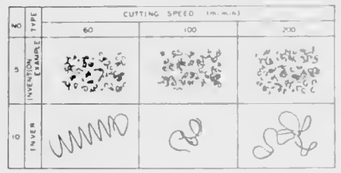
continuing said infiltration and reaction for a time sufficient to produce aid self-supporting body comprising at least one parent metal boron-containing compound.

4,904,447

LOW THERMAL EXPANSION CASTING ALLOY HAVING EXCELLENT MACHINABILITY

Takuo Handa, Kanagawa, Japan, assignor to Nippon Chuzo Kabushiki Kaisha, Kanagawa, Japan

Filed Jun. 1, 1988, Ser. No. 201,088
Int. Cl.[4] C22C *38/08*
U.S. Cl. 420—95 **3 Claims**



1. A low thermal expansion casting alloy of excellent machinability consisting essentially of, by weight percent, C greater than 0.5% to less than 0.8%, Si less than 1.0%, Mn less than 1.0%, Ni greater than 30.0% to less than 38.0%, Co from 2.0% to 8.0%, S less than 0.2%, P Less than 0.2% and one or both of Mg and Ca less than 0.3% in total, the Ni and Co contents being in a composition range given by the following formula

$$Ni + Co \times 0.75 = 32.0 \text{ to } 40.0\%$$

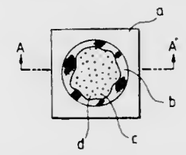
the balance being iron containing unavoidable impurities, and that fine graphite is contained in the alloy structure, and the mean coefficient of thermal expansion is below 4×10^{-6}/°C. between 20° C. and 100° C.

4,904,448

PATCH TEST MATERIALS FOR THE DETECTION OF METAL ALLERGIES

Haruyuki Kawahara, Moriguchi, Japan, assignor to G-C Dental Industrial Corp., Tokyo and Haruyuki Kawahara, both of, Japan

Filed Jul. 22, 1988, Ser. No. 222,747
Claims priority, application Japan, Aug. 21, 1987, 62-206534
Int. Cl.[4] G01N *31/22;* **A61F** *13/00*
U.S. Cl. 422—56 **5 Claims**



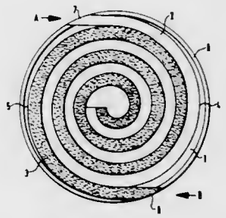
1. In a patch test material for the detection of metal allergies, the improvement which comprises the presence, therein, of a dental metal or an alloy thereof and a biological high molecular weight compound as an allergic reaction aid.

4,904,449

COLORIMETRIC GAS MEASURING DEVICE

Johannes Heckmann, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,011
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709296
Int. Cl.[4] G01J *1/48*
U.S. Cl. 422—87 **11 Claims**



1. A colorimetric measuring device for measuring a particular gas in the ambient, the device comprising:

a housing having an inlet opening formed therein for admitting ambient gas to be detected;

non-linear indicator path means having a predetermined

non-linear length and being disposed in said housing and in gaseous communication with said inlet opening;

said indicator path means having a constant cross section along the entire length thereof and containing an indicator extending along said non-linear length in a predetermined direction along an imaginary axis; said indicator coacting with the gas to provide a color indication of the concentration thereof;

said indicator path means advancing in the direction of said axis by continuously crossing over said axis in the manner of a continuous waveform;

means for permitting an observer to view said indicator path means; and,

said housing being configured so as to isolate said indicator path means from the ambient except at said inlet opening.

4,904,450

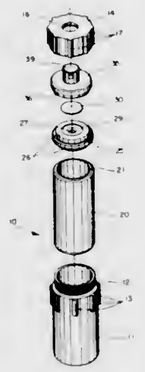
HIGH TEMPERATURE AND HIGH PRESSURE DIGESTION VESSEL ASSEMBLY

Terry Floyd, 4527 Island Fork Rd., Lake Wylie, S.C. 29710

Filed Mar. 1, 1989, Ser. No. 317,461

Int. Cl.[4] G05D *16/08;* **G01N** *31/12;* **F16J** *13/12*

U.S. Cl. 422—113 **10 Claims**



1. A high temperature, high pressure chemical digestion vessel comprising:

(a) a microwave transparent inner container having a bottom and integrally-formed cylindrical sidewalls the upper edge of which defines a cylindrical mouth for receiving material to be chemically digested under high pressure and high temperature;

(b) a lower cap part having a pressure vent therethrough and an annular seat for being positioned on the cylindrical mouth of said container for receiving a replaceable, rupturable pressure release disk having a predetermined rupture pressure for being sealingly interposed in covering relation to said vent to seal the container and thereby enclose a substance to be digested in said container and to rupture and release pressure within said container if pressure within said container reaches said predetermined rupture pressure.

(c) an upper cap part having a pressure vent therethrough and a bottom side with an annular seat matingly fitting onto the top side of said lower cap part without mechanical attachment and cooperating with the pressure vent of said lower cap part for containing a pressure release disk therein; and

(d) a microwave transparent outer casement comprising a bottom and integrally-formed cylindrical sidewalls, an upper edge of which defines a cylindrical mouth, and a casement cap for attachment to the upper edge of said cylindrical sidewalls, said outer casement being of a diameter whereby said container is receivable therein in sliding surface-to surface contact, said casement caps and said outer casement each having connecting me wherein said casement cap is releasably attachable to said outer casement, said casement cap and said outer casement each being of a height whereby said upper and lower cap parts, said inner container, said outer casement, and said casement cap cooperate such that when said casement cap is releasably attached to said outer casement, said upper and lower cap parts, said inner container and said outer casement are maintained in a pressure-resisting relationship with one another.

4,904,451

PROCESS AND DEVICE FOR THE PREPARATION OF FLOWABLE REACTION MIXTURES

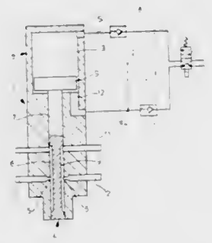
Ferdinand Proksa, Leverkusen; Hans-Michael Sulzbach, Koenigswinter; Ferdinand Althausen, Neunkirchen, and Reiner Raffel, Siegburg, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1989, Ser. No. 393,172

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1988, 3828061

Int. Cl.[4] B05B *1/08*

U.S. Cl. 422—133 **2 Claims**



1. In a process for the preparation of flowable reaction mixtures comprising at least two continuously flowing reaction components which are mixed under high pressure, in which the component mixing times alternate with non-mixing pauses during which each reaction component is separately recirculated, and wherein the change from recirculation to mixing and the change from mixing to recirculation are effected and maintained by the hydraulic operation of at least one flow directing element, wherein the improvement comprises that during redirection of the flowing reaction components the hydraulic pressure maintaining an initial position of said at least one flow directing element is held until the hydraulic pressure for positioning the flow directing element is built up to a predetermined value, and only then is the hydraulic pressure maintaining initial position released and the flow directing element simultaneously moved to the alternate position.

4,904,452

INNER CORE HEATING IN FLUIDIZED BED

Arun Acharya, East Amherst, and William E. Be Vier, Kenmore, both of N.Y., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Mar. 31, 1988, Ser. No. 175,902

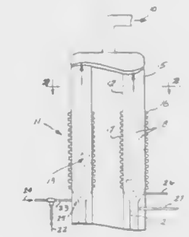
Int. Cl.[4] F27B *15/14*

U.S. Cl. 422—146 **14 Claims**

1. A heated fluidized bed reactor comprising:

(a) a vessel;

(b) a heated fluidized bed within an annular reaction zone located within the vessel and defined by an outer peripheral means and an inner boundary wall, said inner boundary wall also defining and bounding an inner cavity, said inner boundary wall excluding said fluidized bed from within said inner cavity, said annular reaction zone being the only site within the vessel in which the fluidized reaction occurs and said annular reaction zone having no communication with said inner cavity;



(c) means for heating the reaction zone including a first heat source means for supplying heat to the outer periphery means of the fluidized bed reaction zone, and a second heat source means for supplying heat to the inner boundary wall of the fluidized bed reaction zone; and

(d) a fluidizing means for providing fluidization in the reaction zone

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4,904,453

SYSTEM FOR REDUCING ENERGY CONSUMPTION IMPROVING REACTORS FOR HETEROGENEOUS CATALYTIC SYNTHESIS AND RELATIVE REACTORS

Umberto Zardi, Breganzona, Switzerland, assignor to Ammonia Casale S.A., Switzerland

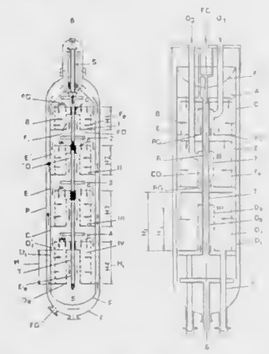
Continuation of Ser. No. 859,044, May 2, 1986, Pat. No. 4,755,362. This application Jul. 1, 1988, Ser. No. 214,582

Claims priority, application Switzerland, May 15, 1985, 2100/85; Jul. 25, 1985, 03-238/85

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.[4] A01C *1/00*

U.S. Cl. 422—148 **11 Claims**



1. A method for retrofitting a heterogeneous synthesis reactor which comprises a cylindrical external shell, an axially positioned synthesis gas transfer pipe, an internal cylindrical cartridge, said cartridge having contained therein at least one catalyst bed having an upper transverse face, a lower end and an internal diameter, said catalyst bed being defined by a portion of an external wall of said cartridge, a portion of an internal cylindrical wall of said axially positioned gas transfer pipe and a bottom, the upper transverse face of each of said bed being an open area adapted to be fed by synthesis gas in axial flow, said method comprising:

(a) inserting a first substantially perforated cylindrical wall having a top and bottom portion into at least one of said catalyst beds inside at a position near said external cartridge wall, said perforated wall having a diameter slightly smaller than that of the internal diameter of said cartridge;

(b) inserting a second substantially perforated wall also having a top and bottom and having a smaller diameter than that of said first perforated wall and a larger diameter than that of said axially positioned synthesis gas transfer pipe into each of the catalyst beds; and,

(c) applying a sealed bottom at the lower end of each catalyst bed.

4,904,454

REACTOR FOR PRODUCING FURNACE CARBON BLACK

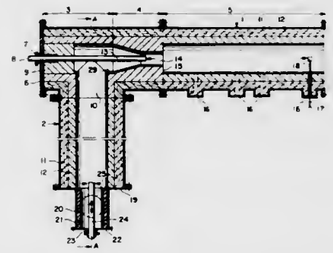
Gerhard Schaefer, Dortmund, and Peter Kopietz, Froendenberg, both of Fed. Rep. of Germany, assignors to KG Deutsche Gasrusswerke GmbH & Co., Dortmund and Degussa Aktiengesellschaft, Frankfurt am Main, both of, Fed. Rep. of Germany

Continuation of Ser. No. 25,762, Mar. 13, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 229,761

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609847

Int. Cl.[4] C09C *1/50*

U.S. Cl. 422—151 **10 Claims**



1. A reactor for producing furnace carbon black by thermal decomposition of liquid hydrocarbons in hot combustion gases, comprising:

an elongated reactor member having a forward end, a rearward end, a longitudinal median axis, and an interior jacket of fire resistant material, said jacket having in sequence from said forward end to said rearward end, a first reactor section, a second constricting reactor section and a third reactor section, said reactor member further including filler means for filling in a portion of said first reactor section, said filler means having a rearward wall and a forward wall with said forward wall being essentially coincident with the forward end of said reactor member;

said first reactor section having an inner wall defining a cylindrical channel therein with the channel having a first end coincident with the rearward wall of said filler means, a median channel axis coincident with the longitudinal median axis of said reactor member and a second end, said first reactor section also having an internal surface defining a laterally extending bore with the bore opening into the channel and extending out to and through a peripheral portion of said reactor member, said bore being positioned rearwardly of the rearward wall of said filler means and forwardly of the second end of said channel, and a portion of the inner wall defining the channel rearward of the bore and forward of the second end of the channel being in a

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transverse relationship with the internal surface defining the bore such that a sharp edge is formed at the intersection of the inner wall and the internal surface;

said second constricting reactor section including an inner wall defining a through-hole, the through-hole opening into the channel in said first reactor section and having a central axis coinciding with the median axis of the channel in said first reactor section, a first portion of the through-hole having a cross-sectional area which, in the direction from the forward end towards the rearward end of said reactor member, symmetrically constricts;

said third reactor section including an inner wall defining a channel therethrough, the channel opening into the through-hole of said second constricting reactor section and having a cross-sectional area along its entire length equal to or greater than the cross-sectional area of the through-hole at the junction of said second constricting reactor section and said third reactor section;

spray nozzle means extending into the channel in said third reactor section for introducing a liquid quenching medium;

a moveable lancelike spray device for introducing carbon black raw material into said reactor member supported by said reactor member and extending into the forward end of said reactor member along the longitudinal median axis of said reactor member;

means defining a combustion chamber having a first open end and an end wall essentially closing the other end, with the open of said combustion chamber connected to said reactor member such that a median axis of said combustion chamber coincides with a median axis of the bore in said first reactor section, and the median axis of the bore formed in said first reactor section intersects and is essentially perpendicular to the median axis of the channel formed in said first reactor section such that combustion gases passing through said combustion chamber impact on the inner wall defining said cylindrical channel and thus are abruptly deflected in passing from said combustion chamber towards said second constricting reactor section.

4,904,455

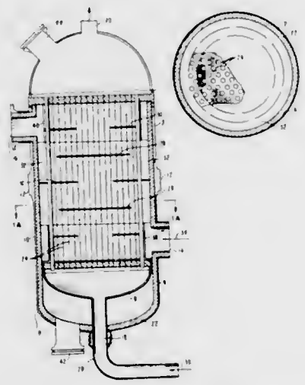
PRODUCTION OF SYNTHESIS GAS USING CONVECTIVE REFORMING

Maxim Karafian, Cold Spring Harbour, and Irving C. Tsang, Flushing, both of N.Y., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Continuation of Ser. No. 749,869, Jun. 27, 1985, abandoned. This application Jul. 14, 1987, Ser. No. 72,904

Int. Cl.[4] B01J *8/06*

U.S. Cl. 422—201 **7 Claims**



1. A device for the convective reforming of a feed mixture of hydrocarbons and steam into a hydrogen-rich gas, which comprises:

(1) an outer shell enclosure comprising (i) two end portions, (ii) a cylindrical main body portion, (iii) separate inlet and outlet conduit means for the conveyance of a heating fluid and (iv) perforated distribution plate means in said inlet and outlet conduit means for delivering the heating fluid substantially uniformly to and from

(2) a core assembly within the outer shell enclosure, which comprises (i) separate inlet and outlet means at opposite ends for the flow-through of the feed mixture of hydrocarbons and steam, said inlet means consisting essentially of a fluid flow through conduit integrally connected to and able to move in concert with said core assembly, said inlet and outlet means extending through the outer shell enclosure (1) to the outside, and (ii) a multiplicity of tubular conduits open to the path of feed mixture flow, the conduits being adapted to contain a particulate solid catalyst for contacting with the feed mixture, wherein outer enclosure (1) and core assembly (2) are separated by a passageway for the heating fluid which is in open communication with the heating fluid inlet and outlet means of outer shell enclosure (1), the passageway surrounding tubular conduits (ii) of core assembly (2).

4,904,456

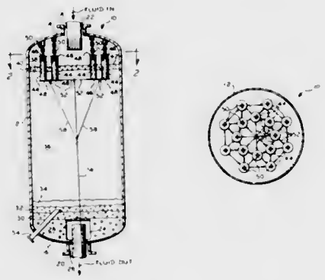
APPARATUS FOR TREATING FLUIDS IN A BED OF PARTICULATE MATERIAL

Mark R. Anderson, Sweeney, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 20, 1985, Ser. No. 746,906

Int. Cl.[4] B01J *8/02*

U.S. Cl. 422—220 **9 Claims**



1. Apparatus comprising:

a vessel having an upper end portion, a lower end portion, inlet means in said upper end portion for allowing introduction of fluids into said vessel, outlet means in said lower end portion for allowing removal of fluids from said vessel, said vessel being adapted to contain a body of particulate material therein;

a plurality of fluid distribution basket means each having an upper end and a lower end, each of said plurality of fluid distribution basket means being suspended within said vessel by suspension means from said upper end portion of said vessel, wherein said suspension means prevents the vertical movement of said fluid distribution basket means towards said lower end portion of said vessel; and

basket anchoring means having at least two ends operatively connected at one end to said lower end portion of said vessel and at the other end to said lower ends of said plurality of fluid distribution basket means, wherein said basket anchoring means prevents the floatation of said fluid distribution basket means towards said upper end portion of said vessel.

4,904,457

SYNTHETIC HYDROTALCITE

Chanakya Misra, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 595,374, Mar. 30, 1974, abandoned. This application Oct. 18, 1985, Ser. No. 788,853

The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.

Int. Cl.[4] C01B *31/24;* **C01F** *5/24, 11/18, 7/02*

U.S. Cl. 423—115 **12 Claims**



1. A method of producing hydrotalcite, comprising

(a) heating magnesium carbonate or magnesium hydroxide to a temperature between about 500–900° C. to form activated magnesia; and

(b) reacting activated magnesia with an aqueous solution of aluminate, carbonate, and hydroxyl ions at a pH above about 13 to form hydrotalcite at a conversion yield greater than about 75%.

4,904,458

PROCESS FOR THE MANUFACTURE OF SODIUM PERBORATE MONOHYDRATE FROM SODIUM PERBORATE TETRAHYDRATE

Jacques Dugua, Charly, and Jean-Pierre Cuer, Francheville, both of France, assignors to Atochem, Paris, France

Filed Feb. 12, 1985, Ser. No. 700,714

Claims priority, application France, Mar. 1, 1984, 8403198

Int. Cl.[4] C01B *35/12*

U.S. Cl. 423—277 **3 Claims**

1. A process for the manufacture of sodium perborate monohydrate by the dehydration of sodium perborate tetrahydrate, comprising carrying out the dehydration in an area where the absolute pressure is maintained between 0.03 and 0.13 bar and at a temperature of the perborate mass to be dehydrated not exceeding about 70° C., without any gaseous current being allowed to penetrate into said dehydration area.

4,904,459

PROCESS FOR WORKING UP DUSTS WHICH ARE PRODUCED IN THE ELECTROTHERMAL PRODUCTION OF PHOSPHORUS

Friedrich Kolkmann, Brühl; Günther Schimmel, Erftstadt, both of Fed. Rep. of Germany, and Johannes Scheffer, Vlissingen, Netherlands, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 26, 1989, Ser. No. 385,492

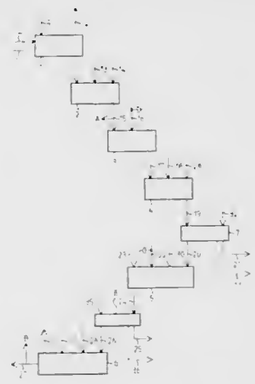
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1988, 3826981

Int. Cl.[4] C01B *15/16, 25/26*

U.S. Cl. 423—305 **12 Claims**

1. A process for working up dusts which have been precipitated electrostatically from the gas mixture comprising carbon monoxide and phosphorus vapor produced in the electrothermal production of yellow phosphorus, which process comprises converting the dusts into a calcinate at 300° to 800° C. under oxidizing conditions in a first step, leaching the calcinate with phosphoric acid in a second step, adjusting the pH of the solution in phosphoric acid to 0 to 1.5 with sodium hydroxide solution in a third step, precipitating the sulfides of lead, copper and cadmium from the partially neutralized solution in phosphoric acid by adding sulfide and filtering them off in a fourth step, adjusting the pH of the filtered, partially neutralized solution in phosphoric acid to about 1.5 to 5.0 with sodium hydroxide solution and precipitating zinc sulfide, optionally by adding further quantities of sulfide, and filtering it off in a fifth step, further neutralizing the sodium phosphate solution, optionally after expelling excess sulfide, with sodium hydroxide solution and separating it from precipitated calcium compounds in a sixth step, and using the resultant sodium phosphate solution in this form to produce sodium phosphate salts.

12. A process for working up dusts which have been precipitated electrostatically from the gas mixture comprising carbon monoxide and phosphorus vapor produced in the electrothermal production of yellow phosphorus, which process comprises converting the dusts into a calcinate at 300° to 800° C. under oxidizing conditions in a first step, leaching the calcinate with phosphoric acid in a second step, adjusting the pH of the solution in phosphoric acid to 1.7 to 2.5 with sodium hydroxide solution in a third step, precipitating the sulfides of lead, copper, cadmium and zinc from the partially neutralized solution in phosphoric acid by adding sulfide, and filtering them off in a fourth step, further neutralizing the sodium phosphate solution, optionally after expelling excess sulfide, with sodium hydroxide solution and separating it from precipitated calcium compounds in a fifth step, and using the resultant sodium phosphate solution in this form to produce sodium phosphate salts.



4,904,460

PROCESS FOR PRODUCING MONOSILANE

Keisuke Wada; Junzo Haji, and Ichiro Yokotake, all of Yokohama, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 337,657

Claims priority, applicatioo Japan, Apr. 13, 1988, 63-91141; Apr. 13, 1988, 63-91142; Dec. 22, 1988, 63-324472

Int. Cl.[4] C01B *33/04*

U.S. Cl. 423—347 **17 Claims**

1. A process for producing a monosilane, which consists essentially of:

disproportionating an alkoxysilane of the formula:

$$H_nSi(OR)_{4-n} \quad (1)$$

wherein R is an alkyl group having from 1 to 6 carbon atoms or a cycloalkyl group having up to 6 carbon atoms and n is an integer of 1, 2 or 3, in the presence of a catalyst, said catalyst

comprising at least one compound selected from the group consisting of aromatic alkoxides of the formula: MOAr (II) wherein M is a metal of group Ia of the Peirodic Table and Ar is a substituted or unsubstituted aromatic hydrocarbon group, quaternary ammonium compounds of the formula $R^1R^2R^3R^4NX$ or phosphonium compounds of the formula: $R^1R^2R^3R^4PX$ wherein each of R^1 through R^4, which may be the same or different, is a substituted or unsubstituted alkyl or aryl group and X is an anion.

4,904,461

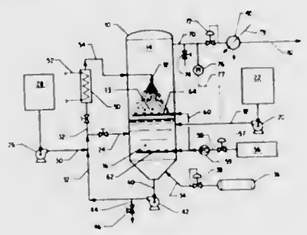
SAFE PRODUCTION OF CHLORINE DIOXIDE IN A PRESSURIZED GASEOUS STATE

Robert E. Yant, Medina, and Thomas S. Sturik, Garfield Heights, both of Ohio, assignors to Quantum Technologies, Inc., Twinsburg, Ohio

Filed Dec. 7, 1987, Ser. No. 129,060

Int. Cl.[4] C01B *11/02*

U.S. Cl. 423—478 **20 Claims**



1. In a method of generating chlorine dioxide from inorganic chlorate by chemically reducing same in an aqueous solution of H_2SO_4 having an acid normality of at least about 4, the improvement which comprises conducting said reducing reaction at a temperature of less than 100° C. under a superatmospheric pressure of more than half an atmosphere in the absence of inert sweep gases while continuously feeding substantially pure, pressurized chlorine gas thereto in proportions to yield a superatmospheric pressurized effluent gaseous product at an absolute pressure of at least 1.5 atmospheres consisting essentially of a mixture of chlorine and chlorine dioxide in volumetric Cl_2/ClO_2 ratios greater than about 10/1, enabling said gaseous product to be transferred directly to a continuous industrial process operating above atmospheric pressure.

4,904,462

MULTIPLY-TRITIATED STEROIDAL-20,17-SPIROLACTONES AND THEIR USE AS TRACER COMPOUNDS

Paul-Eberhard Schulze; Klaus Nickisch; Henry Laurent, all of Berlin, and Kunhard Pollow, Mainz-Hechtsheim, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

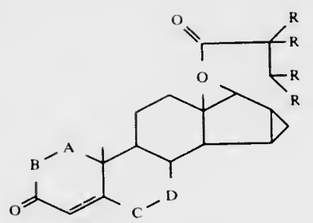
Filed Apr. 12, 1985, Ser. No. 722,255

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3414508

Int. Cl.[4] A61K *49/02, 31/58*

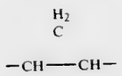
U.S. Cl. 424—1.1 **13 Claims**

1. A multiple-tritiated steroid-20,17-spirolactone of the formula



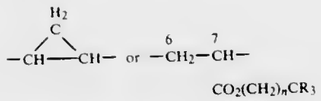
wherein

—A—B— is $-CH_2-CH_2-$, $-CH=CH-$ or



and

—C—D— is



R is hydrogen or tritium and

n is 0 or 1,

with the proviso that at least three R-groups are tritium.

4,904,463

AEROSOL ANTIPERSPIRANT COMPOSITIONS

Philip S. Johnson, and Theresa A. Bakken, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 171,619, Mar. 22, 1988, abandoned. This application May 18, 1989, Ser. No. 355,082

Int. Cl.[4] A01N *25/02*

U.S. Cl. 424—44 **10 Claims**

1. An aerosol antiperspirant composition comprising:

(a) from about 2% to about 10% of a hydrophobic liquid selected from the group consisting of fatty acid and fatty alcohol esters, water-insoluble ethers and alcohols, polyorganosilicones, and mixtures thereof;

(b) from about 20% to about 95% of a propellant;

(c) from about 2% to about 30% of an enhanced efficacy metallic antiperspirant material containing at least about 30% of a high efficacy metallic species (by weight of all metallic species in said antiperspirant material);

(d) from about 0.1% to about 3.0% of a hydrophobically-treated bentonite or hectorite clay suspension agent; and

(e) an activator selected from the group consisting of propylene carbonate, ethanol, and mixtures thereof, wherein the level of activator is from about 0.01% to about 0.195% when the suspension agent is said hectorite clay and from about 0.01% to about 0.03%, when the suspension agent is a bentonite clay.

4,904,464

INSECTICIDE AND AIR FRESHENER PREPARATIONS

James J. Albanese, Eureka, Mo., assignor to United Industries Corporation, St. Louis, Mo.

Division of Ser. No. 708,091, Mar. 4, 1985, Pat. No. 4,826,674, which is a continuation of Ser. No. 648,629, Sep. 10, 1984, abandoned, which is a continuation of Ser. No. 410,375, Aug. 23, 1982, abandoned. This application Aug. 29, 1988, Ser. No. 237,372

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.[4] A01N *25/00, 65/00, 57/00*

U.S. Cl. 424—45 **12 Claims**

1. An insecticide preparation in the form of a dispersion comprising a water phase and an active ingredient phase which are normally separate, with distinct delineation between the same, said phases being capable of transitory intermixture upon agitation, there being a dispersal agent consisting of cocodiethanolamide in an amount within the range of 0.1 to 10% by weight of the preparation, said cocodiehanolamide being an amber liquid having a congealing point of approximately 6 degrees C., a specific gravity at 25 degrees C. of about 0.99, containing a maximum of about 3–4 percent free or unreacted fatty acid (as lauric acid) and having a pH value of 8–9 as a one percent dispersion in water, being soluble in alcohols, glycols, ketones, esters, aromatic and aliphatic hydrocarbons, and chlorinated solvents, and also being dispersible in water at low cconcentration of 1% to 2%, said active ingredient phase comprising an insecticidal agent selected from the class consisting of pyrethroids, carbamates, organo-phosphates, and combinations thereof in a quantity sufficient to exterminate the particular preselected prey, said dispersion having a pH within the range of approximately 6.5 to 7.5.

4,904,465

PERFUMING INGREDIENT, PROCESS FOR ITS PREPARATION AND UTILIZATION OF SAID INGREDIENT IN PERFUMING COMPOSITIONS AND PERFUMED PRODUCTS

Eric Maillefer, Echandens, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed Feb. 15, 1989, Ser. No. 310,565

Claims priority, application Switzerland, Feb. 25, 1988, 701/88

Int. Cl.[4] A61K *7/46; A61L 9/01*

U.S. Cl. 424—70 **5 Claims**

1. A method for enhancing, improving or modifying the odor properties of a perfuming composition or perfumed product, which method comprises adding to said composition or product a fragrance effective amount of 2-methoxy-4-propyl-1-cyclohexanol

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4,904,466

POLYMERS WHICH FORM GELS AT LOW CONCENTRATIONS IN WATER

James E. Carson, Lincoln Park, and James P. Owens, Wyandotte, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Division of Ser. No. 33,334, Mar. 31, 1987, Pat. No. 4,810,503. This application Dec. 27, 1988, Ser. No. 290,765

Int. Cl.[4] A61K *7/00*

U.S. Cl. 424—76.3 **5 Claims**

1. A gel composition comprising a polyether having a molecular weight of about 10,000 to about 100,000 which is selected from the group consisting of

(A) polyethers prepared by reacting ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen-containing compound having from 3 to 10 carbon atoms and from 3 to 6 active hydrogens to prepare a heteric or block copolymer intermediate and further reacting said copolymer intermediate with at least one alpha-olefin oxide having an average carbon chain length of about 20 to about 45 aliphatic carbon atoms and wherein said alpha-olefin oxide is present in the amount of about 0.3 to 10 percent by weight based upon the total weight of said polyether;

(B) polyethers prepared by reacting ethylene oxide with at least one active hydrogen-containing compound having from 3 to 10 carbon atoms and from 3 to 6 active hydrogens to prepare a homopolymer intermediate and further reacting said homopolymer with at least one alpha-olefin oxide having an average carbon chain length of about 20 to 45 aliphatic carbon atoms and wherein said alpha-olefin oxide is present in the amount of about 0.3 to 10 percent by weight based on the total weight of said polyether; and a surfactant selected from sodium laureth-3-sulphate, sodium lauryl sulphate and oxyethylated derivatives thereof, dodecyl benzene sulphate, surfactants having the formula $C_nH_{2n+1}O(C_2H_4O)_mH$ where n is about 8 to 20 and m is about 5 to 20 and alpha-methyl derivatives thereof; and water; and an effective amount of a member selected from the group consisting of anti-psoriasis drugs, vitamins. antiperspirants, antiseptics, mineral oil, lanolin, hydrogen peroxide, insecticides, athlete;s foot treating ingredients and lantars wart treating materials.

4,904,467

STABILIZED INTERLEUKIN-2

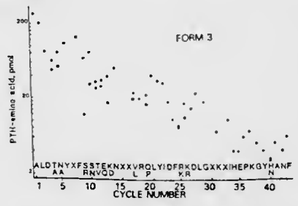
Udo Schwulera, Hanau, Fed. Rep. of Germany, assignor to Biotest Pharma, Frankfurt, Fed. Rep. of Germany

Filed Jun. 23, 1987, Ser. No. 65,539

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621828

Int. Cl.[4] A61K *37/00*

U.S. Cl. 424—85.2 **4 Claims**



1. A stabilized composition comprising interleukin-2 and a stabilizing effective amount of globulin.

4,904,468

CANINE CORONAVIRUS VACCINE

Michael A. Gill, and Stephen W. May, both of Lincoln, Nebr., assignors to Norden Laboratories, Inc., Lincoln, Nebr.

Filed Jun. 8, 1987, Ser. No. 59,437

Int. Cl.[4] A61K *39/12*; C12N *7/00*

U.S. Cl. 424—89 **13 Claims**

1. A vaccine for protecting canine animals from disease caused by infection with Canine Coronavirus (CCV) which comprises an effective amount of CCV peplomer protein and which is free for substantially free of CCV virus externalized during culture of infected cells.

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4,904,469

THERAPEUTIC AGENTS FOR ENZYMATIC WOUND CLEANING

Hans-Ulrich Petereit, Darmstadt, and Gerhard Zeiss, Gross-Gerau, both of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Feb. 5, 1987, Ser. No. 10,983

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606265

Int. Cl.[4] A61K *37/54, 9/70*

U.S. Cl. 424—94.3 13 Claims

1. A wound covering for topical skin treatment, consisting essentially of

(i) a sponge-like carrier consisting essentially of cellulose polysaccharide, and

(ii) an enzymatically effective amount of at least one enzyme in contact with said polysaccharide, wherein said wound covering has an absorbency of 1,500 to 3,000% by weight of water, relative to the dry mass of said cellulose polysaccharide.

4,904,470

ANTIBIOTIC F-0769, PROCESS FOR ITS PRODUCTION, AND ITS USE AS A GROWTH ACCELERATING AND FEED EFFICIENCY INCREASING AGENT AND AS AN ANTITUMOUR AGENT

Hideo Sugawara, Toride; Tomonori Takashina, Chouhu; Nobuko Takahashi, Toda; Machiko Sugiyama, Kawaguchi; Akio Seino, Tokyo, and Yukio Miyazaki, Ageo, all of Japan, assignors to Kaken Pharmaceutical Company, Ltd., Tokyo, Japan

Filed Mar. 3, 1987, Ser. No. 21,125

Claims priority, application Japan, Mar. 4, 1986, 61-45226

Int. Cl.[4] A61K *35/74;* C12P *1/06*

U.S. Cl. 424—119 7 Claims

1. An antibiotic F-0769 having the following properties:

(1) Outer appearance: White or light yellow powder,

(2) Melting point: 245–250° C.,

(3) Specific rotation: $[\alpha]25 = -37.5°$ (c=1, methanol),

(4) Solubility in solvents: Soluble in methanol, ethanol, acetone, chloroform, ethyl acetate and benzene; and insoluble in water and hexane,

(5) Elemental analysis (found %): C:57.53, H:7.36, 0:21.17, N:12.97,

(6) Ultraviolet absorption spectrum (as measured in methanol): As shown in FIG. 1, λmax(el%1cm)=213nm (466nm (200)

(7) Infrared absorption spectrum (as measured by KBr method): As shown in FIG. 2,

(8) Nuclear magnetic resonance spectra (as measured in heavy chloroform):^{1}H-NMR spectrum is as shown in FIG. 3, and ^{13}C-NMR spectrum is as shown in FIG. 4,

(9) Distinction among basicity, acidity and neutrality: Neutral substance,

(10): Amino acid analysis: As a result of the hydrolysis with 6N hydrochloric acid at 110° C. for 18 hours, amino acids i.e. threonine, valine and leucine were detected,

(11) Color reactions: Positive in the iodine reaction and in the ninhydrin reaction and in the ferric chloride reaction,

(12) Thin layer chromatography (by means of silica gel, Art. 5715, manufactured by Merck Co.):

Solvent system	Rf value
Ethyl acetate	0.16
Ethyl acetate-methanol (5:1)	0.33
Chloroform-methanol (10:1)	0.68
Ethyl acetate-acetone (1:1)	0.31
Acetone-benzene (5:1)	0.40

(13) Molecular weight (as measured by Rast method): About 745.

4,904,471

PREPARATION FOR TREATMENT OF HUMAN HAIR AND SKIN AND METHOD OF USING SAME

Angie L. Jones, 75-95 Clinton Ave., Newark, N.J. 07114

Continuation-in-part of Ser. No. 896,900, Aug. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 884,469, Jul. 11, 1986, abandoned. This application Jul. 13, 1987, Ser. No. 72,489

Int. Cl.[4] A61K *7/075*

U.S. Cl. 424—195.1 7 Claims

1. A method of treating human hair to promote control of dryness, encourage growth of healthy hair and softness while minimizing falling hair, hair breakage and split ends, the method comprising the steps of applying a mixture comprising a petroleum-based heavy mineral oil with an effective amount of natural oil extract of burdock root to the hair and scalp on a continuous basis wherein the mineral oil is used at least every other day and wherein heavy mineral oil is massaged into the hair and scalp.

4,904,472

USE OF ADENOSINE ANTAGONISTS IN THE TREATMENT OF BRADYARRHYTHMIAS AND MECHANICAL DYSFUNCTION ASSOCIATED WITH CARDIOPULMONARY RESUSCITATION

Luiz Belardinelli, Ivy, and Robert C. Wesley, Jr., Charlottesville, both of Va., assignors to The University of Virginia Alumni Patent Foundation, Charlottesville, Va.

Filed Apr. 10, 1987, Ser. No. 37,050

Int. Cl.[4] A61K *49/00*

U.S. Cl. 514—263 29 Claims

1. A method of enhancing the efficacy of cardiopulmonary resuscitation, comprising:

applying an electrical defibrillatory shock to a human or animal in cardiac arrest to resuscitate the human or animal;

administering to said human or animal an amount of adenosine antagonist sufficient to alleviate asystole and cardiac arrhythmia associated with said resuscitation, wherein said antagonist is selected from the group consisting of methylxanthines, imidazopyrimidine, pyrazolopyridine, etazolate, pyrazoloquinoline and triazoloquinazoline and wherein said antagonist competitively inhibits adenosine or reduces the level of adenosine present in myocardial tissue and associated fluids.

4,904,473

RUMINANT FEED ANTACID CONTAINING POTASSIUM, SODIUM AND CHLORINE

Brian R. Schricker, and Vikram P. Mehrotra, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Northbrook, Ill.

Filed Jun. 23, 1986, Ser. No. 877,313

Int. Cl.[4] A23K *1/18;* A61K *33/14, 33/08*

U.S. Cl. 424—438 6 Claims

1. A method of producing a pellet suitable for use as a pelletized feed supplement, comprising:

forming a mixture of an antacid selected from the group consisting of sodium and magnesium antacids and an electrolyte selected from the group consisting of potassium, sodium, and chlorine containing electrolytes, said electrolyte and said antacid having a particle size of less than 100 Tyler mesh, said electrolyte supplying said pellet with sufficient potassium, sodium and chlorine so that the weight ratio in said pellet is from about 1.5 to about 1.8 parts potassium and from about 1.2 to about 1.5 parts chlorine per part sodium, and sufficient potassium to provide about 0.8 to about 1 weight parts of potassium per weight part of any magnesium present; and

agglomerating said mixture to form particles having an average particle size of between about 48 and 8 Tyler mesh.

4,904,474

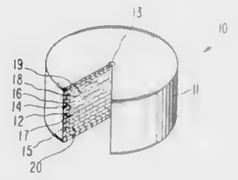
DELIVERY OF DRUG TO COLON BY ORAL DISAGE FORM

Felix Theeuwes, Los Altos; George V. Guittard, Cupertino, and Patrick S. L. Wong, Hayward, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Jan. 25, 1988, Ser. No. 147,840

Int. Cl.[4] A61M *31/00, 7/00*

U.S. Cl. 424—424 22 Claims



1. A device for delivering a drug to the colon of an animal environment of use, the device comprising:

(a) a wall comprising at least in part a composition permeable to the passage of fluid present in the environment of use and substantially impermeable to the passage of drug, which wall surrounds;

(b) a compartment;

(c) means in contact with the surface of the wall that faces the environment of use for substantially delaying the delivery of drug when the device is in the stomach;

(d) a drug for delivering to the colon in the compartment;

(e) first means in the compartment for substantially delaying the delivery of drug when the device is in the intestine;

(f) second means in the compartment in contact with the first means for pushing the first means from the compartment; and,

(g) exit means in the wall communicating with the compartment and the exterior of the device for delivering the drug to the colon.

4,904,475

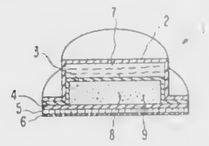
TRANSDERMAL DELIVERY OF DRUGS FROM AN AQUEOUS RESERVOIR

Robert M. Gale, Los Altos, and David J. Enscore, Sunnyvale, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 730,713, May 3, 1985, Pat. No. 4,645,502. This application Feb. 24, 1987, Ser. No. 17,649

Int. Cl.[4] A61K *9/00*

U.S. Cl. 424—449 19 Claims



1. A medical device for the transdermal delivery of a highly ionized, fat-insoluble drug comprising, in combination:

a. aqueous drug reservoir means comprising at least 50% water having said drug dissolved therein;

b. receptacle means containing said reservoir means, said receptacle means being substantially impermeable to the contents of said reservoir means;

c. highly permeable reservoir retaining means disposed over the skin proximal surface of said aqueous reservoir means; and

d. means for maintaining said medical device in permeation enhancer and drug transmitting relationship to the skin.

4,904,476

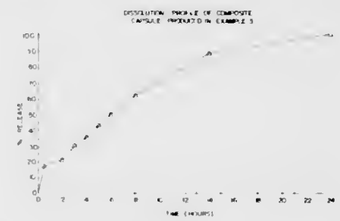
FORMULATIONS PROVIDING THREE DISTINCT RELEASES

Atul M. Mehta, Ramsey, N.J.; Lizbeth A. Bachand; Thomas W. Leonard, both of Plattsburgh, N.Y., and Ronald N. Warner, Grand Isle, Vt., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 100,646, Sep. 24, 1987, Pat. No. 4,794,001, which is a division of Ser. No. 836,033, Mar. 4, 1986, Pat. No. 4,728,512, which is a continuation-in-part of Ser. No. 731,175, May 6, 1985, abandoned. This application Sep. 30, 1988, Ser. No. 252,424

Int. Cl.[4] A61K *9/64*

U.S. Cl. 424—456 5 Claims



1. A therapeutic composition for once daily oral administration consisting essentially of a pharmaceutical gelatin capsule containing a powder blend of isosorbide dinitrate and two groups of coated spheroids each also containing isosorbide dinitrate wherein,

(a) said powder blend comprises 10% to 50% by weight of isosorbide dinitrate in admixture with pharmaceutical excipients for immediate release of isosorbide dinitrate to provide a loading dose of isosorbide dinitrate,

(b) said first group of spheroids comprises film coated spheroids, which spheroids prior to coating comprise 20% to 75% by weight of isosorbide dinitrate in admixture with non-water swellable cellulose, said film coating comprising (i) a copolymer based on methacrylic acid and methacrylic acid methyl ester or (ii) polyvinyl acetate phthalate, said first group of film coated spheroids having a pH sensitive coating to provide a delayed second dose of isosorbide dinitrate and

(c) said second group of spheroids comprises film coated spheroids, which spheroids prior to coating comprise 10% to 60% by weight of isosorbide dinitrate in admixture with non-water swellable microcrystalline cellulose, and said film coating comprising (i) an undercoat selected from the group consisting of hydroxypropyl methylcellulose and hydroxypropyl methylcellulose containing as a disintegrant carboxymethylcellulose sodium or sodium starch glycolate and (ii) an overcoat consisting of a neutral copolymer based on polymethacrylic acid esters containing metallic stearates, said second group of film coated spheroids being double coated with an effective thickness to provide a further delayed third dose of isosorbide dinitrate.

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4,904,477

SPRAY DRIED IBUPROFEN COMPOSITIONS

Ying T. R. Ho, Haddonfield, and Robert G. Blank, Vineland, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 71,116, Jul. 8, 1987, abandoned. This application Jul. 13, 1989, Ser. No. 378,480
Int. Cl.[4] A61K *9/20*
U.S. Cl. 424—465 7 Claims

1. A spray dried ibuprofen composition in powder form suitable for direct compression into tablets consisting essentially of about 80% to about 90% by weight ibuprofen, about 2% to about 6% by weight of a disintegrant selected from the class consisting of crospovidone, croscarmellose sodium and sodium starch glycolate, about 8% to about 12% by weight pregelatinized starch, and about 0.2% to about 2% by weight of a wetting agent selected from the class consisting of polyvinylpyrrolidone and sodium lauryl sulfate, the powder having been spray dried from a dispersion in water of the ibuprofen, the disintegrant, the gelatinized starch and the wetting agent.

4,904,478

SLOW-RELEASE SODIUM FLUORIDE TABLET AND METHOD FOR TREATMENT OF OSTEOPOROSIS

Neill B. Walsdorf, and Charles Y. C. Pak, Dallas, both of Tex., assignors to Mission Pharmacal Company, San Antonio and Board of Regents, The University of Texas System, Austin, both of, Tex.

Continuation-in-part of Ser. No. 842,304, Mar. 21, 1986, Pat. No. 4,726,952, which is a continuation-in-part of Ser. No. 522,014, Aug. 11, 1983, abandoned. This application Oct. 22, 1987, Ser. No. 112,202
Int. Cl.[4] A61K *9/22, 9/26*
U.S. Cl. 424—468 23 Claims

1. A tablet adapted for slow gastrointestinal release of fluoride, the tablet comprising by weight 1% to 10% talc, 1% to 5% lubricant, 20% to 65% compressible sugar and 8% to 12% sodium fluoride dispersed substantially homogeneously throughout a carnauba wax matrix, said carnauba wax being between 35% to 70% by weight of the tablet.

4,904,479

DRUG DELIVERY SYSTEM

Lisbeth Illum, Charlottenlund, Denmark, assignor to Danbiosyst UK Limited, Nottingham, England

Filed Jan. 15, 1987, Ser. No. 4,189
Claims priority, application United Kingdom, Jan. 17, 1986, 8601100
Int. Cl.[4] A61K *9/14, 45/08*
U.S. Cl. 424—490 5 Claims

1. A drug delivery system comprising an active drug as a suspension of colloidal particles, each particle being coated with a material which provides a hydrophilic coat having a thickness of from 100 Å to 154 Å and a steric barrier to particle cell interaction.

4,904,480

RADIATION COMPATIBLE IODINE FORMULATION

Mohammed A. Khan, Sandy, and John F. Moellmer, Salt Lake City, both of Utah, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 19, 1988, Ser. No. 245,484
Int. Cl.[4] A61K *33/36*
U.S. Cl. 424—667 14 Claims

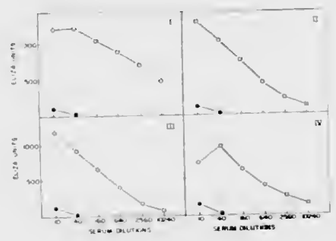
1. A germicidal iodophor composition comprising an aqueous solution of about 1 to 20% by weight of povidone iodine having about 9–12% by weight iodine therein, about 0.001 to 0.1% by weight of a soluble cupric salt and about 0.001 to 0.1% by weight of a water soluble oxidizing agent, said cupric salt being capable of oxidizing iodide ions in said composition to iodine, said oxidizing agent being capable of oxidizing cuprous ions to cupric ions, whereby the pH and the iodine concentration in said composition remain substantially unchanged.

4,904,481

METHOD OF CONFERRING IMMUNO-TOLERANCE TO A SPECIFIC ANTIGEN

C. Garrison Fathman, Menlo Park, Calif., assignor to The Board of Trustess of Leland Stanford University, Stanford, Calif.

Continuatioo-in-part of Ser. No. 724,063, Apr. 17, 1985, Pat. No. 4,681,760. This application Mar. 20, 1987, Ser. No. 28,682
Claims priority, application European Pat. Off., Apr. 15, 1986, 86.302781.9; Canada, Apr. 16, 1986, 506846; Japan, Apr. 17, 1986, 61-89192
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.
Int. Cl.[4] A61K *39/00, 39/395*
U.S. Cl. 424—85.8 7 Claims



1. A method to confer immunotolerance to a specific antigen in a vertebrate subject which comprises administering to a subject in need of such immunotolerance an effective amount of a binding moiety which bins L3T4 or its equivalent, said binding moiety selected from the group consisting of an antibody and derivatives thereof, or immunotoxin, or a pharmaceutical composition thereof including a pharmaceutically acceptable excipient, and further administering to said subject, either simultaneously therewith or within the helper T-cell recovery period, an effective amount of said antigen.

4,904,482

CHEWING GUMS CONTAINING HYDRATED EMULSIFIER AND METHODS OF PREPARATION

Mansukh M. Patel, Downers Grove, and Jayant C. Dave, Bloomingdale, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Dec. 22, 1988, Ser. No. 289,806
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—3 13 Claims

1. In a method of producing a chewing gum composition comprising about 10% to about 50% gum base, about 30% to about 85% bulking and sweetening agents, about 0.1 to about 1.5% emulsifier and optional flavor and color, the improvement comprising:

hydrating at least a portion of said emulsifier by mixing said portion of the emulsifier with water at a ratio of between about 3:1 and about 1:3 and forming a gel with the water prior to mixing said hydrated portion of the emulsifier with the remaining gum ingredients to thereby provide the gum with the water used to hydrate the emulsifier in a bound form to improve the shelf life softness of the gum.

4,904,483

METHOD FOR PRODUCTION OF AN UPGRADED COCONUT PRODUCT

Flemming M. Christensen, Basel, Switzerland, and Hans A. S. Olsen, Holte, Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Filed Feb. 15, 1989, Ser. No. 310,621
Claims priority, application Denmark, Feb. 16, 1988, 0777/88
Int. Cl.[4] A23L *1/36*
U.S. Cl. 426—44 11 Claims

1. A method for production of an upgraded coconut product, which comprises the steps of:

enzymatically treating an aqueous suspension of particles of coconut meat with a cell wall degrading enzyme and a galactomannase, all essentially free from lipases, wherein said cell wall degrading enzyme and said galactomannase are present in an amount effective for generation of a clear oil phase containing the majority of the oil after the enzymatic treatment is completed; and

separating a sludge phase.

4,904,484

PROCESS FOR TREATING COFFEE BEANS WITH ENZYME-CONTAINING SOLUTION UNDER PRESSURE TO REDUCE BITTERNESS

Leonard E. Small, and Thomas N. Asquith, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 11, 1988, Ser. No. 179,703
Int. Cl.[4] A23F *5/04, 5/10, 5/14*
U.S. Cl. 426—45 11 Claims

1. A process for reducing the bitterness and enhancing the aroma and flavor of roast and ground coffee, said process comprising the steps of:

(a) partially roasting green coffee beans to a Hunter L-color of from about 26 to about 44;

(b) drying the partially roasted beans to a moisture content of from about 1.5 to about 4%;

(c) treating the dried, partially roasted beans under an inert, anaerobic atmosphere with an aqueous solution containing from about 0.005 to about 0.5% by weight of the beans of an enzyme selected from the group consisting of hemicellulases, cellulases, proteases, phenol oxidases and mixtures thereof, from about 5 to about 20% by weight of a sugar and from about 0.01 to about 0.02% by weight of a foodgrade base, for a period of from about 5 to about 60 minutes at a temperature of from about 20° to about 100° C. and under a pressure of from about 250 to about 2000 psi, the weight ratio of solution to beans being from about 1:6 to about 3:1;

(d) drying the treated beans to a moisture content of from about 7 to about 11%;

(e) completely roasting the dried, treated beans to a final Hunter L-color of from about 16 to about 24; and

(f) grinding the completely roasted beans to provide roast and ground coffee.

4,904,485

FAT COMPOSITIONS SUITABLE FOR USE IN BAKERIES OR CONFECTIONERIES

Tamotsu Hirskawa, Takasago; Kozo Oya, Kakogawa; Minoru Ueda, Kobe, and Hiroaki Yamauchi, Kakogawa, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 1, 1987, Ser. No. 104,712
Claims priority, application Japan, Oct. 2, 1986, 61-234783; Aug. 3, 1987, 61-194195; Aug. 13, 1987, 61-202226
Int. Cl.[4] A23L *1/28*
U.S. Cl. 426—62 18 Claims

1. A fat composition suitable for use in bakery or in confectionery, comprising

(a) an aqueous phase containing a wheat flour suspension treated with either a disrupted yeast cells suspension or a mixture of a disrupted yeast cells suspension and an yeast.

(b) a fat component and

(c) an emulsifier.

4,904,486

ANIMAL FEED BLOCKS CONTAINING DIETARY SUPPLEMENTS

Dennis Donovan, Malcolm; Michael L. McDonnell, Lincoln; Gerald C. Weigel, Fremont, all of Nebr., and John E. Long, Cedar Springs, Iowa, assignors to Archer Daniels Midland Company, Decatur, Ill.

Continuation of Ser. No. 854,071, Apr. 17, 1986, Pat. No. 4,708,877, which is a continuation of Ser. No. 626,489, Jul. 5, 1984, abandoned, which is a continuation of Ser. No. 543,437, Oct. 19, 1983, abandoned. This application Sep. 11, 1987, Ser. No. 96,516
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—69 6 Claims

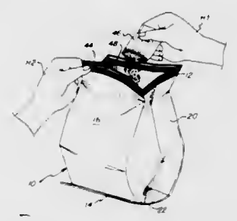
1. A solid animal feed block consisting of 20–60% by weight molasses; 0.5% to 2% by weight calcium sulfate; 0–20% by weight water; 1–5% by weight attapulgite clay; 0–20% by weight fat; 0 to 25% by weight urea; 4–6% by weight magnesium oxide; 0 to 40% by weight cottonseed meal; 1 to 10% by weight calcium carbonate; 1 to 15% by weight salt; 5 to 30% by weight ammonium polyphosphate; and 0.5 to 10% by weight mineral and vitamin feed supplements.

4,904,487

UNIFORMLY-COLORED, CHEESE FLAVORED, MICROWAVEABLE POPCORN

Glenn D. LaBaw, Greenwich, Conn.; Gerald D. Hebert, Hopatcong, and Hanan Reich, Fair Lawn, both of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Mar. 29, 1988, Ser. No. 174,761
Int. Cl.[4] B65D *81/34;* A23L *1/18, 1/275*
U.S. Cl. 426—107 32 Claims



1. In a method of preparing popcorn with microwaves and then imparting a cheese flavoring to the popcorn comprising:

subjecting a package comprising a plurality of corn kernels and oil or shortening to microwaves to form popped corn kernels and

sprinkling powdered cheese of different color than said popped corn kernels on the popped corn kernels only in an amount at which the popped corn kernels will have a mottled appearance, the improvement comprising:

incorporating in the package prior to popping a food color substantially similar to the color of the cheese flavoring and in an amount such that a cheese-flavored popcorn product with a uniform, unspeckled, and pleasing appearance is produced.

13. In a product for preparing cheese-flavored popcorn with microwaves comprising:

a package containing a plurality of unpopped corn kernels and either oil or shortening, wherein said package is suitable for placement in a microwave oven to effect popping of the corn kernels with microwaves to form popped corn kernels and

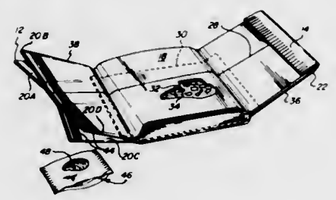
a powdered cheese of different color than said popped corn kernels and present only in an amount at which, when said powdered cheese is applied to said popped corn kernels, said popped corn kernels have a mottled appearance, wherein the improvement comprises incorporating in said package a food color substantially similar to the color of said powdered cheese, whereby, during popping of the corn kernels, said food color is distributed in said package and coats the popped corn so that when said powdered cheese is applied to the popcorn, a cheese-flavored popcorn product with a uniform, unmottled, and pleasing appearance is produced.

4,904,488

UNIFORMLY-COLORED, FLAVORED, MICROWAVEABLE POPCORN

Glenn D. LaBaw, Greenwich, Conn.; Gerald D. Hebert, Hopatcong, and Hanan Reich, Fair Lawn, both of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Mar. 29, 1988, Ser. No. 174,701
Int. Cl.[4] B65D *81/34;* **A23L** *1/18, 1/275*
U.S. Cl. 426—107 **36 Claims**



1. In a method of preparing popcorn with microwaves and then imparting a flavoring to the popcorn comprising:
subjecting a package comprising a plurality of corn kernels and oil or shortening to microwaves to form popped corn kernels and
sprinkling powdered flavoring of different color than said popped corn kernels on the popped corn kernels only in an amount at which the popped corn kernels will have a mottled appearance, the improvement comprising:
incorporating in the package prior to popping a food color substantially similar to the color of the flavoring and in an amount such that a flavored popcorn product with a uniform, unspeckled, and pleasing appearance is produced.

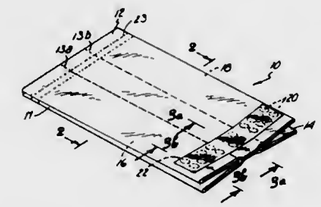
15. In a product for preparing flavored popcorn with microwaves comprising:
a package containing a plurality of unpopped corn kernels and either oil or shortening, wherein said package is suitable for placement in a microwave oven to effect popping of the corn kernels with microwaves to form popped corn kernels and
a powdered flavoring of different color than said popped corn kernels and present only in an amount at which, when said flavoring is applied to said popped corn kernels, said popped corn kernels have a mottled appearance, wherein the improvement comprises incorporating in said package a food color substantially similar to the color of said powdered flavoring and in an amount such that, during popping of the corn kernels, said food color is distributed in said package and coats the popped corn so that when said powdered flavoring is applied to the popcorn, a flavored popcorn product with a uniform, unmottled, and pleasing appearance is produced.

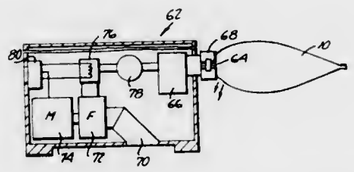
4,904,489

PACKAGE FOR CONVECTION HEATING OF FOOD

Bert R. Bach, 21 Park La., Minneapolis, Minn. 55416

Filed Jul. 22, 1988, Ser. No. 223,223
Int. Cl.[4] B65D *85/00*
U.S. Cl. 426—111 **11 Claims**





1. A package for shipping of food and convection heating of the food when connected to a source of heated forced air comprising:
a flexible sheet folded into a bag having sealed top and bottom ends and having at least a first pleated edge connecting the top and bottom ends to allow expansion of the bag;
a charge of food within the bag;
a perforation running substantially parallel and adjacent to the sealed top end allowing removal of the sealed to end to provide a partially openable top end for temporary attachment to an outlet from the source of forced heated air for admitting forced air to the bag to form a plenum;
exhaust holes in the sheet sized to provide a partially restricted outlet for air from the plenum and positioned with respect to the top end to allow circulation of forced air through the plenum; and
a removable tape for closing the exhaust holes.

4,904,490

PROCESS FOR MICROWAVE BROWNING AND PRODUCT PRODUCED THEREBY

Lawrence L. Buckholz, Jr., Middletown; Brian Byrne, East Brunswick, and Marion A. Sudol, Boonton, all of N.J., assignors to International Flavors and Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 295,450, Jan. 10, 1989, Pat. No. 4,882,184. This application May 25, 1989, Ser. No. 356,503
Int. Cl.[4] A21D *6/00;* **A23L** *1/27*
U.S. Cl. 426—243 **2 Claims**

1. A process for providing a cooked baked goods foodstuff comprising the steps of:
(a) providing an uncooked baked goods composition having a continuous surface;
(b) providing a mixture of:
(i) lysine;
(ii) a sugar selected from the group consisting of rhamnose and ribose; and

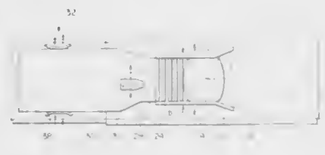
(iii) a solvent which is a mixture of glycerine and ethyl alcohol;
wherein the mixture of ethyl alcohol and glycerine is in an amount sufficient to be capable of raising the dielectric constant of the surface of the foodstuff to be cooked whereby the foodstuff to be cooked is completely cooked in a period of time under 120 seconds;
(c) coating the mixture of (b) onto the surface of the uncooked foodstuff provided in (a); and
(d) exposing the thus coated uncooked foodstuff to microwave radiation for a period of time between 40 seconds and 120 seconds,
with the pH of the coating mixture being in the range of from about 9 up to about 13.

4,904,491

METHOD FOR PRODUCING DOUGH FOR BREAD OR PASTRY

Michio Morikawa; Torahiko Hayashi; Yasunori Tashiro; Hirobumi Mugishima, and Nobuo Ban, all of Tochigi, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 302,162
Claims priority, application Japan, Jan. 27, 1988, 63-16384
Int. Cl.[4] A21C *3/02*
U.S. Cl. 426--502 **15 Claims**



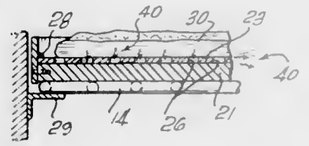
1. A method for producing dough for bread or pastry comprising the steps of:
(a) mixing and kneading materials required for producing a desired type of bread, to make a dough mass,
(b) dividing the dough mass into portions,
(c) weighting each of said dough portions,
(d) placing said dough portions serially on a feed conveyor in a manner which causes each of said dough portions to occupy a length on the conveyor proportional to the weight of the dough portion,
(e) regulating the width and thickness of each said dough portion to form a continuous dough strip of uniform dimensions,
(f) cutting and shaping said dough strip into dough pieces of a desired form, and
(g) fermenting said dough pieces.

4,904,492

METHOD FOR COOKING PIZZA

George W. Prigge, Reno, Nev., assignor to Wells Manufacturing Company, Verdi, Nev.

Filed Jun. 2, 1988, Ser. No. 201,422
Int. Cl.[4] A21D *8/06*
U.S. Cl. 426--523 **1 Claim**



1. The method of cooking pizza in a convection oven comprising: 1. mounting a first massive heat retaining element upon a grill work within a convection oven; 2. mounting a second thin heat conducting and retaining element having perforations through its thickness upon said first massive heat retaining element; 3. heating said convection oven until the said first massive heat retaining element and the said second thin heat conducting element are both at the appropriate temperature to cook a pizza; 4. placing an uncooked pizza upon the heated second thin heat conducting element, thereby generating steam on the underside of said pizza during cooking; 5. allowing said steam generated to pass through the perforations in said second thin heat retaining element and between said first heat retaining element and said second thin heat conducting element; and 6. removing said pizza when it has been cooked for a desired length of time.

4,904,493

SHELF-STABLE PATISSERIE DOUGH

Gaetano Petrizzelli, Gif sur Yvette, France, assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Aug. 3, 1987, Ser. No. 80,732
Claims priority, application France, Aug. 11, 1986, 86 11588
Int. Cl.[4] A21D *6/00, 13/08*
U.S. Cl. 426—549 **9 Claims**

1. A storage-stable, intermediate moisture dough product, which is particularly useful for pastry products, having a water activity fixed in an optimum range from about 0.60–0.80 and which comprises, in percentage by weight with respect to the final product, 30–40% inactivated cereal flour, 13–20% redried native starch, 15–25% fats, 15–25% sugar, 5–10% water, 2–5% glycerol, or alternately 4–7% sorbitol, salt and flavoring agents, wherein the inactivated cereal flour has a zero alpha-amylasic activity, a lipasic activity reduced by more than 90%, a reduced peroxidasic activity and a water content of from about 3 to 6%.

4,904,494

CHEWY DOG SNACKS

Henry C. Spanier, West Milford, N.J., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Filed Sep. 9, 1988, Ser. No. 242,292
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—646 **30 Claims**

1. Process for preparing a chewy, semi-plastic, non-extruded, non-porous, microbiologically-stable dog food consisting essentially of
(i) about 12 to about 30 weight percent, based upon the total weight of the dog food, of gelatin;
(ii) at least one edible acidulant;
(iii) about 5 to about 20 weight percent, based upon the total weight of the dog food, of at least one edible cereal starch-containing textural agent;
(iv) about 1 to about 20 weight percent, based upon the total weight of the dog food, of at least one edible release agent;
(v) about 10 to about 30 weight percent, based on the total weight of the dog food, of at least one edible taste agent;
(vi) about 6 to about 35 weight percent, based upon the total weight of the dog snack, of at least one edible sugar;
(vii) about 0.5 to about 8 weight percent, based on the total weight of the dog snack, of salt; and
(viii) added water, said dog food being a snack or biscuit in a molded form, said dog food having a pH of about 3 to 5, said dog food having a moisture content of about 10 to about 20 weight percent, based upon the total weight of the dog food, and said dog food being chewy, semiplastic, non-extruded, non-porous and microbiologically-stable, said process consisting essentially of:
(a) mixing dry components and liquid components with low speed agitation and continuing the mixing until a dough is obtained;
(b) forming the dough by molding or rotary molding into molded snack or biscuit; and

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(c) packaging the molded dog snack or biscuit in a protective package.

4,904,495

CHEWY DOG SNACKS

Henry C. Spanier, West Milford, N.J., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Division of Ser. No. 242,292, Sep. 9, 1988. This application Jan. 24, 1989, Ser. No. 305,291
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—646 **23 Claims**

1. Chewy, semi-plastic, non-extruded, non-porous, microbiologically-stable dog food consisting essentially of:
(a) 12 to about 30 weight percent, based upon the total weight of the dog food, of gelatin;
(b) at least one edible acidulant;
(c) About 5 to about 20 weight percent, based upon the total weight of the dog food, of at least one edible cereal starch-containing textural agent;
(d) about 1 to about 20 weight percent, based upon the total weight of the dog food, of at least one edible release agent;
(e) about 10 to about 30 weight percent, based on the total weight of the dog food, of at least one edible taste agent;
(f) about 6 to about 35 weight percent, based on the total weight of the dog snack, of at least one edible sugar;
(g) about 0.5 to about 8 weight percent, based upon the total weight of the dog snack, or salt; and
(h) added water, said dog food being a snack or biscuit in a molded form, said dog food having a pH of about 3 to 5, said dog food having a moisture content of about 10 to about 20 weight percent, based upon the total weight of the dog food and said dog food being chewy, semi-plastic, non-extruded, non-porous and microbiologically stable.

4,904,496

LOW-FAT PROCESSED MEAT PRODUCTS

Henry J. Izzo, Bridgewater; Richard H. Lingelbach, Somerville, and Mauro D. Mordini, Parsippany, all of N.J., assignors to Thomas J. Lipton, Jr., Engelwood Cliffs, N.J.

Continuation of Ser. No. 141,944, Jan. 11, 1988, abandoned. This application Apr. 6, 1989, Ser. No. 334,778
Int. Cl.[4] A23L *1/317*
U.S. Cl. 426—646 **14 Claims**

1. A processed meat product comprising a continuous phase of heat-set meat emulsion and a discontinuous phase, the discontinuous phase comprising particles of a water in oil emulsion having a continuous phase and a discontinuous phase, the continuous phase of said water in oil emulsion comprising edible fat, and the discontinuous phase of said water in oil emulsion comprising an aqueous gelatin solution.

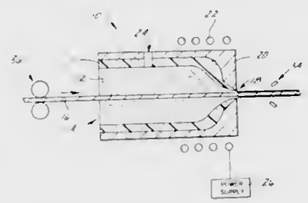
4,904,497

ELECTROMAGNETIC SOLDER TINNING METHOD

Brian G. Lewis, Branford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 26,429, Mar. 16, 1987. This application Jan. 4, 1988, Ser. No. 140,694
Int. Cl.[4] B05D *3/14*
U.S. Cl. 427—47 **9 Claims**

1. A process for applying a coating material having a desired thickness to at least one surface of a substrate, said process comprising:
providing a container having an inlet and an outlet and a supply of coating material within said container;
passing a substrate to be coated through said inlet into contact with said coating material;
providing an inductor adjacent to the outlet of said container; and
supplying a time varying current at a desired frequency to said conductor to create magnetic forces for restricting the flow of said coating material through said outlet and



for controlling the thickness of said coating material applied to said substrate.

4,904,498

METHOD FOR CONTROLLING AN OXIDE LAYER METALLIC SUBSTRATES BY LASER

Jeff C. Wu, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 15, 1989, Ser. No. 352,083
The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—53.1 **4 Claims**

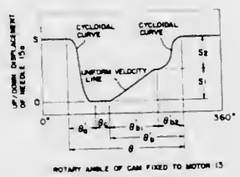
1. A method for controlling the formation of an oxide layer on a metallic substrate over which a polymeric plating resist has been placed, then selectively removed by a focussed excimer laser beam applied thereto, comprising the steps of applying a carbon-containing polymeric plating resist to a metal substrate having a natural oxide layer thereon of a thickness between about 20 to 40 Å, subjecting a selected area of said resist coated metal substrate to a single shot from an excimer laser to ablate said resist from within said area, wherein the laser energy is absorbed primarily at the metallic substrate and the energy density of the said laser is in excess of that required to ablate so as to produce a thin uniform layer of oxide having a thickness no greater than about 7 Å over said substrate, said substrate exhibiting a carbon enriched sub-surface layer beneath the ablated area to improve the surface characteristics thereof.

4,904,499

DIE BONDING METHOD

Yasuhiko Shimizu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 28, 1988, Ser. No. 291,042
Claims priority, application Japan, Dec. 28, 1987, 62-332179
Int. Cl.[4] B32B *31/00*
U.S. Cl. 427—207.1 **7 Claims**



1. In a die bonding method wherein an adhesive agent with which a semiconductor chip is bonded to a substrate of a lead frame, is discharged from a needle of a die bonding apparatus to the substrate, thereafter the substrate and needle are moved apart and the above operation is repeated for each substrate of the lead frame, said die bonding method comprising: after

discharge of said adhesive agent, initially using a first velocity for moving said substrate and needle apart; and thereafter using a second velocity for moving them apart, said second relative movement velocity being greater than said first relative movement velocity

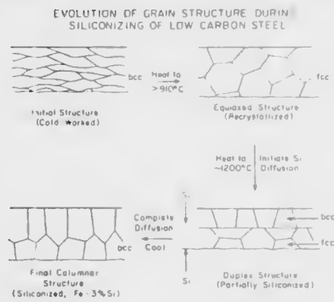
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4,904,500

DIFFUSION OF ELEMENTS INTO STEEL BY CATALYZED OXIDE REDUCTION

Richard C. Krutenat, New Providence, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 59,423, Jun. 8, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 255,895
Int. Cl.[4] C23C *16/06, 16/22*
U.S. Cl. 427—248.1 **7 Claims**



1. A process for diffusing silicon into iron or an iron alloy comprising heating said iron or iron alloy in the presence of silica with a reducing agent and a catalyst; said heating being conducted at a temperature and for a time sufficient to reduce said silica to silicon and to diffuse the silicon into said iron or iron alloy.

4,904,501

METHOD FOR CHROMIZING OF BOILER COMPONENTS

Thomas L. Davis, Louisville, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 29, 1987, Ser. No. 56,503
Int. Cl.[4] C23C *16/00*
U.S. Cl. 427—253 **11 Claims**

1. A method of chromizing a surface of a ferritic boiler component, comprising the steps of:
applying an aqueous coating composition to the surface, the aqueous coating composition containing at least about 10% by weight of chromium, at least about 12% by weight alumina, and a binder selected from the group consisting of ammonium alginate and methyl cellulose, said chromium being present in a weight ratio of chromium to the sum of water and binder of greater than about 0.7;
drying the applied aqueous coating composition on the surface; and
applying a halide activator onto the coated surface, said halide activator being a member selected from the group consisting of ammonium chloride, sodium chloride and ammonium bromide.

4,904,502

COATINGS OF ARYLENE SULFIDE POLYMERS

Lyle R. Kallenbach, and Michael C. Yu, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Divisinn of Ser. No. 18,361, Feb. 24, 1987, Pat. No. 4,835,051. This application Mar. 16, 1989, Ser. No. 324,053
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—314 **23 Claims**

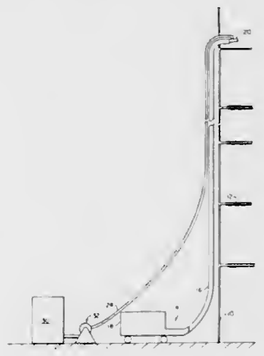
15. A method of coating at least one surface of an iron-containing alloy comprising the steps of:
(a) providing a clean iron-containing alloy surface,
(b) heating said surface from about 350° C. to about 470° C. in an atmosphere comprising oxygen and water vapor for a period of at least about 0.5 hour,
(c) spraying said heated surface with a liquid slurry coating formulation consisting of effective amounts of a metal oxide selected from the group consisting of Group 4b metal oxides, at least one poly(arylene sulfide) and a liquid carrier to provide a coating thereon wherein said at least one poly(arylene sulfide) has an extrusion rate of about 80 to about 400 grams/10 minutes, and
(d) further heating said surface having said coating thereon from about 350° C. to about 470° C. for at least about 0.05 hour to provide a cured coating substantially free of pinhole defects.

4,904,503

RAPID SETTING CEMENTITIOUS FIREPROOFING COMPOSITIONS AND METHOD OF SPRAY APPLYING SAME

Dennis M. Hilton, Londonderry, N.H.; Paul E. Korenberg, Carlisle, and Suzanne M. Conroy, Arlington, both of Mass., assignors to W. R. Grace & Co.-Conn., Lexington, Mass.

Filed Sep. 29, 1987, Ser. No. 102,171
Int. Cl.[4] B05D *3/02, 1/02*
U.S. Cl. 427—373 **15 Claims**



1. A method comprising the steps of: conveying to a spray nozzle a slurry of a hydraulic cement-based fireproofing composition consisting essentially of a hydraulic cement binder selected from the group consisting of Plaster of Paris, gypsum, Portland cement, aluminous cement, and possolanic cement, a set retarding agent and at least about 0.5% of a basic material;
introducing an acidic set accelerating agent into said slurry in close proximity to said nozzle; and
spraying said slurry onto a substrate;
wherein (a) the setting of said slurry is accelerated and (b) said basic material and set accelerating agent react prior to the accelerated setting of said slurry to provide a yield increase therein and a density after the composition has set in the range of about 12 to 25 pounds per cubic foot.

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4,904,504
METHOD OF PREVENTING ADHESION OF ORGANISMS

Osamu Isozaki, Yokohama, and Naozumi Iwasawa, Hiratsuka, both of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Sep. 6, 1988, Ser. No. 240,657
Claims priority, application Japan, Sep. 8, 1987, 62-224452
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—387 **14 Claims**

1. A method of preventing adhesion of organisms to a substrate comprising coating the substrate with a coating composition consisting essentially of, as its vehicle component, a reaction product of 5 to 95 wt.% of a silane compound and/or a low condensation product thereof having a number average molecular weight of up to about 10,000 and 95 to 5 wt% of an organic compound having at least two hydroxyl groups per molecule, the silane compound being represented by the formula

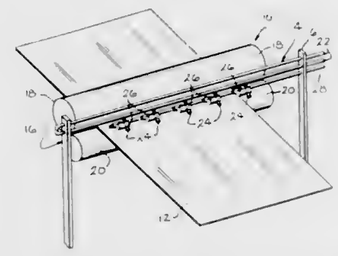
$$(R^1)_n Si\text{-}OR^2)_{4-n}$$

wherein R^1 is an alkyl having 1 to 20 carbon atoms, haloalkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, aryl or aralkyl having an alkyl portion with 1 to 12 carbon atoms, R^2 is a hydrogen atom, alkyl having 1 to 8 carbon atoms, cycloalkyl having 3 to 7 carbon atoms or haloalkyl having 1 to 8 carbon atoms and n is an integer of 0 to 3.

4,904,505
LUBRICANT MIST COATING OF METAL SHEET

Daniel L. Ison, Sandy Hook, Ky., and Jack Hester, Middletown, Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Mar. 18, 1988, Ser. No. 169,803
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—424 **7 Claims**



1. A method of coating the top surface of a metal sheet with a lubricant, comprising the steps of:
providing a spray header above a pass line for a metal sheet, said spray header including a plurality of nozzles inclined at an angle and aligned longitudinally relative to said pass line,
providing a first metal sheet having a first width,
conditioning said nozzles to provide a first nozzle arrangement corresponding to said first width,
passing said first metal sheet having said first width below said spray header,
spraying a lubricant mist above said first sheet which settles by gravity onto said first sheet,
providing a second metal sheet having a second width,
conditioning said nozzles to provide a second nozzle arrangement corresponding to said second width,
passing said second metal sheet having said second width below said spray header,
and spraying said lubricant mist above said second sheet which settles by gravity onto said second sheet, thereby forming a thin film of said lubricant having a uniform thickness across said sheets.

4,904,506
COPPER DEPOSITION FROM ELECTROLESS PLATING BATH

Peter A. Burnett, Endicott; Dae Y. Jung, Endwell; Ronald A. Kaschak, Vestal; Roy H. Magnuson, Binghamton; Robert G. Rickert, Endwell, and Stephen L. Tisdale, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 816,082, Jan. 3, 1986, abandoned. This application Jan. 20, 1987, Ser. No. 4,399
Int. Cl.[4] B05D *1/18*
U.S. Cl. 427—443.1 **23 Claims**

1. A process for plating copper onto a substrate that is catalytic for the deposition of copper thereon which comprises plating a first layer of copper onto said substrate from a first alkaline electroless copper plating bath containing up to about 2.3 ppm of cyanide ions and having an oxygen content of not less than about 2.5 ppm; plating a second layer of copper onto said first layer of copper from a second alkaline electroless copper plating bath containing about 5 to 11 ppm of cyanide ion and having an oxygen content of not less than 1.5 ppm below saturation.

4,904,507
INFORMATION DEVICE

David Greenwood, Oldham, England, assignor to Imperial Chemical Industries plc, London, England

Filed May 9, 1988, Ser. No. 191,972
Claims priority, application United Kingdom, May 11, 1987, 8711105
Int. Cl.[4] B41M *5/00*
U.S. Cl. 428—29 **3 Claims**

1. An information device comprising a substrate having applied thereto:
(1) a dye or florescent brightener which has an affinity for the substrate but is capable of easy removal from the substrate by physical means, and
(2) a fixing agent which is capable of increasing the fixation of the dye or florescent brightener to the substrate, said fixing agent being applied to the substrate in a localized manner to form an invisible image which becomes detectable when the substrate is subjected to a treatment capable of selectively removing the dye or florescent brightener from those parts of the substrate to which the fixing agent has not been applied.

4,904,508
TRIM STRIP HAVING LIGHT RESPONSIVE CHARACTERISTICS

Ciro Madonia, 195 Healey Rd., Bolton, Ontario, Canada (L0P 1A0)

Filed Dec. 18, 1987, Ser. No. 134,968
Int. Cl.[4] B60R *13/04;* **E06B** *7/16*
U.S. Cl. 428—31 **11 Claims**

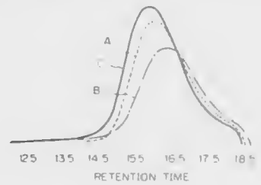


1. A light responsive trim strip for adherent application to a rigid surface, comprising: an elongated plastic strip having a coating of contact adhesive on a first major surface of the strip; a longitudinally extending discontinuity on a second major surface of the strip, so as to divide said second major surface into two longitudinal surface portions; said strip being adapted to be bendable along a longitudinal bend line so as to incline one of said longitudinal portions with respect to the other said longitudinal portion; and light responsive material laminated to at least one of said longitudinal portions; said longitudinally extending discontinuity and said longitudinal bend line being substantially coincident, and being defined by a longitudinal extending ridge-like element between said two longitudinal surface so as to cause a gap between them; so that in use, said strip may adhere to longitudinally adjacent rigid surfaces to provide visual demarcation under predetermined lighting conditions of one of said rigid surfaces.

4,904,509
INJECTION-MOLDED BODY OF OLEFIN/VINYL ALCOHOL COPOLYMER AND PROCESS FOR PREPARATION THEREOF

Shigezo Nohara, Yokohama; Sadao Hirata, Kamakura; Junichi Matsuo, Yokohama; Masami Hirano, Yokohama, and Isao Tanikawa, Ayase, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 32,646, Mar. 31, 1987, Pat. No. 4,798,697. This application Nov. 9, 1988, Ser. No. 269,091
Claims priority, application Japan, Mar. 31, 1986, 61-71236
Int. Cl.[4] C08L *29/04;* **C08F** *8/12;* **B32B** *27/30*
U.S. Cl. 428—36.6 **9 Claims**

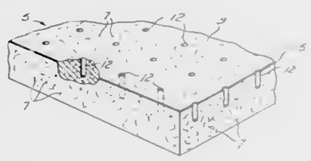


1. An injection-molded body which comprises an ethylene/-vinyl alcohol copolymer having a weight average molecular weight (Mw) of at least 80,000 and a molecular weight distribution (Mw/Mn) of at least 2.1.

4,904,510
SCORCH RESISTANCE PERLITE BOARD

Narikottile G. Nath, Carson; Rainer A. Gruber, Redondo Beach, both of Calif., and Robert W. Eberle, Golden, Colo., assignors to International Permalite, Inc., Ontario, Calif.

Continuation of Ser. No. 258,109, Oct. 13, 1988, abandoned, which is a continuation of Ser. No. 860,497, May 7, 1986, abandoned. This application Jul. 5, 1989, Ser. No. 676,903
Int. Cl.[4] B32B *5/16, 11/02, 19/02*
U.S. Cl. 428—70 **14 Claims**

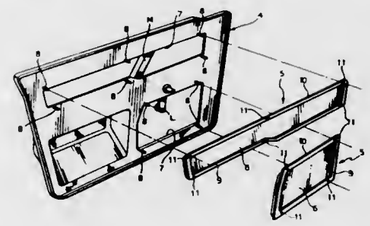


1. An improved perlite insulating board of the type made from an aqueous slurry of fibers, sizing and expanded perlite, wherein the improvement comprises:
a scorch-resistant outer surface integrally formed in a surface of said perlite insulating board by dispersement of said scorch-resistant outer surface as a slurry onto the said aqueous slurry of said fibers, sizing and expanded perlite during the formation of the said perlite insulating board.

4,904,511
PREFORMED ELEMENT FOR THE INTERIOR TRIM OF MOTOR CARS AND A METHOD FOR ITS MANUFACTURE

Franco Barberis, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Apr. 6, 1988, Ser. No. 178,407
Claims priority, application Italy, Apr. 7, 1987, 67286 A/87
Int. Cl.[4] B32B *3/30*
U.S. Cl. 428—133 **7 Claims**

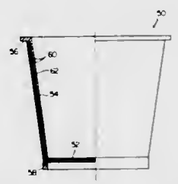


1. A preformed element for the interior trim of motor cars, which comprises a preformed base of thermoplastic material produced by injection moulding and having at least one opening and integral retaining appendages extending therefrom in the region adjacent said at least one opening, and at least one flat panel carrying a soft covering and including a peripherally extending flange thereabout, said flange including apertures corresponding in number and position for reception of said integral retaining appendages when said flat panel is applied to the back face of said base so as to be positioned in correspondence with said at least one opening, such that said retaining appendages extend through said correspondingly positioned apertures of said at least one flat panel, and thereby provide means for affixing said at least one flat panel to said flange.

4,904,512
COMPRESSION-MOLDED ARTICLE HAVING MULTILAYER STRUCTURE

Muneki Yamada, Fujisawa, and Kiyoshi Kawaguchi, Yokohama, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Feb. 2, 1987, Ser. No. 9,974
Claims priority, application Japan, Feb. 10, 1986, 25832/86
Int. Cl.[4] B65D *85/84;* **B29C** *43/08*
U.S. Cl. 428—36.7 **6 Claims**



1. A compression-molded article having a multilayer structure comprising a first resin layer molded from a first synthetic resin and a second resin layer molded from a second synthetic resin, said first and second synthetic resins being dissimilar, said first resin layer completely surrounding the entire second resin layer, said article being produced by compression-molding of a heat-molten composite plastic material formed by intermittently extruding the second synthetic resin, in molten condition, into a main extrusion flow path for the first synthetic resin whereby the first resin, in molten condition, completely

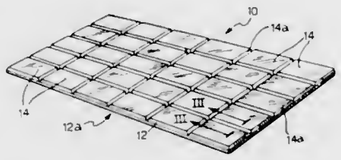
surrounds the second resin, and thereafter extruding the composite plastic through an extrusion opening in the main extrusion flow passage with the first resin completely surrounding the second resin.

4,904,513

COMPOSITE PANES OF GLASS FOR WINDOW-FRAMES AND DOOR-FRAMES

Elide De Nicolo, Via Cavour 70/C, 10045 Piossasco (Torino), Italy

Filed Nov. 14, 1988, Ser. No. 270,588
Claims priority, application Italy, Nov. 13, 1987, 53807-87[U]
Int. Cl.[4] B44F *1/06*
U.S. Cl. 428—46 **1 Claim**



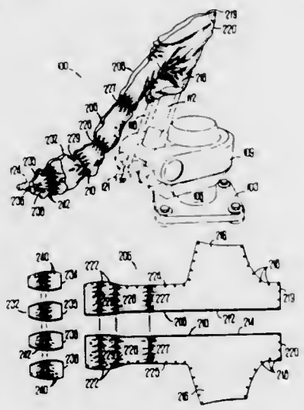
1. A composite glass plate for window-frames and door-frames comprising a plurality of flat glass elements bonded to a flat transparent backing pane by an interposed layer of plastics material wherein the flat glass elements (**14**) have chamfered edges (**14a**) placed side by side in contact with each other.

4,904,514

PROTECTIVE COVERING FOR A MECHANICAL LINKAGE

Robert A. Morrison, Kennesaw, and Malcolm L. Johnson, East Point, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 13, 1988, Ser. No. 243,876
Int. Cl.[4] B25J *3/00, 19/00;* **B32B** *1/04, 1/08, 33/00*
U.S. Cl. 428—53 **36 Claims**



1. Protective covering for a mechanical linkage comprising:
a non-woven panel of fibrous, flexible material which is substantially impermeable to both liquid and particle contaminants, the panel conforming to the outer surface of the mechanical linkage so the protective covering does not billow as the mechanical linkage operates, thereby substantially reducing the detachment of contaminants and portions of the material from the protective covering.

4,904,515

HEAT-TREATMENT MEMBER FOR SEMICONDUCTOR ELEMENTS

Shuitsu Matsuo, Atsugi; Yoshinobu Tanada, Yoshinobu, and Yasumi Sasaki, Nagai, both of Japan, assignors to Toshiba Ceramics Company, Limited, Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,790
Int. Cl.[4] B44C *1/26*
U.S. Cl. 428—67 **7 Claims**

1. A heat-treatment member for semiconductor elements, comprising a body consisting essentially of Si and SiC and, provided on a surface of said body, a coating consisting essentially of SiO_2 which ranges in thickness between about 20 Å and 100,000 Å.

4,904,516

PHENOL-FORMALDEHYDE RESIN SOLUTION CONTAINING WATER SOLUBLE ALKALINE EARTH METAL SALT

Albert W. Creamer, c/o CertainTeed Corporation, P.O. Box 860, Valley Forge, Pa. 19482

Filed Jan. 12, 1988, Ser. No. 142,946
Int. Cl.[4] C08G *8/10*
U.S. Cl. 528—129 **18 Claims**

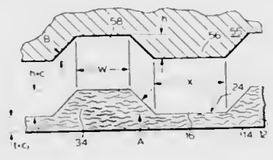
1. A process for preparing a urea-free aqueous solution of a water soluble resole resin having improved storage stability for subsequent use in preparing a binder for mineral fibers, the process comprising:
(a) preparing an aqueous mixture of at least one aldehyde and at least one phenol, the molar ratio of aldehyde to phenol being from about 1.5: 1 to 5.0 : 1;
(b) adding an alkaline earth metal compound to the aqueous mixture in an amount effective to catalyze the reaction between the aldehyde and the phenol;
(c) reacting the aldehyde and the phenol under basic conditions in the absence of urea and in the presence of the alkaline earth metal compound to form a urea-free aqueous solution of a resole resin; and
(d) adding sulfamic acid to the urea-free aqueous solution prepared in step (c) to provide a resin solution having improved stability in an amount sufficient to provide a pH from about 1 to 8.

4,904,517

RIBBED WAFERBOARD PRODUCT

Kenneth K. Lau, Vancouver, and Robert M. Knudson, Coquitlam, both of Canada, assignors to MacMillan Bloedel Research, Canada

Filed Nov. 27, 1987, Ser. No. 126,019
Int. Cl.[4] B27D *1/08;* **D32B** *31/20*
U.S. Cl. 428—167 **7 Claims**



1. A consolidated, structurally reinforced wood waferboard consolidated under elevated temperature and pressure conditions comprising a structurally reinforced consolidated elongated panel having one major surface thereof substantially planar and an opposite major surface thereof provided with longitudinally extending, outwardly projecting, substantially parallel integral ribs having intervening longitudinally extending substantially parallel valleys therebetween, said panel being formed by pressing at elevated temperature a mat of elongated wood wafers coated with adhesive, said mat having one major surface thereof substantially planar and having rib forming projections composed of said wood wafers coated with adhesive extending from a second major surface of said mat opposite said one surface of said mat to provide a mat having rib forming areas of a first thickness spaced by valley forming areas of said composite mat of a second thickness less than said first thickness, said consolidated panel having a density in the area of said ribs within 15 percent of the average density of said consolidated panel in the areas of said valleys, said elongated wafers at least in said areas of said ribs being oriented with their longitudinal axes substantially parallel to the longitudinal axes of said ribs.

4,904,518

MULTIPHASE COMPOSITE AND PROCESSES FOR PREPARING SAME

William C. Mercer, Brookfield, Conn.; Peter K. Coughlin, Yorktown Heights, N.Y.; Stephen T. Wilson, Shrub Oak, N.Y., and Edith M. Flanigen, White Plains, N.Y., assignors to UOP, Des Plaines, Ill.

Filed Jun. 29, 1988, Ser. No. 213,261
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—195 **20 Claims**

1. A multi-compositional, multi-phase composite composition comprising as phases thereof (i) an electrically conducting or semi-conducting substrate, (ii) an inorganic oxide composition layer upon at least a portion of the surface of said electrically conducting or semiconducting substrate and (iii) an inorganic crystalline molecular sieve composition layer upon at least a portion of the surface of said inorganic oxide composition layer wherein said inorganic crystalline molecular sieve layer is joined together with said inorganic oxide layer by direct chemical linkages, the thickness of said inorganic oxide composition layer being insufficient to inhibit an electrical change in the inorganic crystalline molecular sieve composition layer from affecting charge carrying species of the electrically conducting or semi-conducting substrate, and said inorganic crystalline molecular sieve layer is grown by crystal growth upon at least a portion of the surface of said inorganic oxide composition layer and in which the different phases of the composite composition are substantially contiguous and exhibit at least one of a distinct compositional heterogeneity and a distinct structural heterogeneity of one phase to another.

4,904,519

INK-RECEPTIVE SHEET

Donald J. Newman, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 12, 1986, Ser. No. 862,135
Int. Cl.[4] B32B *27/30, 27/34*
U.S. Cl. 428—203 **6 Claims**

1. A recording sheet comprising a transparent polymeric backing having on at least one major surface thereof a transparent, ink-receptive layer comprising a crosslinked, hydrolyzed copolymer of from about 30% to about 70% of vinyl ester comonomer selected from the group consisting of vinyl acetate, vinyl propionate, and vinyl stearate, and about 70% to about 30% of a vinyl amide comonomer selected from the group consisting of N-vinyl pyrrolidone and vinyl acetamide, the degree of hydrolysis being from about 80% to about 95% and the crosslinking being effected by an agent selected from the group consisting of borates, titantes, dichromates and aldehydes in an amount of about 2% to about 8% by weight based on the weight of polymeric material in said ink-receptive layer.

4,904,520

GAS-PERMEABLE, LIQUID-IMPERMEABLE NONWOVEN MATERIAL

David H. Dumas, and Elliott Echt, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Oct. 17, 1988, Ser. No. 258,913
Int. Cl.[4] A61F *13/00;* **B01D** *39/16;* **B32B** *5/32;* **D21H** *1/08, 5/20*
U.S. Cl. 428—212 **24 Claims**

1. A nonwoven material comprising a thermally consolidated , wet laid blend comprising (1) from about 5% to about 30% of a first polyolefin pulp, (2) from about 15% to about 90% of a second polyolefin pulp having a melting point at least 20° C. higher than the first polyolefin pulp, and (3) from about 5% to about 55% of a staple fiber, based on the total weight of the blend, said material being impermeable to liquids and permeable to gases.

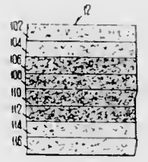
19. A laminate comprising a first layer and a second layer, said second layer comprising a thermally consolidated, wet laid blend comprising
(1) for about 5% to about 30% of a first polyolefin pulp,
(2) from about 15% to about 90% of a second polyolefin pulp having a melting point at least 20° C. higher than the first polyolefin pulp, and
(3) from about 5% to about 55% of a staple fiber, based on the total weight of the blend,
said laminate being impermeable to liquids and permeable to gases.

4,904,521

MELT-BLOWN NONWOVEN WIPER

Malcolm L. Johnson, East Point; Tracey A. Burbank, Eatonton, and Mark D. Strickland, Woodstock, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 26, 1989, Ser. No. 357,397
Int. Cl.[4] B32B *5/06*
U.S. Cl. 428—284 **2 Claims**



1. A nonwoven wiper comprising a composite web comprising interbonded layers of melt-blown thermoplastic fibers, the web having a pore size distribution across its thickness, wherein the web has at least one outer layer having pores with an average size greater than 20 microns and at least one other layer having pores of an average size less than 20 microns.

4,904,522

PROCESS FOR THE PRODUCTION OF FIBERGLASS MATS

Peter H. Markusch, McMurray, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Jul. 26, 1988, Ser. No. 224,847
Int. Cl.[4] D04H *1/58*
U.S. Cl. 428—288 **16 Claims**

9. A fiberglass mat which is prepared by a process which comprises treating fiberglass with a binder based on an aqueous polyisocyanate emulsion in the absence of waterglass.

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4,904,523

POLYESTER HEAT BONDED PRODUCT

Quentin L. Kampf; Chester J. Petkiewicz, both of Lowell, and Gernot K. Buerger, Groveland, all of Mass., assignors to Pellon Company, Lowell, Mass.

Continuation of Ser. No. 855, Jan. 6, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 282,952

Int. Cl.[4] C09J *5/02*

U.S. Cl. 428—288 **28 Claims**

1. A nonwoven fabric which is not spunbonded comprising: a first layer of a thermoplastic binder fiber and a matrix fiber, the matrix fiber being at least one of a second thermoplastic, cotton, wool and regenerated cellulostic fibers and a second layer, the second layer consisting essentially of thermoplastic binder fiber, said binder fiber having a softening point lower than a melting point of said matrix fiber; said first and second layers being bonded by heat and pressure to form said fabric, said fabric being free of standing surface fibers.

4,904,524

WET WIPES

Howard J. Yoh, Berlin, N.J., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 18, 1988, Ser. No. 259,076

Int. Cl.[4] A47K *7/03;* **A61M** *35/00;* **D21D** *3/00;* **D21H** *3/32*

U.S. Cl. 428—311.3 **11 Claims**

1. A porous sheet impregnated with an aqueous lotion comprising a hydrophobic functional ingredient entrapped in polymeric beads, said entrapped ingredient being concentrated near the surface of the sheet.

4,904,525

ANTI-REFLECTION OPTICAL ARTICLE AND PROCESS OF PRODUCING THE SAME

Takashi Taniguchi, Shiga, and Tetsuya Seki, Kyoto, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 29, 1987, Ser. No. 114,061

Claims priority, application Japan, Feb. 13, 1987, 62-29702

Int. Cl.[4] B32B *3/02, 31/04;* **B60J** *1/06*

U.S. Cl. 428—328 **15 Claims**

1. An anti-reflection optical article comprising:

a transparent plastic substrate;

a hard coat film formed on a surface of the substrate, the film having an index of refraction of not less than 1.52; and

a fluorine-containing organopolysiloxane-based film with a thickness of 10 nm to 500 nm, which has an index of refraction lower than that of the hard coat film by not less than 0.02, and which is formed on the hard coat film, where in said anti-reflection optical article has a reflectance of not more than 2.7%.

4,904,526

ELECTRICALLY CONDUCTIVE METAL OXIDE COATINGS

David C. Koskenmaki, St. Paul, Minn., assignor to 3M Company, St. Paul, Minn.

Filed Aug. 29, 1988, Ser. No. 237,855

Int. Cl.[4] B32B *15/16, 31/26, 15/08, 31/22*

U.S. Cl. 428—328 **25 Claims**

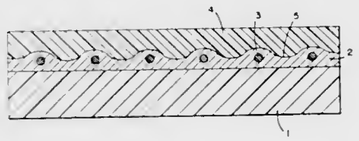
1. A method for forming a metal oxide film on a substrate comprising the steps of:

(a) depositing a continuous metal layer onto a substrate, said layer of metal having an exposed surface;

(b) forming a metal oxide layer on said exposed surface;

(c) contacting said oxide layer with an effective amount of a fluxing agent;

(d) providing a protective polymer layer on said oxide layer; and



(e) forming discrete metal microspheres by melting said metal layer.

4,904,527

LAMINATION FOR USE IN TRANSFORMERS OR THE LIKE AND METHOD OF MAKING THE SAME

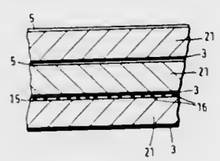
Eugen Nolle, Sachsenheim, and Hugo W. Geschka, Chamerau, both of Fed. Rep. of Germany, assignors to E. Blum GmbH & Co., Vaihingen, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,661

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1982, 3244823

Int. Cl.[4] H01F *1/16, 3/02, 27/24;* **H02K** *1/02*

U.S. Cl. 428—334 **20 Claims**



1. A lamination for use in the cores of transformers, chokes, constant voltage regulators, electric motors and like static or dynamic electric machines, comprising a metallic layer having a first side and a second side; an insulating coat overlying the first side of said layer; and an adhesive coat of hardenable material overlying the second side of said layer.

4,904,528

COATED GAS TURBINE ENGINE COMPRESSOR COMPONENTS

Dinesh K. Gupta, Vernon, and Melvin Freling, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

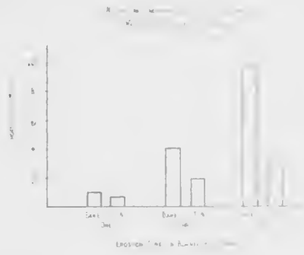
Filed Dec. 24, 1987, Ser. No. 137,852

Int. Cl.[4] B32B *15/04*

U.S. Cl. 428—336 **5 Claims**

1. An erosion resistant coated titanium article having fatigue properties essentially equal to a similar uncoated titanium article which comprises:

a titanium article having residual compressive surface stresses;



a titanium nitride surface coating on said article having residual compressive surface stresses in excess of the pre-existing titanium residual compressive surface stress.

4,904,529

HEAT AND OIL RESISTANT INSULATING COMPOSITION

Norio Ikegaya, Shizuoka, Japan, assignor to Kurabe Industrial Co., Ltd., Shizuoka, Japan

Division of Ser. No. 14,798, Feb. 13, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 220,351

Claims priority, application Japan, Feb. 18, 1986, 61-34450; Feb. 18, 1986, 61-34452; Feb. 18, 1986, 61-34454

Int. Cl.[4] C08L *51/00;* **B32B** *27/28, 15/08*

U.S. Cl. 428—377 **4 Claims**

1. A coated wire in which a mixture is extruded onto a stranded wire assembly to coat the assembly therewith, and the coating being heated and cross-linked to provide an electric insulating wire, said mixture having a composition comprising an ethylene tetrafluoride-propylene copolymer, a multi-functional methacrylic ester or acrylic ester as a cross-linking auxiliary and an organic peroxide as a cross-linking agent, thereby being cross-linked under the atmospheric pressure.

4,904,530

MAGNETIC MATERIAL, MAGNETIC RECORDING MEDIUM, AND METHOD OF MANUFACTURING A MAGNETIC MATERIAL

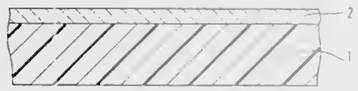
Albert Huizing; Cornelis P. G. M. Zegers, and Johannes J. Brondijk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1987, Ser. No. 45,983

Claims priority, application Netherlands, May 29, 1986, 8601372

Int. Cl.[4] C04B *35/26*

U.S. Cl. 428—402 **6 Claims**



1. A magnetic material for use in the magnetic recording and playback of information, said material having a coercive force of from 10 to 150 k A/m and consisting of ferrite particles having the composition $A_{1-y}Zn_yFe_2O_4$, wherein A is one or more bivalent metal ions, characterized in that the ferrite particles have an average particle size between 5 and 250 nm, the ratio of the dimensions of the largest 10% of the particles to the dimensions of the smallest 10% is less than a factor of 2 and y is between 0.05 and 0.20.

4,904,531

FREE-FLOWING PLURAL EXTRUDATES OF POLAR ETHYLENE INTERPOLYMERS

Laura A. Kelly, Clute, and Kenneth L. Bryce, San Antonio, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 775,561, Sep. 13, 1985, Pat. No. 4,769,289. This application Aug. 23, 1988, Ser. No. 235,222

Int. Cl.[4] B32B *5/16, 27/02, 27/28, 27/14*

U.S. Cl. 428—404 **7 Claims**

1. Free-flowing plural extrudates of a polar ethylene interpolymer, comprising:

plural extrudates of an ethylene interpolymer having interpolymerized therein ethylene and at least about 4 mole percent polar monomer selected from the group consisting of: α,β-ethylenically unsaturated carboxylic acids having 3-8 carbon atoms and alkyl esters thereof, vinyl esters of carboxylic acids, and combinations thereof; and

from about 0.001 to about 2 percent, by weight of the composition, essentially surface coated on said extrudates, fumed silica having an average primary particle size between about 5 and about 25 millimicrons, a surface area of from about 200 to about 250 m^2/g, and which is substantially amorphorus and non-porous.

4,904,532

LAMINATES OF POLYETHER KETONES AND CARBON FIBERS

Philip A. Staniland, Middlesbrough; Roger M. Turner, Whitby, and Frederick N. Cogswell, Guisborough, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 933,614, Nov. 21, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 173,026

Claims priority, application United Kingdom, Dec. 5, 1985, 8530023

Int. Cl.[4] B32B *27/20*

U.S. Cl. 428—408 **6 Claims**

1. A multiply quasi-isotropic laminate which has been formed under pressure and elevated temperature and then cooled, at a rate equal to or less than 5° C., per minute said laminate comprising a component (a) which is a polyetherketone or mixture of polyetherketones and a component (b) which is carbon fibre, said laminate having a residual compression strength of at least 290 MN/m^2 after being subjected to an impact of 4.5 J/mm, or of at least 220 MN/m^2 after being subjected to an impact of 8.9 J/mm, or both, said polyether ketone or polyether ketones consisting essentially of repeating units

—O—PH—OPh—CO—Ph— I

and

—O—Ph—Ph—O—Ph—CO—Ph— II

with components I and II being present in the relative molar proportions of 95:5 to 60:40 and the laminate contains 5 to 80% by weight, calculated on the total of (a) and (b), of the reinforcing agent (b), the laminate being characterized by improved damage tolerance on slow cooling when compared with a corresponding laminate wherein the polyketone contains only units I.

4,904,533

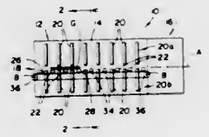
GLASS SHEET HEAT TREATED BY OPPOSED BURNERS

Harold A. McMaster, Woodville, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Division of Ser. No. 159,110, Feb. 23, 1988, Pat. No. 4,832,597, Division of Ser. No. 42,590, Apr. 15, 1987, Pat. No. 4,738,705, and a continuation-in-part of Ser. No. 869,426, Jun. 2, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 294,880

Int. Cl.[4] C03B *29/04*

U.S. Cl. 428—426 **3 Claims**



1. A glass sheet that has been heated while conveyed on spaced rolls of a roller conveyor and subsequently cooled, the invention comprising: the glass sheet having reduced roll-wave distortion and reduced edge distortion, as compared to glass sheets heated primarily by radiant heat, by virtue of having been heated by forced convection from gas burners as the dominant mode of heat transfer to the glass sheet during the conveyance on the rolls of the conveyor, and the gas burners utilized including an upper set of burners located above the conveyor spaced therealong and also including a lower set of burners located below the conveyor spaced along the conveyor between the rolls of the conveyor.

4,904,534

IMPLANT MATERIAL

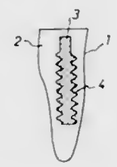
Hirosi Nagai, Chofu, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 120,708, Nov. 16, 1987, abandoned, which is a continuation of Ser. No. 870,990, Jun. 5, 1986, abandoned. This application Jun. 23, 1989, Ser. No. 370,119

Claims priority, application Japan, Jun. 10, 1985, 60-125696; Sep. 20, 1985, 60-207836

Int. Cl.[4] A61F *1/00*

U.S. Cl. 428—457 **13 Claims**



13. An biocompatible implantable artificial tooth of a metallic core and an outer coating of a thermosetting resin composition having an elastic modulus and hardness similar to a natural bone, the thermosetting resin composition containing a polymer of triethylene glycol dimethacrylate with particles of hydroxyapatite distributed therein, the weight ratio of thermosetting resin to hydroxyapatite in the range of 65:35 to 15:85.

4,904,535

ADHESIVE AND BONDING PROCESS

Rentaro Suzuki, and Shinichiro Ikeda, both of Gunma, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,940

Int. Cl.[4] B32B *15/08, 27/06;* **C08L** *85/02*

U.S. Cl. 428—463 **7 Claims**

1. An adhesive for use between metallic substrates, between metallic and plastics substrates or between plastics substrates comprising as a main component, a copolymer comprising 50 to 95% by weight of vinyl chloride, 5 to 50% by weight of a vinyl carboxylate ester and 0.01 to 5% by weight of a phosphoric acid ester having a carbon-carbon double bond and copolymerizable with the foregoing vinyl monomers, and having an average degree of polymerization of from 100 to 900.

4,904,536

PROCESS FOR CONTROLLING MONOMERIC EMISSIONS

Mark Livesay, 1374 Merritt Dr., El Cajon, Calif. 92020

Continuation-in-part of Ser. No. 83,687, Aug. 7, 1987, abandoned, which is a continuation of Ser. No. 804,662, Dec. 4, 1985, Pat. No. 4,720,392. This application Feb. 27, 1989, Ser. No. 316,609

Int. Cl.[4] B32B *27/08*

U.S. Cl. 428—515 **10 Claims**

1. A photocured molding comprising a photocured resinous matrix, said matrix having emitted ethylenic monomer vapors during photocuring, a photocured top layer on said matrix which is formed from at least one olefinically unsaturated monomeric compound, and a polymeric barrier layer between said matrix and said top layer, said barrier layer being formed by said monomeric vapors and the olefinically unsaturated monomeric compound of which said top coat is formed.

4,904,537

COPPER-LEAD COMPOSITE BEARING MATERIAL HAVING FINE LEAD SIZE AND METHOD OF PRODUCING SAME

Michael D. Lytwynec, Brighton, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Continuation of Ser. No. 829,471, Feb. 13, 1986, abandoned, which is a continuation of Ser. No. 555,778, Nov. 28, 1983, abandoned. This application Oct. 14, 1987, Ser. No. 110,642

Int. Cl.[4] B22F *7/100*

U.S. Cl. 428—548 **21 Claims**

1. A composite bearing material comprising a steel backing strip having a leaded-bronze bearing lining tenaciously bonded to at least one face thereof, said composite bearing material further characterized as having a phase composed predominantly of nickel interfacing the bond between said backing strip and said bearing lining, said bearing lining being substantially fully dense and containing about 8 percent to about 35 percent lead, up to about 10 percent tin and the balance essentially all copper, said bearing lining further characterized by the lead constituent thereof being substantially uniformly distributed throughout the bearing lining in the form of fine-sized lead particles having an average size less that about 8 microns.

4,904,538

ONE STEP HIP CANNING OF POWDER METALLURGY COMPOSITES

John J. Juhas, Columbia Station, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 21, 1989, Ser. No. 326,757

Int. Cl.[4] B22F *3/00*

U.S. Cl. 428—552 **14 Claims**

1. A method of canning a powder metallurgy composite containing binders prior to hot isostatic pressing comprising the steps of

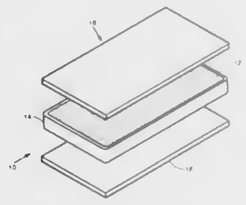
enclosing said composite with a metal frame adjacent the outer peripheral surface thereof,

interposing said composite and frame between spaced face sheets to form an assembly,

positioning said assembly in a die,

loading said die and assembly into a vacuum hot press,

heating said composite in a vacuum to a first temperture that is high enough to remove said binders,



maintaining said composite at said first temperature in said vacuum until substantially all of said binders are removed,

heating said composite to a second temperature that is substantially higher than said first temperature subsequent to the removal of said binders,

maintaining said composite at said second temperature while deforming said frame and producing a solid state diffusion weld between said frame and said face sheets, and

partially densifying said composites thereby establishing the geometry of the same.

4,904,539

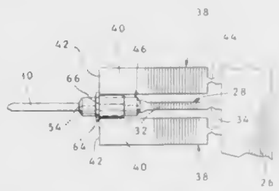
CONTINUOUS STRIP OF ELECTRICAL COMPONENT ASSEMBLIES AND METHOD OF MAKING SAME

John P. Kling, Mt. Joy, and Richard F. Stone, Jr., Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 103,089, Sep. 30, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,251

Int. Cl.[4] H05K *13/00*

U.S. Cl. 428—572 **21 Claims**



1. An intermediate article for use with a plurality of components in making a continuous strip of assemblies including said components, comprising:

a carrier strip having a plurality of first and second members integrally extending therefrom and joined thereto at spaced locations along one longitudinal side thereof, each of said first members having at least one second member associated therewith and therebeside;

said carrier strip further having a plurality of second members extending outwardly along a second longitudinal side thereof;

said second members being formed members having at least one surface lying outside the plane of said carrier strip; and

locating means provided by each of said second members for enabling at least said components to be assembled to said first members in a precisely located relationship, said locating means being adapted to be engaged by a specific portion of said components, whereby after said components are secured to said first members a plurality of assemblies is defined on said carrier strip, with said components and said first members located precisely with respect to each other by said second members during securing thereof without requiring separate fixturing devices.

4,904,540

FE-CR-AL STAINLESS STEEL HAVING HIGH OXIDATION RESISTANCE AND SPALLING RESISTANCE AND FE-CR-AL STEEL FOR CATALYST SUBSTRATE OF CATALYTIC CONVERTER

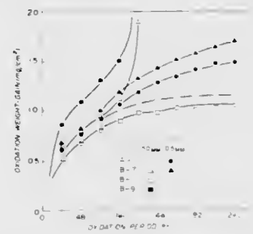
Kazuhide Ishii, and Tatsuo Kawasaki, both of Chiba, Japan, assignors to Kawasaki Steel Corp., Japan

Continuation of Ser. No. 40,629, Apr. 20, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 266,264

Claims priority, application Japan, Apr. 21, 1986, 61-91815; Sep. 17, 1986, 61-218776

Int. Cl.[4] C22C *38/06, 38/18, 38/28*

U.S. Cl. 428—606 **11 Claims**



1. A high oxidation resistantive Fe-Cr-Al stainless steel foil comprising:

C: less than or equal to 0.02 Wt%;

Si: less than or equal to 1.0 Wt%;

Cr: in a range of greater than or equal to 14 Wt% and less than or equal to 27 Wt%;

Al: in a range of greater than or equal to 3.5 Wt% and less than or equal to 6.5 Wt%;

La: in a range of greater than 0.05 Wt% and less than or equal to 0.20 Wt%;

Ce: less than or equal to 0.01%; and

Fe and inevitable impurities as a remainder, said foil having a thickness less than or equal to 80 μm.

4,904,541

WIRE MESH FOR A VANDAL-PROOF SEAT

Terry Askew, Warners Bay, Australia, assignor to Hunter Wire Products Limited, New South Wales, Australia

Filed Nov. 2, 1988, Ser. No. 266,044

Claims priority, application Australia, Nov. 2, 1987, PI5191

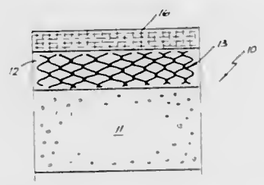
Int. Cl.[4] B21F *27/02*

U.S. Cl. 428—608 **7 Claims**

1. A mesh for incorporation in a seat cushion, said mesh comprising a plurality of wire lengths with each wire length being wound to follow a generally helical path so that each wire provides a plurality of convolutions, with adjacent convolutions of adjacent wire lengths overlapping so as to be linked, and wherein each wire length is formed of medium carbon steel and having a diameter between 0.65 mm and 0.75 mm, and wherein the mesh has parameters A, B and C, and wherein the distance A is the distanct between parallel convo-

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lutions of adjacent wire lengths, and the distance B is the distance between apexes of adjacent convolutions, and the distance C is the convolution pitch in each wire, with the mesh



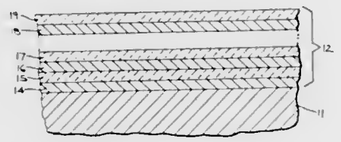
having pitched parameters and wherein distance A is between 5.0 mm and 10.0 mm, distance B is between 10.0 mm to 18.0 mm, and distance C is between 7.0 mm and 12.0 mm.

4,904,542

MULTI-LAYER WEAR RESISTANT COATINGS

Susan J. Mroczkowski, Franklin, Wis., assignor to Midwest Research Technologies, Inc., Milwaukee, Wis.

Filed Oct. 11, 1988, Ser. No. 255,454
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—610 **13 Claims**



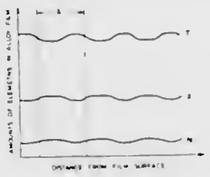
5. A wear resistant coating on a surface of a substrate for protecting against particle induced erosion and water induced erosion and corrosion, said coating having a first set of layers of a ceramic material interleaved with a second set of layers of a metallic material to form a coating with at least four layers, wherein the interface between adjacent layers is a graded transition of the concentration of the two materials.

4,904,543

COMPOSITIONALLY MODULATED, NITRIDED ALLOY FILMS AND METHOD FOR MAKING THE SAME

Hiroshi Sakakima, and Koichi Osano, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 22, 1988, Ser. No. 184,827
Claims priority, application Japan, Apr. 23, 1987, 62-100400; Jul. 23, 1987, 62-184605
Int. Cl.[4] H01F *10/14;* **G11B** *5/127*
U.S. Cl. 428—610 **33 Claims**



1. A compositionally modulated, nitrided magnetic alloy film consisting essentially of an alloy having an average composition of the following general formula

$$T_{\bar{a}}X_{\bar{b}}N_{\bar{c}}$$

in which T represents at least one member selected from the group consisting of Fe, Fe and Co, and Fe and Ni, X represents at least one member selected from the group consisting of Si, Ge, Si and Ga, and Ge and Al, N is nitrogen, $71 \leqq \bar{a} \leqq 97$, $2 \leqq \bar{b} \leqq 28$ and $1 \leqq \bar{c} \leqq 20$, each on the atomic percent basis, provided that $\bar{a}+\bar{b}+\bar{c}=100$, at least the nitrogen being compositionally modulated along the thickness of the film.

4,904,544

ZN-BASED COMPOSITE-PLATED METALLIC MATERIAL AND PLATING METHOD

Kazuhiko Mori, and Toshi Miyawaki, both of Hiratsuka, Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 151,662, Feb. 2, 1988, abandoned. This application Aug. 1, 1988, Ser. No. 226,483
Claims priority, application Japan, Feb. 5, 1987, 62-23510; Nov. 12, 1987, 62-284248
Int. Cl.[4] C25D *3/24, 3/56*
U.S. Cl. 428—658 **14 Claims**

1. A method for plating a Zn-based composite-plated metallic material on a metallic substrate, comprising:

preparing a plating solution containing Zn ions and titanium ions which are only in the form of tetravalent Ti^{4+} and an oxidizer selected from the group consisting of hydrogen peroxide, oxyacid of nitrogen and oxyacid of halogen;

bringing said metallic material as a cathode into contact with said plating solution;

adjusting the pH of said plating solution to such a value that the tetravalent Ti^{4+} is maintained dissolved in the body of the plating solution;

raising pH in the vicinity of the cathode in the presence of said oxidizer;

precipitating said tetravalent Ti^{4+} ions in said vicinity of said cathode; and,

electrodepositing a plating layer which consists essentially of Zn or Zn alloy and a hydroxide, hydroxide hydrate or phosphate of titanium.

2. The product of the process of claim 1.

4,904,545

COMPOSITE ELECTROPLATED STEEL SHEET

Masaru Sagiyama, and Yukimitsu Shiohara, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Jul. 5, 1988, Ser. No. 215,032
Claims priority, application Japan, Jul. 10, 1987, 62-173684
Int. Cl.[4] B32B *15/18*
U.S. Cl. 428—659 **38 Claims**

1. A composite electroplated steel sheet, comprising an electroplated Zn layer on a steel sheet, said Zn layer comprising a Zn matrix containing codeposited particles in said matrix, said codeposited particles comprising at least one selected from the group consisting of $Mg_2Si_3O_8$, $CaSiO_3$ and $BaTiO_3$ in an amount of 0.1 to 5.0 wt.% of said Zn layer.

4,904,546

MATERIAL SYSTEM FOR HIGH TEMPERATURE JET ENGINE OPERATION

Melvin R. Jackson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1989, Ser. No. 331,762
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—661 **5 Claims**

1. A composite structure having high strength at high temperatures, said structure comprising a shaped structural metal substrate of at least one metal selected from the group consisting of the following niobium base alloys as follows:.

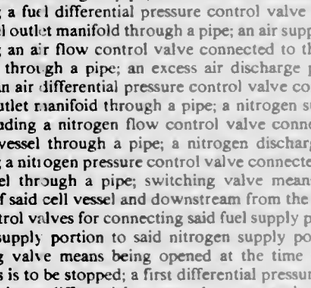
A Niobium; 31–48 a/o titanium; 8–21 a/o aluminum

B Niobium; 32–48 a/o titanium; 8–16 a/o aluminum; 2–12 chromium provided that the sum (Al+Cr)≦22% a/o, and where Ti is less than 37 a/o the sum (Al+Cr)≦16 a/o

C Niobium; 40–48 a/o titanium; 12–22 a/o aluminum; 0.5–6 a/o hafnium

D Niobium; 32–45 a/o titanium; 8–15 a/o hafnium; 3–18 a/o aluminum

E Niobium; 35–45 a/o titanium; 8–15 a/o hafnium



F Niobium; 4–10 a/o hafnium; 4–10 a/o aluminum; 5–18 a/o titanium; 3–8 a/o chromium

G Niobium; 5–18 a/o hafnium; 5–22 a/o aluminum

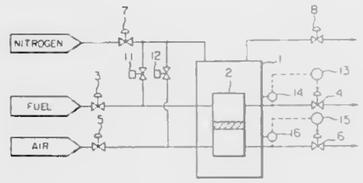
and a protective metal coating on at least a portion of the substrate surface to protect the substrate from environmental attack, said coating having the composition as defined within the enclosure A of FIG. 3.

4,904,547

FUEL-CELL DEVICE

Yoichi Mizumoto, and Kunihiro Doi, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 10, 1986, Ser. No. 827,538
Claims priority, application Japan, Mar. 1, 1985, 60-41442
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—22 **1 Claim**



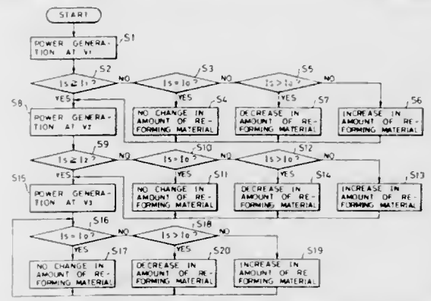
1. An apparatus for producing electricity through an electrochemical reaction comprising a fuel cell stack having fuel inlet and outlet manifolds and air inlet and outlet manifolds; a cell vessel containing the fuel cell stack therein; a fuel supply portion including a fuel flow control valve connected to the fuel inlet manifold through a pipe; an excess fuel discharge portion including a fuel differential pressure control valve connected to the fuel outlet manifold through a pipe; an air supply portion including an air flow control valve connected to the air inlet manifold through a pipe; an excess air discharge portion including an air differential pressure control valve connected to the air outlet manifold through a pipe; a nitrogen supply portion including a nitrogen flow control valve connected with the cell vessel through a pipe; a nitrogen discharge portion including a nitrogen pressure control valve connected with the cell vessel through a pipe; switching valve means disposed outside of said cell vessel and downstream from the respective flow control valves for connecting said fuel supply portion and said air supply portion to said nitrogen supply portion, said switching valve means being opened at the time when said apparatus is to be stopped; a first differential pressure detector for detecting a differential pressure between a nitrogen pressure in said cell vessel and an excess fuel pressure of said excess fuel discharge portion; a first pressure controller for controlling an opening and closing operation of said fuel differential pressure control valve in response to the output of said first differential pressure detector; a second differential pressure detector for detecting a differential pressure between the nitrogen pressure in said cell vessel and an excess air pressure of said excess air discharge portion; and a second pressure controller for controlling an opening and closing operation of said air differential pressure control valve in response to the output of said second differential pressure detector, wherein when said apparatus is to be stopped, said nitrogen flow control valve, said nitrogen pressure control valve, said fuel flow control valve and said air flow control valve are closed, said switching valve means is opened, said fuel differential pressure control valve and said air differential pressure control valve are open, thereby subjecting fuel and air lines to nitrogen replacement by the nitrogen in said cell vessel.

4,904,548

METHOD FOR CONTROLLING A FUEL CELL

Hiroyuki Tajima, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Aug. 2, 1988, Ser. No. 227,608
Claims priority, application Japan, Aug. 3, 1987, 62-192703; Aug. 3, 1987, 62-192704
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—22 **10 Claims**



1. A method for controlling a fuel cell having a fuel cell stack to which a reformed fuel and an oxidizing agent are supplied, said method comprising the steps of:

generating electric power while keeping said fuel cell stack at a voltage having a constant value;

detecting an output current I_s from said fuel cell stack, said output current I_s being proportional to consumed amounts of said reformed fuel and said oxidizing agent;

calculating the difference between the value of said output current I_s detected and a predetermined current value I_o; and

varying the amount of said fuel and/or oxidizing agent to be supplied in accordance with said difference so as to minimize said difference by reducing the amount supplied when $I_s > I_o$ and increasing the amount supplied when $I_s < I_o$, whereby electric power is generated in a stable manner.

4,904,549

BATTERY HOUSING WITH INTEGRAL LATCH AND POSITIVE DISPLACEMENT APPARATUS

Ross P. Goodwin, Chicago, and Michael W. Zarek, St. Charles, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

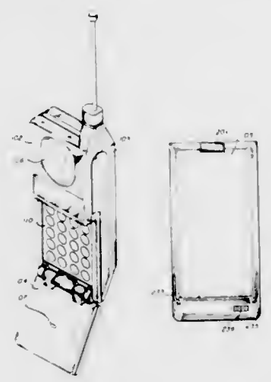
Filed Nov. 4, 1988, Ser. No. 269,853
Int. Cl.[4] H01M *2/10, 2/02*
U.S. Cl. 429—97 **16 Claims**

1. A slide-on battery housing for a portable radiotelephone, enclosing electrochemical cells and having at least one surface

by which the battery housing assembly is attached to the portable radiotelephone, the battery housing comprising:

a latch mechanism attached to the battery housing for locking the battery housing to the portable radiotelephone;

at least one positive displacement spring finger mechanism disposed on the attaching surface of the battery housing and cantilevered in a direction perpendicular to the plane of the attaching surface; and



at least two guide rails on the attaching surface of the battery housing for securing the battery housing to the portable radiotelephone further comprising:

(a) lip portions perpendicular to the plane of the attaching surface and on opposing edges of the attaching surface extending at least part of the length of said opposing edges and

(b) at least one elongated protrusion on facing surfaces of each said lip portion and extending along each said lip portion parallel to the plane of the attaching surface.

4,904,550

SEALED LEAD-ACID BATTERY

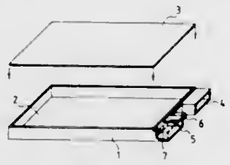
Seizo Kano, and Naoki Fujimoto, both of Kyoto, Japan, assignors to Japan Storage Battery Company Limited, Kyoto, Japan

Filed Jun. 23, 1988, Ser. No. 210,484

Claims priority, application Japan, Jun. 25, 1987, 62-158526

Int. Cl.[4] H01M *2/04*

U.S. Cl. 429—163 **7 Claims**



1. A sealed lead-acid battery, comprising: an assembled battery element comprised of a positive plate, a negative plate and a separator; a container molded from a thermoplastic synthetic resin and open on one major side, for accommodating said assembled element; and means for sealing said container by closing its open side comprising a heat-bondable sealing sheet, wherein said sealing sheet is a laminated metal sheet having at least two synthetic resin films being bonded to an inner surface of a sheet of metal, with the innermost film of said laminated sheet being heat bondable to the container.

4,904,551

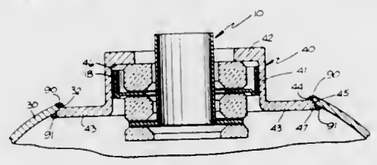
CERAMIC SEAL ASSEMBLY

Peter J. Denoncourt; Guy G. Rampel; Kenneth R. Richardson, and Orville G. Prickett, all of Gainesville, Fla., assignors to Gates Energy Products, Inc., Gainesville, Fla.

Filed Jul. 18, 1988, Ser. No. 220,773

Int. Cl.[4] H01M *2/30*

U.S. Cl. 429—181 **46 Claims**



1. In an assembly for sealing a terminal extending through a housing containing a fluid and an electrical device to which the terminal is connected, the assembly having a substantially cylindrical tube hermetically secured to the terminal, a collar secured to the housing, a first substantially annular ceramic member positioned around the tube and hermetically secured to the tube and the collar, and a second substantially annular ceramic member positioned around the tube and hermetically secured to the collar, the improvement comprising:

means for restraining said first and said second substantially annular ceramic members against axial movement outwardly from said housing; and

an orientation of said first and said second substantially annular ceramic members within said housing such that forces exerted upon said first and said second substantially annular ceramic members by increasing fluid pressure within said housing causes said first and said second substantially annular ceramic members in cooperation with said restraining means to be in compression and thereby maintain a seal between said terminal and said housing.

4,904,552

NON-AQUEOUS SECONDARY CELL

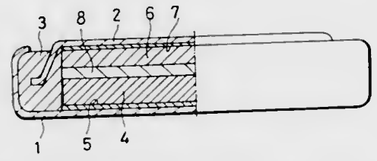
Nobuhiro Furukawa, Hirakata; Toshihiko Saito, and Toshiyuki Nohma, both of Kyoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation of Ser. No. 149,451, Jan. 28, 1988, abandoned. This application Jul. 19, 1989, Ser. No. 383,249

Claims priority, application Japan, Jan. 29, 1987, 62-19330

Int. Cl.[4] H01M *10/40*

U.S. Cl. 429—197 **11 Claims**



1. A repeatedly chargeable and dischargeable nonaqueous secondary cell comprising:

a negative electrode having lithium or a lithium alloy as an active material,

a positive electrode having manganese oxide of the formula $Li_{1-x}Mn_2O_4$, wherein $1>X>0$, as an active material when said cell is prepared,

a separator disposed between said positive electrode and said negative electrode, and

a non-aqueous electrolyte.

4,904,553

POLYANILINE

Tadashi Nakajima, Tokyo; Shinichi Toyosawa; Shigeru Kijima, both of Tokorozawa; Katsuhiko Arai, Iruma; Yuko Maeda, Akishima; Masao Ogawa, Kawagoe; Takahiro Kawagoe, Tokorozawa; Yasuhiro Iino; Ryuzo Osawa, both of Kodaira, and Yuichi Ishino, Fuchu, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 169,881, Mar. 18, 1988. This application Jun. 24, 1988, Ser. No. 211,059

Claims priority, application Japan, Apr. 16, 1987, 62-93962; May 21, 1987, 62-124921; May 21, 1987, 62-124922; Jul. 1, 1987, 62-164968; Sep. 22, 1987, 62-238168; Oct. 2, 1987, 62-249146; Nov. 19, 1987, 62-292391; Dec. 3, 1987, 62-306715; Feb. 10, 1988, 63-29707

Int. Cl.[4] H01M *4/60*

U.S. Cl. 429—213 **4 Claims**

3. A secondary cell which comprises a positive electrode active material in the form of a polyaniline in which up to 7 mol % of said polyaniline is present in the benzenoid-ammonium salt state and up to 25 mol % of said polyaniline is present in the quinoid-diimine state, based on the total molar amount of the polyaniline, and wherein the polyaniline is predominantly in the dope semiquinone radical state having a higher maximum electron density at 7–9 eV than at 15–20 eV when analyzed by X-ray photoelectron spectroscopy.

4,904,554

GAS PHASE HARDENING OF GELATIN HOLOGRAMS

John E. Wreede, Monrovia, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 21, 1988, Ser. No. 170,951

Int. Cl.[4] G03C *5/22*

U.S. Cl. 430—2 **18 Claims**

1. A process for hardening gelatin holograms after dehydration and removing the dehydration agent comprising the step of treating a dehydrated hologram with a sufficient amount of aldehyde vapor along with and in the presence of a sufficient amount of water

vapor and for a sufficient time to harden said dehydrated hologram.

4,904,555

PHOTOSENSITIVE COMPOSITION FOR MAKING REPEATABLY TONABLE LAYERS

Mario Grossa, Dreieich, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 14, 1987, Ser. No. 132,477

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642855

Int. Cl.[4] G03C *1/68, 5/00*

U.S. Cl. 430—25 **14 Claims**

8. A process for the production of a fluorescent screen with a black matrix for color television tubes comprising the steps of:

(1) applying a photosensitive, repeatably tonable layer of a photosensitive composition comprising at least one 1,4-dihydropyridine compound substituted in the 4 position with a 2'-nitrophenyl ring and at least one organic sulfonic acid on the inner surface of the screen,

(2) exposing the layer successively through a shadow mask in the green, blue and red positions,

(3) toning the unexposed tacky areas with a black pigment,

(4) exposing imagewise to produce tacky areas in the green, blue, or red position,

(5) toning the resulting tacky areas with a fluorescent powder of the corresponding color, and

(6) repeating the imagewise exposing and toning steps twice, each time in a different color position, and after each exposure, toning with a fluorescent powder of the corresponding second or third color.

4,904,556

ELECTROPHOTOGRAPHIC PROCESS USING LIGHT RECEIVING MEMBER WITH BUFFER LAYER CONTAINING SILICON AND ALUMINUM ATOMS ON ALUMINUM SUBSTRATE

Hiroshi Amada; Tetsuya Takei, and Naoko Shirai, all of Nagahama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 35,392, Apr. 7, 1987, Pat. No. 4,786,573. This application Jun. 14, 1988, Ser. No. 206,277

Claims priority, application Japan, Apr. 8, 1986, 61-80377; Apr. 8, 1986, 61-80378; Apr. 8, 1986, 61-80379

Int. Cl.[4] G03G *5/14*

U.S. Cl. 430—31 **29 Claims**

1. An electrophotographic process comprising:

(a) charging an improved light receiving member including on a substrate constituted principally of aluminum, a buffer layer, a 0.03 to 15 μm thick high resistance intermediate layer and a 1 to 100 μm thick photoconductive layer being disposed in this order from the side of said substrate; said buffer layer comprising a non-single-crystal containing silicon atoms and aluminum atoms to improve contact between said substrate and said high resistance intermediate layer; said high resistance intermediate layer comprising a non-single-crystal material containing silicon atoms, 1D to 5×10^5 atomic ppm of at least one kind of atom selected from the group consisting oxygen atoms, carbon atoms and nitrogen atoms, and at least one kind of atom selected from hydrogen atoms and halogen atoms; and said photoconductive layer comprising an amorphous material containing silicon atoms as the main constituent and at least one kind of atom selected from the group consisting of hydrogen atoms and halogen atoms in a total amount of 1 to 40 atomic %; and

(b) irradiating said light receiving member with an electromagnetic wave carrying information, thereby forming an electrostatic image.

4,904,557

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER HAVING A ROUGHENED SURFACE

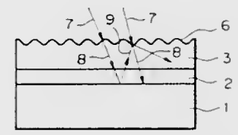
Keiji Kubo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 177,882, Mar. 30, 1988, abandoned, which is a continuation of Ser. No. 1,882, Jan. 9, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,878

Claims priority, application Japan, Jan. 13, 1986, 61-003554

Int. Cl.[4] G03G *5/02, 5/14*

U.S. Cl. 430—56 **8 Claims**



1. An electrophotographic photosensitive member comprising a photosensitive layer on a conductive substrate having a smooth surface, wherein said photosensitive layer has a surface roughness, represented by an average roughness Rz of ten points over a reference length of 2.5 mm, is equal to or larger than ½ of the wavelength of the light source employed for image formation.

4,904,558

MAGNETIC, TWO-COMPONENT DEVELOPER CONTAINING FLUIDITY IMPROVER AND IMAGE FORMING METHOD

Takayuki Nagatsuka; Kenji Okado, and Makoto Kanbayashi, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 317,835
Claims priority, application Japan, Mar. 8, 1988, 63-52649; Oct. 18, 1988, 63-260608; Nov. 16, 1988, 63-287827
Int. Cl.[4] G03G *9/14*
U.S. Cl. 430—122 36 Claims

1. An image forming method, comprising:

providing a developer comprising at least colored resin particles, a fluidity improver and magnetic particles wherein the colored resin particles have a volume-average particle size of 4–10 microns and a volume-basis particle size distribution such that they contain 1% by volume or below of particles having a particle size of 20.2 microns or larger, and the fluidity improver has a triboelectric charging characteristic such that it provides an absolute value of triboelectric charge amount of 100 μc/g or smaller with respect to the magnetic particles;

supplying the developer to a surface of a developer-carrying member disposed opposite to a latent image-bearing member having thereon an electrostatic latent image;

carrying the developer on the surface of the developer-carrying member; and

developing the electrostatic latent image on the latent image-bearing member with the developer in a developing zone where the latent image-bearing member is disposed opposite to the developer-carrying member to form a toner image;

wherein an alternating electric field comprising an AC component and a DC component is imparted to the developing zone; the maximum electric field strength F (V/micron) formed in the minimum clearance G (micron) between the surface of the developer-carrying member and the surface of the electrostatic latent image-bearing member satisfies the following relationships:

$1.5 \leqq F \leqq 3.5$, and

$F=(|V_{ppMax}/2|+|V_{DC}-V_L|)/G$,

wherein V_L (V) denotes the potential of the electrostatic image portion (i.e., portion supplied with image exposure), V_{DC} (V) denotes the voltage of the DC component of the alternating electric field having the same polarity as that of V_L, and VppMax (V) denotes the voltage at the maximum electric field application point which is at the opposite side of the image portion potential V_L, with respect to the V_{DC}; the frequency ν (KHz) of the alternating electric field satisfies $0.8 \leqq \nu \leqq 3.0$; the relative volumetric ratio Q (%) of the magnetic particles satisfies $15.0 \leqq Q \leqq 45.0$; and the ratio σ between the peripheral speed of the developer-carrying member and that of the electrostatic image-bearing member in the developing zone satisfies $1.2 \leqq \sigma \leqq 2.5$.

4,904,559

PROCESSES FOR SUPPRESSING THE FRACTIONATION OF CHALCOGENIDE ALLOYS

Santokh S. Badesha, Pittsford; Paul Cherin, Fairport, and Harvey J. Hewitt, Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 24, 1988, Ser. No. 261,659
Int. Cl.[4] G03G *5/082; C22C 28/00;* C01B *19/02, 19/04*
U.S. Cl. 430—128 28 Claims

1. A process for the preparation of chalcogenide alloy compositions which comprises providing a selenium chalcogenide alloy; admixing therewith crystalline or amorphous selenium; and subsequently subjecting the resulting mixture to evaporation.

4,904,560

SUSPENSION POLYMERIZATION PROCESS FOR PRODUCING ELECTROPHOTOGRAPHIC TONERS

Jiro Yamashiro, Kobe, and Takashi Miki, Tatsuno, both of Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan

Filed Jun. 28, 1988, Ser. No. 212,651
Claims priority, application Japan, Jun. 29, 1987, 62-161540; Jul. 30, 1987, 62-191269; Mar. 25, 1988, 63-072871; Apr. 6, 1988, 63-086133
Int. Cl.[4] G03G *9/08*
U.S. Cl. 430—137 18 Claims

1. A process for producing toners for use in electrophotography which comprises: stirring a mixture of a radical polymerizable liquid monomer and carbon black in the presence of a peroxide polymerization initiator, thereby to disperse the carbon black uniformly and minutely in the monomer; adding an azobisnitrile polymerization initiator to the resulting monomer composition; suspension polymerizing the monomer in an aqueous medium; and recovering and drying the resultant spherical polymer particles.

4,904,561

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND WHEREIN THE MATERIAL IS SENSITIVE FROM ONLY 600 NM TO 950 NM

Soichiro Yamamoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 19, 1987, Ser. No. 122,808
Claims priority, application Japan, Nov. 19, 1986, 61-277092
Int. Cl.[4] G03C *1/72, 1/08*
U.S. Cl. 430—138 6 Claims

1. A light-sensitive material comprising a light-sensitive layer which contains silver halide, a reducing agent, an ethylenically unsaturated polymerizable compound and a color image forming substance provided on a support, said silver halide, polymerizable compound and color image forming substance being contained in microcapsules to form light-sensitive microcapsules which are dispersed in the light-sensitive layer, wherein each of the light-sensitive microcapsules has the maximum spectral sensitivity peak within the wavelength region of 600 nm to 950 nm and said light-sensitive microcapsules comprise at least two kinds of light-sensitive microcapsules differing from each other with respect to spectral sensitivity, the peaks of said microcapsules being apart from each other by a wavelength of not less than 60 nm.

4,904,562

PROCESS FOR PRODUCING ENCAPSULATED TONER

Hiroshi Yuss; Takaaki Kohtaki, both of Yokohama; Masuo Yamazaki, Kawasaki, and Yasutaka Akashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,359
Claims priority, application Japan, Sep. 25, 1986, 61-224949; Sep. 25, 1986, 61-224950; Mar. 11, 1987, 61-53920
Int. Cl.[4] G03G *13/06, 9/08*
U.S. Cl. 430—138 58 Claims

1. A process for producing an encapsulated toner, comprising:

preparing a solution of a shell material resin set to an acidic pH region or a basic pH region wherein the shell material resin comprises a vinyl copolymer having a number-average molecular weight of 5,000 to 40,000, said shell material resin being dissolved in an aqueous medium containing an organic solvent having a solubility parameter of at least 11.0,

dispersing solid core particles in the solution to form a dispersion,

changing the pH of the dispersion to a pH region where the shell material resin is precipitated from the dispersion, and coating the core particles with the precipitated shell material resin.

4,904,563

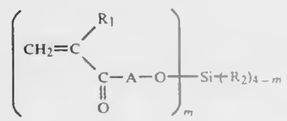
MICROCAPSULES AND LIGHT-SENSITIVE RECORDING MATERIAL USING THE SAME

Toshiaki Aoai, and Yoshimasa Aotani, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

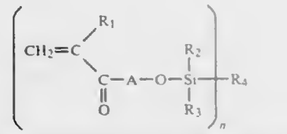
Filed May 14, 1987, Ser. No. 49,366
Claims priority, application Japan, May 14, 1986, 61-109747
Int. Cl.[4] B01J *13/02;* B32B *27/34;* G03C *1/72*
U.S. Cl. 430—138 17 Claims

1. Microcapsules containing (a) a vinyl compound which has at least two polymerizable, ethylenically unsaturated groups linked to each other through a linking group comprising a chemical bond capable of being split by the action of an acid, (b) a thermal polymerization initiator, and (c) one or more compounds capable of producing acid when irradiated with actinic radiation.

11. A light-sensitive recording material which has on its support microcapsules containing (a) a vinyl compound represented by formula (I) or (II)



(I)



(II)

wherein R_1 represents a hydrogen atom, a halogen atom, or an unsubstituted or substituted alkyl group; R_2 and R_3 each represents a hydrogen atom, a substituted or unsubstituted alkyl, alkenyl, aryl, or aralkyl group, or $-OR_5$; R_4 represents an unsubstituted or substituted n-valent aliphatic or aromatic hydrocarbon; R_5 represents an unsubstituted or substituted alkyl, aryl, or aralkyl group; A represents a single chemical bond,

$$-O-R_6-,\ -N-R_6,\ -O-R_6-CO-,\ \text{or}\ -N-R_6-CO-,$$

(R_7 above the N)

R_6 represents an unsubstituted or substituted divalent aliphatic or aromatic hydrocarbon; R_7 represents a hydrogen atom, an unsubstituted or substituted alkyl, aryl, or aralkyl group, or $-CO-R_8$; R_8 represents an unsubstituted or substitited alkyl, aryl, or aralkyl group; m represents an integer of from 2 to 4; and n represents an integer of 2 or more, (b) a thermal polymerization initiator, and (c) one or more compounds capable of producing acid when irradiated by actinic radiation, or a thermally cured product of said microcapsules.

4,904,564

PROCESS FOR IMAGING MULTI-LAYER RESIST STRUCTURE

Kaolin N. Chiong, Pleasantville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1988, Ser. No. 207,574
Int. Cl.[4] G03C *5/18*
U.S. Cl. 430—156 12 Claims

1. A process for providing an image which comprises:

depositing on a substrate a first layer of a positive photoresist comprising a phenolicformaldehyde novolak type polymer with a diazosensitizer and a compound selected from the group of imidazoles, benzimidzoles, triazoles, and indazoles, and mixtures thereof in an amount sufficient to increase the solubility of the layer in aqueous alkaline developer after exposure to imaging radiation;

depositing on said first layer a second and different layer of a positive photoresist comprising a phenolic-formaldehyde novolak type polymer with a diazo-sensitizer wherein said second layer has a lower degree of solubility than said first layer in aqueous alkaline developer after exposure to imaging radiation;

exposing said first layer of positive photoresist and said second layer of positive photoresist to imaging radiation in a predetermined pattern; and

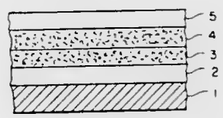
developing said first layer of positive photoresist and said second layer of positive photoresist to thereby remove the portions of said first layer and said second layer that were exposed to said imaging radiation.

4,904,565

HIGH-CONTRAST PHOTOGRAPHIC ELEMENT

Ronald J. Schmidt, and Hermano P. Rocha, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1989, Ser. No. 299,902
Int. Cl.[4] G03C *1/06*
U.S. Cl. 430—264 10 Claims



1. A high-contrast photographic element comprising a support having thereon in order, a layer comprising a filter dye (A), at least one silver halide emulsion layer having a gamma of at least 10, and a layer comprising a filter dye (B), which is the same as or different from dye (A), wherein filter dyes (A) and (B) absorb light in the region of the spectrum to which the silver halide emulsion layer is sensitive.

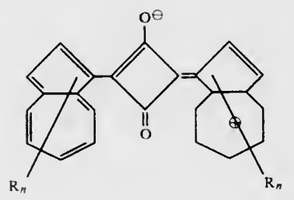
4,904,566

OPTICAL RECORDING MEDIUM CONTAINING AN AZULENIUM DYE

Wolfgang Schrott, Ludwigshafen; Bernhard Albert, Maxdorf; Peter Neumann, Wiesloch, and Heidi Benthack-Thoms, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,909
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1987, 3703985
Int. Cl.[4] G11B *7/24;* G01D *9/00;* G03C *5/16;* B41M *5/26*
U.S. Cl. 430—270 7 Claims

1. An optical recording medium composed of a base material and a laser light sensitive layer which contains an azulenium dye as storage material with or without a binder and obtainable by spincoating a solution containing an azulenium dye of the formula:



(I)

where R is C_1-C_6-alkyl, and n is 1, 2 or 3, with or without a binder selected from the group consisting of polyorgano-siloxanes, epoxides, poly(meth)acrylates, polystyrene homopolymers or copolymers, polyvinylcarbazole, polyvinylpyrrolidone, polyimidazole copolymers, polyvinyl ester copolymers, polyvinyl ether copolymers, polyvinylidene chloride copolymers, acrylonitrile copolymers, polyvinyl chloride or copolymers thereof, and a solvent selected from the group consisting of bromoform and 1,1,2-trichloroethane, onto a transparent base material based on a plastic material or glass at from 10° to 50° C. the spincoating solution having a content of dissolved solids of 0.1 to 15% by weight, based on the solution, and containing from 0 to 50% by weight, based on the content of dissolved solids of the spincoating solution, of a binder.

4,904,567

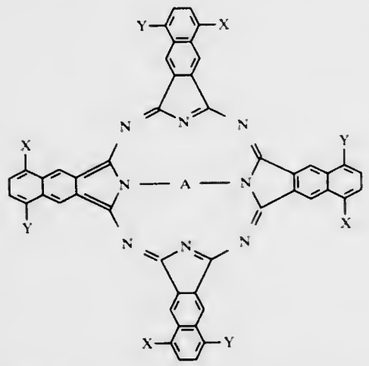
OPTICAL RECORDING MEMBER

Shuichi Maeda, Hidaka; Yutaka Kurose, Kawasaki, and Junko Wada, Sagamihara, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 30,868, Feb. 25, 1987, Pat. No. 4,769,307. This application Feb. 18, 1988, Ser. No. 157,229
Claims priority, application Japan, Feb. 19, 1987, 62-34448
The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.
Int. Cl.[4] G11B *7/24;* **G01D** *9/00;* **G03C** *5/16;* **B41M** *5/26*
U.S. Cl. 430—270 **8 Claims**

1. An optical recording member comprising a recording layer containing a light absorbing substance supported on a substrate in which recording is made by the thermal deformation of the recording layer owing to laser beams and reproduction is made by the reading the difference of the reflection between the non-deformation portion and the deformation portion, said light absorbing substance being represented by the following formula:

(I)



wherein one of X and Y is $-O(C_2H_4O)_nR$ wherein R is an alkyl group which may be branched and n is a number of from 1 to 6, and the other is a hydrogen atom, and A is VO, Cu, Ni or Co.

4,904,568

METHOD OF FORMING PRINTED IMAGE

Koshio Kondo, and Koji Takezoe, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed Jul. 14, 1988, Ser. No. 219,443
Claims priority, application Japan, Jul. 15, 1987, 62-176659
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—294 **20 Claims**

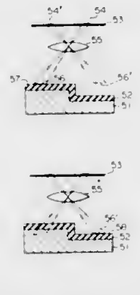
1. An improved method of forming a printed image in the preparation of a printed-circuit board by a process which comprises applying a photocurable electrodeposition coating composition onto a plate having a conductive film to form a photo-sensitive resist film thereon, and exposing the photo-sensitive resist film to light through a pattern mask to polymerize the coating where exposed to light, followed by development to remove the unexposed coating composition therefrom, the improvement comprising applying a dye to the surface of the photo-sensitive resist film after the application of the photo-curable electrodeposition coating to color the surface of said film.

4,904,569

METHOD OF FORMING PATTERN AND PROJECTION ALIGNER FOR CARRYING OUT THE SAME

Hiroshi Fukuda, Kokubunji; Norio Hasegawa; Toshihiko Tanaka, both of Tokyo; Toshiei Kurosaki, Kodaira; Saburo Nonogaki, Tokyo; Yoshio Taniguchi, Hino, and Toshiharu Matsuzawa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 83,211, Aug. 10, 1987, Pat. No. 4,869,999. This application Jan. 15, 1988, Ser. No. 144,065
Claims priority, application Japan, Aug. 8, 1986, 61-185087; Sep. 5, 1986, 61-207835; Jan. 19, 1987, 62-8030; Jan. 23, 1987, 62-12361
Int. Cl.[4] G03C *5/04*
U.S. Cl. 430—311 **5 Claims**



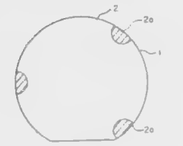
1. A method of forming a pattern comprising the steps of:
exposing a desired portion of a photoresist film in accordance with a mask pattern by a reduction projection aligner to change the solubility of the exposed portion, the photoresist film being formed on a surface of a semiconductor substrate, the surface of the substrate having a topography, an exposure operation for exposing the desired portion of the photoresist film being performed in such a manner that a plurality of reduced images of the same mask pattern are formed at a plurality of different positions spaced apart from each other in the direction of the optical axis of the reduction projection aligner; and
developing the photoresist film to form a pattern of the photoresist film;
wherein the exposure operation is performed after a reversible transmission film has been formed on the photoresist film.

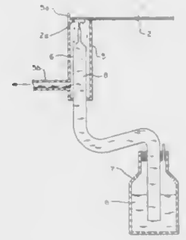
4,904,570

METHOD OF USING A PROJECTION ALIGNER FOR PHOTOETCHING

Akio Gotou, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 220,445, Jul. 13, 1988, abandoned, which is a continuation of Ser. No. 23,982, Mar. 12, 1987, abandoned, which is a continuation of Ser. No. 818,010, Jan. 13, 1986, abandoned. This application Feb. 9, 1989, Ser. No. 309,904
Claims priority, application Japan, Feb. 15, 1985, 60-29136
Int. Cl.[4] G03C *5/00*
U.S. Cl. 480—22 **6 Claims**





1. In a photoetching process on a substrate having a surface covered with photoresist, a method of using a projection aligner having positioning pads for correctly positioning a substrate to be exposed by placing said substrate against said positioning pads, said method comprising the steps of
placing a substrate on a chuck having an open top end such that one of mutually separated peripheral areas as of said substrate covered with photoresist and intended to come into contact with one of said positioning pads covers said open top end of said chuck, said chuck having inserted therein a tube having a jet nozzle,
spraying said one of peripheral areas of said substrate with a washing liquid ejected through said jet nozzle of said tube so as to remove said photoresist from said one of peripheral areas of said substrate,
similarly removing said photoresist from the others of said peripheral areas, thereby removing said photoresist only from selected mutually separated peripheral areas of said substrate corresponding to the positions of said pads, and
thereafter placing said substrate on said projection aligner such that said mutually separated peripheral areas of said substrate are in contact with and supported by said positioning pads.

4,904,571

REMOVER SOLUTION FOR PHOTORESIST

Tsuyoshi Miyashita, Fujisawa; Shigeru Ohtawa, Yamato; Hiroyuki Tobda, Yokohama; Shozo Toda, Chigasaki, and Hisashi Nakane, Yokohama, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kawasaki, Japan

Filed Jul. 15, 1988, Ser. No. 219,638
Claims priority, application Japan, Jul. 21, 1987, 62-180013
Int. Cl.[4] G03C *1/74, 5/16*
U.S. Cl. 430—331 **10 Claims**

1. A method for removing a patterned photoresist film provided on a substrate for a printed circuit during the manufacture of said printed circuit, consisting essentially of the step of immersing said substrate provided with patterned photoresist film in a remover solution for a time period sufficiently long and at a temperature sufficiently high for removing said patterned photoresist film from said substrate, wherein said photoresist is one which is developable by a weakly alkaline developer solution, said immersion step for removing the patterned photoresist film is carried out when the patterned photoresist film is no longer needed during the manufacture of said printed circuit, and said remover solution comprises:
(a) a solvent;
(b) an alkaline compound dissolved in said solvent; and
(c) a borohydride compound dissolved in said solvent,
wherein the concentration of said alkaline compound dissolved in the solvent is in the range from 0.1 to 10% by weight, and the amount of said borohydride compound dissolved in the solvent is in the range from 0.01 to 50 moles per mole of the alkaline compound dissolved in the solvent.

4,904,572

THERMOGRAPHIC RECORDING MATERIALS AND COATING COMPOSITION THEREFOR

Edward J. Dombrowski, Jr., Cambridge, and Patrick F. King, North Quincy, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 18, 1988, Ser. No. 182,966
Int. Cl.[4] G03C *1/40*
U.S. Cl. 430—332 **11 Claims**

1. A thermographic recording material comprising a di- or triarylmethane thiolactone dye precursor, silver behenate, a polymeric binder and 3,5-dihydroxybenzoic acid.

4,904,573

METHOD FOR FORMING A COLOR IMAGE AND IMAGE FORMING APPARATUS THEREFOR

Hirosbi Hara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 10, 1988, Ser. No. 269,404
Claims priority, application Japan, Nov. 11, 1987, 62-283151; Dec. 1, 1987, 62-304167
Int. Cl.[4] G03C *7/00*
U.S. Cl. 430—351 **16 Claims**

1. A method for forming an image by the steps of:
(a) imagewise exposing a heat-developing color light-sensitive material;
(b) uniformly exposing at least a portion of the heat-developable light-sensitive material; and
(c) heat developing the imagewise exposed and uniformly exposed heat-developable light-sensitive material to form a color image, wherein said heat-developable light-sensitive material comprises a support having thereon at least one light-sensitive silver halide emulsion layer containing silver halide grains capable of forming a surface latent image, at least one layer of said material comprising a dye-providing compound capable of imagewise releasing a diffusible dye upon heat development.

4,904,574

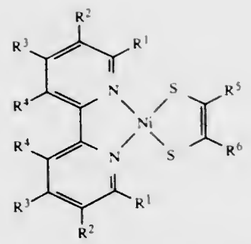
METHOD FOR STABILIZING ORGANIC BASE MATERIAL TO LIGHT

Yoshiaki Suzuki, Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 12, 1988, Ser. No. 155,578
Claims priority, application Japan, Feb. 13, 1987, 62-031096
Int. Cl.[4] C09D *11/00*
U.S. Cl. 430—372 **20 Claims**

1. A method of stabilizing a dye or an image forming dye to light, which comprises allowing a dye or an image forming dye to coexist with at least one metal complex compound having the formula:

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wherein the at least one metal complex compound is present in an amount of 0.01 to 100,000 mol % with respect to the dye or the image forming dye, and R^1 to R^4 are each independently hydrogen atoms, halogen atoms, cyano groups, hydroxyl groups, or alkyl groups, aryl groups, cycloalkyl groups or heterocyclic groups which are bonded directly or indirectly through a divalent linking group to a carbon atom on a benzene ring; two adjacent substituents from among R^1 to R^4 may be joined together to form a ring; the two R^4 substituents may also be joined together to form a ring; R^5 and R^6 are independently hydrogen atoms, alkyl groups, alkylthio groups, aryl groups, arylthio groups, heterocyclic thio groups or cyano groups; the R^5 and R^6 substituents may be joined together to form a ring, with the proviso that when R^1 to R^4 each is a hydrogen atom, R^5 and R^6 is not a phenyl group.

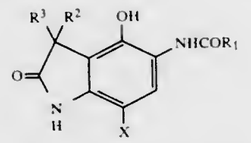
4,904,575

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL WITH HETEROCYLIC FUSED PHENOL COUPLER

Michio Ono; Minoru Sakai, and Kozo Aoki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 8, 1988, Ser. No. 216,573
Claims priority, application Japan, Jul. 9, 1987, 62-171793; Nov. 24, 1987, 62-295736
Int. Cl.[4] G03C *7/34*
U.S. Cl. 430—385 **32 Claims**

1. A silver halide color photographic material comprising a support having coated thereon at least one silver halide emulsion layer, the silver halide color photographic material containing a photographic cyan dye forming coupler represented by the following general formula (I):



(I)

wherein R_1 represents an aliphatic group, an aromatic group, heterocyclic group or a substituted amino group; R_2 and R_3, which may be the same or different, each represents an aliphatic group, an aromatic group or a heterocyclic group, or R_2 and R_3 may combine with each other to form a ring; and X represents a group capable of being released upon an oxidative coupling with a developing agent.

29. A method of forming a color image comprising imagewise exposing the silver halide color photographic material as claimed in claim **1** to light, developing the color photographic material with a color developing solution and then bleach-fixing.

4,904,576

PHOTOSENSITIVE CUPROUS HALIDE MATERIALS AND METHODS FOR THEIR PREPARATION

Ray S. Caldwell, Denver, Colo., assignor to Action Exploration Services, Denver, Colo.

Continuation-in-part of Ser. No. 80,640, Jul. 31, 1987. This application Mar. 18, 1988, Ser. No. 170,289
Int. Cl.[4] G02C *1/72, 5/24*
U.S. Cl. 430—495 **26 Claims**

1. A photosensitive element comprising:
a support;
at least one layer coated on said support, said layer comprising the copper containing anode product, produced by the electrolysis of copper in an aqueous acid halide bath; and
means including a polar substance selected from the group consisting of water, ammonia and hydrofluoric acid in contact with said layer for photosensitizing said layer.

4,904,577

OPTICAL RECORDING ELEMENT AND ALLOY FOR USE THEREIN

Yuan-Sheng Tyan; Pranab K. Raychaudhuri, and Fridrich Vazan, all of Kodak Park Division, Rochester, N.Y. 14650

Filed Nov. 21, 1988, Ser. No. 273,790
Int. Cl.[4] C22C *30/00, 12/00*
U.S. Cl. 430—495 **5 Claims**

1. In an alloy of antimony, tin and indium for use in optical recording, the improvement wherein said alloy includes at least one additional element selected from the group consisting of titanium, aluminum, magnesium, manganese, silver, bismuth, germanium, lead, tellurium, gold, zinc, copper, palladium, nickel, iron, cobalt, and cadmium, said additinal element being present in an amount sufficient to reduce arcing during sputtering of said alloy.

4. In an optical recording element comprising a support having therein an optical recording layer comprising an alloy of antimony, tin and indium, the improvement wherein said alloy includes at least one additional element selected from the group consisting of titanium, aluminum, magnesium, manganese, silver, bismuth, germanium, lead, tellurium, gold, zinc, copper, palladium, nickel, iron, cobalt, and cadmium, said additional element being present in an amount sufficient to reduce arcing during sputtering of said alloy.

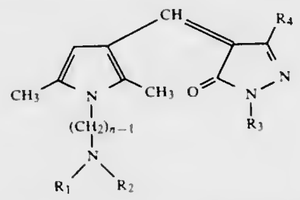
4,904,578

LIGHT ABSORBING DYE FOR PHOTOGRAPHY

Akira Tanaka, and Koichi Sumioka, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 30, 1989, Ser. No. 303,233
Claims priority, application Japan, Feb. 1, 1988, 63-21483; Feb. 1, 1988, 63-21484
Int. Cl.[4] G03C *1/84*
U.S. Cl. 430—507 **4 Claims**

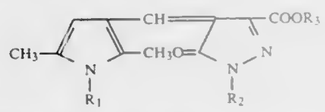
1. A silver halide photographic light-sensitive material which comprises a support and, provided thereon, at least one photographic layer, said photographic layer containing a light absorbing dye represented by the following formula [I] or [II]



[I]

wherein R_1 and R_2 which maybe identical or different each represents a substituted or unsubstituted alkyl group and may

link to each other to form a ring, R_3 represents an alkyl group substituted with at least one sulfo group or an aryl group substituted with at least one sulfo group, R_4 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a carboxy group or an alkoxycarbonyl group, and n represents an integer of 1–4;



[II]

wherein R_1 represents an alkyl group or an aryl group, R_2 represents an aryl group substituted with sulfo group and R_3 represents an alkyl group.

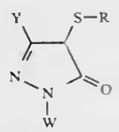
4,904,579

SILVER HALIDE COLOR PHOTOGAPHIC MATERIAL

Keiji Mihayashi, and Hidetoshi Kobayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 29, 1987, Ser. No. 114,320
Claims priority, application Japan, Oct. 29, 1986, 61-257970
Int. Cl.[4] G03C *7/38, 7/26*
U.S. Cl. 430—551 **19 Claims**

1. A light-sensitive silver halide color photographic material comprising a support having coated thereon at least one silver halide emulsion layer, wherein the silver halide color photographic material comprises at least one layer containing a 5-pyrazolone magenta coupler represented by general formula (I) and a non-color forming, diffusion-resistant carboxylic acid compound



(I)

wherein W represents a substituted or unsubstituted aryl group; Y represents a carbonamido group, a ureido group or an anilino group, and R represents an alkyl group, an aryl group or a heterocyclic group, and

wherein said carboxylic acid compound is represented by the following general formula (V):

$$(R_6\text{—}COO^-)_lM^{l+} \quad \text{(V)}$$

wherein R_6 represents a diffusion-resistant substituent having from 8 to 40 total carbon atoms; m^{l+} represents a hydrogen ion, a metal ion or an ammonium ion; and l represents an integer from 1 to 4.

4,904,580

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hajime Komatsu; Susumu Ohkawachi, and Fujitsugu Suzuki, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ind., Tokyo, Japan

Continuation of Ser. No. 840,522, Mar. 13, 1986, abandoned, which is a continuation of Ser. No. 652,830, Sep. 20, 1984, abandoned. This application Apr. 15, 1988, Ser. No. 181,970
Claims priority, application Japan, Sep. 22, 1983, 58-175522
Int. Cl.[4] G03C *1/485*
U.S. Cl. 430--567 **12 Claims**

1. A direct positive silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer containing internal latent image silver halide grains, each of said grains comprising a core/shell structured particle comprising a core, at least one intermediate layer and an outermost layer formed thereon, said outermost layer consisting essentially of silver chloride accounting for not more than 10 mole percent of the silver halide of said internal latent image silver halide grain.

4,904,581

METHOD OF DETECTING AIDS VIRUS INFECTION

Denis R. Burger, and Andrew S. Goldstein, both of Portland, Oreg., assignors to Epitope, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 860,169, May 6, 1986. This application Jun. 23, 1986, Ser. No. 877,609
Int. Cl.[4] G01N *33/569, 33/577*
U.S. Cl. 435—5 **46 Claims**

1. A method for detecting the presence of HTLV III infected cells, which comprises contacting a sample obtained from a mammalian subject suspected of being infected with HTLV III virus with monoclonal antibodies against an antigen produced as a result of said infection and detecting the binding of said antibodies to said antigen on said cells, the binding thereof being related to the presence of HTLV III infected cells in said sample, said antigen being capable of binding to one of the antibodies secreted by a cell line having ATCC accession numbers HB9100, HB9101, HB9102, HB9114, or HB9115.

4,904,582

NOVEL AMPHIPHILIC NUCLEIC ACID CONJUGATES

Richard H. Tullis, Leucadia, Calif., assignor to Synthetic Genetics, San Diego, Calif.

Filed Jun. 11, 1987, Ser. No. 61,874
Int. Cl.[4] C12Q *1/68;* **C07H** *15/12;* **G01N** *33/566*
U.S. Cl. 435—6 **19 Claims**

1. A method for inhibiting the maturation or translation of a messenger RNA in a cell, said method comprising:
contacting said cell with a composition comprising an oligonucleotide sequence complementary to a transcription product of said cell and a group covalently linked to said oligonucleotide sequence to provide an amphiphilic molecule, whereby said composition migrates into the cell interior resulting in the inhibition of maturation and/or translation of said transcription product.

4,904,583

CASCADE IMMUNOASSAY BY MULTIPLE BINDING REACTIONS

James P. Mapes, Raleigh, and Randal A. Hoke, Cary, both of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed May 26, 1987, Ser. No. 53,896
Int. Cl.[4] G01N *33/53, 33/543, 33/537, 33/532*
U.S. Cl. 435—7 **31 Claims**

1. A method for determining an analyte in a liquid comprising:
(a) combining a first liquid suspected of containing an analyte with a tracer comprising an unmasking enzyme and with a solid support having an antianalyte and a first immunologically active component randomly affixed thereto whereby said analyte binds to said antianalyte and said tracer binds to one of said analyte and said antianalyte to give a first bound fraction on said support;
(b) replacing said first liquid with a second liquid containing a second immunologically active compound conjugated to a masking group, said unmasking enzyme removing said masking group to give free second component which binds to said first component, and a signal enzyme conjugated to one of said second component and a third immunologically active component specific for said second component, said signal enzyme becoming affixed to said support;
(c) replacing said second liquid with a third liquid containing

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a substrate which converted by said signal enzyme to a product; and

(d) determining said analyte by a signal associated with said product.

4,904,584

SITE-SPECIFIC HOMOGENEOUS MODIFICATION OF POLYPEPTIDES

Gray Shaw, Bedford, Mass., assignor to Genetics Institute, Inc., Cambridge, Mass.

Filed Dec. 23, 1987, Ser. No. 137,043

Int. Cl.[4] C12D *21/00*

U.S. Cl. 435—69.4 **3 Claims**

1. A polypeptide selected from the group consisting of G-CSF and erythropoietin having one or more lysine residues deleted, or replaced with an amino acid other than lysne, and containing at least one polyalkylene glycol moiety covalently attached to at least one amino acid residue of the polypeptide.

4,904,585

NOVEL ANTIBIOTIC NK84-0218 AND PROCESS FOR THE PRODUCTION OF THE SAME

Nobuyoshi Shimada, Tokyo; Shigeru Hasegawa, Saitama; Takashi Harada; Takayuki Tomizawa, both of Tokyo, and Akio Fujii, Kanagawa, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 796,114, Nov. 8, 1985, Pat. No. 4,743,689.

This application Nov. 2, 1987, Ser. No. 115,980

Claims priority, application Japan, Nov. 20, 1984, 59-243172

Int. Cl.[4] C12P *19/40, 19/38, 17/18;* **C12R** *1/07*

U.S. Cl. 435—88 **1 Claim**

1. A process for production of a novel antibiotic NK84-0218, which comprises culturing a microorganism, *Bacillus megaterium* NK84-0218 strain, in a medium to produce and accumulate the antibiotic NK84-0218 in the medium and collecting the antibiotic NK84-0218 therefrom.

4,904,586

ENZYMATIC PROCESS FOR TREATING XANTHAN GUMS IN ORDER TO IMPROVE THE FILTERABILITY OF THEIR AQUEOUS SOLUTIONS

Daniel Ballerini, Saint Germain en Laye; Yves Benoit, Ermont, and Frédéric Monot, Le Mesnil le Roi, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 5, 1987, Ser. No. 46,223

Int. Cl.[4] C12P *19/06, 39/00;* **C13L** *3/00;* **E21B** *43/22*

U.S. Cl. 435—114 **9 Claims**

1. A process of improving the filterability of an aqueous xanthan gum solution containing at least 10^{-2} equivalent/liter of a salt selected from the group consisting of alkali metal salts, alkaline earth-metal salts and mixtures thereof, comprising contacting said solution with an enzyme extract exhibiting predominately polygalacturonase activity and an enzyme extract exhibiting predominately protease activity to enzymatically treat said aqueous xanthan gum solution.

4,904,587

PRODUCTION OF D-RIBOSE

Katsumitsu Kishimoto; Kazuhiko Kintaka, both of Hikari, and Nobuhiro Uchiyama, Kumage, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 12, 1988, Ser. No. 243,041

Claims priority, application Japan, Sep. 10, 1987, 62-226997

Int. Cl.[4] C12P *19/04;* **C12R** *1/07;* **C12N** *1/20*

U.S. Cl. 435—105 **7 Claims**

1. A process for producing D-ribose which consists essentially of cultivating a D-ribose-producing microorganism of the genus Bacillus in a medium containing nutrients necessary for its growth, wherein the concentrations of L-tryptophan and L-tyrosine in the medium are controlled at 3 μg/ml or less and 10 μg/ml or less, respectively, and harvesting the D-ribose produced and accumulated thereby from the medium.

4,904,588

METHOD FOR PRODUCING L-SORBOSE

Ikuo Nogami; Hideo Shirafuji, both of Nagaokakyo; Takamasa Yamaguchi, Suita, and Masahide Oka, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 6, 1987, Ser. No. 11,826

Claims priority, application Japan, Feb. 11, 1986, 61-28719; Sep. 9, 1986, 61-212953

Int. Cl.[4] C12P *19/02;* **C12N** *1/20;* **C12R** *1/01, 1/02*

U.S. Cl. 435—105 **5 Claims**

1. A process for producing L-sorbose, which comprises oxidizing D-sorbitol microbiologically using a mutant microorganism selected from the group consisting of *Gluconobacter suboxydans* BL-9 (FERM BP-1241), *Gluconobacter suboxydans* BL-115 (FERM BP-1240), *Gluconobacter oxydans* GO-10 (FERM BP-1169) and *Gluconobacter oxydans* GO-14 (FERM BP-1170), said mutant microorganism having a degree of growth in minimum media containing D-sorbitol as the single carbon source which is less than 1/10 of said degree of growth of the parent strain of said mutant microorganism.

4,904,589

PROCESS FOR PRODUCING D-(31)-TARTARIC ACID

Haruyo Sato, and Shinzo Imamura, both of Aichi, Japan, assignors to Toray Industries, Inc., Japan

Filed Sep. 21, 1988, Ser. No. 247,365

Claims priority, application Japan, Oct. 16, 1987, 62-262024

Int. Cl.[4] C07P *41/00;* **C12P** *7/46, 1/22;* **C12R** *1/40*

U.S. Cl. 435—145 **13 Claims**

1. A process for producing D-(−)-tartaric acid characterized by cultivating a microorganism which belongs to the genus *Pseudomonas putida,* or Tricosporon, and has an ability to assimilate L-(+)-tartaric acid and does not assimilate substantially D-(−)-tartaric acid, decomposing asymmetrically thereby L-(+)-tartaric acid and separating and obtaining remaining D-(−)-tartaric acid from the culture broth.

4,904,590

ANTIBIOTIC A80915 AND PROCESS FOR ITS PRODUCTION

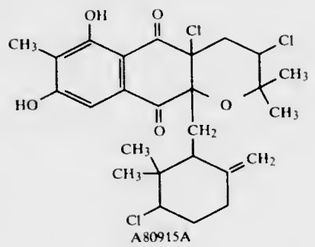
David S. Fukuda, Brownsburg; Jon S. Mynderse, Indianapolis, and Raymond C. Yao, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 27, 1988, Ser. No. 290,724

Int. Cl.[4] C12P *7/24;* **C12R** *1/465;* **C07D** *311/92;* **A61K** *31/35*

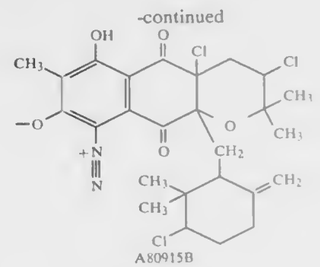
U.S. Cl. 435—147 **18 Claims**

1. Antibiotic A80915 comprising components A, B, C, and D, which have the formulas

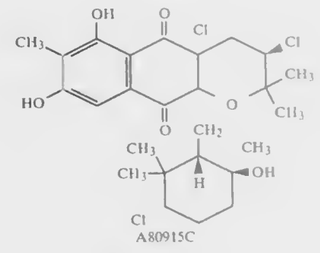


A80915A

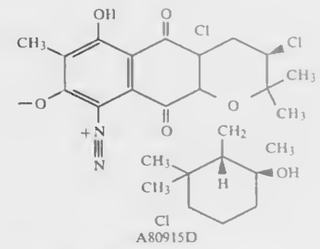
-continued



A80915B



A80915C



A80915D

or a dehydrochlorination derivative of A80915.

4,904,591

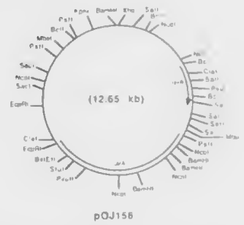
CARBOMYCIN RESISTANCE-CONFERRING GENE, DESIGNATED CARA, FOR USE IN STREPTOMYCES AND OTHER ORGANISMS

Janet K. Epp, Indianapolis, and Brigitte E. Schoner, Zionsville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 28, 1986, Ser. No. 901,240

Int. Cl.[4] C12R *1/465;* **C07H** *15/12;* **C12N** *15/00, 1/20, 1/00;* **C12P** *21/00*

U.S. Cl. 435—172.3 **19 Claims**



pOJ158

1. A method for selecting a recombinant DNAcontaining host cell that comprises transforming a carbomycin-sensitive actinomycetes host cell with a recombinant DNA vector that codes for the carA gene product and culturing the transformed cell under conditions suitable for selection of carbomycin-resistant transformants.

4,904,592

STABILIZED ENZYMES

Amihay Freeman, Ben Shemen, and Ruth Tor, Kiryat Ono, both of Israel, assignors to Ramot University For Applied Research & Industrial Development Ltd., Israel

Filed Jul. 15, 1988, Ser. No. 219,927

Claims priority, application Israel, Aug. 6, 1987, 83451

Int. Cl.[4] C12N *9/00*

U.S. Cl. 435—183 **16 Claims**

1. A stabilized, biologically active, water-soluble enzyme product, comprising

enzyme molecules having a bi-layer protective structure comprising

a polyaldehyde base coat linked to free amino groups of the enzyme, and cross-linked therewith an outer polymer coat,

the polymer constituting said outer coat being of a kind which in the unlinked state comprises at least one of free amino and acyl hydrazide groups.

4,904,593

NOVEL MICROORGANISM, A NOVEL ESTERASE AND METHOD FOR PREPARING THE SAME

Chiaki Sugiki; Kanji Nishizawa, Hyogo; Masako Sugimoto, Hyogo; Kazumi Sonoda, Hyogo, and Fumitaka Kishimoto, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka

Filed Apr. 22, 1987, Ser. No. 41,290

Claims priority, application Japan, Apr. 22, 1986, 61-92595; Jun. 24, 1986, 61-147452

Int. Cl.[4] C12N *9/18, 1/20;* **C12R** *1/07*

U.S. Cl. 435—197 **2 Claims**

1. A process for preparing a novel esterase having the following physicochemical properties, which process comprises cultivating the microorganism Bacillus sp. DC-1 (FERM BP-1254) which is capable of producing an esterase having the following physicochemical properties, and recovering said esterase from the cells;

(1) Activity;

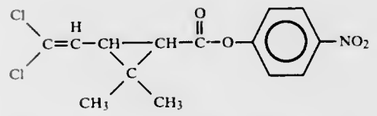
hydrolyzes the ester bond of organic carboxylic acid ester;

(2) Substrate specificity:

active mainly to an alcohol ester moiety of organic carboxylic acid and highly active to water-soluble short chain fatty acid ester; active to short chain mono- or tri-acyl glycerides but not to long chain mono-, di- or tri-acyl glycerides; active to palmitoyl-CoA but not to acetyl-CoA, choline ester or cholesterol ester;

(3) Optimum pH and pH stability:

optimum pH for hydrolysis in the case of using p-nitrophenyl ester of 2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropane carboxylic acid of the formula (I) as a substrate is 8.5–9.0;



when 10 mM Tris-HCl buffer solution (pH 7.0–9.0) is used for hydrolysis of the above substrate at 4° C., remaining activity after 48 hours is about 100%; when 10 mM of phosphate buffer solution (pH 6.0) is used, the remaining activity is about 45%; and when 10 mM of phosphate buffer solution (pH 5.0) is used, the remaining activity is about 20%;

(4) Optimum temperature and heat stability:
optimum temperature for hydrolysis in the case of using p-nitrophenyl ester of 2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropane carboxylic acid as a substrate in 100 mM Tris-HCl buffer (pH 9.0) is 50°–55° C.; remaining activities after treating in 100 mM Tris-HCl buffer solution (pH 9.0) for 10 minutes at 35° C., is about 100%, at 40° C. about 80%, and at 50° C. about 15%;
(5) Molecular weight:
54,000±2,000 (by gel filtration and SDS-polyacrylamide gel electrophoresis)
(6) Isoelectric point: 4.8±0.1
(7) Inactivating conditions:
(a) completely inactivated by treatment with 100 μM phenylmethylsulfonyl fluoride or 80 μM diisopropyl fluorophosphate at 37° C. for 100 minutes;
(b) activity decreased about 25% and about 70% by treatment with 100 mM Tris-HCl buffer solution (pH 9.0) containing 1 mM sodium deoxycholate and 5 mM sodium lauryl sulfate, respectively, at 37° C. for 10 minutes.

4,904,594

ENZYME PREPARATION CAPABLE OF DEGRADING GLYCOSAMINO-GLYCAN, AND A METHOD FOR PRODUCING SAID PREPARATION

Björn O. E. Karlstam, Björklinge, Sweden, assignor to Pharmacia AB, Uppsala, Sweden

Filed Jun. 23, 1987, Ser. No. 65,591
Claims priority, application Sweden, Jul. 9, 1986, 8603051
Int. Cl.[4] C12N *9/26*
U.S. Cl. 435—201 **2 Claims**

1. A glycosaminoglycan-degrading enzyme preparation, characterized by containg krill hyaluronidase isolated from organisms containing such hyaluronidases.

4,904,595

EPITHELIAL CELL LINE USEFUL IN THE DETECTION OF DIOXINLIKE COMPOUNDS AND METHODS OF MAKING AND USING SAME

John F. Gierthy, East Greenbush, N.Y., assignor to Health Research Incorporated, Albany, N.Y.

Filed Jan. 14, 1985, Ser. No. 745,008
Int. Cl.[4] C12N *5/00;* **C12Q** *1/02*
U.S. Cl. 435—240.2 **13 Claims**

1. A non-keratinizing epithelial cell line which has the characteristics of ATCC CRL 8808 wherein the characteristics comprise a low saturation density, flat-cell morphology and inhibition of post-confluent cell proliferation when exposed to polychlorinated dibenzodioxins or polychlorinated dibenzofurans or their structural analogs which exhibit biological activity characteristic of polychlorinated dibenzodioxins or polychlorinated dibenzofurans, when cultured with a culturing means selected from the group consisting of non-proliferating fibroblast cells, a medium conditioned by non-proliferating fibroblast cells, and lethally irradiated 3T3 fibroblast cells, which biological activity comprises a low saturation density, flat cell morphology and inhibition of post-confluent cell proliferation.

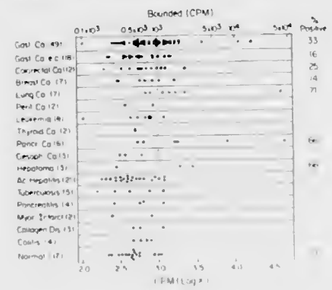
4,904,596

HYBRIDOMA ANTIBODY (FH6) DEFINING A HUMAN CANCER-ASSOCIATED DIFUCOGANGLIOSIDE

Sen-itiroh Hakomori, Mercer Island, Wash., assignor to Fred Hutchinson Cancer Research Center, Seattle, Wash.

Filed Aug. 7, 1985, Ser. No. 763,546
Int. Cl.[4] C12N *5/00;* **C12P** *21/00;* **A61K** *39/395;* **G01N** *33/54*
U.S. Cl. 435—240.27 **13 Claims**

1. A hybridoma cell line having the characteristics of ATCC No. HB 8873, capable of producing a monoclonal antibody capable of specifically binding with the fucoganglioside $V1^{3-}$



$NeuAcV^3III^3Fuc_2nLc_6$ but not specifically binding with the fucoganglioside $1V^3NeuAcII^3FucnLc_4$.

4,904,597

METHOD FOR CULTIVATION OF BACTERIA OF THE GENUS CAMPYLOBACTER

Yoshiaki Inoue, and Jun Hoshino, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 24, 1986, Ser. No. 922,711
Claims priority, application Japan, Oct. 29, 1985, 60-240483
Int. Cl.[4] C12M *1/00, 1/04;* **C12N** *1/00*
U.S. Cl. 435—252.1 **4 Claims**

1. A method for cultivation of a bacterium of the genus Campylobacter which comprises steps,
(1) enclosing, in a container of a gas-barrier material which is a bag made of a film having an oxygen permeability of 100 $ml/m^2.day.atm$ or less and an open edge of the bag that is heat sealed or sealed by a sealing bar, mediums inoculated with bacterium of the genus Campylobacter and packages of a gas-permeable material containing therein a material capable of generating carbon dioxide and absorbing oxygen in the container with carbon dioxide generated in situ, said material capable of generating carbon dioxide comprising 0.025–0.5 g of a dithionite, 0.05–7 g of a hydrogencarbonate, 0.001–0.6 g of a carbonate, 0.002–0.2 g of an aqueous electrolyte solution and 0.01–4 g of a carrier for the electrolyte, for every 100 ml of air present in the container, wherein the composition is packed in a packaging material having an oxygen permeability and a carbon dioxide permeability of at least 300 $ml/Hr.m^2.atm$,
(2) beginning to cultivate the bacterium under such conditions that oxygen and carbon dioxide concentrations in the container are controlled to 3–8% and 13–18%, respectively, within 5 hours from initiation of the cultivation at 37°–43° C., and
(3) keeping the oxygen and carbon dioxide concentrations in the container for at most 72 hours.

4,904,598

NOVEL PLASMID SHUTTLE VECTORS CONFERRING SPIRAMYCIN RESISTANCE IN STREPTOMYCES

R. Nagaraja Rao, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 20, 1986, Ser. No. 841,981
Int. Cl.[4] C12N *1/20, 15/00;* **C12R** *1/465;* **C07H** *21/04*
U.S. Cl. 435—252.3 **14 Claims**

1. A Streptomyces-functional recombinant DNA expression vector which comprises a spiramycin resistance-conferring sequence of *Streptomyces ambofaciens* DNA that is encoded on plasmid pKC550.

4,904,599

DNA FRAGMENTS CONTAINING ALKALINE CELLULASE GENE, RECOMBINANT PLASMIDS WITH SAID DNA FRAGMENTS INSERTED THEREIN, AND RECOMBINANT MICROORGANISMS

Katsuya Ozaki; Kazushi Oshino; Kenzo Koike; Susumu Ito, all of Utsunomiya, and Kikuhiko Okamoto, Koshigaya, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 109,510
Claims priority, application Japan, Oct. 31, 1986, 61-259923
Int. Cl.[4] C12N *9/42, 7/00, 15/00;* **C07H** *15/12*
U.S. Cl. 435—252.33 **9 Claims**

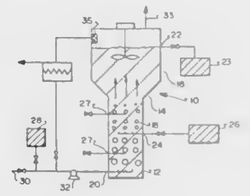
1. A DNA fragment coding for alkaline cellulase K which comprises about 4.0 kilo base pairs and has the restriction map shown in FIG. 1A. wherein said DNA fragment is isolated from Bacillus sp. Ksm-635.

4,904,600

BIOREACTOR FOR CONTINUOUS PROCESSING OF A REACTANT FLUID

Floyd Ramp, 3948 Humphrey Rd., Richfield, Ohio 44286

Division of Ser. No. 11,315, Feb. 5, 1987. This application Oct. 12, 1989, Ser. No. 420,751
Int. Cl.[4] C12M *1/16*
U.S. Cl. 435—299 **6 Claims**



1. A bioreactor for carrying out microbiological reactions comprising a vertical hollow column containing column packing comprising particles classifiable by means of differential liquid settling rates, said column having a lower reaction section and an upper disengagement section, said disengagement section having a volume at least about as large as the volume of said reaction section, said packing being disposed in said column so that when a microbiological reaction is taking place in said column, said column packing is located in said reaction section, and when said column packing is being regenerated, said column packing is substantially located in said disengagement section, and wherein said column includes a reactant inlet near one end, and a product outlet near the other end.

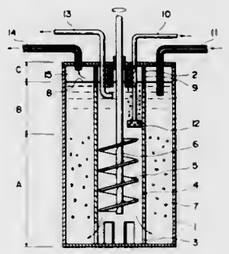
4,904,601

CELL CULTURE TANK

Takashi Mano, Ishihashi; Akihiko Murakami, Ekihigashi; Masatsugu Ueda, Kawagoe, and Eitaro Kumazawa, Oyama, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Japan

Filed Feb. 13, 1989, Ser. No. 309,567
Claims priority, application Japan, Feb. 16, 1988, 63-33663
Int. Cl.[4] B01F *3/04*
U.S. Cl. 435—314 **8 Claims**

1. A cell culture tank for culturing a culture medium having adherent carriers, comprising a cylindrical screen mounted upright within a cell culture tank and having upper and lower openings through which culture medium flows, said upper opening of the cylindrical screen being provided with a rotatable cylindrical filter adapted to pass the culture medium therethrough but to block the adherent carriers, a pipe for supply of oxygen or oxygen containing gas and an agitator adapted to produce a flow of the culture medium, and wherein both said pipe and said agitator are disposed within said cylindrical screen, so that a space defined between the cylindrical screen and the inner wall of the cell culture tank vertically consists of a floating region within which adherent carriers



float in the culture medium and a separating region within which said adherent carriers are separated from the culture medium.

4,904,602

THIOREDOXIN SHUFFLEASE AND USE THEREOF

Vincent P. Pigiet, Winchester; James R. Rusche, Worcester, both of Mass., and Barbara J. Schuster, State College, Pa., assignors to Repligen Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 802,569, Nov. 27, 1985, abandoned. This application Aug. 8, 1986, Ser. No. 894,421
Int. Cl.[4] C12N *9/06, 9/02*
U.S. Cl. 435—191 **10 Claims**

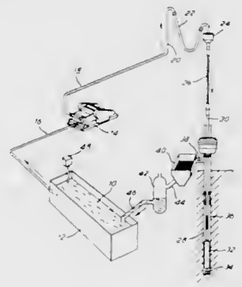
1. An enzyme, thioredoxin shufflease, which is characterized by:
(a) it is thioredoxin, or fragment of thioredoxin, wherein the Cys35 residue has been replaced with a serine residue;
(b) it catalyzes the exchange of disulfides in a protein undergoing the refolding process; and
(c) it is not consumed in the oxidation/refolding process.

4,904,603

MONITORING DRILLING MUD

Timothy G. J. Jones, Waterbeach, and Trevor L. Hughes, Chesterton, both of England, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Mar. 7, 1988, Ser. No. 165,069
Claims priority, application United Kingdom, Mar. 9, 1987, 8705502
Int. Cl.[4] G01N *33/24;* **E21B** *49/08*
U.S. Cl. 436—25 **32 Claims**



1. In a method of testing drilling mud circulating in a borehole being drilled with a drilling rig, the chemical composition

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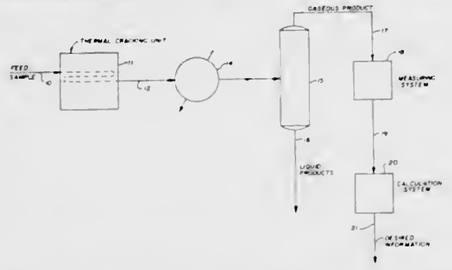
of said mud for an on-going drilling operation being specified within certain desired limits, wherein the improvement comprises periodically taking samples of the circulating mud and separating out aqueous filtrates, analyzing the aqueous filtrates on site by ion chromatography for determining selected positive and negative ion concentrations and determining if the chemical composition of the mud is within said desired limits.

4,904,604

HYDROCARBON MIXTURE ANALYSIS

John A. Kivlen, 4 Hopscotch La., Savannah, Ga. 31411

Filed Nov. 23, 1987, Ser. No. 124,273
Int. Cl.[4] G01N *25/20*
U.S. Cl. 436—140 **8 Claims**



1. A method for determining, in a timely manner consistent with real time control of a chemical or petrochemical process, the characteristics of a crude derived feed hydrocarbon mixture, which comprises
(a) thermally cracking a crude derived feed hydrocarbon mixture by heating to an elevated temperature for a period of time sufficient to form a gaseous fraction containing components comprising acetylene, methane, ethane, propane, ethylene, and propylene,
(b) selecting a component from the gaseous fraction from step (a) and measuring the compositional ratios of five other components of the gaseous fraction each to the selected component to obtain five measured ratios, and
(c) determining one or more of the feed hydrocarbon mixture characteristics selected from the group consisting of normal paraffin content, isoparaffin content, naphthene content, olefin content, aromatic content, hydrogen content, average molecular weight, and viscosity based upon the five ratios obtained in step (b).

4,904,605

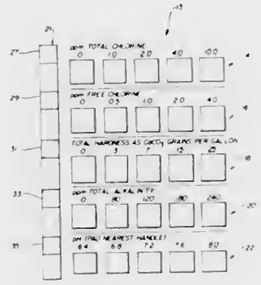
METHOD AND APPARATUS FOR RESIDENTIAL WATER TEST KIT

Mark R. O'Brien, Glastonbury; Mark S. Barre, Stamford, and Michael S. Newton, Durham, all of Conn., assignors to Cuno, Inc., Meriden, Conn.

Filed Jun. 20, 1988, Ser. No. 209,702
Int. Cl.[4] G01N *31/22*
U.S. Cl. 436—169 **12 Claims**

1. A method of testing for a plurality of contaminants in water, comprising the steps of:
(a) providing an elongated test strip having thereon a plurality of reagent test pads along its length, each test pad containing a reagent responsive to a different contaminant in water and indicating a concentration of its respective contaminant by its color characteristic;
(b) immersing the test strip and the reagent test pads into the water for a period of time;
(c) removing the test strip from the water;
(d) providing a comparison chart having thereon a vertical outline of said test strip utilized to indicate the orientation of the test strip with respect to the comparison chart and a plurality of standard value rows,
each of said rows having at least one colored standard area, all of said areas in each row corresponding to a color characteristic for different concentration standards of the same respective contaminant in water; and
a concentration indicator associated with each area for quantitatively indicating the concentration standard of the respective contaminant;
wherein the vertical outline and rows are arranged so that upon positioning of the test strip on the vertical outline each test pad substantially aligns with a test row, each test row corresponding to the concentration standards for the respective contaminant it is aligned with, thereby facilitating test comparisons between the respective test pad and color area;
(e) positioning the test strip on the vertical outline of the comparison chart;
(f) comparing each of the test pads with its associated test row to substantially match the color of the respective test pad with one of the color test areas of the respective associated row, the concentration indicator associated with the area indicating the measured concentration of the respective contaminant substance in the water.

6. A kit for testing for a plurality of contaminants in water comprising:



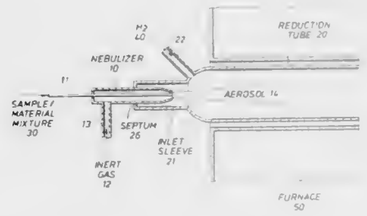
(a) an elongated test strip having thereon a plurality of reagent test pads along its length, each test pad containing a reagent responsive to a different contaminant in the water and indicating a concentration of its respective contaminant by its color characteristics;
(b) providing a comparison chart having thereon a vertical outline of said test strip utilized to indicate the orientation of the test strip with respect to the comparison chart and a plurality of standard value rows,
each of said rows having at least one colored standard area, all of said areas in each row corresponding to a color characteristic for different concentration standards of the same respective contaminant in water; and
a concentration indicator associated with each area for quantitatively indicating the respective concentration standard of the respective contaminant;
wherein the vertical outline and rows are arranged so that upon positioning of the test strip on the vertical outline each test pad substantially aligns with a standard row, each standard row corresponding to the concentration standards of the respective contaminant of the pad it is aligned with, thereby facilitating test comparisons between the respective test pad and color area.

4,904,606

METHOD AND APPARATUS FOR REDUCTIVE DECOMPOSITION AND ANALYSIS OF A SAMPLE

Alan R. Forster, and Gregory J. Kamla, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 19,997, Feb. 27, 1987, abandoned. This application Sep. 28, 1988, Ser. No. 253,550
Int. Cl.[4] G01N *25/48*
U.S. Cl. 436—177 **10 Claims**



5. Apparatus for analyzing a sample, comprising:
a reduction tube with an inlet sleeve having a hydrogen inlet adjacent said inlet sleeve for supplying excess hydrogen to said tube, and having at the opposite end from said inlet sleeve a discharge end containing therein a gas discharge outlet,
a nebulizer sealingly connected to said inlet sleeve so as to discharge into said reduction tube an aerosol of said sample and an inert gas, and
a detector for analyzing gases from said reduction tube for a preselected analyte connected to said discharge outlet.

9. A method for decomposing a sample, comprising:
nebulizing at least a portion of said sample,
transporting said nebulized sample to a decomposition zone, and
decomposing said sample in a hydrogen-rich atmosphere of hydrogen and an inert gas at a temperature sufficient to ensure complete reduction of said sample.

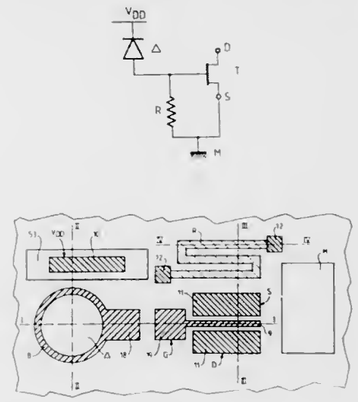
4,904,607

METHOD OF MANUFACTURING AN INTEGRATED INFRARED DETECTOR

Philippe P. Riglet, Limeil-Brevannes, and Jean-Paul R. Chané, Yerres, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Nov. 15, 1988, Ser. No. 271,569
Claims priority, application France, Nov. 20, 1987, 87 16090
Int. Cl.[4] H01L *27/14*
U.S. Cl. 437—3 **26 Claims**

1. A method of manufacturing an integrated circuit for detecting infrared radiation comprising a semi-isolating substrate provided with a buried PIN photodiode, with a junction field effect transistor J-FET, whose gate is connected to the PIN photodiode, and with a resistor R connected to the transistor, this method including the stop of growing a first structure of epitaxial layers of semiconductor materials, in which a transistor of the J-FET type is formed, the step of growing a second structure of epitaxial layers of semiconductor materials, in which the PIN diode is formed, and the step of etching a pit, in which the second structure of layers is formed, characterized in that the step of etching the pit is carried out after the growth of the first structure of epitaxial layers and is effected through this structure into the substrate, in that the growth of the second structure of epitaxial layers is localized in such a manner that this second structure is limited to the pit, and in that its upper surface is coplanar with that of the first structure of layers, the epitaxial growth of the layers of the first structure and of the layers of the second structure being effected without doping other than the residual growth doping, and in that the regions of the n- and the p-conductivity type of the transistor and of the diode are obtained by a method chosen among



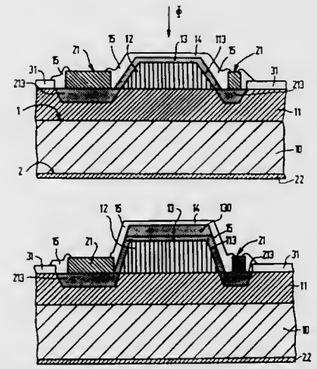
implantation and diffusion of species suitable for obtaining the n- and the p-conductivity type, respectively.

4,904,608

PIN PHOTODIODE HAVING A LOW LEAKAGE CURRENT

Jean-Louis Geotner, Saint-Maur; Jean-Noël Patillon, Paris; Catherine Mallet-Mouko, Boissy-Saint-Leger, and Gérard M. Martin, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 855,234, Apr. 24, 1986, abandoned. This application Jan. 17, 1989, Ser. No. 297,821
Claims priority, application France, May 3, 1985, 85 06753
Int. Cl.[4] H01L *29/201, 31/18*
U.S. Cl. 437—3 **2 Claims**



1. A method of manufacturing a photodiode comprising the steps of:
(a) forming a substrate of indium phosphide of the n+ conductivity type,
(b) depositing a layer of indium phosphide of the n− conductivity type on a surface of said substrate, said layer having a thickness of about 3μm,
(c) depositing a layer of gallium indium arsenide of the n− conductivity type on said layer of indium phosphide, said layer of gallium indium arsenide having a doping level

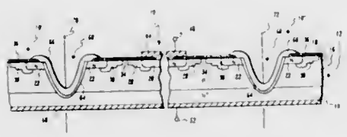
higher than that of said n− conductivity type layer of indium phosphide,
(d) forming at least one mesa region of said layer of gallium indium arsenide by masking said layer of gallium indium arsenide, etching unmasked portions away, and then removing the mask from the surface of said gallium indium arsenide,
(e) depositing a dielectric layer on said layer of indium phosphide, said dielectric layer being separated from said mesa region to define an opening around said mesa region, said opening having a larger diameter than the diameter of said mesa region,
(f) diffusing acceptor atoms into said layer of indium phosphide through said opening to a diffusion depth of about 0.5 μm and diffusing said acceptor atoms into said mesa region of gallium indium arsenide to a diffusion depth of about 0.1 to 0.2 μm to produce a layer of the p+ conductivity type at the surface of said mesa region, at the edges of said mesa region, and along the circumference of said opening,
(g) forming metallization on a back surface of said substrate,
(h) forming an ohmic contact on the p+ zone provided along the circumference of said opening to said layer of indium phosphide,
(i) forming a dielectric antireflective layer at said surface of said mesa region, said antireflective layer having a transparence centered at the operating wavelength of the photodiode, and
(j) forming a dielectric passivation layer at said edges of said mesa region, said passivation layer being analogous and compatible with said antireflective layer.

4,904,609

METHOD OF MAKING SYMMETRICAL BLOCKING HIGH VOLTAGE BREAKDOWN SEMICONDUCTOR DEVICE

Victor A. K. Temple, Clifton Park, N.Y., assignor to General Electric Company, Shenectady, N.Y.

Filed May 6, 1988, Ser. No. 190,903
Int. Cl.[4] H01L *21/223, 21/303*
U.S. Cl. 437—6 **13 Claims**



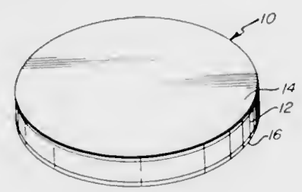
1. A method of fabricating a symmetrical blocking high breakdown voltage semiconductor device comprising: providing a substrate of semiconductor material of a first conductivity type having thereon an epitaxial layer of a second conductivity type; forming first and second laterally spaced regions of the first conductivity type in an upper surface of the epitaxial layer, the first and second regions forming with the layer respective first and second PN junctions; forming a groove having a sloped sidewall in the second region, the groove extending from the upper surface through the second region and the epitaxial layer into the substrate; implanting impurities of the first conductivity type into the sidewall of the groove to form a thin implanted layer of the first conductivity type; and annealing the device sufficiently to activate the impurities in the implanted layer to form a low resistivity path that electrically connects the second region to the substrate.

4,904,610

WAFER LEVEL PROCESS FOR FABRICATING PASSIVATED SEMICONDUCTOR DEVICES

Richard Shyr, Greenlawn, N.Y., assignor to General Instrument Corporation, New York, N.Y.

Filed Jan. 27, 1988, Ser. No. 143,916
Int. Cl.[4] H01L *21/78, 21/80*
U.S. Cl. 437—15 **43 Claims**



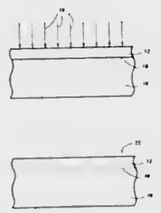
1. A process for fabricating a plurality of semiconductor devices, said process comprising the steps of:
mounting a semiconductor wafer on a substrate by an intervening layer of adhesive;
cutting a multiplicity of grooves in the mounted wafer to form a plurality of chips, said grooves extending entirely through the wafer and partly through said layer of adhesive without extending into said substrate;
putting a resinous bonding and passivating substance into said grooves, said substance at least partially filling portions of said grooves in both the adhesive layer and the wafer, to passivate, bond to, and interconnect the chips; and
curing said substance.

4,904,611

FORMATION OF LARGE GRAIN POLYCRYSTALLINE FILMS

Anne Chiang, Cupertino; I-Wei Wu, San Jose, and Tiao-Yuan Huang, Cupertino, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 98,259, Sep. 18, 1987, abandoned. This application Nov. 25, 1988, Ser. No. 277,432
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—21 **18 Claims**



13. A method for forming large grain polycrystalline films comprising the steps of
providing a layer of insulating material,
depositing a layer of amorphous semiconductor material upon said insulating material to form a composite structure,

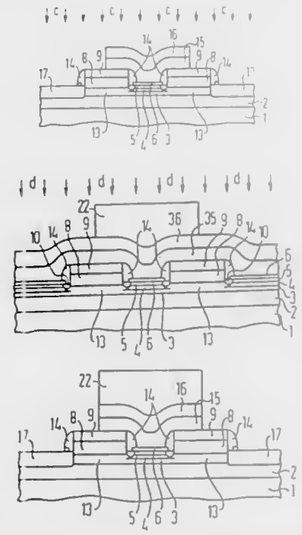
implanting an ion species into said composite structure at an implant energy and dosage so that the projected range of implantation is in the vicinity of the interface between said amorphous layer and said layer of insulating material so as to disrupt said interface by causing recoil of atoms from said insulating material into said amorphous layer so that said amorphous layer will be energetically less favorable to nucleate and to grow grains when said composite structure is annealed, and
annealing said composite structure at a temperature and at a steady state so as to cause random nucleation within said amorphous layer and to form a large grain polycrystalline film at saturation of grain growth within said amorphous layer.

4,904,612

METHOD FOR MANUFACTURING A PLANAR, SELF-ALIGNED EMITTER-BASE COMPLEX

Hans-Peter Zwicknagl, Stuttgart; Josef Willer, Oberschleisheim, and Helmut Tews, Unterbaching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 261,492, Oct. 24, 1988, abandoned.
This application Jun. 30, 1989, Ser. No. 374,617
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735999
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—31 **20 Claims**



1. A method for the manufacture of a planar, self-aligned emitter-base complex including a substrate of semiconductor material, a semiconductor layer structure for hetero-bipolar transistors that is grown thereon, whereby at least one semiconductor layer is doped for the conductivity type of the base, including a passivation layer, including base metallization and a portion of a first dielectric layer situated thereon, and including emitter metallization and a portion of a second dielectric layer situated thereon, the method utilizing phototechnique and lift-off technique, etching technique, implantation and tempering processes, comprising the steps of:
(a) proceeding from the substrate having the semiconductor layer structure grown thereon, a passivation layer is deposited surface-wide on the uppermost of the semiconductor layers;
(b) a first mask layer having an opening for the definition of the base is applied;
(c) an implantation of doping for the conductivity type of the base proceeds first for the formation of a implantated base region through the passivation layer at least down to the semiconductor layer doped for the conductivity type of the base;
(d) the passivation layer and the uppermost semiconductor layer are etched away in those regions occupied by the opening of the first mask layer that serves the purpose of defining the base;
(e) a first metal layer including a first portion as base metallization and having a second portion is applied on the first mask layer;
(f) a high-temperature resistant metal is used as the first metal layer allowing the base metallization to not be negatively influenced by a subsequent tempering cycle for annealing the implantation;
(g) a first dielectric layer having a first portion on the base metallization and having a second portion on the second portion of the first metal layer is deposited;
(h) the first mask layer together with the second portion of the first metal layer and the second portion of the first dielectric layer are removed in a lift-off technique;
(i) a temperature-time cycle is carried out with which the implanted dopant is annealed and the base metallization is alloyed in at the same time;
(j) a second dielectric layer is isotropically deposited;
(k) the second dielectric layer and the passivation layer are etched away to such an extent with anisotropic etching that only spacers completely covering the sides of the base metallization remain;
(l) a second mask layer for the definition of the emitter is applied;
(m) a second metal layer having a first portion as emitter metallization and having a second portion is applied on the second mask layer;
(n) a third dielectric layer having a first portion on the emitter metallization and a second portion on the second portion of the second metal layer is applied;
(o) the second mask layer together with the second portion of the second metal layer and the second portion of the third dielectric layer are removed in a lift-off technique;
(p) the emitter metallization is alloyed in;
(q) the exposed portions of the uppermost semiconductor layer are etched away; and
(r) those portions of the semiconductor layer structure situated outside of the regions of the surface occupied by emitter and base are rendered insulating by insulation implantation at that side facing away from the substrate down to and including the semiconductor layer doped for the conductivity type of the base.

4,904,613

METHOD OF MANUFACTURING A DMOS DEVICE

David J. Coe, East Grinstead; Kenneth Whight, Partridge Green, and Richard J. Tree, Ifield, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,880
Claims priority, application United Kingdom, Dec. 23, 1986, 8630814
Int. Cl.[4] H01L *21/22, 21/467*
U.S. Cl. 437—41 **8 Claims**

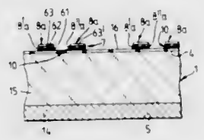
1. A method of manufacturing gas field effect transistor comprising the steps of:
(a) forming an insulating layer on a surface of a semiconductor body,
(b) forming at least one insulated gate structure on said insulating layer by providing separated conductive gate regions on said insulating layer,
(c) forming an opening through each of said conductive gate

regions to said insulating layer, said opening being smaller than separation of said separated conductive gate regions,

(d) growing insulating material on said separated conductive gate regions for a period sufficient to close said opening through each of said conductive gate regions, said insulating material also being grown on said insulating layer between said separated conductive gate regions,

(e) anisotropically etching said insulating material toward said surface of said semiconductor body until said surface is exposed between said separated conductive gate regions, but insulating material remains on edges of said conductive gate regions and said openings remain closed, said insulating material remaining on said edges forming at least in part at least one window through said insulating material to said surface.

(f) introducing impurities through said at least one window to form source regions registered with said insulated gate regions, said source regions being of one conductivity type, and to form channel regions of an opposite conductivity type beneath said insulated gate regions.



4,904,614

METHOD OF MANUFACTURING LATERAL IGFETS INCLUDING REDUCED SURFACE FIELD REGIONS

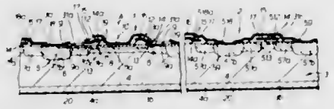
Carole A. Fisher, Horley; David H. Paxman, Redhill, and David J. Coe, East Grinstead, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1988, Ser. No. 197,539

Claims priority, application United Kingdom, Jun. 8, 1987, 8713386

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—41 8 Claims



1. A method of manufacturing a semiconductor device comprising a lateral insulated gate field effect transistor, which method comprises providing a semiconductor body having adjacent a given surface a first region of one conductivity type, first introducing impurities of the opposite conductivity type and then introducing impurities of the one conductivity type into the semiconductor body, heating the semiconductor body in an oxidising atmosphere to cause the introduced impurities to diffuse to define a first RESURF region of the opposite conductivity type adjacent the given surface and a second RESURF region of the one conductivity type within the first RESURF region adjacent the given surface and to grow a relatively thick layer of insulating material on the given surface overlying the first RESURF region, defining an insulated gate structure by providing a relatively thin region of insulating material on a first area of the given surface overlying the first RESURF region and providing a conductive layer extending on the relatively thin insulating layer and onto the relatively thick insulating layer and introducing impurities into the semiconductor body using the insulated gate structure as a mask to form source and drain regions aligned to the insulated gate structure with the second RESURF region providing a drain extension region aligning the drain region and the first RESURF region forming at least part of a well of the opposite conductivity type within which the source and drain regions are formed.

4,904,615

METHOD OF MAKING A READ ONLY MEMORY DEVICE

Kousuke Okuyama, Kowagoe; Ken Uchida, Higashiyamoto; Kouichi Kusuyama, Mitaka; Satoshi Meguro; Hisao Katto, both of Hinode, and Kazuhiro Komori, Kodaiara, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

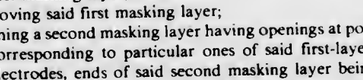
Continuation of Ser. No. 111,690, Oct. 22, 1987, Pat. No. 4,818,716. This application Jan. 26, 1989, Ser. No. 301,978

Claims priority, application Japan, Oct. 22, 1986, 61-249725

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—52 13 Claims



1. A manufacturing method of a semiconductor memory device having a vertical-type mask ROM with first-layer and second-layer gate electrodes, in which the second-layer gate electrodes are formed from a second conductive layer, between adjacent ones of the first-layer gate electrodes, which first-layer gate electrodes are formed from a first conductive layer and are disposed at a predetermined interval in a direction of gate length of the first-layer gate electrodes, comprising the steps of:

introducing an impurity of first conductivity type into a principal surface of a semiconductor substrate;

forming the first-layer gate electrodes at the predetermined interval on the principal surface of the semiconductor substrate;

forming a first masking layer having openings at positions corresponding to said predetermined interval between said ones of first-layer gate electrodes, ends of said masking layer being disposed on said first-layer gate electrodes;

implanting an impurity of a second conductivity type to write information into the principal surface of the semiconductor substrate between the first-layer gate electrodes by using the first-layer gate electrodes as a mask so as to write first information, said first-layer gate electrodes used as said mask being disposed in said openings of said first masking layer;

removing said first masking layer;

forming a second masking layer having openings at positions corresponding to particular ones of said first-layer gate electrodes, ends of said second masking layer being disposed between said ones of said first-layer gate electrodes;

further implanting an impurity of the second conductivity type to write information into the principal surface of the substrate beneath said first-layer gate electrodes, through the first-layer gate electrodes disposed in said openings of said second masking layer, thereby writing second information; and

forming the second layer gate electrodes on the principal surface of the substrate in which said first information has been written.

4,904,616

METHOD OF DEPOSITING ARSINE, ANTIMONY AND PHOSPHINE SUBSTITUTES

David A. Bobling, Macungie; Gregory T. Muhr, Allentown, both of Pa., and David A. Roberts, Carlsbad, Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 25, 1988, Ser. No. 224,089

Int. Cl.[4] H01L *21/20*

U.S. Cl. 437—81 23 Claims

1. In a method for the reactive deposition of a material containing a Group VA metal to a substrate using an organometallic reactant containing arsenic, phosphorus or antimony, the improvement wherein said organometallic reactant is selected from the group consisting of compounds of the formula:

$$MR_1R_2R_3$$

wherein M=As, P or Sb and R_1, R_2, and R_3 are each separately hydrogen or an organic radical wherein at least one R is an organic radical which is at least partially fluorinated.

4,904,617

METHOD FOR SEPARATING MONOLITHICALLY PRODUCED LASER DIODES

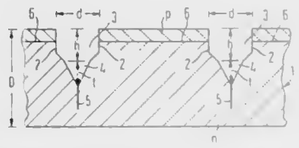
Markus Muschke, Brunnthal, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,476

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731312

Int. Cl.[4] H01L *21/20, 21/302*

U.S. Cl. 437—129 11 Claims



1. A method for separating laser diodes that are produced monolithically on a first major surface on a semiconductor substrate wafer which has a sequence of epitaxially deposited layers on the first major surface suitable for laser operation, said method comprising the following steps:

(a) masking the first major surface of the semiconductor substrate wafer including the deposited layers with a first mask for defining mirror surfaces for the laser diodes,

(b) etching the mirror surfaces out of the semiconductor substrate wafer,

(c) removing said first mask,

(d) masking the semiconductor substrate wafer including said mirror surfaces with a second mask for defining separation trench areas between the mirror surfaces of adjacent laser diodes,

(e) etching separation trenches out of the separation trench areas, and

(f) separating the laser diodes by breaking the semiconductor substrate wafer along the separation trenches.

4,904,618

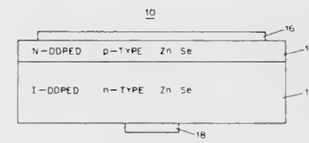
PROCESS FOR DOPING CRYSTALS OF WIDE BAND GAP SEMICONDUCTORS

Gertrude F. Neumark, 153 Old Colony Rd., Hartsdale, N.Y. 10530

Filed Aug. 22, 1988, Ser. No. 234,802

Int. Cl.[4] H01L *21/368*

U.S. Cl. 437—150 5 Claims



1. A process for the non-equilibrium incorporation of a dopant into a crystal of a wide band gap semiconductor comprising the steps of treating the crystal in the presence of first and second compensating dopants of different mobilities for introducing substantially equal amounts of the two dopants into at least a portion of the crystal such that the concentration of the less mobile of the two dopants in said portion of the crystal is in excess of the solubility therein of the less mobile dopant in the absence of the more mobile of the two dopants, and then heating the crystal to remove therefrom preferentially the more mobile of the two dopants whereby there is left a non-equilibrium concentration of the less mobile dopant in said portion of the crystal.

4,904,619

METHOD OF FORMING JOSEPHSON JUNCTION DEVICES

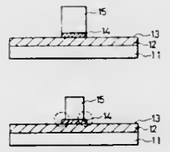
Hirozi Yamada, Tsukui; Sachiko Kizaki, Oume; Hiroyuki Mori, Hachiouji; Yoshinobu Tarutani, Kitatsuru, and Mikio Hirano, Oume, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Feb. 1, 1988, Ser. No. 150,796

Claims priority, application Japan, Mar. 24, 1987, 62-67791

Int. Cl.[4] H01L *21/44*

U.S. Cl. 437—190 4 Claims



1. A method of producing Josephson junction devices, featuring the following production processes;

(a) forming on a desired substrate a base electrode layer, a tunnel barrier layer and a counterelectrode layer of superconducting thin film which constitute a Josephson junction;

(b) forming on said counterelectrode layer a resist pattern of a desired shape for the purpose of forming a counterelectrode pattern;

(c) dry-etching said counterelectrode layer with said resist pattern as a mask;

(d) forming a terrace-shaped portion at the edges and corners of the counterelectrode pattern by ablating part of said resist pattern with oxygen plasma to reform and shrink the cross-sectional geometry of said resist pattern;

(e) depositing a thin insulating film over the entire surface of said substrate to cover the etched layers; and,

(f) removing said resist pattern together with said thin insulating film deposited on said resist pattern.

4,904,620

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE INCLUDING A TITANIUM DISILICIDE CONTACT

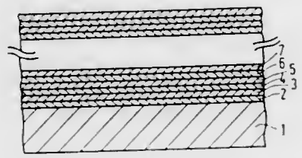
Johannes E. J. Schmitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

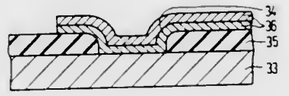
Filed Apr. 4, 1988, Ser. No. 176,916

Claims priority, application Netherlands, Apr. 8, 1987, 8700820

Int. Cl.[4] H01L *21/285*

U.S. Cl. 437—200 **9 Claims**





1. A method of manufacturing a semiconductor device comprising the steps of:

(a) forming alternate layers of equal numbers of titanium silicide and silicon on a substrate by a CVD technique, said layers of titanium silicide having an atomic ratio of titanium to silicon of about 4:5,

wherein said alternate layers are deposited on said substrate alternately from a gaseous phase, and

(b) subsequently heating said alternate layers of titanium silicide and layers of silicon to a homogenized titanium disilicide layer.

4,904,621

REMOTE PLASMA GENERATION PROCESS USING A TWO-STAGE SHOWERHEAD

Lee M. Loewenstein, Plano, and Cecil J. Davis, Greenville, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 16, 1987, Ser. No. 74,371

Int. Cl.[4] H01L *37/32*

U.S. Cl. 437—225 **6 Claims**

1. A method of treating a semiconductor wafer comprising:

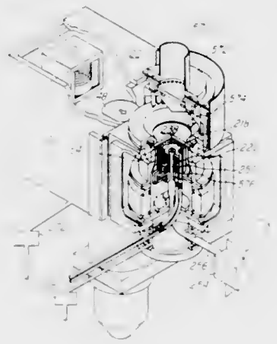
(a) transferring a wafer into a process vacuum chamber;

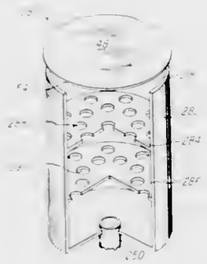
(b) applying a pressure to said chamber less than ambient to maintain said chamber at less than ambient;

(c) heating said wafer to an appropriate temperature;

(d) providing an appropriate gas to a plasma generating module separated from said chamber and producing a remote plasma;

(e) flowing said plasma sequentially through both stages of a two-stage showerhead, wherein each stage includes a baffle having a plurality of holes measuring 0.1–0.25 inch, and none of the holes in one stage is aligned with a hole of the other stage; and





(f) flowing the gas over said wafer disposed within said chamber.

4,904,622

PROCESS FOR THE PREPARATION OF SILICON CARBIDE WHISKERS

Dominique Dubots, Le Fayet, and Francis Dubrous, Sallanches, both of France, assignors to Pechiney Electrometallurgie, Courbevoie, France

Filed Feb. 19, 1988, Ser. No. 157,619

Claims priority, application France, Feb. 23, 1987, 87 02528

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—88 **10 Claims**



1. A process for the preparation of silicon carbide whiskers by reaction in a nitrogen atmosphere at a temperature of at least 1300° C. of a charge comprising a mixture of carbon black and a source of silicon oxide, comprising the steps of:

(1) dry mixing, without packing and without addition of catalyst,

(a) carbon black, having an oxidability rate, measured by heating in air at 600° C. for 30 minutes, of at least 85%, and

(b) a source of silicon oxide having a grain size of less than 100 μm,

in a ratio by weight of carbon to silicon oxide at least equal to the amount necessary for the stoichiometric reaction of the silicon to form silicon carbide, wherein said mixture has a density of about 0.2 to 0.4 grams per cm^3, and

(2) heating said dry mixture to about 1600° C. wherein the rate of rise in temperature at between 1300° and 1600° C. is at most 10° C. min^{-1} under a static atmosphere or at most 25° C. min^{-1} under gas percolation.

4,904,623

MOLDED METAL CARBIDE-BORIDE REFRACTORY PRODUCTS

Günter Petzow, Leinfelden-Echterdingen; Heinrich Hofmann, Gerlingen, and Kurt Weiss, Vaduz, Liechtenstein, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 19,481, Feb. 26, 1987, abandoned, which is a division of Ser. No. 777,230, Sep. 18, 1985, Pat. No. 4,670,408. This application Aug. 2, 1988, Ser. No. 228,811

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1984, 3435345

Int. Cl.[4] C04B *35/56, 35/58*

U.S. Cl. 501--96 **11 Claims**

1. Multiphase hard metal alloy articles consisting essentially of 65–85 volume percent of boron carbide and 34–15 volume percent of tungsten boride, or a combination of tungsten boride and titanium boride in a volume ratio of 3:1 to 2:1 produced by the process comprising intimately contacting a mixture of

from 25 to 75% by weight of finely divided boron carbide,

from 15 to 40% by weight of amorphous boron,

from 10 to 50% by weight of tungsten carbide or a combination of tungsten carbide and titanium carbide,

from 0 to 6% by weight of cobalt, and

from 0 to 8% of finely particulate elemental silicon, and hot pressing the powder so obtained at between 1550° C. and 1850° C.

4,904,624

SILICON NITRIDE WITH IMPROVED HIGH TEMPERATURE STRENGTH

Russell L. Yeckley, Oakham, Mass., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 923,948, Oct. 28, 1986. This application Jan. 15, 1988, Ser. No. 144,458

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501--97 **20 Claims**

1. A polycrystalline ceramic material comprising at least three-fifths atomic fraction of silicon nitride, between 1 and 5 weight percent of a rare earth oxide, not more than 1 weight percent silica as determined by X-ray diffraction, and not more than 0.5 weight percent alumina as determined by chemical analysis, said ceramic material having a flexural strength of at least 525 megapascals when measured at 1370 C.

16. In a process comprising (a) preparing a silicon nitride green body, said green body comprising at least three fifths atomic fraction of silicon nitride, from 1 to 12 weight percent of rare earth metal oxide, and not more than 0.5% alumina, (b) degassing said green body, (c) encapsulating said green body with a flexible fluid-impermeable membrane, and (d) subjecting said fluid-impermeable membrane to uniform fluid pressure while simultaneously maintaining said green body at elevated temperature, whereby said green body is densified, the improvement wherein said green body is heated in an atmosphere of nitrogen at a temperature between 1000 C and 1500 C prior to step (c), for a time sufficient to reduce below the X-ray diffraction detection limit the content of each of the SiO_2 and alpha $E_2Si_2O_7$ phases where E represents any rare earth metal, within the body after step (d).

4,904,625

REFRACTORY COMPOSITES OF ALUMINA AND BORON NITRIDE

Gregory W. Shaffer, Brunswick, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 3, 1986, Ser. No. 914,931

Int. Cl.[4] C04B *35/58, 35/10*

U.S. Cl. 501—98 **9 Claims**

1. A composite produced by heating and compressing a mixture of particulate alumina and boron nitride, which composite consists essentially of between about 50 and about 90 weight percent alumina having a purity of at least 99.90 weight percent, and between about 10 to about 50 weight percent boron nitride having a purity of at least 99 weight percent, said composite having a density not more than about 93% of the theoretical density, and a Rockwell R hardness less than 130.

4,904,626

ZIRCONIA MULLITE/BORON NITRIDE COMPOSITES

Gregory W. Shaffer, Brunswick, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 24, 1989, Ser. No. 300,976

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—98 **8 Claims**

1. A ceramic composite comprising a mixture of boron nitride and fused zirconia mullite, said fused zirconia mullite comprising from 25 to 45 weight percent zirconia and from 55 to 75 weight percent mullite based on the weight of the fused zirconia mullite, and said ceramic composite comprising from 26 to 90 weight percent boron nitride and from 10 to 74 weight percent fused zirconia mullite based on the weight of the ceramic composite.

4,904,627

ALKALINE EARTH METAL SPINEL/KAOLIN CLAYS AND PROCESSES FOR MAKING

Alakanada Bhattacharyya, Columbia, Md., assignor to UOP, Des Plaines, Ill.

Division of Ser. No. 25,355, Mar. 13, 1987, Pat. No. 4,830,840. This application Feb. 10, 1989, Ser. No. 308,612

Int. Cl.[4] B01J *21/16, 23/00*

U.S. Cl. 502—63 **74 Claims**

1. A process for the production of an alkaline earth metal, aluminum-containing spinel/kaolin clay composition comprising:

(a) combining (1) an acidic, aluminum-containing composition in which the aluminum is present in a positively charged species, (2) a basic alkaline earth metal-containing composition to form a gel mixture; and

(b) mixing the gel with kaolin clay to form a co-gel mixture; and

(c) calcining said co-gel mixture to form said alkaline earth metal, aluminum-containing spinel composition, in a kaolin clay matrix.

61. An alkaline earth metal, aluminum-spinel/clay composition wherein said spinel has a surface area greater than about 40 m^2/gm. and an attrition resistance index less than about 3.0.

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4,904,628

COMPONENTS AND CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Enrico Albizzati, Arona; Sandro Parodi, Oleggio, and Pier C. Barbé, Ferrara, all of Italy, assignors to Montedison S.p.A., Milan, Italy and Mitsui Petrochemical Ind., Tokyo, Japan

Continuation of Ser. No. 13,148, Feb. 10, 1987, abandoned, which is a continuation of Ser. No. 855,374, Apr. 24, 1986, abandoned, which is a continuation of Ser. No. 729,124, May 1, 1985, abandoned, which is a continuation of Ser. No. 465,594, Feb. 10, 1983, Pat. No.

Claims priority, application Italy, Feb. 12, 1982, 19624 A/82

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—121 **3 Claims**

1. A solid component to be employed, in combination with metallorganic Al compounds and with electron-donor compounds which are not completely complexed with Al-triethyl at the equivalent point of a potentiometric titration under standard conditions but reactive toward anhydrous Mg chloride, to form catalysts for the polymerization of alpha-olefins $CH_2=CHR$, said component comprising a titanium compound having at least a Ti-halogen bond and an electron-donor compound both supported on an anhydrous Mg dihalide, the electron-donor compound being selected from the group consisting of diisoamyl ether, triphenyl phosphite, α-methyl-α-phenyl-γ-butyrolactone and the following classes of esters:

(1) di-n-butyl succinate and di-isobutyl succinate;

(2) esters of unsaturated polycarboxylic acids in which two carboxyl groups are linked to vicinal, double bond-forming carbon atoms and in which the hydrocarbyl radical or radicals of the COOR groups are linear saturated or unsaturated radicals or cycloaliphatic radicals with 2-20 carbon atoms or hydrocarbyl esters of unsaturated linear or branched polycarboxylic acids with 1-20 carbon atoms in which the carboxy groups are not linked to vicinal double bond-forming carbon atoms;

(3) hydrocarbyl esters of aromatic meta- and paradicarboxylic acids and hydrocarbyl esters of polycarboxylic aromatic acids containing more than two carboxyl groups;

(4) hydrocarbyl esters of aromatic hydroxy compounds containing the OH groups in meta- or para-position and esters of aromatic hydroxy acids the OH groups of which are in meta- or para-position with respect to the carboxyl group;

(5) hydrocarbyl esters of polycarboxylic acids in which at least one carboxyl group is linked to an aromatic ring and at least one other is linked to carbon atom of an aliphatic chain or to a cycloaliphatic ring or at least two carbonyl groups are linked to an aromatic ring through an alkylene group;

(6) esters of aromatic polycarboxylic acids containing at least two non-condensed aromatic rings, each bearing a carboxyl group;

(7) esters of carbonic acid with glycols, and carbonic acid derivatives of formula RO—CO—OR' wherein R and R' are the same or different acyl groups with 1-20 carbon atoms;

(8) esters of polyols and of monohydroxy-phenols; and

(9) hydrocarbyl esters of acetylenic acids; the electron-donor compounds being extractable from the solid for at least 70% by mols with Al-triethyl under standard measurement conditions, and the surface area of the solid subjected to extraction being higher than 20 m^2/g.

4,904,629

QUATERNARY TRIETHYLENEDIAMINE COMPOSITIONS AND THEIR COMBINATION WITH TERTIARY AMINES FOR DELAYED ACTION/ENHANCED CURING CATALYSTS IN POLYURETHANE SYSTEMS

Edward A. Galla, Macungie; Robert L. Ricci, Allentown, and Gary D. Andrew, Walnutport, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 927,897, Nov. 6, 1986, Pat. No. 4,785,025, which is a continuation-in-part of Ser. No. 710,181, Mar. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 670,705, Nov. 13, 1984, Pat. No. 4,582,861. This application Jul. 29, 1988, Ser. No. 226,330

Int. Cl.[4] C04G *19/14*; B01J *31/00*

U.S. Cl. 502—164 **14 Claims**

1. A catalyst composition for the catalysis of the isocyanate/polyol reaction comprising a quaternary triethylenediamine composition prepared by reacting triethlenediamine with two molar equivalents of ethylene or propylene oxide in the presence of an acid of the formula H—A where A is the salt forming anionic portion of the acid HA.

4,904,630

CATALYST FOR OLEFIN POLYMERIZATION

Mitsuyuki Matsuura, and Takashi Fujita, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Ltd., Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 217,983

Claims priority, application Japan, Jul. 13, 1987, 62-174260; Jul. 22, 1987, 62-182720

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—119 **16 Claims**

1. A catalyst for olefin polymerization which comprises a component (A) and a component (B), wherein:

component (A) is a solid catalyst component obtained by contacting together the following components (i) to (iv):

(i) a solid component comprising titanium, magnesium and halogen as essential elements, and which is obtained by contacting a magnesium halide with a titanium compound represented by the formula $Ti(OR^4)_{4-n}X_n$ wherein R^4 stands for a hydrocarbon residue having 1 to 10 carbon atoms, X stands for a halogen atom and n is a number of from 0 to 4;

(ii) a silicon compound represented by the formula(I):

$$R^1{}_mX_nSi(OR^2)_{4-m-n} \quad (I)$$

wherein R^1 and R^2 each represent a hydrocarbon residue, X represents a halogen, and each of m and n is an integer in the range of $0 \leqq m \leqq 3$, $0 \leqq n \leqq 3$, and $0 \leqq m+n \leqq 3$,

(iii) a titanium compound or a silicon compound represented by the formula (II) or (III):

$$Ti(OR^3)_{4-l}X_l \quad (II)$$

$$R^4{}_{4-l}SiX_l \quad (III)$$

wherein R^3 represents a hydrocarbon residue, R^4 represents hydrogen or a hydrocarbon residue, X represents a halogen, and l is an integer in the range of $0 < l \leqq 4$, and

(iv) an organoaluminum compound; and

component (B) is an organoaluminum compound.

4,904,631

SUPPORTED VANADIUM CATALYST FOR POLYMERIZATION OF OLEFINS AND A PROCESS OF PREPARING AND USING THE SAME

Main Chang, Houston, Tex., assignor to Exxon Chemical Patents, Inc., Linden, N.J.

Filed Nov. 8, 1988, Ser. No. 268,833

Int. Cl.[4] C08F *4/68*

U.S. Cl. 502—120 **10 Claims**

1. A supported non-metallocene vanadium alumoxane catalyst complex, produced by:

(a) adding an undehydrated silica gel to a stirred solution of a trialkylaluminum in an amount sufficient to provide a mole ratio of trialkylaluminum to water of from about 3:1 to about 1:2 and allowing the mixture to react;

(b) adding a non-metallocene vanadium compound to the reacted mixture;

(c) removing the solvent; and

(d) drying the solids to form a free flowing powder.

4,904,632

SURFACE-MODIFIED CHROMATOGRAPHIC SEPARATION MATERIAL

Joseph J. Pesek, 4142 Rosenbaum Ave., San Jose, Calif. 95136, and Sally A. Swedberg, 793 Allen Ct., Palo Alto, Calif. 94303

Filed Jun. 19, 1987, Ser. No. 64,329

Int. Cl.[4] B01J *31/02, 20/10, 20/30*

U.S. Cl. 502—158 **13 Claims**

1. A method for coupling an olefinically unsaturated surface-modifying group to the surface of a surface hydroxyl-containing silica material to give an acid- and base-stable surface-modified silica substantially free of contamination and capable of further functionalization through the olefinic bond present in the surface-modifying group, comprising the steps of, in sequence;

(a) reacting the surface hydroxyl groups of the silica material with a halogenating agent in an anhydrous, aprotic solvent, thereby replacing the surface hydroxyl groups with halogen ations so as to provide a halogenated silica material having a halogenated surface;

(b) isolating the halogenated silica material from the solvent, thereby obtaining an isolated halogenated silica material;

(c) washing the isolated halogenated silica material to remove excess halogenating agent thereby forming a washed halogenated silica material;

(d) reacting the washed halogenated silica material with a reagent selected from the group consisting of olefinically unsaturated Grignard reagents of the formula $CH_2=CH-(CH_2)_nMgBr$ and olefinically unsaturated organolithium reagents of the formula $CH_2=CH-(CH_2)_nLi$, in which n is an integer in the range of from one to sixteen inclusive, thereby giving rise to direct covalent carbon to silicon linkages and the formation of an acid- and base-stable surface-modified silica having surface $Si-(CH_2)_n-CH=CH_2$ moieties; and

(e) washing the acid- and base-stable surface-modified silica in the sequence of

(i) first washing the surface-modified silica with sodium hydroxide;

(ii) then washing the sodium hydroxide-washed surface-modified silica with hydrochloric acid; and

(iii) repeating steps (i) and (ii) at least once.

4,904,633

CATALYST FOR PURIFYING EXHAUST GAS AND METHOD FOR PRODUCTION THEREOF

Tomohisa Ohata; Kazuo Tsuchitani; Eiichi Shiraishi, and Shinya Kitaguchi, all of Himeji, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 17, 1987, Ser. No. 134,363

Claims priority, application Japan, Dec. 18, 1986, 61-299948; Jan. 20, 1987, 62-9109; Jan. 20, 1987, 62-9110; Jan. 21, 1987, 62-10009; Jan. 21, 1987, 62-10010; Jan. 23, 1987, 62-12288; Jan. 23, 1987, 62-12289; Jan. 29, 1987, 62-17321; Jan. 30, 1987, 62-18219

Int. Cl.[4] B01J *21/06, 23/10, 23/40*

U.S. Cl. 502—304 **37 Claims**

1. A catalyst for purifying exhaust gas comprising a honeycomb carrier of monolithic structure and a coating layer applied on said honeycomb carrier and formed with a catalyst composition comprising (i) a platinum group metal-supporting zirconia produced by depositing said platinum group metal on zirconia powder, (ii) a refractory inorganic oxide and (iii) a rare earth metal oxide, wherein said platinum group metal is at least one member selected from the group consisting of (a) rhodium, (b) combination of rhodium and platinum, (c) combination of rhodium and palladium, and (d) combination of rhodium, platinum and palladium, and is deposited in proportion in the range of 0.5 to 30% by weight on said zirconia powder.

4,904,634

ACTIVE MATERIAL USEFUL AS ADSORBENT COMPRISING METAL OXIDE/HYDROXIDE SURFACES REACTED WITH ONE OR MORE PHOSPHOROUS-CONTAINING MATERIALS HAVING SELECTED ORGANIC RADICALS ATTACHED THERETO

Larry F. Wieserman; Karl Wefers, both of Apollo; Kathryn Cross, Murrysville, and Edward S. Martin, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 23,423, Mar. 9, 1987, Pat. No. 4,788,176, which is a continuation-in-part of Ser. No. 946,870, Dec. 29, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 265,181

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl.[4] B01J *20/22*

U.S. Cl. 502—401 **49 Claims**

1. A process for chemically bonding a monomolecular layer of phosphorus-containing organic material to a metal oxide/-hydroxide surface to form an active material suitable for use as an adsorbent and having good chemical stability over a pH range of from 1 to 14 which comprises:

(a) providing a liquid containing an organic material therein having 1-2 phosphorus-containing groups thereon selected from the class consisting of:

(i) phosphonic acid having the formula $RPO(OH)_2$; and

(ii) phosphinic acid having the formula RR'PO(OH); where R comprises a 1-30 carbon-containing group and R' comprises hydrogen or a 1-30 carbon-containing group; and

(b) contacting said metal oxide/hydroxide surface with said liquid to chemically bond said phosphorus containing organic material to substantially all of the exposed hydroxyl groups on said metal oxide/hydroxide surface to form a monomolecular layer of said organic material thereon forming said active material.

4,904,635

HEAT-SENSITIVE RECORDING PAPER

Shigehisa Tamagawa, and Tetsuro Fuchizawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 16, 1988, Ser. No. 194,664
Claims priority, application Japan, May 15, 1987, 62-118443
Int. Cl.[4] B41M 5/18
U.S. Cl. 503—207 16 Claims

1. A heat-sensitive recording paper comprising a paper support having coated thereon a heat-sensitive color-forming recording layer, said paper support comprising a base paper onto which has been coated a subbing layer comprising a mixture of fine particles of a thermoplastic resin and a binder, wherein said binder is comprised of a hydrophobic polymer in an amount of 80 wt % or more, and wherein said fine particles of thermoplastic resin are in the form of hollow spheres and wherein said heat-sensitive color-forming recording layer is coated directly on said subbing layer.

4,904,636

HEAT-SENSITIVE RECORDING MATERIAL

Hiroo Hayashi, and Toshimitsu Arikawa, both of Hyogo, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,503
Claims priority, application Japan, Mar. 18, 1987, 62-67550
Int. Cl.[4] B41M 5/18
U.S. Cl. 503—207 2 Claims

1. A heat-sensitive recording material comprising a support and a recording layer provided on the support, said recording layer containing a colorless or pale-colored basic dye and a color developer capable of forming a color upon application of heat and said support containing a back surface layer, wherein electroconductive titanium oxide prepared by treating the surface of fine titanium oxide powder with fine granular tin oxide and antimony oxide is incorporated in one of said recording layer and said back surface layer of said support.

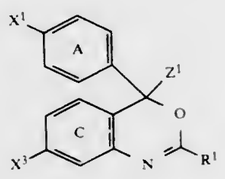
4,904,637

RECORDING MATERIAL COMPRISING CHROMOGENIC 3,1-BENZOXAZINES

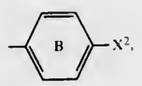
Horst Berneth, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 810,797, Dec. 18, 1985, Pat. No. 4,835,270.
This application Feb. 14, 1989, Ser. No. 311,002
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1985, 3500361
Int. Cl.[4] B41M 5/22; C09B 19/00
U.S. Cl. 503—218 5 Claims

1. A pressure-sensitive, heat-sensitive and electro-sensitive recording material comprising a layer support and a chromogenic 3,1-benzoxazine of the formula



wherein
Z^1 denotes hydrogen, alkyl, cycloalkyl or



R^1 denotes hydrogen, alkyl, cycloalkyl, aralkyl, aryl, heterocyclic-alkylene or a heterocyclic radical,
X^1, X^2 and X^3 independently of one another denote hydrogen, halogen, alkyl, cycloalkyl, aryl, alkanoylamino, aroylamino, a heterocyclic radical, NY^1Y^2, OY^3 or SY^3, at least one of the radicals X^1, X^2 or x^3 representing NY^1Y^2,
Y^1, Y^2 and Y^3 independently of one another denote hydrogen, alkyl, cycloalkyl, aralkyl, aryl or a heterocyclic radical or the remaining members of a 5-membered or 6-membered ring which extends to one of the benzene-C atoms in the o-position and optionally contains further heteroatoms, or
Y^1+Y^2 denote the remaining members of a 5-membered or 6-membered ring which optionally contains further heteroatoms, said heterocyclic radicals being selected from the group consisting of pyridyl, pyrimidyl, pyrazinyl, triazinyl, imidazolyl, oxazolyl, thiazolyl, triazolyl, thiadiazolyl, tetrazolyl, and benzofused, partially hydrogenated or completely hydrogenated derivatives thereof, and said-heterocyclic-alkylene being the ring or ring system recited above for said heterocyclic radical, which is linked on via methylene or ethylene, and wherein the rings A, B and C and the radicals mentioned can in turn carry non-ionic radicals which are customary in dyestuff chemistry, or which in case of the rings A, B and C can be benzo-fused and wherein, if the rings A and B, do not carry further substituents or fused-on systems and if X^3 represents hydrogen, dialkylamono or dialralkylamino, then X^1 and X^2 are not simultaneously dialkylamino, or if R^1 represents



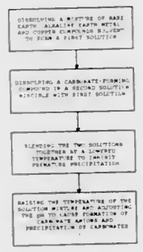
then X^1 and X^2 are not simultaneously methoxy, or if Z^1 represents hydrogen, then X^1 is not C_1–C_3-alkoxy and an acid color developer.

4,904,638

METHOD OF PRODUCING SUPERCONDUCTING CERAMICS BY CO-PRECIPITATION OF CARBONATES

Stephen A. DiCarolis, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 3, 1988, Ser. No. 163,426
Int. Cl.[4] C01F 17/00; C01G 3/00
U.S. Cl. 505—1 23 Claims



1. A process for producing a homogeneous mixture of materials which comprises:
(a) forming a first solution by dissolving in a first solvent two or more compounds having cations capable of reacting with a carbonate ion to form an insoluble precipitate of carbonate salts in the solvent used to form the solution;
(b) forming a second solution containing a carbonate-forming compound dissolved in a second solvent miscible with said first solvent;

(c) blending said first and second solutions together at a temperature sufficiently low to inhibit formation of a precipitate; and
(d) heating said blended solutions sufficiently to form a carbonate precipitate comprising a homogeneous mixture of the carbonate salts of the compounds dissolved in said first solution.

4,904,639

AIR FRESHENERS

Wilfred H. Hallam, Broxton, England, assignor to Joseph Burley, New Brighton, Wales

Continuation of Ser. No. 914,793, Oct. 2, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 245,976
Claims priority, application United Kingdom, Oct. 2, 1985, 8524228
Int. Cl.[4] A61K 7/46
U.S. Cl. 512—4 3 Claims

1. An air freshener consisting essentially of a homogenized mixture of polyethylene glycol and water as a plasticizing agent, said mixture having a perfume incorporated therein and therethrough

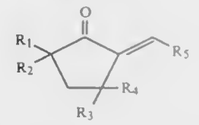
4,904,640

2-ALKYLIDENE-3,3,5(3,5,5)-TRIMETHYL CYCLOPENTANONES

Thomas Markert, Duesseldorf; Klaus Bruns, Krefeld-Traar; Horst-Juergen Krause, Duesseldorf; Josef Penninger, Hilden, all of Fed. Rep. of Germany; Michael Virnig, Santa Rosa, Calif., and Volker Falk, Velbert, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,159
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707209
Int. Cl.[4] A61K 7/46
U.S. Cl. 512—8 12 Claims

1. A 2-alkylidene-3,3,5(3,5,5)-trimethyl cyclopentanone corresponding to the formula



(I)

in which three of the substituents R_1 to R_4 are CH_3, one of the substituents R_1 to R_4 is H, R_5 is a saturated or unsaturated, linear or branched C_1–C_7 alkyl radical, and the double bond is in the endo or exo position to the cyclopentanone structure.

7. In a perfume composition, the improvement wherein the composition contains from about 1 to about 50% by weight of a cyclopentanone of claim 1.

4,904,641

METHOD OF INACTIVATING REPRODUCIBLE FILTERABLE PATHOGENS IN BLOOD PLASMA PRODUCTS

Johann Eibl; Otto Schwarz; Fritz Elsinger, all of Vienna; Günter Wöber, Oberwaltersdorf; Anton Philapitsch, Ebenfurth; Yendra Linnan, Vienna; Friedrich Dorner, Vienna; Karl Trambauer, Vienna, and Wolfgang Frechinger, Vienna, all of Austria, assignors to Immuno Aktiengesellschaft für chemisch-medizinische Produkte, Vienna, Austria

Filed Jan. 3, 1989, Ser. No. 293,085
Claims priority, application Austria, Jan. 12, 1988, 50/88
Int. Cl.[4] A61K 37/02, 35/16
U.S. Cl. 514—2 5 Claims

1. A method of inactivating reproducible filterable pathogens in blood plasma products, wherein said blood plasma products are heat treated in solid state, which method comprises the combination of the following consecutive steps:
moistening the blood plasma products with water vapor under vacuum to adjust the blood plasma products to a water content of from 0.08 to 0.40 (8 to 40% by weight),
subsequently treating the thus obtained moistened blood plasma products, under vacuum, with an organic compound selected from the group consisting of ethanol, acetic acid ethyl ester, diethyl ether, dimethylformamide, toluene, chloroform, n-heptane, 1,2-diacetoxy ethane and acetone in a closed container, to attain a concentration of from 0.01 to 10 g of the organic compound per liter of container volume, and
heat treating the blood plasma products in the closed container at a temperature and for a period of time sufficient to inactivate the reproducible filterable pathogens,
the water remaining substantially physically bound to the blood plasma products, while the organic compounds stay in gaseous phase.

4,904,642

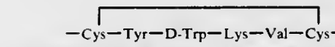
THERAPEUTIC SOMATOSTATIN ANALOGS

David H. Coy, New Orleans; William A. Murphy, Covington, both of La., and Mark L. Heiman, Indianapolis, Ind., assignors to The Administrators of the Tulane Educational Fund, New Orleans, La.

Division of Ser. No. 209,883, Jun. 22, 1988, which is a continuation-in-part of Ser. No. 70,400, Jul. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 10,349, Feb. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 875,266, Jun. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 775,488, Sep. 12, 1985, abandoned. This application Feb. 17, 1989, Ser. No. 312,138
Int. Cl.[4] A61K 37/02; C07K 7/26
U.S. Cl. 514—11 11 Claims

1. An octapeptide of the formula:

D-X—Phe—



—Cys—Tyr—D-Trp—Lys—Val—Cys—L-beta-Nal—NH_2

wherein X is H, OH, CH_3, or a halogen, or a pharmaceutically acceptable salt thereof.

4,904,643

THYMUS DERIVATIVE ACTIVE AFTER ORAL ADMINISTRATION, METHODS OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS

Brunetto Brunetti, and Marco Prada, both of Milan, Italy, assignors to Ellem Industria Farmaceutica, s.r.l., Milan, Italy

Filed Jun. 11, 1987, Ser. No. 60,446
Claims priority, application Italy, Jul. 10, 1986, 21097 A/86
Int. Cl.[4] A61K 37/02; C07K 1/14, 3/02, 15/00
U.S. Cl. 514—21 16 Claims

1. A process for preparing a thymus derivative including the following steps:
(a) subjecting thymus tissue to a first treatment with an inorganic acid at about room temperature for 18 to 24 hours;
(b) increasing the temperature of the product under process to values ranging from 40° to 48° C. and maintaining said temperature for about 70–80 hours;
(c) subsequently increasing the temperature of the product to values ranging from 50° to 55° C. and maintaining said temperature for 70 to 80 hours;
(d) raising the pH of the obtained solution to values ranging from 4.3 to 4.8 and maintaining the solution at 75° to 85° C. for 30 minutes;
(e) filtering the solution to produce a first filtrate;

(f) adjusting the pH of said first filtrate to values ranging from 6.2 to 6.8;
(g) filtering said first filtrate to produce a second filtrate;
(h) adjusting the pH of said second filtrate to values ranging from 9.2 to 9.7;
(i) filtering said second filtrate to produce a third filtrate;
(j) adjusting the pH of said third filtrate to values ranging from 6.6 to 6.8;
(k) removing high molecular weight proteins from said third filtrate to produce a fourth filtrate having a protein content consisting essentially of proteins with a molecular weight of less than 10,000 daltons; and
(l) removing salts from said fourth filtrate.

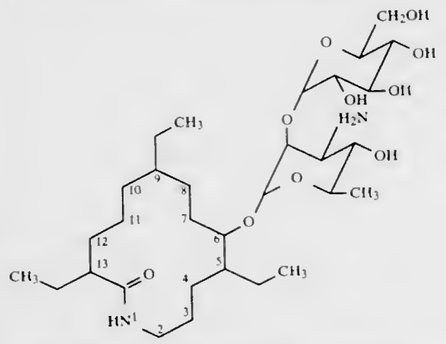
4,904,644

ANTIMICROBIAL COMPOUND ISOLATED FROM *ACTINOMADURA FULVA* SUBSP INDICA

Vinod R. Hedge, Rockaway; Ann C. Horan, Summit; Arthur H. King, East Orange; Frank A. Gentile, Wayne; Mahesh G. Patel, Verona, and Gerald H. Wagman, East Brunswick, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 3, 1988, Ser. No. 227,963
Int. Cl.[4] A61K *31/71;* **C07H** *17/08*
U.S. Cl. 514—29 **12 Claims**

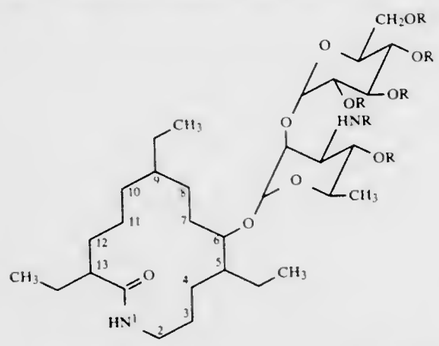
1. The compound represented by the formula 1:



in substantially chemically pure form, or a pharmaceutically acceptable salt thereof.

6. A method for treating a bacterial infection in a host having a susceptible bacterial infection which comprises administering to said host an antibacterially effective amount of the compound of claim 1 or a pharmaceutical composition thereof.

10. A compound represented by the formula 2:



wherein R is a straight or branched chain (C_1-C_{22}) alkanoyl group, a straight or branched chain (C_3-C_{22}) alkenoyl group or hydrogen with the proviso that at least one R is not hydrogen or a pharmaceutically acceptable salt thereof.

4,904,645

ENVIRONMENTALLY SAFE, BROAD SPECTRUM INSECTICIDE

George S. Puritch, Saanichton; Gregory S. Salloum, and Willem W. Nijholt, both of Victoria, all of Canada, assignors to Safer, Ltd., Scarborough, Canada

Filed Jan. 27, 1988, Ser. No. 148,961
Int. Cl.[4] A01N *37/00, 43/54, 47/10, 57/00*
U.S. Cl. 514—65 **10 Claims**

1. A readily biodegradeable, environmentally safe, storage stabilized, aqueous, insecticidal solution for application to decorative and crop plants, said solution being effective to control plant damage from a wide range of chewing and sucking insects, said composition consisting essentially of:
an aqueous solution having a pH between about 7.5 and 8.8 and containing the following ingredients in the following relative parts by weight:
A. between 30 and 50 parts of an aqueous solution comprising about 50 percent by weight of a mixture of monocarboxylic acids and the alkali metal salts thereof, said monocarboxylic acid mixture comprising at least 70 percent oleic acid and its alkali metal salts and at least 6 percent linoleic acid and its alkali metal salt;
B. between 1.0 and 2.0 parts of a pyrethrum extract comprising about 20 percent by weight of a mixture of isecticidally active substances selected from the group consisting of pyrethrin I, pyrethrin II, cinerin I, cinerin II, jasmolin I and jasmolin II;
C. between 3 and 20 parts of a solvent for said insecticidally active pyrethrum extract substances comprising a low molecular weight alcohol; and
D. a trace amount of an antioxidant,
said composition being effective on application to a plant at a dilution in water such that the applied solution contains at least about 0.5% by weight of said monocarboxylic acid mixture and at least 0.005% by weight of said mixture of said insecticidally active pyrethrum extract substances to provide protection against plant damage from infestation by insect species from the orders Homoptera, Coleoptera, Dermaptera, Hemiptera, and Lepidoptera, and from crustacea species from the order Isopoda.

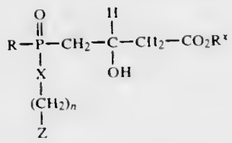
4,904,646

PHOSPHORUS-CONTAINING HMG-COA REDUCTASE INHIBITORS

Donald S. Karanewsky, East Windsor; Scott A. Biller, Ewing, and Eric M. Gordon, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

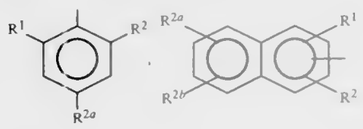
Continuation-in-part of Ser. No. 109,680, Oct. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 53,281, May 22, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 182,696
Int. Cl.[4] A61K *31/66;* **C07F** *9/30, 9/32*
U.S. Cl. 514—120 **22 Claims**

1. A compound of the structure

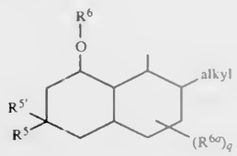


including salts thereof, wherein R is OH, lower alkoxy or lower alkyl;
R^x is H or lower alkyl:
X is —O— or —NH—;

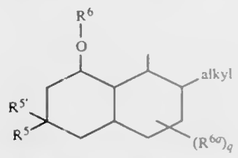
n is 1 or 2
Z is a hydrophobic anchor which is



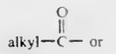
or



wherein the dotted lines represent optional double bonds,
wherein R^1, R^2, R^{2a} and R^{2b} may be the same or different and are H, halogen, lower alkyl, haloalkyl, phenyl, substituted phenyl or OR^Y in which R^Y is H, alkanoyl, benzoyl, phenyl, halophenyl, phenyl-lower alkyl, lower alkyl, cinnamyl, haloalkyl, allyl, cycloalkyl-lower alkyl, adamantyl-lower alkyl or substituted phenyl-lower alkyl;
wherein Z is



R^5 and $R^{5'}$ are the same or different and are H, lower alkyl or OH, one or R^5 and $R^{5'}$ being present when the carbon to which it is attached is linked to a double bond;
R^6 is



R^{6a} is lower alkyl, hydroxy, oxo or halogen, and q is 0, 1, 2 or 3,
wherein R^x is hydrogen or lower alkyl in free acid form or in the form of a physiologically-hydrolysable and -acceptable ester in salt form.

2. A method of inhibiting cholesterol biosynthesis which comprises administering to a patient in need of such treatment an effective cholesterol biosynthesis inhibiting amount of a compound as defined in claim 1.

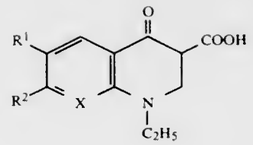
4,904,647

ANTIMICROBIAL PHARMACEUTICAL COMPOSITION

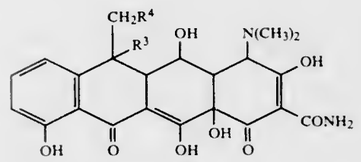
Gábor Kulcsár; Judit Frank; Péter Sárközy, and Katalin Kálóy, all of Budapest, Hungary, assignors to Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara Rt, Budapest, Hungary

Filed Jul. 20, 1988, Ser. No. 222,056
Claims priority, application Hungary, Jul. 20, 1987, 3335/87
Int. Cl.[4] A61K *31/65*
U.S. Cl. 514—154 **6 Claims**

1. A synergistic, antimicrobial pharmaceutical composition which comprises 0.01 to 50% by weight of a quinolinecarboxylic acid derivative or a naphthyridinecarboxylic acid derivative of the formula (I),



wherein
X is carbon or nitrogen;
R^1 is hydrogen or fluorine;
R^2 is methyl, piperazino or methylpiperazino group; or
R^1 and R^2 together are a methylenedioxy group; and 0.01 to 95% by weight of a tetracycline derivative of the formula (II),



wherein
R^3 and R^4 are hydrogen; or
R^3 and R^4 together represent an additional chemical bond, in 20:1 to 1:50 ratio of the compound of the formula (I) to the compound of the formula (II), optionally in an admixture with an amount required to 100% by weight of an inert, solid or liquid carrier.

4,904,648

PHARMACEUTICAL PREPARATIONS FOR INDUCTION OF LABOR AND FOR CONTRACEPTIVE USE

Klaus U. Weithmann, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 16, 1989, Ser. No. 311,257
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3805064
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—171 **16 Claims**

1. A pharmaceutical composition useful as a contraceptive and in the induction of labor comprising a therapeutically effective amount of at least one antigestagen and one or more long-chain fatty acids.

4,904,649

METHOD AND SOLUTION FOR TREATING GLAUCOMA

Bernard Schwartz, Boston, Mass., assignor to New England Medical Center Hospitals, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 866,605, May 23, 1986, abandoned. This application Mar. 27, 1987, Ser. No. 31,695
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—174 **5 Claims**

1. A method for treating elevated intraocular pressure in a mammalian eye comprising:
administering to the eye a therapeutically effective amount of a corticosteroid and a beta adrenergic agent,
said corticosteroid selected from the group consisting of dexamethasone having a concentration from 0.0005 to 0.01%, prednisolone having a concentration from 0.005 to 0.1%, hydrocortisone having a concentration from 0.0025 to 0.05%, cortisone having a concentration from 0.0125 to 0.25%, fluorometholone having a concentration from 0.0005 to 0.01%, betamethasone having a concentration

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from 0.0005 to 0.01%, methyl prednisolone having a concentration from 0.04 to 0.8%, triamcinolone having a concentration of 0.0005 to 0.01% and their physiologically acceptable salts;

said beta adrenergic agent selected from the group consisting of epinephrine having a concentration from 0.05 to 0.1%, cartelol having a concentration ranging fron 0.1 to 0.4%, dipivalyl epinephrine having a concentration from 0.01 to 0.02%, betaxolol having a concentration from 0.05 to 0.1%, timolol having a concentration from 0.025 to 0.1%, levobunolol having a concentration from 0.05 to 0.1% and their physiologically acceptable salts;

the concentration of said corticosteroid and said beta adrenergic agent being selected to produce a prolonged decrease in intraocular pressure while minimizing undesirable side effects of said corticosteroid and said beta adrenergic agent.

4,904,650

SUBSTITUTED ANDROSTA-1,4-DIENE-3,17-DIONES

Franco Buzzetti, Monza; Natale Barbugian, Milan; Paolo Lombardi, Milan, and Enrico di Salle, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Division of Ser. No. 882,364, Jul. 7, 1986, Pat. No. 4,808,616. This application Jul. 26, 1988, Ser. No. 225,674

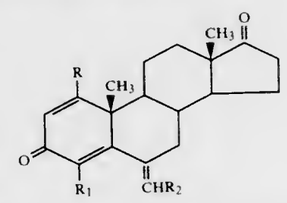
Claims priority, application United Kingdom, Jul. 9, 1985, 8517360

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[4] A61K *31/56;* **C07J** *9/00*

U.S. Cl. 514—177 8 Claims

1. A compound of general formula (I)



(I)

wherein

each of R and R_2, independently, is hydrogen or C_1-C_6 alkyl and R_1 is hydrogen, halogen or C_1-C_6 alkyl.

4,904,651

ANXIOLYTIC 4-AMINOQUINOLINE-3-CARBOXAMIDES

Edward J. Warawa, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

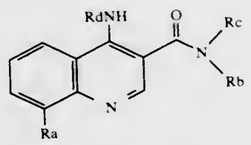
Continuation of Ser. No. 43,843, Apr. 29, 1987, abandoned. This application Aug. 3, 1988, Ser. No. 227,761

Claims priority, application United Kingdom, May 6, 1986, 8610981

Int. Cl.[4] A61K *31/47;* **C07D** *215/54, 401/02, 401/14*

U.S. Cl. 514—183 8 Claims

1. A compound of formula I



wherein

Ra is selected from the group consisting of (1-10C)alkyl, (3-10C)cycloalkyl, (4-10C)cycloalkylalkyl, (2-10C)alkenyl, (2-10C)alkynyl, (6-10C)aryl, (7-12C)arylalkyl, (1-10C)haloalkyl having one to five halo group(s) wherein the halo group(s) is selected from chloro and fluoro, (2-10C)hydroxyalkyl, (4-10C)hydroxycycloalkylalkyl, and thienyl wherein the thienyl is optionally substituted by (1-5C)alkyl;

Rb and Rc may be the same or different and are each independently selected from the group consisting of hydrogen, (1-10C)alkyl, (3-10C)cycloalkyl, (4-10C)cycloalkylalkyl, (2-10C)alkenyl, (2-10C)alkynyl, (2-10C)alkoxyalkyl, (2-10C)hydroxyalkyl, (3-10C)hydroxycycloalkyl, (4-10C)hydroxycycloalkylalkyl, (2-10C)haloalkyl having one to five halo group(s) wherein the halo group(s) is selected from chloro and fluoro, (3-6C)haloalkenyl having one to five halo group(s) wherein the halo group is selected from chloro and fluoro, phenyl and benzyl;

or Rb and Rc taken together form a (3-10C)alkylene and together with the nitrogen to which they are attached form a ring;

Rd is selected from the group consisting of hydrogen, (1-6-C)alkyl and (1-6C)alkanoyl; and

pharmaceutically acceptable acid addition salts thereof.

4,904,652

7-ACYLAMINO-3-SUBSTITUTED CEPHALOSPORANIC ACID DERIVATIVES

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 206,831, Nov. 14, 1980, Pat. No. 4,409,215, and a continuation of Ser. No. 489,236, Apr. 28, 1983, abandoned. This application Oct. 9, 1985, Ser. No. 785,048

Claims priority, application United Kingdom, Nov. 19, 1979, 7939985; Feb. 8, 1980, 8004335; Apr. 21, 1980, 8012991

Int. Cl.[4] C07D *501/36;* **A61K** *31/545*

U.S. Cl. 514—206 3 Claims

1. A compound which is 7[2-(2-aminothiazol-4-yl)-2-methoxyiminoacetamido]-3-methylthiomethyl-3-cephem-4-carboxylic acid or carboxylic ester thereof, or a pharmaceutically acceptable salt thereof.

4,904,653

THIENO[2,3-O]AZEPINE COMPOUNDS AND CNS AFFECTING USE THEREOF

Barry P. Clark, Lower Froyle, and David E. Tupper, Reading, both of England, assignors to Lilly Industries Limited, Basingstoke, United Kingdom

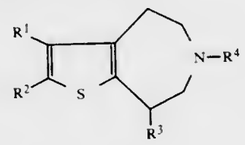
Filed Jan. 6, 1989, Ser. No. 293,917

Claims priority, application United Kingdom, Jan. 15, 1988, 8800891

Int. Cl.[4] C07D *495/04;* **A61K** *31/38*

U.S. Cl. 514—215 8 Claims

1. A compound of the formula



(I)

in which:

R^1 is hydrogen, hydroxy, nitro, cyano, halo, amino, acetamido, hydroxy-C_{1-4} alkyl, carboxaldehydo, C_{1-4} alkylcarbonyl, carboxy, C_{1-4} alkoxy-carbonyl, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} alkylsulphonyl or C_{1-4} alkoxy-C_{1-4} alkyl;

R^2 is hydrogen, hydroxy, nitro, cyano, halo, amino, carboxamido, acetamido, hydroxy-C_{1-4} alkyl, carboxaldehydo, C_{1-4} alkylcarbonyl, carboxy, C_{1-4} alkoxycarbonyl, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} alkylsulphonyl, C_{1-4} alkoxy-C_{1-4} alkyl, oximino or aminomethyl;

R^3 is naphthyl, benzofuranyl, dihydrobenzofuranyl, benzothienyl, chromanyl, chromenyl, indolyl, indolinyl, indanyl, indenyl, 1,2,3,4-tetrahydronaphthyl, dihydronaphthyl, or quinolinyl, each of which may be substituted with halogen, hydroxy, or C_{1-4} alkoxy;

or R^3 is phenyl optionally substituted with one or more substituents selected from the group consisting of nitro, cyano, amino, hydroxyl, trifluoromethyl, C_{1-4} alkyl, C_{1-4} alkoxy, and halo;

R^4 is hydrogen, C_{1-4} alkyl, or C_{2-4} alkenyl;

or R^4 is benzyl optionally substituted on the phenyl nucleus with one or more substituents selected from the group consisting of nitro, cyano, amino, hydroxyl, trifluoromethyl, C_{1-4} alkyl, C_{1-4} alkoxy, and halogen;

or a salt thereof.

8. A method of treating a mammal, including a human, suffering from or susceptible to a disease of the central nervous system which comprises administering an effective amount of a compound as defined in claim 1, or a pharmaceutically-acceptable salt thereof.

4,904,654

7-CHLORO-5,6-DIHYDRO-3-(5-(2-HYDROXY-ISOPROPYL)-1,2,4-OXADIAZOL-3-YL)-5-METHYL-6-OXO-4H-IMIDAZO[1,5A][1,4]BENZODIAZEPINE

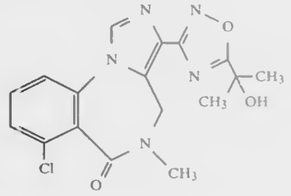
Jiunn H. Lin, Ambler; Steven M. Pitzenberger; Harri G. Ramjit, both of Lansdale, and Edgar H. Ulm, Green Lane, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 26, 1989, Ser. No. 385,039

Int. Cl.[4] C07D *487/04;* **A01K** *31/55*

U.S. Cl. 514—220 3 Claims

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof.

4,904,655

NOVEL INDOLO [3,2,1-DE] [1,4] OXAZINO [2,3,4-IJ] [1,5] NAPHTHYRIDINE-1-CARBOXYLIC ACID DERIVATIVES

Nurgün Aktoğu, Le Plessis Robinson; Francoise Delevallee, Fontenay Sous Bois; Francois Clemence, and Claude Oberlander, both of Paris, all of France, assignors to Roussel Uclaf, Paris, France

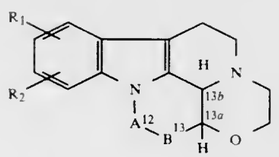
Filed Jan. 26, 1989, Ser. No. 302,810

Claims priority, application France, Jan. 26, 1988, 88 00840

Int. Cl.[4] C07D *413/04;* **A61K** *31/435*

U.S. Cl. 514—229.5 21 Claims

1. A compound selected from the group consisting of all possible racemic or optically active forms of compounds of the formula

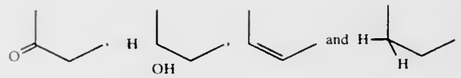


t

wherein R_1 and R_2 are individually selected from the group consisting of hydrogen, halogen alkyl and alkoxy of 1 to 5 carbon atoms, -OH, $-CF_3$ and $-NO_2$ and



is selected from the group consisting of



and their non-toxic, pharmaceutically acceptable acid addition salts.

4,904,656

2-AMINOMETHYLTETRAHYDROFURANS, FUNGICIDAL COMPOSITIONS AND USE

Joachim Weissmuller, Monheim; Dieter Berg, Wuppertal; Stefan Dutzmann, Duesseldorf, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

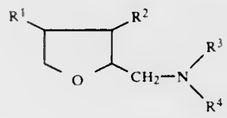
Filed Jan. 25, 1988, Ser. No. 148,395

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703876; Sep. 17, 1987, 3731198

Int. Cl.[4] A01N *43/08, 43/84;* **C07D** *307/14, 413/06*

U.S. Cl. 514—231.5 10 Claims

1. A 2-aminomethyltetrahydrofuran of the formula



in which

R^1 is phenyl substituted by F, mono- and di-Cl, t-butyl or CF_3,

R^2 is hydrogen or methyl, and

R^3 and R^4 together with the nitrogen atom to which they are bonded form a dialkyl substituted piperidine or morpholine ring, or

R^3 is lower alkyl and R^4 is furylmethyl,

or an acid addition salt thereof.

8. A fungicidal composition comprising a fungicidally effective amount of a compound or salt according to claim 1 and a diluent.

4,904,657

4H-QUINOLIZIN-4-ONE COMPOUNDS EXHIBITING THERAPEUTIC ACTIVITIES

Yoshikazu Kurashina; Hiroshi Miyata, and Den-ichi Momose, all of Matsumoto, Japan, assignors to Kissei Pharmaceutical Co., Ltd., Japan

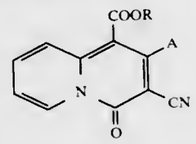
Filed Sep. 15, 1988, Ser. No. 244,269

Claims priority, application Japan, Sep. 24, 1987, 62-239240; Dec. 4, 1987, 62-307090

Int. Cl.[4] C07D *213/60*

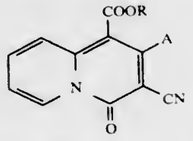
U.S. Cl. 514—233.2 **4 Claims**

1. A method for the treatment of allergic bronchial asthma, allergic rhinitis, atopic dermatitis and hypersensitiveness diseases associated with immunoglobulin E-antibody formation in a mammal which comprises administering an effective dosage from about 0.1 mg to 10 mg per kg of mammal weight by oral administration of from about 0.02 mg to 5 mg per kg of mammal weight by parenteral administration per day of an immunoglobulin E-antibody formation-inhibiting 4H-quinolizin-4-one compound to the mammal; wherein the 4H-quinolizin-4-one compound corresponds to the formula:



where R is an alkyl group or a phenylalkyl group; A is a substituted or unsubstituted phenyl group or a substituted or unsubstituted 5 or 6 membered heterocyclic group; with the proviso that the heterocyclic group is bonded to the quinolizine ring at a nitrogen atom of the heterocyclic ring; or a pharmaceutically acceptable salt thereof.

2. A method for the treatment of allergic bronchial asthma, allergic rhinitis, atopic dermatitis and hypersensitiveness diseases associated with immunoglobulin E-antibody formation in a mammal which comprises administering an effective dosage from about 0.1 mg to 10 mg per kg of mammal weight by oral administration or from about 0.02 mg to 5 per kg of mammal weight by parenteral administration per day of an immunoglobulin E-antibody formation-inhibiting 4H-quinolizin-4-one compound to the mammal; wherein the 4H-quinolizin-4-one compound corresponds to the formula:



where R is an alkyl group or a phenylalkyl group; Ar is a substituted or unsubstituted phenyl group; or a pharmaceutically acceptable salt thereof.

4,904,658

SUBSTITUTED-6H,8H-PYRIMIDO-[1,2,3-CD]PURINE-8,10-(9H)-DIONES AND SUBSTITUTED-6H,10H-PYRIMIDO[1,2-CD]PURIN-10-ONES

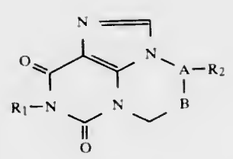
Sbin S. Tseng, Bridgewater, N.J.; Joseph W. Epstelo, Monroe, and Jeremy I. Levin, Spring Valley, both of N.Y., assignors to American Cyanamid Company, Wayne, N.J.

Filed Apr. 15, 1988, Ser. No. 181,845

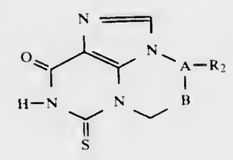
Int. Cl.[4] A61K *31/505*; C07D *487/16*

U.S. Cl. 514—233.2 **17 Claims**

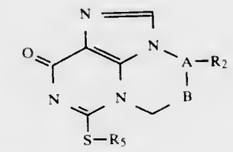
1. Compounds of the formulae:



(I)



(II)

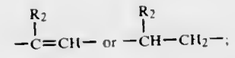


(III)

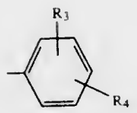
wherein the structure



may be



R_1 is hydrogen, alkyl(C_1-C_6), carbamylmethyl, benzyl or p-nitrobenzyl; R_2 is 3-pyridinyl or a moiety of the formula:



wherein R_3 and R_4 are each individually selected from the group consisting of hydrogen, halogen, alkyl(C_1-C_3), nitro, alkoxy(C_1-C_3), 4-morpholinyl and trifluoromethyl; and R_5 is alkyl(C_1-C_3).

13. A method of treating cognitive and related neural behavioral problems in warm-blooded animals which comprises administering internally to said warm-blooded animal an effective amount of a compound of claim 1.

14. A method of meliorating anxiety in a warm-blooded animal which comprises administering internally to said warm-blooded animal an effective anti-anxiety amount of a compound of claim 1.

15. A method of lowering elevated blood pressure in a mammal which comprises administering to said mammal an effective hypotensive amount of a compound of claim 1.

4,904,659

SUBSTITUTED QUINOLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF

Graham J. Atwell; Bruce C. Baguley; William A. Denny, and Gordon W. Rewcastle, all of Auckland, New Zealand, assignors to Development Finance Corporation of New Zeland, Wellington, New Zealand

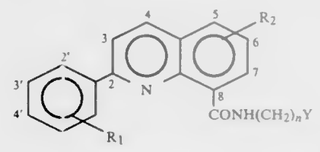
Continuation of Ser. No. 877,556, Jun. 23, 1986, abandoned. This application Oct. 28, 1988, Ser. No. 266,243

Claims priority, application Netherlands, Jun. 24, 1985, 212525

Int. Cl.[4] C07D *215/48, 403/06*; A61K *31/47, 31/535*

U.S. Cl. 514—235.2 **5 Claims**

1. A compound represented by the general formula (I)



(I)

where each of R_1 and R_2 separately represents H or up to three of the groups lower alkyl, halogen, CF_3, CN, SO_2CH_3, NO_2, OH, NH_2, $NHSO_2R_3$, $NHCOR_3$, $NHCOOR_3$, OR_3, SR_3, NHR_3 or NR_3R_3 (where R_3 is lower alkyl optionally substituted with hydroxy, amino or ether functions), and R_1 may additionally represent the substitution of an aza (—N=) group for one of the methine (—CH=) groups in the carbocyclic ring and R_1 may also represent, at positions 2', 3' or 4' only, a phenyl ring optionally further substituted with lower alkyl, halogen, CF_3, CN, SO_2CH_3, NO_2, OH, NH_2, $NHCOR_3$, $NHCOOR_3$, OR_3, SR_3, NHR_3 or NR_3R_3 (where R_3 is lower alkyl optionally substituted with hydroxy, amino or ether functions);

Y represents $C(NH)NH_2$, $NHC(NH)NH_2$ or NR_4R_5, where each of R_4 and R_5 is H or lower alkyl optionally substituted with hydroxy, amino or ether functions, or R_4 and R_5 together with the nitrogen atom form a morpholino ring; and

n is from 2 to 6,

or an pharmaceutically acceptable acid addition salt or 1-N-oxide thereof.

5. A pharmaceutical composition which comprises at least one compound of the general formula (I) defined in claim 1, or a pharmaceutically acceptable acid addition salt or 1-N-oxide thereof, and one or more pharmaceutically acceptable carriers or diluents.

4,904,660

HISTIDINE DERIVATIVES AS SUPERIOR RENIN INHIBITORS

Kohji Nakano; Takashi Fujikura, both of Saitama; Ryuichiro Hara, Tokyo; Masato Ichihara, Tokyo; Yukiko Fukunaga, Tokyo, and Masayuki Shibasaki, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

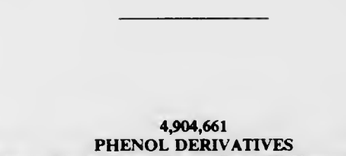
Filed Feb. 25, 1988, Ser. No. 160,173

Claims priority, application Japan, Feb. 27, 1987, 62-46454; May 12, 1987, 62-115144; Aug. 18, 1987, 62-206146; Nov. 16, 1987, 62-289017

Int. Cl.[4] A61K *31/38, 31/40, 31/41, 31/415*; C07D *417/00, 253/00, 413/00, 401, 100, 285/12, 285/14, 513/00, 233/64*

U.S. Cl. 514—236.2 **10 Claims**

1. A compound of the formula (I)



(I)

wherein R_1 is a lower alkoxycarbonyl group, a lower alkoxycarbonylamino group, a group of the formula: —$(CH_2)_n$—A—R^a wherein n is an integer of 1 or 2; A is a single bond, a lower alkylene group which may be substituted by a hydroxy group (s), or a carbonyl group, R^a is a cyano group, a lower alkyl group, a lower alkynyl group, a cycloalkyl, a cylcoalkylidene group, a hydrocarbyl aryl group, an aryloxy group which may be substituted by at least one halogen atom, or a 5 or 6 membered heterocyclic ring group wherein the heteroatoms are at least one of oxygen, nitrogen and sulfur, which groups may be substituted by at least on amino group, or a group of the formula: —CONH—B—R^b wherein B is a single bond, or a lower alkylene; R^b is a hydroxyl group, an aryl group, or a heterocyclic group; R_2 is a phenyl group or a naphthyl group; R_3 is a lower alkyl group, cyclohexyl group, or a phenyl group; R_4 is a nitromethyl group, a group of the formula: —$COOR^c$ wherein R^c is a lower alkyl group; or a group of the formula:



wherein n is zero or an integer of 1 or 2; R^d is a 5 or6 membered heterocyclic ring group wherein the heteroatoms are at least one of oxygen, nitrogen and sulfur which groups may be substituted by at least one lower alkyl group, a carbamoyl-lower-alkyl group (s), or a hydroxy-lower-alkyl group; and R^5 is a hydrogen atom or a lower alkyl group.

5. A pharmaceutical composition useful as an anti-hypertensive agent comprised of an anti-hypertensive effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

4,904,661

PHENOL DERIVATIVES

William R. Pilgrim, Reims, France; Derek W. Young, Wilmslow, United Kingdom; Brian S. Tait; Graham C. Crawley, both of Macclesfield, United Kingdom; Philip N. Edwards, Bramhall, United Kingdom, and George B. Hill, Sandbach, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 604,964, Apr. 27, 1984, Pat. No. 4,732,912. This application Dec. 16, 1987, Ser. No. 134,320

Claims priority, application United Kingdom, Apr. 28, 1983, 8311678

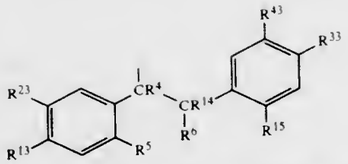
Int. Cl.[4] A61K *31/535*; C07D *295/18*

U.S. Cl. 514—237.5 **9 Claims**

1. A phenol derivative of the formula:

NU—A—X—R^1

where NU is a bis-phenolic nucleus of the general formula



wherein one of R^{13} and R^{23}, and one of R^{33} and R^{43}, has the formula R^3O—, wherein each R^3, which may be the same or different, is hydrogen or alkyl, cycloalkyl, alkanoyl, alkoxycarbonyl, carboxyalkanoyl or aroyl each of up to 10 carbon atoms, and wherein the other of R^{13} and R^{23}, and the other of R^{33} and R^{43}, is hydrogen;

wherein R^4 and R^{14}, which may be the same or different, each is hydrogen or alkyl of up to 5 carbon atoms, or R^4 and R^{14} are joined together so that CR^4 —CR^{14} is an olefinic double bond;

wherein R^5 and R^6 together form a direct link or —CH_2—, —$CH(CH_3)$—, —CH_2CH_2—, —$(CH_2)_3$— or —CH=CH— and R^{15} is hydrogen;

wherein A is straight- or branched-chain alkylene, alkenylene or alkynylene each of from 4 to 12 carbon atoms; or A has the formula:

$$—A^1—Y^3—A^{21}—$$

wherein A^1 is alkylene or alkenylene and A^{21} is a direct link or alkylene, alkenylene or cycloalkylene, such that A^1 and A^{21} together have a total of 2 to 10 carbon atoms, and Y^3 is phenylene or naphthylene which is unsubstituted or substituted with one or more halogen or methyl or ethyl substituents;

wherein R^1 is alkyl, alkenyl, cycloalkyl or halogenoalkyl each of up to 10 carbon atoms, phenyl, chlorophenyl, o-ethylphenyl, p-cyanophenyl, p-hydroxyphenyl, p-methoxyphenyl, alkyl of 1 to 3 carbon atoms which bears a phenyl, tolyl, halogenophenyl or trifluoromethylphenyl substituent, α-methylbenzyl, 3,4-dichlorobenzyl, p-cyanobenzyl or p-methylthiobenzyl, or R^1 is joined to R^2 as defined below; and

wherein X is —$CONR^2$—, —$CSNR^2$—, —$NR^{12}CO$— or —$NR^{12}CS$—, wherein R^2 is hydrogen or alkyl of up to 6 carbon atoms, or R^1 and R^2 together form alkylene such that, with the adjacent nitrogen atom, they form a heterocyclic ring of 5 to 7 ring atoms, one of which may be a second heterocyclic atoms selected from oxygen, sulphur and nitrogen; and

wherein R^{12} is hydrogen or alkyl of up to 6 carbon atoms;

or a pharmaceutically-acceptable salt of a compound wherein R^3 is carboxyalkanoyl.

7. A pharmaceutical composition having antioestrogenic activity comprising an effective amount of a phenol derivative, claimed in claim 1, together with a pharmaceutically acceptable diluent or carrier.

4,904,662

RAISING OF PIGS

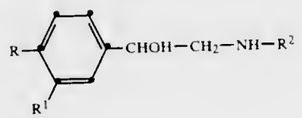
David B. Andersoo, and Edward L. Veenhuizen, both of Greenfield, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 901,908, Aug. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 802,541, Nov. 27, 1985, abandoned. This application Mar. 23, 1987, Ser. No. 29,024

Int. Cl.⁴ A61K *31/535, 31/275, 31/16*

U.S. Cl. 514—237.8 **20 Claims**

1. A method of increasing the triglyceride content of the colostrum or milk of a lactating sow which comprises administering to said sow, at a time from about 3 days before farrowing to about 10 days after farrowing, a milk-fat-increasing amount of a compound of the formula



wherein:

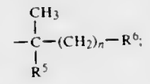
R is hydrogen, hydroxy, methoxy or amino;

R^1 is hydrogen, cyano or NR^3R^4;

R^3 is hydrogen or methyl;

R^4 is hydrogen, methyl, formyl or —$COCH^2NHCHO$;

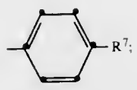
R^2 is C_2-C_4 alkyl or



R^5 is hydrogen or methyl;

n is 1 or 2;

R^6 is morpholino or



R^7 is hydrogen, hydroxy, fluoro, nitro, carbamoyl or methoxy;

provided that:

R and R^7 are not both hydrogen;

R^7 is not hydroxy when R is hydrogen;

R is hydrogen or amino when R^1 is cyano;

R is hydrogen, hydroxy or methoxy when R^1 is hydrogen;

R^2 is not C_2-C_4 alkyl when R^1 is hydrogen;

R is not methoxy when R^2 is alkyl, when R^6 is morpholino, or when R^7 is hydrogen, fluoro, nitro or methoxy;

or a physiologically acceptable acid addition salt thereof.

4,904,663

N-(2-OXPYRROLIDIN-1-YL-)ACETYL)PIPERAZINE DERIVATIVES AND DRUG FOR SENILE DEMENTIA

Hiromu Matsumura, Hyogo; Hiroshi Hashizume, Osaka; Akira Matsushita, Hyogo, and Masami Eigyo, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

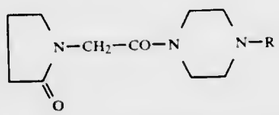
Filed Jul. 15, 1988, Ser. No. 221,450

Claims priority, application Japan, Jul. 15, 1987, 62-178064

Int. Cl.⁴ A61K *31/495;* **C07D** *403/06, 401/14, 403/14*

U.S. Cl. 514—252 **18 Claims**

1. A compound of the formula



(I)

wherein R is —SO_2R^1 or —$CONHR^2$; R^1 is methyl, ethyl, isopropyl, n-butyl, dimethylamino, pyridyl, thienyl, phenylethenyl, or naphthyl; and R^2 is methyl, n-butyl, fluorophenyl, metoxyphenyl, naphthyl or amino.

4,904,664

BENZENE COMPOUNDS HAVING TWO PYRIDAZINONE SUBSTITUENTS

Hunter D. Prain, and Brian H. Warrington, both of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, United Kingdom

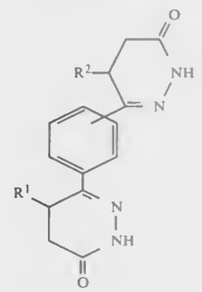
Filed Jul. 1, 1986, Ser. No. 880,849

Claims priority, application United Kingdom, Jul. 5, 1985, 8517051; Mar. 20, 1986, 8606853

Int. Cl.⁴ C07D *401/10;* **A61K** *31/50*

U.S. Cl. 514—252 **18 Claims**

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein

R^1 is hydrogen or methyl;

R^2 is hydrogen or methyl;

and represent double or single bonds; and the benzene ring is para- or meta-substituted.

13. A method for effecting phosphodiesterase (type III) inhibition in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

18. A method for stimulating cardiac activity in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

4,904,665

BENZYLAMINOARYL-DIHYDROPYRIDINELACTONES AND THEIR USE IN MEDICAMENTS

Siegfried Goldmann; Rainer Gross; Martin Bechem, all of Wuppertal; Michael Kayser, Hagen; Matthias Schramm, Cologne, and Siegbert Hebisch, Oberhausen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

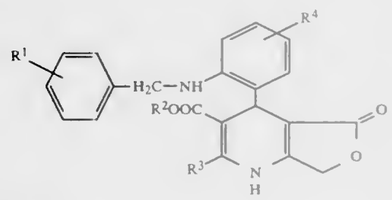
Filed Feb. 18, 1988, Ser. No. 158,184

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706204

Int. Cl.⁴ A61K *31/44;* **C07D** *491/048*

U.S. Cl. 514—256 **7 Claims**

1. A benzylaminoaryl-dihydropyridinelactone compound of the formula (I)



(I)

in which

R^1 represents hydrogen, halogen, cyano, nitro, C_6-C_{12}-aryl, C_1-C_8-alkyl, C_1-C_8-alkoxy, C_1-C_6-alkylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, difluoromethoxy, di-C_1-C_5-alkylamino, C_1-C_6-alkoxycarbonyl or C_1-C_6-alkylsulphonyl,

R^2 represents hydrogen, or represents a straight-chain, branched or cyclic, saturated or unsaturated hydrocarbon radical having up to 10 carbon atoms which is optionally substituted by C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulphonyl, halogen, cyano, hydroxyl, pyridyl, thienyl, pyrimidyl, piperidinyl, phenyl or an amino group, where the amino group carries two identical or different substituents selected from the group consisting of C_1-C_5-alkyl, phenyl and benzyl,

R^3 represents C_1-C_5-alkyl, or represents cyano, hydroxymethyl or formyl, and

R^4 represents hydrogen, halogen, C_1-C_5-alkyl or trifluoromethyl,

in the form of its diastereomers, diastereomeric mixtures, racemates or optical antipodes, and physiologically acceptable salts thereof.

4,904,666

PYRAZOLO(3,4-D)PYRIMIDINE COMPOUNDS, COMPOSITIONS AND METHOD OF USE

Walter-Gunar Friebe, Mannheim; Wolfgang Kampe, Heddesheim, and Otto-Henning Wilhelms, Weinheim-Rittenweier, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

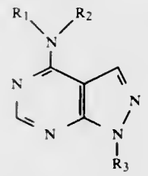
Filed Apr. 14, 1988, Ser. No. 181,729

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712735

Int. Cl.⁴ C07D *487/04;* **A61K** *31/505*

U.S. Cl. 514—258 **21 Claims**

1. Pyrazolo (3,4-d]pyrimidines of the formula:



(I)

wherein

R_1 is a C_1 to C_6-alkyl, a C_2 to C_6-alkenyl, a C_3 to C_7-cycloalkyl or a naphthyl or phenyl,

R_2 is a C_2 to C_6-alkenyl, a C_3 to C_7-cycloalkyl or an unsubstituted or substituted phenyl-C_1-C_6-alkyl or hetero-C_1-C_6-alkyl wherein the hetero radical is a 5 or 6 membered ring selected from the group consisting of furyl, thienyl and pyridinyl and wherein said substituted phenyl-C_1-C_6-alkyl or hetero-C_1-C_6-alkyl is substituted from the group consisting of halogen, C_1 to C_6-alkyl, hydroxyl, C_1 to C_6-alkoxy, C_1 to C_3-haloalkyl, C_3 to C_7-alkoxycarbonyl, aminocarbonyl, C_2 to C_7-alkylaminocarbonyl, C_3 to C_{13}-dialkylaminocarbonyl, cyano and C_1 to C_6-alkylthio, and

R_3 is hydrogen or is an unsubstituted C_2 to C_6-alkyl or is a substituted C_2-C_6 alkyl substituted at least once by hydroxyl or is a tetrahydrofuranyl or tetrahydropyranyl,

with the proviso that R_2 cannot be an unsubstituted benzyl wherein R_1 is methyl and the physiologically acceptable salts thereof with inorganic and organic acids and the racemic or optically active forms thereof.

VOL 1111 ISS 4 FE 27 1990 UMI

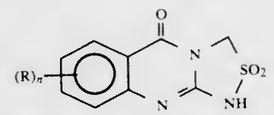
4,904,667

1H-1,2,4-THIADIAZOLO(3,4-B)QUINAZOLIN-5-ONE-2,2-DIOXIDES, AND A METHOD FOR INCREASING THE CARDIAC OUTPUT OF A MAMMAL WITH THEM

James P. Demers, New York, N.Y., and Richard B. Sulsky, Somerville, N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Feb. 24, 1989, Ser. No. 315,063
Int. Cl.[4] A61K *31/505;* **C07D** *513/04*
U.S. Cl. 514—267 **11 Claims**

1. A 1H-1,2,4-thiadiazolo[3,4-b]quinazoline-5-one-2,2-dioxide of the Formula:



wherein each R individually represents halogen, hydroxyl, lower alkyl, OR^1, wherein R^1 represents lower alkyl which may be substituted by $R^2R^3N—CO—$ wherein R^2 and R^3 individually represent lower alkyl or cycloalkyl, nitro, amino which may be substituted by R^1 wherein R^1 is as described above, or $R^1S(O)_x$ wherein R^1 is as described above and wherein x represents a number having a value of from 0 to 2, and wherein n represents a number having a value of from 0 to 4.

10. A method for increasing the cardiac output of a mammal which comprises administering to a mammal an effective dose of a compound of claim **1**.

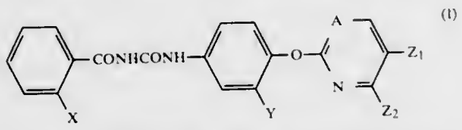
4,904,668

BENZOYL UREA COMPOUND

Nobuo Kondo, Daito; Masahiro Kikuchi, Mino; Tsunetaka Nakajima, Kashiwara; Masahiro Watanabe, Akashi; Kazumasa Yokoyama, Toyonaka; Takahiro Haga, Kusatsu; Nobutoshi Yamada; Hideo Sugi, both of Moriyama, and Toru Koyanagi, Kyoto, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd. and The Green Cross Corporation, both of Osaka, Japan

Filed Sep. 25, 1987, Ser. No. 101,005
Claims priority, application Japan, Sep. 29, 1986, 61-230520; Jun. 30, 1987, 62-164496
Int. Cl.[4] C07D *239/34;* **A61K** *31/505*
U.S. Cl. 514—274 **9 Claims**

1. A benzoyl urea compound have the formula:



wherein X is a halogen atom, a nitro group or a trifluoromethyl group, provided that when Y is a nitro group, X is a halogen atom or a nitro group, Y is a hydrogen atom, a halogen atom, a nitro group or a trifluoromethyl group, Z_1 is a halogen atom or a trifluoromethyl group, Z_2 is a hydrogen atom or a halogen atom, and A is a nitrogen atom, characterized in that its average particle size is not larger than 1 μm.

4. An antitumor composition comprising an effective amount of the benzoyl urea compound according to claim **1**, which is suspended in an aqueous solution containing a dispersant.

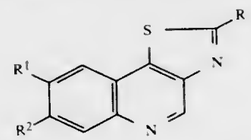
4,904,669

THIAZOLO/4,5-C/QUINOLINES AS MAJOR TRANQUILIZERS

József Knoll; Edit Berényi née Poldermann; Katain Budainée Simonyi; Berta Knoll; Zsuzsa Fürts; Julia Timár; Gabriella Zsila; Ildikó Niklya; Lujza Petocz, and Attila Mándi, all of Budapest, Hungary, assignors to EGIS Gyogyszergyar, Budapest, Hungary

Filed Nov. 12, 1986, Ser. No. 929,353
Claims priority, application Hungary, Nov. 12, 1985, 4304/85
Int. Cl.[4] A61K *31/47;* **C07D** *513/04*
U.S. Cl. 514—293 **9 Claims**

1. A thiazolo[4,5-c] quinoline derivative of the formula I



(I)

wherein

R stands for hydrogen; a straight or branched chained alkyl group having 2–5 carbon atoms optionally substituted by one or more halogen atom(s); trifluoromethyl; phenyl or phenyl-(lower alkyl) optionally bearing one or more halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, hydroxy, nitro or amino substituent(s) on the phenyl ring;

R^1 and R^2 are identical or different and stand for hydrogen, halogen or, lower alkyl

or methoxy or an acid addition salt thereof.

5. A pharmaceutical composition having major tranquilizing properties comprising: as active ingredient in a therapeutically effective amount at least one compound of the formula I as defined in claim **1** or a pharmaceutically acceptable acid addition salt thereof in admixture with a pharmaceutically acceptable carrier.

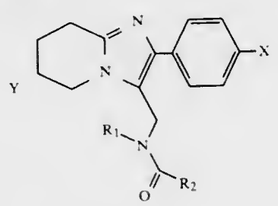
4,904,670

PYRIDINE DERIVATIVES HAVING ANXIETY STATE OR SLEEP THEREAPEUTIC PROPERTIES

Pascal George, Vitry sur Seine, and Claudie Giron, Antony, both of France, assignors to Synthelabo, Paris, France

Filed May 19, 1988, Ser. No. 196,621
Claims priority, application France, May 21, 1987, 87 07125
Int. Cl.[4] A61K *31/445;* **C07D** *471/02*
U.S. Cl. 514—300 **4 Claims**

1. A compound of formula



(I)

in which:

X is hydrogen or a halogen, a C_1–C_4 alkoxy group or a C_1–C_6 alkyl group;

Y is hydrogen or a methyl group;

R_1 is a C_1–C_4 alkyl group; and

R_2 is a C_1–C_6 alkyl group;

or an addition salt thereof with a pharmacologically acceptable acid.

4. A method of treatment of a subject suffering from convulsing anxiety states or sleep disorders or liable to suffer

therefrom, which comprises administering to the subject an effective amount of the compound as defined in claim **1**.

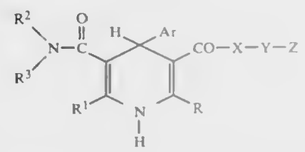
4,904,671

DIHYDROPYRIDINE ANTIALLERGIC AND ANTIINFLAMMATORY AGENTS

Kelvin Cooper, Deal, United Kingdom, assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 15, 1989, Ser. No. 311,317
Claims priority, application United Kingdom, Feb. 25, 1988, 8804439
Int. Cl.[4] A61K *31/44;* **C07D** *471/04*
U.S. Cl. 514—303 **5 Claims**

1. A compound of the formula



(I)

or a pharmaceutically acceptable salt thereof; wherein Ar is chlorophenyl, dichlorophenyl, difluorophenyl, hydroxyphenyl or benzyloxyphenyl; R is alkyl having one to four carbon atoms, phenyl or fluorophenyl; R^1 is alkyl having one to four carbon atoms or phenyl; R^2 is alkyl having one to four carbon atoms or pyridyl; R^3 is hydrogen; X is O or NH; Y is $—(CH_2)_m—$ where m is 4 or 5 or



where n is 1 or 2 and p is 0 or 1; and Z is 2-methylimidazo[4,5-c]pyrid-1-yl, 1-methylimidazo[4,5 -c]pyrid-2-yl, 2-methylbenzimidazol-1-yl or 3,5-dimethyl-1,2,4-triazol-4-yl.

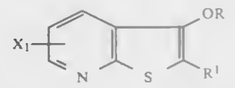
4,904,672

DERIVATIVES OF 3-HYDROXYAZABENZO[B]THIOPHENE USEFUL AS 5-LIPOXYGENASE INHIBITORS

Robert K. Baker; Kathleen M. Rupprecht, both of Cranford; Arsenio A. Pessolano, Colonia, and Philippe L. Durette, New Providence, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 8,881, Jan. 30, 1987, Pat. No. 4,767,766.
This application Apr. 28, 1988, Ser. No. 187,170
Int. Cl.[4] A61K *31/44;* **C07D** *495/04*
U.S. Cl. 514—301 **8 Claims**

1. A compound of formula:



or a pharmaceutically acceptable salt thereof wherein

X_1 is selected from the group consisting of

(a) H,
(b) C_{1-6}alkyl,
(c) halo,
(d) halo C_{1-6}alkyl,
(e) CN,
(f) $—(CO)OR^3$, wherein R^3 is C_{1-6}alkyl, and
(g) $—OC_{1-6}$alkyl;

R is selected from the group consisting of

(a) H,
(b) $—(CO)R^3$,
(c) $—(CO)OR^3$,
(d) $—(CO)NR^3R^4$ wherein $R^4$is C_{1-6}alkyl,
(e) $—(CO)SR^3$, and
(f) $—(CO)(CH_2)_mOR^3$, wherein m is an integer from 1 to 6;

R^1 is selected from the group consisting of

(a) pyridyl, and
(b) substituted phenyl, wherein the substituent is
(1) H,
(2) -methylenedioxy,
(3) haloC_{1-6}alkyl,
(4) halo,
(5) CN,
(6) $—OC_{1-6}$alkyl,
(7) $—(CO)OR^3$,
(8) C_{1-6}alkyl, or
(9) NO_2.

4,904,673

AGENT FOR TREATING BRADYCARDIA AND BRADYARRHYTHMIA

Wolfgang Eberlein; Wolfhard Engel; Gerhard Mihm; Norbert Mayer, all of Biberach, and Adriaan de Jonge, Driebergen, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae, GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Jan. 17, 1989, Ser. No. 298,078
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800868
Int. Cl.[4] A61K *31/445*
U.S. Cl. 514—330 **2 Claims**

1. A method for treatment of bradycardia in a warm-blooded animal comprising administering to said animal a therapeutically effective amount of a compound selected from the group consisting of (±)-1-[4-[ethyl[2-(4-methoxyphenyl)-1-methylethyl]amino]-1-oxobutyl]-N,N-dimethyl-4-piperidinecarboxamide, and (+)-1-[4-[ethyl[2-(4-methoxyphenyl)-1-methylethyl]amino]-1-oxobutyl]-N,N-dimethyl-4-piperidinecarboxamide or physiologically acceptable salts of these compounds with inorganic or organic acids.

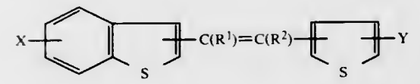
4,904,674

1-(BENZO[B]THIENYL)-2-(THIENYL)ETHENES AND RELATED COMPOUNDS USEFUL AS ANTI-INFLAMMATORY AGENTS

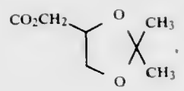
Lawreoce L. Martin, Lebanon, and Joseph F. Payack, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Aug. 16, 1989, Ser. No. 394,690
Int. Cl.[4] C07D *409/14;* **A61K** *31/38, 31/44*
U.S. Cl. 514—337 **28 Claims**

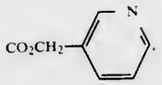
1. A compound of the formula



wherein R^1 and R^2 are independently hydrogen or loweralkyl; X is hydrogen, loweralkyl, loweralkoxy, halogen, or trifluoromethyl; Y is halogen, loweralkyl, hydroxymethyl, formyl, carboxy, loweralkoxycarbonyl, loweralkanoyloxymethyl, (N-loweralkyl-N-hydroxyamino)carbonyl, ω-halololoweralkyl, carboxyloweralkylidene, loweralkoxycarbonylloweralkylidene, (N-loweralkyl-N-hydroxyamino)loweralkyl, (N-cycloalkyl-N-hydroxyamino)carbonyl, (N-cycloalkyl-N-hydroxamino)loweralkyl, a group of the formula



a group of the formula



a group of the formula $CO_2CH_2CH(OH)CH_2OH$, a group of the formula $CH(OH)CH(CO_2R^3)NHCOR^4$ wherein R^3 and R^4 are loweralkyl, a group of the formula $CH(OH)CH(CH_2OH)NHCOR^4$ where in R^4 is loweralkyl, or a group of the formula $CH(OH)CH(CH_2OH)NH_2$; a geometric or optical isomer thereof, or the pharmaceutically acceptable salt thereof.

27. A method of reducing inflammation in mammals comprising administering topically to a mammal requiring inflammation reduction a topical inflammation reducing effective amount of a compound or a pharmaceutically acceptable salt thereof according to claim **1**.

4,904,675

PHAMACOLOGICALLY ACTIVE 5-CARBOXY-2-(5-TETRAZOLYL) PYRIDINES

Eva Winter-Mihaly, Bernex/Geneva; Christian Borel, La Plaine/Geneva, and André J. Weith, Signy, all of Switzerland, assignors to Zyma SA, Nyon, Switzerland

Filed Feb. 10, 1988, Ser. No. 154,217

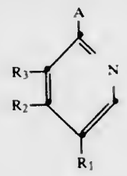
Claims priority, application United Kingdom, Feb. 10, 1987, 8702890

Int. Cl.[4] A61K *31/455;* **C07D** *401/04*

U.S. Cl. 514—340 12 Claims

1. A member selected from the group consisting of

(a) a compound of formula



wherein

A represents 5-tetrazolyl which is unsubstituted or is substituted in the 2-position by a member selected from the group consisting of (1) C_1–C_{20} alkyl, (2) amino-lower alkyl, (3) mono-lower alkylamino-lower alkyl, (4) di-lower alkylamino-lower alkyl, (5) carboxy-lower alkyl, (6) lower alkoxycarbonyl-lower alkyl, (7) aryl-lower alkyl, (8) hydroxy-lower alkyl, (9) lower alkanoyloxy-lower alkyl, (10) lower alkoxy-lower alkyl, (11) hydroxy-lower alkoxymethyl, (12) lower alkanoyloxy-lower alkoxymethyl, (13) lower alkoxy-lower alkoxymethyl, (14) 1-alkoxycarbonyl-1-lower alkoxy-methyl, (15) 3-phthalidyl, (16) lower alkyl-3-phthalidyl, (17) lower alkoxy-3-phthalidyl, (18) halogen-3-phthalidyl, (19) lower alkoxycarbonyloxy-lower alkyl and (20) lower alkanoyl;

R_1 represents carboxy or a pharmaceutically acceptable ester group thereof;

R_2 represents hydrogen or a member selected from the group consisting of lower alkyl, cycloalkyl, aryl-lower alkyl, heteroaryl-lower alkyl and aryl each of which members can be unsubstituted or substituted; and

R_3 represents hydrogen;

(b) a tautomer thereof and (c) a pharmaceutically acceptable salt thereof.

4,904,676

AMINO-OXAZOLE COMPOUNDS HAVING DOPAMINERGIC ACTIVITY

Duncan R. Rae, Lanark, and Samuel G. Gibson, Motherwell, both of Scotland, assignors to Akzo N.V., Arnhem, Netherlands

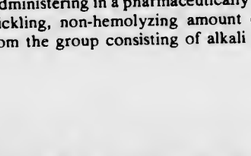
Continuation of Ser. No. 40,458, Apr. 20, 1987, abandoned. This application Aug. 3, 1988, Ser. No. 228,856

Claims priority, application United Kingdom, Apr. 29, 1986, 8610432

Int. Cl.[4] A61K *31/42*

U.S. Cl. 514—340 4 Claims

1. Amino-oxazole derivatives of the formula:



wherein:

R represents hydrogen;

X represents oxygen;

R_1 and R_2 represent hydrogen or alkyl (1–4 C), and the dotted line represents an optional extra bond, as well as pharmaceutically acceptable acid addition salts thereof.

4,904,677

CERTAIN PHENOXY- OR BENZYL SUBSTITUTED PYRIDYLMETHYLOXY-ALKENES HAVING INSECTICIDAL PROPERTIES

Alan J. Whittle, Aldershot, England, assignor to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 939,778, Dec. 9, 1986, Pat. No. 4,812,483. This application Jan. 3, 1989, Ser. No. 292,955

Claims priority, application United Kingdom, Dec. 23, 1985, 8531636; Aug. 6, 1986, 8619235

Int. Cl.[4] C07D *213/26, 213/30, 213/64;* **A01N** *43/40*

U.S. Cl. 514—345 5 Claims

1. A compound of the formula:

$$CXY{=}CH{-}CR^1R^2{-}CH_2OCH_2R$$

wherein X and Y are each selected from hydrogen and halogen, R^1 and R^2 are each lower alkyl of up to four carbon atoms, or together with the adjacent carbon atom form a cycloalkane group of up to six carbon atoms, and R represents a phenoxy- or benzyl-substituted pyridyl group which may optionally be substituted with fluorine.

4,904,678

SICKLE CELL ANEMIA CONTROL

Oji A. Chima, Little Rock, Ark., assignor to Jerome J. Norris, Rockville, Md., a part interest

Filed Aug. 25, 1987, Ser. No. 90,244

Int. Cl.[4] A61K *31/44, 31/21, 31/26*

U.S. Cl. 514—345 7 Claims

1. A method of providing anti-sickling of red blood cells in sickle cell anemia patients without hemolyzing the cells comprising, administering in a pharmaceutically acceptable vehicle an anti-sickling, non-hemolyzing amount of thiocyanate selected from the group consisting of alkali metal salts and an ammonium salt until the Hbss relative solubility ratio is at least 1.200 in the deoxygenated hemoglobin-S.

4,904,679

PYRROLOPHENYLALKANOLAMINES AS ANIMAL YIELD PROMOTERS

Hartmund Wollweber, Wuppertal; Jürgen Stoltefuss, Haan; Friedrich Berschauer, Wuppertal; Ann de Jong, Wuppertal, and Martin Scheer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 185,177

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714485

Int. Cl.[4] C07D *207/416, 207/42, 207/235, 207/335*

U.S. Cl. 514—374 13 Claims

1. A pyrrolophenylalkanolamine of the formula



in which

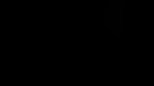
R^1 represents one or more identical or different radicals from the group comprising hydrogen, halogen, cyano, formyl, nitro, carboxyl, carbalkoxyalkyl, alkoxycarboxyalkyl, alkylcarbonyl, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkyl, alkoxy, alkenoxy, halogenoalkyl, halogenoalkoxy, alkylthio, halogenoalkylthio, hydroxyalkyl, cyanoalkyl, alkoxyalkyl, alkylthioalkyl and alkylcarbonylalkoxy,

R^2 represents one or more identical or different radicals from the group comprising hydrogen, hydroxyl, halogen, cyano, nitro, alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy, halogenoalkylthio, cyanoalkyl, alkoxyalkyl, hydroxyalkyl, alkoxycarbonyl, aminocarbonyl and mono- and dialkylaminocarbonyl,

R^3 represents hydrogen, C_{1-6}-alkylcarbonyl, benzoyl, C_{1-6}-alkylsulphonyl, phenylsulphonyl or trialkylsilyl,

R^4 represents hydrogen or alkyl,

R^5 represents hydrogen, or, together with R^3, represents



R^7 represents hydrogen or alkyl, and

R^6 represents straight-chain or branched alkyl or cycloalkyl, which has up to 12 C atoms and is optionally substituted by heterocyclic of 4 to 6 ring atoms consisting of 1 or 2, O or S atoms and the rest carbons, C_{1-6}-alkoxy, C_{1-4}-alkylthio or halogen, or represents cyclo-alkyl-alkyl which has up to 12 C atoms and is optionally substituted by halogen, C_{1-4}-alkoxy or C_{1-4}-alkylthio,

or a salt thereof.

12. A method of promoting growth, improving feed utilization, and shifting the meat/fat ratio in favor of meat of an animal which comprises administering to said animal an amount effective therefor of a compound or salt according to claim **1**.

4,904,680

AMINO ACID DERIVATIVES HAVING ANTI-TUMOR ACTIVITY AND COMPOSITIONS CONTAINING THEM

Takashi Matsui; Mitsuo Nagano; Koichi Kitamura, and Fusaaki Shimizu, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

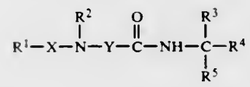
Continuation of Ser. No. 946,430, Dec. 23, 1986, abandoned, which is a continuation of Ser. No. 753,707, Jul. 10, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 146,955

Claims priority, application Japan, Jul. 13, 1984, 59-145731

Int. Cl.[4] C07D *277/06;* **A61K** *31/425*

U.S. Cl. 514—365 15 Claims

1. A compound of formula (I):



(I)

wherein:

R^1 is a benzyl group, a phenyl group, a phenyl group having 1 or 2 substituents selected from the group consisting of C_1–C_4 alkyl, halogen, C_1–C_4 alkoxy, hydroxy, carboxy, nitro, trifluoromethyl, amino, C_1–C_4 alkylamino, dialkylamino wherein each alkyl part is C_1–C_4 alkyl, C_1–C_4 acylamino, C_1–C_4 alkanoyl, cyano, carbamoyl, alkylcarbamoyl wherein the alkyl part is C_1–C_4 alkyl, dialkylcarbamoyl wherein each alkyl part is C_1–C_4 alkyl and C_1–C_4 alkylthio substituents, a naphthyl group, a thienyl group or a pyridyl group;

X is a carbonyl or sulfonyl group;

R^3 is hydrogen or methyl;

R^4 is hydrogen or methyl;

Y and R^2 together with the nitrogen to which they are attached, form a group of the formula

wherein n is 0, 1 or 2; and

R^5 is a C_1–C_4 alkyl group, a phenyl group, a phenyl group having 1 or 2 substituents selected from the group consisting of C_1–C_4 alkyl, halogen, C_1–C_4 alkoxy, hydroxy, carboxy, nitro, trifluoromethyl, amino, C_1–C_4 alkylamino, dialkylamino wherein each alkyl part is C_1–C_4 alkyl, C_1–C_4 acylamino, C_1–C_4 alkanoyl, cyano, carbamoyl, alkylcarbamoyl wherein the alkyl part is C_1–C_4 alkyl, dialkylcarbamoyl wherein each alkyl part is C_1–C_4 alkyl and C_1–C_4 alkylthio substituents.

4,904,681

D-CYCLOSERINE AND ITS PRODRUGS AS COGNITIVE ENHANCERS

Alex A. Cordi, St. Louis; Gail E. Handelmann, Chesterfield, and Joseph B. Monahan, Black Jack, all of Mo., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Dec. 1, 1987, Ser. No. 127,121

Int. Cl.[4] A61K *31/42*

U.S. Cl. 514—380 6 Claims

1. A composition for use in improvement or enhancement of memory, said composition comprising a memory enhancing therapeutically-effective amount of D-4-amino-3-isoxazolidone or a pharmaceutically-acceptable salt thereof.

3. A method to improve or enhance memory comprising administering to an animal a therapeutically-effective amount of a compound selected from the group consisting of 4-amino-3-isoxazolidone and a pharmaceutically-acceptable salt thereof.

4,904,682

TREATING MYCOSES WITH TRIAZOLYLALKANOLS

Wolfgang Krämer, Burscheid; Graham Holmwood, Wuppertal; Karl H. Büchel, Burscheid, and Manfred Plempel, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

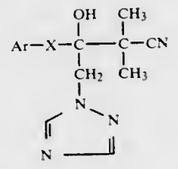
Filed Oct. 19, 1988, Ser. No. 260,082

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736747

Int. Cl.[4] A61K *31/41*

U.S. Cl. 514—383 **8 Claims**

1. A method of combating mycoses in a partner in need thereof which comprises administering to such patient an antimycotically effective amount of a triazolylalkanol of the formula



in which

Ar stands for phenyl which is optionally monosubstituted or polysubstituted by identical or different substituents selected from the group consisting of halogen, in each case straight-chain or branched alkyl, alkoxy or alkylthio each having 1 to 4 carbon atoms, in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio each having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, and phenyl or phenoxy each of which is optionally monosubstituted or polysubstituted by identical or different halogen, and

X stands for one of the groups $-CH_2-$; $-O-CH_2-$; $-S-CH_2-$; $-CH_2-CH_2-$; $-CH=CH-$ or $-C\equiv C-$,

or a physiologically tolerable acid addition salt thereof.

4,904,683

EMULSIFIABLE CONCENTRATES CONTAINING AZOLES

Theo F. M. C. Ligtvoet, Vlimmeren, and Paul F. M. Ruelens, Herk-de-Stad, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 59,209, Jun. 3, 1987, abandoned, which is a continuation of Ser. No. 689,266, Jan. 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 587,096, Mar. 7, 1984, abandoned. This application Sep. 12, 1988, Ser. No. 242,653

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—397 **11 Claims**

1. A method for combating fungus on a living subject or non-living organic material which comprises the steps of:

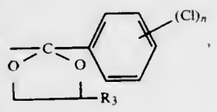
A. diluting an emulsifiable concentrate comprising:

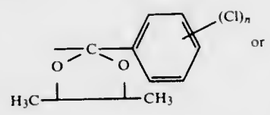
(i) from 1% to 60% w/v of a polyoxyethylene-polyoxypropylene block copolymer;

(ii) from 1% to 98% w/v of an alkanediol; and

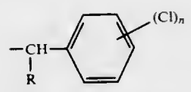
(iii) from 1% to 60% w/v of an azole of the formula:

or an acid addition salt thereof, wherein X is —CH=, and wherein R^1 is a group of the formula:





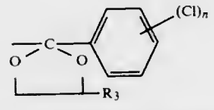
or



wherein n is 1 or 2, R_3 is hydrogen or C_{1-3}alkyl, and R is C_{1-4}alkyl or C_{3-4}alkenyloxy; and

B. applying the diluted concentrate from Step A to said living subject or non-living organic material.

8. The method of claim 1 wherein R^1 is a group of the formula:



wherein n is 1 or 2, and wherein R_3 is hydrogen or C_{1-3}alkyl.

4,904,684

2-(4,5-DIHYDRO-1H-IMIDAZOL-2-YL)-1,2,4,5-TETRAHYDROPYRROLO[3,2,1-HI]INDOLE DERIVATIVES USEFUL AS ANTIDIABETIC AGENTS

Denois Bigg, Castres; Salomon Langer, Paris; Claude Morel, Cresly-Magny-les-Hameaux, and Mireille Sevrin, Paris, all of France, assignors to Synthelabo, Paris, France

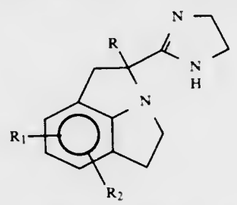
Filed Aug. 25, 1988, Ser. No. 236,423

Claims priority, application France, Oct. 7, 1987, 87 13831

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—402 **5 Claims**

1. A method of treating diabetes in a patient, which comprises administering to said patient an effective antidiabetic amount of a compound of the general formula (I)



(I)

in which R is hydrogen or a linear or branched C_{1-4} alkyl group, and R_1 and R_2, which may be the same or different, are hydrogen, halogen or C_{1-4} alkyl, said compound being in the form of a pure enantiomer or of a mixture of enantiomers, or an addition salt thereof with a pharmaceutically acceptable acid.

4,904,685

ANTIALLERGY AND ANTIINFLAMMATORY AGENTS

Yoshihiko Kitaura; Fumitaka Ito; Rodney W. Stevens, and Nobuko Asai, all of Aichi, Japan, assignors to Pfizer Inc., New York, N.Y.

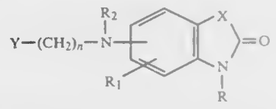
Division of Ser. No. 129,020, Dec. 7, 1987, Pat. No. 4,835,166, Continuation-in-part of Ser. No. 51,873, May 18, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 301,422

Claims priority, application Japan, Jun. 9, 1986, 61-133470; Jun. 8, 1987, 62-142779

Int. Cl.[4] C07D *209/34;* **A61K** *31/40*

U.S. Cl. 514—418 **6 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein R is hydrogen, alkyl having one to three carbon atoms, benzyl or carboxymethyl; R_1 is acetoxy, thiophenoxy, hydrogen, fluoro, chloro, methoxy, methyl or trifluoromethyl; R_2 is hydrogen, alkyl having one to three carbon atoms, alkanoyl having one to three carbon atoms or benzyl; X is CH_2; n is an integer of 1 to 7; and Y is styryl, methyl, N-methylphenylamino, N-benzylphenylamino, phenylamino, phenoxy, thiophenoxy, thienyl, furyl, pyridyl, phenyl, substituted phenyl wherein said substituent is methyl, dimethylamino, methoxy, fluoro or chloro, or disubstituted phenyl wherein said substituents are each chloro, hydroxy or methoxy with the proviso that when Y is phenoxy, thiophenoxy, phenylamino, N-methylphenylamino or N-benzylphenylamino n is 2–7.

4,904,686

ORGANIC COMPOUNDS AND THEIR USE AS PHARMACEUTICALS

Maria I. F. Fernandez, Madrid, Spain; Terrence M. Hotten, Farnborough, and David E. Tupper, Reading, both of England, assignors to Lilly Industries Limited, Basingstoke, England

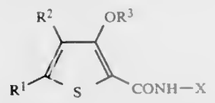
Filed Apr. 11, 1988, Ser. No. 179,601

Claims priority, application United Kingdom, Apr. 13, 1987, 8708833

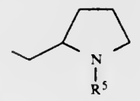
Int. Cl.[4] A61K *31/38;* **C07D** *333/62*

U.S. Cl. 514—422 **13 Claims**

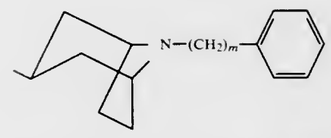
1. A compound of the formula



in which R^1 and R^2 independently are hydrogen, halo, nitro, amino, C_{2-5} acylamino, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} alkylsulphonyl, imidazolyl attached through a nitrogen atom, pyrazolyl attached through a nitrogen atom, attached through a nitrogen atom, phenyl, phenylthio, phenylsulphonyl or phenylsulphonamido, or phenyl, phenylthio, phenylsulphonyl or phenylsulfonamido substituted with one to three halogen, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy, nitro, cyano, amino, carboxy or carboxamido groups, or R^1 and R^2 together form a C_{3-5} alkylene bridge, R^3 is C_{1-4} alkyl or C_{2-4} alkenyl, and X is (i) $-(CH_2)_nN(R^4)_2$ where each R^4 independently is C_{1-4} alkyl, C_{2-4} alkenyl, $C_6H_5CH_2-$, or $C_6H_5CH_2-$ substituted with one to three halogen, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy, nitro, cyano, amino, carboxy or carboxamido groups, and n is 1, 2 or 3, or (ii) an alicyclic group which is



or



m is 1, 2 or 3 and R^5 is C_{1-4} alkyl, C_{2-4} alkenyl, benzyl or benzyl substituted with one to three halogen, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy, nitro, cyano, amino, carboxy or carboxamido groups; and salts thereof.

4,904,687

FUNGICIDAL SUBSTITUTED 3-ARYLPYRROLES

Detlef Wollweber, Wuppertal, and Wilhelm Brandes, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

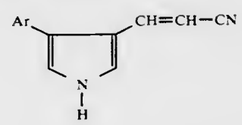
Filed Jul. 15, 1988, Ser. No. 220,055

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 3724554

Int. Cl.[4] C07D *401/04, 409/04, 407/04, 207/34*

U.S. Cl. 514—427 **9 Claims**

1. A substituted 3-arylpyrrole of the formula



in which

Ar represents pyridyl, furyl or thienyl which is in each case optionally monosubstituted or polysubstituted by identical or different substituents from the group consisting of halogen, nitro and straight-chain or branched alkyl having 1 to 4 carbon atoms, or phenyl which is optionally monosubstituted or polysubstituted by identical or different substituents from the group consisting of halogen, cyano, nitro, straight-chain or branched alkyl, alkoxy, alkylthio or alkoxycarbonyl having in each case 1 to 6 carbon atoms, in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio having in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, phenyl and, optionally fluorine-substituted oxyalkyleneoxy having 1 to 2 carbon atoms.

2. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim 1.

4,904,688

TRICYCLIC AMINE DERIVATIVES

Duncan R. Rae, Lanark, and James Cairns, Cumbernauld, both of Scotland, assignors to Akzo N.V., Arnhem, Netherlands

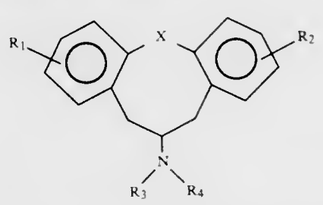
Filed Mar. 8, 1989, Ser. No. 320,340

Claims priority, application European Pat. Off., Mar. 11, 1988, 88302129.7

Int. Cl.[4] A61K *31/335;* **C07D** *313/14*

U.S. Cl. 514—450 6 Claims

1. Compound of the formula:



and pharmaceutically acceptable salts thereof, wherein

X represents oxygen, sulphur, NR or —CH_2—, in which R is hydrogen or alkyl (1–4C);

R_1 and R_2 represent one, two, three or four substituents at the benzo moiety selected from hydrogen, hydroxy, alkyl (1–6C), alkoxy (1–6C), halogen, CF_3 and CN; and

R_3 and R_4, each represent hydrogen or alkyl (1–6C) or together with the nitrogen atom to which they are attached form a heterocyclic 5 or 6-membered ring.

4,904,689

LYSOCELLIN-CONTAINING FEED EFFICIENCY-ENHANCING ANIMAL FEED

Jerome L. Martin; David R. Bright; Robert D. Williams, and Vernon V. Young, all of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Northbrook, Ill.

Division of Ser. No. 643,763, Aug. 24, 1984, Pat. No. 4,761,426, which is a continuation of Ser. No. 291,134, Aug. 7, 1981, abandoned, which is a continuation-in-part of Ser. No. 196,722, Oct. 8, 1980, abandoned. This application Jul. 19, 1988, Ser. No. 221,426

The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—451 9 Claims

1. A ruminant feed composition capable of increasing the rate of growth of a ruminant and which is also capable of enhancing feed efficiency of the ruminant, said feed composition comprising a mixture of a basal feed material for ruminants and a ruminant growth rate-increasing and feed efficiency-enhancing amount of a lysocellin material selected from the group consisting of lysocellin, lysocellin free acid, and the physiologically acceptable salts thereof.

4. A swine feed composition capable of increasing the rate of growth of swine and which is also capable of enhancing feed efficiency of swine, said feed composition comprising a mixture of a basal feed material for swine and a swine growth rate-increasing and feed efficiency-enhancing amount of a lysocellin material selected from the group consisting of lysocellin, lysocellin free acid, and the physiologically acceptable salts thereof.

7. A poultry feed composition capable of increasing the rate of growth of poultry when fed to poultry on a regular basis during the normal growth period of poultry and which is also capable of enhancing feed efficiency of poultry, said feed composition comprising a mixture of a basal feed material for poultry and a poultry growth rate-increasing and feed efficiency-enhancing amount of a lysocellin material selected from the group consisting of lysocellin, lysocellin free acid, and the physiologically acceptable salts thereof.

4,904,690

CHROMONE DERIVATIVES USEFUL AS ANTITUMOR AGENTS

Tetsuya Aono, Nagaokakyo, and Katsutoshi Mizuno, Toyonaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

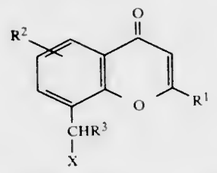
Filed Mar. 1, 1988, Ser. No. 162,765

Claims priority, application Japan, Mar. 2, 1987, 62-49523

Int. Cl.[4] A61K *31/35;* **C07D** *311/30*

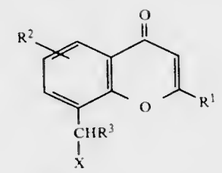
U.S. Cl. 514—456 5 Claims

1. A compound of the formula



wherein R^1 is cycloalkenyl having 3 to 7 carbon atoms; R^2 is hydrogen or halogen; R^3 is hydrogen or lower alkyl; and X is carboxyl, or a pharmaceutically acceptable salt, ester or amide thereof.

5. A pharmaceutical composition having antitumor activity which comprises as an active ingredient an effective amount of a compound of the formula:



wherein R^1 is cycloalkenyl having 3 to 7 carbon atoms; R^2 is hydrogen or halogen; R^3 is hydrogen or a lower alkyl; and X is carboxyl group, or a pharmaceutically acceptable salt, ester or amide thereof.

4,904,691

NOVEL HMG-COA REDUCTASE INHIBITORS

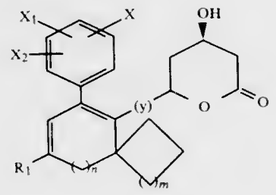
Kent W. Neuenschwander, Ambler, and Anthony C. Scotese, King of Prussia, both of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Continuation-in-part of Ser. No. 135,805, Dec. 21, 1987, Pat. No. 4,863,957. This application Mar. 10, 1989, Ser. No. 321,950

Int. Cl.[4] A61K *31/365;* **C07D** *309/30*

U.S. Cl. 514—449 21 Claims

1. A compound of the formula



wherein

Y is:
—CHR—,
—CHRCHR—,
—CHRCHRCHR—, or
—RC=CR—, wherein R is H or lower alkyl;
X, X_1 and X_2 are independently:
H,
F,
Cl,
Br,
OH,
CF_3,
alkyl, or
alkoxy;
R_1 is:
H,
alkyl,
substituted alkyl,
CF_3,
aryl, or
substituted aryl;
m is: 0, 1, 2 or 3; and
n is: 0 or 1.

21. A method of inhibiting cholesterol biosynthesis in a patient in need of such treatment comprising administering a pharmaceutical composition defined in claim 18.

4,904,692

NOVEL HMG-COA REDUCTASE INHIBITORS

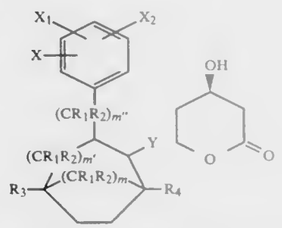
John R. Regan, Princeton, N.J.; Joseph G. Bruno, Sellersville, Pa.; Kent W. Neuenschwander, Ambler, Pa., and Donald E. Kuhla, Doylestown, Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Continuation-in-part of Ser. No. 135,805, Dec. 21, 1987, Pat. No. 4,863,957. This application Dec. 12, 1988, Ser. No. 283,111

Int. Cl.[4] A61K *31/365;* **C07D** *309/30*

U.S. Cl. 514—459 25 Claims

1. A compound of the formula



and the pharmaceutically acceptable salts thereof wherein

Y is: —CHR—,
—CHRCHR—,
—CHRCHRCHR—, or
—RC=CR—;
X, X_1 and X_2 are independently: H, F, Cl, Br, OH, CF_3 alkyl, alkoxy, aryl, NO_2, NH(CO)R, $N(R)_2$, or $S(O)_nR$;
R, R_1, R_2, R_3 and R_4 are independently: H or lower alkyl;
m is: 1 or 2;
m' is: 0 or 1;
m'' is: 0 or 1;
n=0, 1, 2; and
the dotted lines in the bicyclic ring represent optional double bonds.

25. A method of inhibiting cholesterol biosynthesis in a patient in need of such treatment comprising administering a pharmaceutical composition defined in claim 24.

4,904,693

OCTAHYDRO INDENOFURAN DERIVATIVES AND THEIR THERAPEUTIC COMPOSITIONS

Pierre Braquet, Garches, and André Esanu, Paris, both of France, assignors to Societe de Conseils Recherches et d'Applications Scientifiques, France

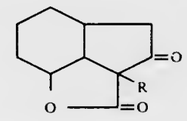
Filed Nov. 4, 1988, Ser. No. 267,438

Claims priority, application United Kingdom, Nov. 4, 1987, 8725872

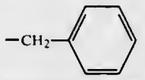
Int. Cl.[4] C07D *307/92*

U.S. Cl. 514—468 2 Claims

1. Indenofuran derivatives of the formula:



wherein R stands for H or for a



group optionally substituted on the phenyl ring by Alk, OH or OAlk, Alk being a lower straight or branched alkyl group up to C_5.

4,904,694

BIPHENYL DERIVATIVE USEFUL IN THE TREATMENT OF LIVER DISEASES

Yoshiyuki Matsuoka; Kunio Hosaka; Shigefumi Takeda, and Hiroshi Mitsuhashi, all of Tokyo, Japan, assignors to Tsumura & Co., Tokyo, Japan

PCT No. PCT/JP87/00387, § 371 Date Feb. 10, 1988, § 102(e) Date Feb. 10, 1988, PCT Pub. No. WO87/07605, PCT Pub. Date Dec. 17, 1987

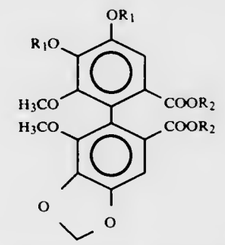
PCT Filed Jun. 13, 1987, Ser. No. 180,107

Claims priority, application Japan, Jun. 13, 1986, 61-136262; Aug. 5, 1986, 61-182628

Int. Cl.[4] A61K *31/36;* **C07D** *317/68*

U.S. Cl. 514—464 2 Claims

1. A biphenyl derivative represented by the following formula (I):



(1)

wherein R_1 and R_2 stand for a hydrogen atom or a methyl group.

4,904,695

INSECTICIDAL AQUEOUS-BASED MICROEMULSION COMPOSITIONS

Mark Bell, Hampshire, England, assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 598,140, Apr. 9, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 892,972

Int. Cl.[4] A01N *37/34*

U.S. Cl. 514—521 17 Claims

1. An aqueous-based insecticidal microemulsion composition comprising, on a weight to volume basis: about 1% to 20% of (±)-α-cyano-m-phenoxybenzyl (+)-2-[p-(difluoromethoxy)-phenyl]-3-methylbutyrate; about 1.0% to 40% of the surfactant blend consisting of one or more components selected from the group consisting of calcium dodecylbenzene sulfonate, ethoxylated distyrylphenol ammonium sulfate with 5 moles of ethoxylation and ethoxylated tristyrylphenol with 17 moles of ethoxylation; about 0% to 12% thickening agents, antifoaming agents, antifreezing agents, antimicrobial preservatives or mixtures thereof; and water to total said composition to 100%.

4,904,696

BENZOYLUREA DERIVATIVE AND ITS PRODUCTION AND USE

Noriyasu Sakamoto; Tatsuya Mori, both of Takarazuka; Tadashi Ohsumi, Nishinomiya; Toshihiko Yano, Ashiya; Izumi Fujimoto, Minoo, all of Japan, and Yoji Takada, Versailles, France, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

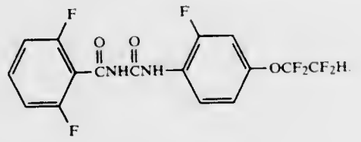
Filed Feb. 1, 1988, Ser. No. 150,990

Claims priority, application Japan, Feb. 4, 1987, 62-23975; Aug. 27, 1987, 62-213945

Int. Cl.[4] C07C *127/22*; A01N *9/12*

U.S. Cl. 514—594 3 Claims

1. A benzoylurea derivative represented by the formula,



4,904,697

CONTROLLING THE GROWTH OF CERTAIN TUMOR TISSUE WITH CHALCONE DERIVATIVES

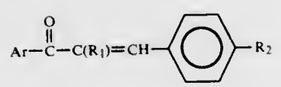
Sai P. Sunkara; Michael L. Edwards, and David M. Stemerick, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Apr. 9, 1987, Ser. No. 36,227

Int. Cl.[4] A61K *31/16*, *31/12*

U.S. Cl. 514—629 21 Claims

8. A method for controlling the growth of tumor tissues sensitive to treatment with the chalcone derivative as defined below which comprises administering to a patient in need thereof an effective amount of a chalcone derivative of the structure



wherein

Ar is a 2,5-dimethoxyphenyl, 2,3,4-trimethoxyphenyl, or 3,4,5-trimethoxyphenyl substituent;

R_1 is a hydrogen, (C_1-C_4)alkyl, chloro, or bromo substituent; and

R_2 is a —N(R)$_2$ or NHCOR wherein R is a (C_1-C_4)alkyl substituent or a pharmaceutically acceptable salt thereof.

4,904,698

EYELID CLEANSING COMPOSITION

Nat G. Adkins, Jr., Richmond, and Douglas S. Rooney, Grapevine, both of Tex., assignors to OcuSoft Inc., Richmond, Tex.

Filed Feb. 11, 1988, Ser. No. 159,403

Int. Cl.[4] A61K *31/14*, *31/74*, *31/79*

U.S. Cl. 514—642 5 Claims

1. A non-irritating, aqueous composition for cleansing eyelids comprising in approximate parts by weight: Miranol MS-2 surfactant mixture present in a concentration of 7–10%; PEG-15 tallow polyamine present in a concentration of 0.1–0.5%; sodium chloride present in a concentration of 0.6–0.9%, at least one microbiological preservative selected from the group consisting of Quaternium-15 and benzyl alcohol present in a concentration of 0.1 to 0.5%; and disodium EDTA present in a concentration of 0–0.1%.

4,904,699

NIFEDIPINE CONCENTRATE STABILIZED AGAINST THE INFLUENCE OF LIGHT AND A PROCESS FOR ITS PREPARATION

Kurt H. Bauer, Im Finkeler 4, 7800 Freiburg, Fed. Rep. of Germany

Filed Dec. 7, 1987, Ser. No. 129,767

Claims priority, application European Pat. Off., Dec. 18, 1986, 86117660.0

Int. Cl.[4] A61K *31/395*

U.S. Cl. 514—972 16 Claims

1. Nifedipine concentrate stabilized against the influence of light, comprising nifedipine, polyethylene glycol, from 0.5 to 20% by weight of Vitamin B_2, based on the nifedipine, and at least one surface-active agent.

6. A process for the preparation of a nifedipine concentrate stabilized against the influence of light, comprising:

(a) dissolving nifedipine and polyethylene glycol in an organic solvent to form a solution,

(b) adding to the solution of (a) an aqueous solution or suspension of Vitamin B_2, at least one of the solution of (a) or said aqueous solution or suspension of Vitamin B_2 also containing surface-active agent,

(c) mixing the result of (b),

(d) concentrating by evaporation the result of (c) to isolate a stabilized product.

12. Medicament comprising nifedipine, polyethylene glycol, from 0.5 to 20% by weight of Vitamin B_2, based on the nifedipine, at least one surface-active agent and pharmaceutical carriers.

4,904,700

IRON CATALYST FOR PREPARATION OF POLYMETHYLENE FROM SYNTHESIS GAS

Richard S. Sapienza, Shoreham, and William A. Slegeir, Hampton Bays, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 175,781, Mar. 31, 1988, abandoned. This application Mar. 22, 1989, Ser. No. 327,465

Int. Cl.[4] C07O *1/02*, *1/10*

U.S. Cl. 518—700 6 Claims

1. A method for synthesizing polymethylene comprising contacting a mixture of hydrogen and carbon monoxide or water and carbon monoxide or mixtures thereof in a solvent with a slurry of a catalyst composed of palladium or platinum or mixtures thereof supported on a solid phase with iron deposited thereon wherein iron comprises at least 40 weight percent and platinum or palladium or mixtures thereof comprise at least 1 weight percent based on the total catalyst weight, under conditions sufficient to convert the gaseous mixture to polymethylene.

4,904,701

PROCESS FOR PREPARING AN ION EXCHANGE MEMBRANE

Tatsuo Hiyoshi, and Makoto Miyazaki, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 15, 1988, Ser. No. 206,732

Claims priority, application Japan, Jun. 15, 1986, 62-146936

Int. Cl.[4] C08F *8/12*

U.S. Cl. 521—32 6 Claims

1. A process for preparing an ion exchange membrane comprising the steps of:

(1) providing a membrane of at least one fluorinated resin having pendant ion exchange precursor groups,

said fluorinated resin being at least one copolymer obtained by reacting at least one fluorovinyl compound represented by the formula:

$$CF_2=CF-O-(CF_2CFL)_m-O-(CF_2)_n-W$$

wherein L represents a fluorine atom or a perfluoroalkyl group having 1 to 3 carbon atoms, m is an integer of 0 to 3, n is an integer of 1 to 3, and W represents a functional group selected from the group consisting of:

$$-SO_2X \text{ and } -CY$$

wherein X represents a halogen atom or —OR in which R represents an alkyl group having 1 to 4 carbon atoms, and Y represents a nitrogen atom or —OX in which X is as defined above, with at least one fluorinated olefin represented by the formula:

$$CF_2=CFZ$$

wherein Z represents a hydrogen atom, a chlorine atom, a fluorine atom or a perfluoroalkyl group having 1 to 3 carbon atoms, said w forming said pendant ion exchange precursor groups, and

(2) contacting without preswelling said membrane with an aqueous solution consisting essentially of at least one basic organic compound for a period of from about 0.5 to about 100 hours to hydrolyze said precursor groups of the formula —SO_2X and/or said precursor groups of the formula —CY to sulfonate groups and/or carboxylate groups, respectively,

said basic organic compound being at least one basic nitrogen compound selected from the group consisting of triethanolamine, diethanolamine, triethylamine, diethylamine, morpholine, isopropylmethylamine, ethylmethyl-n-propylamine, ethyleneimine, dimethy,laminoethanol, n-octylamine, benzylmethylamine, N,N'-dimethylbenzylamine, dodecylamine, tertiary octylamine, tri-n-octylamin diethylenetriamine, isopropanolamine, diisopropanolamine, triisopropanolamine, pyrrolidine, piperidine and piperazine.

4,904,702

FOAMABLE ENGINEERING THERMOPLASTIC COMPOSITIONS

Richard B. Allen, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 947,687, Dec. 30, 1986, abandoned. This application Feb. 28, 1989, Ser. No. 317,010

Int. Cl.[4] C08J *9/10*

U.S. Cl. 521—88 10 Claims

1. A composition adapted for foam molding into an article having a rigid, substantially void-free, substantially uniform cellular core within a solid integral skin, said composition comprising a blend of

(a) a high molecular weight resin in particulate form; and

(b) a pumpable liquid dispersion of a foaming agent in an effective amount of from about 0.02 to about 5 parts by weight based on 100 parts of the total of (a) and (b), said dispersion comprising

(i) a solid blowing agent;

(ii) at least 10 parts by weight of a liquid carrier based on 100 parts by weight of liquid carrier and solid blowing agent combined; and, optionally,

(iii) a thickener.

4,904,703

HIGH TEMPERATURE FOAM

Aniq Sufi, Fountain Valley, Calif., assignor to SMS Associates, Carlsbad, Calif.

Filed Dec. 7, 1988, Ser. No. 281,203

Int. Cl.[4] C08J *9/16*

U.S. Cl. 521—135 8 Claims

1. An insulating foam containing an isocyanate component and a resin and additive component,

(a) said isocyanate component containing polymeric isocyanate in an amount ranging from 90 to 100% and epoxy resin in an amount of from 0 to 10%, and

(b) said resin and additive component containing an aromatic polyester polyol in an amount ranging from 20 to 40%;

a chlorinated polyester polyol in an amount ranging from 20 to 40%;

melamine in an amount ranging from 23.5 to 25%; and

an isocyanurate catalyst in an amount effective to catalyze the quantity of isocyanate present in the isocyanate component to form isocyanurate,

said isocyanate component and resin and additive component being blended in relative amounts of 75:25.

4,904,704

RIGID FOAMS PREPARED FROM TREATED TOLUENE DIISOCYANATE RESIDUE

John L. Nafziger, Lake Jackson; Steven B. Lowenkron, Houston; Charles E. Koehler, Baytown, all of Tex., and Debkumar Bhattacharjee, Meriden, Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 22, 1988, Ser. No. 289,082

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—156 46 Claims

1. A method of treating toluene diisocyanate distillation residues comprising reacting the residues with at least about 0.5 equivalents, based on hydrolyzable chloride concentration in the residues, of an epoxy compound at a temperature of from about 155° C. to about 220° C. to produce a treated distillaton residue having a hydrolyzable chloride concentration of less than about 800 parts per million (ppm).

4,904,705

POLYUREA FOAMS MADE FROM N-(POLYOXYALKYL)-N-(ALKYL)AMINES

Richard M. Gerkin, and Michael W. Jorgenson, both of Cross Lanes, W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

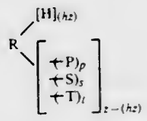
Continuation-in-part of Ser. No. 67,818, Jun. 30, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 176,302
Int. Cl.[4] C08G *18/00, 18/14*
U.S. Cl. 521—163 **30 Claims**

1. A process for the preparation of polyurea foams which process comprises:

(a) forming a reaction mixture of an amine mixture and an organic isocyanate,

(b) reacting the amine mixture with the organic isocyanate in the presence of a catalyst, water and a foam stabilizer, and

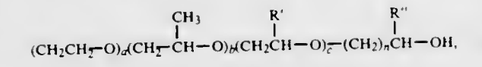
(c) allowing the reaction mixture to rise and cure to form a polyurea foam wherein the amine mixture is of the general formula:



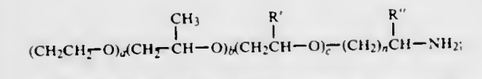
wherein:

R represents an initiator radical based on a compound containing Zerewitinoff active hydrogen atoms;

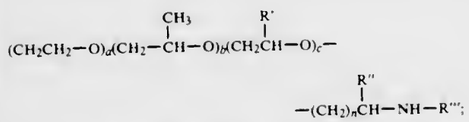
H represents a hydroxy-containing group of the formula:



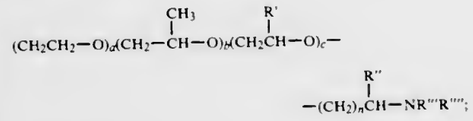
P represents a primary amine-containing group of the formula:



S represents a secondary amine-containing group of the formula:



T represents a tertiary amine-containing group of the formula:



a is 0 to 175;
b is 0 to 175;
c is 0 to 30;
n is 1 to 3;
the sum a+b+c must be greater than or equal to 2 when n equals 1;
R′ is an alkyl group containing from two carbon atoms to eighteen carbon atoms;
R″ is hydrogen or an alkyl group containing up to eighteen carbon atoms;
R‴ and R⁗ are independently alkyl groups containing from two to twelve carbon atoms;
h is from 0 to 0.7;
p is from 0 to 0.7;
s is from 0.3 to 1.0;
t is from 0 to 0.15;
(hz) is the product of h and z;
p+s+t=1; and
z is 2 to 6.

4,904,706

SOFT POLYURETHANE FOAM FROM HYDROXYL URETHANE PREPOLYMER AND POLYESTER ETHER POLYOL

Kazuya Uenishi, Takaishi, and Yasuji Tsunekawa, Kumatori, both of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 841,836, Mar. 20, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 220,980
Int. Cl.[4] C09D *13/00*
U.S. Cl. 521—164 **13 Claims**

1. A heat-fusible soft polyurethane foam produced from at least one polyhydroxy compound, a polyisocyanate, a catalyst, a foam stabilizer and a blowing agent, the improvement wherein the said at least one polyhydroxy compound comprises a mixture of (1) and (2):

(1) a polyol containing a terminal hydroxyl group and an urethane bond obtained by the reaction of at least one polyol selected from the group consisting of components (A) to (H) with a polyisocyanate, and

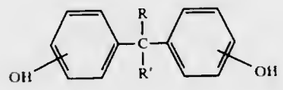
(2) at least one polycl selected from the group consisting of components (D), (E) and (F);

wherein components (A) to (H) are defined as follows:

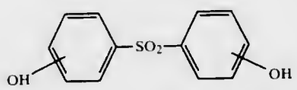
(A) a low-molecular-weight polyhydroxy compound containing 2 to 4 functional groups and having a molecular weight of 60 to 200,

(B) a non-aromatic polyoxyalkylene polyol having a molecular weight of 300 to 5,000 and obtained by adding an alkylene oxide to a low-molecular-weight polyhydroxy compound containing 2 to 4 functional groups and having a molecular weight of 60 to 300,

(C) an aromatic ring-containing diol having a molecular weight of 230 to 5,000 and obtained by adding an alkylene oxide to an aromatic dihydroxy compound represented by the formula



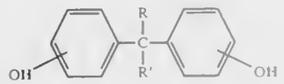
wherein R and R′ each denote hydrogen or an alkyl group, or



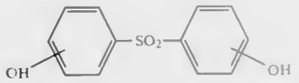
(D) a polyester ether polyol having a molecular weight of 500 to 6,000 and comprising a polyoxyalkylene glycol, said glycol having a molecular weight of 300 to 5,000 and obtained by adding an alkylene oxide other than ethylene oxide to a low-molecular-weight polyhydroxy compound containing 2 to 4 functional groups and having a molecular weight of 60 to 300, and optionally a low-molecular-weight polyhydroxy compound containing 2 to 4 functional groups and having a molecular weight of 60 to 300 as an alcohol component, and at least one compound

selected from aliphatic dicarboxylic acids, aromatic dicarboxylic acids, and their anhydrides and derivatives as an acid component,

(E) a polyester ether polyol having a molecular weight of 500 to 6,000 and comprising an aromatic ring-containing diol having a molecular weight of 230 to 5,000 and obtained by adding an alkylene oxide to an aromatic dihydroxy compound represented by the formula

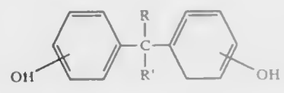


wherein R and R′ each denote hydrogen or an alkyl group, or

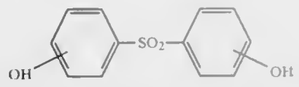


and optionally a low-molecular-weight polyhydroxy compound containing 2 to 4 functional groups and having a molecular weight of 60 to 300 as an alcohol component, and at least one compound selected from aliphatic dicarboxylic acids having 3 to 6 carbon atoms, aromatic dicarboxylic acids, and their anhydrides and derivatives as an acid component,

(F) a polyester ether polyol having a molecular weight of 500 to 6,000 and comprising an aromatic ring-containing diol having a molecular weight of 230 to 5,000 and obtained by adding an alkylene oxide to an aromatic dihydroxy compound represented by the formula



wherein R and R′ each denote hydrogen or an alkyl group, or



and optionally a low-molecular-weight polyhydroxy compound containing 2 to 4 functional groups and having a molecular weight of 60 to 300 as an alcohol component, and a mixture of aromatic dicarboxylic acids and long-chain aliphatic dicarboxylic acids having 7 to 14 carbon atoms, or their anhydrides or derivatives as an acid component,

(G) polyoxytetramethylene glycol having a molecular weight of 500 to 5,000, and

(H) (i) an acid-alcohol-condensation polyester polyol obtained from the low-molecular-weight polyhydroxy compound (A) containing 2 to 4 functional groups and having the molecular weight of 60 to 200 and at least one compound selected from the group consisting of aliphatic dicarboxylic acids, aromatic dicarboxylic acids and their anhydrides and derivatives or (ii) a polylactone polyester polyol formed by polymerizing ϵ-caprolactone, or a mixture of (i) and (ii).

4,904,707

NOVEL POLYOL COMPOSITION AND THE USE THEREOF IN THE PREPARATION OF RIGID POLYURETHANE FOAMS

Soheila R. Lunney, Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Dec. 21, 1988, Ser. No. 287,935
Int. Cl.[4] C08G *18/50*
U.S. Cl. 521—164 **4 Claims**

1. A process for producing a polyurethane foam comprising: reacting an organic di- and/or polyisocyanate with a polyol in the presence of a blowing agent, said polyol comprising:

(a) an adduct obtained by sequentially reacting 2,4- and/or 2,6-toluene diamine with from 3 to 5 moles of ethylene oxide and then with from 1 to 5.1 moles of propylene oxide, the total number of moles of ethylene oxide plus propylene oxide being at least 5 and no more than 8.1, and

(b) an adduct obtained by sequentially reacting 2,3- and/or 3,4-toluene diamine with from 1 to 5 moles of ethylene oxide and then with from 1 to 6 moles of propylene oxide, the total number of moles of ethylene oxide plus propylene oxide being at least 5 and no more than 9, the weight ratio of component (a) to component (b) being from 35:65 to 70:30.

4,904,708

METHOD OF MANUFACTURING SOFT CONTACT LENS MATERIAL

Isao Kaetsu, Takasaki; Minoru Kumakura, Maebashi; Hidenari Suyama, Yokohama; Nobuo Kameda, Tokyo, and Hideo Kouyama, Ohmiya, all of Japan, assignors to Japan Atomic Energy Research Institute and Kabushiki Kaisha Tokyo Contact Lens Kenkyusho, both of Tokyo, Japan

Continuation of Ser. No. 912,366, Sep. 12, 1986, abandoned. This application May 31, 1988, Ser. No. 205,624
Claims priority, application Japan, Sep. 25, 1985, 60-210171
Int. Cl.[4] C08F *2/54*
U.S. Cl. 522—5 **5 Claims**

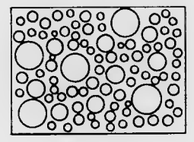
1. Process for preparing base material of soft contact lens characterized in that water is added to one or more kinds of hydrophilic monomer which can be supercooled or a mixture of said hydrophilic monomer and other monomer, subjecting the mixture to polymerization or copolymerization by ionizing radiation while keeping said monomer(s) and water in supercooled transparent state, said water being added in an amount of 0.1 to 4.8% based on the total quantity of monomers.

4,904,709

TEXTURED EXTERIOR SURFACE TREATMENT

Jules J. Hermele, Farmingville, N.Y., assignor to Polymer Plastics Corp., Hauppauge, N.Y.

Filed Sep. 28, 1988, Ser. No. 250,779
Int. Cl.[4] C08K *7/22*
U.S. Cl. 523—220 **6 Claims**



1. A trowelable, synthetic, and textured stucco composition suitable for thin-layer applications, and having a viscosity of about 70 kcps,

the base composition thereof including a latex emulsion with additives dispersed therein, and

the stucco composition further comprising:

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an admixture of microspheres, having a diameter of about 10 to 150 microns, and macrospheres, having a diameter of about 300 to 2000 microns, the microsphere to macrosphere ratio being from about 1:1 to 1:4 by weight, the admixture comprising from 30 to 60% by weight of the trowelable stucco composition.

4,904,710

GAMMA RADIATION RESISTANT CARBONATE POLYMER COMPOSITIONS

Vaughn M. Nace, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 31, 1985, Ser. No. 793,502

Int. Cl.[4] C08K *5/05, 5/06*

U.S. Cl. 523—137 **18 Claims**

1. A solid carbonate polymer composition with improved resistance to gamma radiation which comprises a carbonate polymer and 500 to 50,000 parts per million of one or more polyether polyols or the alkyl ethers thereof.

4,904,711

POLYMER CONCRETE COMPOSITION FOR CEMENTITIOUS ROAD REPAIR AND OVERLAY

Kathy B. Sellstrom, Pflugerville, and Harold G. Waddill, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 79,384, Jul. 30, 1987, Pat. No. 4,828,879. This application Oct. 11, 1988, Ser. No. 255,241

Int. Cl.[4] C08G *59/56*

U.S. Cl. 523—466 **6 Claims**

1. A composition comprising:

A. A binder comprising:

(1) a vicinal polyepoxide having an average of at least 1.8 reactive 1,2-epoxy groups per molecule;

(2) a stoichiometric amount of a curing agent comprising triethyleneglycol diamine;

(3) an accelerator comprising an effective amount of piperazine, and

B. aggregate comprising gravel, sand and fly ash wherein the aggregate binder weight ratio is 7:1 to 12:1.

4,904,712

5-HIGHER ALKYL SUBSTITUTED-2H-BENZOTRIAZOLES IN STABILIZED COMPOSITIONS

Raymond Seltzer, New City, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 772,222, Sep. 3, 1985, Pat. No. 4,727,158. This application Nov. 13, 1987, Ser. No. 120,442

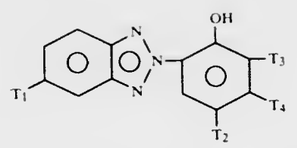
Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—91 **5 Claims**

1. A composition stabilized against light-induced deterioration which comprises

(a) a polymer selected from the group consisting of the olefin homopolymers, olefin copolymers, polystyrene, styrene copolymers, graft copolymers of styrene, halogencontaining vinyl polymers, polyacrylates, polymethacrylates, polyacrylic amides, polyacetals, polymers derived from unsaturated alcohols or amines, or their acyl derivatives, polyacrylonitrile, epoxide resins, polyphenylene oxides, polyureas, polycarbonates, polysulfones, polyamides, polyesters, aminoplasts, alkyd resins, unsaturated polyesters and cellulosics, and

(b) 0.1 to 5% by weight of the stabilized composition of a compound of formula I

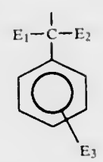


(I)

wherein

T_1 is alkyl of 8 to 18 atoms, and

T_2 and T_3 are independently hydrogen, hydroxyl, alkyl of 8 to 18 carbon atoms or a group of formula II



(II)

wherein E_1 and E_2 are independently hydrogen or alkyl of 1 to 4 carbon atoms and E_3 is hydrogen, halogen or alkyl of 1 to 4 carbon atoms,

T_4 is hydrogen or hydroxyl,

with the proviso that T_2, T_3 and T_4 cannot each be hydrogen at the same time, and that only one of T_2, T_3 and T_4 can be hydroxyl at the same time.

4,904,713

BITUMINOUS COMPOSITION

Willem C. Vonk; Hendrik J. Brouwer, and Anthony L. Bull, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 156,498, Feb. 16, 1988, abandoned. This application Dec. 30, 1988, Ser. No. 293,532

Claims priority, application United Kingdom, Feb. 16, 1987, 8703548

Int. Cl.[4] C08L *53/02, 95/00*

U.S. Cl. 524—68 **16 Claims**

1. A bituminous composition comprising:

(a) a bitumen;

(b) at least 1.0 percent by weight of at least one elastomeric block copolymer, wherein said elastomeric block copolymer is selected from the group consisting of unsaturated and hydrogenated block copolymers, said unsaturated block copolymer and said hydrogenated block copolymer prior to hydrogenation comprising

(1) at least two polymer blocks A, said block A being predominantly a polymerized alkenyl arene block having a number average molecular weight within the range of about 10,000 to 35,000, and

(2) at least one polymer block B, said block B being predominantly a polymerized conjugated diene block,

(3) wherein said at least one block B is between said at least two blocks A; and

(c) at least 0.25 percent by weight of a monoalkenyl arene polymer, said monoalkenyl arene polymer selected from the group consisting of a homopolymer of a monoalkenyl arene and a copolymer consisting essentially of more than one monoalkenyl arene and said monoalkenyl arene polymer having a number average molecular weight in the range of 0.4 to 1.5 times the number average molecular weight of said blocks A and said monoalkenyl-arene polymer having a number average molecular weight within the range of 10,000 to 40,000 and the amount of component (b) plus the amount of compnent (c) in the composition is within the range of about 1.25 to 15% by weight

where the percent by weights are based on the total amount of components (a), (b) and (c).

4,904,714

SYNTHETIC RESIN COMPOSITION AND ITS METHOD OF USE

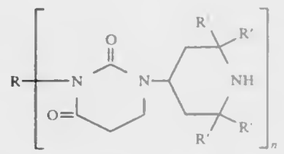
Robert J. Raynor, North Branford, and Francis W. Migliaro, Jr., Waterbury, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 105,356, Oct. 2, 1987, Pat. No. 4,816,585, and a continuation-in-part of Ser. No. 22,311, Mar. 5, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 279,697

Int. Cl.[4] C08J *5/34; C07D 401/04*

U.S. Cl. 524—100 **14 Claims**

1. A synthetic resin composition which is stabilized against the degradative effect of ultraviolet light by the presence therein of a stabilizing amount of a uracil derivative having the formula



wherein each R′ is independently an alkyl radical, n is 1 or 2, and R is a substituted or unsubstituted aliphatic radical, cycloaliphatic radical, aromatic radical or aromatic-aliphatic radical.

4,904,715

METHOD FOR PRODUCING FREE-FLOWING, WATER-SOLUBLE POLYMER GELS

Wood E. Hunter, Pittsburgh, Pa., and Gary P. Crann, Wickliffe, Ohio, assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 11,578, Feb. 6, 1987, abandoned, which is a division of Ser. No. 722,050, Apr. 11, 1985, Pat. No. 4,666,964, which is a division of Ser. No. 562,303, Dec. 16, 1983, Pat. No. 4,525,509. This application Aug. 11, 1988, Ser. No. 231,113

Int. Cl.[4] C08L *33/26;* **C08K** *5/34, 5/19, 5/32*

U.S. Cl. 524—106 **11 Claims**

1. A method for preparing free-flowing, discrete water-soluble polymer gel particles, wherein said method consists essentially of:

(a) reducing the size of a non-ionic water-soluble polymer gel selected from the group consisting of polymer gels made from acrylamide, methacrylamide, N,N-dimethyl acrylamide, or combinations thereof, wherein said polymer gel is hydrolyzed less than 1 percent by weight or is unhydrolyzed, by a size-reduction means, so as to produce discrete polymer gel particles which are less than ¼ inch in their longest dimension; and

(b) adding to the size-reduced discrete polymer gel particles of step (a) 0.001 to 20 weight percent of an amphipathic compound selected from the group consisting of cationic amphipathic compounds selected from the group consisting of quaternary ammonium compounds, imidazolines, fatty amino oxides, fatty amines and amine ethoxylates; and non-ionic amphipathic compounds selected from the group consisting of polyoxyethylene sorbitan fatty acid esters and ethylene oxide/propylene oxide block copolymers, thereby reducing the adhesion of said discrete gel particles to themselves and other substances, wherein said weight percent is based on the total weight of said discrete polymer gel particles and said amphipathic compound.

9. The method of claim 1, wherein said quaternary ammonium compound is selecte d from the group consisting of quaternary imidazoline compounds and hydrogenated tallow quaternary ammonium compounds.

4,904,716

POLYMER BLEND OF CARBON MONOXIDE/OLEFIN COPOLYMER AND POLY(ARYLSULFONE)OLIGOMER

William P. Gergen, Houston, Tex., and Robert G. Lutz, Santa Rosa, Calif., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 203,958, Jun. 8, 1988, Pat. No. 4,839,435. This applicatioo May 31, 1989, Ser. No. 359,442

Int. Cl.[4] C08G *75/18, 67/02*

U.S. Cl. 524—171 **9 Claims**

1. A composition comprising a non-miscible blend of a major portion of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and a minor portion of a poly(arylsulfone) oligomer.

4,904,717

ALIPHATIC THIO ADDITIVE FOR POLYCARBONATE

Thoi H. Ho; Charles O. Mork, both of Lake Jackson; Samuel A. Ogoe, Missouri City, and Jeffrey E. Lackey, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1989, Ser. No. 313,929

Int. Cl.[4] C08K *5/37*

U.S. Cl. 524—392 **20 Claims**

1. A composition of matter comprising, in admixture, a carbonate polymer and an amount of an aliphatic thio compound,

described by the formula

$C_aH_{2a+1}—S—R—S—C_bH_{2b+1}$, where a is independently an integer from 4 to 30 inclusive, b is independently an integer from 4 to 30 inclusive, R is a chain or cyclic hydrocarbon radical represented by either C_dH_{2d} or C_gH_{2g-2}, and d or g is independently an integer from 3 to 12 inclusive,

effective to protect an article molded from said composition from the occurrence of surface defects caused by adhesion of such article to a mold, or (b) reduce the yellowness index and haze percent of said composition, as measured by ASTM Designation D 1925-70, as compared to polycarbonate not admixed with said aliphatic thio compound, or (c) accomplish both said items (a) and (b).

4,904,718

THERMOPLASTIC MOLDING COMPOUNDS WHICH HAVE IMPACT STRENGTH WHEN COLD

Martin Bartmann, Recklinghausen; Armin Gude, Marl; Michael Droescher, Dorsten, and Roland Feinauer, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Apr. 6, 1988, Ser. No. 178,326

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721770

Int. Cl.[4] C08L *77/06*

U.S. Cl. 524—169 **6 Claims**

1. A thermoplastic molding compound having high cold impact strength, comprising:

(i) a polyamide 1012 with a relative viscosity in the range of 1.5-3.0; and

(ii) a plasticizer in the amount of 2-25 wt. % based on weight of the polyamide, wherein said plasticizer imparts high cold impact resistance to said polyamide.

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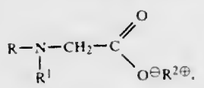
4,904,719

NONCORROSIVE, AQUEOUS ORGANOPOLYSILOXANE EMULSIONS

Ulrich Michel, Burghausen, Fed. Rep. of Germany, assignor to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

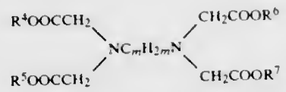
Continuation-in-part of Ser. No. 142,607, Jan. 11, 1988, abandoned. This application Aug. 8, 1988, Ser. No. 230,731
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3700972
Int. Cl.[4] C08K *5/04*
U.S. Cl. 524—238 **1 Claim**

1. A noncorrosive aqueous emulsion containing an organopolysiloxane and an emulsifier selected from the group consisting of a compound of the formula



(I)

a compound of the formula



(II)

and mixtures of compounds (I) and (II), where R is selected from the group consisting of an aliphatically, saturated alkyl carbonyl radical of a carboxylic acid having from 5 to 30 carbon atoms, an aliphatically unsaturated alkyl carbonyl radical of a carboxylic acid having from 5 to 30 carbon atoms, a saturated alkylphenyl carbonyl radical and an unsaturated alkylphenyl carbonyl radical, where the alkyl group has from 2 to 20 carbon atoms, R^1 is selected from the group consisting of hydrogen and a methyl radical, $R^{2\oplus}$ is selected from the group consisting of an alkali metal cation and an ammonium ion of the formula

$$H_{4-n}N^{\oplus}R_n^3,$$

R^3 is selected from the group consisting of an hydroxylated alkyl radical having from 1 to 20 carbon atoms and a radical of the formula $-(C_yH_{2y}O)_xH$, where x is an integer of from 1 to 10, y is 2 or 3 and n is 0, 1, 2 or 3, R^4 is selected from the group consisting of an alkali metal and alkaline-earth metal cation, which forms a salt with the carboxyl group, R^5 is selected from the group consisting of an aliphatically saturated alkyl radical having from 5 to 30 carbon atoms, an aliphatically unsaturated alkyl radical having from 5 to 30 carbon atoms and an alkylphenyl radical, where the alkyl group has from 5 to 30 carbon atoms, R^6 and R^7 are each selected from the group consisting of an alkali metal cation, an alkaline-earth metal cation, which form a salt with the carboxyl group, an aliphatically saturated alkyl radical having from 5 to 30 carbon atoms, an aliphatically unsaturated alkyl radical having from 5 to 30 carbon atoms and an alkylphenyl radical, where the alkyl group has from 5 to 30 carbon atoms, and m is from 2 to 12.

4,904,720

PROCESS FOR IMPROVING PROPERTIES OF SYNTHETIC RESIN POWDER

Atsushi Kawakatsu, Takasago; Ryuichi Takagi, Akashi, and Takeshi Nagano, Yokohama, all of Japan, assignors to Kanegafuchi Kagaku Koyo Kabushiki Kaisha, Osaka, Japan

Filed May 25, 1988, Ser. No. 198,346
Claims priority, application Japan, May 29, 1987, 62-137098
Int. Cl.[4] C08J *3/20;* **C08K** *5/00;* **C08L** *51/04*
U.S. Cl. 524—263 **5 Claims**

1. A process for preparing a powdery synthetic resin which comprises:

subjecting a latex of a graft-copolymer whose backbone is a rubber to coagulation, heat treating the coagulated graft-copolymer

adding a silicone oil to the coagulated graft-copolymer in an amount of 0.01 to 10 parts by weight based on 100 parts by weight of said graft-copolymer before or after heat treatment, and

removing water from the resulting mixture thereby forming the mixture into a dried powder.

4,904,721

ORGANOALKOXYSILANE-CONTAINING COATING COMPOSITION

Hideyuki Hanaoka, Yokkaichi; Kazuo Yamamoto, Mie, and Toshiyuki Suzuki, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1988, Ser. No. 140,998
Claims priority, application Japan, Jan. 6, 1987, 62-209
Int. Cl.[4] C08K *5/24*
U.S. Cl. 524—266 **15 Claims**

1. A coating composition, comprising:

(a) 100 parts by weight, in terms of organoalkoxysilane, of at least one compound selected from the group consisting of (a') an organoalkoxysilane represented by formula (I):

$$RSi(OR^1)_3 \quad (1)$$

wherein R is an organic group having 1–8 carbon atoms and R^1 is an alkyl group having 1–5 carbon atoms or an acyl group having 1–4 carbon atoms, (a'') a hydrolyzate of the organoalkoxysilane (a') and (a''') a partial condensate of the organoalkoxysilane (a'),

(b) 5–50 parts by weight, as solids, of colloidal alumina in which the dispersing medium is water, and

(c) at least one polymer selected from the group consisting of:

(c_1) 2–200 parts by weight of at least one organopolysiloxane having at least one reactive functional group in the polymer molecule and

(c_2) 3–6,000 parts by weight of at least one silyl group-containing vinyl polymer having, at the terminal(s) or side chain(s) of the polymer molecule, at least one silyl group having a silicon atom having bonded thereto a hydrolyzable group, and (d) an organic solvent.

4,904,722

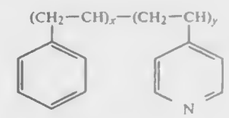
METHOD FOR CONTROLLING VISCOSITY OF ORGANIC LIQUIDS AND COMPOSITIONS THEREOF

Robert D. Lundberg, Bridgewater; Robert R. Phillips, Spring Lake Heights; Dennis G. Peiffer, E. Brunswick, and Ilan Duvdevani, Leonia, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 720,722, Apr. 8, 1985, Pat. No. 4,737,534, which is a continuation-in-part of Ser. No. 547,908, Nov. 2, 1983, abandoned. This application Oct. 18, 1985, Ser. No. 788,963
The portion of the term of this patent subsequent to Oct. 30, 2001, has been disclaimed.
Int. Cl.[4] C08K *5/01, 5/05;* **C08L** *39/08, 23/34*
U.S. Cl. 524—385 **12 Claims**

1. A method for controlling the viscosity of organic liquids, said organic liquid having a solubility parameter of less than 9.5, a viscosity, as measured at 25° C., of less than 200 centipoises and said organic liquid is selected from the group consisting of alkanes, cycloalkanes and aromatic hydrocarbon and mixtures thereof, which comprises incorporating in said organic liquid about 0.01 to 20 grams of a polymer coordination complex per 100 ml. of said organic liquid, said polymer coordination complex being comprised of polymer A, containing neutralized sulfonate groups, and polymer B, containing basic nitrogen groups, the functional groups of both polymer A and polymer B being each present at a level of from about 4 to 500

meq. per 100 g. of polymer, wherein polymer B has the formula:



wherein x is about 50.0 to 99.8 weight percent and y is about 0.2 to about 50.0 weight percent, wherein said sulfonate groups of said polymer A being neutralized with a transition metal ion, said polymer A having a polymeric backbone having a solubility parameter of less than 10.5 and said polymer A having a number average molecular weight of about 1,000 to 10,000,000 wherein a weight ratio of polymer A to polymer B is about 20/1 to 1/20.

2. The method of claim **1**, further including a polar cosolvent, wherein said polar cosolvent comprises from about 0.1 to 40 weight percent of the total mixture of said organic liquid, said polymer coordination complex and said polar cosolvent, wherein the solubility parameter of the polar cosolvent is at least one unit greater than the solubility parameter of said organic liquid.

7. The method of claim **2**, wherein said polar cosolvent is an alcohol.

4,904,723

HYDROLYZED ETHYLENE-VINYL ACETATE COPOLYMER COMPOSITION

Tomoyoshi Uemura; Shinji Okamoto, both of Kurashiki; Takamasa Moriyama, Suita; Kuniyoshi Asano, Hirakata, and Hiroshi Takida, Takatsuki, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1988, Ser. No. 236,829
Claims priority, application Japan, Nov. 20, 1987, 62-294549
Int. Cl.[4] C08K *5/04*
U.S. Cl. 524—394 **2 Claims**

1. A composition consisting essentially of

(1) a hydrolyzed ethylene-vinyl acetate copolymer having an ethylene content of 20 to 60 mol % and a degree of hydrolysis in the vinyl acetate component of at least 95 mol %, and

(2) a secondary or tertiary alkali metal phosphate, the alkali metal content of the composition being from 15 to 250 ppm based on said hydrolyzed copolymer (1) and the phosphorus content of the composition being from 5 to 70 ppm based on said hydrolyzed copolymer (1).

4,904,724

PREPARATION OF AQUEOUS POLYMER DISPERSIONS

Gerhard Auchter, Mannheim, and Gerhard Neubert, Battenberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,667
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743040
Int. Cl.[4] C08F *2/16*
U.S. Cl. 524—458 **4 Claims**

1. A process for the preparation of a surfactant and protective colloid-free aqueous polymer dispersion by free radical polymerization of

(a) from 50 to 100%, based on the total weight of the monomers, of C_1-C_{20}-alkyl (meth)acrylates,

(b) from 0 to 20%, based on the total weight of the monomers, of polyolefinically unsaturated monomers and and from 10 to 70% by weight of the mixture of a solution copolymer (B) obtained from 40–100%, based on its weight, of monomers (II) and 0–60%, based on its weight, of monomers (III) to (V), where the sum of monomers (II)–(V) is 100 wt. %, are used as the preformed copolymers, wherein the viscosity, particle size distribution, freedom from coagulates, gloss and leveling properties of films produced from said aqueous polymer dispersion can be substantially better reproduced than when dispersions not containing copolymer (B) are used.

4,904,725

BLOCK COPOLYMERIC RUBBER COMPOSITIONS FOR SOLES

Glenn R. Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 222,385, Jul. 21, 1988, Pat. No. 4,882,378, which is a continuation of Ser. No. 676,708, Nov. 30, 1984, abandoned. This application Aug. 18, 1989, Ser. No. 395,696
Int. Cl.[4] C08K *5/00, 3/00;* **A43B** *13/04*
U.S. Cl. 524—505 **2 Claims**

1. A unit sole molded from a polymeric composition having high abrasion resistance and freedom from weld lines, said composition comprising:

(a) 100 parts by weight of a block copolymer portion comprising

(1) about 10% to 90% of one or more radial $(AB—)_x—BA$ block copolymers where x is between 1 and 20, each block A being a monoalkenyl arene polymer having an average molecular weight between about 5,000 and 75,000, each block B being an elastomeric conjugated diene polymer having an average molecular weight between about 15,000 and about 300,000 and said blocks A comprise 8–50% by weight of each copolymer;

(2) about 10% to 90% by weight of one or more radial $(CD—)_yDC$ block copolymers where y is between 1 and 20, each block C being a monoalkenyl arene polymer having an average molecular weight between about 5,000 and 75,000, each block D being an elastomeric conjugated diene polymer having an average molecular weight between about 8,000 and about 60,000, and said blocks C comprise60–90% by weight of each copolymer,

(b) about 5 to about 200 parts by weight of a syndiotactic 1,2-polybutadiene;

(c) about 9 to 50 parts by weight of a linear low density polyethylene;

(d) about 0 to about 200 parts by weight of a hydrocarbon rubber extending oil; and

(e) about 10 to about 50 parts by weight of a large agglomerate size filler.

4,904,726

MODIFIED POLYTETRAFLUOROETHYLENE RESINS AND BLENDS THEREOF

Richard A. Morgan, Vienna, W. Va., and Charles W. Stewart, Newark, Del., assignors to E. I. DuPont DeNemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 140,250, Dec. 31, 1987, abandoned, and Ser. No. 140,249, Dec. 31, 1987. This application Dec. 9, 1988, Ser. No. 280,923
Int. Cl.[4] C08L *27/16, 27/18, 27/20, 51/00*
U.S. Cl. 524—520 **17 Claims**

1. Blend of

(a) an elastomeric resin, and

(b) 0.1 to 200 parts per 100 parts of component (a) of a dispersion-process-produced, non-melt-processible, particulate, core-shell, tetrafluoroethylene copolymer, the copolymer being present in said resin in the form of platelets distributed throughout the resin and comprising recurring units of tetrafluoroethylene and modifying recurring units of a comonomer selected from the class consisting of hexafluoropropylene, perfluoro(alkyl vinyl ethers), perfluoro(alkyl vinyl ethers) wherein an alkyl group is replaced with a hexafluoropropylene oxide oligomer, chlorotrifluoroethylene, and a mixture thereof, the number of recurring units of comonomer in the shell being

sufficient to enable the copolymer to compound uniformly with said resin without forming visible agglomerates.

4,904,727
EMULSION POLYMERS

Joachim Probst, Leverkusen; Wolfgang Henning, Kuerten; Heinz Bäumgen, Leverkusen, and Joachim König, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 196,167, May 18, 1988, abandoned. This application Mar. 2, 1989, Ser. No. 318,045

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1987, 3718520

Int. Cl.[4] C08L *33/00;* **C08F** *220/12*

U.S. Cl. 524—820 **9 Claims**

1. Paper sizes consisting essentially of an emulsion polymer obtained by emulsifying a monomer mixture of

(A) 5-95% by weight of acrylonitrile, methacrylonitrile and/or substituted or unsubstituted styrene and

(B) 5-95% by weight of acrylic and/or methacrylic acid esters containing 1-12 carbon atoms in the alcohol group, the sum of components (A)+(B) amounting to 100% by weight, in the presence of an aqueous solution or dispersion of a cationically modified polyurethane, and subjecting the resulting emulsion to a radically initiated polymerization

wherein

the polymers are present in the form of colloid disperse solutions having average particle diameters of 15 to 200 mm.

4,904,728
POLYMER BLENDS

Eric R. George, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 31, 1988, Ser. No. 239,094

Int. Cl.[4] C08L *23/08, 51/04, 53/02*

U.S. Cl. 525—64 **12 Claims**

1. A composition comprising a non-miscible uniform blend of, as a matrix and as a major component, a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon having up to 20 carbon atoms and, dispersed therein,

(a) about 0.5% by weight to about 10% by weight, based on total composition, of a maleated, partially hydrogenated block copolymer, said block copolymer having at least one at least predominantly polymerized vinyl aromatic compound block and at least one at least predominantly aliphatic polymerized conjugated alkadiene block, said maleated, partially hydrogenated block copolymer containing residual aliphatic block unsaturation from about 0.5% to about 20% of the unsaturation of the aliphatic blocks of said block copolymer, and from about 0.02% by weight to about 20% by weight, based on total block copolymer, of moieties of maleic acid compound grafted to the polymer aliphatic blocks, and

(b) about 0.1 by weight to about 4% by weight, based on total composition of a polymer of an alpha-olefin and an alpha,beta-ethylenically unsaturated carboxylic acid.

4,904,729
IMPACT RESISTANT POLYCARBONATE BLEND

Michael K. Langhner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 12, 1988, Ser. No. 256,450

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **6 Claims**

1. A process for preparing a thermoplastic molding composition, comprising:

A. blending, without pre-drying, a mixture comprising:

(i) about 5% to about 95%, based upon total weight, of an aromatic polycarbonate;

(ii) about 5% to about 90%, based upon total weight, of an aromatic polyester; and

(iii) about 0.1% to about 20%, based upon total weight, of a polyalkyleneoxide rubber; and



B. extruding, without pre-drying, the blend obtained in Step A.

4,904,730
RUBBER-MODIFIED RESIN BLENDS

Eugene R. Moore, and Thomas D. Traugott, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 179,445, Apr. 8, 1988, abandoned. This application May 30, 1989, Ser. No. 361,813

Int. Cl.[4] C08L *51/00*

U.S. Cl. 525—75 **20 Claims**

1. A blended composition comprising:

a rigid matrix continuous phase comprising at least one anionically polymerized copolymer of at least one isopropenyl aromatic monomer and at least one vinyl aromatic monomer; and

an elastomeric discontinuous phase dispersed in said matrix phase comprising a melt-agglomerated mixture of at least one cross-linked ungrafted rubber and at least one cross-linked lightly-grafted rubber.

4,904,731
POLYMERIC COMPOSITION

Geoffrey Holden, and David R. Hansen, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 94,955, Sep. 4, 1987, abandoned. This application Dec. 30, 1988, Ser. No. 293,535

Int. Cl.[4] C08L *53/00, 23/16, 23/18*

U.S. Cl. 525—98 **10 Claims**

1. A polymeric composition comprising: 100 parts by weight of a random copolymer of ethylene and propylene, the copolymer containing from about 97 to 94%w polymerized propylene and from about 6 to 3%w polymerized ethylene; from about 2.5 to about 10 parts by weight, of a selectively hydrogenated block copolymer comprising at least two polymeric blocks containing predominantly polymerized monoalkenyl aromatic hydrocarbon monomer units and at least one polymeric block containing predominantly polymerized, hydrogenated diolefin monomer units; and LLDPE wherein the LLDPE is a copolymer of ethylene and less than about 20% by weight of an alpha-olefin having 3 to 10 carbon atoms, the weight ratio of hydrogenated block copolymer to LLDPE being within the range from about 5:1 to about 1:3.

4,904,732
CURABLE ISOBUTYLENE POLYMER

Takahisa Iwahara, Hirakata; Koji Noda, and Katsuhiko Isayama, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 24, 1987, Ser. No. 65,550

Claims priority, application Japan, Jun. 25. 1986, 61-148895; Jun. 26, 1986, 61-150088

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—100 **12 Claims**

1. An isobutylene polymer having an average of 1.2 to 4 silicon-containing groups at its ends, said silicon-containing groups being cross-linkable by the formation of a siloxane bond.

4,904,733
PROCESS FOR PRODUCING THERMOPLASTIC MOLDING COMPOSITIONS FROM POLYCONDENSATION RESINS AND AQUEOUS LATEXES

Christian Gerth, Haltern, and Michael Dröscher, Dorsten, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 66,158, Jun. 25, 1987, which is a division of Ser. No. 776,075, Sep. 13, 1985, Pat. No. 4,708,886. This application Dec. 16, 1987, Ser. No. 133,964

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433976; Jul. 16, 1985, 3525319

Int. Cl.[4] C08L *25/10, 69/00*

U.S. Cl. 525—146 **17 Claims**

1. A process for the production of a molding composition, comprising contacting (a) an aqueous latex, said aqueous latex being prepared by a process consisting essentially of the step of polymerizing monomers by addition polymerization to form an aqueous latex consisting essentially of water and an elastomeric addition polymer, and (b) a thermoplastic polycondensation polymer susceptible to degradation by water, wherein said polycondensation polymer is a polycarbonate and said contacting is effected at sufficiently high temperatures and under sufficiently strong shear forces, for a time sufficiently brief to prevent serious degradation of the polycondensation polymer and sufficiently long to provide a substantially homogeneous molding composition.

4,904,734
DEHYDROGENATED POLYSPIROHEPTADIENE

Bernd Tieke, Marly, and Sheik A. C. Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 95,075, Sep. 11, 1987, Pat. No. 4,840,999. This application Mar. 13, 1989, Ser. No. 322,143

Claims priority, application Switzerland, Sep. 19, 1986, 3756/86

Int. Cl.[4] C08L *77/00*

U.S. Cl. 525--184 **5 Claims**

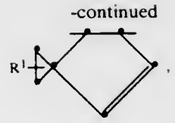
1. A composition containing a dehydrogenated poly(-spiro[2,4]hepta-4,6-diene) which is insoluble in organic solvents, has an electrical conductivity of at least 10^{-1} S×cm^{-1}, and contains, relative to the total number of recurring structural units in the polymer, 0-90 mol% of the recurring structural units of the formulae I and II



(I)

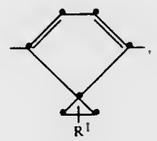
and

-continued



(II)

in which R^1 is in each case a hydrogen atom or an alkyl group having 1 to 4 C atoms, and 10–100 mol% of at least one of the recurring structural units of the formulae III to VI

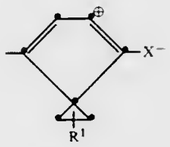


(III)

and



(IV)



(V)

and



(VI)

in which R^1 is as defined in formula I or II and X^- is a bromide or iodide ion or an anion of a Lewis or protonic acid, and a polymer which is soluble in organic solvents.

4,904,735
PROCESSING AID FOR POLYMERS

George R. Chapman, Jr., Media, Pa., and Donnan E. Priester, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 8, 1988, Ser. No. 216,421

Int. Cl.[4] C08L *23/04, 23/10, 27/16, 27/18*

U.S. Cl. 525—199 **64 Claims**

1. Polymer blend composition having improved processibility and comprising:

(a) a major portion of a difficultly melt-processible polymer comprising at least one mono-olefin polymer, and

(b) a minor portion of:

(1) at least an effective amount, to improve processibility, of a fluorocarbon copolymer which at the melt-processing temperature of (a) is either in a melted form if crystalline, or is above its glass transition temperature if amorphous, and

(2) at least an effective amount, to improve processibility, of at least one tetrafluoroethylene homopolymer or copolymer of tetrafluoroethylene and at least one monomer copolymerizable therewith, wherein the mole

ratio of fluorine to hydrogen is at least 1:1, and which is solid at the melt-processing temperature of (a).

4,904,736

ACRYLIC RUBBER COMPOSITION

Hiroaki Shimiza, Oumi; Yasushi Abe, Machida; Masayoshi Ichikawa, Ichinomiya, and Tomoaki Okita, Kasugai, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyoda Gosei Company Limited, Aichi, both of, Japan

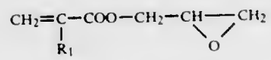
Filed Jun. 13, 1988, Ser. No. 206,133

Claims priority, application Japan, Jun. 16, 1987, 62-148027; Jun. 16, 1987, 62-148028

Int. Cl.[4] C08F *8/30*

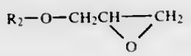
U.S. Cl. 525—279 **25 Claims**

1. An acrylic rubber composition comprising (A) a copolymer and (B) a crosslinking agent, said copolymer (A) consisting essentially of (a) from 3 to 10% by weight of ethylene, (b) from 0 to 10% by weight of at least one crosslinkable monomer selected from the group consisting of monomers of the formulas (1), (2), (3) and (4):



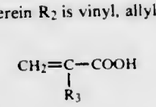
(1)

wherein R_1 is hydrogen or methyl,



(2)

wherein R_2 is vinyl, allyl or methallyl,



(3)

wherein R_3 is hydrogen or methyl, $R_4OOC—CH=CH—COOH$ (4)

wherein R_4 is methyl, ethyl, propyl, butyl, methoxymethyl methoxyethyl, methoxypropyl, methoxybutyl, ethoxybutyl, ethoxyethyl, ethoxypropyl or ethoxybutyl, and (c) from 80 to 97% by weight of other copolymer component, said other copolymer component (c) consisting essentially of (i) from to 10% by weight of vinyl acetate, (ii) from 20 to 45% by weight of ethyl acrylate and (iii) from 45 to 70% by weight of n-butyl acrylate, the total amount of constituents (i), (ii) and (iii) being 100% by weight.

4,904,737

ACTIVE-ENERGY-RAY CURABLE COATING COMPOSITION

Mitsuo Sato, Nagoya, and Masaki Niimoto, Tajimi, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,486

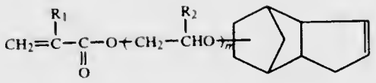
Claims priority, application Japan, Dec. 8, 1986, 61-290606

Int. Cl.[4] C08F *261/06, 263/02, 265/02, 265/06*

U.S. Cl. 525—286 **13 Claims**

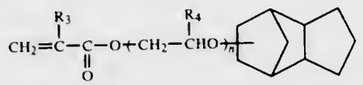
1. An active-energy-ray curable coating composition comprising

(i) 99 to 50 parts by weight of an acrylic copolymer (A) having pendant (meth)acryloyloxy groups introduced by the utilization of functional groups of side chains of the acrylic copolymer wherein the functional groups are selected from the group consisting of a glycidyl group, an isocyanate group, a carboxyl group, a hydroxyl group, an acid amide group and an amino group and wherein the acrylic copolymer is obtained by using as a comonomer at least one member selected from the group consisting of



(I)

wherein each of R_1 and R_2 is a hydrogen atom or a methyl group, and m is zero or an integer of 1 to 4,



(II)

wherein each of R_3 and R_4 is a hydrogen atom or a methyl group, and n is zero or an integer of 1 to 4; and

(ii) an unsaturated compound (B) having two or more crosslinkable double bonds.

4,904,738

FILM OF ALLYLOXY COMPOUND WITH METAL DRIER COMPOSITIONS

Christopher J. Hardiman, Belchertown, and Gary R. Bowers, Westfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 49,573, May 13, 1987, Pat. No. 4,810,757. This application Jan. 23, 1989, Ser. No. 300,008

Int. Cl.[4] C08F *299/06*

U.S. Cl. 525—306 **7 Claims**

1. A cured film comprising a coating composition comprising:

(a) a free radical-polymerizable compound,

(b) an allyloxy compound,

(c) a metal drier catalyst,

(d) a peroxide free radical initiator, and

(e) a pot life extending amount of a catalyst modifier comprising at least one molybdenum compound having a solubility in methyl ethyl ketone, ethanol or toluene of at least about 0.1 percent by weight.

4,904,739

POLY(FLUOROACETYLENE) CONTAINING POLYMERS

Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 870,466, Jun. 4, 1986, abandoned, which is a division of Ser. No. 676,122, Nov. 29, 1984, Pat. No. 4,678,842. This application May 27, 1988, Ser. No. 202,655

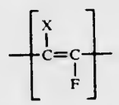
Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—326.4 **6 Claims**

1. A fluorine substituted, conjugated double bond polymer possessing electrical conductivity, consisting essentially of a polymer containing

(a) 5 to 95 mol percent of monomeric units of vinylidene fluoride or trifluoroethylene; and

(b) 95 to 5 mol percent of the monomeric units



said units being derived from a polymer selected from the group consisting of poly(vinylidene fluoride), and poly(-trifluoroethylene), wherein X is H or F and the monomeric units of (b) are arranged to form conjugated double bonds.

4,904,740

BINDER COMBINATIONS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Harald Blum, Wachtendonk; Josef Pedain, Cologne, and Christian Wamprecht, Neuss, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Nov. 28, 1988, Ser. No. 277,017

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742123

Int. Cl.[4] C09D *3/727;* **C07D** *303/12*

U.S. Cl. 525—327.3 **7 Claims**

1. Moisture curable binder compositions which comprise:

(A) from 30 to 99 parts by weight of at least one copolymer of olefinically unsaturated compounds having a weight average molecular weight of from 1500 to 75,000 and containing chemically incorporated moieties capable of undergoing an addition reaction with amino groups, and

(B) from 1 to 70 parts by weight of at least one organic poyamine containing blocked amino groups,

wherein (i) the copolymers of component (A) contain both intramolecular carboxylic acid anhydride moieties and epoxide moieties in a chemically bound form, with the anhydride equivalent weight of the copolymers being from 393 to 9,800 and the epoxide equivalent weight of the copolymers from 568 to 14,200, and (ii) the binder composition contains from 0.2 to 8 anhydride and epoxide moieties for each blocked amino group.

4,904,741

POLYMERS WITH AMINO-METHYL-PROPENE-2-YL GROUPS CONTAING ELECTRON-WITHDRAWING GROUPS

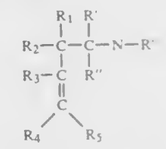
Phillip B. Valkovich, Spring, Tex., and Kechia J. Chou, Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 686,162, Dec. 24, 1984, Pat. No. 4,659,491. This application Feb. 9, 1987, Ser. No. 12,230

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—330.5 **9 Claims**

1. A polymer of $\overline{M}_n$ of 300–100,000 containing a carbon-to-carbon backbone and characterized by the presence of at least one group of the formula



wherein R', R'', R''' are hydrogen, or alkyl, aralkyl, aryl, alkaryl, or cycloalkyl hydrocarbon groups or electron-withdrawing groups selected from the group consisting of $—SO_3H$, $—CX_3$, and —COOR, wherein R is alkyl, alkenyl, alkynyl, aryl, aralkyl or cycloalkyl, at least one of R', R'', and R''' being an electron-withdrawing group; R_1, R_2, R_3, R_4 and R_5 are hydrogen or hydrocarbon, at least one of R_1 through R_5 being a portion of the polymer backbone; and X is halogen.

4,904,742

BINDERS RESISTANT TO FOULING AND ORGANISMS PRESENT IN AN AQUEOUS MEDIUM AND PROCESS FOR THEIR PREPARATION

Alain Perichaud, and Georges Sauvet, both of Marseille, France, assignors to Universite de Provence, Marseille, France

Filed Oct. 29, 1987, Ser. No. 114,004

Claims priority, application France, Oct. 30, 1986, 86 15300

Int. Cl.[4] C08F *8/32*

U.S. Cl. 525—331.4 **17 Claims**

1. A layer of coating comprising a binder which repels micro-organisms when said binder is in contact with an aqueous medium, said binder consisting essentially of a mixture of a chlorinated vinyl resin selected from the group consisting of polyvinyl chloride, postchlorinated polyvinyl chloride, polyvinylidine chloride and copolymers thereof, and chlorinated rubbers, and 10–20% by weight based on the weight of said resin of a quaternary ammonium salt having at least one substituent selected from the group consisting of linear alkyl and aryl long-chain carbon derivatives.

4,904,743

FLUORINATED ETHYLENE/ALPHA-OLEFIN COPOLYMERS

Akira Sano, Kawasaki; Motohiko Yoshizumi, Saitama; Nobuya Takenuki, Omiya, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Company, Limited and Mitsubishi Metal Corporation, both of, Japan

Filed Aug. 22, 1988, Ser. No. 235,001

Claims priority, application Japan, Aug. 20, 1987, 62-205154

Int. Cl.[4] C08F *8/22*

U.S. Cl. 525—334.1 **7 Claims**

1. A modified ethylene/α-olefin copolymer obtained by fluorinating an ethylene/α-olefin copolymer having the following properties (i) to (iv), said ethylene/α-olefin copolymer being prepared by copolymerizing ethylene and an α-olefin having 3 to 12 carbon atoms in the presence of a catalyst comprising a solid catalyst component and an organoaluminum compound, said solid catalyst component containing at least magnesium and titanium:

(i) Melt index: 0.01 –100 g/10 min

(ii) Density: 0.860 –0.910 g/cm^3

(iii) Maximum peak temperature (Tm) as measured according to a differential scanning calorimetry (DSC) not lower than 100° C.

(iv) Insolubles in boiling n-hexane should be not less than 10% by weight.

4,904,744

POLYMER BLENDS OF CARBON MONOXIDE/OLEFIN COPOLYMER AND POLY(ARYLSULFONE) POLYMER AND OLIGOMER

William P. Gergen, Houston, Tex., and Robert G. Lutz, Santa Rosa, Calif., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 203,958, Jun. 8, 1988, Pat. No. 4,839,435. This application May 31, 1989, Ser. No. 359,297

Int. Cl.[4] C08G *67/02*

U.S. Cl. 525—391 **11 Claims**

1. Composition comprising a non-miscible ternary blend of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, a relativley high molecular weight poly(arylsulfone) polymer and a relativley low molecular weight poly(arylsulfone) oligomer.

4,904,745

POLYALKYLENE OXIDE HAVING UNSATURATED END GROUP AND NARROW MOLECULAR WEIGHT DISTRIBUTION

Shohei Inoue; Takuzo Aida, both of Tokyo; Michihide Honma, and Katsuhiko Isayama, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

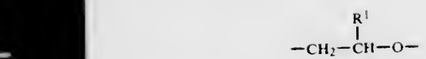
Continuation of Ser. No. 842,588, Mar. 21, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 170,571

Claims priority, application Japan, Mar. 22, 1985, 60-58745; Mar. 25, 1985, 60-60221

Int. Cl.[4] C08F *283/06;* **C07C** *69/52;* **C08G** *65/12*

U.S. Cl. 525—404 **1 Claim**

1. A process for preparing a polyalkylene oxide having a distribution of molecular weight (Mw/Mn) of not more than 1.25, which comprises a main chain consisting essentially of a recurring unit of the formula (I):



(I)

wherein R^1 is a monovalent group selected form the group consisting of hydrogen atom and a monovalent organic group of C_1 to C_6, and may be the same or different in the different recurring units, said main chain having an unsaturated end group of the formula (II):



(II)

wherein R^2 is a divalent organic group of C_1 to C_8, a is 0 or 1, and R^3 is hydrogen atom or methyl, in an amount of not less than 70% of the total end groups; which consist essentially of:

polymerizing an alkylene oxide in the presence of a complex catalyst prepared by reacting an active hydrogen-containing compound with an aluminium porphyrin complex, and

reacting the obtained polymer with an active halogencontaining compound,

said active hydrogen-containing compound being an organic compound selected from the group consisting of

(a) an organic compound having an unsaturated group and an active hydrogen atom-containing group selected from hydroxyl group and carboxylic group in one molecule, and

(b) an organic compound having at least two active hydrogen atom-containing groups selected from hydroxyl group and carboxylic group in one molecule,

said aluminium porphyrin complex being prepared by reacting an organoaluminium compound and a porphyrin compound, and

said active halogen-containing compound being an organic compound selected from the group consisting of

(c) an organic compound having an active halogen atom and an unsaturated group in one molecule, and

(d) an organic compound having at least two active halogen aotms in one molecule, with the proviso that when said active hydrogen-containing compound is compound (b) then said active halogen-containing compound must be compound (c).

4,904,746

PREPARATION OF LINEAR POLYESTER-POLYEPOXIDE REACTION PRODUCTS VIA REACTIVE CONCENTRATE

Sterling B. Brown, Schenectady, N.Y.; Choong Y. Han, Evansville; James L. DeRudder, Mt. Vernon, both of Ind., and Leonard R. Hepp, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 43,074, Apr. 27, 1987, abandoned. This application Apr. 21, 1988, Ser. No. 184,534

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—438 **19 Claims**

1. A method for preparing a branched polymer which comprises the steps of:

(I) forming a reactive concentrate by effecting reaction between the constituents of a mixture consisting essentially of (A) at least one poly(O- or N-epoxyalkyl-substituted) cyclic amide, imide or imidate with (B) at least one linear polymer having substantial proportions of at least one of ester and carbonate structural units, a number average molecular weight of at least about 4000 and a measurable proportion of free carboxylic acid groups, and

(II) melt blending said concentrate with (C) at least one linear polyester having a substantial proportion of free carboxylic acid groups;

the proportion of reagent A employed in step I being at least about 3 parts by weight per 100 parts of reagent B, and about 0.1-3.0 parts per 100 parts of the total of reagents B and C.

4,904,747

BLENDS OF POLYCARBONATES WITH POLYESTERS FROM 4,4'-BIPHENYLDICARBOXYLIC ACID AND 1,6-HEXANEDIOL

John C. Morris, and Winston J. Jackson, both of Kingston, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1988, Ser. No. 288,896

Int. Cl.[4] C08F *20/00*

U.S. Cl. 525—439 **10 Claims**

1. Composition of matter having a tensile strength of at least 13,000 psi comprising a blend of

(a) about 30–95 weight % of a polyester containing repeating units from at least 80 mol % biphenyldicarboxylic acid and at least 80 mol % 1,6-hexanediol, based on 100 mol % of an acid component and 100 mol % of a glycol component and having an I.V. of at least 0.8 and

(b) about 70–5 weight % of a polycarbonate of 4,4'-isopropylidenediphenol having an I.V. of at least 0.3.

4,904,748

BLENDS OF POLY(ETHERESTERS) AND POLYESTERS

Robert W. Seymour, and Thomas E. Flora, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,727

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—444 **3 Claims**

1. A composition comprising a blend of a flexible poly(ether-ester) with a more rigid polyester, the blend comprising

(A) about 98–60 weight % of a flexible poly(etherester) having an I.V. of about 0.8–1.5 and recurring units from

(1) a dicarboxylic acid component consisting essentially of 1,4-cyclohexanedicarboxylic acid having a trans isomer content of at least 70%,

(2) a glycol component consisting essentially of

(a) about 95 to about 65 mol % 1,4-cyclohexanedimethanol, and

(b) about 5 to about 35 mol % poly(oxytetramethylene) glycol having a molecular weight of about 500–1100, and

(B) about 2–40 weight % of a relatively rigid polyester consists essentially of recurring units of terephthalic acid, and recurring units from at least one of the glycols selected from ethylene glycol, 1,4-butanediol, and 1,4-cyclohexane-dimethanol,

the blends having increased stiffness and notched Izod impact strength when compared to the poly(ether-ester) alone.

4,904,749

PREPARATION OF PHEMA BY PRECIPITATION/SUSPENSION POLYMERIZATION

Phyllis L. Brusky, and Richard A. Markle, both of Columbus, Ohio, assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Dec. 16, 1988, Ser. No. 285,507

Int. Cl.[4] C08L *20/28*

U.S. Cl. 526—201 **16 Claims**

1. In a method for preparing poly(hydroxyethyl methacrylate) (PHEMA) particles by precipitation/suspension polymerization wherein a reaction mixture comprising hydroxyethyl methacrylate (HEMA), a solvent, and a freeradical initiator is subjected to heating for a time adequate for said PHEMA particles to be formed, the improvement which comprises: restricting said HEMA to contain less than about 0.5 wt-% polyfunctional acrylate content, incorporating an effective amount of a suspending agent in said reaction mixture, agitating said reaction mixture during said heating, and restricting said solvent to one having a solubility parameter of between about 7.5 and 9, to produce PHEMA particles ranging in size from about 30 to 1,000 microns and having a molecular weight ranging from about 500,000 to 2,000,000.

4,904,750

ESTER-URETHANE DERIVATIVES OF (METH)-ACRYLIC ACID FOR DENTAL MATERIALS

Jürgen Reiners, Leverkusen; Carlhans Süling, Odenthal; Walter Schäfer, Leichlingen; Hanns P. Müller, Bergisch-Gladbach; Wolfgang Podszun, Cologne, and Jens Winkel, Cologne Pesch, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

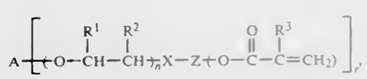
Filed Dec. 20, 1988, Ser. No. 287,424

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743782

Int. Cl.[4] C08G *18/04*

U.S. Cl. 526—301 **9 Claims**

1. A polyfunctional ester-urethane derivative of (meth)acrylic acid of the formula



(I)

in which

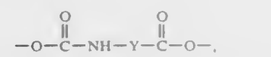
A is a straight-chain or branched aliphatic radical which has 2 to 20 carbon atoms and optionally contains 1 to 3 oxygen bridges, an aromatic radical with 6 to 24 carbon atoms, an araliphatic radical with 7 to 26 carbon atoms or a cycloaliphatic radical with 6 to 26 carbon atoms,

r dentotes the number of chains starting from A and denotes a number from 2 to 6,

R^1 and R^2 are identical and denote hydrogen or are different and dencte hydrogen and methyl,

n denotes a number from 0 to 5 independently for each chain starting from A,

X stands for the group



in which

Y denotes a divalent (cyclo)aliphatic radical which has 2 to 15 carbon atoms and optionally contains ester, ether or urethane groups,

Z denotes a divalent straight-chain or branched aliphatic hydrocarbon radical which has 3 to 15 carbon atoms and can optionally contain 1 to 3 oxygen bridges and can optionally be substituted by 1 to 4 additional (meth)-acrylate radicals and

R^3 denotes hydrogen or methyl independently for each chain starting from A.

4,904,751

N,N'-DIALKYL SUBSTITUTED POLYOXYALKLENE AMINES AS CURING AGENTS FOR BLOCKED ISOCYANATES

George P. Speranza, Austin; Jiang-Jen Lin, Round Rock, and Michael Cuscurida, Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,951

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[4] C08G *18/81*

U.S. Cl. 528—45 **6 Claims**

1. A heat curable polyurethane coating comprising a blocked isocyanate and a curing agent comprising an N,N'-dialkyl substituted polyoxyalkylene amine having 50 to 100% of its amine groups substituted to secondary amines.

4,904,752

LIQUID CRYSTAL COPOLYESTER HAVING BLOCKED MOLECULAR CHAIN TERMINAL

Toshio Kanoe, Fuji, and Kenji Hijikata, Mishima, both of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Nov. 13, 1987, Ser. No. 120,157

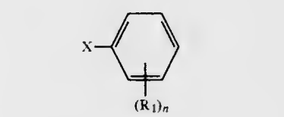
Claims priority, application Japan, Nov. 13, 1986, 61-270537

Int. Cl.[4] C09K *19/52;* **C08G** *69/44*

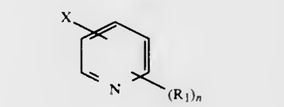
U.S. Cl. 528—97 **10 Claims**

1. A liquid crystal copolyester having a blocked molecular chain terminal, comprising a copolyester which exhibits anisotropy in a molten state and has a functional group located at the terminal of the molecular chain thereof and is blocked with a low-molecular compound having at least one aromatic ring and a molecular weight of 350 or less,

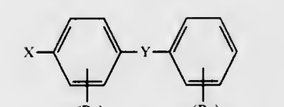
wherein said low-molecular compound used for blocking said molecular chain terminal is at least one member selected from the compounds represented by following formulae (A) to (I):



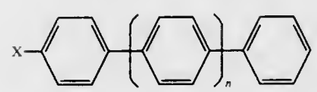
(A)



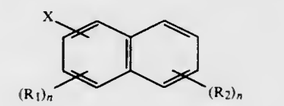
(B)



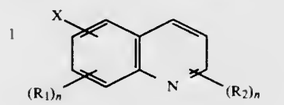
(C)



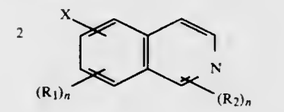
(D)

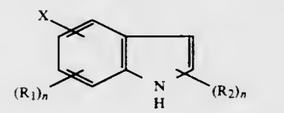


(E)



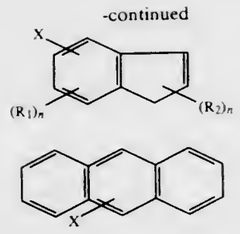
(F)





VOL 1111 ISS 4 FE 27 19 90 UMI

-continued



(H)

(I)

wherein

R_1 and R_2 are each a substituent selected from alkyl having 1 to 10 carbon atoms, —Cl, —Br, —OCH_3, —CN, —NO_2, —NH_2, vinyl, ethynyl, acrylate, phenyl, benzyl, alkylurea, alkyl ester, and maleimino;

Y is a group selected from alkylene having 1 to 4 carbon atoms, alkylidene, —O—, —S—, —SO—, —SO_2—, and —CO—;

n is an integer of 1 to 2; and

x is a functional group selected from aldehyde, hydroxyl, carboxyl, amino, imino, glycidyl ether, glycidyl ester, methyl, isocyanato, acetoxy, carboxyalkyl ester (wherein the alkyl has 1 to 4 carbon atoms) and carboxyphenyl ester.

4,904,753

ACID/OXIDIZER CATALYST SYSTEM FOR STORAGE STABLE, QUICK-CURE PHENOLIC RESINS OF THE RESOLE OR BENZYLIC ETHER RESOLE TYPE

Golden F. Watts, Delaware, and Warren L. Robbins, Westerville, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 23, 1988, Ser. No. 172,012
Int. Cl.[4] C08G *8/28*
U.S. Cl. 528—137 **38 Claims**

1. In a method for heat curing a non-aqueous benzylic ether resole resin, the improvement which comprises using a catalyst system comprising an acid catalyst and an oxidizing agent in an amount adequate for cure in at least about the same time that occurs by use of at least twice the amount of said acid catalyst alone, the shelf life of said catalyzed resole resin being greater with said catalyst system than with said at least twice the amount of said acid catalyst alone.

21. The method of claim **20** wherein said acid catalyst is a mineral acid or an organic acid.

4,904,754

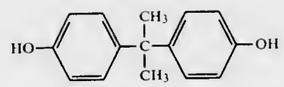
HEAT-STABLE COPOLYCONDENSATE MOLDING MATERIALS

Gerhard Heinz, Weisenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

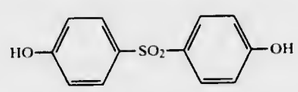
Division of Ser. No. 36,446, Apr. 9, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 242,161
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614753
Int. Cl.[4] C08G *8/02, 14/00*
U.S. Cl. 528—171 **19 Claims**

1. A heat stable copolycondensate molding material which contains polyarylene sulfone and polyarylene ether sulfone units in random distribution and is obtainable by polycondensation of a mixture of

(A) from 2 to 98 mol%, based on the sum of (A) to (C), of

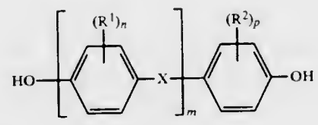


(B) from 2 to 98 mol%, based on the sum of (A) to (C), of

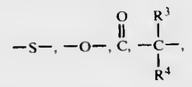


and

(C) from 0 to 96 mol%, based on the sum of (A) to (C), of



where X is a chemical bond or

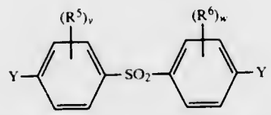


wherein R^3 and R^4 are different when n and p are simultaneously 0 or



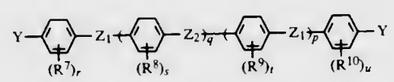
only when n or p is not 0, R^1 and R^2 are each alkyl or alkoxy, each of 1 to 6 carbon atoms, R^3 and R^4 are each hydrogen, alkyl of 1 to 6 carbon atoms, aryl or halogen-substituted alkyl of 1 to 4 carbon atoms, m is 0 or 1 and n and p are 0, 1, 2, 3 or 4, with

(D) from 1 to 100 mol%, based on the sum of (D) and (E), of

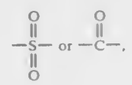


where R^5 and R^6 are each hydrogen or have the same meaning as R^1 and R^2, Y is Cl or F, and v and w are each 0, 1, 2, 3 or 4, and

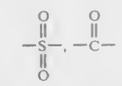
(E) from 0 to 99 mol%, based on the sum of (D) and (E), of



where Y is Cl or F, Z_1 is



Z_2 is —O—, —S—



or a chemical bond, R^7, R^8, R^9 and R^{10} are each hydrogen, Cl or F or may have the same meaning as R^1 and R^2, q and p are each 0 or 1 and r, s, t and u may each be an integer of from 0 to 4, with the proviso that one or more of the components (C) and (E) are present and the molar ratio of (B) to the sum of (A)+(C) is not greater than 1; further comprising from 10 to 60% by weight, based on the total weight, of at least one reinforcing filler.

4,904,755

LOW BIREFRINGENT POLYESTERS IN OPTICAL DEVICES

Julie S. Machell, Webster, and Paul D. Yacobucci, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1989, Ser. No. 299,208
Int. Cl.[4] C08G *63/02, 63/38*
U.S. Cl. 528—193 **5 Claims**

1. In an optical device wherein light passes through a polymeric material, the improvement wherein said polymeric material is a substantially optically anisotropic polyester having diol repeating units derived from 9,9-bis(4-hyroxyphenyl)fluorene and at least about 40% by weight of the diacid repeating units derived from aliphatic or cycloaliphatic dicarboxylic acids, the remainder of the diacid repeating units being derived from aromatic dicarboxylic acids.

4,904,756

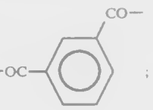
MOLDABLE/EXTRUDABLE THERMOTROPIC COPOLYESTERS/COPOLYESTERAMIDES

Jean-Pierre Quentin, Lyons, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 11, 1988, Ser. No. 217,353
Claims priority, application France, Jul. 10, 1987, 87 10177
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—193 **15 Claims**

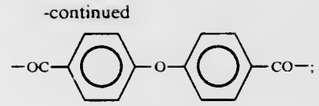
1. A moldable/extrudable, high molecular weight thermotropic aromatic copolyester(amide) comprising recurring structural units of the formulae (I), (II), (III) and (IV), wherein:

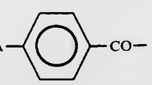
(I) represents the structure:  ;

(II) represents the structure:  ;

(III) represents the structure:

-continued

 ;

(IV) represents the structure: 

in which the symbol A is an oxygen atom or the NH group;

the molar ratio of the units (I) relative to the sum of the units (II)+(III) ranges from 0.95 to 1.05;

the amount of the units (II) in the mixture of (II)+(III) ranges from 20 to 90 mol % and that of the units (III), on the same basis, ranges from 80 to 10 mol %;

the amount of the units (IV), expressed relative to the amount of the units (I), ranges from 25 to 300 mol %; and

said copolyester(amide) having a flow temperature ranging from 200° to 350° C.

4,904,757

POLYESTERS OF 4,4'DIHYDROXYBICYCLOHEXYL

Alfredo Coassolo, Novara; Andrea Gardano, Trino; Marco Fos', Novara, and L. Lawrence Chapoy, Lesa, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 20, 1988, Ser. No. 221,745
Claims priority, application Italy, Jul. 23, 1987, 21402 A/87
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—272 **10 Claims**

1. Polyesters obtained by polycondensation of 4,4'-dihydroxybicyclohexyl with at least an α,ω-alkandioic acid of the general formula:

$$HOOC—(CH_2)_n—COOH \quad (I)$$

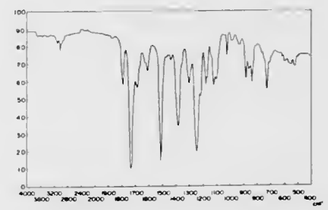
wherein n is an integer from 4 to 12, or at least one alkyl derivative thereof having chiral carbon atom wherein the alkyl radical contains from 1 to 6 carbon atoms.

4,904,758

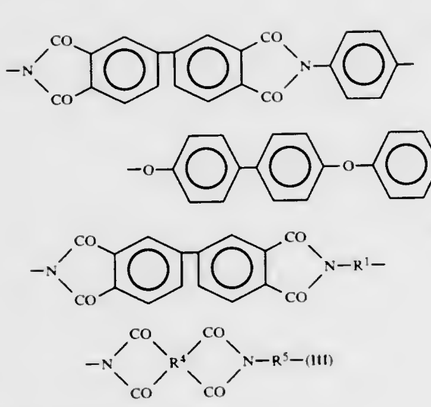
LOW-MELTING POLYIMIDE COPOLYMER AND METHOD FOR PREPARING THE SAME

Kouichi Kunimune, Chiba, and Hirotoshi Maeda, Yokohama, both of Japan, assignors to Chisso Corporation, Osaka, Japan

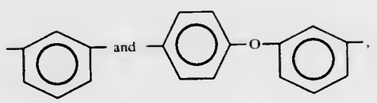
Filed Jan. 5, 1989, Ser. No. 293,326
Claims priority, application Japan, Jan. 6, 1988, 63-1012
Int. Cl.[4] C08G *69/26*
U.S. Cl. 528—353 **7 Claims**



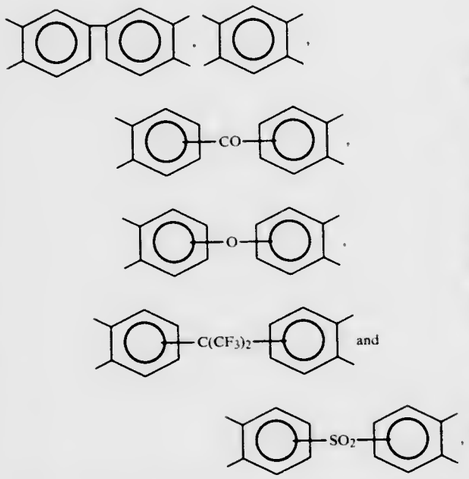
1. A low-melting polyimide copolymer containing 30 to 90 mole % of the following imide repeating unit (I), containing 10 to 70 mole % of the following imide repeating unit (II), containing or not containing the following imide repeating unit (III), and having a logarithmic viscosity number of 0.1 to 5 dl/g when measured in concentrated sulfuric acid at a temperature of 30°±0.01° C. at a concentration of 0.5 g/dl:



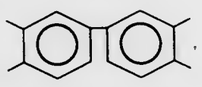
wherein R^1 is at least one of



R^4 is at least one of

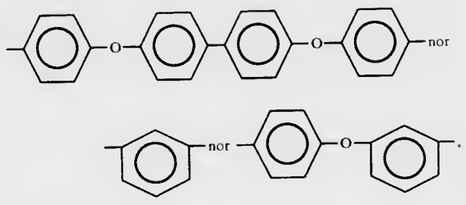


R^5 is a carbon cyclic aromatic group having 6 to 50 carbon atoms, but when R^4 is

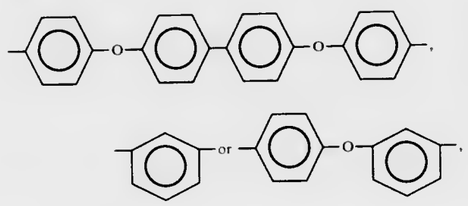


R^5 is neither

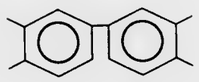
(I)



and when R^5 is



R^4 is not



4,904,759

LINEAR ALTERNATING POLYMER OF CARBON MONOXIDE, OLEFIN AND CONJUGATED DIOLEFIN

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 2, 1988, Ser. No. 266,189

Claims priority, application Netherlands, Nov. 2, 1987, 8702609

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 **20 Claims**

1. The process of producing a linear, alternating polymer by polymerizing carbon monoxide, at least one α-olefin, and at least one conjugated diene, in the presence of a catalyst composition formed by contacting a palladium compound, the anion of an acid having a pKa less than 6, and a bidentate ligand of phosphorus or nitrogen.

4,904,760

THERMOSETTING RESIN COMPOSITION FROM CYANATE ESTER AND NON-BRANCHED AROMATIC COMPOUND

Morio Gaku; Hidenori Kimbara, both of Saitama; Mitsuo Eziri, Tokyo; Masakazu Motegi, Tokyo, and Yousuke Funamoto, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 204,156

Claims priority, application Japan, Apr. 27, 1987, 62-102011; Jul. 9, 1987, 62-169657; Jul. 28, 1987, 62-186695; Aug. 26, 1987, 62-210246; Aug. 26, 1987, 62-210247; Sep. 3, 1987, 62-219065; Sep. 11, 1987, 62-226488

Int. Cl.[4] C08G *61/00, 81/00;* **C08L** *79/00*

U.S. Cl. 528—422 **10 Claims**

1. A thermosetting resin composition comprising:

(I) a cyanate ester compound selected from the group consisting of a polyfunctional cyanate ester having at least two cyanato ester groups, a prepolymer of such a cyanate ester and mixtures thereof, characterized in that said composition contains

(II) at least one non-branched aromatic compound in an amount of 5–40% by weight of the total resin composition, said aromatic compound having a number-average molecular weight of 178–800, an average number of aromatic nuclei of 2–6, and a boiling point of more than 300° C., and in which the portion having aromatic nuclei of 2–6 constitutes more than 50%.

4,904,761

RESIN COMPOSITION FOR SEALING SEMICONDUCTORS

Yuji Okitsu, Tokyo; Koichi Machida; Motoyuki Torikai, both of Yokohoma; Junko Tsuji, Oiso; Kotaro Asahina, Kamakura; Kazuya Shinkoda, Ninomiya; Takayuki Kubo, and Mikio Kitahara, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Nov. 22, 1988, Ser. No. 275,018

Int. Cl.[4] C08L *83/04, 63/10;* **C08K** *3/36*

U.S. Cl. 523—435 **16 Claims**

1. A semiconductor sealing resin composition which comprises;

(a) a modified epoxy resin which is a graft copolymer of a epoxy resin and a vinyl polymer, said modified epoxy resin having dispersed therein a silicone rubber with an average particle diameter less than 1.0μ;

(b) a curing agent; and

(c) an inorganic filler.

4,904,762

TONER COMPOSITIONS WITH CHARGE ENHANCING ADDITIVES

Hui Chang, Pittsford; John R. Laing, Rochester, and Maria E. McCall, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 21, 1989, Ser. No. 396,510

Int. Cl.[4] G03G *9/10*

U.S. Cl. 430—110 **42 Claims**

1. A toner composition comprised of resin, pigment, and a mixture of charge enhancing additives comprised of a first additive of quaternary ammonium salts and a second additive of an alkyl ammonium bisulfate.

4,904,763

PHYSIOLOGICALLY-ACTIVE NOVEL PEPTIDES

Hisayuki Matsuo; Kenji Kangawa; Naoto Minamino, all of Miyazaki; Tetsuji Sudoh, Tokyo; Atsushi Izumi, Tokyo, and Mitsutaka Isogai, Ibaraki, all of Japan, assignors to Daiichi Pure Chemicals Co., Ltd., Tokyo and Hisayuki Matsuo, Miyazaki, both of, Japan

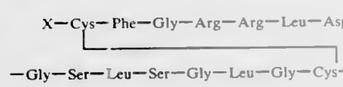
Filed Jun. 17, 1988, Ser. No. 207,855

Claims priority, application Japan, Jun. 17, 1987, 62-150853

Int. Cl.[4] C07K *7/10;* **A61K** *37/02*

U.S. Cl. 530—324 **10 Claims**

1. A substantially pure physiologically-active peptide represented by the formula (I):



(I)

wherein X means H or H-Asp-Ser.-Gly- and Y denotes -Asn-Val-Leu-Arg-Arg-Tyr-OH, -Asn-Val-Leu-Arg-Arg-OH, -Asn-Val-Leu-Arg-Tyr-OH, -Asn-Val-Leu-Arg-OH, -Asn-Val-Leu-OH or Asn-Ser-Phe-Arg-Tyr-OH, or a salt thereof.

4,904,764

4-DIAZO-3-METHYL-2,5-CYCLOHEXADINE-1-ONE AND PHARMACETICALLY ACCEPTABLE SALTS THEREOF

Joseph O'Sullivan, Belle Mead, and Pushpa Singh, Piscataway, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 12, 1985, Ser. No. 808,146

Int. Cl.[4] C07C *113/04;* **A61K** *31/665*

U.S. Cl. 534—564 **2 Claims**

1. 4-Diazo-3-methoxy-2,5-cyclohexadien-1-one, or a pharmaceutically acceptable salt thereof.

4,904,765

DYE MIXTURES CONTAINING AN OIL-SOLUBLE DYE AND AN ACID-EXTRACTABLE DYE

Bernd Derber, Limburgerhof, and Rudolf Denninger, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

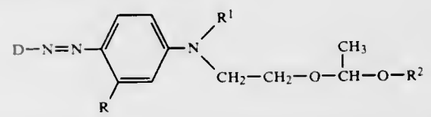
Filed Jul. 14, 1987, Ser. No. 73,143

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627461

Int. Cl.[4] C09B *29/085;* **C10L** *1/10, 1/22;* **C10M** *1/32*

U.S. Cl. 534—573 **8 Claims**

1. A dye mixture, comprising an oil-soluble dye and one or more dyes of the formula I:



(I)

wherein D is phenyl which is unsubstituted or substituted by methyl or methoxy; R is hydrogen or methyl; R^1 is hydrogen or C_1-C_4-alkyl; and R^2 is C_3- or C_4-alkyl, and wherein said dye of the formula I in said mixture is extractable from mineral oil products by aqueous or aqueous alcoholic hydrochloric acid.

4,904,766

MONOAZO COMPOUND HAVING TWO VINYLSULFONE TYPE FIBER REACTIVE GROUPS THROUGH TRIAZINYL BRIDGING GROUP

Kazufumi Yokogawa; Toshihiko Morimitsu, both of Minoo; Naoki Harada, Suita; Takashi Omura, Ashiya, and Sadanobu Kikkawa, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

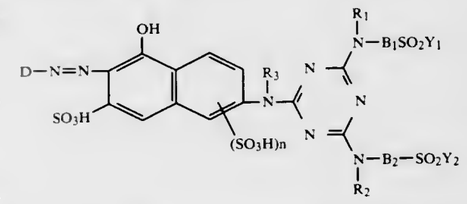
Filed Oct. 13, 1987, Ser. No. 106,798

Claims priority, application Japan, Oct. 17, 1986, 61-248201; Dec. 9, 1986, 61-294514

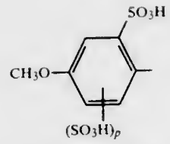
Int. Cl.[4] C09B *62/503, 62/51;* **D06P** *3/66, 1/384*

U.S. Cl. 534—642 **12 Claims**

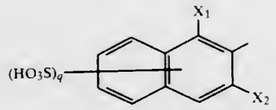
1. A monoazo compound represented by the following formula in a free acid form,



wherein D is a sulfophenyl group of the following formula in a free acid form,



in which p is 0 or 1, or a sulfonaphthyl group of the following formula in a free acid form,



in which any one of X_1 and X_2 is sulfo and the other is hydrogen, and q is 0, 1 or 2; R_1, R_2 and R_3 independently of one another are each hydrogen or alkyl unsubstituted or substituted with hydroxy, cyano, C_{1-4} alkoxy, halogeno, carboxy, carbamoyl, C_{1-4} alkoxycarbonyl, C_{1-4} alkylcarbonyloxy, sulfo or sulfamoyl; B_1 and B_2 independently of one another are each phenylene unsubstituted or substituted with methyl, methoxy, ethyl, ethoxy, chloro, bromo, sulfo or carboxy, naphthylene unsubstituted or substituted with sulfo, or alkylene, provided that at least one of B_1 and B_2 is the phenylene or naphthylene; Y_1 and Y_2 independently of one another are each $—CH=CH_2$ or $—CH_2CH_2Z$ in which Z is a group capable of being split by the action of an alkali; and n is 0 or 1.

4,904,767

ASYMMETRIC 1:2-CHROME COMPLEXES OF BENZENE-AZO-NAPHTHALENE/NAPHTHALENE-AZO-NAPHTHALENE ACID DYES FOR LEATHER

Fabio Beffa, Riehen; Alois Püntener, Rheinfelden, and Peter Loew, Münchenstein, all of Switzerland, assignors to Ciba-Geigy Corporation, Arsdley, N.Y.

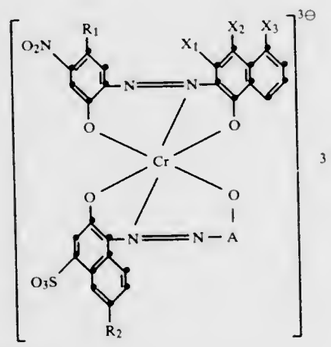
Continuation of Ser. No. 491,616, May 4, 1983, abandoned. This application Jun. 29, 1987, Ser. No. 68,815

Claims priority, application Switzerland, May 14, 1982, 3016/82; Jan. 12, 1983, 145/83; Jan. 12, 1983, 146/83

Int. Cl.[4] C09B *45/06;* **D06P** *1/10, 3/32, 3/24*

U.S. Cl. 534—696 **4 Claims**

1. A metal-complex dye which corresponds to the formula I



(I)

wherein

A is the radical of 1-hydroxynaphthalene or 2-hydroxynaphthalene,

R_1 is hydrogen, chlorine or methyl, R_2 is hydrogen, nitro or chlorine, and $Ka^{\oplus}$ is a cation, and of the substituents X_1, X_2 and X_3, one is an SO_3 group, and the other two are hydrogen, X_3 being hydrogen when R_1 is chlorine and R_2 is hydrogen.

4,904,768

EPIPODOPHYLLOTOXIN GLUCOSIDE 4'-PHOSPHATE DERIVATIVES

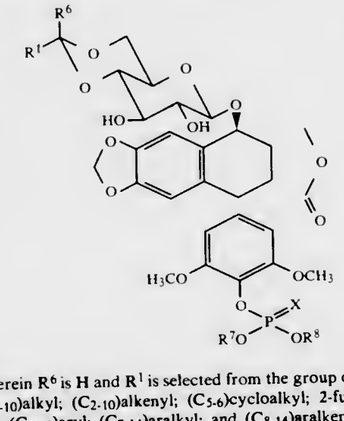
Mark G. Saulnier, Middletown, Conn.; Peter D. Senter, Seattle, Wash., and John F. Kadow, Meriden, Conn., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 81,493, Aug. 4, 1987, abandoned. This application May 27, 1988, Ser. No. 199,731

Int. Cl.[4] C07H *11/04, 15/00*

U.S. Cl. 536—17.1 **31 Claims**

1. A compound having the formula



V

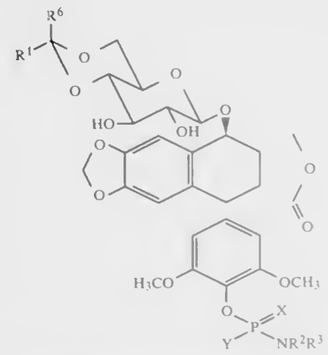
wherein R^6 is H and R^1 is selected from the group consistng of (C_{1-10})alkyl; (C_{2-10})alkenyl; (C_{5-6})cycloalkyl; 2-furyl; 2-thienyl; (C_{6-10})aryl; (C_{7-14})aralkyl; and (C_{8-14})aralkenyl wherein each of the aromatic rings may be unsubstituted or substituted with one or more groups selected from halo, (C_{1-8})alkyl, (C_{1-8})alkoxy, hydroxy, nitro, and amino; or R^1 and R^6 are each (C_{1-8})alkyl; or R^1 and R^6 and the carbon to which they are attached join to form a (C_{5-6})cycloalkyl group;

X is oxygen or sulfur;

R^7 and R^8 are independently selected from the group consisting of H, (C_{1-5})alkyl, halo-substituted (C_{1-5})alkyl, cyano-substituted (C_{1-5})alkyl, (C_{3-6})cycloalkyl, (C_{6-10})aryl, (C_{7-14})aralkyl, wherein the ring portion of said aryl and aralkyl groups is unsubstituted or substituted with a group selected from the group consisting of alkyl, halo, and nitro;

or a pharmaceutically acceptable salt thereof.

17. A compound having the formula



wherein R^1, R^6, and X are as defined in claim 1; Y is Cl, OH, or NR^4R^5; R^2, R^3, R^4, and R^5 are each independently selected from the group consisting of H, (C_{1-5})alkyl, (C_{2-5})alkenyl, (C_{3-6})cycloalkyl; wherein said alkyl, alkenyl, cycloalkyl may be unsubstituted or substituted with one or more of a group selected from the group consisting of hydroxy, alkoxy, halo, mercapto, cyano, alkylthio, alkanoylamino, dialkylamino, alkylamino, and nitropyridyl disulfide; or R^2, R^3, and the nitrogen to which they are attached together represent a 3 to 6 membered ring; or R^4, R^5, and the nitrogen to which they are attached together represent a 3 to 6 membered ring; or a pharmaceutically acceptable salt thereof.

4,904,769

HIGHLY PURE ACARBOSE

Erich Rauenbusch, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 11, 1986, Ser. No. 940,713

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3543999

Int. Cl.[4] C07H *3/08;* **A61K** *31/70*

U.S. Cl. 536—17.2 **11 Claims**

1. A purified acarbose composition which, apart from water, has an acarbose content of about 93–98% by weight.

11. A pharmaceutical composition comprising an effective amount of an acarbose composition according to claim 1, said acarbose, apart from water, contains less than 10% by weight of sugar-like secondary components and a pharmaceutically acceptable excipient therefor.

4,904,770

PRODUCTION OF 2',3'-DIDEOXY-2',3'-DIDEHYDRONUCLEOSIDES

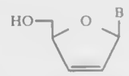
John E. Starrett, Jr., Middletown; Muzammil M. Mansuri; John C. Martin, both of Cheshire, all of Conn.; Carl E. Fuller, Warners, and Henry G. Howell, Jamesville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 24, 1988, Ser. No. 173,473

Int. Cl.[4] C07H *19/06*

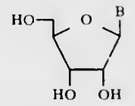
U.S. Cl. 536—23 **1 Claim**

1. A process for producing a 2',3'-dideoxy-2',3'-didehydronucleoside represented by the formula

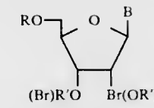


wherein B is a member selected from the group of bases consisting of uracil, and 5-methyluracil comprising the steps of:

(a) reacting a starting ribonucleoside represented by the formula

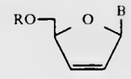


with an acyloxyisobutyryl bromide in a polar solvent under anhydrous conditions at an elevated temperature of about 75°–100° C. for about 1–3 hrs to obtain a reactive intermediate represented by the formulas



wherein R represents the acyloxyisbutyryl group and R' represents the acyl group of the acyloxyisobutyryl bromide;

(b) subjecting the intermediate from step (a) to an elimination reaction by treatment of said intermediate in an aprotic polar solvent with Zn/Cu reagent.



; and

(c) deprotecting the 5'—O-protecting group in the intermediate from step (b) by treatment of said intermediate with a mild base to give derived 2',3'-dideoxy-2',3'-didehydronucleoside.

4,904,771

PSEUDOURIDINE DERIVATIVE

Nobuhiko Katsunuma, 246-2, Myodo 3-chome; Hiroshi Kido, 11-10, Higashiyoshinomachi 3-chome, both of Tokushima-shi, Tokushima-ken; Ikutoshi Matsuura, 1043-67, Ohaza-shimotomi, Tokorozawa-shi, Saitama-ken, and Yoshihiko Ishitani, 8-6, Nakanodaikashimacho, Noda-shi, Chiba-ken, all of Japan

PCT No. PCT/JP87/00209, § 371 Date Dec. 3, 1987, § 102(e) Date Dec. 3, 1987, PCT Pub. No. WO87/05901, PCT Pub. Date Oct. 8, 1987

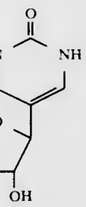
PCT Filed Apr. 3, 1987, Ser. No. 142,856

Claims priority, application Japan, Apr. 4, 1986, 61-78045

Int. Cl.[4] C07G *37/00;* **C07H** *5/04, 15/00;* **A01N** *43/04*

U.S. Cl. 536—55 **2 Claims**

1. 5'-Pseudouridyl-N-oleoyl carbamate represented by the formula:



$CH_3(CH_2)_7CH=CH(CH_2)_7CONHCOOCH_2$

4,904,772

MIXED HYDROPHOBE POLYMERS

Arjun C. Sau, Newark, Del., assignor to Aqualon Company, Wilmington, Del.

Filed Oct. 3, 1988, Ser. No. 252,315
Int. Cl.[4] C08B *11/193*
U.S. Cl. 536—90 23 Claims

1. A water-soluble, cellulose ether polymer having (a) at least one substituent selected from the group consisting of hydroxyethyl, hydroxypropyl, and methyl radicals and (b) two or more hydrophobic radicals having 6 to 20 carbon atoms selected from the group consisting of long chain alkyl, alphahydroxyalkyl, urethane, acyl 3-alkoxy-2-hydroxypropyl, wherein one of the hydrophobic radicals has a carbon chain length that is at least two carbon atoms longer than that of another of the hydrophobic radicals and the hydrophobic radicals are contained in a total amount of between about 0.2 weight percent and an amount such that the cellulose ethers are less than 1% by weight soluble in water.

4,904,773

PROCESS FOR EXTRACTING METHYLXANTHINES FROM AQUEOUS SOLUTIONS CONTAINING SAME

Ernest K. Yu, Brampton; Wayne R. Bellamy, Guelph, and Alexander M. Sills, Thornhill, all of Canada, assignors to Allelix Inc., Mississauga, Canada

Filed Mar. 9, 1987, Ser. No. 23,619
Int. Cl.[4] A23F *5/26, 5/44*
U.S. Cl. 536—103 26 Claims

1. A process for treating an aqueous solution containing a methylxanthine, which comprises the steps of

(1) contacting said aqueous solution with an effective amount of cyclodextrin to produce cyclodextrin-methylxanthine complexes and a treated solution, said treated solution comprising less than 80% of the methylxanthine in said aqueous solution; and

(2)recovering said treated solution.

4,904,774

DECOLORIZATION OF GLYCOSIDES

Robert S. McDaniel, Jr.; Patrick M. McCurry; Rolland W. P. Short, and Paul R. Glor, all of Decatur, Ill., assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 674,109, Nov. 21, 1984, Pat. No. 4,762,918. This application Apr. 22, 1988, Ser. No. 185,016
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[4] C07H *1/06*
U.S. Cl. 536—127 12 Claims

1. A process for reducing the color of a glycoside composition, which process comprises: contacting a colored glycoside composition with hydrogen or a source of hydrogen selected from the group consisting of Raney nickel, lithium aluminum hydride, or sodium borohydride, under catalytic hydrogenation conditions for a suffient time to decrease the color there of and thereafter recovering the glycoside composition of reduced color.

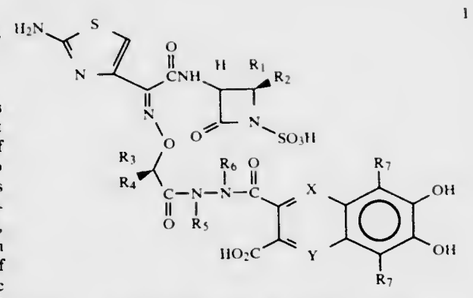
4,904,775

HETEROAROYLHYDRAZIDE DERIVATIVES OF MONOCYCLIC BETA-LACTAM ANTIBIOTICS

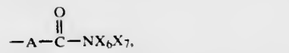
Joseph E. Sundeen, Yardley, Pa., and Peter H. Ermann, Donaustauf, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 16, 1988, Ser. No. 194,355
Int. Cl.[4] C07D *417/14, 241/44, 491/048, 417/12*
U.S. Cl. 540—363 26 Claims

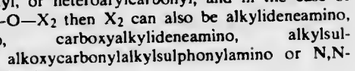
1. Compounds of the formula



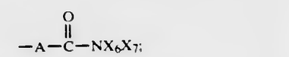
and pharmaceutically acceptable salts thereof, wherein R_1 and R_2 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle or one of R_1 and R_2 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, $-CH_2X_1$; wherein X_1 is azido, amino, hydroxy, carboxy, alkoxycarbonyl, alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,



$-S-X_2$, or $-O-X_2$ (wherein A, X_2, X_6 and X_7 are as hereinafter defined); $-S-X_2$ or $-O-X_2$; wherein X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl,alkanoyl, substituted alkanoyl, phenylalkanoyl, (substituted phenyl)alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroarylcarbonyl; and in the case of when X_1 is $-O-X_2$ then X_2 can also be alkylideneamino, alkanoylamino, carboxyalkylideneamino, alkylsulphonylamino, alkoxycarbonylalkylsulphonylamino or N,N-cyclodialkanoylamino,



wherein one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl groups, and X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano, or



wherein A is $-CH=CH-$, $-(CH_2)_m-$, $-(CH_2)_m-O-$, $-(CH_2)_m-NH-$, or $-CH_2-S-CH_2-$, m is 0, 1 or 2, and X_6 and X_7 are the same or different and each is hydrogen, alkyl, phenyl or substituted pheny, or X_6 is hydrogen and X_7 is amino, substituted amino, alkanoylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, 6 or 7-membered heterocycle;

R_3 and R_4 are the same or different and each is hydrogen or alkyl or R_3 and R_4 taken together with the carbon atom to which they are attached are cycloalkyl;

R_5 and R_6 are the same or different and each is hydrogen or alkyl or R_5 and R_6 taken together with the nitrogen atoms

to which they are attached form a 1,2-diazacylobutane, 1,2-diazacyclopentane, 1,2-diacyclohexane, or 1,2-diazacycloheptane ring;

R_7 is hydrogen, fluorine, chlorine or bromine;

X is a nitrogen atom or CH;

Y is a nitrogen atom or CH;

provided that either X or Y is always a nitrogen atom.

wherein the term "substituted alkyl" refers to alkyl groups substituted with azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkanoyloxy, aminocarbonyl, or carboxy groups;

the term "substituted amino" refers to a group having the formula $-NX_8X_9$ wherein X_8 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and X_9 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substitutedphenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imdazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, teterazol, tetrazolyl or one of the above groups substituted with one or more halogen, hydroxy, nitro,amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino, or substituted alkyl wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "a 4,5,6 or 7-membered heterocycle" refers to pyridinyl. furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolylidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino, or substituted alkyl wherein the alkyl groups has 1 to 4 carbon atom, groups.

4,904,776

METHOD FOR PRODUCING CRYSTALLINE CEFADROXIL HEMIHYDRATE

Leonardo Marsili, Milan, Italy, assignor to Rifar S.R.L., Milan, Italy

Filed Aug. 25, 1987, Ser. No. 89,168
Int. Cl.[4] C07D *501/04;* A61K *31/545*
U.S. Cl. 540—230 2 Claims

1. A method for producing crystalline cefadroxil hemihydrate, which comprises:

(a) adding to an aqueous solution of cefadroxil prepared from 7-ADCA, a solvent selected from the group consisting of dimethylacetamide, N-methyl-2-pyrrolidone and monomethylformamide, while controlling the pH of the solution in the range of 5.5–6.0, to give the corresponding cefadroxil solvate which precipitates and is filtered off and dried, and

(b) slurrying said dried solvate with a mixture of methanol-isopropyl alcohol 30:70 to 70:30 by volume containing about 5% to 12% of water, at a temperature in the range of about +45° C. to +55° C., wherein after the crystalline cefadroxil hemihydrate obtained is isolated from the reaction mixture.

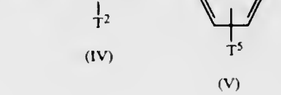
4,904,777

MONO AZO DYES CONTAINING AS DIAZO RADICAL A THIOPHENE RADICAL WHICH POSSESSES AN OXIME GROUP

Karl-Heinz Etzbach, Frankenthal; Guenter Hansen; Ernst Schefczik, both of Ludwigshafen, and Helmut Reichelt, Niederkirchen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

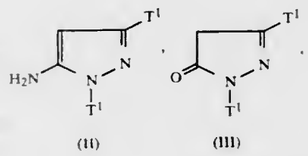
Filed Oct. 19, 1987, Ser. No. 109,525
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 3637438
Int. Cl.[4] C09B *29/033;* D06P *1/04, 3/52, 3/40*
U.S. Cl. 534—738 2 Claims

1. A thiophene-containing azo dye of the formula

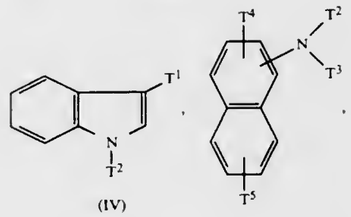


(I)

where R is C_1–C_{12} alkyl or C_1–C_2 alkyl substituted by chlorine, bromine, C_1–C_4-alkoxy, phenyl or phenoxy, C_3–C_6 alkenyl or C_3–C_6 alkenyl substituted by chlorine, bromine, C_1–C_4-alkoxy, phenyl or phenoxy, phenyl or phenyl substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, X is hydrogen, halogen, hydroxyl, C_1–C_8 alkoxy, C_1–C_8-alkoxy substituted by phenyl, C_5–C_7-cycloalkoxy, phenoxy, phenoxy substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, mercapto, alkylthio, alkylthio substituted by hydroxyl-, C_1–C_4-alkoxycarbonyl- or phenyl, C_5–C_7-cycloalkylthio, phenylthio, phenylthio substituted by halogen, C_1–C_4-alkyl or C_1–C_8 alkoxy, C_1–C_4-alkylsulfonyl, phenylsulfonyl, phenylsulfonyl substituted by halogen, C_1–C_4-alkyl or C_1–C_4 alkoxy, C_1–C_8-alkyl, phenyl substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy; Y is cyano, nitro, C_1–C_{10}-alkanoyl, benzoyl, benzoyl substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, C_1–C_4-alkylsulfonyl, phenylsulfonyl, phenylsulfonyl substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, or CO—Z where Z is hydroxyl, C_1–C_8 alkoxy, C_1–C_8 alkoxy substituted by hydroxyl- or C_1–C_4-alkoxy, phenoxy, phenoxy substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, amino, C_1–C_8-mono- or dialkylamino, pyrrolidino, piperidino, morpholino or N-(C_1–C_4-alkyl)piperazino and K is the radical of a coupling component of the formulae II to X:

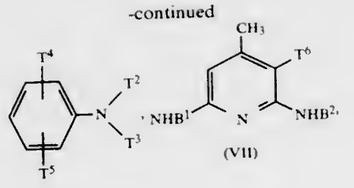


(II) (III)

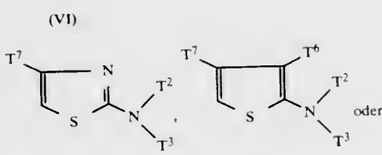


(IV) (V)

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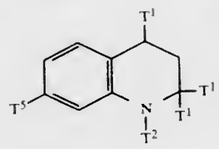
(VII)



(VI)

(VIII)

(IX)



(X)

where B^1 is hydrogen or B^2, B^2 is C_1–C_8 alkyl, C_1–C_8 alkyl substituted by chlorine, bromine, hydroxyl, C_1–C_8-alkoxy, phenoxy, phenyl, cyano, carboxyl, C_1–C_8-alkanoyloxy, C_1–C_8-alkanoyloxy-C_1–C_4-alkoxy, C_1–C_8-alkoxy-C_1–C_4-alkoxy, benzoyloxy, o-, m- or p-methylbenzoyloxy, o-, m- or p-chlorobenzoyloxy, C_1–C_8-alkoxy-C_1–C_8-alkanoyloxy, phenoxy-C_1–C_8-alkanoyloxy, C_1–C_8-alkoxycarbonyloxy, C_1–C_8-alkoxy-C_1–C_8-alkoxycarbonyloxy, benzyloxycarbonyloxy, phenethoxycarbonyloxy, phenoxyethoxy-carbonyloxy, C_1–C_8-alkylaminocarbonyloxy, cyclohexylaminocarbonyloxy, phenylaminocarbonyloxy, C_1–C_8-alkoxycarbonyl, C_1–C_8-alkoxy-C_1–C_8-alkoxycarbonyl, phenoxy-carbonyl, benzyloxycarbonyl, phenoxy-C_1–C_4-alkoxy or phenylethoxycarbonyl, C_5–C_7 cycloalkyl, C_5–C_7 cycloalkyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_2–C_4-hydroxy-alkyl or hydroxyl, phenyl, C_3–C_6-alkenyl or acyl, T^1 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkyl substituted by phenyl, phenyl, or phenyl substituted by halogen or alkyl; T^2 is hydrogen or T^3, T^3 is C_1–C_6 alkyl, C_1–C_6 alkyl substituted by chlorine, bromine, hydroxyl, C_1–C_8-alkoxy, phenoxy, cyano, carboxyl, phenyl C_1–C_8-alkanoyloxy, C_1–C_8-alkoxy-C_1–C_4-alkoxy, benzoyloxy, o-, m- or p-methylbenzoyloxy, o-, m- or p-chlorobenzoyloxy, C_1–C_8-alkoxy-C_1–C_8-alkanoyloxy, phenoxy-C_1–C_8-alkanoyloxy, C_1–C_8-alkoxycarbonyloxy, C_1–C_8-alkoxy-C_1–C_8-alkoxycarbonyloxy, benzyloxycarbonyloxy, phenethoxycarbonyloxy, phenoxyethoxy-carbonyloxy, C_1–C_8-alkylaminocarbonyloxy, cyclohexylaminocarbonyloxy, phenylaminocarbonyloxy, C_1–C_8-alkoxycarbonyl, C_1–C_8-alkoxy-C_1–C_8-alkoxycarbonyl, phenoxy-carbonyl, benzyloxycarbonyl, phenoxy-C_1–C_4-alkoxy or phenylethoxycarbonyl, C_5–C_7-cycloalkyl, C_3–C_6-alkenyl or phenyl, T^4 and T^5 are each, independently of the other, hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenoxy, benzyloxy, halogen, C_1–C_4-alkyl-sulfonylamino, C_1–C_4-dialkylaminosulfonylamino, C_1–C_4-alkoxycarbonylamino, benzoylamino or C_1–C_6-alkanoylamino, T^6 is cyano, nitro, acetyl, carbamoyl, C_1–C_4-mono- or -dialkylcarbamoyl, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkoxyethoxycarbonyl; and T^7 is C_1–C_{10} alkyl, C_1–C_{10} alkyl substituted by cyano-, C_1–C_4-alkoxycarbonyl- or phenyl, phenyl, halogen nitro, C_1–C_{10} alkoxy, C_1–C_{10}-alkoxy substituted by C_1–C_4 alkoxy, phenoxy, benzyloxy, C_1–C_4-alkylthio, phenylthio, C_1–C_4-mono- or dialkylamino, C_1–C_5-alkanoylamino or C_1–C_4-alkoxycarbonyl.

4,904,778

PYRIMIDINE-2-PHENYLAMINO DERIVATIVES

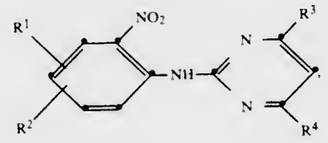
Hermann Rempfler, Ettingen; Erich Stamm, Huttwil, and Rudolph C. Thummel, Courgenay, all of Switzerland, assignors to Ciba-Geigy Corp., Ardsley, N.Y.

Division of Ser. No. 107,437, Oct. 9, 1987, Pat. No. 4,802,909. This application Oct. 24, 1988, Ser. No. 262,122

Int. Cl.[4] **C07D** *239/02*

U.S. Cl. 544—323 **2 Claims**

1. A compound of the formula



(II)

in which

R^1 and R^2 each represents, independently of the other, hydrogen, halogen, C_1–C_6-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkoxy-(C_1–C_4)-alkyl, nitro or cyano, and

R^3 and R^4 each represents, independently of the other, hydrogen, halogen, cyano, OH, SH, C_1–C_6-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkylthio, amino, mono-C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkoxy-(C_1–C_4)-alkyl,

with the proviso that when R^1 represents 4—NO_2 and R^2 represents 6—CF_3 R^3 and R^4 do not represent F, Cl, Br, C_1–C_4-alkyl, C_1–C_3-alkoxy, C_1–C_4-alkylthio, cyano, CCl_3, CF_3, $OCH_2OC_2H_5$, OCH_2F, CH_2OCH_3 or OCH_2CF_3 and when R^1 represents 4—CF_3 and R^2 represents 6—NO_2 the following pairs of meanings for R^3 and R^4 are not included: Cl, Cl; n-C_6H_{13}, Cl; Br, Br; CN, CH_3; F, F; CH_3, CH_3; Cl, SCH_3; Cl, OCH_3; Cl, OCH_2CF_3; Cl, CH_2Cl and Cl, CH_2F; and with the proviso that R^1 and R^2 do not together represent hydrogen when R^3 and R^4 together represent CH_3.

4,904,779

HETEROCYCLES BASED ON PIPERAZINOPIPERAZINE

Peter Neumann, Mannheim; Alexander Aumueller, Deidesheim, and Hubert Trauth, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellscbaft, Ludwigsbafen, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,423

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 3801944

Int. Cl.[4] **C07D** *251/72*

U.S. Cl. 544—180 **14 Claims**

7. A heterocyclic compound as claimed in claim 2, wherein n is 1.

4,904,780

PROCESS FOR THE MONOACYLATION OF WATER-SOLUBLE ORGANIC AMINO COMPOUNDS

Horst Jaeger, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 27, 1988, Ser. No. 224,971

Claims priority, application Fed. Rep. of Germany, Aug. 15, 1987, 3727253

Int. Cl.[4] **C07D** *251/44*

U.S. Cl. 544—211 **6 Claims**

1. In a process for the monoacylation of an aromatic aminosulphonic acid by reaction of said aminosulphonic acid with 2,4,6-trifluorotriazine in aqueous medium, the improvement wherein the monoacylation reaction is carried out at temperatures below 0° C. in the presence of inorganic and/or organic water-soluble salts and/or water-miscible organic solvents.

4,904,781

CARBAMIC ACID DERIVATIVES

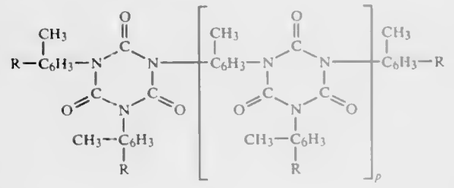
Mikhail G. Ivanov, prospekt Tsiolkovskogo, 31, kv. 47, Dzerzhinsk Gorkovskoi oblasti; Veniamin G. Golov, prospekt Pobedy 3, kv. 11, Dzezshinsk Gorkovskoi oblasti; Vladimir N. Kuzmin, ulitsa Dobroselskaya, 195-a, kv. 48, Vladimir; Aida I. Alyakrinskaya, ulitsa Volosbilova, 6, kv. 2, Vladimir; Roman Y. Mushy, Gvardeisky prospekt, 45, kv. 15, Severodonetsk Voroshilovgradskoi oblasti; Alexei D. Kovalev, prospekt Kosmonavtov, 15, kv. 46, Severodonetsk Voroshilovgradskoi oblasti; Nadezhda V. Shutova, prospekt Leninskogo Komsomola, 42, kv. 103, Dzerzhinsk Gorkovskoi oblasti; Jury A. Rodionov, prospekt Tsiolkovskogo, 81, kv. 31, Dzerzhinsk Gorkovskoi oblasti; Igor I. Molev, ulitsa Griboedova, 36, kv. 22, Dzerzhinsk Gorkovskoi oblasti; Ljudmila S. Yakovleva, Balaklavsky prospekt, 20, korpus 1, kv. 52, Moscow; Vitaly B. Berezin, Ryazansky prospekt, 51, kv. 106, Moscow; Alexei I. Petrashko, ulitsa Tashkentskava, 24, Korpus 1, kv. 181, Moscow; Gennady M. Shuev, ulitsa Profsojuznaya, 18, kv. 64, Narofominsk Moskovskoi oblasti; Boris A. Bukin, ulitsa Profsojuznaya, 40, kv. 17, Narofominsk Moskovskoi oblasti; Tamara M. Belkina, deceased, late of Moscow, and by Naum S. Belkin, administrator, ulitsa Flotskaya, 18, kv. 94, Moscow, all of U.S.S.R.

Continuation of Ser. No. 901,753, Aug. 28, 1986, Pat. No. 4,797,494, which is a division of Ser. No. 573,795, Jan. 25, 1984, Pat. No. 4,623,731. This application Jan. 12, 1988, Ser. No. 143,451

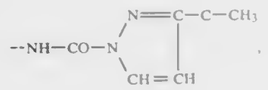
Int. Cl.[4] **C07D** *251/34, 403/10*

U.S. Cl. 544—222 **1 Claim**

1. A compound of the formula:



wherein R is



p is 0–4.

4,904,782

PROCESS FOR THE PRODUCTION OF PHTHALAZINEACETIC ACID ESTER DERIVATIVES AND A NOVEL INTERMEDIATE

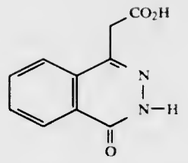
Terry G. Sinay, Jr., Preston, and Robert J. Sysko, Niantic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Feb. 29, 1988, Ser. No. 161,540

Int. Cl.[4] **C07B** *43/00, 43/06;* **C07D** *237/32, 237/34*

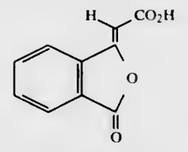
U.S. Cl. 544—237 **22 Claims**

1. A process for the preparation of a compound of the formula



(II)

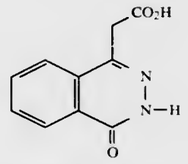
which comprises reacting a compound of the formula



(III)

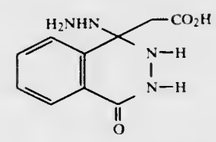
with hydrazine in the presence of a solvent; removing the unreacted hydrazine; and reacting the products so formed with acid in the presence of a solvent.

7. A process for the preparation of a compound of the formula



(II)

which comprises dissolving a compound of the formula



(I)

in water or aqueous NaOH and reacting with acid.

4,904,783

HERBICIDAL COMPOSITIONS

Werner Töpfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

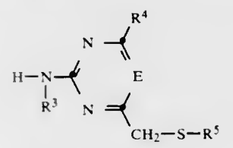
Division of Ser. No. 919,514, Nov. 24, 1986, Pat. No. 4,786,315, which is a division of Ser. No. 641,051, Aug. 15, 1984, Pat. No. 4,639,264. This application Sep. 19, 1988, Ser. No. 245,602

Claims priority, application Switzerland, Aug. 26, 1983, 4669/83

Int. Cl.[4] **C07D** *239/42, 401/04, 403/04, 295/22*

U.S. Cl. 544—320 **3 Claims**

1. An aminopyrimidine of the formula III



(III)

wherein

VOL 1111 ISS 4 FE 27 1990 UMI

E is —CH=,
Z is oxygen or sulfur,
R^3 is hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl or C_1–C_4-alkoxy,
R^4 is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_2–C_4-alkoxyalkyl, C_2–C_4-alkoxyalkoxy, cyclopropyl, —NH_2, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, or a saturated 5- to 7-membered nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine,
R^5 is cyano, —CZ—R^{13},

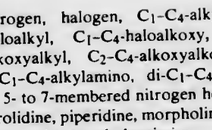


or an unsaturated heterocycle selected from imidazole, triazole, pyridine, pyrimidine, thiazole, oxazole, thiadiazole, oxadiazole, pyridazine, thiophene or furan, as well as partially unsaturated derivatives thereof which are unsubstituted or substituted by a radical selected from the group comprising halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-haloalkyl,
R^{13} is C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, phenyl, di-C_1–C_4-alkylamino, or a saturated 5- to 7-membered nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine and
R^{14} and R^{15} independently of one another are C_1–C_4-alkyl, C_1–C_4-alkoxy, C_3–C_4-alkoxyalkoxy, C_3–C_4-alkenyloxy, C_1–C_6-alkylthio, C_1–C_4-alkylamino or di-C_1–C_4-alkylamino.

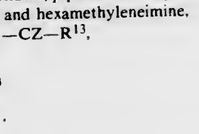
4,904,784
ACTIVE COMPOUNDS
John M. Evans, Roydon; Geoffrey Stemp, and Frederick Cassidy, both of Harlow, all of England, assignors to Beecham Group p.l.c., England
Division of Ser. No. 871,711, Jun. 6, 1986, Pat. No. 4,812,459. This application Feb. 23, 1989, Ser. No. 314,814
Claims priority, application United Kingdom, Jun. 8, 1985, 8514538; Nov. 9, 1985, 8527713
Int. Cl.[4] C07D *401/14, 401/04, 491/052*
U.S. Cl. 546—90 **4 Claims**

1. A compound of formula (II), (V), (VIII) or (IX):

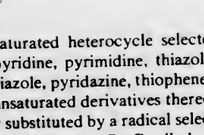
(II)



(V)

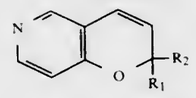


(VIII)



-continued

(IX)

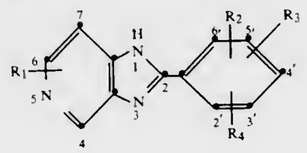


wherein one of R_1 and R_2 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_1 and R_2 together are C_{2-5} polymethylene; $R_3{}^1$ is hydroxy, C_{1-6} alkoxy or C_{1-7} acyloxy; $R_4{}^1$ is hydrogen and $R_6{}^1$ is hydrogen or C_{1-6} alkyl, the $R_6{}^1$NH group being trans to the $R_3{}^1$ group.

4,904,785
2-PHENYLIMIDAZO[4,5-C]PYRIDINES
David W. Robertson, and J. Scott Hayes, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Division of Ser. No. 878,718, Jun. 26, 1986, Pat. No. 4,758,574, which is a continuation of Ser. No. 569,364, Jan. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 469,883, Feb. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 373,932, May 3, 1982, abandoned. This application May 2, 1988, Ser. No. 190,290
Int. Cl.[4] C07D *471/02*
U.S. Cl. 546—118 **15 Claims**

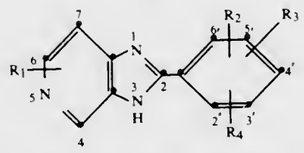
1. A compound of the formula

I



and

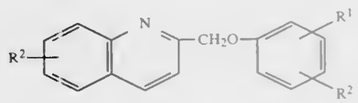
Ia



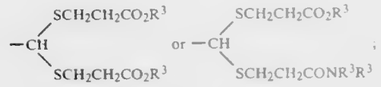
or its pharmaceutically acceptable salt, wherein
R_1 is hydrogen, C_1–C_4 alkyl, or chloro;
R_2 and R_3 each are independently hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, allyloxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, hydroxy, halo, cyano, nitro, amino, mono- or di-(C_1–C_4 alkyl)amino, trifluoromethyl, or Z-Q-substituted C_1–C_4 alkoxy, wherein Q is oxygen, sulfur, sulfinyl, sulfonyl, or a bond, and Z is C_1–C_4 alkyl, phenyl, or phenyl substituted with a group selected from halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, nitro, amino, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, or C_1–C_4 alkylsulfonyl; and
R_4 is hydrogen, C_1–C_4 alkyl, or C_1–C_4 alkoxy;
with the provisions that:
(a) if R_1 and two of R_2, R_3, and R_4 are all hydrogen, the other of R_2, R_3, and R_4 is not hydrogen, halo, hydroxy, nitro, amino, di-(C_1–C_2 alkyl)amino, or C_1–C_2 alkoxy;
(b) if R_1 and one of R_2, R_3, and R_4 are both hydrogen, and another of R_2, R_3, and R_4 is C_1–C_2 alkoxy, the other of R_2, R_3, and R_4 is not hydroxy or C_1–C_2 alkoxy;
(c) if R_1 is chloro and two of R_2, R_3, and R_4 are both hydrogen, the other of R_2, R_3, and R_4 is not hydrogen, halo, C_1–C_2 alkyl, or nitro; and
(d) if R_1 is chloro and R_4 is hydrogen, R_2 and R_3 may not both be nitro.

4,904,786
QUINOLINE COMPOUNDS AS ANTIALLERGIC AND ANTIINFLAMMATORY AGENTS
John H. Musser, Malvern; Dennis M. Kubrak, Drexel Hill; Anthony F. Kreft, III, Trooper, and Reinhold H. W. Bender, Valley Forge, all of Pa., assignors to American Home Products Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 50,595, May 15, 1987, Pat. No. 4,772,703, which is a continuation-in-part of Ser. No. 823,163, Jan. 27, 1986, Pat. No. 4,675,405, which is a continuation-in-part of Ser. No. 787,939, Oct. 16, 1985, abandoned, which is a division of Ser. No. 653,733, Sep. 21, 1984, Pat. No. 4,581,457. This application Aug. 11, 1988, Ser. No. 231,130
Int. Cl.[4] C07D *215/00*
U.S. Cl. 546—152 **3 Claims**

1. A compound having the formula



wherein
R^1 is

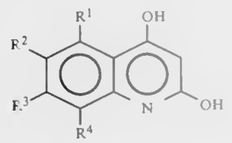


R^2 is hydrogen, loweralkyl, loweralkoxy, lower alkoxycarbonyl, trifluoromethyl, nitro, cyano or halo;
R^3 is hydrogen or loweralkyl;
and the pharmaceutically acceptable salts thereof.

4,904,787
METHOD FOR PRODUCING 2,4-DIHYDROXYQUINOLINE DERIVATIVES
Naoshi Imaki, Atsugi; Yuki Takuma, Machida, and Mari Oishi, Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan
Filed Apr. 4, 1988, Ser. No. 177,045
Int. Cl.[4] C07D *215/220*
U.S. Cl. 546—155 **4 Claims**

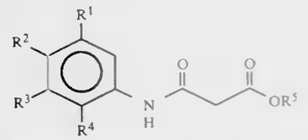
1. A method for producing a 2,4-dihydroxyquinoline compound of the formula:

(II)



wherein each of R^1, R^2, R^3 and R^4 is a hydrogen atom, a lower alkyl group, a lower alkoxy group or a halogen atom, and its tautomer, which comprises cyclizing an aryl malonic acid amide ester compound of the formula:

(I)



wherein R^1, R^2, R^3 and R^4 are as defined above, and R^5 is a lower alkyl group, by means of polyphosphoric acid at a temperature of from 50° C. to 200° C., wherein said polyphosphoric acid is prepared in a molar ratio of P_2O_5/H_3PO_4 within a range of from 0.4 to 0.6.

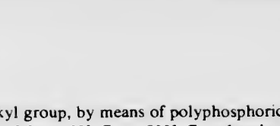
4,904,788
HYDROCARBON-SOLUBLE COMPLEXES OF MAGNESIUM ALKOXIDES WITH MAGNESIUM AMIDES
Andrzej M. Piotrowski, Thornwood, N.Y., and Dennis B. Malpass, LaPorte, Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.
Filed Jun. 7, 1988, Ser. No. 203,192
Int. Cl.[4] C07F *3/02*
U.S. Cl. 546—248 **3 Claims**

1. A hydrocarbon-soluble complex of a magnesium alkoxide and a magnesium amide of the formula $Mg(OR)_x(NR'R'')_y$, where R is alkyl, R' and R'' are selected from the group consisting of hydrogen, aryl, alkyl, and, as conjoint, part of a heterocyclic ring, and x and y can range from 0.1 to 1.9 with their sum being 2.

4,904,789
PROCESS FOR THE PREPARATION OF UNSYMMETRICAL DIHYDROPYRIDINES
Paul Naab; Willi Lange, and Werner Teller, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Nov. 23, 1988, Ser. No. 275,301
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 3741540
Int. Cl.[4] C07D *211/02*
U.S. Cl. 546—321 **4 Claims**

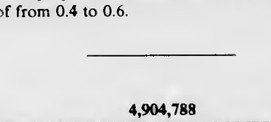
1. In the preparation of nitrendipine by reaction of an ylidene compound of the formula

(IIa)



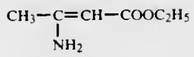
or

(IIb)



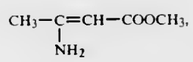
with an enamine compound of the formula

(IIIa)



or

(IIIb)



the improvement which comprises effecting the reaction in the presence of a catalytic amount of diisopropylamine acetate or dimethylbenzylamine acetate.

4,904,790

OPTICALLY ACTIVE STYRENE COMPOUNDS SUBSTITUTED BY A PYRIDINYL GROUP

Jürgen Kaschig, Freiburg, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

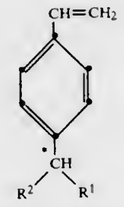
Division of Ser. No. 47,099, May 8, 1987, Pat. No. 4,800,224. This application Oct. 17, 1988, Ser. No. 258,369

Claims priority, application Switzerland, May 16, 1986, 1985/86

Int. Cl.⁴ C07D *213/36*

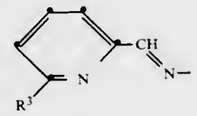
U.S. Cl. 546—333 **2 Claims**

1. An optically active compound of the formula I

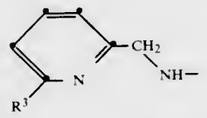


(I)

in which R^1 is C_1–C_4-alkyl, phenyl or benzyl, R^2 is a radical of the formula II or IIa



(II)



(IIa)

in which R^3 is H or $-CH_3$ and • represents predominantly R or predominantly S configuration.

4,904,791

CEPHALOSPORIN DERIVATIVES

Haruo Ohnishi, Funabashi; Hiroshi Kosuzume, Mishima; Masahiro Mizota, Gotenba; Yasuo Suzuki, Kawaguchi, and Ei Mochida, Tokyo, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Japan

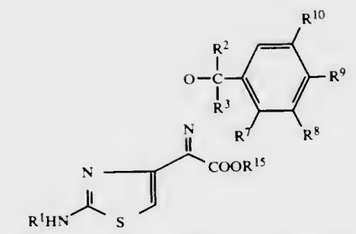
Division of Ser. No. 838,309, Mar. 10, 1986, Pat. No. 4,840,945. This application Mar. 28, 1988, Ser. No. 174,518

Claims priority, application Japan, Apr. 1, 1985, 60-68866; May 17, 1985, 60-105704; Jul. 4, 1985, 60-147359; Jul. 27, 1985, 60-166259

Int. Cl.⁴ C07D *277/40*

U.S. Cl. 548—194 **6 Claims**

1. An intermediate compound in the synthesis of cephalosporin derivatives represented by the formula (XV):



(XV)

or salts, solvates or salts of solvates thereof, wherein R^1 represents a hydrogen atom or a amino-protecting group, R^2 represents a hydrogen atom or a methyl group, R^3 represents a carboxyl group or a protected carboxyl group, R^7 represents a hydrogen atom, a chlorine atom, a carboxyl group, a protected carboxyl group, a methyl group, an isopropyl group, a hydroxy group, a methoxy group or an acetoxy group, R^8 and R^9 are the same or different and represent hydrogen atoms, hydroxy groups, methoxy groups, ethoxy groups, acetoxy groups, chloroacetoxy groups, butanoyloxy groups, methanesulfonyloxy groups; p-toluenesulfonyloxy groups, amino groups, acetamino groups, benzyloxycarabonylamino groups, methanesulfonyl groups, or together an ethylenedioxy group or a carbonyldioxy group, R^{10} represents a hydrogen atom, a hydroxy group, an acetoxy group, a methoxy group, or a chloracetoxy group, with the proviso that R^7, R^8, R^9 and R^{10} do not represent hydrogen atoms at the same time, R^{15} represents a hydrogen atom or a carboxyl-protecting group, and the bond shown with a wavy line represents a bond of anti-form or syn-form.

4,904,792

N-THIAZOLYMETHYLTHIOALKYL-N'-ALKYLAMIDINES AND RELATED COMPOUNDS

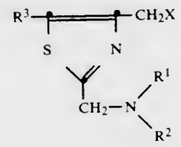
Richard Pioch, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 814,274, Dec. 23, 1985, Pat. No. 4,760,075, which is a continuation of Ser. No. 734,235, May 14, 1985, abandoned, which is a continuation of Ser. No. 486,621, Apr. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 319,155, Nov. 6, 1981, Pat. No. 4,382,090, which is a continuation-in-part of Ser. No. 193,192, Oct. 2, 1980, Pat. No. 4,375,547. This application May 3, 1988, Ser. No. 189,884

Int. Cl.⁴ A61K *31/425*

U.S. Cl. 548—205 **9 Claims**

1. A compound of the formula



wherein

R^1 is methyl, ethyl, H, benzyl or benzoyl; R^2 is methyl or ethyl; or when taken together with the nitrogen to which they are attached, R^1 and R^2 represent piperidino, pyrrolidino or morpholino;

R^3 is H or methyl; and

X is OH, SH or a group labile to nucleophilic displacement.

4,904,793

TRIAZOLE COMPOUNDS, AND THEIR PRODUCTION

Takaharu Ikeda, Toyonaka, and Kazuhiro Tada, Kyoto, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

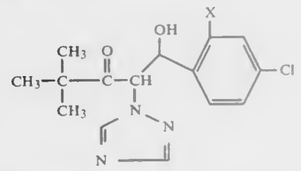
Filed Sep. 14, 1987, Ser. No. 95,833

Claims priority, application Japan, Sep. 29, 1986, 61-230481

Int. Cl.⁴ C07D *249/08*

U.S. Cl. 548—262 **3 Claims**

1. A triazole compound of the formula:



wherein X is a hydrogen atom or a chlorine atom.

4,904,794

PYRAZOLINE COMPOUNDS

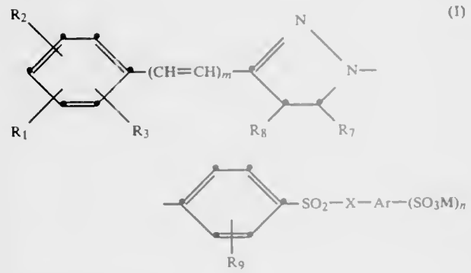
Hans R. Meyer, Binoingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 24, 1988, Ser. No. 159,981

Int. Cl.⁴ C07D *231/06*

U.S. Cl. 548—377 **6 Claims**

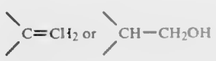
1. A pyrazoline compound of the formula



(I)

in which

X is 1,4-phenylene,



or, if n is 1 or if R_7 or R_8 contains an SO_3M radical, X is also a methylene or $-CH_2CH(OH)-CH_2O-$group or an unbranched C_1–C_4alkyleneoxy group, a direct bond or oxygen, R_1, R_2 and R_3 independently of one another are hydrogen, chlorine or C_1–C_4alkyl, R_7 is C_1–C_4alkyl, chlorophenyl, hydrogen, phenyl or $-C_6H_4-SO_3M$, R_8 is H, C_1–C_4alkyl, $-CH_2SO_3M$, carboxyl, C_2–C_5carboalkoxy, carbamoyl or carboxymethyl, R_9 is H, chlorine or C_1–C_4alkyl, Ar is a phenyl radical which is unsubstituted or substituted by a non-chromophore or, if X is a direct bond, Ar is also a naphthalene radical, M is hydrogen or one equivalent of an alkali metal, an alkaline earth metal or an unsubstituted or substituted ammonium cation and m and n are the number zero or 1.

4,904,795

HALOGEN SUBSTITUTED PHTHALIMIDE FLAME RETARDANTS

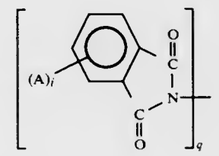
Joseph M. Boben, King of Prussia, Pa.; Gerald H. Reifenberg, East Windsor, N.J., and Daryl L. Stein, Williamsville, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 25, 1988, Ser. No. 173,487

Int. Cl.⁴ C07F *7/02*; **C07D** *209/48*

U.S. Cl. 548—406 **3 Claims**

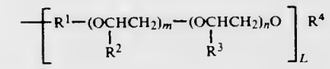
1. Halogen-substituted phthalimides of the formula:



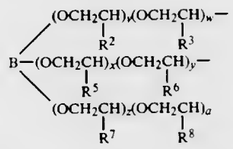
(I)

wherein

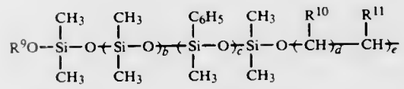
(a) R is selected from



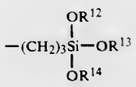
wherein R^1 is alkyl of 1–8 carbons, R^2 and R^3 are H or CH_3 with the proviso that R^2 and R^3 are not the same, and R^4 is alkyl of 1–12 carbons in which some of the carbons may be replaced by oxygen;



where B is a trivalent alkyl group of 1–6 carbons, wherein B does not comprise a central carbon atom bonded to four other carbons, R^5, R^6, R^7 and R^8 are H or CH_3 with the proviso that in the pairs R^2 and R^3, R^5 and R^6, and R^7 and R^8, both members are not the same;

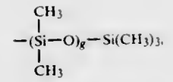


where R^9 is alkyl of 1 to 10 carbons, aryl, or $-(CH_2)_f-$, R^{10} and R^{11} may independently be H or CH_3 with the proviso that R^{10} and R^{11} are not the same, b and c are independently 0 to 100, and d, e and f are independently 0 to 6;

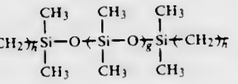


where R^{12}, R^{13} and R^{14} are

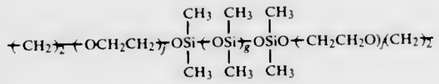
VOL 1111 ISS 4 FE 27 1990 UMI



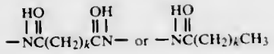
and g=1 to 1000 with the proviso that for each of R^{12}, R^{13} and R^{14}, g may or may not have the same value;



where h=1 to 6;



where j=1 to 500 and



where k=0 to 30;
(b) A is Cl or Br;
(c) i is 1 to 4;
(d) q is an integer of 1 to 6;
(e) L=1 to 2;
(f) m and n independently vary from 0 to 50 with the proviso that both cannot be zero; and
(g) v, w, x, y, z and a independently vary from 0 to 25 with the proviso that for each of the pairs, v and w, x and y, and z and a, both members cannot be zero.

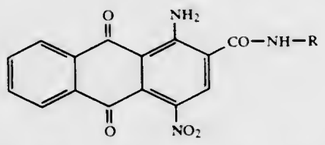
4,904,796

PREPARATION OF A BLUE ANTHRAQUINONOID DISPERSE DYE OF 1,4-NAPHTHOQUINONE-[2,3-F]-PHTHALIMIDES

Eberhard Michaelis, Weingarten, and Helmut Hoch, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 10, 1988, Ser. No. 154,577
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705386
Int. Cl.⁴ C07D *27/50*; C09B *5/24*
U.S. Cl. 548—426 **20 Claims**

1. A process for the preparation of a blue anthraquinonoid disperse dye by reacting a 1-amino-4-nitroanthraquinonecarboxamide of the formula (II)



(II)

where R is C_1-C_6-alkyl, 2-(C_1-C_6-alkoxy)ethyl, 3-(C_1-C_6-alkoxy)propyl or 3-[2'-(C_1-C_4-alkoxy)ethoxy]propyl, with a cyanide in water in the presence of a hydroxyl ion acceptor at from 60° to 100° C., at a pH of from 7.5 to 10.5 and in the presence of one or more quaternary ammonium salts.

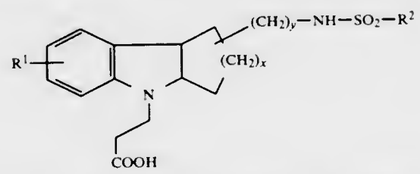
4,904,797

PROCESS OF PREPARING CYCLOALKANO(1,2-B)INDOLE-SULPHONAMIDES

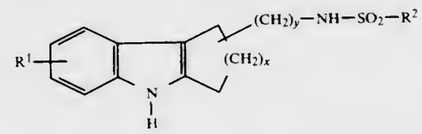
Horst Böshagen, Haan; Ulrich Rosentreter, Wuppertal; Folker Lieb, Leverkusen; Hermann Oediger, Cologne; Friedel Sauter; Elisabeth Perzborn, both of Wuppertal, and Volker-Bernd Fiedler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 212,840, Jun. 29, 1988, Pat. No. 4,827,032, which is a division of Ser. No. 13,302, Feb. 10, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 308,152
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 36055662; Sep. 19, 1986, 36318248
Int. Cl.⁴ C07D *209/86, 209/88, 209/94*
U.S. Cl. 548—448 **1 Claim**

1. A process for preparing a cycloalkano[1,2-b]indole-sulphonamide of the formula



or a salt thereof comprising reacting a (benzenesulphonamidoalkyl)cycloalkano[1,2-b]indole of the formula



in which
R^1 represents hydrogen, halogen, trifluoromethyl, carboxyl or alkoxycarbonyl; or represents a group of the formula $-S(O)_mR^3$,
in which
R^3 denotes alkyl or aryl, and
m denotes one of the numbers 0, 1 or 2; represents a group of the formula



in which
R^4 and R^5 are identical or different and represent hydrogen, alkyl, aryl, aralkyl or acetyl; or represents a group of the formula $-OR^6$,
in which
R^6 denotes hydrogen, alkyl, aryl, aralkyl, alkyl-SO_3—, aryl-SO_2—, aralkyl-SO_2— or trifluoromethyl; or represents alkyl, alkenyl or cycloalkyl each of which is unsubstituted or substituted by carboyl, alkoxycarbonyl, halogen, hydroxyl, alkoxy, alkylthio or cyano,
R^1 represents aryl which is unsubstituted or substituted up to 5 times by halogen, cyano, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, alkyl, carboxyalkyl, alkoxycarbonylalkyl, alkoxy, alkylthio, hydroxyl, carboxyl, alkoxycarbonyl, phenyl, phenoxy, benzyloxy, benzylthio or by a group of the formula



in which
R^4 and R^5 have the abovementioned meanings,
x represents the number 1, 2 or 3, and
y represents the number 0 or 1, with acrylonitrile inthe presence of an inert solvent, hydrolyzing the resultant N,N'-biscyanoethyl compound, and then in the case where a cycloalkano[1,2-b]dihydroindole-sulphonamide is being prepared, hydrogenating the cycloalkano [1,2-b]indolesulphonamide in the presence of an acid and of a reducing agent, or in the case where the salts are being prepared, conducting a reaction with an appropriate base.

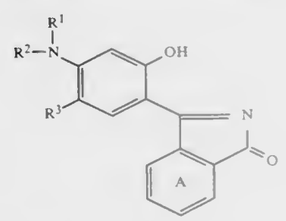
4,904,798

(4-AMINO-2-HYDROXYPHENYL-1-OXOISOINDOLENINES, PREPARATION THEREOF AND HYDROLYSIS THEREOF TO 2-(4-AMINO-2-HYDROXYBENZOYL)BENZOIC ACIDS

Joachim Kranz; Bernd Landmann, both of Ludwigshafen, and Udo Mayer, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 10, 1989, Ser. No. 295,462
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1988, 3800577
Int. Cl.⁴ C07D *413/00, 405/00, 409/00*
U.S. Cl. 548—472 **17 Claims**

1. An isoindolenine of the general formula (I)



(I)

where
R^1 is hydrogen, unsubstituted or chlorine-, hydroxyl-, phenyl- or cyano-substituted C_1-C_{12}-alkyl or C_5-C_8-cycloalkyl or unsubstituted or chlorine- or methyl-substituted phenyl,
R^2 is hydrogen or unsubstituted or chlorine-, hydroxyl-, phenyl- or cyano-substituted C_1-C_6-alkyl, or



is morpholino, pyrrolidino or piperidino, and
R^3 is hydrogen or methyl and the benzene ring A may be substituted by from 1 to 4 chlorines, 1 or 2 C_1-C_4-alkyls or 1 nitro.

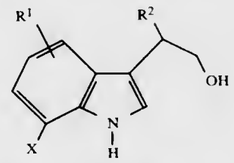
4,904,799

PREPARATION OF TRYPTOPHOLS

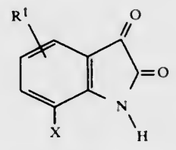
Brian A. McKittrick, Bloomfield, and Alan H. Katz, Lawrenceville, both of N.J., assignors to American Home Products Corp., New York, N.Y.

Division of Ser. No. 223,481, Jul. 25, 1988, which is a division of Ser. No. 117,775, Nov. 5, 1987, Pat. No. 4,785,015. This application Aug. 8, 1989, Ser. No. 390,801
Claims priority, application Canada, Feb. 20, 1987, 530253
Int. Cl.⁴ C07D *209/04*
U.S. Cl. 548—509 **1 Claim**

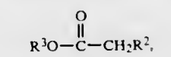
1. The process for producing substituted tryptophols of structure



wherein R^1 is hydrogen, lower alkyl containing 1 to 4 carbon atoms or halogen, R^2 is lower alkyl containing 1 to 4 carbon atoms and X is bromine or iodine which comprises reacting the substituted isatin of structure



wherein R^1 and X are as defined above with



wherein R^2 is as defined above and R^3 is methyl or ethyl, in the presence of lithium diisopropylamine and reducing the resulting product with lithium aluminum hydride.

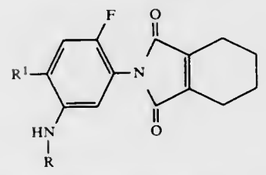
4,904,800

INTERMEDIATES FOR THE PRODUCTION OF BENZOTRIAZOLES

Toru Haga, Takarazuka; Eiki Nagano, Nishinomiya; Ryo Sato, and Kouichi Morita, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Division of Ser. No. 818,812, Jan. 14, 1986, Pat. No. 4,755,215. This application Apr. 14, 1988, Ser. No. 181,376
Claims priority, application Japan, Jan. 14, 1985, 60-004379
Int. Cl.⁴ C07D *209/48*
U.S. Cl. 548—513 **3 Claims**

1. A compound of the formula:



wherein R is a C_1-C_5 alkyl group, a C_3-C_5 alkenyl group, a

C_3-C_5 alkynyl group or a C_3-C_7 cycloalkyl group and R^1 is an amino group or a nitro group.

4,904,801

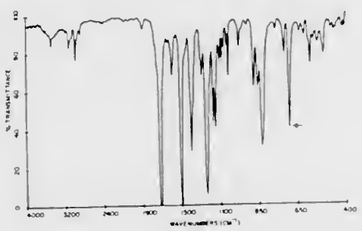
PROCESS FOR THE PREPARATION OF AROMATIC ETHER BISMALEIMIDES

John M. Butler, Centerville; Richard P. Chartoff, Cincinnati, and James A. Harvey, Kettering, all of Ohio, assignors to University of Dayton, Dayton, Ohio

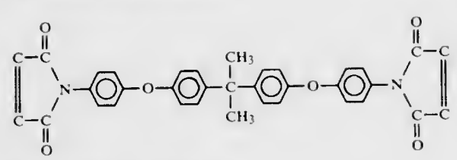
Division of Ser. No. 136,900, Dec. 22, 1987, and a continuation-in-part of Ser. No. 852,474, Apr. 15, 1986, abandoned. This application Dec. 8, 1988, Ser. No. 282,186

Int. Cl.[4] C07D *207/452*

U.S. Cl. 548—521 **1 Claim**



1. A composition which contains at least about 80 weight % of a bismaleimide of Formula (I)



said composition being characterized in:

(a) being curable to a thermoset resin by the application of heat,

(b) having a glass transition (T_g) endotherm of about 65° C. and a reaction exotherm peak at about 240° C. as measured by differential scanning calorimetry at a heating rate of 10° C./minute,

(c) having a viscosity of less than about 300 poises at 120° C.,

(d) having the following solubilities, in weight %, at 25° C. in the following solvents:

(i) Dioxane - ca 16%

(ii) Methylene Chloride - ca 44%

(iii) Tetrahydrofuran - ca 39%

(iv) Toluene - ca 4%

(v) Acetone - ca 55%

(e) having an infrared spectrum corresponding substantially to FIG. 1 of the drawings,

(f) having a strong infrared absorption peak at about 690 cm^{-1},

(g) having, in a fully cured state, a glass transition temperature of at least about 300° C.,

(h) having, as a fully cured compression molded, neat resin, a moisture uptake of only about 2 weight % when exposed to boiling water for 96 hours, said moisture containing specimens retaining at least about 70% of the dynamic modulus values of the bone dry specimens when measured at temperatures up to 300° C., and

(i) releasing only about 2 weight % of volatiles when heated to 300° C. at a heating rate of about 10° C./min.

4,904,802

IMIDES

Satoji Takahashi, and Tadashi Takemoto, both of Yakkaichi, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

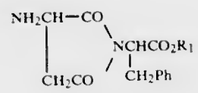
Filed Jun. 6, 1988, Ser. No. 202,565

Claims priority, application Japan, Jun. 30, 1987, 62-162940; Sep. 14, 1987, 62-230697; Nov. 2, 1987, 62-278098; Dec. 28, 1987, 62-331889

Int. Cl.[4] C07D *207/416*

U.S. Cl. 548—546 **2 Claims**

1. An imide of the formula:



where R_1 is hydrogen or C_{1-4} alkyl.

4,904,803

PROCESS FOR PRODUCING N-SUBSTITUTED MALEIMIDES

Takeyuki Fujita, Yokosuka; Tuyoshi Irie, Kobe; Yasuyuki Takayanagi, Yokohama; Takeshi Narita, Yokohama, and Yuya Yano, Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 310,921

Claims priority, application Japan, Feb. 25, 1988, 63-40773; Feb. 25, 1988, 63-40774; May 10, 1988, 63-111540

Int. Cl.[4] C07D *207/448, 207/452*

U.S. Cl. 548—548 **13 Claims**

1. A process for producing N-substituted maleimides, which comprises:

(1) synthesizing an N-substituted maleimide by reacting maleic anhydride with an amine selected from the group consisting of aromatic primary amines and aliphatic primary amines in the presence of a catalyst which promotes the formation of N-substituted maleimide and of at least one member selected from the group consisting of metallic copper and copper compounds, and

(2) purifying the N-substituted maleimide product of step (1) by (i) washing the N-substituted maleimide-containing reaction product mixture with at least one liquid selected from a dilute aqueous alkali solution, water, and a dilute aqueous acid solution, and (ii) isolating the N-substituted maleimide from the washing organic layer.

8. A process for purifying N-substituted maleimides which comprises steps of

washing an N-substituted maleimide-containing reaction product mixture resulting from reacting maleic anhydride with an aromatic or aliphatic primary amine, with at least one liquid selected from a dilute aqueous alkali solution, water, and a dilute aqueous acid solution, and

isolating the maleimide from the resulting organic layer.

4,904,804

PREPARATION OF 2-PYRROLIDONE

Michael S. Matson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 631,411, Jul. 16, 1984, abandoned. This application Apr. 22, 1988, Ser. No. 185,197

Int. Cl.[4] C07D *201/08*

U.S. Cl. 548—554 **9 Claims**

1. A process for the preparation of 2-pyrrolidone in which succinic acid or succinic anhydride is contacted with ammonia and hydrogen in the presence of at least one diluent, wherein the improvements comprise the use of a palladium on alumina catalyst and the use of a molar ratio of said ammonia to said succinic acid or succinic anhydride in the range of about 1:1 to 10:1.

4,904,805

PROCESS FOR MANUFACTURING A DIKETONE

Paul Nösberger, Birsfelden, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

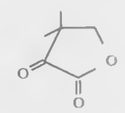
Filed Dec. 17, 1984, Ser. No. 682,123

Claims priority, application Switzerland, Feb. 12, 1982, 889/82

Int. Cl.[4] C07D *307/28*

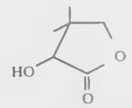
U.S. Cl. 549—319 **13 Claims**

1. A process for producing ketopantolactone of the formula



I

from pantolactone of the formula



II

comprising dehydrogenating pantolactone of formula II in the presence of a vanadium oxide- or molybdenum oxide-containing catalyst with oxygen or an oxygen-containing gas while the pantolactone is in the gas phase.

4,904,806

PREPARATION OF TETRAHYDROFURANS FROM BUTANE-1,4-DIOLS

Wolfgang Hoelderich, Frankenthal, and Matthias Schwarzmann, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,391

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732950

Int. Cl.[4] C07D *307/08*

U.S. Cl. 549—509 **2 Claims**

1. A process for the preparation of a tetrahydrofuran from a butane-1,4-diol which may be substituted by alkyl, alkenyl and/or aryl radicals in the carbon skeleton, in the gas phase, wherein the reaction is carried out in the presence of a borosilicate and/or iron silicate zeolite of the pentasil type as the catalyst.

4,904,807

SELECTIVE EXTRACTION OF ARGON FROM ETHYLENE OXIDE RECYCLE STREAM

Brian J. Ozero, New York, N.Y., assignor to Scientific Design Company, Inc., Little Ferry, N.J.

Continuation of Ser. No. 729,431, May 1, 1985, abandoned. This application Mar. 6, 1987, Ser. No. 22,496

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[4] C07D *301/10*

U.S. Cl. 549—534 **4 Claims**

1. In a process for the production of ethylene oxide which comprises reacting a gas mixture comprising 5–50 mole % ethylene and 5–9 mole % oxygen in the presence of 1–25 mole % argon, 2–15 mole % CO_2, 0.2–1.0 mole % H_2O, and 20–60 mole % combined CH_4 and N_2 in a reaction zone at temperatures of 150°–450° C. and pressures of 100–400 psia over a silver catalyst, the source of oxygen feed to the reactor containing 0.1–5.0 mole % argon and at least 95 mole % oxygen, the improvement comprising the steps of:

(a) recovering ethylene oxide from the reaction gas mixture, as in a scrubbing zone to provide a scrubbed gas which is essentially ethylene oxide free and containing about 5–15 mole % argon and from 5–15 mole % CO_2;

(b) dividing said scrubbed gas into a first stream, a second stream and a third stream, said streams comprising 10–20%, 0.5–25% and 55–89.5% of the total scrubbed gas respectively;

(c) removing about 5–15% of the CO_2 contained in said first stream by chemical absorption to provide a first recycle stream;

(d) removing argon from said second stream in a separation unit having a semi-permeable membrane which selectively removes argon along with CO_2 at a pressure differential across the membrane of 20–400 psi to remove argon from said second stream at substantially the same rate at which it is added in the oxygen stream to provide a second recycle stream;

(e) combining said first recycle stream, said second recycle stream and said third stream to form a combined recycle stream; and

(f) replenishing the combined recycle stream by adding ethylene and oxygen to obtain the desired reaction gas mixture.

4,904,808

CHELATE LIGANDS FOR LOW PRESSURE HYDROFORMYLATION CATALYST AND PROCESS EMPLOYING SAME

Thomas J. Devon; Gerald W. Phillips; Thomas A. Puckette; Jerome L. Stavinoha, and Jeffrey J. Vanderbilt, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

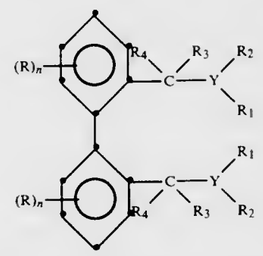
Division of Ser. No. 60,693, Jun. 11, 1987, Pat. No. 4,851,581, which is a division of Ser. No. 873,918, Jun. 13, 1986, Pat. No. 4,694,109. This application Mar. 13, 1989, Ser. No. 322,484

Int. Cl.[4] C07C *45/50*

U.S. Cl. 556—21 **2 Claims**

1. The catalyst comprising rhodium complexed with:

(a) a ligand of the formula



useful as a ligand in hydroformylation and other reactions, wherein

n is 1–4;

each R is independently selected from hydrogen, alkyl, alkoxy, aryloxy, aryl, aralkyl, alkaryl, alkoxyalkyl, cycloaliphatic, halogen, alkanoyl, alkanoyloxy, alkoxycarbonyl, carboxyl or cyano;

each R_1 and R_2 is independently selected from alkyl, aryl, aralkyl, alkaryl or cycloaliphatic;

each R_3 and R_4 is independently selected from hydrogen and the R_1 substituents;

each Y is independently selected from the elements N, P, As, Sb and Bi; and

each alkyl group or moiety is straight or branched chain of 1–20 carbons, each aryl group contains 6–10 ring

carbons, and each cycloaliphatic group contains from 4–6 ring carbons.

in a molar ratio of ligand/Rh of about 1/1; (b) H in a molar ratio of H/Rh of about 1/1; and (c) carbon monoxide in a molar ratio of CO/Rh of about 2/1.

4,904,809

PLATINUM COMPLEX

Koichi Yokoi, Kashiwa; Kinichi Mogi, Abiko; Kazuhiko Irinoda, Chiba; Hidehiko Kohya, Narita; Susumu Sato, Shisui, and Tatsuhiko Katori, Tone, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,222

Claims priority, application Japan, Sep. 25, 1987, 62-241542

Int. Cl.⁴ C07F *15/00*

U.S. Cl. 556—137 **1 Claim**

1. The compound which is bis(chloroacetato)(1,3-diamino-2-propanol)platinum (II).

4,904,810

BISCHOLOROFORMATE PREPARATION METHOD WITH PHOSGENE REMOVAL AND MONOCHLOROFORMATE CONVERSION

Daniel J. Brunelle, Scotia, N.Y., and Thomas G. Shannon, Evansville, Ind., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 4,386, Jan. 16, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 224,528

The portion of the term of this patent subsequent to Feb. 20, 2004, has been disclaimed.

Int. Cl.⁴ C07C *68/02, 69/96*

U.S. Cl. 558—281 **12 Claims**

1. In a method for preparing aromatic bischloroformate compositions which comprises reacting a dihydroxyaromatic compound with phosgene in the presence of an aqueous alkali or alkaline earth metal base and at least one substantially inert and substantially water-insoluble organic liquid at a pH below about 8, the improvement which comprises raising the pH of the aqueous phase to a higher value in the range of about 7–12 after all solid dihydroxyaromatic compound has been consumed, and maintaining it in said range until a major proportion of the unreacted phosgene has been hydrolyzed.

4,904,811

(Z)-2-CYANO-2-OXIMINO-ACETYL CHLORIDES

Winfried Lunkenheimer, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

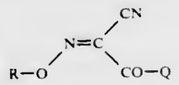
Filed Jul. 10, 1987, Ser. No. 72,087

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1986, 3625434

Int. Cl.⁴ C07C *121/84*

U.S. Cl. 558—301 **4 Claims**

1. A Z compound, substantially free of the E-isomers, of the formula



in which

Q represents Cl or OM,

M represents hydrogen or an alkali metal atom,

R represents cycloalkyl, having 3 to 6 carbon atoms, the



group,

R^1 represents hydrogen or methyl, and

X represents hydrogen, straight-chain or branched alkyl having 1 to 8 carbon atoms, vinyl, ethinyl, cyano, cyclopropyl or phenyl.

4,904,812

PREPARATION OF UNSATURATED NITRILES

Wolfgang Hoelderich, Frankenthal, and Matthias Schwarzmann, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 107,997, Oct. 14, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 281,915

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1986, 36914.3

Int. Cl.⁴ C07C *120/00*

U.S. Cl. 558—310 **11 Claims**

1. A process for preparing olefinically unsaturated nitriles which comprises: in one process step, cleaving lactones, containing 5 to 7 ring members and being unsubstituted or alkyl-, aryl- or aralkyl substituted by reacting the lactone with ammonia at a temperature of 150°–500° C. and in a molar ratio of lactone to ammonia of from 1:1 to 1:30 in the presence of a zeolite catalyst.

4,904,813

CYANOMETHYL ACID HALIDES OF PHOSPHORUS AND PROCESS FOR THEIR PREPARATION

Hans-Jerg Kleiner, Kronberg/Taunus, Fed. Rep. of Germany, assignor to Hoechst Akteingesellschaft, Frankfurt am Main, Fed. Rep. of Germany

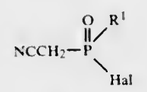
Filed Mar. 8, 1988, Ser. No. 165,581

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1987, 3707639

Int. Cl.⁴ C07C *121/00*

U.S. Cl. 558—386 **12 Claims**

1. A compound of the formula I



(I)

wherein R^1 represents Hal or C_1–C_3-alkyl and Hal represents a halogen having an atomic weight in the range from 35 to 80.

4,904,814

PROCESS FOR THE PREPARATION OF TERT-ALKYL ESTERS

Urs Frei, Liebistorf, and Rudolf Kirchmayr, Marly, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

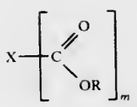
Filed Feb. 8, 1988, Ser. No. 153,375

Claims priority, application Switzerland, Feb. 13, 1987, 534/87

Int. Cl.⁴ C07C *67/03, 120/00*; C07D *239/02, 215/14, 233/66, 311/02*

U.S. Cl. 560—204 **7 Claims**

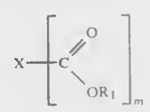
1. A process for the preparation of a tert-alkyl ester of the formula I



(I)

in which m is 1 or 2, R is C_4-C_{12}tert-alkyl and X, when m=1,

is unsubstituted or halogen-substituted alkyl, cycloalkyl, unsubstituted or substituted aryl or aralkyl, or an aromatic heterocyclic radical and, when m=2, is a direct bond, $—CH_2)_n$, in which n can be an integer from 1 to 8, or 1,2-, 1,3- or 1,4-phenylene, by reaction of an ester of the formula II



(II)

in which m and X are as defined above and R_1 is methyl or ethyl, with m×2 to m×10 mol of an alcohol of the formula ROH, in which R is as defined above, in the presence of catalytic amounts of a catalyst chosen from the group consisting of dibutyltin oxide, lithium amide, aluminium tert-butylate, potassium tert-butylate, sodium, lithium, potassium, sodium methylate, sodium ethylate and titanium alcoholates, the methanol or ethanol formed being simultaneously distilled off.

4,904,815

PHENOLS AND THEIR PRODUCTION

Frederick H. Howell, Atherton, England, assignor to Ciba-Geigy AG, Basle, Switzerland

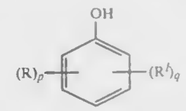
Continuation of Ser. No. 537,664, Sep. 30, 1983, abandoned. This application Oct. 13, 1987, Ser. No. 107,920

Claims priority, application United Kingdom, Oct. 7, 1982, 8228643; Dec. 10, 1982, 8235360

Int. Cl.⁴ C07C *69/76*

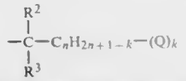
U.S. Cl. 560—75 **16 Claims**

1. A compound having the formula



(I)

wherein p is 1, 2 or 3; and q is 0, 1 or 2 provided that p+q≦3; R is a group of the formula



(II)

and when p is 2 or 3, each group R may be the same or different and is present in the 2-, 4- or 6-position; n is an integer from 2 to 30; K is 1 or 2; Q is

—$COOR^4$ or —$CONR^4R^5$ wherein R^4 is (1) H; (2) a straight or branched chain alkyl having from 1 to 20 carbon atoms; (3) divalent straight or branched chain alkylene having 2–20 carbon atoms; (4) a straight or branched chain alkenyl group having from 3 to 20 carbon atoms, (5) a cycloalkyl group having from 3 to 12 carbon atoms; (6) an aryl group having from 6 to 10 carbon atoms which is unsubstituted or is substituted by a C_1–C_4 alkyl group; (7) an aralkyl group having from 7 to 13 carbon atoms; provided that when k is 2, the two carbon atoms to which the —$COOR^4$ groups are attached are not adjacent to one another; and R^5 is hydrogen or a straight or branched chain alkyl group having from 1 to 20 carbon atoms, or R^4 or R^5 together with the nitrogen atom to which they are each bonded may form a pyrrolidine, piperidine, morpholine or 2,5-dimethyl morpholine; R^2 and R^3 are the same or different and each is straight or branched chain alkyl group having from 1 to 5 carbon atoms and, when Q is CO_2R^4, either R^2 or R^3 is optionally substituted by a —CO_2R^4 group, the R^4 groups being independent, or R^2 or R^3 may be so linked to the residue C_nH_{2n+1-k} that there is formed a C_5–C_{12} cycloalkylene residue substituted by the group —$(CO_2R^4)_k$, the R^4 groups being independent, wherein R^4 and k are as previously defined; R^1 is a C_1–C_{12} straight or branched chain alkyl group, a C_7–C_9 aralkyl group, halogen, CF_3, SH, SR^{13}, CO_2H, CO_2R^{13}, COR^{13}, COC_6H_5, $CONH_2$, CN, SO_3H, SO_2NH_2, $PO(OH)_2$, $PO(OR^{13})_2$, or NO_2 wherein R^{13} is a C_1–C_4 straight or branched chain alkyl group, and, when O is 2, each R^1 group may be the same or different; and provided that, when p is 1, R^1 is C_1–C_{12} alkyl, R^2 and R^3 are C_1–C_5 alkyl, k is 1, O is —$COOR^4$ wherein R^4 is H, and q is as previously defined, then n is not 2; and further provided that when k is 2 and p is 1 and the group R is in the para-position to the phenolic OH, then in such case

(a) when O is —$COOR^4$, R^4 is other than straight or branched chain alkyl and unsubstituted or substituted phenyl, and

(b) when O is —$CONR^4R^5$, R^4 and R^5 are not both H;

or a salt thereof with an organic or inorganic acid or base.

4,904,816

PROCESS FOR THE MANUFACTURE OF ANILINOFUMARATE VIA CHLOROMALEATE OR CHLOROFUMARATE OR MIXTURES THEREOF

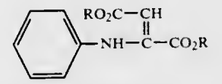
Albert A. Cevasco, and Donald Roy, both of Somerset, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 15, 1989, Ser. No. 366,554

Int. Cl.⁴ C07C *101/453*

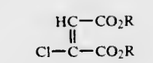
U.S. Cl. 560—44 **8 Claims**

1. A method for the preparation of anilinofumarate of formula I

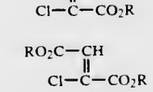


I

wherein R is C_1–C_4 alkyl which comprises reacting chloromaleate of formula II or chlorofumarate of formula III or mixtures thereof



II



III

wherein R is C_1–C_4 alkyl with about 1.0 to 1.5 molar equivalents of aniline in the presence of about 1.0 to 1.8 molar equivalents of aqueous base containing a phase transfer catalyst to form the anilinofumarate.

4,904,817

PROCESS FOR THE PREPARATION OF AROMATIC CARBOXYLIC ACID ESTERS

Guy R. Steinmetz, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.J.

Filed Feb. 21, 1989, Ser. No. 312,983

Int. Cl.⁴ C07C *67/36, 51/10, 17/00*

U.S. Cl. 560—80 **10 Claims**

1. Process for the co-production of an aromatic carboxylic acid ester, containing the corresponding unesterfied aromatic carboxylic acid, and an alkyl iodide which comprises carbonylating an aromatic iodide in the presence of carbon monoxide, a Group VIII metal catalyst selected from the group consisting of palladium, nickel, ruthenium, rhodium and mixtures thereof, an inorganic absorbent and an alkanol at carboxylic acid ester-forming and alkyl iodide-forming conditions of pressure and temperature, wherein the mole ratio of carboxylic

acid ester groups to unesterified carboxylic acid groups in the crude product is at least 25.

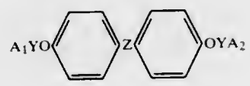
4,904,818

SIZING AGENTS FOR CARBON FIBERS

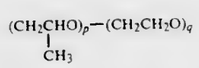
Hiroshi Minami, and Keita Inoue, both of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

Filed Sep. 30, 1988, Ser. No. 252,267
Int. Cl.[4] C07C *69/80*
U.S. Cl. 560—85 **1 Claim**

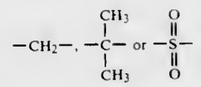
1. A sizing agent for carbon fibers consisting of bisphenol-polyalkylene glycol etherester copolymer shown by the following formula:



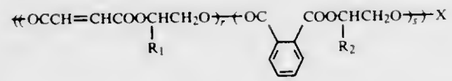
where Y is



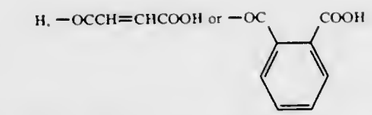
the segments inside parentheses being a block or random copolyether, p being 0 or an integer 1-10, q being 0 or an integer 1-20, and (p+q) being equal to or greater than 1, Z is



and A_1 and A_2 may be identical or different and are



R_1 and R_2 being identical or different and H or CH_3, X being



the segments inside parentheses being a block or random copolyether, r and s being 0 or an integer 1-15, and (r+s) being equal to or smaller than 15 and equal to or greater than 1.

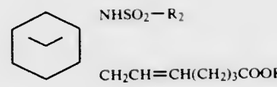
4,904,819

BICYCLIC SULFONAMIDE DERIVATIVES AND PROCESS THEREFOR

Sanji Hagishita, Nara, and Kaoru Seno, Hyogo, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Apr. 28, 1988, Ser. No. 187,645
Claims priority, application Japan, May 8, 1987, 62-113086
Int. Cl.[4] C07C *69/74*
U.S. Cl. 560—118 **8 Claims**

1. A compound of the formula:



(wherein R_1 is hydrogen or lower alkyl; R_2 is lower alkyl, aralkyl or aryl which may be substituted by lower alkyl, alkoxy, acetoxy, hydroxy, halogen, nitro or phenyl; and the wavy line indicates R or S configuration or their mixture) or salt thereof.

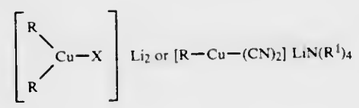
4,904,820

PROCESS FOR SUBSTITUTING A HYDROCARBON GROUP

Arthur L. Campbell, Glenview, and James R. Behling, Lindenhurst, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 59,695, Jun. 9, 1987, Pat. No. 4,777,273.
This application Jul. 14, 1988, Ser. No. 219,426
Int. Cl.[4] C07C *177/00*
U.S. Cl. 560—121 **1 Claim**

1. A process for substituting a hydrocarbon group from a cuprate complex to an expoxide, α,β-unsaturated Ketone or an alkyl halide, tosylate or mesylate through a carbon to carbon bond comprising preparing a higher order cuprate complex by bringing into reactive contact a first cuprate complex of the formula:



wherein

(a) X is —CN, —SCN, $-OSO_2CF_3$, or —S—phenyl;

(b) each R is independently lower alkyl, alkenyl, phenyl, naphthyl, phenanthryl, or thienyl, provided that (i) each of the aforementioned radicals may be substituted with non-interferring substituents and (ii) only one R in the first cuprate complex may be alkenyl, phenyl, naphthyl, phenanthryl, or thienyl; and

(c) each R^1 is independently lower alkyl; with a stannane compound of the formula:

$$R_fSn(R^2)3$$

wherein R_f is a carbanion for carbon to carbon bond formation reactions and is different from any R in the first cuprate complex and each R^2 is independently lower alkyl or R_f;

whereby R_f replaces at least one R on the first cuprate complex to form a higher order cuprate complex;

and

reacting said higher order cuprate complex with an α,β-unsaturated ketone, an epoxide, or an alkyl halide, tosylate or mesylate to substitute R_f to the epoxide, α,β-unsaturated ketone, alkyl halide, tosylate or mesylate.

4,904,821

METHOD OF PREPARING PERACETIC ACID

Georg Boehme; Willi Hofen, both of Rodenbach, Fed. Rep. of Germany; Guenther Prescher, Larchmont, N.Y., and Rainer Siegmeier, Bad Homburg, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfort, Fed. Rep. of Germany

Filed Jun. 14, 1988, Ser. No. 206,488
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1987, 3720562
Int. Cl.[4] C07C *179/10*
U.S. Cl. 562—5 **9 Claims**

1. A method of preparing peracetic acid in organic solution in a continuous manner comprising hydrogen peroxide and acetic acid in the presence of sulfuric acid as reactants in a simple distillation zone in such a manner that (a) hydrogen peroxide and acetic acid are in a molar ratio of 1 to 2:1 and (b) hydrogen peroxide is in a 30–35% by weight aqueous solution whereby the weight ratio of hydrogen peroxide to water is between 0.43 and 0.54, and the reactants are placed in the bottom of said distillation zone before the start of said reaction,

(c) the concentration of sulfuric acid is adjusted to 20–30% by weight in relation to the entire solution,

maintaining this (a)(b)(c) mix state of the above-defined reactants in the bottom of the column in a stationary manner so as to remain constant during the reaction, carrying out the reaction at temperatures of 55° to 70° C. and at system pressures of 100–200 mbars,

removing a vapor phase of peracetic acid, acetic acid and water from the distillation zone,

conducting said zone vapor phase into an absorption zone in countercurrent contact with organic phosphate having 3–30 carbon atoms which takes up the portion of peracetic acid and acetic acid, thereby forming a solution of peracetic acid and acetic acid in the phosphate, and removing the non-absorbed water vapor.

4,904,822

PROCESS FOR THE OPTICAL RESOLUTION OF (+)-2-HYDROXY-4-PHENYLBUTANOIC ACID

Hiroyuki Nohira, Urawa, and Shinichi Yoshida, Misato, both of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Feb. 9, 1989, Ser. No. 307,948
Claims priority, application Japan, Feb. 19, 1988, 63-38273
Int. Cl.[4] C07B *55/00*
U.S. Cl. 562—401 **7 Claims**

1. A process for the optical resolution of (±)-2-hydroxy-4-phenylbutanoic acid which comprises treating (-±)-2-hydroxy-4-phenylbutanoic acid with an optically active 1-(p-tolyl)ethylamine or an optically active N-(2-hydroxy)ethyl-α-methylbenzylamine as a resolving agent.

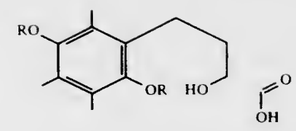
4,904,823

HYDROQUINONE DERIVATIVES AND A PROCESS FOR THEIR PREPARATION

Richard Barner, Wittserswil, and Josef Hübscher, Seon, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 145,166, Jan. 19, 1988, which is a division of Ser. No. 22,303, Mar. 5, 1987, Pat. No. 4,743,696, which is a division of Ser. No. 768,789, Aug. 23, 1985, Pat. No. 4,675,421.
This application Jan. 23, 1989, Ser. No. 299,588
Claims priority, application Switzerland, Aug. 28, 1984, 4117/84; Jul. 11, 1985, 3000/85
Int. Cl.[4] C07C *59/68*
U.S. Cl. 562—470 **1 Claim**

1. Compounds of the general formula



IV

wherein R represents an ether protecting group.

4,904,824

CHEMICAL PROCESS

Liou-Liang Horng, 1731 Wishingwell Dr., Creve Coeur, Mo. 63146; Chung Y. Shen, 12630 Conway Downs Dr., St. Louis, Mo. 63141, and Mark E. Jason, 34 Ridge Point Dr., Chesterfield, Mo. 63017

Filed Aug. 24, 1988, Ser. No. 236,096
Int. Cl.[4] C07C *59/22*
U.S. Cl. 562—583 **17 Claims**

1. A process for preparing a mixture of the alkali metal salts of 1-hydroxy-3-oxa-1,2,4,5-pentane tetracarboxylic acid and 3,6-dioxa-1,2,4,5,7,8-octane hexacarboxylic acid by means of a calcium ion catalyzed reaction which comprises:

a. reacting the salts of maleic and D,L-tartaric acids in alkaline medium;

b. reducing the calcium content of said reaction product mixture to the extent that the molar ratio of calcium to the D,L-tartrate succinate reaction products is less than about 1:10 by precipitation of calcium carbonate;

c. recovering the calcium carbonate removed in step (b) and recycling it to step (a) to prepare additional amounts of reaction product, and

d. recovering and purifying the remainder of the reaction product from step (b).

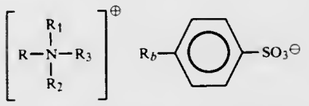
4,904,825

QUATERNARY AMMONIUM ANTISTATIC COMPOUNDS

Cheruthur Govindan, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1988, Ser. No. 268,903
Int. Cl.[4] C07C *87/30, 87/46, 91/38, 91/50*
U.S. Cl. 562—84 **13 Claims**

1. A quaternary ammonium compound represented by the graphic formula:



wherein R is a C_2-C_{22} alkyl, R_1 is selected from the group consisting of C_1-C_{22} alkyl and an alkyleneoxy radical represented by the formula $—CH_2—C(A)H—O]_xH$, R_2 is selected from the group consisting of C_1-C_3 alkyl, and the alkyleneoxy radical, $—CH_2—C(A)H—O]_xH$, or R_2 may join together with R_1 to form a morpholino group, R_3 is an alkyleneoxy radical represented by the formula $—CH_2—C(A)H—O]_xH$, R_b is a C_8-C_{18} alkyl, A is selected from the group consisting of hydrogen, methyl and ethyl, and x is an integer of from 1 to 5.

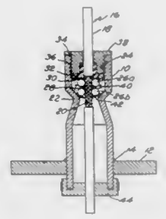
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4,904,826

INTERNAL SHIELD GROUND ADAPTER FOR KICKPIPE/STUFFING TUBES

David S. Dixon, Old Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 5, 1988, Ser. No. 254,553
Int. Cl.[4] H05K *9/00*; H02G *15/013*
U.S. Cl. 174—35 R 8 Claims



1. An internal shield ground adapter system comprising:
a plate having an aperture;
a metallic tube of predetermined length having the opening at a first end of said predetermined length tapering to a smaller opening along a length segment of said tube, said tube extending through said plate with a portion of the outer surface of said tube affixed to the plate in the area surrounding said plate aperture, the second end of said tube extending beyond said plate;
a shielded cable having a portion of its shield exposed, said shielded cable extending through said tube and said plate aperture;
a metallic spring system contacting said exposed shield and the inner surface of said length segment of said tube that tapers to said smaller opening;
compression and sealing means extending through said first end of said tube to compress said metallic spring system against both said shield and said inner surface of said tube in said length segment of said tube that tapers toward the smaller opening, and to environmentally seal the area between said first end of said tube and said shielding cable; and
electromagnetic sealing means, comprising an electromagnetic interference seal affixed to the second end of said tube, and said electromagnetic interference seal together with said cable enclosing the second end of said tube, for preventing electromagnetic energy from exiting through the second end of said tube.

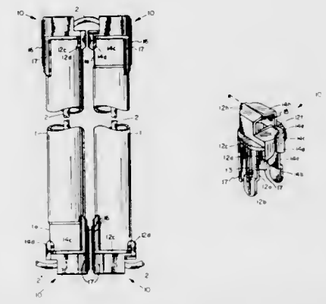
4,904,827

ELECTRIC CORD-PROTECTING SHIPPING PLUG

Elisha L. Potter; Harold J. Coleman, 403 Maple Ridge Dr., and Elisha L. Potter, 572 Northpark Ct., both of Bossier City, La. 71111, assignors to Harold Joseph Coleman and Elisha Lindsay Potter, both of Cleveland, Ohio

Filed Jan. 30, 1989, Ser. No. 303,811
Int. Cl.[4] B65D *59/00*; H01B *17/58*
U.S. Cl. 174—136 8 Claims

8. For use in protecting an electric cord from contact with and damage from an outer end edge of a tubular member through which the cord axially extends, the cord extending generally radially outwardly across the outer end edge, a protective shipping plug removably connectable around the cord and to the tubular member on the end thereof containing the outer end edge, said protective shipping plug comprising:
a hollow body formed from a cord-protective material and circumscribing and extending along a central axis, said body being defined by first and second lateral halves hingedly interconnected along a hinge axis laterally offset from and generally parallel to said central axis for pivotal movement between an open position and a closed position; and
cooperating means on said first and second lateral halves for defining on said body in said closed position thereof:
an outer end closure wall,
a generally radially extending cord opening in a side wall portion of said body positioned axially inwardly of said outer end closure wall, said opening being bounded at an axially outer end thereof by said outer end closure wall and entirely circumscribed by the cord-protective material of said body, and



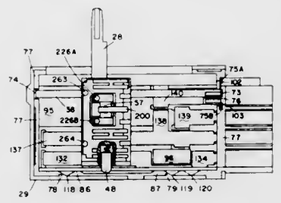
means, positioned axially inwardly of said opening, for coaxially and releasably connecting said body to the tubular member with said opening positioned axially outwardly of the outer end edge of the tubular member, and with the cord extending axially through said body and generally radially outwardly through said opening therein,
said lateral halves of said body being constructed and arranged to sequentially permit said body to be operatively closed around a portion of the cord external to the tubular member, slid inwardly along the cord toward the outer end edge of the tubular member, and then be operatively secured to the tubular member.

4,904,828

MULTI-CIRCUIT SLIDE SWITCH ASSEMBLY WITH DISTINCT PLUNGER OPERATED SWITCH

Ellis P. Lipp, Charlottesville, and Donald L. Ray, Oaklandon, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Sep. 23, 1988, Ser. No. 248,152
Int. Cl.[4] H01H *15/00*
U.S. Cl. 200—16 B 5 Claims



1. A multi-circuit electrical switch comprising:
a housing having at least one substantially flat side and an open end opposite said flat side;
bus bar means mounted on the inner surface of said flat side;

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circuit board means for closing said open end of said housing and having a trace thereon; and

a contact carrier slidably located between said flat side and means for closing, said contact carrier comprising:

first contact means mounted on a first side of said contact carrier for contacting said bus bar means;

second contact means mounted on a second side of said contact carrier opposite said first side for contacting said trace; and

lever means for manually sliding said carrier to cause said first and second contacts to contact said bus bar and said trace; and said switch further comprising:

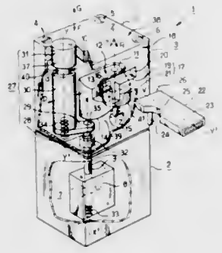
a stabilizer bar for stabilizing said contact carrier in said housing and a connecting means for electrically connecting said bus bar to said trace and for holding said stabilizer bar in place in said housing.

4,904,829

ACTUATOR-CONTROLLED KEYLOCK SWITCH

Denis Berthaud, Saint Michel, and Andre Vergez, St Germain, both of France, assignors to La Telemecanique Electrique, Nanterre, France

Filed Mar. 25, 1988, Ser. No. 173,532
Claims priority, application France, Mar. 27, 1987, 87 04293
Int. Cl.[4] H01H *9/28, 27/08*
U.S. Cl. 200—50 R **12 Claims**



1. A keylock safety switching unit, comprising a key selectively insertable within a key-receiving assembly, said assembly comprising:

at least one switch provided with a control member movable between two control positions corresponding to two conditions of the switch;

a movable component mounted within said assembly and displaceable by said key between an inserted-key position and a withdrawn-key position;

a transmission member mounted operatively between said movable component and said control member of said switch for displacing said control member between the two control positions thereof;

a locking member connected to said transmission member for displacement therewith, said locking member being in a key-locking position when said transmission member is in a position allowed by the movable component when said movable component is in the inserted-key position, and said locking member being in a key-release position when said movable component is in the withdrawn-key position; and

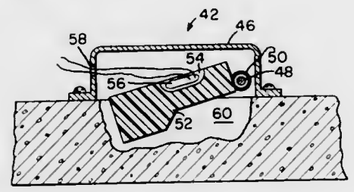
means for selectively urging said locking member to the key release position when said movable component is in the inserted-key position.

4,904,830

LIQUID SHUT-OFF SYSTEM

Anthony B. Rizzuto, 10 Deerfield Dr., Florham Park, N.J. 07932

Filed Feb. 28, 1989, Ser. No. 316,661
Int. Cl.[4] H01H *35/18*
U.S. Cl. 200—84 R **3 Claims**



1. For use in a liquid shut-off system, a float switch, comprising:

a shell;

a pivot pin fixed in said shell and in traverse thereof;

a sleeve rotatably encompassing an intermediate portion of said pin;

a buoyant element coupled at one end thereof to said sleeve;

a liquid switch carried by said element; and

electrical lines, coupled at first ends thereof, to said switch; wherein

said shell has an unapertured top, and a continuous wall depending from said top; and

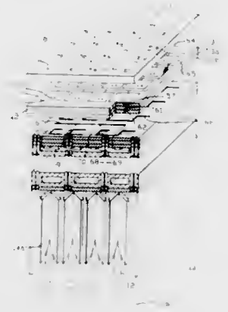
said wall has only (a) a pair of apertures in which said pin is fixed, and (b) a third aperture through which said electrical lines pass.

4,904,831

MITERED MECHANICAL SWITCHES

Harvey C. Nathanson; Michael C. Driver, both of Pittsburgh; Michael W. Cresswell, Plum Borough, all of Pa.; Ronald G. Freitag, Baltimore, Md.; Donald K. Alexander, and Daniel F. Yaw, both of Ellicott City, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 13,499, Feb. 11, 1987, Pat. No. 4,823,136.
This application Jan. 3, 1989, Ser. No. 293,164
Int. Cl.[4] H01H *1/02*
U.S. Cl. 200—269 **1 Claim**



1. Miltered mechanical switches comprising:

a first metallization layer having at least three distinct means: a first layer first means configured as a rectangle having one beveled corner, a first layer second means on the same plane as said first layer first means, located directly across from said bevel of said first layer first means, said first layer second means configured as a bisected rectangle, and a first layer third means, said first layer third means also configured as a bisected rectangle, said first layer third means resting upon the same plane as said first layer first and second means, further said bisected first layer third means positioned directly opposed from said first layer first means and beside said first layer second means,

a second metallization layer, said second metallization layer having at least three distinct means: a second layer first means, said second layer first means being configured as a rectangle, further said second layer first means being smaller in size than said first layer first means, and said second layer first means operable to be layered upon said first layer first means such that a portion of said first layer first means is not covered by said second layer first means, a second layer second means, said second layer second means being configured as a bisected rectangle, further said second layer second means being smaller in size than said first layer second means, and said second layer second means operable to be layered upon said first layer second means such that a portion of said first layer second means is not covered by said second layer second means, and a second layer third means, said second layer third means being configured as a bisected rectangle, further said second layer third means being smaller in size than said first layer third means, and said second layer third means operable to be layered upon said first layer third means such that a portion of said first layer third means is not covered by said second layer third means, and

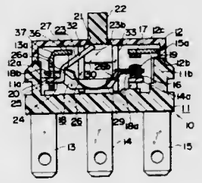
a third metallization layer, said third metallization layer having at least three distinct means: a third layer first means, said third layer first means being configured as a rectangle, further said third layer first means being smaller in size than said second layer first means, and said third layer first means operable to be layered upon said second layer first means such that a portion of said second layer first means is not covered by said third layer first means, a third layer second means, said third layer second means being configured as a bisected rectangle, further said third layer second means being smaller in size than said second layer second means, and said third layer second means operable to be layered upon said second layer second means such that a portion of said second layer second means is not covered by said third layer second means, and a third layer third means said third layer third means configured like two, off-centered interconnected, bisected rectangles, forming a head portion and a tail portion, said head portion of said third layer third means operable to be layered upon said second layer third means such that portion of said head portion of said third layer third means is parallel to, but not resting upon said first layer second means and said first layer third means, and said tail portion of said third layer third means is operable to be parallel to but not resting upon said first layer first means, further said third layer third means operable to be physically deflected in a downward manner at said head and aid tail portions such that the deflection of said head portion would cause said head portion to be permanently interconnected to said first layer second means and said first layer third means and further said tail portion deflection would permanently interconnected said tail portion to said first layer first means.

4,904,832

MICROSWITCH

Toyohiro Nagahara, Shimane; Takashi Niwa, Kyoto; Takezo Sano, Shiga, and Isao Kato, Ootsu, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 27, 1988, Ser. No. 249,648
Claims priority, application Japan, Oct. 8, 1987, 62-254401; Oct. 8, 1987, 62-154541
Int. Cl.[4] H01H *5/00*
U.S. Cl. 200—402 **4 Claims**



1. A microswitch comprising:

a switch casing in which a first common terminal member and at least one second terminal member for fixed contact are fixed to a lower plate portion;

a hole formed in a top plate of the switch casing located between inner end portions of said first common terminal member and said second terminal member for fixed contact;

a push button which is vertically movably inserted into said hole;

a movable member provided with a movable contact at a free end portion thereof and pivotally supported at the inner end portion of the first common terminal member at a base end portion thereof, said movable contact facing a fixed contact fixed to the inner end portion of the second terminal member,

a swingable lever pivotally supported at the inner end portion of the first common terminal member at a base end portion thereof and operated by said push button at a free end thereof wherein

said push button is capable of moving towards a space located between the base end portion of said swingable lever and the free end portion of said movable member; and

a compression spring, one end of which is pivotally engaged with a central portion of said swingable lever and another end of which is engaged with a free end portion of said movable member.

4,904,833

SWITCH DEVICE WITH AUTOMATIC NEUTRAL POINT RESTORING POSITION AND RELEASABLY LOCKABLE NONNEUTRAL POSITION

Hiroyuki Sato, and Yujiro Shimoyama, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1988, Ser. No. 235,350
Claims priority, application Japan, Dec. 14, 1987, 62-188810
Int. Cl.[4] H01H *21/50*
U.S. Cl. 200—557 **9 Claims**

1. A toggle switch having a neutral position and first and second nonneutral positions, the switch comprising:

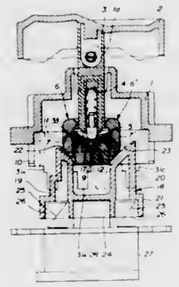
a stem member, operable to move in opposed first and second directions;

a first movable selector member having a stem driven portion and a cam portion, the first selector member being positioned to have its stem driven portion pushed by the stem member only in the first of the opposed directions;

a second movable selector member having a stem driven portion and a cam portion, the second selector member being positioned to have its stem driven portion pushed by the stem member only in the second of the opposed directions; and

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a capture-and-release member having opposed first and second slanted surfaces respectively engagable with the cam portions of the first and second selector members, the capture-and-release member being biased against the cam portions such that when the first selector member is



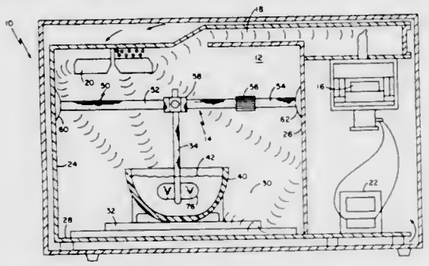
moved in the first direction, the capture-and-release member will be urged in a third direction until the cam portion moves beyond the first slanted surface, at which point the capture-and-release member moves in a fourth direction opposite the third direction to trap the first selector member in a nonneutral switch position.

4,904,834

MIXING ATTACHMENT FOR MICROWAVE OVEN TURNTABLES

Robert F. Bowen, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 16, 1987, Ser. No. 109,004
Int. Cl.⁴ H05B *6/78*
U.S. Cl. 219—10.55 E **17 Claims**



1. Apparatus for mixing food while heating with microwave energy, comprising:

a microwave cavity comprising first and second opposing walls;

means for energizing said oven cavity with microwave energy;

a utensil for holding food, said utensil being disposed within said oven cavity;

a turntable for rotating said utensil;

a shaft extending downwardly into said utensil; and

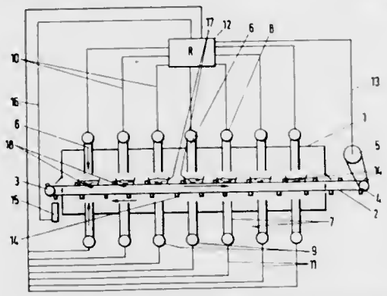
means for holding said shaft in a fixed position said holding means comprising a substantially horizontal bar having an adjustable length, said bar having ends engaging said opposing walls of said microwave cavity wherein, when said utensil containing food is rotated, said food is mixed by flowing across said shaft.

4,904,835

APPARATUS FOR THE UNIFORM AND RAPID HEATING OF FOODSTUFFS

Klaus Koch, and Manfred Klemm, both of Laatzen, Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 179,642, Apr. 8, 1988, Pat. No. 4,839,485.
This application May 8, 1989, Ser. No. 348,864
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712753
Int. Cl.⁴ H05B *6/78*
U.S. Cl. 219—10.55 M **3 Claims**



1. A method of continuously, uniformly and rapidly heating loads contained in sealed packs permeable to microwave, comprising the steps of:

a. providing an elongate treatment chamber,

b. conveying a plurality of sealed packs permeable to microwaves through said chamber, each pack containing a load to be heated by said microwaves,

c. providing longitudinally spaced location identifiers on said conveyor correlating with the placement of said packs on said conveyor,

d. projecting a plurality of upper and lower microwave guides into said chamber above and below, and directed to, said packs, said guides having outlets operably connected to the radially inner ends thereof,

e. corresponding the cross-sectional shape of said outlets to the geometrical surface shape of said packs,

f. generating microwave energy in each of said guides of a fixed predetermined wavelength,

g. controlling the conveying and microwave generation, including scanning the conveyor for detecting said location identifiers correlating with the placement of said packs on said conveyor, and

h. spacing the outlets of said microwave guides from the surfaces of said packs by a distance equal to or less than one wavelength of the microwave energy used for irradiation of said packs.

4,904,836

MICROWAVE HEATER AND METHOD OF MANUFACTURE

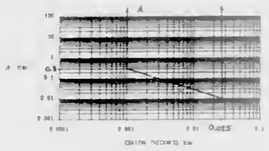
Charles H. Turpin, Minneapolis, and Michael R. Perry, Plymouth, both of Minn., assignors to The Pillsbury Co., Minneapolis, Minn.

Filed May 23, 1988, Ser. No. 198,812
Int. Cl.⁴ H05B *6/80*
U.S. Cl. 219—10.55 E **42 Claims**

1. A microwave heater for use for heating or cooking food in a microwave oven, said heater comprising:

(a) a thermally stable substrate having a first surface; and

(b) a lossy layer on at least a portion of said substrate first surface, said loosy layer having at least one region thereof with thickness and inverse power penetration depth



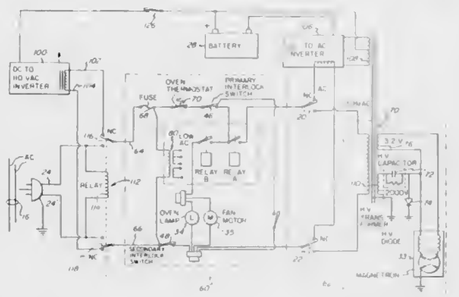
which have values within the ranges of about the values within Area A of FIG. 34.

4,904,837

POWERED MICROWAVE OVEN

Douglas W. Low, 15 Kingsway, Essex, Conn. 06426, and Neil C. Titcomb, 38 Brookwood Dr., Branford, Conn. 06405

Filed Oct. 18, 1988, Ser. No. 259,124
Int. Cl.⁴ H05B *6/76*
U.S. Cl. 219—10.55 B **16 Claims**



1. A microwave oven capable of operating from DC input power available on transports, comprising:

a microwave oven housing enclosing a heating chamber and having, a door for access to the chamber, a source of microwave energy, interlock safety means for preventing external radiation of microwave energy when the door is opened and enabling energizing of the microwave source when the door is closed;

first inverter means for generating internal AC power from DC input power;

means coupled through the interlock safety means to the internal AC power for generating a high voltage power for energizing the microwave source, said high voltage power generating means including power inverter means for generating, in response to activation from said internal AC power, said high voltage from said DC input power;

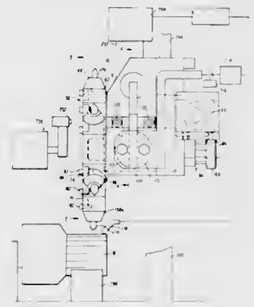
whereby said source is energized with high voltage from said DC input power as long as said internal AC power passes through said interlock safety means so as to preserve the safety provided thereby.

4,904,838

ELECTRODE CHANGERS AND METHODS OF OPERATION FOR ELECTRICAL BONDING APPARATUS

Charles F. Szantho, Roselle Park; Allan Warner, Clark, and Edward D. Riordan, S. Somerville, all of N.J., assignors to Joyal Products, Inc., Linden, N.J.

Continuation-in-part of Ser. No. 908,566, Sep. 18, 1986, Pat. No. 4,766,282. This application Mar. 4, 1988, Ser. No. 164,122
Int. Cl.⁴ B23K *11/30*
U.S. Cl. 219—86.8 **32 Claims**



1. An electrode changer for electrical bonding apparatus comprising:

(a) a frame;

(b) a retaining element movably mounted to the frame;

(c) means for securing at least one electrode defining a plurality of contact regions to said retaining element;

(d) means for arresting movement of said retaining element relative to said frame so as to hold one of said contact regions in an operative position and intermittently moving said retaining element relative to said frame to bring a new one of said contact regions into said operative position;

(e) means for transmitting electrical current to said retaining element, said electrical transmitting means including an electrical transmission element on said frame and an electrical transmission element on said retaining element;

(f) means for biasing said electrical transmission elements into engagement with one another; and

(g) means for temporarily relieving said bias concomitantly with intermittent movement of said retaining element.

4,904,839

ELECTRODES FOR USE IN SPOT WELDING

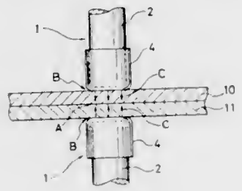
Ryo Tan; Eiichi Shigekura, and Shigeo Kidachi, all of Utsunomiya, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

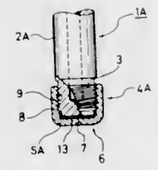
Filed Dec. 22, 1988, Ser. No. 288,187
Claims priority, application Japan, Dec. 25, 1987, 62-327368; Dec. 26, 1987, 62-196634; Dec. 26, 1987, 62-196635; Dec. 26, 1987, 62-196636; Dec. 26, 1987, 62-196637
Int. Cl.⁴ B23K *11/30, 35/00*
U.S. Cl. 219—119 **8 Claims**

1. An electrode for use in spot welding, in which a cup-shaped cap made of metallic material having a small electric conductivity, a small thermal conductivity and a high melting point temperature as compared to those of members to be

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welded, is fitted around a tip end of an electrode main body; said cap has its top surface formed in a shape close to a spheri-





cal surface; and a depression is formed at the central portion of said top surface.

4,904,840

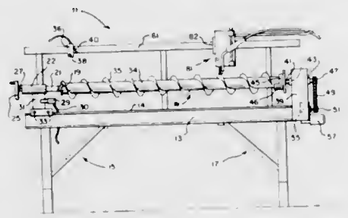
AUGER FLIGHT WELDER

David Fidelman, 5445 W. Plymouth Dr., Littleton, Colo. 80123

Filed Sep. 9, 1988, Ser. No. 242,619

Int. Cl.[4] B23K *9/04*

U.S. Cl. 219—124.34 **14 Claims**



1. Welding apparatus for continuously applying a bead of weld material along the outer edge of a flight of an auger section, comprising:

a. main support frame having attached thereto means for releasably supporting the opposite ends of said auger section and holding said section horizontally for rotation about its longitudinal axis;

b. means mounted to said frame for driving said auger in rotation;

c. guide rail attached to said frame and disposed above said auger section and extending in a direction parallel to said auger section axis;

d. traveller mounted to said rail for horizontal movement therealong;

e. carriage mounted to said traveller for guided free movement in a vertical direction;

f. free-turning follower wheel having a grooved rim and mounted to said carriage, said rim adapted to receive the outer edge portion of said auger flight and said wheel engagable with an upper portion of said flight so as to vertically support said carriage and to vertically follow said flight edge, and said wheel cooperating with said flight edge portion when said auger section is rotated to propel said carriage and traveller in horizontal movement; and

g. arc-welding means including a welding head adjustably mounted to said carriage and including a welding tip held in alignment with said flight edge when said carriage is supported on said flight.

4,904,841

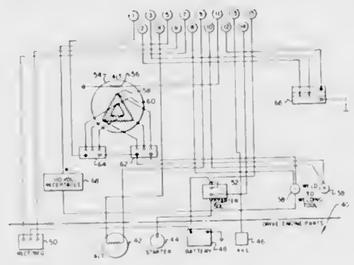
WELDER SYSTEM HAVING CONTROLLABLE DUAL WINDING ALTERNATOR

Dale L. English, 5405 Wild West Dr., Arlington, Tex. 76017

Filed Aug. 15, 1988, Ser. No. 232,478

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—133 **5 Claims**



1. An electric welding system comprising:

an internal combustion engine;

a storage battery for use in starting said internal combustion engine;

a first alternator coupled to said internal combustion engine for generating electricity in response to a relative rotation between an electric field and a plurality of windings;

a supply of consumable welding wire coupled to the output of said first alternator;

a wire feeder for advancing said consumable welding wire including a direct current electric motor wherein said direct current electric motor is selectively coupled to said storage battery for operation thereof in response to the actuation of a trigger; and

control means coupled to said first alternator and said trigger for actuating said electric field in response to actuation of said trigger.

4,904,842

BLOWHOLE-PIT PREVENTING AGENT AND ARC-WELDING METHOD USING THE SAME

Koichi Yasuda; Shosaburo Nakano; Noboru Nishiyama, all of Chiba; Takaro Matsumoto; Katsuaki Nakatsuji, both of Kurashiki; Tadao Komatsu, Kobe, and Tadashi Nakajima, Sakai, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Oct. 21, 1987, Ser. No. 111,870

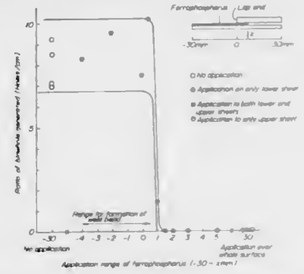
Claims priority, application Japan, Oct. 24, 1986, 61-254433; Mar. 23, 1987, 62-68574

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—137 R **5 Claims**

1. A blowhole-pit preventing agent for arc-welding of (1) used as a coating on galvanized sheets subjected to arc welding consisting of 5–70% by weight of at least one ferrophosphorus

selected from the group consisting of Fe_2P, FeP, Fe_3P and FeP_2 and having a phosphorus content of 15–55% by weight,



0.1–20% by weight of an additive and the balance being a solvent.

4,904,843

AC TIG WELDING APPARATUS USING HOT WIRE

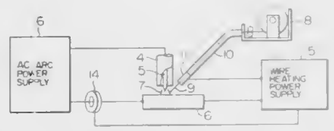
Katsuyoshi Hori; Yasuhiro Butsusaki, both of Kure; Toshiaki Takuwa, Yokohama, and Yoshiaki Matsumura, Kure, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,880

Claims priority, application Japan, Nov. 19, 1987, 62-290550

Int. Cl.[4] B23K *9/10*

U.S. Cl. 219—137 PS **14 Claims**



14. An AC TIG welding method using an AC TIG welding apparatus which includes a base metal to be welded, an unconsumable electrode arranged in opposedly spaced relationship with the base metal, an AC arc welding power supply connected between the base metal and the unconsumable electrode, a filler wire fed toward an arc-generated part formed between the base metal and the unconsumable electrode, wire feeding means for feeding the filler wire, and a wire heating power supply for energizing the filler wire, said method comprising the steps of:

supplying a wire-heating current in pulse form to the filler wire during a period when the unconsumable electrode is kept negative in polarity by the AC arc; and

cutting off the wire-heating current to the filler wire during the period when the uncomsumable electrode is kept positive in polarity by the AC arc.

4,904,844

REMOTELY OPERATED WINDSHIELD DEFROST

Dale L. Chamberlin, 5977-1 Meadowcreek Dr., Milford, Ohio 45150

Filed Apr. 10, 1989, Ser. No. 335,882

Int. Cl.[4] B60S *1/54*

U.S. Cl. 219—203 **2 Claims**

1. A remotely-operated automotive vehicle windshield defrost system comprising:

a deformable pad (18) positionable on a vehicle dashboard to exert a gripper force thereon, a bar (20) attached to said bar for placement in a channel that extends along the lower edge of the vehicle windshield, whereby the pad is removably mounted on the vehicle dashboard;

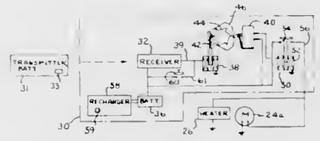
a blower and electric resistance heater unit located on said pad in near proximity to the vehicle windshield for blowing heated air thereagainst;

a portable radio transmitter adapted to be carried by a person remote from the vehicle;

a power pack (30) located on said pad for energizing the blower and resistance heater;

said power pack comprising a radio receiver tuned to the same frequency as the transmitter for generating an electrical pulse in response to a transmitter signal; a battery; a switch means (40) connected between the battery and the blower-heater unit; said switch means having an "on" position wherein battery current is delivered to the blower-heater unit and an "off" position wherein the blower-heater unit is disconnected from the battery; a pulse-





responsive controller connected between the receiver and the switch means for setting the switch means (1) to the "on" position as a response to alternate pulses, and (2) to the "off" position as a response to intervening pulses; a manual switch (60) connected between the battery and the pulse-responsive controller in parallel with the receiver, whereby the controller can be operated by the receiver or by the manual switch; and a battery recharger connected to said battery so that the battery can be periodically recharged by plugging the recharger into a householder electrical outlet;

said deformable pad, blower-heater unit, and power pack being constructed as a single manually movable device installable on the dashboard of a vehicle or removable from the dashboard of a vehicle.

4,904,845

TEMPERATURE CONTROLLED ELECTRICAL CONTINUOUS FLOW HEATER FOR BEVERAGE MAKING APPLIANCES

Boris Wonka, Neu-Isenburg, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Oct. 14, 1987, Ser. No. 108,114

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637378

Int. Cl.[4] H05B *1/02;* **A47J** *31/00;* **F24H** *1/14*

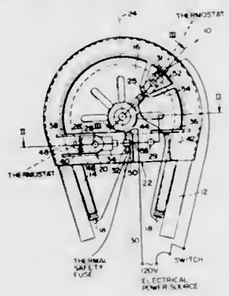
U.S. Cl. 219—283 **7 Claims**

1. An electrical continuous flow heater for coffee makers or similar household appliances for making infusion beverages, comprising a heater element, a water supply pipe assigned thereto, a hot plate located above the heater element and water supply pipe in heat exchange relation therewith and which serves to store and to keep hot a receptacle to be filled with infusion beverages, and comprising a temperature controller destined to control the temperature of the heater element, the said temperature controller being mounted on a connector means provided for this purpose on a support device coupled to at least one of said supply pipe and heater element,

characterized in that the support device for accommodating the temperature controller includes at least two ribs (20, 22, 52) whereat in each case a connector means (28, 29, 31) is arranged for fastening only one temperature controller, and in that each rib (20, 22, 52) is sized and shaped and

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located relative to said heater element and supply pipe to deliver a different amount of heat and that the heat flow from said supply pipe and said heater element is delivered to said temperature controller solely through said rib on



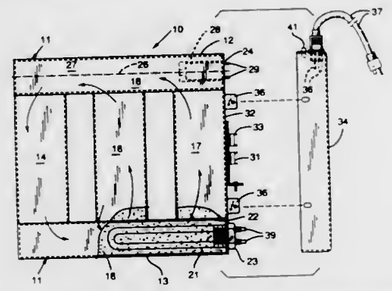
which said temperature controller is mounted, whereby the temperature sensed by said temperature controller is determined by the particular rib on which said temperature controller is mounted.

4,904,846

OIL FILLED BODY HEATER

Augustin Oscadal, 29262 Union City Blvd., Union City, Calif. 94587

Filed Apr. 29, 1988, Ser. No. 187,865
Int. Cl.[4] F24H *7/00*
U.S. Cl. 219—341 **4 Claims**



1. A heating device for storing and distributing heat for a period of time, comprising:
a radiator body having a hollow interior, and including a pair of spaced header tubes and at least two connector tubes extending generally transversely between the header tubes and communicating with the header tubes,
a heat transfer liquid in the interior of the radiator body, substantially filling the header tubes and connector tubes except for a relatively small amount of volume of space above the heat transfer liquid,
said relatively small volume of space being substantially free of air and substantially filled with a gas which is non-reactive chemically with the heat transfer liquid, even at the maximum operating temperature of the heating device,
electrical resistance heating means within the radiator body, positioned so as to be covered with the heat transfer liquid and so as to promote thermal convection and circulation of the heat transfer liquid within the radiator body, without the need for a mechanical pump,
an operating thermostat connected to the electrical resistance heating means, for causing the electrical resistance heating means to remain energized, when the device is connected to a source of power, until the temperature of the circulating heating liquid reaches a preselected maximum operating temperature, then for de-energizing the heating means until the temperature of the heating liquid drops below a preselected range,
and an insulative jacket of fabric material, having one open end and sized for receiving the radiator body to enclose the radiator body and effect the storage of heat in the body for relatively long periods of time, with slow distribution of the heat to surrounding environment,
and the heat transfer liquid and gas being at subatmospheric pressure and at a sufficiently low pressure that they remain below atmospheric pressure even at maximum operating temperature of the heating device, the radiator body being closed and isolated from the atmosphere.

4,904,847

HAIR DRYER HAVING ADJUSTABLE HEIGHT AND AIR FLOW

Genji Kosaka, and Keiko Matoba, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 5, 1988, Ser. No. 228,572
Claims priority, application Japan, Nov. 24, 1987, 62-179351[U]; Nov. 27, 1987, 62-181234[U]; Nov. 27, 1987, 62-181235[U]; Nov. 27, 1987, 62-181236[U]
Int. Cl.[4] F24H *9/02*
U.S. Cl. 219—370 **13 Claims**



1. A hair drier comprising a hair drier body and a stand for supporting the hair drier body thereon, wherein:
said hair drier body comprises a hair drier head provided with an intake port and a blow-off port and having a blast fan, a motor driving the blast fan and an air heating mechanism disposed therebetween, and a rod grip supporting the hair drier head foldably and provided with a switch means for changing an operation of said motor and said air heating mechanism; and
said stand comprises a grip part inserting cylinder containing said grip part detachably and provided with a height adjusting mechanism which adjusts a containable depth of said grip part, and a container part formed integrally with the grip part inserting cylinder and having a containing space formed interiorly.

4,904,848

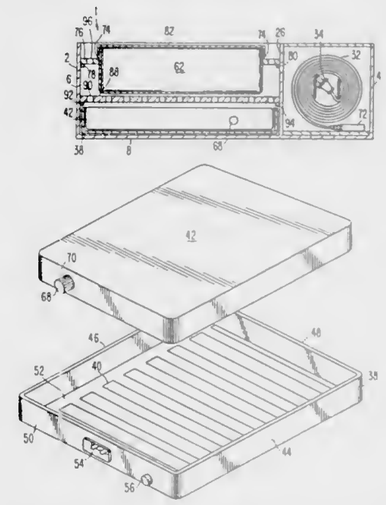
PORTABLE COOLING AND HEATING DEVICE

Geraldean Colevas, 2812 Oakton Manor Ct., Oakton, Va. 22124

Filed Feb. 8, 1989, Ser. No. 307,469
Int. Cl.[4] A47J *36/26*
U.S. Cl. 219—387 **25 Claims**

21. A portable cooling and heating device for cooling and heating food contained in individual receptacles comprising;
a housing having a bottom wall, front wall, rear wall and side walls;

a top closure wall hingedly connected to said rear wall and pivotable between an open and closed position;
a drawer slidably insertable into a first opening in said housing;
a heating means mounted on a bottom wall of said drawer including a means for connecting said heating means to a



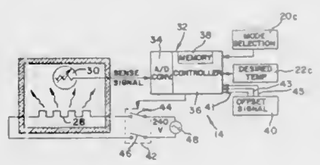
power source, said means for connecting being accessible through a second opening in said housing;
a removable cooling means positioned within said drawer for maintaining the interior of said housing cool prior to the heating of said food; and
means for supporting said individual receptacles adjacent to said drawer within said housing.

4,904,849

SELF-CLEANING OVEN TEMPERATURE CONTROL WITH ADAPTIVE CLEAN MODE RECALIBRATION

Richard E. Sinn, Harrison Township, Bartholomew County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 7, 1988, Ser. No. 267,792
Int. Cl.[4] F24C *7/08, 14/02*
U.S. Cl. 219—413 **10 Claims**



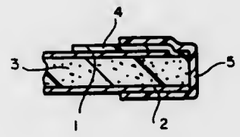
1. A self-cleaning oven comprising:
an oven cavity adapted to receive items to be cooked by said oven;
heating means within said oven for raising the temperature of said oven cavity;
means for controlling said heating means in a bake mode of operation with nominal or recalibrated bake temperatures and in a clean mode of operation with a nominal or recalibrated clean temperature;
means for recalibrating the temperature at which said oven operates in said bake mode to temperatures greater than said nominal bake temperature for a positive recalibration and to temperatures less than said nominal bake temperatures for a negative recalibration; and
means responsive to said bake temperature recalibration means for recalibrating the temperature at which said oven operates in said clean mode, said clean temperature recalibration means being responsive to any positive bake temperature recalibration to increase the clean temperature a fixed amount above said nominal clean temperature and being responsive to any negative bake temperature recalibration to decrease the clean temperature a fixed amount below said nominal clean temperature.

4,904,850

LAMINAR ELECTRICAL HEATERS

James L. Claypool, Los Altos Hills; Thomas A. Kridl, Los Altos, and Lee M. Middleman, Portola Valley, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Mar. 17, 1989, Ser. No. 325,079
Int. Cl.[4] H05B *3/10*
U.S. Cl. 219—548 **17 Claims**



1. An electrical heater which comprises
(1) a laminar resistive element which (i) is composed of a conductive polymer which comprises a continuous matrix comprising a first organic polymer and a first particulate conductive filler which is distributed in the matrix and maintains its identity therein and each particle of which comprises a second organic polymer and a second particulate conductive filler which is distributed in the second polymer and (ii) has a first face and an opposite second face;
(2) a first laminar electrode, the whole of which is secured to the first face of the resistive element; and
(3) a second laminar electrode, the whole of which is secured to the second face of the resistive element;
the first and second electrodes being connectable to a power supply, whereby current can be passed through the resistive element; and the first and second electrodes being so shaped and positioned that (a) when current passes between the electrodes, it does so in a direction which is substantially at right angles to the faces of the resistive element, and (b) there is a continuous marginal portion around the whole of the periphery of the resistive element in which at most one of the first and second electrodes is present.

4,904,851

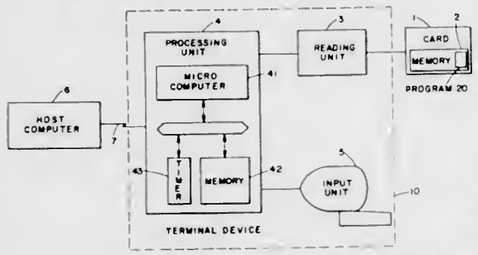
IDENTIFICATION AUTHENTICATING SYSTEM

Eiichi Yukino, Kanagawa, Japan, assignor to Hitachi Ltd., Tokyo, Japan

Filed Nov. 16, 1987, Ser. No. 121,239
Claims priority, application Japan, Nov. 17, 1986, 61-271886
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **12 Claims**

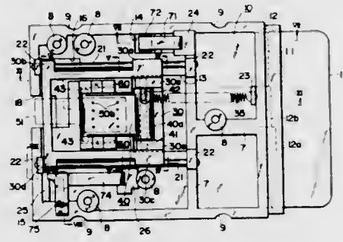
1. A system for authenticating identification comprising:
first memory means adapted for storing a program to perform a preselected calculation on an input value to obtain an expected result;

means for generating the expected result in accordance with the calculation;
means for placing the first memory means in data communication with the generating means;
a second memory means, placed in data communication with the first memory means and the generating means, the second memory means being adapted for storage of a copy of the program of the first memory means;



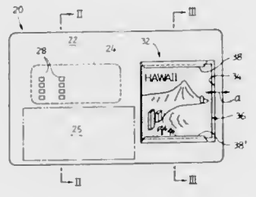
a means for reading out the program from the second memory means in accordance with the execution of the generating means;
means for supplying the input value to the program whereby the calculation is performed thereon;
means for receiving an external signal; and
means for comparing the expected result and the external signal to authenticate the identification.

4,904,852
IC CARD READER
Katsuya Mita, Kyoto, and Muneki Morishita, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan
Continuation of Ser. No. 130,288, Dec. 8, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 287,667
Claims priority, application Japan, Dec. 12, 1986, 61-296423; Dec. 13, 1986, 61-297333; Jun. 1, 1987, 62-138746
Int. Cl.[4] G06F *13/04*
U.S. Cl. 235—479 **7 Claims**



1. An IC card reader comprising:
guide means, provided for a frame of the IC card reader, for guiding an IC card so as to be smoothly inserted and ejected;
a slide member supported to said frame so as to be movable in the inserting and ejecting directions of said IC card and having a receiving projecting portion to move said slide member in the inserting direction of the IC card in contact relation with a part of the inserted IC card;
a contact member supporting means having a plurality of contact members adapted to come into contact with a plurality of contacts of the IC card and pivotally supported to said slide member so as to be freely swung;
first urging means for urging said slide member in the ejecting direction of the IC card;
second urging means for urging said contact member supporting means in such a direction that said contact members are away from a passageway of the IC card;
said first and second urging means being formed by a spring which is attached between said frame and said contact member supporting means; and
a fixed cam fixed to said frame, in which when said slide member is moved in said inserting direction through said receiving projecting portion by the IC card being inserted, said fixed cam comes into contact with a part of said contact member supporting means that is moved in said inserting direction and rotates said contact member supporting means against the urging force of said second urging means in such a direction that said contact members come into contact with the IC card.

4,904,853
DUAL-FUNCTION INFORMATION-CARRYING SHEET DEVICE
Jun Yokokawa, Tokyo, Japan, assignor to Kabushiki Kaisha Astex, Japan
Continuation of Ser. No. 99,472, Sep. 22, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,481
Int. Cl.[4] G06K *19/07*
U.S. Cl. 235—487 **5 Claims**

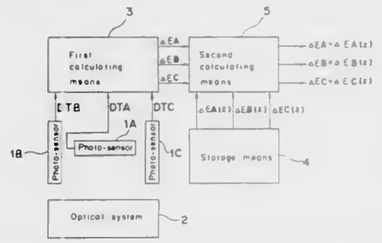


1. A dual-function information carrying device, comprising:
(a) an information carrying sheet and digital data storage means on the sheet for storing digital data;
(b) means for writing data into or reading data from the digital data storage means; and
(c) slide retaining means including inner edges defining in the sheet a substantially rectangular opening which penetrates through and is open on the opposite sides of the sheet such that said slide retaining means is effective for releasably retaining a projection display slide carrying a visible image and formed independently of said sheet in a manner wherein said slide is releasably retained in said opening by means of said inner edges and substantially the entire face area of the slide are exposed externally on both sides of the sheet through said opening.

4,904,854
AUTOMATIC FOCUS DETECTING DEVICE HAVING DEVIATION COMPENSATION
Tokuji Ishida; Toshio Norita, and Hiroshi Ootsuka, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 11, 1988, Ser. No. 141,845
Claims priority, application Japan, Jan. 12, 1987, 62-4621; Jan. 12, 1987, 62-4622; Jan. 12, 1987, 62-4623; Jan. 12, 1987, 62-4624; Jan. 12, 1987, 62-4625; Jan. 12, 1987, 62-4626; Jan. 12, 1987, 62-4627; Jan. 12, 1987, 62-4628
Int. Cl.[4] G01J *1/20;* **G03B** *13/18*
U.S. Cl. 250—201 **22 Claims**

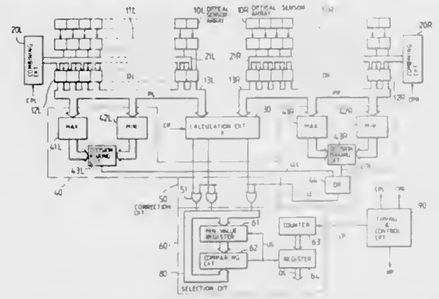
1. An automatic focus control device comprising:
a plurality of photo-sensor means corresponding, respectively, to a plurality of regions for performing focus detection;

an optical system for guiding light to said photosensor means;
a first calculating means for calculating first defocus amounts upon reception of signals from said photosensor means, respectively;



a storage means for storing a plurality of deviation amounts in a direction of an optical axis produced by means of arrangement of the direction of the optical axis of the plurality of photo-sensor means; and
a second calculating means for calculating second defocus amounts corrected on the basis of the first defocus amounts and the deviation amounts, respectively.

4,904,855
METHOD FOR DETECTING RELATIVE POSITION OF AN IMAGE PAIR INCLUDING CONTRAST DETECTION
Takashi Nishibe, and Shotaro Yokoyama, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan
Filed Nov. 28, 1988, Ser. No. 276,832
Claims priority, application Japan, Jan. 27, 1988, 63-16249
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **8 Claims**



1. A method for detecting the relative position of images incident upon a pair of optical sensor arrays on the basis of a pair of image data, the pair of image data comprising a plurality of data indicative of light intensity distribution of the images, the image data being output from a pair of optical sensor arrays that receive the images through separate light paths in space, the method comprising the steps of:
sampling a portion of at least one of the pair of image data and forming a plurality of combinations of verification data comprising a predetermined number of adjacent data on each optical sensor array;
calculating an evaluation value indicative of the correlation between the verification data for every combination formed;
detecting the amount of variation in the respective verification data and determining whether the data is of low contrast when the amount of variation in at least one of the two verification data within the respective combination is smaller than a predetermined limit;
correcting the evaluation value of the combination of verification data which has been determined to be of low contrast to a value indicative of low correlation;
selecting a combination in which the verification data indicates the highest correlation from the plurality of combinations of verification data by using the corrected evaluation value, wherein the relative position of the images on the optical sensor arrays is detected on the basis of the number indicative of the combination selected.

4,904,856
OPTICAL PICKUP DEVICE WITH DIFFRACTION SENSING
Toshiya Nagahama; Yukio Kurata, and Yoshio Yoshida, all of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 9, 1988, Ser. No. 282,109
Claims priority, application Japan, Dec. 9, 1987, 62-311255
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **5 Claims**



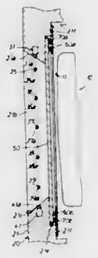
1. An optical pickup device comprising:
a light source;
an optical lens system that converges light beams from said light source onto a recording medium;
a photodetector with three divided regions that detects light beams reflected from said recording medium; and
a hologram optical element that introduces the reflected light beams from said recording medium into said photodetector;
said hologram optical element being divided into a first hologram region and a second hologram region, a part of the reflected light beams from said recording medium is diffracted by said first hologram region of said hologram optical element and focused on a division line in said photodetector in the direction of the diffraction of said hologram optical element;
said division line dividing said photodetector into a first photodetector region and a second photodetector region, and an other part of the reflected light beams is diffracted by said second hologram region of said hologram optical element and focused on a third photodetector region of said photodetector;
said photodetector generating an output intensity from first and second photodetector regions of said photodetector wherein a difference between the output intensity of said first and second photodetector regions results in a focus error signal and a total of the output intensity from said first, second and third photodetector regions of said photodetector results in an information signal.

4,904,857

ELECTRIC CONTROL SYSTEM FOR PHOTOELECTRIC TOUCH INPUT APPARATUS

Noriyoshi Ando; Hajime Mikuni, and Tomohisa Kishigami, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 208,109, Jan. 19, 1988, abandoned, which is a continuation of Ser. No. 2,892, Jan. 13, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,875
Claims priority, application Japan, Jan. 13, 1986, 61-4500
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 6 Claims



6. A photoelectric touch input apparatus adapted to be placed in front of a display device, comprising:

a housing having a frame adapted to be placed in front of a display surface of said display device, said frame defining an opening therein;

a plurality of light-emitting elements mounted on said frame in a row along at least one side of said opening to produce a plurality of light beams in parallel spaced relationship on a common plane;

a plurality of photosensitive elements mounted on said frame in a row along the opposite side of said opening from said plurality of light-emitting elements and aligned with said light-emitting elements to receive the light beams emitted therefrom, said photosensitive elements being arranged to produce a plurality of light-receiving signals in response to the light beams applied thereto from said light-emitting elements;

first means for producing a plurality of drive signals respectively representative of a control value for adjustment of each quantity of light of said light-emitting elements, said first means including means for applying said drive signals to said light-emitting elements in sequence and means for adjusting said control value in such a manner that each level of said light-receiving signals reaches an optimum level, and for memorizing said adjusted control value; and

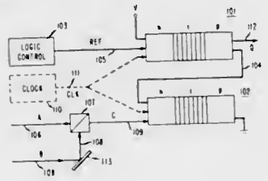
second means for adjusting each level of said drive signals in accordance with said memorized control value only after adjustment of said control value and for maintaining said drive signals at the adjusted level, said second means including means for determining whether or not an object such as an operator's finger interrupts one of the light beams, and if so, producing a signal indicative of the position of the object.

4,904,858

PROGRAMMABLE OPTICAL LOGIC DEVICES OPERABLE BY MEASURING THE RATIO OF OPTICAL DATA SIGNAL POWER TO OPTICAL REFERENCE THRESHOLD POWER

Robert E. LaMarche, Atlantic Highlands, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 31, 1989, Ser. No. 359,252
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 J 14 Claims



1. An arrangement for performing a Boolean logic operation on first and second optical data signals, said arrangement including:

first and second photodiodes connected together in series cascade as a self electrooptic effect device having a predetermined threshold, at least said first photodiode including a semiconductor quantum well region, said first photodiode for generating an optical output signal having first and second levels;

means for generating an optical reference threshold signal, said optical reference threshold signal being incident upon said first photodiode to control the Boolean logic operation being performed by the arrangement;

said first and second optical data signals being incident upon said second photodiode; and

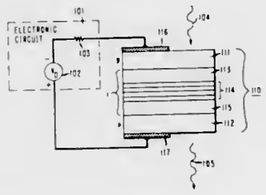
the arrangement for generating said optical output signal at said first level when a ratio of optical reference threshold signal power to total optical data signal power exceeds the predetermined threshold and for generating said optical output signal at said second level when a ratio of total optical data signal power to optical reference threshold signal power exceeds the predetermined threshold.

4,904,859

SELF ELECTROOPTIC EFFECT DEVICE EMPLOYING ASYMMETRIC QUANTUM WELLS

Keith W. Goossen, Matawan, and David A. B. Miller, Fair Haven, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 17, 1989, Ser. No. 298,591
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 J 8 Claims



1. An optical device comprising

means responsive to light for generating a photocurrent,

a structure having a semiconductor quantum well region, and

means responsive to said photocurrent for electrically controlling a coefficient of absorption of said semiconductor quantum well region in order to cause said coefficient of absorption to vary in response to variations of said photocurrent, said optical device CHARACTERIZED IN THAT,

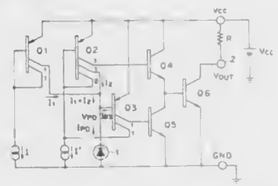
said semiconductor quantum well region includes first and second layers and a subregion between and in contact with said first and second layers, said first and second layers comprising wide bandgap semiconductor material, said subregion comprising at least one layer of substantially narrow bandgap semiconductor material, said subregion having a substantially asymmetric electronic characteristic along a width of said subregion region from said first layer to said second layer for polarizing electrons and holes within said quantum well region in an opposite direction relative to a direction of an electric field applied to said structure.

4,904,860

OPTICAL SIGNAL DETECTION CIRCUIT WITH CONSTANT CURRENT SOURCES

Hiroyuki Okugaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1988, Ser. No. 234,480
Claims priority, application Japan, Aug. 28, 1987, 62-216025
Int. Cl.[4] h01J *40/14*
U.S. Cl. 250--214 R 10 Claims



1. An optical signal detecting circuit, comprising:

first and second transistors which each have a base and a plurality of collectors, wherein a first of said collectors and said base of said first transistor are connected to each other and to a first constant current source, and wherein a first of said collectors and said base of said second transistor are connected to each other and to a second constant current source;

a light receiving element having a first end connected to ground and a second end connected to a second of said collectors of each of said first and second transistors;

a third transistor which has a base and a plurality of collectors, said base of said third transistor being connected to said second end of said light receiving element, and a first of said collectors of said third transistor being connected to said first collector of said second transistor;

fourth and fifth transistors which each have an emitter, a base, and a collector, said emitter of said fifth transistor and said collector of said fourth transistor being respectively connected to ground and to a power source, said emitter of said fourth transistor being connected to said collector of said fifth transistor, said base of said fourth transistor being connected to a third of said collectors of said second transistor, and said base of said fifth transistor being connected to a second of said collectors of said third transistor; and

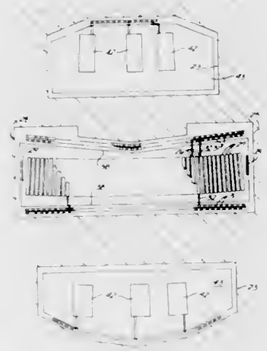
a sixth transistor having a collector, an emitter, and a base which are respectively connected to an output terminal, to ground, and to said collector of said fifth transistor.

4,904,861

OPTICAL ENCODER USING SUFFICIENT INACTIVE PHOTODETECTORS TO MAKE LEAKAGE CURRENT EQUAL THROUGHOUT

Howard C. Epstein, Los Altos; Thomas J. Lugaresi, Campbell, and Michael A. Robinson, Sunnyvale, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 27, 1988, Ser. No. 290,542
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 C 21 Claims



1. An optical encoder comprising:

a plurality of active photodiodes in an array on a semiconductor chip;

a code member having alternating areas for alternately illuminating and not illuminating the active photodiodes in response to movement of the code member;

means connected to the active photodiodes for measuring current from the active photodiodes; and

sufficient inactive photodiode area on the semiconductor chip at each end of the array of active photodiodes to make the leakage current to each end active photodiode of the array substantially equal to the leakage current to an active photodiode remote from an end of the array.

4,904,862

LENS ADJUSTMENT FOR A LIGHT EMITTING DIODE PRINT HEAD

Michael G. Bertagne, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 19, 1989, Ser. No. 299,999
Int. Cl.[4] H01J *3/14;* G01D *15/06*
U.S. Cl. 250—216 13 Claims

1. A method for adjusting a light emitting diode print head comprising a row of LEDs on a mother plate, an elongated lens array approximately parallel to the row of LEDs, and a reference surface at each end of the mother plate for mounting the print head at a fixed location in a printer, comprising the steps of:

passing light from the LEDs through the lens array;

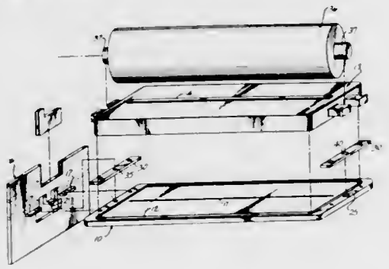
sensing LED light from the lens array with an image quality analyzer;

adjusting the distance between the LEDs and the analyzer for maximizing image quality;

adjusting the location of one end of the lens array in the gap between the analyzer and the LEDs for maximizing image quality at that end of the array;

adjusting the location of the other end of the lens array in the

gap between the analyzer and the LEDs for maximizing image quality at that end of the array;
fixing the lens array in the adjusted position; and



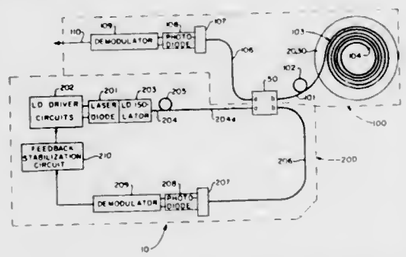
fixing the reference surfaces at known locations relative to the analyzer.

4,904,863

POLARIMETRIC OPTICAL FIBER PRESSURE SENSOR

Graham F. McDearmon, Munroe Falls, Ohio, assignor to Loral Corporation, New York, N.Y.

Filed Nov. 25, 1958, Ser. No. 275,990
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—227 **26 Claims**



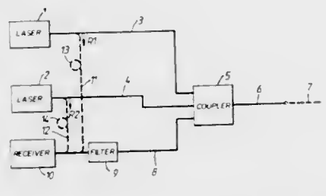
1. A sensor for detecting a pressure in a fluid medium comprises in combination:
A. an optical coupling means having a pair of 'a' terminals and a pair of 'b' terminals wherein light passing into either one of the 'a' terminals is split between the pair of 'b' terminals and light passing into either of the 'b' terminals is split between the pair of 'a' terminals;
B. a first optical polarimetric circuit comprising:
(i) a source of light;
(ii) an optical fiber optically
connecting the source of light into an 'a' terminal of the coupling means;
(iii) means optically connected to a 'b' terminal of the coupling means to convert light to an electrical signal indicative of a change in a particular characteristic of the light from a predetermined value;
(iv) feedback control means interconnecting the convertor means and the source of light to adjust a controlling current and maintain the source within a predetermined operating range;
C. a second optical polarimetric circuit comprising:
(i) a single-mode, pressure-sensing optical fiber arranged in a planar, substantially circuitously-looped configuration and having one end optically connected to the other 'b' terminal of the coupling means and having a mirrored terminal end to reflect light back through the optical fiber;
(ii) means optically connected to the other 'a' terminal of the coupling means to receive light from the optical sensing fiber and to detect any change in the light as may be effected by a pressure and provide an output electrical signal indicative of the change; and
D. a sealed housing comprised of two juxtaposed plates of a material exhibiting a small thermal expansion coefficient, said plates sandwiching the planar, circuitously-looped optical fiber between them such that any pressure incident on at least one of the plates produces a change in the light propogating through the fiber.

4,904,864

MULTI-WAVELENGTH TIME DOMAIN REFLECTOMETER

John P. Dakin, Hampshire, and David J. Pratt, Suffolk, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Dec. 10, 1987, Ser. No. 131,166
Claims priority, application United Kingdom, Dec. 10, 1986, 8629545
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **7 Claims**



1. In an optical sensing system, in which optical pulse outputs of different wavelengths are launched at a launch end into optical fiber means through which returned optical signals are conducted for respective detection at the different wavelengths at the launch end with respect to time by one receiver indicating intensity levels of said returned optical signals corresponding to a parameter being measured, a method of continuously calibrating the receiver, including the steps of: extracting level reference signals directly from the respective optical pulse outputs at the different wavelengths; and feeding back into the receiver said level reference signals varying in accordance with the relative intensity levels of the optical pulse outputs at the different wavelengths being launched into the optical fiber means so that the receiver provides an accurate indication of the parameter being measured.

4,904,865

EXTERNALLY MOUNTED RADIOACTIVITY DETECTOR FOR MWD

James E. Meisner, Citrus Heights; Roger L. Tresler, Sacramento; Edward S. Mumby, Carmichael, and Micheal D. Robie, Folsom, all of Calif., assignors to Exploration Logging, Inc., Sacramento, Calif.

Filed Apr. 1, 1988, Ser. No. 177,389
Int. Cl.[4] G01V *5/10, 5/12, 5/14*
U.S. Cl. 250—254 **22 Claims**

1. In well drilling apparatus which includes a hollow drill string in the well, a rotatable drill bit on the lower end of the drill string and means for circulating drilling liquid through the drill string, the improvement comprising:
a section of drill collar having an annular wall mounted in the drill string in the vicinity of the drill bit, the drill collar wall having a hole extending through it;
a scintillator mounted in the hole in the drill collar;

an electronics housing disposed within the drill collar and arranged to permit drilling liquid to flow past it;
a photomultiplier tube mounted in the housing; and



light-coupling means connecting the scintillator to the photomultiplier tube so light emitted by the scintillator may be detected with the drill string in the well.

4,904,866

WIDE AREA SOFT VACUUM ABNORMAL GLOW ELECTRON BEAM DISCHARGE HARDENING PROCESS

George J. Collins, Ft. Collins, Colo., and Jayaram Krishnaswamy, Raleigh, N.C., assignors to Applied Electron Corporation, Santa Clara, Calif.

Filed Nov. 17, 1988, Ser. No. 272,641
Int. Cl.[4] H01J *37/30*
U.S. Cl. 250—492.2 17 Claims

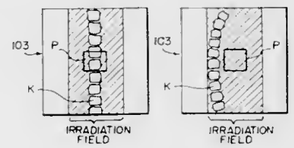
1. A resist hardening process for hardening a previously patterned resist layer on a substrate, the process comprising:
positioning a substrate having a previously patterned resist layer thereon in a vacuum chamber;
evacuating the vacuum chamber with a selected gas to a selected pressure level;
producing a wide area pulsed abnormal glow electron beam discharge from a cold cathode abnormal glow discharge electron gun positioned within the vacuum chamber, said pulsed abnormal glow electron beam discharge being pulsed from a first current level to a higher second current level; and
exposing the previously patterned resist layer on the substrate to the wide area pulsed abnormal glow electron beam discharge for a predetermined number of pulses.

4,904,867

RADIATION IMAGE READ-OUT METHOD AND APPARATUS

Yuuma Adachi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 15, 1987, Ser. No. 61,366
Claims priority, application Japan, Jun. 13, 1986, 61-137660; Jan. 27, 1987, 62-17038
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 **13 Claims**



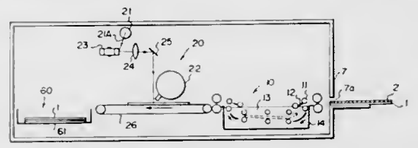
1. A method of reading out a radiation image in which final read-out is carried out for detecting image signals for use in reproduction of a visible image for a recording medium carrying a radiation image of an object recorded thereon, and read-out conditions for the final read-out and/or image processing conditions for an image processing of final read-out image signals detected by the final read-out are adjusted based on image signals for condition adjustment detected by reading out the image information recorded on the recording medium,
wherein the improvement comprises the steps of:
(i) extracting image signals in a partial region at a predetermined position on said recording medium from said image signals for condition adjustment, and calculating a representative value of the image signal for said partial region,
(ii) calculating a predetermined discrimination value representing a relationship between a characteristic value of said image signals for condition adjustment and said representative value, and representative an image recording direction of the object, and
(iii) adjusting said read-out conditions for the final read-out and/or said image processing conditions based on said discrimination value.

4,904,868

RADIATION IMAGE READ-OUT APPARATUS AND STIMULABLE PHOSPHOR SHEET COMPOSITE MEMBER FOR THE SAME

Katsuhiro Kohda; Chiyuki Umemoto; Nobuyoshi Nakajima, and Kazuo Horikawa, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 16, 1988, Ser. No. 232,906
Claims priority, application Japan, Aug. 19, 1987, 62-205876; Aug. 19, 1987, 62-205877; Aug. 19, 1987, 62-205878; Aug. 19, 1987, 62-205879; Aug. 19, 1987, 62-205880; Aug. 27, 1987, 62-213751; Aug. 27, 1987, 62-213752
Int. Cl.[4] G03B *42/02*
U.S. Cl. 250—327.2 **19 Claims**



1. A radiation image read-out apparatus comprising:
(i) a light shielding means removal section for removing a light shielding means by dissolution from a stimulable phosphor sheet comprising a stimulable phosphor layer

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and the light shielding means which is provided at least on a surface on the stimulable phosphor layer side and which is removable by dissolution in a solvent, said stimulable phosphor sheet carrying a radiation image stored on said stimulable phosphor layer, and

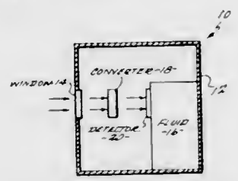
(ii) a read-out section for reading out said radiation image by exposing said stimulable phosphor sheet, from which said light shielding means has been removed, to stimulating rays which cause said stimulable phosphor sheet to emit light in proportion to the stored radiation energy, and photoelectrically detecting the emitted light.

4,904,869

X-RAY SENSOR HAVING A HIGH MASS NUMBER CONVERTOR AND A SUPERCONDUCTING DETECTOR

Richard T. Schneider, Alachua, Fla., assignor to Progress Technologies Corporation, St. Petersburg, Fla.

Filed Dec. 14, 1988, Ser. No. 284,378
Int. Cl.[4] H01L *39/00*; G01T *1/00*
U.S. Cl. 250—336.2 **10 Claims**



1. An apparatus for sensing x-ray radiation comprising:

a housing;

a window formed in said housing that is transparent to x-ray radiation;

means disposed in said housing for converting x-ray radiation into infrared radiation;

means disposed in said housing for detecting said infrared radiation, said detecting means including a superconducting material that has a varying resistance for a given temperature range between a superconducting and a non-superconducting state;

means disposed in said housing for maintaining said detecting means within said given temperature range; and

means for sensing said varying resistance of said detecting means.

4,904,870

DEVICE AND METHOD FOR CORRECTING SENSITIVITY OF A GAMMA CAMERA

Takashi Ichihara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

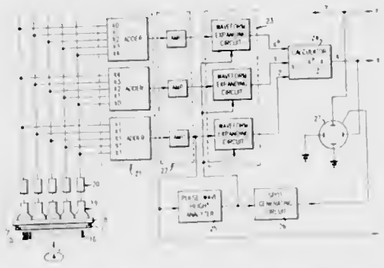
Filed Sep. 16, 1988, Ser. No. 245,280
Claims priority, application Japan, Sep. 18, 1987, 62-234416
Int. Cl.[4] G01T *1/20, 1/164*
U.S. Cl. 250—363.07 **12 Claims**

1. Gamma camera sensitivity correction device capable of sensitivity correction of a gamma camera including a collimator and a light detector, wherein radiation from a radioisotope administered to a subject is detected and an image of the accumulation of the radioisotope in said subject is obtained, comprising:

first calculating means for obtaining collimator characteristic sensitivity data that are characteristic of said collimator;

means for freshly collecting uniformity data that are characteristic of the detector in the condition with said collimator removed;

means for deriving uniformity data in the condition in which the collimator is fitted on said detector, based on the freshly collected uniformity data, from said collecting means, that are characteristic of the detector, and on the collimator characteristic sensitivity data from said first calculating means; and



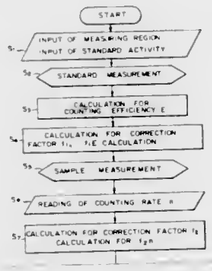
second calculating means for determining uniformity correction coefficients for radioisotope accumulation image correction, based on the uniformity data from said derivation means.

4,904,871

METHOD OF DETERMINING RADIOACTIVITY OF LOW ENERGY BETA RAYS

Hiroaki Ishikawa, Tokyo, Japan, assignor to Japan Science, Inc., Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,977
Claims priority, application Japan, Oct. 12, 1987, 62-254555
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—364 **4 Claims**



1. A method of determining radioactivity of low energy beta emitters using liquid scintillator, which comprises:

obtaining counting efficiencies corrected by working a correction factor on counting efficiencies of the standard which are simultaneously obtained from measuring regions defined by lower and upper levels of a pulse height analyzer using a standard whose maximum counting efficiency is equal to or less than 85% in measuring regions to be used;

obtaining counted values corrected by working a correction factor on counted values of a sample for radioactivity to be measured which are simultaneously obtained in the measuring regions;

determining a regression equation using the corrected counting efficiencies and the corrected counted values; and

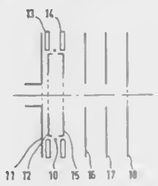
making correction of counted value at counting efficiency 100% of a regression equation by a correction factor obtained by standards.

4,904,872

METHOD FOR GENERATING EXTREMELY SHORT ION PULSES OF HIGH INTENSITY FROM A PULSED ION SOURCE

Raimund Grix, Rheinfelserstr. 38, D-6300 Giessen; Roland Kutscher, Bahnhofstr. 109, D-6307 Linden; Gang Q. Li, Unterbof 61, D-6300 Giessen, and Hermann Wollnik, Auf der Platte 30, D-6301 Fernwald 2, all of Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 200,024
Int. Cl.[4] H01J *49/10*
U.S. Cl. 250—423 R **31 Claims**



1. A method for generating ion pulses for a time-of-flight mass spectrometer where an ion source generates ions by an electron, laser, or particle beam comprising the following steps:

storing said generated ions in a storage volume by providing in said volume a potential well of an electrical field, said well being formed of at least three electrodes with an intermediate central electrode;

imposing on said central electrode a potential which is more attractive for said generated ions relative to said other of said electrodes during said generating and storing of said ions;

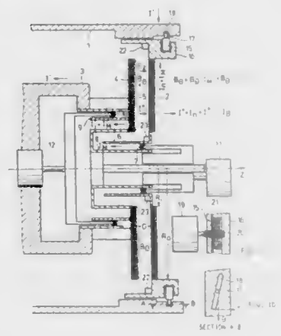
and thereafter extracting ions from said storage volume by a single electrical pulse whereby said ion pulses are generated.

4,904,873

METHOD OF PRODUCING AND GUIDING INTENSIVE, LARGE-AREA ION, ELECTRON AND X-RAY BEAMS

Werner Kühr, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 315,579
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806079
Int. Cl.[4] H01J *37/08*
U.S. Cl. 250—424 **30 Claims**



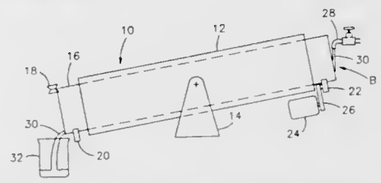
1. In a method for the repeatable generation and guidance of an intensive, large-area charged particle beam, including: applying a pulsed current from a current source to an ion diode particle beam generator, and effecting the beam guidance in the beam generator by means of operationally variable, magnetic and electric fields; the improvement comprising: providing a self-focussing diode beam generator; generating the beam guidance fields in the beam generator by the beam current itself; and generating the desired magnetic correction fields by the current supplied to the beam generator.

4,904,874

APPARATUS FOR IRRADIATING FLUIDS

Sidney Ellner, Bedford, N.Y., assignor to Ultraviolet Purification Systems, Bedford Hills, N.Y.

Filed Aug. 2, 1988, Ser. No. 227,525
Int. Cl.[4] G01N *21/01*
U.S. Cl. 250—436 **16 Claims**



1. Apparatus for irradiating fluids comprising:

a hollow tube capable of transmitting selected wavelengths of light;

drive means connected to rotate said tube at a desired speed;

support means associated with said tube to permit rotation thereof;

one or more elongated light producing lamps exteriorly positioned about said tube, said lamps producing light capable of transmission through said cylinder without undue attenuation;

means to support said exterior lamps;

one or more elongated light producing lamps interiorly positioned about said tube; and

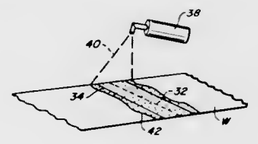
means to support said interior lamps.

4,904,875

FACIAL TISSUE SPLICE DETECTOR SYSTEM

Richard Shankel, Antioch, Calif., assignor to James River Corporation, Richmond, Va.

Filed Jan. 30, 1989, Ser. No. 303,928
Int. Cl.[4] G01N *21/64*; B07C *5/00*
U.S. Cl. 250—461.1 **7 Claims**



1. A method for detecting a splice in a single facial tissue in a stack of discrete facial tissues disposed in engagement and having generally aligned side edges, each said facial tissue in said stack being formed from a different tissue web having a predetermined width, said method comprising the steps of:

prior to formation of said single facial tissue from a tissue web, applying a detector agent invisible to the unaided eye to said tissue web at the location of a splice in said tissue web; said detector agent being applied across the full width of said tissue web;

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during formation of said single facial tissue, folding said single facial tissue so that said detector agent is located at at least one side edge of said single facial tissue;

incorporating said single facial tissue in said stack so that said at least one side edge having the detector agent thereon is in general alignment with the side edges of the other facial tissues in said stack;

transporting the stack of facial tissues including the single facial tissue to a detector station; and

at said detector station, detecting the existence of said detector agent at at least one side edge of said single facial tissue, said detecting step including the steps of fluorescing said detector agent and sensing the fluorescence of said detector agent at said detector station.

4,904,876

DETECTION OF ULTRAVIOLET RADIATION

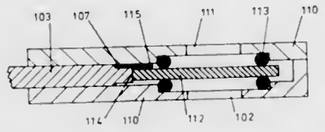
James H. Nobbs, Leeds; Peter K. T. Oldring, and David Duerden, both of Morpeth, all of United Kingdom, assignors to Thomas Swan & Co., Ltd., Co. Durham, United Kingdom

Filed Apr. 29, 1988, Ser. No. 188,255

Claims priority, application United Kingdom, May 2, 1987, 8710522

Int. Cl.⁴ G01J *1/42*

U.S. Cl. 250—461.1 **10 Claims**



1. A method of monitoring the amount of ultraviolet radiation present at a desired location which comprises:

providing at said location a filter having opposed parallel planar surfaces linked by an edge and being of the type which emits fluorescent light when exposed to ultraviolet radiation in an amount dependent on the amount of ultraviolet radiation at said location,

and monitoring the fluorescent light emitted by the filter at said edge to obtain a measure of the amount of ultraviolet radiation at said location.

4,904,877

OPTICAL SCANNING APPARATUS FOR DETECTING FAULTS IN TRANSPARENT MATERIAL WHEREIN THE PLANE OF INCIDENT LIGHT IS ARRANGED AT THE BREUSTER ANGLE TO THE NORMAL TO THE SURFACE

Karl Pietzsch, Geretsried, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,453

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1987, 3728210

Int. Cl.⁴ G01N *21/88*

U.S. Cl. 250—572 **6 Claims**

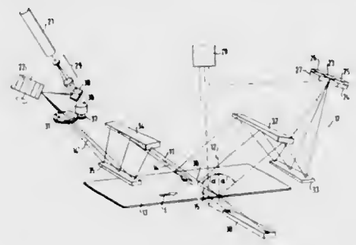
1. An optical scanning apparatus for transparent, plate-like material having a surface, a normal thereto and an upper side and a lower side, said apparatus comprising:

a light source;

means for producing linearly polarized light;

a light deflecting device for generating a scanning beam for executing a periodic scanning movement in a scanning plane extending obliquely to the surface of the material at the brewster angle relative to the normal, the scanning beam generating a scanning light bead on the surface of the material;

photoelectric light receiving means disposed at an angle of reflection for differentially detecting light reflected from the upper side and from the lower side of the material including a position sensitive photo receiver for determining angular deviations between the beams reflected from the upper side and from the lower side of the material; and



wherein said means for producing linearly polarized light polarizes the light alternately parallel to and perpendicular to the scanning plane.

4,904,878

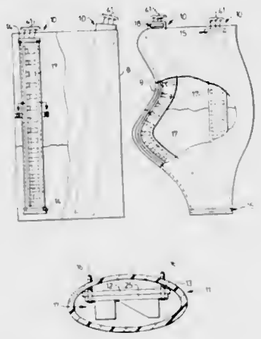
MULTI-POINT REFRACTIVE LIQUID LEVEL SENSOR

Gregory H. Gipp, Peoria, and Jeffrey J. Riebschiager, Toluca, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 12, 1988, Ser. No. 231,328

Int. Cl.⁴ G01F *23/00;* **G01N** *21/00*

U.S. Cl. 250—577 **14 Claims**



13. An apparatus for sensing liquid level in a vessel, comprising:

a mounting apparatus being adapted for insertion into the vessel;

an array of sensing elements electrically connected in parallel and positioned along said mounting apparatus, the sensing elements each being spaced from one another at preselected locations and each being adapted to deliver an electric signal responsive to absence of liquid at the level of the respective sensing element wherein each sensing elements includes;

radiant energy emitting means for producing radiant energy;

radiant energy detecting means for delivering the electric signal responsive to received radiant energy;

said radiant energy refracts away from the detecting means in the presence of liquid, and transmits to the detecting means in the absence of liquid, the detecting means adapted to deliver the electrical signal in response to receiving the radiant energy in the absence of liquid;

means for summing the plurality of received electric signals and delivering a resultant liquid level signal in response thereto.

4,904,879

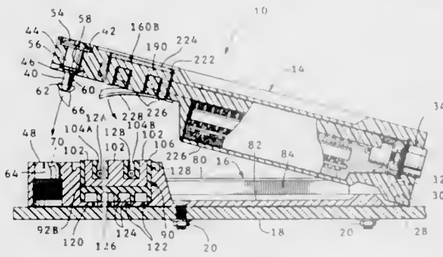
DATA CURRENT COUPLER AND METHODS OF MAKING AND ASSEMBLING SAME

William J. Rudy, Jr., Annville, and Howard R. Shafter, Millersburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 30, 1988, Ser. No. 252,285

Int. Cl.⁴ H02J *3/00;* **H01P** *5/12*

U.S. Cl. 307—17 **10 Claims**



1. A coupler assembly for coupling to a data bus system having a twisted pair of signal conductor wires in a closed loop, to receive and transmit signals therealong with minimal dissipation of signal strength and minimal interference with such signals, and adapted to be electrically connected to a control unit receiving and generating such signals for the data bus, the coupler assembly comprising:

a pair of electromagnet cores defined by pairs of first and second electromagnets each having an E-shape formed of a central and two outer legs having mating end faces forming closed loops upon mating about the spaced apart conducter wires of a twisted pair data bus;

a lower dielectric member within which said first electromagnets are disposed at a coupling end thereof oriented parallel to each other with mating end faces exposed along an upwardly facing planar surface having wire-receiving channels defined thereinto coursing from a first side to a second side of said lower member and between said central legs and associated outer legs of said parallel first electromagnets, said lower member including a first fastener means at said coupling end and a first securing means at a second end opposed from said coupling end; and

an upper member within which said second electromagnets are disposed at a coupling end thereof, said upper member including a second fastener means at said coupling end adapted to cooperate with said first fastener means to fasten said upper and lower members together at final assembly, said upper member further including a second securing means at a second end opposed from said coupling end adapted to cooperate with said first securing means to secure said upper and lower members together at final assembly;

said upper member including an electrical connecting means at said second end having a mating interface adapted to mate with a corresponding connecting means electrically connected to a control unit, said upper member further including an electronic subassembly having electrical and electronic components and circuit means thereof electrically connected to said electrical connecting means and defining amplifier circuits for amplifying said received signals and signals to be transmitted, and said upper member further including a circuit-bearing substrate having circuits electrically connected to other circuit means of said electronic subassembly for electronic connection with said components, said circuits of said circuit-bearing substrate also establishing windings about central legs of said second electromagnets thereby inductively coupling thereto;

said upper member having shielding means surrounding said electronic subassembly and said electrical connecting means rearwardly from said mating interface, and said upper member further having integral cover means surrounding and housing said electrical connecting means rearwardly from said mating interface, surrounding and housing said electronic subassembly and said circuit-bearing substrate and said shielding therearound, and surrounding and housing said second electromagnets exposing said mating end faces thereof along a downwardly facing planar surface; and

said upper and lower members adapted to be assembled and fastened together such that said mating electromagnet end faces engage each other forming said electromagnet cores about said conductor wires disposed along and within said wire-receiving channels, whereby signals transmitted along said conductor wires are sensed by windings of one of said electromagnet cores and amplified by said coupler assembly and transmitted to said control unit, and signals desired to be sent along the data bus by said control unit are amplified by said coupler assembly and sent by the other of said electromagnet cores.

4,904,880

AUTOMATIC DOOR DRIVING SYSTEM

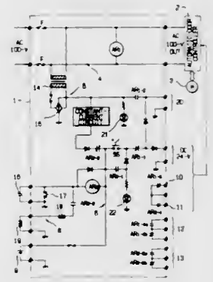
Yukio Yoshida, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,794

Claims priority, application Japan, Aug. 7, 1987, 62-197350

Int. Cl.⁴ H02J *7/00;* **H02P** *1/00*

U.S. Cl. 307—66 **5 Claims**



1. An automatic door driving system, in which an AC power source and a battery power source are connected through an emergency battery unit to an automatic door controller for controlling an automatic door drive motor, also in which normally said automatic door controller is supplied with power from said AC power source for normal operation of an automatic door by said automatic door controller, while power supply from said battery power source to said automatic door controller is inhibited and said battery power source is charged from said AC power source, further in which at the time of power stoppage said emergency battery unit is switched for power supply from said battery power source to said automatic door controller so that said automatic door is subjected to normal operation or operation at the time of power stoppage by said automatic door controller, and still further in which in case of emergency such as occurrence of a fire an external emergency signal is stored so that an emergency operation of said automatic door will be caused according to a predetermined program by said automatic door controller, and said

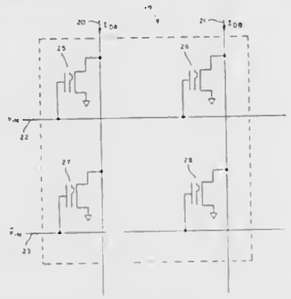
emergency signal and a power stoppage signal are outputted to said automatic door controller, wherein said emergency battery unit includes an AC power source circuit for electrically connecting said AC power source and said automatic door controller to each other, a first relay provided in said AC power source circuit such as to be turned off at the time of power stoppage, a battery power source circuit for electrically connecting said battery power source and said automatic door controller to each other through a switch to be turned on when said first relay is rendered inoperative, a rectifier, a constant current circuit, a switch to be turned on when a fire signal circuit outputs a fire signal, said rectifier, said constant current circuit and said switch being serially provided between said AC power source circuit and said battery power source circuit, a fire signal circuit for outputting a fire signal according to an external situation at the time of occurrence of a fire, a self-holding circuit for holding a fire signal outputted from said fire signal circuit, and various signal output means for providing an operational state of said emergency battery unit to said automatic door controller.

4,904,881

EXCLUSIVE-OR CELL FOR NEURAL NETWORK AND THE LIKE

Hernan A. Castro, Shingle Springs, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 10, 1989, Ser. No. 309,247
Int. Cl.[4] H03K *19/21*
U.S. Cl. 307—201 **14 Claims**



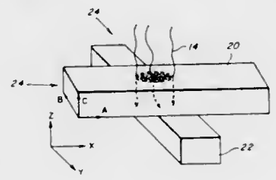
7. In a neural network, a synapse cell useful in performing pattern recognition tasks comprising:
- a pair of input lines for receiving a differential input vector value;
- a pair of output lines for providing a difference current; and
- first, second, third and fourth floating gate devices, said first and said second floating gate devices having their gates coupled to one of said input lines and their drains coupled to alternate ones of said output lines, said third and fourth floating gate devices having their gates coupled to another of said input lines and their drains also coupled to alternate ones of said output lines,
- said floating gate devices storing a weight such that said difference current provided across said pair of output lines is proportional to the match between said input vector and said weight.

4,904,882

SUPERCONDUCTING OPTICAL SWITCH

Harold H. Szu, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 252,486, Sep. 30, 1988. This application Dec. 27, 1988, Ser. No. 289,295
Int. Cl.[4] H03K *17/92, 17/78*
U.S. Cl. 307—245 **7 Claims**



1. A triode comprising:
- a first filament of opto-electric light sensitive material carrying a current flow;
- a second filament of opto-electric light sensitive material carrying a current flow wherein the second filament is perpendicular to and under the first filament, in physical but not electrical conductive contact with the first filament; and
- a light-supplying control means located such that the control means is nearer the first filament than the second filament so that a controlled amount of light is supplied perpendicularly only to the first filament at a location just beyond the point where the second filament crosses the first filament.
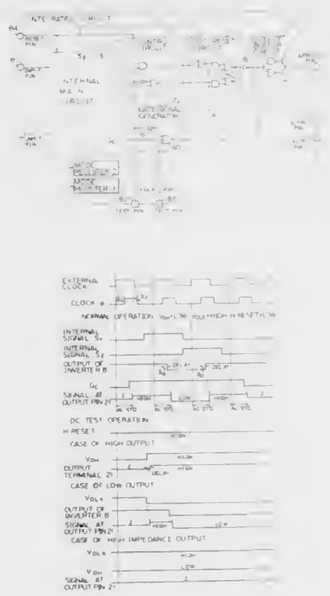
4,904,883

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING A DC TEST FUNCTION

Hideyuki Iino, and Hidenori Hida, both of Yokohama, Japan, assignors to Fujitsu Limited and Fujitsu Microcomputer Systems Limited

Filed Dec. 1, 1988, Ser. No. 278,503
Claims priority, application Japan, Dec. 4, 1987, 62-307930
Int. Cl.[4] H03K *17/22, 3/013, 3/027;* **G01R** *31/28*
U.S. Cl. 307—272.3 **3 Claims**

1. An integrated circuit receiving an input signal and producing output signal comprising:
- an internal main circuit for carrying out various logic operations in accordance with the input signal and producing a first signal and second signal;
- a set/reset circuit, operatively connected to said internal main circuit, being set in response to the first signal and reset in response to the second signal in a normal mode;
- an output buffer circuit, connected to said set/reset circuit, for producing the output signal in response to an output of said set/reset circuit; and
- a control circuit, connected between said internal main circuit and said set/reset circuit, receiving the first signal, a reset signal for initializing said internal main circuit, the first signal, the second signal, and a first test signal, during a DC test mode, said control circuit resetting said set/reset circuit in response to a receipt of the reset signal regardless of the second signal and setting said set/reset circuit in response to a receipt of the first test signal regardless of the reset signal and the first signal.

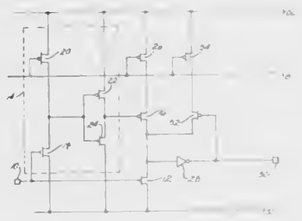


4,904,884

SCHMITT TRIGGER ADAPTED TO INTERFACE BETWEEN DIFFERENT TRANSISTOR ARCHITECTURES

Timothy G. O'Shaughnessy, Norco, and David K. Chung, Lake Elsinore, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Apr. 21, 1988, Ser. No. 184,243
Int. Cl.[4] H03K *3/29, 5/153, 19/094*
U.S. Cl. 307—290 **7 Claims**



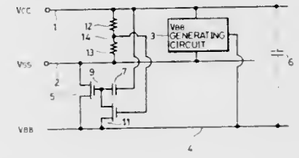
1. A Schmitt trigger circuit comprising:
- a source of signals to be processed;
- first and second complementary switching means each having an input terminal;
- a common output terminal to which the first and second switching means are connected such that the state of the output terminal is representative of the state of the first and second switching means;
- first means for biasing the first and second switching means such that for a low input signal level the switching means are in a first combination of complementary states and for a high input signal level the switching means are in a second combination of complementary states;
- second means for biasing the first and second switching means such that for a signal increasing from the low input signal level the state of the first switching means changes before the second switching means at a first threshold level;
- third means for biasing the first and second switching means such that for a signal decreasing from the high input signal level the state of the second switching means changes at a second threshold level that is lower than the first threshold level; and
- means operative above the second threshold level for coupling the source to the input terminal of the second switching means such that for a signal increasing from the low input signal level the input signal level is raised sufficiently to advance the change of state of the second switching means.

4,904,885

SUBSTRATE BIAS CIRCUIT HAVING SUBSTRATE BIAS VOLTAGE CLAMP AND OPERATING METHOD THEREFOR

Michihiro Yamada; Hiroshi Miyamoto; Tadato Yamagata; Shigeru Mori, and Tetsuya Anno, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 204,126
Claims priority, application Japan, Jun. 10, 1987, 62-145844
Int. Cl.[4] H03K *3/01, 3/353*
U.S. Cl. 307—296.2 **8 Claims**



1. For a semiconductor device including a semiconductor substrate on which field effect transistors are formed, said device including a power supply terminal, a ground terminal and a substrate bias terminal, parasitic capacitance tending to be formed between said power supply terminal and said substrate bias terminal, said device further including a substrate bias generating circuit coupled to said power supply terminal and said ground terminal for generating a substrate bias voltage having a predetermined value and applying said substrate bias voltage to said substrate bias terminal,
- a substrate bias voltage clamp circuit, comprising:
- switching means connected between said substrate bias terminal and said ground terminal, said switching means including a control electrode for controlling said switching means to be on or off, selectively; and
- control means coupled to said control electrode and responsive to a change of voltage at said power supply terminal for turning said switching means on for a predetermined time duration;
- said control means including
  - (a) capacitor means connected between said power supply terminal and said control electrode, and
  - (b) discharge means for discharging said capacitor means,
  - (c) said predetermined time duration being established by a discharge time of said capacitor means by said discharge means.

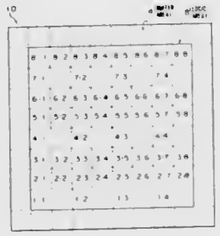
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4,904,886

GATE ARRAY WITH HIGH DRIVING ABILITY CELLS

Toshio Tanahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 226,320
Claims priority, application Japan, Jul. 21, 1987, 62-048
Int. Cl.[4] H03K *19/177*
U.S. Cl. 307—565 **9 Claims**



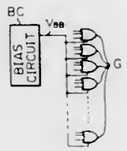
1. A gate array comprising:
a logic area having a first cell and a second cell which is greater in area than said first cell by an integral multiple, wherein said first cell comprises a first transistor group, a first resistor group, and first wiring regions, and said second cell comprises a second transistor group, a second resistor group, and second wiring regions, and wherein said second transistor group is larger than said first transistor group, and said second resistor group has a resistance value lower than a resistance value of said first resistor group; and
an input/output buffer area surrounding said logic area for interfacing said logic area to the outside for interchange of signals.

4,904,887

SEMICONDUCTOR INTEGRATED CIRCUIT APPARATUS

Eiji Sugiyama, Kawasaki; Mitsuaki Natsume, Machida, and Toshiharu Saito, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 861,670, May 7, 1986, abandoned, which is a continuation of Ser. No. 509,399, Jun. 30, 1983, abandoned. This application Aug. 4, 1988, Ser. No. 229,724
Claims priority, application Japan, Jun. 30, 1982, 57-112778; Jul. 1, 1982, 57-114241; Dec. 29, 1982, 57-233774; Dec. 29, 1982, 57-230288
Int. Cl.[4] H03K *19/086;* **H01L** *27/04*
U.S. Cl. 307—467 **10 Claims**



1. A semiconductor integrated circuit apparatus having a substrate, comprising:
a first voltage source;
a second voltage source having a lower voltage than said first voltage source;
a plurality of internal cells formed on a center portion of the substrate, said plurality of internal cells divided into a plurality of groups of internal cells, each of said internal cells including:
a plurality of gate circuits each including:
a pair of first transistors having emitters commonly connected, having collectors operatively connected to said first voltage source, and having bases; and
a second transistor having a collector operatively connected to said commonly connected emitters of said first transistor, having an emitter operatively connected to said second voltage source, and having a base;
a bias buffer circuit operatively connected to said plurality of gate circuits;
an electro-conductive layer formed on the substrate and said plurality of internal cells;
a plurality of bonding pads, formed so as to operatively connect said electro-conductive layer, arranged about the periphery of said plurality of internal cells; and
a plurality of bias cells, operatively connected to said respective groups of said plurality of internal cells, each of said plurality of bias cells providing a first predetermined constant voltage to each of said bias buffer circuits in each of said plurality of groups of internal cells and each of said bias buffer circuits providing second and third predetermined constant voltages to respective bases of one of said first transistors and the second transistor of said plurality of gate circuits in said respective internal cells, the number of said bias cells being smaller than the number of said bias buffer circuits.

4,904,888

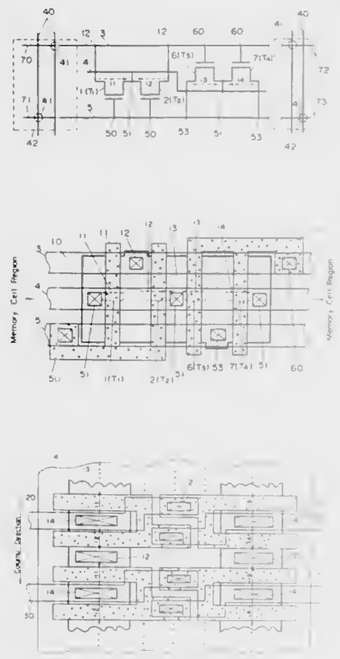
SENSE AMPLIFIER CIRCUIT

Hiroyuki Yamauchi, Hirakata, and Toshio Yamada, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 3, 1988, Ser. No. 253,216
Claims priority, application Japan, Oct. 2, 1987, 62-250128
Int. Cl.[4] H03K *5/24, 3/013;* **G11C** *11/40, 7/00*
U.S. Cl. 307—530 **2 Claims**

1. A sense amplifier circuit comprising first and second bit wires coupled to a memory cell, a first MOS transistor having a drain connected to said first bit wire, said second bit wire is coupled to the gate of the first MOS transistor, a second MOS transistor having a drain connected to said second bit wire, and either an N-type a P-type MOS transistor pair to compose a latch type sense amplifier circuit by coupling the gate of the second MOS transistor and the first bit wire, and coupling the

sources of the first and second MOS transistors commonly to a power source wire, wherein both first and second MOS transistors are composed of a plurality of either N-type or P-type MOS transistor connected in parallel.

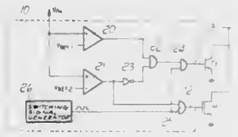


4,904,889

CIRCUIT FOR DRIVING ELECTRONIC DEVICES WITH A LOW SUPPLY VOLTAGE

Davide Chieli, Milan, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Nov. 28, 1988, Ser. No. 277,077
Claims priority, application Italy, Dec. 3, 1987, 22878 A/87
Int. Cl.[4] H03K *7/16, 9/06*
U.S. Cl. 307—570 **8 Claims**



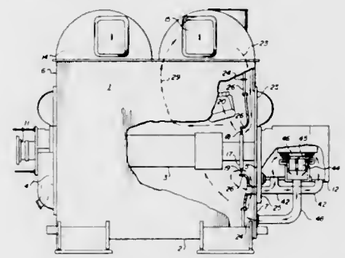
1. A circuit for driving electronic devices with a low supply voltage, comprising a first and a second reference potential lines, a first and a second electronic devices, said first and second electronic devices having first terminals connected together and to said first reference potential line, second terminals connected together and to said second reference potential line and own control terminals, a control stage connected between said first and second reference potential lines and having a first and a second control outputs connected respectively to said control terminals of said first and second electronic devices, a voltage multiplier circuit connected between said first terminals of said first and second electronic devices and said first reference potential line, said voltage multiplier circuit having a high voltage output generating an output voltage and being connected to said control stage, said control stage including means for generating a first drive signal fed to said control terminal of said second electronic device when said output voltage of said voltage multiplier circuit is lower than a threshold voltage and for generating a second drive signal fed to said control terminal of said first electronic device when said output voltage is higher than said threshold voltage.

4,904,890

BORE PACK EXCITER COOLING SYSTEM

James B. Archibald, Schenectady; Ernest L. Moore, Ballston Lake; Richard N. Dawson, Voorheesville, and Kenneth G. Herd, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

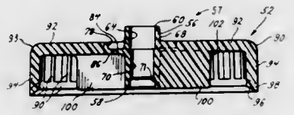
Filed Jan. 3, 1989, Ser. No. 292,979
Int. Cl.[4] H02K *9/06;* **H02P** *11/06*
U.S. Cl. 310—59 **15 Claims**



1. A gas cooling system for a bore pack exciter positioned adjacent to an electric generator to provide direct current power to the generator field comprising:
a fan within said electric generator connected to one end of the shaft of said generator for rotation therewith;
a cooling unit to extract heat from a cooling gas;
means to provide said cooling gas to the interior of said power generator in an end region adjacent said fan;
said fan imparting a maximum velocity to said cooling gas in said end region;
a passageway to connect said maximum velocity cooling gas in said end region of said generator to the interior of said bore pack exciter;
means within said bore pack exciter to direct the flow of said maximum velocity cooling gas fed by said fan and passing through said passageway to flow through the interior of said bore pack exciter to cool the interior thereof;
means to return said cooling gas to the interior of said generator after passing through said bore pack exciter; and
means to direct said returned cooling gas through and out of said generator;
whereby said cooling gas is provided to said bore pack exciter from said end region of said generator by said fan at substantially the coolest temperature and highest velocity available within said generator.

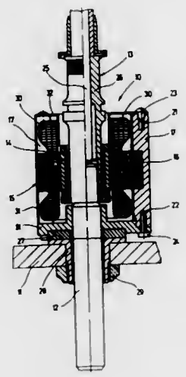
VOL 1111 ISS 4 FE 27 1990 UMI

4,904,891
VENTILATED ELECTRIC MOTOR ASSEMBLY
Gerald N. Baker, and Barry M. Newberg, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Aug. 2, 1988, Ser. No. 227,145
Int. Cl.[4] H02K *9/00*
U.S. Cl. 310—62 **17 Claims**



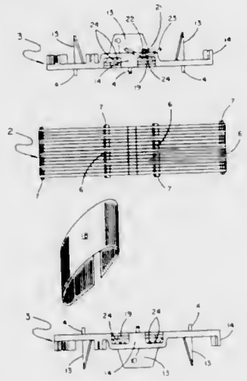
1. A fan assembly for use in an electric motor having a stator assembly, a rotor assembly including a rotatable shaft, and an end shield attached to the motor and having air venting apertures therein, the assembly comprising:
collar means fitting over the shaft;
a first set of blades extending radially outward from the collar means;
a second set of blades also extending radially outward from the collar means, the blades of the first said set alternating with the blades of the second said set about the collar means; and,
paddle means including blades attached to each of the blades comprising the first said set and extending radially outward from said collar means with the first said set to create a flow of air from inside the motor to the external environment through the air venting apertures.

4,904,892
SPINDLES FOR A SPINNING MACHINE WITH INDIVIDUAL DRIVES
Hans P. Hildbrand, Villmergen; David Fricker, Spreitenbach, both of Switzerland, and Horst Wolf, Albershausen, Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany
Filed Oct. 13, 1988, Ser. No. 257,055
Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818195
Int. Cl.[4] H02K *5/04*
U.S. Cl. 310—217 **8 Claims**



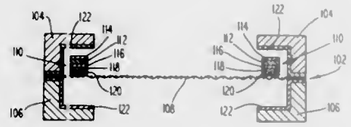
1. A spindle drive apparatus for a spinning machine of the type having a bobbin supporting spindle rotatably supported on a spindle bank of the spinning machine, comprising:
a rotor fixedly coaxially mounted to the spindle;
a stator for rotating said rotor to thereby rotate the spindle, said stator having a plurality of plates of generally square configuration arranged in stacked relation with their respective edges in alignment to form a plate stack of generally square configuration;
means, extending in only one axial direction with respect to said stator, for rotatably supporting the spindle within said stator for driving rotation of the spindle by the cooperative operation of said stator and said rotor, said spindle supporting means including a bearing housing mounted to the spindle bank and extending into said stator; and
means for supporting said stator solely from one axial end thereof in a fixed disposition relative to the spindle bank and said bearing housing, said stator supporting means including an interconnecting member fixedly mounted to said bearing housing and a plurality of brackets for fixedly mounting said plate stack to said interconnecting member, said brackets engaging said plate stack in the corner regions thereof.

4,904,893
STATOR END CAP INSULATOR ASSEMBLY INCLUDING END TURN VENTILATION AND LEAD WIRE TIE DOWN STRUCTURE
S. Duke Snider, and Daniel R. Messner, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 27, 1988, Ser. No. 263,614
Int. Cl.[4] H02K *3/46*
U.S. Cl. 310—260 **7 Claims**



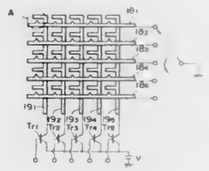
1. An improved stator end cap insulator assembly for a stator core having a central axis with pole pieces having solid end face portions circumferentially spaced about the central axis of said stator core separated by openings extending through said core with magnet wires wound around each pole to extend through adjacent openings on opposite sides of each pole to provide end turns adjacent said solid end face portions and external lead wire means connected to said magnet wires comprising:
molded end cap insulator structure for attachment to opposite end faces of said core including a pair of plate members formed into a shape corresponding to said end faces of said core and including spaced openings aligned with said spaced openings in said core separated by solid end portions to overlie the solid end face portions of said pole pieces with the magnet wires passing thereover to provide magnet wire end turn structure, said plate members including end turn restraining and ventilating means positioned along the peripheral border thereof adjacent said solid end portions to help maintain said magnet wire end turns a preselected distance relative said stator core central axis and to provide ventilation of magnet wire end turn structure, a portion of said end turn restraining and ventilating means being positioned immediately adjacent said end turns to restrain said end turns and a portion being spaced from said end turns to allow ventilation of said end turns.

4,904,894
HAIL SENSOR
John C. Henry, Upper Merion; Kyung Tae Park, Berwyn, and Edward Tom, Philadelphia, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.
Filed Jan. 24, 1989, Ser. No. 302,295
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 **22 Claims**



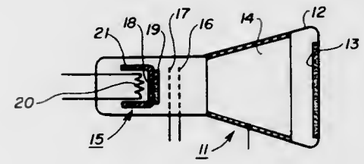
1. A hail sensor, comprising:
a support member;
a perforated member suspended from said support member; and
at least one piezoelectric transducer mechanically coupled to said perforated member for detecting vibrations generated in said perforated member when it is contacted by a hailstone.

4,904,895
ELECTRON EMISSION DEVICE
Takeo Tsukamoto, Atsugi; Mamoru Miyawaki, Tokyo; Tetsuya Kaneko; Akira Suzuki, both of Yokohama; Isamu Shimoda, Zama; Toshihiko Takeda, and Masahiko Okunuki, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 2, 1988, Ser. No. 189,216
Claims priority, application Japan, May 6, 1987, 62-108846; May 6, 1987, 62-108847
Int. Cl.[4] H01J *1/02*
U.S. Cl. 313—336 **8 Claims**



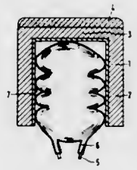
1. An electron emission device comprising an electron emission electrode with plural pointed ends and a counter electrode positioned opposite to said pointed ends, both formed by fine working of a conductive layer laminated on an insulating substrate, wherein a matrix structure is formed by wirings each having said plural pointed ends and by wirings having counter electrodes respectively corresponding to said pointed ends.

4,904,896
VACUUM ELECTRON TUBE HAVING AN OXIDE CATHODE COMPRISING CHROMIUM REDUCING AGENT
Kenneth K. T. Chiang, Lancaster, Pa., assignor to RCA Licensing Corporation, Princeton, N.J.
Filed Nov. 27, 1984, Ser. No. 675,226
Int. Cl.[4] A01J *1/20*
U.S. Cl. 313—337 **13 Claims**



1. In a vacuum electron tube, an oxide cathode comprising a metal substrate a sleeve, means within said sleeve for heating said substrate to its operating temperature and a layer consisting essentially of alkaline-earth-metal oxide on said substrate, wherein said substrate is essentially free from silicon and contains operative concentrations greater than 1.0 weight percent of chromium metal for progressively reducing said oxide to yield alkaline earth metal.

4,904,897
OXIDE CATHODE
Johannes Van Esdonk; Jan Haaker, and Jacobus Stoffels, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 4, 1984, Ser. No. 677,948
Claims priority, applicatioo Netherlands, Dec. 22, 1983, 8304401
Int. Cl.[4] H01J *1/14*
U.S. Cl. 313—346 R **4 Claims**



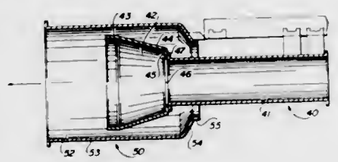
1. An oxide cathode comprising a base consisting essentially of titanium having one side supporting an alkaline earth metal oxide porous emissive layer and including, adjacent an opposite side of the base, an aluminum oxide coated heater element, characterized in that a metal layer consisting essentially of tungsten is disposed on said opposite side of the base between the heater element and the base.

4,904,898
MONOCHROME CATHODE RAY TUBE ELECTRON GUN WITH HIGH VOLTAGE ELECTRODE LENS
Thomas W. Penird, Waterloo; Charles H. Rehkopf, Seneca Falls; Donald L. Say, and Bruce W. Zellar, both of Waterloo, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.
Filed Nov. 14, 1988, Ser. No. 270,989
Int. Cl.[4] H01J *29/48, 29/56*
U.S. Cl. 313—449 **4 Claims**

1. A monochrome cathode ray tube comprising an evacu-

VOL 1111 ISS 4 FE 27 1990 UMI

ated glass envelope comprising a faceplate portion and a funnel-shaped portion including a neck portion, a fluorescent display screen disposed on the inner surface of the faceplate, and an electron gun disposed in the neck, the electron gun comprising a cathode and a series of electrodes terminating with a final focusing electrode and an accelerating electrode, the focusing and accelerating electrodes together forming a high voltage lensing field for an electron beam, the final focusing electrode comprising a lower elongated cylindrical base



portion and an upper cup-shaped portion, and the accelerating electrode comprising a larger cup-shaped portion substantially surrounding the cup-shaped portion of the focusing electrode, characterized in that the focusing electrode cup-shaped portion comprises a short cylindrical upper sidewall portion supported by a lower sidewall portion, the lower sidewall portion inwardly tapering from the upper cylindrical sidewall portion, and in that the short cylindrical upper sidewall portion is nearer the accelerating electrode than the remaining portions of the focussing electrode.

4,904,899

PROJECTION CATHODE RAY TUBE

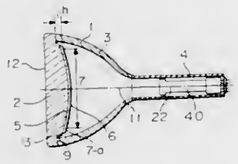
Michio Nakata, Takasago, and Tsunehiko Sugawara, Chiba, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 211,058

Claims priority, application Japan, Jun. 26, 1987, 62-157844; Jun. 26, 1987, 62-157845

Int. Cl.[4] H01J *31/00*

U.S. Cl. 313—477 R 7 Claims



1. A projection cathode ray tube which comprises a glass bulb having a central axis, said glass bulb comprising:
(a) a funnel portion having:
(i) a large opening at one side and
(ii) a small opening at the opposite side;
(b) a neck portion which:
(i) receives therein an electron-gun and
(ii) is sealingly attached to said small opening of said funnel portion; and
(c) a panel portion which:
(i) has a sealing surface which is sealingly attached to said large opening of said funnel portion;
(ii) has an inner surface protruded in a convex form toward the interior of said glass bulb;
(iii) has a fluorescent screen on said inner surface; and
(iv) has a step separating said inner surface from said sealing surface both radially and axially sufficiently so that said inner surface can be polished so as to form an optical lens without interference from said sealing surface.

4,904,900

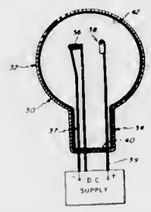
GLOW DISCHARGE LAMP

Andre C. Bouchard, Peabody, and Paul A. Thibault, Danvers, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 139,398, Dec. 30, 1987, abandoned. This application Jul. 10, 1989, Ser. No. 377,781

Int. Cl.[4] H01J *61/067, 61/64, 61/42*

U.S. Cl. 313—491 19 Claims



1. A glow discharge lamp comprising;
a light transmitting envelope containing a noble gas fill material;
a pair of electrodes disposed in said envelope;
lead-in wires coupled to the electrodes and extending through and hermetically sealed in said envelope,
one of said electrodes comprising a refractory metal piece having a thickness less than about 0.025 millimeter and supported from an end of one of said lead-in wires, said one of said lead-in wires being of a refractory material.

4,904,901

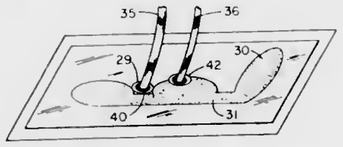
ELECTROLUMESCENT PANELS

Nicholas T. Simopoulos; George N. Simopoulos, and Gregory N. Simopoulos, all of Dayton, Ohio, assignors to Lumel, Inc., Dayton, Ohio

Division of Ser. No. 192,260, May 10, 1988, Pat. No. 4,853,079, which is a division of Ser. No. 840,630, Mar. 17, 1986, Pat. No. 4,767,966, which is a continuation-in-part of Ser. No. 801,511, Nov. 25, 1985, Pat. No. 4,647,337, which is a continuation of Ser. No. 677,645, Dec. 4, 1984, abandoned. This application May 8, 1989, Ser. No. 349,452

Int. Cl.[4] H05B *33/06, 33/14*

U.S. Cl. 313—509 7 Claims



1. An improved electroluminescent panel in which a plurality of layers are applied on a transparent electrode on a support base including a phosphor layer, a dielectric layer, and a second electrode layer, the improvement comprising each said layer formed of a polymer carrier resin base material which has essentially the same composition as that of each other said layer thereby providing an integrated uniformity to said layers, and in which said resin base material is a polyester laminating resin which has been activated by a diisocyanate, the amount of said diisocyanate being sufficient to provide temperature stability to said base material but being insufficient to transform said base material into a urethane.

4,904,902

ION IMPLANTING SYSTEM

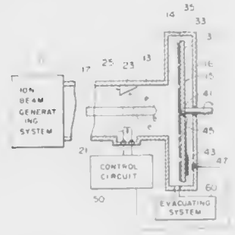
Tadamoto Tamai, Tokyo, and Masateru Sato, Saijo, both of Japan, assignors to Sumitomo Eaton Nova Corporation, Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,765

Claims priority, application Japan, Apr. 16, 1987, 62-93931

Int. Cl.[4] H01J *7/24;* **H05B** *31/26;* **G21K** *27/02*

U.S. Cl. 315—111.81 10 Claims



1. An ion implanting apparatus for implanting ions into a plurality of workpieces, comprising:
a rotatable disk having a front and a rear face, for mounting a plurality of workpieces on the front face;
disk chamber means for defining a hermetic space and containing said disk therein;
a first conductor member disposed on the front face of said disk;
a second conductor member disposed on the rear face of said disk and electrically connected to said first conductor member; and
a third conductor member fixed to said disk chamber means and disposed in the vicinity of the passage of said second conductor member and capacitively coupled to said second conductor member, whereby the charged state of the first conductor is monitored by the electrical state of the third conductor member.

4,904,903

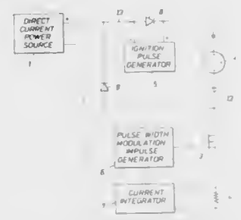
BALLAST FOR HIGH INTENSITY DISCHARGE LAMPS

David R. Pacholok, Sleepy Hollow, Ill., assignor to Innovative Controls, Inc., Houston, Tex.

Filed Apr. 5, 1988, Ser. No. 177,693

Int. Cl.[4] H05B *41/36*

U.S. Cl. 315—209 R 16 Claims



1. A ballast for a high intensity discharge lamp, comprising:
a voltage and current source;
a high intensity discharge lamp;
means for striking said lamp;
means for providing a current path between said source and said lamp;
means for repetitively interrupting said current path before the magnitude of the current flowing through the lamp becomes sufficient to damage said lamp; and
means for repetitively reconnecting said current path after it has been interrupted so that current again flows through said lamp.

4,904,904

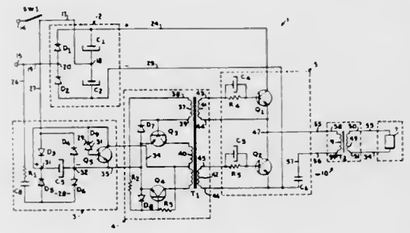
ELECTRONIC TRANSFORMER SYSTEM FOR POWERING GASEOUS DISCHARGE LAMPS

Humberto T. Zarate, Houston, Tex., assignor to Lumintech, Inc., Houston, Tex.

Continuation of Ser. No. 118,793, Nov. 9, 1987, abandoned. This application May 26, 1988, Ser. No. 199,313

Int. Cl.[4] H05B *37/02, 41/36*

U.S. Cl. 315—219 18 Claims



1. A power supply circuit for powering a load from a direct current power source and comprising:
(a) an output transformer having a primary winding and a secondary winding;
(b) a power storage capacitor connected in series with said primary winding to form a series combination;
(c) controlled power switch means connected across said series combination and for connecting said series combination across said power source; and
(d) trigger means independent of said series combination, said trigger means being connected to and cooperating with said controlled power switch means to alternately cause charging current to flow through said primary winding to said capacitor from a direct current power source and discharging current to flow through said primary winding from said capacitor.

4,904,905

DUAL RESONANT FREQUENCY ARC LAMP POWER SUPPLY

Thomas E. Olon, Fairview, Pa., assignor to American Sterilizer Company, Erie, Pa.

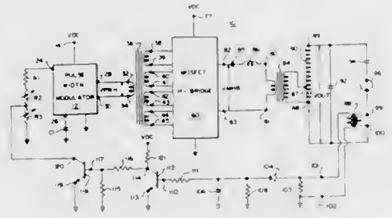
Filed Aug. 5, 1988, Ser. No. 229,075

Int. Cl.[4] H05B *41/36*

U.S. Cl. 315—244 1 Claim

1. An apparatus for starting and operating an arc lamp used in health care applications, comprising:
means for producing a signal suitable for driving the arc lamp, said signal having a frequency controlled by a resistive network;
parallel-connected inductor means and capacitor means forming a resonant circuit to receive said signal;
additional capacitor means connected in series with the arc lamp, the series combination of said additional capacitor means and the arc lamp being connected in parallel with said parallel-connected inductor means and capacitor means;
means for detecting current flow in the arc lamp and pro-

ducing a feedback signal in response to said detected current flow; and



switching means responsive to said feedback signal for modifying said resistive network of said signal producing means.

4,904,906

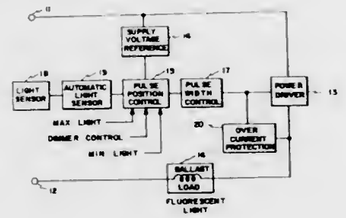
FLUORESCENT LIGHT DIMMING

Larry S. Atherton, Anoka; Robert A. Black, Jr., Brooklyn Park, and Arlon D. Kompelien, Richfield, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 898,569, Aug. 21, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 246,952

Int. Cl.[4] H05B *41/36*

U.S. Cl. 315—291 **25 Claims**



1. A control arrangement for dimming a fluorescent light, said fluorescent light being supplied with an electrical signal having an electrical signal waveform of varying magnitudes and having both a positive and a negative half cycle, said control arrangement positioning a notch of reduced signal magnitude within said electrical signal waveform wherein said fluorescent light has an illumination level dependent upon the position of said notch, said arrangement comprising:

load control means for controlling the supply of said electrical signal to said fluorescent light, said load control means comprising a first gate turn off device and a first SCR for controlling said electrical signal during said positive half cycle and a second gate turn off device and a second SCR for controlling said electrical signal during said negative half cycle, said gate turn off devices conducting during their respective half cycles prior to said notch and said first and second SCRs for conducting during their respective half cycles subsequent to said notch, neither said gate turn off devices nor said SCRs conducting during the notch in their respective half cycles, and a first parallel switch and a second parallel switch for connection in parallel to said fluorescent light, said first parallel switch being turned on during said positive half cycle and said second parallel switch being turned on during said negative half cycle;

light level determining means for providing a light level signal having a frequency determinative of the amount of light to be emitted by said fluorescent light; and

light control means responsive to said electrical signal and a counter responsive to the frequency of said light level signal for controlling said load control means to position said notch within said electrical signal waveform in accordance with said light level signal.

4,904,907

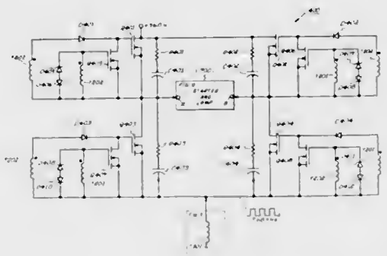
BALLAST CIRCUIT FOR METAL HALIDE LAMP

Joseph M. Allison, Euclid; Richard L. Hansler, Pepper Pike; Park French, Aurora; John M. Davenport, Lyndhurst, and Robert A. Leskovec, Richmond Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 26, 1988, Ser. No. 161,058

Int. Cl.[4] H05B *41/36*

U.S. Cl. 315—307 **16 Claims**



1. A method of operating a gas discharge lamp having a pair of electrodes and containing a fill of excitable ingredients comprising the steps of;

(A) applying a relatively high voltage across said pair of electrodes to cause the excitation of said ingredients;

(B) delivering a square-wave of current to said pair of electrodes to maintain said excitation of said ingredients, said current being of an amplitude in the range of about 0.2 amperes to about 2.0 amperes and a repetition rate of about once every 1.0 milliseconds to about once every 0.1 millisecond and;

(C) detecting said level of current delivered to said electrodes and terminating said current if a predetermined value is detected.

4,904,908

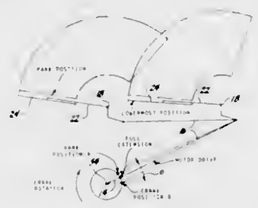
ANTI BLADE SET VEHICLE WIPER PARK MECHANISM

Jeffrey J. Buschur, Beavercreek, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 119,349, Nov. 10, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 255,183

Int. Cl.[4] H02P *1/04*

U.S. Cl. 318—282 **2 Claims**



1. In a vehicle wiper system having at least one wiper arm

with a wiper blade that is flexed in one direction as the arm is swept outwardly from a lowermost position across a vehicle windshield and then flexed in an opposite direction as the arm is swept back inwardly to said lowermost position with each rotation of a switch controlled, electric motor driven crank, and in which the crank is correlated with the wiper arm in such a way that a full extension position of said crank corresponds to said lowermost wiper arm position so that positions of said crank to either side of said full extension position correspond to positions of said wiper arm on said windshield that are above said lowermost position, but with said wiper arm moving in opposite directions, an improved mechanism for stopping said motor and crank, and thereby parking said wiper arm, comprising,

a shutoff gear that is driven by said motor so as to turn at half speed of said crank,

electrical terminals located proximate to said shutoff gear and connected to said electric motor switch such that, when said switch is turned off, said terminals are selectively electrically interconnected so as to either maintain electric power to said motor or to stop said motor, and,

contact means on said shutoff gear interconnecting said terminals as said gear turns in such a way as to maintain electric power to said motor when said switch is turned off, said contact means further having first and second sets of interrupts therein which, when encountered by said terminals, stop said motor, said first and second sets of interrupts being offset from a direct diametrical opposition by an angular amount sufficient to assure that said first and second sets of interrupts randomly encounter said terminals with approximately equal frequency after said switch has been turned off so as to stop said motor when said crank is randomly located symmetrically to either side of said crank full extension position,

whereby said wiper arm will be consequently parked at substantially the same position on said windshield above said lowermost position regardless of which set of interrupts is encountered, but with said wiper blade randomly flexed in either direction with approximately equal frequency, thereby preventing said wiper blade from acquiring a permanent set with time.

4,904,909

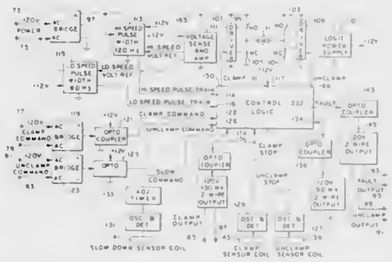
CONTROLLER FOR ELECTRIC CLAMP

Donald L. V. Zeeland, Franklin; Eugene F. Duncan, Waukesha, and Gregory L. Nadolski, Brookfield, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 29, 1988, Ser. No. 213,195

Int. Cl.[4] H02P *1/00*

U.S. Cl. 318—258 **13 Claims**



1. A controller for an electric clamp which is driven open and closed by an electric motor to which power is connected upon commands, comprising in combination:

(a) means responsive to a command to close the clamp, for providing high-speed travel during a run-up in the closing direction;

(b) proximity sensing means for directly detecting when the clamp reaches a predetermined position, and for initiating thereupon an interval during which the speed of travel is lower;

(c) means for terminating the lower-speed travel after a predetermined time;

(d) means for providing higher power to the clamp thereafter during completion of its closing;

(e) sensing means for directly sensing that the clamp has reached a closed position and for interrupting power flow to the motor thereupon.

4,904,910

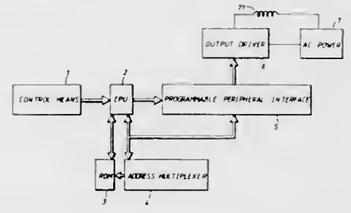
AUTOMATIC DELAY-CONTROLLING DEVICE

Yan-Wen Hsu, 4 Fl., No. 25-3, Lane 179, Sec. 2, Nei Hu Rd., Taipei, Taiwan

Filed Feb. 13, 1989, Ser. No. 309,371

Int. Cl.[4] H01H *43/00*

U.S. Cl. 318—445 **4 Claims**



1. An automatic delay-controlling device for pre-setting a delay of the switching-on and switching-off of a load, said automatic delay-controlling device comprising a control means, a central processing unit, a read only memory, an address multiplexer, a programmable peripheral interface, an output driver and an alternating-current power supply connected to said output driver through said load;

said control means comprising a plurality of buttons electrically connected to said central processing unit and serving as inputs thereof;

said central processing unit, read only memory, address multiplexer and programmable peripheral interface being interconnected to co-process signals from said control means to control the operation of said output driver; and

said output driver comprising a transistor, an optical coupler, a bridge rectifier, a resistor and a TRIAC; the base of said transistor being connected to an output of said programmable peripheral interface; the actuation of said transistor causing said optical coupler to conduct, and via said bridge rectifier and said TRIAC, to control said load.

4,904,911

SYSTEM FOR CONTROLLING ROBOT

Kenichi Toyoda, Hino; Nobutoshi Torii, Hachioji; Ryo Nihei, Musashino, and Akihiro Terada, Hino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP88/00193, § 371 Date Nov. 15, 1988, § 102(e) Date Nov. 15, 1988, PCT Pub. No. WO88/07442, PCT Pub. Date Oct. 6, 1988

PCT Filed Feb. 24, 1988, Ser. No. 283,991

Claims priority, application Japan, Mar. 30, 1987, 62-74248

Int. Cl.[4] B25J *19/06*

U.S. Cl. 318—568.24 **1 Claim**

1. A system controlling a robot, characterized in that said system comprises:

an electric motor for driving a shaft executing a Z-axis linear motion of said robot;

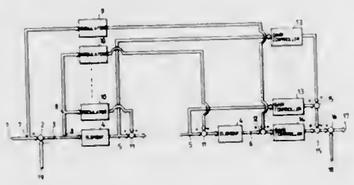
a servo unit for carrying out a signal supply and a signal feedback to said electric motor;
a control portion for supplying a control signal to and receiving a control signal from said servo unit; and
a threshold value supply portion for supplying a threshold value to said control portion;
a comparison between a motor torque instruction value and a threshold value supplied from the threshold value supplying portion being carried out in said control portion;
an alarm being delivered and the process subsequently proceeding to a step of dealing with an abnormal condition when said motor torque instruction value becomes greater than a predetermined threshold value;
whereby, a control is carried out based on a detection of a force along the Z-axis of said robot.

4,904,912

CONTROL MECHANISM EMPLOYING INTERNAL MODEL COORDINATION FEEDFORWARD METHOD

Nobuo Yamamoto, Mukainodanchi, 2917-111, Mawatari-shi, Ibaraki 312, Katsuta, Japan

Filed Oct. 6, 1988, Ser. No. 254,273
Claims priority, application Japan, Oct. 9, 1987, 62-253768
Int. Cl.[4] G05B *13/00*
U.S. Cl. 318—561 **7 Claims**



1. In a control mechanism arranged to obtain a manipulation variable by comparing a desired value or a reference value with a feedback variable into which a controlled variable is transformed to provide an error signal, sequentially transmitting said error signal to an internal model which is composed of the same number of elements as its order, each of said elements including at least a means for storing a state variable, adding the outputs of a plurality of gain controllers into which the state variable of said respective elements are input, and comparing the result of said addition with another feedback variable supplied from a first regulator, said control mechanism employing an internal model coordination feedforward method and comprising:
a second regulator arranged to receive as its input a branched signal of said desired value of said reference value; and
means for adding the output of said second regulator to a predetermined state variable of said internal model, an output of said adding means being input to one of said gain controllers.

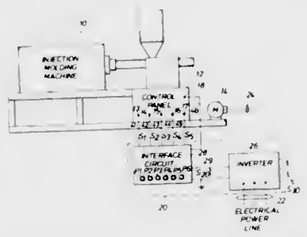
4,904,913

MOTOR CONTROL SYSTEM FOR A PLASTIC FORMING MACHINE

M. Donald Jones, Bullard, and David W. Kennedy, Frankston, both of Tex., assignors to Power Saving Devices, Inc., Houston, Tex.

Filed Jul. 18, 1988, Ser. No. 220,270
Int. Cl.[4] G05B *19/24;* **B29C** *45/77*
U.S. Cl. 318—560 **3 Claims**

1. A motor control system for a motor which powers one or more hydraulic pumps for supplying pressurized hydraulic fluid to a plastic forming machine during operation functions of the machine, said machine having a plurality of electrical signal points, each signal point corresponding to an individual operation function of the machine such that at least one electrical signal is applied to each signal point when the machine is in an operation function, the machine having operating time intervals during which a least one operation function is present, the control system comprising,
input leads individually connected to each of said signal points,
an interface circuit including
an output lead,
a voltage source, and
logic circuit means connected to said voltage source and to said input leads for generating on said output lead a logic control signal comprising a time stream of voltage level steps corresponding in time to said operating time



intervals of said plastic forming machine, wherein the voltage level of each step is representative of the power needed by said motor to provide approximately the least amount of power necessary to power said hydraulic pump for each of said operating time intervals, and
phase inverter means having a line frequency alternating current power source applied to it and responsive to said logic control signal for applying output alternating current power of variable frequency to said motor which powers the one or more hydraulic pumps of said plastic forming machine, said frequency of said output power being approximately directly proportional, during each of said operating intervals of said plastic forming machine, to the voltage level of said logic control signal.

4,904,914

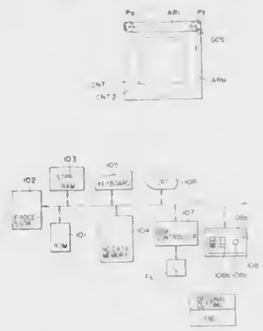
NC DATA CREATION METHOD

Masaki Seki; Takashi Takegahara, both of Tokyo, and Takeshi Arakaki, Yamanashi, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP88/00664, § 371 Date Feb. 9, 1989, § 102(e) Date Feb. 9, 1989, PCT Pub. No. WO89/00304, PCT Pub. Date Jan. 12, 1989
PCT Filed Jul. 1, 1988, Ser. No. 314,059
Claims priority, application Japan, Jul. 2, 1987, 62-166155
Int. Cl.[4] H04N *7/18*
U.S. Cl. 318—567 **2 Claims**

1. A method of creating NC data for machining any area, characterized by:
displaying, on a graphic display screen, contours inputted in order to specify the area;
recognizing the area, which is designated by a graphic cursor by manipulation of a tablet, and painting the interior of the area in a predetermined color;
removing the paint in a circle having as its center a machining starting point designated by the graphic cursor and as its radius a designated tool radius;
then removing paint in a linear area, having a diameter equivalent to a tool width, which connects a machining end point designated by the graphic cursor and said machining starting point, and adopting said machining end point as the next machining starting point; and

thereafter inputting machining end points in succession, and creating NC data for machining the interior of the area by



traversing a finally designated machining starting point and machining end point while moving a tool linearly.

4,904,915

VELOCITY CONTROL APPARATUS

Mitsuo Kurakake, Hino, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00082, § 371 Date Sep. 13, 1988, § 102(e) Date Sep. 13, 1988, PCT Pub. No. WO88/05977, PCT Pub. Date Aug. 11, 1988
PCT Filed Jan. 29, 1988, Ser. No. 251,378
Claims priority, application Japan, Jan. 29, 1987, 62-019385
Int. Cl.[4] G05B *13/00*
U.S. Cl. 318—568 **4 Claims**

1. A velocity control apparatus for estimating velocity of a motor from a detected position signal and controlling a travelling velocity of a mechanical load the movement whereof is controlled by the motor, said velocity control apparatus comprising:
a servomotor for driving the mechanical load;
a servo-controller, operatively connected to said servomotor, for subjecting the servomotor to discrete-value control in dependence upon a position of a distal end of the mechanical load; and
observer means for computing an estimated value as a deviation between rotational velocity of said servomotor and velocity of the distal end of the mechanical load based on a difference value in an amount of rotation of said servomotor every fixed period.

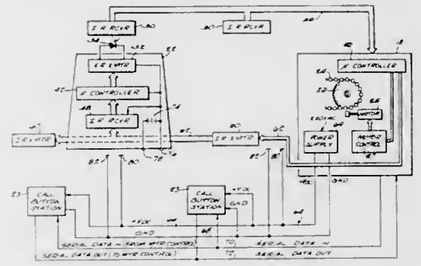
4,904,916

ELECTRICAL CONTROL SYSTEM FOR STAIRWAY WHEELCHAIR LIFT

Edward T. Gisske, Verona, and John F. Prendergast, Sr., Franklin, both of Wis., assignors to The Cheney Company, New Berlin, Wis.

Filed May 18, 1988, Ser. No. 195,251
Int. Cl.[4] B66B *9/06*
U.S. Cl. 318—649 **48 Claims**

1. An electrical control system for controlling the operation of a wheelchair lift of the type adapted for carrying a wheelchair and a wheelchair occupant along a stairway between upper and lower landings, and having a stationary motor drive unit, a mobile platform operated by the motor drive unit and a remote call button station adapted to receive user-generated control instructions, said electrical control system comprising:
a first communications link adapted to communicate the user-generated control instructions from the remote call button station to the motor drive unit;
a second communications link including wireless transmitting means for communicating the user-generated control instructions from the motor drive unit to the mobile platform; and
a third communications link including additional wireless transmitting means for communicating motor control commands from the mobile platform to the motor drive unit.

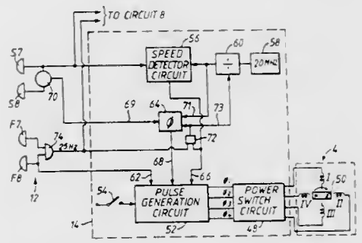


4,904,917

DRIVE APPARATUS

Piers D. Hakluytt, Laindon, England, assignor to Rank Pullin Controls Limited, United Kingdom

Filed Aug. 27, 1987, Ser. No. 90,181
Claims priority, application United Kingdom, Aug. 29, 1986, 86209383
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **19 Claims**



1. A variable drive apparatus, comprising:
a stepper motor having a rotor and a plurality of coils;
power supply means arranged to supply pulses to said coils in sequence to cause sustained rotation of said rotor;
means for modulating the width of said pulses for varying the power applied to said coils;
signal generating means for generating a variable rate signal;
signal producing means for receiving said variable rate signal and producing a first signal, the timing of which controls the timing of the centers of said pulses, and a second signal, which controls progress through said sequence, the first and second signals having a predetermined timing relationship to each other and each having a timing and a frequency determined by said variable rate signal;
means to supply a control signal having a timing in accordance with the phase position of said rotor; and

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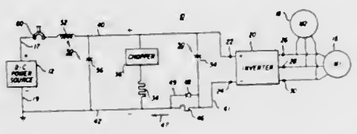
means to enable the generation of the variable rate signal by said signal generating means to be effected by said control signal so as to maintain the centers of said pulses substantially coincident with the positions of the rotor relative to the coils at which maximum torque is generated.

4,904,918

POWER CONVERSION SYSTEM INCLUDING AN IMPROVED FILTER FOR ATTENUATING HARMONICS

Ronald B. Bailey; Ajith K. Kumar, both of Erie, Pa., and David L. Plette, Lyndon, Ky., assignors to General Electric Company, Erie, Pa.

Filed Mar. 13, 1989, Ser. No. 322,376
Int. Cl.[4] H02P 3/18
U.S. Cl. 318—762 **10 Claims**



1. An electric power conversion system for conveying power between a d-c power source and an electric motor, comprising:

a. an electric power converter having a set of load terminals on its motor side for connection to at least one motor and a pair of d-c terminals on its source side, said converter having alternative motoring and electrical braking modes of operation;

b. means for connecting said d-c terminals to a d-c power source;

c. said connecting means including an electrical filter for attenuating harmonics generated by operation of said converter during motoring and electrical braking, said filter comprising:

(i) line-filter inductance means connected in the path of current between said source and said converter,

(ii) first capacitance means directly connected between said d-c terminals,

(iii) second capacitance means, and

(iv) interconnecting means characterized by the absence of appreciable inductance for connecting said second capacitance means in parallel with said first capacitance means;

d. dynamic braking circuit connected across said second capacitance means and comprising the series combination of a dynamic braking resistance and an electric power chopper that can be repetitively turned on and off during electrical braking to control current in said dynamic braking resistance;

e. said interconnecting means of said filter including additional ohmic resistance means in the path of current between said first and second capacitance means so that during electrical braking a substantially higher voltage is developed across said first capacitance means than across said second capacitance means; and

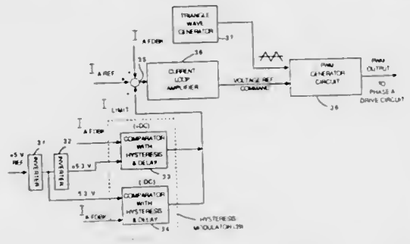
f. means for effectively removing said additional resistance means from said interconnecting means during the motoring mode of converter operation.

4,904,919

DUAL MODE CONTROL OF A PWM MOTOR DRIVE FOR CURRENT LIMITING

Larry S. McNaughton, Mequon, Wis., assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jun. 21, 1988, Ser. No. 209,681
Int. Cl.[4] H02P 5/40
U.S. Cl. 318—798 **12 Claims**



1. A method of limiting a phase current that is supplied to an electrical motor as a result of pulse signals being generated by a pulse width modulating (PWM) generator to control power semiconductors in a DC-to-AC inverter, the method comprising:

sensing the phase current being drawn by the electrical motor;

generating a time-varying phase voltage reference to the PWM generator in response to a difference between the sensed phase current and a time-varying phase current command;

generating a phase voltage command as an output of the PWM generator in response to comparing two inputs to the PWM generator, wherein a first input is the time-varying phase voltage reference and wherein the second input is a triangular wave reference;

generating a limit current in response to a magnitude of the sensed phase current reaching a hysteresis band limit; and

algebraically summing the limit current, the sensed phase current and the time-varying phase current command to control the time-varying phase voltage reference to the PWM generator and to limit the phase voltage command from the output of the PWM generator in response to the magnitude of the sensed phase current reaching the hysteresis band limit.

4,904,920

METHOD AND DEVICE FOR OPERATING AN INDUCTION MACHINE

Alfred Rufer, Lauffohr, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Jun. 24, 1988, Ser. No. 210,807
Claims priority, application Switzerland, Jul. 7, 1987, 2581/87
Int. Cl.[4] H02P 5/40
U.S. Cl. 318—800 **7 Claims**

1. Device for operating an induction machine (33) via a self-commutated inverter (30, Q1–Q1),

(a) which exhibits a flux conducting circuit for controlling the inverter,

(b) the flux conducting circuit exhibiting a first comparator (46, V1) for comparing m first actual flux value components (ψ_1–ψ_3; ψ_{11}–ψ_{1m}) of the induction machine (33) with at least one nominal flux value (ψ_s), m = the number of phases,

(c) m first comparator output signals (K11–K13) produced by this comparison being supplied via a signal converter (36) to the inverter (30), wherein

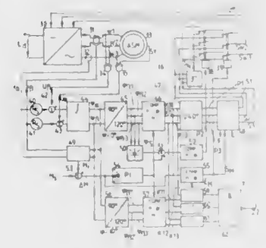
(d) the output of the first comparator (46, V1) is control-connected, on the one hand, via a phase shifter device (47, 98)

to a selection circuit (48, 99) for a phase shift of 180°+180°/m and

(e) on the other hand, via at least one logic circuit (Y, Y21-Yp-1) to this selection circuit,

(f) the output of the selection circuit is effectively connected to the signal converter (36),

(g) at least one second coordinate converter (56, KW1, KW2, KW2') is provided which supplies m second actual flux value components ($\psi_{\beta 1'}$–$\psi_{\beta 3'}$; $\psi_{\beta 11'}$–$\psi_{\beta 1m'}$, $\psi_{\beta 2m}$–$\psi_{\beta 2n'}$), which are phase shifted by a predetermina-



ble angle (ψ) with respect to these m first actual flux value components ($\psi_{\beta 1}$–$\psi_{\beta 3}$; $\psi_{\beta 11}$–$\psi_{\beta 1m}$), to at least one second comparator (57, V1', V2') which compares these second actual flux value components with the at least one nominal flux value (ψ_s),

(h) m second comparator output signals (K11'–K1m', K21'–K2m') produced by this second comparator are supplied to the at least one logic circuit,

(i) the logic circuit exhibits elements (63–73) for logically combining the first and second comparator output signals in accordance with the following relation:

$$Z2 = K11 \neq K11' \quad K12 \neq K12' \quad \ldots \quad K1m \neq K1m',$$

$$Z_j = \sum_{i=1}^{j-1} K_i1 \neq K_i1' \quad K_i2 \neq K_i2' \quad K_im \neq K_im'$$
$$K11 \neq K_{j-1}, 1 \quad K12 \neq K_{j-1}, 2 \quad \ldots$$
$$K1m \neq K_{j-1}, m \quad Z_{j-1}$$

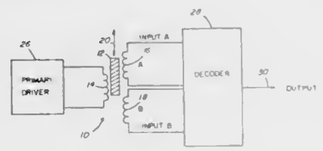
for j = 3 . . . p.

4,904,921

MONOLITHIC INTERFACE CIRCUIT FOR LINEAR VARIABLE DIFFERENTIAL TRANSFORMERS

Lawrence M. DeVito, Tewksbury, and A. Paul Brokaw, Burlington, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Nov. 13, 1987, Ser. No. 120,118
Int. Cl.[4] G05F 1/14
U.S. Cl. 323—264 **14 Claims**



1. An interface circuit for use with a linear variable differential transformer (LVDT) position transducer, said interface circuit comprising:

drive means for providing an excitation signal to a primary winding of an LVDT position transducer; and

decoder means responsive to signals induced in a pair of secondary windings of the LVDT position transducer for computing the position p of a core of the LVDT position transducer as a solution to the equation

$$p = \frac{K(A - B)}{A + B},$$

where A and B represent the signals induced in said pair of secondary windings and K is a constant scale factor, said decoder means including

means for rectifying and filtering the signals induced in said pair of secondary windings to provide detected A and detected B signals,

a charge balance loop responsive to said detected A and detected B signals for providing a binary signal having a duty cycle representative of B/(A+B), and

output circuit means responsive to said binary signal for providing the value of

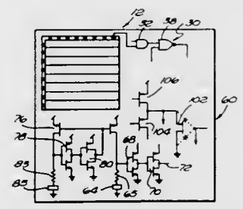
$$\frac{K(A - B)}{A + B}.$$

4,904,922

APPARATUS FOR CONVERTING BETWEEN DIGITAL AND ANALOG VALUES

Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Division of Ser. No. 104,690, Oct. 5, 1987, Pat. No. 4,831,282, which is a division of Ser. No. 714,503, Mar. 21, 1985, abandoned. This application Jul. 26, 1988, Ser. No. 225,055
Int. Cl.[4] G05F 3/08
U.S. Cl. 323—316 **35 Claims**



1. In combination for converting binary valves to analog values where the binary values are represented by first and second pluralities of binary signals respectively corresponding to rows and columns,

a plurality of output means disposed in a matrix defining rows and columns and having first inputs to the rows and second inputs to the columns,

first means for introducing the first plurality of signals to the inputs defining the rows,

second means for introducing the second plurality of signals to the inputs defining the columns,

third means responsive to a coincidence of the binary signals from the first and second pluralities on a particular one of the output means common to a particular row and a particular column for activating the particular output member,

fourth means responsive to the activation of the particular output means for producing an activation of the output means preceding the particular output means in the particular row, and

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fifth means responsive to the activation of the particular output means for producing an activation of the output means in the rows preceding the particular row, the output means including:

pluralities of first, second and third transistors each of the p-type and each having conductive and non-conductive states, the first, second and third transistors being disposed in groups, the first second and third transistors in each group being associated with an individual one of the output means,

the first transistors being associated with the third, fourth and fifth means to become conductive in response to the signals from any of the associated third, fourth and fifth means for activating the associated output means, each of the first transistors having distributed capacitances receiving a charge upon a state of non-conductivity in such first transistor and discharging this charge through such first transistor upon a state of conductivity in such first transistor to shorten the time for making the first transistor fully conductive,

each of the second transistors being connected to the associated first transistor to become non-conductive upon a state of conductivity in such first transistor, such second transistor providing an output voltage dependent upon the state of conductivity or non-conductivity in such second transistor,

the charging of the distributed capacitances in each of the first transistors during the state of non-conductivity in such first transistor being operative to prevent the output voltage from the associated second transistor from overshooting during the change in the operation of such associated second transistor from the state of non-conductivity to the state of conductivity,

each of the third transistors being biased to produce continually a substantially constant current and being connected to the associated ones of the first and second transistors to pass the substantially constant current through the associated first transistor during the state of conductivity in the associated first transistor and through the associated second transistor during the state of conductivity in the associated second transistor, and

means for accumulating the currents flowing through the second transistors to provide an indication of the analog value in accordance with the magnitude of such current.

4,904,923

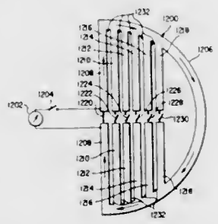
CURRENT AMPLIFYING DEVICE

Oved S. F. Zucker, Del Mar, Calif., assignor to Energy Compression Research Corp., Del Mar, Calif.

Continuation of Ser. No. 578,172, Feb. 8, 1984, abandoned, which is a continuation-in-part of Ser. No. 319,065, Nov. 6, 1981, Pat. No. 4,431,960. This application Aug. 12, 1988, Ser. No. 233,542

Int. Cl.⁴ G05B *24/02*

U.S. Cl. 323—340 **49 Claims**



1. An energy transfer, current amplifying device comprising:

a single turn energy storage inductor comprising a plurality of at least partially mutually coupled inductor elements for storing magnetic energy;

an energy source switchably connected to said single turn inductor for supplying an energizing current thereto;

a load inductor integrally formed with said single turn inductor and operable to receive a current flowing in said single turn inductor;

means operable to effectively connect said single turn inductor to said load inductor to form a first current carrying circuit between said single turn inductor and load inductor and to thereafter progressively disconnect at least some of said inductor elements of said single turn inductor from said circuit, thereby defining a continuously smaller single turn energy storage inductor in said current carrying circuit and increasing the magnitude of the current in said circuit.

4,904,924

OUTPUT CIRCUIT FOR OUTPUTTING A LEVEL SHIFTED OUTPUT SIGNAL

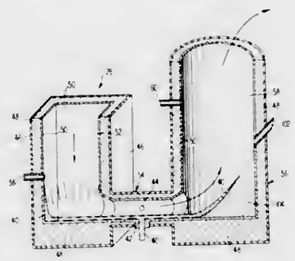
Masaji Ueno, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 7, 1989, Ser. No. 362,552

Claims priority, application Japan, Jul. 8, 1988, 63-170686

Int. Cl.⁴ H03K *5/13*

U.S. Cl. 323—351 **12 Claims**



1. An output circuit responsive to an input signal having a first voltage level for a prescribed period and a second votage level for a specified period, a reference voltage and a power source voltage, comprising:

control signal generating means responsive to the input signal for outputting a control signal having a predetermined voltage level for a short period less than the prescribed period following the prescribed period of the input signal;

self-bias circuit means for producing a bias voltage established in a self-bias manner and triggered by the control signal;

pull-up circuit means biased by the bias voltage of the self-bias circuit means for raising the voltage level of the output signal substantially to the level of the power source voltage; and

pull-down circuit means responsive to the first voltage level of the input signal for lowering the voltage level of the output signal substantially to the level of the reference voltage.

4,904,925

APPARATUS FOR RECOVERING AN ALTERNATING VARIABLE OF A CONTROLLED SEMICONDUCTOR

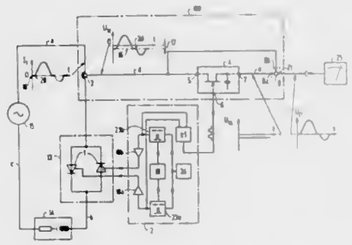
Marcos A. Cavalcanti Pereira, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 2, 1989, Ser. No. 346,478

Claims priority, application Fed. Rep. of Germany, May 9, 1988, 3815849

Int. Cl.⁴ H01F *40/06*

U.S. Cl. 323—357 **18 Claims**



1. Apparatus for recovering an alternating variable having a direct current component of a controlled semiconductor component, comprising an electromagnetic transducer for measurement having a secondary winding, a sample and hold element having a trigger input, an output and another input connected to said secondary winding of said transducer, a control system for the semiconductor component connected to said trigger input for feeding trigger pulses from said control system to said trigger input at respective control times of the semiconductor component, and a comparator having a first input connected to said output of said sample and hold element for receiving an output signal proportional to the direct current component, a second input connected to said secondary winding of said transducer and an output supplying the simulated alternating variable.

4,904,926

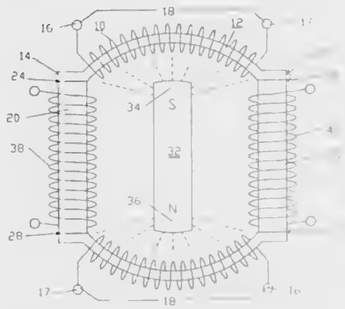
MAGNETIC MOTION ELECTRICAL GENERATOR

Mario Pasichinskyj, 10666 NE. 11th Ct., Miami Shores, Fla. 33138

Filed Sep. 14, 1988, Ser. No. 244,021

Int. Cl.⁴ G05F *7/00*

U.S. Cl. 323—362 **11 Claims**



1. An electrical generator, comprising:

(a) an electrical winding defining a magnetically conductive zone having bases at each end thereof, said winding including means for removing an induced current therefrom;

(b) two pole electromagnets, each having a first and a second pole, each first pole thereof in magnetic communication with one base of said magnetically conductive zone;

(c) a third pole magnet, said magnet comprising a permanent magnet, said third magnet oriented intermediately of said first poles of said two pole electromagnets and in magnetic communication with said electromagnets, said third pole magnet having a magnetic axis substantially transverse to an axis of said magnetically conductive zone, said third magnet having a pole thereof nearest to said zone and in magnetic attractive relationship to said first poles of said two pole electromagnets, in which said first poles thereof are like poles;

(d) control means for cyclically reversing the magnetic polarities of said electromagnets,

whereby said control means, through said cyclical change in said magnetic polarities of said electromagnets, will cause magnetic flux lines associated with said attractive magnetic relationship between said first poles of said electromagnets and said nearest pole of said third magnet to correspondingly reverse, thereby causing a wiping effect across said magnetically conductive zone, as lines of magnetic flux swing between respective first poles of said two electromagnets, thereby inducing electron movement within said winding and thusly generating a flow of current within said winding.

4,904,927

METHOD FOR MEASURING A CHARACTERISTIC IMPEDANCE AND A PROPAGATION CONSTANT OF A TWO-PORT NETWORK

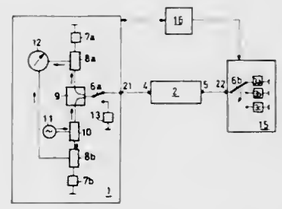
Heyno Garbe, Baden, and Diethard Hansen, Berikon, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Dec. 22, 1988, Ser. No. 288,421

Claims priority, application Switzerland, Dec. 23, 1987, 5013/87

Int. Cl.⁴ G01R *27/32*

U.S. Cl. 324—642 **6 Claims**



1. Method for measuring a characteristic impedance and a propagation constant of a two-port network, which method comprises the steps of:

measuring at least two input impedances ZE1, ZE2 by means of a reflection measuring instrument at an input port of the two-port network with at least two different terminations of an output port of the two-port network; and

determining from the at least two input impedances ZE1, ZE2 the characteristic impedance ZW and the propagation constant g; wherein:

known finite impedances, which are independent of the two-port network, are used as terminations of the output port; and

for measuring the characteristic impedance and the propagation constant of a line, the terminations of the two-port network are measured by themselves, wherein said network is exclusively a line and said terminations comprise connecting plugs and a short section of the line.

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4,904,928

MEASUREMENT APPARATUS AND METHOD UTILIZING MULTIPLE RESONANT MODES OF MICROWAVE ENERGY

Richard W. Lewis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 9, 1988, Ser. No. 281,783
Int. Cl.[4] G01N *22/00*
U.S. Cl. 324—636 **11 Claims**



1. Measurement apparatus utilizing microwave energy comprising:

a. an n-fold symmetric self-oscillating microwave cavity (where n is an integer equal to or greater than 2) having at least two identical resonant modes of oscillation at substantially the same frequency, each with a different field orientation;

b. means for exciting said cavity to oscillate simultaneously and continuously in each of said at least two identical resonant modes at substantially the same frequency;

c. positioning means for positioning a sample of material to interact with said at least two identical resonant modes so that a property of said sample which is to be measured changes the resonant frequency of oscillation of at least one of said resonant modes from its normal resonant frequency; and

d. means for measuring the difference in the simultaneously and continuously excited resonant frequencies of oscillation of said at least two identical resonant modes with said sample so positioned to measure said property of said sample.

4,904,929

METHOD FOR DETECTION OF WEAK LINKS IN THE CURRENT PATH OF ELECTRICALLY CONTINUOUS SUPERCONDUCTORS

Joseph Bohandy, Columbia; Boris F. Kim, Pasadena; Terry E. Phillips, Ellicott City; Frank J. Adrian, Olney, and Kishin Moorjani, Silver Spring, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Mar. 20, 1989, Ser. No. 325,823
Int. Cl.[4] G01N *27/00*
U.S. Cl. 324—71.6 **17 Claims**

1. A method for detecting weak links in a current path of an electrically continuous superconducting sample comprising:

(a) providing the electrically continuous superconducting sample;

(b) imposing a magnetic field on the sample;

(c) modulating the imposed magnetic field in such a fashion that the total magnetic field is always of the same polarity;

(d) sequentially changing the temperature of the sample, recording the temperature at each change and producing first signals;

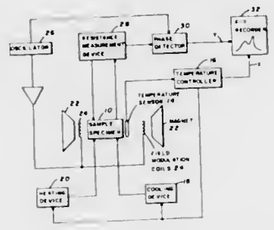
(e) determining the resistance of the sample at each temperature change and producing second signals;

(f) comparing the second signals to the modulation frequency by phase detection and producing third signals;

(g) plotting a series of coordinate points where one axis represents said first signals and the other axis represents said third signals; and

(h) measuring the dc resistance of the sample as a function of temperature to obtain a dc resistance curve;

wherein the T_c of the superconducting sample is indicated by the presence of a first peak formed by the series of coordinate



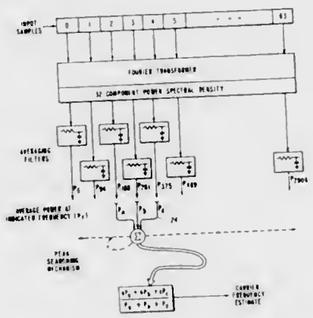
points and a corresponding precipitous drop in resistance on the resistance curve and further wherein the existence of weak links in the superconducting sample is indicated by the presence of a second peak formed by the series of coordinate points at a lower temperature than the first peak and a corresponding tail on the low temperature end of the resistance curve.

4,904,930

METHOD OF CARRIER FREQUENCY ESTIMATION

David C. Nicholas, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 16, 1988, Ser. No. 245,478
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 E **8 Claims**



1. A method of estimating the unknown frequency of a carrier contained in a received data signal within a search bandwidth, comprising the steps of:

taking a multiplicity of time domain samples of the data signal;

performing a single Fast Fourier Transform on said samples to obtain a plurality of power spectral density components at discrete points across the search bandwidth;

moving a search window encompassing a plurality of the power spectral density components across said search bandwidth to determine an area of greatest power concentration; and

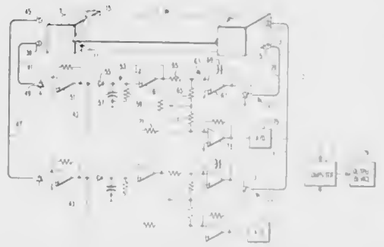
computing a weighted average frequency from the plurality of power spectral density components in the area of greatest power concentration, said frequency being said estimated carrier frequency of said data signal.

4,904,931

ELECTRO-OPTICAL VOLTAGE MEASURING SYSTEM INCORPORATING A METHOD AND APPARATUS TO DERIVE THE MEASURED VOLTAGE WAVEFORM FROM TWO PHASE SHIFTED ELECTRICAL SIGNALS

Robert C. Miller, New Alexandria, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1988, Ser. No. 250,289
Int. Cl.[4] G01R *31/00, 31/02*
U.S. Cl. 324—96 **18 Claims**



11. A method of measuring electrical voltage between two spaced objects comprising the steps of:

positioning an electro-optic crystal exhibiting birefringence in two orthogonal axes transverse to an optical axis in response to an electric field, with said optical axis extending between said two objects;

generating collimated light polarized with a selected plane of polarization;

passing the polarized collimated light through said crystal parallel to the optical axis and with the plane of polarization of the polarized collimated light at a selected angle to said two orthogonal axes of the crystal;

retarding a first portion of said polarized collimated light emerging from said crystal with respect to a second portion;

passing the two portions of polarized collimated light after the first has been retarded relative to the second through polarizing means;

converting the two portions of said polarized collimated light as they emerge from the polarizing mean into first and second phase shifted electrical signals; and

generating an output signal representative of the voltage between said two spaced objects from said two phase shifted electrical signals.

4,904,932

CIRCUIT CONDITION MONITOR WITH INTEGRALLY MOLDED TEST POINT SOCKET AND CAPACITIVE COUPLING

Edmund O. Schweitzer, Jr., Northbrook, Ill., assignor to E. O. Schweitzer Manufacturing Co., Inc., Mundelein, Ill.

Continuation of Ser. No. 62,875, Jun. 16, 1987, abandoned. This application Oct. 4, 1988, Ser. No. 253,427
Int. Cl.[4] G01R *1/04, 31/00;* **H02G** *15/08*
U.S. Cl. 324—133 **37 Claims**

1. A connector for establishing an electrical connection between the electrical terminals of components of an electrical distribution system, said connection being monitored by a removable circuit condition monitoring module requiring simultaneous electrical coupling to said electrical connection and to electrical ground, said connector comprising:

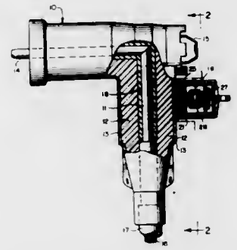
a connector body portion formed of electrically non-conductive material;

first and second terminal means for electrically and mechanically engaging the electrical terminals of said components;

electrical conductor means extending within said body portion between said first and second terminal means for providing an electrical current path therebetween, said conductor means being substantially surrounded by said body portion;

an electrically grounded sheath layer formed of an electrically-conductive material overlying the surface of said body portion;

means defining on the surface of said connector a recess forming a test point socket for receiving the circuit condition monitoring module, at least a portion of the bottom of



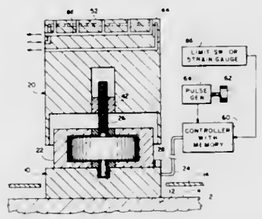
said test point socket being formed of said electrically non-conductive material of said body portion said test point socket further being complementarily dimensioned to the circuit condition monitoring module whereby the monitoring module, when received in said socket, is fixedly positioned and simultaneously electrically coupled through said non-conductive body portion to said monitored conductor means and through said sheath layer to electrical ground.

4,904,933

INTEGRATED CIRCUIT PROBE STATION

Delmer E. Snyder, Hillsboro; Cornelis T. Veenendaal, Cornelius, and Theodore G. Creedon, Lake Oswego, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 8, 1986, Ser. No. 905,359
Int. Cl.[4] G01R *1/02, 1/04*
U.S. Cl. 324—158 F **12 Claims**



1. A probe station comprising:

a table having a substantially planar upper surface,

support means for supporting a probe a fixed distance above said upper surface,

a chuck carrier having a substantially planar lower surface, the chuck carrier resting on the table with said lower surface of the carrier confronting said upper surface of the table,

a film of viscous bearing material interposed between the confronting surfaces to permit relative movement between the chuck carrier and the table in directions parallel to said upper surface through the application of manual force directly to the chuck carrier, said movement being

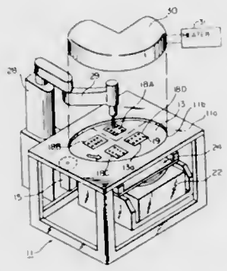
substantially without resistance other than the viscous damping force produced by the viscous bearing material,
a chuck mounted on the chuck carrier by means permitting relative movement between the chuck and carrier in opposite directions substantially perpendicular to said upper surface of the table, and
a mechanical prime mover effective between the carrier and the chuck for bringing about movement between them in said opposite directions.

4,904,934

TESTING APPARATUS FOR SEMICONDUCTOR DEVICES

Ryouji Nishihashi; Kiyoji Imanaka; Katsuji Kawaguchi, and Hidekazu Iwasaki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 19, 1988, Ser. No. 259,779
Claims priority, application Japan, Oct. 21, 1987, 62-267187
Int. Cl.[4] G01R *31/22*
U.S. Cl. 324—158 F **13 Claims**



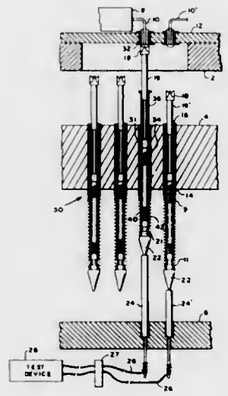
1. A testing apparatus comprising:
a plurality of pallets, each of said pallets having a plurality of electrode patterns and a plurality of supports, each of which supports a semiconductor device and electrically connects the semiconductor device to one of said electrode patterns;
pallet moving means for moving said pallets along a path having a plurality of positions, the positions including a testing position and an exchanging position;
a tester for testing the semiconductor devices;
a plurality of contacts electrically connected to said tester;
connecting means for electrically connecting said contacts to said electrode patterns for electrically connecting a plurality of the semiconductor devices on a pallet at the testing position to the tester at the same time;
heating means for heating the semiconductor devices to a prescribed testing temperature; and
exchanging means for exchanging the semiconductor devices on the pallet at the exchanging position with other semiconductor devices.

4,904,935

ELECTRICAL CIRCUIT BOARD TEXT FIXTURE HAVING MOVABLE PLATENS

John A. Calma, Selden, and Thomas M. Joy, Medford, both of N.Y., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 14, 1988, Ser. No. 270,866
Int. Cl.[4] G01R *31/28, 15/12*
U.S. Cl. 324—159 F **5 Claims**



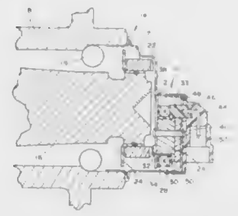
1. A fixture for contacting selected terminals of an electrical assembly, said fixture comprising:
spaced-apart lower, middle and upper platens selectively movable according to a selected one of: (a) the lower platen being secured against movement relative the upper and middle platens and the upper and middle platens being concurrently and/or independently movable towards and away from the lower platen; and (b) the middle and upper platens being secured against movement relative the lower platen and the lower platen being movable towards and away from the middle and upper platens; and (c) the middle platen being secured against movement relative the upper and lower platens and the upper and lower platens being concurrently and/or independently movable relative the middle platen,
said upper platen adapted for securement of the assembly thereupon with at least the selected terminals thereof to be contacted respectively extending therefrom towards the middle platen,
said lower platen having a predetermined array of electrical contacts extending therefrom towards the middle platen respectively corresponding to and in registration with the assembly terminals to be contacted, said electrical contacts restricted against reciprocal movement relative the lower platen and respectively electrically connected to a device operative to provide desired information relative the selected components,
said middle platen having an array of openings extending transversely therethrough of which selected openings respectively correspond to and are substantially aligned with each of the terminals to be contacted and the respective electrical contacts in registration therewith,
electrically conductive probe members respectively extending through at least the middle platen selected openings and reciprocally movable therethrough, said probe members respectively having a first end adapted to make electrical contact with the terminal in registration therewith and having an opposite end adapted to electrically engage the electrical contact in registration therewith, and
said fixture operative such that one of movements (a), (b) and (c) causes the electrical contacts to engage the respective probe members opposite end in registration therewith and thence urge the probe member towards the upper platen for a distance sufficient to enable the first end to make electrical contact with the terminal in registration therewith.

4,904,936

AUTOMOTIVE WHEEL SPEED SENSOR INCLUDING FERROMAGNETIC FLUX CARRYING CUP CLOSING AN OPENING IN THE WHEEL BEARING HOUSING

James W. Richmond, Carmel, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 835,514, Mar. 3, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 171,162
Int. Cl.[4] G01P *3/488;* **B60T** *8/32;* **H02K** *21/26*
U.S. Cl. 324—174 **20 Claims**



16. In a speed sensor assembly for providing an electrical signal representative of the speed of a vehicle wheel, said speed sensor assembly being of the type utilizable in combination with a vehicle wheel bearing assembly having a bearing enclosed in a wheel bearing housing, the housing having an opening providing access to said bearing which opening is closed by a cup, said speed sensor assembly further being of the type comprising electromagnetic means for providing said electrical signal which means includes magnetic means for generating a magnetic flux and a ferromagnetic means for carrying said magnetic flux, the improvement wherein said ferromagnetic means comprises said wheel bearing cup.

4,904,937

APPARATUS FOR MAGNETICALLY DETECTING POSITIONS WITH MINIMUM LENGTH MAGNETIC INFORMATION UNITS RECORDED ON A PLURALITY OF MAGNETIC TRACKS

Tadashi Takahashi; Kunio Miyashita, and Syooichi Kawamata, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 560,178, Dec. 12, 1983, abandoned. This application Oct. 3, 1988, Ser. No. 253,333
Claims priority, application Japan, Dec. 13, 1982, 57-216899
Int. Cl.[4] G01B *7/30;* **G01P** *3/487;* **G06K** *7/08, 19/06*
U.S. Cl. 324—207.21 **14 Claims**



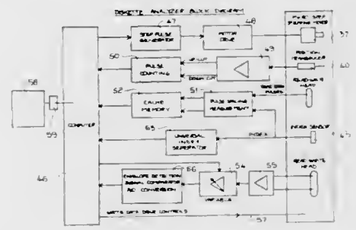
1. An apparatus for magnetically detecting positions comprising:
a plurality of magnetic tracks, each track having at least one portion therealong where magnetic information is recorded and at least one other portion where magnetic information is not recorded, the magnetic recorded information portion extending over a different predetermined length for at least two of said plurality of tracks, each different predetermined length magnetic information recorded portion for a respective track comprising a different number of the same minimum length magnetic information units recorded continuously along the direction of extension of a respective track, each different predetermined length magnetic information recorded portion including at least two adjacent minimum length magnetic information units, each of the minimum length magnetic information units generating a magnetic signal for detection;
magnetic sensing means disposed closely to said magnetic tracks for detecting the magnetic information recorded on said magnetic tracks and providing signals indicative of the actual length of each magnetic information recorded portion on each of said tracks so that the signals provided represent a binary 1 and binary 0 assuming that the magnetic information recorded portion of each track represents one of a binary 1 and 0 and the other portion of each track where magnetic information is not recorded represents the other of a binary 1 and 0, said magnetic sensing means including magnetic sensing devices for each track, each of said sensing devices being in the form of two magnetoresistive elements adapted for connection as part of a processing circuit and spaced a predetermined length along the track direction, each of said elements having an internal resistance which changes in accordance with the intensity of a magnetic field in the same manner irrespective of the difference of polarity of the magnetic field, and
means for moving said magnetic tracks and said magnetic sensing means relative to one another so that the signals detected by said magnetic sensing means are indicative of a respective portion.

4,904,938

METHOD AND APPARATUS FOR TESTING CHARACTERISTICS OF A FLOPPY DISC AND A FLOPPY DISC DRIVE

James O'Reilly, Blackrock, and Finbar Kavanagh, Bray, both of Ireland, assignors to Benares Limited, Dublin, Ireland

Filed Jun. 8, 1988, Ser. No. 203,968
Claims priority, application Ireland, Jun. 10, 1987, 1533/87
Int. Cl.[4] G01R *33/12;* **G11B** *27/36, 5/56*
U.S. Cl. 324—212 **18 Claims**



17. Apparatus for testing alignment of a data track written on a magnetic disc, the apparatus comprising:
means for rotating the disc,
reading means for reading data from the disc,
means for moving the reading means radially across the disc and for selectively positioning the reading means at a plurality of radially spaced apart positions on a data track,
means for recording the radius of each position from the centre of the disc,
means for determining the track average amplitude of the signal of the track at each position over at least a portion of the length of a track from which data is read by the reading means,
means for obtaining the radius of the centre line of the data track by determining the radial position of the peak value of the track average amplitude of the signal from the values of the track average amplitude and their positions, and
means for comparing the radius of the centre line of the data track with the radius at which the centre line should have occurred in a correctly aligned track.

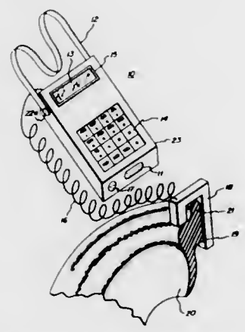
VOL 1111 ISS 4 FE 27 19 90 UMI

4,904,939

PORTABLE ELECTRONIC WHEEL WEAR GAUGE

Zahid F. Mian, Troy, N.Y., assignor to International Electronic Machines Corp., Troy, N.Y.

Filed Sep. 16, 1988, Ser. No. 245,780
Int. Cl.[4] G01B *7/02, 7/10;* **G01D** *5/34;* **B61K** *9/12*
U.S. Cl. 324—229 **20 Claims**



14. An electronic wheel wear measurement system for measuring certain dimension of train wheels, comprising:

a portable computer controller for acquiring measurement data, said controller being battery powered so that it can be carried around anywhere it is needed; and

a portable electronic gauge head electrically connected to said controller, said gauge head having a generally inverted J-shape with a first section configured to hook over a flange on a rim of a train wheel and contact a tread of the wheel substantially along a known gauging line and a second section extending generally parallel to and abutting an outer face of the rim when the gauge head is positioned on and in alignment with the wheel, said gauge head including positioning sensor means for providing an indication of alignment of the gauge head with respect to a wheel, said gauge head further including measurement sensor means interacting with known locations on said flange and rim for taking measurement readings of said certain dimensions and providing output signals representative of said measurement readings to said controller.

4,904,940

FIBER-OPTIC MULTICOMPONENT MAGNETIC FIELD GRADIOMETER FOR FIRST, SECOND AND HIGHER ORDER DERIVATIVES

Raymond D. Rampt, Woodinville, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 169,802, Mar. 18, 1988, Pat. No. 4,814,706, which is a continuation-in-part of Ser. No. 22,681, Mar. 16, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 325,825
Int. Cl.[4] G01R *33/022, 33/023;* **G01B** *9/02*
U.S. Cl. 324—244 **27 Claims**

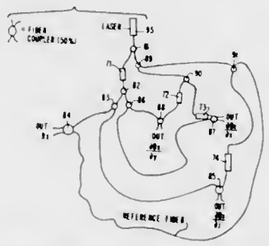
1. A multicomponent magnetic field gradiometer comprising:

(a) first through fourth magnetic transducers, each having a magnetically sensitive axis oriented along a first, x direction, wherein said first and third magnetic transducers are colinear and said second and fourth magnetic transducers are displaced along a second, y direction and a third, z direction respectively relative to said first and third magnetic transducers, said x, y and z directions being mutually perpendicular;

(b) first through fourth optical fibers, one fiber wrapped around each of said magnetic transducers wherein said fibers define first through fourth optical paths;

(c) laser means coupled to said fibers for providing laser light within said fibers, wherein the laser light travels along the optical paths defined by said fibers;

(d) an applied magnetic field generating means for immersing each of said magnetic transducers in an applied magnetic field having an AC and a DC component; and



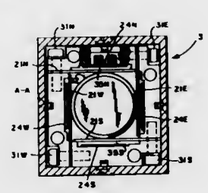
(e) first means operative when said fibers are to an external magnetic field to be measured for detecting a change in the length $\Delta L_{1,j}$ of the optical paths defined by said fibers between said first and jth magnetic transducers, where j takes on integral values 2, 3 and 4, said changes in length proportional to the gradient of Bx in the x, y and z directions.

4,904,941

GAUGE FOR DETECTING MISALIGNMENT

Eugene F. Duncan, Wauwatosa; Gregory L. Nadolski, Brookfield, and Donald L. Van Zeeland, Franklin, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 23, 1987, Ser. No. 137,045
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[4] G01B *7/31*
U.S. Cl. 324—207.18 **17 Claims**



1. A displacement gauge (3) comprising:

an object (12) whose displacement is to be sensed;

sensor means (21N, 24N, 27, etc.) positioned near said object and responsive to the position of said object relative to said sensor means, for sensing displacement of said object;

said sensor means comprising a plurality of N transducer means (24N, etc.) positioned at spaced-apart directions from said object, each for providing a first signal (N-S from 45; E-W from 54) dependent upon the component vector of the object's displacement along a respective directional line;

first processing means (48, 57) receiving said first signals for converting said first signals to respective signals magnitude signals (at 61, 62) representative of their magnitudes irrespective of the sign (north or south; east or west) of said respective component vector of displacement;

means (51) receiving said magnitude signals for algebraically adding at least two of said magnitude signals in sums of at least two signals, and for weighting each by a predetermined factor for providing at least one composite signal (at 59);

second processing means (60) for displacement-signal processing comprising a logic OR-function devide (64a) receiving said composite signal (at 59) and said individual magnitude signals (at 61, 62), for selecting the greatest of them as an indication of the magnitude of displacement of said object (12);

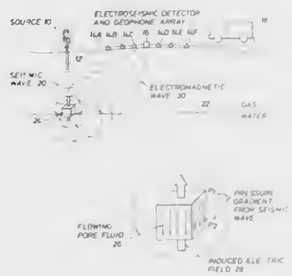
whereby said sensor means (21N, etc.) senses the relative displacement of said object (12) with substantially equal sensitivity irrespective of its the object's direction of displacement.

4,904,942

ELECTROSEISMIC PROSPECTING BY DETECTION OF AN ELECTROMAGNETIC SIGNAL PRODUCED BY DIPOLAR MOVEMENT

Arthur H. Thompson, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Dec. 21, 1988, Ser. No. 287,882
Int. Cl.[4] G01V *11/00, 3/12, 3/30, 1/00*
U.S. Cl. 324—323 **32 Claims**



1. The method of electroseismic prospecting for the existence of hydrocarbon deposits by the detection of two immiscible fluids present in a porous subterranean formation, which comprises

initiating a seismic impact at a source location such that if the acoustical wavefront therefrom encounters a region of porous subterranean formation containing at least two immiscible fluids in a common pore space an electromagnetic signal originating from dipolar movement in said region and traveling from said region at the speed of light is produced and

detecting said electromagnetic signal as an indication of the existence of likely hydrocarbon deposits in the vicinity of said region.

4,904,943

METHOD FOR DETECTING LONG WAVES AND PREDICTING EARTHQUAKES

Kozo Takahashi, Higashi-Kurume, Japan, assignor to Communications Research Laboratory Ministry of Posts and Telecommunications, Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,261
Claims priority, application Japan, Oct. 7, 1987, 62-251470
Int. Cl.[4] G01V *3/12*
U.S. Cl. 324—344 **8 Claims**

1. A method for detecting pre-earthquake long electromagnetic waves and for predicting earthquakes based thereon, comprising the steps of:

locating a plurality of observation points at which long waves may be detected;

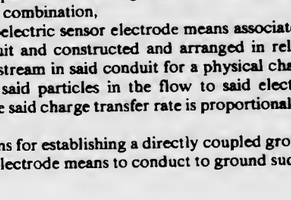
installing an antenna at each of said plurality of locations;

sensing the presence of said long waves by each of said antennas;

transmitting a signal indicative of said long waves from each antenna to a storage device;

storing data representing the transmitted signal in said storage device;

computing the value of a phase shift time at which a correlation function between two of said signals becomes maximal;



determining the location of a rotational hyperboloid of two sheets having its foci at the two observation points from which the sensed signals are obtained;

repeating the computing and determining steps for at least one additional pair of sensed signals and observation points;

determining the intersection of the hyperboloids; and

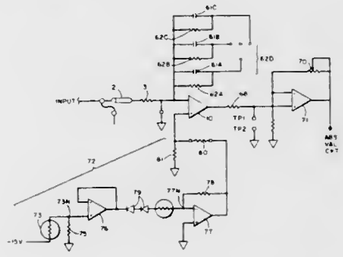
predicting the occurrence, location and magnitude of an earthquake based on both the intersection of the hyperboloids and the correlation coefficient of said correlation function.

4,904,944

FLOW MEASURING APPARATUS WITH ANALOG, ESSENTIALLY LINEAR OUTPUT

Ronald L. Dechene, Boxford, and Robert E. Newton, Tewksbury, both of Mass., assignors to Auburn International, Inc., Danvers, Mass.

Continuation-in-part of Ser. No. 658,587, Oct. 9, 1984, Pat. No. 4,714,890. This application Dec. 21, 1987, Ser. No. 135,661
Int. Cl.[4] G01R *27/60*
U.S. Cl. 324—454 **1 Claim**



1. Flow measuring apparatus for determining quantitatively, in a linear, analog reading, available in real time, the flow rate of a solid particle containing fluid moving in a conduit comprising, in combination,

(a) triboelectric sensor electrode means associated with said conduit and constructed and arranged in relation to the flow stream in said conduit for a physical charge transfer from said particles in the flow to said electrode means where said charge transfer rate is proportional to said flow rate,

(b) means for establishing a directly coupled ground path for said electrode means to conduct to ground such current as

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is produced at said electrode means through interaction with the flow stream including an absolute value circuit and output device,

(c) front end means for converting said current to a voltage signal at a low frequency response, 3.0dB below 1 hertz, with a multi-decade range control, part of which is established in feedback resistor steps and part of which is established with adjustable voltage gain of respective op amps in a cascaded array, and further comprising a front end temperature compensation system for the highest sensitivity range of said range control with two negative temperature coefficient devices in cascaded array and providing upper and lower sections of a voltage/temperature ramp.

4,904,945

APPARATUS AND PROCESS FOR DETECTING DIRECT CURRENT MAGNETIC FLUX DEFLECTIONS IN AN ELECTRICAL TRANSFORMER EMPLOYING FOURIER ANALYSIS

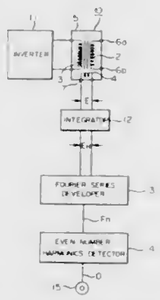
Toyokazu Kouan, and Katsumi Shiono, both of Ako, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 20, 1988, Ser. No. 246,747

Claims priority, application Japan, Sep. 22, 1987, 62-238107; Mar. 8, 1988, 63-52717

Int. Cl.[4] G01R *31/34*

U.S. Cl. 324—547 **10 Claims**



1. An apparatus for detecting direct current magnetic flux deflection in an electrical transformer having a magnetic core comprising:

a transformer;

a magnetic detector disposed within said transformer for detecting the magnetic flux in the transformer and for generating an output voltage waveform in response to the magnetic flux;

Fourier series developing means connected to said magnetic detector for developing the output voltage waveform from said magnetic detector into a Fourier series; and

an even number harmonic detector connected to said Fourier series developing means for detecting the presence of an even number harmonic in the Fourier series, thereby indicating the presence of direct current magnetic flux deflection.

4,904,946

METHOD FOR EVALUATING INSULATING FILMS

Yoshio Hirai, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Continuation of Ser. No. 913,686, Sep. 30, 1986, abandoned. This application Nov. 7, 1988, Ser. No. 268,678

Claims priority, application Japan, Oct. 2, 1985, 60-219848

Int. Cl.[4] G01R *27/02*

U.S. Cl. 324—551 **10 Claims**

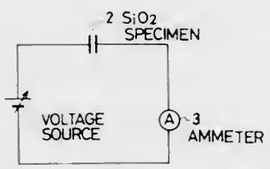
1. A method of evaluating the insulating properties of an insulating film comprising the steps of:

(a) measuring breakdown currents of the insulating film, the breakdown currents being measured just before the insulating film undergoes catastrophic breakdown;

(b) determining the distribution of breakdown current densities;

(c) obtaining a correlation between the mean value of the

(a)



breakdown current densities and the mean time to failure of a constant-current Time Dependent Dielectric Breakdown; and

(d) finding an expected breakdown time and the distribution of Time Dependent Dielectric Breakdown of the insulating films according to the correlation.

4,904,947

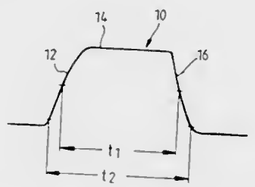
METHOD AND CIRCUIT FOR MEASURING PULSE WIDTH

James E. Olivenbaum, Houston, and Richard A. Kester, Magnolia, both of Tex., assignors to Tideland Signal Corporation, Houston, Tex.

Filed Nov. 9, 1988, Ser. No. 269,270

Int. Cl.[4] H03K *5/22/3/017;* **G01R** *19/00*

U.S. Cl. 328—111 **2 Claims**



2. The circuit of claim 1 wherein the time constant circuit includes an RC timing circuit and voltage divider including a first and second resistor and a second capacitor, said first resistor, second resistor, and second capacitor connected to the output of the amplifier.

4,904,948

PHASE COMPARATOR CIRCUIT

Fumitaka Asami, Kunitachi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 14, 1988, Ser. No. 167,712

Claims priority, application Japan, Mar. 19, 1987, 62-062404

Int. Cl.[4] H03K *9/06, 5/26*

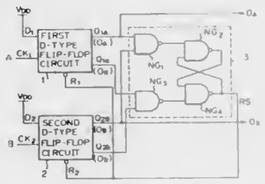
U.S. Cl. 328—133 **5 Claims**

1. A phase comparator circuit for comparing a phase of a first input signal with that of a second input signal and outputting a first output signal and a second output signal in accordance with a result of the comparison, comprising:

a first flip-flop circuit for receiving said first input signal and outputting said first output signal and an inverted output signal of said first output signal;

a second flip-flop circuit for receiving said second input signal and outputting said second output signal and an inverted output signal of said second output signal; and

a latch circuit, connected to said first and second flip-flop circuits, for receiving said output signals and said inverted output signals of said first and second flip-flop circuits and applying a reset signal to said first and second flip-flop



circuits in accordance with said output signals and said inverted output signals;

said first and second output signals being output by applying said reset signal to said first and second flip-flop circuits, when said first and second input signals are in-phase.

4,904,949

SYNCHROTRON WITH SUPERCONDUCTING COILS AND ARRANGEMENT THEREOF

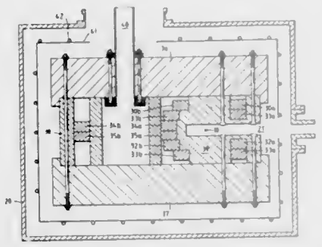
Martin N. Wilson, Abingdon, United Kingdom, assignor to Oxford Instruments Limited, Osney Mead, United Kingdom

Filed Aug. 28, 1985, Ser. No. 770,270

Claims priority, application United Kingdom, Aug. 28, 1984, 8421867

Int. Cl.[4] H05H *13/04*

U.S. Cl. 328--235 **16 Claims**



1. A synchrotron having at least two sets of superconducting coils, each arranged for deflecting charged particles in a curved path, said sets being spaced to provide at least one straight portion of the path for said particles, a transformer device located along said portion of the path for accelerating said particles to operating energy, characterized in that at least one coil (**30**, **31**, **32**, and **33**) has its main go and return arms curved to lie substantially parallel to the required curved path (**11**, **12**) and at least one coil (**34**, **35**) has only its main go arm curved to lie substantially parallel to said path (**11**, **12**).

4,904,950

TELEMETRY DIGITAL SUBCARRIER DEMODULATOR

Jay E. Brown, La Canada; Gary M. Zednick, Valencia, and Bibiano P. Costello, North Hollywood, all of Calif., assignors to Medical Data Electronics, Inc., Arleta, Calif.

Filed Nov. 4, 1988, Ser. No. 267,024

Int. Cl.[4] H03D *3/00*

U.S. Cl. 329—341 **11 Claims**

1. A biomedical telemetry signal decode circuit comprising:

a first flip-flop circuit, connected to receive a signal input, a clock input and a reset input;

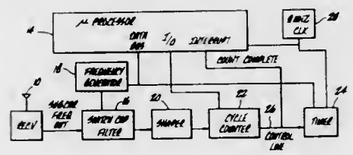
a second flip-flop circuit, connected to receive said signal input, said clock input and said reset input;

a latch circuit, connected to said first and second flip-flop circuits, for receiving said output signals and said inverted output signals of said first and second flip-flop circuits and applying a reset signal to said first and second flip-flop circuits in accordance with said output signals and said inverted output signals;

said first and second output signals being output by applying said reset signal to said first and second flip-flop circuits, when said first and second input signals are in-phase;

filter means for selecting a desired passband arranged to receive said signal,

a cycle counter arranged to receive the output of said filter means,



a timer to receive a signal output from the cycle counter and a microprocessor for control of the decode circuit.

4,904,951

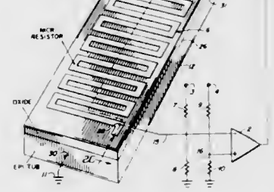
METHOD AND CIRCUIT FOR REDUCING EFFECTS OF DISTRIBUTED CAPACITANCE ASSOCIATED WITH LARGE THIN FILM RESISTORS

Johnnie F. Molina, and Robert M. Stitt, II, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Jun. 6, 1988, Ser. No. 203,250

Int. Cl.[4] H03F *1/36*

U.S. Cl. 330—107 **11 Claims**



1. A method of reducing the effects of distributed parasitic capacitance on a signal passing through a first resistor disposed on a first surface of an insulating layer, comprising the steps of:

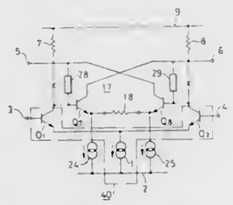
(a) applying the signal to a first terminal of the first resistor and a first terminal of a second resistor disposed along a second surface of the insulating layer, the first resistor overlapping the second resistor so there exists a distributed parasitic capacitance between the first and second resistors;

(b) maintaining a second terminal of the first resistor at approximately a ground voltage, thereby causing a first current to flow through the first resistor in response to the signal;

(c) maintaining a second terminal of the second resistor at a ground voltage thereby causing a second current to flow through the second resistor in response to the signal, the first current producing a first voltage gradient in the first resistor, the second current producing a second voltage gradient in the second resistor, the first and second voltage gradients being sufficiently nearly equal to prevent substantial charging currents from flowing through the parasitic capacitance, whereby the signal undergoes reduced phase shift as it passes through the first resistor.

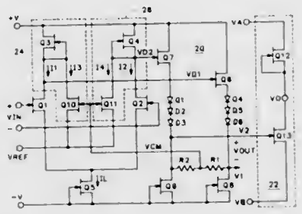
VOL 1111 ISS 4 FE 27 1990 UMI

4,904,952
DIFFERENTIAL AMPLIFIER INCORPORATING NEGATIVE RESISTANCE
Hiroshi Tanimoto, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 6, 1988, Ser. No. 254,242
Claims priority, application Japan, Oct. 12, 1987, 62-254785
Int. Cl.[4] H03F *3/45, 1/42*
U.S. Cl. 330—252 **27 Claims**



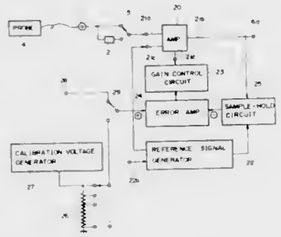
1. A differential amplifier, comprising:
first input terminals;
first output terminals;
first load resistor means connected to the first output terminals for generating output voltages;
first negative resistance means for producing negative such that a resistance value in a numerator of a fraction expressing the gain of the differential amplifier is maximized, the first negative resistance means including first level shaft circuit means for producing additional voltages, the first negative resistance means being connected to the first output terminals;
a first pair of transistors having emitters connected to each other, collectors connected to the first output terminals, and bases coupled to the first input terminals; and
first current source means connected to the emitters of the first pair of transistors for providing emitter currents to the first pair of transistors.

4,904,953
DIFFERENTIAL AMPLIFIER WITH COMMON-MODE BIAS FEEDBACK
Gary D. McCormack, Aloha, Oreg., assignor to TriQuint Semiconductor, Inc., Beaverton, Oreg.
Filed Apr. 22, 1988, Ser. No. 185,000
Int. Cl.[4] H03F *3/45, 3/16*
U.S. Cl. 330—258 **12 Claims**



1. A differential amplifier compensated for temperature and process variations comprising:
first load means coupling a first circuit node to a supply voltage input,
second load means coupling a second circuit node to a supply voltage input,
current control means connected to said first and second circuit nodes for apportionably directing a load current through said first and second load means in response to an input signal, and
feedback means connected to said first and second circuit nodes for supplying control currents through said first and second load means via said first and second nodes of magnitude determined by a common mode voltage of a differential signal developed between said first and second nodes in response to said load and control currents flowing through said first and second load means.

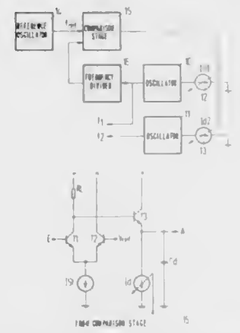
4,904,954
ULTRASONIC SIGNAL AMPLIFIER CIRCUIT AND SYSTEM OF GAIN CONTROL THEREOF
Kan Otake, Tsuchiura; Junichi Kajiwara, Shimoinayoshi; Yoshio Akutsu, Chiyoda; Katsuyoshi Miyaji, Shimoinayoshi, and Yoichi Katsuyama, Minori, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan
Filed May 9, 1988, Ser. No. 191,961
Claims priority, application Japan, May 25, 1986, 62-126032; May 8, 1987, 62-111763; May 28, 1987, 62-129910
Int. Cl.[4] H03G *3/10*
U.S. Cl. 330—281 **17 Claims**



1. An amplifier circuit for an ultrasonic receiving signal comprising a variable gain amplifying circuit for amplifying an ultrasonic receiving signal, said variable gain amplifying circuit having a gain variable according to a gain control signal, a reference signal generator for supplying a reference signal to said variable gain amplifying circuit during an idle period in which there is no said receiving signal, an aimed value generator for generating an aimed value corresponding to a gain set and a control circuit responsive to a difference between said aimed value and a value of said reference signal amplified by said variable gain amplifying circuit during said idle period to generate said gain control signal corresponding to said aimed value and holding it for at least a time in which said receiving signal exists.

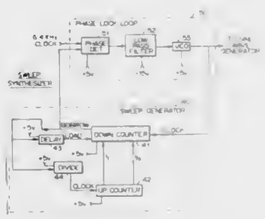
4,904,955
CIRCUIT FOR GENERATING TWO CLOSELY ADJACENT FREQUENCIES
Manfred Ley, Villach, Austria, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Sep. 6, 1988, Ser. No. 240,947
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730645
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—2 **3 Claims**

1. Circuit for generating two closely adjacent frequencies, comprising two oscillators each generating one of two closely adjacent frequencies, and a PLL circuit connected to said oscillators for regulating the frequencies, said PLL circuit including means for performing a frequency comparison of the frequency generated by only one of said oscillators with a reference frequency to generate a frequency comparison output signal of said PLL circuit, and for regulating the frequencies of both of said oscillators as a function of the frequency comparison output signal of said PLL circuit; wherein said oscillators are ring oscillators formed by ECL inverters; including means for defining the frequencies of said ring oscilla-



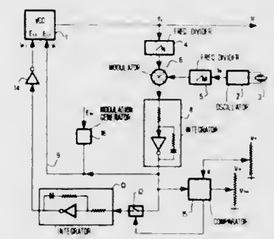
tors formed by ECL inverters with a dissimilar value of a frequency-determining magnitude, and means for regulating the frequencies by adjusting the value of the frequency-determining magnitude through the frequency comparison output signal of the PLL circuit.

4,904,956
LINEAR DIGITAL FREQUENCY SWEEP SYNTHESIZER
Charles L. Dennis, Richardson, and Edgar A. Bowden, Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 5, 1988, Ser. No. 253,291
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—4 **10 Claims**



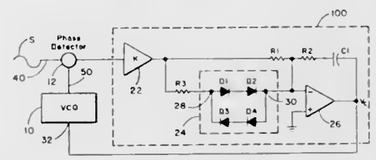
1. A method for producing a linear digital frequency sweep signal, comprising the steps of
(a) producing a plurality of count down cycles linearly increasing with time,
(b) producing a first signal having a plurality of pulses with time interval between pulses linearly increasing with time in response to said plurality of count down cycles,
(c) determining phase differences between said first signal and a reference clock signal, and
(d) producing a second signal having a plurality of pulses with a frequency sweep linearly increasing with time determined by said phase differences.

4,904,957
SERVO DEVICE FOR RAPIDLY, AND WITH LOW NOISE, LOCKING THE FREQUENCY AND PHASE OF SIGNAL TO THAT OF AN IMPOSED SIGNAL
Patrick Coquerel, Houilles, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France
Filed Dec. 2, 1988, Ser. No. 278,842
Claims priority, application France, Dec. 3, 1987, 87 16947
Int. Cl.[4] H03L *7/10*
U.S. Cl. 331—11 **7 Claims**



1. A device for rapidly and with low nose locking the frequency of a signal to that of an imposed signal from a reference oscillator comprising a slaved oscillator whose oscillation frequency can be varied by application of a control voltage and a first feed-back loop for bringing the control voltage back to an optimum value for stabilizing the frequency of the slaved oscillator, the phase noise inherent in said first loop and its response speed being relatively low, further comprising, in parallel with the first feed-back loop, which is permanently closed, a second feed-back loop causing a much faster variation of the oscillation frequency of the slaved oscillator than that caused by the first loop and control means for closing said second loop intermittently as long as the voltage difference between the control voltage applied to the slaved oscillator and said optimum value is greater than a given threshold value, said second loop including voltage storage means.

4,904,958
ENHANCED PHASE DETECTOR
Michael A. Wyatt, Clearwater, Fla., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 3, 1989, Ser. No. 318,898
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—17 **6 Claims**



1. A phase locked loop comprising:
(a) a phase detector having first and second inputs and an output;
(b) a first means for amplifying the phase detector output;
(c) a means for generating a voltage controlled oscillation signal to the first input, where the voltage controlled oscillation means includes a voltage control signal input; and
(d) means for providing a control signal to the voltage control signal input wherein the means for providing a control signal further comprises first, second and third resistance means, an array of diodes, a second amplifying means and a capacitance means having first and second

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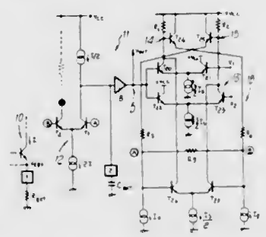
plates, wherein the diode array has first and second nodes and the first node is connected to one terminal of the third resistance means and the second node is connected to the inverting input of the second amplifying means and, wherein a first terminal of the first resistance means is connected to the second terminal of the third resistance means and also in common to the amplified phase detector output, further, wherein the second terminal of the first resistance means is connected to a first terminal of the second resistance means and also in common to the inverting input of the second amplifying means, further, wherein a second terminal of the second resistance means is connected to a first plate of the capacitance means and a second plate of the capacitance means is connected to the output of the second amplifying means, and wherein the control signal is responsive to the amplified phase detector output such that varying forward conduction of the amplified phase detector output increases the amplitude of the control signal when forward conduction is increased.

4,904,959

CURRENT-CONTROLLED SAW-TOOTH WAVE OSCILLATOR STAGE

Silvano Gornati, Casorezzo, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Feb. 13, 1989, Ser. No. 310,175
Claims priority, application Italy, Feb. 26, 1988, 19569 A/88
Int. Cl.[4] H03K *3/26*
U.S. Cl. 331—111 **8 Claims**



1. A saw-tooth wave oscillator stage having an output terminal feeding a drive signal for driving a capacitive element to be alternately and periodically brought in a charge and in a discharge state and generating an output signal, said stage comprising:

a first and a second, upper and lower, threshold voltages,

a threshold detector circuit connected to said first and second threshold voltages and to said output terminal and having a pair of detector circuit outputs defining a differential voltage switching between a positive and a negative sign when said output signal reaches said first and second thresholds,

a control and memory circuit connected to said detector circuit outputs for generating a differential charge and discharge signal alternately and periodically having charge and discharge phases, and

an output driving circuit receiving said charge and discharge signal and generating said drive signal,

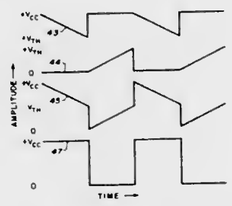
wherein said control and memory circuit comprises a differential voltage detector connected between said detector circuit outputs for detecting switching of said sign of said differential voltage and for correspondingly switching said differential charge and discharge signal between said charge and discharge phases, and a memory element controlled by said differential voltage detector and connected to said driving circuit for maintaining said charge and discharge phases until subsequent switching of said differential voltage.

4,904,960

PRECISION CMOS OSCILLATOR CIRCUIT

Mansour Izadinia, Santa Clara, and Tamas Szepesi, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 10, 1989, Ser. No. 335,614
Int. Cl.[4] H03K *3/00*
U.S. Cl. 331—111 **7 Claims**



1. An oscillator circuit operating from first and second power supply terminals connectable to a source of operating potential, said circuit comprising:

first and second capacitors, each having a first terminal connected to one of said supply terminals and having a second terminal coupled in series through current conducting means to the opposite of said supply terminals;

first and second switching means comprising transistors having their controlled conduction electrodes connected across said first and second capacitors respectively thereby creating two parallel connected capacitor and switching transistor combinations whereby said switching transistors can be turned on by their control electrodes to discharge the parallel connected capacitor; and

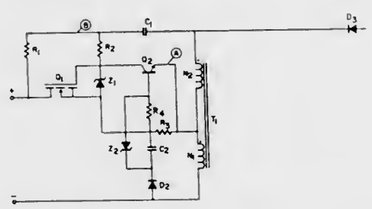
means for alternately turning said switching means on thereby discharging said capacitors alternately whereby said capacitors charge alternately as a result of said current conducting means and said charge establish a timing period that determines the frequency of oscillation of said circuit.

4,904,961

CONTROL CIRCUIT FOR BLOCKING OSCILLATOR

Floyd M. Minks, 2700 Partin Settlement Rd., Kissimmee, Fla. 32743

Division of Ser. No. 70,234, Jul. 6, 1987, Pat. No. 4,829,971, Division of Ser. No. 791,764, Oct. 28, 1985, Pat. No. 4,705,013. This application May 15, 1989, Ser. No. 351,970
Int. Cl.[4] H03K *3/354*
U.S. Cl. 331—112 **7 Claims**



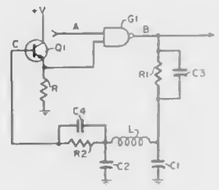
1. A blocking oscillator for supplying energy from a source of electrical power to a load comprising an electronic switching device with an input terminal, an output terminal, and a common input-output terminal, an inductor, a resistive shunt, said output terminal and said common input-output terminal effectively connected in series with said resistive shunt and said inductor to terminals for receiving power from said source of electrical power, a feedback circuit responsive to voltage across said inductor to supply voltage between said input terminal and said common input-output terminal to turn on said electronic switching device, said feedback circuit containing a feedback control device, said feedback control device being responsive to the voltage across said resistive shunt.

4,904,962

GATED HIGH STABILITY LC STABILIZED OSCILLATOR

David C. Greene, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Jan. 31, 1989, Ser. No. 304,698
Int. Cl.[4] H03B *5/12*
U.S. Cl. 331—117 R **9 Claims**



1. A gated LC stabilized oscillator circuit having high stability for generating a sampling clock signal for digital signal processing, including:

an LC oscillator;

means for controlling loading on said LC oscillator; and

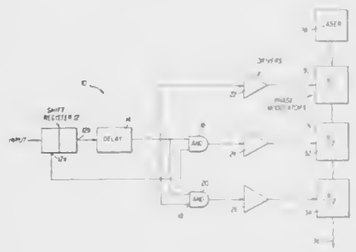
gate means for starting and stopping oscillations of said LC oscillator, wherein said LC oscillator is a Colpitts oscillator comprising a buffer amplifier and an LC tank circuit coupled between an input and an output of said buffer amplifier, said output of said buffer amplifier forming an output of said oscillator, and wherein said means for controlling the loading on said oscillator comprises a first parallel arrangement of a resistor and a capacitor coupled between said output of said buffer amplifier and said tank circuit.

4,904,963

STAGGERED QUADRATURE PHASE SHIFT KEYED LASER MODULATOR

Jeffrey R. Heidel, Red Bud, Ill., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 16, 1988, Ser. No. 271,882
Int. Cl.[4] H01S *3/10;* **H04L** *27/10*
U.S. Cl. 330—4.3 **9 Claims**



1. An optical modulator having an electronic signal input and an optical output comprising:

a shift register receiving said input and producing a first output and a second output;

a delay line connected to said first output to produce a delayed output;

logic means connected to said delayed output said second output for producing a plurality of control signals;

a plurality of optical phase modulators, each controlled by one of said control signals, which change the phase of light traveling therethrough;

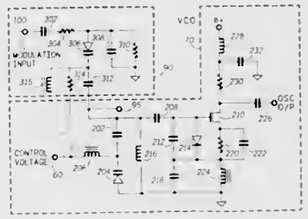
a light source producing a light beam which serially passes through each of said phase modulators to produce a phase shifted optical output.

4,904,964

VOLTAGE CONTROL OSCILLATOR WITH MODULATION COMPENSATION

Kwan K. Peng, Bukit Purmei Ro, Singapore, and Leng H. Ooi, Sunrise, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1988, Ser. No. 290,728
Int. Cl.[4] H03L *7/00*
U.S. Cl. 332—123 **8 Claims**



1. A compensated voltage controlled oscillator having a substantially constant modulation levl, comprising:

a voltage controlled oscillator (VOC) having a compensated modulation input and an adaptive input for receiving an adaptive signal; and

compensation means including a modulation input for receiving a modulating signal and capacitance means having a variable capacitance for coupling said modulating signal to said compensated modulation input of said VCO, said compensation means including a control input for receiving an unadjusted control signal, said capacitance means varying its capacitance in response to said unadjusted control signal for providing a compensated modulated signal to said compensated input of said VCO.

4,904,965

MINIATURE CIRCULATOR FOR MONOLITHIC MICROWAVE INTEGRATED CIRCUITS

Ronald F. Blight, Framingham; Robert L. Mozzi, Lincoln, and Ernst F. R. A. Schloemann, Weston, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 27, 1988, Ser. No. 289,879
Int. Cl.[4] H01P *1/383*
U.S. Cl. 333—1.1 **15 Claims**

1. A radio frequency circulator, comprising:

a semiconductor substrate having a ground plane conductor disposed over a first surface thereof;

a patterned metal node layer disposed over a second opposite surface of said substrate;

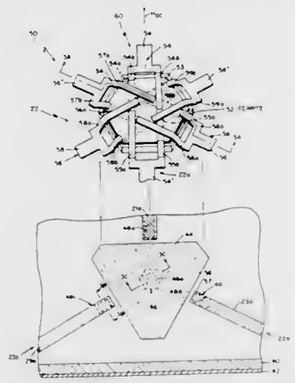
a patch of dielectric disposed under a central, relatively small portion of said patterned node layer;

a layer of metal disposed on said substrate between said substrate and patch of dielectric;

a plated via disposed through said substrate to couple said metal layer to said ground plane conductor;

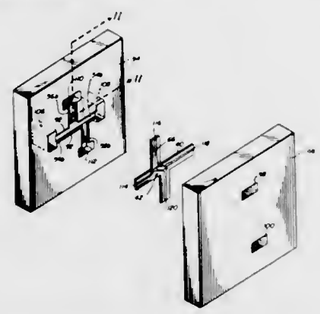
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a disc comprised of a ferromagnetic material disposed on said patterned layer;
a coupling structure disposed over said disc including at least two strip conductors spaced by a dielectric with first ends of said strip conductors providing termini of the



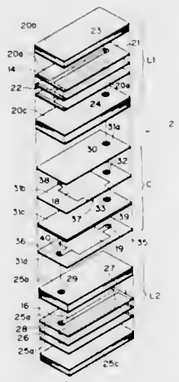
circulator and the second ends of said strip conductors disposed to be connected to said patterned metal layer disposed on the second surface of said substrate; and
means for providing a D.C. magnetic field through said ferromagnetic disc.

4,904,966
SUSPENDED SUBSTRATE ELLIPTIC RAT-RACE COUPLER
David Rubin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 24, 1987, Ser. No. 100,515
Int. Cl.[4] H01P *5/22*
U.S. Cl. 333—120 **13 Claims**



9. A suspended substrate rate-race coupler comprising:
a metallic housing having first, second and third channels for propagating electromagnetic energy in the TEM mode;
a suspended substrate circuit card positioned within said first, second, and third channels, having an electrically conductive pattern formed thereon, said pattern comprising a rat-race coupler, said conductive pattern coacting with said metallic housing to propagate electromagnetic energy in a predominant TEM mode down said first, second, and third channels;
said second and third channels each having near walls positioned relatively close to each other and each having far walls positioned relatively further away from each other, said second and third channel near walls each having a longitudinal axis, said longitudinal axes of said second and third walls being non-collinear and each of said longitudinal axes, whether or not extended, lying outside of the other channel.

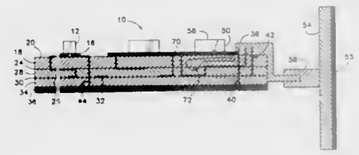
4,904,967
LC COMPOSITE COMPONENT
Hiroshi Morii; Yasuyuki Naito; Takeshi Azumi, and Yukio Sakabe, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Jan. 27, 1989, Ser. No. 303,449
Claims priority, application Japan, Jan. 27, 1988, 63-16517
Int. Cl.[4] H03H *7/00*
U.S. Cl. 333—185 **12 Claims**



1. An LC composite component comprising:
a laminated structure provided with first and second inductor layers and a capacitor layer positioned therebetween and having first and second opposite major surfaces, first and second opposite side surfaces and first and second opposite end surfaces,
said first inductor layer being provided with a first magnetic member and first conductor line means formed inside said first magnetic member, said first conductor line means having a first inner end portion positioned inside said first magnetic member and a first outer end portion exposed on said first end surface,
said second inductor layer being provided with a second magnetic member and second conductor line means formed inside said second magnetic member, said second conductor line means having a second inner end portion positioned inside said second magnetic member and a second outer end portion exposed on said second end surface,
said capacitor layer being provided with a dielectric member and first and second internal electrode means being opposite to each other through at least a part of said dielectric member, said first internal electrode means having a side end portion exposed on at least one of said first and second side surfaces, said second internal electrode means having first and second terminal parts positioned inside said dielectric member;
first conduction/connection means electrically connecting said first inner end portion with said first terminal part in the interior of said laminated structure;
second conduction/connection means electrically connecting said second inner end portion with said second terminal part in the interior of said laminated structure;

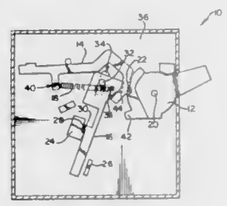
a first external electrode formed on said first end surface to be electrically connected with said first outer end portion;
a second external electrode formed on said second end surface to be electrically connected with said second outer end portion; and
a third external electrode provided on at least one of said first and second side surfaces to be electrically connected with said side end portion.

4,904,968
CIRCUIT BOARD CONFIGURATION FOR REDUCING SIGNAL DISTORTION
John G. Theus, Sherwood, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Apr. 7, 1989, Ser. No. 334,827
Int. Cl.[4] H01P *5/00*
U.S. Cl. 333—246 **11 Claims**



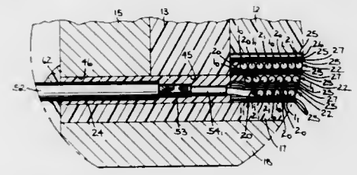
1. A circuit board comprising:
a signal plane having a plurality of signal traces,
a first insulating layer above said signal plane,
a connector having a ground pin and a signal pin, the signal pin connecting to one of the signal traces,
a first device adjacent said connector, said first device having a ground terminal and a signal terminal,
means for connecting the signal terminal through said first insulating layer to one of the signal traces, and
a ground return plane on the surface of said first insulating layer which surrounds said first device and electrically connects the ground terminal of said first device to the ground pin of said connector.

4,904,969
ELECTRIC CIRCUIT BREAKER
Dante Bagalini, Johannesburg, South Africa, assignor to Circuit Breaker Industries Limited, Elandsfontein, South Africa
Filed Jul. 29, 1988, Ser. No. 226,476
Int. Cl.[4] H01H *9/20*
U.S. Cl. 335—167 **19 Claims**



1. A circuit breaker mechanism, which includes an operating handle, which is pivotal about a pivotal axis between on, off and tripped positions and which has an armature engaging portion;
a moving contact carrier which is pivotally connected with the operating handle at a pivotal connection region that is spaced from the pivotal axis of the operating handle to be pivotal between on and off positions;
an armature component that is substantially slidably displaceable between latched and tripped positions and has a reset portion engageable by the armature engaging portion of the operating handle, said armature component having a latching formation a fixed holding element that is engaged by the latching formation to hold the armature component in its latched position; and
an urging means connected between the contact carrier and the armature component for displacing the armature component, the contact carrier and the operating handle.

4,904,970
SUPERCONDUCTIVE SWITCH
Vishnu C. Srivastava, Florence, S.C., assignor to General Electric Company, Milwaukee, Wis.
Filed Feb. 17, 1988, Ser. No. 157,205
Int. Cl.[4] H01F *7/22*
U.S. Cl. 335—216 **13 Claims**



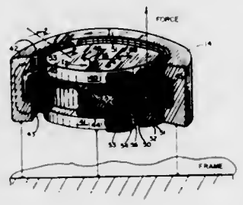
1. A superconducting switch, comprising:
a core;
a heater element wrapped around the core;
at least two separate lengths of superconducting wire bifilarly wound in at least one layer around the core, said bifilar winding of each wire being made by bending the wire in the middle and starting the winding around the core at the bend, each wire having an input portion on one side of the bend and an output portion on the other side of the bend so that two wire portions from each wire are wound in side by side relation to make up each layer of wire windings;
a casing enclosing the core, heater element and wire windings;
a solid body filling the voids between the casing and the core to restrain the wire against movement;
wherein each superconducting wire comprises a multitude of filaments of superconducting material held in a cupronickel matrix and the diameter of each filament is less than approximately 32 microns; and
the switch is capable of conducting a persistnet current of at least approximately 1500 amperes in an external magnetic field of zero Tesla.

4,904,971
SUPERCONDUCTIVE ELECTROMAGNET
Korda K. Jin, Brea, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Feb. 8, 1988, Ser. No. 153,740
Int. Cl.[4] H01F *7/22;* **H01B** *12/00*
U.S. Cl. 335—216 **9 Claims**

1. A superconducting electromagnet comprising:
an outer core having an aperture;
an inner core having a periphery characterized for complementary insertion into said outer core aperture leaving a uniform gap therebetween;
a frame means for coupling said outer and inner cores into a fixed position relation;
a magnetizing means for developing a flux field having a closed flux path passing through a inner core, said first gap, said outer core, across a second gap to said inner core in response to excitation of said magnetizing means;
said outer and inner cores being coated on all surfaces except

opposing inner and outer core gap surfaces with superconductive material;

said superconductive material being applied to said outer and inner cores at regions selected to pass induced magnetizing current, said induced magnetizing current circulating via closed current paths within said superconductive material to support said flux substantially free of energy loss on termination of excitation of said magnetizing means; and



a force coil for connection to a control current source, said force coil being shaped for insertion in and free movement within the gap between said opposing inner and outer core gap surfaces, said force coil being coupled to apply a force to a workpiece in response to application of a control current to said force coil in the presence of said flux field in said first and second gaps.

4,904,972

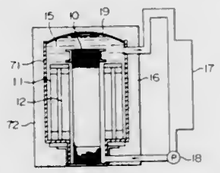
GAS-INSULATED STATIONARY INDUCTION ELECTRICAL APPARATUS

Etsunori Mori; Tadashi Kiuchi; Kiyoto Hiraishi, and Masaru Watanabe, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 28, 1989, Ser. No. 372,309

Int. Cl.[4] H01F *27/08*

U.S. Cl. 336—55 **5 Claims**



1. A gas-insulated stationary induction electrical apparatus comprising:

a first closed vessel sealing accommodating therein a main body having an iron core formed by laminating silicon steel sheets and also having at least one set of windings each consisting of a high-voltage winding and a low-voltage winding which are disposed apart from said iron core on both side thereof, and a liquid medium for effecting cooling and insulation;

a second closed vessel formed of an insulating material and sealingly accommodating therein said first closed vessel; and

an insulating gas under a predetermined pressure which is sealed within the gap between said first and second vessels,

wherein said main body is submerged in said liquid medium.

4,904,973

FOIL-ROLL ELECTRONIC PART

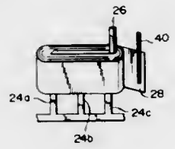
Takeshi Ikeda, 5-6-213 Sanno-2, Ohta-Ku, Tokyo 143, Japan

Filed Jan. 13, 1988, Ser. No. 144,874

Claims priority, application Japan, Jan. 14, 1987, 62-4967; Jan. 7, 1988, 63-1774

Int. Cl.[4] H01F *15/10, 15/14*

U.S. Cl. 336—69 **10 Claims**



1. A rolled foil electronic part comprising:

at least three flat leads arranged substantially parallel to, and spaced apart at scheduled intervals from, each other, with the flat surface of said at least three leads substantially in the same plane;

at least one belt-shaped conductive foil rolled a selected number of turns around said at least three leads substantially perpendicularly to the main axis of said leads; and

at least one insulating film rolled a selected number of times around said at least three leads substantially perpendicularly to the main axis of said leads, each of said at least one insulating film adjacent the inner surface of each of said at least one belt-shaped conductive foil;

wherein one end of at least one of said at least one belt-shaped conductive foil is connected in the center of the rolled-foil electronic part to a given lead of said at least three leads, and wherein a portion of at least one of said at least one belt-shaped conductive foil is connected to another of said at least three leads other than in the center of the rolled-foil electronic part.

4,904,974

CONNECTING STRUCTURE OF COIL IN ELECTROMAGNETIC RELAY

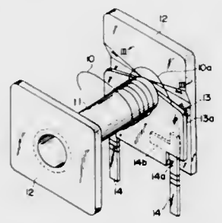
Hideaki Tsuji, Yamagashi, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 13, 1989, Ser. No. 322,013

Claims priority, application Japan, Mar. 14, 1988, 63-33583[U]

Int. Cl.[4] H01F *15/10*

U.S. Cl. 336—192 **2 Claims**



1. A coil connecting structure in an electromagnetic relay in which a pair of flanges are provided on both sides of a bobbin and a coil core wire is wound around an outer periphery of the bobbin, said structure comprising:

a pair of pockets which are provided in both side portions of one of said flanges and in each of which an enclosing groove is formed and a lateral groove is formed so as to communicate with said enclosing groove; and

a pair of connecting terminals each of which has a thickness almost equal to a gap in the direction of thickness of said pocket and has a projecting portion adapted to be fitted into said lateral groove and is fitted into the pocket with a pressure,

wherein a starting side of the coil core wire is wound around one of said connecting terminals and a terminating side of the coil core wire is wound around the other connecting terminal.

4,904,975

COIL FORMER FOR A HIGH-VOLTGE TRANSFORMER

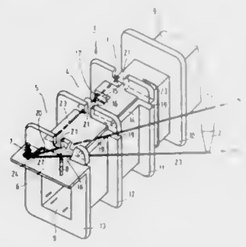
Gernot Medenbach, Braunfels, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 13, 1989, Ser. No. 297,819

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1988, 3801334?

Int. Cl.[4] H01F *15/10, 27/30*

U.S. Cl. 336—192 **2 Claims**



1. A coil former for a high voltage transformer comprising: a hollow central body; winding chambers axially arranged on the central body; flanges which separate the winding chambers, the flanges being provided with passage slots which extend from winding chamber to winding chamber; and connection pins on a connection strip at one end of said body; further comprising, as an improvement, an additional wall member disposed over the hollow body which extends parallel to a wall of said body from a remotest winding chamber at the other end of said body to the connection strip and which forms, in conjunction with said body, a wire guiding gap which is opened at a side of the connection strip and at on one of its longitudinal sides; and wherein the flanges are slotted in a prolongation of the open wire guiding gap.

4,904,976

COMBINATION PLUG

Nan W. Liaq, No. 18, Tzu Yu Rd., Hsin Chu City, Taiwan

Filed Mar. 21, 1989, Ser. No. 326,670

Int. Cl.[4] H01H *85/02*

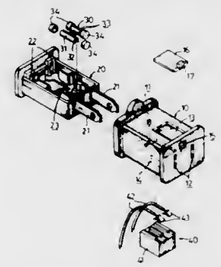
U.S. Cl. 337—197 **4 Claims**

1. A combination plug comprising:

an outer housing which is substantially a hollow shell having an opening at a rear face thereof, two slots at a front face thereof, a first access opening at an upper face thereof, a second access opening at a lower face thereof, a hole on the front face thereof proximate to said first access opening and horizontally positioned between the two slots, and a door for covering said first access opening;

an inner housing slidably insertable into the outer housing through said opening, said inner housing comprising a pair of prongs which are passable through the slots of the outer housing, a pair of openings at a rear face for receiving the prongs of an add-on plug, and an access opening at a lower face thereof which matches with said second access opening of the outer housing;

a fuse assembly retained within the inner housig, said fuse assembly comprising an H-shaped plastic fuse holder, a pair of fuses held in respective grooves of the plastic fuse holder, and four copper covers, each said cover covering respective terminal of the H-shaped fuse holder; and



a snap fitted conductor body fitted within said outer housing, said conductor body comprising a conductor tap casing, two conducting wires, and two conductor taps;

said fuse assembly contacting both the conductor taps of the conductor body and the prongs when in an assembled position, said copper covers providing a large contact surface between said fuses and said conducting taps of said conductor body and said prongs.

4,904,977

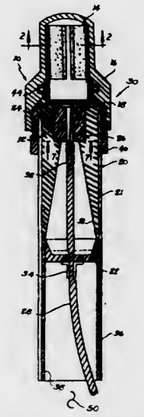
SUPERSONIC EXPULSION FUSE

William R. Mahieu, R.R. 4, Centralia, Mo. 65240

Continuation-in-part of Ser. No. 205,660, Jun. 13, 1988. This application Feb. 14, 1989, Ser. No. 310,794

Int. Cl.[4] H01H *85/42*

U.S. Cl. 337—281 **38 Claims**



1. A supersonic expulsion fuse in an ambient dielectric gas for conducting load currents and interrupting fault currents in a high voltage, alternating current network, comprising:

a. a pair of spaced arc terminating electrodes conductively connected in a current path of said network;

b. a fusible element conductively bridging said electrodes;

c. a short length, small cross-sectional area nozzle surrounding a portion of the length of said fusible element, said nozzle having an initial geometry and arc ablation charac-

teristics to remain nearly filled with plasma during most of the arcing period preceding the period of interruption of the highest fault currents said fuse must interrupt;

d. a pressure chamber effectively sealed over one end of said nozzle, thereby enclosing one of said electrodes, designated the high pressure electrode; and

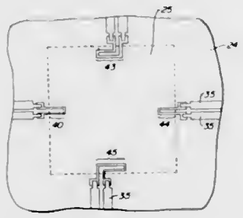
e. an expansion chamber, effectively sealed over the opposing end of said nozzle and opening to said ambient gas through a flow area greater than said cross-sectional area of said nozzle, and the other electrode of said pair, designated the low pressure electrode, being initially located either inside said expansion chamber or outside it in said ambient gas.

4,904,978

MECHANICAL SENSOR FOR HIGH TEMPERATURE ENVIRONMENTS

Phillip W. Barth, Palo Alto, and Kurt E. Petersen, San Jose, both of Calif., assignors to Solartron Electronics, Inc., Oxnard, Calif.

Filed Apr. 29, 1988, Ser. No. 187,687
Int. Cl.[4] H01C *10/10*; G01L *1/22*
U.S. Cl. 338—47 **11 Claims**



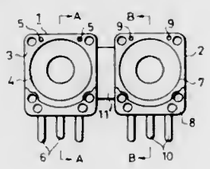
1. A sensor comprising:
a base having an opening therein;
a flexing layer connected to the base and disposed over the opening;
a first layer of insulator disposed on the flexing layer;
a monocrystalline silicon resistive region deposited on the first layer;
a second layer of electrically-insulating material disposed over the resistive region; and
electrical connections to the resistive region at at least a first and second contact location.

4,904,979

COMPONENT ASSEMBLY FOR ELECTRICAL PART

Akira Oyama, and Junichi Kuratani, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 172,954, Mar. 17, 1988, Pat. No. 484,548, which is a division of Ser. No. 7,614, Jan. 28, 1987, abandoned.
This application Apr. 4, 1989, Ser. No. 333,822
Claims priority, application Japan, Apr. 21, 1986, 61-90011
Int. Cl.[4] H01C *10/16*
U.S. Cl. 338—132 **4 Claims**



1. A component assembly to be used in assembling an electrical part having a pair of resistor components controlled by a single shaft with sliding contacts thereon each contacting a respective one of the resistors, comprising:

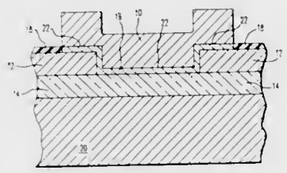
a pair of similar resistor components each having a base on which a resistor surface is formed and a frame formed integrally with the base, wherein the frames of the pair of similar resistor components are joined together by a connecting plate, and their resistor surfaces are formed under similar conditions with the frames joined together so that the resistor surfaces have similar electrical characteristics, whereupon said connecting plate can be severed and then separated, similar resistor components having similar electrical characteristics can be assembled as the resistor components for the electrical part, in order that operation of the single shaft can result in a similar response from each of the assembled pair of resistor components.

4,904,980

REFRACTORY RESISTORS WITH ETCH STOP FOR SUPERCONDUCTOR INTEGRATED CIRCUITS

John X. Przybysz, Penn Hills, and Joseph Buttyan, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 19, 1988, Ser. No. 234,436
Int. Cl.[4] H01C *1/012*
U.S. Cl. 338—307 **10 Claims**



1. A method for preparing molybdenum resistors in a superconductor integrated circuit; said method comprising:

(a) depositing superconductor film on a support;

(b) patterning said superconductor film to provide a patterned superconductor and exposed support;

(c) applying an aluminum film on said superconductor film and said exposed support;

(d) applying a molybdenum film on said aluminum film to provide an aluminum-molybdenum, etch-stop interface;

(e) applying a patterned resist film on said molybdenum film to provide exposed molybdenum film and unexposed molybdenum film;

(f) etching said exposed molybdenum film to define the molybdenum resistor and expose a portion of said aluminum-molybdenum, etch-stop interface; and

(g) oxidizing said exposed aluminum-molybdenum, etch-stop interface, whereby the aluminum-molybdenum, etch-stop interface protects the patterned superconductor film and the support and increases processing margins for the etch time.

9. A molybdenum resistor configuration for a superconductor integrated circuit; said resistor comprising:

(a) a support;

(b) areas of superconductor film covering portions of said support;

(c) a 10–200 Angstroms thick aluminum film on said areas of superconductor film;

(d) an aluminum-molybdenum etch stop interface on said aluminum film;

(e) a molybdenum film on said aluminum-molybdenum etch stop interface; and

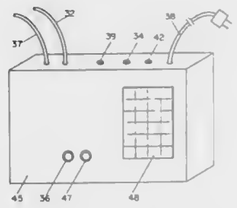
(f) an aluminum oxide film on said support covering portions of said support not covered by said areas of superconductor film.

4,904,981

MULTIFUNCTIONAL BASKETBALL GAME MONITORING UNIT

Thomas C. Mele; Mary K. Mele, both of 4804 Palisade Dr.; Robert C. Dyer, and Margaret A. Dyer, both of 4806 Palisade Dr., all of Austin, Tex. 78731

Filed Jan. 5, 1989, Ser. No. 293,703
Int. Cl.[4] G08B *23/00*; A63B *71/06*
U.S. Cl. 340—323 R **6 Claims**



4. A multifunctional basketball game monitoring unit comprising:

A. a housing,

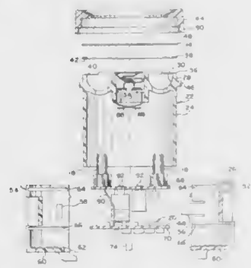
B. an electronic circuitry means in said housing connected with a sensor means to determine when a basketball passes through a hoop, and with an impact sensor means to determine when said basketball impacts said hoop and when said basketball impacts the backboard, said electronic circuitry means acting to calculate, store, and display total score of baskets made and percent of baskets made of total baskets attempted.

4,904,982

VISUAL AND AUDIBLE WARNING DEVICE

M. Jeremy Lieb, Northbrook, and Paul T. Ng, Vernon Hills, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 18, 1988, Ser. No. 161,458
Int. Cl.[4] G08B *7/00*
U.S. Cl. 340—326 **21 Claims**



1. A visual audible warning device comprising:

a light transmitting member operable to at least transmit vibrations of a predetermined frequency,

a piezoelectric element affixed to a portion of a first side of said light transmitting member operable to cause said vibrations upon receiving a predetermined electrical signal, said piezoelectric element comprising a metallic resonator plate affixed on one side thereof to said first side of said light transmitting member, and a piezoelectric ceramic coating affixed to an opposite side of said metallic resonator plate, said plate having a small dimension relative to said light transmitting member to permit light to be transmitted through a substantial portion of said light transmitting member,

a plurality of illuminative light emitting elements positioned adjacent another portion of said first side of said light transmitting member, other than the portion to which said piezoelectric element is affixed, said light transmitting elements being spaced from the perimeter of the light transmitting member and spaced from the piezoelectric element, each of said light emitting elements being spaced substantially equally distant from adjacent light emitting elements, and means coupled with said piezoelectric element and said light emitting elements for causing said predetermined electrical signal to generate a plurality of signals, a first selected portion of said signals actuating said piezoelectric element and a second selected portion of said signals causing energization of said plurality of light emitting elements,

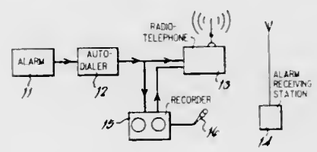
whereby upon actuation of said means an audible warning signals is emitted by said piezoelectric element and said light transmitting member and a visual warning is transmitted by at least one of said light emitting elements through the light transmitting member so as to be visible in light or dark conditions.

4,904,983

ALARM SYSTEM

Steven Mitchell, 108 Brentmoor Road, Bramhall, Cheshire, England

Filed May 13, 1987, Ser. No. 49,227
Claims priority, application United Kingdom, Jun. 5, 1986, 8613694; Aug. 2, 1986, 8618948
Int. Cl.[4] G08B *25/02*; B60R *25/10*
U.S. Cl. 340—426 **7 Claims**



1. An alarm system for vehicles and other movable entities, comprising:

alarm means for detecting a desired alarm condition;

auto dialing means activated by the alarm means;

radiotelephone means actuated by the auto dialing means for being put in radiotelephonic connection with an alarm receiving station;

recording means for recording a two-part message which message is to be broadcast to the alarm receiving station by the radiotelephone means;

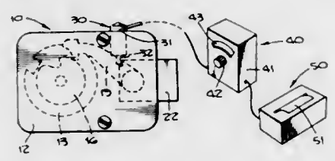
said message comprising fixed information identifying the vehicle or other movable entity and variable information identifying the present location of the vehicle or other movable entity; and

means for recording said variable information adapted to be used each time the vehicle or other movable entity is left at a new location and for informing the alarm receiving station that there is an alarm condition, which vehicle or other movable entity the alarm condition is associated with, and the present location of said vehicle or other movable entity.

4,904,984
COMBINATION LOCK WITH AN ADDITIONAL SECURITY LOCK

Klaus W. Gartner, 2632 Via Anacapa, Palos Verdes Estates, Calif. 90274, and Alan K. Uyeda, 8317 Elsomore Dr., Rosemead, Calif. 91770

Filed Jun. 10, 1988, Ser. No. 205,447
Int. Cl.[4] E05B *45/06*; G06F *7/04*; H01H *47/00*
U.S. Cl. 340—543 10 Claims

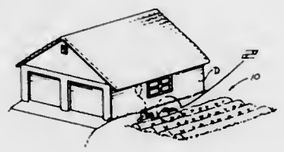


1. In a combination lock having a housing, a bolt moveable relative the housing, a bolt locking mechanism operable between a bolt locking and bolt release condition through entry of a lock opening combination by digital input of a predetermined code to operate the locking mechanism, the improvement comprising the provision of:
an electrically operable solenoid having an armature post normally biased outwardly of a solenoid body;
mounting means for mounting said solenoid body to said housing with said post positioned to normally block a lock opening movement of said bolt relative said housing; and
electrical signal generating means operable by said digital input of a predetermined code for selectively operating said solenoid to retract said post and thereby release said bolt for movement by the associated locking mechanism.

4,904,985
MOLE DETECTOR APPARATUS

Lendel D. Hall, 16840 S. Memorial, Bixby, Okla. 74008

Filed Jan. 9, 1989, Ser. No. 295,141
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—573 8 Claims

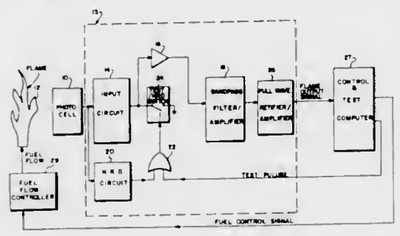


1. A mole detection apparatus for positioning in overlying relationship to a burrow, comprising,
a framework means for straddling and overlying said burrow, and
a switch pivotally mounted to said framework means pivotal from a first lower position to a second raised position relative to said framework, and
an audible alarm remotely mounted relative to said framework for actuation upon said switch's pivoting to said second raised position for indication of a mole in said burrow.

4,904,986
IR FLAME AMPLIFIER

B. Hubert Pinckaers, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 4, 1989, Ser. No. 293,377
Int. Cl.[4] G08B *17/12*; F23N *5/08*
U.S. Cl. 340—578 56 Claims

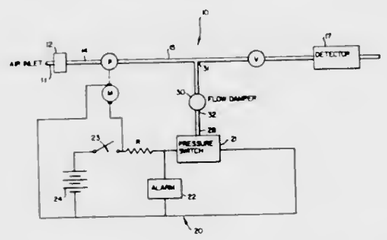


1. A flame detector for use with flame detection means for detecting the presence of a flame and producing a flame signal which includes an AC component and a DC component when the flame is detected and for producing a no-flame signal when no flame is detected, the flame detector comprising:
input means, coupled to the flame detection means, for receiving and buffering the AC component of the flame signal thereby providing an AC buffered flame signal;
filter means, coupled to the input means, for filtering the AC buffered flame signal thereby providing an AC filtered flame signal;
output means, coupled to the filter means, for amplifying the AC filtered flame signal and for providing a flame output signal;
shorting means, coupled to the input means, for substantially, selectively short circuiting the AC component of the flame signal to a known voltage level; and
hot refractory detection means, coupled to the flame detection means, for detecting the no-flame signal and for generating an HRD signal causing the AC component of the flame signal to be substantially short circuited to a known voltage level, thereby substantially eliminating a false flame output signal caused by hot refractory shimmering.

4,904,987
AIR SAMPLING AND ALARM CONTROL SYSTEM

William T. Fleming, 139 Red Mill Rd., Glen Gardner, N.J. 08826, and Hill S. Lalin, 10 Bonita Ter., Wayne, N.J. 07470

Filed Dec. 16, 1987, Ser. No. 133,615
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—611 6 Claims



1. An air sampling and alarm control system comprising a vacuum pump driven by a motor, with one end of said vacuum pump open to the atmosphere, air sample detection means connected to the opposite end of said vacuum pump for detecting the presence of a predetermined contaminant in a sample of said atmosphere drawn through said vacuum pump, a pressure switch pneumatically connected at one end thereof to a common connection between said vacuum pump and said sample detection means and said pressure switch being pneumatically open to the atmosphere at the opposite end thereof,
with said pressure switch being connected electrically in circuit between a source of power and an audible alarm for actuating said alarm in response to a predetermined pressure change at said common connection between said vacuum pump and said sample detection means, and air flow damping means interposed between said pressure switch and said common connection for dampening pulsations in air flow caused by said motor drive.

4,904,988
TOY WITH A SMOKE DETECTOR

Charles E. Nesbit, 9206 Willard Ct., Des Moines, Iowa 50322, and Mark S. Nesbit, 1248 17th, West Des Moines, Iowa 50265

Filed Mar. 6, 1989, Ser. No. 319,616
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—628 31 Claims



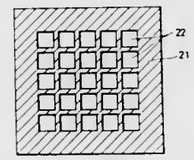
1. A fire safety device, comprising:
a portable toy including a body secton formed of pliable shock absorbent material, a hollow interior cavity surrounded by said body section, and an access opening in said body section communicating with said interior cavity;
an alarm signal device disposed within said interior cavity; wherein said alarm signal device emits an audible alarm having a sound output equivalent of at least about 70 decibels and
means for activating said alarm signal device when a fire condition is detected in the vicinity of said toy.

4,904,989
DISPLAY DEVICE

Makoto Matsui, Kunitachi; Jun-ichi Ohwada, Hitachi; Yasuhiro Shiraki, Hino, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 467,301, Feb. 17, 1983. This application Oct. 30, 1987, Ser. No. 115,616
Claims priority, application Japan, Feb. 17, 1982, 57-22744
Int. Cl.[4] G09G *3/20*
U.S. Cl. 340—719 7 Claims

1. An active matrix display device comprising:
picture elements which are arrayed on a transparent insulating substrate;
a semiconductor layer formed on said transparent insulating substrate;
a transistor matrix which is formed using said semiconductor layer; and
bus conductors coupled to said transistor matrix,
wherein said semiconductor layer is formed in the shape of a mesh, and said bus conductors extend only inside an area where said mesh-shaped semiconductor layer exists so as

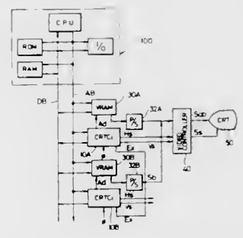


not to extend over edges of said mesh-shaped semiconductor layer.

4,904,990
DISPLAY CONTROL DEVICE

Hiroshi Takeda, Koganei; Shigeaki Yoshida, Sayama, and Koyo Katsura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 686,594, Dec. 26, 1984, Pat. No. 4,720,708. This application Jan. 15, 1988, Ser. No. 144,279
Claims priority, application Japan, Dec. 26, 1983, 58-243802
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—814 9 Claims



1. A system including memory means for storing image data, a central processing unit coupled to said memory means and a display system coupled to said central processing unit and said memory means, wherein said central processing unit controls said display system and supplied image data to said memory means and wherein said display system displays image data stored in said memory means on a display device as an image display formed of horizontal scanning lines with a preselected timing, said display system comprising:
means, including at least first and second display control devices, for accessing said memory means to read out said image data, each of said first and second display control devices including
(a) scanning counter means, incremented at a rate based on a required timing of access to said memory means, for generating a count which is repeated in accordance with said preselected timing,
(b) address generating means, responsive to said scanning counter means, for generating sequential addresses for accessing said memory means,
(c) timing signal generator means, responsive to said scanning counter means, for generating a horizontal synchronizing signal and a vertical synchronizing signal based on said count, wherein said timing signal generator means includes means for discriminating between an odd-numbered display field and an even-numbered display field so that said timing signal generating means provides interlace scanning,
(d) synchronizing signal generator means, responsive to said

timing signal generator means, for generating a periodic synchronizing signal,

(e) control terminal means for transmitting said periodic synchronizing signal to or receiving a periodic synchronizing signal from another of said display control devices,

(f) switching means for connecting said control terminal means either to said synchronizing signal generator means for sending out said periodic synchronizing signal or to said scanning counter means and said discriminating means so that a periodic initialization of said scanning counter means is effected and said discriminating means is periodically set to a predetermined state in response to an externally received periodic synchronizing signal;

display means connected to said memory means for displaying image data read out of said memory means in response to said first and second display control devices, respectively, as superimposed images with identical timing; and

synchronizing control means for connecting the control terminal means of said first display control device to the control terminal means of said second display control device, so that said periodic synchronizing signal generated in one of said first and second display control devices may be applied to the other of said first and second display control devices.

4,904,991

DISPLAY UNIT SUBJECT TO AMBIENT LIGHT HAVING LIGHT-REFLECTIVE AND LIGHT-EMITTING DISPLAY ELEMENTS

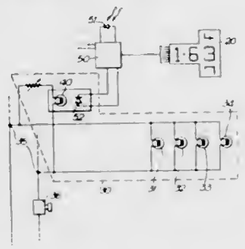
John W. D. Jones, Stonehouse, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Nov. 30, 1987, Ser. No. 126,983

Claims priority, application United Kingdom, Dec. 10, 1986, 8629488

Int. Cl.[4] G08B *5/00*

U.S. Cl. 340—815.15 **6 Claims**



1. Illumination means for a display unit of the kind visually displaying data, as for example in an aircraft instrument or the like, and being of the kind in which both light-emitting elements and light-reflective display elements are concurrently operative and in which both said light-reflective and light-emitting elements are at times subject to ambient light impinging thereon, said illumination means comprising:

first illumination means comprising at least one lamp so disposed as to illuminate substantially only said light-reflective elements,

a first light detector for providing an output which is a manifestation of only the intensity of ambient light incident on said display unit,

a second light detector shielded from ambient light,

second illumination means having illumination characteristics substantially the same as said first illumination means,

said second light detector being illuminated substantially only by said second illumination means to thereby cause said second light detector to provide an output which is a manifestation of only the intensity of illumination provided by said first illumination means on said light-reflective elements,

adjustable control means for varying the intensity of illumination provided by said first illumination means,

and means jointly responsive to both said first detector in accordance with the level of ambient light and also to said second detector in accordance with the level of illumination provided by said second illumination means to control the level of illumination of said light-emitting elements.

4,904,992

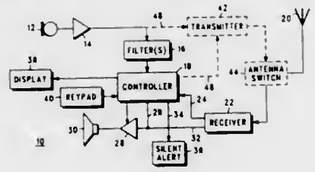
RADIO WITH MESSAGE RECEPTION AND AMBIENT NOISE LEVEL CONTROLLED INDICATOR

Timothy A. Grothause, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 28, 1989, Ser. No. 330,324

Int. Cl.[4] H04Q *7/02*

U.S. Cl. 340—825.44 **25 Claims**



1. A radio, comprising:

means for determining ambient sound level;

means for receiving an information signal;

means for comparing said ambient sound level to a threshold level, and for providing a control signal when said ambient sound level is at least equal to said threshold; and

delay means for delaying activation of a message received indicator in response to said control signal.

4,904,993

REMOTE CONTROL APPARATUS WITH SELECTABLE RF AND OPTICAL SIGNAL TRANSMISSION

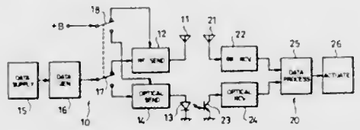
Kazuo Sato, Iwanuma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Feb. 9, 1987, Ser. No. 12,013

Claims priority, application Japan, May 16, 1986, 61-73686[U]

Int. Cl.[4] H04Q *7/00*

U.S. Cl. 340—825.570 **1 Claim**



1. A remote control communication apparatus comprising: a transmitter having a radio signal sending circuit connected to a transmitting antenna, an optical signal sending circuit connected to a light emitting element, data supplying means for supplying data to be transmitted by one of said radio signal sending circuit and said optical signal sending circuit, a battery power source, and switching means for selectively switching said data supplying means and said battery power source to one of said radio and optical signal sending circuits, wherein said optical signal sending circuit has the characteristic of requiring substantially less power from said battery power source for sending an optical signal than said radio signal sending circuit requires to send a radio signal; and

a receiver having a radio signal receiving circuit connected to a receiving antenna for receiving the radio signal from said transmitter, an optical signal receiving circuit connected to a light detecting element for receiving the optical signal from said transmitter, and data processing means for processing data received by said radio signal receiving circuit and said optical signal receiving circuit,

whereby, when a user provided said the transmitter is within unimpeded visual range of a location where said receiver is installed, the user can switch over said switching means to transmit an optical signal to said receiver in order to save consumption of power from said battery power source.

4,904,994

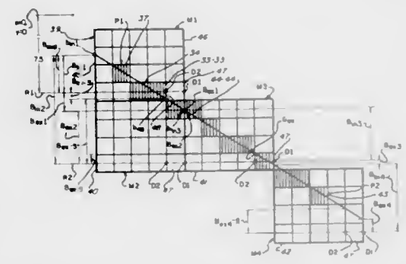
APPARATUS AND METHOD FOR IDENTIFYING NEXT MATRICES FOR VECTOR DRAWING

Carey J. Sasser, Itasca, Ill., and Vahid A. Samiee, Tualatin, Oreg., assignors to Auto-trol Technology Corporation, Denver, Colo.

Filed Sep. 8, 1987, Ser. No. 94,469

Int. Cl.[4] G09G *1/14*

U.S. Cl. 340—744 **18 Claims**



1. Apparatus for vector to pixel conversion to draw a vector on a display screen having pixels thereon extending in both x and y coordinate directions, said vector having directional characteristics indicating the direction thereof, comprising:

means for dividing all of said pixels on said screen into a fixed array of matrices, each said matrix having a size defined by a given number of pixels in said x coordinate direction and by a selected number of pixels in said y coordinate direction, a first pixel of said vector being inside a first of said matrices and a last pixel of said vector being inside a last one of said matrices;

means for defining the location of first and second decision points within each of said matrices of said display screen;

first means for generating an exit intersection signal representing the location of an intersection of said vector with an exit side of each current matrix through which said vector extends before extending into a next matrix following each said current matrix;

next matrix means responsive to said exit intersection signal and certain of said directional characteristics for generating a next matrix signal to identify which of said matrices in said fixed array is the next matrix with respect to a given current matrix, said next matrix signal being generated according to the location of said intersection relative to said first and second decision points; and

matrix address means initially being effective for generating a matrix address signal for a current matrix, said matrix address means being responsive to said next matrix signals for changing said matrix address signal to that of the matrix address of each said next matrix through which said vector extends.

4,904,995

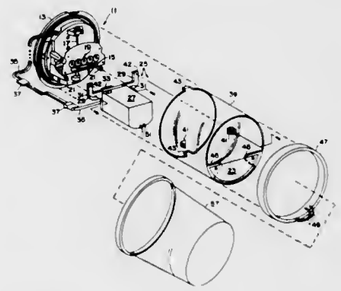
INTEGRATED REMOTE ELECTRICITY METER TRANSPONDER AND COMBINATION

Mark N. Bonner, Yardley, Pa.; Ralph H. Carmen, Lebanon; Geoffrey F. Ringle, Trenton; Douglas W. Smith, Belle Mead; Izrail Tsals, Princeton Junction, all of N.J.; Thomas G. Moore, Jr., Kirkwood, and Ronald K. Hamlin, St. Peters, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 21, 1986, Ser. No. 820,071

Int. Cl.[4] G08C *9/06*

U.S. Cl. 340—870.02 **2 Claims**



1. In combination, an electricity meter for connection to an electric distribution system having a base on which meter components are mounted, said components including means for measuring the energy from the electric distribution system used by a user and a display mounted on the front of the meter for visually displaying data representing the energy used, remote transponder means secured to the front of the meter adjacent the measuring means without obscuring the display for transmitting data over the electric distribution system, said transponder means extending substantially outwardly from the front of the meter, said data including data representing the energy used by a user, said transponder means including a closed housing extending substantially outwardly from the front of the meter, means for securing the housing to the meter without obscuring the meter display, means for obtaining information represented by the data from the measuring means, means for electrically connecting the remote transponder means through the electricity meter to the electric distribution system, a sleeve secured to the meter base which encircles and supports the transponder housing, a generally annular inductor mounted at the end of the sleeve opposite the meter face and means for electrically connecting the inductor to the transponder circuitry, said inductor being a heat source and being held separate from the transponder circuitry by the sleeve.

4,904,996

LINE-MOUNTED, MOVABLE, POWER LINE MONITORING SYSTEM

Roosevelt A. Fernandes, 104 Ruby Rd., Liverpool, N.Y. 13088

Filed Jan. 19, 1988, Ser. No. 145,506

Int. Cl.[4] G08C *9/06, 19/22*

U.S. Cl. 340—870.07 **29 Claims**

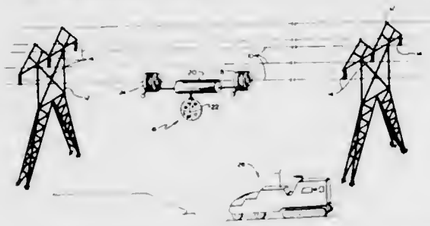
1. A mobile system for monitoring electrical, physical and/or environmental parameters and conditions associated with or in proximity to an energized electrical power conductor supported by insulators on a succession of towers extending along a power corridor, said system comprising:

(a) at least two toroidal propulsion modules;

(b) means for mounting and removing each said toroidal propulsion module to and from said energized conductor;

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(c) each said propulsion module including means powered by current flowing through said conductor for moving said propulsion module upon and along said conductor;
(d) means mounted to and movable with said propulsion modules for carrying equipment including means for imaging, measuring, sensing and/or recording data commen-



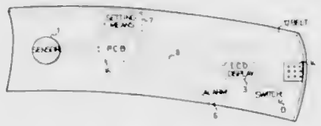
surate with at least one of said parameters and conditions at selected positions in proximity to said propulsion modules as the latter moves along said conductor;
(e) means for transmitting said data via an RF link; and
(f) means for receiving said data at a location remote from said conductor.

4,904,997

BELTED ELECTRONIC DISPLAY CLINICAL THERMOMETER WITH ALARM

Daniel Chen, 2Fl., No. 48, Lane 163, Sec. 5, Yen-Ping N. Rd., Taipei, and Houng Y. Liu, No. 193, Yung Mei Rd., Pu Hsin Li, Yang Mei Chen, Tao-Yuean Hsuean, both of Taiwan

Filed Dec. 17, 1987, Ser. No. 133,932
Int. Cl.[4] A61B *5/00*; **G01K** *7/00*; **G08B** *21/00*
U.S. Cl. 340—870.17 **4 Claims**



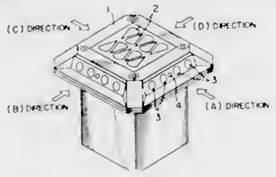
1. A belted electronic display clinical thermometer adopted for being secured about an arm of a person comprising:
a belt having an inner face, an outer face and means for fixing said belt about an arm of a user;
a thermal sensor mounted on said inner face to be held adjacent said arm, said thermal sensor having a resistance in proportion to a temperature of said arm to derive an internal signal proportional to said temperature of said arm;
a temperature measuring integrated circuit, said internal signal being applied to said temperature measuring integrated circuit, said temperature measuring integrated circuit developing an output signal corresponding to said temperature in response to said input signal;
a liquid crystal display to which said output signal is applied to provide a readable indication of said temperature;
a comparator to which said output signal is applied to compare said temperature to a preset reference temperature, said comparator developing a high signal when said temperature exceeds said reference temperature;
a trigger circuit responsive to said high signal to develop an analog output signal; and
an alarm for sounding an audible signal response to said analog output signal.

4,904,998

LIGHTING PEG WITH VARIABLE PULSATION RATE

Kikuo Niimi, Aichi, Japan, assignor to Kictec Incorporation, Nagoya, Japan

Filed Dec. 9, 1988, Ser. No. 282,480
Claims priority, application Japan, May 30, 1988, 63-70408[U]
Int. Cl.[4] E01F *9/00*; **G08G** *1/00*; **B60Q** *7/00*
U.S. Cl. 340—908.1 **4 Claims**



1. A lighting peg with a variable pulsation rate, comprising:
a square outer casing provided with a solar cell and a battery, and adapted to be installed at a road intersection;
light-emitting diodes and a photoelectric conversion element provided on each side-surface of said outer casing;
an ambient light sensor for sensing light of a surrounding area;
a comparator for comparing an output voltage of said solar cell with a reference voltage and providing an output;
a pulse signal generating circuit operated by an output of said ambient light sensor so as to generate a number of pulse signals of different rates; wherein upon operation of said pulse signal generating circuit, said light-emitting diodes provided on all of the side surfaces being operated by one of said pulse signals having the lowest rate;
vehicle sensors on each of said sides of said casing, each comprising said photoelectric conversion element series connected with a variable resistor, a differential circuit connected across said variable resistor, and a comparator comparing an output of said differential circuit with a reference voltage; and
a control circuit comprising OR gates, each receiving outputs of a pair of the vehicle sensors on opposite sides of said casing, discriminating circuits discriminating the outputs of the OR gates, and pulsation rate control circuits which control the rate of pulsation of the light emitted from said light emitting diodes toward said road intersection in accordance with those of the pulse signals generated from said pulse signal generating circuit.

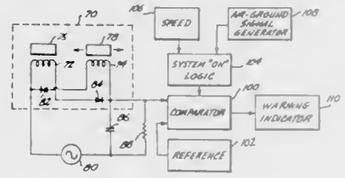
4,904,999

FAULT MONITORING SYSTEM FOR AIRCRAFT POWER CONTROL UNITS

James E. Klansnic, Bellevue, and Bernus G. Turner, Woodinville, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 28, 1983, Ser. No. 479,723
Int. Cl.[4] G05B *9/03*
U.S. Cl. 340—945 **6 Claims**

1. In an aircraft control surface positioning system wherein multiple actuator units respond to a control input to position the control surface, a monitoring system for detecting a fault condition in any one of said actuation units, the monitoring system comprising:
activation means for detecting the presence of a predetermined load condition on the control surface and activating the monitoring system in response thereto;
sense means for producing a sense signal related to the load at each actuator unit;
reference level means for producing a predetermined reference level signal;
comparator means for comparing each sense signal with said reference level signal and producing a fault signal in response to a predetermined relation therebetween; and,



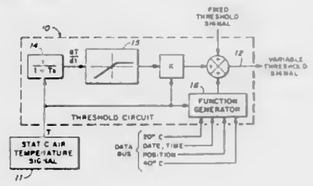
indicator means for producing a fault indication in response to a comparator means produced fault signal.

4,905,000

REACTIVE WINDSHEAR WARNING INSTRUMENT

Charles D. Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Apr. 3, 1987, Ser. No. 34,807
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—958 **13 Claims**



1. In an aircraft having means for providing a signal representative of a windshear condition; means for providing a temperature signal representative of the temperature of the air through which the aircraft is flying and the rate of change of the temperature representative signal; and means for providing a warning in the event that the signal representative of a windshear condition exceeds a threshold signal, the improvement comprising:
threshold setting means for decreasing the value of the threshold signal when the rate of change of the temperature representative signal is decreasing. further including means for providing a signal representative of the time and date; and means for biasing said threshold setting means to lower said threshold signal for predetermined ranges of times and dates.

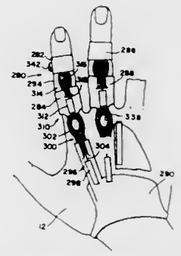
4,905,001

HAND-HELD FINGER MOVEMENT ACTUATED COMMUNICATION DEVICES AND SYSTEMS EMPLOYING SUCH DEVICES

Henry C. Penner, 3320 Bardstown Rd., #105, Louisville, Ky. 40218

Filed Oct. 8, 1987, Ser. No. 105,597
Int. Cl.[4] G06F *3/02*
U.S. Cl. 341—20 **5 Claims**

1. A finger movement actuated communication device individually responsive to thrust and push motions of at least one finger of a person's hand with reference to the metacarpal portion of the hand, said device comprising:
a metacarpal reference attachment member adapted to be secured to the back of the hand;
a first collar-like attachment member adapted to be secured to the proximal segment of the one finger so as to follow motion of the proximal segment;
a second collar-like attachment member adapted to be secured to a segment of the one finger beyond the proximal segment so as to follow motion of the middle segment of the one finger;
a first extendable switch assembly mechanically linking said metacarpal reference and said first collar-like attachment members such that said first extendable switch assembly lengthens and shortens as the proximal finger segment pivotally moves with reference to the metacarpal portion of the hand in a thrust motion, said first extendable switch assembly including a first switch element having two states, said first switch element being in one of its states when said first extendable switch assembly is lengthened and in the other of its states when said first extendable switch assembly is shortened; and



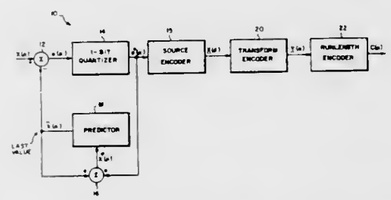
a second extendable switch assembly mechanically linking said first and second collar-like attachment members such that said second extendable switch assembly lengthens and shortens as the middle finger segment pivotally moves with reference to the proximal finger segment in a push motion, said second extendable switch assembly including a second switch element having two states, said second switch element being in one of its states when said second extendable switch assembly is lengthened and in the other of its states when said second extendable switch assembly is shortened;
whereby said first switch element responds to thrust motions of the finger and said second switch element responds to push motions of the finger.

4,905,002

DELTA MODULATION ENCODER/DECODER METHOD AND SYSTEM

Paul W. Jones, Churchville, and Majid Rabbani, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 9, 1988, Ser. No. 166,072
Int. Cl.[4] H03M *7/32*
U.S. Cl. 341—77 **10 Claims**



1. An encoder for use in a delta modulation encoder of the type which provides a binary level signal indicative of the difference between an input signal and the predicted value of

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the input signal being approximated by a positive or a negative step comprising:

a delay means for receiving said provided binary level signal and for providing an output delayed by one time period later;

an exclusive-OR means for receiving said binary level signal and the delayed signal from said delay means for providing a mod 2 transformed output signal; and

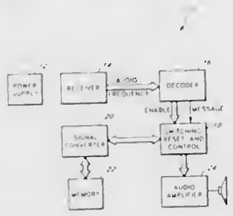
a runlength encoder means for runlength encoding the output signal from said exclusive-OR means.

4,905,003

ANALOG/DIGITAL DATA STORAGE SYSTEM

Richard J. Helferich, 154 Donegal Ave., Newbury Park, Calif. 91320, assignor to Richard J. Helferich, Newbury Park and Martin A. Schwartz, Chatsworth, both of, Calif., a part interest

Filed Jul. 24, 1987, Ser. No. 77,496
Int. Cl.[4] H03M *1/00*
U.S. Cl. 341—110 **41 Claims**



1. A digital voice storage communication system including:

at least one transmitting station selectively addressing and transmitting a communication packet including an address code followed by a voice message;

at least two receiving stations having a corresponding predetermined stored address, each comprising:

a. a receiver circuit for receiving an incoming signal carrying said communication packet;

b. decoder circuitry responsive to said receiver circuit for emitting a record enable signal responsive to said communication packet carried by said incoming signal, including:

a comparator for comparing said predetermined stored address with said communication packet address code and automatically generating said record enable signal in response to said comparison, without reference to a separate record enable signal from said transmitter;

c. digital memory for storing said voice message of said communication packet in response to said record enable signal;

d. signal conversion circuitry for converting digital data in said digital memory into analog data for playback.

4,905,004

CYCLE-PORTION ENCODER

Robert F. Thelen, Austin, Tex., assignor to University of Texas system The Board of Regents, Austin, Tex.

Filed Apr. 11, 1988, Ser. No. 179,962
Int. Cl.[4] G06F *1/04*
U.S. Cl. 341—116 **8 Claims**

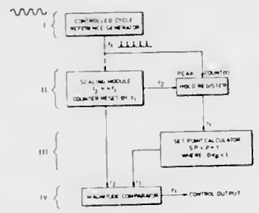
2. A control signal generator for generating a control output signal at a predetermined phase angle of a periodic input signal comprising:

(a) a reference signal generator for receiving the periodic input signal and generating a series of pulses at the frequency of the periodic input signal;

(b) a counter for developing a digital value representative of the current phase angle of the input signal, the counter being reset by each pulse in the series of pulses;

(c) a register operable coupled to said counter for holding a digital value representative of the period of the most recently completed input signal cycle;

(d) a setpoint calculator operably coupled to said register to



derive a preselected fraction of the contents of the register, the preselected fraction representing a predetermined phase angle; and

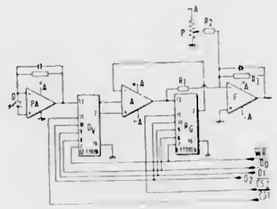
(e) a comparator operably coupled to the counter and the setpoint calculator such that a control output signal is generated when the counter value equals or exceeds the fraction of the value derived by the setpoint calculator.

4,905,005

LOGARITHMIC CONVERTERS AND THEIR APPLICATION TO THE MEASUREMENT OF TRANSMITTED LIGHT

Herve Arribard, Montmorency; Bruno Cornut, Pau; Gilbert Passade, Bizanos, and Claude Sesques, Pau, all of France, assignors to Inovelf, France

Continuation of Ser. No. 102,651, Sep. 30, 1987, which is a continuation of Ser. No. 860,208, May 6, 1986, abandoned. This application Apr. 27, 1988, Ser. No. 189,408
Claims priority, application France, May 6, 1985, 85 06820
Int. Cl.[4] H03M *1/18*
U.S. Cl. 341—139 **24 Claims**



1. An assembly for the conversion of an analog signal into a digital logarithmic signal, comprising:

a linear amplifier including means for receiving and linearly amplifying an analog signal;

gain varying means for varying the gain of said linear amplifier;

an analog-to-digital converter including means for receiving said linearly amplified analog signal from said linear amplifier and converting said linearly amplified analog signal into a digital signal;

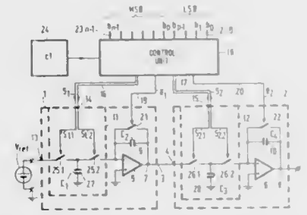
a computer including means for receiving said digital signal and control means for controlling said gain varying means to reduce the gain of said amplifier when the magnitude of said digital signal exceeds a predetermined limit indicative of the saturation point of said analog-to-digital converter, and further including means for converting said digital signal into a digital logarithmic signal according to a predetermined relationship between the logarithm of the digital signal and the gain of said linear amplifier, and wherein the reduction in said gain by said control means is limited to a predetermined value which does not impair the resolution of said analog signal such that, for a particular analog signal, a plurality of adjacent gain levels may be selected by said control means.

4,905,006

DIGITAL-TO-ANALOG CONVERTER

Marcellinus J. M. Pelgrom, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 5, 1988, Ser. No. 178,049
Claims priority, application Netherlands, Apr. 27, 1987, 8700982
Int. Cl.[4] H03M *1/76*
U.S. Cl. 341—150 **17 Claims**



1. A digital-to-analog converter for converting a digital signal having a word length n into an analog signal, comprising

a series arrangement of a first and a second integrating circuit each having an input an output and a control signal input, the output of the first integrating circuit being coupled to the input of the second integrating circuit,

a control unit for supplying a first and a second control signal at a first and a second output, respectively, coupled to the control signal input of the first and the second integrating circuit, respectively, for applying the first and the second control signal to the first and the second integrating circuit, respectively,

the first and the second integrating circuit being adapted to perform an integration step under the influence of the first and the second control signal, respectively, and the control unit being adapted to generate, in this order, the first control signal M1 times, the second control signal M2 times, the first control signal M3 times and the second control signal M4 times, characterized in that M2+M4 is equal to a constant (k) for converting arbitrary digital signals having a word length n.

4,905,007

CHARACTER INPUT/OUTPUT DEVICE

Samson Rohm, 9933 - 147 Street, Edmonton, Alberta, Canada (T5N 3B6)

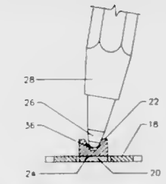
Filed May 29, 1987, Ser. No. 55,739
Int. Cl.[4] G06F *3/00*
U.S. Cl. 341—173 **21 Claims**

1. A character input/pointing and positioning device for a computer, comprising:

(a) a substantially planar centre plate:

(b) selection recognition means arranged around said centre plate;

(c) a disk centred at and slidably movable about said centre plate in a plane parallel to said centre plate such that said disk may be moved toward said selection recognition means to make a selection, said disk having a top cavity such that a tip of a pointed instrument may be inserted into



said cavity and confined thereby to control the movement of said disk.

4,905,008

RADAR TYPE UNDERGROUND SEARCHING APPARATUS

Akio Kawano, and Masaru Tsunasaki, both of Osaka, Japan, assignors to Osaka Gas Co., Ltd., Osaka, Japan

PCT No. PCT/JP87/00852, § 371 Date Jul. 5, 1988, § 102(e) Date Jul. 5, 1988, PCT Pub. No. WO88/03656, PCT Pub. Date May 19, 1988
PCT Filed Nov. 4, 1987, Ser. No. 238,096
Int. Cl.[4] G01S *13/08*
U.S. Cl. 342—22 **1 Claim**



1. A radar type underground searching apparatus comprising:

a pulse generating unit for periodically generating pulses having a fixed peak value;

a transmitting antenna for transmitting the pulses generated by said pulse generating unit from the ground surface into the ground;

a receiving antenna for catching reflected pulses caused by objects buried in said ground;

a housing for screening electromagnetic radiation and having one side open, said transmitting antenna and said receiving antenna being disposed in said housing;

a radio-frequency amplifier for amplifying a reflected wave corresponding to each of said pulses with an amplification which increases each time pulses are transmitted;

a sampler for obtaining a low-frequency signal formed by the extension of said reflected wave in time base by sampling the output of said radio-frequency amplifier at a series of sampling times, each being succeedingly delayed by a fixed period from the transmitting timing of each pulse wave; and

a waveform display unit for displaying the wave-form of a low-frequency signal appearing at the output of said sampler;

said transmitting antenna and said receiving antenna including:

a pair of antenna elements each made of a plate shaped like an isosceles triangle bent to form an obtuse angle between a vertex portion and a trapezium portion and having a fold

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line between said vertex portion and said trapezium portion generally running parallel with the trapezium base of said isosceles triangle and nearly symmetrically abutted to each other at each said vertex portion, each said vertex portion having a height arranged approximately equal to the height of said housing, and each said trapezium portion lying in the same plane in general as the open side of said housing;

a first load resistor and a second load resistor each connected at one of their ends to respective ends of the trapezium base of one antenna element of said pair of antenna elements;

a third load resistor and a fourth load resistor each connected at one of their ends connected to respective ends of the trapezium base of the other antenna element of said pair of antenna elements;

a first conductor and a second conductor each connected at one of their ends to respective other ends of said first resistor and said second resistor;

a third conductor and a fourth conductor each connected at one of their ends to respective other ends of said third resistor and said fourth resistor;

a fifth load resistor connected between said first conductor and said third conductor; and

a sixth load resistor connected between said second conductor and said fourth conductor;

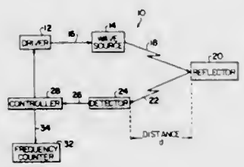
whereby the presence of said objects is detected by the presence of peaks in said low-frequency signal caused by the reflection from said objects and the depth of said objects is detected by the time of the appearance of said peaks.

4,905,009

DISTANCE MEASURING DEVICE

Bobby L. Ulich, Tuscon, Ariz.; Gregory H. Ames; Albert J. Lazzarini, both of Colorado Springs, Colo., and Edward K. Conkun, Hermosa Beach, Calif., assignors to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Jun. 1, 1987, Ser. No. 56,964
Int. Cl.[4] G01S *13/32*
U.S. Cl. 342—118 **8 Claims**



1. A distance measuring device for measuring the distance between the device and a target, said device comprising:

a source of continuous energy waves arranged for transmitting said energy waves along a path extending from said source to the target;

control means coupled to said wave source for activating and deactivating said wave source, said source continuously transmitting said energy waves in response to being activated and said source not transmitting said energy waves in response to being deactivated;

means located at said target for reflecting energy waves in a direction toward said device when such energy waves are transmitted in the direction of said target;

a single means located at said device for receiving energy waves reflected from said reflecting means located at said target, and

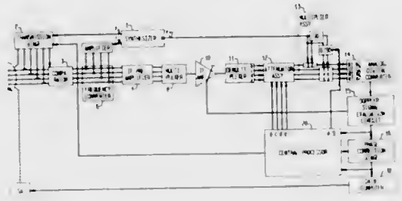
a single means located at and coupled to said receiving means for detecting the presence and absence of said energy waves, said detecting means being coupled to said control means and producing a first output signal in response to the detection of the absence of said energy waves to cause said control means to activate said wave source and producing a second output signal in response to the detection of the presence of said energy waves to cause said control means to deactivate said wave source, said wave source being alternately activated and deactivated at a frequency related to and representative of the distance between said device and said target.

4,905,010

METHOD FOR BALANCING CHANNELS IN A MULTICHANNEL PULSE RADAR SYSTEM AND A RADAR SYSTEM USING THIS METHOD

Rolf Baechtiger, Oberwil-Lieli; Pierino Pacozzi, and Albert Schenkel, both of Zurich, all of Switzerland, assignors to Siemens-Albis Aktiengesellschaft, Zurich, Switzerland

Filed Apr. 14, 1989, Ser. No. 338,929
Claims priority, application Switzerland, Jan. 31, 1989, 00314/89
Int. Cl.[4] G01S *13/44*
U.S. Cl. 342—151 **7 Claims**



1. A method for balancing n individual channels of a pulse radar system having multichannel signal evaluation, in which there is provided for the emission of the radar pulses and the reception of the echo signals a common antenna having a plurality of primary radiators corresponding to the number n of channel and in which a test signal is fed into the antenna or the feed lines of the primary radiators, wherein:

the IF-output signal of each channel is directly multiplied by a phase reference signal derived from a transmission oscillator of the radar system and also multiplied with a derived signal whose phase has been shifted by 90° with respect to said reference signal, so as to form 2n multiplication signals;

the 2n multiplication signals thus formed are subjected to an amplitude comparison with respect to a sum signal formed from the multiplication signals for developing amplitude correction signals, and by means of the resulting amplitude correction signals, the individual channel signals are regulated in a feedback type manner to the same amplitude value; and

the individual channel signals whose amplitudes have been so adjusted are then compared to the sum signal with respect to their phase and phase correction signals resulting from such comparison are used to adjust the phases of the individual channels to make them equal with respect to the phase of the sum signal.

4,905,011

CONCENTRIC RING ANTENNA

Donald F. Shea, Plano, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Jul. 20, 1987, Ser. No. 81,962
Int. Cl.[4] H01Q *21/06, 1/36*
U.S. Cl. 342—361 **6 Claims**

1. A broadband antenna comprising:

a first plurality of symmetrical paired antenna elements, positioned in a first circularly spaced relationship, each element having a first and a second end with the first and second ends of each of said elements proximate to the second and first ends respectively of adjacent elements in the circularly spaced relationship;

at least a second plurality of symmetrical paired antenna elements positioned in a second circularly spaced relationship and in a concentric spaced relationship with said first plurality of elements, each element having a first end and a second end with the first and second ends of each of said elements proximate to the second and first ends respectively of adjacent elements in the second spaced relationship and proximate to the second and first ends of adjacent elements in the concentrically spaced first plurality of elements;

a plurality of first switching means, each capable of being energized from an off state to an on state whereby a conducting path is formed through the switching means, each of the first switching means interconnected between the



first end of one of the antenna elements in said first circularly spaced relationship and the second end of the proximate antenna element in the concentrically spaced second plurality of elements;

a plurality of second switching means identical to said first switching means, each interconnected between the first end of one of the antenna elements in said second circularly spaced relationship and the second end of the proximate antenna element in the concentrically spaced first plurality of elements; and

means for an energizing said first switching means into a conducting or on state and each of said second switching means to non-conducting or off state, said energizing means alternately capable of energizing each of said second switching means to an on state and each of said first switching means to an off state, wherein energizing one of said first or second switching means to an on state determines the polarization of the antenna.

4,905,012

POWER EFFICIENT FEED NETWORK FOR TACAN ANTENNA ARRAYS

Stephen J. Foti, Tenterden, United Kingdom, assignor to ISC Cardion Electronics, Inc., Woodbury, N.Y.

Filed Jun. 8, 1989, Ser. No. 362,914
Int. Cl.[4] G01S *1/44*
U.S. Cl. 342—399 **8 Claims**

1. An antenna feed for a circular array of antenna elements which generate a TACAN radiation envelope comprising:

a source of radio frequency signals;

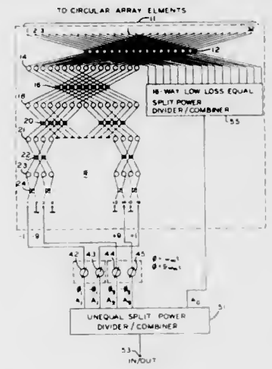
a power divider for providing first and second pairs of radio frequency signals from said source, and one additional signal larger in amplitude than each of said signals of each pair;

a first pair of phase shifters connected to receive said first pair of signals, and phase shifting said first pair of signals at a first periodic frequency;

a second pair of phase shifters connected to receive said second pair of signals and phase shifting said signals at a second periodic frequency;

a feed matrix connected to each element of said circular array, including a plurality of hybrid networks equal to one half the number of said elements, each having a pair of output ports connected to a pair of said and a pair of inputs;

a second power divider for dividing said one additional signal into a plurality of signals equal in number to said



number of hybrid networks, and supplying each of said plurality of said signals to one input of each hybrid network;

a phase shift network having first and second pairs of inputs connected to each pair of phase shifters, and providing a plurality of outputs for the remaining inputs of said hybrid networks, whereby a combined signal proportional to the sum of said phase shifted signals is applied to each hybrid; and,

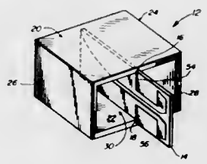
said circular array forming a pattern of radiation having an omni-directional component produced by said additional output signal and first and second modulation components from said first and second pairs of phase shifters.

4,905,013

FIN-LINE HORN ANTENNA

John Reindel, San Diego, Calif., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 25, 1988, Ser. No. 147,970
Int. Cl.[4] H01Q *13/00*
U.S. Cl. 343—786 **14 Claims**



1. A fin-line horn antenna assembly comprising:

a waveguide horn having a longitudinal axis and having an open end for radiating and receiving electromagnetic energy;

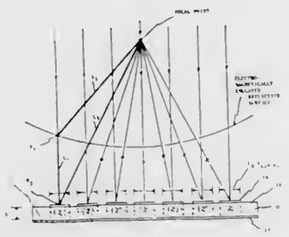
a planar, dielectric card positioned within said waveguide, the plane of said card being parallel to said longitudinal axis;
a layer of conductive material disposed on a surface of said card;
a fin-line slot for propagating electromagnetic energy, formed in said layer of conductive material;
a dipole radiator formed on said dielectric card and coupled to said fin-line slot for propagating electromagnetic energy therebetween; and
energy transition means formed on said dielectric card and operably coupled to said fin-line slot for providing coupling of electromagnetic energy from said waveguide to said fin-line slot.

4,905,014

MICROWAVE PHASING STRUCTURES FOR ELECTROMAGNETICALLY EMULATING REFLECTIVE SURFACES AND FOCUSING ELEMENTS OF SELECTED GEOMETRY

Daniel G. Gonzalez, Alhambra; Gerald E. Pollon, and Joel F. Walker, both of Malibu, all of Calif., assignors to Malibu Research Associates, Inc., Calabasas, Calif.

Filed Apr. 5, 1988, Ser. No. 178,063
Int. Cl.[4] H01Q *3/40*
U.S. Cl. 343—909 **68 Claims**



1. A microwave phasing structure for electromagnetically emulating a desired reflective surface of selected geometry over an operating frequency band, which comprises:
(a) a support matrix;
(b) a reflective means for reflecting microwaves within said operation frequency band, said reflective means supported by said support matrix; and
(c) a phasing arrangement of electromagnetically-loading structures supported by said support matrix and generally being resonant at some frequency outside of said operating frequency band, said electromagnetically-loading structures varying in dimension and having an orientation and interspacing from each other and being disposed at a distance from said reflective means by said support matrix so as to provide said emulation of said desired reflective surface of selected geometry.

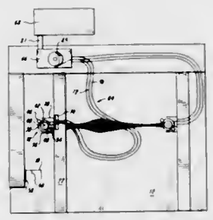
4,905,015

APPARATUS AND METHOD FOR GENERATING A VARIABLE LINE WIDTH

Jonathan D. Sieber, 20 Clubhouse La., Wayland, Mass. 01778, and Joseph S. Sieber, 31 Granville Rd., Cambridge, Mass. 02138

Filed May 18, 1988, Ser. No. 195,200
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—1.1 **17 Claims**

1. An apparatus for drawing with an ink pen having a radially asymmetric nib, comprising:
a. a plotter having:
i. a table for receiving medium upon which said pen will draw;
ii. a pen slider translatable with respect to said table parallel a first axis (nominally designated the "X" axis); and
iii. a pen holder for receiving said pen, mounted on said slider and translatable with respect to said slider parallel a second axis (nominally designated the "Y" axis), orthogonal to said first axis, said pen holder including means for maintaining said pen substantially parallel to



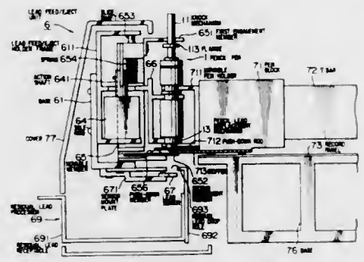
and at a known angular orientation with respect to a third axis (nominally designated the "Z" axis) perpendicular said X and Y axes and said pen is rotatable about said Z axis; and
b. means for selectively varying the angular orientation of said pen nib with respect to said Z axis, thereby controlling said pen to apply ink of selectable and variable widths along a line independent of the shape of the line or its orientation with respect to the X and Y axes.

4,905,016

RECORDER WITH A PENCIL PEN AND METHOD THEREFOR

Nobuyuki Kobayashi; Yukihiro Kaneko; Tikao Nakagawa; Masatoshi Noguchi; Takamichi Yoshikawa, and Masashi Nakamura, all of Tokyo, Japan, assignors to Graphtec Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1988, Ser. No. 233,154
Claims priority, application Japan, Aug. 21, 1987, 62-208985; Nov. 30, 1987, 62-183594[U]; Mar. 18, 1988, 63-65367; Apr. 17, 1988, 63-95181; Jun. 30, 1988, 63-163091
Int. Cl.[4] G01D *9/00, 15/16;* B41J *3/46*
U.S. Cl. 364—1.1 **13 Claims**



11. In a recorder with a pencil pen having a plurality of pencil leads therein,
the pencil pen including a lead chuck mechanism for holding and releasing the pencil lead, and a pencil lead displacement mechanism for holding the pencil lead with an appropriate friction force, and a pen block for holding the pencil pen and recording data on a record medium by the pencil pen, the method comprising:

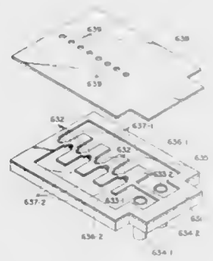
(a) issuing a command signal to remove an unnecessary pencil lead of the pencil pen and drive out a new pencil lead;
(b) alternately engaging a first engagement means with the lead chuck mechanism of the pencil pen and a second engagement means with the pencil lead displacement mechanism, in response to the command signal for feeding the lead through the pencil.

4,905,017

LAMINATED LIQUID-JETTING HEAD CAPABLE OF RECORDING IN A PLURALITY OF COLORS, A METHOD OF PRODUCING THE HEAD AND AN APPARATUS HAVING THE HEAD

Hiroshi Sugitani, Machida; Hiroto Matsuda, Yokohama, and Masami Ikeda, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 865,409, May 21, 1986, abandoned, which is a continuation of Ser. No. 451,500, Dec. 20, 1982, Pat. No. 4,611,219. This application Apr. 5, 1988, Ser. No. 178,881
Claims priority, application Japan, Dec. 29, 1981, 56-215328; Dec. 29, 1981, 56-215329; Dec. 29, 1981, 56-215330
Int. Cl.[4] G01D *15/16;* B41J *3/04*
U.S. Cl. 346—1.1 **13 Claims**



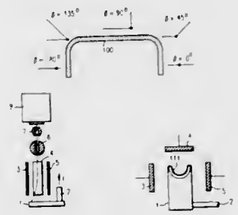
4. A liquid-jetting recording head capable of recording in a plurality of colors, the head comprising a base member having a plurality of heaters thereon and a plurality of perforations therethrough, at least one plate member having at least one perforation therethrough surrounded on all sides by said plate member, and an orifice plate having holes therethrough, wherein:
said base member, said plate member and said orifice plate are laminated together to provide a laminated liquid-jetting recording head having a plurality of substantially identically shaped, separate liquid supply paths, each being in communication with an associated perforation in said base member for supplying different color recording liquids to said liquid supply paths;
each said liquid supply path includes a main liquid path and a plurality of said branched liquid paths branched off from said main liquid path, said liquid supply paths, said main liquid paths and said branched liquid paths being formed by said perforation through said plate member; and
liquid can be ejected from the liquid-jetting head through said holes in said orifice plate by the action of heat energy applied to the liquid in the branched paths by said heater.

4,905,018

INK JET PRINTING HEAD AND INDUSTRIAL PLOTTER WHICH IS EQUIPPED WITH IT

Luc Regnault, Bourg les Valence, France, assignor to Imaje S.A., Bourg les Valence, France

PCT No. PCT/FR87/00286, § 371 Date May 19, 1988, § 102(e) Date May 19, 1988, PCT Pub. No. WO88/00529, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 20, 1987, Ser. No. 180,103
Claims priority, application France, Jul. 21, 1986, 86 10727
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **8 Claims**



1. An ink jet printing head comprising:
(a) an ink feed device;
(b) a modulation system having an ejection nozzle operatively connected to said ink feed device;
(c) a charging electrode downstream of said ejection nozzle in position to charge ink droplets ejected by said ejection nozzle;
(d) a first deflection plate downstream of said charging electrode and adjacent the path of the ink droplets;
(e) a second deflection plate downstream of said charging electrode by the same distance as said first deflection plate, adjacent the path of the ink droplets, and perpendicular to said first deflection plate;
(f) a third deflection plate downstream of said charging electrode by the same distance as said first and second deflection plates, adjacent the path of the ink droplet, parallel to said first deflection plate, and perpendicular to said second deflection plate; and
(g) electronic circuit means for controlling the voltages on said first, second, and third deflection plates so that the electric field generated by said first, second, and third deflection plates is oriented along an angle β which may vary from 0° to 180°.

4,905,019

PRESSURIZED FLUID PRINTER ARRANGEMENT HAVING TRANSIENT FLUID PRESSURE DROP BUFFERING MEANS

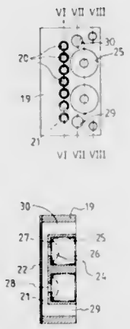
Jiri Vonasek, Kungälv, Sweden, assignor to Markpoint System AB, Goteborg, Sweden

Filed Jul. 8, 1988, Ser. No. 216,271
Claims priority, application Sweden, Jul. 13, 1987, 8702846-0
Int. Cl.[4] G01D *15/16;* B41J *3/04*
U.S. Cl. 346—75 **10 Claims**

1. In a device for printing using a pressurized fluid medium for recording characters on an information carrier and including a valve housing containing therewithin a fluid chamber for the pressurized fluid medium, discharge openings provided in a wall of the fluid chamber for discharging therethrough the pressurized fluid medium from said fluid chamber, and valve means arranged for controlling the opening and closing of the discharge openings at high opening and closing frequencies in a predetermined manner, the improvement comprising:
at least one buffer chamber means provided within said valve housing closely proximate to and in direct fluid pressure communication with said fluid chamber and said

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discharge openings thereof for directly absorbing short duration transient pressure changes in said pressurized



fluid medium in said fluid chamber and at said discharge openings upon said discharge openings being opened by said valve means.

4,905,020

THERMAL PRINT HEAD

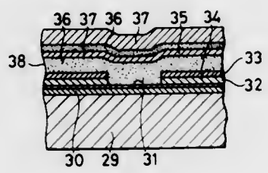
Yozo Kobayashi; Norihito Mochizuki, both of Fuji; Hisao Suzuki, and Shinichi Mizushima, both of Mishima, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1988, Ser. No. 218,915

Claims priority, application Japan, Jul. 14, 1987, 62-175653; Sep. 16, 1987, 62-231680; Nov. 24, 1987, 62-295730; Jan. 14, 1988, 53-006398

Int. Cl.[4] G01D *15/10;* **H05B** *1/00;* **H01C** *1/012;* **B32B** *15/00*

U.S. Cl. 346—76 PH **9 Claims**



1. A thermal print head comprising: an insulating substrate; a heating resistance layer formed over the insulating substrate; an electrode layer formed over the heating resistance layer in a predetermined pattern; and a protective layer formed over the electrode layer; characterized in that the protective layer is formed of a mixture of Al_2O_3 as a principal component, and SiO_2 in the range of 20 to 45 mol %.

4,905,021

OPTICAL PRINTER HEAD WITH A LIGHT EMITTING DIODE ARRAY

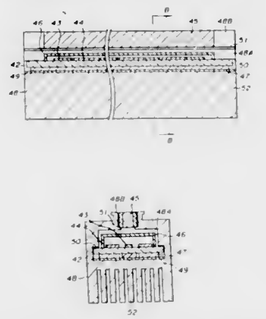
Hisao Iizuka, Ibaraki; Shigetoshi Hiratsuka, Kanagawa; Kiyohiko Tanno, Ibaraki; Teruji Satou, Ibaraki, and Norihiro Ashizuka, Ibaraki, all of Japan, assignors to Hitachi Cable, Ltd., Japan

Continuation of Ser. No. 184,074, Apr. 20, 1988, Pat. No. 4,829,321. This application Feb. 24, 1989, Ser. No. 315,055

Int. Cl.[4] G01D *9/42;* **H04N** *1/23*

U.S. Cl. 346—107 R **8 Claims**

1. A substrate with a light emitting diode array comprising:
electric lead patterns provided on a ceramic substrate,
a light emitting diode array chip mounted on a first portion of said electric lead patterns provided on said ceramic substrate,
a driver integrated circuit for driving said light emitting diode array chip, said driver integrated circuit being mounted on a second portion of said electric lead patterns provided on said ceramic substrate, and



an electric conducting member for decreasing electric resistance of said electric lead patterns, said electric conducting member being mounted on a third portion of said electric lead patterns provided on said ceramic substrate.

4,905,022

IMAGE FORMING APPARATUS HAVING LASER LIGHT SOURCE

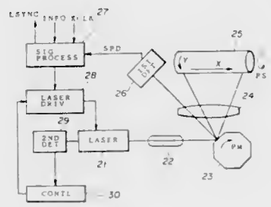
Kiyoto Nagasawa, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

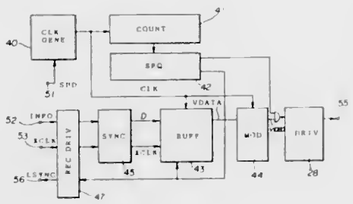
Filed Mar. 28, 1989, Ser. No. 329,808

Claims priority, application Japan, Apr. 8, 1988, 63-85357

Int. Cl.[4] G01D *15/14;* **H04N** *1/21*

U.S. Cl. 346—108 **15 Claims**





1. An image forming apparatus comprising:
a photosensitive body;
scanning means including a laser light source for scanning said photosensitive body by a laser beam emitted from the laser light source;
modulation means for pulse-width-modulating the laser beam by an input digital image data which is synchronized to a clock signal; and
driving means for driving the laser light source by an output pulse width modulated image data of said modulation means,
said modulation means including a high-speed clock generator for generating a high-frequency clock signal which has a frequency higher than the clock signal, counter means for counting pulses of the high-frequency clock signal, a resetting circuit for resetting said counter means when a counted value reaches a predetermined value, and pulse signal generating means for generating a pulse signal having a pulse width dependent on the input digital image data and the counted value of said counter means, said pulse signal being outputted as said pulse width modulated image data.

4,905,023

IMAGE FORMING APPARATUS INCLUDING DIGITAL IMAGE SIGNAL INPUT MEANS

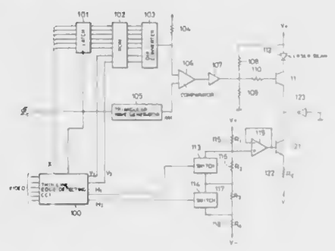
Yoshiyuki Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,622

Claims priority, application Japan, Nov. 14, 1986, 61-269866

Int. Cl.[4] G01D *9/42*

U.S. Cl. 346—108 **19 Claims**



1. An image forming apparatus comprising:
digital image signal input means;
image forming means for forming an image for each of predetermined elements by scanning a recording medium in response to the digital image signal entered through said input means, said image forming means being capable of scanning said recording medium in first and second scanning directions for image formation,
said image forming means including means for forming a pulse-width modulated signal on the basis of the level of the digital image signal entered through said input means; and
means for correcting the size of at least one of the predetermined elements formed on said recording medium in first and second modes in relation to the first and second scanning directions, said first and second modes being different from each other,
wherein in said first mode said correcting means corrects the pulse width of the pulse-width modulated signal.

4,905,024

IMPROVED PRODUCING ELECTRODE FOR INK DOT PRINTER

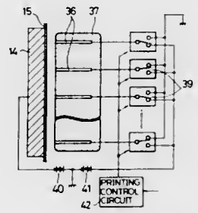
Hisashi Nishikawa, Suntoh, and Mitsuharu Endo, Susono, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 180,689, Apr. 8, 1988, Pat. No. 4,806,956. This application Dec. 1, 1988, Ser. No. 278,448

Claims priority, application Japan, Mar. 20, 1985, 60-56582; Jul. 5, 1985, 60-204846

Int. Cl.[4] G01D *15/16;* **B41J** *3/04*

U.S. Cl. 346—140 R **5 Claims**



1. An ink dot printer wherein a recording electrode fed with ink at the fore end thereof is disposed opposite to an opposed electrode through a recording medium, and a picture is drawn with the ink sputtered from the fore end of said recording electrode toward the recording medium by generating a potential difference between said opposed electrode and said recording electrode, said ink dot printer characterized in that said recording electrode is composed of a conductive material formed on an ink supply member by thin-film techniques, wherein said ink supply member has both an insulation property and an ink-impregnation property, and a potential difference is generated between said opposed electrode and said recording electrode in such a manner that the voltage of said recording electrode become higher.

4,905,025

METHOD OF AND APPARATUS FOR RECORDING IMAGE ON PHOTOSENSITIVE MATERIAL WITH A PLURALITY OF PHOTOBEAMS

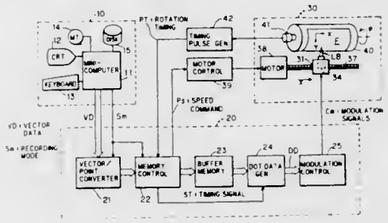
Takashi Sakamoto; Masafumi Kawatani; Kazutaka Tasaka, and Masahide Okazaki, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jun. 16, 1989, Ser. No. 367,466

Claims priority, application Japan, Jun. 20, 1988, 63-152901; Jun. 20, 1988, 63-152902; Feb. 10, 1989, 64-32499

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—154 **23 Claims**



1. A method of recording an image on a photosensitive material through a scan of said photosensitive material with a plurality of modulated photobeams wherein said scan is conducted along a sequence of main scannings, each of said main scannings being conducted with said plurality of modulated

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photobeams in a main scanning direction, said sequence being directed in a subscanning direction, said method comprising the steps of:

(a) generating image signals expressing said image for each scanning line,

(b) modulating a plurality of photobeams with said image signals to generate a plurality of modulated photobeams which form a plurality of photospots substantially aligned on said photosensitive material in said subscanning direction, wherein said plurality of modulated photobeams are classified into front photobeams existing in a side to which subscanning is to be advanced and rear photobeams existing in another side opposite to said side, and

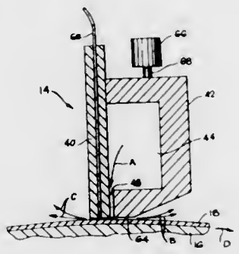
(c) scanning said photosensitive material with said plurality of modulated photobeams along said sequence of said main scannings while relatively moving said photosensitive material and said plurality of modulated photobeams in said subscanning direction so that scanning lines which are scanned with said front photobeams in a main scanning are positionally alternated with other scanning lines which are scanned with said rear photobeams in another main scanning which follows said main scanning in said sequence.

4,905,026

GAS-SUPPORTED ELECTROGRAPHIC WRITING HEAD

Gene F. Day, Hillsborough, Calif., assignor to Precision Image Corporation, Redwood City, Calif.

Filed Feb. 17, 1989, Ser. No. 313,166
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—155 **26 Claims**



1. An apparatus for forming an electrographic latent image on an image carrier, comprising,

an electrographic writing head having a plurality of charging elements disposed to provide localized electrical charge on said image carrier, one of said writing head and said image carrier resiliently biased with respect to the other to provide a forward bias to the extent that said writing head and image carrier are biased into a mutually contacting condition, and

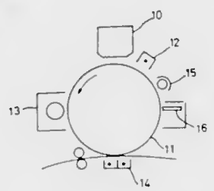
means coupled to said writing head for projecting pressurized gas at said image carrier to provide a force causing a back bias between said writing head and said image carrier in a direction to relieve contact pressure between said writing head and said image carrier.

4,905,027

CONTROL METHOD AND APPARATUS FOR OPTICAL PRINTER HEAD

Tetsuya Itoh, Osaka, Japan, assignor to Minolta Camera Co., Ltd., Osaka, Japan

Filed Jun. 28, 1989, Ser. No. 372,891
Claims priority, application Japan, Jun. 29, 1988, 63-161268
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160 **4 Claims**



1. In a method of controlling an optical printer having a movable photosensitive member and a plurality of dot type light emitting elements linearly aligned normal to the moving direction of the photosensitive member, with the respective light emitting element being energized for light emission based on one line amount of received image data, the method comprising the steps of:

(1) selecting one from a plurality of strobe signals each having a different ON time, the strobe signals including a predetermined number of base signals each having a different ON time and a plurality of composite signals each composed of a different combination of the base signals;

(2) outputting one line amount of image data by a number of times equal to the number of the base strobe signals within a time allotted for one line amount of image exposure; and

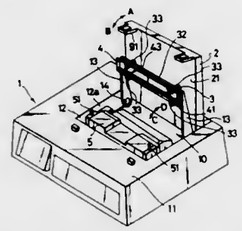
(3) energizing the light emitting elements corresponding to the image data for light emission for a time corresponding to the ON time of the selected strobe signal.

4,905,028

ELECTROPHOTOGRAPHIC PRINTER

Takehiko Okubo, and Shigeki Nakajima, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1989, Ser. No. 370,438
Claims priority, application Japan, Jun. 30, 1988, 63-87337[U]
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160 **6 Claims**



1. An electrophotographic printer comprising:

an enclosure having a cavity with an upper opening;

an access cover for opening and closing the upper opening;

a rotatable head holder supported adjacent to the inner surface of said access cover so that it can rotate;

an optical print head provided on the inner surface of said head holder; and

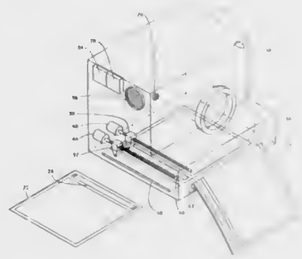
a process cartridge containing a photosensitive drum provided so that it can be inserted and removed through said upper opening.

4,905,029

AUDIO STILL CAMERA SYSTEM

Scott A. Kelley, 1261 Enclave Cir. #2203, Arlington, Tex. 76011

Filed Sep. 28, 1988, Ser. No. 250,712
Int. Cl.[4] G03B *29/00*
U.S. Cl. 354—76 **2 Claims**



1. An audio still camera apparatus for producing a still photograph with an associated reproducible acoustic message comprising:

a camera means for capturing a photographic image on a photographic recording medium;

the camera means incorporating means for sensing an acoustic message associated with the photographic image and means for transferring the sensed acoustic message to acoustic recording medium and signaling means to visually or audibly indicate the beginning and termination of transferring sensed acoustic message to acoustic recording medium; and

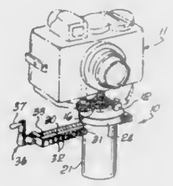
means for sensing and converting the message from the acoustic recording medium to an electrical signal suitable for playback of the recorded message.

4,905,030

MANUALLY OPERATED HANDLE FOR PANORAMIC CAMERAS

Richard C. Corrales, 7355 College Ave., Whittier, Calif. 90602

Filed Feb. 9, 1989, Ser. No. 308,052
Int. Cl.[4] G03B *29/00*
U.S. Cl. 354—82 **7 Claims**



1. A manually operated handle for panoramic cameras comprising:

a handle body having a central opening, said handle body having a vertical axis;

a rotatable central shaft held by said handle body, said central shaft having a central axis parallel with the vertical axis of said handle body, said central shaft having an upper portion affixable to a panoramic camera and said central shaft having a lower portion;

gear means affixed to the lower portion of said central shaft, said gear means having an axis of rotation at said central axis of said central shaft;

a first one-way clutch means contacting the lower portion of said central shaft, said first one-way clutch means being located between said gear means and the upper portion of said central shaft, said one-way clutch means permitting said gear means to turn in a first direction to turn the upper portion of said central shaft and to turn in a direction opposite to said first direction freely without turning the upper portion of said central shaft;

rack means slidably held by said handle body, said rack means having teeth which mesh with said gear means and said rack means being mounted at a right angle with respect to the central axis of said central shaft;

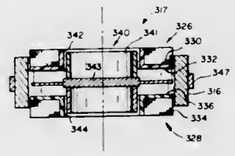
a second one-way clutch held by said handle body, said second one-way clutch contacting the upper portion of said central shaft and permitting it to turn only in a first direction, whereby when said rack means is moved in a first direction, said gear means turns said central shaft in a first direction and said second one-way clutch permits such turning, but when said rack means is moved in a direction opposite to said first direction, said first one-way clutch means permits the gear means to turn freely with respect to the upper portion of said central shaft and said second one-way clutch prevents any turning of the upper portion of said central shaft in a direction opposite to said first direction.

4,905,031

AXIAL MAGNETIC ACTUATOR

Hemant K. Mody, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 132,732, Dec. 14, 1987, abandoned.
This application Apr. 10, 1989, Ser. No. 334,774
Int. Cl.[4] G03B *3/10;* **G02B** *7/02;* **H01H** *47/04*
U.S. Cl. 354—195.1 **3 Claims**



1. An axial magnetic actuator for providing a driving force along an axis, said actuator comprising:

a member movable along said axis between first and second locations, said member having at least a portion thereof formed of a magnetic material which provides a low reluctance path for magnetic flux;

magnetic means disposed around said axis for forming a magnetic circuit adjacent said portion, said magnetic means maintaining said member in a rest position wherein said member is suspended in an axial direction between said locations, said magnetic means including an annular permanent magnet which is radially magnetized and is located between said locations; and

means for creating an imbalance in said circuit to effect movement of said member, said means for creating an imbalance including a first electromagnet located at said first location and a second electromagnet located at said second location.

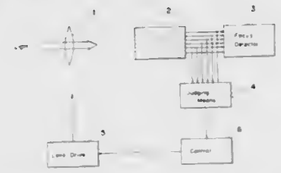
VOL 1111 ISS 4 FE 27 1990 UMI

4,905,032

AUTOMATIC FOCUS DETECTING DEVICE

Tokuji Ishida; Toshio Norita; Masataka Hamada, and Hiroshi Ootsuka, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 4, 1988, Ser. No. 267,547
Claims priority, application Japan, Nov. 6, 1987, 62-280482
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—402 **15 Claims**



1. An automatic focusing condition detecting device comprising:

an objective lens;

a light receiving means having a plurality of receiving portions, each receiving portion being adapted to receive through said objective lens light from one of a plurality of focusing areas, respectively;

a focus detecting means for detecting based on the output of each receiving portion a focusing condition of said objective lens in the respective focusing area;

means for judging based on the output of each receiving portion whether or not it is possible for said focus detecting means to detect a focusing condition of said objective lens in the respective focusing area;

means for driving said objective lens; and

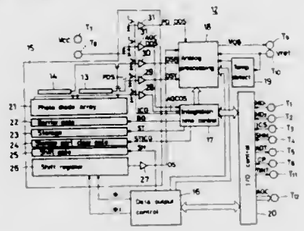
means for controlling said driving means to drive said objective lens when said judging means judges that it is possible for said focus detecting means to detect a focusing condition in at least one but not whole of the focusing areas, for the purpose of investigation whether or not there is another focusing area where said focus detecting means can detect a focusing condition.

4,905,033

IMAGE SENSING SYSTEM

Tokuji Ishida; Toshio Norita, and Jun Hasegawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 5, 1988, Ser. No. 141,080
Claims priority, application Japan, Jan. 6, 1987, 62-950; Mar. 18, 1987, 62-63459
Int. Cl.[4] G03B *3/00;* **H04N** *5/335;* **G01J** *1/20;* **H01J** *40/14*
U.S. Cl. 354—402 **39 Claims**



32. An image sensing system comprising:

a photoelectric converting means for outputting an electric signal responding to the intensity of incident light;

a storing means, having a first and a second storage portions, for storing the electric signal outputted from said photoelectric converting means;

a measuring means for measuring the luminance of incident light;

a selecting means for selecting one of a first mode and a second mode responding to the measured luminance; and

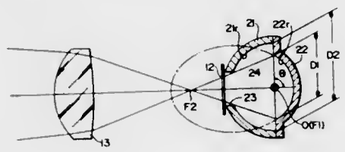
a controlling means responding to said selecting means, for controlling said storing means to store the electric signal outputted from said photoelectric converting means in the first storage portion when the first mode is selected, and for controlling said storing means to store the electric signal outputted from said photoelectric converting means in the second storage portion when the second mode is selected.

4,905,034

AUTOMATIC FOCUSING PROJECTOR

Yasuyuki Tejima; Akihiro Arai; Hideaki Yuda; Saburoh Sugawara, and Shigeo Tohji, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 29,924, Mar. 25, 1987, Pat. No. 4,771,308. This application Nov. 16, 1987, Ser. No. 120,650
Claims priority, application Japan, Nov. 17, 1986, 61-176497[U]
Int. Cl.[4] G03B *3/00;* **G01J** *1/20*
U.S. Cl. 354—403 **12 Claims**



1. An automatic focusing projector having a light source, a contrast chart having a predetermined contrast pattern, a reflector which reflects rays of light from the light source towards the contrast chart, and a projecting lens which projects the light which is transmitted through the contrast chart onto an object, said reflector comprising a front semispherical mirror having an exit opening for light, and a rear semielliptical mirror having a first focal point which is located at a center of the semispherical mirror, said light source being located in the vicinity of the first focal point of the semielliptical mirror, said contrast chart being located between the first focal point and a second focal point of the semielliptical mirror, said projecting lens being located in front of the second focal point of the semielliptical mirror.

4,905,035

CAMERA

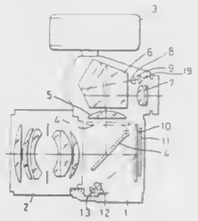
Tadao Takagi, Yokohama, and Toru Fukuhara, Isehara, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 98,394, Sep. 18, 1987, Pat. No. 4,809,030. This application Nov. 30, 1988, Ser. No. 277,859
Claims priority, application Japan, Sep. 24, 1986, 61-225570; Sep. 29, 1986, 61-230450
Int. Cl.[4] G03B *7/08, 7/099*
U.S. Cl. 354—432 **6 Claims**

1. A camera comprising:

producing means for dividing an object field into a first area, a second area, a third area and a fourth area, measuring the intensity of light from only said first, second, and third areas and producing corresponding measurement outputs;

said producing means comprising light receiving means provided with a first receiving portion, a second receiving portion and a third receiving portion and a pentagonal prism disposed between a photo-taking lens and said light receiving means, said first, second, and third receiving portions being disposed to receive light from said first, second, and third areas, respectively, said light receiving means and said pentagonal prism being disposed so that said light receiving means is prevented from receiving light from said fourth area, said light receiving means outputting electrical signals which correspond, respectively, to the intensity of light incident on said first, said second and said third receiving portions, said light receiving means being devoid of a receiving portion for receiving light from said fourth area, said producing means producing said measurement outputs on the basis of said electrical signals of said light receiving means;



said fourth area being positioned on the sky side with respect to said other areas when said camera is held by a photographer in a standard supported state, said first, said second and said third areas adjoining each other, said fourth area adjoining said second and said third areas, said first area being positioned at a center of the object field, said second and said third areas being positioned so that said second and said third areas sandwich said first area; and

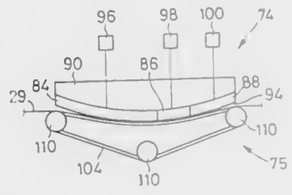
calculating means for calculating an exposure value on the basis of said measurement outputs corresponding to said first, said second and said third areas.

4,905,036

IMAGE FORMING PROCESS AND SYSTEM, INCLUDING HEATING STEP OR DEVICE FOR INCREASED DENSITY OF IMAGES

Yuji Asano; Jun Sakai; Yumio Matsumoto; Osamu Takagi; Akira Sago, all of Nagoya; Kiyoharu Hayakawa, Aichi; Masashi Ueda, Nagoya; Yukichi Sawaki, Gifu, and Keiko Suzuki, Okazaki, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 26, 1987, Ser. No. 112,217
Claims priority, application Japan, Oct. 29, 1986, 61-257469; Mar. 19, 1987, 62-64946; Apr. 6, 1987, 62-51960; Apr. 17, 1987, 62-58986; May 12, 1987, 62-70457; Jun. 8, 1987, 62-142561
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **22 Claims**



1. A recording system for forming images on a recording sheet, comprising:

an exposing device for image-wise exposing a pressure-sensitive photosensitive sheet to radiation, so as to form thereon latent images, according to source image information;

a developing device for applying pressure to the image-wise exposed photosensitive sheet, for causing a chemical reaction to thereby develop said latent images into visible images on a recording sheet;

a feeding device for feeding said recording sheet; and

a heating device for heating said recording sheet for promotion said chemical reaction to thereby increase a density of said visible images,

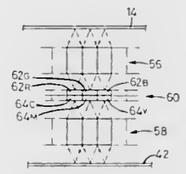
said heating device having an inlet portion and an outlet portion which are disposed such that said recording sheet is fed in a direction from said inlet portion toward said outlet portion, said heating device being operated such that said inlet portion has a heating temperature lower than that of said outlet portion.

4,905,037

IMAGE TRANSFER SYSTEM

Takemi Yamamoto, and Jun Sakai, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 6, 1987, Ser. No. 22,956
Claims priority, application Japan, Mar. 13, 1986, 61-55366
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **10 Claims**



1. An image transfer system wherein images are transferred from an original to a color-imaging photosensitive medium, said original and said photosensitive medium being disposed parallel to each other, said image transfer system comprising:

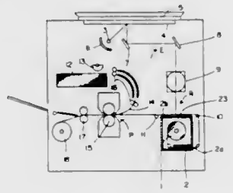
a first self-focusing lens array disposed between said original and said color-imaging photosensitive medium, said first self-focusing lens array consisting of a multiplicity of self-focusing fibers which are arranged in a first plane parallel to said original, said first self-focusing lens array receiving from said original a radiation having a first wavelength;

a second self-focusing lens array disposed between said first self-focusing lens array and said photosensitive medium, said second self-focusing lens array consisting of a multiplicity of self-focusing fibers which are arranged in a second plane parallel to said photosensitive medium; and

a wavelength converter disposed between said first and second self-focusing lens arrays, said wavelength converter comprising a multiplicity of filters aligned with said multiplicity of self-focusing optical fibers of said first and second self-focusing lens arrays, respectively, and a multiplicity of fluorescent elements aligned with said multiplicity of filters, respectively, said wavelength converter converting said first wavelength of the radiation received from said first self-focusing lens array, to a second wavelength which is shorter than said first wavelength and to which said color-imaging photosensitive medium is sensitive.

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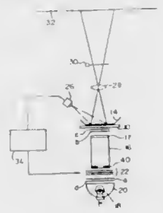
4,905,038
EXPOSURE DEVICE
Takashi Tomizawa, Aichi; Shigeyuki Hayashi, Nagoya; Motoshi Ohno, Nagoya; Yoichi Horaguchi, Nagoya, and Takashi Nakata, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan
Filed Jul. 13, 1988, Ser. No. 218,219
Claims priority, application Japan, Jul. 17, 1987, 62-179718
Int. Cl.[4] G03B *27/32*
U.S. Cl. 355—27 **7 Claims**



1. An exposure device for use in an image recording apparatus for exposing a photosensitive recording medium to light so as to form a latent image thereon, said medium having a first and second surfaces, said device comprising:
a sheet storage cartridge detachably provided to said image recording apparatus, said cartridge being formed of a light-shielding material for storing therein said photosensitive recording medium and having an exposure zone on an outer surface thereof when installed in said recording apparatus;
exposure means which emits an original image carrying light directing in alignment with said outer surface for exposing said first surface of said photosensitive medium to light in said exposure zone to form said latent image on said photosensitive medium;
sheet feeding means driven in timed relation with an exposure for pulling said photosensitive recording medium from said sheet cartridge and positioning said medium on said outer surface; and,
a color-tone controlling means fixed to said outer surface and having a reflectivity distribution for exposing said second surface of said photosensitive recording medium for correcting exposure amount with respect to said photosensitive medium with at least one of specific light having at least one of selected wavelengths.

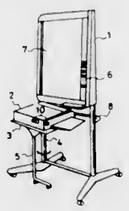
4,905,039
COLOR IMAGE EXPOSURE APPARATUS
Takaaki Terashita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 13, 1989, Ser. No. 296,723
Claims priority, application Japan, Jan. 14, 1988, 63-6403; Jan. 14, 1988, 63-6404
Int. Cl.[4] G03B *27/72, 27/76*
U.S. Cl. 355—35 **18 Claims**

1. A color image exposure apparatus for obtaining a color picture from a color original, comprising:
a color-light limiting means arranged in an optical path of light emitted from a light source and provided with a dielectric multilayer film for limiting color light around at least a wavelength band in which a blue light wavelength range and a green light wavelength range overlap;
an exposure control means having yellow, magenta and cyan color-light control filters for color light which has transmitted through or has been reflected by the color-light limiting means and has transmitted through or has been reflected by the color original, said filters being inserted in the optical path to control the exposure of each of three primary-color-sensitive layers in a copying color-sensitive material; and
a guide means for irradiating, as copying light, only those



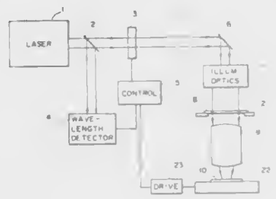
rays having an angle in a predetermined range relative to an optical axis of the light source out of rays transmitted through or reflected by the color-light limiting means provided with the dielectric multilayer film.

4,905,040
BOARD COPYING APPARATUS
Mamoru Nagai, Tokyo; Yukio Takemura, Kawasaki; Toshiya Kanazawa, Tokyo; Sohei Tanaka, Yokohama; Fumio Mikami, Hachioji, and Hiroyuki Nakano, Kodaira, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 9, 1987, Ser. No. 117,958
Claims priority, application Japan, Nov. 13, 1986, 61-271466; Nov. 17, 1986, 61-273510; Nov. 17, 1986, 61-273511; Nov. 17, 1986, 61-273512; Nov. 17, 1986, 61-273513; Nov. 17, 1986, 61-273514; Nov. 17, 1986, 61-273515; Jan. 12, 1987, 62-005832; Jan. 19, 1987, 62-009457
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—43 **28 Claims**



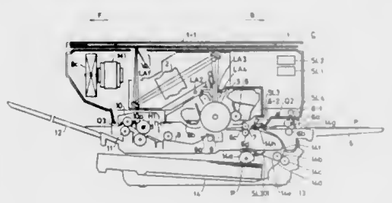
9. A board copying apparatus comprising:
board means having a sheet on which information is writable;
copying means for copying on a recording material an image written on said sheet;
first density setting means for setting a copy density of said image at a predetermined constant level by keeping constant an operation condition regarding a density of said copying means;
second density setting means for setting a copy density of said copy image at a desired level; and
selecting means for selecting one of said first and second density setting means when an image written on said sheet is copied.

4,905,041
EXPOSURE APPARATUS
Masato Aketagawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 18, 1988, Ser. No. 259,146
Claims priority, application Japan, Oct. 19, 1987, 62-264622
Int. Cl.[4] G03B *27/42*
U.S. Cl. 355—53 **14 Claims**



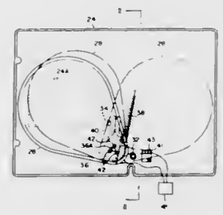
1. An exposure apparatus for exposing, to a pattern of a first object, a second object by use of a radiation beam, said apparatus comprising:
illuminating means for illuminating the first object with a radiation beam having a predetermined wavelength;
detecting means for detecting a change in the wavelength of the radiation beam irradiating the first object; and
control means operable in response to a signal from said detecting means, to cause the second object to be substantially unexposed to the pattern of the first object.

4,905,042
IMAGE FORMING APPARATUS
Koki Kuroda, Tokyo; Sohei Tanaka, Yokohama, and Yoshitaka Ogino, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 674,551, Nov. 26, 1984, abandoned.
This application Oct. 3, 1988, Ser. No. 253,330
Claims priority, application Japan, Nov. 25, 1983, 58-222539; Nov. 25, 1983, 58-222540; Nov. 25, 1983, 58-222541
Int. Cl.[4] G03B *27/52, 27/34*
U.S. Cl. 355—56 **12 Claims**



1. An image forming apparatus comprising:
an optical system for projecting an original image, said optical system including a lens associated with a magnification factor for image formation;
means for forming an image projected through said optical system onto a recording medium;
means for manually setting a magnification factor;
means for moving said lens;
a locking member for mechanically locking said lens moved by said moving means at a position corresponding to the magnification factor set by said setting means;
means for detecting the position at which said lens is locked by said locking means; and
means for discriminating the magnification factor set by said setting means on the basis of an output from said detection means to control said optical system and said image forming means.

4,905,043
SHUTTER DRIVING APPARATUS FOR PHOTOGRAPHIC PRINTER
Hiroyuki Satou; Hiromitsu Wakui; Junichi Tsuji, and Satoru Takemoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 30, 1988, Ser. No. 292,071
Claims priority, application Japan, Jan. 18, 1988, 63/8188
Int. Cl.[4] G03B *27/72, 9/08, 9/10*
U.S. Cl. 355—71 **9 Claims**



1. A shutter driving apparatus for a photographic printer arranged to drive a shutter so as to open and close the path of light which is incident on a photographic paper, comprising:
a pulse motor for causing said shutter to pivot in a first direction and a second direction which is reverse to it;
a first stopper arranged said to come into contact with said shutter when pivoted in the first direction so as to dispose said shutter in a first position where it opens said light path;
a second stopper arranged to come into contact with said shutter when pivoted in the second direction so as to dispose said shutter in a second position where it closes said light path;
control means for suspending to operation of said pulse motor when said shutter which is being pivoted in the second direction by means of the driving force from said pulse motor reaches a third position which is between the first and second positions and which is closer to the second position; and
biasing means for biasing said shutter in the second direction so that said shutter rotates over the entire range, that is, from the first position to the second position, with torque which is smaller than the starting torque and holding torque of said pulse motor and greater than the detent torque of said pulse motor.

4,905,044
DOCUMENT CONVEYING APPARATUS
Hiroaki Hamano, Okazaki, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 122,218, Nov. 18, 1987, Pat. No. 4,816,865.
This application Mar. 24, 1989, Ser. No. 328,246
Claims priority, application Japan, Nov. 19, 1986, 61-275637
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—206 **12 Claims**

1. A document conveying apparatus for conveying a document manually inserted from an inserting section to an ejecting section via an exposing section, comprising:
a conveying path extending from said inserting section via said exposing section to said ejecting section;
means disposed in said inserting section and provided with a conveying roller movable to an operable position and to a retracted position for conveying the document along said copying path;

VOL 1111 ISS 4 FE 27 1990 UMI

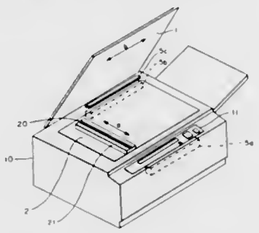
first detecting means for detecting the insertion of a document into said inserting section;
means for moving said conveying roller from the retracted position to the operative position in response to said first detecting means;
second detecting means for detecting an operation to draw out the document after said conveying roller is moved to the operative position;
third detecting means for detecting an abnormality in document conveyance; and
means for moving said conveying roller from the operative position to the retracted position and stopping an operation of said third detecting means in response to said second detection means.

4,905,045

IMAGE FORMING DEVICE USING POLARIZED LIGHT

Hiromo Sasaki, and Akihiro Soga, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 163,229, Feb. 26, 1988, abandoned, which is a continuation of Ser. No. 1,688, Jan. 9, 1987, abandoned. This application Mar. 29, 1989, Ser. No. 330,963
Claims priority, application Japan, Jan. 13, 1986, 61-5521; Jan. 20, 1986, 61-11415
Int. Cl.[4] G03G *15/04, 21/00;* **G03B** *27/72, 27/62*
U.S. Cl. 355—229 **3 Claims**



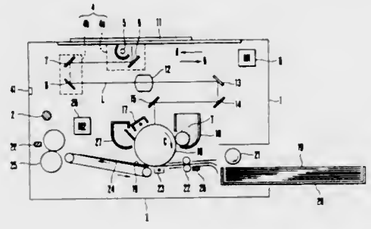
1. An image forming device comprising
a light source including laser diodes assembled along a specified direction, said laser diodes adapted to emit light which is linearly polarized in said specified direction,
a document table plate for placing a document sheet thereon, said document table plate being disposed above said light source and is transmissive to light from said light source, and
a cover plate which can be placed over said table plate and to thereby sandwich a document sheet between said document table plate and said cover plate, said cover plate functioning as a linear polarizer with the direction of polarization nearly perpendicular to said specified direction when said cover plate is placed over said table plate such that the position of a document sandwiched between said plates is visually ascertainable through said cover plates but linearly polarized light from said light source is substantially prevented from passing through both said plates.

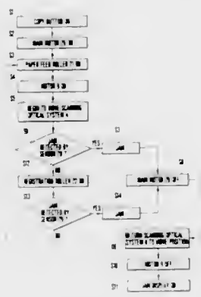
4,905,046

COPYING APPARATUS HAVING MEANS FOR MOVING THE OPTICAL SCANNING SYSTEM TO A PREDETERMINED POSITION WHEN AN ABNORMALITY IS DETECTED

Haruo Tsunoi; Naoki Okuda, both of Kanagawa, and Akiyoshi Kimura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1988, Ser. No. 197,165
Claims priority, application Japan, May 26, 1987, 62-127185
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—235 **18 Claims**





1. A copying apparatus having an optical scanning system comprising:
a lower casing;
an upper casing arranged to open and close relative to said lower casing;
scanning means, arranged on said upper casing, for scanning an original; and
an abnormality detector for detecting an abnormality the copying operation,
wherein said scanning means is moved to a predetermined scanning start position of said upper casing when said abnormality detector detects an abnormality, said scanning start position being at a side opposed to an opening side of said upper casing.

4,905,047

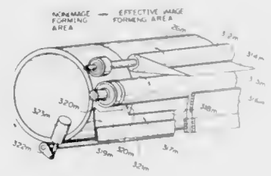
WET TYPE IMAGE FORMING APPARATUS

Kenzo Ariyama, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 10, 1989, Ser. No. 308,452
Claims priority, application Japan, Feb. 12, 1988, 63-30663; Feb. 12, 1988, 63-30664
Int. Cl.[4] G03G *15/10*
U.S. Cl. 355—256 **10 Claims**

1. A wet type image forming apparatus comprising:
a rotary photoconductor drum having a surface on which an electrostatic latent image is formed;

a development unit for forming a visual image from the latent image by supplying the photoconductor with a liquid developer;
a transferring portion under the photoconductor drum where the developed visual image is transferred to a transfer paper;



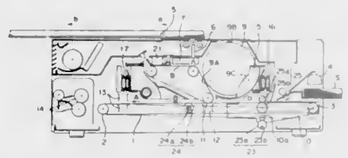
a cleaning unit for removing the liquid developer which remains on the surface of the photoconductor after the visual image is transferred to the transfer paper; and
a drip prevention plate which is arranged to come in contact with the photoconductor surface to prevent the liquid developer from dripping through the photoconductor surface.

4,905,048

COLOR COPYING APPARATUS

Minoru Suzuki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 3, 1989, Ser. No. 305,636
Claims priority, application Japan, Feb. 5, 1988, 63-23962; Dec. 27, 1988, 63-327960
Int. Cl.[4] G03G *15/16*
U.S. Cl. 355—271 **16 Claims**



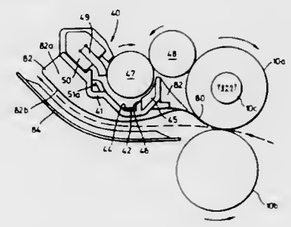
1. A color copying apparatus comprising:
a latent image forming means for forming a latent image of a figure to be printed;
an image forming medium on which the latent image is formed;
a plurality of development means for developing the latent image formed on the image forming medium by a different color toner, respectively;
an endless conveyor belt spanning between two rollers and for carrying a transfer material to which the developed colored toner image is transferred from the image forming medium;
a first shifting means for shifting a support frame of the conveyor belt close to and away from the image forming medium; and
a second shifting means for shifting a part of the conveyor belt close to and away from the image forming medium at a position where the toner image is transferred from the image forming medium to the transfer material.

4,905,049

TONER FUSING APPARATUS

Alan E. Bickerstaff, London; Barry J. Collier, Henlow; Joseph F. Hale, Welwyn; Peter M. Hitchmough, Wirral; Ian Pitts, Cambridge, and Ghulam Rasul, Hemel Hempstead, all of England, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 21, 1988, Ser. No. 184,212
Claims priority, application United Kingdom, Jun. 22, 1987, 8714588
Int. Cl.[4] G03G *15/20, 21/00*
U.S. Cl. 355—284 **7 Claims**



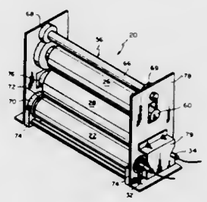
1. An apparatus for fusing toner images on copy substrates, including:
means for applying heat and pressure to the toner images on the copy substrates;
an elongated trough containing a supply of release fluid;
means for receiving the release fluid from said elongated trough for application onto said applying means; and
means for guiding the copy substrate exiting said applying means, said guiding means being formed integrally with said elongated trough, said guiding means includes a plurality of ribs projecting from the underside of said elongated trough.

4,905,050

FUSING APPARATUS HAVING AXIALLY UNSUPPORTED FUSER ROLLER

John E. Derimiggio, Fairport, and Linn C. Hoover, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1988, Ser. No. 290,787
Int. Cl.[4] G03G *15/20;* **H05B** *3/10, 1/00*
U.S. Cl. 355—290 **10 Claims**



1. An apparatus for fusing toner particles to a receiver such as a copy sheet through the application of heat and pressure, the apparatus including:
(a) a heater roller;
(b) at least one other roller;
(c) a pressure roller, spaced from said heater roller and said other roller;
(d) means for supporting said pressure, heater and other rollers; and

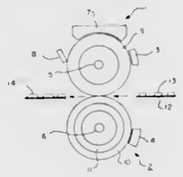
(e) an axially unsupported fuser roller nested rotatably between said heater, pressure and other rollers.

4,905,051

FIXING MEANS FOR ELECTROPHOTOGRAPHIC COPIER

Fumio Satoh, Habikino; Yoichi Shimazawa, Nara; Yasuhiro Takai, Sakurai, and Katsumi Nakanishi, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 135,548, Dec. 18, 1987, abandoned, which is a continuation of Ser. No. 830,125, Feb. 18, 1986, abandoned. This application Sep. 23, 1988, Ser. No. 249,231
Claims priority, application Japan, Mar. 12, 1985, 60-49523; Mar. 12, 1985, 60-49524; Mar. 25, 1985, 60-62720
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—290 **6 Claims**



1. A fixing means for a copier comprising
a first roller,
a second roller adapted to become compressed against said first roller and to thereby receive heat from said first roller, said first roller and said second roller serving to fix toner images on an image transferring medium,
means for measuring surface temperatures of said first and second rollers,
heating means for independently heating said first roller and said second roller, and
a control means programmed to initially operate said heating means to heat both said first and second rollers until a first point in time when the surface temperature of said first roller reaches a first predetermined temperature level which is appropriate for fixing, to begin to rotate said rollers and stop heating said second roller by said heating means at said first point in time, to thereafter continue to rotate said rollers while continuing to heat said first roller by said heating means until a second point in time when the surface temperature of said first roller reaches a second predetermined temperature level which is higher than said first temperature level, and to thereafter alternately stop and start heating said first roller by said heating means such that the surface temperature of said first roller stays substantially at said second predetermined temperature level after said second point in time.

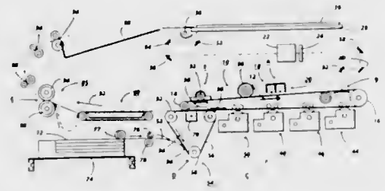
4,905,052

SHEET TRANSPORT VELOCITY MISMATCH COMPENSATION APPARATUS

James R. Cassano, Penfield; Richard M. Dastin, Fairport; Scott C. Durland, and Arthur J. Sobon, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 6, 1989, Ser. No. 318,990
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—312 **16 Claims**

1. An apparatus that compensates for velocity mismatches in transporting a sheet along a path, including:
a first sheet transport adapted to advance the sheet along a first portion of the path at a first velocity.
a second sheet transport adapted to advance the sheet along a second portion of the path at a second velocity with the first velocity of said first sheet transport being greater than the second velocity of said second sheet transport; and
means, interposed between said first sheet transport and said second sheet transport, for supporting the sheet as the sheet moves from said first sheet transport to said second



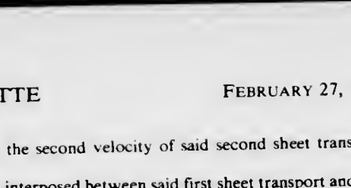
sheet transport, said supporting means being adapted to move away from the sheet when the leading edge of the sheet is received by said second sheet transport so as to form a buckle in the sheet due to said second sheet transport advancing the sheet at a slower velocity than said first sheet transport.

4,905,053

SHEET RE-FEEDING APPARATUS PROVIDED FOR IMAGE FORMING APPARATUS

Hirokazu Matsuo, and Hiroyasu Nagato, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 26, 1988, Ser. No. 148,698
Claims priority, application Japan, Jan. 28, 1987, 62-17771; Jan. 28, 1987, 62-17772; Jan. 28, 1987, 62-17773; Jan. 28, 1987, 62-17774; Jan. 28, 1987, 62-17775; Jan. 28, 1987, 62-17776; Jan. 28, 1987, 62-17777; Jan. 28, 1987, 62-17778; Jan. 28, 1987, 62-17779
Int. Cl.[4] G03G *15/00, 15/00*
U.S. Cl. 355—319 **18 Claims**



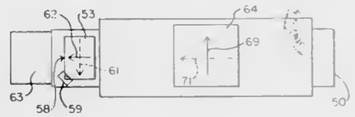
1. A sheet re-feeding apparatus for once storing a sheet already having an image formed thereon with an image forming apparatus and then re-feeding the sheet to the image forming apparatus, comprising:
a cassette for stacking and storing the sheets having images formed thereon, which cassette is detachable from a main body of the sheet re-feeding apparatus, wherein the size of the cassette corresponds to the size of the sheets to be stored in said cassette;
transporting means for transporting the sheets having images formed thereon from said image forming apparatus to said cassette;
sheet feeding means for feeding the sheets which have been stored in said cassette one by one to said image forming apparatus; and
sheet-size detecting means for detecting the size of the sheets to be stored in said cassette.

4,905,054

METHOD AND APPARATUS FOR PRODUCING CORNER-BOUND PORTRAIT AND LANDSCAPE DOCUMENT SETS

Allan J. Reed, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,674
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355--324 **22 Claims**



1. A method for selectively producing common-corner bound portrait or landscape document sets, comprising the steps of,
providing a print station capable of printing portrait or landscape images on a given surface of a blank sheet,
providing a supply of blank sheets to be printed by said print station,
feeding sheets from said supply of sheets with the same edge orientation for both portrait and landscape printing,
providing set accumulator means located down stream of said print station,
feeding sheets from said print station to said set accumulator means in a manner to stack portrait-printed and landscape-printed sheets with a common-corner orientation, and
providing corner binding means at said set accumulator means at a location coincident with said common-corner orientation.

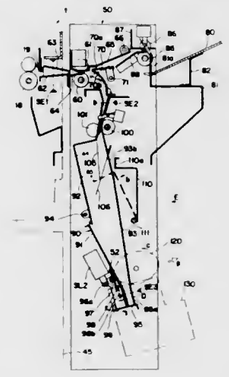
4,905,055

COPYING MACHINE PROVIDED WITH A PAPER HANDLING DEVICE WITH A PAPER STAPLING FUNCTION

Masahiro Higaki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 19, 1989, Ser. No. 299,620
Claims priority, application Japan, Jan. 21, 1988, 63-12411; Jan. 21, 1988, 63-12412; Mar. 29, 1988, 63-76691
Int. Cl.[4] G03G *15/00;* **B42B** *2/00*
U.S. Cl. 355—324 **6 Claims**

1. A copying apparatus, comprising:
a copying machine for forming images on papers and for ejecting the papers therefrom;
automatic reset means for resetting a copying mode to an initial mode when said copying machine has not operated for a specified time since the completion of a copying operation;
a paper handling device for storing and aligning a predetermined number of papers ejected from said copying machine, for stapling the papers and for ejecting the bound papers therefrom;
means for detecting the presence or the absence of papers in said copying paper handling device; and
control means for controlling said paper handling device to eject the papers therefrom when the copying mode is reset to the initial mode by said automatic reset means and said



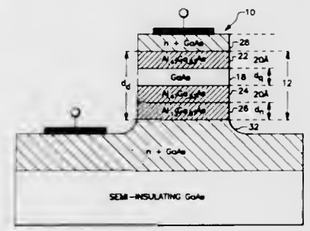
paper detecting means detect the presence of papers in said paper handling device.

4,905,056

SUPERLATTICE PRECISION VOLTAGE REFERENCE

Dale F. Berndt, 335 Pineview La. N., Plymouth, Minn. 55441, and Andrzej Peczalski, 9000 Cherokee Dr., Brooklyn Park, Minn. 555428

Filed Sep. 30, 1988, Ser. No. 251,596
Int. Cl.[4] H01L *27/12*
U.S. Cl. 357—4 **18 Claims**



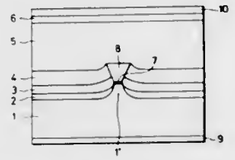
1. A superlattice precision voltage reference comprising:
a host semi-insulating substrate;
a first layer of doped semiconductor material forming an ohmic contract, on said host semi-insulating substrate;
a superlattice structure comprising a double barrier system having a layer of smaller band-gap material sandwiched between two layers of larger band-gap material, on said first layer of doped semiconductor material; and
a second layer of doped semiconductor material forming an ohmic contract on said superlattice structure.

4,905,057

SEMICONDUCTOR DEVICES

Akio Ohishi; Takao Kuroda; Shinji Tsuji; Motohisa Hiro, all of Tokyo, and Hiroyoshi Matsumura, Saitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 943,148, Dec. 18, 1986, abandoned.
This application Mar. 17, 1989, Ser. No. 325,123
Claims priority, application Japan, Dec. 18, 1985, 60-282853; Feb. 28, 1986, 61-41773
Int. Cl.[4] H01S *3/18*
U.S. Cl. 357—17 **26 Claims**



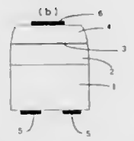
1. A semiconductor device comprising at least one buried hetero-semiconductor laser diode, the at least one buried hetero-semiconductor laser diode including a mesa stripe formed on a substrate, the mesa stripe including a laser active layer and having opposed sides and an upper surface, with semiconductor structure, including a p-n junction, formed on both of the opposed sides of the mesa stripe, the semiconductor structure forming a current blocking layer on each side of the mesa stripe, wherein said semiconductor structure includes at least one InGaAsP layer on each of the opposed sides of the mesa stripe, the energy band width of the InGaAsP layer being at least 1.3 eV and no greater than 1.4 eV.

4,905,058

LIGHT-EMITTING SEMICONDUCTOR DEVICE

Masato Yamada; Shinji Orimo, and Takao Takenaka, all of Annaka, Japan, assignors to Shin-Etsu Handotai Company Limited, Tokyo, Japan

Filed Aug. 1, 1988, Ser. No. 226,542
Claims priority, application Japan, Jul. 31, 1987, 62-190247
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 **1 Claim**



1. A light-emitting semiconductor device of a multilayer structure consisting of the following layers accumulated in the following order: a highly-doped substrate or a growth layer of a p-type mixed crystal $Ga_{1-x2}Al_{x2}As$ with carrier concentration p_2, a clad layer of $Ga_{1-x1}Al_{x1}As$ with carrier concentration p_1, a non-dope active layer of mixed crystal $Ga_{1-y}Al_yAs$, and an n-type mixed crystal $Ga_{1-z}Al_zAs$-clad layer with carrier concentration n; where the compositions of the mixed crystals are selected as follows:

$y<x_1$,

$y<z$,

$0<x_1<1$,

$0 \leqq x_2 < 1$,

$0<y<1$,

$0<z<1$;

and the parameters p_1, p_2, and n are restricted, respectively, within the following limits:

$1\times10^{17}cm^{-3}<n<5\times10^{17}cm^{-3}$

$1\times10^{16}cm^{-3}<p_1<3\times10^{17}cm^{-3}$ 3

$5\times10^{17}cm^{-3}<p_2$

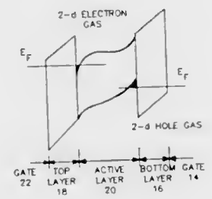
and at the same time $p_1<n$.

4,905,059

MODULATION DOPED RADIATION EMITTING SEMICONDUCTOR DEVICE

Michael Shur, Golden Valley, Minn., assignor to Regents of the University of Minnesota, St. Paul, Minn.

Continuation of Ser. No. 911,520, Sep. 25, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 245,974
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 **13 Claims**



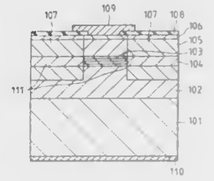
1. A radiation emitting semiconductor device for emitting radiation based upon recombination of electrons and holes comprising:
a layered structure including:
a first gate electrode for applying a first electric field;
a second gate electrode for applying a second electric field;
a narrow band gap semiconductor layer between the first and second gate electrodes within which radiative recombination takes place between electrons from a first field-induced channel and holes from a second field-induced channel;
a first wide band gap semiconductor layer sandwiched between the first gate electrode and the narrow band gap semiconductor layer, the first wide band gap semiconductor layer having a wider band gap than the narrow band gap semiconductor layer, wherein the first wide band gap semiconductor layer and the narrow band gap semiconductor layer form a first heterojunction for confining electrons, so that upon application of the first electric field by the first gate electrode the first field-induced channel for electrons is formed in the narrow band gap semiconductor layer adjacent to the first heterojunction; and
a second wide band gap semiconductor layer sandwiched between the narrow band gap semiconductor layer and the second gate electrode, the second wide band gap semiconductor layer having a wider band gap than the narrow band gap semiconductor layer, wherein the second wide band gap semiconductor layer and the narrow band gap semiconductor layer form a second heterojunction for confining holes, so that upon application of the second electric field by the second gate electrode the second field-induced channel for holes is formed in the narrow band gap semiconductor layer adjacent to the second heterojunction;
an n+ region contacting the layered structure for providing electrical contact to the first field-induced channel in the narrow band gap semiconductor layer;
a p+ region contacting the layered structure for providing electrical contact to the second field-induced channel in the narrow band gap semiconductor layer;
a first electrical contact contacting the n+ region; and
a second electrical contact contacting the p+ region.

4,905,060

LIGHT EMITTING DEVICE WITH DISORDERED REGION

Naoki Chinone, Chofu; Hisao Nakashima, Minoo; Makoto Okai, Kodaira, and Shinji Tsuji, Iruma, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,198
Claims priority, application Japan, May 29, 1987, 62-131125
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 **17 Claims**



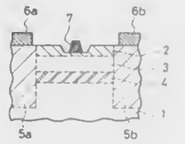
1. A light emitting device comprising:
a semiconductor substrate;
a plurality of semiconductor layers stacked on said semiconductor substrate, being made of compound semiconductors which include indium substantially but not phosphorus substantially, and having a disordered region formed by introducing impurities into the semiconductor layers; and
a pair of electrodes for injecting carriers into said semiconductor layers so as to emit light.

4,905,061

SCHOTTKY GATE FIELD EFFECT TRANSISTOR

Kazuhiko Ohmuro, and Hiroshi Nakamura, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1988, Ser. No. 253,214
Claims priority, application Japan, Oct. 9, 1987, 62-253542
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 **3 Claims**



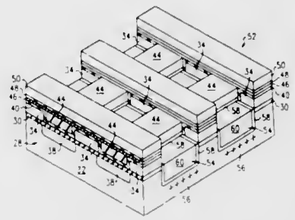
1. A Schottky gate field effect transistor comprising:
a compound semiconductor substrate formed of GaAs;
a channel formed by ion-implanting Si ions as donor ions in the surface layer of the substrate and performing heat treatment;
a Schottky gate electrode formed over the channel;
a source electrode and a drain electrode formed on respective sides of the Schottky gate electrode;
a first region formed by implantation of C ions which are to become carrier killers and having a concentration peak at a part shallower than the concentration peak of the donor ions of the channel; and
a second region formed by implantation of C ions which are to become carrier killers and having a concentration peak at a part deeper than the concentration peak of the donor ions of the channel.

4,905,062

PLANAR FAMOS TRANSISTOR WITH TRENCH ISOLATION

Agerico L. Esquivel, Dallas, and Allan T. Mitchell, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 122,952, Nov. 19, 1987, abandoned.
This application Feb. 17, 1989, Ser. No. 312,398
Int. Cl.[4] H01L *29/78, 27/10, 27/12, 29/34*
U.S. Cl. 357—23.5 **8 Claims**



1. A non-volatile memory cell array comprising:
a semiconductor substrate;
a plurality of doped bit line regions formed in said substrate;
a plurality of floating gates overlying said substrate, each having a top surface, and each of said floating gates disposed between a pair of bit line regions and defining a channel region in said substrate lying under said floating gate and between said bit line regions;
a plurality of dielectric structures, each disposed over one of said bit line regions and having a top surface substantially even with the top surfaces of said floating gates;
a plurality of control gages each overlying a plurality of floating gates and overlying a plurality of dielectric structures and bit line regions therebelow; and
a plurality of trench isolation regions each disposed between adjacent ones of said floating gates disposed between the same pair of bit line regions, and between adjacent ones of said dielectric structures overlying said pair of bit line regions, said trench isolation regions extending into said substrate substantially below the surface of said channel regions.

4,905,063

FLOATING GATE MEMORIES

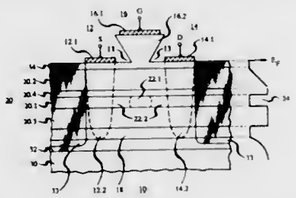
Fabio Beltram, Jersey City; Federico Capasso, Westfield; Roger J. Malik, Summit, and Nitin J. Shah, Scotch Plains, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 21, 1988, Ser. No. 209,466
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.5 **10 Claims**

1. A memory device comprising
source, drain and control gate electrode means,
a semiconductor channel for conducting carriers from said source to said drain means, characterized by
a semiconductor heterostructure disposed between said

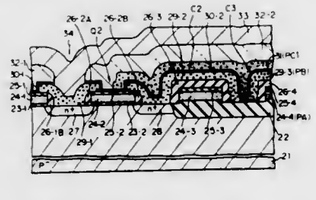
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channel and control gate means, said heterostructure including a floating gate potential well for confining carriers in a region sufficiently close to said channel to at least



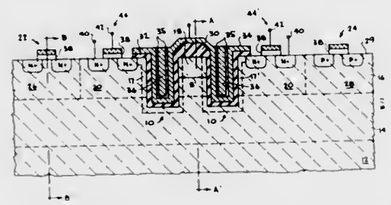
partially deplete it and further including a graded bandgap injector region for controlling the flow of carriers between said control gate means and said potential well.

4,905,064
SEMICONDUCTOR MEMORY DEVICE HAVING STACKED-CAPACITOR TYPE MEMORY CELLS
Takashi Yabu, Yokohama, and Taiji Ema, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 827,102, Feb. 7, 1986, abandoned. This application Nov. 23, 1988, Ser. No. 275,646
Claims priority, application Japan, Feb. 9, 1985, 60-022768
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.6 **8 Claims**



1. A semiconductor memory device comprising:
a substrate;
a plurality of word lines;
a plurality of bit lines intersecting said word lines; and
a plurality of memory cells, each of said memory calls positioned at an intersection defined y one of said word lines and one of said bit lines and including a capacitor for storing data and a transistor, operatively connected to said capcitor, for transferring data to said capacitor;
said word lines being formed by a first conductive layer, said transistor in each of said memory cells including a gate formed by said first conductive layer and connected to a first one of said word lines, a gate insulting layer, and source and drain regions, each of said memory cells including:
a first insulating layer covering said gate of said transistor; and
a second insulating layer covering a second one of said word lines adjacent to said first one of said word lines and being thicker than said first insulating layer covering said gate;
said capacitor in each of said memory cells including:
a second conductive layer which is in contact with one of aid source and drain regions of said transistor in each of said memory cells, extending over the gate of said transistor on said first insulating layer and covering said second insulating layer;
a third insulating layer formed on said second conductive layer;
a third conductive layer extending over said third insulating layer, one of said bit lines being connected to the other one of said source and drain regions of said transistor in each of said memory cells; and
a fourth insulating layer formed between said third conductive layer and said one of said bit lines, said one of said bit lines having portions extending above and over said gate covered by said first insulating layer, said fourth insulating layer formed under the extending portions of said one of said bit lines.

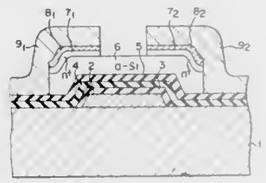
4,905,065
HIGH DENSITY DRAM TRENCH CAPACITOR ISOLATION EMPLOYING DOUBLE EPITAXIAL LAYERS
Asim A. Selcuk, Santa Clara; Pau-ling Chen, San Jose, and Darrell M. Erb, Los Altos, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed May 12, 1987, Ser. No. 49,194
Int. Cl.[4] H01L *29/78, 24/06, 27/02*
U.S. Cl. 357—23.6 **14 Claims**



1. In a dynamic random access memory device including at least one of P-channel and N-channel periphery support circuitry (**22, 24**) and a memory core (**20**) comprising a plurality of trench capacitors (**10, 10'**) formed in a semiconductor region, pairs of said capacitors being separated by a minimum distance (**S**), with said capacitors employing a common capacitor plate (**34**) and further storing charge in portions (**17, 17'**) of said region adjacent said capacitors, said region comprising (a) a first epitaxial layer (**14**) formed on a substrate (**12**), said epitaxial layer having the same conductivity type as that of said substrate and having a resistivity higher than that of said substrate, and (b) a second epitaxial layer (**16**) formed on said first epitaxial layer, said second epitaxial layer having the same conductivity type as said first epitaxial layer and said substrate and having a resistivity higher than that of said first layer, said device formed on the top surface of said second epitaxial layer and said trench capacitors extending through said second epitaxial layer into said first epitaxial layer to thereby isolate said portions of said trench capacitor having a distance of less than about 2 μm, with said core having a substantially uniform doping profile.

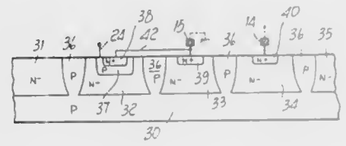
4,905,066
THIN-FILM TRANSISTOR
Masayuki Dohjo; Yasuhisa Oana, and Mitsushi Ikeda, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 19, 1989, Ser. No. 340,546
Claims priority, application Japan, May 19, 1988, 63-122771
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.15 **6 Claims**

1. A thin-film transistor comprising:
a substrate;
a gate electrode formed in said substrate and made of molybdenum-tantalum alloy containing 60 to 85 atomic of tantalum;
gate insulation film formed on said gate electrode and made of a laminated layer including silicon nitride film and oxide film formed by oxidizing the surface of said gate electrode,
semiconductor film formed on said gate insulation film and contacting the silicon nitride film; and



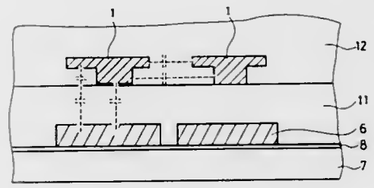
source and drain electrodes formed on the semiconductor film.

4,905,067
INTEGRATED CIRCUIT FOR DRIVING INDUCTIVE LOADS
Marco Morelli, Livorno; Fabio Marchiò , Gallarate; Francesco Tricoli, Milan, and Giampietro Maggioni, Cornaredo, all of Italy, assignors to SGS-Thomson Microelectronics S.p.A., Cantania, Italy
Filed Mar. 25, 1988, Ser. No. 173,213
Claims priority, application Italy, Mar. 31, 1987, 19921 A/87
Int. Cl.[4] H01L *27/04;* **H03K** *3/01, 3/26, 3/335*
U.S. Cl. 357—48 **5 Claims**



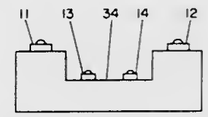
1. An integrated circuit for driving inductive loads, comprising a semiconductor body including at least one substrate and a plurality of isolated epitaxial regions in said substrate, at least one of said isolated epitaxial region having a portion thereof defining a circuit ground region, said integrated circuit having at least one output terminal for connection to an inductive load and a reference terminal for connection to a reference potential, said output terminal having a variable output potential, said circuit comprising first switching means interposed between said substrate and said output terminal, second switching means interposed between said substrate and said reference terminal and third switching means interposed between said reference terminal and said circuit ground region for connecting said substrate to said reference terminal and keeping said circuit ground region at a same potential as said substrate when said output potential is greater than said reference potential and for connecting said substrate to said output terminal when said output potential becomes smaller than said reference potential.

4,905,068
SEMICONDUCTOR DEVICE HAVING INTERCONNECTION LAYERS OF T-SHAPE CROSS SECTION
Shinichi Satoh; Makoto Hirayama; Masao Nagatomo; Ikuo Ogoh; Yoshikazu Ohno, and Masato Fujinaga, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 13, 1988, Ser. No. 143,400
Claims priority, application Japan, Mar. 10, 1987, 62-55904
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—68 **13 Claims**



1. An interconnecting structure of a semiconductor device comprising:
a conductor;
an insulating film formed on said conductor; and
an interconnection layer electrically insulated from said conductor, said interconnection layer formed on said insulating film and having T-shape cross section comprising a vertical portion above and overlapping said conductor and a horizontal portion in relation to said conductor, upper surfaces of said vertical and horizontal portions of said interconnection layer lying in a common plane whereby a low parasitic capacitance exists between said conductor and said interconnection layer.

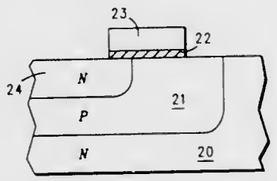
4,905,069
DARLINGTON TRANSISTOR ARRANGEMENT
Hisao Shigekane, Nagano, Japan, assignor to Fuji Electric Co., Ltd., Tokyo, Japan
Filed Nov. 13, 1984, Ser. No. 670,828
Claims priority, application Japan, Nov. 10, 1983, 58-173957[U]
Int. Cl.[4] H01L *23/48, 23/28, 23/16, 27/02*
U.S. Cl. 357—72 **1 Claim**



1. A Darlington transistor including a resin housing body having a stepped surface comprising alternating upper and lower planar portions; a collector terminal and an emitter terminal formed on respective upper portions of the stepped surface; a base terminal and an emitter-base terminal formed on respective lower portions of the stepped surface, wherein the lower portion of the stepped surface on which the base terminal is formed is situated between an edge of the stepped surface and the upper portions thereof on which the collector and emitter terminals are respectively formed and the lower portion of the stepped surface on which the emitter-base terminal is formed is situated between the upper portions of the stepped surface on which the collector and emitter terminals are respectively formed.

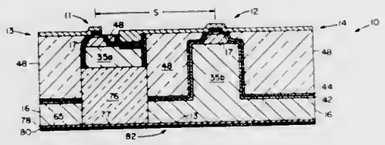
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4,905,070
SEMICONDUCTOR DEVICE EXHIBITING NO DEGRADATION OF LOW CURRENT GAIN
Israel A. Lesk, Phoenix; Peter J. Zdebel, and Han-Bin K. Liang, both of Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 2, 1988, Ser. No. 239,879
Int. Cl.[4] H01L *49/02, 29/72, 27/02*
U.S. Cl. 357—51 9 Claims



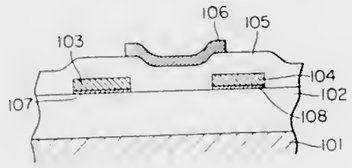
8. An integrated semiconductor device having improved gain, comprising:
a semiconductor substrate; a P-N junction formed in the substrate; and a resistive surface shunt positioned on the substrate to overlap the P-N junction to prevent a surface channel from forming and to prevent reverse bias P-N junction ageing induced reduction of low and high current gain.

4,905,071
MONOLITHIC SERIES-SHUNT DIODE SWITCH
Henri R. Chalifour, Andover, and Clifford A. Levi, Billerica, both of Mass., assignors to Alpha Industries, Inc., Woburn, Mass.
Filed Apr. 1, 1988, Ser. No. 176,786
Int. Cl.[4] H01L *29/92*
U.S. Cl. 357—14 26 Claims



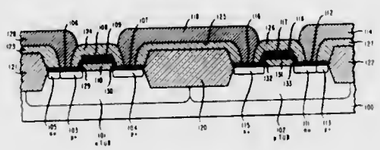
1. A switching circuit comprising
a substrate of semiconductor material,
a first switching device formed in a first region of said substrate,
a second switching device formed in a second region of said substrate integral with said first region, said second switching device being electrically coupled to said first switching device, and
means, disposed in said substrate, for electrically isolating said first substrate region from said second substrate region,
wherein said first and second substrate regions are disposed adjacent one another, said isolating means comprising a first region of dielectric material disposed in a first cavity formed in said substrate between said first and second substrate regions.

4,905,072
SEMICONDUCTOR ELEMENT
Toshiyuki Komatsu, Yokohama; Yutaka Hirai, Tokyo; Katsumi Nakagawa, Tokyo; Yoshiyuki Osada, Yokosuka; Satoshi Omata, Tokyo, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 56,328, May 28, 1987, abandoned, which is a continuation of Ser. No. 716,508, Mar. 25, 1985, abandoned, which is a continuation of Ser. No. 438,910, Nov. 3, 1982, abandoned. This application Apr. 29, 1988, Ser. No. 188,677
Claims priority, application Japan, Nov. 13, 1981, 56-182652; Nov. 13, 1981, 56-182653; Nov. 13, 1981, 56-182654
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] H01L *23/54, 29/04, 29/12*
U.S. Cl. 357—59 10 Claims



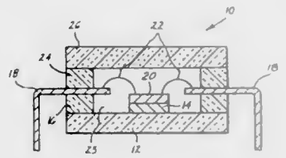
1. A semiconductor device which comprises a substrate and a semiconductor layer of a polycrystalline silicon thin film formed on the substrate, said film containing hydrogen atoms in an amount of not more than 3 atomic % and having a surface unevenness of substantially not more than 800 Å at its maximum, and said semiconductor layer of a polycrystalline silicon thin film constituting the main part of the semiconductor device.

4,905,073
INTEGRATED CIRCUIT WITH IMPROVED TUB TIE
Min-Liang Chen, Lower Macungie Township, Lehigh County; Chung W. Leung, South Whitehall Township, Lehigh County, and Daniel M. Wroge, Allentown, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Continuation of Ser. No. 65,235, Jun. 22, 1987, abandoned. This application Jul. 3, 1989, Ser. No. 376,919
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—67 13 Claims



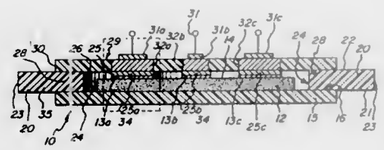
1. An integrated circuit having a first transistor formed in a doped first tub region of a first conductivity type formed in a silicon body of a given conductivity type, with the source of said first transistor being electrically connected by means of a first tub tie to said first tub region, and with a dielectric layer overlying at least a portion of said first transistor,
characterized in that said first tub tie is a metal silicide that contacts said silicon body from said source to an adjacent heavily doped contact region of said first conductivity type formed entirely within said first tub region;
and wherein a first contact window is formed in said dielectric layer, and a metal first power supply conductor extends into said first window and physically contacts said first tub tie.

4,905,074
INTERDIFFUSION RESISTANT FE-NI ALLOYS HAVING IMPROVED GLASS SEALING PROPERTY
Chung-Yao Chao, Hamden, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.
Division of Ser. No. 803,021, Nov. 29, 1985, Pat. No. 4,816,216. This application Nov. 24, 1986, Ser. No. 934,279
Int. Cl.[4] H01L *23/54*
U.S. Cl. 357—67 13 Claims



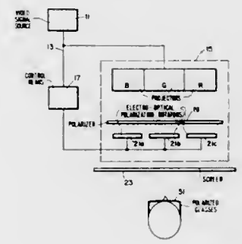
1. A structure having: a component formed from a single phase alloy consisting essentially of from about 30% to about 60% nickel, from about 0.001% to about 0.15% nitrogen, at least one element selected from the group of from about 1% to about 10% molybdenum and from about 0.001% to about 2% aluminum, and the balance essentially iron.

4,905,075
HERMETIC SEMICONDUCTOR ENCLOSURE
Victor A. K. Temple, Clifton Park, and Alexander J. Yerman, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 859,598, May 5, 1986, abandoned. This application Dec. 21, 1988, Ser. No. 287,767
Int. Cl.[4] H01L *23/02;* H01J *15/00*
U.S. Cl. 357—74 24 Claims



1. A packaged semiconductor device comprising:
a semiconductor device having a signal terminal;
a substantially planar base comprising the same semiconductor material as said device and having a thermal expansion coefficient which closely matches that of said device, said base having a first upper surface;
a sidewall spacer having a first lower surface and a second upper surface, said first lower surface sealingly engaging said first upper surface of said base, said sidewall spacer comprising the same semiconductor material as said device and having a thermal expansion coefficient which closely matches that of said device;
said sidewall spacer in combination with said base defining a cavity containing said semiconductor device;
a cover having a first lower surface sealingly engaging said second upper surface of said sidewall spacer to enclose said device in said cavity, said cover comprising the same semiconductor material as said device and having a thermal expansion coefficient which closely matches that of said device; and
one of said base, sidewall spacer and cover including means for coupling a signal between an external signal source and said signal terminal of said enclosed semiconductor device, said means for coupling including a selected portion of one of said base, sidewall spacer, and cover, said selected portion being in registry with a terminal of said semiconductor device and being specially treated to be conductive to signals applied thereto.

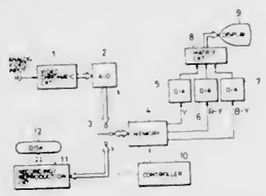
4,905,076
THREE DIMENSIONAL TELEVISION SYSTEM AND PROJECTION TELEVISION RECEIVER
Marcellinus J. J. C. Annegarn; Sing L. Tan, both of Eindhoven, Netherlands; David A. Cammack, White Plains, N.Y.; Douglas A. Stanton, and Rameshwar N. Bharagava, both of Ossining, N.Y., assignors to N.A. Philips & U.S. Philips Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 472,372, Mar. 4, 1983, abandoned. This application Aug. 12, 1986, Ser. No. 895,961
Int. Cl.[4] H04N *15/00*
U.S. Cl. 358—3 15 Claims



1. A three dimensional projection television system including a pair of television cameras each viewing a scene from different predetermined positions and each generating picture signals which upon receipt by an associated television receiver would produce picture fields on its receiver; a transmission system; a switch receiving the picture signals from each camera, said switch alternately connecting said cameras to said transmission system so that the picture signals received from said cameras alternate field by field between those generated by one camera and those generated by the other, a projection television receiver with red, green and blue projectors and a screen, said receiver receiving said transmitted field signals and projecting the associated fields on said screen; polarizer means disposed in front of said screen, said fields being transmitted through said polarizer means; electro-optical apparatus disposed in front of said screen, said apparatus including a separate electro-optical crystal device for each projector, said fields being transmitted through said electro-optical crystal devices; and control means connected to said electro-optical crystal devices and controlling their characteristics from field to field so that said screen alternately receives a field as polarized by said polarizer means and a field which is orthogonally polarized with respect to the fields polarized by said polarizer means whereby a viewer viewing said screen through glasses, the lenses of which are appropriately orthogonally polarized with respect to each other, perceives the screen to be providing a three dimensional image, said control means applying a different voltage to each of the crystal devices for the red, green and blue projectors during every other field, each said different voltage being different from each other.

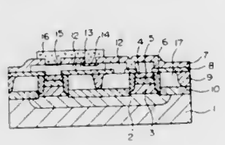
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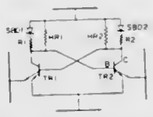
4,905,077
MULTI-SCENE DISPLAY SYSTEM
Tsuneo Ishii, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Feb. 10, 1988, Ser. No. 154,391
Claims priority, application Japan, Feb. 10, 1987, 62-28751
Int. Cl.[4] H04N *5/262, 5/222, 9/74*
U.S. Cl. 358—22 **9 Claims**



1. A multi-scene display system, comprising:
means for receiving a video signal representing a plurality of scenes;
means for storing each of said scenes as a plurality of regions; and
means for simultaneously displaying only selected regions of said plurality of scenes.

4,905,078
SEMICONDUCTOR DEVICE
Kazuhiko Sagara, Tokyo; Yoichi Tamaki, Kokubunji; Noriyuki Homma, Kodaira, and Tohru Nakamura, Tanashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 11, 1987, Ser. No. 84,074
Claims priority, application Japan, Sep. 24, 1986, 61-223525
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—34 **29 Claims**



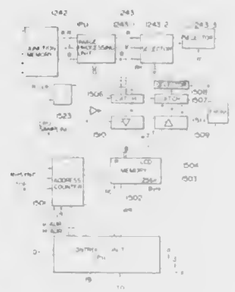


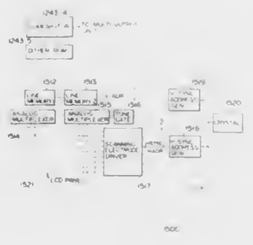
1. A semiconductor device comprising:
first and second vertical bipolar transistors respectively formed in first and second isolated protruding epitaxial layer segments which segments are formed on an upper surface of a semiconductor substrate, each epitaxial layer segment including a first region of a first conductivity type, a second region of a second conductivity type and a third region of said first conductivity type, wherein said first, second and third regions are stacked in descending order from an upper surface of said epitaxial layer, and wherein an upper surface of said first region is in the same plane as the upper surface of said epitaxial layer segments;
an insulating film formed above the upper surface of said semiconductor substrate and having openings wherein the first regions of said first and second epitaxial layer segments are disposed;
a first semiconductor layer, having at least first and second adjacent regions respectively having different impurity concentrations and being of the same conductivity type as the first region of said first and second epitaxial layer segments which form said transistors, said first semiconductor layer being formed above said insulting film and being in electrical contact, via the first region thereof, with the first region of said first epitaxial layer segment through one of said openings of said insulating film and wherein the second region of said first semiconductor layer is in electrical contact on one side thereof with the first region of said semiconductor layer, which first region overlies said first epitaxial portion, and is in electrical contact on another side thereof, through a further opening of said insulating film, with the second region of said second epitaxial layer segment;
a Schottky barrier diode located above the first region of said first epitaxial layer segment, having a junction formed on the first region at an upper surface region of said first semiconductor layer, said first region of said first semiconductor layer being a low resistive region connecting said Schottky barrier diode to the first region of said first epitaxial layer segment; and
wherein the second region of said first semiconductor layer is of a relatively lower impurity concentration doped region than said first region thereof and has a highly concentrated impurity doped region formed thereon.

4,905,079
COLOR IMAGE PROCESSING APPARATUS FOR PROCESSING SEPARATED COLOR SIGNALS
Kimiyoshi Hayashi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 26, 1987, Ser. No. 112,468
Claims priority, application Japan, Oct. 28, 1986, 61-257548
Int. Cl.[4] H04N *1/46, 1/40*
U.S. Cl. 358—78 **26 Claims**

1. A color image processing apparatus comprising:
supply means for supplying color separation signals corresponding to a plurality of color components; and
processing means for causing at least one of the color separation signals supplied from said supply means to be subjected to density conversion processing different from that for the other ones of the color separation signals;
wherein said processing means includes means for calculating an average of signals corresponding to a plurality of pixels for the at least one of said color separation signals and means for outputting a signal corresponding to one of a plurality of pixels for the other ones of the color separation signals.
7. A color image processing apparatus comprising:
separation mean for separating an image of an object to be read into a plurality of color signal components;
first processing means for simultaneously processing the plurality of color signal components separated by said separation means;
second processing means for sequentially selecting the color signal components separated by said separation means; and
means for synthesizing the signals processed by said first processing means and the signals selected by said second processing means.
14. A color image processing apparatus comprising:
separation means for separating an image of an object to be read into a plurality of color signal components;
first processing means for simultaneously processing said plurality of color signal components separated by said separation means, and performing density conversions of at least one of said plurality of color signal components; and
second processing means for sequentially selecting the color signal components separated by said separation means.
21. A color image processing apparatus, comprising:
storage means for storing image data of plural color component signals relating to a predetermined area;

output means for outputting plural color component signals obtained by converting a color imaged into an electric signal and processing the electric signal;
selecting means for selecting one of the color component signals output from said output means; and

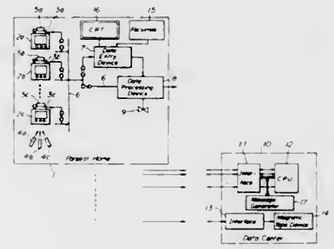




processing means adapted to select one of said plural color component signals out of said storage means in response to a selection operation of said selecting means, to combine the thus selected color component signal with the color component signal selected by said selecting means, and to supply the thus combined signal to a color printer.

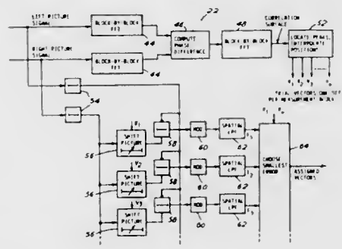
4,905,080
APPARATUS FOR COLLECTING TELEVISION CHANNEL DATA AND MARKET RESEARCH DATA
Fumio Watanabe; Yoshikazu Itoh, both of Tokyo, and Shunji Wake, Kawasaki, all of Japan, assignors to Video Research Ltd. and Ikegami Tsushinki Co., Ltd., both of Tokyo, Japan
PCT No. PCT/JP87/00578, § 371 Date Jun. 1, 1988, § 102(e) Date Jan. 1, 1988, PCT Pub. No. WO88/01117, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 31, 1987, Ser. No. 214,716
Claims priority, application Japan, Aug. 1, 1986, 61-180135; Aug. 1, 1986, 61-180136; May 26, 1987, 62-130791; Jun. 5, 1987, 62-140057
Int. Cl.[4] H04H *9/00*
U.S. Cl. 358—84 **33 Claims**

1. An apparatus for collecting television channel data and market research data, comprising:
a channel detector means for detecting a channel of a television receiver being viewed by panelists to provide channel data;
a personal data entry device means for entering personal identification information which is added to the channel data supplied from the channel detector means;
a market research data entry device means for entering market research data including a plurality of information items regarding each of a plurality of purchased products, said market research data entry device means including means for entering the market research data in a sequence-non-ordered mode wherein a panelist is not constrained to enter information items for a purchased product in a predetermined order, and means for entering personal identification information which is added to the market research data; and
a data processing device means for receiving the channel data and market research data supplied from the channel



detector means and the market research data entry device means, respectively, to provide data having a predetermined format, for storing the data having a predetermined format, and for transmitting the data having a predetermined format to a data center, said data processing device means including means for transmitting the channel data having the personal identification data added thereto and the market research data having the personal identification information added thereto to the data center via a subscriber telephone link of a panelist's home in response to a polling from the data center within a predetermined time period.

4,905,081
METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING 3D VIDEO PICTURES
David H. Morton, Oxted, United Kingdom, assignor to British Broadcasting Corporation, London, England
Filed Nov. 6, 1987, Ser. No. 118,217
Claims priority, application United Kingdom, Nov. 6, 1986, 8626527
Int. Cl.[4] H04N *13/00, 7/12*
U.S. Cl. 358—88 **13 Claims**



1. A method of transmitting video pictures containing depth information, comprising the steps of:
providing video signals from at least two sources, the signals being derived from different representations of the same scene;
correlating the video signal from a first source with the

video signal from each other source to determine a plurality of peak correlation values corresponding to vectors representing depth information;
testing for each pixels in the pictures which of these vectors gives the best fit in deriving one of the pictures from the other;
assigning each pixel to that vector which gives the best fit;
transmitting the video signal from the first source; and
transmitting the derived vectors for each pixel as difference information indicating how the first signal needs to be changed to form a display containing depth.

4,905,082

RIGID VIDEO ENDOSCOPE HAVING A DETACHABLE IMAGING UNIT

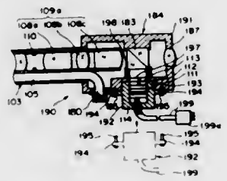
Shinichi Nishigaki, Tokyo; Takeaki Nakamura, Hino; Minoru Okabe, Musashino; Hitoshi Karasawa, Hachioji; Hiroyuki Kusuoki, Tokyo; Tadao Hagino, Yokohama; Tetsumaru Kubota, Hachioji; Mototsugu Ogawa, Hachioji; Masato Toda, Hachioji, and Teruaki Sugata, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 5, 1988, Ser. No. 190,724

Claims priority, application Japan, May 6, 1987, 62-110051; May 6, 1987, 62-110059; May 13, 1987, 62-116401; May 13, 1987, 62-116406; May 13, 1987, 62-117427; May 15, 1987, 62-118663; May 19, 1987, 62-121754; May 20, 1987, 62-123356; Oct. 27, 1987, 62-272609

Int. Cl.[4] A61B *1/04*; H04N *7/18*

U.S. Cl. 358—98 **35 Claims**



1. A rigid endoscope comprising:
an elongated rigid inserting section;
an objective lens system provided in said inserting section at the distal end thereof for forming an optical image of an object;
a relay optical system inserted into the interior of said inserting section and opposing at one end surface said objective optical system, said optical image being transferred through said relay optical system from said one end surface to the other end surface; and
a disconnectable solid state imaging device disconnectably attached to said inserting section at a focus position on which said optical image transferred through said relay optical system is formed.

4,905,083

T.V. INPUT SOURCE IDENTIFIER RESPONSIVE TO JITTER AND NOISE

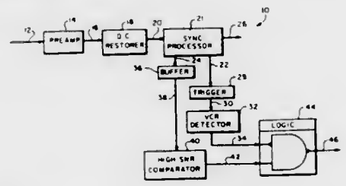
Anthony R. Bugni; Larry G. Phillips; Ted A. Darby; Saiprasad V. Naimpally, all of Knoxville, and William S. Burdick, Strawberry Plain, all of Tenn., assignors to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 119,603, Nov. 12, 1987, Pat. No. 4,785,350. This application Aug. 31, 1988, Ser. No. 239,089

Int. Cl.[4] H04N *17/00, 5/04, 17/02*

U.S. Cl. 358—139 **15 Claims**

1. An apparatus for analyzing a video signal containing a plurality of frames with each frame containing at least one field and each field having a time period and for determining whether the video signal is from a local video playing device or a broadcast signal source, comprising:
means for receiving the video signal and for generating timing data corresponding to the period of at least one selected field in each frame of a plurality of selected frames;
storage means for receiving the timing data and storing a maximum number corresponding to the greatest period of any one of the selected fields in the selected frames and for storing a minimum number corresponding to the least period of any one of the selected fields in the selected frames; and



judgment means for comparing the maximum number to the minimum number and producing a local signal when the difference between the maximum number and the minimum number is greater than or equal to a predetermined threshold to indicate that the video signal is from a local video playing device and for generating a nonlocal signal when the difference is less than the predetermined threshold to indicate that the video signal is from a broadcast signal source.

4,905,084

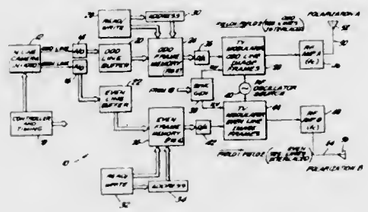
COMPATIBLE AND SPECTRUM EFFICIENT HIGH DEFINITION TELEVISION

Leo Zucker, Yorktown Heights, N.Y., assignor to Carole Broadcasting Technologies, Inc., White Plains, N.Y.

Filed Jan. 30, 1989, Ser. No. 303,917

Int. Cl.[4] H04N *7/04, 7/08, 11/20, 11/06*

U.S. Cl. 358—141 **27 Claims**



1. A method of broadcasting high definition television (HDTV) signals on a radio frequency carrier wave, whereby the broadcast HDTV signals are compatible with television receivers that operate to reproduce standard definition images, and the broadcast HDTV signals are contained within a frequency band or channel in the electromagnetic spectrum allocated for transmission of the standard definition images, comprising the steps of:
generating an image to be broadcast with high definition source means capable of producing a high definition image frame having a resolution of N lines, wherein N is a positive number equal to about twice the line resolution of a standard definition television image frame, and wherein successive lines n comprising the image frame are consecutively numbered from n=1 to N;
carrying out said generating step by producing odd line image signals corresponding to each odd numbered line of the image frame and producing even line image signals

corresponding to each even numbered line of the image frame;
modulating the odd line image signals on a radio frequency (RF) carrier wave signal to produce HDTV odd line image signals occupying at most the same frequency band or channel in the electromagnetic spectrum as occupied by the standard definition images;
modulating the even line image signals on a RF carrier wave signal to produce HDTV even line image signals that occupy at most said same frequency band;
providing first transmitting antenna means of a first polarization;
providing second transmitting antenna means of a second polarization orthogonal to said first polarization;
radiating the HDTV odd line image signals from the first transmitting antenna means to produce first radiated electromagnetic waves of said first polarization;
simultaneously radiating the HDTV even line image signals from the second transmitting antenna means while the HDTV odd line image signals are radiated from the first transmitting antenna means, to produce second radiated electromagnetic waves of said second polarization mutually orthogonal with said first polarization; and
carrying out said simultaneously radiating step so that corresponding portions of odd and even line image signals representing adjacent pairs of lines of the generated high definition image frame are propagated in phase with one another.

4,905,085

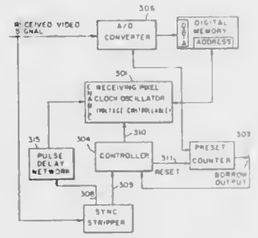
SYNCHRONOUS SAMPLING SYSTEM

Mark E. Faulhaber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1988, Ser. No. 251,961

Int. Cl.[4] H04N *5/04*

U.S. Cl. 358—148 **8 Claims**



1. In a sampling system for digitally sampling a regular sequence of received analog signals, said signals each having a sampled data portion and a synchronizing portion both comprising time durations that are substantially integer multiples of the period of a transmitting system clock used in generating said signals, apparatus for synchronizing a system clock of said sampling system with said received signals, the invention comprising:
means for detecting said received signals;
controllable variable frequency oscillator means, enabled by said detecting means during said sampled data portions of said received signals, for utilization as the sampling system clock;
analog-to-digital sampling means, responsive to an output of said controllable variable frequency oscillator means, for sequentially sampling said sampled data portions of said received signals;
preset computer means, responsive to an output of said controllable variable frequency oscillator means, for counting the number of points of oscillation of said oscillator occuring between sequential synchronizing portions of said received signals;
control means, responsive to outputs of said preset counter means and said detecting means, for generating a compensating control signal that automatically adjusts the frequency of said variable frequency oscillator so that the number of periods of oscillation of said controllable variable frequency oscillator means occurring during said sampled data portions of said received signals substantially corresponds to a preset count;
means for digitally storing the output of said analog-to-digital samplings means; and,
delaying means, disposed between said detecting means and said oscillator means, for delaying a horizontal synch output of said detecting means.

4,905,086

TELEVISION TRANSMITTER EMPLOYING KLYSTRON WITH NONLINEARITY CORRECTION CIRCUIT

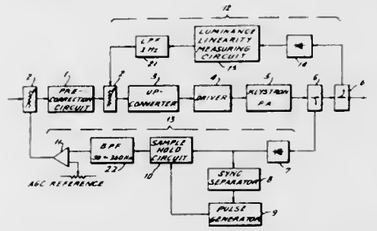
Noboru Tahara, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 30, 1988, Ser. No. 278,185

Claims priority, application Japan, Nov. 30, 1987, 62-182658[U]

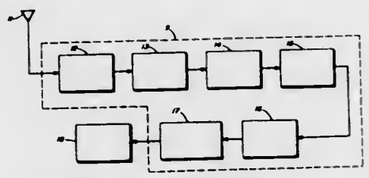
Int. Cl. H04N *5/38*

U.S. Cl. 358—186 **21 Claims**



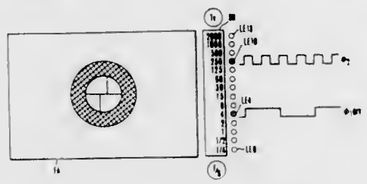
1. A television transmitter employing a klystron, comprising:
a klystron power amplifier;
a non-linearity correction circuit which receives an input high frequency television signal and corrects a distortion generated by said klystron power amplifier;
a driving amplifier which receives an output from said non-linearity correction circuit and drives said klystron power amplifier;
non-linearity detection means for receiving an output of said klystron power amplifier and for detecting a non-linearity thereof;
first level varying means for controlling an output level of said non-linearity correction circuit according to an output of said non-linearity detection means, an output of said level varying means being supplied to said drive amplifier;
hum component detection means for detecting a hum frequency component in the output of said klystron power amplifier; and
second level varying means for controlling an input level to said non-linearity correction circuit according to an output of said hum component detection means.

4,905,087
UHF FM RECEIVER HAVING IMPROVED FREQUENCY STABILITY AND LOW RFI EMISSION
Francesco Lupinetti, Albuquerque, N. Mex., assignor to The United States of American as represented by the United States Department of Energy, Washington, D.C.
Filed Aug. 29, 1988, Ser. No. 237,191
Int. Cl.[4] H04N 5/455; H04B 1/30
U.S. Cl. 358—191.1 6 Claims



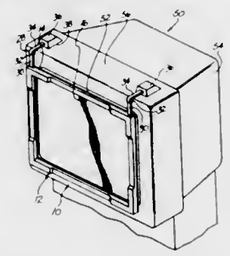
1. A television receiver, for directly converting ultra high frequency (UHF) carrier signals frequency modulated with video signals to baseband video signals, comprising:
(a) a fixed frequency bandpass filter having a passband in the UHF frequency spectrums, said filter having an input connected to receive an antenna signal;
(b) a low noise UHF preamplifier connected to receive a signal from said fixed frequency bandpass filter, for amplifying said signal;
(c) a limiter circuit connected to receive a signal from said low noise UHF preamplifier; and,
a video demodulator circuit connected to receive an amplitude limited UHF signal from said limiter circuit and produce, without frequency converting said UHF signal, said baseband video signal substantially free from said UHF signal.

4,905,088
PICK-UP DEVICE
Tokuichi Tsunekawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 248,271, Sep. 20, 1988, which is a continuation of Ser. No. 168,527, Mar. 7, 1988, which is a continuation of Ser. No. 906,584, Sep. 9, 1986, which is a continuation of Ser. No. 793,457, Oct. 28, 1985, which is a continuation of Ser. No. 442,574, Nov. 18, 1982. This application Apr. 4, 1989, Ser. No. 333,793
Claims priority, application Japan, Nov. 25, 1981, 56-188917
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.13 26 Claims



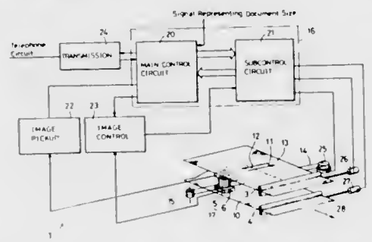
1. An image pick-up device comprising:
(a) image pick-up means for converting an optical picture information into an electrical signal; and
(b) picture number designating means for selectively designating a number of picture pick-ups per unit time in the image pick-up means out of a plural number of set values, whereby the plural number of set values is in the relation satisfying about 2^n, (n: an integer).

4,905,089
FILTER SCREEN FOR CATHODE RAY TUBES
Paul M. Liang, and Tony H. Wen, both of Taipei, Taiwan, assignors to RCS Technology Corporation, Taipei, Taiwan
Filed Jan. 3, 1989, Ser. No. 293,068
Int. Cl.[4] H04N 5/65
U.S. Cl. 358—247 9 Claims



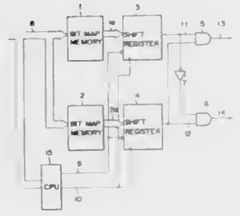
1. In combination, a screen formed of interwoven electrically conductive fibers, said screen constituting means for diffusing electromagnetic radiation emitted from a cathode ray tube, and a frame connected about a periphery of said screen, a ground wire connected to said screen, said screen and frame positioned adjacent to a cathode ray tube, the improvement wherein said frame includes non-conductive outer frame members which define an interior channel, a conductive inner frame member fitted in said channel with the screen and ground wire connected to the inner frame member, and a hanger connected to the frame, said hanger constituting means for positioning said frame and screen in front of said cathode ray tube.

4,905,090
READING OR WRITING METHOD AND APPARATUS THEREOF
Hideyuki Miyake, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Sep. 28, 1988, Ser. No. 250,410
Claims priority, application Japan, Sep. 30, 1987, 62-247629
Int. Cl.[4] H04N 1/04, 1/17, 1/23
U.S. Cl. 358—296 12 Claims



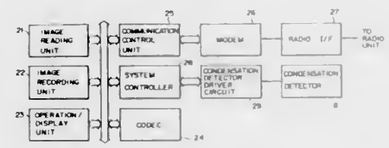
1. A reading or writing method for reading data from a medium or writing data thereon by reciprocatively driving a reading/writing head over the medium, the reading or writing method comprising:
determining a reading or writing length of one line from the medium size or the writing data, respectively;
driving the head forward at a predetermined speed independent of reading or writing length; and
returning the head at a speed which is a predetermined maximum speed when the reading or writing length is at a maximum or at a speed lower than the maximum speed when the reading or writing length is shorter than the maximum so as to complete the reciprocation of the head within a substantially constant time period independent of the length of one line.

4,905,091
RECORDING DATA PROCESSOR
Masayoshi Suzuki, Yokohama; Hisao Urata, Tokyo; Satoshi Egawa, Kawasaki, and Shigeru Ueda, Wako, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 26, 1988, Ser. No. 262,823
Claims priority, application Japan, Oct. 29, 1987, 62-271617
Int. Cl.[4] H04N 1/21, 1/46; G03G 15/01
U.S. Cl. 358—256 21 Claims



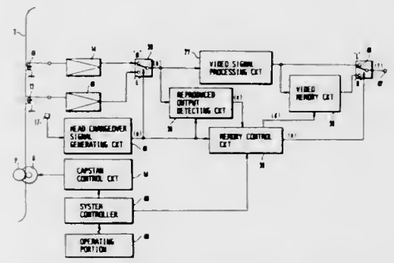
1. A recording data processor comprising:
first storage means for storing recording data;
second storage means for storing color data representing reproduction color of the recording data stored in said storage means, for each of the recording data;
generation means for generating the recording data for each color based on the recording data output from said first storage means and the color data output from said second storage means; and
first and second shift registers for converting the parallel recording data and color data supplied from said first and second storage means to first and second serial signals, respectively.

4,905,092
CONDENSATION-FREE DATA READING MACHINE
Takaho Koshiishi, Tokyo, and Shiro Uchida, Isehara, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Nov. 2, 1988, Ser. No. 265,955
Claims priority, application Japan, Nov. 4, 1987, 62-277370
Int. Cl.[4] H04N 1/23
U.S. Cl. 358—296 6 Claims



1. A data reading machine comprising:
an LED type light source for illuminating an original;
image reading means for optically reading said original;
a condensation sensor for detecting formation of water droplets by condensation on said image reading means, said condensation sensor generating a detection signal upon detection of formation of water droplets by condensation on said image reading means; and
means for activating said light source in response to said detection signal, whereby said light source is lit to produce heat which is applied to said image reading means to cause said water droplets to disappear.

4,905,093
VIDEO REPRODUCTION APPARATUS WITH PLURAL HEADS AND FIELD MEMORY
Keiji Satoh, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 10, 1988, Ser. No. 204,878
Claims priority, application Japan, Jun. 23, 1987, 62-156135; Jun. 23, 1987, 62-156136
Int. Cl.[4] H04N 5/782
U.S. Cl. 358—335 8 Claims



1. A video signal reproduction apparatus comprising:
(a) transport means capable of transporting a recording medium having a video signal recorded thereon at the same predetermined speed as when said video signal was recorded;
(b) a plurality of reproducing heads each arranged to trace said recording medium in a direction crossing the direction in which said transport means transports said recording medium;
(c) switching means for alternately selecting reproduced signals from said plurality of reproducing heads to output a video signal;
(d) memory means capable of storing at least one field of the video signal obtained through said switching means;
(e) detecting means for detecting whether or not a reproduction output is obtained from said plurality of reproducing heads;
(f) control means, arranged to be operable when said transport means transports said recording medium at said predetermined speed, for controlling a mode of said memory means between a writing mode and a reading mode in accordance with an output of said detecting means; and
(g) output means for selectively outputting the video signal obtained through said switching means and the video signal read out from said memory means.

4,905,094
SYSTEM FOR AUDIO/VIDEO PRESENTATION
Terrence H. Pocock, Delaware; Richard M. McNorgan, London; Gary B. Allen, Burlington; Peter J. M. Coumans, London, all of Canada; Karl W. McCalley, Palatine, and John R. Bertram, Deerfield, both of Ill., assignors to Telaction Corporation, Schaumburg, Ill.
Filed Jun. 30, 1988, Ser. No. 213,357
Int. Cl.[4] H04N 5/76; G11B 7/00
U.S. Cl. 358—342 13 Claims

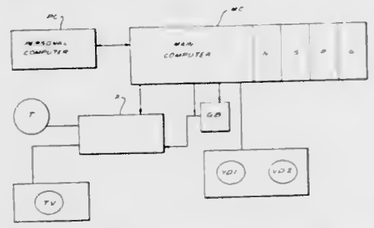
1. A system for providing a retrievable network of video presentations, each such video presentation including one or more video images which may be associated with an audio segment, said network of video presentations being stored on a retrievable storage medium and incorporating a plurality of

permissible pathways between said video presentations, said system comprising:

means for storing a plurality of video images on a first recording medium,

means for storing a plurality of audio segments on a second recording medium,

means for defining in a preselected format said permissible pathways in said network between said video presentations, and the association between each said audio segment, if present, and one or more of said video images, and



means for storing on a third recording medium said plurality of video images with said associated audio segments according to said defining means, said video images and said associated audio segments being stored on said third recording medium as video frames with each said video frame being electronically identified for retrieval.

4,905,095

IMAGE PROCESSING APPARATUS

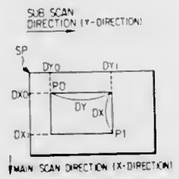
Masanori Yamada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 889,922, Jul. 28, 1986, abandoned. This application Jun. 27, 1989, Ser. No. 372,166

Claims priority, application Japan, Jul. 31, 1985, 60-169418; Jul. 31, 1985, 60-169419

Int. Cl.[4] H04N *1/04*

U.S. Cl. 358—451 **66 Claims**



1. An image processing apparatus comprising:

generating means for generating image data representing an original image;

first outputting means for outputting size data representing the size of a print sheet;

second outputting means for outputting magnification data to be used for varying the size of the original image;

process means for determining a number of divisions of the original image in accordance with the size data and the magnification data; and

reproducing means for reproducing an image on the print sheet on the basis of the image data, said reproducing means being operable to divide the original image into a plurality of images on the basis of the number of divisions determined by said process means and to reproduce the thus divided images, the sizes of which are varied in accordance with the magnification data, on different print sheets, respectively.

4,905,096

IMAGE READING ARRANGEMENT

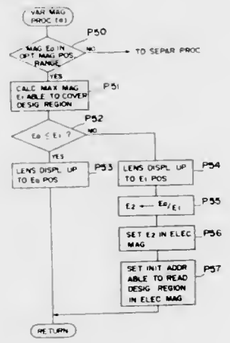
Shigeru Moriya, Osaka, Japan, assignor to Minolata Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1988, Ser. No. 236,933

Claims priority, application Japan, Aug. 28, 1987, 62-216227

Int. Cl.[4] H04N *1/393*

U.S. Cl. 358—451 **5 Claims**



1. An image reading arrangement which comprises:

an optical projecting mechanism for projecting an image of an original document;

an image reading device for converting the projected image into an electrical image signal;

a first magnifying means associated with said optical projecting mechanism for optically enlarging the size of the image to be projected onto said image reading device;

a second magnifying means including a memory means for temporarily storing an electrical image signal and arranged to electrically enlarge the size of an image by controlling writing and reading of the image signal into and from said memory means;

a magnification input means for inputting enlarging magnification when the size of the image of the original document is enlarged;

a region input means for inputting data designating a region on the original document to be read and outputted; and

a control means for controlling said first and second magnifying means in response to said magnification input means and said region input means; said control means effects the control in such a manner that, when an entire region as designated can not be read if only said first magnifying means is operated at the input magnification, said control means sets magnification to be used in each of said first and second magnifying means so as to cause said first and second magnifying means to function simultaneously.

4,905,097

IMAGE PROCESSING SYSTEM CAPABLE OF PROCESSING BOTH BINARY AND MULTIVALUE IMAGE DATA AND HAVING CONVERTERS FOR CONVERTING EACH TYPE OF IMAGE DATA INTO THE OTHER TYPE OF IMAGE DATA

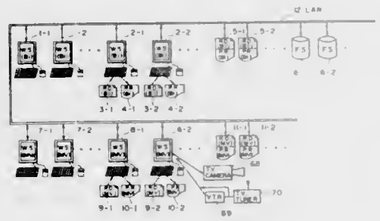
Yasuhiro Watanabe, Yokohama, and Yukari Shibuya, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1987, Ser. No. 97,491

Claims priority, application Japan, Sep. 20, 1986, 61-222713; Sep. 26, 1986, 61-229088; Sep. 26, 1986, 61-229089; Oct. 6, 1986, 61-237440

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—456 **49 Claims**



1. An image processing system comprising:

binary image processing means for image processing one pixel of image data as a binary digital signal (referred to as binary image data);

multivalue image processing means for image processing one pixel of image data as a multivalue digital signal (referred to as multivalue image data);

binary/multivalue converting means for converting the binary image data into multivalue image data; and

multivalue/binary converting means for converting the multivalue image data into binary image data,

wherein said binary image processing means processes binary image data converted by said multivalue/binary converting means and said multivalue image processing means processes multivalue data converted by said binary/multivalue converting means and wherein said binary image processing means and said multivalue image processing means can transmit and receive image data to and from each other and can image process either binary image data or multivalue image data.

4,905,098

COPIER WITH AN OPTIONAL FACSIMILE FUNCTION AND METHOD OF CONTROLLING THE SAME

Seiji Sakata, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 9, 1988, Ser. No. 191,393

Claims priority, application Japan, May 9, 1987, 62-113075; Apr. 1, 1988, 63-78157

Int. Cl.[4] H04N *1/32*

U.S. Cl. 358—468 **14 Claims**

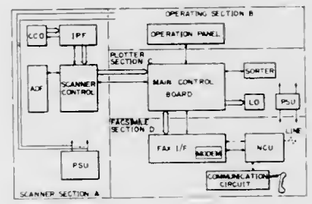
1. A copier with an optional facsimile function, comprising:

mode selecting means;

mode displaying means;

mode display holding means; and

control means for controlling said mode selecting means, said mode displaying means and said mode display holding means such that when said mode selecting means is operated to switch a copy mode to a facsimile mode, said mode display holding means holds the copy mode and, when said mode selecting means is operated to switch the facsimile mode back to the copy mode, said mode displaying



means displays the mode which is held by said mode display holding means.

4,905,099

INTERMEDIATE PICTURE FIELD STORAGE SYSTEM FOR VARIABLE SPEED MAGNETIC TAPE VIDEO DATA READ-OUT

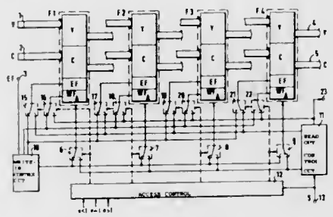
Roland Mester, Darmstadt; Jürgen Heitmann, Alsbach-Hähnlein; Rolf Loos, Müster, and Jürgen Müller, Griesheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 1, 1988, Ser. No. 201,484

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719496

Int. Cl.[4] H04N *5/91*

U.S. Cl. 360—10.1 **9 Claims**



1. Video data intermediate storage system for variable speed equipment for reading out from a magnetic tape video data recorded with sector subdivisions in a plurality of channels, having tape speed control means providing settings for tape speeds respectively slower than, equal to, or greater than the tape speed at which video data was recored on the tape, comprising:

four picture field memories, each including a luminance sample value memory a chrominance sample value memory, a write flag memory and an error flag memory, said write flag memory being for storage of write flag for designating that, at a corresponding address, there is at least a luminance or a chrominance sample value which was not read-out in a previous picture field read-out;

a set of four read/write switching means respectively connected to said picture field memories for connecting each of them selectively either exclusively for video data write-in or exclusively for video data read-out, in accordance with control signals for said respective memories;

means for generating said control signals for said memories in such a way that at any one time only one of said picture field memories is available for readout and so that the number and sequence of said memories made available for write-in is variable, in repsonse to said settings of said tape speed control means, and for allocating the number of said

picture field memories available for write-in in response to a said setting of said tape speed control means;

write-in and read-out memory addressing means for addressing in every addressing step a luminance sample value a chrominance sample value, a corresponding error flag address, and a corresponding error flag address, and

means for synchronizing switchover of said switching means and for synchronizing read-out from that one of said picture field memories which is being used in read-out therefrom, said synchronizing means including means for generating a reference synchronizing signal containing at least pulses of a read-out vertical scan frequency.

4,905,100

MAGNETIC RECORDER/REPRODUCER

Kazuhito Endo; Masayuki Ishida, and Yoshinobu Ishida, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

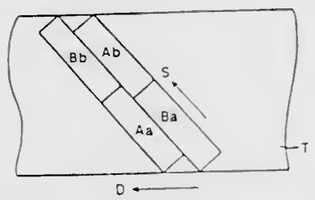
Continuation of Ser. No. 19,612, Feb. 27, 1987, Pat. No. 4,835,627, which is a continuation of Ser. No. 696,051, Jan. 29, 1985, Pat. No. 4,675,754. This application Jun. 30, 1988, Ser. No. 214,275

Claims priority, application Japan, Feb. 21, 1984, 59-32130; Mar. 16, 1984, 59-51866; Mar. 30, 1984, 59-64584

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.⁴ G11B *5/09*

U.S. Cl. 260—32 **62 Claims**



1. A magnetic recorder comprising recording means including a plurality of rotary heads (10,11) for performing helical scanning to produce a recording in the form of a plurality of tracks, the recorder further comprising signal processing means (4,5) for providing to the recording means digital signals comprising odd and even samples of at least one channel for enabling interleaved recording of said digital signals in such a way that the odd and even samples of said channel are recorded in different tracks and that sequentially occurring odd and even samples are separated in a direction defined along the length of the tracks,

wherein the signal processing means (4,5) is structured for providing the digital signals of a plurality of channels in such a manner that, for each channel, the odd samples are recorded in a group in a region of one track, and the even samples are recorded in a group in a region of a different track, the region of said different track containing the even samples occupying a portion of the length of said different track which excludes a portion of said different track corresponding in location to a portion of the length of said one track occupied by the region in which the odd samples are recorded.

4,905,101

TIME BASE CORRECTOR

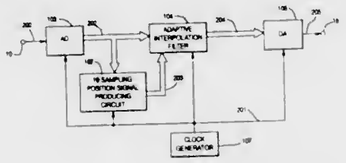
Haruo Ohta, Yawata, and Tokikazu Matsumoto, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 7, 1988, Ser. No. 216,416

Claims priority, applicatioo Japan, Jul. 21, 1987, 62-181530

Int. Cl.⁴ H04N *5/78*

U.S. Cl. 360—36.2 **8 Claims**



1. A time base corrector for correcting a time base error of an input analog signal, comprising:

clock generating means for generating a clock signal having a fixed period;

analog-to-digital conversion means responsive to said clock signal for sampling amplide values of said input analog signal at respective sampling points given by said clock signal thereby to obtain a digitized signal;

resampling position signal producing means for detecting said time base error and producing from the detected time base error a resampling position signal indicative of a position of a resampling point relative to corresponding one of said sampling points, said resampling point being a point at which an amplitude value of said input analog signal which would be sampled at the corresponding sampling point is present;

interpolation means for interpolating amplitude values each at the resampling point using said sampled amplitude values from said analog-to-digital conversion means and said resampling position signal, and outputting as a digital signal the interpolated amplitude values at the sampling timings given by said clock signal; and

digital-to-analog conversion means responsive to said clock signal for converting the output digital signal from said interpolation means to an analog signal, which is a time base error corrected analog signal.

4,905,102

SYSTEM FOR PROCESSING SIGNALS REPRODUCED FROM A DIGITAL MAGNETIC RECORD IN A RECORDER-REPRODUCER

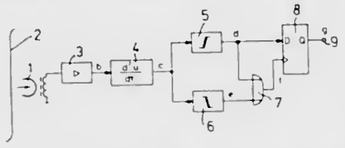
Axel Schulz, Bickenbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 229,132

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726316

Int. Cl.⁴ G11B *5/09*

U.S. Cl. 360—46 **3 Claims**



1. A system for processing signals in a digital recording and reproducing apparatus in which a digital signal written on a magnetic carrier is reconverted, in reproduction operation of the apparatus, into a digital signal, comprising:

means for twice differentiating a said signal (d) read out from said carrier (2) to obtain a second derivative signal (c);

a first comparator switch (5) for detecting positive components (b) of said second derivative signal (c) having an output and providing a detected positive component signal at the output of said first comparator switch;

a second comparator switch (6) for detecting negative components (e) of said second derivative signal (c) having an output and providing a detected negative component signal at the output of said second comparator;

and OR gate (7) having a first input connected to the output of said first comparator switch and a second input connected to the output of said second comparator switch, and also having an output;

a D-flipflop (8) having a clock input connected to the output of said OR gate (7), a D input connected to the output of only one of said comparator switches and an output (Q) connected to an output (9) of the system for directly supplying a digital signal freed of distortion for further processing.

4,905,103

MAGNETIC RECORDING APPARATUS

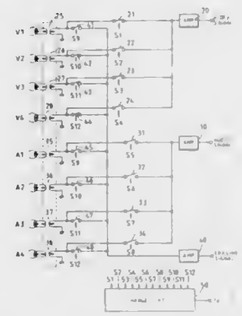
Tsunehisa Ohira, Sagamihara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 14, 1988, Ser. No. 183,535

Claims priority, application Japan, Apr. 20, 1987, 62-97181

Int. Cl.⁴ G11B *15/14*

U.S. Cl. 360—64 **4 Claims**



1. A magnetic recording apparatus comprising:

(a) a rotary drum around which a magnetic tape extends in an angular range substantially equal to 270 ° C.; and

(b) four pairs of magnetic rotary heads mounted on the rotary drum, wherein the rotary heads in each of the pairs have a common azimuth angle, wherein two of the pairs of the rotary heads are angularly spaced substantially at right angles and have track widths greater than a track pitch in a long-play mode and constitute video heads used in both the long-play mode and a normal-play mode, wherein the other two pairs of the rotary heads are angularly spaced substantially at right angles and constitute audio heads, wherein the video heads alternate with the audio heads in a direction of rotation of the rotary drum;

wherein during a recording mode where guard bands are provided between video signal recording tracks formed via the video heads, a group of audio signal recording tracks and a group of video signal recording tracks are formed in a deep portion and an outermost portion of a magnetic layer of the magnetic tape respectively by repeating processes as follows: one of the audio heads forms an audio signal recording track in the magnetic tape, then the subsequent audio head and video head erase a previously-recorded signal from an outermost portion of the tape magnetic layer in the audio signal recording track and from both sides of the audio signal recording track, and one of the video heads forms a video signal recording track; and one of the video heads forms a video signal recording track in an outermost portion of the tape magnetic layer in an area substantially to a location of the audio signal recording track where recorded signal was erased from the outermost portion of the tape magnetic layer and the sides of the recording track.

4,905,104

ROTARY HEAD TYPE DIGITAL SIGNAL RECORDING AND/OR REPRODUCING APPARATUS FOR RECORDING AND/OR REPRODUCING WITH A VARIABLE SPEED

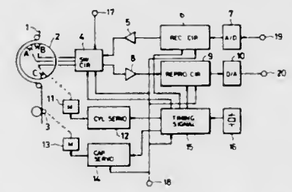
Hiroo Okamoto; Takaharu Noguchi; Masaharu Kobayashi, and Taihei Nakama, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1987, Ser. No. 76,604

Claims priority, application Japan, Jul. 22, 1986, 61-170774

Int. Cl.⁴ G11B *21/04, 5/52, 5/09*

U.S. Cl. 360—70 **24 Claims**



1. An apparatus utilizing at least one rotary head for at least one of recording and reproducing a digital signal on and from tracks of a recording medium, comprising:

means for controlling a feed speed of the recording medium; and

means for controlling a timing of at least one of a recording and reproducing interval between tracks of the recording medium;

wherein for at least one of recording and reproducing the digital signal on the recording medium at one of a normal recording speed and normal reproducing speed, the feed speed control means controls the feed speed of the recording medium to a normal feed speed and the timing control means controls at least one of the recording interval and reproducing interval to at least one of a normal recording and reproducing interval between tracks, and for at least one of recording and reproducing at $\frac{1}{N}$ times the normal speed for at least one of recording and reproducing, the feed speed control means controls the recording medium feed speed to $\frac{1}{N}$ times the normal speed, and the timing control means controlling one of the recording and reproducing interval between tracks to 2N times the at least one of the normal recording and reproducing interval when the speed for at least one of recording and reproducing is at $\frac{1}{N}$ times, N being an integer greater than one; and

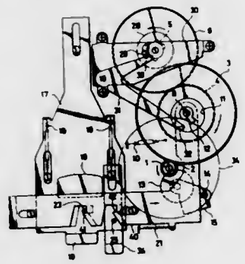
wherein at least two rotary heads are mounted at adjacent positions on a rotating cylinder, one of the at least two rotary heads having a plus azimuth angle and the other of the at least two rotary heads having a minus azimuth angle.

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4,905,105
AUTOMATIC STOP MECHANISM FOR TAPE RECORDER

Shinsaku Tanaka, Tokyo, and Kunio Kido, Wako, both of Japan, assignors to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1987, Ser. No. 103,068
Claims priority, application Japan, Mar. 29, 1985, 60-65287
Int. Cl.[4] G11B *15/02, 15/44*
U.S. Cl. 360—74.2 **3 Claims**



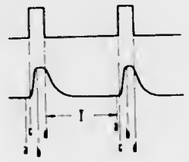
1. An automatic stop mechanism for a tape recorder, said mechanism comprising:
- a control member movable between an operated and a non-operated position;
- a lock member operably coupled to said control member for moving said control member between said operated and non-operated positions, said lock member being ordinarily biased in a locked position corresponding to said operated position;
- a rotation transmitting member rotatably supported on said lock member;
- a reel shaft; and
- a means operably coupled between said reel shaft and said rotation transmitting member for transmitting a rotary force to said reel shaft, said means detecting each stop of said reel shaft and, upon detecting a stop, said means causing said rotation transmitting member to move out from a rotary force transmitting path at an operated position of said rotation transmitting member, thus causing said lock member to move to its unlocked position, thus moving said control member to its non-operated position.

4,905,106
DEVICE FOR DETECTING LIGHT TRANSMISSIVITY OF DETECTED OBJECT AND RECORD AND/OR REPRODUCING APPARATUS USING SAME

Koichiro Suzuki, Kanagawa, and Toshihiro Segikubo, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 89,069, Aug. 25, 1987, abandoned. This application May 22, 1989, Ser. No. 356,635
Claims priority, application Japan, Aug. 28, 1986, 61-131956[U]; Aug. 28, 1986, 61-131958[U]
Int. Cl.[4] G11B *15/48*
U.S. Cl. 360—74.6 **5 Claims**

1. A device for discriminating a light transmissivity of an object to be discriminated, comprising:
- (a) a light emitting element;
- (b) a light control circuit arranged to intermittently send an electric current to said light emitting element in a predetermined cycle, each of the predetermined cycle having a first period during which said light control circuit is feeding the electric current to said light emitting element and a second period during which said light control circuit is not feeding the electric current to said light emitting element, and said first period being shorter than said second period;
- (c) a light receiving element which is opposed to the light emitting element across said object to be detected and is arranged to produce an electrical signal corresponding to a quantity of light received;
- (d) a first detection circuit arranged to detect the electrical signal produced by said light receiving element in the predetermined cycle at a first timing within said first period and to produce a first detection signal;

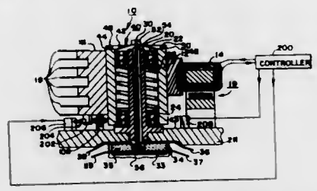


- (e) a second detection circuit arranged to detect the electrical signal produced by said light receiving element in the predetermined cycle at a second timing within said second period and to produce a second detection signal, a period of time from said first timing to said second timing being arranged to be longer than a period of time from said second timing to said first timing; and
- (f) a discrimination means for discriminating the light transmissivity of said object on the basis of said first and second detection signals.

4,905,107
TORSION TRANSDUCER FOR MAGNETIC STORAGE DISK DRIVES

Enrique J. Klein, 1686 Christina Dr., Los Altos, Calif. 94022

Filed Feb. 5, 1988, Ser. No. 152,774
Int. Cl.[4] G11B *5/55;* **G01L** *3/10*
U.S. Cl. 360—75 **24 Claims**

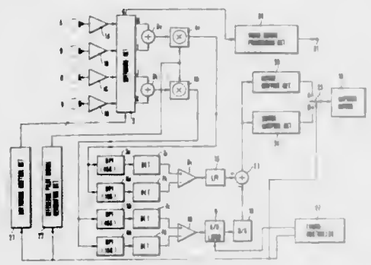


1. A torsion transducer for use in rigid disc drives having magnetic heads positioned by a rotary actuator including a stationary support post having a central bore forming a passageway extending longitudinally therethrough and affixed to a base of the disc drive, said base having an aperture aligned with said passageway, and a rotary element journalled to said stationary support post for moving the magnetic heads, said torsion transducer comprising:
- a torsion bar extending through said passageway and said aperture;
- connector means attached to one end of said torsion bar for coupling said torsion bar to said rotary element; and
- transducer means coupled to the other end of said torsion bar for detecting torque developed in said torsion bar when said rotary element is rotated and for producing electrical signals proportional to said torque.

4,905,108
ROTARY HEAD TYPE REPRODUCING APPARATUS WITH TRACKING CONTROL FUNCTION

Mitsuhiro Otokawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,520
Claims priority, application Japan, Nov. 6, 1986, 61-262731
Int. Cl.[4] G11B *15/467, 5/53*
U.S. Cl. 360—77.14 **6 Claims**



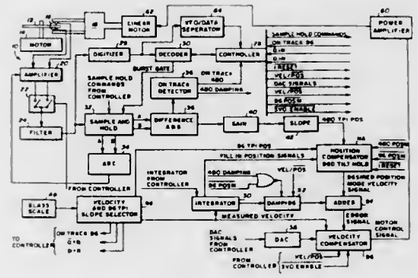
1. An apparatus for reproducing information with rotary heads from a record bearing medium on which an information signal and pilot signals are recorded in many parallel recording tracks, comprising:
- (a) a plurality of rotary heads including first, second and third heads which are arranged to be capable of simultaneously tracing different parts of said tracks, differing both in longitudinal and transverse directions of said tracks;
- (b) reproducing means for reproducing said information signal by using said first head;
- (c) first means for forming a first tracking error signal on the basis of pilot signals reproduced from the second and third tracks which are located on both sides of a first track by the first head positioned between the second and third heads;
- (d) second means for forming a second tracking error signal on the basis of pilot signals reproduced from said second and third tracks by the second and third heads; and
- (e) control means for controlling the positions of the plurality of heads relative to a position of said record bearing medium by using both said first and second tracking error signals.

4,905,109
PROCESS FOR OPTIMIZING HEAD POSITION TO OVERCOME DISK MISCLAMPING AND IMPERFECTIONS

Kenneth G. Burtlett, and Per-Erik Walberg, both of San Jose, Calif., assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,805
Int. Cl.[4] G11B *5/54, 5/596*
U.S. Cl. 360—77.02 **11 Claims**

4. A process for optimizing head position to compensate for disk misclamping and imperfections comprising the steps of:
- i. moving a transducer head to a track position on a disk, said head having a width less than a track width;
- ii. repeatedly reading said track at different microstep positions;
- iii. determining a number of identification fields detected at each microstep position;
- iv. if an odd number of microstep positions have a maximum number of identification fields detected, then finding the optimum position as the middle one of said odd number of microstep positions; and
- v. if an even number of microstep positions have a maximum number of identification fields detected, then defining said microstep positions as maximum positions and determining which one of a couple of boundary microstep positions located one microstep on either side of said maximum positions has a greater number of identification fields

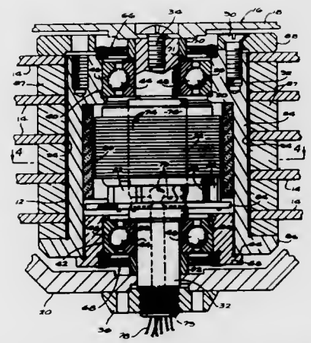


detected, and defining the optimum microstep position as one of the two middle most of said maximum microstep positions which is closest to the boundary position having the greatest number of identification fields detected.

4,905,110
DISK DRIVE SPINDLE MOTOR

Richard G. Krum, Thousand Oaks; Eddy J. Milanes, Simi Valley, and Michael B. Moir, Newbury Park, all of Calif., assignors to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Mar. 25, 1988, Ser. No. 173,619
Int. Cl.[4] G11B *5/016*
U.S. Cl. 360—99.08 **15 Claims**



1. A disk drive spindle motor for rotatably driving a plurality of memory storage disks or the like, said spindle motor comprising:
- a stator shaft;
- an armature carried by said stator shaft;
- a rotor hub;
- means for rotatably supporting said rotor hub from said stator shaft;
- a permanent magnet sleeve carried by said rotor hub in a magnetic coupled relation with said armature, said sleeve having a one piece configuration including a plurality of circumferentially arranged alternating poles, whereby said permanent magnet sleeve and said hub are rotatably driven upon supply of electrical power to said armature;
- Hall-effect switch means carried by said stator shaft generally at one end of said armature and at a position generally radially within one end of said permanent magnet sleeve,

said Hall-effect switch means detecting and responding to changing motor phases to control motor rotational speed and direction; and

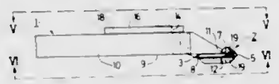
a flux concentrator ring carried by said stator shaft at a position adjacent said armature in magnetically coupled relation with said Hall-effect switch means.

4,905,111

DAMPING MATERIAL OF AN IMPROVED FORMULATION FOR USE ON A MAGNETIC HEAD

Wolfgang Tuma, Vienna; Ulrich Traxlmayr, Laxenburg; Walter Kodym, Seebenstein, all of Austria; Jean H. J. Lortelje, Waalre, and Roeland Den Bakker, Eindhoven, both of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jul. 26, 1988, Ser. No. 224,105
Claims priority, application Austria, Jul. 30, 1987, 1934/87
Int. Cl.⁴ G11B *5/16*
U.S. Cl. 360—126 **5 Claims**



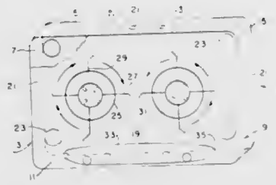
1. A magnetic head comprising two combined plate-shaped ferrite core limbs constituting on a side a tape contact face for a record carrier in which a gap bounded by the two core limbs terminates, a damping material being at least partly provided on at least one of the two side faces constituted by said two core limbs and extending transversely to the tape contact face, characterized in that the damping material is a synthetic resin filled with less than 30% by volume of filler, which filler has a density of more than 10×10^3 kg/m^3 and is at least 74% by weight of the damping material and in that the density of the damping material is larger than 4×10^3 kg/m^3 and its modulus of elasticity ranges between 10^7 and 10^9 Pa.

4,905,112

SCENT CASSETTE

Steven W. Rhodes, 214 Elm St., Charleston, W. Va. 25302

Filed Jun. 24, 1988, Ser. No. 211,544
Int. Cl.⁴ G11B *23/02*
U.S. Cl. 360—132 **24 Claims**



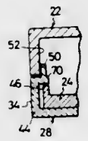
1. A tape cassette having a generally rectangular relatively thin housing having holes extending through the housing into an interior of the housing and having a scent carrier and means for mounting the carrier inside of the housing for flowing the scent from the carrier through the holes to an outside of the housing for providing scent from the inside of the housing to an atmosphere near the housing.

4,905,113

MAGNETIC TAPE CASSETTE HAVING A SLIDER MOUNTED ON THE LOWER CASING MEMBER

Haruo Shiba; Takateru Satoh; Masaru Ikebe, and Morimasa Sasaki, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,326
Claims priority, application Japan, Feb. 25, 1987, 62-25565[U]; Feb. 25, 1987, 62-25566[U]
Int. Cl.⁴ G11B *23/087*
U.S. Cl. 360—132 **4 Claims**



1. A magnetic tape cassette comprising:

(a) an upper casing member and a lower casing member which are combined together to constitute a casing adapted to receive a magnetic tape therein, said upper and lower casing members including side walls defining a gap therebetween, and

(b) a slider slidably mounted on said lower casing member so as to cover a part of the bottom and sides of said lower casing member, said slider including:

(i) side walls each comprising a lower portion opposite to an outer surface of each of said side walls of said lower casing member;

(ii) an intermediate portion arranged in said gap; and

(iii) an upper portion arranged opposite to an inner surface of each of said side walls of said upper casing member, wherein:

(c) said inner surface of each of said side walls of said upper casing member is positioned outwardly from said outer surface of said side wall of said lower casing member with a slit being defined therebetween and

(d) each of said upper portions of said side wall of said slider has a thickness larger than said slit,

whereby said slider is prevented from being separated from said casing.

4,905,114

DISK DRIVE COMPATIBLE TAPE CARTRIDGE WITH DEVICE FOR POSITIONING THE TAPE RELATIVE TO THE DISK DRIVE

Toshiro Obta, Kanagawa, Japan; Richard H. Henze, San Carlos, Calif.; Charles H. McConica, Windsor, Colo.; George Clifford, Los Altos Hills, and Bruce F. Spenner, Los Gatos, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif. and Sony Corporation, Japan

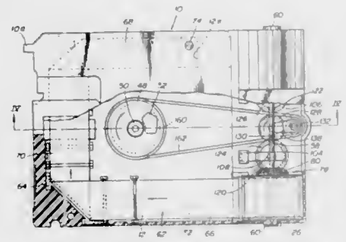
Continuation of Ser. No. 945,607, Dec. 23, 1986, abandoned. This application Jan. 12, 1989, Ser. No. 296,916
Claims priority, application Japan, Dec. 28, 1985, 60-293526; Dec. 28, 1985, 60-UM199944
Int. Cl.⁴ G11B *5/78, 17/04, 25/10*
U.S. Cl. 360—132 **17 Claims**

1. A magnetic tape cartridge suitable for transferring data between a magnetic tape and a disk drive head in a disk drive which is designed for driving a magnetic disk, comprising:

a cartridge casing acceptable in a disk drive and defining therein a tape run path across a disk drive for transferring data between a magnetic tape and said disk drive for recording and reproducing a tape track formed on said magnetic tape;

a tape drive mechanism for driving said magnetic tape along said tape run path, said tape driving mechanism being designed to selectively drive said magnetic tape both in forward and reverse directions;

a center core assembly received within said cartridge casing and exposed therefrom to be chucked by a disk driving mechanism of said disk drive, said center core assembly including a chucking means active for establishing chucking engagement between said center core assembly and said disk driving mechanism to said tape drive mechanism, and



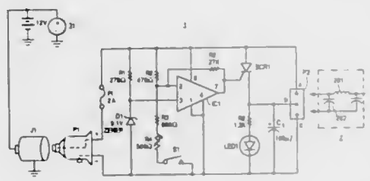
a tape positioning means housed within said cartridge casing for positioning said magnetic tape in a predetermined position with respect to said disk drive head, said tape positioning means including a positioning section and tape guide section, said sections being integrally formed wherein alignment of the positioning section with the rotation axis of the said center core assembly results in highly accurate tracking of said disk drive head with respect to said magnetic tape.

4,905,115

AUTOMATIC AND MANUAL DC POWER SWITCH

James R. Whidden, Baldwinsville, and Paul H. Lindsay, Vernon, both of N.Y., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Feb. 26, 1988, Ser. No. 160,899
Int. Cl.⁴ H02H *3/24*
U.S. Cl. 361—92 **12 Claims**



1. An automatic power switching apparatus, for use in a vehicle including a rechargeable battery, having first and second battery terminals, and a charging device wherein the terminal voltage V1 between said first and second battery terminals is higher when said charging device is operating than the terminal voltage V2 between said first and second battery terminals when said charging device is not operating, comprising:

power input connection means including a plug for mating with an accessory receptacle of said vehicle and having only two terminals, said two terminals being a power input terminal coupled via said accessory receptacle to said first battery terminal for receiving power from said battery and said charging device, and a reference potential terminal coupled via said accessory receptacle to said second battery terminal, said plug providing all of the electrical connection between said power switching apparatus and said vehicle;

a power output terminal for supplying power to a load which may be connected thereto;

first switch means coupled between said power input terminal and said power output terminal for selectively applying power to said power output terminal in response to a control signal;

comparator means, coupled to said power input terminal, and responsive to the level of said terminal voltage for generating said control signal for controlling said first switch to decouple power from said output terminal when said voltage at said power input terminal is less than a predetermined threshold level, said predetermined threshold level being less than said battery terminal voltage V1 but greater than said battery terminal voltage V2; and

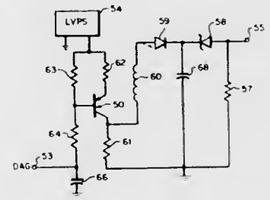
second switch means, accessible to a user, and coupled to said comparator means for disabling the operation of said comparator means so that said output terminal is not decoupled from said power input terminal when said voltage at said power input terminal is less than said predetermined threshold level.

4,905,116

X-RADIATION PROTECTION CIRCUIT

Willy F. Stierberger, Knoxville, Tenn., assignor to North American Philips Corp., New York, N.Y.

Continuation-in-part of Ser. No. 101,878, Sep. 28, 1987, Pat. No. 4,841,406. This application Dec. 1, 1988, Ser. No. 278,699
Int. Cl.⁴ H02H *3/20*
U.S. Cl. 261—91 **6 Claims**



1. In a television having a cathode ray tube producing an electron beam, a high voltage transformer for providing a high voltage potential, and an electronic beam current to the tube, a protective circuit, comprising:

a transistor having a base terminal, emitter terminal and collector terminal;

a voltage divider having one end connected to a low voltage power supply first terminal of said television, and a second end connected to a DAG terminal of said cathode ray tube, and an output terminal connected to said base terminal, whereby a current flows through said voltage divider proportional to said beam current;

resistor connecting said emitter terminal to said voltage divider one end, whereby changes in said power supply voltage are impressed on said emitter and base terminals;

a collector resistor connecting said collector terminal to a second terminal of said low voltage power supply;

a high voltage sensing winding having one end connected to said collector terminal, and a second end connected to supply a voltage proportional to a combination of voltage produced by said high voltage transformer and the magnitude of a beam current; and,

a threshold detecting means for detecting when said voltage proportional to said combination exceeds a reference level.

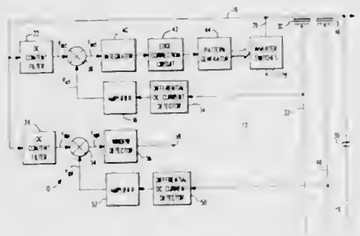
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4,905,117

CIRCUIT AND METHOD FOR DC CONTENT PROTECTION OF PARALLEL VSCF POWER SYSTEMS

Mirza A. Beg, Lima, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 2, 1988, Ser. No. 240,185
Int. Cl.[4] H02H 7/00
U.S. Cl. 361—93 6 Claims



1. A circuit for selectively isolating faulty channels in an electrical power system, having at least two controllable AC power sources connected for parallel operation, said circuit comprising:

means for producing a DC content signal representative of the magnitude of DC voltage in the AC output of a first one of said power sources;

means for producing a differential current signal representative of the differential DC current flowing in connected phases of said power sources;

means for combining said DC content signal and said differential current signal to produce an error signal;

means for controlling the operation of said first power source in response to said error signal to reduce the magnitude of said DC voltage; and

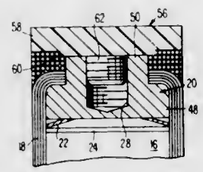
means for producing a trip signal when said error signal exceeds a predetermined threshold level.

4,905,118

BASE MOUNTED ELECTRICAL ASSEMBLY

John D. Sakich, Wadsworth, Ohio, assignor to Hubbell Incorporated, Orange, Conn.

Continuation of Ser. No. 214,613, Jul. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 176,317, Mar. 31, 1988. This application Jun. 20, 1989, Ser. No. 368,869
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—117 26 Claims



1. A modular electrical assembly, comprising:

a plurality of electrical components having nonlinear voltage-current characteristics aligned in a row along an axis and having axially directed ends, said electrical components being electrically connected at said axially directed ends;

first and second conductive end members having a shoulder surfaces nonparallel to said axis and substantially coaxial with said components and located at opposite ends of said row; and

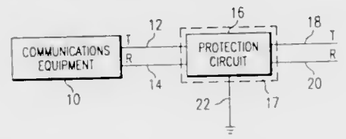
a non-conductive filament winding wrapped about said electrical components and said end members and surrounding said shoulder surfaces to apply an axially directed compressive force on said electrical components and end members through said shoulder surfaces to maintain electrical connection therebetween, said winding having axial end portions wrapped about said end members and extending axially beyond said end members in a direction opposite to said electrical components.

4,905,119

SOLID STATE OVERVOLTAGE PROTECTION CIRCUIT

Monty F. Webb, Richardson, Tex., assignor to Teccor Electronics, Inc., Irving, Tex.

Filed Jun. 27, 1988, Ser. No. 212,195
Int. Cl.[4] H02H 9/00
U.S. Cl. 361—119 13 Claims



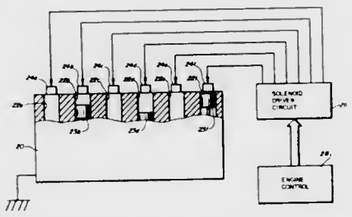
8. The solid state transient voltage protection circuit for electronic equipment of claim 7, wherein said first, second and third bidirectional voltage sensitive switches are housed in a single, three-lead package.

4,905,120

DRIVER CIRCUIT FOR SOLENOID OPERATED FUEL INJECTORS

Conrad G. Grembowicz, Peoria, and Brad Harrell, Morton, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Oct. 20, 1988, Ser. No. 260,241
Int. Cl.[4] H01H 47/32
U.S. Cl. 36—154 8 Claims



1. A driver circuit for first and second solenoid coils which control the actuation of first and second fuel injectors, respectively, wherein each fuel injector is operable to inject fuel into an associated cylinder of an engine and wherein a piston reciprocates within each cylinder, comprising:

first and second selector switches associated with the first and second solenoid coils, respectively, and coupled between first terminals of the first and second coils, respectively, and a first common junction;

first and second diodes coupled between second terminals of the first and second solenoid coils, respectively, and a second common junction;

a source of first potential coupled to the first common junction;

a source of second potential;

a modulation switch coupled between the second common junction and the source of second potential;

means coupled to the selector switches for selectively closing the switches at desired points in time in synchronism with the reciprocation of the pistons in the cylinder; and

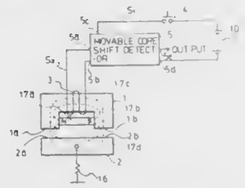
means for operating the modulation switch in alternating on and off states while each selector switch is closed whereby a first average magnitude of current is supplied to the associated solenoid coil during a first period of time and a second average magnitude of current is supplied to the associated solenoid coil during a second period of time subsequent to the first period of time so that a particular quantity of fuel is injected into each cylinder.

4,905,121

OPERATION CONFIRMING DEVICE FOR ELECTROMAGNETIC ACTUATOR

Tokio Uetsuhara, Urawa, and Kenji Iio, Kurate, both of Japan, assignors to Mitsubishi Mining & Cement Co., Ltd., Tokyo, Japan

PCT No. PCT/JP86/00513, § 371 Date May 27, 1987, § 102(e) Date May 27, 1987, PCT Pub. No. WO87/02506, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 8, 1986, Ser. No. 66,745
Claims priority, application Japan, Nov. 10, 1985, 60-226347
Int. Cl.[4] H01F 7/08
U.S. Cl. 361—159 1 Claim



1. An electromagnetic actuator consisting essentially of a stationary core, a movable core facingly arranged with respect to the stationary core so that the movable core can be moved close to or apart from the stationary core and formed in a closed magnetic circuit together with the stationary core, and an electric coil wound around the closed magnetic circuit,

an operation confirming device for the electromagnetic actuator comprising a movable core shift detector for detecting time when shift operation of the movable core with respect to the stationary core by applying DC current to the electric coil is completed by means of transitional fluctuating wave of the applied DC current, the electromagnetic actuator further comprising a permanent magnet fixed to the stationary core to generate a second magnetic flux arranged parallel to the first magnetic flux generated when the electric coil is supplied with electric current in the closed magnetic circuit comprised of the stationary core and the movable core.

4,905,122

BOLT-IN CIRCUIT BREAKER WITH IMPROVED TERMINAL FASTENER RETAINING STRUCTURE

Thomas E. Colnan, Lincoln, and Lacy L. Hall, II, Elkhart, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 26, 1989, Ser. No. 343,758
Int. Cl.[4] H02B 1/04
U.S. Cl. 361--376 6 Claims

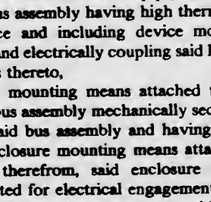
1. In an overload responsive circuit breaker having a terminal adapted for bolted connection against a surface of an electric conductor, said terminal comprising:

an elongated conductive strap projecting from said circuit breaker;

a hole in said strap;

upstanding sidewalls at opposite lateral edges of said strap, said sidewalls having longitudinally extending openings; and

threaded fastener means comprising a rotatable element on said strap and a cooperable fixed element on said conductor, said rotatable element having an annular flange



greater in diameter than spacing between said sidewalls, arcuate portions of said flange being received in said sidewall openings, thereby rotatably retaining said rotatable element on said strap, one of said elements comprising a threaded shank extending through said hole.

4,905,123

HEAT SINK BUS ASSEMBLY

W. Eric Windle, Antwerp, Ohio, and James W. Kruse, Fort Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Oct. 8, 1987, Ser. No. 106,096
Int. Cl.[4] H05K 7/00, 7/20
U.S. Cl. 361—388 13 Claims



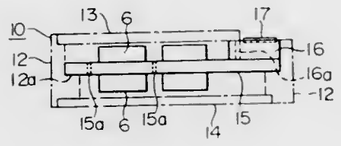
12. In combination with a circuit board, a plurality of heat generating devices and a device sup-ply current,

a heat sink bus assembly having high thermal and electrical conductance and including device mounting structure thermally and electrically coupling said high heat generating devices thereto,

circuit board mounting means attached to and extending from said bus assembly mechanically securing said circuit board to said bus assembly and having electrically conductive enclosure mounting means attached thereto and extending therefrom, said enclosure mounting means being adapted for electrical engagement to a device supply current for supplying current to said circuit board via said heat generating devices mounted on said bus assembly, and being electrically insulated from an enclosure mounted over said bus and said circuit board.

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4,905,124
IC CARD
Toshinobu Banjo; Shigeo Onoda, and Makoto Omori, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Mar. 29, 1988, Ser. No. 174,955
Claims priority, application Japan, Mar. 31, 1987, 62-79923
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—395 **5 Claims**



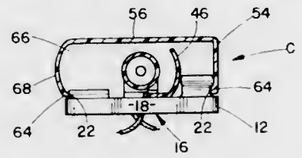
1. An IC card comprising:
a circuit board having two opposed surfaces and electrical wiring disposed on at least one of said surfaces, said circuit board including an exposed edge along which electrode terminals for connection of said circuit board to an external device are disposed;
a plurality of electronic parts mounted on said surfaces;
a package including a frame enclosing part of said circuit board, first and second covers disposed on said frame to enclose said circuit board while leaving said electrode terminals exposed, said frame including an internal portion on which said circuit board is mounted intermediate of said first and second covers; and
a terminal base mounted on one of said surfaces, said electrode terminals being disposed on said terminal base spaced from said circuit board for positioning said electrode terminals relative to said first cover.

4,905,125
ANTI REFLEX LAMP
George Stefan, 164 Grecian Pl., Ft. McMurray, Canada (T9H 2N1), and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007
Filed Aug. 25, 1988, Ser. No. 236,174
Int. Cl.[4] B60Q *3/02*
U.S. Cl. 362—61 **3 Claims**



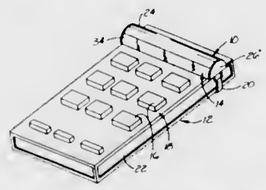
1. A fatigue reducing device for a driver of a motor vehicle which comprises means for producing an indirect, soft, purple light mounted on a vehicle interior and directed at the eyes of the driver to reduce eye fatigue from effects of approaching headlights, wherein said indirect, soft purple light producing means includes:
(a) a housing with a front wall and a bottom wall;
(b) means for mounting said housing within driver's compartment in front of and above the drivers eyes;
(c) a light source disposed within said housing;
(d) a power source electrically connected in a circuit to said light source;
(e) a switch in the circuit to manually turn said light source on and off;
(f) a transparent purple plate located in front wall of said housing facing away from said driver so that when said switch is turned on, said light source will shine through said plate away from the drivers eye producing said indirect, soft, purple light therefrom, wherein said mounting means is a bracket pivotly attached to said housing, whereby said bracket can be attached in one of a number of positions within the driver's compartment and said housing can be adjusted so that said, soft, purple light will not shine directly into the eyes of the driver, further comprising a second transparent purple plate located in said bottom wall of said housing so that when said switch is turned on, said light source will shine separately through both said first plate and said second plate, thereby providing more diffusion due to different paths of diffused light.

4,905,126
REFLECTOR TRUCK LIGHT
Joseph P. Faia, 9703 Lilac Ave., Garfield Hts., Ohio 44125
Filed Sep. 23, 1988, Ser. No. 248,793
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 362—61 **14 Claims**



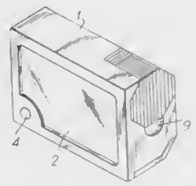
1. An apparatus for illuminating media affixed or applied to a generally planar area in the form of a side of a truck trailer comprising: a plurality of reflector light assemblies that are disposed about the area, each reflector light assembly including:
a base rigidly affixed to the generally planar area;
a light source rigidly affixed to the base;
a reflecting means affixed to the base, the reflecting means having at least one reflecting surface to reflect light transmitted by the source over the planar area; and,
a ho using enclosing said light source and said reflecting means, said housing having a transparent portion and a tinted semi-translucent portion, said transparent portion positioned to permit light from said source to pass over said truck trailer planar area and said tinted portion positioned to face away from said planar area, the reflecting means substantially removed from the housing.

4,905,127
REMOTE CONTROL ILLUMINATOR
Bonnie M. Kaminski, 15319 Rushmore Dr., Taylor, Mich. 48180
Filed Feb. 10, 1989, Ser. No. 309,614
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—109 **4 Claims**



1. An illumination device for a remote control, said remote control having a key pad incorporating a plurality of keys, said illumination device comprising:
a case, said case having a length and a cross section, said case having a low profile shape in that said cross section is substantially smaller than said length;
illumination means connected with said case, said illumination means selectively producing illumination from said case, said illumination means being elongate along said length of said case;
elongation means connected with said case for selectively adjusting said length of said case so as to match a width of said remote control;
electrical circuit means within said case for selectively actuating said illumination means; and
attachment means connected to said case for releasably attaching said case to said remote control so that said illumination means may selectively illuminate said plurality of keys of said key pad.

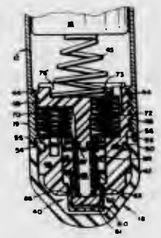
4,905,128
LIPSTICK APPLICATION ASSISTING DEVICE
Richard Cairos, 45 W. 60th St., New York, N.Y. 10023
Filed Aug. 3, 1988, Ser. No. 227,898
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—109 **13 Claims**



1. A lipstick application assisting device, comprising a housing having an outer front surface; a receptacle formed in said housing so as to accommodate a lipstick; a mirror provided on said housing and occupying a greater portion of said outer front surface of said housing; and an illuminating element including a switch, a power supply activated and deactivated by said switch, and an electric light source supplied from said power supply during its activation and located on a small corner portion of said outer front surface of said housing, said electric light source being inclined relative to said mirror at an angle less than 90° such that its light is directed toward a user's lips so as to illuminate the user's lips and to obtain in said mirror an illuminated image of the user's lips and at the same time does not impinge the user's eyes, said mirror having a substantially rectangular shape with one corner removed, said electric light source being located on said small corner portion of said outer front surface of said housing and in a region vacated by said one corner of said mirror.

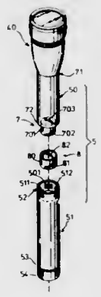
4,905,129
FLASHLIGHT WITH TAIL CAP SWITCH
Raymond L. Sharrah, 661 Barrington Rd., Collegeville, Pa. 19426
Filed Oct. 13, 1988, Ser. No. 257,333
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—158 **18 Claims**

1. A flashlight comprising:
an elongated casing for holding one or more power cells, said casing having a head-end and an open tail-end;
a light bulb mounted at the head-end of said casing;
an electric circuit including electrical switching means for connecting and disconnecting said light bulb to and from the power cells, said switching means being mounted in the open tail-end so as to retain the power cells in said casing;
means for retaining said electrical switching means in the tail-end such that said switching means can be easily removed and re-mounted;
an imperforate flexible boot for enclosing a portion of said switching means, said flexible boot having an open end including a peripheral sealing portion formed to fit between said switching means and said casing so as to form a watertight seal therebetween when said switching means is mounted in the tail-end of said casing;
said flexible boot being dome-shaped and formed of a resilient water-resistant material; and



said switching means comprising a switch housing having a peripheral groove formed therein, and the sealing portion of said flexible boot comprising:
an inwardly directed lip extending substantially around the open end, said lip being dimensioned and positioned to fit within the switch housing grooves,
a bead projecting perpendicularly from said lip and extending substantially around the open end in an annular region between the switch housing and said casing, and
said lip and bead being operable to provide a water-proof seal between said housing and said casing when said switching means is mounted in the casing.

4,905,130
FLASHLIGHT ASSEMBLY
Tien-Tsai Huang, No. 4, Lane 30, Wu-Chuan St., Pan-Chiao City, Taiwan
Continuation-in-part of Ser. No. 895,456, Aug. 11, 1986, Pat. No. 4,750,095. This application Oct. 19, 1988, Ser. No. 259,708
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—203 **8 Claims**



3. A flashlight comprising:
a lighting means;
an elongated hollow housing joined with said lighting means for receiving a set of batteries which are adapted to be

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aligned within said elongated hollow housing, making contact singly and electrically connecting in series, constituting an electric circuit with said lighting means, said elongated hollow housing having a hole formed at a position where, when a non-conductive sheet is inserted therethrough, the electrical contact of said batteries can be broken;

said elongated hollow housing further comprising:

a first hollow housing having a first end and a second end, said first end being joined with said lighting means and said second end having a first hole formed therein; and

a second hollow housing having a third end and a fourth end, said third end having a second hole formed therein and being adapted to rotatably join with said second end so that said second hollow housing can be joined with said first hollow housing, forming the elongated hollow housing, and rotated to a certain angle where said second hole is aligned with said first hole, forming the through hole, and said fourth end being covered by a removable cap upon the removal of which, said set of batteries can be put into said elongated hollow housing and aligned singly so as to make electrical contact with each other;

wherein said first hollow housing comprises a hollow joint member, axially extending from said second end and having said first hole formed therein, adapted to insert into and join with said third end of said second hollow housing; and

wherein said joint member further comprises a packing member having a third hole formed therein, said packing member being tightly fixed around said joint member, aligning said third hole with said first hole, and protecting the inside of said elongated hollow housing from the infiltration of moisture into the joint between said first and second hollow housings.

4,905,131

BRACKET FOR DECORATIVE LIGHTING

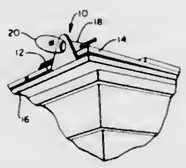
Lonnie F. Gary, Lubbock, Tex., assignor to Gary Products Group, Inc., Lubbock, Tex.

Continuation-in-part of Ser. No. 229,563, Aug. 5, 1988, Pat. No. 4,851,977. This application Jan. 6, 1989, Ser. No. 294,269

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[4] F21V *21/00*

U.S. Cl. 362—249 **19 Claims**



1. A decorative light support device adapted to support and display a decorative light bulb and socket assembly on a roof structure, said device comprising a face portion and a base portion joined in angular relation to each other, said base portion adapted to be inserted between adjacent and overlapping layers of said building roof structure by the application of manual force and to maintain said device and said bulb and socket assembly in substantially fixed relation to said building roof structure solely by frictional contact between said base portion and said layers, said base portion further comprising top and bottom surfaces and at least one means adapted to be biased in a direction substantially perpendicular to one of said surfaces to enhance frictional contact between said base portion and at least one of said overlapping layers to restrict movement between said base portion and said overlapping layers pending the reapplication of manual force in substantially the opposite direction, said means being further adapted to be pressured against said bias into closer relation to one of said surfaces of said base portion during insertion of said base portion between said overlapping layers; said face portion further comprising at least one means adapted to support and maintain said decorative light bulb and socket assembly in substantially fixed relation so said face portion.

4,905,132

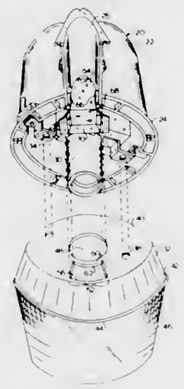
LAMP FIXTURE WITH A MODIFIED ENCLOSURE PLATE

Santiago Singarayar, Burlington, and Robert M. Parker, Greensboro, both of N.C., assignors to Regent Lighting Corporation, Burlington, N.C.

Filed Dec. 22, 1988, Ser. No. 289,364

Int. Cl.[4] F21V *29/00*

U.S. Cl. 362—294 **13 Claims**



1. A light fixture comprising:

(a) an upper housing and an outwardly extending support arm, said support arm having an opening into one side of the upper housing; and

(b) a reflector attachable to said upper housing, said reflector having an upper planar surface, said upper planar surface having a peripheral opening, said peripheral opening located on the side of the planar surface where the support arm is located, wherein the primary path of heat escape from the light fixture is through the peripheral opening and the support arm.

4,905,133

LAMP REFLECTOR

Mark J. Mayer, Lisle, Ill., and Charles D. Lemme, Tucson, Ariz., assignors to Blazer International, Franklin Park, Ill.

Filed Aug. 18, 1989, Ser. No. 396,147

Int. Cl.[4] F21V *7/00*

U.S. Cl. 362—346 **8 Claims**

1. A lamp reflector comprising:

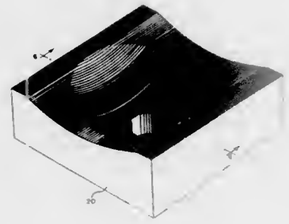
a reflector body which defines a reflector surface comprising a series of paraboloid strips arranged side by side along a lateral direction, said series comprising a central paraboloid strip;

wherein each of the paraboloid strips defines a respective focus and all of the focuses substantially coincide at selected point in space;

wherein the paraboloid strips are aimed in a plurality of non-parallel directions to laterally disperse reflected light originating at the selected point in space;

wherein each of the paraboloid strips defines a respective focal length and the focal lengths of paraboloid strips progressively farther from the central paraboloid strip are progressively greater; and

wherein the focuses are selected such that adjacent paraboloid strips are matched in position such that the reflector surface is substantially continuous;



said reflector body defining a region extending over at least one quadrant, wherein the second derivative of lateral displacement with respect to axial displacement is substantially continuous throughout the region to provide a visually smooth appearance to the region.

4,905,135

INVERTER APPARATUS

Shunsuke Unehara, Kadoma; Sachio Ueno, Katano, and Tutomu Seri, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

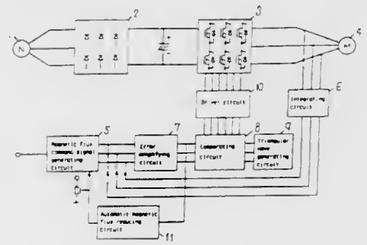
PCT No. PCT/JP87/00663, § 371 Date Jul. 12, 1988, § 102(e) Date Jul. 12, 1988, PCT Pub. No. WO88/02195, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 7, 1987, Ser. No. 199,035

Claims priority, application Japan, Sep. 12, 1986, 61-216620

Int. Cl.[4] H02M *5/42;* **H02P** *5/40*

U.S. Cl. 363—98 **14 Claims**



1. An inverter apparatus for driving an electric motor comprising:

magnetic flux command signal generating means for generating a magnetic flux command signal having a frequency proportional to an inverter output frequency signal, the inverter output frequency signal being input to said magnetic flux command signal generating means from an outside source,

an inverter part for supplying electric power to the electric motor, the inverter part having an output voltage,

integrating means for integrating the output voltage of the inverter part, the integrating means outputting a motor voltage integrating signal,

error amplifying means for amplifying an error between the motor voltage integrating signal and the magnetic flux command signal,

triangular wave generating means for generating a carrier frequency signal, and

comparison means for generating a pulse width modulating signal on the basis of a comparison of the error amplified by the error amplifying means and the carrier frequency signal.

4,905,134

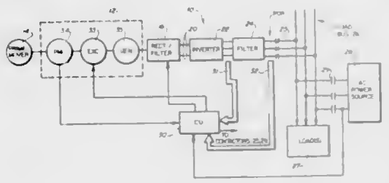
PARALLELING METHOD AND CONTROL FOR A VSCF SYSTEM

Bradley J. Recker, Rockford, Ill.; Christopher J. Rozman, Delavan, Wis., and Derrick I. Roe, Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 29, 1988, Ser. No. 291,501

Int. Cl.[4] H02M *5/42;* **H02V** *3/16*

U.S. Cl. 363--98 **11 Claims**



1. A method of controlling the supply of power to a load from an inverter coupled in parallel with an AC power source across the load, comprising the steps of:

sensing the real and reactive components of the currents supplied by the inverter;

sensing the phase displacement of the power developed by the inverter relative to the power developed by the AC power source to derive an angular displacement signal;

controlling the phase angle of the inverter output in dependence upon the real current component supplied by the inverter and the angular displacement signal; and

controlling the magnitude of the inverter output in dependence upon the real and reactive current components supplied by the inverter.

4,905,136

POWER SUPPLYING APPARATUS

Shigeru Tanaka, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 29, 1988, Ser. No. 277,247

Claims priority, application Japan, Nov. 30, 1987, 62-29932

Int. Cl.[4] H02M *7/00*

U.S. Cl. 363—124 **8 Claims**

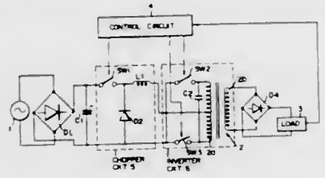
1. An apparatus for converting input DC power into AC power and supplying said AC power to a load, said apparatus comprising:

a chopper circuit, having an output terminal, for switching said DC power to adjust power;

an inverter circuit, coupled to said output terminal of said chopper circuit, for switching an output of said chopper circuit to apply an AC output of a desired frequency to a load; and

control means for controlling switching operations of said chopper circuit and said inverter circuit in such a way that a switching frequency of said chopper circuit is set equal to a switching frequency of said inverter circuit and an ON duration of said chopper circuit is synchronized with

an ON duration of said inverter circuit, wherein said control means includes means for permitting a middle



timing of an ON duration of said chopper circuit to coincide with an ON/OFF switching timing of said inverter circuit.

4,905,137

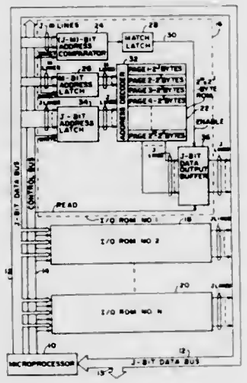
DATA BUS CONTROL OF ROM UNITS IN INFORMATION PROCESSING SYSTEM

Gregory K. Goodhue; William J. Price, both of San Jose; Ronald L. Treadway, Saratoga, all of Calif., and Brian M. Willis, Beaverton, Oreg., assignors to North American Philips Corporation Signetics Division, Sunnyvale, Calif.

Filed Dec. 18, 1987, Ser. No. 136,249

Int. Cl.[4] G06F *12/00, 12/06, 12/08*

U.S. Cl. 364—200 **3 Claims**



1. An information processing system comprising

means for storing information in up to 2^J pages each having up to 2^J bytes per page, where J is a positive integer,

a first bus connected to said storing means,

means for supplying J bits to said first bus for application to said storing means during a first cycle to select one of said pages,

means for supplying J bits to said first bus for application to said storing means during a second cycle to select one of said bytes in said selected page,

means for applying said selected byte from said storing means to said first bus during a third cycle,

a second bus connected to said storing means,

and means for supplying successive first, second and third signals to said second bus to enable said first, second and third cycles, respectively,

wherein said first- and second-mentioned supplying means comprise a microprocessor,

wherein said storing means comprises

a page-mode-organized read-only-memory unit,

an address decoder connected to said unit for selecting a particular byte on a particular page of said unit,

an M-bit address latch responsive to M of the bits supplied to said first bus during said first cycle and to said first signal supplied to said second bus for applying signals to said address decoder representative of the selected one of said pages, where M is a positive integer equal to or less than J,

and a J-bit address latch responsive to the J bits supplied to said first bus during said second cycle and to said second signal supplied to said second bus for applying signals to said address decoder representative of the selected one of said bytes on said selected page,

wherein said applying means comprises a J-bit output buffer responsive to said third signal from said second bus and connected between said read-only-memory unit and said first bus for receiving said selected byte read out of said unit,

wherein said storing means comprises N of said page-mode-organized read-only-memory units, each of said units including up to 2^M pages, where $N \times 2^M$ equals 2^J,

and wherein each of said units has connected thereto one of said address decoders, one of said M-bit address latches, one of said J-bit address latches and one of said J-bit output buffers.

4,905,138

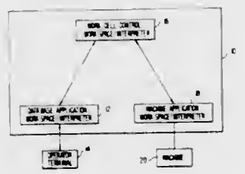
META-INTERPRETER

David A. Bourne, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 788,650, Oct. 17, 1985, Pat. No. 4,787,035. This application Oct. 20, 1988, Ser. No. 260,214

Int. Cl.[4] G06F *9/44*

U.S. Cl. 364—200 **17 Claims**



1. An interpreter apparatus, comprising:

parser means for converting an input message into a parse table using a grammar table, said parse table having contents thereof;

processing means cooperatively associated with said parser means for comparing the contents of the parse table to data needed in a condition to execute a named function; and

execution means cooperatively associated with said processing means for executing the named function.

4,905,139

CACHE MEMORY SYSTEM WITH IMPROVED RE-WRITING ADDRESS DETERMINATION SCHEME INVOLVING HISTORY OF USE

Hidehiro Asai, and Kenichi Echigoya, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 9, 1988, Ser. No. 153,891

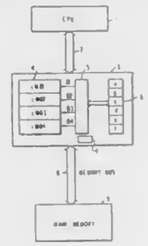
Claims priority, application Japan, Feb. 9, 1987, 62-29292

Int. Cl.[4] G06F *13/00, 12/12*

U.S. Cl. 364—200 **4 Claims**

1. A system comprising a central processing unit, a main memory, a cache memory having a plurality of memory blocks, a first bus connected between said central processing unit and said cache memory for transferring signals therebetween, a second bus connected between said cache memory

and said main memory for transferring signals therebetween, said central processing unit accessing one of said memory blocks through said first bus, a control memory having a plurality of control storage cells, a relation of oldness in access to said memory blocks by said central processing unit being defined between each combination of two of said memory blocks, each of said control storage cells storing said relation between each combination of two of said memory blocks, a first detection circuit coupled to said control memory for designating a first one of said memory blocks in accordance with contents of said control storage cells, said first one of said memory blocks being the oldest memory block in history of accessed order of said memory blocks, a second detection circuit coupled to said control memory for designating a last one of said memory blocks in accordance with the contents of said control storage cells, said last one of said memory blocks being the newest memory block in the history of accessed order of said memory blocks, first means coupled to said first detection circuit for generating a first signal when said first detection circuit fails to



designate said first one of said memory blocks, second means coupled to said second detection circuit for generating a second signal when said second detection circuit fails to designate said last one of said memory blocks, third means coupled to said first and second means for generating a control signal when both of said first and second signals are generated, a first control circuit coupled to said first and third means, said first control circuit addressing the last one of said memory blocks designated by said first detection circuit when said control signal is not present and addressing a predetermined one of said memory blocks when said control signal is present, fourth means coupled to said third means for setting said control storage cells in such a state that designates said predetermined one of memory blocks in response to said control signal, and a second control circuit coupled to said cache memory for writing data from said main memory to the memory block addressed by said first control circuit when data requested by said central processing unit is not stored in any of said memory blocks.

4,905,140

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yasuhiro Sakakibara, Kodaira; Isamu Kobayashi, Tokyo, and Yoshinori Suzuki, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Division of Ser. No. 768,112, Aug. 21, 1985. This application Sep. 16, 1987, Ser. No. 96,912

Claims priority, application Japan, Aug. 22, 1984, 59-173329

Int. Cl.[4] G06F *9/00, 13/00*

U.S. Cl. 364—200 **15 Claims**

1. A one-chip microcomputer comprising:

a bus;

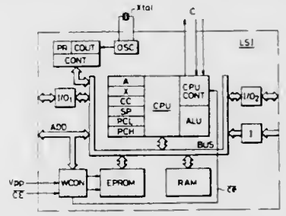
a microprocessor coupled to said bus;

a random access memory which is coupled to said bus and which is coupled to said microprocessor via said bus so that said random access memory is accessed by said microprocessor, wherein said random access memory has a first predetermined address space defining a range of addresses assigned to the random access memory;

an electrically programmable read only memory which has address input terminals and data input/output terminals coupled to said bus and which is accessed by either said microprocessor or from outside of said one-chip microcomputer, wherein said electrically programmable read only memory has a second predetermined address space defining a range of addresses assigned to the electrically programmable read only memory;

a first external terminal coupled to said bus for transmitting an address signal from the outside of said one-chip microcomputer to said bus when said electrically programmable read only memory is accessed from the outside of said one-chip microcomputer;

a second external terminal which is coupled to said bus via input/output means and to which either data signals to be



read from said electrically programmable read only memory or data signals to be fed to said electrically programmable read only memory are provided;

discriminator means responsive to said address signal for discriminating whether or not said address signals is within the second predetermined address space of said electrically programmable read only memory; and

means coupled to said input/output means and responsive to an output signal of said discriminator means for setting the data signals to be outputted to said second external terminal at a predetermined level indicating satisfactory operation of said electrically programmable read only memory if said address signal designates an address other than those within the second predetermined address space of said electrically programmable read only memory to prevent an improper indication of error in the electrically programmable read only memory.

4,905,141

PARTITIONED CACHE MEMORY WITH PARTITION LOOK-ASIDE TABLE (PLAT) FOR EARLY PARTITION ASSIGNMENT IDENTIFICATION

James G. Brenza, Putnam Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1988, Ser. No. 265,316

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **24 Claims**

1. A cache complex for operation with a CPU capable of rapidly making CPU memory requests to a system storage hierarchy, the cache complex comprising:

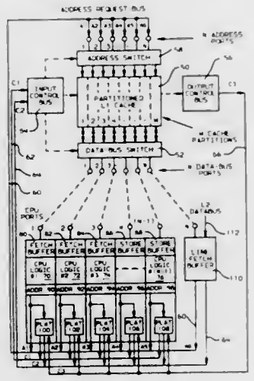
a cache with a plurality of independent partitions, each partition having a partition data memory and a partition cache directory having cache entries for locating data units in the partition data memory, the data memory in any partition operating independently of the data memory in any other partition;

partition look aside table (PLAT) means for temporarily storing PLAT entries for recent CPU requests having corresponding data units stored in various partition data memories of the cache;

the PLAT means generating a local request to a particular

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partition when a current CPU memory request is found to have a valid PLAT entry in the PLAT means (a PLAT hit), each valid PLAT entry containing at least a partition indentifier (of the particular partition that is storing data requested by a CPU memory request) and the PLAT entry also containing address components for comparison with corresponding address components in a received CPU memory request, the local request providing the partition identifier and a cache data address generated from the address components of a PLAT entry having a PLAT hit, the local request directly locating requested



data in the identified partition while bypassing the cache directory to non-associatively access the requested data;

switching means connected to the partitions for steering each local request from the PLAT means to the identified partition provided in the local request;

address decoding and accessing means in each partition data memory for directly accessing the requested data by an address and partition identifier provided by each local request; and

data bus means for transferring the data between the CPU and the partition data memory located in the cache by the address decoding and accessing means.

4,905,142

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH BUILT-IN ARRANGEMENT FOR MEMORY TESTING

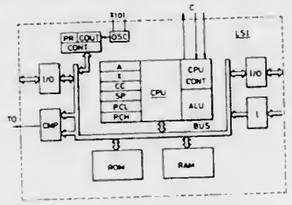
Kiyoshi Matsubara, Kodaira, and Tadashi Yamaura, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 909,927, Sep. 22, 1986, Pat. No. 4,777,586. This application Oct. 4, 1988, Ser. No. 253,182
Claims priority, application Japan, Sep. 20, 1985, 60-206419
The portion of the term of this patent subsequent to Oct. 11, 2003, has been disclaimed.
Int. Cl.[4] G06F *12/00*; **G11C** *29/00*
U.S. Cl. 364—200 **23 Claims**

1. A semiconductor integrated circuit device including a plurality of external terminals for receiving signals to be supplied to the device and outputting signals from the device, comprising:

a memory circuit, an output of predetermined programmed data of which is inhibited to said external terminals; and

comparing means for comparing the programmed data read out from said memory circuit with an input signal supplied from one of said external terminal, and including means



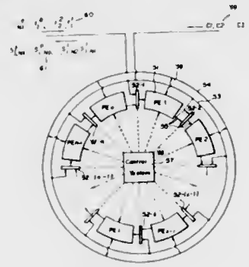
for outputting a resulting coincidence or discordance signal to one of said external terminals.

4,905,143

ARRAY PROCESSOR AND CONTROL METHOD THEREOF

Junichi Takahashi; Sanshiro Hattori; Takashi Kimura, and Atsushi Iwata, all of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Public Company, Tokyo, Japan

Continuation of Ser. No. 705,376, Feb. 25, 1985, abandoned. This application Jun. 14, 1988, Ser. No. 220,970
Claims priority, application Japan, Feb. 27, 1984, 59-34450; May 16, 1984, 59-96656
Int. Cl.[4] G06F *15/16, 15/00*
U.S. Cl. 364—200 **5 Claims**



1. An array processor comprising:

n multipliers;

n processing elements, each one of said n processing elements being connected to the subsequent processing element through one of said n multiplexers so that said n processing elements and said n multipliers are connected in the form of a ring, each of said n processing elements including:

first input means for inputting one of input vector data c_i of a first input vector data series $C=\{c_i\}$ $(i=1, 2, \ldots, I)$ from one input vector data bus;

first storing means for string said one of said input vector data c_i;

second input means for inputting one of input vector data r_j of a second input vector data series $R=\{r_j\}$ $(j=1, 2, \ldots, N)$ from an I/O data bus;

second storing means for storing one of said input vector data r_j;

computation means for performing predetermined computations including addition, subtraction, comparison and product-sum computation between said one of said input vector data c_i and said one of said input vector data r_j;

third storing means for storing the results of the computations;

first data transfer means for transmitting one of said input vector data c_i stored in said first storing means and said computation result stored in said third storing means to an adjacent processing element;

output means for outputting as a final computation said result stored in said third storing means to said I/O bus;

second data transfer means for simultaneously transferring the respective processing results from all processing elements to respective adjacent processing elements

$$\frac{(\mathrm{mod}N)}{n}$$

times, where

$$\frac{(\mathrm{mod}N)}{n}$$

expresses the remainder when N is divided by n, in parallel with a computation processing in a respective processing element;

control means for controlling operation timings in said first and second input means, said first, second and third storing means, said computation means, said first and second data transfer means and said output means;

each of said n multiplexers being provided for selecting either a data transfer path for the data exchange between the two processing elements connected through the multiplexer or the input data bus for providing said input vector data from an external source to the processing element associated with the respective multiplexer;

said first input means being connected directly to the output of said multipliexer so that the data transfer path of said preceding processing element or said input vector data bus can be directly connected to said first input means via said multiplexer;

said second input means being connected directly to said I/O data bus;

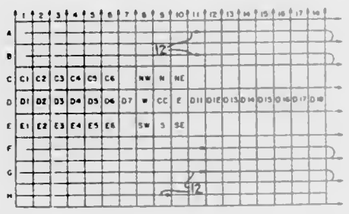
whereby both said input vector data series from said input vector data bus and said second input vector data series from said I/O data bus can be applied simultaneously to said processing element.

4,905,144

HIGH SPEED PATH OPTIMIZATION CO-PROCESSOR

John M. Hansen, Livermore, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Nov. 2, 1987, Ser. No. 116,804
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—200 **9 Claims**



1. A data processor having a pipeline-parallel structure for rapid solving optimization problems for use with a plurality of sequentially numbered sources of directional cost values, a plurality of sources of directional sum values, and a source of center cell values, said processor comprising:

a plurality of sequentially numbered pipeline stages, each of said pipeline stages having first, second and third input leads and first and second output leads, each of said pipeline stages having means for adding signals on said first and second input leads to produce a total signal and having means for comparing said total signal with a center cell signal on said third input lead, each of said pipeline stages having means for selecting a smaller value of signal from said total signal and said center cell signal and coupling said smaller signal to said first output lead of said pipeline stage, each of said pipeline stages having means for developing an exchange signal to indicate the result of said comparing of said total signal and said center cell signal, said exchange signal being coupled to said second output lead of said pipeline stage;

means for coupling said first input lead of each of said sequentially numbered pipeline stages to a corresponding numbered one of said sources of directional cost values;

means for coupling said second input lead of each of said sequentially numbered pipeline stages to one of said sources of directional sum values;

means for coupling said third input lead of a first of said sequentially numbered pipeline stages to said source of center cell values;

means for coupling said third input lead of each of the remainder of said sequentially numbered pipeline stages to said first output lead of an adjacent lower numbered one of said pipeline stages;

control means for directing the flow of signals in said data processor, said control means being connected to each of said pipeline stages and to each of said sources of cost and sum values; and

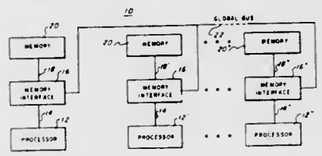
means for coupling said first output lead of a highest numbered pipeline stage to said source of center cell values, said exchange signals on said second output leads causing said control means to couple signals to said source of center cell values from said first output lead of said higher numbered pipeline stage.

4,905,145

MULTIPROCESSOR

William F. Sauber, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 22,501, Mar. 6, 1987, abandoned, which is a continuation of Ser. No. 611,298, May 17, 1984, abandoned. This application Nov. 15, 1988, Ser. No. 273,140
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **34 Claims**



1. A multiprocessor comprising:

(a) a plurality of processor systems, each processor system comprising memory means for storage of instructions and data, processor means for processing data responsive to predetermined instructions and memory interface means coupled to said memory means and said processor means for interfacing said memory means and said processor means,

(b) a global bus interconnecting said memory interface means of each of said processor systems,

(c) each said processor means including means to provide first instruction data including an address to its associated memory interface means,

(d) each said memory interface means including means responsive to said first address signal from its associated processor means and non-coincidence of said first address

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signal in its associated memory to provide a second instruction data including an address signal on said global bus, and

(e) means at each said memory interface means other than the memory interface providing said second instruction data including an address signal and responsive to said second instruction data signal to provide operation of its associated processor means and memory means in accordance with and responsive to said instruction data signal on said global bus.

4,905,146

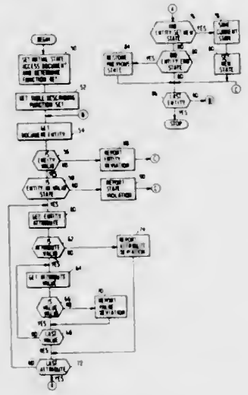
EXPLICIT SPECIFICATION OF VALID COMPOUND DOCUMENT DATA STREAM STRUCTURE AND CONTENT

Barbara A. Barker, Round Rock; Thomas R. Edel, Austin, and Jeffrey A. Stark, Grapevine, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1988, Ser. No. 197,878

Int. Cl.[4] G06F *9/06*

U.S. Cl. 364—300 **8 Claims**



1. A process for verifying if a compound document data stream conforms to a specified architecture function set comprising the steps performed by a computer of:

creating an architecture function set description for a compound document;

testing values of said data stream to determine if the values conform with said function set description; and

generating a report of each value deviation from said function set description.

4,905,147

COLLISION DETECTION SYSTEM FOR VIDEO SYSTEM

George E. Logg, 1410 Cedar Pl., Los Altos, Calif. 94022

Filed Oct. 15, 1986, Ser. No. 919,128

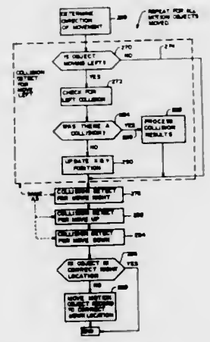
Int. Cl.[4] G06F *15/44*

U.S. Cl. 364—410 **9 Claims**

1. An apparatus for collision detection between objects on a video display comprising:

means for storing moving and nonmoving object data records containing position information as to the location of the associated objects on said display in terms of the x and y coordinates of a reference point on each object relative to a predetermined reference point, said storing of data records being in memory as a two-dimensional array where each array element is mapped to a corresponding area on said video display;

means for detecting a collision between objects on said display by detecting the desired movement of an object on said video display and comparing the position information in the data record of said object being moved with the position information of the data records of objects, if any, stored in, at most, the nearest array locations in the direction of movement and for determining that a collision has occurred if predetermined criteria are met regarding the degree of proximity of said reference points of said object being moved and the objects whose data records are stored in said adjacent array locations.



4,905,148

THREE-DIMENSIONAL SURFACE REPRESENTATION USING CONNECTIVITY METHOD WITHOUT LEAKS

Carl R. Crawford, Milwaukee, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Aug. 4, 1988, Ser. No. 228,404

Int. Cl.[4] G06F *15/62*

U.S. Cl. 364—413.1 **7 Claims**



1. A method for generating a three-dimensional surface definition of an object-of-interest within a three-dimensional tomographic data set, said data set including a plurality of voxel data points, each voxel having a respective density value, said object-of-interest including voxels having density values satisfying a predetermined property, said method comprising the steps of:

identifying a non-object seed voxel in said data set not in said object-of-interest and having a density value satisfying said property;

applying connectivity to said non-object seed voxel according to a first criterion C_1;

modifying the density value of each voxel satisfying connectivity according to C_1;

specifying an object-of-interest seed voxel; and

applying connectivity to said object-of-interest seed voxel according to a second criterion C_2, where C_1 is not equal to C_2.

4,905,149

METHOD OF DETERMINING DESIRED IMAGE SIGNAL RANGE

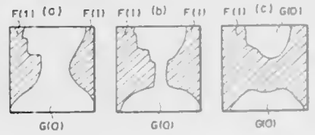
Yuuma Adachi, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1988, Ser. No. 234,861

Claims priority, application Japan, Aug. 20, 1987, 62-207212

Int. Cl.[4] G06F *15/68, 15/62;* **G03B** *42/02;* **A61B** *6/00*

U.S. Cl. 364—414.13 **1 Claim**



1. A method of determining a desired image signal range in image signals carrying an image having an object image portion and a pair of empty image portions separated by the object image portion, comprising steps of:

binary-coding the image signals carrying the image into object image portion corresponding signals and empty image portion corresponding signals on the basis of a predetermined threshold value,

forming a binary-coded image consisting of an object image portion corresponding part carried by the object image portion corresponding signals and two empty image portion corresponding parts carried by the empty image portion corresponding signals and separated by the object image portion corresponding part,

repeating the binary-coding step and the binary-coded image forming step while the value of said predetermined threshold is gradually lowered until the two empty image portion corresponding parts are united into a united empty image portion corresponding part,

and determining the desired image signal range on the basis of the image signals carrying the picture elements included in the united empty image portion corresponding part at the time the two empty image portion corresponding parts are united.

4,905,150

X-RAY DIAGNOSTICS INSTALLATION WITH MEAN PARENCHYMA DOSE CALCULATOR

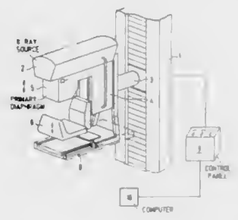
Horst Aichinger, Fuerth, and Karlheinz Koehler, Herzogenaurach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 24, 1988, Ser. No. 261,084

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1988, 3801210

Int. Cl.[4] H05G *1/26;* **G06F** *15/42*

U.S. Cl. 364—413.26 **3 Claims**



I. An x-ray diagnostics installation for mammography exposures comprising:

means for generating an x-ray beam in which an examination subject is disposed;

means for recording an x-ray image formed by radiation attenuated by said examination subject; and

means for calculating a means parenchyma dose $\bar{D}$ for said examination subject according to the following equations:

$$D = \frac{f \cdot J_E}{a \cdot (d - 2d_F)} \cdot [e^{-a \cdot dF} - e^{-a(d-dF)}]$$

with

f = 1.03 (conversion factor)

d = subject thickness in cm

d_F = thickness of the fatty tissue

d_F = 0.5 cm for d ≦ 5.0 cm

d_F = 1.0 cm for d ≦ 5.0 cm

$J_E = k \cdot (I \cdot t)$

I = x-ray tube current

t = exposure time

k = calibration

$a = 1/d \cdot \ln J_E/J_A$

J_A = exit dose.

4,905,151

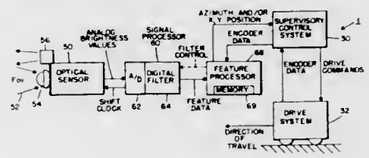
ONE DIMENSIONAL IMAGE VISUAL SYSTEM FOR A MOVING VEHICLE

Carl F. R. Weiman, Westport, and John M. Evans, Jr., Brookfield, both of Conn., assignors to Transitions Research Corporation, Danbury, Conn.

Filed Mar. 7, 1988, Ser. No. 165,015

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—424.02 **36 Claims**



1. A vision system for a mobile vehicle comprising:

means, having a substantially planar field of view of an environment, for generating a substantially linear, one-dimensional image of the environment through which a mobile vehicle moves, the environment including at least one object, said image generating means having an output signal for expressing a characteristic of the image at a plurality of points along the substantially one dimensional image; and

means, coupled to said output signal, for processing said output signal to determine at least one characteristic associated with a position of the object relative to a position of said mobile vehicle within the environment.

4,905,152

ACTIVELY CONTROLLED SUSPENSION SYSTEM WITH CONTROL CHARACTERISTICS VARIABLE DEPENDING UPON VEHICULAR SPEED

Kazunobu Kawabata, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 28, 1988, Ser. No. 263,764

Claims priority, application Japan, Oct. 29, 1987, 62-274425

Int. Cl.[4] B60G *17/00*

U.S. Cl. 364—424.05 **28 Claims**

1. An actively controlled suspension system comprising:

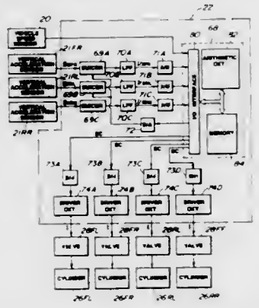
a cylinder disposed between a vehicle body and a suspension member which rotatably supports a road wheel, and defin-

ing therein a working chamber filled with a pressure medium variable of pressure between a predetermined maximum pressure and a predetermined minimum pressure;

a pressure medium source circuit means connected to said working chamber, for supplying said pressure medium to said working chamber of said cylinder;

a pressure control valve means disposed within said pressure medium circuit means and variable of valve position between a first mode for increasing pressure of said pressure medium within said working chamber, a second mode for decreasing pressure in said pressure medium within said working chamber, and a third mode for maintaining said pressure in said pressure medium constant;

a vehicular attitude change monitoring means for monitoring vehicle body attitude change for producing a vehicle body attitude change indicative sensor signal;



a vehicular speed monitoring means for monitoring a vehicular driving speed and producing a vehicle speed indicative signal representative of the monitored vehicular speed;

a limiting means for receiving said attitude change indicative sensor signal and limiting variation range of the value of said attitude change indicative sensor signal within a predetermined range;

a controller means receiving said sensor signal having said limited range of signal value for deriving a control signal for controlling said pressure control valve means in order to suppress attitude change, said controller means being responsive to said vehicular speed indicative signal for varying said variation range of said attitude change indicative sensor signal depending upon the vehicle speed indicative signal value.

4,905,153

SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING A VEHICLE SPEED TO A DESIRED CRUISING SPEED

Koichi Suzuki; Kiyoshi Konishi, and Eisaku Hori, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 4, 1988, Ser. No. 190,078
Claims priority, application Japan, Jun. 5, 1987, 62-139997
Int. Cl.[4] B60K *31/04*
U.S. Cl. 364—426.04 **10 Claims**

7. A system for automatically controlling vehicle speed to a desired cruising speed, comprising:

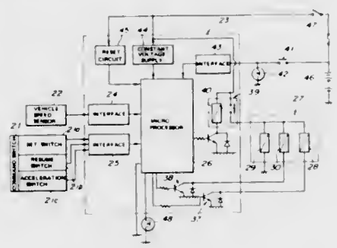
(a) first means for detecting an actual vehicle speed;

(b) second means for storing a vehicle speed when a set switch is operated;

(c) a throttle actuator for driving a throttle valve independently of a vehicle accelerator;

(d) third means for carrying out a first initialize control such that an acceleration command signal is produced and outputted for a predetermined period of time to said throttle actuator when said set switch is operated;

(e) fourth means for monitoring a change ate of said vehicle speed when a transient response is carried out immediately after the vehicle speed control by said third means is carried out and for intermittently outputting said acceleration command signal to said throttle actuator until the rate of deceleration is below a constant rate;



(f) fifth means for controlling an opening angle of said throttle valve so as to reduce the difference between said actual vehicle speed and said stored vehicle speed;

(g) sixth means for setting a limit speed which is lower by a predetermined value than said stored vehicle speed; and

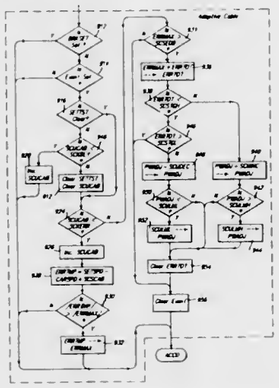
(h) seventh means for inhibiting an operation of said fourth means when said vehicle speed is larger than said limit speed when the operation of said fourth means is completed.

4,905,154

METHOD FOR COMPENSATING FOR CABLE LENGTH IN A VEHICLE ELECTRONIC SPEED CONTROL SYSTEM

Matthew H. Strong, and James L. Vincent, both of Pontiac, Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Mar. 14, 1988, Ser. No. 167,678
Int. Cl.[4] B60K *31/04*
U.S. Cl. 364—426.04 **2 Claims**



1. In a vehicle electronic speed control system including a pulse width controlled vacuum servo, a method of compensating for cable length comprising:

monitoring a set speed selected by an operator of the vehicle;

monitoring a vehicle speed;

determining an error between said operator selected speed and said vehicle speed;

comparing said error with error dead band limits;

totalizing said error with previously determined errors, only if the error exceeds said dead band limits;

comparing said totalized error with predetermined trigger limits;

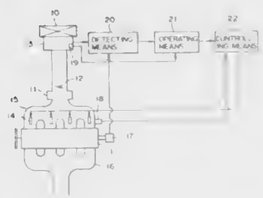
adjusting the pulsewidth to said servo according to the size of the totalized error, only if the totalized error exceeds said trigger limits, thereby relating the pulsewidth to the particular cable installed on the vehicle.

4,905,155

FUEL SUPPLY CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Yoshiaki Kanno, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 111,256
Claims priority, application Japan, Oct. 22, 1986, 61-252320
Int. Cl.[4] F02D *41/30;* **F02M** *51/00*
U.S. Cl. 364—431.05 **5 Claims**



1. A fuel supply control apparatus for an internal combustion engine, comprising an air flow sensor detecting quantity of intake air for the internal combustion engine, a crank angle sensor for detecting a crank angle of said internal combustion engine, an operating means for determining a value proportional to the quantity of intake air per one intake stroke of said internal combustion engine as provided by an output of said air flow sensor in a range where said crank angle sensor detects the crank angle of the internal combustion engine, said determined value being transmitted as an output to a controlling means for limiting said output of said operating means by a predetermined value L and controlling a quantity of a fuel to be supplied to said internal combustion engine dependent on an output of said operating means.

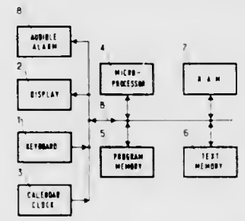
4,905,156

FRANKING MACHINE INCLUDING AN ALARM

Bernard Vermesse, L'Hay-les-Roses, France, assignor to Societe Anonyme dite : SMH ALCATEL, Paris, France

Filed Feb. 29, 1988, Ser. No. 161,947
Claims priority, application France, Feb. 27, 1987, 8702670
Int. Cl.[4] G07B *17/00*
U.S. Cl. 364—464.02 **7 Claims**

1. A franking machine comprising a keyboard, a display of the alphanumeric type, a calendar clock, a microprocessor, a program memory, a text memory, and a working memory interconnected by a bus, the text memory including a first set of messages for normal franking operations and a second set of messages for special operations which are accessible by means of a Menu key on the keyboard, the program memory containing programs with each program relating to one of the messages in the first and second sets of messages, each message being split into screens each having as many lines as the display can display, with the screens of a message being displayed successively on the display, wherein the machine includes an audible alarm connected to said bus and controlled by alarm indications contained in the program relating to a message



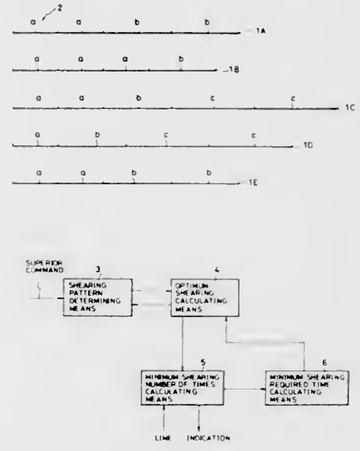
whenever said message is a warning message for warning an operator.

4,905,157

CONTROL METHOD FOR SHEARING BARS IN BAR STEEL LINE

Tomoko Yamamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 34,934, Apr. 6, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 333,778
Claims priority, application Japan, Apr. 7, 1986, 61-78324
Int. Cl.[4] B21F *13/00*
U.S. Cl. 364—472 **3 Claims**



1. A control method for shearing bars in a bar steel line provided on the final end side of a bar steel production line so as to shear collectively and simultaneously to desired lengths a plurality of bars obtained by dividing a bar steel blank and arranged in parallel with each other, which comprises:

obtaining a minimum shearing number of times for shearing said plurality of bars in a minimum time,

selecting the order of several different shearing lengths in each of said plurality of bars so as to minimize the time required for completion of shearing on the basis of said minimum shearing number of times, and

shearing said plurality of bars simultaneously to each different shearing length in said minimum shearing number of times and in the minimum time required for completion of shearing.

4,905,158

NORMAL VECTOR COMPUTATION METHOD

Masaki Seki, and Kouji Samukawa, both of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

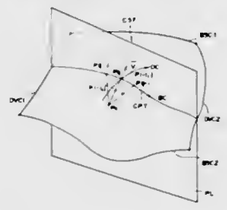
PCT No. PCT/JP87/00296, § 371 Date Jan. 11, 1988, § 102(e) Date Jan. 11, 1988, PCT Pub. No. WO87/07047, PCT Pub. Date Nov. 19, 1987

PCT Filed May 12, 1987, Ser. No. 159,584

Claims priority, application Japan, May 13, 1986, 61-109185

Int. Cl.[4] G06F *15/46*; G05B *19/18*

U.S. Cl. 364—474.29 **5 Claims**



1. A normal vector computation method comprising the steps of:

(a) inputting data specifying a three-dimensional curved surface, a tool radius length and a normal vector computation method;

(b) obtaining points discretely on the three-dimensional curved surface, each of the points aligned in first and second directions with other points, by using the data specifying the three-dimensional curved surface;

(c) computing, if the normal vector is to be computed by using three consecutive points in one of the first and second directions, the center of a circular arc passing through the three consecutive points;

(d) computing the normal vector by adopting a direction from the center of the circular arc to a middle point, defined by a position vector, among the three consecutive points as a normal line direction of the three-dimensional curved surface at the middle point;

(e) computing a position vector of an offset point separated from the middle point by the tool radius length in dependence upon the position vector of the middle point and the normal vector; and

(f) producing a machining program for machining a complex curved surface in dependance upon the position vector of the offset point computed in step (e) for the points obtained in step (b).

4,905,159

METHOD AND APPARATUS FOR CUTTING OUT PIECES FROM A FABRIC HAVING A REPETITIVE DESIGN THEREON

Jean-Marc Loriot, Paris, France, assignor to Vestra, Bischwiller, France, a part interest

Filed Dec. 29, 1987, Ser. No. 138,754

Claims priority, application France, Dec. 31, 1986, 8618490

Int. Cl.[4] G06F *15/00*

U.S. Cl. 364—470 **6 Claims**

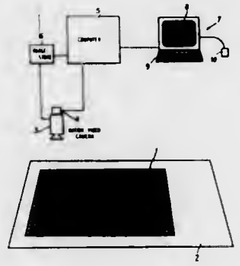
1. A method of cutting out pieces for assembly together, said pieces being cut out from sheet material having a design thereon which is regularly periodic in at least one direction, such as a length of fabric having a checked pattern thereon, the method serving to establish continuity or alignment in the design when at least two of the pieces are assembled, with the positions of the pieces on the length of fabric being previously determined for at least two of the pieces and including a margin which is not less than one half of a design element in at least one direction, the method comprising the following steps:

(a) disposing a length of fabric on a cutting-out table;

(b) storing shapes, positions, and orientations of the pieces to be cut out in a computer system memory, with a margin corresponding to at least one half of a design element being reserved between outlines of said at least two pieces in at least one direction;

(c) selecting and storing points (A,B) on edges of said at least two pieces which must coincide upon assembly;

(d) taking a pair of images of said length of fabric, with each image being substantially centered over a corresponding one of said points, using a camera connected to said computer system and disposed over said length of fabric, with co-ordinates of the camera in a frame of reference relating to the cutting-out table being controlled by said computer system;



(e) displaying the two images on a screen to observe any offset between adjacent design elements at said edges whereat said points lie, in particular by juxtaposing or superposing the designs of the images;

(f) correcting any observed offset by means of an input accessory to said computer system to establish design continuity between said images in said at least one direction, and

(g) storing correction parameters of said offset in the computer memory to define a new cutting-out program in which design continuity is ensured when said pieces are assembled.

4,905,160

DEVICE FOR REGULATING THE OPERATION OF A CHEMICAL TREATMENT PLANT, TO IMPROVE EFFICIENCY BY ATTENUATION OF THE VARIANCES OF THE REGULATING PARAMETERS

Jacques Maurice, Pau; Gérard Butte, Mourenx; Alain Vignau, Beuste, and Marc Albertini, Pau, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Jan. 11, 1988, Ser. No. 141,781

Claims priority, application France, Jun. 2, 1987, 87 07693

Int. Cl.[4] G06G *7/58*

U.S. Cl. 364—500 **4 Claims**

1. A device for regulating operations of a chemical treatment plant to improve efficiency by attenuation of variances of adjustment parameters wherein said plant comprises:

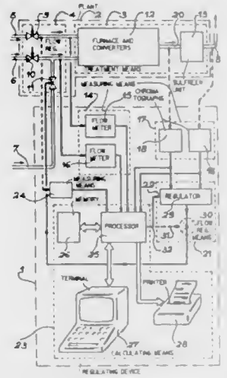
chemical treatment means connected to adjustable flow means for feeding respectively the chemical treatment means with input reactive chemical compounds, said plant providing at said plant's output at least one chemical element present in the input compounds, and wherein said regulating device comprises:

measuring means providing signals indicative of the measurement of input flows of compounds;

means for providing signals of measurements of contents of any residual input compounds which are still present at an output of the treatment means;

flow regulating means connected to the means for providing measuring signals indicative of the contents of any residual compounds and to the adjustable flow means;

said regulating means having an input for receiving a set-point signal to apply a signal to the adjustable flow means for modifying the flow of the corresponding input compound, so as to cause the contents of any of the output residual compounds to tend toward zero values, said regulating device also comprising calculation means connected to the means for measuring said flows of the input compounds, and to said means for measuring the contents of any residual portions of the input compounds still present at an output of the treatment means, and to said measuring means providing measurement signals of the contents of the input compounds, the calculation means performing coherence processings of measurement values of flows and contents, attenuating any variances of the measured flows and contents, the calculation means providing on an output a set-point signal improved by the coherence processing performed by said calculation means and applied to the regulating means.



4,905,161

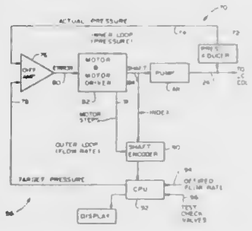
FLOW STABILITY REPORTING SYSTEM FOR A LIQUID CHROMATOGRAPHY SYSTEM

Les A. Miller, San Jose, and Roberta Shafer, Milpitas, both of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Jan. 11, 1988, Ser. No. 142,581

Int. Cl.[4] G06G *7/57*; G01N *31/00*

U.S. Cl. 364—510 **19 Claims**



1. An apparatus for testing the flow stability in a column of liquid in a liquid chromatography system comprising:

means for pumping liquid through the column of said liquid chromatography system including a pump motor controlled by a control system that generates a control signal to control the flow rate based upon input data;

means for measuring the value of said control signal a plurality of times over a plurality of cycles and for recording the lowest value of said control signal for each revolution and the highest value of said control signal for each revolution and for calculating a flow stability criterion using the following formula:

$$\text{flow stability criterion} = \frac{2000 \times (\max - \min)}{\max + \min}$$

where,

max = the maximum of maximum value for said control signals over all the recorded values for all the revolutions tested, and

min = the minimum of the minimum values for said control signals over all the recorded values for all the revolutions tested.

4,905,162

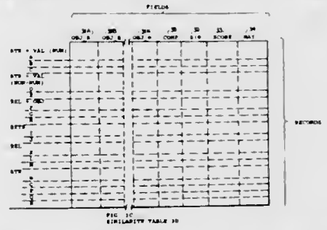
EVALUATION SYSTEM FOR DETERMINING ANALOGY AND SYMMETRIC COMPARISON AMONG OBJECTS IN MODEL-BASED COMPUTATION SYSTEMS

David J. Hartzband, Nashua, N.H., and Laura E. Holly, Groton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 30, 1987, Ser. No. 32,161

Int. Cl.[4] G06F *15/20*; G06K *9/62*

U.S. Cl. 364—513 **60 Claims**



1. A system for determining a selected relationship among a plurality of objects each having a plurality of characteristics having diverse values, said system comprising:

A. Association means for establishing associations among characteristics of said objects;

B. comparison means for performing a selected similarity operation in connection with each of the values of associated ones of said objects' characteristics to determine a characteristic similarity value associated with said characteristics; and

C. similarity determination means for performing a composite operation in response to the characteristic similarity values for determining a composite similarity value representing a degree of similarity among objects.

4,905,163

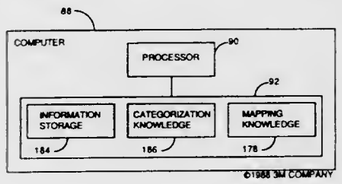
INTELLIGENT OPTICAL NAVIGATOR DYNAMIC INFORMATION PRESENTATION AND NAVIGATION SYSTEM

Sharon R. Garber, Crystal; Darryn J. Kozak, New Brighton; John M. Kruse, Minneapolis, all of Minn., and Mark K. Clare, Fort Wayne, Ind., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

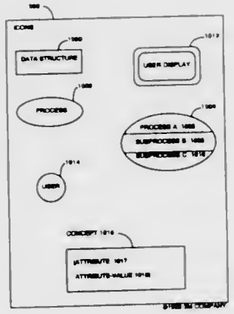
Filed Oct. 3, 1988, Ser. No. 252,917

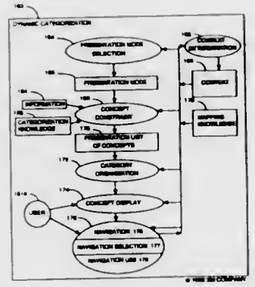
Int. Cl.[4] G06F *15/18*

U.S. Cl. 364—513 **313 Claims**



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1. A computerized information presentation system for dynamically organizing information in order to present to a user previously unrecognized relationships among portions of the information and for presenting techniques for navigation through the information comprising:

information description means for storing information comprising a plurality of concepts, the information description means comprising means for storing for each concept knowledge of allowable attributes for the concept and one or more of attributes, attribute values, and relationships among attributes and attribute values;

categorization knowledge means for storing knowledge of criteria for placing the concepts into categories;

context determination means for determining a context based on system state;

mapping knowledge means for storing knowledge of mappings between a context and the presentation of information; and

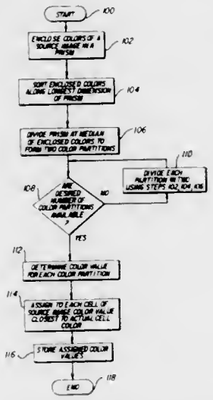
dynamic categorization means for dynamically placing the concepts into categories for presentation using the categorization criteria, the context and the knowledge of mappings and for displaying on a user screen selected concepts and categories.

4,905,164

METHOD FOR MODULATING COLOR FOR EFFECTING COLOR CELL TEXTURE

Jimmy E. Chandler, Holly Hill, and Richard G. Fadden, Ormond Beach, both of Fla., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 19, 1986, Ser. No. 943,690
Int. Cl.[4] G09G *1/16*
U.S. Cl. 364—518 **12 Claims**



9. In a visual image generating system for generating a visual image in real time by color intensity control of pixels forming the visual image, the visual image able to be derived from a source image having a plurality of cells, each cell having a predetermined color intensity value and a center, a method for true full color real time cell texture modulating the visual image, comprising the steps of:

subjecting the source image to a tapered quantization scheme for identifying a predetermined number of members of a small set of colors representative of all colors of the source image, wherein the number of members of the set of colors are less than all colors of the source image;

quantizing the source image by assigning a neatest color of the set to each cell of the source image;

and controlling the color intensity of each pixel of the visual image in response to the assigned nearest color for the cells surrounding a respective center of each pixel.

4,905,165

MEASURED DATA DISPLAY DEVICE WITH STRIP CHART SIMULATION AND TABLE FORMAT

Toshikazu Inden, Fujioka; Hideki Negishi, Takasaki; Koudou Hara, Kumagaya, and Takayuki Kanzawa, Takasaki, all of Japan, assignors to Chino Corporation, Tokyo, Japan

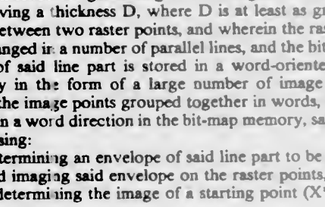
Filed Aug. 20, 1987, Ser. No. 87,475
Claims priority, application Japan, Aug. 20, 1986, 61-192737; Aug. 20, 1986, 61-192738
Int. Cl.[4] G09G *1/00*
U.S. Cl. 364—518 **6 Claims**

1. A measuring instrument for converting a plurality of physical values into prescribed units for comparing physical values obtained as a result of measurements, and displaying the same, comprising:

a display unit having a screen;

a trend format display controlling section having a video memory for storing screen information and connected to memorize the trend format screen at a plurality of memory areas designated by a series of addresses corresponding to each scanning line of the display screen, a data memory for storing information of measured data for displaying the measured data, and means for producing on the screen of the display unit a screen simulating a recording paper moving at said given speed by sequentially changing the address of said video memory when retrieving the information following one screen after taking out the information of one screen by accessing the content in the video memory;

a matrix table format display controlling section for processing the measured data to memorize at the data memory and to display each of the measured data of each channel on the screen as digital numerals in table format as a matrix formed of each channel and each time;



a switching section connected to change the display format displayed by the trend format display controlling section and the matrix table format display controlling section by switching the content of the video memory and the content of the data memory; and

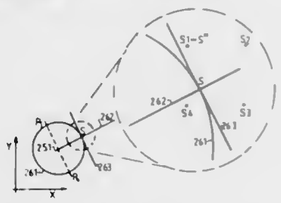
a display screen controlling section having means to display a cursor on the screen of the trend format controlled by the trend format display controlling section so that the cursor can be moved in the axial direction for indicating time, and means to change the display for displaying a plurality of measured data at the specific time designated by the cursor on the screen in the table format under control of the matrix table format display controlling section.

4,905,166

METHOD OF GENERATING LINE PARTS

Cornelis P. Schuerman, Venlo, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Continuation of Ser. No. 943,255, Dec. 17, 1986, abandoned. This application Dec. 22, 1988, Ser. No. 290,823
Claims priority, application Netherlands, Dec. 17, 1985, 8503461
Int. Cl.[4] G06F *15/40*
U.S. Cl. 364—518 **3 Claims**



1. A method for generating on a homogeneous raster a line part having a thickness D, where D is at least as great as the space between two raster points, and wherein the raster points are arranged in a number of parallel lines, and the bit representation of said line part is stored in a word-oriented bit-map memory in the form of a large number of image points or pixels, the image points grouped together in words, the words stored in a word direction in the bit-map memory, said method comprising:

a. determining an envelope of said line part to be generated and imaging said envelope on the raster points, by

i. determining the image of a starting point (X°, Y°) and end point of said line part on the raster points, and generating a circle having said starting point as the center (X°, Y°) and a radius (D−1)/2;

ii. determining four raster points where a point of intersection (S) of said circle with a line through said starting point and said end point is located within said four points; and

iii determining a raster point (S°) in the direction vicinity of said point of intersection (S) having the smallest distance from a tangent to said circle through intersection (S), and by means of said determined raster point (S°), determining four raster points of intersection (P1° to P4°) as points of said image envelope;

b. determining for all successive raster lines the length of a section through the line part; and

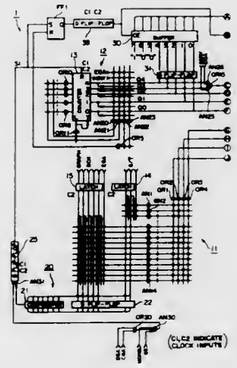
c. placing the bit representation of said lengths in the bit-map memory on said lines at corresponding locations, the direction of said determined lengths corresponding to the word direction of the bit-map memory.

4,905,167

IMAGE PROCESSING SYSTEM INTERFACING WITH DIFFERENT MONITORS

Shigemitsu Yamaoka, and Kenji Iwamoto, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Shizuoka, Japan

Filed Dec. 10, 1987, Ser. No. 131,213
Claims priority, application Japan, Dec. 11, 1986, 61-295228
Int. Cl.[4] G06F *3/153*
U.S. Cl. 364—521 **7 Claims**



1. An image processing apparatus designed to interface with different monitors and having a plurality of registers for storing reference data for a display control, said image processing apparatus performing an image display based upon reference

data stored in said registers under control of a central processing unit, said image processing apparatus comprising:

(a) memory means for storing a plurality of sets of reference data used for a plurality of different monitors in the event said image processing apparatus uses an alternative monitor other than an original monitor to be originally used; and

(b) register writing control means, including,

(i) mode selection detecting means for detecting whether a preset mode signal is identical to a mode signal which is set based on the type of monitor to be utilized, and said mode selection detecting means detecting a mode selection timing when said mode signal indicates a different selected mode and outputting a predetermined conversion start signal upon detection of said mode selection timing, and said register writing control means being responsive to said mode selection detecting means for selecting particular selected registers from said plurality of registers, the data in which is to be changed when said predetermined conversion start signal is supplied thereto, to cause said register writing control means to read the requisite reference data from said memory means and write the requisite reference data in the selected registers,

(ii) a first address setting means for setting a first address for said memory means, said first address having a specific value corresponding to the selected mode,

(iii) a second address setting means for sequentially varying a value of a second address for said memory means in response to the selected mode after said mode selection timing,

(iv) register control means for generating write enable signals, each corresponding to each of said plurality of registers, said write enable signals having values which are varied in accordance with the selected mode, and said write enable signals sequentially selecting said selected registers each of which is write said reference data read from said memory means based upon said first and second addresses, and

(v) variation range setting means for setting a variation range of the value of said second address in response to the selected mode, said variation range setting means stopping reading out of said reference data from said memory means when the value of said second address reaches a last value within said variation range.

4,905,168

OBJECT PROCESSING FOR VIDEO SYSTEM USING SLIPS AND LINKED LIST

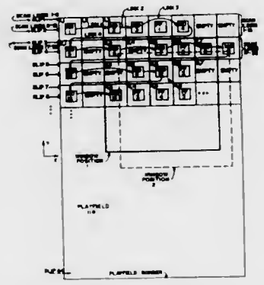
Patrick J. McCarthy, San Jose, and George E. Logg, Los Altos, both of Calif., assignors to Atari Games Corporation, Milpitas, Calif.

Filed Oct. 15, 1986, Ser. No. 919,236
Int. Cl.[4] G06F *15/72*
U.S. Cl. 364—521 **18 Claims**

1. An apparatus for rapidly processing data records representing moving and non-moving objects on a playfield to determine which objects to display on a portion of the playfield being displayed on a video display comprising:

means for organizing all of the data records for moving objects to be displayed as a single linked list in memory, said single linked list organized by the locations where the objects would be displayed if the whole playfield were to be displayed;

means for processing only that portion of the single linked list for objects positioned near said portion of said playfield to be displayed;



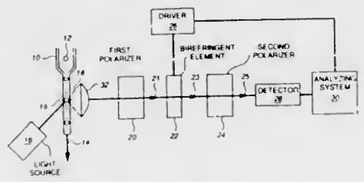
wherein the data records for said objects include positional information expressed as x and y coordinate offsets from a reference point on the playfield.

4,905,169

METHOD AND APPARATUS FOR SIMULTANEOUSLY MEASURING A PLURALITY OF SPECTRAL WAVELENGTHS PRESENT IN ELECTROMAGNETIC RADIATION

Tudor N. Bulcan, and John C. Martin, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 201,272, Jun. 2, 1988, abandoned, which is a continuation of Ser. No. 869,179, May 30, 1986, abandoned. This application Jun. 15, 1989, Ser. No. 366,348
Int. Cl.[4] G01J *4/00;* **G01B** *9/02*
U.S. Cl. 364—525 **36 Claims**



1. An apparatus for simultaneously measuring a plurality of spectral wavelengths present in fluorescence, the apparatus comprising in combination:

a. a first polarizer for receiving the fluorescence having an electric field disposed in an arbitrary direction and for defining a first direction for the electric field of the fluorescence transmitted therethrough;

b. modulatable birefringent means for receiving the transmitted polarized light from said first polarizer, said birefringent means having first and second optical axes along which the electric field of the transmitted polarized light is resolved into two components, the light wave corresponding to each of the resolved electric field components traveling at a different velocity, so that two first light waves emerge from said birefringent means having different electric field directions and a shift in phase greater than one wavelength of the longest wavelength component of the fluorescence;

c. a second polarizer for receiving the two first light waves emerging from said birefringent means and resolving their electric fields along a second direction, so that two second light waves emerge plane polarized and with the same direction of polarization;

d. means for modulating said birefringent means such that resolution suitable for measurement of the plurality of spectral wavelengths is achieved;

e. first detector means for receiving the two second light waves emerging from said second polarizer and interacting therewith to produce an electrical signal characteristic of the interference pattern generated as a result of the interference of the two second light waves having different phase; and

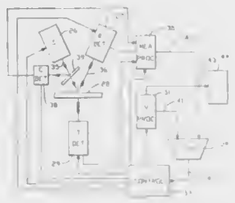
f. means for receiving the electrical signal from said first detector means and for separating the signal into its spectral components.

4,905,170

METHOD AND APPARATUS OF DETERMINING OPTICAL CONSTANTS OF AMORPHOUS SEMICONDUCTORS AND DIELECTRICS

Abdul R. Forouhi, and Iris L. Bloomer, both of 7216 Clarendon St., San Jose, Calif. 95129

Continuation-in-part of Ser. No. 119,855, Nov. 12, 1987. This application Jul. 26, 1988, Ser. No. 224,559
Int. Cl.[4] G01N *21/00*
U.S. Cl. 364—556 **23 Claims**



1. A method of determining the optical properties of a material by means of an optical instrument and data processor means, comprising:

providing in said instrument an input beam, having a plurality of frequencies where each frequency has an associated photon energy and an input intensity, said input beam incident upon said material and interacting with said material to provide an output beam, said output beam having said plurality of frequencies where each frequency has an associated photon energy and has an output intensity, said material having electrons transferring from an initial state to a final state as a result of interaction with said input beam;

measuring in said instrument the output intensities of said output beam for said frequencies to form measured output signals proportional to the output intensities at said frequencies;

calculating in said data processor means a calculated complex index of refraction for said material as a function of energy and of

a probability term related to the probability that an electron transition will occur from the initial state to the final state for the material,

an energy term related to the difference in energy between the initial state and the final state for the material,

a life-time term related to the life-time that electrons tend to remain in the final state for the material;

processing in said data processor means said calculated complex index of refraction to form calculated output signals,

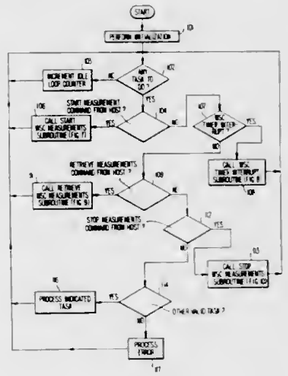
comparing said calculated output signals with said measured output signals to determine difference signals proportional to the difference between said measured output signals and said calculated output signals.

4,905,171

WORKSTATION CONTROLLER PERFORMANCE MONITOR

Harvey G. Kiel; Jeffrey E. Remfert, and Jeffery J. Van Heuklon, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1987, Ser. No. 117,864
Int. Cl.[4] G06F *11/34*
U.S. Cl. 364—551.01 **17 Claims**



1. A method for determining the performance of a processor in a computer system, comprising the steps of:

starting a performance test of said processor;

continuously checking to see if there are any tasks for said processor to perform;

incrementing an idle loop count if there are no tasks for said processor to perform, responsive to said checking step;

stopping said performance test after an elapsed time; and

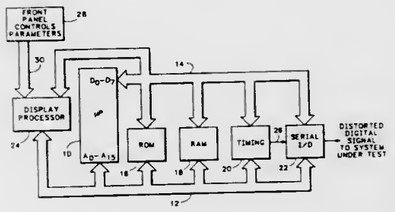
determining a processor utilization using said elapsed time, an idle loop time, and said idle loop count, said idle loop time being the time said processor takes to perform one said checking step and one said incrementing step.

4,905,172

METHOD OF GENERATING AND TRANSMITTING DIGITALLY DISTORTED TEST SIGNALS

William C. Randle, Bend, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 21, 1988, Ser. No. 222,460
Int. Cl.[4] G06F *7/06, 3/09*
U.S. Cl. 364—580 **5 Claims**



1. A method of generating and transmitting a distorted digital signal to a system under test having a known baud rate, the steps comprising:

generating a bit pattern representative of input data to be sent to said system under test;

expanding each bit of said bit pattern by an integer multiple to create an expanded bit pattern representative of said input data;

toggling selected bits of said expanded bit pattern to create an altered expanded bit pattern representative of said input data with distortion added thereto; and

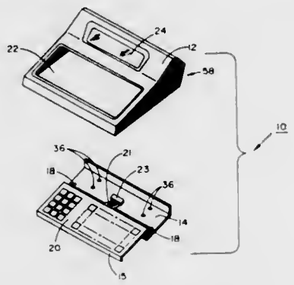
transmitting said altered expanded bit pattern as said distorted digital signal to said system under test.

4,905,173

HARDENED SHOP-FLOOR DATA TERMINAL

James S. Bianco, 217 Brainard Rd., Enfield, Conn. 06082

Filed Dec. 8, 1987, Ser. No. 130,161
Int. Cl.[4] G06C *5/02*
U.S. Cl. 364—708 **24 Claims**



1. A hardened data terminal, comprising:

(a) a planar base member having an upper surface and having a front end portion formed therein, said front end portion to contact a surface upon which said terminal rests, said front end portion being free of attachment to, or contact with, any other element of said data terminal; and

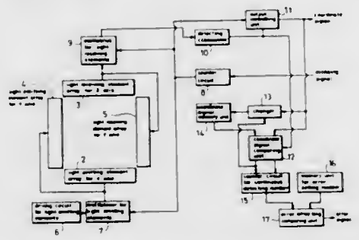
(b) keyboard means displayed upon said upper surface of said base member, generally in proximity to said front end portion, such that a substantial portion of the punching forces resulting from the use of said keyboard is transferred directly to said surface upon which said terminal rests.

4,905,174

OPTICAL COORDINATE INPUT APPARATUS

Junichi Ouchi, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,006
Claims priority, application Japan, Sep. 7, 1987, 62-223770
Int. Cl.[4] G06F *13/00;* **G09G** *3/02;* **G08C** *21/00*
U.S. Cl. 364—709.11 **1 Claim**



1. An optical coordinate input apparatus, which comprises:

at least two light emitting element arrays having a plurality of light emitting elements;

at least two light receiving element arrays having a plurality of light receiving elements arranged opposite the light emitting elements of said light emitting element arrays;

means for sequentially energizing a pair of opposing elements of the light emitting element arrays and the light receiving arrays;

means for specifying the positions of the opposing elements to be sequentially energized;

means for detecting whether the light receiving element at a specified position receives light and outputting a position value for the light receiving elements which do not receive light;

means for storing position value of a light receiving element which does not receive any light;

means for comparing the stored position value with the next determined position value corresponding to a light receiving element which does not receive light;

means for replacing the stored position value with the next determined position value if the stored position value is not equal to the next determined position value;

means for counting and storing the number of consecutive times the stored position value is equal to the next determined position value; and

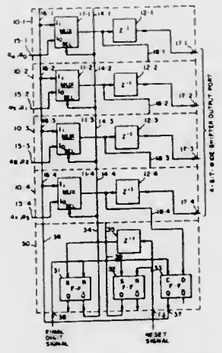
means for comparing the stored number of consecutive times the stored position value is equal to a predetermined number and outputting an error signal if the stored number of consecutive times is coincident with the predetermined number.

4,905,175

DIGIT-SERIAL SHIFTERS CONSTRUCTED FROM BASIC CELLS

Peter F. Corbett, Princeton, N.J., and Richard I. Hartley, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,070
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—715.08 **20 Claims**



1. A shifter for digit-serial input signal having m-digit words supplied in successive n-bit digits, which successive digits are supplied in respective digit intervals and are consecutively ordinally numbered modulo m from first to zeroeth in each successive word, where m and n are each a respective positive integer greater than or equal to two, said shifter comprising:

a control cell generating first and second control signals supplied via a first control signal bus and a second control signal bus respectively:

first and second flip-flops of a synchronous SR type included in said control cell, each of said first and second flip-flops having a set input connection, a reset input connection, and true and not-true output connections which are complementary to each other, each of said first and second flip-flops responding to a ONE signal applied to its set or reset connection during a current digit interval only after a new digit interval is reached, each of said first and second flip-flops responding to ONEs being applied to both its set and reset connections as if a ONE were applied only to its reset connection, one of the output connections of said first flip-flop supplying said first control signal to said first control signal bus and a complementary one of the output connections of said second flip-flop supplying said second control signal to said second control signal bus;

means for applying a final-digit signal to the reset input connection of said first flip flop and to the set input connection of said first flip-flop, said final-digit signal being a ONE during the zeroeth digits of words of said digit-serial input signal and being a ZERO during all other digits of said digit-serial input signal;

means for applying a reset signal to the reset input connection of said second flip-flop, said reset signal having a value of ONE during digits of said digit-serial input signal having a specified ordinal number modulo m, and said reset signal having a value of ZERO during the remaining digits of said digit-serial input signal;

means for applying a set signal to the set input connection of said first flip-flop, said set signal having a value of ONE during the digits of said digit-serial input signal having an ordinal number modulo m one more than said specified ordinal number modulo m, and said set signal having a value of ZERO during the remaining digits of said digit-serial input signal;

a plurality n in number of bit-slice cells consecutively ordinally numbered from first through nth, having respective input signal bit connections receptive of bits of said digit serial input signal with significance increasing with increase in the ordinal number of the bit-slice cell, having respective output signal bit connections, and sharing a broadcast bit bus;

a respective multiplexer included in each of said n bit-slice cells, having a respective first input connection to the input signal bit connection of the bit-slice cell that multiplexer is included in, having a respective second input connection to said broadcast bit bus, and having a respective output connection selecting a bit from said broadcast bit bus or from said input signal bit connection of the bit-slice cell in accordance with one of said first and second control signals supplied via its respective bus;

at least one respective clocked unit-delay element included in each of said n bit-slice cells between the output connection of the multiplexer in that bit-slice cell and the output signal bit connection of that bit-slice cell, and arranged for being clocked at digit rate for said digit-serial input signal; and

means for applying a broadcast bit signal to said broadcast bit bus.

4,905,176

RANDOM NUMBER GENERATOR CIRCUIT

Raymond A. Schulz, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1988, Ser. No. 264,467
Int. Cl.[4] G06F *1/02*
U.S. Cl. 364—717 **9 Claims**

1. A random number generator circuit, formed on an integrated circuit chip, said chip having power supply voltage which randomly varies with respect to time, comprising:

a plurality of n delay stages serially connected in a sequence with a feedback input at a first stage in said sequence and a feedback output at a last stage in said sequence, each stage including at least two inverter circuits, each inverter circuit having a power supply input terminal;

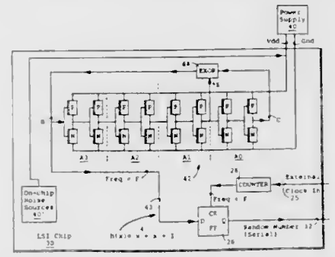
an exclusive OR circuit coupled in a feedback path between said feedback output of said last stage and said feedback input of said first stage;

said plurality of n delay stages being divided into a first subplurality of i stages, having a first output coupled as a first input to said exclusive OR circuit;

said plurality of n delay stages having a second subplurality of n minus i stages in said plurality of stages, with said feedback output coupled as a second input to said exclusive OR circuit;

said exclusive OR circuit generating a pseudo-random signal pattern at the output thereof in response to inputs from said first and second subpluralitys of delay stages;

each said delay stage in said plurality of n delay stages propagating signals which traverse consecutive ones of said



delay stages, each said delay stage applying a randomly varying magnitude of signal propagation delay to said signals in response to said randomly varying power supply voltage applied to said delay stages, resulting in randomly occurring race conditions between said first and second inputs of said exclusive OR circuit;

said exclusive OR circuit randomly changing said pseudo-random signal pattern in response to said randomly occurring race conditions, and;

a sampling circuit having an input connected to said feedback output of said second subplurality of stages, for periodically sampling the binary state at said feedback output of said second subplurality of stages;

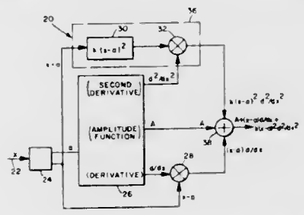
whereby said sampling circuit outputs a pseudo-random signal pattern which randomly changes with time.

4,905,177

HIGH RESOLUTION PHASE TO SINE AMPLITUDE CONVERSION

Lindsay A. Weaver, Jr., and Richard J. Kerr, both of San Diego, Calif., assignors to Qualcomm, Inc., San Diego, Calif.

Filed Jan. 19, 1988, Ser. No. 145,789
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—721 **20 Claims**



11. An apparatus for converting phase data into amplitude data of a preselected periodic function, comprising:

input means for splitting phase data corresponding to an

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independent variable of a preselected periodic function into an upper phase increment and a lower phase increment;

expansion means connected to said input means for generating at least three Taylor series expansion terms about said periodic function from said upper and lower phase increments;

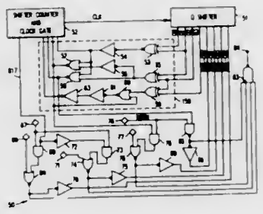
adder means for summing said series terms to form an output amplitude.

4,905,178

FAST SHIFTER METHOD AND STRUCTURE

Yeshayahu Mor, Cupertino, Calif.; Yeshayahu Schatzberger, Haifa, Israel, and Leonardo Sandman, Cupertino, Calif., assignors to Performance Semiconductor Corporation, Sunnyvale, Calif.

Filed Sep. 19, 1986, Ser. No. 909,521
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—748 **21 Claims**



10. A structure for normalizing a floating point number having an exponent and a mantissa comprising:

shifter means for storing said floating point number, capable of performing from 1 to N−1 bit shifts in a single clock cycle, where N is an integer less than a length of the mantissa and greater than 2;

means for analyzing the N most significant bits of the mantissa of the floating point number and providing central signals to said shifter means to cause from 1 to N−1 bit shifts of the mantissa if said floating point number is not normalized; and

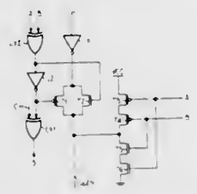
a shift counter for counting the number of bit shifts performed during the normalization of said floating point number.

4,905,179

CMOS CELL FOR LOGIC OPERATIONS WITH FAST CARRY

Luigi Licciardi, Almese, and Alessandro Torielli, Turin, both of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Apr. 27, 1988, Ser. No. 186,895
Claims priority, application Italy, May 20, 1987, 67440 A/87
Int. Cl.[4] G06F *7/50, 7/52*
U.S. Cl. 364—786 **7 Claims**



1. An elementary C-MOS cell for executing logic additions between two operand bits (A,B) with carry propagation, comprising:

a first EX-OR logic gate (EX2) which receives said operand bits (A,B);

a first inverter (I1) which receives a carry input (Cin);

a second inverter (I2) which receives the output of the first EX-OR logic gate (EX2);

a first transfer gate (T1, T2) which receives at the transfer input the output of said first inverter (I1), and which is controlled by input and output logic levels of said second inverter (I2);

a second EX-OR logic gate (EX1) which receives input carry (Cin) and the output of said second inverter (I2) and supplies the addition result (S); and

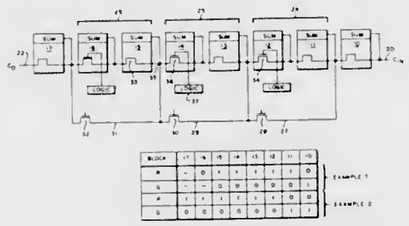
a first pair of series P-MOS transistors (T3, T4) and a second pair of series N-MOS transistors (T5, T6), said first and second pair being connected in series between two reference voltages, the bit of a first operand (A) being brought to the gate of a transistor of both pairs, the bit of a second operand (B) being brought to the gate of the other transistor of both pairs, the common node of said two pairs being connected to the output of said first transfer gate (T1, T2) and supplying the complemented output carry (CoutN), said first transfer gate consisting of a P-MOS transistor (T1) in parallel with an N-MOS transistor (T2), the input of said second inverter (I2) being sent to the gate of an N-MOS transistor and the output of the second inverter to the gate of a P-MOS transistor of the transfer gate.

4,905,180

MOS ADDER WITH MINIMUM PASS GATES IN CARRY LINE

Sudarshan Kumar, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 16, 1988, Ser. No. 286,227
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—787 **12 Claims**



1. An MOS partitioned, carry lookahead adder comprising:

a plurality of groups each generating a group propagate signal and a plurality of sum signals for its respective group, each group having a carry-in terminal and a carry-out terminal;

said carry-out terminal of one of said groups being coupled to said carry-in terminal of the next of said groups, thereby coupling said groups in series;

a main lookahead carry line for propagating carry signals having a plurality of sections, each section coupling the carry-out terminals of the nth one of said groups to the carry-in terminals of the n+2 one of said groups in said series; and,

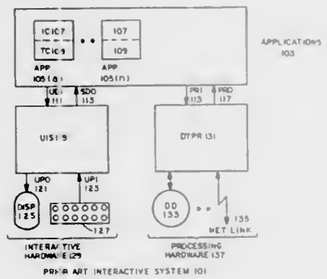
each of said sections of said carry line having a single first transistor with a first region and a second region coupled into one of said sections of said propagate line, such that carry signals propagating along said section pass from said first region to said second region of said first transistor and said carry signals is controllable by the gate of said first transistor, said gate of said first transistor being coupled to receive said group propagate signal for its respective group.

4,905,181

INTERACTIVE SYSTEM WITH STATE MANAGER SUBSYSTEM

Keith E. Gregory, Acton, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Apr. 20, 1987, Ser. No. 40,405
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 **5 Claims**



1. An interactive system comprising:

(1) a user interaction subsystem for controlling an interactive device belonging to the interactive system, the user interaction subsystem receiving a user-produced input from the interactive device and a user-destined input and producing a user-perceivable output of output to the interactive device and a system-destined output;

((2) a data transformation subsystem which receives a problem input and produces a result output; and

(3) a state manager subsystem for managing transitions between states of the interactive system, the state manager subsystem receiving state manager inputs including the system-destined output and the result output and producing state manager outputs including the problem input and the user-destined input and the state manager subsystem including

(a) expected state describing means for describing a set of expected states of the states of the interactive system and the transitions therebetween,

(b) active state describing means for describing a current set of active states of the states of the interactive system, and

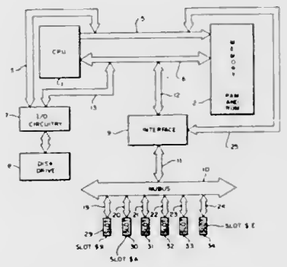
(c) state management means responsive to a state manager input, to the expected state describing means and to the active state describing means for producing the transitions, each transition being produced as required by the current set of active states, the state manager input, and the expected states, producing a new current set of active states, and producing a state manager output in connection with certain of the transitions.

4,905,182

SELF-CONFIGURING MEMORY MANAGEMENT SYSTEM WITH ON CARD CIRCUITRY FOR NON-CONTENTIOUS ALLOCATION OF RESERVED MEMORY SPACE AMONG EXPANSION CARDS

Jonathan Fitch, Cupertino, and Ronald Hochsprung, Saratoga, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 13, 1987, Ser. No. 25,500
Int. Cl.[4] G06F *13/14, 13/36*
U.S. Cl. 364—900 **10 Claims**



1. A printed circuit board card having terminals electrically connecting with cooperating terminals disposed in one of six slots on a main circuit board of a personal computer system, wherein said main circuit board includes a central processing unit (CPU), a first memory coupled to said CPU to receive addresses of memory locations from said CPU and to provide data to said CPU, a 32-bit address bus being coupled to said CPU to receive addresses from said CPU, and input/output circuitry coupled to said first memory to provide data to said first memory and coupled to said CPU to receive control signals from said CPU, each of said slots being coupled to said 32-bit address bus, said CPU including an address generation means for generating 2^{32} different addresses ranging from location **$0000 0000** to location **$FFFF FFFF**, said locations being in hexadecimal notation, each of said slots having a distinct number in said computer system and being coupled to distinct identification line means on said main circuit board, said distinct identification line means comprising four lines each carrying binary values, and wherein said six slots on said main circuit board have distinct numbers **$9, $A, $B, $C, $D,** and **$E** each of said slots having its own distinct identification line means providing its own distinct signal identifying the distinct number of the slot, such that a slot having a distinct number **$9** is slot **$9** and said distinct identification line means coupled to said slot **$9** will provide the value **$9** to said slot **$9**, said card comprising a second memory disposed on said card, said second memory being a random access memory and being selectively coupled to said CPU through said 32-bit address to bus to receive addresses of memory locations and to provide data over said address bus, said second memory being coupled to said 32-bit address bus which provides, during a first cycle, an address and receives, during a second cycle, data located at said address, said card further comprising a decoder means coupled to said distinct identification line means for receiving said distinct signal, said decoder means comparing said distinct number to the most significant hexadecimal digit of said address to determine when said distinct number, in hexadecimal, is equal to the most significant hexadecimal digit of said address, said decoder means enabling said second memory to be addressed to provide data when said distinct number, in hexadecimal, is equal to the most significant hexadecimal digit of said address such that, where said distinct number of said slot is X, said second memory is addressed whenever addresses between **$X000 0000** and **$XFFF FFFF** appear on said 32-bit address bus, whereby 256 megabytes of memory space are reserved for said card in said slot, said 256 megabytes of memory space beginning at location **$X000 0000** and ending at location **$XFFF FFFF**.

4,905,183

PATTERN GENERATOR HAVING PLURAL PATTERN GENERATING UNITS EXECUTING INSTRUCTIONS IN PARALLEL

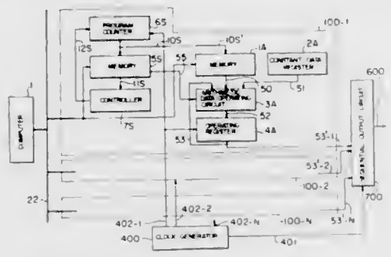
Ikuo Kawaguchi, Tokyo; Sbuji Kikuchi, and Chisato Hamabe, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 78,993

Claims priority, application Japan, Jul. 30, 1986, 61-177548; Jan. 30, 1987, 62-18310

Int. Cl.[4] **G06F** *15/16, 11/00*

U.S. Cl. 364—900 **5 Claims**



1. A pattern generator for executing a series of input or original operation processing instructions input thereto to generate a test pattern, comprising:

first to N-th pattern generator units each including arithmetic logical operation means for executing a series of operation processing instructions;

sequential output circuit means, coupled to outputs of said first to N-th pattern generator units and responsive to clock pulses, for sequentially selecting one of the outputs of said first to N-th pattern generator units in synchronism with said clock pulses, said sequentially selected outputs providing said test pattern; and

memory means disposed in each of said first to N-th pattern generator units and connected to respective arithmetic logical operation means, for storing information including a series of new operation processing instructions, each of said new operation processing instructions being obtained by putting together operation processing instructions, N by N, taken from said series of input or original operation processing instructions and stored in an order according to which said series of input or original operation processing instructions are to be executed if said series of input or original operation processing instructions were serially executed.

4,905,184

ADDRESS CONTROL SYSTEM FOR SEGMENTED BUFFER MEMORY

Rangaswamy P. Giridhar, Mission Viejo, and Jeffrey T. Reeve, Fullerton, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 21, 1987, Ser. No. 99,447

Int. Cl.[4] **G06F** *12/00, 1/00*

U.S. Cl. 364—900 **13 Claims**

1. A control system for permitting multiple simultaneous I/O data transfer cycles, in a peripheral controller, to be executed between a host computer which initiates I/O data transfer commands, and multiple numbers (n) of peripheral terminal units, the combination comprising:

(a) a segmented buffer memory means having "n+1" addressable page segments and "m" addressable word locations in each of the first "n" of said page segments and wherein

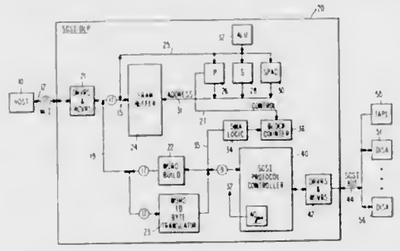
(i) each one of said addressable page segments, except the "n+1"th segment, is exclusively dedicated to a different one of said "n" peripheral terminal units;

(ii) said "n+1"th segment includes:

(iia) "n" scratch pad areas, addressable by a scratch pad address register, such that one of said "n" scratch pad areas is exclusively dedicated to a different one of said "n" peripheral terminal units and each one of said "n" scratch pad areas functions to hold status information on the status of each I/O instruction initiated by a processor means;

(b) memory address means for addressing page segments and word locations in said segmented buffer memory means, said memory address means including:

(b1) a peripheral address register, controlled by an arithmetic logic unit, for selecting one of said "n+1" page segments and "m" word locations for data being transferred



out of said buffer memory means to a selected peripheral terminal unit or for data being transferred from a selected peripheral terminal unit to said buffer memory means;

(b2) a system address register, controlled by said arithmetic logic unit, for selecting one of said "n+1" page segments and "m" word locations for data being transferred from said host computer to said buffer memory means or for data being transferred from said buffer memory means to said host computer;

(b3) said scratch pad address register for addressing only the "n+1" page segment and the "m" word locations therein;

(c) said processor means including an arithmetic logic unit for controlling the execution of data transfers and for controlling said peripheral, system, and scratch pad address registers.

4,905,185

APPARATUS FOR TRANSFERRING BLOCK DATA IN ORIGINAL FORM AND EDITING THE BLOCK DATA

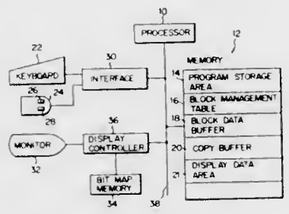
Toshinari Sakai, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 14, 1987, Ser. No. 73,450

Claims priority, application Japan, Jul. 17, 1986, 61-166753

Int. Cl.[4] **G06F** *3/14, 3/153*

U.S. Cl. 364—900 **16 Claims**



1. An editing apparatus comprising:

display data storage means for sequentially storing a plurality of display data blocks, each display data block being stored in a form predetermined in accordance with a type of the display data block;

display memory means for storing a display data image, the display data image including a plurality of display data block images which correspond to the plurality of display data blocks;

management data storage means for sequentially storing a plurality of management data blocks, each management data block corresponding to one display data block and including type data representing the type of the corresponding display data block and start position data representing position for the corresponding display data block to be displayed on a current page with respect to a reference position;

display means for reading out the display data image from said display memory means to display the display data block image on the current page;

developing means responsive to an input develop command, for sequentially reading out the plurality of display data blocks from said display data storage means and the plurality of management data blocks from said management data storage means and selectively developing each display data block into the corresponding data block image in accordance with the type data of the corresponding management data block and storing the corresponding display data block image in said display memory means in accordance with the start position data of the corresponding management data block;

buffer means for storing a specific display data block and a specific management data block corresponding to the specific display data block; and

editing means responsive to an input edit command for editing the plurality of display data blocks and the plurality of management data blocks in order to write as the specific display data block one of the plurality of display data blocks and as the specific management data block one of the plurality of management data blocks in said buffer means, to delete the specific display data block from the plurality of display data blocks and the specific management data block from the plurality of management data blocks, and to write the specific display data block in said display data storage means after the plurality of display data blocks and the specific management data block in said management data storage means after the plurality of management data blocks, and generating and outputting the develop command to said developing means after editing.

4,905,186

PORTABLE DATA TERMINAL

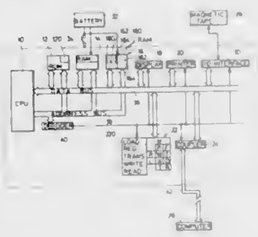
Takao Fukui, Nara, Japan, assignor to Sharp Kabushiki Kaisha

Continuation of Ser. No. 220,943, Jun. 27, 1988, abandoned, which is a continuation of Ser. No. 481,984, Apr. 4, 1983, abandoned. This application Jul. 13, 1989, Ser. No. 382,054

Claims priority, application Japan, Apr. 6, 1982, 57-58619; Apr. 7, 1982, 57-58759

Int. Cl.[4] **G06F** *15/30*

U.S. Cl. 364—900 **1 Claim**



1. A system for collecting money from customers on a customer list, said list including customer data inclusive of customer names and associated amounts of money to be collected from each customer, and recording the money amounts collected for each respective customer comprising:

external data source means including a magnetic storage device for storing a portion of said customer list including a selected group of customer names and associated money amounts to be collected from each respective customer, and a main computer for storing the entire said customer list including revised money amounts to be collected for each respective customer; and

a plurality of portable data terminals units, each of said plurality of portable data terminal units including,

a first random access memory for storing the terminal unit operation program suitable for conducting the money collection operation,

a keyboard panel for inputting money data related to the amounts of money collected from each customer and generating function commands for conducting the money collection operation,

a second random access memory having first, second, and third memory portions, said first memory portion storing data for the customer names, said second memory portion storing data for the associated money amounts to be collected from each respective customer and said third memory portion storing a flag for indicating when the entire money amount has been collected from each respective customer,

means for selectively setting said flag upon payment of the entire money amount,

acoustic coupler means for transmitting said data for the customer names and said data for the associated money amounts to said main computer through a public telephone network and for receiving the revised money amounts from the main computer, and

central processing unit means for controlling the manipulation of data in said terminal units and bi-directional communication of data between said second random access memory and said main computer through said acoustic coupler means in response to function commands from said keyboard panel.

4,905,187

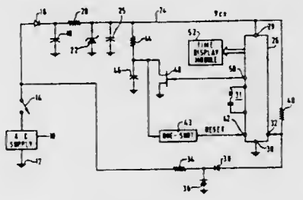
TIME-KEEPING APPARATUS

Billy W. Beyers, Jr., Greenfield, Ind., assignor to RCA Lincensing Corporation, Princeton, N.J.

Continuation of Ser. No. 824,674, Jan. 31, 1986, abandoned. This application May 20, 1988, Ser. No. 202,657

Int. Cl.[4] **G06F** *11/00;* **G11C** *7/00*

U.S. Cl. 364—900 **6 Claims**



1. Apparatus for keeping the time of day, comprising:

an input for receiving an AC power line voltage subject to interruption;

processor means, including a source of clock signals, and a memory for storing a program of operating instructions;

said processor means operating in a normal mode while said AC power line voltage is present to keep the time of day by counting cycles of said AC power line voltage; and

an R-C network input for producing a varying voltage when triggered;

said processor means operating to determine the duration of said interruption of said AC power line voltage so that the time of day can be updated by repetitively triggering said R-C network to produce repetitive cycles of said varying voltage during said power interruption, said cycles each consisting essentially of a voltage ramp from a first prede-

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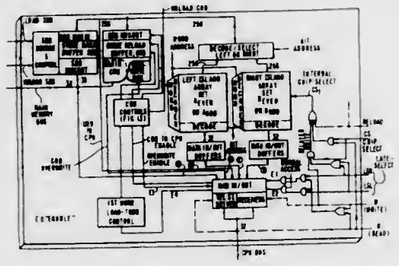
termined voltage level to a second predetermined voltage level and having the same substantially constant duration; and calculating the time duration of said power interruption by measuring said substantially constant duration of said cycles and multiplying said substantially constant duration of said cycles by the number of cycles occurring during said power interruption.

4,905,186

FUNCTIONAL CACHE MEMORY CHIP ARCHITECTURE FOR IMPROVED CACHE ACCESS

Chiao-Mei Chuang, Briarcliff Manor; Richard E. Matick, Peekskill, and Fred T. Tong, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 22, 1988, Ser. No. 158,964
Int. Cl.[4] G06F *12/00, 13/00*
U.S. Cl. 364—900 **17 Claims**



1. A VLSI cache memory subsystem including, on-chip a single-port, late-select, cache array organized to be n-way set associative said chip including a plurality of functionally interrelated units on-chip with the cache array which comprise; (1) means for performing a normal CPU read access operation including means for accessing the chip in a fast, "late-select" mode, which is n-way set-associative, in effectively one memory cycle for a read operation to the CPU, (2) means for performing an internal late-write operation including means for allowing a CPU "write" to one of n accessed words in effectively one cycle, and (3) means for performing a cache reload operation including means for providing a highly parallel multi-word store-back and reload operation to and from main memory, to reduce the reload time for a store-in cache organization, said means for performing the reload operation additionally including means for performing a nearly transparent, multiple word reload and including a Cache-Reload Buffer, a Store-Back Buffer and a load-thru mechanism all included on the chip for reloading,

said system further including two separate decoders integrated on the chip, one actuable for normal single word read/write cache access by the CPU and one actuable for parallel multi-word cache reload, and means to access date in the Cache Reload Buffer which has been transferred out of main memory to the chip but not yet reloaded into the cache array, said two decoders providing two different accessing modes required for CPU or main memory operations.

4,905,189

SYSTEM FOR READING AND WRITING INFORMATION

Michael J. Brunolli, Escondido, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Dec. 18, 1985, Ser. No. 810,911
Int. Cl.[4] G11C *7/00*
U.S. Cl. 364—900 **40 Claims**

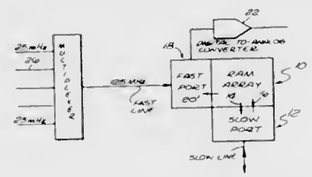
1. In a combination for reading and writing binary coded information for video display,

first signal means for passing first signals having first and second logic levels respectively corresponding to binary "1" and "0",

second signal means for passing second signals having first and second logic levels respectively corresponding to binary "1" and "0",

memory means having a plurality of positions for storing binary coded information,

first means operatively coupled to the first signal means and the memory means for writing binary coded information in a particular position in the memory means dependent upon the logic levels of the first signals from the first signal means and for reading binary coded information from the particular position in the memory means and transferring such information to the first signal means as the first signals,



second means operatively coupled to the memory means and the second signal means for reading binary coded information from the particular position in the memory means and transferring such binary coded information to the second signal means as the second signals, and

third means operatively coupled to the first and second means for isolating any disturbances resulting from the reading through the second means of the binary coded information from the particular position in the memory means such that, in a time coincidence with the writing of binary coded information through the first means to the particular position in the memory means, any such disturbances resulting from the reading through the second means of the binary coded information from the particular position in the memory means will be prevented from affecting such writing through the first means to the particular position in the memory means.

4,905,190

MULTIPROGRAM CONTROL INFORMATION PROCESSING SYSTEM WITH PROCESS ROLL-IN FROM MAIN MEMORY

Yasushi Yokoyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 7, 1987, Ser. No. 82,558
Claims priority, application Japan, Aug. 20, 1986, 61-194916
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **6 Claims**

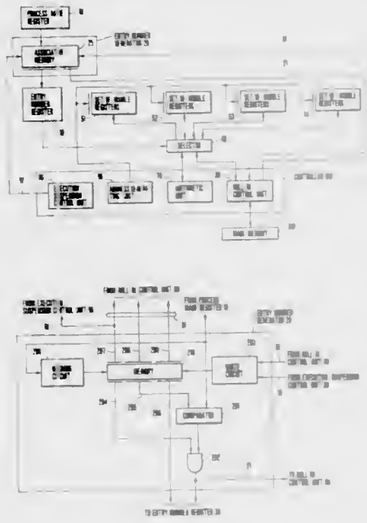
1. A multiprogram control information processing system with process roll-in from a main memory to hardware of a central processing unit of said multiprogram control information processing system, comprising:

a plurality of sets of visible registers, each of said plurality of sets of visible registers corresponding to each of a plurality of processes stored in corresponding saving areas of said main memory, having a distinct entry number and being configured by various registers for collectively representing current processing status of the corresponding process;

entry number generating means having a memory for storing identification codes of said plurality of processes and the entry numbers of said plurality of sets of visible registers in one-to-one correspondence, said entry number generating means being adapted to receive a given identification code of a process to be rolled in from said main memory, to output a given entry number corresponding to the given identification code, to output a hit signal representing a coincidence, and to output a mishit signal if the given identification code is not present in said memory;

selector means for selecting one of said plurality of sets of visible registers in correspondence with the given entry number output from said entry number generating means to connect the one of said plurality of sets of visible registers selected by said selecting means to an arithmetic unit; and

roll-in control means for controlling to immediately initiate



execution of a new process corresponding to said set of visible registers selected by said selector means in response to the hit signal, and to output an entry number selected from said memory according to an arbitrary selection scheme to said selector means and to roll-in the necessary information from said corresponding saving area in said main memory to a set of visible registers having the entry number selected according to the arbitrary selection scheme in response to the mishit signal.

4,905,191

MICROCOMPUTER WITH BUILT-IN EPROM AND TEST MODE

Masahiko Arai, Kodaira, Japan, assignor to Hitachi Ltd., Tokyo, Japan

Filed Dec. 15, 1987, Ser. No. 132,996
Claims priority, application Japan, Jan. 16, 1987, 62-5959
Int. Cl.[4] G11C *7/00, 17/00, 29/00*
U.S. Cl. 371--21.2 **9 Claims**

1. A single-chip microcomputer comprising:

an internal bus;

a microprocessor coupled to the internal bus for executing information processing in according with a predetermined program;

an electrically programmable read only memory coupled to the internal bus for storing the predetermined program therein, the electrically programmable read only memory including,

memory cell means having first memory cells for storing data constituting the predetermined program and at least one second memory cell for storing data for testing, selecting means for selecting one of either the first memory cells or the second memory cell,

input means for providing data to be written into the memory cell means from the internal bus to the memory cell means, and

output means for providing data to be read out from the memory cell means to the internal bus,

wherein the electrically programmable read only memory has a first operating mode in which the electrically programmable read only memory is accessed from the microprocessor, and a second operating mode in which the electrically programmable read only memory is accessed from outside of the single-chip microcomputer, and wherein the second operating mode further includes a test mode in which the selecting means only selects the second memory cell in response to a control signal;

first control means coupled to the electrically programmable read only memory for controlling whether or not the electrically programmable read only memory is to be operated in the second operating mode;

first external terminals to which address signals to be applied to the selecting means are applied in the second operating mode;

second external terminals to which data to be fed to or from the electrically programmable read only memory is applied in the second operating mode; and

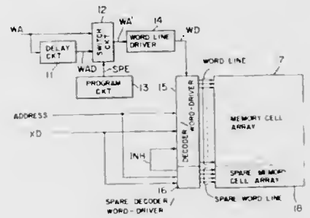
second control means coupled to one of the first external terminals and for discriminating whether or not the electrically programmable read only memory is to be operated in the test mode and for providing the control signal to the selecting means when the electrically programmable read only memory is to be operated in the test mode.

4,905,192

SEMICONDUCTOR MEMORY CELL

Kazutaka Nogami, Kawasaki, and Takayasu Sakurai, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1988, Ser. No. 175,252
Claims priority, application Japan, Mar. 31, 1987, 62-79156
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—200 **7 Claims**



1. A semiconductor memory device comprising:

a memory cell array having a spare memory cell array;

first addressing means for designating an address of said memory cell array;

second addressing means for designating an address of said spare memory cell array, said second addressing means being activated simultaneously with said first addressing means;

drive means for activating a select line designated by each of said first and second addressing means;

a program circuit for generating a predetermined output based on whether said memory cell array has a defect or fault or not; and

a select circuit responsive to said output from said program circuit for supplying an activation signal delayed by a delay circuit to said designated select line for the selection

of said spare memory cell array when there is a fault in said memory cell array.

4,905,193

LARGE SCALE INTEGRABLE MEMORY CELL WITH A TRENCH CAPACITOR WHEREIN THE TRENCH EDGE IS SURROUNDED BY A FIELD OXIDE REGION

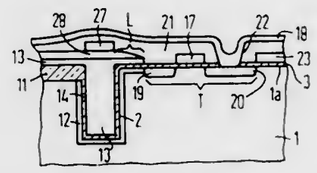
Lothar Risch, Ottobrun, and Reinhard Tielert, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 185,454, Apr. 25, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 372,236

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722939

Int. Cl.[4] G11C *11/24*

U.S. Cl. 365—149 **7 Claims**



1. A large scale integrable memory cell, comprising:

a semiconductor substrate of a first conductivity type;

a field effect transistor formed in said substrate;

a bit line operatively connected to said field effect transistor;

a storage trench capacitor formed in said substrate, said trench capacitor including edges positioned at an upper boundary of said substrate, one wall of said trench capacitor forming one electrode of said storage capacitor, said electrode being operatively connected to said transistor;

an insulating layer over said substrate, said insulating layer having a strip-shaped thin film region extending from a lateral edge of said trench capacitor over said transistor, said thin film region defining an active region of the memory cell which lies outside of said trench capacitor, said insulating layer also including a thick film region surrounding said thin film region and directly surrounding the edges of said trench capacitor not contacted by said thin film region,

said thick film region having a thickness, as measured substantially perpendicularly from said substrate boundary surface, which is greater than a thickness of said thin film region; and

a layer of electrically conductive material covering said insulating layer and constituting a second electrode of said storage capacitor.

4,905,194

SEMICONDUCTOR MEMORY DEVICE WITH A CIRCUIT FOR ANALYZING DEFECTS IN WORD-LINES

Nobuaki Ohtsuka, and Junichi Miyamoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 14, 1989, Ser. No. 310,137

Claims priority, application Japan, Feb. 16, 1988, 63-33436

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—185 **6 Claims**

I. A semiconductor memory device comprising:

a memory cell array including a plurality of memory cells;

a plurality of word-lines, each word-line connected to corresponding memory cells;

a plurality of bit-lines, each bit-line connected to corresponding memory cells;

a row decoder connected to the plurality of word-lines for selecting word-lines in accordance with address signals and a column decoder connected to the plurality of bit-lines for selecting bit-lines in accordance with address signals; and

a plurality of transistors connected in parallel between a predetermined potential supply terminal and a pad, each of said plurality of transistors having a gate connected to a corresponding word-line, each of said plurality of transistors being switch-controlled in accordance with a potential of said corresponding word-line.

4,905,195

SEMICONDUCTOR MEMORY

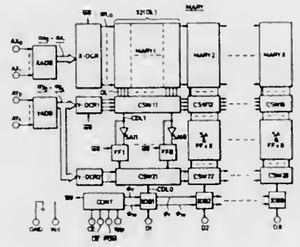
Minoru Fukuda, Tateno; Hideaki Takahashi, Koganei, both of Japan; June Sagiura, Troy, N.Y.; Fumio Tsuchiya, Kodaira, and Toshimasa Kihara, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 75,986, Jul. 21, 1987, Pat. No. 4,788,665, which is a division of Ser. No. 770,576, Aug. 29, 1985, Pat. No. 4,691,298. This application Nov. 29, 1988, Ser. No. 277,131

Claims priority, application Japan, Sep. 26, 1984, 59-199576

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189.05 **27 Claims**



1. In a semiconductor memory, the improvement for writing information comprising:

a memory array having a plurality of data lines, including a plurality of nonvolatile semiconductor memory cells which can be erased and electrically written into;

external terminal means for receiving serially applied input signals or an input signal to be written into said memory array;

converter means having an input coupled to said external terminal means and having a plurality of outputs, said converter means responding to said serially applied input signals for converting said input signals into a plurality of parallel produced output signals;

a plurality of terminals, corresponding in number to the number of outputs of said converter means, being respectively coupled to said outputs of said converter means, and being coupled to the data lines of said memory array;

transmitting means having an input coupled to said external terminal means and having a plurality of outputs coupled to said terminals, said transmitting means responding to said input signal for controllably transmitting said input signal to one of said terminals;

an external control terminal for receiving a control signal; and

control means coupled to said converter means and to said transmitting means for selecting either a serial-to-parallel transmission of said serially received input signals through said converter means or transmitting said input signal through said transmitting means to one of said terminals in accordance with said control signal.

4,905,196

METHOD AND STORAGE DEVICE FOR SAVING THE COMPUTER STATUS DURING INTERRUPT

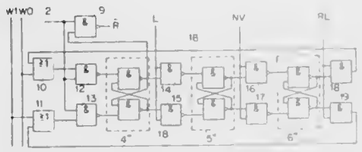
Hubert Kirrmann, Dättwil-Baden, Switzerland, assignor to BBC Brown, Boveri & Company Ltd., Baden, Switzerland

Continuation of Ser. No. 651,770, Sep. 18, 1984, abandoned. This application Oct. 5, 1987, Ser. No. 105,448

Claims priority, application Switzerland, Apr. 26, 1984, 2053/84

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—200 **3 Claims**



1. An apparatus for saving the task status of a computer to facilitate recovery in the event of a hardware failure occurring during execution of an executable program, said program having variables and being provided with a plurality of recovery points, each pair of such recovery points delimiting a program block, said computer including a main memory, a processor having at least one internal register, and an input-/output device having an internal register, said main memory, said processor and said input/output device communicating with each other via an address bus and a data bus, and said main memory containing the current task status of the computer including the status of said variables and said registers during the program run, comprising;

a cascaded memory having a plurality of storage units, each storage unit including a main memory cell forming a part of said main memory and being controlled by at least one first switching element, a second memory cell having an input connected to an output of said main memory cell via at least a second switching element, said second switching element operative to load said second memory cell with the contents of said main memory at said program recovery points, a non-volatile archival memory cell having an input connected to an output of said second memory cell via at least a third switching element and an output connected to an input of said first switching element via at least a fourth switching element, said third switching element operative to load said non-volatile memory cell with the contents of said second memory cell upon occurrence of a failure.

4,905,197

SEMICONDUCTOR MEMORY HAVING CIRCUITRY FOR DISCHARGING A DIGIT LINE BEFORE VERIFYING OPERATION

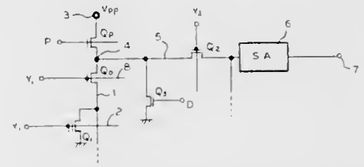
Takahiko Urai, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 840,784, Mar. 18, 1986, abandoned. This application Oct. 21, 1988, Ser. No. 262,227

Claims priority, application Japan, Mar. 18, 1985, 60-53655

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—204 **4 Claims**



3. A memory device comprising at least one word line, at least one digit line, at least one memory cell coupled to said at least one word line and said at least one digit line, a circuit node, a selecting transistor connected between said circuit node and said at least one digit line, a terminal supplied with a programming voltage, a program control transistor connected between said terminal and said circuit node, means responsive to address information for energizing said at least one word line and for turning ON said selecting transistor to select said at least one memory cell, means for turning ON said program control transistor during a programming period to supply said programming voltage to said at least one memory cell via said program control transistor, said selecting transistor and said at least one digit line, said at least one digit line being charged by said programming voltage to a first potential and said circuit node being charged by said programming voltage to a second potential that is higher than said first potential, a ground terminal, a discharging transistor having a drain-source path connected directly between said circuit node and said ground terminal and means for turning ON said discharging transistor during a time period when said program control transistor is in a nonconductive state and said selecting transistor is in a conductive state, whereby said discharging transistor directly discharges electric charges at said circuit node and further discharges electric charges at said at least one digit line through said selecting transistor.

4,905,198

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Kanji Oishi, Koganei, and Takashi Shinoda, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 40,848, Apr. 21, 1987, Pat. No. 4,771,406, which is a division of Ser. No. 727,922, Apr. 29, 1985, Pat. No. 4,680,737. This application Sep. 6, 1988, Ser. No. 240,603

Claims priority, application Japan, May 7, 1984, 59-89420

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—222 **26 Claims**

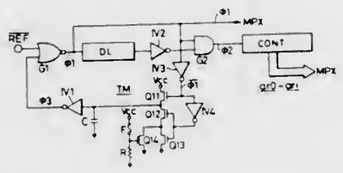
1. A semiconductor integrated circuit device comprising:

dynamic memory cells that need to be periodically refreshed;

a timer circuit for generating output signals to determine a refresh timing of said dynamic memory cells, said timer

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circuit including program means for changing the period of said output signals; and



terminals coupled to said program means for receiving signals for programming said program means.

4,905,199

METHOD OF AND APPARATUS FOR REDUCING CURRENT OF SEMICONDUCTOR MEMORY DEVICE

Takayuki Miyamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,587
Claims priority, application Japan, Aug. 7, 1987, 62-198683
Int. Cl.[4] G11C *7/00, 8/00;* **H03K** *3/01*
U.S. Cl. 365—226 **11 Claims**

1. A semiconductor memory device (1) formed on a semiconductor substrate operative in a first operating state and a second operating state, wherein said memory device (1) consumes more current in said first operating state than in said second operating state, said semiconductor device (1) comprising:

at least one memory cell for storing data;

control means (11) responsive to an external control signal for controlling said memory device (1) to operate selectively in said first and second operating states;

power detector means (57) for detecting an application of power to said memory device;

pseudo state signal generating means (58) responsive to said power detector means (57) for generating a pseudo state signal defining said second operating state of said memory device (1);

substrate bias voltage generating means (29) receiving a power for generating a bias voltage to be applied to said substrate;

wherein said memory device (1) operates normally when a voltage of a prescribed level is applied to said substrate from said substrate bias voltage generating means (29),

voltage establishment detector means (50, 58) detecting that the voltage generated by said substrate bias voltage generating means (29) is established in said prescribed level; and

switching means (59) responsive to said voltage establishment detector means (50, 58) for selectively applying either an externally applied control signal or a signal from said pseudo state signal generating means (58) to said control means (11), wherein

said control means (11)controls said memory device (1) to operate in said second operating state in response to said applied pseudo state signal.

4,905,200

APPARATUS AND METHOD FOR CORRECTING MICROCOMPUTER SOFTWARE ERRORS

Richard A. Pidsosny, Canton; Michael J. Burke, Milford, both of Mich., and Mark W. Jarvis, Unionville, Canada, assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 29, 1988, Ser. No. 237,468
Int. Cl.[4] G11C *13/00*
U.S. Cl. 364—300 **21 Claims**

9. An apparatus for replacing an undesired code stored in a plurality of storage locations in read-only memory (ROM) with a replacement code, comprising:

an electronically programmable memory having a first storage location for storing a beginning address of the undesired code, a second storage location for storing a beginning address of the replacement code, and a plurality of addressable storage locations for storing the replacement code wherein the last of said addressable storage locations stores a return instruction for readdressing said ROM;

a program counter responsive to a central processing unit for addressing both said ROM and said electronically programmable memory;

a comparator coupled to said first storage location and said program counter for detecting said beginning address of said undesired code;

transfer logic responsive to said comparator and coupled to both said electronically programmable memory and said program counter for transferring said beginning address of said replacement code to said program counter;

said program counter sequencing addresses through said plurality of addressable storage locations in said electronically programmable memory; and

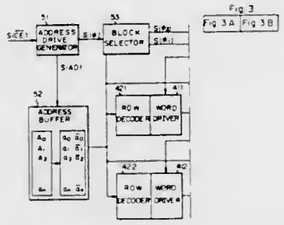
said central processing unit receiving code from said ROM and said electronically programmable memory, said central processing unit recognizing said return address for instructing said program counter to address said ROM after said replacement code has replaced said undesired code.

4,905,201

SEMICONDUCTOR MEMORY DEVICE CAPABLE OF SELECTIVE OPERATION OF MEMORY CELL BLOCKS

Tsuyoshi Ohira, and Tomio Nakano, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 5, 1987, Ser. No. 59,063
Claims priority, application Japan, Jun. 6, 1986, 61-131443
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—230.03 **5 Claims**



1. A semiconductor memory device including row decoders and column decoders, comprising:

a memory cell array including a plurality of memory cell blocks, each of said memory cell blocks being respectively operatively connected to one of the row decoders and one of the column decoders;

clock generator means including a plurality of clock generator sections, each of said clock generator sections corresponding to one of said memory cell blocks and each of said clock generator sections sequentially generating a plurality of clock signals for driving corresponding memory cell blocks;

address drive generator means for generating an address drive signal;

address buffer means, coupled to said address drive generator means, for receiving the address drive signal and outputting address bit signals; and

block selector means, coupled to said clock generator means, for selecting one of said clock generator sections in correspondence with the row address of a designated address and causing clock signals of only said selected clock generator section to be output for operating a corresponding one of said memory cell blocks, said block selector means comprising:

a plurality of two-input logic gates having first input terminals for receiving address drive signals from said address drive generator, means, and second input terminals for receiving address bit signals from said address buffer,

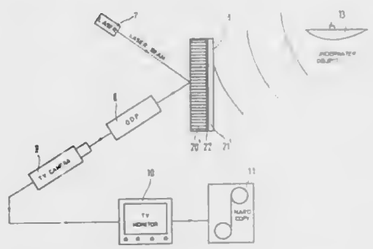
whereby only a clock generator section corresponding to said selected memory cell block is operated by said designated address.

4,905,202

DETECTION PANEL AND METHOD FOR ACOUSTIC HOLOGRAPHY

Jean J. A. Robillard, Las Cruces, N. Mex., assignor to Richard L. Scully, Charlottesville, Va.

Filed Dec. 28, 1987, Ser. No. 138,438
Int. Cl.[4] G03H *3/00*
U.S. Cl. 367—8 **10 Claims**



1. A system for acoustic holography comprising:

means for projecting an acoustic wave onto an object;

a detection panel for receiving the acoustic wave after reflection from the object, said detection panel being in the form of a flat cell containing a liquid crystal layer including a mixture of nematic and cholesteric liquid crystals whose composition provides a refractive index which varies as a function of acoustic pressure;

at least one optical window and at least one acoustical window provided in connection with the flat cell of said detection panel, the flat cell being oriented to receive the reflected acoustic wave through the acoustic window so that the refractive index is varied over the liquid crystal layer in response to the phase and amplitude of the reflected acoustic wave;

means for directing coherent light at the optical window of said detection panel, the light reflected from the liquid crystal layer being modulated in phase and amplitude by the refractive index variations of the liquid crystal layer; and

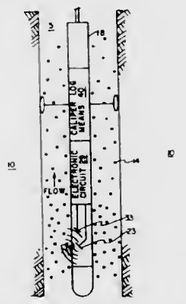
means for producing a visible image from the modulated light reflected from the liquid crystal layer.

4,905,203

DOWNHOLE DOPPLER FLOWMETER

Jackie C. Sims, and Irwin R. Supernaw, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 30, 1988, Ser. No. 251,286
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—25 **8 Claims**



1. A well logging system for monitoring the flow rate of a fluid flowing in a borehole traversing an earth formation comprising:

a sonde including therein:

transmitter means for transmitting acoustical waves into the fluid at a predetermined frequency,

receiver means for receiving reflected acoustical waves and providing a received signal corresponding thereto,

caliper means for sensing the diameter of the borehole and providing a diameter signal D corresponding thereto, and

means for processing the received signal to provide a frequency signal, corresponding to a relationship between the frequency of the transmitted acoustical waves and the frequency of the reflected waves in accordance with the received signal;

cable means connected to the processing means and to the caliper means for carrying the frequency signal and the diameter signal D to the surface; and

surface electronics including:

means connected to the cable means for deriving the flow rate FR of the fluid in accordance with the frequency signal and the diameter signal and providing an output signal corresponding thereto.

4,905,204

METHOD OF WEIGHTING A TRACE STACK FROM A PLURALITY OF INPUT TRACES

Phillip A. Hughes, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Division of Ser. No. 240,956, Sep. 6, 1988, Pat. No. 4,882,713.
This application Jul. 13, 1989, Ser. No. 379,488
Int. Cl.[4] G01V *1/28*
U.S. Cl. 367—62 **3 Claims**

2. The method of suppressing noise from a plurality of related seismic traces including noise, comprising

developing a weighted trace stack, including for each respective one of an ensemble of related input traces for producing respective resulting weighted traces,

sampling and squaring each sample of each input trace to produce a time series of corresponding instantaneous power values,

transforming said series of instantaneous power values to the frequency domain, thereby producing an energy frequency spectrum,

low pass filtering said energy frequency spectrum to form a time varying estimate of the energy of the said input

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trace, thereby producing a filtered energy frequency spectrum,

truncating said filtered energy frequency spectrum for the purpose of decimating the corresponding time function, thereby producing a truncated energy frequency spectrum,

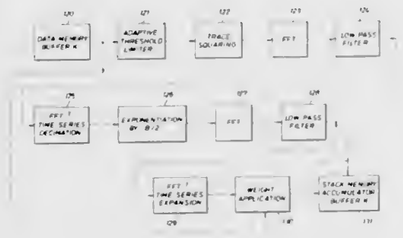
transforming the said truncated energy frequency spectrum to the time domain to produce a decimated energy envelope, the sampling interval therefor being at a larger interval than the original digital sampling interval of said input trace,

calculating the decimated weight function from said decimated energy envelope by exponentiating each sample of the said decimated energy envelope by a factor equal to $-B/2$, where B is the exponential bias factor,

transforming said decimated weight function to the frequency domain to produce a weight function frequency spectrum,

low pass filtering said weight function frequency spectrum to eliminate higher frequencies caused by said exponentiation, thereby producing a filtered weight function frequency spectrum,

expanding said filtered weight function frequency spectrum to the size of said energy frequency spectrum by converse padding to reverse the effects of the spectral



truncation of the decimating step, thereby producing an expanded weight function spectrum,

transforming said expanded weight function spectrum to the time domain to produce a weight function having a sampling interval equal to the sampling interval of said input trace, and

multiplying said input trace by said weight function to produce a weighted trace; and

adding the respective said weighted traces to produce a weighted trace stack, and

adding said respective filtered weight function frequency spectra to develop a weight stack frequency spectrum;

expanding said weight stack frequency spectrum to the size of said energy frequency spectrum by converse padding to reverse the truncation caused by the decimating step, thereby producing an expanded weight stack frequency spectrum,

transforming said expanded weight stack frequency spectrum to the time domain to produce a weight stack having a sampling interval equal to the sampling interval of said input trace; and

dividing said weighted trace stack by said weight stack at each of the sampling occurrences of the original said input traces to produce an optimized stack trace, the signal component of which is substantially the same as the signal component common to all said input traces.

4,905,205

METHOD FOR TRANSMITTING TO A CENTRAL RECORDING DEVICE SEISMIC DATA COLLECTED BY ACQUISITION APPARATUS DISTRIBUTED OVER THE GROUND AND A DEVICE FOR IMPLEMENTING SAME

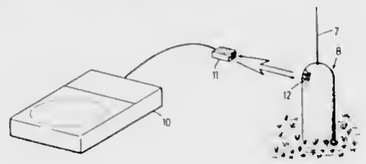
Joseph Rialan, Meudon, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Dec. 23, 1987, Ser. No. 137,336

Claims priority, application France, Dec. 23, 1986, 86 18030

Int. Cl.[4] G01V *1/22*; H04M *11/10*

U.S. Cl. 367—77 **12 Claims**



1. A method for transferring to a central control and recording assembly data corresponding to signals received by a set of seismic sensors spaced apart along a seismic profile to be prospected that is remote from said central control and recording assembly, in response to vibrations transmitted and reflected back by discontinuities in the subsoil, during successive transmission-reception cycles, these signals being collected by a plurality of acquisition apparatus adapted for sampling, digitizing and storing the signals received, said method including the steps of:

providing each acquisition apparatus with a short range data flow transmission means and a narrow transmission band radio transmission and reception means for bidirectional communications with said central control and recording assembly;

storing in an electronic random access memory seismic data collected during a seismic recording session formed of a given number of seismic transmission-reception cycles;

transmitting data indicative of correct operation of each said acquisition apparatus directly by said narrow transmission band radio transmission means to said central control and recording assembly during an interval between successive transmission-reception cycles of a seismic recording session;

transporting a high speed mass storage device to the vicinity of each said acquisition apparatus successively at the end of said seismic exploration session;

transferring to said mass storage device from individual ones of said acquisition apparatus successively the seismic data stored by each said acquisition apparatus over a single data flow connection at a high data flow rate; and

thereafter transmitting all the data collected in the mass storage device to the central control and recording assembly.

4,905,206

ULTRASONIC DOPPLER FLOW METER

Hisashi Nishiyama; Kageyoshi Katakura; Toshio Ogawa, all of Tokyo; Satoshi Tamano; Koji Tanabe, both of Kashiwa, and Shizuo Ishikawa, Kanagawa, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Jun. 20, 1989, Ser. No. 369,656

Claims priority, application Japan, Jun. 22, 1988, 63-153850; Aug. 4, 1988, 63-195038; Aug. 26, 1988, 63-210757; Aug. 26, 1988, 63-210758

Int. Cl.[4] G01F *1/66*

U.S. Cl. 367—90 **19 Claims**

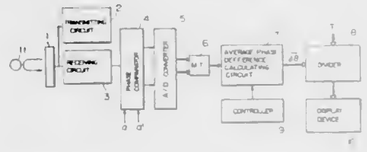
1. An ultrasonic pulse Doppler flow meter comprising:

transmitter-receiver means for transmitting ultrasonic pulsed continuous wave towards an object with a predetermined

interval and receiving wave reflected by said object to obtain a reception signal;

phase detecting means for generating a phase vector indicating the phase of said reception signal, each time said reception signal is obtained;

first average phase difference calculating means for obtaining the phase difference $\Delta\theta$ between the phase vector at current time point and the phase vector at the time preceding by one time period, each time said phase vector is obtained, decomposing it into a cosine component and a sine component, and calculating the angle represented by



the average of a plurality of cosine components and the average of a plurality of sine components as a first average phase difference;

second average phase difference calculating means for adding said phase difference $\Delta\theta$ a plurality of times to obtain the average thereof as a second average phase difference; and

selecting means for selecting one of said first and said second average phase difference, depending on the magnitude of the speed of said object, as a signal indicating the speed of said object.

4,905,207

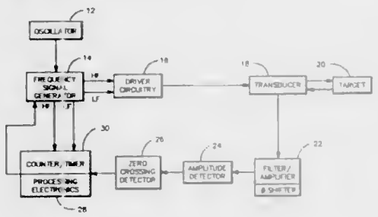
MEASURING DISTANCES USING A PLURALITY OF FREQUENCIES

Michael W. Fellinger, Boulder, and Richard J. Shelquist, Longmont, both of Colo., assignors to Merrill Engineering Laboratories, Inc., Englewood, Colo.

Filed Sep. 21, 1988, Ser. No. 247,412

Int. Cl.[4] G01S *15/00*

U.S. Cl. 367—99 **27 Claims**



1. A method for measuring the distance to an object, comprising:

transmitting to the object a transmitted signal having a first frequency;

a transmitting to the object a transmitted signal having a second frequency, said second frequency being different from said first frequency;

receiving from the object a returned signal having said first frequency;

receiving from the object a returned signal having said second frequency;

determining a first magnitude relating to a coarse distance which relates to the coarse time taken by at least one of said first frequency signal and said second frequency signal to make a round trip to and from the object;

determining a second magnitude relating to a first fine distance and a first fine time, both of said first fine distance and said first fine time being associated with said first frequency signal;

determining a third magnitude relating to a second fine distance and a second fine time, both of said second fine distance and said second fine time being associated with said second frequency signal;

determining a whole number of signal cycles taken by said first frequency signal to make the round trip distance relative to the object and determining a whole number of signal cycles taken by said second frequency signal to make the round trip distance relative to the object, using at least said first magnitude; and

using said second magnitude, said third magnitude, said whole number of signal cycles taken by said first frequency signal and said whole number of signal cycles taken by said second frequency signal in making a single determination of the distance to the object.

4,905,208

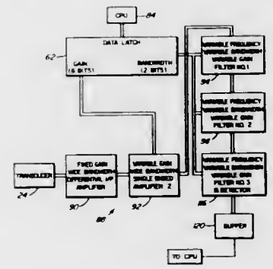
DISTANCE DETECTING APPARATUS

Norman R. Dick, Sooke, Canada, assignor to Interphase Technologies Inc., Richmond, Canada

Filed Aug. 4, 1987, Ser. No. 81,330

Int. Cl.[4] G01S *7/52*

U.S. Cl. 367—99 **24 Claims**



1. A distance detecting apparatus, comprising:

first means for producing a cyclic output pulse;

second means operatively connected to the first means for setting the output pulse at a first frequency and means for connecting the apparatus to a transducer to convert the output pulse to an ultrasonic signal, the first frequency being any of a plurality of transmit frequencies in a bandwidth of frequencies, said transmit frequencies being separated by increments of frequency which are small relative to the bandwidth, thereby allowing the transmit frequency to be tuned for transducers of different resonant frequencies;

third means for receiving a return pulse and having an adjustable centre frequency of response;

fourth means operatively connected to the third means for adjusting the centre frequency of response of the third means, so said centre frequency of response is the same as said first frequency; and

fifth means operatively connected to the first means and the third means for measuring time between an output pulse and a return pulse and thereby a distance.

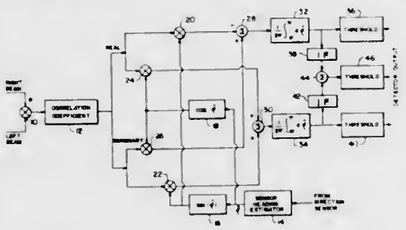
VOL 1111 ISS 4 FE 27 1990 UMI

4,905,209

CORRELATION MATCH FILTER FOR PASSIVE SIGNAL DETECTION

Stanley S. Huang, Bellevue, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 27, 1988, Ser. No. 199,507
Int. Cl.[4] G06G 9/00
U.S. Cl. 367—125 6 Claims



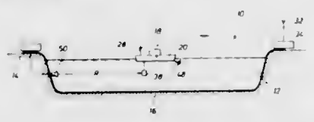
1. A passive target detector employing a correlation match filter comprising:
- beam forming means for forming two passive phase offset beams and dynamically sweeping said beats across a target to generate first and second phase offset received signals;
- complex correlation means connected to said beam forming means for generating a complex cross-correlation coefficient of said first and second phase offset signals, said coefficient having real and imaginary parts;
- replica function generating means for generating a replica signal in the form of complementary functions of a relative angle between a sensor line-of-sight and a source of signal to be detected;
- four quadrant multiplier means for multiplying said real and imaginary parts of said coefficient by said complementary functions to generate a plurality of partial products;
- summing and integrating means for accumulating over time the partial products from said four quadrant multiplier means to provide real and imaginary filter outputs; and
- output means connected to said summing and integrating means for generating a detection output if a target has been detected.

4,905,210

LIQUID IMPOUNDMENT SURVEY VEHICLE INCORPORATING POSITIONING FINDING AND TRACKING SYSTEM

Thomas E. Owen, Helotes, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Mar. 19, 1987, Ser. No. 27,848
Int. Cl.[4] G01S 15/74
U.S. Cl. 367—128 13 Claims



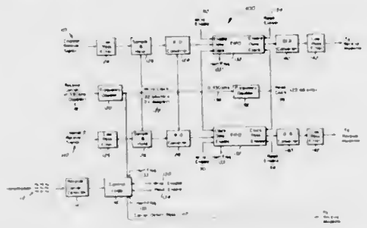
1. For use with a vessel traveling across liquid in an impoundment confined within a geomembrane wherein the vessel carries leak detecting apparatus to locate leaks in the geomembrane, a position determining system which comprises:
- (a) at least three hydrophones located around the periphery of the liquid impoundement adapted to receive sound transmissions through the liquid impoundment;
- (b) acoustic transmitter means on the vessel for emitting periodic acoustic pulses into the impounded liquid for reception by said hydrophones;
- (c) timing means for providing a measure of elapsed travel time from the acoustic transmitter on the vessel to the respective hydrophones, said timing means providing the elapsed time as a function of travel through the impounded liquid; and
- (d) calculating means for determining as a function of the elapsed travel time determined by said timing means, said calculating means determining the range from said hydrophones to said acoustic transmitter and further determining the location of the vessel on the impoundment as a function of range, said calculating means being independent of the value of the velocity of sound in said liquid.

4,905,211

PRECISION DOPPLER EFFECT COMPENSATOR

Gerald R. Mackelburg, Stanley J. Watson, both of San Diego; Jayson T. Durham, North Highland, and Alan Gordon, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 22, 1989, Ser. No. 326,951
Int. Cl.[4] H04B 11/00
U.S. Cl. 367—134 24 Claims



1. A system for transmitting information from a remote station to a local station wherein a signal transmitted is subject to Doppler effect comprising:
- means positioned at said remote station for transmitting a transmit information signal, and for simultaneously transmitting a transmit reference signal;
- said transmit information signal and said transmit reference signal both being subject to the same Doppler effect during transmission;
- means positioned at said local station for receiving a receive information signal that comprises said transmit information signal as received by said receiving means and that may be Doppler effected, and for receiving a receive reference signal that comprises said transmit reference signal as received by said receiving means and that may be Doppler effected; and
- means positioned at said local station and operably coupled to said receiving means for sampling said receive information signal at a rate corresponding to a characteristic of said receive reference signal.

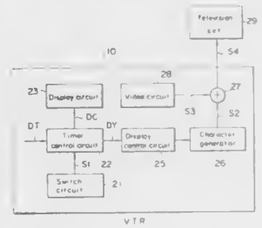
4,905,212

TIMER SETTING APPARATUS FOR A VIDEO TAPE RECORDER

Tatsuya Wakahara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 63,525, Jun. 18, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,138
Claims priority, application Japan, Jun. 19, 1986, 61-144337
Int. Cl.[4] G04B 47/00
U.S. Cl. 368—10 4 Claims

1. A timer setting apparatus for an electronic appliance comprising a manually controllable setting means which produces output signals necessary for timer setting and which has a first display means; timer control circuit means coupled to said manually controllable setting means for generating set data in response to said output signals and comprising a memory for storing set data, and capable of controlling said electronic appliance based on said data stored in said memory and a time signal representing the current time; and display control means coupled to said timer control circuit means and said manually controllable setting means for generating display images necessary for timer setting operation to be supplied to a cathode ray tube which comprises a second display means which is connected and including a character generator means,



wherein said display control means generates a selecting table and a pointing cursor in said display images and said set data are selected by selecting the position of said pointing cursor on said selecting table with said manually controllable setting means and wherein first display illustrates the following information, the current date, the current time, the event to be recorded number, the week, the day of the week, the recording starting time and simultaneously the recording ending time and the channel and wherein said second display shows the date, month, day year, day of the week of the setting month, number of the event to be recorded with the recording date, month, day, starting time and ending time, the channel and the recording speed so that set data can be compared on said first and second display means.

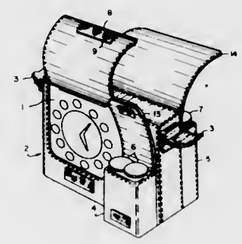
4,905,213

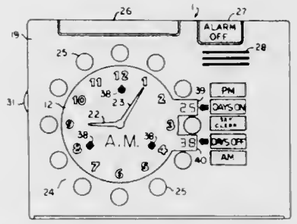
MEDICATION REMINDER

Viola H. Masse, 13300 E. Los Coches Rd., El Cajon, Calif. 92021, and Angus R. Colson, Jr., 14160 Myrtle St., Jamul, Calif. 92035

Filed Dec. 6, 1988, Ser. No. 280,568
Int. Cl.[4] G04C 17/00; G04B 47/00
U.S. Cl. 368—10 13 Claims

1. A multiple-alarm electronic clock for use by persons with limited dexterity which comprises:
- an audio alarm signal generator;
- an electronic digital clock circuit having the capacity to control multiple alarm settings and to drive said signal generator;
- an electronic time display driven by said clock circuit, said display being formatted to simulate the progress of a minute hand and a hour hand over a conventional analog clock face having twelve peripheral hour marks, said time display having a diameter at least twice the size of a conventional wristwatch face;
- twelve fingertip-sized programming push-buttons, each corresponding to a specific time of day, circumferentially positioned around the time display and in radial alignment with said hour marks;
- means responsive to the activation of one or more of said push-buttons, for triggering said audio alarm signal generator when said electronic clock reaches a specific time of day corresponding to an activated push-button; and





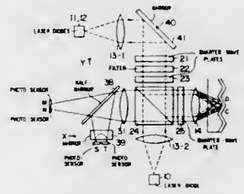
means alternately responsive to the activating of one or two of said push-buttons, for presetting said time display.

4,905,214

METHOD FOR ILLUMINATING ADJOINING SLANTS OF AN OPTICAL DISK HAVING A V-SHAPED GROOVE

Michiyoshi Nagashima, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

Division of Ser. No. 170,130, Mar. 14, 1988, Pat. No. 4,868,820, which is a continuation of Ser. No. 525,411, Aug. 22, 1983, abandoned. This application Jan. 18, 1989, Ser. No. 298,025
Claims priority, application Japan, Aug. 24, 1982, 57-147133
Int. Cl.[4] G11B 7/09, 7/007
U.S. Cl. 369—44 2 Claims



1. A method of reproducing or recording an optical disk which is provided with a groove having a V-shaped cross section in the radial direction and defining first and second slants and a groove bottom between the first and second slants, said method comprising the steps of:
- providing at least three laser sources creating first, second, and third laser beams independently, the third laser beam having a wavelength that is different from the wavelength of the first laser beam and the wavelength of the second laser beam;

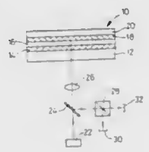
focusing said third laser beam along said bottom of said V-shaped groove;
using said third laser beam, following reflection from said optical disk, for focusing control and tracking control;
conducting said first and second laser beams to an objective lens for focusing said first and second laser beams onto said optical disk substantially parallel to the optical axis of said lens so that said first laser beam is focused on the first slant of said V-shaped groove and said second laser beam is focused on the second slant adjoining said first slant;
preventing said first and second laser beams from returning to said laser sources after reflection from said optical disc; and
subjecting said first and second laser beams to information reproduction or recording processes separately.

4,905,215

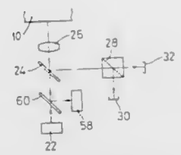
SYSTEM FOR READING INFORMATION FROM TWO STORAGE LAYERS OF AN OPTICAL DISK IN DIFFERENT MANNERS

Yutaka Hattori, Aichi, and Yukimasa Yoshida, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 14, 1987, Ser. No. 132,188
Claims priority, application Japan, Dec. 22, 1986, 61-197174[U]
Int. Cl.[4] G11B *13/00, 7/12*
U.S. Cl. 369—14 **12 Claims**







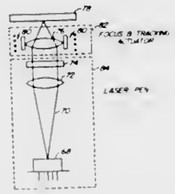
1. An information-reproducing system for reading information from two storage layers of an optical disk, the two storage layers being spaced from each other in a direction of thickness of the optical disk, wherein the information is based on a change in the Kerr rotation angle reflected by one of said two storage layers and on a change in an intensity of radiation reflected by the other of said two storage layers comprising:
a single laser source for irradiating corresponding local areas of said two storage layers of said optical disk with a linearly polarized laser beam having a predetermined wavelength, such that said laser beam is partially reflected by a top one of said two storage layers and partially passes through the top one of said two storage layers, to irradiate the remaining storage layer;
a half mirror disposed in a light path defined between said laser source and said optical disk, for reflecting the laser beam reflected by said two storage layers of the optical disk;
a beam splitter for splitting the laser beam reflected by said half mirror, into a first beam and a second beam which have polarization planes perpendicular to each other;
a first optical sensor and a second optical sensor which are operable to receive said first and second beams and produce first and second output signals, respectively;
a differential amplifier operable to receive said first and second output signals from said first and second optical sensors, and amplify a difference between said first and second output signals, thereby producing an output signal indicative of said change in the angle of Kerr rotation of the radiation reflected by said one of said two storage layers of the optical disk; and
an adder operable to add said first and second output signals from said first and second optical sensors, and produce an output signal indicative of said change in the intensity of the radiation reflected by said other storage layer of the optical disk.

4,905,216

METHOD FOR CONSTRUCTING AN OPTICAL HEAD BY VARYING A HOLOGRAM PATTERN

Wai-Hon Lee, Cupertino, Calif., assignor to Pencom International Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 938,085, Dec. 4, 1986, Pat. No. 4,794,585, which is a continuation-in-part of Ser. No. 860,154, May 6, 1986, Pat. No. 4,731,772. This application Jan. 20, 1988, Ser. No. 141,460
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—112 **10 Claims**



1. A method for aligning a photodetector and a diffraction grating, in an optical head which uses said diffraction grating to direct a light beam onto said photodetector, comprising the steps of:
mounting said photodetector in a housing for said optical head;
measuring a distance from a position for said diffraction grating to a surface of said mounted photodetector;
creating a grating pattern on said diffraction grating to produce, in cooperation with other elements of said optical head, one or more focused spots of diffracted beams at said distance; and
mounted said diffraction grating in said optical head at said position.

4,905,217

ENCLOSURE FOR OPTICAL DISK OR THE LIKE

Richard W. King, Bloomington, Ind., and Timothy P. Wilsey, Pittsfield, Mass., assignors to Simplicity Products, Inc., Bloomington, Ind.

Filed Nov. 18, 1988, Ser. No. 272,939
Int. Cl.[4] G11B *23/03*; B65D *85/57*
U.S. Cl. 369—291 **1 Claim**

1. An enclosure for an optical disk or the like, comprising:
a pair of elongated, spaced apart substantially parallel side walls having substantially planar, spaced apart inner surfaces facing each other and forming an elongated, substantially flat space therebetween;
edge walls extending between opposed lateral edges of said side walls to enclose the lateral edges of said elongated space;
an end wall extending between said side walls at one end thereof to enclose said one end of said elongated space and to form with said side walls and said edge walls a partially enclosed elongated and substantially flat cavity between said spaced apart, inner facing surfaces of said side walls with the other end of said cavity remaining open to form means for inserting and removing a disk into and from said cavity;



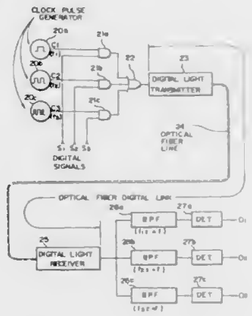
positioning means within said cavity for positioning the disk within said cavity including means for engaging the outer edges of the disk at a plurality of spaced apart locations around the perimeter thereof to position the disk with the active face surfaces thereof positioned and held in spaced apart relation to said inner facing surfaces of said side walls; and
a cover element for insertion into the open end of said cavity, including engagement means for engaging the disk and finger grip portions interacting with said engagement means to increase the engaging force on the disk when said finger grip portions are grasped and squeezed to remove the disk from said cavity.

4,905,218

OPTICAL MULTIPLEX COMMUNICATION SYSTEM

Kunihiko Takeuchi, Kawasaki; Yasuo Shimomura, Tokyo; Yuji Morishige, Funabashi, and Kiyoshi Hayashi, Tokyo, all of Japan, assignors to Tokyo Keiki Company, Limited, Tokyo, Japan

Continuation of Ser. No. 175,579, Mar. 29, 1988, abandoned, which is a continuation of Ser. No. 81,610, Aug. 3, 1987, abandoned, which is a continuation of Ser. No. 746,765, Jun. 20, 1985, abandoned. This application May 3, 1989, Ser. No. 348,123
Claims priority, application Japan, Jun. 21, 1984, 59-128119
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 **2 Claims**



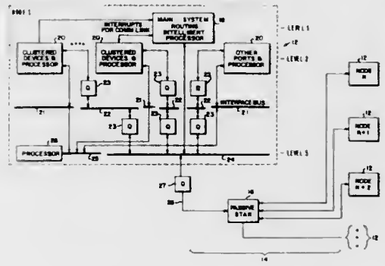
1. In an optical multiplex communication system for transmitting n kinds of digital signals from a transmitting end to a receiving end by the use of a single digital-link optical fiber line, the improvement wherein:
said transmitting end includes means for generating said digital signals so that only one of said digital signals goes true at a time, and two or more digital signals never go true simultaneously; clock pulse generating means for generating n kinds of carrier clock signals having different pulse frequencies, one for each of said digital signals of said digital signals and a respective one of said carrier clock signals when said digital signal goes true, to produce a logical product output, whereby said logical circuit means produces n logical product outputs; means for producing a logical sum output of said n logical product outputs; and digital optical transmitter means for converting the logical sum output of said logical circuit means to a light signal and delivering the same onto said optical fiber line; and
said receiving end includes digital light receiver means for receiving said light signal from said optical fiber line and converting the same to an electric signal output; n band-pass filter means each having a pulse frequency pass band corresponding to the frequency of a respective one of the pulse frequencies of said carrier clock signals, so as to extract from the electric signal output of said digital light receiver means a signal having said one pulse frequency and passing said extracted signal; and detection circuit means for detecting the extracted signal passed by each of said filter means and generating signals corresponding to respective ones of said digital signals, thereby restoring corresponding ones of said digital signals.

4,905,219

THREE LEVEL DISTRIBUTED CONTROL FOR NETWORKING I/O DEVICES

Paul Barr, and Leon K. Woo, both of Framingham, Mass., assignors to Aetna Life Insurance Company, Hartford, Conn.

Filed Sep. 22, 1983, Ser. No. 534,562
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—4 **24 Claims**



1. A node structure for communication system comprising:
a first level logical processor operative in response to indicia indicative of a desired communication recipient for generating routing indicia corresponding to a selected routing for communication to the desired recipient;
one or more second level asynchronous logical processors connected to one or more sources of communication signals and responsive to the routing indicia from said first level logical processor for providing outgoing signals comprising communication signals from an associated source and header routing indicia from said first level logical processor; and
one or more third level asynchronous logical processor responsive to said outgoing signals for routing said communication signals in accordance with the routing indicia, wherein said indicia indicative of a desired recipient comprises an interrupt signal from a source associated with a second level logical processor to said first level logical processor.

4,905,220

CIRCUIT FOR A CENTRAL CONTROL TIME DIVISION MULTIPLEX PCM TELECOMMUNICATIONS SYSTEM

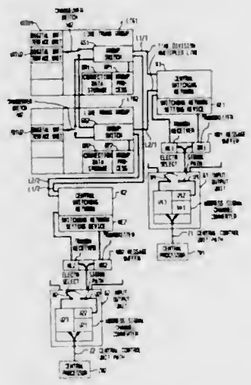
Uwe Junge, Munich; Helmut Seeger, Wolfratshausen; Anthony Maher, Munich, and Axel Leichum, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 2, 1987, Ser. No. 69,470

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622369

Int. Cl.[4] H04M 3/08; H04Q 11/04

U.S. Cl. 370—16 4 Claims



1. A circuit for a central control PCM telecommunications exchange having a stand-by operating facility, said circuit including:

a duplicate pair of central switching networks each capable of carrying out system operation for the switching of line connections, and a duplicate pair of central processors each associated with and operatively connected to a respective one of said central switching networks for system operation thereof, wherein one central switching network and associated one central processor are used for normal system operation and the other central switching network and associated other central processor are kept in stand-by for backup system operation, and

a plurality of decentral terminal groups, each one of which is connected in parallel to the two central switching networks by respective link lines, and each one of which includes a plurality of terminal units, a subsidiary switching network associated with the terminal units for connecting them to the central switching networks via the respective link lines, and a programmable, decentral control device associated with the subsidiary switching network which is capable of receiving, processing and/or transmitting switching information to and from the central processors via the respective link lines and the respective central switching networks, wherein the decentral control device of each of said plurality of decentral terminal groups is loaded with program software and switching software from a central processor for initializing system operation with the central processor and associated central switching network,

wherein the improvement comprises:

said plurality of decentral terminal groups being assigned to each other in pairs and having switching lines connected between the decentral terminal groups of each assigned pair,

said subsidiary switching network of each decentral terminal group being capable of connecting the terminal units of the other decentral terminal group of its assigned pair, as well as its associated terminal units, to one central switching network via a respective link line, in a stand-by mode during a changeover of system operation from the one central switching network and associated one central processor to the other central switching network and associated other central processor, and

each decentral terminal group having a plurality of changeover switches which are switchable between a normal position, for respectively connecting its terminal units to its associated subsidiary switching network in normal operation, and a stand-by position, for respectively connecting its terminal units to the subsidiary switching network of the other decentral terminal group of its assigned pair via said switching lines in stand-by operation during a changeover of system operation,

wherein a changeover of system operation is carried out without a substantial interruption of the switching functions of the decentral terminal groups by switching the terminal units of one decentral terminal group of each assigned pair, via the changeover switches in the stand-by position, for connection to the subsidiary switching network of the other decentral terminal group of each assigned pair while the one central processor continues in system operation, so as to remove the subsidiary switching network and associated decentral control device of said one decentral terminal group of each assigned pair from operation temporarily so that switching software and program software can be loaded to said decentral control device removed from operation from the other central processor kept in stand-by, and then switching back the terminal units of said one decentral control group to its associated subsidiary switching network, via the changeover switches in the normal position, when the loading of switching software and program software to said decentral control device removed from operation has been completed.

4,905,221

EARTH STATION CAPABLE OF EFFECTIVELY USING A FREQUENCY BAND OF A SATELLITE

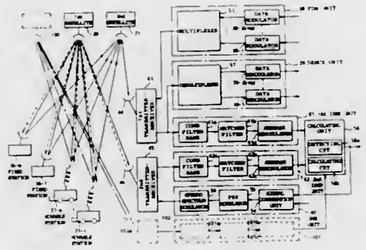
Osamu Ichiyoshi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 24, 1988, Ser. No. 236,019

Claims priority, application Japan, Aug. 24, 1987, 62-209764; Sep. 4, 1987, 62-221587

Int. Cl.[4] H04J 13/00, 1/02

U.S. Cl. 370—18 7 Claims



1. In an earth station for carrying out communication in a satellite communication system through a satellite by the use of an up-link frequency band and a down-link frequency band, said earth station comprising a transmission section responsive to first and second input signals for transmitting first and second transmission signals through said up-link frequency band towards said satellite, the improvement in combination with the foregoing wherein:

each of said up-link and said down-link frequency bands has a plurality of frequency subbands spaced apart from one another with frequency gap bands interposed between said frequency subbands;

said transmission section comprising:

modulating means for modulating a carrier by said first input signal to produce a transmission subband signal occupying a selected one of said frequency subbands of the up-link frequency band;

first transmitting means coupled to said modulating means for transmitting said transmission subband signal as said first transmission signal through said selected one of the frequency subbands;

spread spectrum processing means for processing said second input signal into a spread spectrum transmission signal having said up-link frequency band; and

second transmitting means coupled to said spread spectrum processing means for transmitting said spread spectrum transmission signal as said second transmission signal through said up-link frequency band.

4,905,222

CIRCUIT ARRANGEMENT FOR CENTRALLY CONTROLLED TIME DIVISION MULTIPLEX TELECOMMUNICATION SWITCHING SYSTEMS, PARTICULARLY PCM-TELEPHONE SWITCHING SYSTEMS WITH LINE TRUNK GROUPS CONNECTED TO A SWITCHING MATRIX

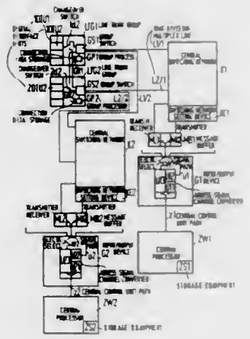
Helmut Seeger, Wolfratshausen; Axel Leichum, and Anthony Maher, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,534

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717269

Int. Cl.[4] H04Q 11/04

U.S. Cl. 370—58.1 9 Claims



1. A circuit arrangement for centrally controlled telecommunication systems, including PCM time-division multiplex telephone switching systems, including a central switching matrix serving for the switching-through of connections and a central processor serving, at least, for the control thereof and for the necessary switch identifier processing and being duplicated for stand-by service, wherein a number of local line groups, each including a sub-switching matrix for the external connection of trunk and/or subscriber lines and each including a local control unit for the reception of switch identifiers from said lines, for switch identifier pre-processing and forwarding to the central processor and for the transmission of switch identifiers on said lines, wherein in each of said line groups a respective sub-switching matrix is internally connected separately by group via two groups link lines, with switching matrix terminations to the one and the other of two parallel central switching matricies provided, wherein data connections for each respective local control unit are brought into service-ready condition and/or maintained therein, for data exchange between local control units on the one hand and the respective service-ready processor on the other, for processing said switch identifiers, wherein said line groups are in each case allocated to each other in pairs, wherein within each of the same line units, serving for the external connection of subscriber and/or trunk lines and primarily connected to their sub-switching matrix, are connected to change-over switches, wherein said line units of a respective first of said two line groups is switchable over by means of said change-over switch to the respective second line group and can be switched over to the sub-switching matrix of the second line group and vice versa, and wherein switch identifier processing for connections to be switched through the switched-over line units are well as the sub-switching matrix setting are also executed by the local control unit of the other line group; characterized

in that a switch-over within each of said pairs of line groups allocated to each other effects a switch-over from one of the two central processors, together with its allocated central switching matrix, to the other of the two processors, with its allocated central switching matrix;

in that in preparation for said switch-over, and while a first of the two processors continues in service for the time being,

firstly, connection data are stored in the local control units of the respective second line groups, which data indicate, relative to the existing, individual connections, via the central switching matrix still in service and via the sub-switching matrices of the respective second line groups, which external sub-switching matrix is connected with which of its counterparts, or which two external sub-switching matrices are connected with which two central switching matrix terminations and which central matrix termination is connected with which of its counterparts;

secondly, data connections are brought into service-ready state by the other central processor via its allocated central switching matrix to the local control units of all first line groups;

thirdly, in each respective line group pair, said connection data are called for by means of a request signal sent by the local control unit of the respective first line group to the control unit of the respective second line group, are transmitted via local transmission paths individual to each line group pair respectively, from the last-named control unit to the first-named control unit, and stored therein, and subsequently retrieved therefrom by the other central processor, and

fourthly, the last-named central processor establishes connections via its central switching matrix and the sub-switching matrices of the respective first line groups on the basis of the connection data that it has retrieved; and

in that, thereafter, the switch-over to the alternate circuit is effected by the switch-over of all the line units of the first line groups from the sub-switching matrices of all the first line groups to the sub-switching matrices of all the second line groups through their respective local control units.

4,905,223

WIDEBAND/MULTISLOT SWITCHING ARRANGEMENT

Richard J. Proctor, and Thomas S. Maddern, both of Dorset, England, assignors to The Plessey Company plc, Ilford, England

Filed Feb. 16, 1988, Ser. No. 156,503

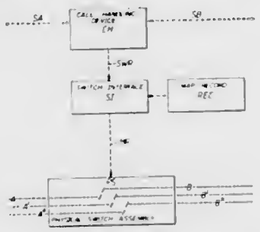
Claims priority, application United Kingdom, Feb. 17, 1987, 8703649

Int. Cl.[4] H04Q 11/04

U.S. Cl. 370—58.2 5 Claims

1. A wideband/multislot switching arrangement, for use in a digital telecommunications exchange including a call handling device controlling circuit connections of a physical switch assembly and a switch interface in communication with the call handling device, the switch interface includes means for stor-

ing a map record of each of the circuit connections controlled by the call handling device and available services at the respective circuit connections, said call handling device including means for receiving signalling information about paths established by said circuit connections and means generating a



single switch request presented to the switch interface for addressing the map record storing means and rendering the switch interface operative to generate multiple switch requests to control the physical switch assembly in establishing the paths.

4,905,224

SORTING UNIT FOR A SWITCHING NODE COMPRISING A PLURALITY OF DIGITAL SWITCHING MATRIX NETWORKS FOR FAST, ASYNCHRONOUS PACKET SWITCHING NETWORKS

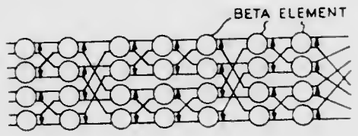
Manfred Lobjinski; Michael Horn, and Andreas Reppekus, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 22, 1988, Ser. No. 247,680

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3733068

Int. Cl.[4] H04Q *11/04*; H04J *3/26*

U.S. Cl. 370—60 **2 Claims**



1. A sorting unit for a switching node comprising a plurality of digital switching matrix networks for fast, asynchronous packet switching networks, said switching node comprising a multi-stage, mixed connecting structure in accord with a banyan tree structure, that forms a complete trunk group in which every input of the switching node is connectable to every output thereof, characterized in that

said digital switching matrix networks comprise a plurality of self-controlling and self-routing sorting units that are a multi-stage circuit switching arrangement comprising a rectangular array of beta elements (β) with m rows and $2m-1$ columns, where 2m is equal to the number of inputs and is also equal to the number of outputs of the sorting unit and m is a power of two;

each said sorting unit is divided into a first sub-unit acting as distributor unit comprising an array of beta elements (β) with m columns, and a second sub-unit acting as a correction unit comprising an array with m-1 columns of beta elements (β);

said sub-units each composed of m smallest units, each said smallest unit respectively containing four beta elements, of which two beta elements form one input pair and two beta elements form one output pair, said pairs being connected to one another such that every input of said input pair of connectable to every output of said output pair;

two first ones of said smallest units forming an input unit pair and two second ones of said smallest units forming an output unit pair, whereby said units are in turn connected such to one another that each of the inputs of an input unit pair is connectable to each of the outputs of an output unit pair; and

means for connecting the outputs of the last ($2m-1^{th}$) column of said correction unit to a following group of switching matrix networks of the switching node.

4,905,225

COMMUNICATION SYSTEM FOR TIMING MULTIPLEX HYBRIDS

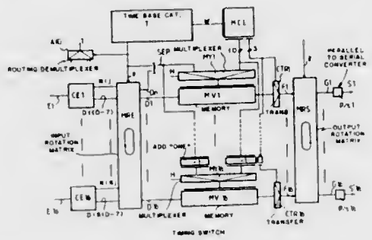
Joël Francois, Prat Cotel Bihan, Saint Quay Perros, and Jean-Paul Quinquis, Rue de Cornic, both of 22700 Perros-Guirec, France

Filed Feb. 8, 1988, Ser. No. 153,248

Claims priority, application France, Feb. 27, 1987, 87 02892

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **9 Claims**



1. A hybrid time multiplex switching system, in which entering time multiplex signal and outgoing multiplex signals are made up of time frames having fixed length time intervals, each interval carrying a block of words that make up either a packet or a channel, except for a first time interval of each of said frames which contains a frame synchronization block, the entering multiplex signals being applied to a packet time switch using a paragonal conversion and having one input circuit for each of said entering multiplex signals, an input rotation matrix, a packet buffer memory, transfer circuits, an output rotation matrix, a time base clock circuit, a label translation memory circuit and memory file circuit for giving a packet write addresses into the packet buffer memory, each write address being associated with output multiplex signals, each of said input circuits comprising a synchronization circuit capable of recognizing the presence of a frame synchronization block, a file circuit and a word serial to parallel converter, the synchronization circuit of each of said input circuits generating file order data for each time interval in a frame, the order data being transmitted from the input circuits to the input rotation matrix which has an output and generating the said file order data which with identification data of the entering multiplex signal makes up a block identification data which is applied to an address input of a programmable discrimination memory whose output is connected to means for blocking validation signals generated by the first label translation memory to address storage files, outputs of the input rotation matrix being also connected to corresponding buffer memories having write address inputs which receive the block identity data, said buffer memories having read address input connected to the output of a read control memory and outputs of said buffer memories connected to the corresponding inputs of transfer circuits, address input of a third read control memory receiving data from the time base clock circuit and also generating two signals which are applied to a switch control circuit for

the transfer circuits and for which the first is connected to means of inhibiting the reading of the storage means.

4,905,226

DOUBLE-BUFFERED TIME DIVISION SWITCHING SYSTEM

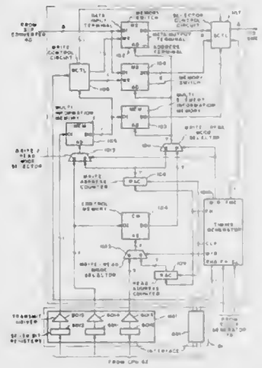
Tsuneo Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 28, 1988, Ser. No. 187,258

Claims priority, application Japan, Apr. 28, 1987, 62-106060

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—66 **11 Claims**



1. A double-buffered time division switching system comprising:

first and second K-bit×N-multiplex memory switches, into whose N time slots per frame are sequentially inputted time division multiplexed data, either of said memory switches may be placed in a write state;

a control memory for storing the read sequence of data in said first and secont memory switches;

first and second multi-element information memories for storing multi-element information which indicates, corresponding to a plurality of input time slots constituting a series of data in said frame, that these time slots are multi-element data;

first control means for checking said first multi-element information memory in synchronism with the writing of input time slots into said memory switches and, if said multi-element information is stored corresponding to the time slots into which to write in said information, alternately switching the data writing of the time slots between said first and second memory switches on a frame-by-frame basis; and

second control means for checking said second multi-element information memory in synchronism with the reading into output time slots from said memory switches and, if said multi-element information is stored corresponding to the time slots to output said information, alternately outputting into the output time slots data which is read out of said first memory switch and data which is read out of said second memory switch on a frame-by-frame basis.

4,905,227

CIRCUIT FOR SUBSCRIBER LINE INTERFACE CIRCUITS IN A DIGITAL TIME-DIVISION MULTIPLEX COMMUNICATION SWITCHING CENTER

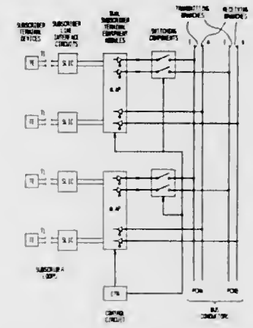
Robert Lechner, Sankt Poelten, Austria, and Norbert Wingerath, Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 163,484

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1987, 3707500; Apr. 2, 1987, 3711030

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—67 **2 Claims**



1. A circuit for subscriber line interface circuits in a digital time-division multiplex communication switching center over which a connection is established to a four-wire bus conductor of the time-division multiplex communication switching center during respective alloted time slots, comprising:

means connected to and providing access to the receiver of subscriber line interconnect circuits from said four-wire bus conductor, during the same time slot, for the simultaneous reception of the same information by a plurality of subscriber line interconnect circuits; and

means for preventing access of the transmit driver stages of said subscriber line interconnect circuits to said bus conductor, whereby said subscriber line interface circuits each comprises a separate module for the time slot allocation and for the connection to the bus conductor including said transmit driver stages having transmit amplifiers which each include means for selectively placing said amplifiers in a high impedance state.

4,905,228

DIGITAL TRANSMISSION CHANNEL FRAMING

Eric H. Angell, North Andover; Thomas J. Aprille, Andover; Rong-Chin Fang, North Andover; Byeong G. Lee, Methuen, all of Mass., and Jan-Dieter Spalink, Woodbridge, Va., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 60,952, Jun. 15, 1987, abandoned, which is a continuation of Ser. No. 769,427, Aug. 26, 1985, abandoned. This application May 9, 1988, Ser. No. 219,121

Int. Cl.[4] H04J *3/22*

U.S. Cl. 370—84 **39 Claims**

1. A digital frame formatter for generating channel frames each having a plurality of data bit positions and a plurality of other bit positions to facilitate combining a plurality of digital signals of one or more digital transmission bit rates, comprising,

means for inserting bits from a particular one of said plurality of incoming digital signals into data bit positions of a channel frame dependent on the particular one of said incoming digital signals being formatted, and

means for generating a number of said channel frames in-

cluding said bits of said particular incoming digital signal during a predetermined interval dependent on a predetermined relationship of the digital transmission bit rate of said particular incoming digital signal being formatted and a transmission bit rate of one of a predetermined set of digital signals.

4,905,229

LOCAL AREA COMMUNICATION NETWORK

Haruo Kato, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

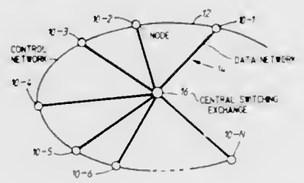
Continuation of Ser. No. 150,500, Feb. 1, 1988, Pat. No. 47,805,168, which is a continuation of Ser. No. 806,375, Dec. 9, 1985, abandoned. This application Oct. 21, 1988, Ser. No. 260,867

Claims priority, application Japan, Dec. 7, 1984, 59-259633

The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.

Int. Cl.[4] H04J *3/02*

U.S. Cl. 370—85.7 **6 Claims**



1. A local area communication network comprising:

a plurality of input/output data terminal equipment nodes;

a first network means for establishing first communication paths by means of a first communication medium for said nodes, and for transmitting data information between at least one data communication sending node which rearranges the data information into data units for transmission via the first communication medium and at least one receiving node which receives the transmitted data units and reassembles the received data units into the data information; and

a second network means for establishing second communication paths independently of said first communication paths by means of a second communication medium between said data communication sending and receiving nodes, and for transmitting selectively via said second communication medium one of control information to cause said first network means to be available for data communication and data to be sent between said nodes, said control information including parameters of communication control which determine, at least, data unit addressing functions, type of data unit service, node operation characteristics and error reporting functions; and

means for selecting whether or not to transmit said data via said first network means or via said second network means.

4,905,230

TOKEN RING EXPANDER AND/OR HUB

Robert Madge, Chalfont St. Giles, and David Woodfield, Walsall, both of England, assignors to Madge Networks Limited, Great Britain

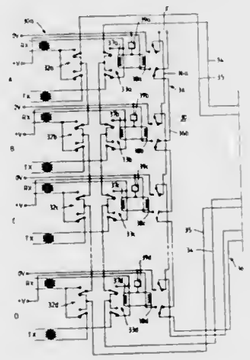
Filed Apr. 5, 1988, Ser. No. 177,764

Claims priority, application United Kingdom, Apr. 24, 1987, 8709771

Int. Cl.[4] H04J *3/16*

U.S. Cl. 370—85.5 **7 Claims**

1. In a computer communications network the improvement comprising a portable communications network-hub device having a plurality of input/output ports, each for connection to an input/output port of a respective computer fitted with a token ring adaptor, a trunk insertion unit having an electrical connector for adaptively coupling the device into an expansion port of a local area network (LAN) implemented as a token ring, and an internal token ring adapted to pass serially through each of the device ports and the trunk insertion unit, wherein each of said device ports comprises first and second switch means and control means therefor, said first switch means normally closing the internal token ring for isolating the latter from the associated device port, said first switch means for inserting a computer connected to the associated device port into said internal token ring when operated by said control means, and said second switch means normally closing a bias signal line for isolating the latter from an associated device port, which bias signal line extends from the open circuit at one



end through each said device port to output terminals in said electrical connector of said trunk insertion unit, said second switch means for connecting said bias signal line to a bias voltage source in the connected associated computer when operated by said control means, and wherein said control means in each port is adapted to be responsive to the token ring adaptor of said associated computer whereby the device port to which the computer is connected takes part in the standard computer protocols for communicating on a token ring, at the completion of which protocols said first switch means are operated so as to install the said associated computer into said internal token ring and said second switch means are operated so as to provide a bias voltage signal provided by the associated computer on said output terminals in the electrical connector of the trunk insertion unit.

4,905,231

MULTI-MEDIA VIRTUAL CIRCUIT

Wu-Hon F. Leung, Downers Grove; Michael J. Morgan, Warrenville, and Shi-Chuan Tu, Lisle, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

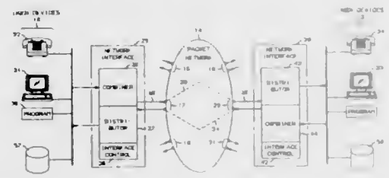
Filed May 3, 1988, Ser. No. 189,851

Int. Cl.[4] H04Q *11/04*; **H04J** *3/24*

U.S. Cl. 370—94.1 **16 Claims**

1. In a packet communication arrangement comprising a first interface means, a second interface means and a virtual circuit through a packet network between said first and said second interface means, a method comprising;

communicating control information packets between said first and said second interface means over a predetermined virtual channel of said virtual circuit, said control information defining allocations of a plurality of virtual channels on said virtual circuit for communication of data packets in said virtual channels; and



distributing, by said interface means, data packets received from said virtual channels in accordance with the allocations thereof defined in said control information.

4,905,232

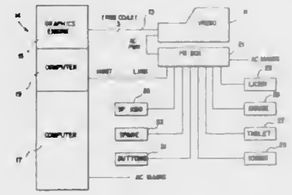
PERIPHERAL REPEATER BOX

Bruce E. Newman, North Plainfield, N.J., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 13, 1987, Ser. No. 85,097

Int. Cl.[4] H04J *3/24*

U.S. Cl. 370—94.1 **26 Claims**



1. In a system which includes a data transmitting device; a repeater; and a data receiving device, the repeater accumulating input data in packets from said transmitting device and retransmitting said packets to said receiving device, a memory structure for storing said data in said repeater comprising:

(a) a data buffer;

(b) a receive queue having a plurality entries, each entry capable of storing a starting address for the packets in said data buffer received from said transmitting device;

(c) a transmit queue for storing the starting addresses of packets for transmitting to said receiving device; and

(d) means to transfer said addresses from said receive queue to said transmit queue, each of said buffer and said queues being circular.

4,905,233

MULTIPLE PATH ROUTING MECHANISM FOR PACKET COMMUNICATIONS NETWORK

Joseph B. Cain; Stanley L. Adams, both of Indialantic, and Michael D. Noakes, Melbourne, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 23, 1987, Ser. No. 124,282

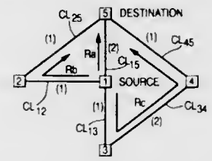
Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—94.1 **20 Claims**

1. For use in a multinode communications network having a plurality of communication nodes each of which is capable of transmitting communication signals to and receiving communication signals from other nodes of the network, so that at least one transmission route from a source node to a destination node may be established among plural nodes of the network, a method of establishing at least one transmission route between a source node at which communication signals originate and a destination node for which communication signals originating at said source node are to be transmitted comprising the steps of:

(a) monitoring transmission characteristics of each of the transmission paths among the nodes of the network so as to derive therefrom a plurality of path metrics representative of the ability of the transmission paths of the network to transmit communication signals thereover;

(b) selecting, as feasible transmission routes to be used for the transmission of communication signals from said source node to said destination node, those routes which extend



from said source node through neighbor nodes thereof to said destination node and each of which is comprised of one or more transmission paths among the nodes of the network the sum of path metrics of transmission paths from said neighbor nodes to said destination node is less than the path metric of a transmission path the end nodes of which correspond to said source and destination nodes; and

(c) transmitting communication signals from said source node to said destination node over the feasible transmission routes selected in step (b).

4,905,234

APPARATUS AND METHOD FOR TRANSMITTING DIGITAL DATA OVER A RADIO COMMUNICATIONS CHANNEL

Jeffrey S. Childress; Nancy L. Hall, and Houston H. Hughes, III, all of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jun. 3, 1987, Ser. No. 56,923

Int. Cl.[4] H04J *3/24*

U.S. Cl. 370—94.1 **20 Claims**



1. A method for reliably and quickly exchanging bursts of digital data packets between a first site and a second site, said method comprising the steps of:

(a) transmitting a plurality N digital data packets from said first site to said second site;

(b) checking for the correct receipt of all N packets at said second site;

(c) transmitting a binary coded N-bit map of digital data from said second site back to said first site identifying any data packets not yet correctly received at said second site;

(d) retransmitting at least such identified data packets, if any, from said first site to said second site; and

(e) repeating said steps (b)–(d) until all N-packets have been correctly received at said second site.

4,905,235

TDMA SYSTEM CAPABLE OF INDIVIDUALLY CONTROLLING ELECTRIC POWER OF BURSTS

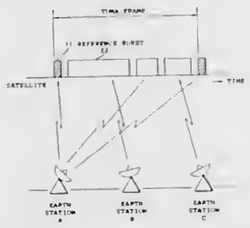
Akio Saburi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 19, 1988, Ser. No. 145,114

Claims priority, application Japan, Jan. 16, 1987, 62-5908; Jan. 16, 1987, 62-5909; Jan. 16, 1987, 62-5910; Jan. 16, 1987, 62-5911

Int. Cl.[4] H04J *3/16*

U.S. Cl. 370—95.3 **18 Claims**



1. In a time division multiple access system comprising a plurality of earth stations communicable with one another in accordance with a burst time plan through a satellite which comprises a single transponder operable in response to a first predetermined number of carrier waves, N in number, where N is a natural number greater than unity, said transponder having a first total electric power level available for said first predetermined number of the carrier waves, the improvement wherein:

a second predetermined number of said carrier waves, M in number, are selected as selected carrier waves from said carrier waves of the first predetermined number in accordance with said burst time plan so that said selected carrier waves have a second total electric power level which does not exceed said first total electric power level in transponder, each of said first and said second predetermined numbers being representative of the number of up link carrier waves directed from the earth stations towards said satellite;

at least one of said earth stations having a transmitting end which is accessible to a plurality of said link carrier waves by frequency hopping.

4,905,236

CIRCUIT ARRANGEMENT FOR DESIGNATIONAL READING OF INFORMATION OF A BIT GROUP ORIENTED, CONTINUOUS INFORMATION STREAM AT AN ISDN-ORIENTED INTERFACE

Gerhard Leibe, and Albert Weiss, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,211

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723436

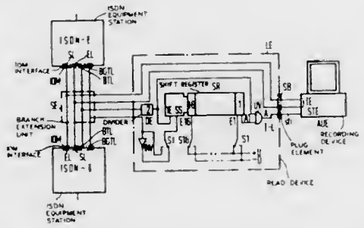
Int. Cl.[4] H04J *3/02*

U.S. Cl. 370—110.1 **18 Claims**

1. A circuit arrangement for generating signals corresponding to the read points in time necessary to allow a recording unit to designationally read information contained in two serial, bit-oriented ISDN information signal streams respectively transmitted via communication lines of first and second ISDN-oriented interfaces respectively disposed in first and second ISDN equipment stations, said first and second ISDN-oriented interfaces facilitating communication between said first and second ISDN equipment stations, each of said two serial, bit-oriented ISDN information signal streams formed as a continuous sequence of bit groups, each bit group having a prescribed plurality of bits arranged in sub-groups or channels having a defined plurality of bits with a defined information content, said first ISDN-oriented interface providing a bit clock signal and a bit group clock signal to said second ISDN-oriented interface, said arrangement comprising:

a shift register having a clock input and a plurality of storage locations respectively dedicated to said prescribed plurality of bits of a bit group, said shift register further having a shift-set input connected to receive said bit group clock signal;

reset means connecting said shift-set input to said bit group clock signal and operable to generate a shift register reset signal from said bit group clock signal;



said shift register further having a plurality of parallel inputs corresponding to said plurality of storage locations, each of said parallel inputs being connectible to a voltage potential representing two binary conditions;

switch means connecting said inputs to said voltage potential;

an AND logic gate connected to receive said shift register output and said bit clock signal, said AND logic gate having an output; and

a recording unit connected to said output of said AND gate for recording the informational contents of those bits of the bit determined by said switch means.

4,905,237

COMMUNICATIONS SYSTEM COMPRISING AN ISDN TERMINAL EQUIPMENT CONNECTION FOR DIFFERENT ISDN INTERFACES IN AN ISDN SWITCHING EQUIPMENT NETWORK

Eckhard Voelzke, Gruenwald, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

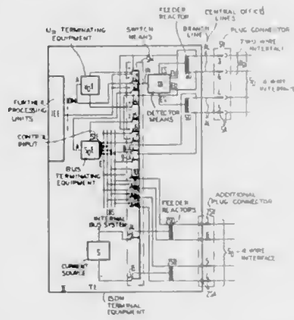
Filed Jul. 21, 1988, Ser. No. 222,044

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1987, 3725841

Int. Cl.[4] H04J *3/02;* **H04Q** *11/04*

U.S. Cl. 370—110.1 **9 Claims**

1. A communications system comprising, an integrated service digital network switching equipment having two-wire, ISDN transmission (U) interfaces and four-wire, standardized ISDN bus (S) interfaces, and having ISDN terminal equipment which are respectively connected either to an ISDN transmission interface through an ISDN transmission terminating equipment realizing a layer 1-functions of the OSI reference model for an integrated transmission procedure or to one of the ISDN bus interfaces through an ISDN terminating equipment realizing a layer 1-function of the OSI reference model for an ISDN bus interface, whereby, through a control input, an ISDN bus terminating equipment is drivable either into an operating mode realizing the layer 1-function at the side of the switching equipment or into an operating mode realizing the layer 1-function at the side of the ISDN terminal equipment and, at the side of the switching equipment, a current source is provided for the remote power supply of the ISDN terminal equipment connected through a central office line which is coupled directly to the two lines of the two-wire interface or to a phantom circuit of the four-wire ISDN bus interface, characterized in that an ISDN transmission terminating equipment (U_0E) and an ISDN bus terminating equipment (S_0E) are provided for an ISDN terminal equipment; the current type of connection of the current source at an exchange is identified at



the respective interfaces by a detector means (DE) which is connected to the ISDN terminal equipment, and which is also connected to switch means (SM) so as to connect either the ISDN bus terminating equipment (S_0E) or the transmission terminating equipment (U_0E) to the respective ISDN interface.

4,905,238

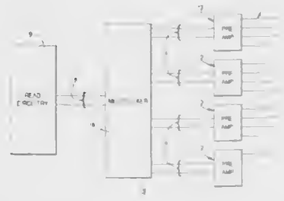
ANALOG AMPLIFIER-MULTIPLEXER FOR A DATA SYSTEM

Joseph M. Rinaldis, Colorado Springs, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 4, 1987, Ser. No. 93,196

Int. Cl.[4] H04J *3/02*

U.S. Cl. 370—112 **7 Claims**



1. In a data system including a plurality of differential signal lines, each carrying a data signal, and an output channel, a multiplexer comprising:

means for differentially amplifying said data signals having a plurality of inputs coupled to said plurality of differential signal lines and an output coupled to the output channel;

means for activating said means for differentially amplifying to selectively amplify in response to select signals one of said data signals and to cause the amplified data signal to be an output to the output channel;

means for introducing a select signal said select signal corresponding to a particular one of said plurality of data signals;

means for producing a bias signal; and

means for switching, responsive to said bias signal and said select signal, for producing as an output an activation signal, said output of said means for switching being coupled to said means for amplifying, wherein said means for switching includes a current switch coupled to the means for differentially amplifying, the current switch including: a first transistor having a collector coupled to a reference voltage, an emitter and a base; a second transmitter having a base coupled to the emitter of the first transistor, a collector and an emitter; a third transistor having a base and a collector, each of which are coupled to the base of the first transistor, and an emitter coupled to the collector of the second transistor, and a fourth transistor having a base coupled to the emitter of the second transistor, and a collector coupled to the means for differentially amplifying, with the emitters of the second and fourth transistors receiving said select signals, and the emitter of the fourth transistor providing an activation signal in response to said reference voltage and said select signals.

4,905,239

R. F. SIGNAL DISTRIBUTION

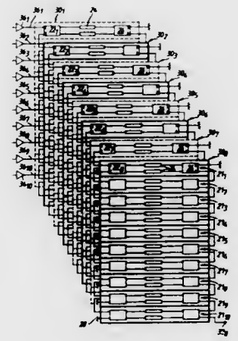
Andrew S. Lockwood, and Richard J. Barnett, both of Stevenage, United Kingdom, assignors to British Aerospace Public Limited Company, London, England

Filed Mar. 28, 1988, Ser. No. 172,785

Claims priority, application United Kingdom, Mar. 26, 1987, 8707260; Sep. 10, 1987, 8721287

Int. Cl.[4] H04J *1/10*

U.S. Cl. 370—123 **10 Claims**



1. Apparatus for distributing a plurality of signals between N input means and M output means, said apparatus comprising:

a series of M multiplexing circuits, each circuit including N tunable filter/coupler combinations, one of said N combinations associated with a respective one of said N input means, and said N combinations having their outputs connected in cascade fashion comprising a means for supplying signals passed by said combination to a multiplexer output means which forms a respective one of said M output means:

means for controlling the transmission characteristics of each of said tunable filter/coupler combinations and for selectively passing a signal applied thereto: and

means for interconnecting said multiplexing circuits, said interconnecting means being capable of providing a signal path between each tunable filter/coupler combination and an associated one of said N input means, whereby a signal supplied to one of said N input means may be distributed to a selected one of said M output means by appropriate control of the transmission characteristics of the filter/-coupler combinations associated with said input terminal.

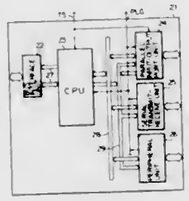
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4,905,240

SEMI-CUSTOM-MADE INTEGRATED CIRCUIT DEVICE

Manabu Kimoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 26, 1987, Ser. No. 113,553
Claims priority, application Japan, Oct. 27, 1986, 61-254981
Int. Cl.[4] G01R 3/28; G06F 11/00
U.S. Cl. 371—22.1 8 Claims



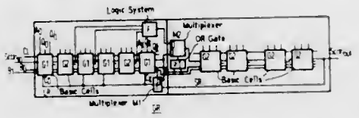
1. An integrated circuit device fabricated on a semi-conductor substrate, said device comprising a plurality of function blocks each achieving a predetermined function and an internal bus system which is operative to couple said function blocks, wherein one of said function blocks comprises a control signal generating circuit responsive to external control signals fed from outside said integrated circuit device and operative to produce a plurality of internal control signals representing respective commands used for a diagnostic operation for another function block, said diagnostic operation being carried out on the basis of pieces of data information, and an input-output circuit which is operative to transfer said pieces of data information supplied from outside said integrated circuit device through said internal bus system to another function block.

4,905,241

LOGIC MODULE FOR GENERATING UNEQUIPROBABLE/RANDOM PATTERNS FOR INTEGRATED CIRCUITS

Detlef Schmid, and Hans-Joachim Wunderlich, both of Karlsruhe, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 13, 1987, Ser. No. 120,545
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639577
Int. Cl.[4] H04B 17/00
U.S. Cl. 371—22.5 6 Claims



1. A logic system for generating an unequiprobable random bit pattern for supporting the self-test of integrated circuits comprising: a first logic module including,

a concatenated series of first and second basic cells having outputs responsive to a plurality of input control signals and connected to operate said first logic module selectively as a normal register, a series shift register, or a feedback shift register in response to said plurality of input control signals,

a feedback path for minimizing the autocorrelation function of the outputs of said concatenated series of first and second basic cells during operation of said first logic module as a feedback shift register, said feedback path supplying an output of a last basic cell of said concatenated series of first and second basic cells to inputs of a plurality of first basic cells in said concatenated series of first and second basic cells, each of said first basic cells in said plurality of first basic cells including combining logic means having first (A), second (B) and third (C) data inputs for logically combining signals on said data inputs to provide a plurality of Boolean function signals at respective outputs of said combining logic means, at least one of said plurality of Boolean function signals being a combinatorial function having said second (B) and third (C) data inputs as operands, said third (C) data input connected to said feedback path and said second (B) data input accepting an output of an immediately preceding basic cell in said concatenated series of first and second basic cells, said at least one of said plurality of Boolean function signals being supplied for output by each of said first basic cells during operation of said first logic module as a feedback shift register, and

a combinatorial logic circuit connected to selected data outputs of said concatenated series of first and second basic cells for operating said selected data outputs in accordance with a predetermined Boolean function to provide at an output of said combinatorial logic circuit a bit sequence in which the probability of an occurrence of a logical "1" is defined by said predetermined Boolean function; and

a second logic module connected to said first logic module including,

selecting means responsive to said input control signals for selectively through-connecting to an output of said selecting means either the output of said last basic cell of said concatenated series of first and second basic cells or said output of said combinatorial logic circuit, and

a concatenated series of second basic cells responsive to said input control signals and connected to operate as a serial shift register, a first occurring second cell in said concatenated series of second basic cells being connected to receive said output of said selecting means.

4,905,242

PIPELINED ERROR DETECTION AND CORRECTION APPARATUS WITH PROGRAMMABLE ADDRESS TRAP

Raymond H. Popp, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 9, 1987, Ser. No. 59,696
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—40.1 5 Claims

1. An error detection and correction apparatus with programmable address trap comprising in combination:

means for receiving and holding data signals, said data means receiving data signals from a random access memory,

means for generating check bits, said check bit means generating a predetermined number of check bits, said check bits are parity bits which are derived from said data signals,

means for outputting signals, said signal output means operatively connected to said data means and said check bit means to receive said data signals and said check bits therefrom, said signal output means applying said data signals and check bits to said random access memory, said random access memory applying said data signals and check bits to said data means,

means for error correction, said error correction means receiving said check bits and said data signals from said data means, said error correction means decodes said check bits for signal bit errors, said error correction means will correct a single bit error in said data signals by inverting the error bit in said data signals, said data signals either error free or error corrected, is passed to said signal output means, said error correction means provides an error signal, said error signal is coded to represent either no error, a single bit error, a double bit error, or more than a double bit error,

an address trap register operatively connected to said signal output means to trap the address of said data signal at which an error occurs, and,

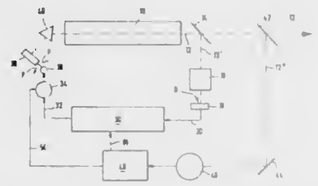
means for error detection, said error detection means operatively connected to said error correcting means to receive said error signal therefrom, said error detection means decoding said error signal to determine the error state.

4,905,243

METHOD AND APPARATUS FOR STABILIZING THE FREQUENCY OF A LASER BEAM

Peter Lokai, Bovenden, and Heribert Rosenkranz, Göttingen, both of Fed. Rep. of Germany, assignors to Lambda Physik Forschungs-Und Entwicklungs-GmbH, Gott Ingen, Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 288,428
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1987, 3744323
Int. Cl.[4] H01S 3/13
U.S. Cl. 372—32 11 Claims



1. A method of stabilizing the wavelength of a laser beam (12) emitted by an Excimer laser which includes a wavelength-selective means (38) for adjusting said wavelength, and a spectral apparatus (16) into which a part (12') of the laser beam is introduced to derive an adjusting signal for adjustment of the wavelength-selective means, including the steps of:

projecting an image (B) onto a solid-state image sensor, by means of the spectral apparatus (16), said image being dependent on the wavelength of the laser beam (12);

generating, by means of the solid-state image sensor (18), an electrical signal (20) dependent on the wavelength of the laser beam (12);

comparing the electrical signal (20) with a predetermined reference signal; and

deriving from the comparing step an adjusting signal (32) for the wavelength-selective means (38).

4,905,244

HETERODYNE LASER SPECTROSCOPY SYSTEM

Richard W. Wyeth, Livermore; Jeffrey A. Paisner, San Ramon, and Thomas Story, Antioch, all of Calif., assignors to United States Department of Energy, Washington, D.C.

Division of Ser. No. 911,842, Sep. 26, 1986, Pat. No. 4,817,101.
This application Jun. 15, 1988, Ser. No. 207,996
Int. Cl.[4] H01S 3/13
U.S. Cl. 372—32 4 Claims

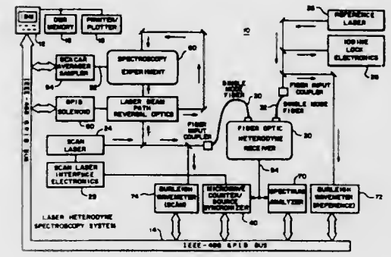
1. A laser heterodyning system comprising

a first turnable laser for generating a laser beam with an adjustable frequency f_1,

a second reference laser for generating a laser beam having reference frequency f_2,

detector means for heterodyning said adjustable frequency and said reference frequency to form a difference frequency, and

digital phase locked loop control means responsive to said difference frequency for adjusting the output of said turnable laser to a predetermined frequency output wherein said control means include a digital fractional frequency divider circuit having a resolution within approximately one hertz increments for generating a first control signal corresponding to said difference frequency, reference oscillator means for generating a second control signal,



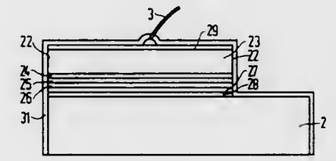
and detector means responsive to said first and second control signals for generating an adjustable output signal to permit digital selection of an accurate offset frequency between said first turnable laser and said second reference laser.

4,905,245

SEMICONDUCTOR LASER DEVICE AND METHOD OF MANUFACTURING SAME

Johannes J. Ponjee, and Rudolf P. Tijburg, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 29, 1988, Ser. No. 174,743
Claims priority, application Netherlands, Apr. 16, 1987, 8700904
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—49 6 Claims
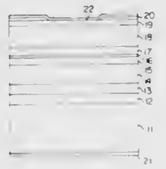


1. In a semiconductor laser device the improvement comprising

a semiconductor body having surfaces for emanating a laser beam, and

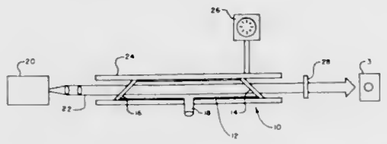
a coating disposed on said surfaces, said coating comprising at least one layer including a layer of an alkyl compound, said alkyl compound having converted groups of silanes at a surface of said layer, said groups of silanes being substituted with at least one alkyl group having at least one fluorine atom, and said compound having carbonic acids with an alkyl group having at least seven carbon atoms.

4,905,246
SEMICONDUCTOR LASER DEVICE
Toshiro Hayakawa, Yokohama; Takahiro Suyama, Tenri; Kosei Takahashi, Nara, and Masafumi Kondo, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 28, 1988, Ser. No. 291,124
Claims priority, application Japan, Dec. 29, 1987, 62-332707
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—45 3 Claims



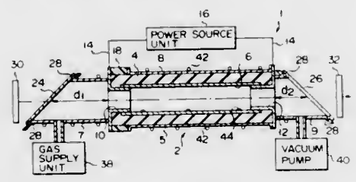
1. In a semiconductor laser device containing a laser oscillation-operating area which comprises a $Ga_{1-x}A_{1x}As$ ($0 \leqq x \leqq 1$) quantum well active layer, $Ga_{1-y}Al_yAs$ optical guiding layers interposing said quantum well active layer therebetween, and $Ga_{1-z}Al_zAs$ cladding layers superposed on said optical guiding layers, respectively, the improvement wherein the AlAs mole fraction y at the area of each of said optical guiding layers positioned adjacent the interface of the optical guiding layers and the quantum well active layer meets the relationships $y-x \geqq 0.3$ and $z-y \leqq \leqq 0.25$.

4,905,247
HIGH POWER TUNABLE INFRARED MIRRORLESS LASER
John W. Glessner, Kirkland ABF, N. Mex.; Steven J. Davis, Londonderry, N.H., and Leonard Hanko, Rio Rancho, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Sep. 9, 1988, Ser. No. 242,399
Int. Cl.[4] H01S 3/22
U.S. Cl. 372—55 19 Claims



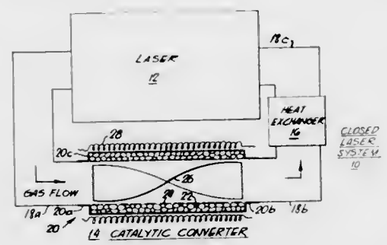
1. A mirrorless iodine laser comprising:
(a) an elongated sealed cell having a long axis and which contains iodine;
(b) a pumping laser for projecting a laser beam into the sealed cell along its long axis in order to cause said iodine to lase; and
(c) a heater means for heating said sealed cell to a temperature that increases amplified spontaneous emissions from said iodine in said sealed cell wherein iodine laser emissions propagate primarily along the long axis of the sealed cell.

4,905,248
METAL VAPOR LASER APPARATUS
Naoto Nishida, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 6, 1988, Ser. No. 280,352
Claims priority, application Japan, Dec. 8, 1987, 62-308566
Int. Cl.[4] H01S 3/22, 3/03
U.S. Cl. 372—56 5 Claims



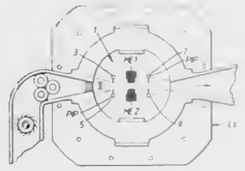
1. A metal vapor laser apparatus comprising:
a discharge tube for generating a laser beam, said tube containing a buffer gas under a predetermined pressure and having at least one set of a cathode electrode and an anode electrode, a distance between said cathode electrode and a cathode side end of said discharge tube along a tube axis direction being at least 1.3 times a distance between said anode electrode and an anode side end of said discharge tube;
power source means for applying a voltage to said electrodes;
a metal vapor source arranged in said discharge tube; and
a pair of resonator mirrors for reflecting the laser beam generated in said discharge tube to cause optical resonation.

4,905,249
CATALYTIC CONVERTER
Robert Turner, St. James, N.Y., assignor to Applied Photonics, Inc., Hauppauge, N.Y.
Filed Jan. 6, 1989, Ser. No. 294,465
Int. Cl.[4] H01S 3/22
U.S. Cl. 372—59 6 Claims



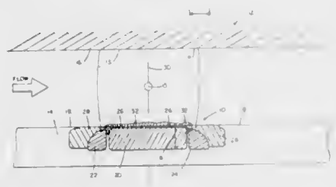
1. A closed-loop carbon dioxide laser system comprising: a carbon dioxide laser; a heat exchanger; a catalytic converter comprising a conduit means for conducting a gas, a catalysing means, said catalysing means having an annular recess in said conduit means, a plurality of pellets of platinum-plated alumina in said annular recess and porous means for containing said pellets in said annular recess, a heating means, for heating said catalysing means and turbulating means for deflecting a portion of the gas towards said catalysing means; and conduit means for interconnection of said laser, said heat exchanger and said catalytic converter in a closed loop.

4,905,250
PRE-IONIZING ELECTRODE ARRANGEMENT FOR A GAS DISCHARGE LASER
Johannes W. Van Dijk, North Ferriby, Great Britain, assignor to The European Atomic Energy Community, Plateau du Kirchberg, Luxembourg
Filed Nov. 13, 1987, Ser. No. 120,153
Int. Cl.[4] H01S 3/097
U.S. Cl. 372—86 9 Claims



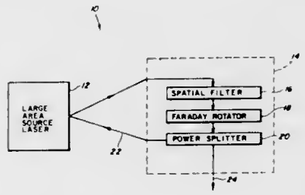
1. In a gas-discharge laser including an optical axis situated between a pair of main electrodes, said optical axis and said main electrodes being substantially parallel to each other, and wherein one of said pair of main electrodes is arranged to have a lower voltage than the other of said pair of main electrodes during operation of said laser, the improvement comprising a plurality of pre-ionizing electrode arrays arranged on two sides of said pair of main electrodes to provide ionization throughout the discharge volume between the main electrodes, said arrays including means for causing a sliding-spark discharge in said pairs of pre-ionizing electrodes, the sliding-spark progressing sequentially from a first pair to a last pair, wherein said pairs of pre-ionizing electrodes are symmetrically displaced on opposite sides of the optical axis and the main electrodes.

4,905,251
SELF-PREIONIZING RESISTIVELY BALLASTED SEMICONDUCTOR ELECTRODE
Michael von Dadelszen, Kirkland, Wash., assignor to Spectra-Physics, Inc., San Jose, Calif.
Filed Nov. 7, 1988, Ser. No. 267,820
Int. Cl.[4] H01S 3/00, 3/097
U.S. Cl. 372—87 6 Claims



1. An electrode for use with a gas discharge laser having a discharge region, the electrode having a surface in the gas discharge region and being subjected to a predetermined voltage waveform, the voltage waveform having a first, rapidly-changing portion, the electrode comprising:
a first electrical conductor;
one or more second electrical conductors;
a block of a dielectric material, a portion of the block being contoured to define a portion of the surface of the electrode, the remainder of the block being contoured to receive the first and second electrical conductors below the surface of the electrode; and
an electronic circuit connected between the first electrical conductor and the one or more second electrical conductors, the circuit comprising:
a block of a first semiconductor material having a first dielectric constant and being in electrical contact with portions of both the first electrical conductor and the one or more second electrical conductors, a surface of the block of the first semiconductor material forming a portion of the surface of the electrode, and
two blocks of a second semiconductor material having a second dielectric constant that is substantially smaller than the first dielectric constant, the two blocks of the second semiconductor material forming the remainder of the surface of the electrode, one of the two blocks being in electrical contact with the first electrical conductor and the other of the two blocks being in electrical contact with both the dielectric material and one of the one or more second electrical conductors,
the circuit connecting the first electrical conductor to the one or more second conductors through a path which is primarily capacitive during the first portion of the voltage waveform and primarily resistive subsequent to the first portion of the voltage waveform,
whereby surface discharges are initiated above the portion of the first semiconductor material that form the surface of the electrode during the first portion of the voltage waveform and the electrode is resistively ballasted subsequent to the first portion of the voltage waveform.

4,905,252
RING LASER CAVITIES
Lew Goldberg, Alexandria, Va., and Joseph F. Weller, Fort Washington, Md., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 16, 1988, Ser. No. 245,176
Int. Cl.[4] H01S 3/083
U.S. Cl. 372—94 23 Claims



1. A ring laser, comprising:
a cavity;
a source laser emitting a wide diverging pattern of polarized radiation into the cavity of the ring laser, the source laser being a device that is effective to emit a wide pattern of polarized radiation with a wide-lobed far field distribution;
routing means located in the cavity near the source laser for routing an angular portion of the wide pattern of polarized radiation in a predetermined direction;
a Faraday rotator for rotating polarization direction of radiation;
the Faraday rotator being located in the cavity of the ring laser;
a half-wave plate for rotating polarization direction of radiation;
the half-wave plate being located in the cavity of the ring laser;
the routing means and the Faraday rotator and the half-wave plate being located in an optical ring path in the cavity so that radiation can propagate around the path and pass from the routing means to and through the Faraday rotator and to and through the half-wave plate;
the routing means and the Faraday rotator and the half-wave plate in conjunction with the source laser allowing radiation to propagate in only one direction in the ring path in

VOL 1111 ISS 4 FE 27 19 90 UMI

the cavity by causing the radiation polarization in that direction to be correct for maximum amplification by the source laser when the polarized radiation is routed from the routing means to the source laser via the Faraday rotator and the half-wave plate, while causing the radiation polarization to be such that it allows minimum gain for radiation propagating in the ring path in the cavity in the opposite direction to the one direction;

optical means including a spatial filter and a power splitter located along the ring path to filter polarized radiation propagating along the ring path and to split radiation from the radiation propagating in the ring path;

the Faraday rotator, the spatial filter, and the power splitter being located along the ring path being arranged in serial fashion so that radiation routed from the source laser by the routing means can return to the source laser after passing through the spatial filter, the power splitter, and the Faraday rotator;

the Faraday rotator rotating the polarization of the radiation emitted by the laser source and assuring propagation of the radiation in the one direction around the ring path because the polarized radiation on passing through the Faraday rotator changes its polarization direction so that on returning to the source laser the polarized radiation returning to the source laser has a polarization matching the polarization of the radiation emitted by the source laser;

the power splitter being located on the ring path where the power splitter serves as a radiation coupling means for coupling some of the radiation out of the ring path while passing some of the radiation along to the source laser;

the radiation passing through the Faraday rotator and the spatial filter and the half-wave plate being injected into the source laser with a polarization that assures emission of radiation in a narrow far field lobe by the source laser as a result of suppressing broad lobed radiation of the polarized radiation emitted by the source laser through interaction of the injected radiation with the source laser.

4,905,253

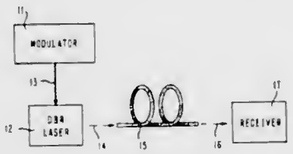
DISTRIBUTED BRAGG REFLECTOR LASER FOR FREQUENCY MODULATED COMMUNICATION SYSTEMS

Andrew R. Chraplyvy, Matawan; Thomas L. Koch, Holmdel, and Robert W. Tkach, Little Silver, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 27, 1989, Ser. No. 303,526

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—96 **4 Claims**



1. A lightwave transmitter including a distributed Bragg reflector laser and means for frequency modulating said laser, said laser comprising first and second semiconductor heterostructure regions, said first region optically coupled to said second region along a propagation direction for lightwave signals supported therein, said first region including a gain medium having a characteristic wavelength λ_p, and said second region having a modal refractive index n and including an integrated feedback means, said integrated feedback means including spatially periodic perturbations of a transmission characteristic of said second semiconductor heterostructure region and having an effective period Λ_{eff}, said transmitter CHARACTERIZED IN THAT,

said effective period is related to said characteristic wavelength as $\Lambda_{eff} > \lambda_p M/2n$, where M is an integer greater than or equal to 1 for characterizing an order of the integrated feedback means.

4,905,254

ARRANGEMENT FOR COMBATING INTERSYMBOL INTERFERENCE AND NOISE

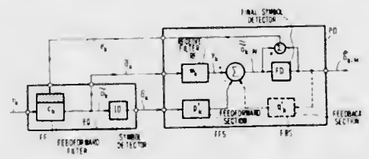
Johannes W. M. Bergmans, Tokyo, Japan, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 7, 1988, Ser. No. 203,652

Claims priority, application Netherlands, Jun. 9, 1987, 8701333

Int. Cl.[4] H04B *3/06*

U.S. Cl. 375—14 **7 Claims**



1. Apparatus for combating intersymbol interference and noise which are introduced into a data signal transmitted at a symbol rate 1/T by a dispersive transmission channel with a transfer characteristic, the transfer characteristic having a presumed main character, said apparatus comprising:

(a) an input for receiving a transmitted data signal resulting from the dispersive transmission channel;

(b) an adaptive equalizer having:

(i) a fixed symbol detector for forming tentative symbol decision signals from an input signal; and

(ii) at least one adaptive filter, having an input coupled with the input of the apparatus, for producing an output signal which is the input signal of the fixed symbol detector; and

(c) a non-adaptive post-detector for forming final symbol decision signals from the tentative symbol decision signals utilizing an auxiliary signal derived from the transmitted data signal, which auxiliary signal is the input signal of the fixed symbol detector.

4,905,255

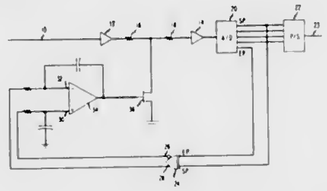
DECISION DIRECTED GAIN CONTROL

Farajollah Aalael, Hudson, N.H., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 3, 1989, Ser. No. 293,027

Int. Cl.[4] H04L *25/06*

U.S. Cl. 375—17 **1 Claim**



1. In a receiver having decoding means for decoding a baseband multilevel signal into a digital data signal,

said decoding means comprising quantizing means for quantizing said multilevel signal into discrete amplitude ranges and producing in response to each discrete amplitude range a unique combination of bits including a plurality of data bits in descending order of significance to form said data signal and a less significant soft bit,

an arrangement for automatically controlling the amplitude of said multilevel signal comprising:

an EXCLUSIVE-OR gate connected to said quantizing means and having a first output for producing a modulo-two sum of said soft bit and said most significant bit and a second output for producing the complement of said sum;

an integrating differential amplifier having an output, an inverting input connected to said first EXCLUSIVE-OR gate output and a non-inverting input connected to said second EXCLUSVIE-OR gate output;

resistance means connected in series in the path of said multilevel signal; and

a transistor having its gate electrode connected to the output of said differential amplifier and its source-drain path connected from a point on said multilevel signal path between said resistance means and said quantizing means to ground

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4,905,256

METHOD AND DEVICE FOR MULTISTATE MODULATION AND DEMODULATION WITH ADJUSTABLE PROTECTION LEVEL

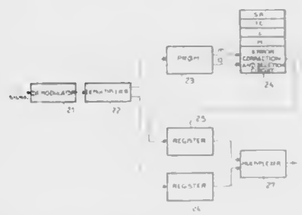
Pierre A. Laurent, Bessancourt, France, assignor to Thomson CSF, Paris, France

Filed Dec. 7, 1987, Ser. No. 129,197

Claims priority, application France, Dec. 5, 1986, 86 17043

Int. Cl.[4] H04L *27/10*

U.S. Cl. 375—48 **8 Claims**



7. A multistate binary signal modulation device comprising:

a demultiplier for separating fragile information, for which errors can be less tolerated from non-fragile information,

a plurality of registers for reforming the fragile and non-fragile information into words of dibits,

a programmable read only memory for adding to the fragile information redundancy bits for automatic error correction, and

a modulator coupled to said multiplexer for transmitting alternately the dibits of the fragile and non-fragile information.

4,905,257

MANCHESTER DECODER USING GATED DELAY LINE OSCILLATOR

Thomas G. Palkert, St. Paul, and John A. Kolling, Eagan, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 31, 1988, Ser. No. 238,383

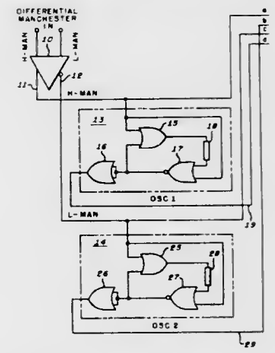
Int. Cl.[4] H04B *14/02;* **H04L** *27/22*

U.S. Cl. 375—87 **8 Claims**

1. Apparatus for converting Manchester coded data signals into non-return to zero data signals, said Manchester coded data signals having first and second components that are the inverse of each other, said Manchester coded data signals being formatted in consecutive data cells, comprising

a first gated oscillator enabled and disabled by first and second states, respectively, of said first component for generating a single pulse between enablement and disablement in response to consecutive data cells conveying the same binary data and for generating two pulses between enablement and disablement in response to consecutive data cells conveying a change in binary data,

a second gated oscillator enabled and disabled by first and second states, respectively, of said second component for generating a single pulse between enablement and disablement in response to consecutive data cells conveying the same binary data and for generating two pulses between enablement and disablement in response to consecutive data cells conveying a change in binary data,



first logic means responsive to said Manchester coded data signals and coupled to said first gated oscillator for providing a first toggling signal in response to the occurrence of said two pulses from said first gated oscillator, said first logic means being reset by said Manchester coded data signals,

second logic means responsive to said Manchester coded data signals and coupled to said second gated oscillator for providing a second toggling signal in response to the occurrence of said two pulses from said second gated oscillator, said second logic means being reset by said Manchester coded data signals, and

bistable means responsive to said first and second toggling signals for toggling in response to the occurence of either said first or second toggling signal,

said bistable means providing said non-return to zero data signals.

4,905,258

DATA CIRCUIT-TERMINATING EQUIPMENT

Toshimichi Shimatani, Fuchun; Yoshihiro Kawata, Tokorozawa, and Masaharu Kamigaki, Tokyo, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,558

Claims priority, application Japan, Sep. 30, 1987, 62-247600

Int. Cl.[4] H04L *25/38*

U.S. Cl. 375—117 **22 Claims**

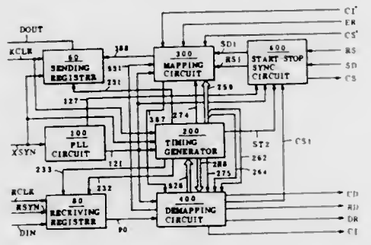
1. A data circuit-terminating equipment for connecting a start-stop synchronous data terminal equipment with a PCM transmission line which can transmit at various transmission rates by means of accommodating data and control signals in a multiframe construction by using at least a PCM synchronization signal and at least a PCM clock, wherein said data circuit-terminating equipment comprises:

start-stop synchronizing means for sampling a request-to-

send signal and send data, which are transmitted from said start-stop synchronous data terminal equipment, with a sampling clock of which repetition rate is higher than a repetition rate of said send data in which said sampling clock is synchronized with a standard clock, for delivering said sampled request-to-send signal and said sampled send data, and for transmitting a clear-to-send signal to said start-stop synchronous data terminal equipment corresponding with data volume of said sampled send data to be sent out;

mapping means for mapping said sampled request-to-send signal, said samples send data and control signals from said start-stop synchronizing means in a predetermined procedure and for constructing multiframes to send out a mapped signal;

sending register means for registering said mapped signal to send out at a transmission rate of said PCM transmission line at a timing being determined by said PCM synchronization signal and said PCM clock to said PCM transmission line;



receiving register means for receiving and registering data and control signals of multiframes which are received from said PCM transmission line at said transmission rate and for delivering a signal to-be-demapped at a predetermined timing synchronized with said PCM synchronization signal;

demapping means for demapping said signal to-be-demapped to obtain demapped data and control signals and for delivering said demapped data and control signals to said start-stop synchronous data terminal equipment at a predetermined timing;

PLL means including a phase-locked loop for generating said standard clock which synchronizes with said PCM synchronization signal; and

timing generating means for generating required timing signals from said standard clock, said PCM synchronizaoan signal and said PCM clock which are supplied to said start-stop synchronizing means, said sending register means, said receiving register means, said mapping means and said demapping means.

4,905,259

METHOD OF CONSTRUCTING BLOCK CODES

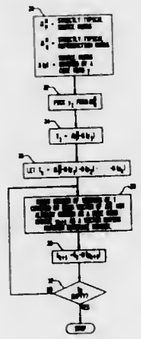
Jerry S. Nardi, 7815 Mandan Rd., Apt. 203, Greenbelt, Md. 20770

Filed Apr. 18, 1988, Ser. No. 182,445
Int. Cl.[4] H04N *1/40, 7/12*
U.S. Cl. 375—122 **27 Claims**

1. A method of selecting at least one code word from a set of second data, said at least one code word being selected to represent data in a set of first data, said sets of first and second data each having at least one data group, the method comprising the steps of:

determining for one of said at least one data group of said set of second data, all those data groups in said set of first data covered by said one of said at least one data group of said set of second data;

selecting as one of said at least one code word the one of said at least one data group of said set of second data which covers the maximum number of data groups remaining in said set of first data;



eliminating the covered data groups from said set of first data; and

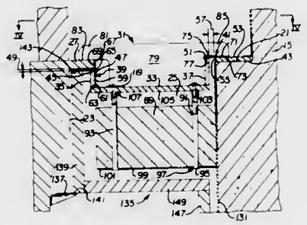
repeating the above steps until a given criteria is satisfied.

4,905,260

NUCLEAR REACTOR CONTAINMENT ARRANGEMENT WITH PERMANENT CAVITY SEAL RING

Kenneth J. Swidwa, N. Versailles; Robert B. Saltos, Plum Borough, and James R. Marshall, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1988, Ser. No. 270,879
Int. Cl.[4] G21C *19/00, 11/00*
U.S. Cl. 376—203 **17 Claims**



1. A nuclear reactor containment arrangement including:

a reactor pressure vessel which thermally expands and contracts during cyclic operation of the reactor, the vessel having a peripheral wall and a horizontally outwardly extending flange thereon;

a containment wall having a shelf, said wall spaced from and surrounding the peripheral wall of the reactor pressure vessel defining an annular expansion gap therebetween, and

an annular ring seal extending across said annular expansion gap to provide a water-tight seal therebetween, which annular ring seal comprises:

a support ring disposed in said annular expansion gap having inner and outer upwardly extending cylindrical sections, with said inner cylindrical section disposed beneath, and spaced from, the horizontally extending flange of the reactor pressure vessel, and said outer cylindrical section having a terminus at a location substantially parallel with, and spaced from, the shelf of the containment wall;

a vertically extending flexible inner seal, extending between said inner cylindrical section and said reactor pressure vessel flange sealing the space between said section and the horizontally extending flange of the reactor pressure vessel; and

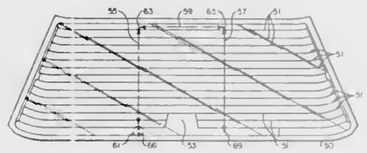
a horizontally extending flexible outer seal, extending between the terminus of said outer cylindrical section and the shelf of said containment wall sealing the space therebetween.

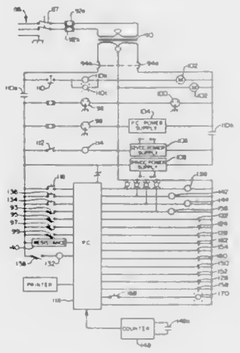
4,905,261

DEFROSTING GRID SYSTEM TESTING APPARATUS

Keith L. Knight, Lancaster, Ohio, assignor to Zane Machine Co., Lancaster, Ohio

Filed Jan. 23, 1989, Ser. No. 300,572
Int. Cl.[4] G01R *31/02;* **G06M** *1/27*
U.S. Cl. 377—19 **10 Claims**





1. An apparatus for continuity testing of windows provided with a resistance defrosting grid pattern of the type having a plurality of spaced, parallel extending grid lines connected at each opposing ends thereof to an electrically conducting bus line, comprising, in combination:

(a) means to support a window under test;

(b) a first and second electrically conducting probe, each of said probes conformed to engage a different one of said bus lines in electrically conducting relationship;

(c) a third probe movable for travel transverse to the length dimension of said grid lines in electrically conducting relationship to each of said grid lines at a preselected position intermediate the ends of said grid lines;

(d) an electrical power source operatively communicated to said probes and said grid lines;

(e) control means operatively connected to said power source and including switch means to selectively alternate the polarity of said first and second probe relative to said third probe to establish an opposing polarity between said third probe and a selected one of said first and second probes;

(f) sensing means operatively connected to said third probe for generating an electrical signal responsive to a predetermined voltage value selected to indicate a continuous non-defective grid line; and

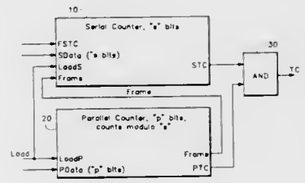
(g) means to count the signals generated by said sensing means and to indicate the number of non-defective grid lines contacted by said third probe operatively connected to said power source and said sensing means.

4,905,262

SYNCHRONOUS PROGRAMMABLE TWO-STAGE SERIAL/PARALLEL COUNTER

David H. Eby, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 28, 1988, Ser. No. 225,415
Int. Cl.[4] H03K *23/40, 23/58*
U.S. Cl. 377—44 **6 Claims**



1. A synchronous two-stage serial/parallel counter circuit comprising:

a parallel counter section for counting on system clocks and producing a parallel terminal count output and a frame output;

a serial counter section for counting on the frame output of the parallel counter section and producing a serial terminal count output, the serial counter section having as many bits in its length as the maximum count capacity of the parallel counter section; and

means for producing a terminal count signal upon the simultaneous occurrence of the parallel terminal count and the serial terminal count.

4,905,263

METHOD AND DEVICE FOR TIGHTNESS CONTROL OF A JOINT

Lennart Larsson, Malmö ; Bo Ullman, Åhus, and Håkan Ohlsson, Lund, all of Sweden, assignors to AB Akerlund & Rausing, Sweden

Division of Ser. No. 122,289, Nov. 18, 1987, Pat. No. 4,852,136.
This application May 12, 1989, Ser. No. 336,854
Claims priority, application Sweden, Nov. 27, 1986, 8605083
Int. Cl.[4] G01B *15/06*
U.S. Cl. 378—89 **9 Claims**

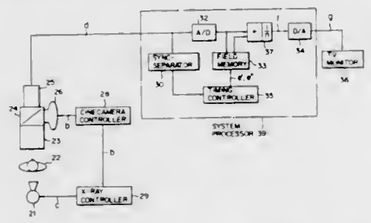
1. A method of inspecting the integrity of a joint between two elements of a packaging container defining a rim with two sides, comprising the steps of:

(a) directing radiant energy into said rim from a source on one side thereof so that said radiant energy impinges on

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said joint creating an area of irradiation smaller than the width of the joint;
(b) moving said container relative to said radiant energy so that said area of irradiation moves in one direction along said rim;
(c) scanning said joint crosswise to said one direction with said area of irradiation during said movement so that said area of irradiation moves across the width of the joint;
(d) detecting radiant energy reflected from said area of irradiation so that the detected radiant energy indicates the characteristics of the joint; and
(e) comparing said characteristics to a predetermined set value characteristic to detect any product residue or other defects in said joint.

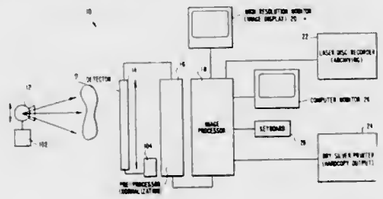
4,905,264
METHOD AND SYSTEM FOR DISPLAYING FLICKERLESS X-RAY DYNAMIC IMAGES
Ichiro Ogura, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 15, 1988, Ser. No. 219,368
Claims priority, application Japan, Jul. 16, 1987, 62-175844
Int. Cl.[4] H05G *1/64*
U.S. Cl. 378—99 **4 Claims**



1. A method for displaying X-ray dynamic images, the method comprising the steps of:
acquiring a first X-ray image signal during a first field period of a frame corresponding to an X-ray image;
storing the acquired first X-ray image signal during the first field period;
reading out the stored first X-ray image signal during a second field period of the frame corresponding to the X-ray image;
acquiring a second X-ray image signal during the second field period;
obtaining a third X-ray image signal by adding the read out first X-ray image signal to the acquired second X-ray image signal during the second field period; and
displaying the X-ray image in accordance with the obtained third X-ray image signal.

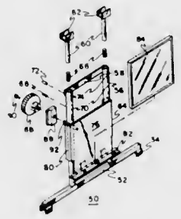
4,905,265
X-RAY IMAGING SYSTEM AND SOLID STATE DETECTOR THEREFOR
John D. Cox; Alan M. Jacobs; Stephen A. Scott, and Yi-Shung Juang, all of Gainesville, Fla., assignors to General Imaging Corporation, Gainsville, Fla.
Continuation-in-part of Ser. No. 807,650, Dec. 11, 1985. This application Feb. 1, 1988, Ser. No. 151,235
Int. Cl.[4] H05G *1/64*
U.S. Cl. 378—99 **41 Claims**

38. A method of detecting an x-ray image comprising:
storing charges on a plurality of charge storage devices formed in a random access integrated circuit;
producing an x-ray field having an energy level sufficiently high that compton scattering and pair production have a combined probability of producing free electrons in silicon greater than the photoelectric effect;
exposing an object to be imaged to said x-ray field;
exposing said integrated circuit to the x-ray field from said object such that said x-ray field interacts with said inte-



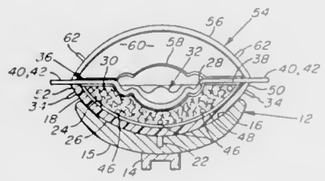
grated circuit to produce said free electrons to reduce the charge on said charge storage devices; and
sensing the charge on said charge storage devices.

4,905,266
FILM CARTRIDGE SUPPORT FOR BED-LIKE STRETCHER
Jay L. Kuck, St. Mary's, and Rudolph F. Quinter, Troy, both of Ohio, assignors to Midmark Corporation, Versailles, Ohio
Filed Jan. 29, 1988, Ser. No. 149,749
Int. Cl.[4] G03B *42/02*
U.S. Cl. 378—177 **15 Claims**



1. An x-ray film cartridge support for a bed-like stretcher, said stretcher having a frame with crossbars, said x-ray film cartridge support comprising:
an elongated base having a first base end and a second base end;
first means for engaging one of said crossbars wherein the first means is located on both said first base end and said second base end of said elongated bae;
an elongated spaced apart member, having a first and a second end, said member connected at said first end to said elongated base;
second means for engaging another of said crossbars wherein said second means is located on said second end of said elongated spaced apart member, said second engaging means comprising a rod inserted into said second ends of said elongated spaced apart member wherein said rod has a rod first end and a rod second end, said rod first end having a shoe thereat, said rod second end resting on a spring located within said elongated spaced apart member; and
means for holding an x-ray film cartridge on said two elongated spaced apart member.

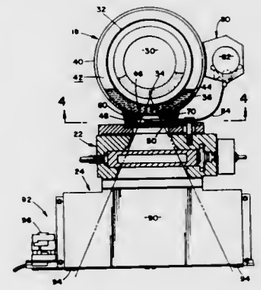
4,905,267
METHOD OF ASSEMBLY AND WHOLE BODY, PATIENT POSITIONING AND REPOSITIONING SUPPORT FOR USE IN RADIATION BEAM THERAPY SYSTEMS
Daniel W. Miller, Yucaipa; Thomas M. Potts, Grand Terrace, both of Calif.; Rudolf E. Prechter, Cranbury; Benjamin A. Prichard, Jr., East Windsor, both of N.J., and James M. Slater, Redlands, Calif., assignors to Loma Linda University Medical Center, Loma Linda, Calif.
Filed Apr. 29, 1988, Ser. No. 187,722
Int. Cl.[4] H05G *1/00*
U.S. Cl. 378—208 **13 Claims**



1. A whole-body patient positioning and repositioning support for fixedly securing a patient in an original position during radiation treatment and for repositioning the patient to the same original position for subsequent radiation treatments, the support comprising:
a rigid, longitudinally extending base member for support on a moveable transport, the base member having a transverse slightly concave top surface;
a relatively thin, longitudinally extending, shell releasably secured to and supported by the base member with a transverse convex bottom of the shell nested in the concave top of the base member and a transverse concave top surface of the shell exposed to receive a liner;
interlocking means between the shell and the base member;
a thin flexible plastic liner overlying the shell; and
a rigid foam between and bonded to the shell and the liner and comprising a mold conforming exactly to a side of the patient for securely holding the patient in the original position during radiation treatments.

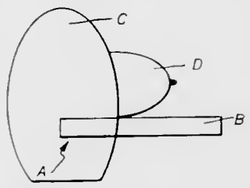
4,905,268
ADJUSTABLE OFF-FOCAL APERTURE FOR X-RAY TUBES
Rodney A. Mattson, Mentor, and Robert E. Levar, Willoughby, both of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio
Continuation of Ser. No. 46,860, May 7, 1987, which is a continuation-in-part of Ser. No. 791,210, Oct. 25, 1985, Pat. No. 4,672,648. This application Jul. 21, 1988, Ser. No. 222,521
Int. Cl.[4] G21K *3/00, 1/04*
U.S. Cl. 378—158 **13 Claims**

1. An x-ray tube assembly for radiographic scanners, the tube assembly comprising:
an evacuated envelope;
an anode rotatably mounted within the envelope;
a housing surrounding the envelope to define a cooling fluid reservoir therebetween, the housing defining an aperture therein and having a collar surrounding the aperture;
an x-ray permeable, fluid impermeable window mounted to the housing to seal the aperture;
an x-ray beam defining means including a first radiation attenuating member with a first radiation passing region therein, the first member being mounted with the collar;
an off-focal radiation attenuating means including a moveable second radiation attenuating member, movably mounted in relation to the first radiation attenuating member, which defines first and second radiation passing portions, the second member being movably mounted to the collar to be moveable at least between a first position in which the first radiation passing portion is aligned with the radiation passing region and a second position in which the second radiation passing portion is aligned with the radiation passing region;
a flexible cable means interconnected between the moveable



second member and a source of motive power for moving the moveable second member at least between the first and second positions;
a first stop means for preventing rotation of the moveable second member past the first position and a second stop means for preventing rotation of the moveable second member in an opposite direction past the second position.

4,905,269
CONTOURED CASSETTE
Richard A. Mosby, P.O. Box 20554, Houston, Tex. 77225
Filed Feb. 16, 1988, Ser. No. 155,708
Int. Cl.[4] G03B *42/04*; A61B *6/04*
U.S. Cl. 378—182 **5 Claims**



1. An X-ray cassette for examination of the interior of objects, said cassette comprising a flat hollow box for holding an X-ray film,
said box being of a material permitting transmission of X-rays to said X-ray film, and
said box having an edge wall portion with a concave contour for receiving an X-ray film having the same concave contour and comprising means for receiving X-ray film having the same contour, the contoured edge being configured to fit around the surface of an object adjacent to the portion of the object to be X-rayed to position said X-ray film more closely in line with the X-rays being transmitted thereto.

4,905,270

VEHICULAR HANDS-FREE TELEPHONE SYSTEM

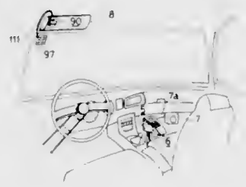
Hideyo Ono, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1988, Ser. No. 284,412

Claims priority, application Japan, Dec. 18, 1987, 62-193246; Jun. 27, 1988, 63-156957

Int. Cl.[4] H04Q *7/04*

U.S. Cl. 379—58 **14 Claims**



1. A vehicular hands-free telephone apparatus comprising

a microphone for converting an acoustic signal to an electrical signal,

an FM transmitter for generating a frequency-modulated radio signal in response to the output of said microphone,

a transmitting antenna for transmitting in a vehicle said radio signal generated from said FM transmitter,

a solar battery for converting light energy to electrical energy and providing operation power to said FM transmitter, said solar battery being mounted on a windshield of said vehicle,

a receiving antenna for receiving said radio signal transmitted from said transmitting antenna,

a receiver for receiving and frequency-demodulating said radio signal received by said receiving antenna, and

a transceiver for transmitting the output of receiver outside of said vehicle,

wherein said microphone, transmitting antenna and FM transmitter are built in a sun visor of said vehicle.

4,905,271

METHOD OF PREVENTING AUTO THEFT

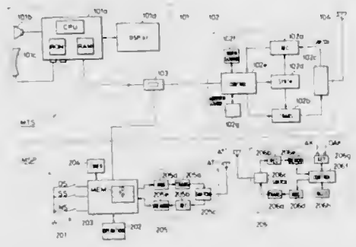
Makoto Namekawa, Twaki, Japan, assignor to Alpine Electronics Inc., Tokyo, Japan

Continuation of Ser. No. 102,234, Sep. 28, 1987, abandoned, which is a continuation of Ser. No. 881,894, Jul. 3, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 274,533

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[4] H01Q *7/04*

U.S. Cl. 379—58 **3 Claims**



1. A method of preventing the theft of an automobile which is equipped with a mobile telephone system and an anti-theft system for preventing a car from being stolen, said method comprising the steps of:

providing said anti-theft system with a remote control unit which actuates said anti-theft system or releases the actuated state of said anti-theft system and which sounds an alarm when receiving the information as to the occurrence of abnormality indicative of possible auto theft from said anti-theft system; and

providing a means for ascertaining the state of said anti-theft system when said alarm is sounded by receiving a call from an external telephone to said mobile telephone system, the power of which is turned on so as to be capable of receiving external calls by said anti-theft system at the time of the occurrence of abnormality, and transmitting information corresponding to the state of said anti-theft system to said external telephone.

4,905,272

PABX CORDLESS TELEPHONE SYSTEM

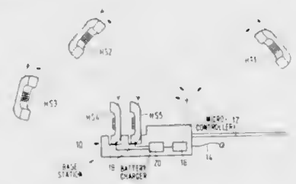
Petrus P. Van de Mortel, and Johannes C. F. Van Loon, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 22, 1988, Ser. No. 235,253

Claims priority, application United Kingdom, Aug. 26, 1987, 8720089

Int. Cl.[4] H04Q *7/04*

U.S. Cl. 379—62 **14 Claims**



1. A PABX cordless telephone system comprising a base station and a plurality of disconnectable handsets, the base station and the handsets each having a respective transceiver for communication to and from each other by way of a respective duplex radio link, the base station having a micro-controller for controlling the system, and each handset having a respective micro-controller for controlling various functions in the handset, each respective micro-controller in the handsets including a respective memory for storing a respective n-bit security address code which is used in call set-up protocol with the base station and the micro-controller in the base station including a memory for storing all the respective security address codes, wherein the micro-controller in the base station is programmed to carry out security checks on the handsets by using m bits of the respective security address codes where $m<n$.

4,905,273

DATA TRANSMISSION SYSTEM

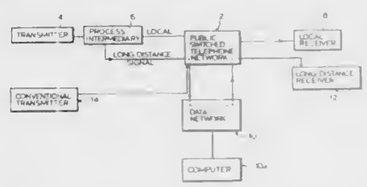
Alastair T. Gordon, 61 Dalewood Road, Toronto, Ontario, Canada (M4P 2N4), and Michael H. Reichmann, 137 Blantyre Avenue, Toronto, Ontario, Canada (M1N 2R6)

Filed Dec. 24, 1987, Ser. No. 137,799

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—93 **15 Claims**

1. In combination, a plurality of data receivers each having a unique telephone identification code, a plurality of data transmitters adapted to transmit signals to particular receivers, a telephone system adapted to operatively connect a data transmitter to a particular data receiver identified by said telephone identification code, a plurality of process means each associated with one data transmitter and located between said respective data transmitters and said telephone system, each process means identifying long distance telephone signals originating from said respective data transmitter and redirecting via said telephone system the long distance telephone signal to a predetermined data transmission system adapted to receive the signal, and wherein said predetermined data transmission system transmits the signal through the data transmis-



sion system to a particular point in the data transmission system and thereafter said data transmitting system transmits the signal via said telephone system to the appropriate data receiver.

4,905,274

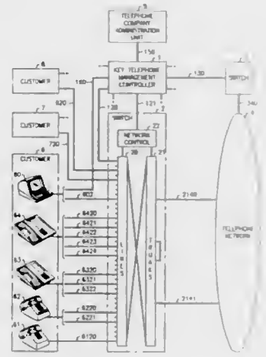
KEY TELEPHONE MANAGEMENT SYSTEM

Bret A. Cooper, Columbus; James R. Hahn, III, Gahanna; William H. Havanas, Reynoldsburg, and Mark A. Martinka, Pickerington, all of Ohio, assignors to American Telephone & Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J. and American Telephone and Telegraph Company, New York, N.Y.

Filed Jun. 22, 1989, Ser. No. 370,955

Int. Cl.[4] H04M *3/22*

U.S. Cl. 379--157 **18 Claims**



1. A management controller for controlling and implementing changes to customer key telephone systems served by a telephone switching system wherein said management controller comprises:

means coupled with the telephone switching system for recording both telephone customer-defined key telephone button and line features provided by the telephone switching system, and

means interactive with customers for enabling a customer to select both ones of the recorded key telephone button and line features and for controlling the telephone switching system to assign the customer-selected button and line features to telephone sets of a customer key telephone system.

4,905,275

LAMINAR TYPE TELEPHONE PROTECTOR BLOCK AND INTERCONNECTABLE MODULAR ELEMENTS THEREFOR

Carl Meyerhoefer, Dix Hills, and Helmuth Neuwirth, Garden City, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Feb. 6, 1989, Ser. No. 306,084

Int. Cl.[4] H04Q *1/14*

U.S. Cl. 379—327 **11 Claims**



1. In combination, an improved laminar type telephone connector block and subscriber circuit protector module therefor; said connector block comprising a plurality of laminar elements in juxtaposed mutually parallel relation, and at least one elongated interconnecting means penetrating each of said laminar elements serving to maintain said laminar elements in integrated condition, said last-mentioned means providing interconnection with a source of ground potential; said laminar elements including a plurality of quick clip terminals having exposed ends thereon for the interconnection of circuit conductors accessible from side edges of said laminar elements; a plurality of integrally molded ground strips extending from said side edges of said laminar elements to contact said elongated interconnecting means; said protector module being of planar configuration corresponding in thickness to that of an individual laminar element and comprising mating housing and cover members, tip and ring contacts positioned within said housing member and contacting at one end thereof corresponding quick clip terminals on said block, a grounding contact positioned within said housing member and contacting said grounding strip at exposed mating ends thereof; and serially connected gas tube and fusible members communicating with said tip, ring and grounding contacts.

4,905,276

TELEPHONE EARPIECE EXTENSION ATTACHMENT

Harry Catey, 3330 91st St. Southeast, Everett, Wash. 98208, and Erling C. Hesla, 3101 111th St. N.W., Ste. C, Everett, Wash. 98204

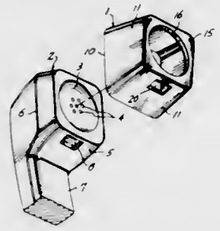
Filed Jun. 15, 1988, Ser. No. 207,348

Int. Cl.[4] H04R *1/10;* **H04M** *1/03*

U.S. Cl. 379—450 **9 Claims**

1. An extension attachment for a telephone earpiece having a sound-emitting surface, which attachment comprises a thin shell having an open end and sidewall portions sized and shaped to fit snugly over the earpiece, said shell having an outer face remote from said open end and positioned by said sidewall portions so as to be spaced outward from the earpiece sound-emitting surface when said shell is fitted over the earpiece, said outer face having an aperture for substantially unrestricted transmission of sound from the earpiece sound-

emitting surface through said shell and through said aperture, said shell including vent means forming unrestricted air passages from the interior of said shell to the exterior thereof other than through said aperture.

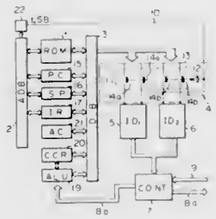


4,905,277

METHOD FOR ENCIPHERING AND DECIPHERING INSTRUCTIONS IN A MICROCOMPUTER, AND A MICROCOMPUTER USED FOR EFFECTING SAME

Haruhiko Nakamura, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 91,346, Aug. 28, 1987, abandoned, which is a continuation of Ser. No. 453,111, Dec. 27, 1982, abandoned. This application Apr. 17, 1989, Ser. No. 338,454
Claims priority, application Japan, Dec. 29, 1981, 56-213711
Int. Cl.[4] H04K *1/00*
U.S. Cl. 380—4 **21 Claims**



4. A deciphering apparatus for microcomputer capable of executing a plurality of types of instructions, said microcomputer including:

a read only memory for storing a program having instructions of an instruction set, the program being contructed from a combination of first type instruction codes enciphered by a first enciphering format and second type instruction codes enciphered by a second enciphering format;

a data bus connected to said read only memory;

an address bus connected to said read only memory;

a program counter, connected to said address bus, for generating an address to access said read only memory; and

a control unit for generating control signals to control the microcomputer itself and external circuits; and said apparatus comprising:

a first instruction decipherer, connected to said control unit, for supplying a deciphered instruction code, capable of deciphering all of the first type instruction codes corresponding to said plurality of types of instructions in a one to one correspondence;

a second instruction decipherer, connected to said control unit, for supplying the deciphered instructions, capable of deciphering all of the second type instruction codes corresponding to said plurality of types of instructions in a one to one correspondence;

a selecting circuit, connected between outputs of said first and second instruction decipherers and said control unit, for selectively outputting the deciphered results from one of said first and second instruction decipherers; and

a discriminating circuit, connected between said address bus and said selecting circuit, for controlling said selecting circuit in response to a least significant bit of the address to supply the first or the second type instruction code read from said read only memory to a corresponding one of said first and second instruction decipherers; and

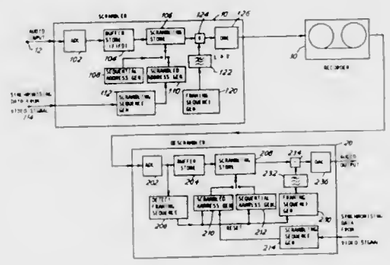
whereby the program constructed from the combination of said first type instruction codes and said second type instruction codes is executed.

4,905,278

SCRAMBLING OF ANALOGUE ELECTRICAL SIGNALS

Michael A. Parker, London, United Kingdom, assignor to British Broadcasting Corporation, London, United Kingdom

Filed Jul. 20, 1988, Ser. No. 221,901 ·
Claims priority, application United Kingdom, Jul. 20, 1987, 8717066
Int. Cl.[4] H04K *1/04*
U.S. Cl. 380—7 **7 Claims**



1. A method of scrambling an analogue electrical input signal having a certain frequency spectrum in which:

said signal is divided into segments;

said segments are re-ordered to form a re-ordered signal; and

a defined binary sequence having a frequency spectrum substantially similar to the said spectrum of said analogue electrical input signal is added to the re-ordered signal in synchronism with the segments.

4,905,279

LEARNING-FUNCTIONALIZED REMOTE CONTROL RECEIVER

Masaaki Nishio, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

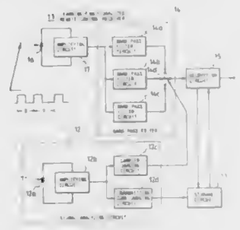
Filed Dec. 1, 1988, Ser. No. 278,455
Claims priority, application Japan, Feb. 26, 1988, 63-43756
Int. Cl.[4] H03J *9/00*
U.S. Cl. 380—9 **3 Claims**

1. A learning-functionalized remote control receiver, comprising:

signal analyzing means for receiving a remote control signal and determining its carrier and transmitting code in a learning mode of said remote control receiver;

storage means for storing during the learning mode the transmitting code of said remote control signal determined by said signal analyzing means in connection with the content of an instruction of said analyzed remote control signal;

band pass filter means having a filter band set in accordance with the determined carrier of said analyzed remote control signal in said learning mode; and



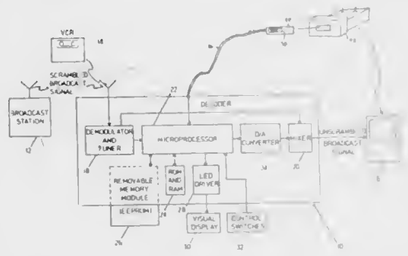
decryption means for decrypting a remote control signal transmitted in an operation mode of said remote control receiver in accordance with the transmitting code stored in said storage means during said learning mode.

4,905,280

HIGH SECURITY VIDEOTEXT AND VIDEOGAME SYSTEM

John D. Wiedemer, c/o Signal Security Technologies, 1127 Texas Bank & Trust Tower, 6161 Savoy Dr., Houston, Tex. 77036

Continuatioo-in-part of Ser. No. 660,512, Oct. 12, 1984, Pat. No. 4,696,034. This application Sep. 22, 1987, Ser. No. 100,024
Int. Cl.[4] H04N *7/167*
U.S. Cl. 380—16 **7 Claims**



1. A receiving station decoder for a system for the secure transmission and pay per view viewing of scrambled broadcast signals of television, videotext and videogame programming, the decoder adapted for use with a home game computer, the decoder comprising

an internal fixed memory containing a fixed station-unique internal code;

a removable electrically alterable memory module containing at least one station-unique external code and a portion onto which billing information may be entered;

means for generating a descrambling signal complementary to the scrambling signal upon the input of a proper numerical sequence;

a remote memory unit connected to the decoder and accessible therefrom and adapted for connection to and to be also accessed by the home game computer; and

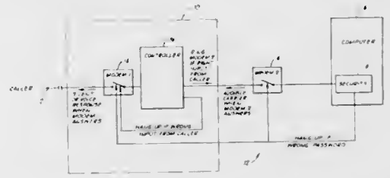
a microprocessor programmed (1) to read the internal code from the internal memory, and the external code from the memory module, (2) to derive a broadcast code from the broadcast signal, (3) to combine the internal and external codes to generate a numerical code for descrambling the broadcast signal, (4) if the broadcast code indicates that the broadcast signal is videotext or videogame programming, to logically combine the numerical code to the videotext and videogame programming received and to load the result directly into the remote memory unit, (5) if the broadcast code indicates that the broadcast signal is television programming, to direct the numerical code to the means for generating the descrambling signal, and (6) to write information about television, videotext or videogame broadcast signals received, as derived from the broadcast code, into the memory module so that use of the decoder can be billed on a usage basis both for television programming and for videotext and videogame programming.

4,905,281

SECURITY APPARATUS AND METHOD FOR COMPUTERS CONNECTED TO TELEPHONE CIRCUITS

Jim B. Surjaatmadja, Duncan, and Jack C. Penn, Tulsa, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 4, 1988, Ser. No. 190,284
Int. Cl.[4] H04K *1/00*
U.S. Cl. 380—25 **15 Claims**



14. A system for connecting a computer with an incoming call over a telephone circuit, said system comprising:

a first modem connected to said telephone circuit for answering said incoming call without emitting an audible carrier tone;

a second modem connected to said computer;

controller means, connected to said first modem and said second modem, for controlling said second modem in response to a valid incoming call being received through said first modem so that said computer is communicated through both said second modem and said first modem to said telephone circuit to receive said valid incoming call, said controller means comprising:

timer means for detecting the expiration of a predetermined timing period commenced in response to said first modem answering said incoming call, said timer means generating a time signal indicating that said timing period has expired, and

a modem ring circuit, responsive to said time signal, which generates an internal call to said second modem upon receiving said time signal so that, upon answering said internal call, said second modem and said computer are in communication with said telephone circuit through said first modem; and

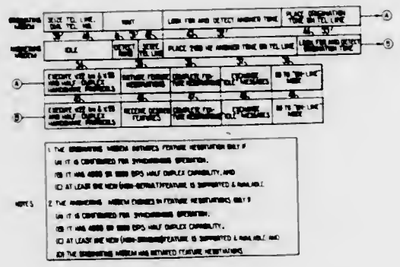
means, connected between said computer and said first and second modems, for disconnecting said modems from said valid incoming call when said first modem, said second modem, and said computer are all in communication with said telephone circuit and an incorrect password is transmitted in said incoming call.

4,905,282

FEATURE NEGOTIATION PROTOCOL AND DYNAMICALLY ADJUSTABLE RETRAINING SEQUENCE FOR A HIGH SPEED HALF DUPLEX MODEM

Paul E. McGlynn, Decatur, and Randy D. Nash, Dacula, both of Ga., assignors to Hayes Microcomputer Products, Inc., Norgross, Ga.

Filed Oct. 19, 1988, Ser. No. 259,882
Int. Cl.[4] H01B *1/38*
U.S. Cl. 380—48 **43 Claims**



7. In half-duplex communications between a first modem and a second modem, a method of operating said second modem, comprising the steps of:

establishing communications with said first modem;

negotiating with said first modem to select a table of retraining sequence durations, each retraining sequence duration of said retraining sequence durations being for a predetermined range of values for a period of non-reception, said table being one of a plurality of tables contained in a memory;

obtaining a measurement of each said period of non-reception;

obtaining from said table which was selected a value for said retraining sequence duration corresponding to said measurement;

entering a resynchronization mode;

using a signal from said first modem for said retraining sequence duration to effect resynchronization after said period of non-reception; and

entering a data transfer mode.

4,905,283

SURROUND DECODER

Tsutomu Ishikawa; Ryuichi Ogawa; Masaya Tanno, and Fumio Tosaka, all of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

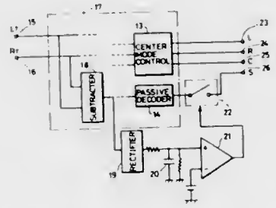
Filed Aug. 7, 1989, Ser. No. 390,056
Claims priority, application Japan, Aug. 12, 1988, 63-107176[U]
Int. Cl.[4] H04S *3/00*
U.S. Cl. 381—22 **5 Claims**

1. A surround-decoder comprising:

means for providing left and right stereo input signals,

decoder means for receiving said left and right stereo output signals to generate left and right stereo output signals, a center output signal and a surround output signal,

detectihg means for detecting said left and right stereo input signals to be monaural signals, and



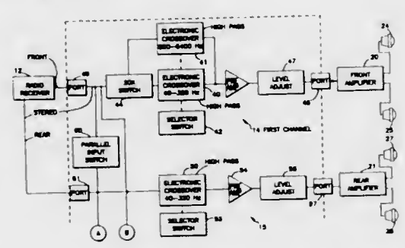
means responsive to said detecting means for cutting off said surround signal from said decoder means.

4,905,284

AUDIO SYSTEM FOR VEHICULAR APPLICATIONS

David Kwang, Pasadena, Calif., assignor to Concept Enterprises, Inc., Vernon, Calif.

Filed Feb. 21, 1989, Ser. No. 314,509
Int. Cl.[4] H04S *3/00*
U.S. Cl. 381—27 **16 Claims**



1. An electronic crossover system for use in a variety of multi-amplifier configurations receiving signals from an audio signal source, comprising:

means defining first, second and third signal channels, each having an input and an output;

first switch means for selectively coupling the inputs of the first and second channels in parallel;

means for summing the inputs of the first and second channels at the input of the third channel;

first adjustable high pass crossover means coupled in the first channel;

second adjustable high pass crossover means coupled in the second channel;

first adjustable low pass crossover means coupled in the third channel, wherein each of the crossover means is independently adjustable of the other; and

selectively actuable high pass crossover means disposed in the first signal channel for providing an adjustable high pass crossover at a substantially higher frequency than the first high pass crossover means.

4,905,285

ANALYSIS ARRANGEMENT BASED ON A MODEL OF HUMAN NEURAL RESPONSES

Jont B. Allen, Scotch Plains, and Oded Ghitza, Westfield, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 34,815, Apr. 3, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 317,104
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—41 **41 Claims**

1. A method for analyzing a sensory type pattern comprising:

receiving a sensory type pattern;

dividing the frequency spectrum of the waveform of the received sensory type pattern into a plurality of spectral portions;

partitioning each spectral portion of the received sensory type pattern into successive time segments;

defining threshold levels of intensity of each such partitioned spectral portion for which crossings are to be detected, said levels corresponding one-to-one to sensory neueral response intensity levels;

detecting the crossings of each such threshold level of intensity and determining the inverse time intervals therebetween;

classifying said inverse time intervals;

generating a signal representative of the classification of inverse time intervals for each partitioned spectral portion; and

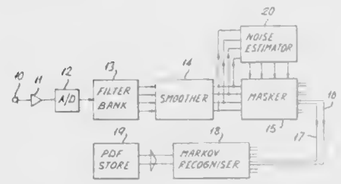
producing a signal representative of the distribution of the generated classification signals for the current time segment waveform of the sensory type pattern.

4,905,286

NOISE COMPENSATION IN SPEECH RECOGNITION

Nigel C. Sedgwick, Royston, and John N. Holmes, Uxbridge, both of England, assignors to National Research Development Corporation, London, United Kingdom

Filed Apr. 1, 1987, Ser. No. 32,566
Claims priority, application United Kingdom, Apr. 4, 1986, 8608289
Int. Cl.[4] G10L *7/08*
U.S. Cl. 381—43 **20 Claims**



1. Apparatus for use in sound recognition comprising.

means for deriving a plurality of input signals during recognition, each of which is representative of a signal level in a corresponding region of a frequency spectrum in which frequency components appear when sounds to be recognized occur;

means for storing a plurality of groups of values representing respective probability density functions, indicating likelihoods that input signals arise from states in finite state machine models of groups of sounds to be recognized;

means for estimating an input noise level in each of said regions of said frequency spectrum; and

means for recognizing sounds from the input signals, employing respective distance measures, each derived from one of said input signals and one of said probability density functions are represented by one group of said values, each distance measure representing, in a first circumstance, a likelihood, and, in a second circumstance, a cumulative likelihood which is cumulative from minus infinity to an upper limit, of obtaining the input signal from which that distance measure is derived from the probability function from which it is also derived,

the first circumstance arising when the input signal from which the distance measure is derived is above a predetermined level equal to said upper limit, and set substantially at the estimated noise level in said region corresponding to that input signal, and

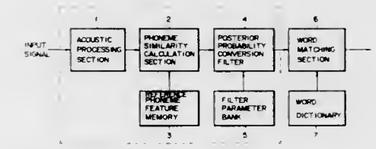
the second circumstance arising when the input signal from which the distance measure is derived is below said predetermined level.

4,905,287

PATTERN RECOGNITION SYSTEM

Hideo Segawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 16, 1988, Ser. No. 169,054
Claims priority, application Japan, Mar. 16, 1987, 62-60394
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **6 Claims**



1. A pattern recognition system comprising:

a feature extraction means for extracting feature data of an input pattern;

a memory for storing a reference pattern of data each category;

a multiple similarity calculation section for calculating multiple similarities between the feature data extracted by said feature extraction means and the reference patterns stored in said memory;

posterior probability conversion means for converting the multiple similarities obtained by said similarity calculation section into posterior probabilities and

means for performing matching between the posterior probabilities and data stored in a dictionary so as to obtain a pattern recognition output;

wherein said posterior probability conversion means includes: a parameter table storing parameter sets each composed of a plurality of parameter pairs of α and β, said parameter α indicating a number of components which are not involved in a subspace spanned by a reference pattern, the parameter β indicating a variance in a direction of non-reference subspace, and both parameters α and β being estimated from multiple similarity values between a reference pattern and training data, for each category of learning patterns, and for every category of reference patterns; and means for calculating the posterior probabilities based on the multiple similarities calculated by said multiple similarity calculation section and the parameter sets stored in said parameter table.

4,905,288

METHOD OF DATA REDUCTION IN A SPEECH RECOGNITION

Ira A. Gerson, Hoffman Estates, and Brett L. Lindsley, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 816,163, Jan. 3, 1986, abandoned. This application Oct. 18, 1988, Ser. No. 262,173
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **34 Claims**

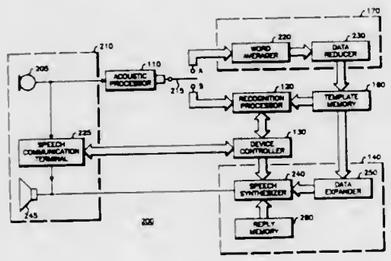
1. In a speech processing system, wherein speech is repre-

sented as a sequence of original frames, a method for reducing the sequence of original frames into a reduced set of representative frames comprising the steps of:

storing a plurality of original frames from the sequence;

combining said stored original frames into a plurality of representative frames;

generating, for each representative frame, a distortion measure corresponding to the distance between each said



representative frame and said original frames combined therein;

comparing each said distortion measure to a predetermined distortion threshold; and

determining a set of a minimum number of said representative frames representing said stored original frames and each representative frame having a generated distortion measure less than said predetermined distortion threshold.

4,905,289

APPARATUS FOR THE DIGITAL STORAGE OF AUDIO SIGNALS EMPLOYING READ ONLY MEMORIES

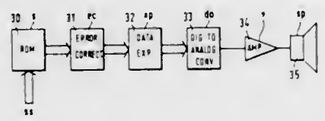
Ljubomir Micic, Freiburg, and Thomas Fischer, Umkirsch, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Continuation of Ser. No. 37,371, May 1, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 315,248

Claims priority, application European Pat. Off., May 15, 1986, 86106577.9

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—51 **5 Claims**



1. An audio playback apparatus for playback of stored audio signals without the use of mechanically moving playback means, comprising:

a read only memory having a plurality of storage locations, including at least one plurality of a large number of storage locations sufficient in capacity to permanently store at least one set of said audio signals in a digitized format corresponding to at least one continuous sound signal which is to be played back, a data reduction algorithm which is associated with each of said at least one set of audio signals which are stored in a digitized format, said each of at least one set of audio signals stored in a digitized format having a tag identifying the data reduction algorithm with which it is associated, and an error detecting and correcting algorithm which is associated with each of said at least one set of audio signals which are stored in a digitized format;

read out means for reading out at least one set of stored audio signals and tags associated therewith, said data reduction algorithm associated therewith, and said error detecting and correcting algorithm associated therewith from said at least one plurality of storage locations of said read only memory;

an error detecting and correcting means including a first programmable microprocessor for converting the output from the read out means into error corrected audio signals and correcting algorithm, said first programmable microprocessor having its control program stored in said read only memory;

a data expander means including a second programmable microprocessor for converting the output from said error detecting and correcting means into a digitized audio signal under control of said data reduction algorithm, said second programmable microprocessor having its control program stored in said read only memory, whereby said second programmable microprocessor selects said controlling data reduction algorithm according to the tag associated with said output from said error detecting and correcting means;

a digital-to-analog converter for converting said digitized audio signals output from said data expander into analog audio signals;

an analog audio amplifier having an input coupled to the output of said digital-to-analog converter for providing an output of amplified analog audio signals; and

a loudspeaker system having an input coupled to the output of said amplifier for providing an audible sound signal from said amplifier analog audio signals.

4,905,290

HOWLING PROTECTIVE APPARATUS

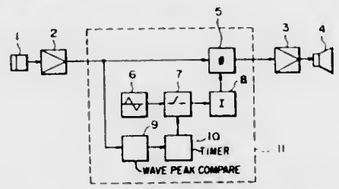
Akira Yaoita, Tokyo, Japan, assignor to Viva Co., Ltd., Noda, Japan

Filed Jul. 12, 1989, Ser. No. 378,674

Claims priority, application Japan, Jul. 12, 1988, 63-309367

Int. Cl.[4] H04R *27/00*

U.S. Cl. 381—83 **3 Claims**



1. A howling protective apparatus having a phase fluctuation circuit in a transmission channel comprising a microphone, an amplifier and a speaker, which comprises a phase fluctuation control means for controlling the operation of the phase fluctuation circuit, a wave peak comparison means for detecting a signal of which the maximum absolute values of adjacent two positive and negative peaks of an input signal are substantially equal and a timer circuit for receiving an output from said wave peak comparison means and outputting a signal having a predetermined time width, wherein said phase fluctuation circuit is controlled by an output from said timer circuit.

4,905,291

CYBEROPTIC AUDIO LEVEL CONTROL SYSTEM

James C. Strickland, Miami, Fla., assignor to Rockford Corporation, Tempe, Ariz.

Filed Dec. 29, 1988, Ser. No. 291,529

Int. Cl.[4] H03G *3/00*

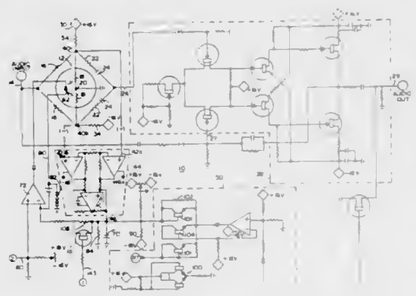
U.S. Cl. 381—108 **32 Claims**

1. An audio level control system comprising:

means for receiving an audio signal;

attenuator means for controllably attenuating said audio signal to produce an attenuated audio signal, said attenuating means including means for receiving a control signal, said attenuating means further including a center-tapped photocell;

means for producing a detection signal indicative of the level of said attenuated audio signal;



means for receiving a command level signal; and

means for producing a control signal as a function of the command level signal and the detection signal, the control signal being applied to the control signal receiving means of said attenuator means.

4,905,292

HIGH PROBABILITY OF DETECTION, LOW FALSE ALARM MULTISENSOR ATR

Edwin W. Wentworth, Woodbridge, and Stuart B. Horn, Fairfax, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 14, 1987, Ser. No. 95,784

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382--1 **6 Claims**



1. An improved ATR system for detecting, identifying and prioritizing targets from a plurality of detected targets, including:

a plurality of sensor means for detecting mutually exclusive sets of waves emanating from the environment including said targets;

all of said sensors being passive and having response thresholds low enough to detect all possible targets including a very large number of false targets;

a sub-ATR circuit means coupled to each of said sensors for locating, classifying, prioritizing and listing a separate preselected quota in each of a preselected number of classes of targets detected by said sensors, in accordance with prerecorded target signatures and other user constraints,

a first of said sensors having a lower probability of detection for a given false alarm rate than a second of said sensors, but based on a different distribution pattern of false alarms among said targets;

a final decision means coupled to all of said sensors for reassigning the classifications and priorities of targets detected by both of said sensors according to a preselected set of logical classification rules.

4,905,293

IMAGE INPUT DEVICE

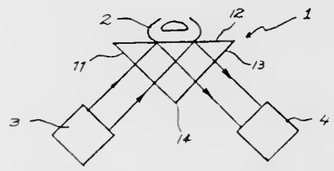
Ko Asai, and Koichiro Morita, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 142,279, Jan. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 943,877, Dec. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 755,575, Jul. 16, 1985, abandoned. This application Mar. 22, 1989, Ser. No. 326,426

Claims priority, application Japan, Jul. 18, 1984, 59-148890; Jul. 18, 1984, 59-148891

Int. Cl.[4] G06K *9/32*

U.S. Cl. 382—4 **16 Claims**



1. An image input device for optically sensing a pattern of an object to convert the pattern to an electrical signal for examination, consisting essentially of a single prism wherein:

said single prism has three discrete surfaces which comprise an incidence surface to which light is incident, a reflective surface for reflecting light which is incident to said incidence surface and on which the object is to be laid, and a way-out surface through which light reflected by said reflective surface comes out;

said image input device further comprising:

a light source for irradiating said incidence surface of the prism; and

non-movable guide means fixed to said reflective surface and having a fixed configuration, for causing a lengthwise direction of the pattern of the object to extend substantially in alignment with a direction which is parallel to a ridge defined by the incidence surface and the wayout surface of the prism.

4,905,294

IMAGE PROCESSING APPARATUS

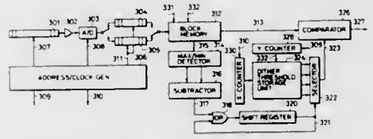
Susumu Sugiura, and Yukio Masuda, both of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 786,645, Oct. 11, 1985, abandoned. This application Apr. 14, 1989, Ser. No. 338,426

Claims priority, application Japan, Oct. 19, 1984, 59-218587

Int. Cl.[4] G06K *9/36*

U.S. Cl. 382—9 **5 Claims**



1. An image processing apparatus comprising:

image data input means; and

processing means for processing image data input by said image data input means, said processing means including image content discrimination means for discriminating a content of the input image data and binarization means for binarizing the input image data;

wherein said discriminating means divides the input image

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data into a plurality of blocks and discriminates the image content for each of said blocks, each of said blocks comprising a plurality of image data;

wherein said binarization means includes:

first, second and third binarizing circuits for binarizing the input image data using first, second and third threshold matricies different from each other to output respectively first, second and third binary data, and

first, second and third memory means for storing the first, second and third binary data output from said first, second and third binarization means, respectfully;

wherein said first, second and third memory means are capable of storing said first, second and third binary data of plural lines associated with said block, respectively, to delay said first, second and third binary data, respectively, in response to a discrimination operation performed by said discrimination means; and

wherein said processing means includes means for selecting one of said first, second and third binary data output from said first, second and third memory means in accordance with a result of the discrimination operation performed by said discrimination means.

4,905,295

CODE SEQUENCE MATCHING METHOD AND APPARATUS

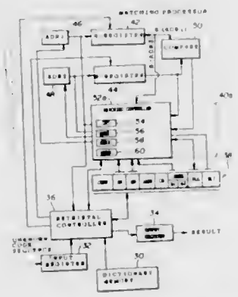
Gen Sato, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Nov. 9, 1987, Ser. No. 118,528

Claims priority, application Japan, Nov. 13, 1986, 61-270528; Jul. 8, 1987, 62-170510; Oct. 12, 1987, 62-256654

Int. Cl.[4] G06K *9/18*

U.S. Cl. 382—21 **8 Claims**



1. A code sequence matching method adapted to pattern recognition of characters, comprising the steps of:

successively selecting one code from an unknown code sequence which is extracted from an input pattern and indicates the sequence of features of the input pattern;

successively selecting one code from a reference code sequence;

comparing said one code selected from the unknown code sequence with said one code selected from the reference code sequence;

discriminating whether or not the unknown code sequence and the reference code sequence match each other by checking the correspondence between the codes of the unknown code sequence and the codes of the reference code sequence on the basis of compared results;

wherein the reference code sequence has one or more special codes for controlling the order of comparison between the codes of the unknown code sequence and the codes of the reference code sequence and said selecting steps select said codes in accordance with said special codes; and

wherein when both the codes of the unknown and reference code sequences are identical to each other at said comparing step, subsequent codes are selected from the unknown and reference code sequences and compared with each other, and wherein when said special code is selected from the reference code sequence, a code subsequent to said special code is selected from the reference code sequence and compared with said one code selected from the unknown code sequence.

4,905,296

SYSTEM FOR SHAPE RECOGNITION

H. Keith Nishihara, Los Altos, Calif., assignor to Schlumberger Systems & Services, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 888,535, Jul. 22, 1986. This application Mar. 18, 1988, Ser. No. 169,798

Int. Cl.[4] G06K *9/64*

U.S. Cl. 382—42 **5 Claims**



1. A machine method of processing an image containing pixels comprising:

applying a first Laplacian of Gaussian convolution to the image to produce a first filtered image;

extracting the sign of each pixel in the first filtered image to provide a second filtered image;

applying a second Laplacian of Gaussian convolution to the second filtered image to provide a third filtered image; and

detecting a first set of peaks in the third filtered image, where said peaks are used to establish a shape description of original image.

4,905,297

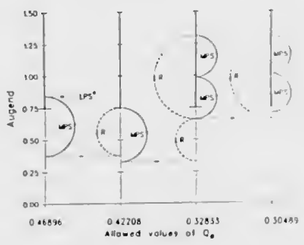
ARITHMETIC CODING ENCODER AND DECODER SYSTEM

Glen G. Langdon, Jr., San Jose, Calif.; Joan L. Mitchell, Ossining; William B. Pennebaker, Carmel, both of N.Y., and Jorma J. Rissanen, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1988, Ser. No. 274,711

Int. Cl.[4] G06K *9/36*

U.S. Cl. 382—56 **15 Claims**



1. In a binary arithmetic coding data compression system in which interval an augend A is reduced in value as successive binary decision events are encoded and in which, when A drops in value to less than a prescribed minimum AMIN, A is renormalized to exceed or equal AMIN, a computer-implemented method of adapting an estimated value Qe of one of the two possible binary decision events as successive decision events are encoded comprising the steps of:

storing A in the computer as a word having at least n bits where n is a positive integer;

selecting and storing in computer memory a plurality of permitted Qe values;

pointing to one of the stored Qe values as a current Qe value;

upon each successive binary decision event, changing the value of A to correspond to a current Qe value or current (A—Qe) value;

selecting a value for AMIN;

changing and storing in the computer the selected value for AMIN by a scale factor to represent AMIN by a 1 bit followed by (n—1) 0 bits;

scaling, with a processor in the computer, the selected Qe values by the scale factor; and

renormalizing A and up-dating a current scaled Qe value to another scaled Qe value in a processor of the computer in response to the nth bit of A changing from 1 to 0.

4,905,298

RESEALABLE CLOSURE

Curtis J. Walor, 732 Greenbriar Ter., Crystal Lake, Ill. 60014

Filed Dec. 12, 1988, Ser. No. 282,625

Int. Cl.[4] B65D *33/16*

U.S. Cl. 383—95 **8 Claims**



1. A resealable container having a reclosure seal that includes at least one sealing flap formed of a flexible thermoplastic film having a sealing surface and located opposite a coacting sealing surface, the improvement comprising:

a. a first band of a static cling vinyl plastic received within said container adjacent said sealing surface of said flap and with its outer edge permanently bonded to said sealing surface and with its inner edge being unbonded to said sealing surface, thereby forming an inner flap; and

b. a second band also of a static cling vinyl plastic received within said container adjacent said coacting sealing surface and with its inner edge permanently bonded to said coacting sealing surface and with its inner edge being unbonded to said coacting sealing surface, thereby forming a second inner flap, whereby

said first and second bands can be removably secured together to form a seal along their entire width, including said inner flaps within said container.

4,905,299

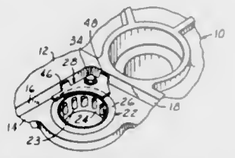
HOLD DOWN BEARING RETAINER

Diamond G. Ferraiuolo, Livonia, Mich., and James R. Ure, Tecumseh, Canada, assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Aug. 14, 1989, Ser. No. 392,877

Int. Cl.[4] F16C *43/04*

U.S. Cl. 384—585 **3 Claims**



1. In a bearing assembly of the type used to rotatably mount a shaft in a cast metal housing, said bearing assembly sized and configured for reception in an axially extending circular cavity formed in a recessed surface of said housing so as to journally support the shaft on the axis of said cavity, wherein the bearing assembly includes an annular thrust collar concentrically disposed about said cavity, retainer means acting to prevent axial separation of said thrust collar from said housing recessed surface, said housing recessed surface defined in part by a pair of substantially vertically disposed wall portions wherein the imaginary planes of said wall portions intersecting at a predetermined obtuse included dihedral angle, the improved retainer means for said bearing assembly comprising:

a one piece metallic plate-like bearing retainer device having an elongated attachment slot extending intermediate a radiused juncture of first and second outer linear edges and an inner concave arcuate edge of said device, extensions of said first and second linear edges intersecting at an imaginary common point defining an included obtuse angle, said attachment slot having its principal centerline disposed such that an imaginary vertical plane including said principal centerline bisects said included obtuse angle;

said first and second linear edges each formed with a coplanar integral locating tab extending therefrom, each said tab bent upwardly from the plane of said retainer device at a predetermined obtuse angle such that each said tab defines a raised line-contact edge disposed parallel to its linear edge contacting an associated opposed housing wall portion;

said retainer device configured and sized such that upon each said tab raised line-contact edge engaging its associated wall portion the imaginary vertical plane of said slot principal centerline bisects said included obtuse dihedral angle defined by said wall portions such that said slot principal centerline intersects the axis of said housing borehole; and

whereby said retainer device arcuate edge overlies in a substantially concentric manner a peripheral annular sector of said bearing assembly thrust collar, such that upon a single threaded fastener being inserted through said attachment slot and engaging said housing bore said bearing retainer is fixedly mounted on said housing with said tab raised line-contact edges obviating rotational movement of said retainer so as to releasably secure said bearing assembly in said housing cavity.

4,905,300

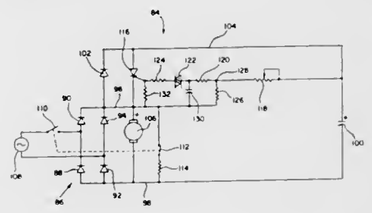
MOTOR CONTROL AND POWER SYSTEMS AND METHODS OF OPERATION THEREOF

Pradeep M. Bhagwat; Richard T. Walter, and Alan A. Gilmore, all of Baltimore, Md., assignors to Black & Decker Inc., Newark, Del.

Filed May 21, 1987, Ser. No. 52,760

Int. Cl.[4] H02P *5/402*

U.S. Cl. 388—800 **27 Claims**



19. A power system for supplying power to a load, which comprises:

rectifier connected directly for continuously supplying power from a power source to the load;

reactive means connected to derive its energy from the power source and responsive to a demand from the load for supplying additional power to the load simultaneously with the supply of power to the load by the rectifier, and

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means for maintaining the reactive means in a disconnected state from the load unless and until the load demands additional power.

20. A power system for supplying power to a load, which comprises:

rectifier connected directly for supplying power from a power source to the load;

reactive means connected to derive its energy from the power source for supplying power to the load;

means for sensing that the load requires power in addition to the power supplied by the rectifier;

means responsive to the sensing means for supplying power from the reactive means to the load at least during a period when the rectifier is supplying power to the load, and

means for maintaining the reactive means in a disconnected state from the load unless and until the load demands additional power.

4,905,301

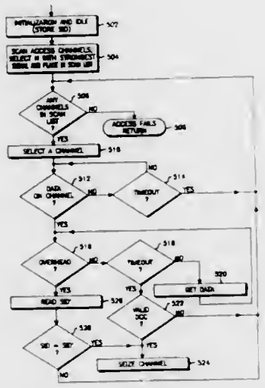
SELECTIVE SYSTEM SCAN FOR MULTIZONE RADIOTELEPHONE SUBSCRIBER UNITS

Robert K. Krolopp, Hoffman Estates; Thomas J. Auchter, Barrington, and Jeffery L. Mullins, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 28, 1988, Ser. No. 225,337

Int. Cl.[4] H04Q *7/00*

U.S. Cl. 455—34 **14 Claims**



1. A radiotelephone subscriber unit having the capacity for operating into more than one radiotelephone system, each radiotelephone system having a plurality of radio coverage areas with at least one control channel and at least one access channel each associated with one radiotelephone system and located in each of the plurality of radio coverage areas, each control channel transmitting a system identification unique to its associated radiotelephone system, the subscriber unit comprising:

means for selecting one control channel, detecting the transmitted control channel system identification, and storing said control channel system identification;

means, responsive to said means for selecting, detecting, and storing, for selecting one of the access channels;

means for detecting an overhead data message transmitted on said selected one access channel;

means for reading an access channel system identification from said detected overhead data message;

means for comparing said access channel system identification with said stored control channel system identification; and

means for seizing e channel of said comparison of said access channel system identification and said control channel system identification substantially yields a latch.

4,905,302

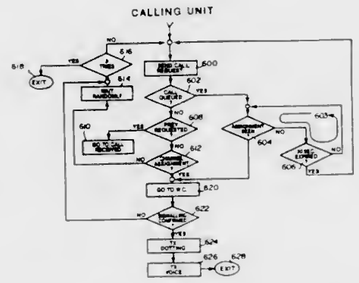
TRUNKED RADIO REPEATER SYSTEM

Jeffrey S. Childress, Lynchburg; Marc A. Dissosway, Forest; Gerald M. Cooper, Gretna, and Houston H. Hughes, III, Lynchburg, all of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jun. 3, 1987, Ser. No. 56,922

Int. Cl.[4] H04B *7/24;* **H04Q** *7/04*

U.S. Cl. 455—34 **82 Claims**



1. A method for achieving reliable and prompt communication within a trunked radio repeater system having a digital control channel and plural working channels, which working channels are assigned for temporary use of individual radio units specified by digital control signals transmitted over the control channel, said control channal carrying inbound digital control signals from said radio units to a control site, said inbound digital control signals having a time-multiplexed format defining discrete signalling slots, said method comprising the steps of:

(a) requesting assignment of a working channel by passing digital request signals from a first radio unit to said control site over a control channel inbound digital signalling slot;

(b) monitoring said control channel for responsive channel assignment signals returned over the control channel from the control site within a predetermined expected response time; and

(c) if no such responsive channel assignment signals are detected, then (c1) repeating steps (a) and (b) within a retry time window, and (c2) increasing the duration of the retry time window as a function of the number of retries.

4,905,303

TELEVISION AUDIO SIGNAL CONVERTER

John L. Johnson, Jr., 5512 Hillvale, Dallas, Tex. 75241, and Robert J. Pitre, 2642 S. Harwood, Dallas, Tex. 75215

Filed Jul. 5, 1988, Ser. No. 215,354

Int. Cl.[4] H04B *1/00*

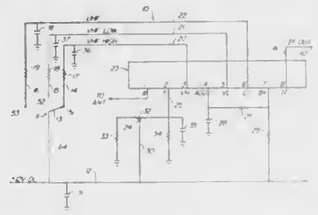
U.S. Cl. 455—45 **4 Claims**

1. A system for providing reception of television audio signals through conventional battery powdered FM radio receivers comprising:

(a) a television signal tuner means adapted to receive modulated television broadcast signal carriers at any selected standard channel carrier frequency and to convert said modulated channel carrier frequency signals to a correspondingly modulated conventional television intermediate carrier frequency signals;

(b) a frequency converter means adapted to receive said modulated intermediate frequency carrier signals by direct connection from said tuner means and to produce in response thereto correspondingly modulated carrier signals at least partially within the FM radio band comprising a first transistor means having its input tuned at the television sound sub-carrier frequency of said modulated intermediate frequency carrier signals from said tuner, a second transistor means and a tunable coupling circuit between said first and said second transistor means, said coupling circuit being electively tunable to frequencies within the FM radio band;

(c) means connecting said tuner means and said converter



means to be powdered from a battery source also powering said FM radio receiver;

(d) antenna connection means to said tuner for the reception of said TV signals;

(e) means connecting said intermediate frequency signal produced by said tuner to said input of said first transistor means;

(f) and means connecting signals from said coupling circuit through said second transistor means to the antenna circuit of said FM radio receiver.

4,905,304

MOBILE RADIO FACILITY

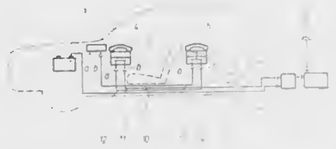
Hermann Barden, and Ernst Macher, both of Nuremberg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 23, 1988, Ser. No. 210,267

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3721806

Int. Cl.[4] H04B *1/06*

U.S. Cl. 455—89 **5 Claims**



1. A mobile radio facility for installation in a motor vehicle which includes as a part thereof a junction cable extending from the passenger compartment to another compartment of the vehicle and having a plug connector at each end thereof; said facility comprising a radio unit and one or more peripheral units, the radio unit being for installation in said other compartment and for plug-connection to said vehicular cable, the peripheral units being for installation in said passenger compartment;

said facility being characterized in that:

each peripheral unit has at least a pair of identical plug-in terminals providing identical connections thereto;

another junction cable is plug-connected at opposite ends thereof respectively to said vehicular cable and to a plug-in terminal of any one of said peripheral units; and

one or more additional junction cables are respectively plug-connected at opposite ends thereof to plug-in terminals of different ones of said peripheral units so as to establish a sequential order of interconnection of all of said peripheral units with said vehicular cable;

whereby said interconnection sequence can be optimized for whatever combination of peripheral equipments is comprised in said mobile radio facility.

4,905,305

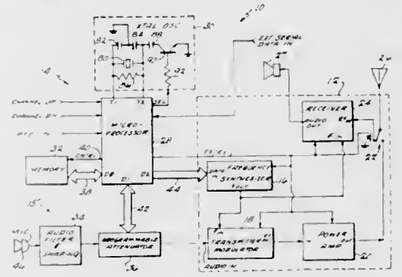
METHOD AND APPARATUS FOR CONTROLLING THE FREQUENCY OF OPERATION AND AT LEAST ONE FURTHER VARIABLE OPERATING PARAMETER OF A RADIO COMMUNICATIONS DEVICE

Terry N. Garner, Lynchburg, and Ralph R. Sherman, Forest, both of Va., assignors to General Electric Company, Lynchburg, Va.

Division of Ser. No. 844,158, Mar. 26, 1986, Pat. No. 4,870,699. This application Jun. 30, 1989, Ser. No. 373,505

Int. Cl.[4] H04B *1/26*

U.S. Cl. 455—183 **15 Claims**



1. In a radio frequency receiving device of the type including: (1) a tunable radio receiver for receiving radio frequency signals at selected radio frequencies, (2) clock oscillator means for producing a clock synchronizing signal, and (3) a memory, a digital controller synchronized by said clock synchronizing signal communicating with said memory, connected to control said radio receiver and said clock oscillator means, and programmed so as to effect the following functions:

(a) select one of a plurality of radio frequency values stored in said memory;

(b) tune said receiver to receive signals using said selected radio frequency value; and

(c) adjust the frequency of the clock synchronizing signal produced by said clock oscillator means using information associated with said selected radio frequency information stored in said memory to prevent spurious signals generated by said clock oscillator means from interfering with radio frequencies to which said receiver is tuned.

4,905,306

FILTER SWITCHING ARRANGEMENT FOR A TUNER

William D. Anderson, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Feb. 26, 1988, Ser. No. 160,979

Int. Cl.[4] H04B *11/16*

U.S. Cl. 455—191 **21 Claims**

1. Tuning apparatus for tuning channels with respective RF signals occurring in first and second frequency bands comprising:

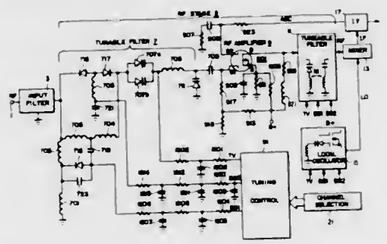
a RF signal input;

a RF signal output;

tunable filter means coupled between said RF signal input and said RF signal output and having a frequency selective response characteristic controlled in response to a tuning control signal representing a channel to be tuned

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for allowing the RF signal corresponding to the channel to be tuned to pass from said RF signal input to said RF signal output; said tunable filter means including a variable capacitance element responsive to said tuning control signal, first and second inductance elements, and a bandswitching diode having a high impedance state and a low impedance state selectable in response to a bandswitching signal representing the frequency band of the selected channel and connected to a point intermediate said first and second inductance elements for forming a first configuration of said tunable filter means including both of said



first and second inductance elements for tuning channels in said band when in said high impedance state and for forming a second configuration of said tunable filter means including one but not the other of said second inductance elements for tuning channels in said second band when in said low impedance state; and

a second capacitance element connected in parallel with said bandswitching diode to be functionally connected to said tunable filter means when said bandswitching diode is in said high impedance state and to be functionally disconnected from said tunable filter means when said bandswitching diode is in said low impedance state.

4,905,307

SYNCHRONOUS RECEIVER WITH DIRECT MIXING

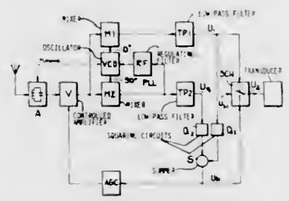
Georg Frank, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 134,868

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644392

Int. Cl.⁴ H04B *1/16*

U.S. Cl. 455—209 **28 Claims**



1. A direct conversion synchronous receiver which tunes the frequency of an oscillator signal to an input signal, comprising:

a phase-lock loop including a regulating filter, a voltage controlled oscillator controlled by an output of said regulating filter to generate first and second oscillator signals which are respectively 90 degrees out of phase with one another, and a first phase detector in the form of an amplitude demodulator which synchronously demodulates an input signal by mixing the input signal with the second oscillator signal to produce a first mixed signal, said regulating filter filtering the first mixed signal, such that the first oscillator signal is tuned in frequency and phase to that of the input signal;

a second phase detector which demodulates the input signal by mixing the input signal with the first oscillator signal to produce a second mixed signal;

first and second low-pass filter means respectively coupled to said first and second phase detectors, for respectively low-pass filtering the first and second mixed signals,

means, coupled to said first and second filter means for quadrating the respective low-pass filtered outputs of said first and second filter means;

means for summing together the quadrated outputs of said quadrating means to obtain a square law envelope signal; and

means for making the envelope signal audible or visible during tuning.

4,905,308

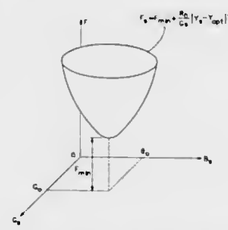
NOISE PARAMETER DETERMINATION METHOD

Andrew C. Davidson, Portland, Oreg., assignor to Cascade Microtech, Inc., Beaverton, Oreg.

Filed Apr. 5, 1989, Ser. No. 333,633

Int. Cl.⁴ G01S *7/40;* **G01R** *27/28*

U.S. Cl. 455—226 **6 Claims**



1. A method of determining the four parameters of a noise characterization equation which describes a receiver's noise performance as a function of the receiver's source termination, comprising the steps of:

(a) measuring the receiver's noise power for each of four different known source terminations having a first noise temperature, and thereby determining a set of first noise power measurements;

(b) measuring the receiver's noise power for a further known source termination having a second noise temperature, and thereby determining another noise power measurement;

(c) determining a respective relative gain for each of said source terminations;

(d) determining a respective ratio for each of said set of first noise power measurements to said respective relative gains;

(e) substituting each of said respective ratios in said noise characterization equation, and thereafter calculating the four parameters in a form where two of said parameters are scaled by a constant; and

(f) utilizing said further noise power measurement to determine said constant.

4,905,309

OPTICAL REMOTE CONTROL SYSTEM

Jean-Michel Maisonneuve, Toulouse; Francis Lacan, Saintgeniez d'Olt, and Jean-Paul Domergue, Toulouse, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

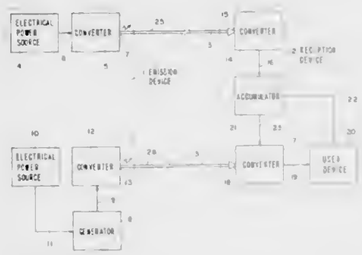
PCT No. PCT/FR88/00044, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988, PCT Pub. No. WO88/05980, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 27, 1988, Ser. No. 249,190

Claims priority, application France, Jan. 28, 1987, 87 01004

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 455—603 **14 Claims**



1. System for remote-control of an electric device (20) and comprising, an emission device (1) provided with a source of electrical supply (4), a generator (8) generating sequential electrical digital information intended for controlling said electric device (2), a first electro-optical converter (12) electrically connected to the generator for receiving and converting said sequential electrical information into sequential optical information, as well as a second electro-optical converter (5) for converting the electrical energy of said supply source (4) into optical energy, a reception device (2) optically connected to the emission device and provided with a first opto-electrical converter (17) capable of reconverting said sequential information into sequential electrical information, a second opto-electrical converter (14) optically connected to said second electro-optical converter (5) and capable of reconverting the optical energy into electrical energy, and an accumulator of electrical energy (21,24) capable of storing the electrical energy delivered by said second opto-electrical converter (14) and of supplying electrical energy, at least partially, to the electric device (20), said electric device (20) comprising an electrical apparatus (43) and a digital control device (42) controlling said apparatus by means of said reconverted sequential information generated by said first opto-electrical converter (17) and controlling supply of said electrical energy to said apparatus (43) so that the electrical energy is supplied fully from said energy accumulator (21, 24) only during exploitation of each sequence of said reconverted electrical information.

4,905,310

LASER CUTTING AND WELDING OF SHEET METAL USING A SHIELD OF COMPRESSED AIR

Robert R. Ulrich, Westminster, Md., assignor to Laser Applications, Inc., Westminster, Md.

Filed Jul. 1, 1988, Ser. No. 214,395

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121.64 **1 Claim**

1. A method of simultaneously cutting and welding at least two sheets of metal, comprising the steps of overlaying said sheets of metal on each other, producing a focused beam of laser energy, subjecting the areas of said overlaid sheets along a line of progress where they are to be cut and welded to said focused beam of laser energy, providing a gaseous shield around said laser beam; and selecting the operating parameters of at least said gaseous shield, said laser energy, and the speed of progress of said laser beam on said sheets along said line of progress with respect to at least the number, thicknesses and types of metals in said sheets so that a relatively narrow melt zone and cut is created along said line of progress, and so that surface tension on the molten metal in said melt zone after breakthrough will cause said molten metal in said melt zone on both sides of said line of progress to form beads on the cut edges of said sheets on both sides of said line of progress, wherein said metal sheets are formed of 321 stainless steel composed of an outer thickness of 0.006 inches, and an inner sheet of 0.004 thickness, wherein two such sheets are to be worked upon in most of the areas to be simultaneously cut and welded and the operating parameters of said laser and said shielding gas are selected as follows: continuous wave CO_2 laser; 5.00 focal length lens by 1.1 of zinc selenide, focus at surface; and compressed air as the shield gas at 50–60 PSI maintaining a flow of 48 cubic feet per hour via 0.090 diameter nozzle.

4,905,311

OPTICAL SURFACE ROUGHNESS MEASURING APPARATUS WITH POLARIZATION DETECTION

Motohito Hino, Nagoya; Yoshinori Bessho, Mie, and Michio Kondo, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 7, 1989, Ser. No. 307,303

Claims priority, application Japan, Feb. 10, 1988, 63-29312; Feb. 12, 1988, 63-31584

Int. Cl.⁴ G02F *1/01*

U.S. Cl. 250—225 **14 Claims**

1. An optical surface roughness measuring device for measuring roughness of a surface of a subject in a non-contacting manner, by irradiating said surface with two linearly polarized beams of light which have mutually perpendicular polarization planes and different frequencies, and detecting a change in a beat frequency of said two beams reflected by said surface, comprising:

a laser device for producing two linearly polarized laser beams as said two linearly polarized beams; and

an optical device receiving said two linearly polarized beams, converging one of said two laser beams so as to irradiate a first reading spot on the surface of said subject, converting the other of said two laser beams into parallel rays of light, and irradiating a second reading spot on said surface with said parallel rays of light of said other laser beam, such that said second reading spot is aligned with said first reading spot and has a diameter sufficiently larger than that of said first reading spot.

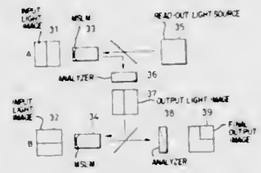
VOL 1111 ISS 4 FE 27 1990 UMI

4,905,312

IMAGE LOGIC OPERATION DEVICE

Naohisa Mukozaka, Shizuoka, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 71,140, Jul. 8, 1987, abandoned. This application Jul. 17, 1989, Ser. No. 380,756
Claims priority, application Japan, Jul. 11, 1986, 61-162980
Int. Cl.[4] G06F 7/56
U.S. Cl. 250—213 VT 4 Claims



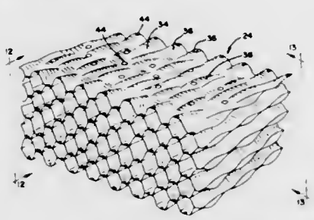
1. An image logic operation device for performing logic operations on images, comprising:
a first microchannel spatial light modulator, including a first voltage-controlled electro-optic crystal, for storing a first light image and sending out said first light image by a first reading-out light, wherein the first light image is reversed when a voltage is applied to said first voltage-controlled electro-optic crystal;
a second microchannel spatial light modulator, including a second voltage-controlled electro-optic crystal, for storing a second light image and sending out said second light image by a second reading-out light, wherein the second light image is reversed when a voltage is applied to said second voltage-controlled electro-optic crystal; and
an analyzer for passing therethrough said first light image, wherein the output of the analyzer is provided as said second reading-out light to said second microchannel spatial light modulator, thereby performing an AND operation on said first and second light images.

4,905,313

GAS/LIQUID CONTACT APPARATUS

David W. Stackhouse, Sebastopol, Calif., assignor to Custodis-Ecodyne, Santa Rosa, Calif.

Filed Mar. 17, 1989, Ser. No. 324,920
Int. Cl.[4] B01F 3/04
U.S. Cl. 261—112.2 8 Claims



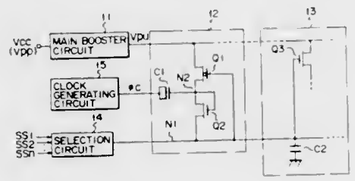
1. Apparatus for gas/liquid contact, comprising:
(a) a plurality of packing sheets arranged in a generally parallel, vertical, upright, face-to-face relationship;
(b) each of said packing sheets having a series of generally parallel corrugations formed therein that generally extend at an angle in the range of about 10 to 45 degrees from a vertical direction;
(c) each of said corrugations being formed so as to define an alternating series of longitudinally extending, oppositely inclined surfaces that intersect and pass through a center plane of the packing sheet so as to define hills and valleys on opposite sides of the center plane;
(d) wherein the amplitude relative to the center plane of said inclined surfaces at said hills is substantially equal to and opposite the amplitude of said inclined surfaces at said valleys;
(e) wherein the relative location and the distance between the adjacent hills and valleys in adjacent corrugations varies; and
(f) said packing sheets being arranged adjacent to each other such that the corrugations of adjacent packing sheets are oppositely oriented.

4,905,314

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING AN OBJECT CIRCUIT TO WHICH OUTPUT VOLTAGES OF THE SUB- AND MAIN BOOSTER CIRCUITS ARE APPLIED

Hideo Kato, Kawasaki; Hiroshi Iwahashi, Yokohama; Masamichi Asano, Tokyo; Akira Narita, Kawasaki, and Shinichi Kikuchi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 21, 1988, Ser. No. 184,580
Claims priority, application Japan, Apr. 24, 1987, 62-101419
Int. Cl.[4] H03K 17/10, 3/57
U.S. Cl. 307—264 3 Claims



1. A semiconductor integrated circuit device comprising:
main booster means for stepping up a power source voltage;
sub-booster means for stepping up an output voltage of said main booster means;
an object circuit to which the output voltages of said main booster means and said sub-booster means are applied, said object circuit including an input stage MOS transistor whose one end is connected to an output terminal of said main booster means and whose gate is connected to an output terminal of said sub-booster means,
said sub-booster means and said object circuit being adapted to apply through another end of said input stage MOS transistor the output voltage of said main booster means not reduced by the threshold voltage of said input stage MOS transistor; and
selection means for selectively applying the output voltage of said main booster means to said object circuit by selectively driving said sub-booster means when a plurality of selection signals are applied to said selection means.

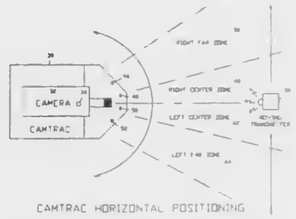
4,905,315

CAMERA TRACKING MOVABLE TRANSMITTER APPARATUS

Peter L. Solari, Goshen Hill Rd., R.D. 3, Box 138, Lebanon, Conn. 06249; Howard A. Miller, P.O. Box 97, Rte. 201, Hinkley, Me. 04944, and Stanley G. Spencer, Westriver Rd., Cornville, Me. 04976

Filed Jun. 30, 1988, Ser. No. 213,896
Int. Cl.[4] G06B 1/06
U.S. Cl. 318—640 18 Claims

1. Apparatus for mounting and positioning a camcorder which comprises:
a transmitter for producing a first control signal, said transmitter being dimensioned and configured for being carried on an object to be followed by the camcorder;
a mounting platform, said mounting platform being movable about horizontal and vertical axes;
means for carrying the associated camcorder, said means for carrying being disposed on said mounting platform;
a first control apparatus disposed on said platform including a first plurality of sensors disposed substantially in a first plane at angularly spaced intervals about a first axis, each of said first plurality of sensors being constructed to receive said first control signal radiated by said transmitter, said first



CAMTRAC HORIZONTAL POSITIONING

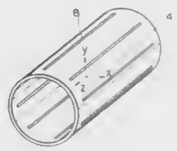
control signal being an infrared control signal having a beam width that normally extends to less than all of said first plurality of sensors at any given time;
means for discriminating which of said first plurality of sensors is receiving said first control signal from said transmitter; a servomechanism supporting said platform and said means for carrying the associated camcorder; and
means for controlling said servomechanism to position the camcorder, said means for controlling producing a second control signal based on the location of one or more of said first plurality of sensors receiving said signal at any instant.

4,905,316

MAGNETIC FIELD GENERATING SYSTEM FOR MAGNETIC RESONANCE IMAGING SYSTEM

Kazuya Okamoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1987, Ser. No. 136,337
Claims priority, application Japan, Dec. 22, 1986, 61-303671
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—319 6 Claims



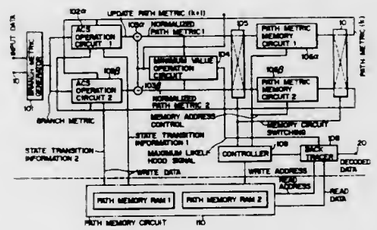
1. A magnetic field generating system for use in a magnetic resonance imaging system, which causes a magnetic resonance at least at a region of interest of a body under examination and obtains magnetic resonance data about said magnetic resonance to provide a magnetic resonance image of said region of interest, said field generating system for applying a gradient field and a high frequency field in a pulse form to said body, in addition to said static magnetic field, to excite said magnetic resonance and to collect magnetic resonance data about said magnetic resonance, and said magnetic field generating system comprising:
superconducting magnet means, including a superconducting coil, a heat shielding member, a bobbin and a cooling medium container which are cylindrically formed, for generating said static magnetic field, said body being inserted at a center portion of said superconducting magnet means, at least part of said superconducting magnet means being formed of a metal member and at least part, located inside said superconducting coil, of said metal member being provided with non-conductive sections for impeding an eddy current;
gradient coil means, arranged inside said superconducting magnet means, for generating a pulse of said gradient field to be applied to said body; and
high frequency coil means for generating an excitation pulse of said high frequency field to be applied to said body, and detecting a magnetic resonance signal produced in said body;
wherein said at least part of said metal member provided with said non-conductive sections is interposed between said superconducting coil and said gradient coil means, and said non-conductive sections are slits formed on said metal member.

4,905,317

PATH MEMORY CONTROL METHOD IN VITERBI DECODER

Hideo Suzuki, Kawasaki, and Masato Tajima, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

PCT No. PCT/JP87/00207, § 371 Date Dec. 1, 1987, § 102(e) Date Dec. 1, 1987, PCT Pub. No. WO87/06081, PCT Pub. Date Oct. 8, 1987
PCT Filed Apr. 2, 1987, Ser. No. 143,169
Claims priority, application Japan, Apr. 3, 1986, 61-75434; Aug. 14, 1986, 61-189561
Int. Cl.[4] H03M 13/22
U.S. Cl. 341—51 6 Claims



1. A path memory control method of a Viterbi decoder comprising the steps of:
storing state transition information between a predetermined time and a time, as a surviving path, in a path memory circuit in accordance with a unit cell structure of a code trellis diagram;
determining decoding data by a trace back on the basis of the state transition information which is stored in the path memory circuit; and
outputting encoding data, corresponding in number to the plurality of decoding steps, from the path memory circuit, at a time when a plurality of decoding steps are required in a trace back to a final stage on the surviving path.

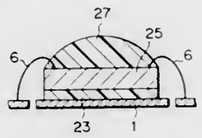
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4,905,318

SEMICONDUCTOR HALL ELEMENT WITH MAGNETIC POWDER IN RESIN

Toshikazu Fukuda, Kawasaki, and Toshihiro Kato, Chigasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 43,607, Apr. 28, 1987, abandoned. This application Mar. 27, 1989, Ser. No. 328,792
Claims priority, application Japan, May 6, 1986, 61-102126
Int. Cl.[4] H01L *27/22*
U.S. Cl. 357—27 7 Claims



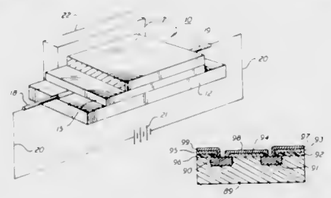
1. A highly magnetic Hall element comprising:
a substrate;
a Hall element chip formed of a semiconductor wafer and mounted over said substrate, said Hall element chip having opposed first and second surfaces;
a resin layer, including a magnetic powder, situated between the substrate and the first surface of said Hall element chip, a substantial portion of said resin layer being positioned beneath the first surface of said Hall element chip, said resin layer adhering said Hall element chip to said substrate;
an encap including a resin mixed with a magnetic powder, a substantial portion of said encap being positioned over the second surface of said Hall element chip, magnetic flux passing through said encap and traveling toward the second surface of said Hall element chip, said encap being thickest in a portion corresponding to a center portion of said Hall element chip;
bonding wires, connecting two pairs of electrodes of said Hall element chip and lead portions of said substrate; and
said sealing material sealing the encap, the Hall element chip, bonding wires, the substrate, and the resin layer.

4,905,319

SUPERCONDUCTING DEVICE INCLUDING A THIN CHROMIUM FILM WITH NEGATIVE SUSCEPTIBILITY

Klaus Schroder, East Syracuse, and Hussin Hejase, Syracuse, both of N.Y., assignors to Syracuse University, Syracuse, N.Y.

Filed Jul. 28, 1987, Ser. No. 78,758
Int. Cl.[4] H01L *23/48, 29/40*
U.S. Cl. 357—65 26 Claims



1. A superconducting device that includes a substrate, a thin metallic film that has a negative susceptibility at room temperature that is mounted upon the substrate, and means to prevent the thin film from oxidizing wherein said thin metallic film is former of chromium.

DESIGN PATENTS

GRANTED FEB. 27, 1990

ERRATA

For CLASS	See PATENT NO.
D19-075	306,234
D07-401	306,267

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306,230
SHIRT
Aniello Nigro, 6720 Via Regina, Boca Raton, Fla. 33433
Filed Feb. 21, 1989, Ser. No. 312,253
Term of patent 14 years
U.S. Cl. D2—220



306,231
SIDE PATCH AND SOLE PERIPHERY FOR A SHOE
Louis B. Dorfman, Newport Beach, Calif., assignor to Vision Street Wear, Inc., Costa Mesa, Calif.
Filed May 4, 1987, Ser. No. 45,139
Term of patent 14 years
U.S. Cl. D2—314



306,232
BLOCKER SOLE WITH TAP INSERT
Craig C. Cummings, Nashville, Tenn., assignor to Acme Boot Company, Inc., Clarksville, Tenn.
Filed May 31, 1989, Ser. No. 359,785
Term of patent 14 years
U.S. Cl. D2—310



306,233
COMBINED KEYCHAIN AND ARTICLE HOLDER
Herbert M. Smith, 27 Elmwood Ave., East Orange, N.J. 07018
Filed Dec. 18, 1987, Ser. No. 134,918
Term of patent 14 years
U.S. Cl. D3—62

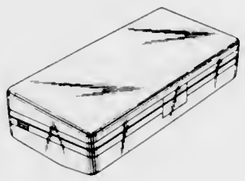






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306,234
BOX
Erhard Ferstl, Kowloon, Hong Kong, assignor to Form & Pac Co., Ltd., Kowloon, Hong Kong
Filed Aug. 19, 1986, Ser. No. 898,185
Claims priority, application United Kingdom, Feb. 20, 1986, 1032362
Term of patent 14 years
U.S. Cl. D19—75



306,235
HOLDING CASE FOR DINING AND COOKING ARTICLES
Hiromi Tamamura, Tokyo, Japan, assignor to Plus Corporation, Tokyo, Japan
Filed Jun. 23, 1986, Ser. No. 877,683
Claims priority, application Japan, Feb. 3, 1986, 61-3586
Term of patent 14 years
U.S. Cl. D3—75



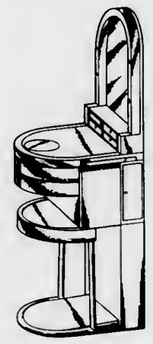
306,236
BRUSH HEAD FOR MOUNTING IN A DENTAL INSTRUMENT
Hans Olsen, Copenhagen, Denmark, assignor to Professional Dental Technologies, Inc., Batesville, Ark.
Continuation of Ser. No. 654,189, Sep. 18, 1984. This application May 10, 1988, Ser. No. 192,499
Claims priority, application Denmark, Mar. 29, 1984, 296/84
Term of patent 14 years
U.S. Cl. D4—104

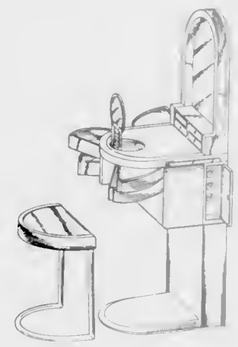


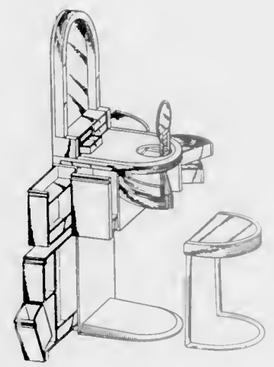
306,237
TUBULAR ARM CHAIR
Gregory M. Saul, Jefferson City, Tenn., assignor to Shelby Williams Industries, Inc., Chicago, Ill.
Filed Mar. 26, 1987, Ser. No. 30,097
Term of patent 14 years
U.S. Cl. D6—380



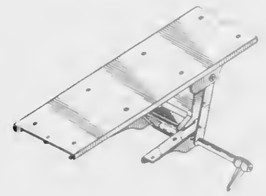
306,238
COMBINED VANITY AND SEAT UNIT
Oanh Pham-Phu, Hohenzollernstrasse 97, 8000 Munich 40, Fed. Rep. of Germany
Filed Oct. 22, 1986, Ser. No. 922,541
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, AR 313/86
Term of patent 14 years
U.S. Cl. D6—397



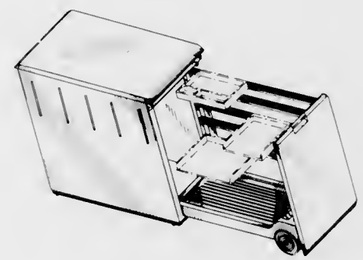




306,239
KEYBOARD SUPPORT
Richard L. Watt, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.
Filed Jan. 16, 1987, Ser. No. 4,023
Term of patent 14 years
U.S. Cl. D6—430



306,240
STORAGE CABINET
Thomas J. Newhouse, Grand Rapids, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Jun. 2, 1987, Ser. No. 57,825
Term of patent 14 years
U.S. Cl. D6—448

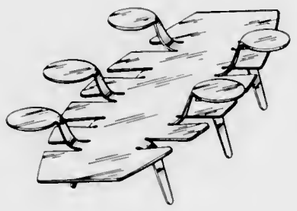


306,241
BATHROOM ETAGERE
Peter Y. K. Mo, Flat 1002, Block A, 10th Floor, Lotto Villa, 18 Broadwood Road, Happy Valley, Hong Kong
Filed Mar. 29, 1989, Ser. No. 328,831
Term of patent 14 years
U.S. Cl. D6—465

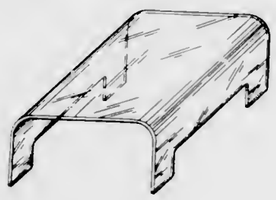


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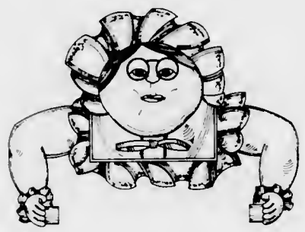
306,242
TABLE
Massimo Morozzi, Milan, Italy, assignor to Fiam S.r.l., Tavillia, Italy
Filed Dec. 23, 1986, Ser. No. 1,532
Claims priority, application Italy, Jun. 25, 1986, 22370/86[U]
Term of patent 14 years
U.S. Cl. D6—482



306,243
TABLE
Vittorio Livi, Pesaro, Italy, assignor to Fiam S.r.l., Tavullia, Italy
Filed Dec. 23, 1986, Ser. No. 1,531
Claims priority, application Italy, Jun. 25, 1986, 22371/86[U]
Term of patent 14 years
U.S. Cl. D6—485



306,244
PAPER TOWEL HOLDER
Mary L. King, 3742-A Gettysburg St., Ft. Irwin, Calif. 92310
Filed Jun. 22, 1988, Ser. No. 209,792
Term of patent 14 years
U.S. Cl. D6—522

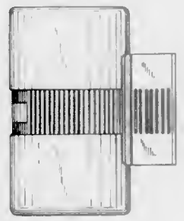




306,245
PILLOW
Farid Akhtarekhavari, 8621 SW. 179th St., Miami, Fla. 33157
Filed Feb. 12, 1987, Ser. No. 942,584
Term of patent 14 years
U.S. Cl. D6—601



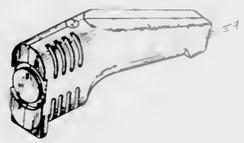
306,246
FOOD AND BEVERAGE MAKER
Howard L. Rauch, Old Saybrook, Conn., assignor to North American Philips Corp., New York, N.Y.
Filed Dec. 17, 1986, Ser. No. 943,289
Term of patent 14 years
U.S. Cl. D7—300



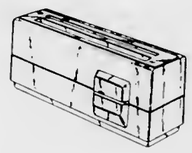
306,247
GOLF GREEN HOLE AUGER
Robert L. Shields, Rte. 3, Box 72, Miltona, Minn. 56354
Filed Aug. 15, 1988, Ser. No. 232,130
Term of patent 14 years
U.S. Cl. D8—8



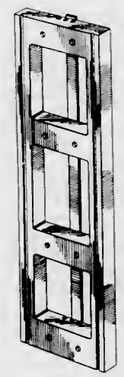
306,248
ELECTRICALLY HEATED TOOL FOR APPLYING AN ANCHORING FASTENER
Edward D. Levy, Stuart, Fla.; Edward H. Meisner, Short Hills, N.J.; Michael P. Ballone, New Providence, N.J., and Carson E. Ahlman, Oradell, N.J., assignors to Parker Manufacturing Company, Mass.
Filed May 6, 1987, Ser. No. 47,056
Term of patent 14 years
U.S. Cl. D8—30



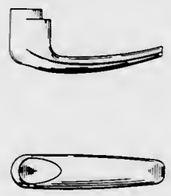
306,249
COMBINED PAPER FOLDER AND ENVELOPE OPENER OR SIMILAR ARTICLE
Kenji Tamada, and Kimitoshi Saito, both of Kodaira, Japan, assignors to Silver Seiko Ltd., Tokyo, Japan
Filed Jun. 24, 1987, Ser. No. 66,105
Claims priority, application Japan, Dec. 25, 1986, 61-51966
Term of patent 14 years
U.S. Cl. D8—61



306,250
ROUTER GUIDE FOR DOOR HINGES
John A. Kyrklund, 6496 Cleo St., San Diego, Calif. 92115
Filed Nov. 10, 1986, Ser. No. 929,163
Term of patent 14 years
U.S. Cl. D8—70

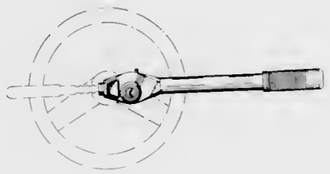


306,251
DOOR HANDLE
Arnold I. Kuli, San Francisco, Calif., assignor to Schlage Lock Company, San Francisco, Calif.
Filed Dec. 29, 1987, Ser. No. 139,334
Term of patent 14 years
U.S. Cl. D8—302



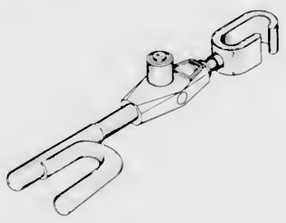
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306,252
AUTOMOBILE STEERING WHEEL LOCK ARM
Charles R. Johnson, Hudson, Ohio, assignor to James E. Winoer, Jr., Sharon, Pa.
Filed Oct. 5, 1987, Ser. No. 104,097
Term of patent 14 years
U.S. Cl. D8—331

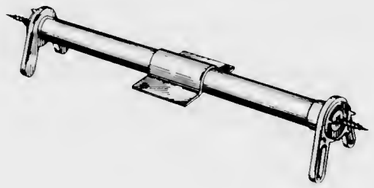




306,253
AUTOMOBILE LOCK FOR ATTACHMENT TO A FLOOR-MOUNTED GEAR SHIFT LEVER AND HAND BRAKE
Joseph E. Solow, Plainview, N.Y., assignor to Wolo Manufacturing Company, Deer Park, N.Y.
Filed Jan. 6, 1988, Ser. No. 141,331
Term of patent 14 years
U.S. Cl. D8—331



306,254
WALL/CEILING HANGER ASSEMBLY
Jack R. Kerr, Jr., 6017 Meadowside, Arlington, Tex. 76017
Continuation of Ser. No. 337,341, Apr. 13, 1989. This application May 17, 1989, Ser. No. 354,098
Term of patent 14 years
U.S. Cl. D8—376

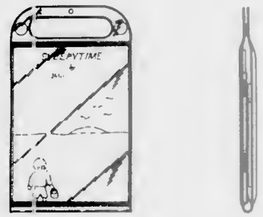








306,255
COMBINED PACKAGE, BOOK AND CASSETTE
Leonard H. Lambert, 40 Sanderstead Rd., Croydon, Surrey CR2 UPA, United Kingdom
Filed Nov. 25, 1986, Ser. No. 934,989
Claims priority, application United Kingdom, May 27, 1986, 1034480
Term of patent 14 years
U.S. Cl. D9—305





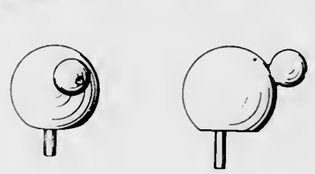
306,256
COMBINED COMPACT DISC SLEEVE AND CLOSURE INDEXING FLAP
Francis Hsu, 16 Coventry Cir., Piscataway, N.J. 08854
Filed Oct. 7, 1985, Ser. No. 785,384
Term of patent 14 years
U.S. Cl. D9—335



306,257
BOTTLE
Loretta H. Uhmeyer, Stamford, Conn., assignor to Max Factor & Co., New York, N.Y.
Filed Apr. 10, 1987, Ser. No. 36,692
Term of patent 14 years
U.S. Cl. D9—384



306,258
LIQUID DISPENSING CAP
Douglas M. Liss, New York, N.Y., assignor to Alko Ltd., Finland
Filed Nov. 12, 1987, Ser. No. 119,428
Term of patent 14 years
U.S. Cl. D9—447



306,259
BOTTLE
Michel Daucourt, Cognac, France, assignor to Camus la Grande Marque, Cognac, Canada
Filed Apr. 20, 1987, Ser. No. 40,495
Term of patent 14 years
U.S. Cl. D9—385



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306,260
BOTTLE
Michel Daucourt, Cognac, France, assignor to Camus la Grande Marque, Cognac, France
Filed Apr. 20, 1987, Ser. No. 40,494
Term of patent 14 years
U.S. Cl. D9—391



306,261
BOTTLE
Vernon C. Rader, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 525,353, Aug. 22, 1983. This application Feb. 2, 1984, Ser. No. 575,261
Term of patent 14 years.
U.S. Cl. D9—393



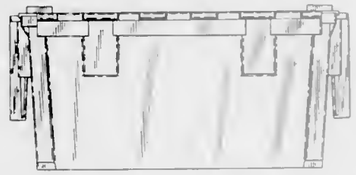
306,262
BOTTLE
Claude Bit, Thonon, France, assignor to Societe Anonyme des Eaux Minerales d'Evian, Evian Les Baines, France
Filed Jan. 28, 1986, Ser. No. 823,281
Claims priority, application Hague, Oct. 29, 1985, DM/006 016
Term of patent 14 years
U.S. Cl. D9—396



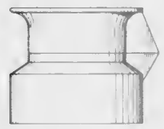
306,263
CONTAINER
Leopold P. Kerr, and Alice P. Kerr, both of Laval, Canada, assignors to Artel Incorporated, Quebec, Canada
Filed Feb. 5, 1987, Ser. No. 11,309
Claims priority, application Canada, Aug. 7, 1986, 07-08-86-4
Term of patent 14 years
U.S. Cl. D9—423



306,264
CONTAINER WITH LID
John A. Malmanger, Vashon Island, Wash., assignor to Xytec Plastics, Inc., Tacoma, Wash.
Filed Aug. 3, 1987, Ser. No. 80,704
Term of patent 14 years
U.S. Cl. D9—432



306,265
BOTTLE CAP
Anton C. G. Leebeek, Brussels, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Oct. 27, 1987, Ser. No. 114,259
Claims priority, application Benelux, Apr. 27, 1987, 04089-00
Term of patent 14 years
U.S. Cl. D9—435



306,266
SAMPLING BOTTLE CLOSURE
Barry C. Hargrove, 8300 NW. 38 Ter., Bethany, Okla. 73008, and James D. Madden, 428 Hanging Elm, Norman, Okla. 73069
Filed Jun. 13, 1986, Ser. No. 875,775
Term of patent 14 years
U.S. Cl. D9—447



306,267
CONDIMENT DISPENSER CAP OR THE LIKE
Charles P. Stewart, Ligonier, Pa., assignor to Kerr-Hays Company, Ligonier, Pa.
Filed Jan. 9, 1987, Ser. No. 1,992
Term of patent 14 years
U.S. Cl. D7—401.1



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306,268
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,113
Claims priority, application Italy, Jun. 22, 1987, 35872/87[]
Term of patent 14 years
U.S. Cl. D11—11



306,270
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,119
Claims priority, application Italy, Jun. 22, 1987, 35871/87-[U]
Term of patent 14 years
U.S. Cl. D11—16



306,269
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,115
Claims priority, application Italy, Jun. 22, 1987, 85872/87-[U]
Term of patent 14 years
U.S. Cl. D11—15



306,271
LINK ELEMENT
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,117
Claims priority, application Italy, Jun. 22, 1987, 35872/87[U]
Term of patent 14 years
U.S. Cl. D11—93

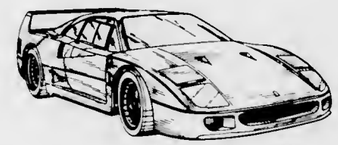


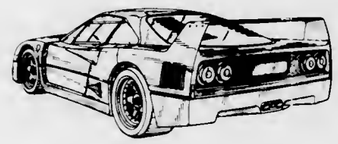
306,272
OVERALL CLIP
James B. Kruger, Oxford, Conn., assignor to West Haven Buckle Company, West Haven, Conn.
Filed Feb. 5, 1987, Ser. No. 11,495
Term of patent 14 years
U.S. Cl. D11—212





306,274
AUTOMOBILE
Leonardo Fioravanti, Moncalieri, Italy, assignor to Ferrari Societa per Azioni Esercizio Fabbriche Automobili e Corse, Modena, Italy
Filed Dec. 11, 1987, Ser. No. 132,541
Claims priority, application Italy, Jun. 12, 1987, 53403/87[U]
Term of patent 14 years
U.S. Cl. D12—91

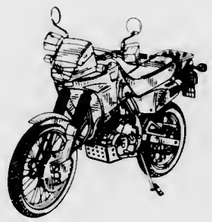




306,273
AUTOMOBILE
Yasuo Tsuda, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Oct. 19, 1987, Ser. No. 109,614
Claims priority, application Japan, Apr. 27, 1987, 62-16536
Term of patent 14 years
U.S. Cl. D12—91

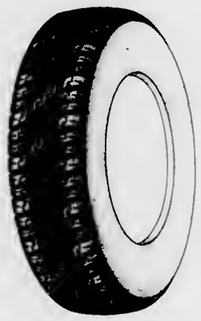


306,275
MOTORCYCLE
Takashi Maruyama, Oomiya; Shinri Chibuka, Wako, and Tomonori Mogi, Tsurugashima, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 21, 1987, Ser. No. 110,802
Claims priority, application Japan, Apr. 22, 1987, 62-15710
Term of patent 14 years
U.S. Cl. D12—110



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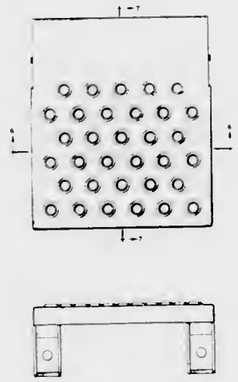
306,276
TIRE
Maurice Graas, Luxembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 19, 1987, Ser. No. 28,145
The portion of the term of this patent subsequent to Jan. 16, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147



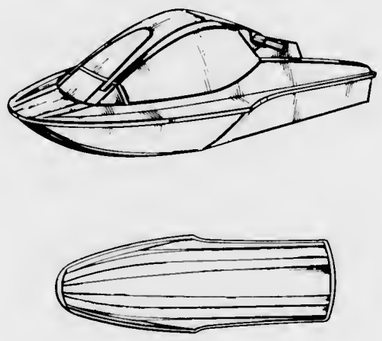
306,277
CONVEX MIRROR
Richard C. Wilson, Carefree Box 14F, Big Lake, Minn. 55309
Filed Sep. 1, 1987, Ser. No. 91,703
Term of patent 14 years
U.S. Cl. D12—189



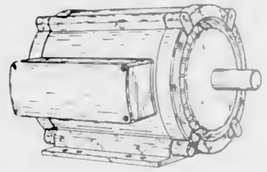
306,278
STEP PLATFORM FOR OVER-THE-ROAD TRUCKS OR TRACTORS
Robert E. Hafvenstein, 4353 Svensk La., Eagan, Minn. 55123
Filed Oct. 23, 1987, Ser. No. 111,708
Term of patent 14 years
U.S. Cl. D12—203



306,279
MOTORBOAT
Keizi Nakagawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Jan. 7, 1987, Ser. No. 1,100
Claims priority, application Japan, Jul. 12, 1986, 61-27322
Term of patent 14 years
U.S. Cl. D12—307

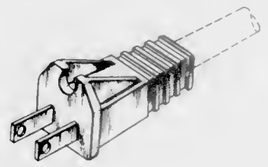


306,280
DYNAMOELECTRIC MACHINE
Herbert H. F. Pfeifer, San Jose, and Steven C. McDonald, Los Gatos, both of Calif., assignors to General Electric Company, Fort Wayne, Ind.
Filed Feb. 17, 1987, Ser. No. 15,333
Term of patent 14 years
U.S. Cl. D13—3

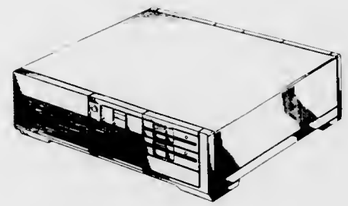


306,281
AUXILIARY BATTERY
Richard R. Braswell, Long Beach, Calif., assignor to The Richards Braswell Research Corporation, Signal Hill, Calif.
Filed Mar. 3, 1988, Ser. No. 163,873
Term of patent 14 years
U.S. Cl. D13—8

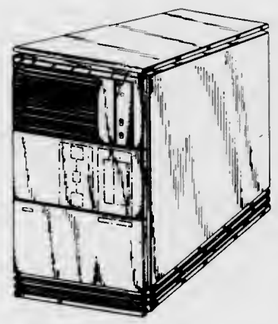
306,282
ELECTRIC LINE CORD PLUG
Robert W. Arehart, Downers Grove; Raymond W. Peeler, and Keith F. Kraus, both of Chicago, all of Ill., assignors to Ryobi Motor Products Corp., Pickens, S.C.
Filed Jul. 20, 1987, Ser. No. 75,921
Term of patent 14 years
U.S. Cl. D13—28



306,283
COMPUTER
Duane M. Loose, Chelmsford, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.
Filed Feb. 5, 1987, Ser. No. 11,553
Term of patent 14 years
U.S. Cl. D14—100



306,284
COMPUTER HOUSING
Marcus C. Koepke, Clinton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Oct. 22, 1986, Ser. No. 922,098
Term of patent 14 years
U.S. Cl. D14—102

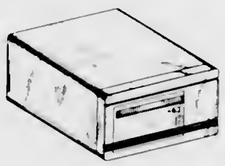


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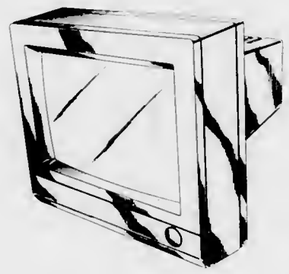
306,285
PORTABLE PERSONAL COMPUTER OR SIMILAR ARTICLE
Chien T. Yu, Panchiao, Taiwan, assignor to P & C Shiten Enterprise Co., Ltd., Taipei, Taiwan
Filed Dec. 10, 1987, Ser. No. 130,965
Term of patent 14 years
U.S. Cl. D14—106



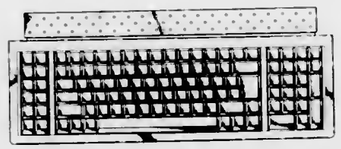
306,286
OPTICAL DISK STORAGE
Masaharu Sawatani, Kamakura, and Akio Kusaura, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 26, 1987, Ser. No. 66,634
Claims priority, application Japan, Dec. 26, 1986, 61-52477
Term of patent 14 years
U.S. Cl. D14—109



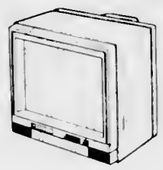
306,287
VIDEO DISPLAY
Lawrence M. Kuba, Nashua, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.
Filed Nov. 10, 1986, Ser. No. 929,236
The portion of the term of this patent subsequent to Nov. 7, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—113



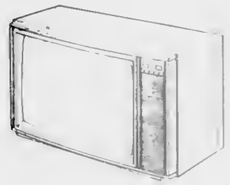
306,288
KEYBOARD
Howell Hsiao, Mountain View, and Herbert Pfeifer, San Jose, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.
Filed Feb. 9, 1988, Ser. No. 154,124
Term of patent 14 years
U.S. Cl. D14—115



306,289
TELEVISION RECEIVER
Suk J. Lee, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 4, 1987, Ser. No. 81,886
Claims priority, application Rep. of Korea, Feb. 14, 1987, 1821/1987
Term of patent 14 years
U.S. Cl. D14—126



306,290
TELEVISION RECEIVER
Suk J. Lee, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 4, 1987, Ser. No. 81,891
Claims priority, application Rep. of Korea, Feb. 14, 1987, 1820/1987
Term of patent 14 years
U.S. Cl. D14—126



306,291
PORTABLE RADIO TELEPHONE
Katsuhito Watanabe, and Kazuhito Takai, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Oct. 25, 1988, Ser. No. 262,028
Claims priority, application Japan, Apr. 27, 1988, 63-16824
Term of patent 14 years
U.S. Cl. D14—138





306,292
TELEPHONE SET
Edward Blinn, and Diane Hughes, both of 428 S. Washington Ave., Moorestown, N.J. 08057
Filed Jan. 3, 1989, Ser. No. 292,733
Term of patent 14 years
U.S. Cl. D14—143





306,293
VEHICULAR HANDSET TELEPHONE CONTROL UNIT OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, and Terrance N. Taylor, Cary, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 21, 1988, Ser. No. 288,053
Term of patent 14 years
U.S. Cl. D14—148

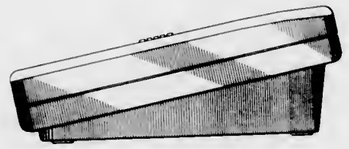


306,294
PORTABLE RADIO TELEPHONE
Katsuhito Watanabe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Mar. 8, 1989, Ser. No. 321,196
Claims priority, application Japan, Sep. 12, 1988, 63-35749
Term of patent 14 years
U.S. Cl. D14—148

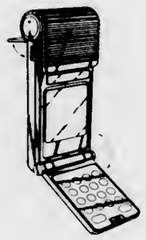


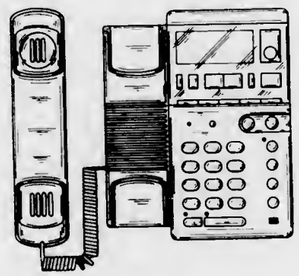
306,295
DESK TOP CONTROLLER OR SIMILAR ARTICLE OF MANUFACTURE
Albert L. Nagele, Wilmette, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 31, 1989, Ser. No. 305,662
Term of patent 14 years
U.S. Cl. D14—149

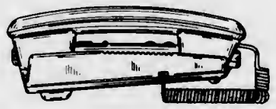




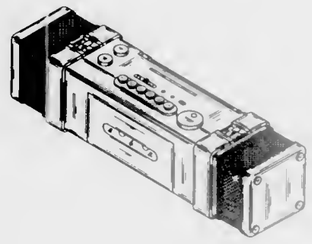
306,296
TELEPHONE SET
Ryozo Hayashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 10, 1988, Ser. No. 230,770
Claims priority, application Japan, Feb. 17, 1988, 63-6405
Term of patent 14 years
U.S. Cl. D14—151



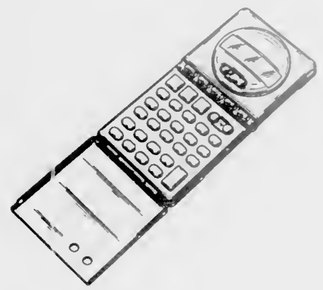


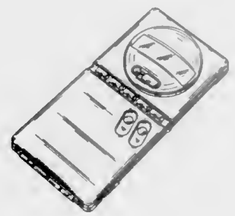


306,297
COMBINED TAPE RECORDER AND RADIO
Tatsuo Mori, and Tsutomu Yamazaki, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 28, 1987, Ser. No. 138,687
Claims priority, application Japan, Jun. 29, 1987, 62-26519
Term of patent 14 years
U.S. Cl. D14—163

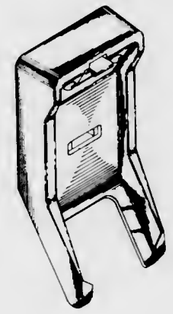


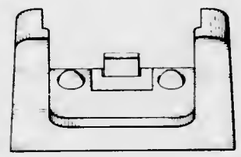
306,298
AUTODIALER WITH ELECTRONIC TELEPHONE DIRECTORY
Masaji Sawada, and Tadahiko Saimen, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 26, 1988, Ser. No. 224,129
Claims priority, application Japan, Jan. 28, 1988, 63-3157
Term of patent 14 years
U.S. Cl. D14—245





306,299
TELEPHONE HANDSET HOLDER OR SIMILAR ARTICLE
Leonid Soren, Lincolnwood, and Gary R. Weiss, Wheeling, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 27, 1988, Ser. No. 264,305
Term of patent 14 years
U.S. Cl. D14—251

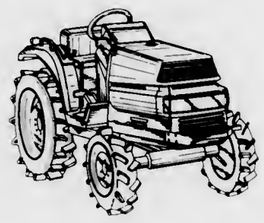




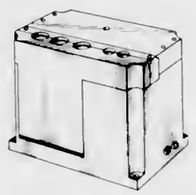
306,300
COMBINED VAPOR AND OIL COLLECTION UNIT FOR ATTACHMENT TO A DIESEL ENGINE BREATHING TUBE
Melvin L. Hoover, Rte. 1, Como, Tex. 75431
Filed Jun. 25, 1987, Ser. No. 66,398
Term of patent 14 years
U.S. Cl. D15—5



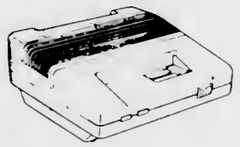
306,301
AGRICULTURAL TRACTOR
Genichi Funabashi, Seanan, and Hiroyuki Miki, Sakai, both of Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Mar. 27, 1987, Ser. No. 30,631
Term of patent 14 years
U.S. Cl. D15—23



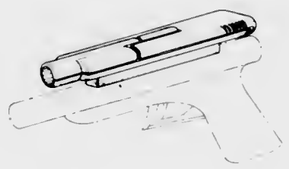
306,302
WELDING CONTROL UNIT FOR RESISTANCE WELDING
Takatomo Izume, Urawa, Japan, and Michael Lalonde, Detroit, Mich., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 7, 1988, Ser. No. 178,446
Term of patent 14 years
U.S. Cl. D15—144.1



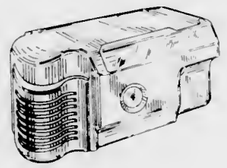
306,303
LAMINATING DEVICE FOR IDENTIFICATION CARDS OR THE LIKE
Shigekazu Takeda, Tokyo, Japan, assignor to Fuji Plastic Kikai Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 30, 1987, Ser. No. 102,643
Claims priority, application Japan, Apr. 2, 1987, 62-12420
Term of patent 14 years
U.S. Cl. D15—199



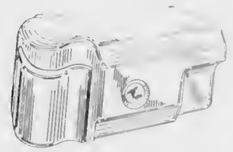
306,304
LIGHT EMITTING SIGHT DEVICE USED WITH WEAPON-TYPE AMUSEMENT DEVICES
Daryl J. Tichy, Orem, Utah, assignor to Tradimex International Inc., Orem, Utah
Filed Jul. 28, 1988, Ser. No. 225,145
Term of patent 14 years
U.S. Cl. D16—130

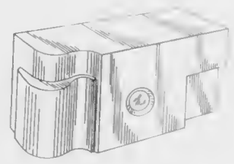


306,305
CAMERA HOUSING
Scott Robinson, Northbrook, and Hari Matsuda, Evanston, both of Ill., assignors to W. Haking Enterprises Limited, North Point, Hong Kong
Filed Aug. 29, 1986, Ser. No. 900,378
The portion of the term of this patent subsequent to Feb. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—200

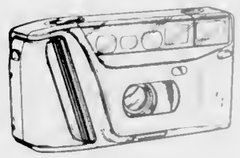


306,306
CAMERA HOUSING
Scott Robinson, Northbrook, and Hari Matsuda, Evanston, both of Ill., assignors to W. Haking Enterprises Limited, North Point, Hong Kong
Filed Aug. 29, 1986, Ser. No. 900,377
The portion of the term of this patent subsequent to Feb. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—200

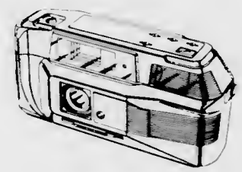




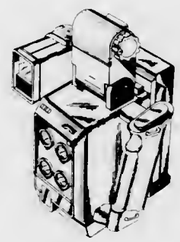
306,307
35 MM CAMERA
Hitoshi Suyama, Kawasaki, and Hiroshi Kobayashi, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Jan. 8, 1987, Ser. No. 1,556
Claims priority, application Japan, Jul. 22, 1986, 61-28622
Term of patent 14 years
U.S. Cl. D16—209



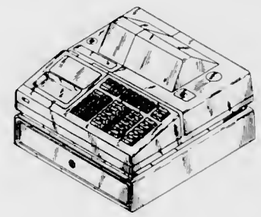
306,308
CAMERA
Yoshihisa Minakawa, Chiba, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Feb. 20, 1987, Ser. No. 17,432
Claims priority, application Japan, Aug. 29, 1986, 61-33930
Term of patent 14 years
U.S. Cl. D16—209



306,309
PORTRAIT CAMERA WITH BUILT-IN FOLDING FLASH
Stephen E. Lane; Aidan Petrie, both of Boston, Mass., and Erik P. Thomas, Warwick, R.I., assignors to Polaroid Corporation, Cambridge, Mass.
Filed May 28, 1987, Ser. No. 55,117
Term of patent 14 years
U.S. Cl. D16—209



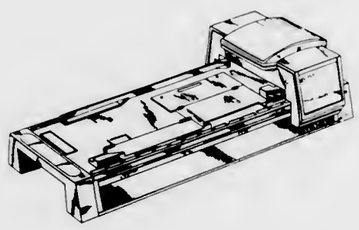
306,310
ELECTRORNIC CASH REGISTER
Yutaka Kobayashi, Hirakata, and Koichi Hyakutake, Nogata, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan
Filed Apr. 28, 1987, Ser. No. 43,294
Claims priority, application Japan, Nov. 4, 1986, 61-43676
Term of patent 14 years
U.S. Cl. D18—4



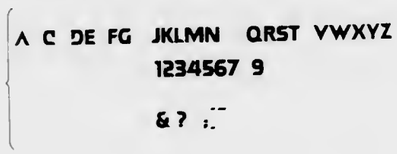
306,311
ELECTRONIC CALCULATOR
Tetsuo Sugi, and Kazuyoshi Kojima, both of Kanagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 6, 1987, Ser. No. 12,216
Claims priority, application Japan, Nov. 20, 1986, 61-45953
Term of patent 14 years
U.S. Cl. D18—7



306,312
MANUAL IMPRINTER
Mark Cunnane, Clontarf, and Richard P. Delaney, Portmarnock, both of Ireland, assignors to Security Imprinter Corporation, Walkersville, Md.
Filed Sep. 23, 1986, Ser. No. 911,082
Claims priority, application Ireland, May 30, 1986, 166/86
Term of patent 14 years
U.S. Cl. D18—14



306,313
TYPEFACE
Paul M. Levy, Washington, D.C., assignor to International Monetary Fund, Washington, D.C.
Filed Oct. 20, 1987, Ser. No. 110,489
Term of patent 14 years
U.S. Cl. D18—24



306,314
FILE FOLDER LABEL SHEET
Alison Jessamine, Toronto; Oscar Aharonian, Mississanga; George M. Buttigieg, Toronto, and E. Anne McKee, North York, all of Canada, assignors to Avery Label Systems, Inc., Mississanga, Canada
Filed Apr. 28, 1986, Ser. No. 857,804
Term of patent 14 years
U.S. Cl. D19—1



306,315
COMBINED TWIN-NIBBED MARKER AND BALL-POINT PEN
Koichi Shintani, Kashiwa, Japan, assignor to Colleen Pencil Co. Ltd., Tokyo, Japan
Filed Apr. 24, 1987, Ser. No. 43,197
Term of patent 14 years
U.S. Cl. D19—36



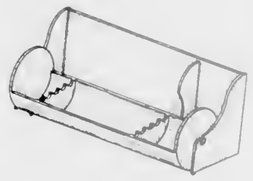
306,316
TWIN-NIBBED MARKING INSTRUMENT
Koichi Shintani, No. 1872-77, Hananoi, Kashiwa-shi, Japan
Filed Apr. 24, 1987, Ser. No. 43,198
Term of patent 14 years
U.S. Cl. D19--36



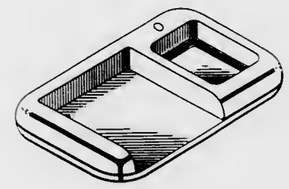
306,317
CLIP FOR A WRITING INSTRUMENT OR SIMILAR ARTICLE
Tor Petterson, Rancho Palos Verdes, Calif., assignor to Pentel of America. Ltd., Torrance, Calif.
Filed Dec. 11, 1986, Ser. No. 940,643
Term of patent 14 years
U.S. Cl. D19--56



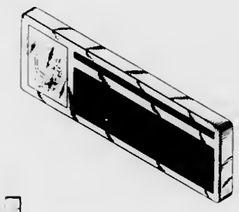
306,318
HOLDER FOR ASSORTED STATIONERY ARTICLES
Fu-Chung Hsiao, P.O. Box 10160, Taipei, Taiwan
Filed Nov. 28, 1986, Ser. No. 936,025
Term of patent 14 years
U.S. Cl. D19—75



306,319
HOLDER FOR ASSORTED DESK ARTICLES
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Division of Ser. No. 769,316, Aug. 26, 1985. This application Mar. 6, 1989, Ser. No. 320,388
Term of patent 14 years
U.S. Cl. D19—77

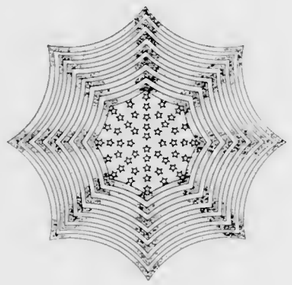


306,320
SIGN
George N. Stonbely, New York, N.Y., assignor to Spectacolor Inc., New York, N.Y.
Filed Jun. 22, 1987, Ser. No. 65,206
Term of patent 14 years
U.S. Cl. D20—10

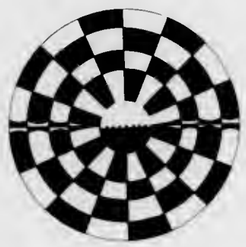


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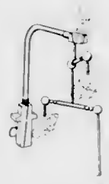
306,321
ADHESIVE LABEL
Robert E. Gramera, 228 Aspen Dr. D.W. II, Durango, Colo. 81301
Filed Sep. 14, 1987, Ser. No. 97,075
Term of patent 14 years
U.S. Cl. D20—11



306,322
GAME BOARD
Steven F. Kropfl, 34 Chestnut St., Murray Hill, N.J. 07974
Filed Jun. 9, 1986, Ser. No. 872,441
Term of patent 14 years
U.S. Cl. D21—24



306,323
MOBILE
Robert D. Wise, Akron, Ohio, assignor to Century Products Company, Macedonia, Ohio
Filed Oct. 20, 1987, Ser. No. 111,522
Term of patent 14 years
U.S. Cl. D21—63



306,324
SCOOP CONTAINER
Christopher Dykes, Great Falls, Va., assignor to Tyco Industries, Inc., Moorestown, N.J.
Filed Dec. 5, 1986, Ser. No. 938,706
Term of patent 14 years
U.S. Cl. D21—120



306,325
TOY CAROUSEL
Tony R. Maness, Booneville, Ark., assignor to Spang & Company, Butler, Pa.
Filed Dec. 21, 1987, Ser. No. 135,291
Term of patent 14 years
U.S. Cl. D21—124



306,326
STUFFED TOY FIGURE
Gwendolyn A. Fiust, 526 Hellwig La., West Islip, N.Y. 11795
Filed Dec. 19, 1986, Ser. No. 943,594
Term of patent 14 years
U.S. Cl. D21—148



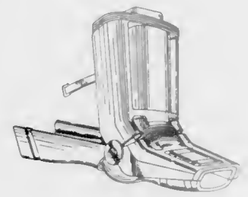
306,327
STUFFED TOY DOLL
A. Edward Fogarty, and Bonnie R. Fogarty, both of 39 Sandy Hook Rd., Sarasota, Fla. 34242
Filed Jan. 27, 1987, Ser. No. 7,384
Term of patent 14 years
U.S. Cl. D21—166



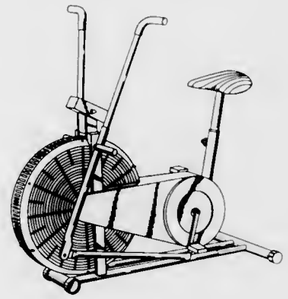
306,328
STUFFED TOY FIGURE
Gwendolyn A. Fiust, 526 Hellwig La., West Islip, N.Y. 11795
Filed Dec. 19, 1986, Ser. No. 943,593
Term of patent 14 years
U.S. Cl. D21—177



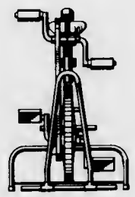
306,329
AQUATIC EXERCISE BOOT
Daniel S. Solloway, 11121 Ashford Dr., Yukon, Okla. 73099
Filed Jul. 28, 1987, Ser. No. 78,699
Term of patent 14 years
U.S. Cl. D21—191



306,330
CYCLE EXERCISER
James F. Lucas, Auburn; Michael R. Byrd, and Bruce F. Coody, both of Opelika, all of Ala., assignors to Diversified Products Corporation, Opelika, Ala.
Filed Dec. 23, 1988, Ser. No. 288,808
Term of patent 14 years
U.S. Cl. D21—194



306,331
BICYCLE EXERCISER
Vernon A. Miller, 41069 Sunset La., Hemet, Calif. 92344
Filed Feb. 25, 1988, Ser. No. 160,110
Term of patent 14 years
U.S. Cl. D21—194



306,332
BARBELL WEIGHT OR SIMILAR ARTICLE
David L. Mayfield, 623 S. Maple, Staunton, Ill. 62088
Filed Nov. 2, 1987, Ser. No. 116,503
Term of patent 14 years
U.S. Cl. D21—196



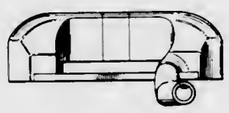
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306,333
PUTTER HEAD
Roy G. Obester, 1039 Humboldt St., Reno, Nev. 89509
Filed Nov. 4, 1986, Ser. No. 926,767
Term of patent 14 years
U.S. Cl. D21—219



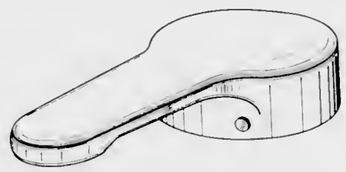
306,334
GOLF PUTTER HEAD
Felix E. Alcala, 13967 Marquesas Way, #2, Marina del Rey, Calif. 90292
Filed Dec. 22, 1986, Ser. No. 944,607
Term of patent 14 years
U.S. Cl. D21—219



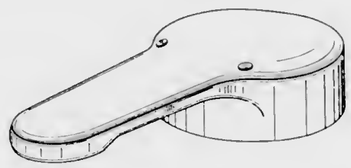
306,335
SNAP-ON LEVEL FOR GOLF PUTTERS
Joseph M. Franey, 7432 Landau Curve, Bloomington, Minn. 55438
Filed Jun. 29, 1987, Ser. No. 67,090
Term of patent 14 years
U.S. Cl. D21—234



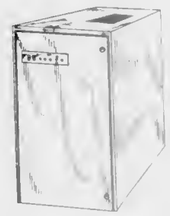
306,336
FAUCET HANDLE
Hans Oberdörfer, Stuttgart, Fed. Rep. of Germany, assignor to Hansa Metallwerke AG, Fed. Rep. of Germany
Filed Mar. 30, 1987, Ser. No. 31,451
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, MR6229
The portion of the term of this patent subsequent to Feb. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—252



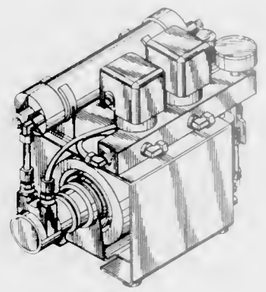
306,337
FAUCET HANDLE
Hans Oberdörfer, Stuttgart, Fed. Rep. of Germany, assignor to Hansa Metallwerke AG, Fed. Rep. of Germany
Filed Mar. 30, 1987, Ser. No. 31,121
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, MR6166
The portion of the term of this patent subsequent to Feb. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—252



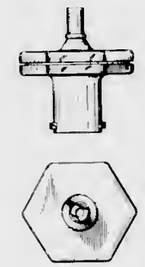
306,338
WATER DISTILLATION UNIT
Dale A. Rempe; David J. Shannon, and Keith L. Vacha, all of Lincoln, Nebr., assignors to Pure Water, Inc., Lincoln, Nebr.
Filed Mar. 10, 1987, Ser. No. 24,256
Term of patent 14 years
U.S. Cl. D23—207



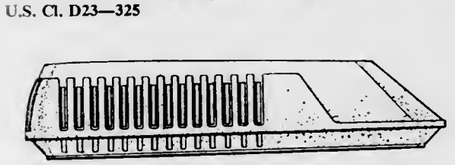
306,339
REVERSE OSMOSIS WATER PURIFICATION UNIT
Jack P. Sloval, 8901 Crescent, Huntington Beach, Calif. 92646
Filed Jul. 30, 1987, Ser. No. 79,602
Term of patent 14 years
U.S. Cl. D23—207



306,340
FILTER HOUSING
Graham J. Whiting, Doddington, England, assignor to British Alcan Aluminium PLC, Chalfont Park, England
Filed Feb. 25, 1988, Ser. No. 160,083
Claims priority, application United Kingdom, Sep. 4, 1987, 1044589
Term of patent 14 years
U.S. Cl. D23—209



306,341
VEHICLE ROOFTOP AIR CONDITIONER HOUSING
David W. Bales, Manchester, and James E. Roth, DeSoto, both of Mo., assignors to Nordyne, Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 899,250, Aug. 22, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 107,756
Term of patent 14 years
U.S. Cl. D23—325

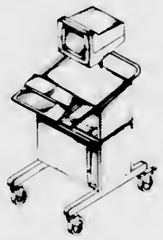


306,342
ELECTRIC STORAGE HEATER
Richard J. Lane, Willowdene, Moddershall, Stone, Staffordshire ST 15 8TG, England
Filed Jul. 28, 1987, Ser. No. 79,331
Claims priority, application United Kingdom, Feb. 3, 1987, 1039707
Term of patent 14 years
U.S. Cl. D23—332



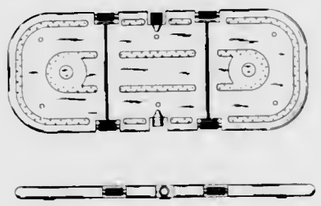
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306,343
MEDICAL ULTRASOUND SCANNER
Joseph L. Ungar, Redmond, Wash., assignor to Advanced Technology Laboratories, Inc., Bothell, Wash.
Filed Apr. 27, 1987, Ser. No. 43,682
Term of patent 14 years
U.S. Cl. D24—17

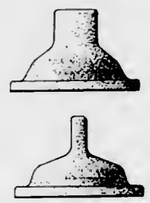


306,344
HAND-HELD DRY HYDRO-MASSAGE UNIT FOR A SPA
Jonathan Watkins, Vista, Calif., assignor to Watkins Manufacturing Corporation, Carlsbad, Calif.
Filed Jul. 13, 1988, Ser. No. 218,762
Term of patent 14 years
U.S. Cl. D24—36

306,345
AIR BUBBLING BATH MAT
Stanley T. Walczak, Brookfield, and Samuel F. Peterson, Chicago, both of Ill., assignors to Associated Mills Inc., Chicago, Ill.
Filed Jun. 26, 1987, Ser. No. 67,456
Term of patent 14 years
U.S. Cl. D24—38



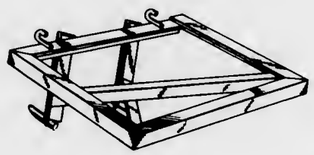
306,346
PET NURSING NIPPLE
Patricia A. Saras, 506 Addison Ave. W., Twin Falls, Id. 83301
Filed Jul. 22, 1987, Ser. No. 76,564
Term of patent 14 years
U.S. Cl. D24—46



306,347
DELAYED ACTION DOSAGE UNIT FOR RELEASING MEDICAMENTS OR THE LIKE IN RUMINANTS
Robert J. Gyurik, Downington, Pa., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.
Filed Nov. 19, 1986, Ser. No. 932,979
Term of patent 14 years
U.S. Cl. D24—63



306,348
DEER STAND
Rodney L. Baumeister, 130 Railway St., Loretto, Minn. 55357
Filed Oct. 11, 1988, Ser. No. 255,532
Term of patent 14 years
U.S. Cl. D25—62



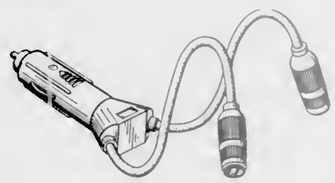
306,349
UNASSEMBLED SAW HORSE IN STORAGE CONDITION
Clifford K. Logan, Jr., 9810 Hefner Village Blvd., Oklahoma City, Okla. 73132
Filed Feb. 5, 1988, Ser. No. 152,919
Term of patent 14 years
U.S. Cl. D25—67



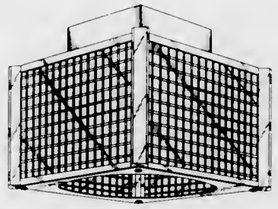
306,350
ELEVATED FLOOR PLATE
Carl S. Hardwicke, Grosse Pointe, Mich.; Howard R. Leffel, Jr., Maumee, and George S. Spatoulas, Sylvania, both of Ohio, assignors to Farley, Inc., Chicago, Ill.
Filed Mar. 23, 1987, Ser. No. 29,476
Term of patent 14 years
U.S. Cl. D25—138



306,351
FLEXIBLE AUTOMOBILE MAP LIGHT
Marc R. Iacovelli, Miami, Fla., assignor to Rally Manufacturing, Inc., Miami, Fla.
Filed Nov. 26, 1986, Ser. No. 935,552
Term of patent 14 years
U.S. Cl. D26—43



306,352
LIGHT FIXTURE
Fredrick R. Glassman, 9170 La Alba Dr., Whittier, Calif. 90603
Filed Jan. 7, 1987, Ser. No. 1,093
Term of patent 14 years
U.S. Cl. D26—91



306,353
PERFUME BOTTLE
David DiNuccio, New York, N.Y., assignor to L'Oreal S.A., France
Filed Jun. 30, 1987, Ser. No. 68,826
Term of patent 14 years
U.S. Cl. D28—5



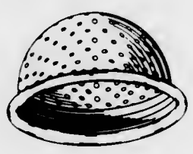
306,354
COMBINED COSMETIC APPLICATOR WITH CAP
Yoshiomi Konose, Tatsuishi, Japan, assignor to Mitsuoishi Pencil Co., Ltd., Tokyo, Japan
Filed May 4, 1987, Ser. No. 46,417
Claims priority, application Japan, Nov. 4, 1986, 61-43341
Term of patent 14 years
U.S. Cl. D28—7



306,355
COMBINED COSMETIC APPLICATOR AND CAP
Kaoru Shinohara, Higashi, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan
Filed Sep. 3, 1987, Ser. No. 92,511
Claims priority, application Japan, Mar. 6, 1987, 62-84797
Term of patent 14 years
U.S. Cl. D28—7



306,356
HAIR-STREAKING CAP
Vincent L. Ramik, Annandale, Va., assignor to Duchess Limited, Alexandria, Va.
Filed Apr. 4, 1986, Ser. No. 847,893
Term of patent 14 years
U.S. Cl. D28—20



306,357
HAIR ROLLER
Helen Scorgie, Box 23, Site 7, R.R. #1, Beaverlodge, Alberta, Canada (T0H 0C0)
Filed Nov. 9, 1987, Ser. No. 118,638
Term of patent 14 years
U.S. Cl. D28—35



306,358
HAIR CURLER HEAD
Leandro P. Rizzuto, Greenwich, Conn.; Kit-Lun Leung, North Point, and Lo: Hou-On, Kowloon, both of Hong Kong, assignors to Conair Corporation, Stamford, Conn.
Filed Jun. 13, 1988, Ser. No. 205,801
Term of patent 14 years
U.S. Cl. D28—35



306,359
DRY SHAVER
Willem Anema, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 3, 1988, Ser. No. 152,600
Claims priority, application Benelux, Aug. 11, 1987, 62399-02
Term of patent 14 years
U.S. Cl. D28—49





306,360
DRY SHAVER
Klaas T. Oord, Drachten, and Frank H. Newman, Zuidlaren, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 27, 1989, Ser. No. 328,928
Claims priority, application Burma, Mar. 10, 1988, 63676-01
Term of patent 14 years
U.S. Cl. D28—50



306,361
DRY SHAVER
Klaas T. Oord, Drachten, and Frank H. Newman, Zuidlaren, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 22, 1989, Ser. No. 327,180
Claims priority, application Belgium, Oct. 3, 1988, 63676-02
Term of patent 14 years
U.S. Cl. D28—50



306,362
DRY SHAVER
Marten F. Elkerbout, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 3, 1988, Ser. No. 152,602
Claims priority, application Benelux, Aug. 11, 1987, 62399-01
Term of patent 14 years
U.S. Cl. D28—51

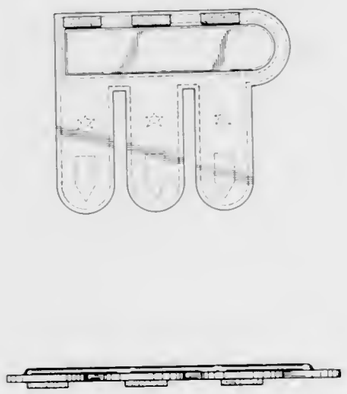


306,363
FACE SHIELD
Wyman H. Stackhouse, 3201 Poinsettia Ave., Manhattan Beach, Calif. 90266, and Ian M. Williamson, 555 N. Harbor Dr., Redondo Beach, Calif. 90277
Filed Sep. 9, 1987, Ser. No. 93,985
Term of patent 14 years
U.S. Cl. D29—17



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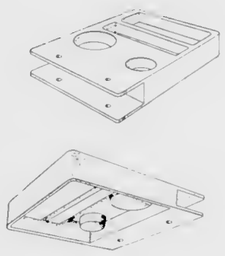
306,364
WRIST BRACE
Wesley L. Hamilton, 2619 N. Confederate St., Tyler, Tex. 75702
Filed Apr. 28, 1986, Ser. No. 857,809
Term of patent 14 years
U.S. Cl. D29—20



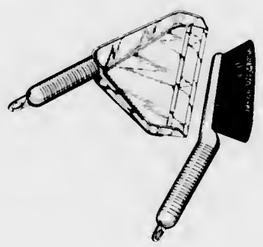
306,366
COMBINED GLOVE ATTACHED CLEANER AND HOLDER THEREFOR FOR GOGGLES, VISORS, OR THE LIKE
Paul D. Turpie, 12 Bowler Street, East Hawthorn, Victoria, Australia
Filed Aug. 22, 1985, Ser. No. 768,046
Term of patent 14 years
U.S. Cl. D32—42



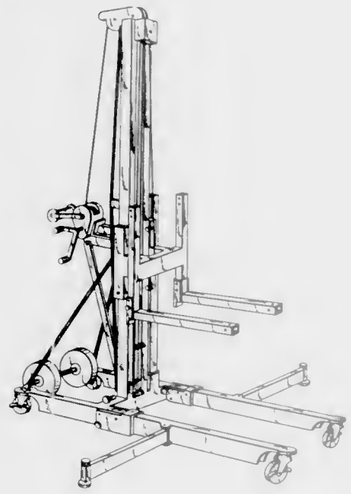
306,365
UTILITY TRAY FOR ATTACHMENT TO AN IRONING BOARD
Terence W. Brown, Townsville, and Shirley J. Masters, Port Douglas, both of Australia, assignors to Terall Design Pty. Ltd., Townsville, Australia
Filed Feb. 9, 1987, Ser. No. 12,637
Claims priority, application Australia, Aug. 7, 1986, 6182/86
Term of patent 14 years
U.S. Cl. D32—35



306,367
DUSTPAN AND BROOM SET
Roland Vetter, Giengen-Sachsenhausen, Fed. Rep. of Germany, assignor to Schwaebische Buerstenfabrik Hans Haug KG, Koenigsbrunn, Fed. Rep. of Germany
Filed Aug. 5, 1987, Ser. No. 82,098
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1987, 4656
Term of patent 14 years
U.S. Cl. D32—74



306,368
TELESCOPING PORTABLE MECHANICAL LIFT
Andrew H. Daugherty, Hammond, Ind., assignor to Vermette Machine Company, Inc., Hammond, Ind.
Filed Jul. 7, 1986, Ser. No. 882,695
Term of patent 14 years
U.S. Cl. D34—28



306,369
MOBILE ELEVATING WORKING PLATFORM
Mitsuhiro Kishi, Tochigi, Japan, assignor to Hikoma MFG Co., Ltd., Tochigi, Japan
Filed Feb. 27, 1987, Ser. No. 19,714
Term of patent 14 years
U.S. Cl. D34—28



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF FEBRUARY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Henricson, Kaj O., 4,904,395, Cl. 210-741.000.

A. K. Allen Company: *See*—
Allen, Alton K., 4,903,732, Cl. 137-625.650.

A-LOK Products, Inc.: *See*—
Ditcher, Jack; and Westhoff, James A., 4,903,970, Cl. 277-9.500.

A/S Platon: *See*—
Hallberg, Carl R., 4,904,121, Cl. 405-258.000.

A. W. Showell (SURGICRAFT) Limited: *See*—
Dove, John; Hardcastle, Philip H.; Davis, John K.; and King, Brian M., 4,904,261, Cl. 623-17.000.

Aalaei, Farajollah, to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Decision directed gain control. 4,905,255, Cl. 375-17.000.

Aalto, Erkki: *See*—
Pellinen, Teuvo; Niemela, Mertsi; and Aalto, Erkki, 4,903,894, Cl. 236-492.000.

AB Akerlund & Rausing: *See*—
Larsson, Lennart; Ullman, Bo; and Ohlsson, Håkan, 4,905,263, Cl. 378-89.000.

AB Idea: *See*—
Bruce, Lars M.; and Bruce, Ingrid E., 4,904,267, Cl. 623-23.000.

AB Profor: *See*—
Hakansson, Jan, 4,903,458, Cl. 53-410.000.

ABB Atom AB: *See*—
Dahlquist, Erik, 4,904,392, Cl. 210-708.000.

ABC/Sebrn Tech. Corp., Inc.: *See*—
Shannon, Joseph W.; Green, Thomas S.; and Rice, Jeffrey C., 4,903,862, Cl. 222-54.000.

Abe, Shintaro; and Haganuma, Tomoyuki. Electronic typewriter. 4,904,099, Cl. 400-348.000.

Abe, Yasunao, to Yamaha Corporation. Automatic music playing apparatus. 4,903,565, Cl. 84-611.000.

Abe, Yasushi: *See*—
Shimizu, Hiroaki; Abe, Yasushi; Ichikawa, Masayoshi; and Okita, Tomoaki, 4,904,736, Cl. 525-279.000.

Abriou, Daniel: *See*—
Garnier, Patrick; Abriou, Daniel; and Beghin, Benoit, 4,904,293, Cl. 65-21.400.

Acharya, Arun; and Be Vier, William E., to Union Carbide Chemicals and Plastics Company Inc. Inner core heating in fluidized bed. 4,904,452, Cl. 422-146.000.

Acket, Gerard A.: *See*—
Tatsuno, Kimio; van der Poel, Carolus J.; and Acket, Gerard A., 4,904,068, Cl. 350-421.000.

Acrowood Corporation: *See*—
Artiano, Adrian, 4,903,845, Cl. 209-671.000.

Action Exploration Services: *See*—
Caldwell, Ray S., 4,904,576, Cl. 430-495.000.

Acushnet Company: *See*—
Isaac, Edward J.; and Lala, Joseph P., 4,904,320, Cl. 156-146.000.

Ad-Tech Medical Instrument Corporation: *See*—
Putz, David A., 4,903,702, Cl. 128-642.000.

Adachi, Yuuma, to Fuji Photo Film Co., Ltd. Radiation image read-out method and apparatus. 4,904,867, Cl. 250-327.200.

Adachi, Yuuma, to Fuji Photo Film Co., Ltd. Method of determining desired image signal range. 4,905,149, Cl. 364-414.130.

Adams, Fred H., to Adams Products Company. Concrete footer block and foundation system formed therefrom. 4,903,450, Cl. 52-293.000.

Adams Products Company: *See*—
Adams, Fred H., 4,903,450, Cl. 52-293.000.

Adams, Stanley L.: *See*—
Cain, Joseph B.; Adams, Stanley L.; and Noakes, Michael D., 4,905,233, Cl. 370-94.100.

Adamski, Maximilian; Kosrow, Robert L.; and Ruderman, Stephen, to Union Special Corporation. Hemmer seamer assembly. 4,903,623, Cl. 112-286.000.

Adkins, Nat G., Jr.; and Rooney, Douglas S., to OcuSoft Inc. Eyelid cleansing composition. 4,904,698, Cl. 514-642.000.

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Bartmann, Martin; Gude, Armin; Droescher, Michael; and Feinauer, Roland, 4,904,718, Cl. 524-169.000.
Droscher, Michael: *See—*
Gerth, Christian; and Droscher, Michael, 4,904,733, Cl. 525-146.000.
Dubots, Dominique; and Dubrous, Francis, to Pechiney Electrometallurgie. Process for the preparation of silicon carbide whiskers. 4,904,622, Cl. 501-88.000.
Dubrous, Francis: *See—*
Dubots, Dominique; and Dubrous, Francis, 4,904,622, Cl. 501-88.000.
Ducassou, Francis L., to Hitachi, Ltd. Support for detachable junction between cables. 4,904,199, Cl. 439-304.000.
Ducay, James; Schmidt, Josef; and Forman, Hugh, to Baxter International Inc. Closure and port assembly. 4,903,855, Cl. 220-356.000.
Duello, Leonard E., to Kimberly-Clark Corporation. Apparatus for dispensing and accounting absorbent surgical articles. 4,903,837, Cl. 206-440.000.
Duerden, David: *See—*
Nobbs, James H.; Oldring, Peter K. T., and Duerden, David, 4,904,876, Cl. 250-461.100.
Duffy, James C. Library shelf assembly. 4,903,847, Cl. 211-187.000.
Dugua, Jacques; and Cuer, Jean-Pierre, to Atochem. Process for the manufacture of sodium perborate monohydrate from sodium perborate tetrahydrate. 4,904,458, Cl. 423-277.000.
Dumas, David H.; and Echt, Elliott, to Hercules Incorporated. Gas-permeable, liquid-impermeable nonwoven material. 4,904,520, Cl. 428-212.000.
Duncan, Eugene F.; Nadolski, Gregory L.; and Van Zeeland, Donald L., to Eaton Corporation. Gauge for detecting misalignment. 4,904,941, Cl. 324-207.180.
Duncan, Eugene F.: *See—*
Zeeland, Donald L. V.; Duncan, Eugene F.; and Nadolski, Gregory L., 4,904,909, Cl. 318-258.000.
Dunn, Lawrence R.; White, Ian A.; and White, Willard C., III, to American Telephone and Telegraph Company, AT&T Bell laboratories. Methods of and systems for optical fiber sensing. 4,904,050, Cl. 350-96.290.
Dunton, Harvey R.; and Rez, Donald H., to Standard Concrete Products, Inc. Particle wetting process and apparatus. 4,904,089, Cl. 366-6.000.
Duo-Fast Corporation: *See—*
Austin, Ronald; and Flowers, Dale M., 4,903,880, Cl. 227-8.000.
Du Pont de Nemours, E. I., and Company: *See—*
Chapman, George R., Jr.; and Priester, Donnan E., 4,904,735, Cl. 525-199.000.
Faulhaber, Mark E., 4,905,085, Cl. 358-148.000
Grossa, Mario, 4,904,555, Cl. 430-25.000.
Lewis, Richard W., 4,904,928, Cl. 324-636.000.
Morgan, Richard A.; and Stewart, Charles W., 4,904,726, Cl. 524-520.000.
Shapiro, Rafael, 4,904,299, Cl. 71-92.000.
Du Prez, Eddie R.: *See—*
Creyf, Hubert S. G.; and Du Prez, Eddie R., 4,903,358, Cl. 5-459.000.
Dupuis, Herve: *See—*
Marsais, Christian; and Dupuis, Herve, 4,903,762, Cl. 165-149.000.
Dupuis, Jean M., to Aerospatiale Societe Nationale Industrielle. Air missile provided with at least one releasable power unit. 4,903,605, Cl. 102-377.000.
Durazzani, Piero; and Carniel, Giuseppe, to Industrie Zanussi S.p.A. Clothes washing machine convertible to combined clothes washing and drying machine. 4,903,508, Cl. 68-4.000.
Durbin, Roger W.; Hoffecker, Mark P.; Kling, John P.; and Vernau, Brian W., to AMP Incorporated. Electrical connector assembly. 4,904,212, Cl. 439-751.000.
Durette, Philippe L.: *See—*
Baker, Robert K.; Rupprecht, Kathleen M.; Pessolano, Arsenio A.; and Durette, Philippe L., 4,904,672, Cl. 514-301.000.
Durham, Jayson T.: *See—*
Mackelburg, Gerald R.; Watson, Stanley J.; Durham, Jayson T.; and Gordon, Alan, 4,905,211, Cl. 367-134.000.
Durland, Scott C.: *See—*
Cassano, James R.; Dastin, Richard M.; Durland, Scott C.; and Sobon, Arthur J., 4,905,052, Cl. 355-312.000.
Durocher, Donald F.: *See—*
Barnes, Russell D.; Shelar, Gary R.; Bullwinkel, Edward P.; Cartwright, William F.; Chambers, Leon E., Jr.; Durocher, Donald F.; Geer, Robert G.; Kasbo, Loyd G.; and Radwanski, Fred R., 4,903,714, Cl. 131-335.000.
Durst, Homer D.: *See—*
Stephens, David J.; Mader, Rodney G.; Durst, Homer D.; and Sonnenberg, Sven, 4,903,956, Cl. 271-178.000.
Dutcher, John S.: *See—*
Sharifian, Hossein; and Dutcher, John S., 4,904,357, Cl. 204-73.00R.
Duthie, Anthony J.; and Offley, Clive F., to Johnston Engineering Limited. Road sweeping vehicles. 4,903,368, Cl. 15-339.000.
Dutzmann, Stefan: *See—*
Weissmuller, Joachim; Berg, Dieter; Dutzmann, Stefan; and Hanssler, Gerd, 4,904,656, Cl. 514-231.500.
Duvdevani, Ilan: *See—*
Lundberg, Robert D.; Phillips, Robert R.; Peiffer, Dennis G.; and Duvdevani, Ilan, 4,904,722, Cl. 524-385.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Herbst, Thomas; and Schnitzler, Lorenz, 4,904,122, Cl. 405-260.000.
Dyer, Margaret A.: *See—*
Mele, Thomas C.; Mele, Mary K.; Dyer, Robert C.; and Dyer, Margaret A., 4,904,981, Cl. 340-323.00R.
Dyer, Robert C.: *See—*
Mele, Thomas C.; Mele, Mary K.; Dyer, Robert C.; and Dyer, Margaret A., 4,904,981, Cl. 340-323.00R.
Dykes, Christopher E.; Francis, Peter W.; and Hopper, Hans P., to British Petroleum Company p.l.c., The. Annulus shut-off mechanism. 4,903,774, Cl. 166-363.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Mathey, Christoph, 4,903,606, Cl. 102-401.000.
Dyneer Corporation: *See—*
Stock, George W.; and Heldt, David L., 4,903,810, Cl. 192-103.00B.
E. Blum GmbH & Co.: *See—*
Nolle, Eugen; and Geschka, Hugo W., 4,904,527, Cl. 428-334.000.
E. O. Schweitzer Manufacturing Co., Inc.: *See—*
Schweitzer, Edmund O., Jr., 4,904,932, Cl. 324-133.000.
E. R. Squibb & Sons, Inc.: *See—*
Karanewsky, Donald S.; Biller, Scott A.; and Gordon, Eric M., 4,904,646, Cl. 514-120.000.
O'Sullivan, Joseph; and Singh, Pushpa, 4,904,764, Cl. 534-564.000.
Sundeen, Joseph E.; and Ermann, Peter H., 4,904,775, Cl. 540-363.000.
E-Systems, Inc.: *See—*
Shea, Donald F., 4,905,011, Cl. 342-361.000.
Eastham, Ian M.: *See—*
Royston, Lindsay I.; and Eastham, Ian M., 4,903,884, Cl. 228-51.000.
Eastman Kodak Company: *See—*
Bridges, Mark E., 4,904,055, Cl. 350-272.000.
Buja, Frederick J., 4,904,172, Cl. 425-140.000.
Derimiggio, John E.; and Hoover, Linn C., 4,905,050, Cl. 355-290.000.
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., 4,904,808, Cl. 556-21.000.
Enix, Bruce W., 4,904,100, Cl. 400-613.000.
Jones, Paul W.; and Rabbani, Majid, 4,905,002, Cl. 341-77.000.
Machell, Julie S.; and Yacobucci, Paul D., 4,904,755, Cl. 528-193.000.
Mody, Hemant K., 4,905,031, Cl. 354-195.100.
Morris, John C.; and Jackson, Winston J., 4,904,747, Cl. 525-439.000.
Russel, Steven M.; Bricklemyer, John T.; and Shea, Robert H., 4,903,952, Cl. 270-53.000.
Schmidt, Ronald J.; and Rocha, Hermano P., 4,904,565, Cl. 430-264.000.

Seymour, Robert W.; and Flora, Thomas E., 4,904,748, Cl. 525-444.000.
Steinmetz, Guy R., 4,904,817, Cl. 560-80.000.
Yokajty, Joseph; and Long, Michael, 4,903,907, Cl. 242-56.00R.

Eaton Corporation: *See—*
Calma, John A.; and Joy, Thomas M., 4,904,935, Cl. 324-159.00F.
Culnan, Thomas E.; and Hall, Lacy L., II, 4,905,122, Cl. 361-376.000.
Duncan, Eugene F.; Nadolski, Gregory L.; and Van Zeeland, Donald L., 4,904,941, Cl. 324-207.180.
Zeeland, Donald L. V.; Duncan, Eugene F.; and Nadolski, Gregory L., 4,904,909, Cl. 318-258.000.

Ebara Corporation: *See—*
Tamaru, Nobuhiro; and Jujita, Tadao, 4,903,642, Cl. 122-401.000.

Eberle, Robert W.: *See—*
Nath, Narikottile G.; Gruber, Rainer A.; and Eberle, Robert W., 4,904,510, Cl. 428-70.000.

Eberlein, Wolfgang; Engel, Wolfhard; Mihm, Gerhard; Mayer, Norbert; and de Jonge, Adriaan, to Dr. Karl Thomae, GmbH. Agent for treating bradycardia and bradyarrhythmia. 4,904,673, Cl. 514-330.000.

Eberman, Brian S.: *See—*
Salisbury, J. Kenneth, Jr.; Townsend, William T.; DiPietro, David M.; and Eberman, Brian S., 4,903,536, Cl. 74-89.220.

Eby, David H., to Tektronix, Inc. Synchronous programmable two-stage serial/parallel counter. 4,905,262, Cl. 377-44.000.

Echigoya, Kenichi: *See—*
Asai, Hidehiro; and Echigoya, Kenichi, 4,905,139, Cl. 364-200.000.

Echt, Elliott: *See—*
Dumas, David H.; and Echt, Elliott, 4,904,520, Cl. 428-212.000.

Eckert, Robert P.: *See—*
Hannan, Clarence W.; Snead, Wilford A.; Pospisil, Jirina V.; and Eckert, Robert P., 4,904,183, Cl. 433-3.000.

Eckes, Helmut: *See—*
Rudolphy, Albert; and Eckes, Helmut, 4,904,303, Cl. 106-30.000.

Eddy, Richard P., to Christie Electric Corp. Endless loop transport and storage system. 4,903,906, Cl. 242-55.19R.

Edel, Thomas R.: *See—*
Barker, Barbara A.; Edel, Thomas R.; and Stark, Jeffrey A., 4,905,146, Cl. 364-300.000.

Eder, Klaus: *See—*
Cameron, Dugald; Friedrich, Karl; Eder, Klaus; and Bachhiesl, Franz, 4,903,791, Cl. 180-252.000.

Edwards, Michael L.: *See—*
Sunkara, Sai P.; Edwards, Michael L.; and Stemerick, David M., 4,904,697, Cl. 514-629.000.

Edwards, Philip N.: *See—*
Pilgrim, William R.; Young, Derek W.; Tait, Brian S.; Crawley, Graham C.; Edwards, Philip N.; and Hill, George B., 4,904,661, Cl. 514-237.500.

Egan, Philip D., to Reinforced Earth Company, The. Constructional work and method of construction of vertical retaining wall. 4,904,124, Cl. 405-262.000.

Egawa, Kazufumi: *See—*
Mori, Shoichi; Fujii, Shigeo; Yoshizawa, Masao; Miyasaka, Kenji; Tabuchi, Jyoichi; Egawa, Kazufumi; Hirano, Minoru; and Yoshida, Yoshikazu, 4,904,257, Cl. 623-16.000.

Egawa, Satoshi: *See—*
Suzuki, Masayoshi; Urata, Hisao; Egawa, Satoshi; and Ueda, Shigeru, 4,905,091, Cl. 358-296.000.

Eggenschwiler, Hans: *See—*
Thurlemann, Silvan; Meisser, Claudio; and Eggenschwiler, Hans, 4,903,883, Cl. 228-1.100.

EGIS Gyogyszergyar: *See—*
Knoll, Jozsef; Berenyi nee Poldermann, Edit; Budainee Simonyi, Katain; Knoll, Berta; Furts, Zsuzsa; Timar, Julia; Zsila, Gabriella; Niklya, Ildiko; Petocz, Lujza; and Mandi, Attila, 4,904,669, Cl. 514-293.000.

Ehrlich, Rodney P., to Monon Corporation. Trailer construction. 4,904,017, Cl. 296-181.000.

Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte. Method of inactivating reproducible filterable pathogens in blood plasma products. 4,904,641, Cl. 514-2.000.

Eick, Edward C., to Brunswick Corporation. Marine stern drive with lubricated and sealed output coupler. 4,904,214, Cl. 440-83.000.

Eickmann, Karl. Membranes and neighboring members in pumps, compressors and devices. 4,904,167, Cl. 417-395.000.

Eigyo, Masami: *See—*
Matsumura, Hiromu; Hashizume, Hiroshi; Matsushita, Akira; and Eigyo, Masami, 4,904,663, Cl. 514-252.000.

Eimer, Klaus; Schildmann, Hans-Werner; Taprogge, Detlef; Bitzer, Klaus-Michael; and Patzig, Dieter, to Taprogge Gesellschaft mbH. Device for the mechanical cleansing of fluids. 4,904,397, Cl. 210-791.000.

Ejiri, Takashi: *See—*
Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, 4,903,939, Cl. 251-63.400.

Ekrann, Steinar: *See—*
Hanssen, Jan E.; and Ekrann, Steinar, 4,903,771, Cl. 166-292.000.

Elbe, Hans-Ludwig: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Elbe, Hans-Ludwig; Kraatz, Udo; Regel, Erik; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,904,297, Cl. 71-92.000.

Elder, Robert L.: *See—*
Campbell, John A. L.; Elder, Robert L.; Gardner, Tony G.; Hughes, Jerry L.; Krause, Kenneth E.; and Pepper, Ronald K., 4,904,154, Cl. 414-786.000.

Electric Power Research Institute: *See—*
Lippert, Thomas E.; and Ciliberti, David F., deceased, 4,904,287, Cl. 55-302.000.

Electricite de France: *See—*
Cros, Pierre; and Daumas, Christian, 4,904,347, Cl. 203-73.000.

Electroplating Engineers of Japan, Limited: *See—*
Katsutsugu, Kitada, 4,904,311, Cl. 148-24.000.

Eli Lilly and Company: *See—*
Anderson, David B.; and Veenhuizen, Edward L., 4,904,662, Cl. 514-237.800.
Epp, Janet K.; and Schoner, Brigitte E., 4,904,591, Cl. 435-172.300.
Fukuda, David S.; Mynderse, Jon S.; and Yao, Raymond C., 4,904,590, Cl. 435-147.000.
Ploch, Richard, 4,904,792, Cl. 548-205.000.
Rao, R. Nagaraja, 4,904,598, Cl. 435-252.300.
Robertson, David W.; and Hayes, J. Scott, 4,904,785, Cl. 546-118.000.

Ellem Industria Farmaceutica, s.r.l.: *See—*
Brunetti, Brunetto; and Prada, Marco, 4,904,643, Cl. 514-21.000.

Ellingson, Chester W., Jr. Wall corner guard structure. 4,903,449, Cl. 52-288.000.

Elliott, James; Hoke, William E.; and Kreismanis, Vilnis G., to Raytheon Company. Photo-enhanced pyrolytic MOCVD growth of group II-VI materials. 4,904,337, Cl. 156-610.000.

Ellner, Sidney, to Ultraviolet Purification Systems. Apparatus for irradiating fluids. 4,904,874, Cl. 250-436.000.

Elloy, Martin; Gallinaro, Paulo; and Masse, Giacomo, to Gallinaro, Paulo; and Masse, Giacomo. Hip joint prosthesis. 4,904,269, Cl. 623-23.000.

Elsinger, Fritz: *See—*
Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, 4,904,641, Cl. 514-2.000.

Ema, Taiji: *See—*
Yabu, Takashi; and Ema, Taiji, 4,905,064, Cl. 357-23.600.

Embrex, Inc.: *See—*
Hebrank, John H., 4,903,635, Cl. 119-1.000.

Embru-Werke, Mantel & Cie.: *See—*
Rutsche, Wendolin; and Menzi, Rudolf, 4,903,924, Cl. 248-159.000.

Emerson Electric Co.: *See—*
Baker, Gerald N.; and Newberg, Barry M., 4,904,891, Cl. 310-62.000.
Bonner, Mark N.; Carmen, Ralph H.; Ringle, Geoffrey F.; Smith, Douglas W.; Tsals, Izrail; Moore, Thomas G., Jr.; and Hamlin, Ronald K., 4,904,995, Cl. 340-870.020.
Snider, S. Duke; and Messner, Daniel R., 4,904,893, Cl. 310-260.000.

Emhart Industries, Inc.: *See—*
Lipp, Ellis P.; and Ray, Donald L., 4,904,828, Cl. 200-16.00B.
Richmond, James W., 4,904,936, Cl. 324-174.000.

EMS Medical Group Ltd., Unit 3: *See—*
Pearce, Harold J., 4,903,826, Cl. 206-63.300.

Endo, Kazuhito; Ishida, Masayuki; and Ishida, Yoshinobu, to Mitsubishi Denki Kabushiki Kaisha. Magnetic recorder/reproducer. 4,905,100, Cl. 260-32.000.

Endo, Mitsuharu: *See—*
Nishikawa, Hisashi; and Endo, Mitsuharu, 4,905,024, Cl. 346-140.00R.

Energy Compression Research Corp.: *See—*
Zucker, Oved S. F., 4,904,923, Cl. 323-340.000.

Engel, Wolfhard: *See—*
Eberlein, Wolfgang; Engel, Wolfhard; Mihm, Gerhard; Mayer, Norbert; and de Jonge, Adriaan, 4,904,673, Cl. 514-330.000.

Engelhard Corporation: *See—*
Raterman, Michael F., 4,904,281, Cl. 55-1.000.

English, Dale L. Welder system having controllable dual winding alternator. 4,904,841, Cl. 219-133.000.

Enix, Bruce W., to Eastman Kodak Company. Cartridge and printer system for using roll print media. 4,904,100, Cl. 400-613.000.

Enscore, David J.: *See—*
Gale, Robert M.; and Enscore, David J., 4,904,475, Cl. 424-449.000.

Environmental Security Incorporated: *See—*
Greene, Jay S., 4,904,398, Cl. 252-2.000.

Epitope, Inc.: *See—*
Burger, Denis R.; and Goldstein, Andrew S., 4,904,581, Cl. 435-5.000.

Epp, Janet K.; and Schoner, Brigitte E., to Eli Lilly and Company. Carbomycin resistance-conferring gene, designated carA, for use in streptomyces and other organisms. 4,904,591, Cl. 435-172.300.

Epstein, Howard C.; Lugaresi, Thomas J.; and Robinson, Michael A., to Hewlett-Packard Company. Optical encoder using sufficient inactive photodetectors to make leakage current equal throughout. 4,904,861, Cl. 250-214.00C.

Epstein, Joseph W.: *See—*
Tseng, Shin S.; Epstein, Joseph W.; and Levin, Jeremy I., 4,904,658, Cl. 514-233.200.

Erb, Darrell M.: *See—*
Selcuk, Asim A.; Chen, Pau-ling; and Erb, Darrell M., 4,905,065, Cl. 357-23.600.

Ercole, Pellegrino, to C.M.S. S.r.l. Drive arrangement for knives in silk-screen printing machines. 4,903,594, Cl. 101-123.000.

Erdmann, Suzanne L. Curtain tieback with a holder for interchangeable decorative fronts. 4,903,370, Cl. 16-87.200.

Ericsson, Sylve J. D., to Svecia Silkscreen Maskiner AB. Silkscreen printing system for multicolor printing in a predetermined order of colors. 4,903,592, Cl. 101-115.000.

Ericsson, Sylve J. D. Arrangement for producing a plurality of printing forms automatically and in sequence. 4,903,595, Cl. 101-128.400.

Ermann, Peter H.: *See—*
Sundeen, Joseph E.; and Ermann, Peter H., 4,904,775, Cl. 540-363.000.

Erwin Sick GmbH Optik-Elektronik: *See—*
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Esaki, Seiji: *See—*
Sasaki, Akira, Esaki, Seiji; Hashimoto, Yasushi, and Kurita, Shigeo, 4,904,227, Cl. 464-111.000.

Esanu, Andre: *See—*
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Esco Corporation: *See—*
Kreitzberg, John S.; Jones, Herbert E.; and Briscoe, Terry L., 4,903,420, Cl. 37-195.000.

ESEC SA: *See—*
Thurlemann, Silvan; Meisser, Claudio; and Eggenschwiler, Hans, 4,903,883, Cl. 228-1.100.

Esquivel, Agerico L.; and Mitchell, Allan T., to Texas Instruments Incorporated. Planar famos transistor with trench isolation. 4,905,062, Cl. 357-23.500.

Estee Lauder, Inc.: *See—*
Kane, Patricia L., 4,903,534, Cl. 73-865.900.

Etablissement Supervis: *See—*
Matt, Lukas, 4,903,543, Cl. 74-567.000.

Etemad, Shahrokh: *See—*
Fraser, Howard H., Jr.; Lane, William R.; and Etemad, Shahrokh, 4,904,165, Cl. 417-312.000.

Etesia: *See—*
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Ethicon, Inc.: *See—*
Middleton, Ian P.; and Paprotny, Jerzy, 4,904,272, Cl. 623-66.000.

Etzbach, Karl-Heinz; Hansen, Guenter; Schefczik, Ernst, and Reichelt, Helmut, to BASF Aktiengesellschaft. Mono azo dyes containing as diazo radical a thiophene radical which possesses an oxime group. 4,904,777, Cl. 534-738.000.

Eureka Company, The: *See—*
Sepka, Arnold L., 4,903,911, Cl. 242-86.000.

European Atomic Energy Community, The: *See—*
Van Dijk, Johannes W., 4,905,250, Cl. 372-86.000.

Evans, John M.; Stemp, Geoffrey; and Cassidy, Frederick, to Beecham Group p.l.c. Active compounds. 4,904,784, Cl. 546-90.000.

Evans, John M., Jr.: *See—*
Weiman, Carl F. R.; and Evans, John M., Jr., 4,905,151, Cl. 364-424.020.

Evarts, C. McCollister: *See—*
MacCollum, Maureen A.; Evarts, C. McCollister; and Tarr, Richard R., 4,904,265, Cl. 623-22.000.

Everest Medical Corporation: *See—*
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Everett, James W.: *See—*
Stickel, Mark M.; Everett, James W.; Shirey, Ray A., Hosley, Roy D.; Ciferro, Eugene P.; and Fulmer, George D., 4,903,392, Cl. 29-426.500.

Everpure, Inc.: *See—*
Thomsen, Jack W., 4,904,382, Cl. 210-236.000

Exploration Logging, Inc.: *See—*
Meisner, James E.; Tresler, Roger L.; Mumby, Edward S.; and Robie, Micheal D., 4,904,865, Cl. 250-254.000

Exxon Chemical Patents, Inc.: *See—*
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Exxon Production Research Company: *See—*
Hughes, Phillip A., 4,905,204, Cl. 367-62.000
Thompson, Arthur H., 4,904,942, Cl. 324-323.000

Exxon Research and Engineering Company: *See—*
Brown, Terrance O.; Slack, David A., and Alexander, A. G., 4,904,400, Cl. 252-32.70E.
Krutenat, Richard C., 4,904,500, Cl. 427-248.100.
Lundberg, Robert D.; Phillips, Robert R.; Peiffer, Dennis G.; and Duvdevani, Ilan, 4,904,722, Cl. 524-385.000.
Ryan, Douglas G.; and Trust, Donald B., 4,904,367, Cl. 208-33.000.

Eziri, Mitsuo: *See—*
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Zanzotto, Ludo; Faber, Albert J.; Foley, Dennis P.; Jeffries, Royston B.; and Watson, R. David, 4,904,305, Cl. 106-284.000.

Fadden, Richard G.: *See—*
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Fader, Philip D.: *See—*
Friedman, Robert H.; Surles, Billy W.; and Fader, Philip D., 4,903,770, Cl. 166-288.000.

Faget, Maxime A.: *See—*
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Faia, Joseph P. Reflector truck light. 4,905,126, Cl. 362-61.000.

Fain, Donald G.: *See—*
Colley, David E.; Fain, Donald G.; and Arnett, Frederick R., 4,903,677, Cl. 124-23.00R.

Falconieri, Remo; and Uggetti, Sergio, to Ing.C. Olivetti & C., S.p.A. Cartridge for a printing ribbon. 4,904,097, Cl. 400-248.000.

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Greene, David C., to North American Philips Corporation. Gated high stability LC stabilized oscillator. 4,904,962, Cl. 331-117.00R.

Greene, Jay S., to Environmental Security Incorporated. Class D fire extinguishing. 4,904,398, Cl. 252-2.000.

Greenwood, David, to Imperial Chemical Industries plc. Information device. 4,904,507, Cl. 428-29.000.

Greer, Jack B. Lubricating apparatus for clay extruders. 4,904,171, Cl. 425-97.000.

Gregoire, Daniel, to Hutchinson. Hydraulic antivibratory supports. 4,903,950, Cl. 267-140.100.

Gregory, Keith E., to Wang Laboratories, Inc. Interactive system with state manager subsystem. 4,905,181, Cl. 364-900.000.

Greiner, James A.: *See—*
Campbell, Pat C.; Greiner, James A.; and Nattinger, Bruce E., 4,904,092, Cl. 383-35.000.

Grembowicz, Conrad G.; and Harrell, Brad, to Caterpillar Inc. Driver circuit for solenoid operated fuel injectors. 4,905,120, Cl. 36-154.000.

Gressco, Ltd.: *See—*
Gresswell, Patrick, 4,903,451, Cl. 52-584.000.

Gresswell, Patrick, to Gressco, Ltd. Modular system and fastening devices therefor. 4,903,451, Cl. 52-584.000.

Grimes, Frank H.; and Chenoweth, Terrence E., to Westinghouse Electric Corp. Method of containing an amorphous core joint. 4,903,396, Cl. 29-606.000.

Grina, Larry D.: *See—*
Liu, Christopher S.; Benfaremo, Nicholas; Kapuscinski, Maria M.; and Grina, Larry D., 4,904,404, Cl. 252-51.50A.

Grix, Raimund; Kutscher, Roland; Li, Gang Q.; and Wollnik, Hermann. Method for generating extremely short ion pulses of high intensity from a pulsed ion source. 4,904,872, Cl. 250-423.00R.

Grobsky, Kevin D.: *See—*
Lu, Samuel; and Grobsky, Kevin D., 4,904,083, Cl. 356-350.000.

Groff, Edward G.; Solomon, Arun S. P.; and De Nagel, Stephen F., to General Motors Corporation. Method and apparatus for closed loop fuel control. 4,903,669, Cl. 123-478.000.

Groger, Klaus; and Ampferer, Herbert, to Dr. Ing.h.c.F. Porsche AG. Air intake section of an internal combustion engine. 4,903,644, Cl. 123-52.0MC.

Grollier, Jean F., to L'Oreal. Hair dyeing composition based on oxidation dyes and bio-heteropolysaccharides. 4,904,275, Cl. 8-408.000.

Gross, Rainer: *See—*
Goldmann, Siegfried; Gross, Rainer; Bechem, Martin; Kayser, Michael; Schramm, Matthias; and Hebisch, Siegbert, 4,904,665, Cl. 514-256.000.

Grossa, Mario, to Du Pont de Nemours, E. I., and Company. Photosensitive composition for making repeatably tonable layers. 4,904,555, Cl. 430-25.000.

Grothause, Timothy A., to Motorola, Inc. Radio with message reception and ambient noise level controlled indicator. 4,904,992, Cl. 340-825.440.

Groves, George D., to B & G Consultants, Inc. Fence or other structure vegetation barrier. 4,903,947, Cl. 256-32.000.

Gruber, Rainer A.: *See—*
Nath, Narikottile G.; Gruber, Rainer A.; and Eberle, Robert W., 4,904,510, Cl. 428-70.000.

Gruber, Thomas J.; Putnat, Dale G.; and Zajaczkowski, Ernest J., to Hunter Manufacturing Co. Air control system for a burner. 4,903,684, Cl. 126-116.00A.

Grumman Aerospace Corporation: *See—*
Anderson, Robert E., 4,904,109, Cl. 403-374.000.

Grupp, Joachim, to Asulab, S.A. Liquid crystal display cell having a diffusely-reflective counter electrode. 4,904,060, Cl. 350-339.00D.

Grutzmacher, Bertold; and Blaser, Peter T., to Heidelberger Druckmaschinen AG. Device for positioning an adjusting member. 4,903,940, Cl. 251-129.160.

GTE Products Corporation: *See—*
Bouchard, Andre C.; and Thibault, Paul A., 4,904,900, Cl. 313-491.000.
Mizuhara, Howard, 4,903,890, Cl. 228-263.130.

Gude, Armin: *See—*
Bartmann, Martin; Gude, Armin; Droescher, Michael; and Feinauer, Roland, 4,904,718, Cl. 524-169.000.

Guernet, Henri: *See—*
Heng, Jean-Paul; Marmonier, Andre; and Guernet, Henri, 4,904,204, Cl. 439-425.000.

Guittard, George V.: *See—*
Theeuwes, Felix; Guittard, George V.; and Wong, Patrick S. L., 4,904,474, Cl. 424-424.000.

Gunther, Roland E. Device for preventing infant colic. 4,903,711, Cl. 128-874.000.

Gupta, Dinesh K.; and Freling, Melvin, to United Technologies Corporation. Coated gas turbine engine compressor components. 4,904,528, Cl. 428-336.000.

Gurtler, Dieter: *See—*
Jambor, Arno; and Gurtler, Dieter, 4,903,988, Cl. 280-771.000.

Gutknecht, Wilfried: *See—*
Schugerl, Karl; and Gutknecht, Wilfried, 4,904,412, Cl. 252-357.000.

Gutov, Sergei K.: *See—*
Plesser, Dmitry A.; Radutsky, Grigory A.; and Gutov, Sergei K., 4,903,823, Cl. 198-845.000.

Gyobu, Ichiro: *See—*
Nagaoka, Takashi; Gyobu, Ichiro; Muramatsu, Kimio; Ueyama, Keiji; Mase, Masahiro; Awada, Yoshihisa; and Nishiuchi, Akira, 4,904,155, Cl. 415-90.000.

Haase, Gerald A. Metal catching cover. 4,904,376, Cl. 209-215.000.

Habeck, Karl: *See—*
Schweighofer, Werner; Schwabedissen, Christian M. Z.; Siewert-Posielek, Brigitte; Habeck, Karl; and Seifert, Klaus, 4,904,390, Cl. 210-664.000.

Haberkorn, Jean-Paul, to Kuhn s.a. Mower-conditioner having deflector. 4,903,468, Cl. 56-16.400.

Hachiya, Satoshi: *See—*
Yuasa, Kimihiro; Hashimoto, Kenji; Uchida, Shunji; Morita, Kazuharu; and Hachiya, Satoshi, 4,904,065, Cl. 350-350.00S.

Hack, Hrabanus: *See—*
Paschke, Hartmut; Kreutzmann, Gerd; and Hack, Hrabanus, 4,904,046, Cl. 350-96.200.

Hackman, Lloyd E., to Ribbon Technology Corporation. Two wheel melt overflow process and apparatus. 4,903,751, Cl. 164-480.000.

Hafner, Gunther: *See—*
Letsche, Ulrich; Hafner, Gunther; and Noreikat, Karl-Ernst, 4,903,896, Cl. 239-88.000.

Haga, Takahiro: *See—*
Kondo, Nobuo; Kikuchi, Masahiro; Nakajima, Tsunetaka; Watanabe, Masahiro; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 4,904,668, Cl. 514-274.000.

Haga, Toru; Nagano, Eiki; Sato, Ryo; and Morita, Kouichi, to Sumitomo Chemical Company Limited. Intermediates for the production of benzotriazoles. 4,904,800, Cl. 548-513.000.

Haganuma, Tomoyuki: *See—*
Abe, Shintaro; and Haganuma, Tomoyuki, 4,904,099, Cl. 400-348.000.

Hager, Volker, to J. Blaschke Pumpen-Filteranlagen. Ventilating apparatus for a protective suit. 4,903,694, Cl. 128-204.150.

Hagino, Tadao: *See—*
Nishigaki, Shinichi; Nakamura, Takeaki; Okabe, Minoru; Karasawa, Hitoshi; Kusnoki, Hiroyuki; Hagino, Tadao; Kubota, Tetsumaru; Ogawa, Mototsugu; Toda, Masato; and Sugata, Teruaki, 4,905,082, Cl. 358-98.000.

Hagishita, Sanji; and Seno, Kaoru, to Shionogi & Co., Ltd. Bicyclic sulfonamide derivatives and process therefor. 4,904,819, Cl. 560-118.000.

Hahn, James R., III: *See—*
Cooper, Bret A.; Hahn, James R., III; Havanas, William H.; and Martinka, Mark A., 4,905,274, Cl. 379-157.000.

Haimberger, Walter P.: *See—*
Binder, Alan M.; Haimberger, Walter P.; LaBelle, Theodore J.; and McAuley, Kenneth A., 4,903,957, Cl. 271-277.000.

Haines, Edwin L., to Goodyear Tire & Rubber Company, The. Air deflection system. 4,904,015, Cl. 296-180.300.

Haines, John S. Planing motor boat hull. 4,903,626, Cl. 114-56.000.

Haji, Junzo: *See—*
Wada, Keisuke; Haji, Junzo; and Yokotake, Ichiro, 4,904,460, Cl. 423-347.000.

Hakansson, Jan, to AB Profor. Arrangement for the attachment of bendable, elongated objects, in particular suction tubes, along the side of a packing container. 4,903,458, Cl. 53-410.000.

Hakluytt, Piers D., to Rank Pullin Controls Limited. Drive apparatus. 4,904,917, Cl. 318-696.000.

Hakomori, Sen-itiroh, to Fred Hutchinson Cancer Research Center. Hybridoma antibody (FH6) defining a human cancer-associated difucoganglioside. 4,904,596, Cl. 435-240.270.

Hale, Joseph F.: *See—*
Bickerstaff, Alan E.; Collier, Barry J.; Hale, Joseph F.; Hitchmough, Peter M.; Pitts, Ian; and Rasul, Ghulam, 4,905,049, Cl. 355-284.000.

Halevy, Ben-Zion. Safety razors. 4,903,405, Cl. 30-47.000.

Halff, Albert; and Vossen, Manfred, to Bobst S.A. Punching devices. 4,903,560, Cl. 83-277.000.

Hall, Lacy L., II: *See—*
Culnan, Thomas E.; and Hall, Lacy L., II, 4,905,122, Cl. 361-376.300.

Hall, Lendel D. Mole detector apparatus. 4,904,985, Cl. 340-573.000.

Hall, Nancy L.: *See—*
Childress, Jeffrey S.; Hall, Nancy L.; and Hughes, Houston H., III, 4,905,234, Cl. 370-94.100.

Hallam, Wilfred H., to Burley, Joseph. Air fresheners. 4,904,639, Cl. 512-4.000.

Hallberg, Carl R., to A/S Platon. Device for stabilizing bulk material. 4,904,121, Cl. 405-258.000.

Halliburton Company: *See—*
Manke, Kevin R., 4,903,775, Cl. 166-373.000.
Surjaatmadja, Jim B.; and Penn, Jack C., 4,905,281, Cl. 380-25.000.
Zunkel, Gary D., 4,903,765, Cl. 166-162.000.

Hallings, Leonard L., to MDT Corporation. Rotating contact assembly for electrical supply. 4,904,189, Cl. 439-13.000

Halton Oy: *See—*
Pellinen, Teivo; Niemela, Mertsi; and Aalto, Erkki, 4,903,894, Cl. 236-492.000.

Haluska, Edward A.: *See—*
Baker, Ross G., Jr.; Haluska, Edward A.; and Vandgriff, Joseph W., 4,903,699, Cl. 128-419.0PG

Hamabe, Chisato. *See—*
Kawaguchi, Ikuo; Kikuchi, Shuji; and Hamabe, Chisato, 4,905,183, Cl. 364-900.000.

Hamada, Masataka: *See—*
Ishida, Tokuji; Norita, Toshio; Hamada, Masataka; and Ootsuka, Hiroshi, 4,905,032, Cl. 354-402.000.

Hamamatsu Photonics Kabushiki Kaisha: *See—*
Mukozaka, Naohisa, 4,905,312, Cl. 250-213.0VT

Hamano, Eiji: *See—*
Horiike, Satoru; Nakano, Yasuhiko; Okano, Shigetaro; Kimura, Shigeru; Yamamoto, Toshiteru; Matsuzaki, Masanobu; Hamano, Eiji; and Kubo, Mikio, 4,903,790, Cl. 180-219.000

Hamano, Hiroaki, to Minolta Camera Kabushiki Kaisha. Document conveying apparatus. 4,905,044, Cl. 355-206.000.

Hamanoue, Yukio: *See—*
Tatsumi, Hisato; Sakai, Kunio; Hamanoue, Yukio; and Ishizuka, Satoshi, 4,904,016, Cl. 296-180.500.

Hamilton, Harry J. Pressure-release valve and conduit for preventing damage to seal of hydraulic power drive unit. 4,903,579, Cl. 92-86.000.

Hamilton, Thomas A., to Unisys Corporation. Flexible print ribbon shield. 4,904,098, Cl. 400-248.000.

Hamlin, Ronald K.: *See—*
Bonner, Mark N.; Carmen, Ralph H.; Ringle, Geoffrey F.; Smith, Douglas W.; Tsals, Izrail; Moore, Thomas G., Jr.; and Hamlin, Ronald K., 4,904,995, Cl. 340-870.020.

Han, Choong Y.: *See—*
Brown, Sterling B.; Han, Choong Y.; DeRudder, James L.; and Hepp, Leonard R., 4,904,746, Cl. 525-438.000.

Hanabusa, Osamu, to Mitsubishi Jukogyo Kabushiki Kaisha. Centrifugal type gas-liquid separator. 4,904,284, Cl. 55-165.000

Hanada, Haruyoshi: *See—*
Yoshimura, Makoto; Hanada, Haruyoshi; and Fukuoka, Hirofumi, 4,904,079, Cl. 353-122.000.

Hanania, Amnon. Automobile protective cover. 4,903,749, Cl. 160-370.200.

Hanaoka, Hideyuki; Yamamoto, Kazuo; and Suzuki, Toshiyuki, to Japan Synthetic Rubber Co., Ltd. Organoalkoxysilane-containing coating composition. 4,904,721, Cl. 524-266.000.

Handa, Takuo, to Nippon Chuzo Kabushiki Kaisha. Low thermal expansion casting alloy having excellent machinability. 4,904,447, Cl. 420-95.000.

Handelmann, Gail E.: *See—*
Cordi, Alex A.; Handelmann, Gail E.; and Monahan, Joseph B., 4,904,681, Cl. 514-380.000.

Handler, Anthony, to Koloman Handler Gesellschaft m.b.H. Base plate for a loose-leaf holder. 4,904,102, Cl. 402-34.000.

Haneishi, Hidehiko: *See—*
Motohashi, Akira; Tsukahara, Yoshimitsu; Masuda, Kazuo; Haneishi, Hidehiko; Kume, Masafumi; and Hayashi, Hirokazu, 4,904,361, Cl. 204-181.700.

Hanko, Leonard: *See—*
Glessner, John W.; Davis, Steven J., and Hanko, Leonard, 4,905,247, Cl. 372-55.000.

Hannan, Clarence W.; Snead, Wilford A.; Pospisil, Jirina V.; and Eckert, Robert P., to Unitek Corporation. Orthodontic debonding method and tool. 4,904,183, Cl. 433-3.000.

Hansch, Egon, to Ferag AG. Method of, and apparatus for, processing flat products, especially folded printed products, arriving in an imbricated formation. 4,903,908, Cl. 242-59.000.

Hansen, David R.: *See—*
Holden, Geoffrey; and Hansen, David R., 4,904,731, Cl. 525-98.000.

Hansen, Diethard: *See—*
Garbe, Heyno; and Hansen, Diethard, 4,904,927, Cl. 324-642.000.

Hansen, Guenter *See—*
Etzbach, Karl-Heinz; Hansen, Guenter; Schefczik, Ernst, and Reichelt, Helmut, 4,904,777, Cl. 534-738.000

Hansen, John M., to FMC Corporation. High speed path optimization co-processor. 4,905,144, Cl. 364-200.000.

Hansler, Richard L.: *See—*
Allison, Joseph M.; Hansler, Richard L.; French, Park; Davenport, John M.; and Leskovec, Robert A., 4,904,907, Cl. 315-307.000.

Hanson, Jay L., to Thermo King Corporation. Temperature controlling for a transport refrigeration system. 4,903,498, Cl. 62-126.000.

Hanson, Jay L., to Thermo King Corporation. Methods and apparatus for detecting the need to defrost an evaporator coil. 4,903,500, Cl. 62-156.000.

Hanson, Jay L.; and Herrig, Doyle G., to Thermo King Corporation. Rate of change temperature control for transport refrigeration systems. 4,903,502, Cl. 62-228.500.

Hanssen, Jan E.; and Ekrann, Steinar, to Rogalandsforskning. Method for establishing effective barriers to production of undesired fluids in the recovery of oil. 4,903,771, Cl. 166-292.000

Hanssler, Gerd: *See—*
Weissmuller, Joachim; Berg, Dieter; Dutzmann, Stefan; and Hanssler, Gerd, 4,904,656, Cl. 514-231.500.

Hanzawa, Hiroko: *See—*
Morishita, Ichiro; and Hanzawa, Hiroko, 4,904,062, Cl. 350-432.000.

Happ, Kenneth C.: *See—*
Butzen, James K.; and Happ, Kenneth C., 4,903,944, Cl. 251-240.000.

Hara, Hiroshi, to Fuji Photo Film Co., Ltd. Method for forming a color image and image forming apparatus therefor. 4,904,573, Cl. 430-351.000.

Hara, Kazuyoshi: *See—*
Honma, Shigeo; and Hara, Kazuyoshi, 4,904,334, Cl. 156-540.000.

Hara, Koudou: *See—*
Inden, Toshikazu; Negishi, Hideki; Hara, Koudou; and Kanzawa, Takayuki, 4,905,165, Cl. 364-518.000.

Hara, Masao: *See—*
Sudo, Rey; Kurumada, Norimitsu; Todo, Fukuzo; Hara, Masao; and Sauda, Kenzo, 4,904,416, Cl. 252-628.000.

Hara, Ryuichiro: *See—*
Nakano, Kohji; Fujikura, Takashi; Hara, Ryuichiro; Ichihara, Masato; Fukunaga, Yukiko; and Shibasaki, Masayuki, 4,904,660, Cl. 514-236.200.

Hara, Toshiyuki: *See—*
Yamazaki, Hiroshi; Hara, Toshiyuki; Tanaka, Yuji; and Mouri, Takayuki, 4,904,003, Cl. 292-126.000.

Harada, Hiroshi: *See—*
Iwasawa, Yoshiyuki; Ishida, Tsutomu; Harada, Hiroshi; Kobayashi, Shintaro; Okamoto, Kenji; Matsumoto, Takashi; Yamamoto, Kiwamu; and Takasu, Toshio, 4,904,153, Cl. 414-735.000.
Matsumoto, Takashi; Tanaka, Shigeru; Shinya, Tsutomu; Iwasawa, Yoshiyuki; Ishida, Tsutomu; Harada, Hiroshi; Kobayashi, Shintaro; and Okamoto, Kenji, 4,903,610, Cl. 104-118.000.

Harada, Naoki: *See—*
Yokogawa, Kazufumi; Morimitsu, Toshihiko; Harada, Naoki; Omura, Takashi; and Kikkawa, Sadanobu, 4,904,766, Cl. 534-642.000.

Harada, Takashi: *See—*
Shimada, Nobuyoshi; Hasegawa, Shigeru; Harada, Takashi; Tomizawa, Takayuki; and Fujii, Akio, 4,904,585, Cl. 435-88.000.

Harara, Mitsuhiko; Takizawa, Shozo; Tanaka, Tadao; and Wada, Shunichi, to Mitsubishi Denki Kabushiki Kaisha. Suspension control apparatus and method for a vehicle. 4,903,982, Cl. 280-707.000.

Harbour, David A. Equatorial mounting system and drive therefor. 4,904,071, Cl. 350-568.000.

Hardcastle, Philip H.: *See—*
Dove, John; Hardcastle, Philip H.; Davis, John K.; and King, Brian M., 4,904,261, Cl. 623-17.000.

Hardiman, Christopher J.; and Bowers, Gary R., to Monsanto Company. Film of allyloxy compound with metal drier compositions. 4,904,738, Cl. 525-306.000.

Hargrave, James R. Golf swing training apparatus. 4,903,968, Cl. 273-186.00A.

Harl, James O., to Whirlpool Corporation. Refrigerator air control heated baffle. 4,903,501, Cl. 62-187.000.

Harlan, Sven; and Verina, Ernest A., to 21st Century Coin Products, Inc. Holder for encased collector's coins. 4,903,825, Cl. 206-0.800.

Harmer, Brian, to Agrifibre Developments Limited. Manufacture of structural members, in particular furniture components. 4,904,432, Cl. 264-112.000.

Harrell, Brad: *See—*
Grembowicz, Conrad G.; and Harrell, Brad, 4,905,120, Cl. 36-154.000.

Harris Corporation: *See—*
Cain, Joseph B.; Adams, Stanley L.; and Noakes, Michael D., 4,905,233, Cl. 370-94.100.

Harris, Gerald. Pivotal adapter for bipods and attachment therefor. 4,903,425, Cl. 42-94.000.

Harris, John H., III. Hose holding fixture. 4,903,922, Cl. 248-75.000.

Harrow Products, Inc.: *See—*
Frolov, George, 4,904,005, Cl. 292-251.500.

Harsh, Don J.; Hills, Linda R.; and Howard, Kennalyn. Apparatus for safely removing needles from hypodermic syringes. 4,904,244, Cl. 604-187.000.

Hart, William G., Jr.: *See—*
Robertson, Atholl A.; and Hart, William G., Jr., 4,903,954, Cl. 271-7.000.

Hartley, Richard I.: *See—*
Corbett, Peter F.; and Hartley, Richard I., 4,905,175, Cl. 364-715.080.

Hartmann, Heinrich: *See—*
Kud, Alexander; Trieselt, Wolfgang; and Hartmann, Heinrich, 4,904,408, Cl. 252-174.240.

Hartzband, David J.; and Holly, Laura E., to Digital Equipment Corporation. Evaluation system for determining analogy and symmetric comparison among objects in model-based computation systems. 4,905,162, Cl. 364-513.000.

Hartzell Propeller Inc.: *See—*
Pace, Loy D.; Stackhouse, Donald C.; Jones, Earl W.; and Zimpfer, Dennis S., 4,904,157, Cl. 416-46.000.

Harvey, George T.; and Watkins, Laurence S., to American Telephone & Telegraph Co., AT&T Bell Laboratories; and American Telephone & Telegraph Company. Method for aligning photomasks. 4,904,087, Cl. 356-400.000.

Harvey, James A.: *See—*
Butler, John M.; Chartoff, Richard P.; and Harvey, James A., 4,904,801, Cl. 548-521.000.

Harvey, Peter, to BICC Public Limited Company. Manufacture of a flexible core for an optical cable. 4,904,321, Cl. 156-185.000.

Hasegawa, Hiroaki: *See—*
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 4,903,533, Cl. 73-861.910.

Hasegawa, Jun: *See—*
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 4,905,033, Cl. 354-402.000.

Hasegawa, Katsumi; Ohno, Michio; and Kadotsuji, Akira, to Toray Industries, Inc. Method of balancing a yarn winder. 4,903,905, Cl. 242-18.00R.

Hasegawa, Mikio: *See—*
Doi, Makoto; Nakada, Akiyoshi; Inoue, Toshitsugu; Hasegawa, Mikio; Sogawa, Kenji; and Ide, Toshihiro, 4,904,152, Cl. 414-730.000.

Hasegawa, Norio: *See—*
Fukuda, Hiroshi; Hasegawa, Norio; Tanaka, Toshihiko; Kurosaki, Toshiei; Nonogaki, Saburo; Taniguchi, Yoshio; and Matsuzawa, Toshiharu, 4,904,569, Cl. 430-311.000.

Hasegawa, Shigeru: *See—*
Shimada, Nobuyoshi; Hasegawa, Shigeru; Harada, Takashi; Tomizawa, Takayuki; and Fujii, Akio, 4,904,585, Cl. 435-88.000.

Hasegawa, Shinya: *See—*
Ikeda, Hiroyuki; Yamagishi, Fumio; Hasegawa, Shinya; Kitagawa, Syunji; Yamazaki, Kozo; and Inagaki, Takefumi, 4,904,033, Cl. 350-3.690.

Hasegawa, Yoshio: *See—*
Kataoka, Shotaro; Hasegawa, Yoshio; and Muroda, Hisashi, 4,903,524, Cl. 73-45.500.

Hashimoto, Kenji: *See—*
Yuasa, Kimihiro; Hashimoto, Kenji; Uchida, Shunji; Morita, Kazuharu; and Hachiya, Satoshi, 4,904,065, Cl. 350-350.00S.

Hashimoto, Kiyoshi: *See—*
Sonoda, Takefumi; and Hashimoto, Kiyoshi, 4,904,178, Cl. 425-667.000.

Hashimoto, Yasushi: *See—*
Sasaki, Akira; Esaki, Seiji; Hashimoto, Yasushi; and Kurita, Shigeo, 4,904,227, Cl. 464-111.000.

Hashizume, Hiroshi: *See—*
Matsumura, Hiromu; Hashizume, Hiroshi; Matsushita, Akira; and Eigyo, Masami, 4,904,663, Cl. 514-252.000.

Hasker, Jan: *See—*
Van Esdonk, Johannes; Hasker, Jan; and Stoffels, Jacobus, 4,904,897, Cl. 313-346.00R.

Hatanaka, Masahiko; Mori, Daisuke; and Nakanishi, Masahiro, to Matsushita Electric Industrial Co., Ltd. Musical tone waveform producing apparatus for electronic musical instrument. 4,903,564, Cl. 84-622.000.

Hatano, Mikio: *See—*
Sassa, Takamitsu; Ishikawa, Minoru; and Hatano, Mikio, 4,903,612, Cl. 105-18.000.

Hattori, Sanshiro: *See—*
Takahashi, Junichi; Hattori, Sanshiro; Kimura, Takashi; and Iwata, Atsushi, 4,905,143, Cl. 364-200.000.

Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. Belt-and-pulley type continuously variable transmission and method for controlling the same. 4,904,229, Cl. 474-12.000.

Hattori, Yutaka; and Yoshida, Yukimasa, to Brother Kogyo Kabushiki Kaisha. System for reading information from two storage layers of an optical disk in different manners. 4,905,215, Cl. 369-14.000.

Havanas, William H.: *See—*
Cooper, Bret A.; Hahn, James R., III; Havanas, William H.; and Martinka, Mark A., 4,905,274, Cl. 379-157.000.

Hawera Probst GmbH & Co.: *See—*
Moser, Bernhard; and Peetz, Wolfgang, 4,903,787, Cl. 175-410.000.

Hawk, Ernest D. Shovel and method of making the same. 4,904,011, Cl. 294-49.000.

Hayakawa, Hisashi: *See—*
Kawashima, Kazuki; and Hayakawa, Hisashi, 4,904,230, Cl. 474-112.000.

Hayakawa, Kiyoharu: *See—*
Asano, Yuji; Sakai, Jun; Matsumoto, Yumio; Takagi, Osamu; Sago, Akira; Hayakawa, Kiyoharu; Ueda, Masashi; Sawaki, Yukichi; and Suzuki, Keiko, 4,905,036, Cl. 355-27.000.

Hayakawa, Shigeru; Fukumoto, Ryoichi; and Torii, Nozomu, to Aisin Seiki Kabushiki Kaisha. Door lock assembly for automotive vehicles. 4,904,006, Cl. 292-336.300.

Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kosei; and Kondo, Masafumi, to Sharp Kabushiki Kaisha. Semiconductor laser device. 4,905,246, Cl. 372-45.000.

Hayakawa, Youichi; Hosono, Chihiro; and Nishida, Masaaki, to Aisin AW Co., Ltd. Snap ring support device for an automatic transmission. 4,903,548, Cl. 475-59.000.

Hayashi, Hirokazu: *See—*
Motohashi, Akira; Tsukahara, Yoshimitsu; Masuda, Kazuo; Haneishi, Hidehiko; Kume, Masafumi; and Hayashi, Hirokazu, 4,904,361, Cl. 204-181.700.

Hayashi, Hiroo; and Arikawa, Toshimitsu, to Kanzaki Paper Mfg. Co., Ltd. Heat-sensitive recording material. 4,904,636, Cl. 503-207.000.

Hayashi, Kazuhiko: *See—*
Sogawa, Ichiro; Maeda, Nao-omi; Hayashi, Kazuhiko; Kanda, Masahiko; and Yotsuya, Koro, 4,904,048, Cl. 350-96.260.

Hayashi, Kimiyoshi, to Canon Kabushiki Kaisha. Color image processing apparatus for processing separated color signals. 4,905,079, Cl. 358-78.000.

Hayashi, Kiyoshi: *See—*
Takeuchi, Kunihiko; Shimomura, Yasuo; Morishige, Yuji; and Hayashi, Kiyoshi, 4,905,218, Cl. 370-3.000.

Hayashi, Shigeyuki: *See—*
Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; Horaguchi, Yoichi; and Nakata, Takashi, 4,905,038, Cl. 355-27.000.

Hayashi, Takao: *See—*
Akao, Mutsuo; Nakamura, Kotaro; and Hayashi, Takao, 4,903,834, Cl. 206-410.000.

Hayashi, Tetsuaki: *See—*
Murakawa, Masatake; Bando, Niro; Tone, Masatsugu; Yuki, Mikio; Miyata, Junji; Hayashi, Tetsuaki; and Kurohara, Kazuaki, 4,903,469, Cl. 56-202.000.

Hayashi, Torahiko: *See—*
Morikawa, Michio; Hayashi, Torahiko; Tashiro, Yasunori; Mugishima, Hirobumi; and Ban, Nobuo, 4,904,491, Cl. 426-502.000.

Hayashi, Toru: *See—*
Kagawa, Junichi; and Hayashi, Toru, 4,904,216, Cl. 445-7.000.

Hayes, J. Scott: *See—*
Robertson, David W.; and Hayes, J. Scott, 4,904,785, Cl. 546-118.000.

Hayes, Jerry R., to L. R. Nelson Corporation. Turret nozzle with ball valve flow adjustment. 4,903,897, Cl. 239-394.000.

Hayes Microcomputer Products, Inc.: *See—*
McGlynn, Paul E.; and Nash, Randy D., 4,905,282, Cl. 380-48.000.

Health Research Incorporated: *See—*
Gierthy, John F., 4,904,595, Cl. 435-240.200.

Hebels, Albert; and Pagendarm, Ralph, to Pagendarm Beschichtungstechnik GmbH. Method of reducing tension in webs of thermoplastic material. 4,904,425, Cl. 264-40.100.

Hebert, Gerald D.: *See—*
LaBaw, Glenn D.; Hebert, Gerald D.; and Reich, Hanan, 4,904,487, Cl. 426-107.000.
LaBaw, Glenn D.; Hebert, Gerald D.; and Reich, Hanan, 4,904,488, Cl. 426-107.000.

Hebisch, Siegbert: *See—*
Goldmann, Siegfried; Gross, Rainer; Bechem, Martin; Kayser, Michael; Schramm, Matthias; and Hebisch, Siegbert, 4,904,665, Cl. 514-256.000.

Hebrank, John H., to Embrex, Inc. High speed automated injection system for avian embryos. 4,903,635, Cl. 119-1.000.

Heckmann, Johannes, to Dragerwerk Aktiengesellschaft. Colorimetric gas measuring device. 4,904,449, Cl. 422-87.000.

Heckmann, Siegfried; and Rybach, Johannes, to U.S. Philips Corp. Coupling device for guiding a light beam. 4,904,035, Cl. 350-96.200.

Hedge, Vinod R.; Horan, Ann C.; King, Arthur H.; Gentile, Frank A.; Patel, Mahesh G.; and Wagman, Gerald H., to Schering Corporation. Antimicrobial compound isolated from *Actinomadura fulva* subsp indica. 4,904,644, Cl. 514-29.000.

Hegg, Ronald G., to Hughes Aircraft Company. High-contrast fiber optic diffusion faceplate with radiused fibers. 4,904,049, Cl. 350-96.270.

Heidel, Jeffrey R., to McDonnell Douglas Corporation. Staggered quadrature phase shift keyed laser modulator. 4,904,963, Cl. 330-4.300.

Heidelberger Druckmaschinen AG: *See—*
Grutzmacher, Bertold; and Blaser, Peter T., 4,903,940, Cl. 251-129.160.
Jeschke, Willi; and Rambausek, Hugo, 4,903,596, Cl. 101-148.000.

Heider, James E., to Owens-Illinois Plastic Products Inc. Method of making plastic container with multilayer label applied by in-mold labeling. 4,904,324, Cl. 156-214.000.

Heiman, Mark L.: *See—*
Coy, David H.; Murphy, William A.; and Heiman, Mark L., 4,904,642, Cl. 514-11.000.

Hein, Josef T.; and Dittmar, Herbert, to Henkel Kommanditgesellschaft auf Aktien. Process for stripping off an adhered-on coating and device for carrying out the process. 4,904,329, Cl. 156-344.000.

Heinl, Thomas. Set of surgical instruments for joining bone fragments. 4,903,691, Cl. 606-70.000.

Heinold, Hans; Rau, Josef; and Unverzagt, Thomas, to Sussman, Jennewein Bekleidungstechnik GmbH. Apparatus for transporting garment hangers. 4,903,819, Cl. 198-465.400.

Heinrich, William: *See—*
Leopoldi, Norbert; and Heinrich, William, 4,903,860, Cl. 221-4.000.

Heinz, Gerhard, to BASF Aktiengesellschaft. Heat-stable copolycondensate molding materials. 4,904,754, Cl. 528-171.000.

Heitmann, Jurgen: *See—*
Mester, Roland; Heitmann, Jurgen; Loos, Rolf; and Muller, Jurgen, 4,905,099, Cl. 360-10.100.

Hejase, Hussin: *See—*
Schroder, Klaus; and Hejase, Hussin, 4,905,319, Cl. 357-65.000.

Held, Jimmy L.; and Tallerino, Charles E., to United States of America, Navy. Pressure armed release device. 4,903,382, Cl. 24-602.000.

Heldt, David L.: *See—*
Stock, George W.; and Heldt, David L., 4,903,810, Cl. 192-103.00B.

Helferich, Richard J., to Helferich, Richard J.; and Schwartz, Martin A., a part interest. Analog/digital data storage system. 4,905,003, Cl. 341-110.000.

Helgeson, Peter L.: *See—*
Winkler, Theodore; Helgeson, Peter L.; Sherman, William, III; and Snow, Thomas B., 4,903,953, Cl. 271-4.000.

Hemker, Heinrich; and Ostrup, Heinrich, to Claas Ohg. Self-propelling harvester thresher with two-part cutting mechanism. 4,903,470, Cl. 56-228.000.

Heng, Jean-Paul. Marmonier, Andre; and Guernet, Henri, to CGEE Alsthom. Insulation-piercing connector for coaxial cables. 4,904,204, Cl. 439-425.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Friese, Hans-Herbert; Pieper, Friedrich; and Bosse, Reinhard, 4,903,362, Cl. 8-94.230.
Hein, Josef T.; and Dittmar, Herbert, 4,904,329, Cl. 156-344.000.
Markert, Thomas; Bruns, Klaus; Krause, Horst-Juergen; Penninger, Josef; Virnig, Michael; and Falk, Volker, 4,904,640, Cl. 512-8.000.
McDaniel, Robert S., Jr.; McCurry, Patrick M.; Short, Rolland W. P.; and Glor, Paul R., 4,904,774, Cl. 536-127.000.
Waldhoff, Heinrich; Schindler, Joachim; and Viehweg, Holger, 4,904,389, Cl. 210-637.000.

Henning, Wolfgang: *See—*
Probst, Joachim; Henning, Wolfgang; Baumgen, Heinz; and Konig, Joachim, 4,904,727, Cl. 524-820.000.

Henricksen, Douglas A.; Clemente, Joseph R.; and Miller, Thomas P., to Henricksen, Douglas Alan. Vehicular mounted food receptacle. 4,903,872, Cl. 224-42.430.

Henricksen, Douglas Alan: *See—*
Henricksen, Douglas A.; Clemente, Joseph R.; and Miller, Thomas P., 4,903,872, Cl. 224-42.430.

Henricson, Kaj O., to A. Ahlstrom Corporation. Method and apparatus for thickening fiber suspension. 4,904,395, Cl. 210-741.000.

Henry, Francois *See—*
Buisson, Dominique; Henry, Francois; Leblanc, Jean; Pferfle, Helmut; and Pigeroulet, Jean, 4,903,666, Cl. 123-447.000.

Henry, John C.; Park, Kyung Tae; and Tom, Edward, to Pennwalt Corporation. Hail sensor. 4,904,894, Cl. 310-328.000.

Henze, Richard H.: *See—*
Ohta, Toshiro; Henze, Richard H.; McConica, Charles H., Clifford, George; and Spenner, Bruce F., 4,905,114, Cl. 360-132.000.

Hepp, Leonard R.: *See—*
Brown, Sterling B.; Han, Choong Y.; DeRudder, James L., and Hepp, Leonard R., 4,904,746, Cl. 525-438.000.

Heraeus Edelmetalle GmbH. *See—*
Domes, Anton; and Horitzer, Alfred, 4,904,348, Cl. 204-4.000.

Herbst, Thomas; and Schnitzler, Lorenz, to Dyckerhoff & Widmann Aktiengesellschaft. Anchoring device, such as a rock anchor. 4,904,122, Cl. 405-260.000.

Hercules Incorporated: *See—*
Dumas, David H.; and Echt, Elliott, 4,904,520, Cl. 428-212.000.

Herd, Kenneth G.: *See—*
Archibald, James B.; Moore, Ernest L.; Dawson, Richard N., and Herd, Kenneth G., 4,904,890, Cl. 310-59.000.

Herdzina, Frank J.; and Goodrich, Rollie M., to Service Tool Die & Mfg. Co. Dual lane conversion system. 4,904,140, Cl. 413-56.000.

Herion-Werke KG: *See—*
Motzer, Helmut, 4,903,727, Cl. 137-596.160.
Motzer, Helmut, 4,903,728, Cl. 137-596.160.
Motzer, Helmut, 4,903,729, Cl. 137-596.160.

Hermann Berstorff Maschinenbau GmbH: *See—*
Koch, Klaus; and Klemm, Manfred, 4,904,835, Cl. 219-10.55M.

Hermele, Jules J., to Polymer Plastics Corp. Textured exterior surface treatment. 4,904,709, Cl. 523-220.000.

Herr, Richard W., to Man-O-War, Inc. Fastener system for pipe coupling bands. 4,903,996, Cl. 285-39.000.

Herrig, Doyle G.: *See—*
Hanson, Jay L.; and Herrig, Doyle G., 4,903,502, Cl. 62-228.500.

Herrmann, Gunter: *See—*
Loehr, Hans-Guenter; and Herrmann, Gunter, 4,903,818, Cl. 198-409.000.

Herron, Michael M., to Schlumberger Technology Corp. Quantitative clay typing and lithological evaluation of subsurface formations. 4,903,527, Cl. 73-152.000.

Herter, Bruno: *See—*
Kappler, Manfred; Herter, Bruno; and Winkler, Rolf, 4,904,076, Cl. 351-138.000.

Herzog, Philippe: *See—*
LeBlond, Henri; Herzog, Philippe; and Bruneau, Michel, 4,903,531, Cl. 73-505.000.

Hesla, Erling C.: *See—*
Catey, Harry; and Hesla, Erling C., 4,905,276, Cl. 379-450.000.

Hess, Peter L., to Inland Aqua-Tech Co., Inc. Gold and silver recovery processes by electrolytic generation of active bromine. 4,904,358, Cl. 204-111.000.

Hesse, Alfons, to Schmidt, Paul. Apparatus for making tunnels in the ground and for laying supply lines. 4,904,116, Cl. 405-183.000.

Hester, Jack: *See—*
Ison, Daniel L.; and Hester, Jack, 4,904,505, Cl. 427-424.000

Hetzel & Co.: *See—*
Gloeckle, Friedrich, 4,904,104, Cl. 402-80.00R.

Hewitt, Harvey J.: *See—*
Badesha, Santokh S.; Cherin, Paul; and Hewitt, Harvey J., 4,904,559, Cl. 430-128.000.

Hewlett-Packard Company: *See—*
Bertagne, Michael G., 4,904,862, Cl. 250-216.000
DiCarolis, Stephen A., 4,904,638, Cl. 505-1.000.
Epstein, Howard C.; Lugaresi, Thomas J., and Robinson, Michael A., 4,904,861, Cl. 250-214.00C.
Ohta, Toshiro; Henze, Richard H.; McConica, Charles H., Clifford, George; and Spenner, Bruce F., 4,905,114, Cl. 360-132.000.

Hickerson, Karen M. V. Torso sling for a hoist for lifting and supporting a physically disabled person. 4,903,355, Cl. 5-89.000.

Hida, Hidenori: *See—*
Iino, Hideyuki; and Hida, Hidenori, 4,904,883, Cl. 307-272.300.

Higaki, Masahiro, to Minolta Camera Kabushiki Kaisha. Copying machine provided with a paper handling device with a paper stapling function. 4,905,055, Cl. 355-324.000.

Higashiyama, Kazuhiro: *See—*
Ooki, Masayuki; and Higashiyama, Kazuhiro, 4,903,663, Cl. 123-425.000.

High Frequency Products, Inc.: *See—*
Merritt, Thomas D., 4,903,499, Cl. 62-149.000.

Higuchi, Hirokazu, to Murata Manufacturing Co., Ltd. Method for inserting chip parts into a holding plate. 4,903,393, Cl. 29-450.000.

Hijikata, Kenji: *See—*
Kanoe, Toshio; and Hijikata, Kenji, 4,904,752, Cl. 528-97.000.

Hildbrand, Hans P.; Fricker, David; and Wolf, Horst, to Zinser Textilmaschinen GmbH. Spindles for a spinning machine with individual drives. 4,904,892, Cl. 310-217.000.

Hill, George B.: *See—*
Pilgrim, William R.; Young, Derek W.; Tait, Brian S.; Crawley, Graham C.; Edwards, Philip N.; and Hill, George B., 4,904,661, Cl. 514-237.500.

Hills, Linda R.: *See—*
Harsh, Don J.; Hills, Linda R.; and Howard, Kennalyn, 4,904,244, Cl. 604-187.000.

Hilti Aktiengesellschaft: *See—*
Odoni, Walter; Berchtold, Oliver; and Gerber, Wilhelm, 4,903,785, Cl. 175-293.000.

Hilton, Dennis M.; Korenberg, Paul E.; and Conroy, Suzanne M., to W. R. Grace & Co.-Conn. Rapid setting cementitious fireproofing compositions and method of spray applying same. 4,904,503, Cl. 427-373.000.

Himes, Glenn R., to Shell Oil Company. Block copolymeric rubber compositions for soles. 4,904,725, Cl. 524-505.000.

Hinca, William F. Sign holder. 4,903,423, Cl. 40-205.000.

Hino, Motohito; Bessho, Yoshinori; and Kondo, Michio, to Brother Kogyo Kabushiki Kaisha. Optical surface roughness measuring apparatus with polarization detection. 4,905,311, Cl. 250-225.000.

Hira, Yasuo: *See—*
Imoto, Katsuyuki; Sano, Hirohisa; and Hira, Yasuo, 4,904,037, Cl. 350-96.120.

Hirai, Yoshio, to Seiko Instruments Inc. Method for evaluating insulating films. 4,904,946, Cl. 324-551.000.

Hirai, Yutaka: *See—*
Komatsu, Toshiyuki; Hirai, Yutaka; Nakagawa, Katsumi; Osada, Yoshiyuki; Omata, Satoshi; and Nakagiri, Takashi, 4,905,072, Cl. 357-59.000.

Hiraishi, Kiyoto: *See—*
Mori, Etsunori; Kiuchi, Tadashi; Hiraishi, Kiyoto; and Watanabe, Masaru, 4,904,972, Cl. 336-55.000.

Hirakawa, Jun, to Asahi Kogaku Kogyo Kabushiki Kaisha. Telephoto lens system. 4,904,070, Cl. 350-454.000.

Hirakawa, Tamotsu; Oya, Kozo; Ueda, Minoru; and Yamauchi, Hiroaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Fat compositions suitable for use in bakeries or confectioneries. 4,904,485, Cl. 426-62.000.

Hiramatsu, Takeo; and Niiyama, Tsunefumi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Failsafe hydraulic control system for vehicle automatic transmission. 4,903,551, Cl. 74-869.000.

Hirano, Masami: *See—*
Nohara, Shigezo; Hirata, Sadao; Matsuo, Junichi; Hirano, Masami; and Tanikawa, Isao, 4,904,509, Cl. 428-36.600.

Hirano, Mikio: *See—*
Yamada, Hirozi; Kizaki, Sachiko; Mori, Hiroyuki; Tarutani, Yoshinobu; and Hirano, Mikio, 4,904,619, Cl. 437-190.000.

Hirano, Minoru: *See—*
Mori, Shoichi; Fujii, Shigeo; Yoshizawa, Masao; Miyasaka, Kenji; Tabuchi, Jyoichi; Egawa, Kazufumi; Hirano, Minoru; and Yoshida, Yoshikazu, 4,904,257, Cl. 623-16.000.

Hirata, Kenji; Ninomiya, Hideki; Yoshino, Shigetoshi; Inoue, Hiromu; and Mizutani, Jue, to Shikoku Research Institute Incorporated. Method of generating a metal vapor in a metal vapor laser. 4,904,310, Cl. 148-4.000.

Hirata, Sadao: *See—*
Nohara, Shigezo; Hirata, Sadao; Matsuo, Junichi; Hirano, Masami; and Tanikawa, Isao, 4,904,509, Cl. 428-36.600.

Hiratsuka, Shigetoshi: *See—*
Iizuka, Hisao; Hiratsuka, Shigetoshi; Tanno, Kiyohiko; Satou, Teruji; and Ashizuka, Norihiro, 4,905,021, Cl. 346-107.00R.

Hirayama, Makoto: *See—*
Satoh, Shinichi; Hirayama, Makoto; Nagatomo, Masao; Ogoh, Ikuo; Ohno, Yoshikazu; and Fujinaga, Masato, 4,905,068, Cl. 357-68.000.

Hiro, Motohisa: *See—*
Ohishi, Akio; Kuroda, Takao; Tsuji, Shinji; Hiro, Motohisa; and Matsumura, Hiroyoshi, 4,905,057, Cl. 357-17.000.

Hirono, Tadamichi: *See—*
Kawamura, Toshio; Nihei, Norihisa; Hirono, Tadamichi; and Hyodo, Tadayoshi, 4,904,365, Cl. 204-299.0EC.

Hiroshima, Yasunori, to Pioneer Electronic Corporation. Projection apparatus for projection television receiver. 4,904,054, Cl. 350-253.000.

Hirscher, Hans; and Wagner, Rudolf, to Balzers Aktiengesellschaft. Method and apparatus for the transmission heat to or from plate like object. 4,903,754, Cl. 165-1.000.

Hirschfeld, Gidoon; and Shotland, Abraham, to I.V.D.M. Ltd. Automatic vending machine and system for dispensing articles. 4,903,815, Cl. 194-205.000.
Hirukawa, Itsushi; Takeuchi, Kazuya; and Motoshige, Nobuki, to Sanshin Kogyo Kabushiki Kaishi. Spark timing controller for spark ignited internal combustion engine. 4,903,662, Cl. 123-418.000.
Hisayuki Matsuo: *See—*
Matsuo, Hisayuki; Kangawa, Kenji; Minamino, Naoto; Sudoh, Tetsuji; Izumi, Atsushi; and Isogai, Mitsutaka, 4,904,763, Cl. 530-324.000.
Hitachi Cable, Ltd.: *See—*
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Hitachi Carbide Tools, Inc.: *See—*
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Hitachi Construction Machinery Co., Ltd.: *See—*
Otake, Kan; Kajiwara, Junichi; Akutsu, Yoshio; Miyaji, Katsuyoshi; and Katsuyama, Yoichi, 4,904,954, Cl. 330-281.000.
Hitachi Heating Appliances Co., Ltd.: *See—*
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Hitachi Ltd.: *See—*
Arai, Masahiko, 4,905,191, Cl. 371-21.200.
Baba, Kenji; Watanabe, Shoji; Yahagi, Hayao; and Ogasawara, Hitoshi, 4,904,388, Cl. 210-605.000.
Chinone, Naoki; Nakashima, Hisao; Okai, Makoto; and Tsuji, Shinji, 4,905,060, Cl. 357-17.000.
Ducassou, Francis L., 4,904,199, Cl. 439-304.000.
Fukuda, Hiroshi; Hasegawa, Norio; Tanaka, Toshihiko; Kurosaki, Toshiei; Nonogaki, Saburo; Taniguchi, Yoshio; and Matsuzawa, Toshiharu, 4,904,569, Cl. 430-311.000.
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,905,195, Cl. 365-189.050.
Igarashi, Yoshiki; and Shudo, Tuyosi, 4,903,703, Cl. 128-653.00A.
Imoto, Katsuyuki; Sano, Hirohisa; and Hira, Yasuo, 4,904,037, Cl. 350-96.120.
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Kimura, Tomoaki; and Sekiya, Teruo, 4,903,518, Cl. 72-249.000.
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Matsui, Makoto; Ohwada, Jun-ichi; Shiraki, Yasuhiro; and Maruyama, Eiichi, 4,904,989, Cl. 340-719.000.
Mori, Etsunori; Kiuchi, Tadashi; Hiraishi, Kiyoto; and Watanabe, Masaru, 4,904,972, Cl. 336-55.000.
Nagaoka, Takashi; Gyobu, Ichiro; Muramatsu, Kimio; Ueyama, Keiji; Mase, Masahiro; Awada, Yoshihisa; and Nishiuchi, Akira, 4,904,155, Cl. 415-90.000.
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Suefuji, Kazutaka; Senshu, Takao; Arata, Tetsuya; Muramatsu, Masatoshi; Okamoto, Jyoji; and Murayama, Akira, 4,904,170, Cl. 418-55.000.
Takahashi, Tadashi; Miyashita, Kunio; and Kawamata, Syoichi, 4,904,937, Cl. 324-207.210.
Takeda, Hiroshi; Yoshida, Shigeaki; and Katsura, Koyo, 4,904,990, Cl. 340-814.000.
Tatsuno, Kimio; van der Poel, Carolus J.; and Acket, Gerard A., 4,904,068, Cl. 350-421.000.
Tokita, Jiro; Nagai, Kenichi; Simada, Tamotu; Watanabe, Ken'ichi; Nakano, Ryusei; and Sumitani, Tomoaki, 4,904,366, Cl. 204-299.00R.
Yamada, Hirozi; Kizaki, Sachiko; Mori, Hiroyuki; Tarutani, Yoshinobu; and Hirano, Mikio, 4,904,619, Cl. 437-190.000.
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Hitachi Medical Corporation: *See—*
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Nishiyama, Hisashi; Katakura, Kageyoshi; Ogawa, Toshio; Tamano, Satoshi; Tanabe, Koji; and Ishikawa, Shizuo, 4,905,206, Cl. 367-90.000.
Hitachi Metals, Ltd.: *See—*
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Sakakibara, Yasuhiro; Kobayashi, Isamu; and Suzuki, Yoshinori, 4,905,140, Cl. 364-200.000.
Hitachi Zosen Corporation: *See—*
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Bickerstaff, Alan E.; Collier, Barry J.; Hale, Joseph F., Hitchmough, Peter M.; Pitts, Ian; and Rasul, Ghulam, 4,905,049, Cl. 355-284.000.
Hiyoshi, Tatsuo; and Miyazaki, Makoto, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing an ion exchange membrane. 4,904,701, Cl. 521-32.000.
Håkansson, Bo; and Carlsson, Peder. Arrangement in a hearing aid device. 4,904,233, Cl. 600-25.000.
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Lupinetti, Francesco, to United States of America, Energy. UHF FM receiver having improved frequency stability and low RFI emission. 4,905,087, Cl. 358-191.100.

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Machell, Julie S.; and Yacobucci, Paul D., to Eastman Kodak Company. Low birefringent polyesters in optical devices. 4,904,755, Cl. 528-193.000.

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Okamoto, Hiroo; Noguchi, Takaharu; Kobayashi, Masaharu; and Nakama, Taihei, 4,905,104, Cl. 360-70.000.
Noguchi, Yoshihiro; and Kitazawa, Hideo, to Nakamichi Corporation; and Kabusiki Kaisha Sankyo. Stationary tape guide for a magnetic tape recorder. 4,903,879, Cl. 226-199.000.
Nohara, Shigezo; Hirata, Sadao; Matsuo, Junichi; Hirano, Masami; and Tanikawa, Isao, to Toyo Seikan Kaisha, Ltd. Injection-molded body of olefin/vinyl alcohol copolymer and process for preparation thereof. 4,904,509, Cl. 428-36.600.
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Iwaki, Takashi; Katagiri, Kazuharu; and Yamada, Yoko, to Canon Kabushiki Kaisha. Mesomorphic compound and liquid crystal composition containing same. 4,904,410, Cl. 252-299.610.
Nohira, Hiroyuki; and Yoshida, Shinichi, to Kuraray Co., Ltd. Process for the optical resolution of (+)-2-hydroxy-4-phenylbutanoic acid. 4,904,822, Cl. 562-401.000.
Nohma, Toshiyuki: *See—*
Furukawa, Nobuhiro; Saito, Toshihiko; and Nohma, Toshiyuki, 4,904,552, Cl. 429-197.000.
Noll, Wilfried: *See—*
Wieninger, Klaus; Sattelmaier, Walter; Noll, Wilfried; Stehle, Hans P.; and Apfel, Norbert, 4,903,410, Cl. 30-387.000.
Nolle, Eugen; and Geschka, Hugo W., to E. Blum GmbH & Co. Lamination for use in transformers or the like and method of making the same. 4,904,527, Cl. 428-334.000.
Nonogaki, Saburo: *See—*
Fukuda, Hiroshi; Hasegawa, Norio; Tanaka, Toshihiko; Kurosaki, Toshiei; Nonogaki, Saburo; Taniguchi, Yoshio; and Matsuzawa, Toshiharu, 4,904,569, Cl. 430-311.000.
Norden Laborstories, Inc.: *See—*
Gill, Michael A.; and May, Stephen W., 4,904,468, Cl. 424-89.000.
Noreikat, Karl-Ernst: *See—*
Letsche, Ulrich; Hafner, Gunther; and Noreikat, Karl-Ernst, 4,903,896, Cl. 239-88.000.
Norita, Toshio: *See—*
Ishida, Tokuji; Norita, Toshio; and Ootsuka, Hiroshi, 4,904,854, Cl. 250-201.000.
Ishida, Tokuji; Norita, Toshio; Hamada, Masataka; and Ootsuka, Hiroshi, 4,905,032, Cl. 354-402.000.
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 4,905,033, Cl. 354-402.000.
Norris, Jerome J.: *See—*
Chima, Oji A., 4,904,678, Cl. 514-345.000.
North American Philips Corporation: *See—*
Bugni, Anthony R.; Phillips, Larry G.; Darby, Ted A.; Naimpally, Saiprasad V.; and Burdick, William S., 4,905,083, Cl. 358-139.000.

Greene, David C., 4,904,962, Cl. 331-117.00R.
Penird, Thomas W.; Rehkopf, Charles H.; Say, Donald L.; and Zellar, Bruce W., 4,904,898, Cl. 313-449.000.
Reeder, Bruce L.; Wilson, Joseph M.; and Wade, Stephen D., 4,903,816, Cl. 194-350.000.
Stierberger, Willy F., 4,905,116, Cl. 261-91.000.
Van Eggermond, Johannes M., Whitman, Russell, II; Naparstek, Abraham; and Rombotis, Stamatis M., 4,903,704, Cl. 128-653.00A.
North American Philips Corporation Signetics Division: *See—*
Goodhue, Gregory K.; Price, William J.; Treadway, Ronald L.; and Willis, Brian M., 4,905,137, Cl. 364-200.000.
Northern Telecom Limited: *See—*
Cristescu, Alex G.; and Marc, Eugene F., 4,904,210, Cl. 439-676.000.
Nadeau, Serge, 4,904,323, Cl. 156-203.000.
Pelletier, Claude, 4,904,201, Cl. 439-352.000.
Norton Christensen, Inc.: *See—*
Frear, Lawrence; Davis, John S.; and Hyland, Craig R., 4,904,228, Cl. 464-152.000.
Norton Company: *See—*
Cygan, Stanley W.; and Ramakrishnan, Muni S., 4,904,280, Cl. 51-296.000.
Yeckley, Russell L., 4,904,624, Cl. 501-97.000.
Norton, Jeffrey M.; Paukovits Jr., Edward J., Rudy Jr., William J.; and Shaffer, Howard R., to AMP Incorporated. Method of assembling a connector to a circuit card. 4,903,402, Cl. 29-843.000.
Nosberger, Paul, to Hoffmann-La Roche Inc. Process for manufacturing a diketone. 4,904,805, Cl. 549-319.000.
Nova Husky Research Corporation. *See—*
Zanzotto, Ludo; Faber, Albert J., Foley, Dennis P., Jeffries, Royston B.; and Watson, R. David, 4,904,305, Cl. 106-284.000.
Novich, Bruce E.; Occhionero, Mark A.; and Pober, Richard L., to Ceramics Process Systems Corp. Highly loaded, pourable suspensions of particulate materials. 4,904,411, Cl. 252-309.000.
Novo Industri A/S: *See—*
Christensen, Flemming M., and Olsen, Hans A. S., 4,904,483, Cl. 426-44.000.
Nowata Agricultural Management Co., Inc. *See—*
Howard, Carl B., 4,903,555, Cl. 81-145.000.
Noxell Corporation: *See—*
Broers, Becky; and Gaelen, Lois, 4,903,838, Cl. 206-459.000.
NTN Toyo Bearing Co., Ltd.: *See—*
Kawashima, Kazuki; and Hayakawa, Hisashi, 4,904,230, Cl. 474-112.000.
Nuytten, Rene T., to International Hard Suits, Inc. Pressure equalizing rotary joint. 4,903,941, Cl. 251-148.000.
Nytomt, Jan: *See—*
Gillbrand, Per; Johansson, Hans, and Nytomt, Jan, 4,903,676, Cl. 123-639.000.
Oakes, John: *See—*
Darwent, James R.; Francis, Keith C., Oakes, John; and Thornthwaite, David W., 4,904,406, Cl. 252-102.000.
Oakley, Thurman B. Stockings with connecting crotchpiece. 4,903,345, Cl. 2-240.000.
Oana, Yasuhisa *See—*
Dohjo, Masayuki; Oana, Yasuhisa, and Ikeda, Mitsushi, 4,905,066, Cl. 357-23.150.
Oatey Co.: *See—*
Kifer, David E., 4,903,997, Cl. 285-43.000.
OBE-Werk Ohrmacht & Baumgartner GmbH & Co. KG. *See—*
Drlik, Gunther, 4,904,077, Cl. 351-141.000.
Oberlander, Claude: *See—*
Aktogu, Nurgun; Delevallee, Francoise; Clemence, Francois; and Oberlander, Claude, 4,904,655, Cl. 514-229.500.
O'Brien, Mark R.; Barre, Mark S.; and Newton, Michael S., to Cuno, Inc. Method and apparatus for residential water test kit. 4,904,605, Cl. 436-169.000.
Occhionero, Mark A.: *See—*
Novich, Bruce E.; Occhionero, Mark A., and Pober, Richard L., 4,904,411, Cl. 252-309.000.
Oce-Nederland B.V.: *See—*
Schuerman, Cornelis P., 4,905,166, Cl. 364-518.000.
OcuSoft Inc.: *See—*
Adkins, Nat G., Jr.; and Rooney, Douglas S., 4,904,698, Cl. 514-642.000.
Odoni, Walter; Berchtold, Oliver; and Gerber, Wilhelm, to Hilti Aktiengesellschaft. Drilling and chiseling tool bit. 4,903,785, Cl. 175-293.000.
Oediger, Hermann: *See—*
Boshagen, Horst; Rosentreter, Ulrich; Lieb, Folker; Oediger, Hermann; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,904,797, Cl. 548-448.000.
Offley, Clive F.: *See—*
Duthie, Anthony J.; and Offley, Clive F., 4,903,368, Cl. 15-339.000.
Ogami, Etsuo: *See—*
Minagawa, Shunichi, Kuzuoka, Hiroaki; Nakamura, Hitoshi; and Ogami, Etsuo, 4,903,646, Cl. 123-55.0VE.
Ogasawara, Hiroshi: *See—*
Baba, Kenji; Watanabe, Shoji; Yahagi, Hayao; and Ogasawara, Hitoshi, 4,904,388, Cl. 210-605.000.
Ogawa, Masao *See—*
Nakajima, Tadashi; Toyosawa, Shinichi; Kijima, Shigeru; Arai, Katsuhiko; Maeda, Yuko; Ogawa, Masao; Kawagoe, Takahiro; Iino, Yasuhiro; Osawa, Ryuzo; and Ishino, Yuichi, 4,904,553, Cl. 429-213.000.
Ogawa, Mototsugu: *See—*
Nishigaki, Shinichi; Nakamura, Takeaki; Okabe, Minoru; Karasawa, Hitoshi; Kusnoki, Hiroyuki; Hagino, Tadao; Kubota, Tetsumaru; Ogawa, Mototsugu; Toda, Masato; and Sugata, Teruaki, 4,905,082, Cl. 358-98.000.
Ogawa, Ryuichi: *See—*
Ishikawa, Tsutomu; Ogawa, Ryuichi; Tanno, Masaya; and Tosaka, Fumio, 4,905,283, Cl. 381-22.000.
Ogawa, Toshio: *See—*
Nishiyama, Hisashi; Katakura, Kageyoshi; Ogawa, Toshio; Tamano, Satoshi; Tanabe, Koji; and Ishikawa, Shizuo, 4,905,206, Cl. 367-90.000.
Ogino, Toru: *See—*
Sato, Masato; Tamba, Shinichi; and Ogino, Toru, 4,903,654, Cl. 123-196.00W.
Ogino, Yoshitaka: *See—*
Kuroda, Koki; Tanaka, Sohei; and Ogino, Yoshitaka, 4,905,042, Cl. 355-56.000.
Oglesby, Robert L., to R. J. Reynolds Tobacco Company. Release coating on cigarette carton top flap. 4,903,844, Cl. 206-631.100.
Ogoe, Samuel A.: *See—*
Ho, Thoi H.; Mork, Charles O.; Ogoe, Samuel A.; and Lackey, Jeffrey E., 4,904,717, Cl. 524-392.000.
Ogoh, Ikuo: *See—*
Satoh, Shinichi; Hirayama, Makoto; Nagatomo, Masao; Ogoh, Ikuo; Ohno, Yoshikazu; and Fujinaga, Masato, 4,905,068, Cl. 357-68.000.
Ogura, Ichiro, to Kabushiki Kaisha Toshiba. Method and system for displaying flickerless X-ray dynamic images. 4,905,264, Cl. 378-99.000.
Ogura, Masami: *See—*
Kajiwara, Hajime; Ogura, Masami; Sano, Shoichi; and Kumata, Masataka, 4,903,984, Cl. 280-712.000.
Oh, Young S.: *See—*
Pancheri, Eugene J.; Oh, Young S.; and Wise, Rodney M., 4,904,359, Cl. 252-548.000.
Ohashi, Tamiyosi: *See—*
Goto, Fumio; Kondou, Mitsutaka; Nakagawa, Noboru; Ohashi, Tamiyosi; and Kondo, Masatoshi, 4,904,318, Cl. 156-64.000.
Ohashi, Yutaka: *See—*
Chiba, Masaaki; Maruhashi, Hideki; Ohashi, Yutaka; Murata, Shigemi; and Miyaji, Hidetoshi, 4,903,673, Cl. 123-617.000.
Ohata, Akira, to Toyota Jidosha Kabushiki Kaisha. Fuel injection system of an internal combustion engine. 4,903,668, Cl. 123-478.000.
Ohata, Tomohisa; Tsuchitani, Kazuo; Shiraishi, Eiichi; and Kitaguchi, Shinya, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Catalyst for purifying exhaust gas and method for production thereof. 4,904,633, Cl. 502-304.000.
Ohi Seisakusho Co., Ltd.: *See—*
Tatsumi, Hisato; Sakai, Kunio; Hamanoue, Yukio; and Ishizuka, Satoshi, 4,904,016, Cl. 296-180.500.
Yamazaki, Hiroshi; Hara, Toshiyuki; Tanaka, Yuji; and Mouri, Takayuki, 4,904,003, Cl. 292-126.000.
Ohira, Tsunehisa, to Victor Company of Japan, Ltd. Magnetic recording apparatus. 4,905,103, Cl. 360-64.000.
Ohira, Tsuyoshi; and Nakano, Tomio, to Fujitsu Limited. Semiconductor memory device capable of selective operation of memory cell blocks. 4,905,201, Cl. 365-230.030.
Ohishi, Akio; Kuroda, Takao, Tsuji, Shinji; Hiro, Motohisa; and Matsumura, Hiroyoshi, to Hitachi, Ltd. Semiconductor devices. 4,905,057, Cl. 357-17.000.
Ohkawachi, Susumu: *See—*
Komatsu, Hajime; Ohkawachi, Susumu; and Suzuki, Fujitsugu, 4,904,580, Cl. 430-567.000.
Ohkubo, Satoru: *See—*
Washino, Shoichi; and Ohkubo, Satoru, 4,903,665, Cl. 123-435.000.
Ohkumo, Hiroya: *See—*
Miyama, Shuji; and Ohkumo, Hiroya, 4,903,526, Cl. 73-117.300.
Miyama, Shuji; and Ohkumo, Hiroya, 4,903,658, Cl. 123-339.000.
Ohlendorf, Rolf; Treyz, Willy; Doll, Gerhard; and Speier, Wolfgang, to Daimler-Benz AG. Apparatus for relative angular adjustment between two shafts in drive connection. 4,903,650, Cl. 123-90.170.
Ohlsson, Håkan: *See—*
Larsson, Lennart; Ullman, Bo; and Ohlsson, Håkan, 4,905,263, Cl. 378-89.000.
Ohmuro, Kazuhiko; and Nakamura, Hiroshi, to Oki Electric Industry Co., Ltd. Schottky gate field effect transistor. 4,905,061, Cl. 357-22.000.
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, to Mochida Pharmaceutical Co., Ltd. Cephalosporin derivatives. 4,904,791, Cl. 548-194.000.
Ohno, Michio: *See—*
Hasegawa, Katsumi; Ohno, Michio; and Kadotsuji, Akira, 4,903,905, Cl. 242-18.00R.
Ohno, Motoshi: *See—*
Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; Horaguchi, Yoichi; and Nakata, Takashi, 4,905,038, Cl. 355-27.000.
Ohno, Yoshikazu: *See—*
Satoh, Shinichi; Hirayama, Makoto; Nagatomo, Masao; Ogoh, Ikuo; Ohno, Yoshikazu; and Fujinaga, Masato, 4,905,068, Cl. 357-68.000.
Ohsaka, Yohnosuke; Tohzuka, Takashi; Honda, Yoshitaka; and Yanagisawa, Norio, to Daikin Industries Ltd. Fluorine-containing polyether and process for preparing the same. 4,904,417, Cl. 562-849.000.

Ohsima, Shigeyuki; and Moteki, Yoshiji, to Kabushiki Kaisha Hosokawa Yoko. Pouch with superposed tear lines. 4,903,841, Cl. 206-604.000.

Ohsumi, Tadashi: *See*—
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Yano, Toshihiko; Fujimoto, Izumi; and Takada, Yoji, 4,904,696, Cl. 514-594.000.

Ohta, Haruo; and Matsumoto, Tokikazu, to Matsushita Electric Industrial Co., Ltd. Time base corrector. 4,905,101, Cl. 360-36.200.

Ohta, Hideji: *See*—
Sakai, Tadashi; and Ohta, Hideji, 4,903,505, Cl. 62-347.000.

Ohta, Toshiro; Henze, Richard H.; McConica, Charles H.; Clifford, George; and Spenner, Bruce F., to Hewlett-Packard Company; and Sony Corporation. Disk drive compatible tape cartridge with device for positioning the tape relative to the disk drive. 4,905,114, Cl. 360-132.000.

Ohtawa, Shigeru: *See*—
Miyashita, Tsuyoshi; Ohtawa, Shigeru; Tohda, Hiroyuki; Toda, Shozo; and Nakane, Hisashi, 4,904,571, Cl. 430-331.000.

Ohtsuka, Nobuaki; and Miyamoto, Junichi, to Kabushiki Kaisha Toshiba. Semiconductor memory device with a circuit for analyzing defects in word-lines. 4,905,194, Cl. 365-185.000.

Ohwada, Jun-ichi: *See*—
Matsui, Makoto; Ohwada, Jun-ichi; Shiraki, Yasuhiro; and Maruyama, Eiichi, 4,904,989, Cl. 340-719.000.

Oishi, Kanji; and Shinoda, Takashi, to Hitachi, Ltd. Semiconductor integrated circuit device. 4,905,198, Cl. 365-222.000.

Oishi, Mari: *See*—
Imaki, Naoshi; Takuma, Yuki; and Oishi, Mari, 4,904,787, Cl. 546-155.000.

Oka, Masahide: *See*—
Nogami, Ikuo; Shirafuji, Hideo; Yamaguchi, Takamasa; and Oka, Masahide, 4,904,588, Cl. 435-105.000.

Okabe, Minoru: *See*—
Nishigaki, Shinichi; Nakamura, Takeaki; Okabe, Minoru; Karasawa, Hitoshi; Kusnoki, Hiroyuki; Hagino, Tadao; Kubota, Tetsumaru; Ogawa, Mototsugu; Toda, Masato; and Sugata, Teruaki, 4,905,082, Cl. 358-98.000.

Okada, Takao; Shimazu, Hisanari; Toda, Akitoshi; and Sato, Susumu, to Olympus Optical Co., Ltd. Liquid crystal lenses having a Fresnel lens. 4,904,063, Cl. 350-347.00V.

Okada, Tetsuo: *See*—
Nishizawa, Jun-ichi; Kasai, Shinzo; Okada, Tetsuo; and Dohzono, Mitsuhiko, 4,903,938, Cl. 251-61.500.

Okado, Kenji: *See*—
Nagatsuka, Takayuki; Okado, Kenji; and Kanhayashi, Makoto, 4,904,558, Cl. 430-122.000.

Okagaki, Hiroyuki, to Clarion Co., Ltd. Optical signal detection circuit with constant current sources. 4,904,860, Cl. 250-214.00R.

Okai, Makoto: *See*—
Chinone, Naoki; Nakashima, Hisao; Okai, Makoto; and Tsuji, Shinji, 4,905,060, Cl. 357-17.000.

Okamoto, Hiroo; Noguchi, Takaharu; Kobayashi, Masaharu; and Nakama, Taihei, to Hitachi, Ltd. Rotary-head type digital signal recording and/or reproducing apparatus for recording and/or reproducing with a variable speed. 4,905,104, Cl. 360-70.000.

Okamoto, Jyoji: *See*—
Suefuji, Kazutaka; Senshu, Takao; Arata, Tetsuya; Muramatsu, Masatoshi; Okamoto, Jyoji; and Murayama, Akira, 4,904,170, Cl. 418-55.000.

Okamoto, Kazuya, to Kabushiki Kaisha Toshiba. Magnetic field generating system for magnetic resonance imaging system. 4,905,316, Cl. 324-319.000.

Okamoto, Kenji: *See*—
Iwasawa, Yoshiyuki; Ishida, Tsutomu; Harada, Hiroshi; Kobayashi, Shintaro; Okamoto, Kenji; Matsumoto, Takashi; Yamamoto, Kiwamu; and Takasu, Toshio, 4,904,153, Cl. 414-735.000.
Matsumoto, Takashi; Tanaka, Shigeru; Shinya, Tsutomu; Iwasawa, Yoshiyuki; Ishida, Tsutomu; Harada, Hiroshi; Kobayashi, Shintaro; and Okamoto, Kenji, 4,903,610, Cl. 104-118.000.

Okamoto, Kikuhiko: *See*—
Ozaki, Katsuya; Oshino, Kazushi; Koike, Kenzo; Ito, Susumu; and Okamoto, Kikuhiko, 4,904,599, Cl. 435-252.330.

Okamoto, Shinji: *See*—
Uemura, Tomoyoshi; Okamoto, Shinji; Moriyama, Takamasa; Asano, Kuniyoshi; and Takida, Hiroshi, 4,904,723, Cl. 524-394.000.

Okano, Shigetaro: *See*—
Horiike, Satoru; Nakano, Yasuhiko; Okano, Shigetaro; Kimura, Shigeru; Yamamoto, Toshiteru; Matsuzaki, Masanobu; Hamano, Eiji; and Kubo, Mikio, 4,903,790, Cl. 180-219.000.

Okashiro, Tetsuo: *See*—
Suzuki, Ryozo; Shiraga, Jun; Iwai, Shingo; and Okashiro, Tetsuo, 4,904,162, Cl. 417-44.000.

Okazaki, Kouji: *See*—
Yamamoto, Hitoshi; Okazaki, Kouji; and Iwashita, Kanau, 4,903,647, Cl. 123-65.0PE.

Okazaki, Masahide: *See*—
Sakamoto, Takashi; Kawatani, Masafumi; Tasaka, Kazutaka; and Okazaki, Masahide, 4,905,025, Cl. 346-154.000.

Oki Electric Industry Co., Ltd.: *See*—
Ohmuro, Kazuhiko; and Nakamura, Hiroshi, 4,905,061, Cl. 357-22.000.
Okubo, Takehiko; and Nakajima, Shigeki, 4,905,028, Cl. 346-160.000.

Okinaka, Keizo, to Furukawa Mfg. Co., Ltd. Method and apparatus for discharging vacuum packaged goods from vacuum packaging apparatus. 4,903,459, Cl. 53-434.000.

Okita, Tomoaki: *See*—
Shimizu, Hiroaki; Abe, Yasushi; Ichikawa, Masayoshi; and Okita, Tomoaki, 4,904,736, Cl. 525-279.000.

Okitsu, Yuji; Machida, Koichi; Torikai, Motoyuki; Tsuji, Junko; Asahina, Kotaro; Shinkoda, Kazuya; Kubo, Takayuki; and Kitahara, Mikio, to Mitsui Toatsu Chemicals, Inc. Resin composition for sealing semiconductors. 4,904,761, Cl. 523-435.000.

Okma Oberkochener Maschinen GmbH: *See*—
Zweig, Siegfried, 4,903,743, Cl. 144-3.00R.

Okubo, Kiyokazu; and Fujimoto, Shinji, to Honda Giken Kogyo Kabushiki Kaisha. Guide device for release bearing in pull type friction clutch. 4,903,808, Cl. 192-98.000.

Okubo, Takehiko; and Nakajima, Shigeki, to Oki Electric Industry Co., Ltd. Electrophotographic printer. 4,905,028, Cl. 346-160.000.

Okuda, Naoki: *See*—
Tsunoi, Haruo; Okuda, Naoki; and Kimura, Akiyoshi, 4,905,046, Cl. 355-235.000.

Okumura, Eiji: *See*—
Watanabe, Yoshitane; Okumura, Eiji; and Ando, Mikio, 4,903,304, Cl. 106-85.000.

Okumura, Takashi; and Yamaguchi, Koshiro, to Brother Kogyo Kabushiki Kaisha. Printing device. 4,904,096, Cl. 400-120.000.

Okunuki, Masahiko: *See*—
Tsukamoto, Takeo; Miyawaki, Mamoru; Kaneko, Tetsuya; Suzuki, Akira; Shimoda, Isamu; Takeda, Toshihiko; and Okunuki, Masahiko, 4,904,895, Cl. 313-336.000.

Okuyama, Kousuke; Uchida, Ken; Kusuyama, Kouichi; Meguro, Satoshi; Katto, Hisao; and Komori, Kazuhiro, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Method of making a read only memory device. 4,904,615, Cl. 437-52.000.

Oldring, Peter K. T.: *See*—
Nobbs, James H.; Oldring, Peter K. T.; and Duerden, David, 4,904,876, Cl. 250-461.100.

Olin Corporation: *See*—
Chao, Chung-Yao; and Breedis, John F., 4,905,074, Cl. 357-67.000.
Lewis, Brian G., 4,904,497, Cl. 427-47.000.
Raynor, Robert J.; and Migliaro, Francis W., Jr., 4,904,714, Cl. 524-100.000.

Olivenbaum, James E.; and Kester, Richard A., to Tideland Signal Corporation. Method and circuit for measuring pulse width. 4,904,947, Cl. 328-111.000.

Oliver, Colin C., to Thorn EMI plc. Temperature sensing arrangement. 4,904,090, Cl. 374-124.000.

Olon, Thomas E., to American Sterilizer Company. Dual resonant frequency arc lamp power supply. 4,904,905, Cl. 315-244.000.

Olsen, Hans A. S.: *See*—
Christensen, Flemming M.; and Olsen, Hans A. S., 4,904,483, Cl. 426-44.000.

Olsson, Sven O.; and Rudman, Lars J., to Dobel AB. Rolling mill machine for longitudinal bending of plate. 4,903,516, Cl. 72-181.000.

Olympus Optical Co., Ltd.: *See*—
Nishigaki, Shinichi; Nakamura, Takeaki; Okabe, Minoru; Karasawa, Hitoshi; Kusnoki, Hiroyuki; Hagino, Tadao; Kubota, Tetsumaru; Ogawa, Mototsugu; Toda, Masato; and Sugata, Teruaki, 4,905,082, Cl. 358-98.000.
Okada, Takao; Shimazu, Hisanari; Toda, Akitoshi; and Sato, Susumu, 4,904,063, Cl. 350-347.00V.

O'Malecki, Samuel L., to Baxter International, Inc. Process for manufacturing catheters. 4,904,431, Cl. 264-103.000.

Omata, Satoshi: *See*—
Komatsu, Toshiyuki; Hirai, Yutaka; Nakagawa, Katsumi; Osada, Yoshiyuki; Omata, Satoshi; and Nakagiri, Takashi, 4,905,072, Cl. 357-59.000.

Ombredane, Etienne, to Thomson-CGR. Device for sealing an enclosure containing an expandable fluid, especially within an electrical connection assembly. 4,903,972, Cl. 277-171.000.

Omori, Makoto: *See*—
Banjo, Toshinobu; Onoda, Shigeo; and Omori, Makoto, 4,905,124, Cl. 361-395.000.

Omron Tateisi Electronics Co.: *See*—
Mita, Katsuya; and Morishita, Muneki, 4,904,852, Cl. 235-479.000
Nagahara, Toyohiro, Niwa, Takashi; Sano, Takezo; and Kato, Isao, 4,904,832, Cl. 200-402.000.
Tsuji, Hideaki, 4,904,974, Cl. 336-192.000.

Omura, Takashi: *See*—
Yokogawa, Kazufumi; Morimitsu, Toshihiko; Harada, Naoki; Omura, Takashi; and Kikkawa, Sadanobu, 4,904,766, Cl. 534-642.000.

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Sakayori, Hiroyuki; and Kobayashi, Ippei, to Semiconductor Energy Laboratory Co., Ltd. Liquid crystal device with a smectic chiral liquid crystal and with a rectifier in series with each pixel. 4,904,057, Cl. 350-333.000.
Sakich, John D., to Hubbell Incorporated. Base mounted electrical assembly. 4,905,118, Cl. 361-117.000.
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Sano, Akira; Yoshizumi, Motohiko; Takenuki, Nobuya; and Matsuura, Kazuo, to Nippon Oil Company, Limited; and Mitsubishi Metal Corporation. Fluorinated ethylene/alpha-olefin copolymers. 4,904,743, Cl. 525-334.100.
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Sasaki, Akira; Esaki, Seiji; Hashimoto, Yasushi; and Kurita, Shigeo, to Honda Giken Kogyo Kabushiki Kaisha. Stopper apparatus for inner member in sliding universal joints. 4,904,227, Cl. 464-111.000
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Wollweber, Hartmund; Stoltefuss, Jurgen; Berschauer, Friedrich; de Jong, Ann; and Scheer, Martin, 4,904,679, Cl. 514-374.000.

Stone, Richard F., Jr.: *See—*
Kling, John P.; and Stone, Richard F., Jr., 4,904,539, Cl. 428-572.000.

Stone & Webster Engineering Corporation: *See—*
Goelzer, Alan R., 4,904,372, Cl. 208-113.000.
Karafian, Maxim; and Tsang, Irving C., 4,904,455, Cl. 422-201.000.

Story, Thomas: *See—*
Wyeth, Richard W.; Paisner, Jeffrey A.; and Story, Thomas, 4,905,244, Cl. 372-32.000.

Strickland, James C., to Rockford Corporation. Cyberoptic audio level control system. 4,905,291, Cl. 381-108.000.

Strickland, Mark D.: *See—*
Johnson, Malcolm L.; Burbank, Tracey A.; and Strickland, Mark D., 4,904,521, Cl. 428-284.000.

Strong, Matthew H.; and Vincent, James L., to Chrysler Motors Corporation. Method for compensating for cable length in a vehicle electronic speed control system. 4,905,154, Cl. 364-426.040.

Strunck, Fritz-Jurgen: *See—*
Wolf, Josef; and Strunck, Fritz-Jurgen, 4,903,948, Cl. 266-220.000.

Strydom, Mauritz L., to Tobacco Research and Development Institute Limited. Cigarettes and methods of making them. 4,903,712, Cl. 131-84.100.

Stuble, Helmut; Burkhardt, Heinz; and Velinsky, Josef, to LTG Luftechnische GmbH. Filter apparatus and method of operating same. 4,904,282, Cl. 55-96.000.

Sturik, Thomas S.: *See—*
Yant, Robert E.; and Sturik, Thomas S., 4,904,461, Cl. 423-478.000.

Sturm, Blaine C.: *See—*
Blenkush, Brian J.; and Sturm, Blaine C., 4,903,995, Cl. 285-38.000.

Stutts, Kenneth J., to Dow Chemical Company, The. Electrochemical organic reactions via catalytic halide substitution. 4,904,370, Cl. 204-59.00R.

Styles, Toni C. H. Deodorizing air vent attachment. 4,903,584, Cl. 98-101.000.

Sublett, Tommy J. Collection basin and drain for dishwasher leakage. 4,903,723, Cl. 137-312.000.

Suburbia Systems, Inc.: *See—*
Wickoren, Dean R., 4,904,159, Cl. 416-183.000.

Suda, Shoji: *See—*
Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, 4,903,939, Cl. 251-63.400.

Suda, Yoshihisa, to Mitsubishi Pencil Co., Ltd. Process of making a hollow structure of carbon material. 4,904,326, Cl. 156-242.000.

Sudo, Rey; Kurumada, Norimitsu; Todo, Fukuzo; Hara, Masao; and Sauda, Kenzo, to Kyushu Electric Power Co., Ltd.; and JGC Corp. Cement solidification treatment of spent ion exchange resins. 4,904,416, Cl. 252-628.000.

Sudoh, Tetsuji: *See—*
Matsuo, Hisayuki; Kangawa, Kenji; Minamino, Naoto; Sudoh, Tetsuji; Izumi, Atsushi; and Isogai, Mitsutaka, 4,904,763, Cl. 530-324.000.

Sudol, Marion A.: *See—*
Buckholz, Lawrence L., Jr.; Byrne, Brian; and Sudol, Marion A., 4,904,490, Cl. 426-243.000.

Suefuji, Kazutaka; Senshu, Takao; Arata, Tetsuya; Muramatsu, Masatoshi; Okamoto, Jyoji; and Murayama, Akira, to Hitachi, Ltd. Scroll-type fluid machine with different terminal end wrap angles. 4,904,170, Cl. 418-55.000.

Sueyoshi, Tadahiro; Kato, Tetsuo; and Maeda, Akira, to Yazaki Corporation. Releasable connector for electric circuits. 4,904,196, Cl. 439-188.000.

Sufi, Aniq, to SMS Associates. High temperature foam. 4,904,703, Cl. 521-135.000.

Sugano, Kazuhiko: *See—*
Ueki, Akihiro; and Sugano, Kazuhiko, 4,903,549, Cl. 74-867.000.

Sugata, Teruaki: *See—*
Nishigaki, Shinichi; Nakamura, Takeaki; Okabe, Minoru; Karasawa, Hitoshi; Kusnoki, Hiroyuki; Hagino, Tadao; Kubota, Tetsumaru; Ogawa, Mototsugu; Toda, Masato; and Sugata, Teruaki, 4,905,082, Cl. 358-98.000.

Sugawara, Hideo; Takashina, Tomonori; Takahashi, Nobuko; Sugiyama, Machiko; Seino, Akio; and Miyazaki, Yukio, to Kaken Pharmaceutical Company, Ltd. Antibiotic F-0769, process for its production, and its use as a growth accelerating and feed efficiency increasing agent and as an antitumour agent. 4,904,470, Cl. 424-119.000.

Sugawara, Saburoh: *See—*
Tejima, Yasuyuki; Arai, Akihiro; Yuda, Hideaki; Sugawara, Saburoh; and Tohji, Shigeo, 4,905,034, Cl. 354-403.000.

Sugawara, Tsunehiko: *See—*
Nakata, Michio; and Sugawara, Tsunehiko, 4,904,899, Cl. 313-477.00R.

Sugi, Hideo: *See—*
Kondo, Nobuo; Kikuchi, Masahiro; Nakajima, Tsunetaka; Watanabe, Masahiro; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 4,904,668, Cl. 514-274.000.

Sugiki, Chiaki; Nishizawa, Kanji; Sugimoto, Masako; Sonoda, Kazumi; and Kishimoto, Fumitaka, to Sumitomo Chemical Company, Limited. Novel microorganism, a novel esterase and method for preparing the same. 4,904,593, Cl. 435-197.000.

Sugikubo, Toshihiro: *See—*
Suzuki, Koichiro; and Sugikubo, Toshihiro, 4,905,106, Cl. 360-74.600.

Sugimoto, Masaki; Nakayama, Akira; Nakagawa, Isao; Maruyama, Noboru; Morikawa, Kunihiko; and Yoshioka, Hideji, to Nissan Motor Co., Ltd. Annular milling cutter for machining bevel gear. 4,904,129, Cl. 407-21.000.

Sugimoto, Masako: *See—*
Sugiki, Chiaki; Nishizawa, Kanji; Sugimoto, Masako; Sonoda, Kazumi; and Kishimoto, Fumitaka, 4,904,593, Cl. 435-197.000.

Sugitani, Hiroshi; Matsuda, Hiroto; and Ikeda, Masami, to Canon Kabushiki Kaisha. Laminated liquid-jetting head capable of recording in a plurality of colors, a method of producing the head and an apparatus having the head. 4,905,017, Cl. 346-1.100.

Sugiura, June: *See—*
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,905,195, Cl. 365-189.050.

Sugiura, Susumu; and Masuda, Yukio, to Canon Kabushiki Kaisha. Image processing apparatus. 4,905,294, Cl. 382-9.000.

Sugiyama, Eiji; Natsume, Mitsuaki; and Saito, Toshiharu, to Fujitsu Limited. Semiconductor integrated circuit apparatus. 4,904,887, Cl. 307-467.000.

Sugiyama, Machiko: *See—*
Sugawara, Hideo; Takashina, Tomonori; Takahashi, Nobuko; Sugiyama, Machiko; Seino, Akio; and Miyazaki, Yukio, 4,904,470, Cl. 424-119.000.

Sukup Manufacturing Company: *See—*
Smit, Edward H., 4,903,781, Cl. 172-316.000

Suling, Carlhans: *See—*
Reiners, Jurgen; Suling, Carlhans; Schafer, Walter; Muller, Hanns P.; Podszun, Wolfgang; and Winkel, Jens, 4,904,750, Cl. 526-301.000.

Sullivan, Jerry F., to Ipco Corporation. Flexible ultrasonic cleaning bag. 4,903,718, Cl. 134-184.000.

Sulsky, Richard B.: *See—*
Demers, James P.; and Sulsky, Richard B., 4,904,667, Cl. 514-267.000.

Sulzbach, Hans-Michael: *See—*
Proksa, Ferdinand; Sulzbach, Hans-Michael; Althausen, Ferdinand; and Raffel, Reiner, 4,904,451, Cl. 422-133.000.

Sulzer Brothers Limited: *See—*
Mandrin, Charles, 4,903,496, Cl. 62-87.000.

Sumioka, Koichi: *See—*
Tanaka, Akira; and Sumioka, Koichi, 4,904,578, Cl. 430-507.000.

Sumitani, Tomoaki: *See—*
Tokita, Jiro; Nagai, Keiichi; Simada, Tamotu; Watanabe, Ken'ichi; Nakano, Ryusei; and Sumitani, Tomoaki, 4,904,366, Cl. 204-299.00R.

Sumitomo Bakelite Company Limited: *See—*
Tokuda, Koichi; Yasuda, Kazuo; and Yoshida, Kazuhiro, 4,903,842, Cl. 206-404.000.

Sumitomo Chemical Company Limited: *See—*
Haga, Toru; Nagano, Eiki; Sato, Ryo; and Morita, Kouichi, 4,904,800, Cl. 548-513.000.
Ikeda, Takaharu; and Tada, Kazuhiro, 4,904,793, Cl. 548-262.000.
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Yano, Toshihiko; Fujimoto, Izumi; and Takada, Yoji, 4,904,696, Cl. 514-594.000.
Sugiki, Chiaki; Nishizawa, Kanji; Sugimoto, Masako; Sonoda, Kazumi; and Kishimoto, Fumitaka, 4,904,593, Cl. 435-197.000.
Yokogawa, Kazufumi; Morimitsu, Toshihiko; Harada, Naoki; Omura, Takashi; and Kikkawa, Sadanobu, 4,904,766, Cl. 534-642.000.

Sumitomo Eaton Nova Corporation: *See—*
Tamai, Tadamoto; and Sato, Masateru, 4,904,902, Cl. 315-111.810.

Sumitomo Electric Industries, Ltd.: *See—*
Nishiguchi, Masanori; and Sekiguchi, Takeshi, 4,904,012, Cl. 294-64.100.
Sogawa, Ichiro; Maeda, Nao-omi; Hayashi, Kazuhiko; Kanda, Masahiko; and Yotsuya, Koro, 4,904,048, Cl. 350-96.260.

Sumnitsch, Franz, to Sez Semiconductor-Equipment Zubehoer Fuer die Halbleiterfertigung Gesellschaft m.b.H. Support for slice-shaped articles and device for etching silicon wafers with such a support. 4,903,717, Cl. 134-99.000.

Sundeen, Joseph E.; and Ermann, Peter H., to E. R. Squibb & Sons, Inc. Heteroaroylhydrazide derivatives of monocyclic beta-lactam antibiotics. 4,904,775, Cl. 540-363.000.

Sundstrand Corporation: *See—*
Recker, Bradley J.; Rozman, Christopher J.; and Roe, Derrick I., 4,905,134, Cl. 363-98.000.

Sundstrand Data Control, Inc.: *See—*
Bateman, Charles D., 4,905,000, Cl. 340-968.000.

Sundstrand-Sauer: *See—*
Louis, Joseph E.; and Johnson, Alan W., 4,903,545, Cl. 74-606.00R.

Sunkara, Sai P.; Edwards, Michael L.; and Stemerick, David M., to Merrell Dow Pharmaceuticals Inc. Controlling the growth of certain tumor tissue with chalcone derivatives. 4,904,697, Cl. 514-629.000.

Super Sagless Corporation: *See—*
May, Teddy J., 4,904,019, Cl. 297-85.000.

Supernaw, Irwin R.: *See—*
Sims, Jackie C.; and Supernaw, Irwin R., 4,905,203, Cl. 367-25.000.

Sura, Maria: *See—*
Siebers, Friedrich; Kiefer, Werner; and Sura, Maria, 4,904,291, Cl. 65-18.100.

Surjaatmadja, Jim B.; and Penn, Jack C., to Halliburton Company. Security apparatus and method for computers connected to telephone circuits. 4,905,281, Cl. 380-25.000.

Surles, Billy W.: *See—*
Friedman, Robert H.; Surles, Billy W.; and Fader, Philip D., 4,903,770, Cl. 166-288.000.

Surles, Keanen T. Vehicle antitheft device. 4,903,510, Cl. 70-202.000.

Sussman, Jennewein Bekleidungstechnik GmbH: *See—*
Heinold, Hans; Rau, Josef; and Unverzagt, Thomas, 4,903,819, Cl. 198-465.400.

Suyama, Hidenari: *See—*
Kaetsu, Isao; Kumakura, Minoru; Suyama, Hidenari; Kameda, Nobuo; and Kouyama, Hideo, 4,904,708, Cl. 522-5.000.

Suyama, Takahiro: *See—*
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kosei; and Kondo, Masafumi, 4,905,246, Cl. 372-45.000.

Suzuki, Akira: *See—*
Tsukamoto, Takeo; Miyawaki, Mamoru; Kaneko, Tetsuya; Suzuki, Akira; Shimoda, Isamu; Takeda, Toshihiko; and Okunuki, Masahiko, 4,904,895, Cl. 313-336.000.

Suzuki, Fujitsugu: *See—*
Komatsu, Hajime; Ohkawachi, Susumu; and Suzuki, Fujitsugu, 4,904,580, Cl. 430-567.000.

Suzuki, Fujiyuki: *See—*
Inagaki, Makoto; Yamaguchi, Shoichi; and Suzuki, Fujiyuki, 4,903,659, Cl. 123-339.000.

Suzuki, Hideo; and Tajima, Masato, to Kabushiki Kaisha Toshiba. Path memory control method in Viterbi decoder. 4,905,317, Cl. 341-51.000.

Suzuki, Hisao: *See—*
Kobayashi, Yozo; Mochizuki, Norihito; Suzuki, Hisao; and Mizushima, Shinichi, 4,905,020, Cl. 346-76.0PH.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Inagaki, Makoto; Yamaguchi, Shoichi; and Suzuki, Fujiyuki, 4,903,659, Cl. 123-339.000.

Suzuki, Keiko: *See—*
Asano, Yuji; Sakai, Jun; Matsumoto, Yumio; Takagi, Osamu; Sago, Akira; Hayakawa, Kiyoharu; Ueda, Masashi; Sawaki, Yukichi; and Suzuki, Keiko, 4,905,036, Cl. 355-27.000.

Suzuki, Koichi; Konishi, Kiyoshi; and Hori, Eisaku, to Nissan Motor Company, Limited. System and method for automatically controlling a vehicle speed to a desired cruising speed. 4,905,153, Cl. 364-426.040.

Suzuki, Koichiro; and Sugikubo, Toshihiro, to Canon Kabushiki Kaisha. Device for detecting light transmissivity of detected object and record and/or reproducing apparatus using same. 4,905,106, Cl. 360-74.600.

Suzuki Manufacturing, Ltd.: *See—*
Sakuma, Kouichi, 4,903,619, Cl. 112-67.000.

Suzuki, Masayoshi; Urata, Hisao; Egawa, Satoshi; and Ueda, Shigeru, to Canon Kabushiki Kaisha. Recording data processor. 4,905,091, Cl. 358-296.000.

Suzuki, Minoru, to Ricoh Company, Ltd. Color copying apparatus. 4,905,048, Cl. 355-271.000.

Suzuki, Rentaro; and Ikeda, Shinichiro, to Denki Kagaku Kogyo Kabushiki Kaisha. Adhesive and bonding process. 4,904,535, Cl. 428-463.000.

Suzuki, Ryoichi, to USUI Kokusai Sangyo Kaisha Ltd. Sliding exhaust brake system. 4,903,733, Cl. 137-630.120.

Suzuki, Ryoichi: *See—*
Takigawa, Kazunori; and Suzuki, Ryoichi, 4,903,802, Cl. 188-273.000.

Suzuki, Ryozo; Shiraga, Jun; Iwai, Shingo; and Okashiro, Tetsuo, to Mitsubishi Denki Kabushiki Kaisha. Fuel supplying pump. 4,904,162, Cl. 417-44.000.

Suzuki, Seiji, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Brake for paper roll bearing shaft in paper roll support frame of web feeder for rotary press. 4,903,909, Cl. 242-75.400.

Suzuki, Toshiyuki: *See—*
Hanaoka, Hideyuki; Yamamoto, Kazuo; and Suzuki, Toshiyuki, 4,904,721, Cl. 524-266.000.

Suzuki, Yasuo: *See—*
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, 4,904,791, Cl. 548-194.000.

Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Method for stabilizing organic base material to light. 4,904,574, Cl. 430-372.000.

Suzuki, Yoshinori: *See—*
Sakakibara, Yasuhiro; Kobayashi, Isamu; and Suzuki, Yoshinori, 4,905,140, Cl. 364-200.000.

Suzuki, Yoshiyuki, to Canon Kabushiki Kaisha. Image forming apparatus including digital image signal input means. 4,905,023, Cl. 346-108.000.

Svecia Silkscreen Maskiner AB: *See—*
Ericsson, Sylve J. D., 4,903,592, Cl. 101-115.000.

Svendsen, Leo G.; Leary, Rebecca A.; and Geschwind, Gary I., to Raychem Corporation. Connection to a component for use in an electronics assembly. 4,903,889, Cl. 228-180.200.

Svenning, Bjornar; Swensson, Rune; and Truedsson, Lars, to Den Norske Stats Oljeselskap A.S. Access apparatus connecting a first and second chamber at great water depths. 4,904,117, Cl. 405-189.000.
Svensson, Roland; and Osterberg, Ake, to Asea Brown Boveri AB. Balancing unit for pivotable mechanical elements, such as doors, robot arms, etc. 4,904,150, Cl. 414-719.000.
Swan, Ellen L.; Basu, Rajat S.; Wilson, David P.; and Lund, Earl A. E., to Allied-Signal Inc. Azeotrope-like compositions of 1,1,2-trichloro-1,2,2-trifluoroethane, methanol, nitromethane, 1,2-dichloroethylene and 1-chloropropane. 4,904,407, Cl. 252-171.000.
Swartz, Michael R.: *See*—
Ferrari, Harry M.; and Swartz, Michael R., 4,903,967, Cl. 273-73.00C.
Swedberg, Sally A.: *See*—
Pesek, Joseph J.; and Swedberg, Sally A., 4,904,632, Cl. 502-158.000.
Swensson, Rune: *See*—
Svenning, Bjornar; Swensson, Rune; and Truedsson, Lars, 4,904,117, Cl. 405-189.000.
Swidwa, Kenneth J.; Salton, Robert B.; and Marshall, James R., to Westinghouse Electric Corp. Permanent cavity seal ring for a nuclear reactor containment arrangement. 4,904,442, Cl. 376-203.000.
Swidwa, Kenneth J.; Salton, Robert B.; and Marshall, James R., to Westinghouse Electric Corp. Nuclear reactor containment arrangement with permanent cavity seal ring. 4,905,260, Cl. 376-203.000.
Sykes, Anne F.: *See*—
Blewett, Francis M.; Pike, Gary E. J.; and Sykes, Anne F., 4,903,604, Cl. 102-364.000.
Synthelabo: *See*—
Bigg, Dennis; Langer, Salomon; Morel, Claude; and Sevrin, Mireille, 4,904,684, Cl. 514-402.000.
George, Pascal; and Giron, Claudie, 4,904,670, Cl. 514-300.000.
Synthetic Genetics: *See*—
Tullis, Richard H., 4,904,582, Cl. 435-6.000.
Syracuse University: *See*—
Schroder, Klaus; and Hejase, Hussin, 4,905,319, Cl. 357-65.000.
Sysko, Robert J.: *See*—
Sinay, Terry G., Jr.; and Sysko, Robert J., 4,904,782, Cl. 544-237.000.
Szantho, Charles F.; Warner, Allan; and Riordan, Edward D., to Joyal Froducts, Inc. Electrode changers and methods of operation for electrical bonding apparatus. 4,904,838, Cl. 219-86.800.
Szczepanski, Henry: *See*—
Schneider, Hans-Dieter; Lutz, William R.; Szczepanski, Henry; and Topfl, Werner, 4,904,300, Cl. 71-92.000.
Szepesi, Tamas: *See*—
Izadinia, Mansour; and Szepesi, Tamas, 4,904,960, Cl. 331-111.000.
Szittar, Antal: *See*—
Doleschall, Sandor; Gaal, Gyorgyi; Kristof, Miklos; Milley, Gyula; Paal, Tibor; Papay, Jozsef; Szittar, Antal; and Udvardi, Geza, 4,903,773, Cl. 166-303.000.
Szu, Harold H., to United States of America, Navy. Superconducting optical switch. 4,904,882, Cl. 307-245.000.
Tabai Espec Co. Ltd.: *See*—
Nagashima, Tsueno; and Yamane, Makoto, 4,903,462, Cl. 55-317.000.
Tabuchi, Jyoichi: *See*—
Mori, Shoichi; Fujii, Shigeo; Yoshizawa, Masao; Miyasaka, Kenji; Tabuchi, Jyoichi; Egawa, Kazufumi; Hirano, Minoru; and Yoshida, Yoshikazu, 4,904,257, Cl. 623-16.000.
Tachi, Kozi; and Saji, Hideo, to Nippondenso Co., Ltd.; and Asmo Co., Ltd. Oil regulating pump for lubricating engines and method of controlling thereof. 4,904,163, Cl. 417-53.000.
Tachi-S Company, Ltd.: *See*—
Shimazaki, Mitsuo, 4,903,931, Cl. 248-421.000.
Tacq, Jo, to Picanol N.V. Method for threading a pick insertion device on weaving machines, and a device which uses this method. 4,903,739, Cl. 139-435.300.
Tada, Kazuhiro: *See*—
Ikeda, Takaharu; and Tada, Kazuhiro, 4,904,793, Cl. 548-262.000.
Tagawa, Itsuo; and Kanno, Samon, to Sangojuuki Co., Ltd. Steel plate cutter. 4,903,408, Cl. 30-228.000.
Tahara, Noboru, to NEC Corporation. Television transmitter employing klystron with nonlinearity correction circuit. 4,905,086, Cl. 358-186.000.
Tait, Brian S.: *See*—
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Tajima, Hiroyuki, to Fuji Electric Co., Ltd. Method for controlling a fuel cell. 4,904,548, Cl. 429-22.000.
Tajima, Masato: *See*—
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Takada, Yoji: *See*—
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Yano, Toshihiko; Fujimoto, Izumi; and Takada, Yoji, 4,904,696, Cl. 514-594.000.
Takagi, Osamu: *See*—
Asano, Yuji; Sakai, Jun; Matsumoto, Yumio; Takagi, Osamu; Sago, Akira; Hayakawa, Kiyoharu; Ueda, Masashi; Sawaki, Yukichi; and Suzuki, Keiko, 4,905,036, Cl. 355-27.000.
Takagi, Ryuichi: *See*—
Kawakatsu, Atsushi; Takagi, Ryuichi; and Nagano, Takeshi, 4,904,720, Cl. 524-263.000.
Takagi, Tadao; and Fukuhara, Toru, to Nikon Corporation. Camera. 4,905,035, Cl. 354-432.000.
Takahama, Teizo: *See*—
Tamai, Mitsuru; Nakamura, Kimihiro; Takahama, Teizo; and Matsuda, Mikihiko, 4,903,532, Cl. 73-718.000.
Takahashi, Hideaki: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,905,195, Cl. 365-189.050.
Takahashi, Junichi; Hattori, Sanshiro; Kimura, Takashi; and Iwata, Atsushi, to Nippon Telegraph and Telephone Public Company. Array processor and control method thereof. 4,905,143, Cl. 364-200.000.
Takahashi, Kan-ichi; and Inoue, Toshihiro, to Honda Giken Kogyo Kabushiki Kaisha. Method of producing a molding of foamed resin having a section for fitting an electrical part. 4,904,429, Cl. 264-46.700.
Takahashi, Kosei: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kosei; and Kondo, Masafumi, 4,905,246, Cl. 372-45.000.
Takahashi, Kozo, to Communications Research Laboratory Ministry of Posts and Telecommunications. Method for detecting long waves and predicting earthquakes. 4,904,943, Cl. 324-344.000.
Takahashi, Nobuko: *See*—
Sugawara, Hideo; Takashina, Tomonori; Takahashi, Nobuko; Sugiyama, Machiko; Seino, Akio; and Miyazaki, Yukio, 4,904,470, Cl. 424-119.000.
Takahashi, Satoji; and Takemoto, Tadashi, to Ajinomoto Co., Inc. Imides. 4,904,802, Cl. 548-546.000.
Takahashi, Setsuko, to Nisshin Steel Co., Ltd.; and Mitsubishi Petrochemical Co., Ltd. Plating bath for electrodeposition of aluminum and plating process making use of the bath. 4,904,355, Cl. 204-58.500.
Takahashi, Susumu, to Kanto Yakin Kogyo K.K. Conveyor belt made of carbon or ceramic fibers. 4,903,824, Cl. 198-853.000.
Takahashi, Tadashi; Miyashita, Kunio; and Kawamata, Syooichi, to Hitachi, Ltd. Apparatus for magnetically detecting positions with minimum length magnetic information units recorded on a plurality of magnetic tracks. 4,904,937, Cl. 324-207.210.
Takai, Yasuhiro: *See*—
Satoh, Fumio; Shimazawa, Yoichi; Takai, Yasuhiro; and Nakanishi, Katsumi, 4,905,051, Cl. 355-290.000.
Takara Co., Ltd.: *See*—
Satoh, Yasuta; Nakane, Shigeru; Saitoh, Shinya; and Kataoka, Isamu, 4,903,424, Cl. 40-414.000.
Takase, Isao: *See*—
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Takashina, Tomonori: *See*—
Sugawara, Hideo; Takashina, Tomonori; Takahashi, Nobuko; Sugiyama, Machiko; Seino, Akio; and Miyazaki, Yukio, 4,904,470, Cl. 424-119.000.
Takasu, Toshio: *See*—
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TOA Corporation: *See—*
Nishikawa, Yutaka, 4,903,419, Cl. 37-59.000.

Toa Nenryo Kogyo K. K.: *See—*
Mori, Shoichi; Fujii, Shigeo; Yoshizawa, Masao; Miyasaka, Kenji; Tabuchi, Jyoichi; Egawa, Kazufumi; Hirano, Minoru; and Yoshida, Yoshikazu, 4,904,257, Cl. 623-16.000.
Tobacco Research and Development Institute Limited: *See—*
Strydom, Mauritz L., 4,903,712, Cl. 131-84.100.
Toda, Akitoshi: *See—*
Okada, Takao; Shimazu, Hisanari; Toda, Akitoshi, and Sato, Susumu, 4,904,063, Cl. 350-347.00V.
Toda, Masato: *See—*
Nishigaki, Shinichi; Nakamura, Takeaki; Okabe, Minoru; Karasawa, Hitoshi; Kusnoki, Hiroyuki; Hagino, Tadao; Kubota, Tetsumaru; Ogawa, Mototsugu; Toda, Masato; and Sugata, Teruaki, 4,905,082, Cl. 358-98.000.
Toda, Shozo: *See—*
Miyashita, Tsuyoshi; Ohtawa, Shigeru; Tohda, Hiroyuki; Toda, Shozo; and Nakane, Hisashi, 4,904,571, Cl. 430-331.000.
Todo, Fukuzo: *See—*
Sudo, Rey; Kurumada, Norimitsu; Todo, Fukuzo; Hara, Masao; and Sauda, Kenzo, 4,904,416, Cl. 252-628.000.
Tohda, Hiroyuki: *See—*
Miyashita, Tsuyoshi; Ohtawa, Shigeru; Tohda, Hiroyuki; Toda, Shozo; and Nakane, Hisashi, 4,904,571, Cl. 430-331.000.
Tohi, Toshiaki: *See—*
Kobayashi, Yousuke; and Tohi, Toshiaki, 4,903,598, Cl. 101-409.000.
Tohji, Shigeo: *See—*
Tejima, Yasuyuki; Arai, Akihiro; Yuda, Hideaki, Sugawara, Saburoh; and Tohji, Shigeo, 4,905,034, Cl. 354-403.000.
Tohzuka, Takashi: *See—*
Ohsaka, Yohnosuke; Tohzuka, Takashi, Honda, Yoshitaka; and Yanagisawa, Norio, 4,904,417, Cl. 562-849.000.
Tokai Corporation: *See—*
Nitta, Tomio, 4,904,180, Cl. 431-153.000.
Tokico Ltd.: *See—*
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 4,903,533, Cl. 73-861.910.
Tokita, Jiro; Nagai, Keiichi; Simada, Tamotu; Watanabe, Ken'ichi; Nakano, Ryusei; and Sumitani, Tomoaki, to Hitachi, Ltd. Instrument for determination of the base sequence of nucleic acid. 4,904,366, Cl. 204-299.00R.
Tokuda, Koichi; Yasuda, Kazuo; and Yoshida, Kazuhiro, to Sumitomo Bakelite Company Limited. Container. 4,903,842, Cl. 206-604.000.
Tokushima, Tadao; and Shiraki, Makoto, to Nippon Gakki Seizo Kabushiki Kaisha. Methods for producing optomagnetic recording media and systems for their use. 4,904,349, Cl. 204-27.000.
Tokyo Electric Co., Ltd.: *See—*
Kobayashi, Yozo; Mochizuki, Norihito; Suzuki, Hisao; and Mizushima, Shinichi, 4,905,020, Cl. 346-76.0PH.
Nishikawa, Hisashi; and Endo, Mitsuharu, 4,905,024, Cl. 346-140.00R.
Tokyo Keiki Company, Limited: *See—*
Takeuchi, Kunihiko; Shimomura, Yasuo; Morishige, Yuji; and Hayashi, Kiyoshi, 4,905,218, Cl. 370-3.000.
Tokyo Ohka Kogyo Co., Ltd.: *See—*
Miyashita, Tsuyoshi; Ohtawa, Shigeru; Tohda, Hiroyuki; Toda, Shozo; and Nakane, Hisashi, 4,904,571, Cl. 430-331.000.
Tokyo Seimitus Co., Ltd.: *See—*
Honda, Katsuo; and Tsukada, Shuichi, 4,903,681, Cl. 125-13.00R.
Tom, Edward: *See—*
Gastgeb, Raymond F.; and Tom, Edward, 4,904,222, Cl. 446-405.000.
Henry, John C.; Park, Kyung Tae; and Tom, Edward, 4,904,894, Cl. 310-328.000.
Tomei Sangyo Kabushiki Kaisha: *See—*
Ando, Ichiro; and Kawaguchi, Toru, 4,904,421, Cl. 264-2.600.
Tomioka, Katsumi: *See—*
Otsuki, Noboru; Tomioka, Katsumi; and Onishi, Toshihiko, 4,903,730, Cl. 137-614.030.
Tomita, Ikuo: *See—*
Kato, Shoichi; Arai, Kaoru; and Tomita, Ikuo, 4,904,058, Cl. 350-335.000.
Tomiyama, Yuji: *See—*
Nakata, Masaru; and Tomiyama, Yuji, 4,903,789, Cl. 180-155.000.
Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; Horaguchi, Yoichi; and Nakata, Takashi, to Brother Kogyo Kabushiki Kaisha. Exposure device. 4,905,038, Cl. 355-27.000.
Tomizawa, Takayuki: *See—*
Shimada, Nobuyoshi; Hasegawa, Shigeru; Harada, Takashi; Tomizawa, Takayuki; and Fujii, Akio, 4,904,585, Cl. 435-88.000.
Tomotake, Hroshi; and Fukatani, Yasunobu, to Kabushi Kaisha Daikin Seisakusho. Clutch disc. 4,903,814, Cl. 192-107.00C.
Tone, Masatsugu: *See—*
Murakawa, Masatake; Bando, Niro; Tone, Masatsugu; Yuki, Mikio; Miyata, Junji; Hayashi, Tetsuaki; and Kurohara, Kazuaki, 4,903,469, Cl. 56-202.000.
Tong, Fred T.: *See—*
Chuang, Chiao-Mei; Matick, Richard E.; and Tong, Fred T., 4,905,188, Cl. 364-900.000.
Tong, Hua Sou, to Zenith Electronics Corporation. Blackening of non-iron-based flat tensioned foil shadow masks. 4,904,218, Cl. 445-47.000.
Topfl, Werner, to Ciba-Geigy Corporation. Herbicidal compositions. 4,904,783, Cl. 544-320.000.
Topfl, Werner: *See—*
Schneider, Hans-Dieter; Lutz, William R.; Szczepanski, Henry; and Topfl, Werner, 4,904,300, Cl. 71-92.000.
Tor, Ruth: *See—*
Freeman, Amihay; and Tor, Ruth, 4,904,592, Cl. 435-183.000.
Toray Industries, Inc.: *See—*
Hasegawa, Katsumi; Ohno, Michio; and Kadotsuji, Akira, 4,903,905, Cl. 242-18.00R.
Sato, Haruyo; and Imamura, Shinzo, 4,904,589, Cl. 435-145.000.
Taniguchi, Takashi; and Seki, Tetsuya, 4,904,525, Cl. 428-328.000.
Torielli, Alessandro: *See—*
Licciardi, Luigi; and Torielli, Alessandro, 4,905,179, Cl. 364-786.000.
Torigoe, Tsunemitsu, to Alps Electric Co., Ltd. Liquid crystal display element having a nonconducting layer of particular index of refraction. 4,904,059, Cl. 350-339.00R.
Torii, Nobutoshi: *See—*
Toyoda, Kenichi; Torii, Nobutoshi; Nihei, Ryo; Terada, Akihiro; and Kikuchi, Jun, 4,903,539, Cl. 74-479.000.
Toyoda, Kenichi; Torii, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,904,911, Cl. 318-568.240.
Torii, Nozomu: *See—*
Hayakawa, Shigeru; Fukumoto, Ryoichi; and Torii, Nozomu, 4,904,006, Cl. 292-336.300.
Torii, Shuuji: *See—*
Fukushima, Naoto; and Torii, Shuuji, 4,903,983, Cl. 280-707.000.
Torikai, Motoyuki: *See—*
Okitsu, Yuji; Machida, Koichi; Torikai, Motoyuki; Tsuji, Junko; Asahina, Kotaro; Shinkoda, Kazuya; Kubo, Takayuki; and Kitahara, Mikio, 4,904,761, Cl. 523-435.000.
Tosaka, Fumio: *See—*
Ishikawa, Tsutomu; Ogawa, Ryuichi; Tanno, Masaya; and Tosaka, Fumio, 4,905,283, Cl. 381-22.000.
Toshiba Ceramics Company, Limited: *See—*
Matsuo, Shuitsu; Tanada, Yoshinobu; and Sasaki, Yasumi, 4,904,515, Cl. 428-67.000.
Touze , Eric, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Screwed attachment of a body of revolution to an annular flange in a turbine engine. 4,904,156, Cl. 415-190.000.
Townsend, William T.: *See—*
Salisbury, J. Kenneth, Jr.; Townsend, William T.; DiFietro, David M.; and Eberman, Brian S., 4,903,536, Cl. 74-89.220.
Toyo Seikan Kaisha, Ltd.: *See—*
Nohara, Shigezo; Hirata, Sadao; Matsuo, Junichi; Hirano, Masami; and Tanikawa, Isao, 4,904,509, Cl. 428-36.600.
Yamada, Muneki; and Kawaguchi, Kiyoshi, 4,904,512, Cl. 428-36.700.
Toyoda Gosei Co., Ltd.: *See—*
Goto, Fumio; Kondou, Mitsutaka; Nakagawa, Noboru; Ohashi, Tamiyosi; and Kondo, Masatoshi, 4,904,318, Cl. 156-64.000.
Shimizu, Hiroaki; Abe, Yasushi; Ichikawa, Masayoshi; and Okita, Tomoaki, 4,904,736, Cl. 525-279.000.
Toyoda, Kenichi; Torii, Nobutoshi; Nihei, Ryo; Terada, Akihiro; and Kikuchi, Jun, to Fanuc Ltd. Direct-drive-type multi-articulated robot. 4,903,539, Cl. 74-479.000.
Toyoda, Kenichi; Torii, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, to Fanuc Ltd. System for controlling robot. 4,904,911, Cl. 318-568.240.
Toyosawa, Shinichi: *See—*
Nakajima, Tadashi; Toyosawa, Shinichi; Kijima, Shigeru; Arai, Katsuhiko; Maeda, Yuko; Ogawa, Masao; Kawagoe, Takahiro; Iino, Yasuhiro; Osawa, Ryuzo; and Ishino, Yuichi, 4,904,553, Cl. 429-213.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Ohata, Akira, 4,903,668, Cl. 123-478.000.
Traglia, Peter. Self wringing mop. 4,903,366, Cl. 15-119.00R.
Trambauer, Karl: *See—*
Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, 4,904,641, Cl. 514-2.000.
Transitions Research Corporation: *See—*
Weiman, Carl F. R.; and Evans, John M., Jr., 4,905,151, Cl. 364-424.020.
Tranter, Donald F.: *See—*
Dawes, Cyril; and Tranter, Donald F., 4,904,316, Cl. 148-318.000.
Traugott, Thomas D.: *See—*
Moore, Eugene R.; and Traugott, Thomas D., 4,904,730, Cl. 525-75.000.
Trauth, Hubert: *See—*
Neumann, Peter; Aumueller, Alexander; and Trauth, Hubert, 4,904,779, Cl. 544-180.000.
Travis, Robert J.: *See—*
Steber, Charles E.; Travis, Robert J.; and Rizzo, John A., 4,903,476, Cl. 60-39.320.
Traxlmayr, Ulrich: *See—*
Tuma, Wolfgang; Traxlmayr, Ulrich; Kodym, Walter; Lorteije, Jean H. J.; and Den Bakker, Roeland, 4,905,111, Cl. 360-126.000.
Treadway, Ronald L.: *See—*
Goodhue, Gregory K.; Price, William J.; Treadway, Ronald L.; and Willis, Brian M., 4,905,137, Cl. 364-200.000.
Tree, Richard J.: *See—*
Coe, David J.; Whight, Kenneth; and Tree, Richard J., 4,904,613, Cl. 437-41.000.
Tresler, Roger L.: *See—*
Meisner, James E.; Tresler, Roger L.; Mumby, Edward S.; and Robie, Micheal D., 4,904,865, Cl. 250-254.000.

Treyz, Willy: *See—*
Ohlendorf, Rolf; Treyz, Willy; Doll, Gerhard; and Speier, Wolfgang, 4,903,650, Cl. 123-90.170.
Tri-Stage, Inc.: *See—*
Zingheim, William F., 4,904,187, Cl. 433-173.000.
Tricoli, Francesco: *See—*
Morelli, Marco; Marchio , Fabio; Tricoli, Francesco; and Maggioni, Giampietro, 4,905,067, Cl. 357-48.000.
Trieselt, Wolfgang: *See—*
Kud, Alexander; Trieselt, Wolfgang; and Hartmann, Heinrich, 4,904,408, Cl. 252-174.240.
Trinity Industrial Corporation: *See—*
Kawamura, Toshio; Nihei, Norihisa; Hirono, Tadamichi; and Hyodo, Tadayoshi, 4,904,365, Cl. 204-299.0EC.
TriQuint Semiconductor, Inc.: *See—*
McCormack, Gary D., 4,904,953, Cl. 330-258.000.
Trommen, Hartmut, to G. A. Pfleiderer GmbH & Co. KG. Mast for measuring or illumination purposes, especially for flight navigation lights. 4,903,442, Cl. 52-116.000.
Truedsson, Lars: *See—*
Svenning, Bjornar; Swensson, Rune; and Truedsson, Lars, 4,904,117, Cl. 405-189.000.
Trust, Donald B.: *See—*
Ryan, Douglas G.; and Trust, Donald B., 4,904,367, Cl. 208-33.000.
Trutzschler GmbH & Co. KG: *See—*
Hosel, Fritz, 4,903,374, Cl. 19-80.00R.
TRW Inc.: *See—*
Wieland, Howard N., Jr., 4,903,881, Cl. 227-143.000.
TRW Repa GmbH: *See—*
Fohl, Artur, 4,904,023, Cl. 297-472.000.
Tsals, Izrail: *See—*
Bonner, Mark N.; Carmen, Ralph H.; Ringle, Geoffrey F.; Smith, Douglas W.; Tsals, Izrail; Moore, Thomas G., Jr.; and Hamlin, Ronald K., 4,904,995, Cl. 340-870.020.
Tsang, Irving C.: *See—*
Karafian, Maxim; and Tsang, Irving C., 4,904,455, Cl. 422-201.000.
Tscheplak, Ernst: *See—*
Worner, Gunter; and Tscheplak, Ernst, 4,904,225, Cl. 464-67.000.
Tseng, Shin S.; Epstein, Joseph W.; and Levin, Jeremy I., to American Cyanamid Company. Substituted-6H,8H-pyrimido-[1,2,3-cd]purine-8,10-(9H)-diones and substituted-6H,10H-pyrimido[1,2-cd]purin-10-ones. 4,904,658, Cl. 514-233.200.
Tsubakimoto Bulk Systems Corporation: *See—*
Yamaguchi, Tameaki, 4,903,821, Cl. 198-550.700.
Tsubakimoto Chain Co.: *See—*
Yaguchi, Akio; and Kyoo, Takatsugu, 4,903,817, Cl. 198-406.000.
Tsuchitani, Kazuo: *See—*
Ohata, Tomohisa; Tsuchitani, Kazuo; Shiraishi, Eiichi; and Kitaguchi, Shinya, 4,904,633, Cl. 502-304.000.
Tsuchiya, Fumio: *See—*
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,905,195, Cl. 365-189.050.
Tsuge, Kazuo: *See—*
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 4,903,533, Cl. 73-861.910.
Tsuji, Hideaki, to Omron Tateisi Electronics Co. Connecting structure of coil in electromagnetic relay. 4,904,974, Cl. 336-192.000.
Tsuji, Junichi: *See—*
Satou, Hiroyuki; Wakui, Hiromitsu; Tsuji, Junichi; and Takemoto, Satoru, 4,905,043, Cl. 355-71.000.
Tsuji, Junko: *See—*
Okitsu, Yuji; Machida, Koichi; Torikai, Motoyuki; Tsuji, Junko; Asahina, Kotaro; Shinkoda, Kazuya; Kubo, Takayuki; and Kitahara, Mikio, 4,904,761, Cl. 523-435.000.
Tsuji, Koichiro: *See—*
Horibe, Kinya; Kawai, Masazumi; Hoshino, Yasukazu; Tsuji, Koichiro; and Uchida, Kiyofumi, 4,904,175, Cl. 425-174.400.
Tsuji, Shinji: *See—*
Chinone, Naoki; Nakashima, Hisao; Okai, Makoto; and Tsuji, Shinji, 4,905,060, Cl. 357-17.000.
Ohishi, Akio; Kuroda, Takao; Tsuji, Shinji; Hiro, Motohisa; and Matsumura, Hiroyoshi, 4,905,057, Cl. 357-17.000.
Tsukada, Sbuichi: *See—*
Honda, Katsuo; and Tsukada, Shuichi, 4,903,681, Cl. 125-13.00R.
Tsukahara, Yoshimitsu: *See—*
Motohashi, Akira; Tsukahara, Yoshimitsu; Masuda, Kazuo; Haneishi, Hidehiko; Kume, Masafumi; and Hayashi, Hirokazu, 4,904,361, Cl. 204-181.700.
Tsukamoto, Takeo; Miyawaki, Mamoru; Kaneko, Tetsuya; Suzuki, Akira; Shimoda, Isamu; Takeda, Toshihiko; and Okunuki, Masahiko, to Canon Kabushiki Kaisha. Electron emission device. 4,904,895, Cl. 313-336.000.
Tsumura & Co.: *See—*
Matsuoka, Yoshiyuki; Hosaka, Kunio; Takeda, Shigefumi; and Mitsuhashi, Hiroshi, 4,904,694, Cl. 514-464.000.
Tsunasaki, Masaru: *See—*
Kawano, Akio; and Tsunasaki, Masaru, 4,905,008, Cl 342-22.000.
Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Pick-up device. 4,905,088, Cl. 358-213.130.
Tsunekawa, Yasuji: *See—*
Uenishi, Kazuya; and Tsunekawa, Yasuji, 4,904,706, Cl. 521-164.000.
Tsunoi, Haruo; Okuda, Naoki; and Kimura, Akiyoshi, to Canon Kabushiki Kaisha. Copying apparatus having means for moving the optical scanning system to a predetermined position when an abnormality is detected. 4,905,046, Cl. 355-235.000.
Tu, Shi-Chuan: *See—*
Leung, Wu-Hon F.; Morgan, Michael J.; and Tu, Shi-Chuan, 4,905,231, Cl. 370-94.100.
Tullis, Richard H., to Synthetic Genetics. Novel amphiphilic nucleic acid conjugates. 4,904,582, Cl. 435-6.000.
Tuma, Wolfgang; Traxlmayr, Ulrich; Kodym, Walter; Lorteije, Jean H. J.; and Den Bakker, Roeland, to U.S. Philips Corp. Damping material of an improved formulation for use on a magnetic head. 4,905,111, Cl. 360-126.000.
Tupper, David E.: *See—*
Clark, Barry P.; and Tupper, David E., 4,904,653, Cl. 514-215.000.
Fernandez, Maria I. F.; Hotten, Terrence M.; and Tupper, David E., 4,904,686, Cl. 514-422.000.
Turin, Gilles: *See—*
Fournier, Jean-Pierre; and Turin, Gilles, 4,904,095, Cl. 384-517.000.
Turner, Bernus G.: *See—*
Klansnic, James E.; and Turner, Bernus G., 4,904,999, Cl. 340-945.000.
Turner, Joe D., to Ashland Oil, Inc. Method for removal of furfural coke from metal surfaces. 4,904,368, Cl. 208-48.00R.
Turner, Robert, to Applied Photonics, Inc. Catalytic converter. 4,905,249, Cl. 372-59.000.
Turner, Roger M.: *See—*
Staniland, Philip A.; Turner, Roger M.; and Cogswell, Frederick N., 4,904,532, Cl. 428-408.000.
Turpin, Charles H.; and Perry, Michael R., to Pillsbury Co., The. Microwave heater and method of manufacture. 4,904,836, Cl. 219-10.55E.
Tyan, Yuan-Sheng; Raychaudhuri, Pranab K.; and Vazan, Fridrich. Optical recording element and alloy for use therein. 4,904,577, Cl. 430-495.000.
UBE Industries: *See—*
Shimomura, Yasushi; Yamaguchi, Masahiko; Kuromatsu, Yuuzou; and Fukuzaki, Koichiro, 4,904,234, Cl. 604-5.000.
UBE Industries, Ltd.: *See—*
Sonoda, Takefumi; and Hashimoto, Kiyoshi, 4,904,178, Cl. 425-667.000.
Uchida, Kanzaburo, to Daiichi Denshi Kogyo Kabushiki Kaisha. Spring locking device for connector. 4,904,202, Cl. 439-372.000.
Uchida, Ken: *See—*
Okuyama, Kousuke; Uchida, Ken; Kusuyama, Kouichi; Meguro, Satoshi; Katto, Hisao; and Komori, Kazuhiro, 4,904,615, Cl. 437-52.000.
Uchida, Kiyofumi: *See—*
Horibe, Kinya; Kawai, Masazumi; Hoshino, Yasukazu; Tsuji, Koichiro; and Uchida, Kiyofumi, 4,904,175, Cl. 425-174.400.
Uchida, Shiro: *See—*
Koshiishi, Takaho; and Uchida, Shiro, 4,905,092, Cl. 358-296.000.
Uchida, Shunji: *See—*
Yuasa, Kimihiro; Hashimoto, Kenji; Uchida, Shunji; Morita, Kazuharu; and Hachiya, Satoshi, 4,904,065, Cl. 350-350.00S.
Uchida, Taichi: *See—*
Nagashima, Tsueno; and Yamane, Makoto, 4,903,462, Cl. 55-317.000.
Uchiyama, Keiichi: *See—*
Miyamoto, Yasuo; and Uchiyama, Keiichi, 4,903,951, Cl. 267-140.100.
Uchiyama, Nobuhiro: *See—*
Kishimoto, Katsumitsu; Kintaka, Kazuhiko; and Uchiyama, Nobuhiro, 4,904,587, Cl. 435-105.000.
Uchtman, Charles C. Pin and clip arrangement for name tags and badges. 4,903,379, Cl. 24-351.000.
Udvardi, Geza: *See—*
Doleschall, Sandor; Gaal, Gyorgyi; Kristof, Miklos; Milley, Gyula; Paal, Tibor; Papay, Jozsef; Szittar, Antal; and Udvardi, Geza, 4,903,773, Cl. 166-303.000.
Ueda, Masashi: *See—*
Asano, Yuji; Sakai, Jun; Matsumoto, Yumio; Takagi, Osamu; Sago, Akira; Hayakawa, Kiyoharu; Ueda, Masashi; Sawaki, Yukichi; and Suzuki, Keiko, 4,905,036, Cl. 355-27.000.
Ueda, Masatsugu: *See—*
Mano, Takashi; Murakami, Akihiko; Ueda, Masatsugu; and Kumazawa, Eitaro, 4,904,601, Cl. 435-314.000.
Ueda, Minoru: *See—*
Hirakawa, Tamotsu; Oya, Kozo; Ueda, Minoru; and Yamauchi, Hiroaki, 4,904,485, Cl. 426-62.000.
Ueda, Shigeru: *See—*
Suzuki, Masayoshi; Urata, Hisao; Egawa, Satoshi; and Ueda, Shigeru, 4,905,091, Cl. 358-296.000.
Ueki, Akihiro; and Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Shift control system for automatic transmission. 4,903,549, Cl. 74-867.000.
Uemura, Tomoyoshi; Okamoto, Shinji; Moriyama, Takamasa; Asano, Kuniyoshi; and Takida, Hiroshi, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Hydrolyzed ethylene-vinyl acetate copolymer composition. 4,904,723, Cl. 524-394.000.
Uenishi, Kazuya; and Tsunekawa, Yasuji, to Dainippon Ink and Chemicals, Inc. Soft polyurethane foam from hydroxyl urethane prepolymer and polyester ether polyol. 4,904,706, Cl. 521-164.000.
Ueno, Masaji, to Kabushiki Kaisha Toshiba. Output circuit for outputting a level shifted output signal. 4,904,924, Cl. 323-351.000.
Ueno, Sachio: *See—*
Unehara, Shunsuke; Ueno, Sachio; and Seri, Tutomu, 4,905,135, Cl. 363-98.000.

Uetsuhara, Tokio, and Iio, Kenji, to Mitsubishi Mining & Cement Co., Ltd. Operation confirming device for electromagnetic actuator. 4,905,121, Cl. 361-159.000.
Ueyama, Keiji: *See—*
Nagaoka, Takashi; Gyobu, Ichiro; Muramatsu, Kimio; Ueyama, Keiji; Mase, Masahiro; Awada, Yoshihisa; and Nishuchi, Akira, 4,904,155, Cl. 415-90.000.
Uggetti, Sergio: *See—*
Falconieri, Remo; and Uggetti, Sergio, 4,904,097, Cl. 400-248.000.
Ulich, Bobby L.; Ames, Gregory H.; Lazzarini, Albert J.; and Conkun, Edward K., to Kaman Aerospace Corporation. Distance measuring device. 4,905,009, Cl. 342-118.000.
Ullman, Bo: *See—*
Larsson, Lennart; Ullman, Bo; and Ohlsson, Håkan, 4,905,263, Cl. 378-89.000.
Ullmann, Klaus: *See—*
Mattiebe, Gunter; and Ullmann, Klaus, 4,903,839, Cl. 206-554.000.
Ulm, Edgar H.: *See—*
Lin, Jiunn H.; Pitzenberger, Steven M.; Ramjit, Harri G.; and Ulm, Edgar H., 4,904,654, Cl. 514-220.000.
Ulrich, Robert R., to Laser Applications, Inc. Laser cutting and welding of sheet metal using a shield of compressed air. 4,905,310, Cl. 219-121.640.
Ultraviolet Purification Systems: *See—*
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Penird, Thomas W.; Rehkopf, Charles H.; Say, Donald L.; and Zellar, Bruce W., 4,904,898, Cl. 313-449.000.
Zenith Electronics Corporation: *See*—
Tong, Hua Sou, 4,904,218, Cl. 445-47.000.
Ziesel, Lawrence B.; and Hughes, Robert D., to Coca-Cola Company, The. Motorless carbonator pump with gas saving device. 4,904,418, Cl. 261-35.000.
Zimmer, George A., to Magna International, Inc. Rocker joint for chain. 4,904,231, Cl. 474-214.000.
Zimmerman, Leon H.: *See*—
Goddard, James B.; Zimmerman, Leon H.; and Martin, Larry L., 4,904,113, Cl. 405-45.000.
Zimmern, Bernard; and Knopp, Joseph L., to Zimmern, Bernard. Methods and devices for cooling a motor of a refrigerating machine with liquid and economizer gas. 4,903,497, Cl. 62-113.000.
Zimpfer, Dennis S.: *See*—
Pace, Loy D.; Stackhouse, Donald C.; Jones, Earl W.; and Zimpfer, Dennis S., 4,904,157, Cl. 416-46.000.
Zingheim, William F., to Tri-Stage, Inc. Dental implant. 4,904,187, Cl. 433-173.000.
Zinser Textilmaschinen GmbH: *See*—
Hildbrand, Hans P.; Fricker, David; and Wolf, Horst, 4,904,892, Cl. 310-217.000.
Zoltner, John D., to Xerox Corporation. Decorative binding apparatus. 4,904,333, Cl. 156-479.000.
Zsila, Gabriella: *See*—
Knoll, Jozsef; Berenyi nee Poldermann, Edit; Budainee Simonyi, Katain; Knoll, Berta; Furts, Zsuzsa; Timar, Julia; Zsila, Gabriella; Niklya, Ildiko; Petocz, Lujza; and Mandi, Attila, 4,904,669, Cl. 514-293.000.
Zucker, Jane E.: *See*—
Alferness, Rodney C.; Koch, Thomas L.; Koren, Uziel; and Zucker, Jane E., 4,904,045, Cl. 350-96.190.
Zucker, Leo, to Carole Broadcasting Technologies, Inc. Compatible and spectrum efficient high definition television. 4,905,084, Cl. 358-141.000.
Zucker, Oved S. F., to Energy Compression Research Corp. Current amplifying device. 4,904,923, Cl. 323-340.000.
Zunkel, Gary D., to Halliburton Company. Delayed opening fluid sampler. 4,903,765, Cl. 166-162.000.
Zurcher, Erwin: *See*—
Moosmayer, Peter; Budliger, Jean-Pierre; Zurcher, Erwin; and Wadsworth, Larry C., 4,904,174, Cl. 425-174.80E.
Zurek, Michael W.: *See*—
Goodwin, Ross P.; and Zurek, Michael W., 4,904,549, Cl. 429-97.000.
Zwambag, Henry: *See*—
Brouwer, Gerardus J.; and Zwambag, Henry, 4,903,778, Cl. 172-1.000.
Zweig, Siegfried, to Okma Oberkochener Maschinen GmbH. Woodworking machine. 4,903,743, Cl. 144-3.00R.
Zwicknagl, Hans-Peter; Willer, Josef; and Tews, Helmut, to Siemens Aktiengesellschaft. Method for manufacturing a planar, self-aligned emitter-base complex. 4,904,612, Cl. 437-31.000.
Zyma SA: *See*—
Winter-Mihaly, Eva; Borel, Christian; and Weith, Andre J., 4,904,675, Cl. 514-340.000.
21st Century Coin Products, Inc.: *See*—
Harlan, Sven; and Verina, Ernest A., 4,903,825, Cl. 206-0.800.
3M Company: *See*—
Koskenmaki, David C., 4,904,526, Cl. 428-328.000.
3T S.p.A.: *See*—
Borromeo, Lucio, 4,903,542, Cl. 74-551.800.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF FEBRUARY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bolte, Steven B.: *See*—
Gruber, Robert J.; Knapp, John F.; and Bolte, Steven B., Re. 33,172, Cl. 430-39.000.
Byers, Charles L., to University of California, The Regents of the. Surgically implantable disconnect device. Re. 33,170, Cl. 128-419.00R.
Cassey, Russel A., to Trigon Packaging Systems (NZ) Ltd. Envelope with pouch and method of manufacture thereof. Re. 33,173, Cl. 493-195.000.
Gruber, Robert J.; Knapp, John F.; and Bolte, Steven B., to Xerox Corporation. Process for magnetic image character recognition. Re. 33,172, Cl. 430-39.000.
Hitachi, Ltd.: *See*—
Ogasawara, Tsuyoshi; Ichiryu, Ken; Nakamura, Ichiro; and Kido, Yasuo, Re. 33,171, Cl. 187-111.000.
Ichiryu, Ken: *See*—
Ogasawara, Tsuyoshi; Ichiryu, Ken; Nakamura, Ichiro; and Kido, Yasuo, Re. 33,171, Cl. 187-111.000.
Kido, Yasuo: *See*—
Ogasawara, Tsuyoshi; Ichiryu, Ken; Nakamura, Ichiro; and Kido, Yasuo, Re. 33,171, Cl. 187-111.000.
Knapp, John F.: *See*—
Gruber, Robert J.; Knapp, John F.; and Bolte, Steven B., Re. 33,172, Cl. 430-39.000.
Nakamura, Ichiro: *See*—
Ogasawara, Tsuyoshi; Ichiryu, Ken; Nakamura, Ichiro; and Kido, Yasuo, Re. 33,171, Cl. 187-111.000.
Ogasawara, Tsuyoshi; Ichiryu, Ken; Nakamura, Ichiro; and Kido, Yasuo, to Hitachi, Ltd. Hydraulic elevator. Re. 33,171, Cl. 187-111.000.
Trigon Packaging Systems (NZ) Ltd.: *See*—
Cassey, Russel A., Re. 33,173, Cl. 493-195.000.
University of California, The Regents of the: *See*—
Byers, Charles L., Re. 33,170, Cl. 128-419.00R.
Xerox Corporation: *See*—
Gruber, Robert J.; Knapp, John F.; and Bolte, Steven B., Re. 33,172, Cl. 430-39.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Christodoulou, Spyros D., to Din Engineering Limited. Heat treating a particulate commodity. B1 4,444,553, 2-27-90, Cl. 432-15.000.
Din Engineering Limited: *See*—
Christodoulou, Spyros D., B1 4,444,553, Cl. 432-15.000.
E.I. Du Pont de Nemours and Co.: *See*—
Levitt, George, B1 4,753,672, Cl. 71-92.000.
Kubo, Shigeki, to Sumitomo Metal Mining Company. Method of recovering gallium from scrap containing gallium. B1 4,666,575, 2-27-90, Cl. 204-105.00R.
Levitt, George, to E.I. Du Pont de Nemours and Co. Herbicidal acetals and ketals. B1 4,753,672, 2-7-90, Cl. 71-92.000.
Meglino, Don A. Slat retaining means for chain link fences. B1 4,512,556, 2-27-90, Cl. 256-34.000.
Moore, Jack, to Oregon Bank. Lumber sorting apparatus. B1 4,098,407, 2-27-90, Cl. 209-517.000.
Oregon Bank: *See*—
Moore, Jack, B1 4,098,407, Cl. 209-517.000.
Safety Trim Industries, Inc.: *See*—
Steinman, Barry, B1 4,595,627, Cl. 428-241.000.
Seegmiller, Ben L. Truss systems and components thereof. B1 4,666,344, 2-27-90, Cl. 405-259.000.
Steinman, Barry, to Safety Trim Industries, Inc. Fluorescent textile material. B1 4,595,627, 2-27-90, Cl. 428-241.000.
Sumitomo Metal Mining Company: *See*—
Kubo, Shigeki, B1 4,666,575, Cl. 204-105.00R.

LIST OF DESIGN PATENTEES

Acme Boot Company, Inc.: *See*—
Cummings, Craig C., 306,232, Cl. D2-320.000.
Advanced Technology Laboratories, Inc.: *See*—
Ungar, Joseph L., 306,343, Cl. D24-17.000.
Aharonian, Oscar: *See*—
Jessamine, Alison; Aharonian, Oscar; Buttigieg, George M.; and McKee, E. Anne, 306,314, Cl. D19-1.000.
Ahlman, Carson E.: *See*—
Levy, Edward D.; Meisner, Edward H.; Ballone, Michael P.; and Ahlman, Carson E., 306,248, Cl. D8-30.000.
Akhtarekhavari, Farid. Pillow. 306,245, 2-27-90, Cl. D6-601.000.
Alcala, Felix E. Golf putter head. 306,334, 2-27-90, Cl. D21-219.000.
Alko Ltd.: *See*—
Liss, Douglas M., 306,258, Cl. D9-447.000.
Anema, Willem, to U.S. Philips Corporation. Dry shaver. 306,359, 2-27-90, Cl. D28-49.000.
Arehart, Robert W.; Peeler, Raymond W.; and Kraus, Keith F., to Ryobi Motor Products Corp. Electric line cord plug. 306,282, 2-27-90, Cl. D13-28.000.
Artel Incorporated: *See*—
Kerr, Leopold P.; and Kerr, Alice P., 306,263, Cl. D9-428.000.
Associated Mills Inc.: *See*—
Walczak, Stanley T.; and Peterson, Samuel F., 306,345, Cl. D24-38.000.
Avery Label Systems, Inc.: *See*—
Jessamine, Alison; Aharonian, Oscar; Buttigieg, George M.; and McKee, E. Anne, 306,314, Cl. D19-1.000.
Bales, David W.; and Roth, James E., to Nordyne, Inc. Vehicle rooftop air conditioner housing. 306,341, 2-27-90, Cl. D23-325.000.
Ballone, Michael P.: *See*—
Levy, Edward D.; Meisner, Edward H.; Ballone, Michael P.; and Ahlman, Carson E., 306,248, Cl. D8-30.000.
Baumeister, Rodney L. Deer stand. 306,348, 2-27-90, Cl. D25-62.000.
Bit, Claude, to Societe Anonyme des Eaux Minerales d'Evian. Bottle. 306,262, 2-27-90, Cl. D9-396.000.
Blinn, Edward; and Hughes, Diane. Telephone set. 306,292, 2-27-90, Cl. D14-143.000.
Braswell, Richard R., to Richards Braswell Research Corporation, The. Auxiliary battery. 306,281, 2-27-90, Cl. D13-8.000.
British Alcan Aluminium PLC: *See*—
Whiting, Graham J., 306,340, Cl. D23-209.000.
Brown, Terence W.; and Masters, Shirley J., to Terall Design Pty. Ltd. Utility tray for attachment to an ironing board. 306,365, 2-27-90, Cl. D32-35.000.
Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Necklace. 306,268, 2-27-90, Cl. D11-11.000.
Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Necklace. 306,269, 2-27-90, Cl. D11-15.000.

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Lucas, James F.; Byrd, Michael R.; and Coody, Bruce F., 306,330, Cl. D21-194.000.
Cummings, Craig C., to Acme Boot Company, Inc. Blocker sole with tap insert. 306,232, 2-27-90, Cl. D2-320.000.
Cunnane, Mark; and Delaney, Richard P., to Security Imprinter Corporation. Manual imprinter. 306,312, 2-27-90, Cl. D18-14.000.
Daucourt, Michel, to Camus la Grande Marque. Bottle. 306,259, 2-27-90, Cl. D9-385.000.
Daucourt, Michel, to Camus la Grande Marque. Bottle. 306,260, 2-27-90, Cl. D9-391.000.
Daugherty, Andrew H., to Vermette Machine Company, Inc. Telescoping portable mechanical lift. 306,368, 2-27-90, Cl. D34-28.000.
Delaney, Richard P.: *See—*
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Digital Equipment Corporation: *See—*
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DiNuccio, David, to L'Oreal S.A. Perfume bottle. 306,353, 2-27-90, Cl. D28-5.000.
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Dorfman, Louis B., to Vision Street Wear, Inc. Side patch and sole periphery for a shoe. 306,231, 2-27-90, Cl. D2-314.000.
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Elkerbout, Marten F., to U.S. Philips Corporation. Dry shaver. 306,362, 2-27-90, Cl. D28-51.000.
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Fiust, Gwendolyn A. Stuffed toy figure. 306,328, 2-27-90, Cl. D21-177.000.
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Lee, Suk J., 306,290, Cl. D14-126.000.
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Gramera, Robert E. Adhesive label. 306,321, 2-27-90, Cl. D20-11.000.
Gyurik, Robert J., to SmithKline Beckman Corporation. Delayed action dosage unit for releasing medicaments or the like in ruminants. 306,347, 2-27-90, Cl. D24-63.000.
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Hargrove, Barry C.; and Madden, James D. Sampling bottle closure. 306,266, 2-27-90, Cl. D9-447.000.
Hayashi, Ryozo, to Sharp Corporation. Telephone set. 306,296, 2-27-90, Cl. D14-151.000.
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Hoover, Melvin L. Combined vapor and oil collection unit for attachment to a diesel engine breathing tube. 306,300, 2-27-90, Cl. D15-5.000.
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King, Mary L. Paper towel holder. 306,244, 2-27-90, Cl. D6-522.000.
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Kropfl, Steven F. Game board. 306,322, 2-27-90, Cl. D21-24.000.
Kruger, James B., to West Haven Buckle Company. Overall clip. 306,272, 2-27-90, Cl. D11-212.000.
Kuba, Lawrence M., to Wang Laboratories, Inc. Video display. 306,287, 2-27-90, Cl. D14-113.000.
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Lee, Suk J., to Gold Star Co., Ltd. Television receiver. 306,290, 2-27-90, Cl. D14-126.000.
Leebeek, Anton C. G., to Procter & Gamble Company, The. Bottle cap. 306,265, 2-27-90, Cl. D9-435.000.
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Maness, Tony R., to Spang & Company. Toy carousel. 306,325, 2-27-90, Cl. D21-124.000.
Maruyama, Takashi; Chibuka, Shinri; and Mogi, Tomonori, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 306,275, 2-27-90, Cl. D12-110.000.
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Brown, Terence W.; and Masters, Shirley J., 306,365, Cl. D32-35.000.
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Robinson, Scott; and Matsuda, Hari, 306,306, Cl. D16-200.000.
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Sugi, Tetsuo; and Kojima, Kazuyoshi, 306,311, Cl. D18-7.000.
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288 4,903,449
293 4,903,450
584 4,903,451
646 4,903,452
648 4,903,453
766 4,903,454
822 4,903,455

CLASS 53

69 4,903,456
251 4,903,457
410 4,903,458
434 4,903,459
550 4,903,460
569 4,903,461

CLASS 55

1 4,904,281
96 4,904,282
131 4,904,283
165 4,904,284
191 4,904,285
269 4,904,286
302 4,904,287
317 4,903,462
485 4,904,288

CLASS 56

1 4,903,463
10.1 4,903,464
12.7 4,903,465
14.6 4,903,466
16.4 4,903,468
16.6 4,903,467
202 4,903,469
228 4,903,470
340.1 4,903,471

CLASS 57

12 4,903,472
15 4,903,473
413 4,903,474

CLASS 59

16 4,903,475

CLASS 60

39.281 4,903,478
39.32 4,903,476
39.37 4,903,477
203.1 4,903,479
270.1 4,903,480
276 4,903,481
301 4,903,482
313 4,903,483
316 4,903,484
320 4,903,485
324 4,903,486
547.1 4,903,487
609 4,903,488
612 4,903,489
646 4,903,490
692 4,903,491
733 4,903,492

CLASS 62

60 4,903,493
4,903,494
81 4,903,495
87 4,903,496
113 4,903,497
126 4,903,498
149 4,903,499
156 4,903,500
157 4,904,289
187 4,903,501
228.5 4,903,502
238.3 4,903,503
347 4,903,504
4,903,505
4,903,506

CLASS 63

15.6 4,903,507

CLASS 65

1 4,904,290
18.1 4,904,291
21.3 4,904,292
21.4 4,904,293
106 4,904,294

CLASS 68

4 4,903,508
5 C 4,903,509

CLASS 70

202 4,903,510
252 4,903,511
379 R 4,903,512
422 4,903,513
456 R 4,903,514

CLASS 71

88 4,904,295
92 4,904,296
4,904,297
4,904,298
4,904,299
4,904,300
4,904,301
B1 4,753,672

CLASS 72

85 4,903,515
181 4,903,516
245 4,903,517
249 4,903,518
309 4,903,519
4,903,520
336 4,903,521
391 4,903,522

CLASS 73

1 DV 4,903,523
45.5 4,903,524
116 4,903,525
117.3 4,903,526
152 4,903,527
159 4,903,528
168 4,903,529
304 R 4,903,530
505 4,903,531
718 4,903,532
861.91 4,903,533
865.9 4,903,534

CLASS 74

89.1 4,903,535
89.22 4,903,536
125.5 4,903,537
417 4,903,538
479 4,903,539
493 4,903,540
501.5 R 4,903,541
551.8 4,903,542
567 4,903,543
574 4,903,544
606 R 4,903,545
4,903,546
867 4,903,549
869 4,903,550
4,903,551

CLASS 75

233 4,904,302

CLASS 76

36 4,903,552
37 4,903,553

CLASS 81

63 4,903,554
145 4,903,555
149 4,903,556
166 4,903,557
416 4,903,558

CLASS 83

24 4,903,559
277 4,903,560
811 4,903,561
833 4,903,562

CLASS 84

294 4,903,567
313 4,903,568
413 4,903,569
421 4,903,570
442 4,903,571
4,903,572
611 4,903,565
622 4,903,564
723 4,903,563
734 4,903,566

CLASS 86

50 4,903,573

CLASS 87

57 4,903,574

CLASS 89

34 4,903,575

CLASS 91

459 4,903,576
488 4,903,577
499 4,903,578

CLASS 92

86 4,903,579
158 4,903,580

CLASS 98

2.04 4,903,581
2.12 4,903,582
30 4,903,583
101 4,903,584

CLASS 99

275 4,903,585
287 4,903,586
325 4,903,587
348 4,903,588
4,903,589
487 4,903,590

CLASS 101

91 4,903,591
115 4,903,592
123 4,903,593
4,903,594
128.4 4,903,595
148 4,903,596
401.1 4,903,597
409 4,903,598
450.1 4,903,599
485 4,903,600
488 4,903,601

CLASS 102

213 4,903,602
293 4,903,603
364 4,903,604
377 4,903,605
401 4,903,606
504 4,903,607

CLASS 104

7.2 4,903,608
10 4,903,609
118 4,903,610
307 4,903,611

CLASS 105

18 4,903,612
167 4,903,613

CLASS 106

30 4,904,303
85 4,904,304
284 4,904,305

CLASS 108

19 4,903,614

CLASS 110

204 4,903,615
234 4,903,616
345 4,903,617

CLASS 111

118 4,903,618

CLASS 112

67 4,903,619
121.12 4,903,620
121.15 4,903,621
152 4,903,622
286 4,903,623
410 4,903,624
4,903,625

CLASS 114

56 4,903,626
270 4,903,627
312 4,903,628
361 4,903,629

CLASS 116

22 A 4,903,630

CLASS 118

63 4,903,631
123 4,903,632
268 4,903,633
653 4,903,634

CLASS 119

1 4,903,635
3 4,903,636
19 4,903,637
114 4,903,638
159 4,903,639

CLASS 122

6 A 4,903,640
33 4,903,641
401 4,903,642

CLASS 123

41.12 4,903,643
52 MC 4,903,644
4,903,645
55 VE 4,903,646
65 PE 4,903,647
65 R 4,903,648
73 A 4,903,649
90.17 4,903,650
90.46 4,903,651
193 C 4,903,652
195 P 4,903,653
196 W 4,903,654
198 C 4,903,655
259 4,903,656
339 4,903,657
4,903,658
4,903,659
4,903,660
383 4,903,661
418 4,903,662
425 4,903,663
4,903,664
435 4,903,665
447 4,903,666
463 4,903,667
478 4,903,668
4,903,669
489 4,903,670
4,903,671
520 4,903,672
617 4,903,673
634 4,903,674
635 4,903,675
639 4,903,676

CLASS 124

23 R 4,903,677
90 4,903,678

CLASS 125

11 R 4,903,679
13 R 4,903,680
4,903,681
16 R 4,903,682

CLASS 126

25 B 4,903,683
116 A 4,903,684
299 D 4,903,685
500 4,903,686

CLASS 127

46.1 4,904,306
63 4,904,307

CLASS 128

66 4,903,687
4,903,688
72 4,903,689
78 4,903,690
203.12 4,903,693
204.15 4,903,694
419 PG 4,903,699
4,903,700
4,903,701
419 R Re.33,170
642 4,903,702
653 A 4,903,703
4,903,704
654 4,903,705
745 4,903,706
748 4,903,707
749 4,903,708
754 4,903,709
849 4,903,710
874 4,903,711

CLASS 131

84.1 4,903,712
198.2 4,904,308
283 4,903,713
335 4,903,714

CLASS 132

270 4,903,715

CLASS 134

42 4,904,309
56 R 4,903,716
99 4,903,717
184 4,903,718

CLASS 137

15 4,903,719
38 4,903,720
209 4,903,722
312 4,903,723
414 4,903,724
454.5 4,903,725
505.13 4,903,726
596.16 4,903,727
4,903,728
4,903,729
614.03 4,903,730

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624.11 4,903,731
625.65 4,903,732
630.12 4,903,733
811 4,903,721

CLASS 138

31 4,903,734
133 4,903,735
154 4,903,736

CLASS 139

190 4,903,737
317 4,903,738
435.3 4,903,739

CLASS 141

1 4,903,740
350 4,903,741
353 4,903,742

CLASS 144

3 R 4,903,743
341 4,903,744

CLASS 148

4 4,904,310
24 4,904,311
110 4,904,312
113 4,904,313
4,904,314
245 4,904,315
318 4,904,316
431 4,904,317

CLASS 150

134 4,903,745

CLASS 152

216 4,903,746

CLASS 156

64 4,904,318
73.4 4,904,319
146 4,904,320
185 4,904,321
196 4,904,322
203 4,904,323
214 4,904,324
233 4,904,325
242 4,904,326
250 4,904,327
272.2 4,904,328
344 4,904,329
384 4,904,330
435 4,904,331
461 4,904,332
479 4,904,333
540 4,904,334
584 4,904,335
601 4,904,336
610 4,904,337
628 4,904,338
640 4,904,339
643 4,904,340
4,904,341

CLASS 160

117 4,903,747
370.2 4,903,748
4,903,749

CLASS 162

76 4,904,342
145 4,904,343
193 4,904,344

CLASS 164

150 4,903,750
480 4,903,751
488 4,903,752
493 4,903,753

CLASS 165

1 4,903,754
7 4,903,755
8 4,903,756
4,903,757
11.1 4,903,758
4,903,759
41 4,903,760
104.25 4,903,761
149 4,903,762
175 4,903,763

CLASS 166

78 4,903,764
162 4,903,765
270 4,903,766
4,903,767
4,903,768
272 4,903,769
288 4,903,770
292 4,903,771
299 4,903,772
303 4,903,773
363 4,903,774
373 4,903,775
382 4,903,776
387 4,903,777

CLASS 172

1 4,903,778
10 4,903,779
122 4,903,780
316 4,903,781
799.5 4,903,782

CLASS 173

12 4,903,783
116 4,903,784

CLASS 174

35 R 4,904,826
136 4,904,827

CLASS 175

293 4,903,785
367 4,903,786
410 4,903,787

CLASS 177

210 FP 4,903,788

CLASS 180

155 4,903,789
219 4,903,790
252 4,903,791
253 4,903,974
308 4,903,792

CLASS 181

0.5 4,903,793
131 4,903,794

CLASS 182

92 4,903,795
129 4,903,796
142 4,903,797

CLASS 184

6.24 4,903,798

CLASS 187

111 Re.33,171

CLASS 188

20 4,903,799
79.54 4,903,800
218 XL 4,903,801
273 4,903,802

CLASS 192

3.28 4,903,803
56 F 4,903,804
58 B 4,903,805
85 CA 4,903,806
98 4,903,807
4,903,808
4,903,809
103 B 4,903,810
106 F 4,903,811
106.2 4,903,812
4,903,813
107 C 4,903,814

CLASS 194

205 4,903,815
350 4,903,816

CLASS 196

46.1 4,904,345

CLASS 198

406 4,903,817
409 4,903,818
465.4 4,903,819
501 4,903,820
550.7 4,903,821
624 4,903,822
845 4,903,823
853 4,903,824

CLASS 200

16 B 4,904,828
50 R 4,904,829
84 R 4,904,830
269 4,904,831
402 4,904,832
557 4,904,833

CLASS 203

60 4,904,346
73 4,904,347

CLASS 204

4 4,904,348
27 4,904,349
28 4,904,350
4,904,351
32.1 4,904,352
37.1 4,904,353
40 4,904,354
58.5 4,904,355
59 R 4,904,370
64 R 4,904,356
73 R 4,904,357
105 R B1 4,666,575
111 4,904,358
181.7 4,904,360
4,904,361
192.12 4,904,362
202 4,904,363
224 R 4,904,364
299 EC 4,904,365
299 R 4,904,366

CLASS 206

0.8 4,903,825
63.3 4,903,826
204 4,903,827
221 4,903,828
310 4,903,829
328 4,903,830
347 4,903,831
366 4,903,832
407 4,903,833
410 4,903,834
416 4,903,835
419 4,903,836
440 4,903,837
459 4,903,838
554 4,903,839
581 4,903,840
604 4,903,841
4,903,842
609 4,903,843
631.1 4,903,844

CLASS 208

33 4,904,367
39 4,904,371
48 R 4,904,368
96 4,904,369
113 4,904,372

CLASS 209

166 4,904,374
4,904,375
167 4,904,373
215 4,904,376
380 4,904,377
400 4,904,378
517 B1 4,098,407
671 4,903,845

CLASS 210

169 4,904,379
193 4,904,380
223 4,904,381
236 4,904,382
269 4,904,383
309 4,904,384
490 4,904,385
602 4,904,386
605 4,904,387
4,904,388
637 4,904,389
664 4,904,390
695 4,904,391
708 4,904,392
712 4,904,393
739 4,904,394
741 4,904,395
745 4,904,396
791 4,904,397

CLASS 211

113 4,903,846
187 4,903,847

CLASS 215

227 4,903,848
256 4,903,849

CLASS 219

10.55 B 4,904,837
10.55 E 4,904,834
4,904,836
10.55 M 4,904,835
86.8 4,904,838
119 4,904,839
121.64 4,905,310
124.34 4,904,840
133 4,904,841
137 PS 4,904,843
137 R 4,904,842
203 4,904,844
271 4,903,850
283 4,904,845
341 4,904,846
370 4,904,847
387 4,904,848
413 4,904,849
548 4,904,850

CLASS 220

3.9 4,903,851
5 R 4,903,852
6 4,903,853
94 A 4,903,854
356 4,903,855
430 4,903,858
462 4,903,859

CLASS 221

4 4,903,860
265 4,903,861

CLASS 222

54 4,903,862
61 4,903,863
78 4,903,864
83.5 4,903,865
129 4,903,866
207 4,903,867
256 4,903,868
449 4,903,869
482 4,903,870

CLASS 223

38 4,903,871

CLASS 224

42.43 4,903,872
160 4,903,873
206 4,903,874
258 4,903,875
321 4,903,876

CLASS 225

93 4,903,877

CLASS 226

190 4,903,878
199 4,903,879

CLASS 227

8 4,903,880
143 4,903,881
147 4,903,882
178 4,903,697

CLASS 228

1.1 4,903,883
51 4,903,884
106 4,903,885
4,903,886
112 4,903,887
119 4,903,888
180.2 4,903,889
263.13 4,903,890

CLASS 229

48 T 4,903,891
120.14 4,903,892

CLASS 235

379 4,904,851
479 4,904,852
487 4,904,853

CLASS 236

1 A 4,903,893
492 4,903,894

CLASS 239

14.2 4,903,895
88 4,903,896
394 4,903,897
533.12 4,903,898

CLASS 241

14 4,903,899
30 4,903,900
33 4,903,901
84 4,903,902
101.7 4,903,903
154 4,903,904

CLASS 242

18 R 4,903,905
55.19 R 4,903,906
56 R 4,903,907
59 4,903,908
75.4 4,903,909
81 4,903,910
86 4,903,911
107.3 4,903,912
115 4,903,913
147 M 4,903,914
198 4,903,915
199 4,903,916

CLASS 244

3.21 4,903,917
158 R 4,903,918
161 4,903,919

CLASS 248

71 4,903,920
74.5 4,903,921
75 4,903,922
153 4,903,923
159 4,903,924
206.1 4,903,925
214 4,903,926
219.4 4,903,927
225.1 4,903,928
229 4,903,929
406.2 4,903,930
421 4,903,931
444 4,903,932
500 4,903,933
551 4,903,934

CLASS 250

201 4,904,854
4,904,855
4,904,856
205 4,904,857
211 J 4,904,858
4,904,859
213 VT 4,905,312
214 C 4,904,861
214 R 4,904,860
216 4,904,862
225 4,905,311
227 4,904,863
4,904,864
254 4,904,865
327.2 4,904,867
4,904,868
336.2 4,904,869
363.07 4,904,870
364 4,904,871
423 R 4,904,872
424 4,904,873
436 4,904,874
461.1 4,904,875
4,904,876
492.2 4,904,866
572 4,904,877
577 4,904,878

CLASS 251

9 4,903,935
14 4,903,936
26 4,903,937
61.5 4,903,938
63.4 4,903,939
129.16 4,903,940
148 4,903,941
149.1 4,903,942
235 4,903,943
240 4,903,944

CLASS 252

2 4,904,398
11 4,904,399
32.7 E 4,904,400
4,904,401
46.3 4,904,402
47.5 4,904,403
51.5 A 4,904,404
90 4,904,405
102 4,904,406
171 4,904,407
174.24 4,904,408
299.61 4,904,409
4,904,410
309 4,904,411
357 4,904,412
389.23 4,904,413
514 4,904,414
4,904,415
548 4,904,359
628 4,904,416

CLASS 254

28 4,903,945
45 4,903,946

CLASS 256

32 4,903,947
34 B1 4,512,556

CLASS 260

32 4,905,100

CLASS 261

35 4,904,418
64.1 4,904,419
91 4,905,116
92 4,904,420
112.2 4,905,313

CLASS 264

2.6 4,904,421
22 4,904,422
25 4,904,423
29.2 4,904,424
40.1 4,904,425
41 4,904,426
42 4,904,427
46.5 4,904,428
46.7 4,904,429
102 4,904,430
103 4,904,431
112 4,904,432
130 4,904,433
146 4,904,434
154 4,904,435
258 4,904,436
295 4,904,437
331.19 4,904,438
510 4,904,439
517 4,904,440

CLASS 266

220 4,903,948

CLASS 267

103 4,903,949
140.1 4,903,950
4,903,951

CLASS 270

53 4,903,952

CLASS 271

4 4,903,953
7 4,903,954
176 4,903,955
178 4,903,956
277 4,903,957

CLASS 272

27 N 4,903,958
29 4,903,959
70.3 4,903,960
72 4,903,961
123 4,903,962
130 4,903,963

CLASS 273

1.5 R 4,903,964
22 4,903,965
26 R 4,903,966
73 C 4,903,967
186 A 4,903,968
248 4,903,969

CLASS 277

9.5 4,903,970
152 4,903,971
171 4,903,972

CLASS 280

89 4,903,973
93 4,903,975
160 4,903,856
267 4,903,857
426 4,903,976
475 4,903,977
477 4,903,978
628 4,903,979
647 4,903,980
691 4,903,981
707 4,903,982
4,903,983
712 4,903,984
724 4,903,985
743 4,903,986
752 4,903,987
771 4,903,988

CLASS 282

9 R 4,903,989

CLASS 283

44 4,903,990
95 4,903,991

CLASS 285

24 4,903,992
4,903,993
26 4,903,994
38 4,903,995
39 4,903,996
43 4,903,997
156 4,903,998
197 4,903,999
305 4,904,000
316 4,904,001
4,904,002

CLASS 292

126 4,904,003
216 4,904,004
251.5 4,904,005
336.3 4,904,006
341.15 4,904,007

CLASS 293

120 4,904,008

CLASS 294

7 4,904,009
19.1 4,904,010
49 4,904,011
64.1 4,904,012

CLASS 296

97.4 4,904,013
146 4,904,014
180.3 4,904,015
180.5 4,904,016
181 4,904,017

CLASS 297

4 4,904,018
85 4,904,019
317 4,904,020
397 4,904,021
440 4,904,022

472 4,904,023

CLASS 299

39 4,904,024

CLASS 300

7 4,904,025

CLASS 303

10 4,904,026
35 4,904,027
110 4,904,028
116 4,904,029

CLASS 305

35 EB 4,904,030

CLASS 307

17 4,904,879
66 4,904,880
201 4,904,881
245 4,904,882
264 4,905,314
272.3 4,904,883
290 4,904,884
296.2 4,904,885
467 4,904,887
530 4,904,888
565 4,904,886
570 4,904,889

CLASS 310

59 4,904,890
62 4,904,891
217 4,904,892
260 4,904,893
328 4,904,894

CLASS 312

295 4,904,031
350 4,904,032

CLASS 313

336 4,904,895
337 4,904,896
346 R 4,904,897
449 4,904,898
477 R 4,904,899
491 4,904,900
509 4,904,901

CLASS 315

111.81 4,904,902
209 R 4,904,903
219 4,904,904
244 4,904,905
291 4,904,906
307 4,904,907

CLASS 318

258 4,904,909
282 4,904,908
445 4,904,910
560 4,904,913
561 4,904,912
567 4,904,914
568 4,904,915
568.24 4,904,911
640 4,905,315
649 4,904,916
696 4,904,917
762 4,904,918
798 4,904,919
800 4,904,920

CLASS 323

264 4,904,921
316 4,904,922
340 4,904,923
351 4,904,924
357 4,904,925
362 4,904,926

CLASS 324

71.6 4,904,929
77 E 4,904,930
96 4,904,931
133 4,904,932
158 F 4,904,933
4,904,934
159 F 4,904,935
174 4,904,936
207.18 4,904,941
207.21 4,904,937
212 4,904,938
229 4,904,939
244 4,904,940
319 4,905,316
323 4,904,942
344 4,904,943
454 4,904,944
547 4,904,945
551 4,904,946
636 4,904,928
642 4,904,927

CLASS 328

111 4,901,947
133 4,901,948
235 4,904,949

CLASS 329

341 4,904,950

CLASS 330

4.3 4,904,963
107 4,904,951
252 4,904,952
258 4,904,953
281 4,904,954

CLASS 331

2 4,904,955
4 4,904,956
11 4,904,957
17 4,904,958
111 4,904,959
4,904,960
112 4,904,961
117 R 4,904,962

CLASS 332

123 4,904,964

CLASS 333

1.1 4,904,965
120 4,904,966
185 4,904,967
246 4,904,968

CLASS 335

167 4,904,969
216 4,904,970
4,904,971

CLASS 336

55 4,904,972
69 4,904,973
192 4,904,974
4,904,975

CLASS 337

197 4,904,976
281 4,904,977

CLASS 338

47 4,904,978
132 4,904,979
307 4,904,980

CLASS 340

323 R 4,904,981
326 4,904,982
426 4,904,983
543 4,904,984
573 4,904,985
578 4,904,986
611 4,904,987
628 4,904,988
719 4,904,989
744 4,904,994
814 4,904,990
815.15 4,904,991
825.44 4,904,992
825.570 4,904,993
870.02 4,904,995
870.07 4,904,996
870.17 4,904,997
908.1 4,904,998
945 4,904,999
968 4,905,000

CLASS 341

20 4,905,001
51 4,905,317
77 4,905,002
110 4,905,003
116 4,905,004
139 4,905,005
150 4,905,006
173 4,905,007

CLASS 342

22 4,905,008
118 4,905,009
151 4,905,010
361 4,905,011
399 4,905,012

CLASS 343

786 4,905,013
909 4,905,014

CLASS 346

1.1 4,905,015
4,905,017
75 4,905,018
4,905,019
76 PH 4,905,020
107 R 4,905,021
108 4,905,022
4,905,023
140 R 4,905,024
154 4,905,025
155 4,905,026
160 4,905,027
4,905,028

CLASS 350

3.69 4,904,033
3.71 4,904,034
96.11 4,904,036
96.12 4,904,037
96.14 4,904,038
4,904,039
96.15 4,904,040
4,904,041
96.16 4,904,042
96.18 4,904,043
4,904,044
96.19 4,904,045
96.2 4,904,035
96.20 4,904,046
96.23 4,904,047
96.26 4,904,048
96.27 4,904,049
96.29 4,904,050
96.30 4,904,051
96.33 4,904,052
96.34 4,904,053
253 4,904,054
272 4,904,055
333 4,904,056
4,904,057
335 4,904,058
339 D 4,904,060
339 F 4,904,061
339 R 4,904,059
347 V 4,904,063
350 S 4,904,064
4,904,065
4,904,066
358 4,904,067
421 4,904,068
432 4,904,062
452 4,904,069
454 4,904,070
568 4,904,071
607 4,904,072
613 4,904,073
635 4,904,074

CLASS 351

114 4,904,075
138 4,904,076
141 4,904,077
158 4,904,078

CLASS 353

122 4,904,079

CLASS 354

76 4,905,029
82 4,905,030
195.1 4,905,031
402 4,905,032
4,905,033
403 4,905,034
432 4,905,035

CLASS 355

27 4,905,036
4,905,037
4,905,038
35 4,905,039
43 4,905,040
53 4,905,041
56 4,905,042
71 4,905,043
206 4,905,044
229 4,905,045
235 4,905,046
256 4,905,047
271 4,905,048
284 4,905,049
290 4,905,050
4,905,051
312 4,905,052
319 4,905,053
324 4,905,054
4,905,055

CLASS 356

133 4,904,080
152 4,904,081
345 4,904,082
350 4,904,083
360 4,904,084
364 4,904,085
400 4,904,086
4,904,087
402 4,904,088

CLASS 357

4 4,905,056
14 4,905,071
17 4,905,057
4,905,058
4,905,059
4,905,060
4,905,061
23.15 4,905,066
23.5 4,905,062
4,905,063
23.6 4,905,064
4,905,065
27 4,905,318
34 4,905,078
48 4,905,067
51 4,905,070
59 4,905,072
65 4,905,319
67 4,905,073
4,905,074
68 4,905,068
72 4,905,069
74 4,905,075

CLASS 358

3 4,905,076
22 4,905,077
78 4,905,079
84 4,905,080
88 4,905,081
98 4,905,082
139 4,905,083
141 4,905,084
148 4,905,085
186 4,905,086
191.1 4,905,087
213.13 4,905,088
247 4,905,089
296 4,905,090
4,905,091
4,905,092
335 4,905,093
342 4,905,094
451 4,905,095
4,905,096
456 4,905,097
468 4,905,098

CLASS 360

10.1 4,905,099
36.2 4,905,101
46 4,905,102
64 4,905,103
70 4,905,104
74.2 4,905,105
74.6 4,905,106
75 4,905,107
77.02 4,905,109
77.14 4,905,108
99.08 4,905,110
126 4,905,111
132 4,905,112
4,905,113
4,905,114

CLASS 361

92 4,905,115
93 4,905,117
117 4,905,118
119 4,905,119
159 4,905,121
376 4,905,122
388 4,905,123
395 4,905,124

CLASS 362

61 4,905,125
4,905,126
109 4,905,127
4,905,128
158 4,905,129
203 4,905,130
249 4,905,131
294 4,905,132
346 4,905,133

CLASS 363

98 4,905,134
4,905,135
124 4,905,136

CLASS 364

1.1 4,905,016
200 4,905,137
4,905,138
4,905,139
4,905,140
4,905,141
4,905,142
4,905,143
4,905,144
4,905,145
300 4,905,146
4,905,200
410 4,905,147
413.1 4,905,148
413.26 4,905,150
414.13 4,905,149
424.02 4,905,151
424.05 4,905,152
426.04 4,905,153
4,905,154
45 4,905,246
49 4,905,245
55 4,905,247
56 4,905,248
59 4,905,249
86 4,905,250
500 4,905,160
510 4,905,161
513 4,905,162
4,905,163
518 4,905,164
4,905,165
4,905,166
521 4,905,167
4,905,168
525 4,905,169
551.01 4,905,171
556 4,905,170
580 4,905,172
708 4,905,173
709.11 4,905,174
715.08 4,905,175
717 4,905,176
721 4,905,177
748 4,905,178
786 4,905,179
787 4,905,180
900 4,905,181
4,905,182
4,905,183
4,905,184
4,905,185
4,905,186
4,905,187
4,905,188
4,905,189
4,905,190

CLASS 365

149 4,905,193
185 4,905,194
189.05 4,905,195
200 4,905,192
4,905,196
204 4,905,197
222 4,905,198
226 4,905,199
230.03 4,905,201

CLASS 366

6 4,904,089

CLASS 367

4 4,905,202
8 4,905,203
25 4,905,204
62 4,905,205
77 4,905,206
90 4,905,207
99 4,905,208
4,905,209
125 4,905,210
128 4,905,211
134 4,905,212
4,905,213

CLASS 368

10 4,905,215
4,905,214

CLASS 369

14 4,905,216
112 4,905,217
291 4,905,218
3 4,905,219
4 4,905,220
16 4,905,221
18 4,905,222
58.1 4,905,223
58.2 4,905,224
60 4,905,225
66 4,905,226
67 4,905,227
84 4,905,228
85.5 4,905,230
85.7 4,905,229
94.1 4,905,231
4,905,232
4,905,233
4,905,234
95.3 4,905,235
110.1 4,905,236
4,905,237
112 4,905,238
123 4,905,239

CLASS 371

21.2 4,905,191
22.1 4,905,240
22.5 4,905,241
40.1 4,905,242

CLASS 372

32 4,905,243
4,905,244
45 4,905,246
49 4,905,245
55 4,905,247
56 4,905,248
59 4,905,249
86 4,905,250
87 4,905,251
94 4,905,252
96 4,905,253

CLASS 374

124 4,904,090
179 4,904,091

CLASS 375

14 4,905,254
17 4,905,255
48 4,905,256
87 4,905,257
117 4,905,258
122 4,905,259

CLASS 376

101 4,904,441
203 4,904,442
4,905,260
233 4,904,443
261 4,904,444

CLASS 377

19 4,905,261
44 4,905,262

CLASS 378

89 4,905,263
99 4,905,264
4,905,265
158 4,905,268
177 4,905,266
182 4,905,269
208 4,905,267

CLASS 379

58 4,905,270
4,905,271
62 4,905,272
93 4,905,273
157 4,905,274
327 4,905,275
450 4,905,276

CLASS 380

4 4,905,277
7 4,905,278
9 4,905,279
16 4,905,280
25 4,905,281
48 4,905,282

CLASS 381

22 4,905,283
27 4,905,284
41 4,905,285
43 4,905,286
4,905,287
4,905,288
51 4,905,289
83 4,905,290
108 4,905,291

CLASS 382

1 4,905,292
4 4,905,293
9 4,905,294
21 4,905,295
42 4,905,296
56 4,905,297

CLASS 383

35 4,904,092
95 4,905,298
120 4,904,093

CLASS 384

492 4,904,094
517 4,904,095
585 4,905,299

CLASS 388

800 4,905,300

CLASS 400

120 4,904,096
248 4,904,097
4,904,098
4,904,099
613 4,904,100

CLASS 401

52 4,904,101

CLASS 402

34 4,904,102
35 4,904,103
80 R 4,904,104

CLASS 403

24 4,904,105
39 4,904,106
122 4,904,107
173 4,904,108
374 4,904,109
379 4,904,110

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CLASS 404

48	4,904,111

CLASS 405

45	4,904,112
	4,904,113
82	4,904,114
143	4,904,115
183	4,904,116
189	4,904,117
195	4,904,118
228	4,904,119
258	4,904,120
	4,904,121
259	B1 4,666,344
260	4,904,122
261	4,904,123
262	4,904,124
264	4,904,125

CLASS 406

39	4,904,126
50	4,904,127
195	4,904,128

CLASS 407

21	4,904,129

CLASS 408

16	4,904,130

CLASS 409

216	4,904,131

CLASS 411

13	4,904,132
43	4,904,133
54	4,904,134
55	4,904,135
82	4,904,136
396	4,904,145
501	4,904,137

CLASS 412

8	4,904,138
37	4,904,139

CLASS 413

56	4,904,140

CLASS 414

8	4,904,141
142.6	4,904,142
217	4,904,143
383	4,904,144
563	4,904,146
608	4,904,147
680	4,904,148
695.6	4,904,149
719	4,904,150
727	4,904,151
730	4,904,152
735	4,904,153
786	4,904,154

CLASS 415

90	4,904,155
190	4,904,156

CLASS 416

46	4,904,157
183	4,904,158
	4,904,159
193 A	4,904,160

CLASS 417

22	4,904,161
44	4,904,162
53	4,904,163
308	4,904,164
312	4,904,165
360	4,904,166
395	4,904,167
477	4,904,168

CLASS 418

55	4,904,169
	4,904,170

CLASS 419

13	4,904,445
	4,904,446

CLASS 420

95	4,904,447

CLASS 422

56	4,904,448
87	4,904,449
113	4,904,450
133	4,904,451
146	4,904,452
148	4,904,453
151	4,904,454
201	4,904,455
220	4,904,456

CLASS 423

115	4,904,457
277	4,904,458
305	4,904,459
347	4,904,460
478	4,904,461

CLASS 424

1.1	4,904,462
44	4,904,463
45	4,904,464
70	4,904,465
76.3	4,904,466
85.2	4,904,467
85.8	4,904,481
89	4,904,468
94.3	4,904,469
119	4,904,470
195.1	4,904,471
424	4,904,474
438	4,904,473
449	4,904,475
456	4,904,476
465	4,904,477
468	4,904,478
490	4,904,479
667	4,904,480

CLASS 425

97	4,904,171
140	4,904,172
149	4,904,173
174.4	4,904,175
174.8 E	4,904,174
391	4,904,176
406	4,904,177
667	4,904,178

CLASS 426

3	4,904,482
44	4,904,483
45	4,904,484
62	4,904,485
69	4,904,486
107	4,904,487
	4,904,488
111	4,904,489
243	4,904,490
502	4,904,491
523	4,904,492
549	4,904,493
646	4,904,494
	4,904,495
	4,904,496

CLASS 427

47	4,904,497
53.1	4,904,498
207.1	4,904,499
248.1	4,904,500
253	4,904,501
314	4,904,502
373	4,904,503
387	4,904,504
424	4,904,505
443.1	4,904,506

CLASS 428

29	4,904,507
31	4,904,508
36.6	4,904,509
36.7	4,904,512
46	4,904,513
53	4,904,514
67	4,904,515
70	4,904,510
133	4,904,511
167	4,904,517
195	4,904,518
203	4,904,519
212	4,904,520
241	B1 4,595,627
284	4,904,521
288	4,904,522
	4,904,523
311.3	4,904,524
328	4,904,525
	4,904,526
334	4,904,527
336	4,904,528
377	4,904,529
402	4,904,530
404	4,904,531
408	4,904,532
426	4,904,533
457	4,904,534
463	4,904,535
515	4,904,536
548	4,904,537
552	4,904,538
572	4,904,539
606	4,904,540
608	4,904,541
610	4,904,542
	4,904,543
658	4,904,544
659	4,904,545
661	4,904,546

CLASS 429

22	4,904,547
	4,904,548
97	4,904,549
163	4,904,550
181	4,904,551
197	4,904,552
213	4,904,553

CLASS 430

2	4,904,554
25	4,904,555
31	4,904,556
39	Re.33,172
56	4,904,557
110	4,904,762
122	4,904,558
128	4,904,559
137	4,904,560
138	4,904,561
	4,904,562
	4,904,563
156	4,904,564
264	4,904,565
270	4,904,566
	4,904,567
294	4,904,568
311	4,904,569
331	4,904,571
332	4,904,572
351	4,904,573
372	4,904,574
385	4,904,575
495	4,904,576
	4,904,577
507	4,904,578
551	4,904,579
567	4,904,580

CLASS 431

2	4,904,179
153	4,904,180
314	4,904,181
354	4,904,182

CLASS 432

15	B1 4,444,553

CLASS 433

3	4,904,183
72	4,904,184
164	4,904,185
172	4,904,186
173	4,904,187
215	4,904,188

CLASS 435

5	4,904,581
6	4,904,582
7	4,904,583
69.4	4,904,584
88	4,904,585
105	4,904,587
	4,904,588
114	4,904,586
145	4,904,589
147	4,904,590
172.3	4,904,591
183	4,904,592
191	4,904,602
197	4,904,593
201	4,904,594
240.2	4,904,595
240.27	4,904,596
252.1	4,904,597
252.3	4,904,598
252.33	4,904,599
299	4,904,600
314	4,904,601

CLASS 436

25	4,904,603
140	4,904,604
169	4,904,605
177	4,904,606

CLASS 437

3	4,904,607
	4,904,608
6	4,904,609
15	4,904,610
21	4,904,611
31	4,904,612
41	4,904,613
	4,904,614
52	4,904,615
81	4,904,616
129	4,904,617
150	4,904,618
190	4,904,619
200	4,904,620
225	4,904,621

CLASS 439

13	4,904,189
15	4,904,190
68	4,904,191
78	4,904,192
92	4,904,193
101	4,904,194
173	4,904,195
188	4,904,196
260	4,904,197
281	4,904,198
304	4,904,199
349	4,904,200
352	4,904,201
372	4,904,202
399	4,904,203
425	4,904,204
504	4,904,205
578	4,904,206
585	4,904,207
654	4,904,208
676	4,904,209
	4,904,210
719	4,904,211
751	4,904,212
824	4,904,213

CLASS 440

83	4,904,214

CLASS 441

79	4,904,215

CLASS 445

7	4,904,216
34	4,904,217
47	4,904,218

CLASS 446

36	4,904,219
227	4,904,220
397	4,904,221
405	4,904,222

CLASS 453

7	4,904,223

CLASS 455

34	4,905,301
	4,905,302
45	4,905,303
89	4,905,304
183	4,905,305
191	4,905,306
209	4,905,307
226	4,905,308
603	4,905,309

CLASS 460

59	4,904,224

CLASS 464

67	4,904,225
68	4,904,226
111	4,904,227
152	4,904,228

CLASS 474

12	4,904,229
112	4,904,230
214	4,904,231
238	4,904,232

CLASS 475

59	4,903,548
84	4,903,547

CLASS 480

322	4,904,570

CLASS 493

195	Re.33,173

CLASS 501

88	4,904,622
96	4,904,623
97	4,904,624
98	4,904,625
	4,904,626

CLASS 502

63	4,904,627
119	4,904,630
120	4,904,631
121	4,904,628
158	4,904,632
164	4,904,629
304	4,904,633
401	4,904,634

CLASS 503

207	4,904,635
	4,904,636
218	4,904,637

CLASS 505

1	4,904,638

CLASS 512

4	4,904,639
8	4,904,640

CLASS 514

2	4,904,641
11	4,904,642
21	4,904,643
29	4,904,644
65	4,904,645
120	4,904,646
154	4,904,647
171	4,904,648
174	4,904,649
177	4,904,650
183	4,904,651
206	4,904,652
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427	4,904,691
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464	4,904,693
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521	4,904,696
594	4,904,697
629	4,904,698
642	4,904,699
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CLASS 518

700	4,904,700

CLASS 521

32	4,904,701
88	4,904,702
135	4,904,703
156	4,904,704
163	4,904,705
164	4,904,706
	4,904,707

CLASS 522

5	4,904,708

CLASS 523

137	4,904,710
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435	4,904,761
466	4,904,711

CLASS 524

68	4,904,713
91	4,904,712
100	4,904,714
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169	4,904,718
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392	4,904,717
394	4,904,723
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820	4,904,727

CLASS 525

64	4,904,728
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391	4,904,744
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439	4,904,747
444	4,904,748

CLASS 526

201	4,904,749
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CLASS 528

45	4,904,751
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353	4,904,758
392	4,904,759
422	4,904,760

CLASS 530

324	4,904,763

CLASS 534

564	4,904,764
573	4,904,765
642	4,904,766
696	4,904,767
738	4,904,777

CLASS 536

17.1	4,904,768
17.2	4,904,769
23	4,904,770
55	4,904,771
90	4,904,772
103	4,904,773
127	4,904,774

CLASS 540

230	4,904,776
363	4,904,775

CLASS 544

180	4,904,779
211	4,904,780
222	4,904,781
237	4,904,782
320	4,904,783
323	4,904,778

CLASS 546

90	4,904,784
118	4,904,785
152	4,904,786
155	4,904,787
248	4,904,788
321	4,904,789
333	4,904,790

CLASS 548

194	4,904,791
205	4,904,792
262	4,904,793
377	4,904,794
406	4,904,795
426	4,904,796
448	4,904,797
472	4,904,798
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513	4,904,800
521	4,904,801
546	4,904,802
548	4,904,803
554	4,904,804

CLASS 549

319	4,904,805
509	4,904,806
534	4,904,807

CLASS 556

21	4,904,808
137	4,904,809

CLASS 558

281	4,904,810
301	4,904,811
310	4,904,812
386	4,904,813

CLASS 560

44	4,904,816

75	4,904,815
80	4,904,817
85	4,904,818
118	4,904,819
121	4,904,820
204	4,904,814

CLASS 562

6	4,904,821
84	4,904,825
401	4,904,822
470	4,904,823
583	4,904,824
849	4,904,417

CLASS 600

25	4,904,233

CLASS 604

5	4,904,234
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9	4,904,236
28	4,904,237
43	4,904,238
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329	4,904,248
378	4,904,249
379	4,904,250
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385.2	4,904,251
389	4,904,253

CLASS 606

4	4,903,695
37	4,903,696
70	4,903,691
99	4,903,692
235	4,903,698

CLASS 623

2	4,904,254
3	4,904,255
14	4,904,256
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38	4,904,270
65	4,904,271
66	4,904,272

CLASSIFICATION OF DESIGNS

D2—	220	306,230		376	306,254		307	306,279		144.1	306,302		120	306,324	
	314	306,231	D9—	305	306,255	D13—	3	306,280		199	306,303		124	306,325	D25—
	320	306,232			306,256		8	306,281	D16—	130	306,304		148	306,326	
D3—	62	306,233		384	306,257		28	306,282		200	306,305		166	306,327	
	75	306,215		385	306,259	D14—	100	306,283			306,306		177	306,328	D26—
D4—	104	306,216		391	306,260		102	306,284		209	306,307		191	306,329	
D6—	380	306,237		393	306,261		106	306,285			306,308		194	306,330	D28—
	397	306,238		396	306,262		109	306,286			306,309			306,331	
	430	306,239		428	306,263		113	306,287	D18—	4	306,310		196	306,332	
	448	306,240		432	306,264		115	306,288		7	306,311		219	306,333	
	465	306,241		435	306,265		126	306,289		14	306,312			306,334	
	482	306,242		447	306,258			306,290		24	306,313		234	306,335	
	485	306,243			306,266		138	306,291	D19—	1	306,314	D23—	207	306,338	
	522	306,244	D11—	11	306,268		143	306,292		36	306,315			306,339	
	601	306,245		15	306,269		148	306,293			306,316		209	306,340	
D7—	300	306,246		16	306,270			306,294		56	306,317		252	306,336	
	401.1	306,257		93	306,271		149	306,295		75	306,234			306,337	D29—
D8—	8	306,247		212	306,272		151	306,296			306,318		325	306,341	
	30	306,248	D12—	91	306,273		163	306,297		77	306,319		332	306,342	D32—
	61	306,249			306,274		245	306,298	D20—	10	306,320	D24—	17	306,343	
	70	306,250		110	306,275		251	306,299		11	306,321		36	306,344	
	302	306,251		147	306,276	D15—	5	306,300	D21—	24	306,322		38	306,345	D34—
	331	306,252		189	306,277		23	306,301		63	306,323		46	306,346	
		306,253		203	306,278										

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	306,244	08 :	306,321		306,295		306,278		306,258	47 :	306,232
	306,250	09 :	306,246		306,299		306,335		306,320		306,237
	306,251		306,257		306,305		306,348		306,326	48 :	306,254
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	306,339		306,351	26 :	306,240						

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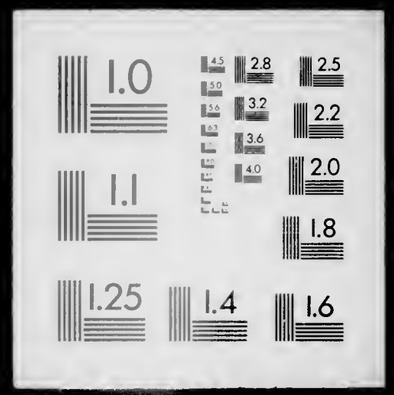
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